



# **Hardware Guide for Avaya Communication Manager**

555-245-207  
Issue 3  
January 2005

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#### Notice

Every effort was made to ensure that the information in this document was complete and accurate at the time of printing. However, information is subject to change.

#### Warranty

Avaya Inc. provides a limited warranty on this product. Refer to your sales agreement to establish the terms of the limited warranty. In addition, Avaya's standard warranty language as well as information regarding support for this product, while under warranty, is available through the following Web site: <http://www.avaya.com/support>.

#### Preventing Toll Fraud

"Toll fraud" is the unauthorized use of your telecommunications system by an unauthorized party (for example, a person who is not a corporate employee, agent, subcontractor, or is not working on your company's behalf). Be aware that there may be a risk of toll fraud associated with your system and that, if toll fraud occurs, it can result in substantial additional charges for your telecommunications services.

#### Avaya Fraud Intervention

If you suspect that you are being victimized by toll fraud and you need technical assistance or support, in the United States and Canada, call the Technical Service Center's Toll Fraud Intervention Hotline at 1-800-643-2353.

#### Disclaimer

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#### How to Get Help

For additional support telephone numbers, go to the Avaya support Web site: <http://www.avaya.com/support>. If you are:

- Within the United States, click the *Escalation Management* link. Then click the appropriate link for the type of support you need.
- Outside the United States, click the *Escalation Management* link. Then click the *International Services* link that includes telephone numbers for the international Centers of Excellence.

#### Providing Telecommunications Security

Telecommunications security (of voice, data, and/or video communications) is the prevention of any type of intrusion to (that is, either unauthorized or malicious access to or use of) your company's telecommunications equipment by some party.

Your company's "telecommunications equipment" includes both this Avaya product and any other voice/data/video equipment that could be accessed via this Avaya product (that is, "networked equipment").

An "outside party" is anyone who is not a corporate employee, agent, subcontractor, or is not working on your company's behalf. Whereas, a "malicious party" is anyone (including someone who may be otherwise authorized) who accesses your telecommunications equipment with either malicious or mischievous intent.

Such intrusions may be either to/through synchronous (time-multiplexed and/or circuit-based), or asynchronous (character-, message-, or packet-based) equipment, or interfaces for reasons of:

- Utilization (of capabilities special to the accessed equipment)
- Theft (such as, of intellectual property, financial assets, or toll facility access)
- Eavesdropping (privacy invasions to humans)
- Mischief (troubling, but apparently innocuous, tampering)
- Harm (such as harmful tampering, data loss or alteration, regardless of motive or intent)

Be aware that there may be a risk of unauthorized intrusions associated with your system and/or its networked equipment. Also realize that, if such an intrusion should occur, it could result in a variety of losses to your company (including but not limited to, human/data privacy, intellectual property, material assets, financial resources, labor costs, and/or legal costs).

#### Responsibility for Your Company's Telecommunications Security

The final responsibility for securing both this system and its networked equipment rests with you - Avaya's customer system administrator, your telecommunications peers, and your managers. Base the fulfillment of your responsibility on acquired knowledge and resources from a variety of sources including but not limited to:

- Installation documents
- System administration documents
- Security documents
- Hardware-/software-based security tools
- Shared information between you and your peers
- Telecommunications security experts

To prevent intrusions to your telecommunications equipment, you and your peers should carefully program and configure:

- Your Avaya-provided telecommunications systems and their interfaces
- Your Avaya-provided software applications, as well as their underlying hardware/software platforms and interfaces
- Any other equipment networked to your Avaya products

#### TCP/IP Facilities

Customers may experience differences in product performance, reliability and security depending upon network configurations/design and topologies, even when the product performs as warranted.

#### Standards Compliance

Avaya Inc. is not responsible for any radio or television interference caused by unauthorized modifications of this equipment or the substitution or attachment of connecting cables and equipment other than those specified by Avaya Inc. The correction of interference caused by such unauthorized modifications, substitution or attachment will be the responsibility of the user. Pursuant to Part 15 of the Federal Communications Commission (FCC) Rules, the user is cautioned that changes or modifications not expressly approved by Avaya Inc. could void the user's authority to operate this equipment.

#### Product Safety Standards

This product complies with and conforms to the following international Product Safety standards as applicable:

Safety of Information Technology Equipment, IEC 60950, 3rd Edition, or IEC 60950-1, 1st Edition, including all relevant national deviations as listed in Compliance with IEC for Electrical Equipment (IECEE) CB-96A.

Safety of Information Technology Equipment, CAN/CSA-C22.2 No. 60950-00 / UL 60950, 3rd Edition, or CAN/CSA-C22.2 No. 60950-1-03 / UL 60950-1.

Safety Requirements for Information Technology Equipment, AS/NZS 60950:2000.

One or more of the following Mexican national standards, as applicable: NOM 001 SCFI 1993, NOM SCFI 016 1993, NOM 019 SCFI 1998.

The equipment described in this document may contain Class 1 LASER Device(s). These devices comply with the following standards:

- EN 60825-1, Edition 1.1, 1998-01
- 21 CFR 1040.10 and CFR 1040.11.

The LASER devices used in Avaya equipment typically operate within the following parameters:

Typical Center Wavelength	Maximum Output Power
830 nm - 860 nm	-1.5 dBm
1270 nm - 1360 nm	-3.0 dBm
1540 nm - 1570 nm	5.0 dBm

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Klass 1 Laser Apparat

Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposures. Contact your Avaya representative for more laser product information.

### Electromagnetic Compatibility (EMC) Standards

This product complies with and conforms to the following international EMC standards and all relevant national deviations:

Limits and Methods of Measurement of Radio Interference of Information Technology Equipment, CISPR 22:1997, EN55022:1998, and AS/NZS 3548.

Information Technology Equipment - Immunity Characteristics - Limits and Methods of Measurement, CISPR 24:1997 and EN55024:1998, including:

- Electrostatic Discharge (ESD) IEC 61000-4-2
- Radiated Immunity IEC 61000-4-3
- Electrical Fast Transient IEC 61000-4-4
- Lightning Effects IEC 61000-4-5
- Conducted Immunity IEC 61000-4-6
- Mains Frequency Magnetic Field IEC 61000-4-8
- Voltage Dips and Variations IEC 61000-4-11

Power Line Emissions, IEC 61000-3-2: Electromagnetic compatibility (EMC) - Part 3-2: Limits - Limits for harmonic current emissions.

Power Line Emissions, IEC 61000-3-3: Electromagnetic compatibility (EMC) - Part 3-3: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems.

### Federal Communications Commission Statement

#### Part 15:

**Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.**

#### Part 68: Answer-Supervision Signaling

Allowing this equipment to be operated in a manner that does not provide proper answer-supervision signaling is in violation of Part 68 rules. This equipment returns answer-supervision signals to the public switched network when:

- answered by the called station,
- answered by the attendant, or
- routed to a recorded announcement that can be administered by the customer premises equipment (CPE) user.

This equipment returns answer-supervision signals on all direct inward dialed (DID) calls forwarded back to the public switched telephone network. Permissible exceptions are:

- A call is unanswered.
- A busy tone is received.
- A reorder tone is received.

Avaya attests that this registered equipment is capable of providing users access to interstate providers of operator services through the use of access codes. Modification of this equipment by call aggregators to block access dialing codes is a violation of the Telephone Operator Consumers Act of 1990.

#### REN Number

##### For MCC1, SCC1, CMC1, G600, and G650 Media Gateways:

This equipment complies with Part 68 of the FCC rules. On either the rear or inside the front cover of this equipment is a label that contains, among other information, the FCC registration number, and ringer equivalence number (REN) for this equipment. If requested, this information must be provided to the telephone company.

##### For G350 and G700 Media Gateways:

This equipment complies with Part 68 of the FCC rules and the requirements adopted by the ACTA. On the rear of this equipment is a label that contains, among other information, a product identifier in the format US:AAAEQ##TXXXX. The digits represented by ## are the ringer equivalence number (REN) without a decimal point (for example, 03 is a REN of 0.3). If requested, this number must be provided to the telephone company.

##### For all media gateways:

The REN is used to determine the quantity of devices that may be connected to the telephone line. Excessive RENs on the telephone line may result in devices not ringing in response to an incoming call. In most, but not all areas, the sum of RENs should not exceed 5.0. To be certain of the number of devices that may be connected to a line, as determined by the total RENs, contact the local telephone company.

REN is not required for some types of analog or digital facilities.

### Means of Connection

Connection of this equipment to the telephone network is shown in the following tables.

#### For MCC1, SCC1, CMC1, G600, and G650 Media Gateways:

Manufacturer's Port Identifier	FIC Code	SOC/REN/A.S. Code	Network Jacks
Off premises station	OL13C	9.0F	RJ2GX, RJ21X, RJ11C
DID trunk	02RV2-T	0.0B	RJ2GX, RJ21X
CO trunk	02GS2	0.3A	RJ21X
	02LS2	0.3A	RJ21X
Tie trunk	TL31M	9.0F	RJ2GX
Basic Rate Interface	02IS5	6.0F, 6.0Y	RJ49C
1.544 digital interface	04DU9-BN	6.0F	RJ48C, RJ48M
	04DU9-IKN	6.0F	RJ48C, RJ48M
	04DU9-ISN	6.0F	RJ48C, RJ48M
120A4 channel service unit	04DU9-DN	6.0Y	RJ48C

#### For G350 and G700 Media Gateways:

Manufacturer's Port Identifier	FIC Code	SOC/REN/A.S. Code	Network Jacks
Ground Start CO trunk	02GS2	1.0A	RJ11C
DID trunk	02RV2-T	AS.0	RJ11C
Loop Start CO trunk	02LS2	0.5A	RJ11C
1.544 digital interface	04DU9-BN	6.0Y	RJ48C
	04DU9-DN	6.0Y	RJ48C
	04DU9-IKN	6.0Y	RJ48C
	04DU9-ISN	6.0Y	RJ48C
Basic Rate Interface	02IS5	6.0F	RJ49C

#### For all media gateways:

If the terminal equipment (for example, the media server or media gateway) causes harm to the telephone network, the telephone company will notify you in advance that temporary discontinuance of service may be required. But if advance notice is not practical, the telephone company will notify the customer as soon as possible. Also, you will be advised of your right to file a complaint with the FCC if you believe it is necessary.

The telephone company may make changes in its facilities, equipment, operations or procedures that could affect the operation of the equipment. If this happens, the telephone company will provide advance notice in order for you to make necessary modifications to maintain uninterrupted service.

If trouble is experienced with this equipment, for repair or warranty information, please contact the Technical Service Center at 1-800-242- 2121 or contact your local Avaya representative. If the equipment is causing harm to the telephone network, the telephone company may request that you disconnect the equipment until the problem is resolved.

A plug and jack used to connect this equipment to the premises wiring and telephone network must comply with the applicable FCC Part 68 rules and requirements adopted by the ACTA. A compliant telephone cord and modular plug is provided with this product. It is designed to be connected to a compatible modular jack that is also compliant. It is recommended that repairs be performed by Avaya certified technicians.

The equipment cannot be used on public coin phone service provided by the telephone company. Connection to party line service is subject to state tariffs. Contact the state public utility commission, public service commission or corporation commission for information.

This equipment, if it uses a telephone receiver, is hearing aid compatible.

#### **Canadian Department of Communications (DOC) Interference Information**

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

This equipment meets the applicable Industry Canada Terminal Equipment Technical Specifications. This is confirmed by the registration number. The abbreviation, IC, before the registration number signifies that registration was performed based on a Declaration of Conformity indicating that Industry Canada technical specifications were met. It does not imply that Industry Canada approved the equipment.

#### **Installation and Repairs**

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations.

Repairs to certified equipment should be coordinated by a representative designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

#### **Declarations of Conformity**

United States FCC Part 68 Supplier's Declaration of Conformity (SDoC)

Avaya Inc. in the United States of America hereby certifies that the equipment described in this document and bearing a TIA TSB-168 label identification number complies with the FCC's Rules and Regulations 47 CFR Part 68, and the Administrative Council on Terminal Attachments (ACTA) adopted technical criteria.

Avaya further asserts that Avaya handset-equipped terminal equipment described in this document complies with Paragraph 68.316 of the FCC Rules and Regulations defining Hearing Aid Compatibility and is deemed compatible with hearing aids.

Copies of SDoCs signed by the Responsible Party in the U. S. can be obtained by contacting your local sales representative and are available on the following Web site: <http://www.avaya.com/support>.

All Avaya media servers and media gateways are compliant with FCC Part 68, but many have been registered with the FCC before the SDoC process was available. A list of all Avaya registered products may be found at: <http://www.part68.org> by conducting a search using "Avaya" as manufacturer.

#### **European Union Declarations of Conformity**



Avaya Inc. declares that the equipment specified in this document bearing the "CE" (*Conformité Européenne*) mark conforms to the European Union Radio and Telecommunications Terminal Equipment Directive (1999/5/EC), including the Electromagnetic Compatibility Directive (89/336/EEC) and Low Voltage Directive (73/23/EEC).

Copies of these Declarations of Conformity (DoCs) can be obtained by contacting your local sales representative and are available on the following Web site: <http://www.avaya.com/support>.

#### **Japan**

This is a Class A product based on the standard of the Voluntary Control Council for Interference by Information Technology Equipment (VCCI). If this equipment is used in a domestic environment, radio disturbance may occur, in which case, the user may be required to take corrective actions.

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に基づくクラスA情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

#### **To order copies of this and other documents:**

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200 Ward Hill Avenue  
Haverhill, MA 01835 USA  
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E-mail: [totalware@gwsmail.com](mailto:totalware@gwsmail.com)

For the most current versions of documentation, go to the Avaya support Web site: <http://www.avaya.com/support>.

## Contents

<b>Overview</b> . . . . .	<b>25</b>
<b>A wide range of converged voice and data applications</b> . . . . .	<b>25</b>
<b>Ruggedization of servers and gateways</b> . . . . .	<b>26</b>
<b>Avaya media servers</b> . . . . .	<b>26</b>
<b>Avaya media gateways</b> . . . . .	<b>27</b>
<b>Avaya Integrated Management</b> . . . . .	<b>27</b>
<b>Avaya communications devices</b> . . . . .	<b>28</b>
<b>Avaya S8300 Media Server and an Avaya G700 Media Gateway</b> . . . . .	<b>29</b>
<b>Overview</b> . . . . .	<b>29</b>
<b>Detailed description</b> . . . . .	<b>30</b>
<b>Configuration description</b> . . . . .	<b>30</b>
<b>Server features</b> . . . . .	<b>31</b>
<b>Avaya G700 Media Gateway</b> . . . . .	<b>32</b>
<b>Expansion modules</b> . . . . .	<b>34</b>
<b>P330 LAN expansion modules</b> . . . . .	<b>35</b>
<b>C360 Converged Stackable Switches</b> . . . . .	<b>35</b>
<b>Avaya Octaplane Stacking Fabric</b> . . . . .	<b>36</b>
<b>Power supply</b> . . . . .	<b>36</b>
<b>Motherboard</b> . . . . .	<b>37</b>
<b>Fans</b> . . . . .	<b>37</b>
<b>Gateway software</b> . . . . .	<b>38</b>
<b>LEDs</b> . . . . .	<b>38</b>
<b>Media module LEDs</b> . . . . .	<b>38</b>
<b>System-level LEDs</b> . . . . .	<b>38</b>
<b>Maintenance software</b> . . . . .	<b>39</b>
<b>Avaya media modules</b> . . . . .	<b>39</b>
<b>LEDs</b> . . . . .	<b>40</b>
<b>MM710 T1/E1 media module</b> . . . . .	<b>41</b>
<b>MM711 Analog media module</b> . . . . .	<b>42</b>
<b>MM712 DCP media module</b> . . . . .	<b>43</b>
<b>MM714 Analog media module</b> . . . . .	<b>43</b>
<b>MM717 DCP media module</b> . . . . .	<b>43</b>
<b>MM720 BRI media module</b> . . . . .	<b>44</b>
<b>MM722 BRI media module</b> . . . . .	<b>45</b>
<b>MM760 VoIP media module</b> . . . . .	<b>45</b>
<b>S8300 Media Server in an LSP configuration</b> . . . . .	<b>46</b>
<b>IP addressing</b> . . . . .	<b>47</b>
<b>Preservation of customer translations</b> . . . . .	<b>47</b>

## Contents

IA770 INTUITY AUDIX messaging . . . . .	47
Call center . . . . .	49
G700 announcement software . . . . .	49
Customer configuration options . . . . .	51
System management . . . . .	51
Avaya Integrated Management . . . . .	51
S8300 Media Server Web interface . . . . .	52
Adjuncts . . . . .	52
International information . . . . .	53
Digital trunks and CO trunks . . . . .	54
<b>Avaya S8500 Media Server . . . . .</b>	<b>57</b>
Detailed description of the S8500 Media Server . . . . .	57
Components . . . . .	59
Remote Supervisor Adapter (RSA) . . . . .	60
RSA power . . . . .	61
Modems . . . . .	62
Detailed description of the S8500B Media Server . . . . .	64
Components . . . . .	65
Server Availability Management Processor (SAMP) . . . . .	66
Modem . . . . .	67
Backing up an S8500 Media Server. . . . .	68
Port-network connectivity. . . . .	68
Media gateways . . . . .	69
G650 Media Gateway . . . . .	69
S8500 Media Server reliability . . . . .	70
Migrating to an S8500 Media Server . . . . .	72
RAM disk . . . . .	73
High-level capabilities . . . . .	74
System management . . . . .	75
Avaya Integrated Management suite . . . . .	75
Avaya S8500 Media Server Web interface . . . . .	76
<b>Avaya S8700-series Media Servers with an Avaya G650 Media Gateway . . . . .</b>	<b>77</b>
Detailed description . . . . .	77
Configuration information. . . . .	77
S8700-series media server control complex. . . . .	78
S8700 Media Server . . . . .	78
S8710 Media Server . . . . .	80

IPSI Circuit Pack (TN2312BP) . . . . .	83
Determining the number of IPSIs required based on PNs . . . . .	83
Ethernet switch . . . . .	84
UPS or power backup . . . . .	85
USB modem . . . . .	85
Media gateways . . . . .	86
The G650 Media Gateway . . . . .	86
The MCC1 Media Gateway (voice bearer over ATM or CSS only) . . . . .	88
SCC1 Media Gateway (voice bearer over ATM or CSS only) . . . . .	90
CMC1 Media Gateway (voice bearer over IP only) . . . . .	91
G600 Media Gateway (voice bearer over IP only) . . . . .	92
G700 and G350 Media Gateways . . . . .	93
Reliability . . . . .	93
Reliability when sending voice bearer over IP . . . . .	93
Duplex-Reliability when sending voice bearer over IP . . . . .	93
High-reliability when sending voice bearer over IP . . . . .	95
Reliability when sending voice bearer over ATM or CSS . . . . .	97
Duplex-Reliability when sending voice bearer over CSS or ATM . . . . .	97
High-Reliability when sending voice bearer over CSS or ATM . . . . .	99
Critical-Reliability when sending voice bearer over CSS or ATM . . . . .	102
Connectivity . . . . .	102
Connectivity when sending voice bearer over ATM or CSS . . . . .	102
Port Networks . . . . .	102
CSS Network . . . . .	103
ATM Network . . . . .	103
Connectivity when sending voice bearer over IP . . . . .	103
S8700-series media server recoverability . . . . .	104
S8300 Media Server in an LSP mode . . . . .	104
Power outages . . . . .	104
Survivable Remote EPN (voice bearer over CSS only) . . . . .	104
Manual Backup Server . . . . .	105
High-level capabilities . . . . .	105
BHCC capacity for the S8700-series media server . . . . .	107
S8700-series media server with MCC1/SCC1/G600 Media Gateways general call mix - analog, DCP stations, and PRI trunks . . . . .	107
S8700-series media server with MCC1/SCC1/G600 Media Gateways - IP endpoints and PRI trunks . . . . .	107
S8700-series media server with MCC1/SCC1/G600 Media Gateways and contact center - analog, DCP stations, and PRI trunks . . . . .	107
S8700-series media server with MCC1/SCC1/G600 Media Gateways and contact center - IP endpoints and PRI trunks . . . . .	108

## Contents

S8700-series media server with G700 Media Gateway (IP endpoints) and MCC1/SCC1/G600 Media Gateways - (DCP stations) general call mix . . .	108
S8700-series media server with G700 Media Gateway - IP endpoints and PRI trunks . . . . .	108
S8700-series media server with G700 Media Gateway and MCC1/SCC1/G600 Media Gateways - contact center - low usage . . . . .	108
System management . . . . .	109
Avaya Integrated Management suite . . . . .	109
S8700-series media server Web interface . . . . .	110
Adjuncts . . . . .	110
<b>DEFINITY Server SI . . . . .</b>	<b>111</b>
Overview . . . . .	111
Detailed description . . . . .	112
Configuration information. . . . .	112
Processor Port Network and Switch Processing Element . . . . .	113
Port Network . . . . .	114
Carriers . . . . .	115
Cabinets . . . . .	116
Single-carrier cabinets . . . . .	116
Multicarrier cabinets . . . . .	117
Network Control and Packet Interface . . . . .	117
Options . . . . .	118
Expansion Port Network . . . . .	118
IP Media Processor . . . . .	118
DEFINITY IP Solutions. . . . .	118
Trunks . . . . .	120
H.323 IP Trunk (IP Solutions mode) . . . . .	120
IP Trunk mode . . . . .	120
Connectivity . . . . .	121
LAN Gateway. . . . .	121
C-LAN. . . . .	121
IP Asynchronous Links using C-LAN . . . . .	121
Switch Client Applications . . . . .	122
Switch Server Applications . . . . .	122
Reliability. . . . .	123
BHCCI. . . . .	123
Adjuncts . . . . .	124

<b>DEFINITY Server CSI</b> . . . . .	<b>125</b>
Overview . . . . .	125
Detailed description . . . . .	125
Configuration information. . . . .	126
TN2402 Processor board . . . . .	126
Tone-Clock (TN2182) . . . . .	126
CMC1 Media Gateway . . . . .	126
Reliability and recovery . . . . .	128
System capacity . . . . .	128
Avaya Communication Manager . . . . .	129
Adjuncts . . . . .	130
<b>Avaya Converged Communications Server (for SIP)</b> . . . . .	<b>131</b>
What is the Converged Communications Server? . . . . .	131
System Architecture. . . . .	131
Types of CCS Hosts . . . . .	131
Edge . . . . .	131
Home . . . . .	132
Home/Edge . . . . .	132
Local Failover Option . . . . .	133
Administrative Interfaces . . . . .	133
Requirements for the SIP server . . . . .	134
Hardware . . . . .	134
Software . . . . .	135
Firmware . . . . .	135
Related Systems . . . . .	135
<b>Media gateways</b> . . . . .	<b>137</b>
G150 Media Gateway . . . . .	137
Capacities . . . . .	138
Effect on station and trunk limits on Communication Manager . . . . .	139
Two models . . . . .	139
G150 2T + 4A (4 VoIP) . . . . .	139
G150 4T+4A+8DS (16 VoIP) . . . . .	142
G150 WAN Expansion Interfaces . . . . .	143
G150 WAN Expansion Module . . . . .	144
G150 BRI Module. . . . .	144
G150 PRI Module . . . . .	144
Survivable Mode . . . . .	144

## Contents

Operation in survivable mode. . . . .	145
Return of control to server . . . . .	145
Optional Wireless LAN Card & Access Point . . . . .	146
Summary . . . . .	147
Avaya G350 Media Gateway. . . . .	147
Feature highlights . . . . .	148
Deployment modes . . . . .	151
Physical description. . . . .	151
G350 capabilities. . . . .	153
Media modules . . . . .	154
G600 Media Gateway . . . . .	156
G600 Media Gateway cooling . . . . .	156
Required circuit packs for a G600 Media Gateway and an S8700/S8710 Media Server . . . . .	157
IP Server Interface (TN2312BP) . . . . .	157
C-LAN (TN799DP) . . . . .	157
IP Media Processor (TN2302AP) . . . . .	158
Required circuit packs for a G600 Media Gateway and an S8100 Media Server . . . . .	158
TN2314 Processor (S8100) . . . . .	159
TN744E Call Classifier and Tone Detector . . . . .	159
Avaya G650 Media Gateway. . . . .	160
Overview . . . . .	160
Mounting G650s . . . . .	161
Mounting a single G650 . . . . .	161
Mounting multiple G650s . . . . .	161
Carrier addressing . . . . .	161
I/O connections . . . . .	164
I/O adapters . . . . .	164
Fan assembly . . . . .	164
655A power supply . . . . .	164
Input power. . . . .	165
655A faceplate LEDs. . . . .	166
655A ring generation . . . . .	167
Avaya G700 Media Gateway . . . . .	168
Expansion modules . . . . .	170
X330 WAN Access routing module . . . . .	171
Avaya P330 LAN expansion modules . . . . .	171
C360 Converged Stackable Switches . . . . .	171
Octaplane stacking fabric . . . . .	172

Power supply . . . . .	172
Motherboard . . . . .	173
Fans. . . . .	173
LEDs . . . . .	173
Media module LEDs . . . . .	174
System-level LEDs. . . . .	174
Gateway software . . . . .	174
Maintenance software . . . . .	174
Connectivity . . . . .	175
Media modules. . . . .	176
CMC1 Media Gateway . . . . .	177
SCC1 Media Gateway . . . . .	180
Carriers . . . . .	183
Basic control cabinet for a DEFINITY Server SI . . . . .	183
Duplicated control cabinet for a DEFINITY Server SI . . . . .	184
Expansion control cabinet for a DEFINITY Server SI, S8700 Media Server, S8710 Media Server, or S8500 Media Server. . . . .	185
Port cabinet for a DEFINITY Server SI, S8700 Media Server, S8710 Media Server, or S8500 Media Server . . . . .	187
MCC1 Media Gateway . . . . .	188
Auxiliary cabinet . . . . .	189
Port network cabinet for DEFINITY Server SI . . . . .	189
Port network cabinet for Avaya S8700 Media Server or S8710 Media Server . . . . .	189
Port network cabinet for Avaya S8500 Media Server . . . . .	191
Expansion port network cabinet for DEFINITY Server SI . . . . .	191
Carriers . . . . .	192
Control carrier for DEFINITY Server SI. . . . .	193
Duplicated control carrier for DEFINITY Server SI. . . . .	194
Processor carrier for DEFINITY Server SI . . . . .	195
Expansion Control Carrier for all server models . . . . .	196
Port carrier for DEFINITY Server SI, S8700 Media Server, S8710 Media Server, or S8500 Media Server . . . . .	197
Switch node carrier for S8700 Media Server or S8710 Media Server. . . . .	198
<b>Circuit packs and power supplies . . . . .</b>	<b>201</b>
Power supplies and adapters . . . . .	201
1217B AC power supply . . . . .	201
631DA1 AC power unit . . . . .	201
631DB1 AC power unit . . . . .	201

## Contents

649A DC power unit . . . . .	202
650A AC power unit . . . . .	202
655A power supply . . . . .	203
Input power. . . . .	203
655A faceplate LEDs. . . . .	204
655A ring generation . . . . .	205
655A replaceable DC-input fuse . . . . .	205
676D DC power supply . . . . .	206
982LS current limiter . . . . .	206
CFY1B current limiter . . . . .	206
ED-1E546 — DEFINITY AUDIX R3 System (TN2169, TN2170, TN566, TN567) . . . . .	206
ED-1E568 DEFINITY AUDIX R4 . . . . .	207
J58890MA-1 Multiapplication Platform for DEFINITY (MAPD) . . . . .	207
NAA1 fiber-optic cable adaptor . . . . .	207
Circuit Packs . . . . .	208
TN429D Incoming Call Line Identification (ICLID) . . . . .	208
TN433 Speech Synthesizer . . . . .	208
TN436B Direct Inward Dialing Trunk (8 ports) . . . . .	208
TN438B Central Office Trunk (8 ports) . . . . .	208
TN439 Tie Trunk (4 ports) . . . . .	209
TN457 Speech Synthesizer . . . . .	209
TN459B Direct Inward Dialing Trunk (8 ports) . . . . .	209
TN464GP DS1 Interface, T1 (24 channels) or E1 (32 channels). . . . .	209
TN465C Central Office Trunk (8 ports) . . . . .	210
TN479 Analog Line (16 ports) . . . . .	210
TN497 Tie Trunk (4 ports) . . . . .	211
TN556D ISDN-BRI 4-Wire S/T-NT Interface (12 ports) . . . . .	211
TN568 DEFINITY AUDIX 4.0 Voice Mail System (part of ED-1E568) . . . . .	212
TN570D Expansion Interface . . . . .	212
TN572 Switch-Node Clock. . . . .	212
TN573B Switch-Node Interface . . . . .	213
TN574 DS1 Converter — T1, 24 Channel . . . . .	213
TN725B Speech Synthesizer . . . . .	213
TN726B Data Line (8 ports) . . . . .	213
TN735 MET Line (4 ports) . . . . .	214
TN744E Call Classifier and Tone Detector (8 ports). . . . .	214
TN746B Analog Line (16 ports) . . . . .	214
TN747B Central Office Trunk (8 ports) . . . . .	215
TN750C Recorded Announcement (16 channels) . . . . .	216
TN753B Direct Inward Dialing Trunk (8 ports) . . . . .	216

TN754C DCP Digital Line (4-wire, 8 ports) . . . . .	216
TN755B Neon Power Unit . . . . .	217
TN758 Pooled Modem (2 ports) . . . . .	217
TN760E Tie Trunk (4-wire, 4 ports) . . . . .	218
TN762B Hybrid Line (8 ports) . . . . .	218
TN763D Auxiliary Trunk (4 ports) . . . . .	218
TN767E DS1 Interface, T1 (24 channels) . . . . .	218
TN769 Analog Line (8 ports) . . . . .	219
TN771DP Maintenance and Test . . . . .	220
TN775C Maintenance . . . . .	221
TN780 Tone Clock . . . . .	221
TN787K Multimedia Interface . . . . .	222
TN788C Multimedia Voice Conditioner . . . . .	222
TN789B Radio Controller . . . . .	223
TN791 Analog Guest Line (16 ports) . . . . .	223
TN792 Duplication Interface. . . . .	224
TN793B Analog Line with Caller ID (24 ports) . . . . .	224
TN797 Analog Trunk or Line Circuit Pack (8 ports) . . . . .	225
TN799DP Control LAN (C-LAN) Interface . . . . .	226
TN801B MAPD (LAN Gateway Interface) . . . . .	226
TN802B MAPD (IP Interface Assembly) . . . . .	227
TN1654 DS1 Converter, T1 (24 channels) and E1 (32 channels) . . . . .	227
TN1655 Packet Interface. . . . .	227
TN2138 Central Office Trunk (8 ports) . . . . .	228
TN2139 Direct Inward Dialing Trunk(8 ports) . . . . .	228
TN2140B Tie Trunk (4-wire, 4 ports) . . . . .	228
TN2146 Direct Inward Dialing Trunk (8 ports) . . . . .	228
TN2147C Central Office Trunk (8 ports) . . . . .	229
TN2181 DCP Digital Line (2-wire, 16 ports) . . . . .	229
TN2182 Tone Clock, Tone Detector, and Call Classifier (8 ports) . . . . .	229
TN2183/TN2215 Analog Line for multiple countries (16 ports) . . . . .	230
TN2184 DIOD Trunk (4 ports) . . . . .	230
TN2185B ISDN-BRI S/T-TE Interface (4-wire, 8 ports) . . . . .	230
TN2198 ISDN-BRI U Interface (2-wire, 12 ports) . . . . .	231
TN2199 Central Office Trunk (3-wire, 4 ports) . . . . .	232
TN2202 Ring Generator . . . . .	232
TN2207 DS1 Interface, T1 (24 channels) and E1 (32 channels) . . . . .	232
TN2209 Tie Trunk (4-wire, 4 ports) . . . . .	233
TN2214CP DCP Digital Line (2-wire, 24 ports) . . . . .	233
TN2215/TN2183 Analog Line for Multiple Countries (16 ports) (International Offers or US and Canada Offer B only) . . . . .	234

## Contents

TN2224CP DCP Digital Line (2-wire, 24 ports) . . . . .	235
TN2242 Digital Trunk . . . . .	235
TN2301 Logic Switch . . . . .	235
TN2302AP IP Media Processor . . . . .	235
TN2305B ATM-CES Trunk/Port-Network Interface for multimode fiber . . . . .	236
TN2306B ATM-CES Trunk/Port-Network Interface for single-mode fiber . . . . .	237
TN2308 Direct Inward Dialing Trunk (8 ports) . . . . .	237
TN2312BP IP Server Interface. . . . .	237
I/O adapters . . . . .	239
Compatibility . . . . .	239
Number of IPSI circuit packs per configuration . . . . .	240
TN2313AP DS1 Interface (24 channels) . . . . .	240
TN2314 S8100 Media Server . . . . .	241
TN2401 Network Control/Packet Interface for SI . . . . .	241
TN2401/TN2400 Network Packet Interface complex assembly for SI upgrades . . . . .	241
TN2402 Processor . . . . .	242
TN2404 Processor . . . . .	242
TN2464BP DS1 Interface with Echo Cancellation,T1/E1 . . . . .	243
TN2501AP Voice Announcements over LAN (VAL) . . . . .	243
TN2793B Analog Line with Caller ID (24 ports) . . . . .	244
TNCCSC-1 PRI to DASS Converter . . . . .	245
TNCCSC-2 PRI to DPNSS Converter . . . . .	245
TNCCSC-3 PRI to DPNSS Converter . . . . .	245
TN-C7 PRI to SS7 Converter . . . . .	245
TN-CIN Voice, FAX and Data Multiplexer. . . . .	245
<b>Media modules. . . . .</b>	<b>247</b>
MM312 DCP media module . . . . .	247
MM314 LAN media module . . . . .	248
MM340 E1/T1 media module . . . . .	249
MM342 USP WAN media module . . . . .	249
MM710 T1/E1 media module . . . . .	250
Echo cancellation . . . . .	251
CSU function . . . . .	251
Loopback/BERT functions . . . . .	251
E1 impedance . . . . .	251
Bantam jacks. . . . .	252
LEDs . . . . .	252

DB 25 DCE connector . . . . .	252
Loopback jack . . . . .	252
<b>MM711 Analog media module . . . . .</b>	<b>253</b>
External interfaces: CO trunk side . . . . .	254
Caller ID . . . . .	254
Analog line interface requirements. . . . .	255
Companding . . . . .	255
<b>MM712 DCP media module . . . . .</b>	<b>255</b>
Hardware interface. . . . .	256
<b>MM714 Analog media module. . . . .</b>	<b>256</b>
<b>MM717 DCP media module . . . . .</b>	<b>257</b>
Hardware interface. . . . .	257
<b>MM720 BRI media module . . . . .</b>	<b>258</b>
<b>MM722 BRI media module. . . . .</b>	<b>259</b>
<b>MM760 VoIP media module . . . . .</b>	<b>259</b>
Ethernet interface . . . . .	260
Voice compression . . . . .	260
<b>Optional components: S8300 Media Server with a G700 or G350 Media Gateway . . . . .</b>	<b>261</b>
Media gateways . . . . .	261
Media modules for a G700 Media Gateway . . . . .	261
Media modules for a G350 Media Gateway . . . . .	262
Avaya telephones . . . . .	262
IP telephones. . . . .	262
Digital telephones . . . . .	263
Analog telephones. . . . .	263
Wireless telephone . . . . .	263
Speakerphones . . . . .	264
Consoles . . . . .	264
<b>Optional components: S8500 Media Server . . . . .</b>	<b>265</b>
Media gateways . . . . .	265
Circuit packs . . . . .	265
Power . . . . .	265
Line circuit packs . . . . .	266
Trunk circuit packs . . . . .	267
Control circuit packs . . . . .	268
Service circuit packs . . . . .	268

## Contents

Application circuit packs . . . . .	268
Port circuit packs . . . . .	269
Avaya telephones . . . . .	269
IP telephones. . . . .	269
Digital telephones . . . . .	270
SoundStation speakerphones . . . . .	270
Analog telephones. . . . .	270
Avaya Explosive Atmosphere telephone. . . . .	271
Wireless telephone . . . . .	271
Consoles . . . . .	271
<b>Optional components for an S8700/S8710</b>	
<b>Media Server in an IP Connect configuration . . . . .</b>	<b>273</b>
Media gateways . . . . .	273
Circuit packs . . . . .	274
Line circuit packs . . . . .	274
Trunk circuit packs . . . . .	275
Control circuit packs . . . . .	275
Service circuit packs . . . . .	276
Application circuit packs . . . . .	276
Port circuit packs . . . . .	276
Avaya telephones . . . . .	277
IP telephones. . . . .	277
Digital telephones . . . . .	277
SoundStation speakerphones . . . . .	278
Analog telephones. . . . .	278
Avaya Explosive Atmosphere telephone. . . . .	278
Wireless telephone . . . . .	278
Consoles . . . . .	278
<b>Optional components: S8700/S8710 – Voice Bearer</b>	
<b>Over CSS or ATM . . . . .</b>	<b>279</b>
Media gateways . . . . .	279
Circuit packs . . . . .	279
Power . . . . .	279
Line circuit packs . . . . .	280
Trunk circuit packs . . . . .	281
Control circuit packs . . . . .	282
Service circuit packs . . . . .	282
Application circuit packs . . . . .	283

Port circuit packs . . . . .	283
Avaya telephones . . . . .	283
IP telephones. . . . .	283
Digital telephones . . . . .	284
SoundStation speakerphones . . . . .	284
Analog telephones. . . . .	284
Avaya Explosive Atmosphere telephone. . . . .	285
Wireless telephone . . . . .	285
Consoles . . . . .	285
<b>Optional components for DEFINITY Server CSI. . . . .</b>	<b>287</b>
Media gateways . . . . .	287
Circuit packs for DEFINITY Server CSI. . . . .	287
Power circuit packs . . . . .	287
Line circuit packs . . . . .	288
Trunk circuit packs . . . . .	289
Control circuit packs . . . . .	289
Service circuit packs . . . . .	290
Application circuit packs . . . . .	290
Port circuit packs . . . . .	290
Adapter . . . . .	290
Avaya telephones for DEFINITY Server CSI . . . . .	291
IP telephones. . . . .	291
Digital telephones . . . . .	291
SoundStation speakerphones . . . . .	292
Analog telephones. . . . .	292
Explosive Atmosphere telephones. . . . .	292
Wireless telephone . . . . .	292
Consoles . . . . .	292
<b>Optional components for DEFINITY Server SI. . . . .</b>	<b>293</b>
Media gateways . . . . .	293
Circuit packs for DEFINITY Server SI. . . . .	293
Power Circuit Packs . . . . .	293
Line Circuit Packs . . . . .	294
Trunk Circuit Packs . . . . .	295
Control Circuit Packs . . . . .	296
Service Circuit Packs . . . . .	296
Application Circuit Packs . . . . .	296
Port Circuit Packs . . . . .	297

## Contents

Avaya telephones for DEFINITY	
Server SI . . . . .	297
IP telephones. . . . .	297
Digital telephones . . . . .	298
Soundstation speakerphones. . . . .	298
Analog phones. . . . .	298
Avaya Explosive Atmosphere telephones . . . . .	299
Wireless . . . . .	299
Consoles . . . . .	299
<b>Telephones and speakerphones . . . . .</b>	<b>301</b>
Avaya telephones . . . . .	301
Avaya IP Softphone . . . . .	301
Avaya IP Softphone for Pocket PC . . . . .	302
Avaya IP telephones. . . . .	304
Avaya 4601 IP telephone . . . . .	304
Avaya 4602 IP telephone . . . . .	305
Avaya 4602SW IP telephone . . . . .	306
Avaya 4606 IP telephone . . . . .	306
Avaya 4610SW IP telephone . . . . .	307
Avaya 4620SW IP telephone . . . . .	309
Avaya 4624 IP telephone . . . . .	310
Avaya 4630SW IP Screenphone. . . . .	311
Avaya 4690 IP conference telephone. . . . .	313
Avaya digital telephones . . . . .	314
Avaya 2402 Digital Telephone. . . . .	314
Avaya 2410 digital telephone . . . . .	315
Avaya 2420 digital telephone . . . . .	315
Avaya 6402 and 6402D digital telephones . . . . .	316
Avaya 6408D+ digital telephone . . . . .	317
Avaya 6416D+M digital telephone . . . . .	318
Avaya 6424D+M digital telephone . . . . .	319
Avaya Callmaster IV (603H) digital telephone . . . . .	321
Avaya Callmaster V (607A) digital telephone . . . . .	321
Avaya Callmaster VI (606A) digital telephone . . . . .	322
Avaya attendant consoles. . . . .	323
Avaya 302D attendant console . . . . .	323
Avaya Softconsole. . . . .	324
Avaya analog telephones . . . . .	325
Avaya 2500 and 2554 analog telephones. . . . .	325
Avaya 6211 Analog Telephone . . . . .	326

Avaya 6219 analog telephone . . . . .	327
Avaya 6221 analog telephone . . . . .	328
AT&T TTY 8840 Analog Telephone . . . . .	328
AT&T 958 Analog Telephone Caller ID and Speakerphone . . . . .	329
Avaya EA401 and EA401A Explosive Atmosphere telephones. . . . .	329
Avaya wireless telephones . . . . .	330
Avaya TransTalk 9040 . . . . .	330
Avaya 3410 wireless telephone . . . . .	331
Avaya 3606 wireless VoIP telephone . . . . .	331
Avaya 3616 wireless VoIP telephone . . . . .	333
Avaya 3626 wireless VoIP telephone . . . . .	334
Motorola CN620 Mobile Office Device . . . . .	335
Power for Avaya IP telephones . . . . .	338
Power for Avaya IP telephones . . . . .	338
Power for First Generation Avaya IP telephones (4606, 4612, and 4624) . . . . .	338
Power for Avaya 4630 IP telephones . . . . .	338
Power for Avaya 4690 IP telephones . . . . .	339
SoundPoint and SoundStation speakerphones . . . . .	339
3127 SoundPoint Speakerphone . . . . .	339
Highlights. . . . .	339
Models . . . . .	340
3127 SoundStation speakerphone . . . . .	340
Highlights. . . . .	340
Models . . . . .	341
3127 SoundStation Premier audioconferencing speakerphone . . . . .	341
Highlights. . . . .	342
Models . . . . .	342
<b>Avaya UPS Units. . . . .</b>	<b>345</b>
Avaya Series 1 (AS1) UPS. . . . .	345
AS1 1000 VA 120 V Online Uninterruptible Power Supply (UPS). . . . .	345
1000 VA 120 V models include the following accessories: . . . . .	345
AS1 1000VA 230V Online UPS . . . . .	346
1000VA 230 V models include the following accessories: . . . . .	346
AS1 1500VA 120V Online UPS . . . . .	346
The AS1 1500 VA model includes the following accessories: . . . . .	346
AS1 1500VA 230V Online UPS . . . . .	347
1500 VA 230 V models include the following accessories: . . . . .	347
UPS Add-on Modules . . . . .	347
Extended Battery Module-EBM24 1000 VA. . . . .	347

**Contents**

UPS Extended Battery Module-EBM48 1500-2000 VA . . . . .	348
SNMP MODULE 1000-2000 VA . . . . .	348
BYPASS DISTRIBUTION MODULE 120V 1000-1500 VA . . . . .	348
PWR UPS BYPASS DISTR MOD S1 1000VA-2K VA . . . . .	348
<b>Avaya Wireless Solutions . . . . .</b>	<b>349</b>
W310 WLAN Gateway . . . . .	349
Voice-Enabled Wireless Local Area Network (WLAN) Infrastructure . . . . .	350
Superior infrastructure for Voice over IP (VoIP). . . . .	350
Investment Protection . . . . .	350
Avaya W310 WLAN Gateway Features . . . . .	350
W310 WLAN Gateway for Seamless Communications . . . . .	351
Wireless Services Manager (for Seamless Communications) . . . . .	353
W110 Light Access Point (for Seamless Communications) . . . . .	353
Additional documentation for Seamless Communications. . . . .	354
Extension to Cellular and Off-PBX Station. . . . .	355
<b>Avaya Ethernet Switches . . . . .</b>	<b>357</b>
Avaya P330 Ethernet Switches . . . . .	357
Features of the Avaya P330 Stackable Switches . . . . .	358
Stacking . . . . .	358
Layer 2 Features . . . . .	359
Layer 3 Features . . . . .	359
Management . . . . .	360
Power over Ethernet (PoE) . . . . .	360
Physical Characteristics . . . . .	361
Environmental Conditions . . . . .	361
Power Requirements . . . . .	361
Agency Approval . . . . .	361
Avaya C360 Ethernet Switches . . . . .	362
Features of the Avaya C360 Converged Stackable Switches. . . . .	363
Stacking . . . . .	363
Layer 2 Features . . . . .	364
Layer 3 Features . . . . .	365
Management . . . . .	365
Power over Ethernet (PoE) . . . . .	366
Physical Characteristics . . . . .	366
Environmental Conditions . . . . .	366
Power Consumption. . . . .	367
Agency Approval . . . . .	367

Avaya P130 Ethernet Switches . . . . .	368
Avaya P133G2 . . . . .	368
Avaya P134G2 . . . . .	368
General Features of the P133G2 and P134G2 Switches . . . . .	369
Interfaces . . . . .	369
Standards Supported . . . . .	369
Physical Characteristics. . . . .	370
Environmental Conditions . . . . .	370
Power Consumption . . . . .	370
Agency Approval . . . . .	370
<b>Site requirements . . . . .</b>	<b>371</b>
Rack mounting, temperature and humidity information for the G600 Media Gateway . . . . .	371
Heat dissipation for the G600 Media Gateway . . . . .	372
Typical G600 Media Gateway heat-dissipation specifications . . . . .	373
G650 specifications . . . . .	373
Power requirements . . . . .	373
AC power . . . . .	373
DC power . . . . .	373
Power output . . . . .	373
Dimensions. . . . .	374
Operating conditions . . . . .	375
G350 Site Requirements. . . . .	375
Power Cord Specifications . . . . .	375
Environmental considerations for the G700 Media Gateway . . . . .	376
Power requirements for the G700 Media Gateway . . . . .	377
Thermal Protection . . . . .	377
Manual Reset. . . . .	378
AC and Load Center Circuit Breakers . . . . .	378
AC power distribution . . . . .	378
AC Grounding/Protective Grounds. . . . .	378
S8500 Media Server environmental specifications . . . . .	379
Altitude, air pressure and air purity for the S8700 Media Server or S8710 Media Server . . . . .	380
Air Purity . . . . .	381
Temperature and humidity for the S8700 Media Server or S8710 Media Server . . . . .	381
EMI and RFI specifications for the S8700 Media Server or S8710 Media Server . . . . .	383

## Contents

Power supply specifications for the S8700 Media Server or S8710 Media Server . . . . .	384
BTU . . . . .	384
Regulatory certification for an S8700 Media Server or S8710 Media Server. . . . .	385
Product-safety standards and approvals . . . . .	385
Electromagnetic-compatibility (EMC) standards and approvals . . . . .	385
Data rack mounting and media gateway floor loading for an S8700/S8710 Media Server with voice bearer over ATM and CSS. . . . .	386
19-Inch Rack . . . . .	386
S8700/S8710 Media Server . . . . .	386
Avaya 700VA or 1500VA UPS Units . . . . .	387
Avaya Ethernet switches . . . . .	387
Media gateways . . . . .	388
Site requirements for DEFINITY . . . . .	388
Altitude, air pressure, and air purity for DEFINITY . . . . .	388
Altitude and air pressure . . . . .	388
Air purity . . . . .	389
Cabinet dimensions and clearances . . . . .	389
Floor load requirements. . . . .	391
Power requirements . . . . .	391
Global AC MCC power supply . . . . .	391
AC power . . . . .	392
50-Hz power sources . . . . .	393
DC power . . . . .	395
Circuit-breaker sizes for AC and DC cabinets . . . . .	396
MCC1 power system. . . . .	396
AC power distribution . . . . .	397
Circuit breaker . . . . .	398
48-VDC batteries . . . . .	399
Battery charger. . . . .	399
DC power relay. . . . .	399
EMI filters. . . . .	399
Ring generator . . . . .	399
Fuses . . . . .	399
Power backup . . . . .	400
UPS . . . . .	400
AC power-distribution unit (J58890CH-1) . . . . .	400
Power backup . . . . .	401
Small batteries . . . . .	401

Large batteries . . . . .	402
DC power distribution . . . . .	403
DC power-distribution unit (J58890CF-2) . . . . .	403
Ground isolation . . . . .	404
DC power converter (649A) . . . . .	405
AC and DC grounding . . . . .	405
Approved grounds . . . . .	405
Protective grounds . . . . .	406
Approved floor grounds . . . . .	407
Coupled bonding conductor . . . . .	407
SCC1 power systems . . . . .	407
AC power supply (1217A) . . . . .	408
DC power supply (676C) . . . . .	408
DC power-distribution unit (J58890CG) . . . . .	408
Enhanced DC rectifier cabinet (J58890R) . . . . .	409
CMC1 AC power supply (650A) . . . . .	409
CMC1 UPS . . . . .	409
Cabinet cooling fans . . . . .	410
CMC1 fan unit . . . . .	410
MCC1 fans . . . . .	410
SCC1 fan unit . . . . .	410
System protection . . . . .	411
Protection from hazardous voltages . . . . .	411
Overvoltage protection . . . . .	411
Sneak current protection . . . . .	412
Lightning protection . . . . .	412
Earthquake protection . . . . .	412
Temperature and humidity for DEFINITY . . . . .	413
W310 Site Requirements . . . . .	414
Overcurrent Protection . . . . .	414
<b>Customer configurations . . . . .</b>	<b>415</b>
Small businesses . . . . .	415
Medium-sized business solution . . . . .	417
Large businesses . . . . .	418
Branch Office and Multi-Site Configurations . . . . .	419
Branch Office Configuration . . . . .	419
Multi-Site Environment . . . . .	421
<b>Index . . . . .</b>	<b>423</b>

## **Contents**

# Overview

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## A wide range of converged voice and data applications

Avaya's portfolio of Communication Manager applications enables a business to harness the power of a converged IP-based voice/data network and put it to work for the business. Driven by Avaya's rock-solid Communication Manager application, this portfolio operates with Avaya's media servers, media gateways, Integrated Management (network-management tools), and communication devices.

Using Avaya's Communication Manager applications, an enterprise can review the operation of its existing communication networks, rethink where IP telephony can maximize returns on investment, and then reshape the network to realize those goals. The choices are nearly unlimited, given Avaya's flexible, modular architecture and our commitment to standards-based software and hardware.

While Avaya brings continuous voice-application innovation to the enterprise, Communication Manager delivers massive new scalability to provide network devices for as few as 20 users, or up to a million. Avaya's Communication Manager application is also highly scalable and reliable voice-application software with

- Rich call-processing and contact-center features
- A widely accepted application-programming interface (API) supporting both 3<sup>rd</sup>-parties' and Avaya's own applications

Avaya's media servers and media gateways provide smart ways to rethink networking by adding top-tier scalability and reliability, while supporting mission-critical applications in a distributed, yet secure, multivendor environment. To provide businesses with maximum flexibility, the server and gateway components in Avaya's family of Communication Manager applications follow a modular mix-and-match approach. A wide range of custom configurations can be deployed to meet a broad spectrum of business needs:

- From a single location (upgrading to a converged IP network for 200 employees)
- To a complex multinational converged network (capable of supporting 10,000-plus voice/data users)

---

## Ruggedization of servers and gateways

Some of Avaya's media servers and gateways have been tested against stringent physical and environmental requirements (i.e., shock, vibration, EMI, etc.) imposed by the United States Navy for use on their ships, with the use of specialized racks and re-enforcements (though no physical changes have been made to the servers and gateways themselves). Customers that are interested in obtaining information for the design and implementation of such a ruggedized solution should contact the Avaya Custom Engineering Group.

---

## Avaya media servers

Avaya's line of media servers provides a robust application platform based on industry-standard operating systems to support distributed IP networking and centralized call processing across multiprotocol networks. These servers are available as an integrated solution with other servers or can operate independently.

Avaya media servers have the following features and benefits:

- Redundant, survivable call processing and media processing supports crucial business continuity.
- Standards-based computing supports Linux, Microsoft Windows, and Avaya's DEFINITY® operating system.
- Distributed survivable IP networking supports campus, global-multisite, and branch environments.

---

## Avaya media gateways

Avaya media gateways are stackable and modular hardware elements that deliver applications – enabling data, voice, FAX, video, and messaging capabilities to your network. Avaya media gateways support both bearer and signaling traffic that is routed between packet- and circuit-switched networks. These gateways are optimized for enterprise-class telephony. Avaya media gateways provide a variety of flexible deployment options, including 100%-IP environments and blended environments such as IP and TDM.

Avaya media gateways have the following features and benefits:

- Interoperable with standards-based data networks
- Stackable, modular, and configurable component solutions
- Redundant capabilities
- Distributed networking
- Compatible with cabinets in traditional Avaya systems

---

## Avaya Integrated Management

Designed for a converged network environment, Avaya's Integrated Management provides a comprehensive set of standards-based software tools to facilitate management of a complex network infrastructure (including both voice and data communications) through a common web-based user interface. This enables you to improve your network's uptime, increase your staff's productivity, and reduce your operating costs.

Integrated Management has the following features and benefits:

- Web-based system view – Of Avaya media servers, media gateways, and IP phones
- Voice-over-IP monitoring – Based on endpoint information, provides industry-leading, centralized monitoring of network quality
- Directory-enabled [Lightweight Directory Access Protocol (LDAP)] platform – Enables integration of management activities with business processes
- On-demand phone and feature management – Provides users with necessary customization tools

## Avaya communications devices

Innovative and standards-based, providing new mobility opportunities – Avaya offers a wide choice of flexible, intelligent, mobile, and easy-to-use communication devices to meet your company's unique needs. With analog, digital, and IP telephones, the spectrum is covered. Highlights of the portfolio include:

- Avaya Softconsole – A software attendant console that brings features and functionality of a high-end attendant console to your converged network.
- Avaya IP Softphone – A collection of computer telephony integration (CTI) applications that enables you to control telephone calls (both incoming and outgoing) directly from your personal computer (PC).
- Avaya IP Softphone for Pocket PC – Brings the full functionality of an Avaya office phone to your hand-held pocket PC.
- Avaya IP Agent – An advanced PC-based application that allows access to the contact center agent functionality of Communication Manager over the private network or public network. It also may be used to handle calls associated with an IP telephone or Callmaster VI telephone.
- Avaya 4630 Screenphone – A full-color touch-screen phone with Web access.

Avaya IP communication devices are supported without special power requirements.

# Avaya S8300 Media Server and an Avaya G700 Media Gateway

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## Overview

An Avaya S8300 Media Server, with a G700 (or G350 Media Gateway — see [Avaya G350 Media Gateway](#) on page 147) and the gateway's media modules, converges voice and data into one infrastructure. Using the same form factor as a media module, an S8300 Media Server is an Intel Celeron-based processor residing in a G700 Media Gateway or a G350 Media Gateway. An S8300 Media Server can also be configured as a Local Survivable Processor (LSP). A G700 Media Gateway, which is architecturally-based on the Avaya P330 and C360 switches, contains VoIP resources and modular interface connectivity. The G350 Media Gateway features a VoIP engine and WAN router and provides full support for legacy digital and analog telephones. The media modules in the gateways provide analog, digital, T1/E1, BRI, and additional VoIP capabilities.

**! CAUTION:**

The S8300 Media Server must be version B to operate Communication Manager R2.2 software. Versions earlier than R2.1 of the S8300 Media Server must be replaced with the S8300B in order to upgrade to Communication Manager R2.2.

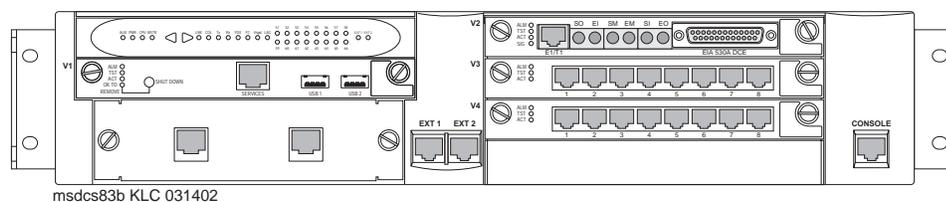
**Note:**

For more information on the G350 Media Gateway, see [Avaya G350 Media Gateway](#) on page 147.

The following figure shows an S8300 Media Server and media modules in a G700 Media Gateway.

---

**Figure 1: S8300 Media Server, G700 Media Gateway, and media modules**



## Detailed description

This section contains information about the following:

- [Configuration description](#)
- [Server features](#)
- [Avaya G700 Media Gateway](#)
- [LEDs](#)
- [Maintenance software](#)

---

## Configuration description

The following components can be used with an S8300 Media Server and a G700 Media Gateway:

- Avaya media modules:
  - MM710 T1/E1 Media Module
  - MM711 Analog Media Module
  - MM712 DCP Media Module
  - MM714 Analog Media Module
  - MM717 DCP Media Module
  - MM720 BRI Media Module
  - MM722 BRI Media Module
  - MM760 VoIP Media Module
- Avaya Communication Manager

For information about Avaya Communication Manager, refer to the "Overview for Avaya Communication Manager," 555-233-767.
- Avaya P330 expansion modules (LAN and WAN)
- Avaya WAN Access router modules for the Avaya P330/C360 stackable switching systems

An S8300 Media Server, the G700 Media Gateway, and all other components are described in more detail in the following sections.

**Note:**

For more information on the G350 Media Gateway, see [Avaya G350 Media Gateway](#) on page 147.

---

## Server features

An S8300 Media Server (version B) is a Celeron-based processor running the Linux operating system and residing in Slot V1 of a G700 Media Gateway. The main features include:

- Avaya Communication Manager application software
  - For a description of Communication Manager, refer to one of the following Web sites:
    - For customer access – [www.avaya.com](http://www.avaya.com)  
Click Products and services.
    - For business partner access – <http://avaya.com/businesspartner>  
Click Products, services, and solutions.
- A 30-GB hard disk
- 512 MB RAM
- A Web server used for the following:
  - Backups and restores of customer data
  - Easy access to view current alarms
  - The ability to perform server maintenance including busy out and release busyout, shutdown, and status of an S8300 Media Server.
  - Security commands to enable and disable the modem, start and stop the FTP server, and view the software license
  - SNMP access to configure trap destinations and to stop and start the master agent
  - Configuration information about an S8300 Media Server
  - Upgrade access to an S8300 Media Server
- Linux operating system
- Trivial File Transfer Protocol (TFTP) server
- Secure HTTP server for IP phone file downloads
- H.248 Media Gateway Signaling Protocol
- Control messages tunneled over H.323 Signaling Protocol
- Two USB ports and a 10/100 Base-T port
  - One USB port supports a readable CD-ROM, which is used for system upgrades.
- One services port.

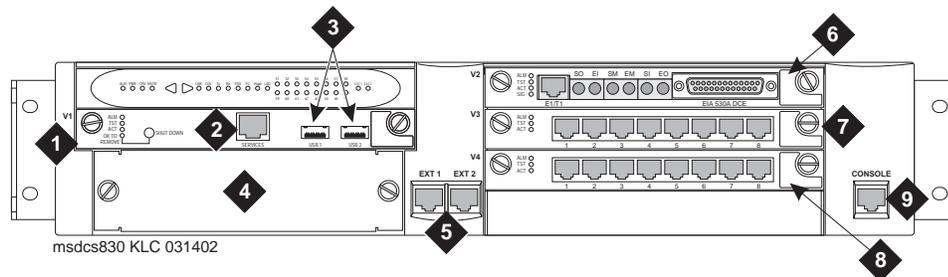
## Avaya S8300 Media Server and an Avaya G700 Media Gateway

The S8300 supports a maximum of:

- 900 total ports (combination of trunks and stations)
  - 450 IP, non-IP, or a combination of IP and non-IP stations
  - 450 trunks
- 50 G700 or G350 Media Gateways

The following figure shows an S8300 Media Server and media modules in a G700 Media Gateway.

**Figure 2: S8300 Media Server in a G700 Media Gateway**



**Figure notes:**

- |  |  |
|--|--|
| 1. <b>S8300 Media Server in Slot V1.</b>           | 6. <b>Media module, Slot V2</b>                          |
| 2. <b>Services port</b>                            | 7. <b>Media module, Slot V3</b>                          |
| 3. <b>Two USB ports</b>                            | 8. <b>Media module, Slot V4</b>                          |
| 4. <b>Slot for an P330 expansion module</b>        | 9. <b>Console connection for on-site administration.</b> |
| 5. <b>Dual 10/100 Base-T Ethernet switch ports</b> |  |

## Avaya G700 Media Gateway

An Avaya G700 Media Gateway is scalable and offers options. It is functional on its own or with other G700 Media Gateways. Up to 50 G700 Media Gateways can be supported using an S8300 Media Server. Up to 250 G700 Media Gateways can be supported using an S8500 Media Server, an S8700 Media Server, or an S8710 Media Server. The G700 is also functional in a stack that is mixed with selected Avaya P330 and Avaya C360 devices.

To power IP telephones without additional cables, stack the G700 Media Gateways with the Avaya P333T-PWR, C363T-PWR, or C364T-PWR.

The following list describes the basic architecture of the G700 Media Gateway:

- Intel i960 controller that hosts the base switch control and management software
- Supports 15 ports of tone detection
- Fits in an EIA-310-D standard 19-inch data rack

- Can sit on a desk top
- Contains four slots for media modules
- One slot for P330 expansion module (LAN/WAN)
- One slot for a P330 Octaplane stacking fabric
- Contains an internal motherboard described in detail later in this section
- Standards-based 10/100 Ethernet Interface connection types
- Internal global AC/DC power supply that provides low-voltage DC power to the fans, motherboard, and media modules
- Four internal fans that provide cooling for the internal components
- A LED board that indicates system-level status
- A serial port for command-line access
- A VoIP engine that supports up to 64 G.711 single-channel calls
- An 8-port layer-2 switch
- Transport of the following:
  - Teletypewriter device (TTY) tone relay over the Internet
  - Faxes over a corporate IP intranet

**Note:**

The path between endpoints for fax transmissions must use Avaya telecommunications and networking equipment.

 **SECURITY ALERT:**

Faxes sent to non-Avaya endpoints cannot be encrypted.

- T.38 Fax over the Internet (including endpoints connected to non-Avaya systems)
- Modem tones over a corporate IP intranet

**Note:**

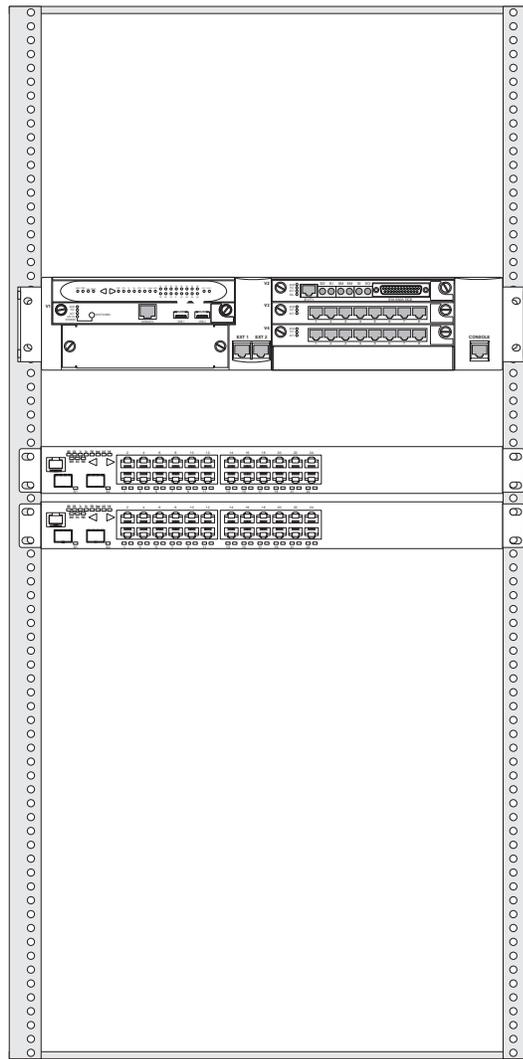
The path between endpoints for modem tone transmissions must use Avaya telecommunications and networking equipment.

The G700 Media Gateway has a similar architectural design to the Avaya stackable switching products. The following figure shows the G700 Media Gateway with two Avaya P330 switches. The G700 is shown at the top of the stack.

**Note:**

The G700 Media Gateway can also share the Octaplane stacking fabric with other selected P330 stackable switches and C360 converged stackable switches.

**Figure 3: G700 Media Gateway with two Avaya C360 switches**



sccmrack LAO 083104

## Expansion modules

A G700 Media Gateway is architecturally based on the Avaya P330 and C360 switches. Therefore, customers can use selected P330 expansion modules with the G700 Media Gateway. The P330 local-area network (LAN) and wide-area network (WAN) expansion modules connect directly to the G700 Media Gateway without requiring additional hardware. Two types of expansion modules are available from Avaya:

- X330 WAN Access routing modules
- P330 LAN expansion modules

## X330 WAN Access routing module

Customers with multiple branch offices need network solutions that are simple, flexible, and scalable. An Avaya X330 WAN Access routing module allows customers to deploy a unified, high-performance LAN/WAN infrastructure in one data stack.

Highlights of an X330 WAN Access router:

- Provides integrated WAN access that can be used with external firewalls or VPN Gateways
- Works with the following WAN and routing protocols:
  - Point-to-Point Protocol (PPP) over channeled E1/T1
  - Frame Relay
  - Routing Information Protocol (RIP) v1 and v2
  - Single-area Open Shortest Path First (OSPF)
  - VRRP Redundancy
  - Throughput: wire-speed WAN routing

## P330 LAN expansion modules

Highlights of P330 LAN expansion modules:

- Maximum flexibility to the data stack
- Standard auto-negotiation
- Link Aggregation Group (LAG)
- LAG redundancy
- Link redundancy
- Congestion control
- 802.1Q/p VLAN and priority

 **CAUTION:**

Avaya expansion modules and Octaplane stacking modules are not hot-swappable. Turn off the system before you remove or insert an expansion module.

## C360 Converged Stackable Switches

For information about C360 converged stackable switches, see [Avaya C360 Ethernet Switches](#) on page 362.

## Avaya Octaplane Stacking Fabric

Octaplane is an Avaya hardware capability to bundle stackable components using bidirectional 4-Gbps transmission. This technology combines separate units into a larger logical switch using different lengths of cables that are connected to the expansion slots behind the units. The cables are wired in a ring configuration, providing redundancy to the stack. If a single unit should fail, the stack’s integrity is maintained. You can also remove or replace a single unit without disrupting operation or without first reconfiguring the stack.

**Table 1: Octaplane cabling**

Cable	Description and function	Length	Length (metric)
X330SC short Octaplane cable (30 cm)	Short Octaplane cable – light-colored, used to connect adjacent switches or switches separated by one backup universal power supply (BUPS) unit.	1 foot	0.3 m
X330LC long Octaplane cable (2 m)	Long Octaplane cable – light-colored, used to connect switches from two different physical stacks	6 feet	2 m
X330RC redundant Octaplane cable (2 m)	Redundant cable – black, used to connect the top and bottom switches of a stack.	6 feet	2 m
X330L-LC extra-long Octaplane cable (8 m)	Extra-long Octaplane cable – light-colored, used to connect switches from two different physical stacks	24 feet	8 m
X330L-RC long redundant Octaplane cable (8 m)	Long Redundant cable – black, used to connect the top and bottom switches of a stack.	24 feet	8 m

## Power supply

A G700 Media Gateway uses an internal AC/DC power supply that converts AC or DC input power to the required voltages.

## Motherboard

A motherboard resides in a G700 Media Gateway. This board controls the following:

- The VoIP Engine which supports up to 64 channels. If more than 64 channels are needed, a VoIP media module is required. The VoIP Engine performs the following functions:
  - IP/UDP/RTP processing
  - Echo cancellation
  - G.711 A-/ $\mu$ -Law
  - G.729 and G723.1 encode/decode
  - T.38 and Avaya Proprietary FAX relay
  - FAX pass-through
  - Modem pass-through
  - Modem relay
  - Teletypewriter device (TTY) tone relay
  - Silence suppression
  - Jitter buffer management
  - Packet loss concealment
  - Avaya Encryption Algorithm (AEA) and Advanced Encryption Standard (AES) encryption of VoIP audio
  - Packet reorder
- The gateway's processor complex controls every resource inside the gateway. The processor's functions include managing the media modules, and controlling the Tone Clock and H.248 signaling.
- An Avaya P330 processor complex is based on the Avaya P330 switch architecture. This complex provides an 8-port layer-2 switch function and manages the Expansion and Cascade modules.
- The electrical and physical connectivity for the four media module's slots.

**Note:**

The motherboard cannot be replaced or upgraded in the field.

For more information about the VoIP media module, see [MM760 VoIP media module](#) on page 259.

## Fans

The G700 Media Gateway contains four 12-volt fans. These fans are monitored and can be alarmed via SNMP to a management station.

## Gateway software

Gateway software is responsible for:

- Individual media-gateway operations
- Terminating H.248 on the G700 Media Gateway
- Interacting with maintenance operations

---

## LEDs

An S8300 Media Server with a G700 Media Gateway uses two types of LEDs:

- Media module
- System-level.

### Media module LEDs

A media module's LEDs have the following characteristics:

- Three or more LEDs reside on each media module to provide status information about the media module, its ports, and its current maintenance or administration mode.
- Every LED on each media module has a fixed user-visible location, spacing, and labeling.

### System-level LEDs

An LED board visually indicates status of the system and its Ethernet data ports, and allows the customer to change between status-indication modes. The LED board resides in the upper left front of each G700 Media Gateway. The board's LEDs reside in an oblong fascia panel.

You must remove the LED board when you install or remove either an S8300 Media Server or an LSP-configured S8300 Media Server. An S8300 Media Server and its LED board must be installed or removed as a unit.

**Note:**

The LED panel is not the same size as standard slots for media modules. You cannot insert a media module into the LED board's slot, or vice versa.

---

## Maintenance software

An S8300 Media Server with a G700 Media Gateway has a dual maintenance strategy. Maintenance software runs on both the G700 Media Gateway's platform and the S8300 Media Server for subsystems on the platform. This platform software performs initialization and motherboard maintenance, along with internal environmental monitoring.

In contrast, media modules are tested and brought into service by the S8300 Media Server's maintenance software after a G700 Media Gateway registers with the S8300 Media Server. While the G700 Media Gateway's maintenance software is aware of its own media modules, these modules and their associated ports are controlled by the S8300 Media Server. Error logs are also maintained on the S8300 Media Server.

---

## Avaya media modules

Media modules reside in a G700 Media Gateway and interact with the motherboard and backplane.

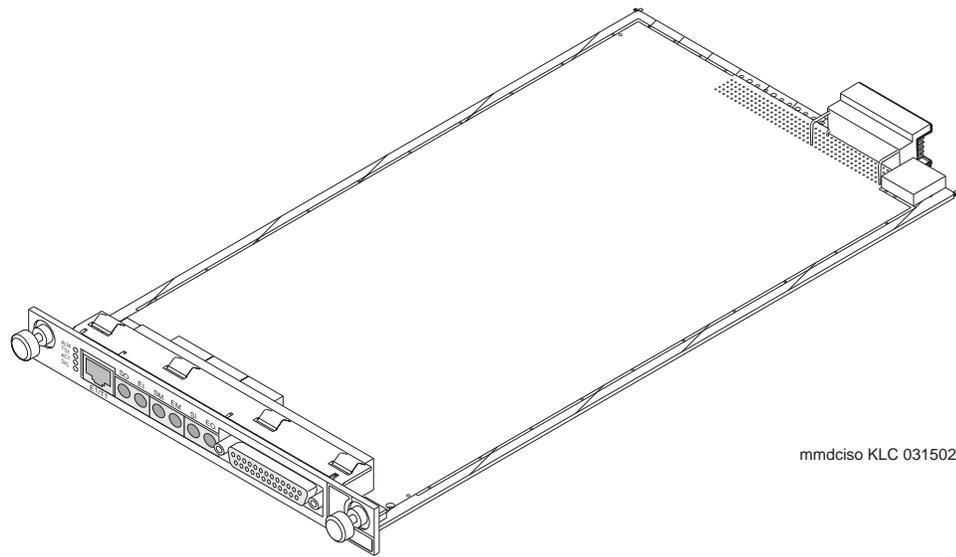
The G700 supports the following media modules:

- MM710 T1/E1 Media Module
- MM711 Analog Media Module
- MM712 DCP Media Module
- MM714 Analog Media Module
- MM717 DCP Media Module
- MM720 BRI Media Module
- MM722 BRI Media Module
- MM760 VoIP Media Module

The following figure shows a top view of a media module.

---

**Figure 4: Top view of media module**



---

## LEDs

Although some media modules have additional LEDs, a standard 3-LED pattern on each of their faceplates indicates the following conditions:

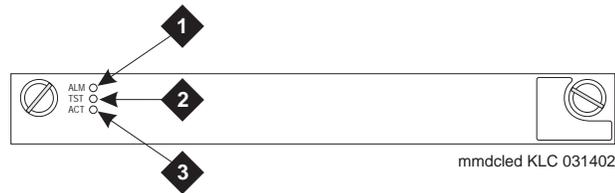
- Red – Fault condition

This LED also lights when the media module is physically inserted, and should turn off when the board initializes.

- Green – Test condition
- Yellow – In-use condition

See the following figure for the LEDs on the media module.

---

**Figure 5: Media modules LEDs**
**Figure notes:**

1. ALM – Alarm LED
  2. TST – Test LED
  3. ACT – Active LED
- 

---

## MM710 T1/E1 media module

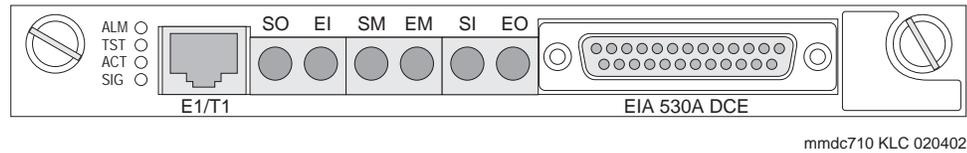
The MM710 terminates a T1 or E1 connection. The MM710 has built-in channel-service unit (CSU) so an external CSU is not necessary. The CSU is only used for the T1 circuit.

The attributes of an MM710 include:

- Software-selectable T1 or E1 operation
- Integrated CSU for T1 circuit only
- A-law (E1) and  $\mu$ -law (T1) companding
- Gain control and echo cancellation
- D4, ESF, or CEPT framing
- ISDN-PRI capability (23B + D or 30B + D)
- Line coding – AMI, ZCS, B8ZS (T1) or HDB3 (E1)
- Trunk signaling to support US and International CO or tie trunks
- Echo cancellation in either direction
- Fractional T1 support
- OIC DB 25-pin interface
- A Bantam loop-back jack for testing T1 or E1 circuits

The following figure shows an MM710 media module.

**Figure 6: MM710 T1/E1 media module**



For more information, see [MM710 T1/E1 media module](#) on page 250.

## MM711 Analog media module

The MM711 provides analog trunk and telephone features and functionality. Up to four 8-port M711 media modules can reside in one G700 Media Gateway.

An administrator can assign each analog port of an MM711 as follows:

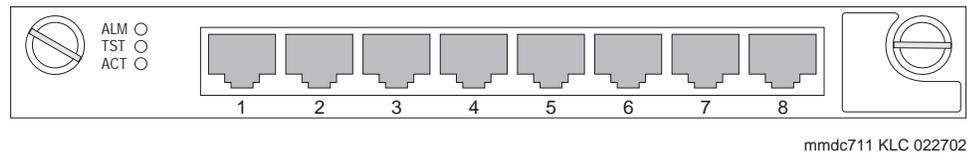
- Central Office trunk, either loop- or ground-start
- Direct Inward Dialing (DID) trunks, either wink- or immediate-start
- 2-wire outgoing CAMA E911 trunks, with MF signaling for connectivity to the PSTN
- Tip/ring devices such as single-line telephones, with or without LED message-waiting indication

The MM711 also supports:

- Type-1 Caller ID
- Ring-voltage generation for a variety of international frequencies and cadences

The following figure shows an MM711 media module.

**Figure 7: MM711 Analog media module**



For more information, see [MM711 Analog media module](#) on page 253.

**Note:**

The MM711 is supported in both the G700 and G350 Media Gateways.

---

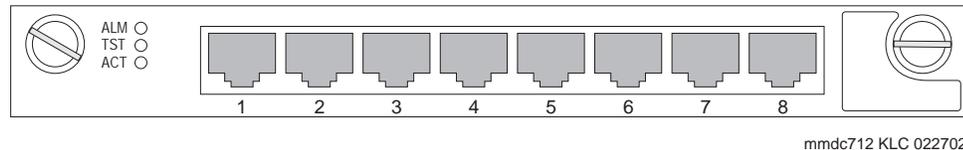
## MM712 DCP media module

The MM712 allows you to connect up to eight 2-wire Digital Communications Protocol (DCP) voice terminals.

The following figure shows an MM712 media module.

---

**Figure 8: MM712 DCP media module**



For more information, see [MM712 DCP media module](#) on page 255.

**Note:**

The MM712 is supported in both the G700 and G350 Media Gateways.

---

## MM714 Analog media module

The Avaya MM714 Media Module provides four analog telephone ports and four analog trunk ports. **The four analog trunk ports can not be used for analog DID trunks.** Instead, the four analog line ports must be used for analog DID trunks. See the following figure for an example of the MM714.

---

**Figure 9: MM714 analog media module**



**Note:**

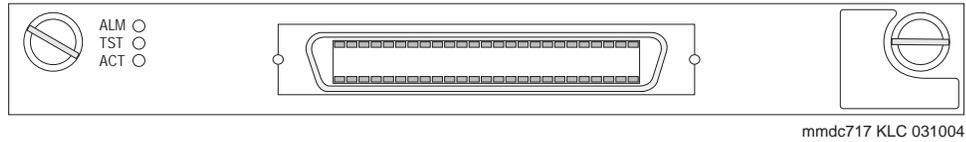
The MM714 is supported in both the G700 and G350 Media Gateways.

---

## MM717 DCP media module

The Avaya MM717 Media Module provides 24 Digital Communications Protocol (DCP) ports connected through an RJ21X Amphenol connector. The MM717 supports simultaneous operation of all 24 ports. Each port can be connected to a 2-wire DCP telephone. The MM717 does not support 4-wire DCP telephones.

**Figure 10: Avaya MM717 DCP Media Module**



**Note:**

The MM717 is supported in both the G700 and G350 Media Gateways.

**Hardware interface**

Signal timing specifications for the MM717 support TDM Bus Timing in receive and transmit modes. The G700 and G350 Media Gateways supply only +5 VDC and –48 VDC to the MM717 Media Module.

Loop range secondary protection is provided on the MM717. The MM717 is also self-protecting from an over current condition on a tip and ring interface.

---

**MM720 BRI media module**

Each port of the 8-port MM720 provides an interface to the central office at the ISDN T reference point. Information is communicated in two ways:

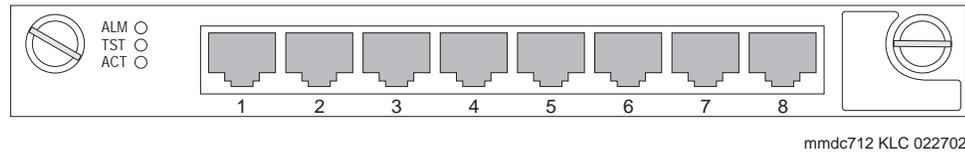
- Over two 64-kbps channels called B1 and B2
  - Can be circuit-switched simultaneously
- Over a 16-kbps channel called the D channel
  - Used for signaling
  - Occupies one time slot for all eight D channels

The circuit-switched connections have an A- or  $\mu$ -law companding option for voice operation. When in the data mode, the circuit-switched connections operate as 64-kbps clear channels.

The MM720 does not support the following:

- BRI stations
- Combining both B channels together to form a 128-kbps channel

The following figure shows an MM720 media module.

**Figure 11: MM720 BRI media module**

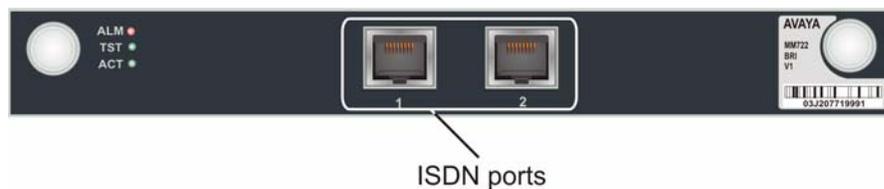
For more information, see [MM710 T1/E1 media module](#) on page 250.

**Note:**

The MM720 is supported in both the G700 and G350 Media Gateways.

## MM722 BRI media module

The Avaya MM722 Media Module provides two 4-wire S/T ISDN BRI (Basic Rate Interface) 2B+D access ports with RJ-45 jacks. Each port interfaces to the central office at the ISDN T reference point. Information is communicated in the same manner as for the MM720.

**Note:**

The MM722 is supported in both the G700 and G350 Media Gateways.

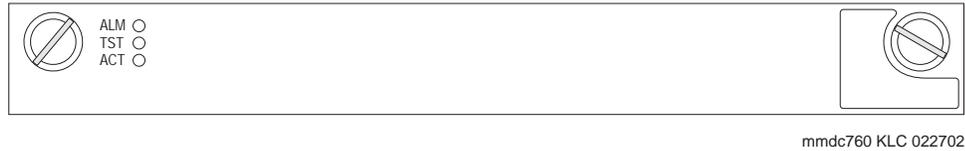
## MM760 VoIP media module

The MM760 is a clone of the G700 motherboard's VoIP engine. The MM760 provides an additional 64 VoIP channels with G.711 compression on the G700 Media Gateway.

The capacity is 64 G.711 TDM/IP simultaneous calls, or 32 compression codec, G.729 or G.723, TDM/IP simultaneous calls. These call types can be mixed on the same resource; in other words, the simultaneous call capacity of the resource is 64 G.711 equivalent calls.

The following figure shows an MM760 media module.

**Figure 12: MM760 VoIP media module**



For more information, see [MM760 VoIP media module](#) on page 259.

**Note:**

The MM760 is not supported in the G350 Media Gateway.

---

## S8300 Media Server in an LSP configuration

An S8300 Media Server in a Local Survivable Processor (LSP) configuration uses the S8300 hardware component and a software license to activate a standby feature. This software allows the LSP with a G700 Media Gateway (or a G350 Media Gateway) to be a survivable call-processing server for remote and branch locations. The number of LSPs that can be supported in a configuration depends on the controlling media server. An S8500 Media Server, S8700 Media Server, or S8710 Media Server can support up to 250 LSPs. An S8300 Media Server can support up to 50 LSPs. An S8300 Media Server and the LSP cannot reside in the same G700/G350 Media Gateway.

The difference between an S8300 configured as a primary controller and an S8300 configured as an LSP is entirely in software. Therefore, the hardware installation is identical for both configurations.

If for any reason communication between a G700/G350 Media Gateway and its primary controller stops, the G700/G350 Media Gateway registers with an LSP, if available. This "fail-over" of the G700/G350 Media Gateway from the primary controller to the LSP is an automatic process without human intervention. The LSP assumes control of any IP telephone provided that telephone has the LSP in its list of controllers. Not every call is preserved during a fail-over. IP-to-IP shuffled calls are preserved; any other calls end.

The LSP can continue to support calls as the primary controller for 30 days. While supporting calls, the LSP is considered to be in "license-error" mode. After 30 days in license-error mode, the LSP administration is blocked and display telephones show **License Error** in their display windows. However, even after 30 days, telephone operations can continue.

The fail-back from the LSP to the primary controller is manual, requiring a reset on the LSP. This reset breaks the communication between the LSP and every registered endpoint and causes the endpoints to register with the primary controller. During fail-back to the primary controller, every call is dropped with the exception of IP-to-IP calls.

---

## IP addressing

IP telephones obtain their own IP address from a DHCP server. The DHCP server also sends a list of controllers, LSPs, and their associated IP addresses. The IP telephone then registers with the controller corresponding to the first IP address in this list. When connectivity is lost between the controller and the endpoint, the endpoint registers with the second IP address in the list, and so on. This list is administrable for telephones on the DHCP server.

---

## Preservation of customer translations

An automatic process copies customer translation changes made on the primary server to every LSP.

---

## IA770 INTUITY AUDIX messaging

IA770 INTUITY AUDIX messaging is an optional voice mail system used with an S8300 Media Server. IA770 INTUITY AUDIX messaging is a software-only version of INTUITY AUDIX messaging that uses a QSIG-MWI H.323 virtual trunk for communication between the Communication Manager and IA770 software. This version is available on both the G700 and G350 media gateway configurations. Without the need for additional hardware, IA770 INTUITY AUDIX software processes touch tones, converts messages to the G.711 format, and converts text to speech.

**Note:**

**For upgrades only**, a G700 or G350 Media Gateway that previously used a CWY1 board will continue to use the CWY1 board with IA770 INTUITY AUDIX software. However, the CWY1 board is no longer available for new systems.

The IA770 INTUITY AUDIX system can be a solution for one location in a stand-alone S8300 configuration or the system can be networked with other voice mail systems using TCP/IP and Avaya Message Networking.

Highlights of an IA770:

- Supports up to 450 local users for typical call volumes and usage and up to 300 local users for heavy call volumes and usage
- Up to 60,000 remote messaging subscribers, with up to 50 hours of storage for recorded names and announcements.
- INTUITY AUDIX telephone user interface
- Up to 450 Message Manager clients

## Avaya S8300 Media Server and an Avaya G700 Media Gateway

- Up to 16 Message Manager simultaneous sessions, and four when using text-to-speech
- 35 different languages are available for prompts
- Backup of translations and messages over LAN and WAN
- Message storage of up to 30 minutes for each mailbox and 85 total hours for messages and greetings

**Note:**

The actual number of hours of storage available for messages and greetings may be higher if fewer than 60,000 subscriber names are recorded. Each recorded name requires approximately 3 seconds of storage.

An IA770 uses many resources of the S8300 Media Server and the G700 or G350 Media Gateway where it resides. The following outlines the S8300's shared resources used by the IA770:

- Hard drive for data storage and retrieval
- TFTP server for:
  - Downloading and updating the license file
  - Backing up and restoring data
  - Updating and upgrading software
- IP address for administration access
- License file for feature activation
- General Alarm Manager for alarm display
- Web interface to start and stop the system

The IA770 system also shares the same switch-tone parameters established for the S8300 Media Server. With the currently-sold software-only version of the IA770 system, the S8300 Media Server handles switch tones on behalf of the IA770 system and passes on the control information to the IA770 system using QSIG signaling. With the IA770 system that uses a CWY1 board, the installer or administrator must set IA770 parameters to match those of the S8300 Media Server.

The following countries require country-specific switch-tone parameters:

- Brazil
- Canada – uses the same parameters as the United States
- China
- France
- Germany
- Hong Kong
- Italy

- Japan
- Korea
- Mexico
- United Kingdom
- United States

Additional countries may be added in the future.

---

## Call center

An S8300 Media Server provides an excellent solution for a small call center. An S8300 Media Server with a G700 Media Gateway supports the following call-center capabilities:

- All three Avaya call-center packages: Avaya Call Center Basic, Avaya Call Center Deluxe, and Avaya Call Center Elite
- Supports up to 250 agents
- Supports a maximum of 16 ASAI links
- Avaya G700 announcement software

---

## G700 announcement software

Voice announcements are used in a call-center environment to announce delays, direct customers to different departments, entertain and inform calling parties. The announcement capability is standard and coresident on a G700. The G700's announcement software has many capabilities of the TN2501AP VAL circuit pack.

The following table compares the G700 Announcement software and the VAL circuit pack.

Area description	TN2501AP (VAL) circuit pack	G700 announcement software
Requires hardware	Yes	No
Maximum storage time per board for TN750 or TN2501AP	Up to 60 minutes at 64-kbps sample rate	Up to 20 minutes at 64-kbps uncompressed speech

## Avaya S8300 Media Server and an Avaya G700 Media Gateway

Area description	TN2501AP (VAL) circuit pack	G700 announcement software
Concurrent Calls per Announcement	50 when using a DEFINITY Server SI or DEFINITY Server CSI 1,000 when using the S8700/S8710 Media Server	1,000
Backup and restore over LAN	Yes	Yes
Recording Method	Use PC or telephone	Use PC or telephone
File portability to multiple DEFINITY or Avaya servers	Yes	Yes
Playback quality	Toll quality	Toll quality
Backup speed	2.6 seconds for each 60 seconds of announcement time	2.6 seconds for each 60 seconds of announcement time
Reliability	High	High
Firmware downloadable	Yes	Yes
Number boards or G700 announcement software per configuration	5 with the DEFINITY® CSI and DEFINITY SI 10 with the S8700/S8710 Media Server	250 when using the S8700/S8710 Media Server 50 when using the S8300 Media Server
Number of ports	32 (31 playback, 1 record)	16 (15 playback, 1 record)
Announcements per board	256	256
Maximum number of announcements in a configuration	128 DEFINITY Server CSI or DEFINITY Server Si 3,000 S8700/S8710 Media Server	6,400 when using the S8700/S8710 Media Server 1280 when using the S8300 Media Server
Format	CCITT A- or $\mu$ -law companding	CCITT A- or $\mu$ -law companding
Sample bits	eight	eight
Sample rate	8,000 Hz	8,000 Hz
Channels	Mono	Mono

---

## Customer configuration options

An S8300 Media Server with a G700 Media Gateway provides a standards-based, IP communications infrastructure without compromising the customer's applications, reliability, and multiservice networking. This solution can be installed for either small customers or large customers with branch offices or a multisite configuration.

An S8300 Media Server with G700 Gateways provides the following networking benefits:

- Feature transparency across the network via QSIG or DCS+
- A consistent user experience with the same user interface
- Unified system management
- Applications controlled by Avaya's Communication Manager, yet offering a rich enterprise feature set administered using an H.248-based control interface
- Ease of moves, adds, and changes using the same administration interface

For examples of configurations see:

- [Small-business solution using the Avaya S8300 Media Server in the G700 Media Gateway](#) on page 415
- [Branch Office Configuration](#) on page 420
- [Multi-Site Configuration](#) on page 421

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## System management

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### Avaya Integrated Management

Avaya Integrated Management offers a comprehensive set of Web-based network and system management solutions that support the Avaya converged voice solutions. Integrated Management combines individual applications into five offers:

- Standard Management
- Standard Management Solutions Plus
- MultiService Network Management
- Enhanced Converged Management
- Advanced Converged Management

For more detailed information on the Avaya Integrated Management suite see:

- <http://www.avaya.com> >Products and Services>Products A-Z

## S8300 Media Server Web interface

The Web browser-based tool on the S8300 Media Server uses a graphical user interface (GUI) interface to perform server-administration tasks such as:

- Backing up and restoring customer data
- Viewing current alarms
- Maintaining the media server including:
  - Checking the media server's status
  - Busying out and releasing busy out the media server
  - Shutting down the media server
- Executing security commands to enable and disable the modem, start and stop the FTP server, and view the license
- Accessing SNMP to configure trap destinations and to stop and start the master agent
- Accessing the media server to acquire configuration information and upgrade access

The media server's Web interface contains an extensive help system that describes every Web screen and its procedures.

---

## Adjuncts

The following are some Avaya-provided adjuncts:

- A system printer is supported when a terminal server is used.
- A journal printer is supported when a terminal server is used.
- Call Detail Recording (CDR) is supported when a terminal server is used.
- External INTUITY AUDIX
- Avaya Business Communication Management System
- Avaya Call Management System

---

## International information

An S8300 Media Server is available in the following countries:

- Argentina
- Australia
- Austria
- Bahamas
- Belgium
- Bermuda
- Brazil
- Bolivia
- Canada
- Chile
- China
- Colombia
- Costa Rica
- France
- Germany
- Guatemala
- Hong Kong
- Ireland
- Israel
- Italy
- Jamaica
- Japan
- Korea
- Mexico
- Panama
- Paraguay
- Peru
- Puerto Rico

- The Netherlands
- New Zealand
- Nordics
- Russia
- Singapore
- Spain
- Sweden
- Switzerland
- Taiwan
- Trinidad
- Tobago
- United Kingdom
- United States
- Uruguay
- Venezuela

---

## Digital trunks and CO trunks

The following table contains digital- and CO-trunk information for each country.

Country	Digital trunk	CO trunk	AC power (see note)	Plug type	DC power <sup>1</sup>	Companding	ICID	R2MFC over
Argentina	E1	LS	220 V	B, C, E	-48 V	A-law	-. <sup>2</sup>	E1
Australia	E1	LS DID	220 V	C	-	A-law	-	-
Austria	E1	LS	220 V	B, E	-48 V	A-law	-	-
Belgium	E1	LS	220 V	A, B, E	-60 V	A-law	-	-
Brazil	E1	LS	110/220 V	A, B, D, E	-48 V	A-law	-	E1
Canada	T1	LS GS DID	110 V	A	-	A-law	Bellcore FSK	-
China	E1	LS	220 V	B, C, E	-48 V	A-law	-	E1
Denmark	E1	-	220 V	B, E	-60 V	A-law	-	-
Finland	E1	-	220 V	B, E	-60 V	A-law	-	-
France	E1	LS	220 V	B, E	-60 V	A-law	-	-

Country	Digital trunk	CO trunk	AC power (see note)	Plug type	DC power <sup>1</sup>	Companding	ICID	R2MFC over
Germany	E1	LS	220 V	B, E	-60 V	A-law	-	-
Hong Kong	T1	LS	220 V	D, E, I	-	μ-law	Bellcore FSK	-
Ireland	E1	LS	220 V	B, D, E	-60 V	A-law	-	-
Israel	E1	LS DID E&M	220 V	B, G	-48 V	A-law	-	-
Italy	E1	LS E&M	220 V	B, F	-60 V	A-law	-	-
Japan	T1	LS DID	100 V	A	-	μ-law	NTT Clip	-
Korea	E1	LS DID	110/220 V	A, B	-	A-law	-	-
Mexico	E1	LS	110 V	A	-60 V	A-law	Bellcore FSK	E1
Netherlands	E1	LS	220 V	B, E	-60 V	A-law	-	-
New Zealand	E1	LS DID	220 V	C	-	A-law	-	-
Norway	E1	-	220 V	B, E	-60 V	A-law	-	-
Russia								
Singapore	E1	LS DID	220 V	B, D, E, I	-	A-law	Bellcore FSK	-
Spain	E1	LS	220 V	A, B, E	-48 V	A-law	-	-
Sweden	E1	-	220 V	B, E	-60 V	A-law	-	-
Switzerland	E1	LS	220 V	B, E	-60 V	A-law	-	-
Taiwan	E1	LS DID	110 V	A	-48 V	μ-law	-	-
U.K.	E1	LS	220 V	D, E	-60	A-law	-	-
U.S.	T1	LS GS DID	110 V	A	-	μ-law	Bellcore FSK	-

1. DC power is only a TA issue in China.

2. Indicates that the feature is not important or applicable.

**Note:**

These are nominal voltages. In general, a reference to 110 V applies to a range from 100 to 160 V. Whereas, a reference to 220 V applies to a range from 220 to 240 V.



# Avaya S8500 Media Server

The Avaya S8500 Media Server is a rack mounted telephony server, running the Linux operating system, and featuring the Avaya world class call processing application, Communication Manager. The S8500 is capable of supporting Internet Protocol (IP), Session Initiation Protocol (SIP), and traditional endpoints enabling new technology and ease of migration from legacy Avaya systems. The S8500 Media Server is a perfect solution for mid-sized customers, with growth of up to 3200 ports.

There are actually two S8500 models, the S8500 and the S8500B. While their functionality is basically the same, the S8500 and S8500B Media Servers have slightly different hardware components. The hardware components of the S8500 Media Server are described in one of the following sections:

- [Detailed description of the S8500 Media Server](#) on page 57
- [Detailed description of the S8500B Media Server](#) on page 64

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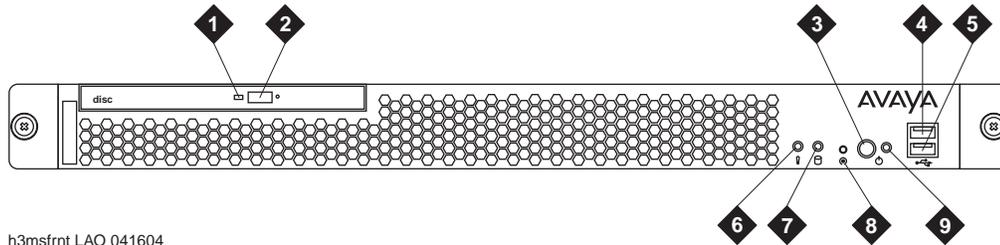
## Detailed description of the S8500 Media Server

See [Figure 13: S8500 Media Server \(front\)](#) on page 58 and [S8500 Media Server \(back\)](#) on page 59 for examples of the front and back of the S8500 Media Server.

**Note:**

For a description of the S8500B Media Server hardware, see [Detailed description of the S8500B Media Server](#) on page 64.

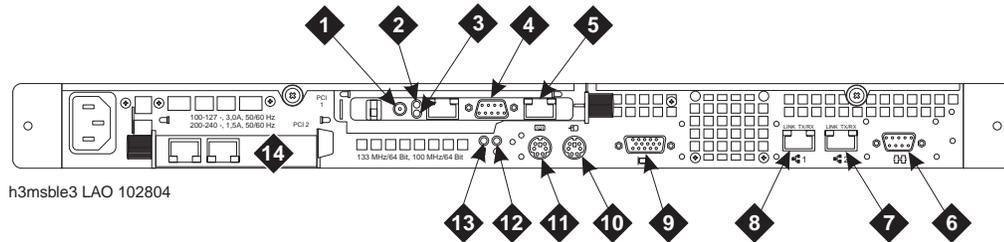
**Figure 13: S8500 Media Server (front)**



h3msfrnt LAO 041604

**Figure notes:**

Number	Description
1. <b>CD-ROM drive activity LED</b>	When this LED is lit, the CD-ROM drive is in use.
2. <b>CD eject button</b>	Press this button to release a CD from the CD-ROM drive.
3. <b>Power-control button</b>	Press this button to turn the server on or off manually
4. <b>USB connector 1</b>	This USB port configures automatically and uses a serial interface standard for telephony and multimedia devices.
5. <b>USB connector 2</b>	This USB port configures automatically and uses a serial interface standard for telephony and multimedia devices.
6. <b>System-error LED</b>	This amber LED lights when a system error occurs.
7. <b>Hard disk drive activity LED</b>	When this LED is flashing, it indicates that the associated hard disk drive is in use.
8. <b>Reset button</b>	Press this button to reset the server and run the power-on self-test (POST).
<p><b>Note:</b> Self-test results are not available for viewing.</p>	
9. <b>Power-on LED</b>	When this LED is lit, it indicates that the server is turned on.

**Figure 14: S8500 Media Server (back)****Figure notes:**

- |   |   |
|---|---|
| <b>1. External power-supply connector for RSA</b> | <b>8. Connection to customer network (port 1[Eth0])</b> |
| <b>2. Power LED for RSA</b>                       | <b>9. Connector</b>                                     |
| <b>3. Error LED for RSA</b>                       | <b>10. Mouse connector (not used)</b>                   |
| <b>4. Serial connector for RSA modem</b>          | <b>11. Keyboard connector (not used)</b>                |
| <b>5. Ethernet RJ45 connector on RSA</b>          | <b>12. LED</b>  |
| <b>6. 9-pin RS232 connector</b>                   | <b>13. LED</b>  |
| <b>7. Services port (port 2 [Eth1])</b>           | <b>14. Network interface card (NIC) (optional)</b>      |

---

## Components

The S8500 Media Server comes standard with the following hardware components:

- Pentium IV 512 KB Level-2 cache and MMX (MMX2) technology Microprocessor
- 512 MB RAM
- IDE CD-ROM
- 40-GB (minimum) hard drive
- Two USB ports
- One serial port
- A keyboard port
- A mouse port
- Two 10/100/1000Base-T Ethernet ports
- A Remote Supervisor Adapter (RSA)
- External (USB) Compact Flash drive with a 128 MB flash card
- One USB modem
- One serial modem

- AC-powered
- Includes RAM disk

**Note:**

An optional dual-NIC card can be added to the configuration when the network control is sent over a dedicated LAN.

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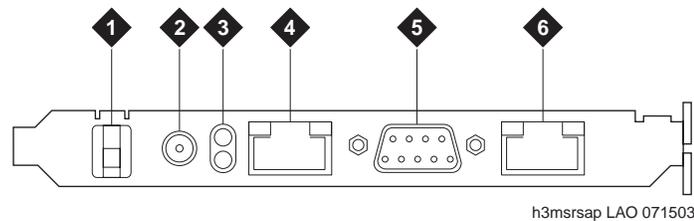
## Remote Supervisor Adapter (RSA)

A Remote Supervisor Adapter (RSA) is installed in PCI-X slot 1 of the S8500 Media Server. It monitors and reports alarms on S8500 components and provides control to remotely power-on and power-off the S8500. Administration of the RSA is accomplished through the Advanced System Management (ASM) Web interface using a browser.

See [Figure 15: RSA](#) on page 60 for an example of the RSA.

---

**Figure 15: RSA**



**Figure notes:**

RSA Component	Description
1. <b>Clip</b>	Power cord retaining clip
2. <b>External power-supply connector</b>	Connect the power-supply adapter to this connector. A power cord connects from the power-supply adapter to the power source. This connection provides power to the RSA that is independent of the S8500 Media Server power supply.
3. <b>Power and error LEDs</b>	The green LED: Shows the status of the power connection. The amber LED: Shows that an error condition exists on the RSA.
4. <b>Ethernet RJ-45 connector</b>	A 10/100 Mbps connector for LAN connectivity.
5. <b>Serial connector</b>	Used for serial modem connectivity.
6. <b>ASM RS-485 RJ-14 connector</b>	Not used in the S8500 Media Server configuration.

---

Standard features of the RSA are:

- Continuous health monitoring and control of the S8500 Media Server
- Automatic notification and alerts
- Event log showing time-stamped entries
- Remote access through the LAN and serial modem
- Automatic server reset upon detection of out-of-norm processing
- Automatic server reset upon after failed server handshake (after a defined length of time)
- Simple Network Management Protocol (SNMP) trap support
- Domain Name System (DNS) server support
- Dynamic Host Configuration Protocol (DHCP) support
- Remote power control
- Remote firmware updates

**Note:**

The S8500 Media Server monitors the health of the RSA and generates an alarm if a failure condition is detected.

## **RSA power**

The RSA obtains power from an external power source using its own built-in transformer or from the S8500 Media Server through its connection at the PCI bus. Avaya recommends that an external power source on a different circuit from the S8500 be provided for the RSA. In this way, if the RSA's power fails, the S8500 can provide backup power.

For external power, plug the cord from the power-supply adapter into the power connector on the RSA. For domestic installations a 3 pronged power cord will be plugged from the power-supply adapter into the power source. For international installations a power cord with a male IEC320 connector is used. The RSA can only be plugged into a AC power source. A power LED on the RSA lights when either or both of the following conditions are met:

- The RSA is receiving power from the external power-supply adapter.
- The RSA is receiving power from the S8500 Media Server in which it is installed.

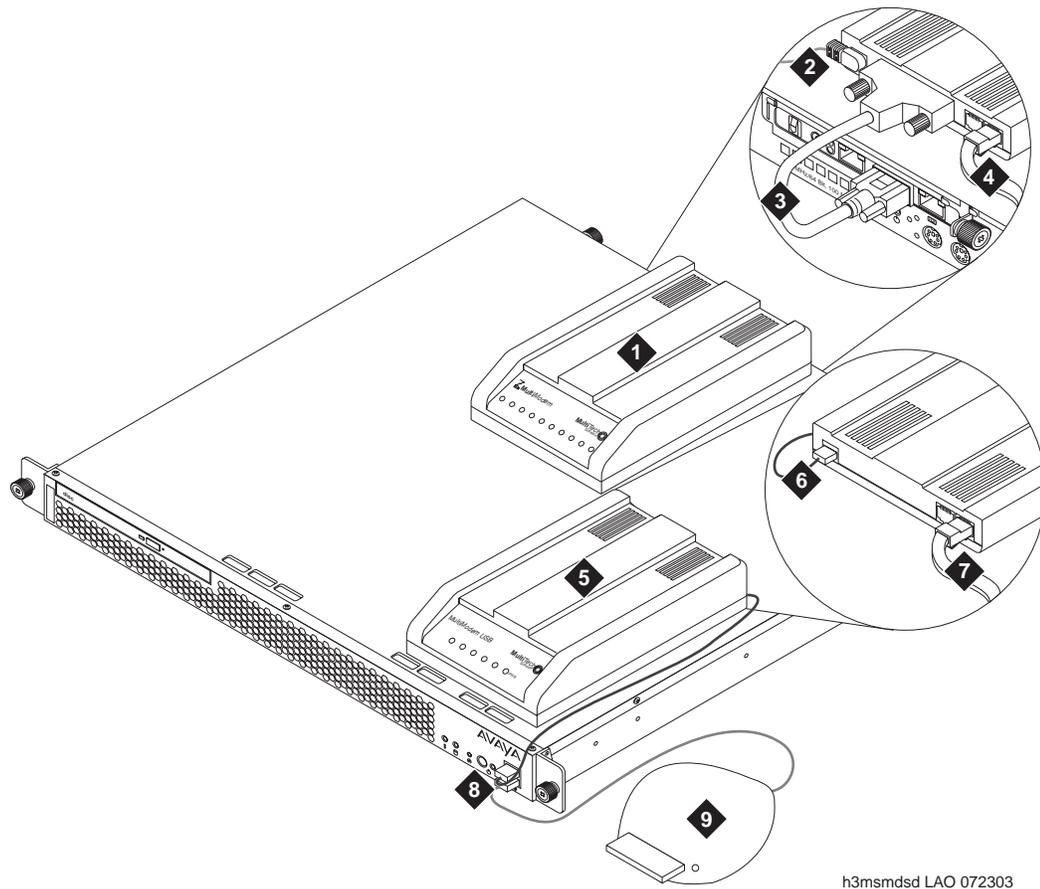
## Modems

The S8500 Media Server is equipped with two modems for remote alarming. One modem connects to the USB port on the front of the S8500 Media Server and is used for Communication Manager alarms. The other modem connects to the RS232 port on the RSA and is used for S8500 O/S and environmental alarms. The RSA modem provides remote access for diagnostics for the S8500. Both modems are connected to the same analog trunk, and the S8500 Media Server's modem answers calls first if the S8500 is operational. See [Figure 16: Modem connectivity to the S8500](#) on page 63 for an example of modem connectivity to the S8500 Media Server.

**Note:**

Avaya recommends that an external power source on a different circuit from the S8500 be provided for the RSA. If the RSA and the S8500 Media Server are powered by the same power supply, the ability to access the RSA may be prohibited in the case of a power failure.

Figure 16: Modem connectivity to the S8500



h3msmdsd LAO 072303

## Figure notes:

Number	Description
1.	Serial modem: used for the RSA.
2.	Serial modem cable: connects a serial modem to an RS-232 port on the RSA
3.	Serial modem cable: connects a serial modem to an RS-232 port on the RSA
4.	Telephone line: connects the serial modem to the CO line
5.	USB modem: used for Communication Manager and SAMP card
6.	USB cable: connects a USB modem to a USB port in front of the server.
7.	Telephone line: connects a USB modem to the CO line
8.	Two USB ports on the front of the server: one for the USB modem, the other for the compact flash memory reader.
9.	Compact flash memory reader: connects to a USB port in front of the server.

---

## Detailed description of the S8500B Media Server

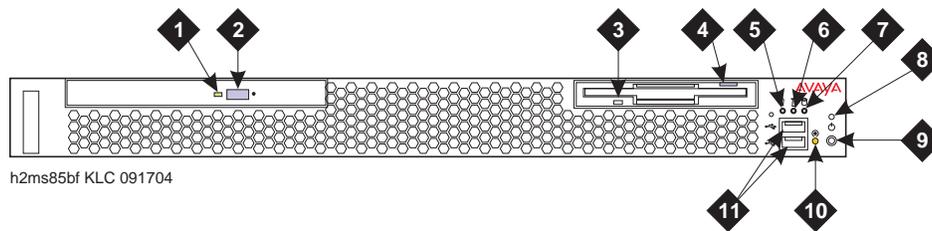
The S8500B Media Server has a different configuration than the S8500 Media Server. See [Figure 17: S8500B Media Server \(front\)](#) on page 64 and [S8500B Media Server \(back\)](#) on page 65 for examples of the front and back of the S8500B Media Server.

**Note:**

For a description of the S8500 Media Server hardware (*not* S8500B), see [Detailed description of the S8500 Media Server](#) on page 57.

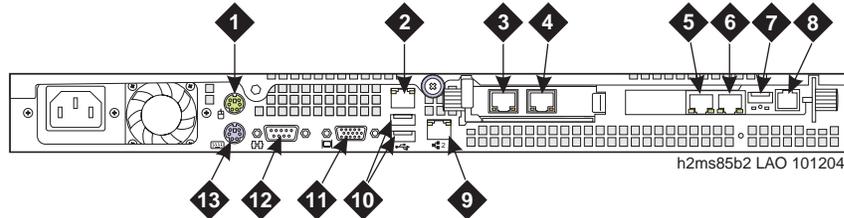
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**Figure 17: S8500B Media Server (front)**



**Figure notes:**

- |                                   |                                 |
|-----------------------------------|---------------------------------|
| 1. CD-ROM drive activity LED      | 7. Hard disk drive activity LED |
| 2. CD eject button                | 8. Power LED                    |
| 3. Floppy disk drive activity LED | 9. Power button                 |
| 4. Floppy disk drive eject button | 10. Reset button                |
| 5. System-error LED               | 11. USB connectors              |
| 6. System-locator LED             |                                 |

**Figure 18: S8500B Media Server (back)****Figure notes:**

- |   |  |
|---|--|
| 1. Mouse connector (not used)   | 8. External power, SAMP  |
| 2. Connection to customer's network (in non-dedicated control network) or direct connection to gateway IPSI (dedicated control network) (Eth 0) | 9. Connection to services laptop (Eth 1)   |
| 3. Eth 2 on optional Dual Nic Card (provides connection to customer network if Eth 0 is dedicated control network connection)                   | 10. Additional USB ports   |
| 4. Eth 3 on optional Dual Nic Card (not used)   | 11. Video port (not used)  |
| 5. Connection to services laptop for Server Availability Management Processor (SAMP) (Eth 2)  | 12. RS-232 serial interface — can be used for console redirection to perform BIOS upgrades |
| 6. Eth 1 on SAMP (not used)   | 13. Keyboard connector (not used)  |
| 7. USB ports — SAMP connection to modem   |  |
- See [Server Availability Management Processor \(SAMP\) on page 66](#).

---

## Components

The S8500B Media Server comes standard with the following hardware components:

- Pentium IV 1024-KB Level-2 cache and MMX (MMX2) technology microprocessor.
- 512 MB RAM
- IDE DVD-ROM drive
- 1.44 MB floppy drive
- 80-GB (minimum) SATA hard drive

- Two USB ports on the front and two USB ports on the back (one the four is used for the Compact Flash drive)

**Note:**

The SAMP card also has USB ports that are *in addition to* the four specified on the S8500B itself. The Compact Flash drive is always connected to a USB port on the S8500B chassis, *not* on the SAMP card.

- One serial port (may be used for console redirection)
- A keyboard port (not used)
- A mouse port (not used)
- Two 10/100/1000Base-T Ethernet ports
- A Server Availability Management Processor (SAMP) card for maintenance
- An external Compact Flash Memory Reader
- A Compact Flash 128 MB industry media (optional)
- One USB modem
- AC-powered
- Includes RAM disk.

**Note:**

An optional dual-NIC card can be added to the configuration when the network control is sent over a dedicated LAN.

---

## Server Availability Management Processor (SAMP)

The SAMP card is a Remote Maintenance Board (RMB) that is pre-installed in the S8500B Media Server and provides remote maintenance and serviceability to the media server.

Similar in functionality to the RSA card, the SAMP card provides the following functionality:

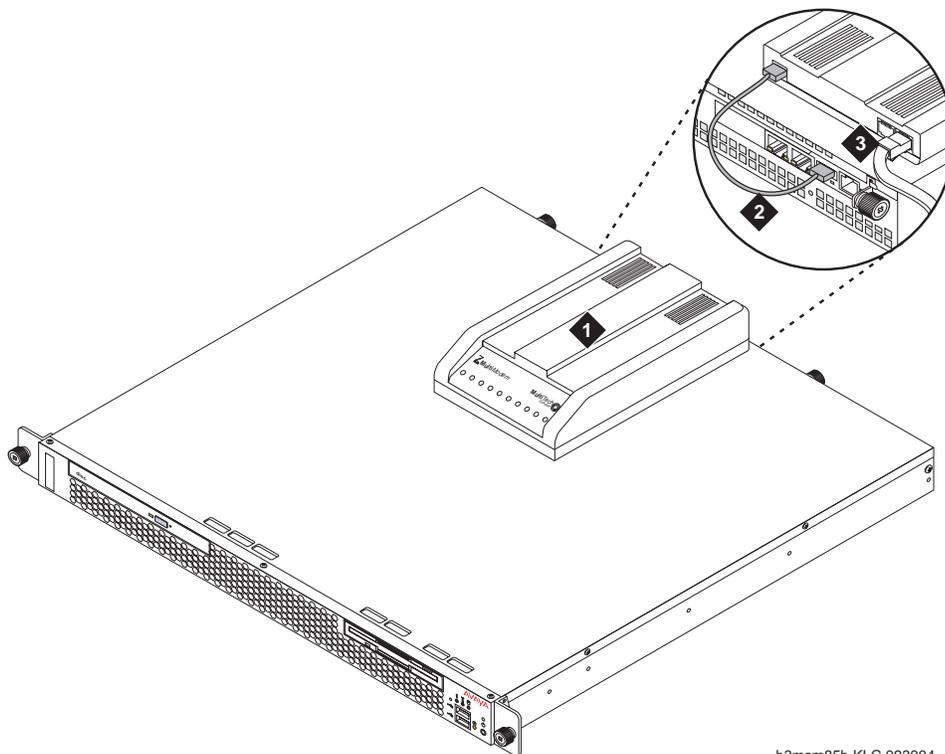
- Monitors the server state of health: fans, voltages, and temperature
- Reports server failure and other alarms to INADS by modem
- Provides remote server power-on and reset capability
- Secure dial-in connection to the SAMP (and subsequently the host) using SSH (secure shell)
- Services laptop access to the SAMP (and subsequently the host)

The SAMP obtains power from an external power source using its own built-in transformer or from the S8500B Media Server through its connection at the PCI bus. Avaya recommends that an external power source on a different circuit from the S8500B be provided for the SAMP. In this way, if the SAMP's power fails, the S8500B can provide backup power.

## Modem

The S8500B Media Server is equipped with one modem for remote alarming. The modem connects to the USB port on the SAMP. The S8500B Media Server, through its internal Ethernet port connection to the SAMP, can also use the modem, either for alarming or for remote access. As a result, the single modem of the S8500B Media Server is used for remote access for diagnostics for the S8500B, O/S and environmental alarms, and Communication Manager alarms. Remote access to the SAMP through the modem uses port 10022, and remote access to Communication Manager through the modem uses port 22. See [Figure 19: Modem connectivity to the S8500B](#) on page 67 for an example of modem connectivity to the S8500B Media Server.

**Figure 19: Modem connectivity to the S8500B**



h3msm85b KLC 093004

**Figure notes:**

Number	Description
1.	Modem
2.	USB cable connecting modem to the USB port
3.	Telephone line connecting the modem to an outside trunk

## Backing up an S8500 Media Server

You can back up the S8500 Media Server to a server on the LAN or to the Compact Flash memory reader that is installed in one of the USB ports. The Compact Flash memory reader uses a 128-MB Compact Flash card. Avaya recommends that use of the industrial grade Compact Flash for the following reasons:

- Improved data integrity and reliability
  - Powerful error correction
- Extreme endurance
  - 2,000,000 program/erase cycles per block
- Increased reliability
  - Mean time between failures (MTBF) greater than 3 million hours
- Industry-leading 7-year warranty
- Enhanced durability
  - New RTV silicone for added strength and stability

The industrial grade Compact Flash is available through Avaya and Avaya business partners.

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## Port-network connectivity

**Note:**

This section (including the Media Gateway subsections that follow) applies to both the S8500 and S8500B Media Servers.

For new installations, the S8500 Media Server uses IP connectivity between the Port Networks (PNs). Port network connectivity is provided by the IPSI-2 (TN2312BP) circuit packs and the IP Media Processor (TN2302AP) circuit pack. Direct connection between expansion interface boards in PNs (up to three) is available for systems migrating from a DEFINITY G3r or DEFINITY G3si. However, S8500 Media Server configurations with four or more PNs requires IP port network connectivity.

Forms of traditional network connectivity such as Center Stage Switch (CSS) and ATM port-network connectivity (ATM-PNC) are not supported. Also traditional options of survivability such as the Survivable Remote Processor or the ATM WAN Spare Processor are not supported.

---

## Media gateways

The G650 Media Gateway is used for new S8500 Media Server configurations. The following media gateways are supported in a migration from an existing Avaya solution to the S8500 Media Server:

- CMC1
- SCC1
- MCC1
- G600

**Note:**

The G700 Media Gateway and the G350 Media Gateway are supported through the C-LAN board mounted in a CMC1, SCC1, MCC1, G600, or G650 Media Gateway.

**Note:**

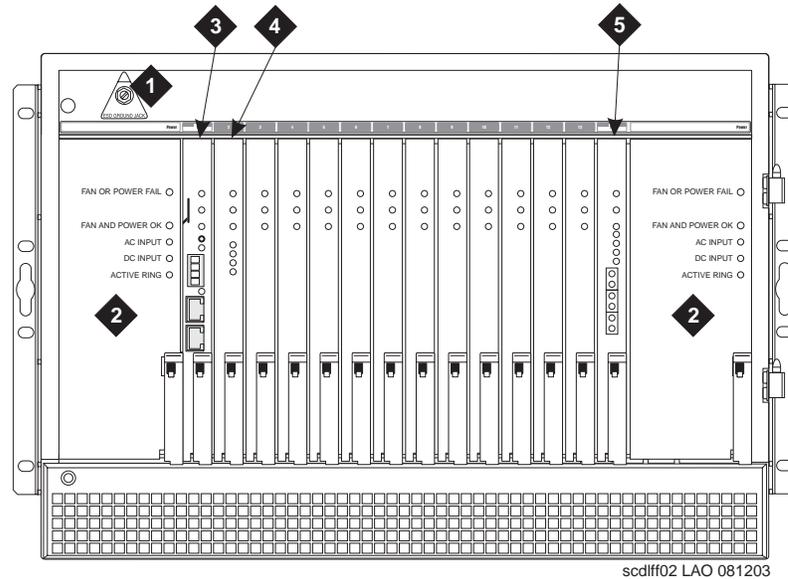
Media Gateway types cannot be mixed within the same PN.

### G650 Media Gateway

The Avaya G650 Media Gateway is a fourteen slot, rack mounted carrier configured for TN format circuit packs. The G650 is 8U high (14 inches (35.6 centimeters)) and mounts in a standard 19 inch (48.3 centimeters) data rack. The G650 uses one or two 655A power supplies, operating on either AC and DC input power. Either power supply can provide all the power needed by the G650. When two power supplies exist, they share the power load. One power supply can operate on AC power and the other on DC power. The system will always use AC power if available.

See [Figure 20: G650 Media Gateway](#) on page 70 for an example of a G650 Media Gateway.

**Figure 20: G650 Media Gateway**



**Figure notes:**

Number	Description
1.	EDS ground jack
2.	655A power supply
3.	TN2312BP IP server interface (IPSI)
4.	TN799DP C-LAN
5.	TN2302 IP media processor

For more information on the G650 Media Gateway, see [Avaya G650 Media Gateway](#) on page 160.

## S8500 Media Server reliability

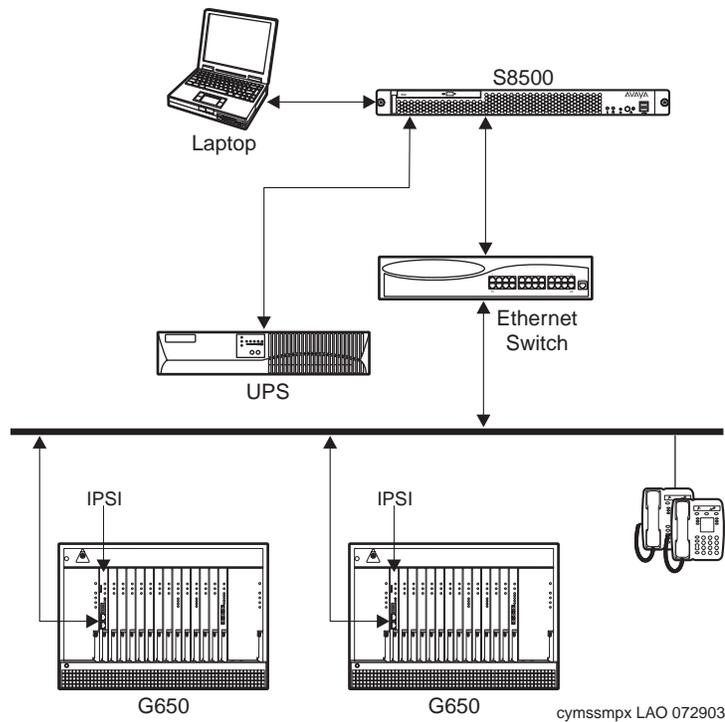
**Note:**

This section applies to both the S8500 and S8500B Media Servers.

The S8500 Media Server supports a simplex-reliability configuration. With simplex reliability, Communication Manager maintenance software continually monitors the system, performs audits, and often automatically resets the system if processes stop or are operating slowly. The maintenance software also sends alarms when there is a failure in the system.

See the following figure for an example of a simplex configuration.

**Figure 21: S8500 simplex configuration**



**Figure notes:**

Number	Description of Connection
1	S8500 Media Server
2	A dedicated Ethernet connection to a laptop. This connection is active only during on-site administration or maintenance.
3	Connection from the server to the Ethernet switch.
4	Ethernet Switch – A device that provides port multiplication on a LAN by creating more than one network segment. In an IP-Connect environment, the Ethernet switch should support 802.1 ip/Q, VLAN, 10-/100-Mbps, and Gigabit Ethernet.
5	UPS unit
6	Port Network – An optional configuration of Media Gateways that provides increased port capacity.
7	IPSI – A circuit pack that transports control messages over IP. This IPSI circuit pack is used so the S8500 Media Server can communicate with the PNs.
8	Customer LAN
9	Control Lan Interface (C-LAN) - A circuit pack that provides call control for every IP endpoint that is connected to the media server using an Avaya media gateway.

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## Migrating to an S8500 Media Server

**Note:**

This section applies to both the S8500 and S8500B Media Servers.

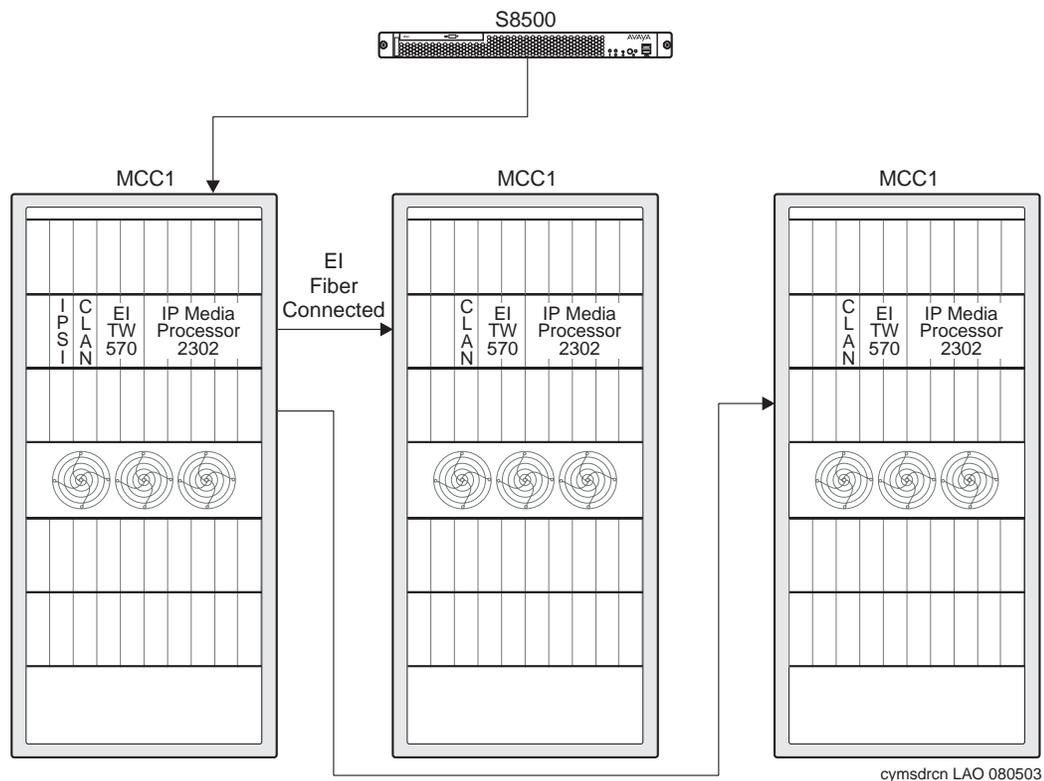
Migrations from the DEFINITY R, DEFINITY SI, DEFINITY CSI and S8100 Media Server are supported to a S8500 Media Server configuration. The following describes a high-level migration from the DEFINITY R, DEFINITY SI, DEFINITY CSI and S8100 Media Server platforms:

- DEFINITY R simplex:
  - Direct-connect configurations only
  - All control circuit packs will be removed and replaced with an IPSI (TN2312BP) circuit pack.
  - Voice announcements must be on a VAL board or migrated to a VAL board.
  - The PPN control carrier must be replaced with an EPN control carrier.
  - Existing translations can be migrated using the Translation Migration Tool.
- DEFINITY SI:
  - Direct-connect configurations only
  - SCC1 EPN cabinet will migrate to a SCC1 PN
  - SCC1-SPE cabinet will be removed and replaced with a SCC1 EPN or the G50 Media Gateway.
  - SI processor, Net Pkt (TN2401), and Tone Clock (TN2182), are removed and replaced with an IPSI (TN2312BP).
  - Voice announcements must be on a VAL board or migrate to a VAL board.
  - Existing translations can be migrated using the Translation Migration Tool.
- DEFINITY CSI:
  - The CSI Media Server (TN798 or the TN2402) and the Tone Clock (TN2182) will be removed and an IPSI (TN2312BP) circuit pack will be installed in slot 2.
  - Voice announcements must be on a VAL board or migrate to a VAL board.
  - Existing translations can be migrated using the Translation Migration Tool.
- S8100 Media Server in a G600 Media Gateway or a CMC1 Media Gateway:
  - The S8100 Media Server (TN795) will be removed and replaced with a IPSI (TN2312BP) circuit pack.
  - The Tone Detector (TN744) will be removed.

- The S8100 Media Server runs Intuity Audix co-resident. In the event of a migration the subscriber data and voice files must be retranslated to an external voice messaging solution.
- Voice announcement must be on a VAL board or migrate to a VAL board.
- Existing translations are migrated using the Translation Migration Tool.

See [Figure 22: S8500 Media Server in a direct-connect configuration](#) on page 73 for an example of the S8500 Media Server in a direct-connect configuration.

**Figure 22: S8500 Media Server in a direct-connect configuration**



## RAM disk

### Note:

This section applies to both the S8500 and S8500B Media Servers.

RAM disk is a portion of memory used as a disk partition. In the event of a hard disk failure, the S8500 Media Server, using only RAM disk, will continue to provide call processing for up to 72 hours. Administration and backups will be prohibited.

## High-level capabilities

**Note:**

This section applies to both the S8500 and S8500B Media Servers.

The following table presents a subset of high-level capabilities for the S8500 Media Server. For more detailed system capacity information refer to the Avaya Communication Manager System Capacities Table (555-233-601). The Capacities Table can be found on the <http://support.avaya.com> Web site.

**Table 2: High-level capabilities**

Capability	S8500/S8500B Media Server
Call processing feature set	Avaya Communication Manager 2.2
Reliability options	Simplex
Port-network connectivity	IP and direct connect
Supported media gateways	G650, G700, G350 (new installs); G600, CMC1, SCC1, MCC1 (migrations only)
Maximum number of supported gateways	250
Maximum locations	64 G650 port networks, plus up to 250 G700/G350 Media Gateways
Survivability options	G350 and G700 with S8300 LSP
Number of LSPs in one configuration	Maximum of 250 LSPs
Port networks per IPSI	One

In addition to voice calls, the S8500 Media Server supports transport of the following:

- Teletypewriter device (TTY) tone relay over the Internet
- Faxes over a corporate IP intranet

**Note:**

The path between endpoints for fax transmissions must use Avaya telecommunications and networking equipment.



**SECURITY ALERT:**

Faxes sent to non-Avaya endpoints cannot be encrypted.

- T.38 Fax over the Internet (including endpoints connected to non-Avaya systems)
- Modem tones over a corporate IP intranet

**Note:**

The path between endpoints for modem tone transmissions must use Avaya telecommunications and networking equipment.

See [TN2302AP IP Media Processor](#) on page 235 and the *Administrator's Guide for Avaya Communication Manager*, 555-233-506 for more information.

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## System management

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### Avaya Integrated Management suite

The Avaya Integrated Management suite offers a comprehensive set of Web-based network and system management solutions that support the Avaya converged voice solutions. Integrated Management combines individual applications into five offers:

- Standard Management
- Standard Management Solutions Plus
- MultiService Network Management
- Enhanced Converged Management
- Advanced Converged Management

For more detailed information on the Avaya Integrated Management suite see:

- <http://www.avaya.com> >Products and Services>Products A-Z

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## Avaya S8500 Media Server Web interface

The S8500 Media Server uses a media server Web interface to perform a wide variety of functions. This browser-based tool uses a Graphical User Interface (GUI) for performing server administration tasks such as:

- Backups and restores for customer data
- Provides easy access to view current alarms
- The ability to perform server maintenance including busy out and release busy out, shutdown, and status of the S8500 Media Server.
- Security commands that will enable and disable the modem, start and stop FTP server, and view license.
- SNMP access to configure trap destinations, stop and start the master agent.
- S8500 Media Server configuration information and upgrade access.

The Web interface contains an extensive help system that describes all the Web screens and fields.

# Avaya S8700-series Media Servers with an Avaya G650 Media Gateway

The Avaya S8700-series (S8700 and S8710) media servers use a standard microprocessor engine with either a Pentium 3 (S8700) or a Pentium 4 (S8710) processor on a commercial server. Although the S8710 Media Server is provided by a different manufacturer than the S8700 Media Server, it has similar internal components and the same functionality as the S8700 Media Server. Both the S8700 and the S8710 Media Servers support Communication Manager. The S8710 Media Server is the server normally shipped for new systems.

The S8700-series media servers use high-speed connections to route voice, data, and video between analog and digital trunks, data lines that are connected to host computers, data-entry terminals, personal computers, and internet addresses

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## Detailed description

The S8700-series media servers use a Linux platform. The S8700-series media servers are derived from the DEFINITY® processor, have fewer physical components, and provide most of the same features and functionality with increased capacity.

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## Configuration information

The S8700-series media servers are available in two configurations:

- Voice bearer over Center Stage Switch (CSS) or Asynchronous Transfer Mode (ATM) (Multi-Connect): In this configuration the bearer paths and control paths are separate. The control information for port networks travels over a control network and terminates on the S8700 or S8710 Media Server at one end and an IP Server Interface (IPSI) circuit pack on the other. The control network consists of one of the following:
  - A dedicated control network in which an Ethernet switch is used only for the control network and therefore creates a private LAN
  - A non-dedicated control network in which control data passes through an Ethernet switch that is also connected to the customer LAN
- Voice bearer over IP (IP-Connect): An all-IP configuration that carries both control and bearer information.

## S8700-series media server control complex

An S8700-series media server configuration uses the following components and software:

- Two media servers
- An IP Server Interface (IPSI) circuit pack (TN2312BP)
- An Avaya Ethernet Switch, which can be an Avaya P133, P134, P333, P334, C360, or C460 switch, or customer-provided Ethernet switch
- An Avaya 1000VA/1500VA online UPS (though a non-Avaya UPS or a UPS with a higher VA rating may also be used)
- An Abstract Control Model (ACM) compliant Universal Serial Bus (USB) modem (supported by the Linux operating system)
- Avaya Communication Manager

For information about Avaya Communication Manager, see the "Overview for Avaya Communication Manager", 555-233-767.

The following sections describe each of the main components.

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## S8700 Media Server

**Note:**

For a description of the S8710 Media Server hardware, see [S8710 Media Server](#) on page 80.

The S8700 Media Server dimensions are (HxWxD) 3.5 in. (9 cm.) x 17 in. (43 cm.) x 17 in. (43 cm.).

Characteristics of the S8700 Media Server:

- 10/100 Ethernet ports to support IPSI network control links, services access, duplication, administration and alarming.
- An IDE hard disk
- An IDE CD-ROM
- Support for global power ranging from 100V to 250V
- Storage media for the operating system, customer translations, and maintenance software
- Support for USB port connectivity for modem
- A 128 MB Flash Card for removable media
- Support for remote call out alarming from either server
- SNMP alarming

- Transport of the following:
  - Teletypewriter device (TTY) tone relay over the Internet
  - Faxes over a corporate IP intranet

**Note:**

The path between endpoints for fax transmissions must use Avaya telecommunications and networking equipment.

**▲ SECURITY ALERT:**

Faxes sent to non-Avaya endpoints cannot be encrypted.

- T.38 Fax over the Internet (including endpoints connected to non-Avaya systems)
- Modem tones over a corporate IP intranet

**Note:**

The path between endpoints for modem tone transmissions must use Avaya telecommunications and networking equipment.

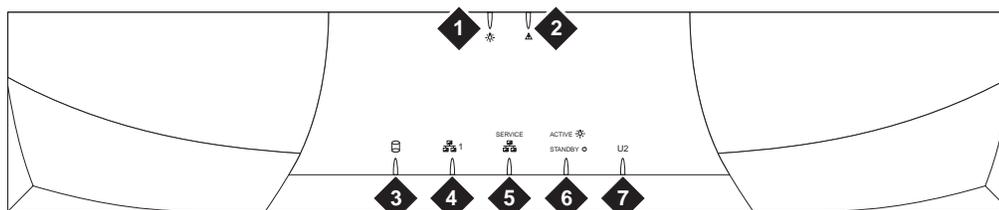
See [TN2302AP IP Media Processor](#) on page 235 and the *Administrator's Guide for Avaya Communication Manager*, 555-233-506, for more information.

The S8700 Media Server must be mounted in an open, 2-post or 4-post, 19-inch rack that is EIA-310-D compliant. The use of slide out rails is the preferred option.

See [Figure 23: S8700 Media Server \(front view\)](#) on page 79 for an example of the S8700 Media Server.

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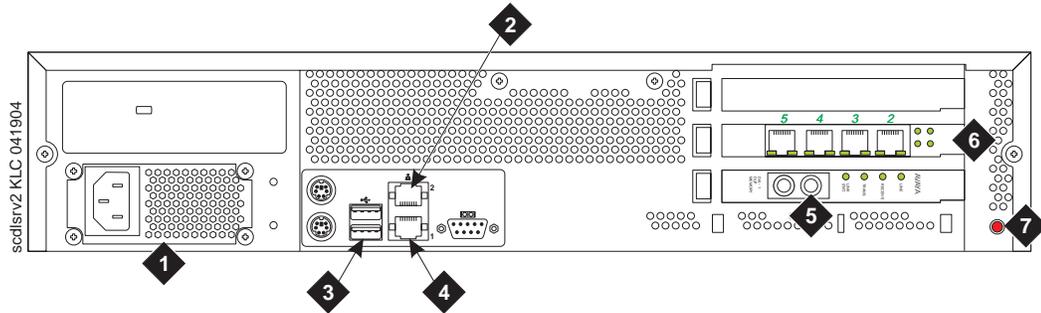
**Figure 23: S8700 Media Server (front view)**

**Figure notes:**

Number	Description of Device	Number	Description of Device
1.	Power LED	5.	Service — configuration health LED
2.	Configuration fault LED	6.	Active or standby mode indicator
3.	Hard drive activity LED	7.	U2 (not currently used)
4.	Network activity (CNA) LED		

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**Figure 24: S8700 Media Server (back view)**



**Figure notes:**

Number	Description of Device
1.	Power supply
2.	Ethernet port (services)
3.	USB ports, one of which is used for a modem connection
4.	Port 1 — port for ethernet switch connection
5.	DAJ1 Duplication board (used for control signaling between servers)
6.	4-port NIC card (the right-hand ports are used for data transfers between servers)
7.	LED (not currently used)

## S8710 Media Server

**Note:**

For a description of the S8700 Media Server hardware, see [S8700 Media Server](#) on page 78.

The S8710 server’s dimensions are (HxWxD) 3.38 in. (8.6 cm.) x 17.50 in. (44.5 cm.) x 25.75 in. (65.4 cm.). The S8710 Media Server has a 2U form factor.

Characteristics of the S8710 Media Server include:

- 3.06 GHz P4 processor
- 512 MB memory
- 72GB 10,000 RPM SCSI hard drive
- 2 10/100/1000 Ethernet ports on the motherboard to support IPSI network control links, services access, and administration

- Two USB ports, one of which you use for a modem connection and the other to connect the Compact Flash drive
- External (USB) Compact Flash
- 4-port (10/100BaseT) network interface card (quad NIC)
- A SCSI CD/DVD-ROM.
- A DAL1 Duplication board for connections to the duplicated server.

A DAL1 board resides in a PCI slot on both the active server and the standby server. The DAL1 operates in either active or standby mode to match the mode of its server. When the active server saves data to its DAL1 board, the data is also sent over the fiber link to the DAL1 board on the standby server.

- A distance limitation of 10 km between the S8710 Media Servers in the pair
- Support for global power ranging from 100V to 250V AC
- Active/standby status LED (for easy in rack server identification)
- Transport of the following:
  - Teletypewriter device (TTY) tone relay over the Internet
  - Faxes over a corporate IP intranet

**Note:**

The path between endpoints for fax transmissions must use Avaya telecommunications and networking equipment.

 **SECURITY ALERT:**

Faxes sent to non-Avaya endpoints cannot be encrypted.

- T.38 Fax over the Internet (including endpoints connected to non-Avaya systems)
- Modem tones over a corporate IP intranet

**Note:**

The path between endpoints for modem tone transmissions must use Avaya telecommunications and networking equipment.

See [TN2302AP IP Media Processor](#) on page 235 and the *Administrator's Guide for Avaya Communication Manager*, 555-233-506, for more information.

The S8710 Media Server is normally mounted in a 4-post rack with square holes. It can, however, also be mounted in a 2-post rack if you use an adapter kit. In either case, the server must be able to slide out using rails or a slide-out shelf.

The S8710 Media Server power supply has the following input requirements:

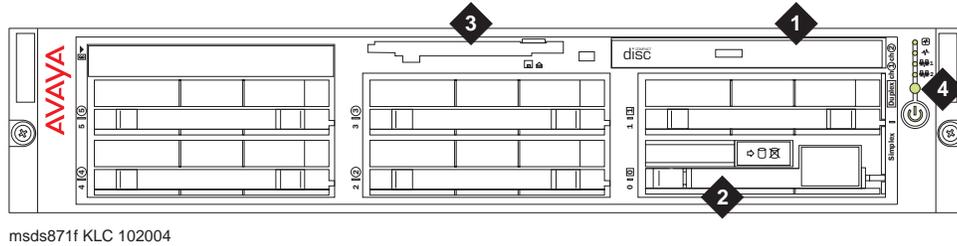
- Line Voltage Range: 90 to 132 VAC/180 to 265 VAC
- Nominal Line Voltage: 100 to 120 VAC/220 to 240 VAC
- Rated Input Current: 6A (110V) to 3A (220V)

## Avaya S8700-series Media Servers with an Avaya G650 Media Gateway

- Rated Input Frequency: 50 to 60 Hz
- Rated Input Power: 600W

See the following figures for an example of the S8710 Media Server.

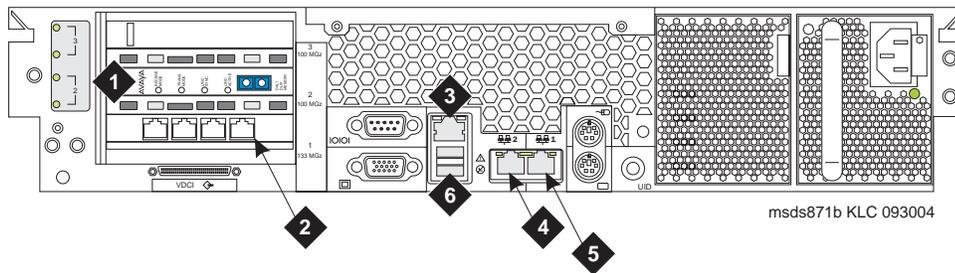
**Figure 25: S8710 Media Server (front view)**



**Figure notes:**

Number	Description of Device
1.	CD/DVD-ROM drive
2.	Hard drive
3.	Floppy drive
4.	Active/standby server LED (lit for active)

**Figure 26: S8710 Media Server (back view)**



**Figure notes:**

Number	Description of Device
1.	DAL1 Duplication board (used for control signaling between servers)
2.	4-port NIC card (the left-hand ports are used for data transfers between servers)
3.	1 iLO NIC port (not used)
4.	Services port (Eth 1)
5.	Control network A (Eth 0)
6.	USB ports for modem and Compact Flash drive

## IPSI Circuit Pack (TN2312BP)

The TN2312BP IP Server Interface (IPSI) provides the link between the control network and the gateways. A TN2312BP IPSI placed in a G650 provides environmental maintenance and, with a carrier address set to A, acts as the serial bus master. (A TN2312BP IPSI can only be placed in a G650 with a carrier address set to A or B.)

The TN2312BP IPSI is backward compatible with the CMC1, MCC1, SCC1, and G600 media gateways, but provides environmental maintenance only when used in a G650. The TN2312BP IPSI always provides tone detection, call classification, tone generation, and clock functions.

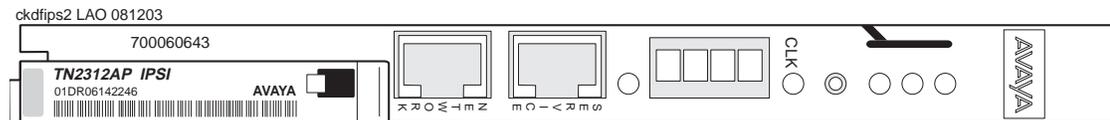
When the TN2312BP IPSI is used in an MCC1 or SCC1, a TN775D provides the environmental maintenance.

The TN2312BP IPSI provides maintenance functions for the G650. This includes:

- Power supply, cabinet, and ring generator maintenance
- External device alarm detection
- Emergency transfer control
- Customer-provided alarm device control

See [Figure 27: IPSI faceplate](#) on page 83 for an example of the IPSI faceplate

**Figure 27: IPSI faceplate**



## Determining the number of IPSIs required based on PNs

For configurations where voice bearer is over IP, there must be one IPSI in each PN.

For a direct connect configuration, a single IPSI is installed in only one of the PNs, and this IPSI controls the other PNs.

For configurations where voice bearer is over CSS or ATM, each IPSI typically controls up to five port networks by tunneling control messages over the bearer network to PNs that do not have IPSIs.

### Note:

An IPSI cannot be placed in:

- A PN that has a Stratum-3 clock interface
- A Survivable Remote Expansion Port Network (SREPN)

To determine the number of IPSIs that are recommended for a specified number of PNs in an S8700 or S8710 bearer-over-ATM-or CSS configuration, do the following:

### For standard duplex CSS or ATM configurations

1. Divide the number of PNs by 5.
2. Round the dividend from Step 1 up to the nearest whole number.
3. Add one to the whole number from Step 2.

The result from Step 3 is the required number of IPSIs.

For example, with nine port networks, you would divide nine by five, which results in 1.8. Then, you would round 1.8 up to 2 and add 1, which results in 3. Thus, 3 IPSIs would be required.

The IPSI added in Step 3 above provides fault tolerance and is placed in a PN that does not already have an IPSI.

### For high and critical reliability CSS or ATM configurations

1. Divide the number PNs by 5.
2. Round the dividend from Step 1 up to the nearest whole number.
3. Multiply the whole number from Step 2 by 2.

The result from Step 3 is the required number of IPSIs.

For example, with nine port networks, you would divide nine by five, which results in 1.8. Then, you would round 1.8 up to 2 and multiply by 2, which results in 4. Thus, 4 IPSIs would be required. These 4 IPSIs would be installed as a pair of IPSIs in each of two IPSI-connected PNs. Thus, fault tolerance is doubled in high- or critical-reliability configurations.

For more information on the IP Server Interface, see [TN2312BP IP Server Interface](#) on page 237

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## Ethernet switch

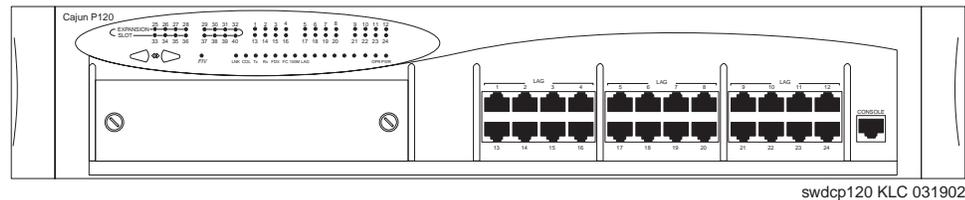
An Ethernet switch provides connectivity between the servers and the IPSI circuit packs that reside in some PNs. For duplex reliability, one Ethernet switch is provided. For high and critical reliability, the Ethernet switches are duplicated. An S8700-series media server supports two Ethernet connections to the Ethernet switch in the control network.

An S8700-series media server normally uses an Ethernet switch as part of the control complex. The Ethernet switch extends Ethernet connectivity to the PN where it connects to an IPSI. One Ethernet switch is required for duplex reliability. Two are required for high or critical reliability (voice bearer over CSS or ATM only). If desired, customer-provided non-Avaya Ethernet switches can be substituted for Avaya Ethernet switches.

Although an S8700-series media server control network does not have to be a dedicated one, an installation that uses a dedicated set of Ethernet switches provides simplicity and greater reliability.

See [Figure 28: Avaya Ethernet switch](#) on page 85 for an example of an Avaya Ethernet switch.

**Figure 28: Avaya Ethernet switch**



## UPS or power backup

Power backup for an S8700-series media server is highly-desirable. The Avaya 1000-VA UPS provides approximately 30 minutes of power backup. Combinations of battery extension modules and a 1500-VA UPS provide up to eight hours of power backup. See [Avaya UPS Units](#) on page 345 for more information on some of the UPS units available.

The Avaya UPS units send SNMP traps to the S8700/S8710 Media Server when power fails. The server's Global Maintenance Manager may then send an alarm to the services organization or send a trap to a network management system. When a separate 48V-DC battery string is used, it might be possible for the battery string to send a trap when voltage is below a threshold.

## USB modem

Each S8700-series media server in a server pair requires a Universal Serial Bus (USB) modem for maintenance access and to call out an alarm. The modems can share a common phone line if the media servers are co-located. When the media servers are sufficiently separated, an additional phone line will be required. Incoming calls are answered by the on-line server. The callers can access the off-line server via a telnet session. Each modem connects to a USB port on the media server. The USB modems used must conform to the Communication Device Class (CDC) specification, and usually to the Abstract Control Model (ACM) sub-class. Any modem that does not comply with the specification will not work with the driver that the S8700-series media server provides.

## Media gateways

Avaya media gateways are modular and, with one exception, stackable hardware elements that deliver connectivity to a variety of endpoint and trunk types – enabling data, voice, FAX, video, and messaging capabilities to your network. The Avaya G650 Media Gateway is the preferred gateway for new installations of an S8700-series media server. For migrations from an existing Avaya solution, and additions to an existing Avaya solution, the type of gateway that will be supported depends on the configuration. For the voice bearer over CSS or ATM, the G350, G650, MCC1, SCC1, and G700 media gateways are supported. For the voice bearer over IP the G350, G650, G600, G700, and CMC1 media gateways are supported. The following section offers a high-level description of each of the media gateways.

### The G650 Media Gateway

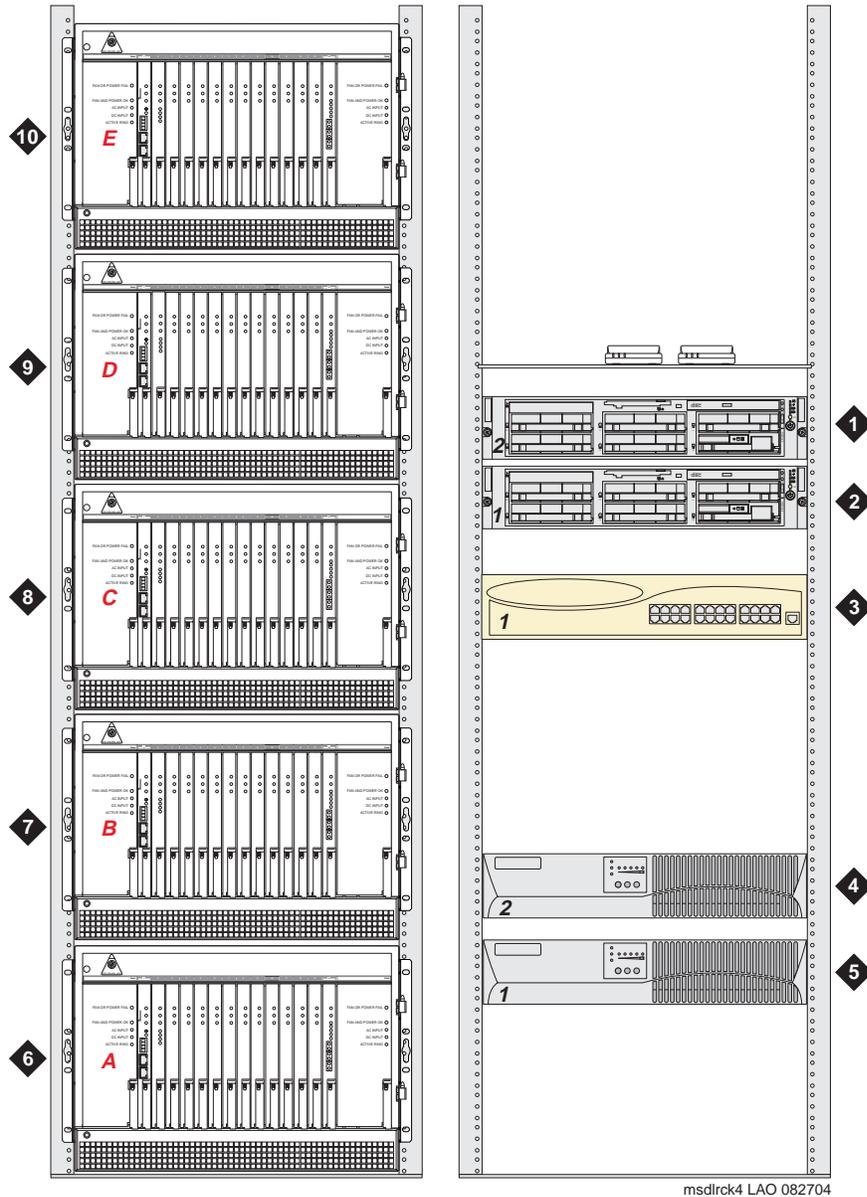
The Avaya G650 Media Gateway is a fourteen slot, rack mounted carrier configured for TN format circuit packs. The G650 is 8U high (14 inches (35.6 centimeters)) and mounts in a standard 19 inch (48.3 centimeters) data rack. The G650 uses one or two 655A power supplies, operating on either AC and DC input power. Either power supply can provide all the power needed by the G650. When two power supplies exist, they share the power load. One power supply can operate on AC power and the other on DC power. The system will always use AC power if available.

**Note:**

An S8700-series media server operates on AC power only.

See [Figure 29: G650 Media Gateway](#) on page 87 for an example of a stack of G650 Media Gateways mounted in a data rack.

Figure 29: G650 Media Gateway



msdlrck4 LAO 082704

Figure notes:

Number	Description	Number	Description
1 & 2	S8700 or S8710 Media Servers	7	G650 Media Gateway: Carrier position "B"
3	Ethernet switch	8	G650 Media Gateway: Carrier position "C"
4 & 5	UPS units: one for each server	9	G650 Media Gateway: Carrier position "D"
6	G650 Media Gateway: Carrier position "A"	10	G650 Media Gateway: Carrier position "E"

For more information about the Avaya G650 Media Gateway, see [Avaya G650 Media Gateway](#) on page 160.

## **The MCC1 Media Gateway (voice bearer over ATM or CSS only)**

The MCC1 Media Gateway can contain up to five carriers. The MCC1 Media Gateway uses circuit packs. Doors on the front and on the rear of the cabinet protect internal equipment and allow easy access to circuit packs. The MCC1 Media Gateway can contain the following carriers:

- A Port Carrier can that contains one or more of the following:
  - Port circuit packs
  - IPSI
  - VoIP conversion resources
  - Service circuit packs
  - Tone clocks
  - Expansion Interface (EI) circuit packs
- A Switch Node Carrier that contains Switch Node Interface circuit packs that compose the Center Stage Switch (CSS).
- An Expansion Control Carrier that contains service slots and port slots.

See [Figure 30: MCC1 Media Gateway](#) on page 89 for an example of the MCC1 Media Gateway.

Figure 30: MCC1 Media Gateway

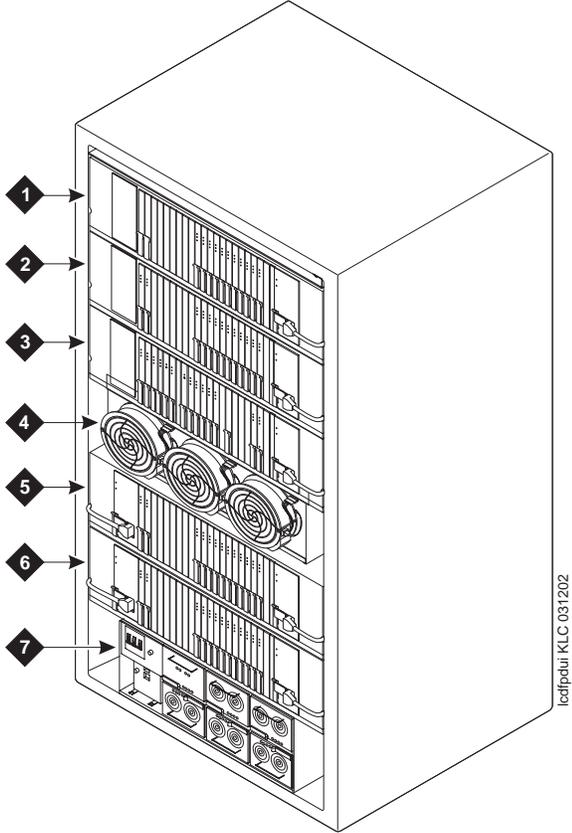


Figure notes:

Number	Description	Number	Description
1.	Carrier in position C	5.	Carrier in position D
2.	Carrier in position B	6.	Carrier in position E
3.	Carrier in position A	7.	Power-distribution unit
4.	Fan unit		

For more information, see the [MCC1 Media Gateway](#) on page 188.

## SCC1 Media Gateway (voice bearer over ATM or CSS only)

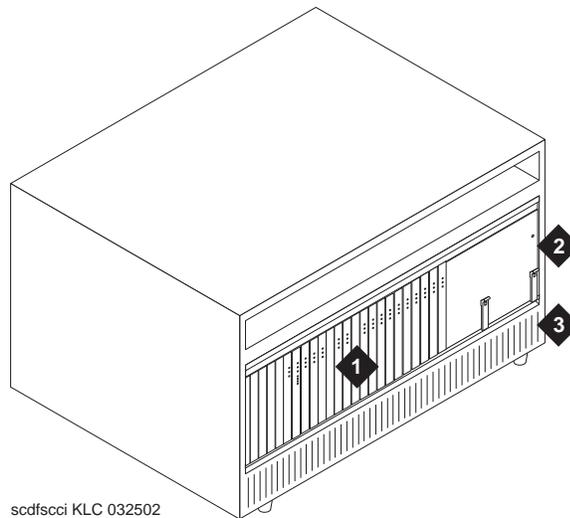
The SCC1 Media Gateway consists of a single carrier. Up to four SCC1 Media Gateways can be connected together in one location to form a PN. The SCC1 Media Gateway provides vertical slots for circuit packs. Rear cabinet clips connect the cabinets together. A ground plate connects the stacked cabinets for ground integrity. There are two types of SCC1 Media Gateways:

- An Expansion Control Cabinet that contains service slots and port slots.
- A Port Cabinet that contains ports and interfaces to an Expansion Control Cabinet.

See [Figure 31: Typical SCC1 Media Gateway](#) on page 90 for an example of the SCC1 Media Gateway.

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**Figure 31: Typical SCC1 Media Gateway**



**Figure notes:**

Number	Description
1.	Circuit packs
2.	Power converter
3.	Air circulation vents

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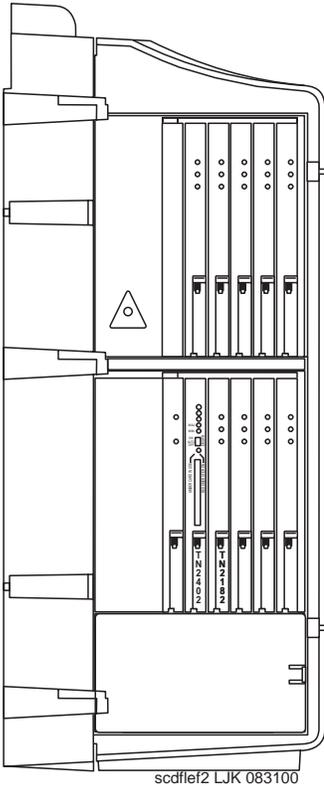
For more information, see [SCC1 Media Gateway](#) on page 180.

### CMC1 Media Gateway (voice bearer over IP only)

The CMC1 Media Gateway can be mounted on a wall or on the floor, and uses an AC-only power supply. The control carrier contains two control slots, one for a processor (not used) and the other for the IPSI (TN2312BP). Slots 3 to 10 can contain optional port circuit packs and service circuit packs.

See [Figure 32: CMC1 Media Gateway](#) on page 91 for an example of the CMC1 Media Gateway.

**Figure 32: CMC1 Media Gateway**



For more information on the CMC1 Media Gateway see [CMC1 Media Gateway](#) on page 177.

## G600 Media Gateway (voice bearer over IP only)

A G600 Media Gateway has the following characteristics:

- 19 inches wide, 13 inches high, and 21 inches deep
- 10 universal slots and one power-supply slot
- AC-powered only

There are no internal batteries, and internal DC power is not an option. However, external DC powering or a UPS is supported.

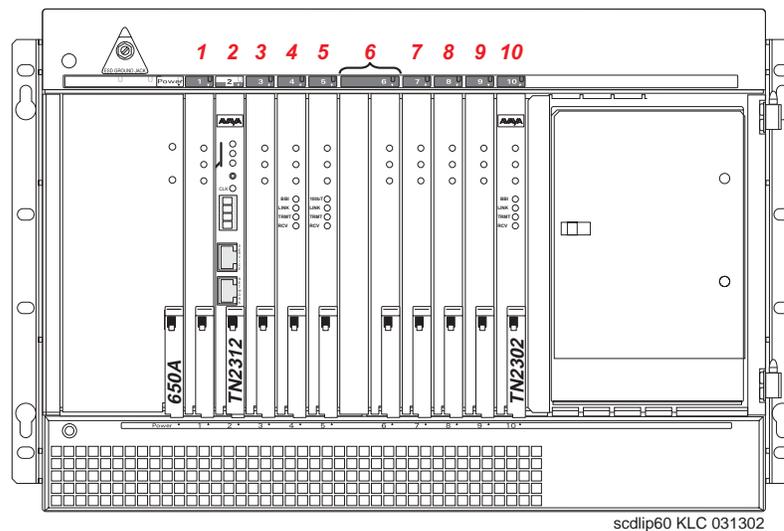
- Its circuit packs are inserted and removed from the front of the cabinet.
- Cabinet I/O is through the back and through a front cable pass-through slot on the right.

A PN has the following characteristics:

- Contains up to 4 G600 Media Gateways
  - The first G600 is designated "A." Optional second, third, and fourth G600s are designated "B," "C," and "D" respectively.
  - Must reside in the same 19-inch data rack due to TDM-cable length
- A maximum of 64 port networks
- Recommended RJ45 patch panel for cross-connecting to LAN or 110 hardware.

The [Figure 33: G600 Media Gateway](#) on page 92 for an example of a G600 Media Gateway.

**Figure 33: G600 Media Gateway**



For more information, see [G600 Media Gateway](#) on page 156.

## G700 and G350 Media Gateways

The G700 and G350 Media Gateways are not PNs by themselves. The G700 or G350 Media Gateway connects to the S8700 or S8710 Media Server through an H.248 IP registration with the CLAN that resides in the SCC1, MCC1, CMC1, G600, or G650 Media Gateway. One S8700-series media server can support a maximum of 250 G700 or G350 Media Gateways. Up to 10 G700s can be in one stack, and the stack can be mixed with Avaya P330 devices such as the P333T, P333R, and P334 or Avaya C360 devices such as the C363T, C363T-PWR, C364T, and C364T-PWR.

For more information, see [Avaya G700 Media Gateway](#) on page 168 or [Avaya G350 Media Gateway](#) on page 147.

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## Reliability

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### Reliability when sending voice bearer over IP

The following are supported with an S8700-series media server when sending voice bearer over IP:

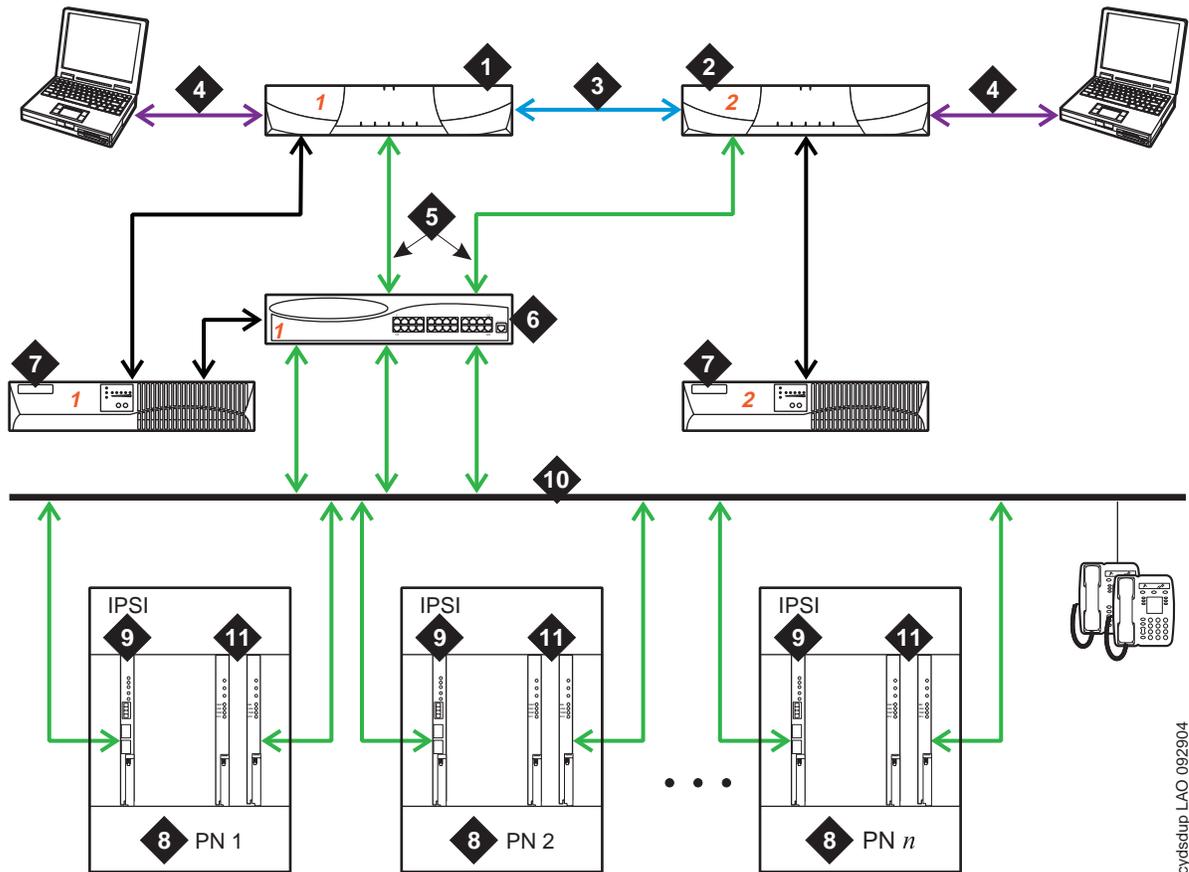
- Duplex reliability
- High reliability

### Duplex-Reliability when sending voice bearer over IP

An S8700-series media server is duplicated. Tone-Clock functionality is provided by the IPSI circuit pack in each PN. As an all-IP solution, only IP connected port networks are supported.

See [Figure 34: Duplex-reliability configuration when sending voice bearer over IP](#) on page 94 for an example of a duplex-reliability configuration when sending voice bearer over IP.

Figure 34: Duplex-reliability configuration when sending voice bearer over IP



cydsdup LAC 092904

Figure notes:

Number	Description of Connection
1 & 2	S8700 or S8710 Media Server pair. One in a active mode and the other on standby.
3	Duplication Links: The Ethernet connection default Ethernet 2 and the fiber link
4	A dedicated Ethernet connection to a laptop. This connection is active only during on-site administration or maintenance and the services interface can link to the standby server through a telnet session.
5	Connection from the servers to the Ethernet switch.
6	Ethernet Switch – A device that provides port multiplication on a LAN by creating more than one network segment. In an IP-Connect environment, the Ethernet switch should support 802.1 ip/Q, VLAN and 10-/100-Mbps.
7	Two UPS units
8	Port Network – A single gateway or an optional configuration of TDM-bus connected media gateways (for increased port capacity).
9	IPSI – A circuit pack that transports control messages over IP. This IPSI circuit pack is used so the S8700/S8710 media server can communicate with the PNs.
10	Customer LAN
11	Control Lan Interface (C-LAN) - A circuit pack that provides call control for every IP endpoint that is connected to the media server using an Avaya media gateway.

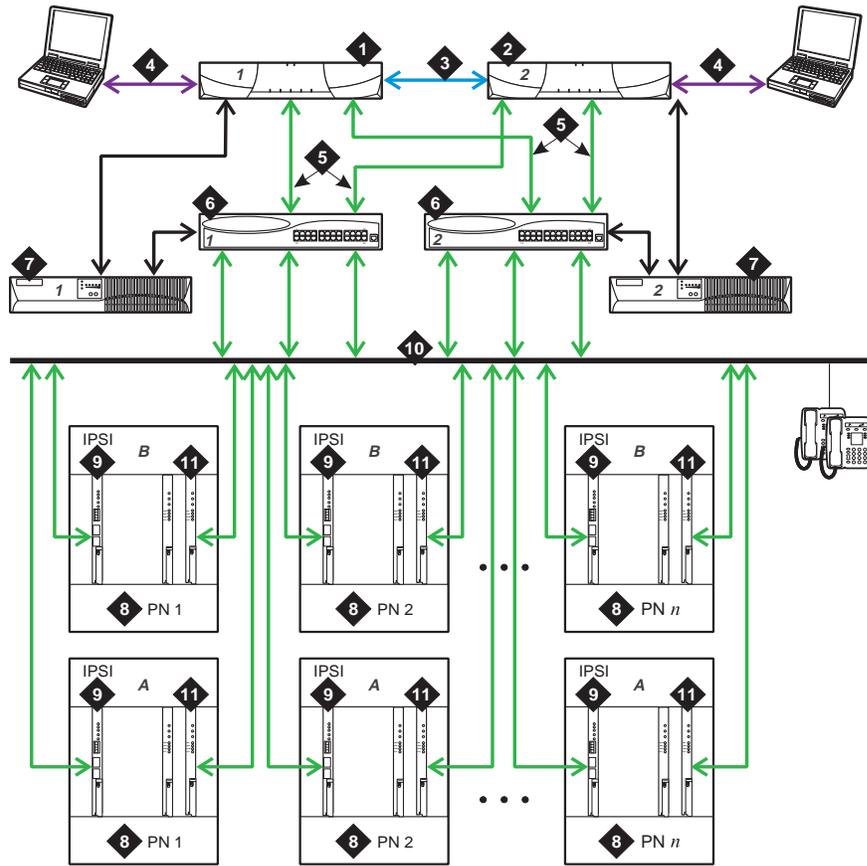
## High-reliability when sending voice bearer over IP

The high-reliability configuration option builds on the duplex reliability option. The high-reliability duplicates components so that no single point of failure exists in the control network. The high-reliability configuration consists of the following:

- Two S8700 or S8710 Media Servers
- Two IPSI circuit packs in each IPSI-connected port network
- Two Ethernet switches
- Two UPS units

See [Figure 35: High-reliability when sending voice bearer over IP](#) on page 96 for an example of a high-reliability configuration when sending voice bearer over IP.

Figure 35: High-reliability when sending voice bearer over IP



cyms0001 LAO 081203

Figure notes:

Number	Description of Connection
1 & 2	S8700 or S8710 Media Server pair. One in a active mode and the other on standby.
3	Duplication Links: The Ethernet connection default Ethernet 2 and the fiber link
4	A dedicated Ethernet connection to a laptop. This connection is active only during on-site administration or maintenance and the services interface can link to the standby server through a telnet session.
5	Connection from the servers to the Ethernet switch.
6	Ethernet Switch – A device that provides port multiplication on a LAN by creating more than one network segment. In an IP-Connect environment, the Ethernet switch should support 802.1 ip/Q, VLAN and 10-/100-Mbps.
7	Two UPS units
8	Port Network – A single gateway or an optional configuration of TDM-bus connected media gateways (for increased port capacity).
9	IPSI – A circuit pack that transports control messages over IP. This IPSI circuit pack is used so the S8700-series media server can communicate with the PNs.
10	Customer LAN
11	Control Lan Interface (C-LAN) - A circuit pack that provides call control for every IP endpoint that is connected to the media server using an Avaya media gateway.

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## Reliability when sending voice bearer over ATM or CSS

The following are supported with an S8700-series media server when sending voice bearer over ATM or CSS:

- Duplex-reliability
- High-reliability
- Critical-reliability

## Duplex-Reliability when sending voice bearer over CSS or ATM

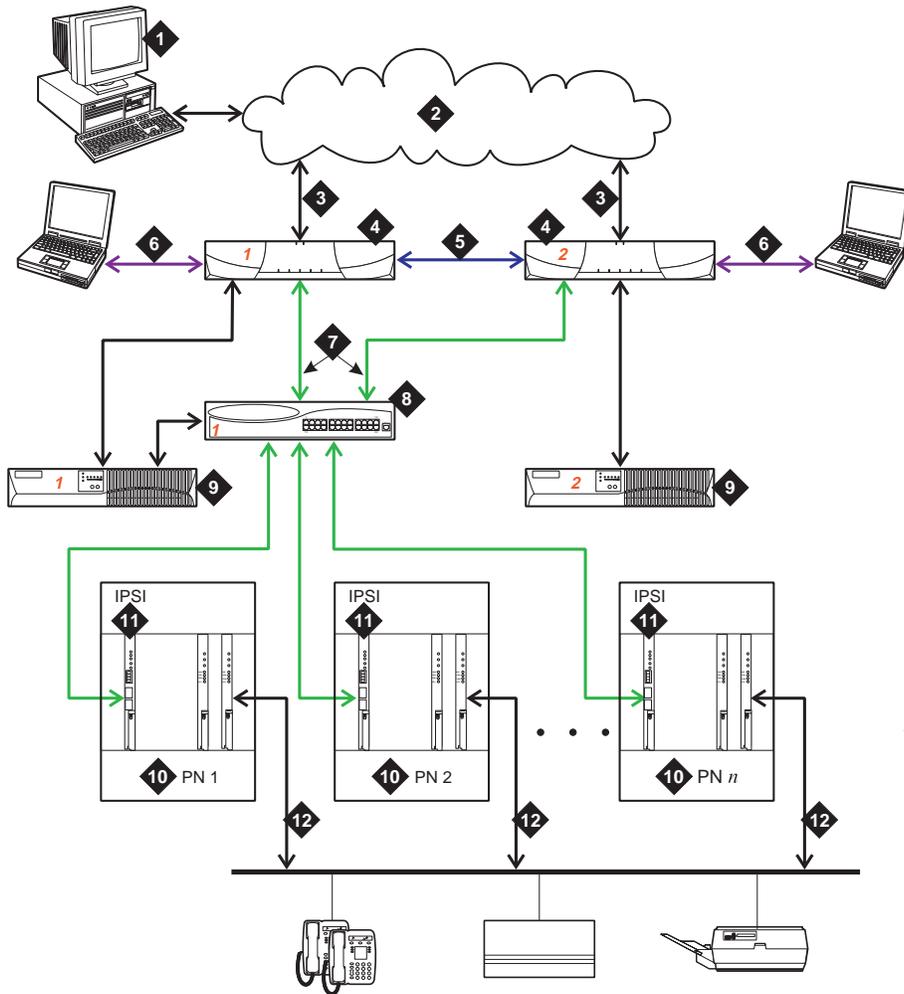
The duplex-reliability option is the most basic option. Voice and data bearer traffic between port networks is carried on a simplex network that is made up of one Expansion Interface (EI) in each port network for CSS or one ATM interface in each port network for ATM. The EI/ATM circuit packs are cabled with lightguide fiber to either a Center Stage Switch (CSS) in an MCC1 or an Asynchronous Transfer Mode (ATM) switch.

A duplex-reliability configuration also consists of the following:

- Two S8700 or S8710 Media Servers
- One Ethernet switch
- One UPS unit for each S8700 or S8710 Media Server. The use of two UPS units ensures that a single UPS failure or repair operation will not disable the system.
- One IPSI in every fifth port network in an ATM network or in each MCC1 with a CSS.
- An additional IPSI in one port network that doesn't already have an IPSI

See [Figure 36: Duplex-reliability configuration when sending voice bearer over CSS or ATM](#) on page 98 for an example of a duplex-reliability when sending voice bearer over CSS or ATM.

Figure 36: Duplex-reliability configuration when sending voice bearer over CSS or ATM



cydeman2\_LAO 022503

**Figure notes:**

Number	Description of the Connection
1.	The Administration PC can be used to access the S8700 or S8710 Media Server over the corporate LAN.
2.	Corporate LAN.
3.	Corporate LAN interface: default Ethernet 4— The Ethernet link from the S8700 or S8710 Media Server to the LAN. Used for administration and can be used for alarming by way of Simple Network Message Protocol (SNMP) traps. The Ethernet connection to the corporate LAN in this figure is a non-dedicated network. IP addresses for the various components of the S8700 or S8710 Media Server must be administered with care to prevent conflicts with other equipment that shares the LAN.
4.	The S8700 or S8710 Media Server pair, one server in an active mode and the other server on standby.
5.	Duplication links: The Ethernet link, default Ethernet 2, and the fiber link.

**Figure notes:**

Number	Description of the Connection
6.	Services interface: default Ethernet 1-The server's dedicated Ethernet connection from the S8700 or S8710 Media Server to a laptop. This link is active only during on-site administration or onsite maintenance.
7.	Network control A interface: default Ethernet 0-The server's Ethernet connection to one or two Ethernet switches. This private LAN carries the control signals for the PNs.
8.	Ethernet switch — at least one Ethernet switch is required to support the S8700 or S8710 Media Server's control network. If many PNs are present, two Ethernet switches may be daisy-chained together to provide sufficient Ethernet connections to the IPSI boards in the PNs.
9.	UPS — Keeps the S8700 or S8710 Media Servers and Ethernet switches functional during brief power outages.
10.	PN — Provides the telecommunications functions of the S8700-series media server.
11.	IPSI — The IPSI circuit pack carries the control network signals to the PNs and provides tone clock functionality.
12.	Bearer connectivity

## High-Reliability when sending voice bearer over CSS or ATM

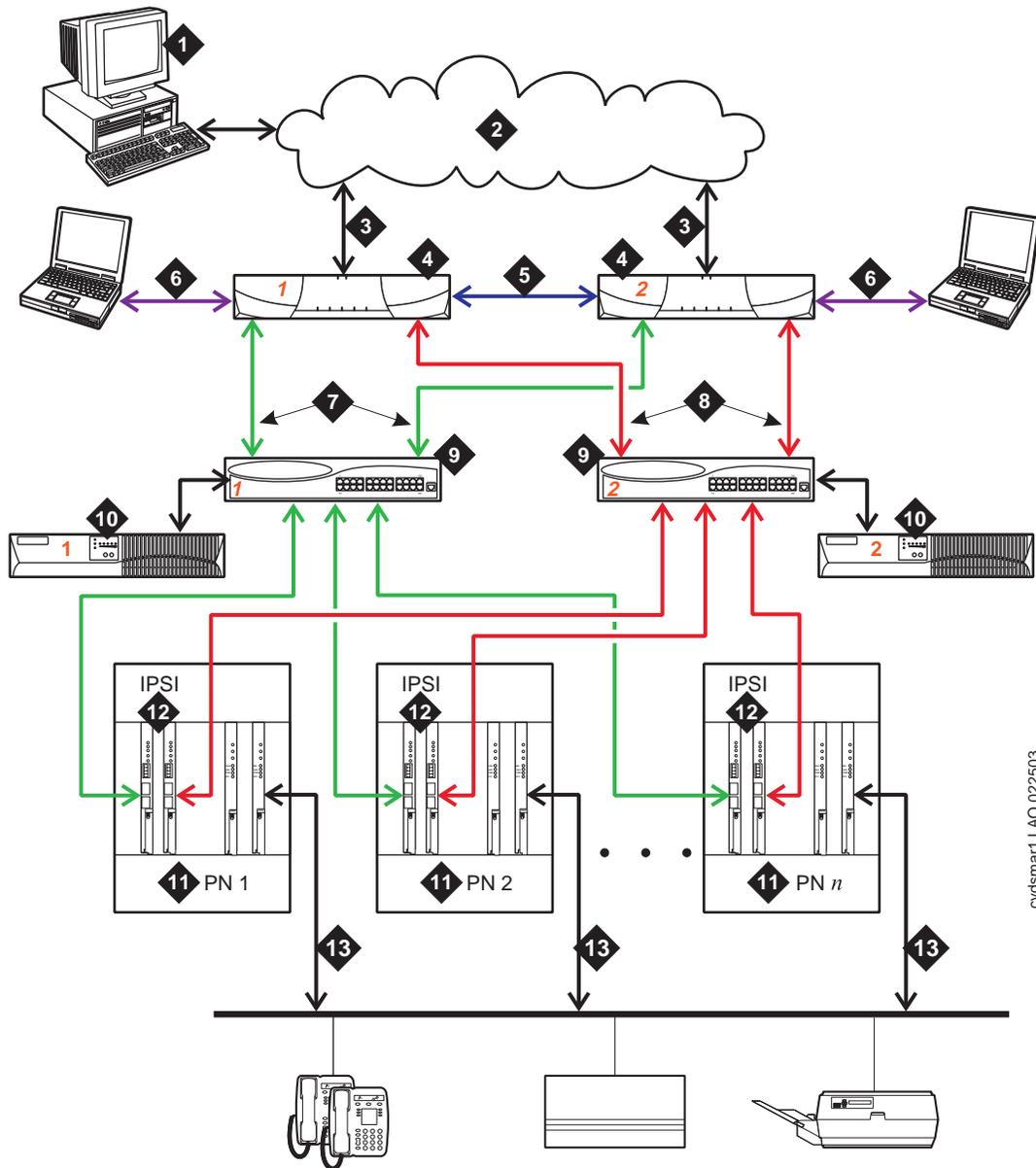
The high-reliability configuration option builds on the duplex reliability option. The high-reliability duplicates Ethernet switches and IPSIs so that no single point of failure exists in the control network. Thus, there are two IPSIs in every fifth port network in an ATM network or in each MCC1 with a CSS. Voice and data bearer traffic between port networks is carried on a simplex network that is made up of one Expansion Interface (EI) in each port network for CSS or one ATM interface in each port network for ATM. The EI/ATM circuit packs are cabled with lightguide fiber to either a Center Stage Switch (CSS) in an MCC1 or an Asynchronous Transfer Mode (ATM) switch.

As with the standard duplex reliability configuration, the high-reliability configuration also consists of the following:

- Two S8700 or S8710 Media Servers
- Two UPS units

See [Figure 37: High-reliability configuration when sending voice bearer over CSS or ATM](#) on page 100 for an example of a high-reliability configuration when sending voice bearer over CSS or ATM.

Figure 37: High-reliability configuration when sending voice bearer over CSS or ATM



cydsmar1 LAO 022503

## Figure notes:

Number	Description of Connection
1.	Administration PC — Used to access the S8700 or S8710 Media Server over the corporate LAN.
2.	Corporate LAN.
3.	Corporate LAN interface: default Ethernet 4 —The Ethernet link from the S8700 or S8710 Media Server to the LAN. Used for administration and can be used for alarming by way of the Simple Network Message Protocol (SNMP) traps.
4.	S8700 or S8710 Media Server — Two are always present. One in active mode and the other on standby.
5.	Duplication Links: The Ethernet link, default Ethernet 2, and the fiber link.
6.	Services interface: default Ethernet 1-The server's dedicated Ethernet connection from the S8700 or S8710 Media Server to a Services laptop. This link is active only during onsite administration or onsite maintenance.
7.	Network control A interface: default Ethernet 0-The server's Ethernet connection to one or two Ethernet switches. This private LAN carries the control signals for the PNs when possible. Control network A is considered the primary control network because it connects to the primary IPSI board in a PN.
8.	Network control B interface: default Ethernet 3-The S8700 or S8710 Media Server's Ethernet connection to a duplicated set of Ethernet switches. This private LAN carries control signals for the PNs when the primary control network is unavailable. Control network B connects to the secondary IPSI board in a PN. When the problem is resolved, primary control is returned to control network A.
9.	Ethernet switch — At least one is required to support each control network.
10.	UPS — Keeps the S8700 or S8710 Media Servers and Ethernet switches functional during brief power outages. Usually, UPS one powers server one and the Ethernet switch associated with it. UPS two powers server two and the Ethernet switch associated with it.
11.	PN — Provides the telecommunications functions of the S8700 or S8710 Media Server. For high reliability, each IPSI-connected PN contains a pair of IPSI circuit packs. This pair consists of, one primary circuit pack, and a duplicate secondary circuit pack as a backup. For critical reliability, the bearer network, among the port networks is also duplicated. Two EI circuit packs or two ATM circuit packs are present in each PN instead of just one.
12.	IPSI — The IPSI circuit pack is duplicated in every IPSI-connected PN in a high- or critical-reliability configuration. The secondary IPSI is connected to control network B. The secondary IPSI takes over in case of problems with the primary control network. The S8700 or S8710 Media Server regularly tests the duplicated IPSI to make sure it is ready for service.
13.	Bearer Connectivity

## Critical-Reliability when sending voice bearer over CSS or ATM

The critical-reliability configuration option is similar to the high-reliability configuration option. In addition, the critical-reliability configuration duplicates the bearer network channels among the PNs. Thus, voice and data bearer traffic between port networks is carried on a duplex network that is made up of two Expansion Interface (EI) in each port network. The EIs are cabled with lightguide fiber to either a duplicated Center Stage Switch (CSS) or a duplicated Asynchronous Transfer Mode (ATM) switch.

Like the high-reliability configuration, the critical-reliability configuration also consists of the following:

- Two S8700 or S8710 Media Servers
- Two IPSI circuit packs in every fifth port network in an ATM network or in each MCC1 with a CSS
- Two Ethernet switches
- Two UPS units

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## Connectivity

Connectivity for an S8700-series media server depends on the method by which the voice bearer is being transmitted.

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## Connectivity when sending voice bearer over ATM or CSS

### Port Networks

A new configuration consists of the G650 Media Gateways for all port networks. The MCC1 Media Gateway or the SCC1 Media Gateway are used for migrating configurations, and for configurations experiencing growth. For migrations from a DEFINITY® Server to an S8700-series media server processor, the MCC1 cabinet that was the Processor Port Network (PPN) will be converted to a PN by replacing the control carriers with port carriers.

The IPSI extends Ethernet control by connecting the S8700-series media server processor to the PNs. The IPSI replaces the TN2182B tone clock in each of the PNs that are connected by an IPSI. Not all PNs require the IPSI board. One IPSI-connected PN can control up to four other PNs.

## CSS Network

The CSS is a connection hub that provides PN communication. A CSS can be used when more than three port networks are needed. Often the CSS is incorporated into smaller configurations to allow for growth. The CSS consists of from one to three switch nodes (SN). SNs are composed of one or two switch node carriers, depending on whether the solution is being duplicated for critical reliability. PN expansion depends on internal SN-to-SN traffic, according to the following guidelines:

- One SN expands from 1 to up to 15 PNs.
- Two SNs expands to up to 29 PNs.
- Three SNs expands to up to 44 PNs.

## ATM Network

The Asynchronous Transfer Mode (ATM) switch is a replacement option for the CSS or for the direct-connect switch. The Avaya M770 Multifunction switch can provide port network connectivity. Non-Avaya ATM switches that comply with the ATM standards that are set by the European Union can also provide port network connectivity.

When the voice bearer is sent over ATM, ATM port-network connectivity (ATM-PNC) allows any ATM switch or ATM network that complies with specified standards and capacities to serve as the means to connect to the PN. In this type of configuration, the ATM switch or network replaces the CSS. ATM-PNC is used to connect port networks within a single switch. The (WAN) spare processor is not supported.

---

## Connectivity when sending voice bearer over IP

Sending bearer (voice) traffic over IP uses IP connectivity between PNs. An existing IP infrastructure can be used once it has been certified as being capable of adequately carrying voice over IP (VoIP) traffic. This solution saves customers the cost of building a separate telephony network.

**Note:**

When using IP connections between PNs, video cannot be sent directly between port networks. In this case, video calls must be routed through the public network and back into the media server.

## S8700-series media server recoverability

In addition to the high reliability of the duplicated S8700 or S8710 Media Servers, additional recovery capability is embedded in the Communication Manager software that resides on the S8700 or S8710 Media Server. Thus, the S8700 or S8710 Media Server can use the following recovery options:

- [S8300 Media Server in an LSP mode](#) on page 104
- [Survivable Remote EPN \(voice bearer over CSS only\)](#) on page 104
- [Manual Backup Server](#) on page 105

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### S8300 Media Server in an LSP mode

The LSP is located in the G350 or G700 Media Gateway and provides survivability when the S8700-series media server is inaccessible. Each S8700-series media server can have up to 250 LSPs. The LSP has a copy of the S8700-series media server's customer translations. The translations are updated regularly from the S8700-series media server using a virtual link through a IP network. Typically, all LSPs are in idle mode, where the LSP is not processing any calls. When the Media Gateway's Processor (MGP) or IP endpoints perceive the Avaya media server to be unreachable, the MGP or IP endpoints will attempt to register with an LSP. The LSP does not actively take over when the primary controller becomes unreachable, but waits for MGPs and IP endpoints to register with it. Switchback from the LSP to the primary Avaya media server is a manual operation requiring a reset 3 command on the LSP.

---

### Power outages

In most cases an Avaya solution can recover from a power outage or other failure instantly, regardless of the source of the failure. Each PN includes a set of segmented, parallel buses. If one of the paired segments fails, the other bus segment continues to handle communications. The UPS units supply power to the control complex.

---

### Survivable Remote EPN (voice bearer over CSS only)

The Survivable Remote Expansion Port Network (SREPN) allows either an MCC1 PN or SCC1 PN to provide service to the customer when connectivity links fail. When the links to the PN are restored and stable, a logic switch in the SREPN is manually reset and the PN is reconnected to the links from the switch. The logic switch can either be reset locally at the SREPN or reset remotely by way of a dial-up connection to the SREPN.

The SREPN must be administered separately, not as a duplicated PN, to be able to recover after a failure. It does not function as a SREPN without the administration of stations, trunks, and features to support its operation. SREPN is not compatible with ATM port-network connectivity (ATM-PNC).

An SREPN cannot be an IPSI connected PN.

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## Manual Backup Server

A manual backup server (MBS) may also be used for survivability. A manual backup server is a media server pair with identical translations in a non-call-processing state. The manual backup server becomes available manually to control port networks (PNs) when a major outage takes place. For more information, see *Job Aid: Manual Backup Servers for S8500 or S8700 Media Servers — R2.0.1 or later*, 03-300154.

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## High-level capabilities

An S8700-series media server provides a large scale solution with a high number of endpoints. Specifically, it supports the following high-level capabilities.

The following table gives high-level information about S8700-series media server capabilities.

**Table 3: High-level capabilities 1 of 2**

Capability	Description
Call processing feature set	Communication Manager
Duplication options available	Voice bearer over IP: Duplex, and high Voice bearer over CSS or ATM: Duplex, high, and critical
Port Network connectivity	Voice bearer over IP: IP Voice bearer over CSS or ATM: Center Stage Switch (CSS) or ATM, or Direct
Supported Media Gateways	Voice bearer over IP: G350, G650, G600, CMC1 and G700 Voice bearer over CSS or ATM: G350, G650, SCC1, MCC1 and G700
<b>1 of 2</b>	

**Table 3: High-level capabilities 2 of 2**

Capability	Description
Maximum number of Port Networks (PN)	Voice bearer over IP: 64 Voice bearer over CSS or ATM: <ul style="list-style-type: none"> <li>● 44 – Center Stage Switch (CSS)</li> <li>or</li> <li>● 64 – ATM-PNC</li> </ul>
Survivability options	Voice bearer over IP: LSP and MBS Voice bearer over CSS or ATM: SRP, MBS, and LSP
LSP options	S8300 Media Server in a Local Survivable Processor (LSP) configuration (maximum of 250)
Port Networks per IPSI (voice bearer over CSS or ATM only)	Up to five Note: A high- or critical-reliability configuration (voice bearer over CSS or ATM) requires two IPSIs per IPSI-connected PN.
Modem calls	Supported
Wideband connections	Supported, except video not supported for direct transmission between PNs
<b>2 of 2</b>	

For more detailed system capacity information refer to the Avaya Communication Manager System Capacities Table (555-233-601). The Avaya Communication Manager System Capacities Table can be found on the <http://support.avaya.com> Web site.

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## BHCC capacity for the S8700-series media server

The following is information about busy-hour call completion (BHCC) capacities for the S8700 or S8710 Media Server. The values are based on currently-available data and may change.

### **S8700-series media server with MCC1/SCC1/G600 Media Gateways light call mix - 100% analog station-to-station**

- 300,000 BHCC
- 250 Media Gateways
- 36,000 - analog stations
- 8,000 trunks.

### **S8700-series media server with MCC1/SCC1/G600 Media Gateways general call mix - analog, DCP stations, and PRI trunks**

- 220,000 BHCC
- 250 Media Gateways
- 36,000 analog and DCP stations
- 8,000 trunks.

### **S8700-series media server with MCC1/SCC1/G600 Media Gateways - IP endpoints and PRI trunks**

- 100,000 BHCC
- 250 Media Gateways
- 12,000 IP endpoints
- 450 IP endpoints per CLAN board.

### **S8700-series media server with MCC1/SCC1/G600 Media Gateways and contact center - analog, DCP stations, and PRI trunks**

- "Low" Contact Center Usage - 75,000 BHCC (low = simple vectors, minimal skill level use - skills-based routing is under "High")
- "Typical" Contact Center Usage - 40,000 BHCC
- "High" Contact Center Usage - 25,000 BHCC (high = pre-routed calls, BSR with many skill levels, heavily linked vectors, long speed to answer and many different announcements).

## **S8700-series media server with MCC1/SCC1/G600 Media Gateways and contact center - IP endpoints and PRI trunks**

- "Low" Contact Center Usage - 65,000 BHCC (low = simple vectors, minimal skill level use - skills-based routing is under "High")
- "Typical" Contact Center Usage - 35,000 BHCC
- "High" Contact Center Usage - 25,000 BHCC (high = pre-routed calls, BSR with many skill levels, heavily linked vectors, long speed to answer and many different announcements).

## **S8700-series media server with G700 Media Gateway (IP endpoints) and MCC1/SCC1/G600 Media Gateways - (DCP stations) general call mix**

- 90% MCC1/SCC1/G600 Media Gateway processing and 10% G700 processing - 202,000 BHCC (198,000 MCC1/SCC1/G600 Media Gateway BHCC and 4,000 BHCC G700 Media Gateway).
- 50% MCC1/SCC1/G600 Media Gateway processing and 50% G700 processing - 130,000 BHCC (110,000 MCC1/SCC1/G600 Media Gateway BHCC and 20,000 BHCC G700 Media Gateway).

## **S8700-series media server with G700 Media Gateway - IP endpoints and PRI trunks**

- 90% MCC1/SCC1/G600 Media Gateway processing and 10% G700 processing - 94,000 BHCC (90,000 MCC1/SCC1/G600 Media Gateway BHCC and 4,000 BHCC G700 Media Gateway).
- 50% MCC1/SCC1/G600 Media Gateway processing and 50% G700 processing - 70,000 BHCC (50,000 MCC1/SCC1/G600 Media Gateway BHCC and 20,000 BHCC G700 Media Gateway).

## **S8700-series media server with G700 Media Gateway and MCC1/SCC1/G600 Media Gateways - contact center - low usage**

- 90% MCC1/SCC1/G600 Media Gateway processing and 10% G700 processing - 71,000 BHCC (68,000 MCC1/SCC1/G600 Media Gateway BHCC and 3,000 BHCC G700 Media Gateway).
- 50% MCC1/SCC1/G600 Media Gateway processing and 50% G700 processing - 50,000 BHCC (37,000 MCC1/SCC1/G600 Media Gateway BHCC and 13,000 BHCC G700 Media Gateway).

**Note:**

Any configuration that includes IP Solutions applications such as Road Warrior, Telecommuter, or H.322 trunking, has an impact on the BHCCs and processor capacity. If a customer uses these applications in a high traffic solution, it is recommended that the Avaya Technology and Consulting (ATAC) team be involved to review any potential impact on traffic.

The information in this table represents the *maximum* number of calls the S8700 or S8710 Media Server could execute, assuming it was unconstrained by other factors such as:

- TDM bus limitations
- Call duration
- Small number of telephones

We assume processor occupancy of 0.90, at which various delay criteria such as cut through is preserved, and is just at the threshold where calls could no longer be processed.

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## System management

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### Avaya Integrated Management suite

The Avaya Integrated Management Suite offers a comprehensive set of Web-based network and system management solutions that support the Avaya converged voice solutions. Integrated Management combines individual applications into five offers:

- Standard Management
- Standard Management Solutions Plus
- MultiService Network Management
- Enhanced Converged Management
- Advanced Converged Management

For more detailed information on the Avaya Integrated Management Suite see:

- <http://www.avaya.com> >Products and Services > Products A-Z

## S8700-series media server Web interface

The S8700-series media server uses a media server Web interface to perform a wide variety of functions. This browser-based tool uses a Graphical User Interface (GUI) for performing server administration tasks such as:

- Backups and restores for customer data
- Provides easy access to view current alarms
- The ability to perform server maintenance including busy out and release busy out, shutdown, and status of the S8700 or S8710 Media Server.
- Security commands that will enable and disable the modem, start and stop FTP server, and view license.
- SNMP access to configure trap destinations, stop and start the master agent.
- S8700 or S8710 Media Server configuration information and upgrade access.

The Web interface contains an extensive help system that describes all the Web screens and fields.

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## Adjuncts

This is a partial list of the adjuncts that Avaya provides:

- Voice messaging and response such as INTUITY AUDIX.
- Call center tools such as Avaya Call Management System, NICE Analyzer, Avaya Call Recording, Avaya Visual Vectors and Avaya Basic Call Management System Reporting Desktop.
- System printer is supported with the use of a terminal server.
- Journal printer is supported with the use of a terminal server.
- Call Accounting Systems is supported with the use of a terminal server.
- Call Detail Recording (CDR) is supported with the use of a terminal server.
- ASA is supported with the use of a terminal server.
- DEFINITY Network Management (DNM)

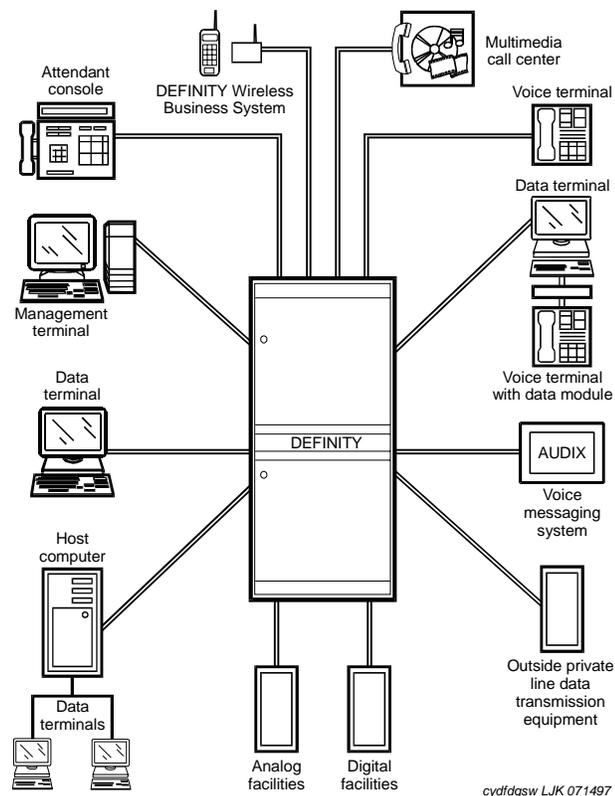
# DEFINITY Server SI

## Overview

Avaya Communication Manager on a DEFINITY<sup>®</sup> Server SI offers a high-level operating system, open interfaces, and distributed processing. DEFINITY Server SI provides circuit-switched voice communications and Internet Protocol (IP) telephony including voice and data network integration, unified messaging, and multimedia conferencing and collaboration.

All major hardware is contained in a multicarrier cabinet (MCC1) that hold up to five carriers or stackable single-carrier cabinets (SCC1s). The solution enables high-speed connections between analog and digital trunks, data lines connected to host computers, data-entry terminals, personal computers, and IP network addresses. See the following figure for an example of a DEFINITY Server SI solution.

**Figure 38: DEFINITY Server SI with Communication Manager**



## Detailed description

The DEFINITY Server SI with Avaya Communication Manager provides a common architecture platform across all supported line sizes. The Processor Port Network (PPN) is the master controller of the system. The Expansion Port Network (EPN) contains line ports and trunk ports. The universal port hardware allows station circuit packs, trunk circuit packs, and service circuit packs to be installed in any available slot.

DEFINITY Server SI with Communication Manager provides:

- Scalable applications for messaging, conferencing, collaboration, call centers, mobility, and remote users.
- Control of operational costs through the use of networking and management solutions
- A simple process for adding features. Add a circuit pack and use the graphical user interface (GUI) to administer it.
- Cost-effective and distributed switching arrangements in both LANs and WANs.
- Converged network environments through the use of IP and Asynchronous Transfer Mode (ATM) protocols and services
- Time Division Multiplex (TDM) transmission and switching infrastructures for both LANs and WANs. TDM supports analog, digital, and IP endpoints, both trunking and station, and an IP interface to a LAN or WAN.

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## Configuration information

The following are main system components:

- Avaya Communication Manager. For information about Avaya Communication Manager, see the Overview for Avaya Communication Manager, 555-233-767.
- A Processor Port Network (PPN) with a Switch Processing Element (SPE) and Port Network (PN).
- The 631DA power unit and 631DB power unit for AC power.
- The 649A power unit for DC power
- The Control Carrier
- The DEFINITY Server SI can use the following Media Gateways:
  - SCC1, including power supplies for AC power or DC power [SCC1 Media Gateway](#) on page 180
  - MCC1, including power supplies for AC power or DC power [MCC1 Media Gateway](#) on page 188

- Circuit Packs
  - The TN2404 processor
  - The TN2401 network control and packet interface (NetPkt)
  - TN768, TN780, or TN2182 tone clock

Each of the main components is described in the following section.

## Processor Port Network and Switch Processing Element

The PPN is a DEFINITY Server SI configuration of carriers that contains the following control complex SPE of the system and port interfaces. The control complex consists of three circuit packs:

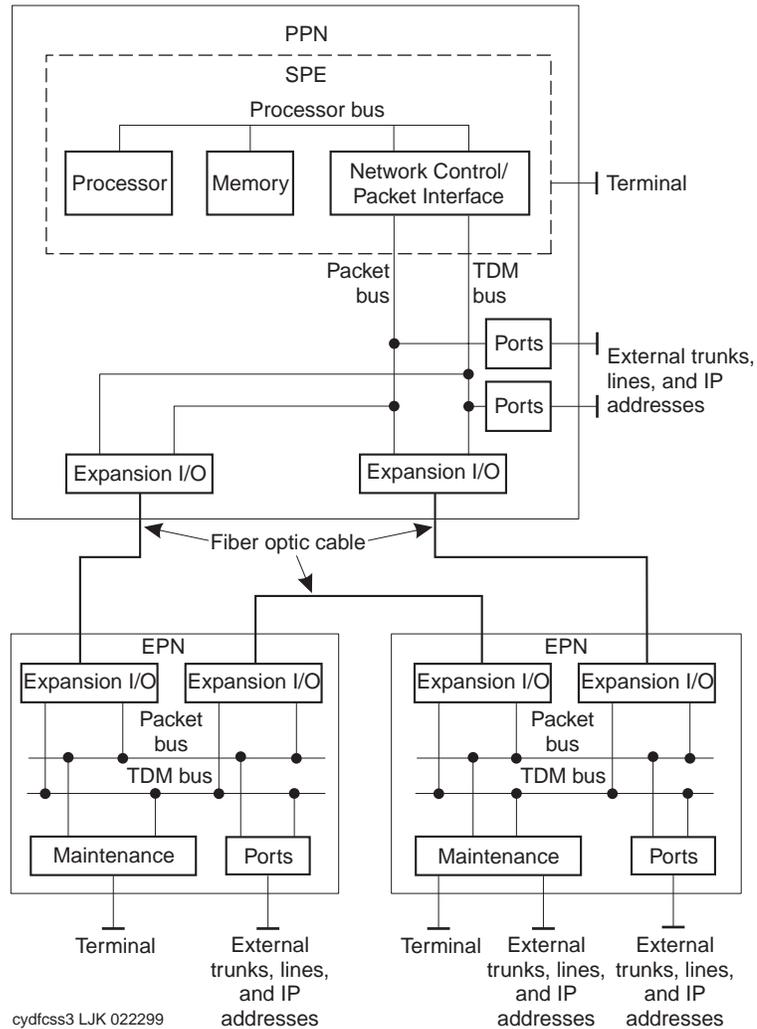
- The TN2404 RISC processor
- The TN2401 Network controller
- The TN2182, TN780 or TN768 tone clock board.

All of the control circuit packs reside in the control carrier within the PPN. Additional optional circuit packs might be needed such as the TN799DP C-LAN board which provides TCP/IP connectivity and the TN765 Processor Interface for BX.25 connectivity. For high- and critical-reliability systems, the TN792 Duplication Interface pack is used.

When a telephone goes off-hook or signals call initiation, the SPE receives a signal from the port circuit that is connected to the device. The digits of the called number are collected, and the switch is set up to make a connection between the calling device and the called devices.

The following figure shows a direct-connect system with an **SPE** in the **PPN**. Buses route voice and data calls between external trunks and external lines.

Figure 39: Components of a DEFINITY Server SI Configuration



## Port Network

The Port Network (PN) consists of the following components:

- Time Division Multiplexing (TDM) bus:** The TDM bus has 484 time slots, 23 B channels, and 1 D channel available per bus. The TDM bus runs internally throughout each PN and terminates on each end. The TDM bus consists of two 8-bit parallel buses, bus A and bus B. Bus A and bus B carry switched digitized voice and data signals and control signals to all port circuits and between port circuits and the SPE. The port circuits place digitized voice signals and data signals on a TDM bus. Bus A and bus B are typically active simultaneously.

- *Packet bus*: The packet bus runs internally throughout each **PN** and terminates on each end. The packet bus is an 18-bit parallel bus that carries logical links and control messages from the **SPE**, through port circuits, to endpoints such as terminals and adjuncts. The packet bus carries logical links for both on-switch and off-switch control between some specific port circuits in the system; for example, D-channels, X.25, and remote management terminals.
- *Port circuits*: The port circuits form analog/digital interfaces between the **PN** and external trunks and devices that provide links between these devices and the **TDM** bus and packet bus. Incoming analog signals are converted to pulse-code modulated (**PCM**) digital signals and placed on the **TDM** bus by port circuits. Port circuits convert outgoing signals from **PCM** to analog for external analog devices. All port circuits connect to the **TDM** bus. Only specific ports connect to the packet bus.
- *Interface circuits*: Interface circuits are types of port circuits that reside in the PPN and each EPN. Interface circuits terminate fiber optic cables that connect TDM buses and the packet bus from the PPN cabinet to the TDM bus and packet bus of each **EPN** cabinet.
- An Expansion Interface (**EI**) circuit pack also terminates:
  - Each end of a cable connecting the **PPN** to an **EPN**
  - Each end of a cable that connects an **EPN** to another **EPN**
  - The **PN** end of a cable connected between a **PN** carrier and an **SN** carrier.
- A Switch Node Interface (**SNI**) circuit pack terminates the **SN** carrier end of a cable that is connected between an **SN** carrier and a **PN**.
- Service circuits connect to an external terminal to monitor, maintain, and troubleshoot the system. Service circuits also provide tone production and detection, call classification, recorded announcements, and speech synthesis.

## Carriers

Carriers hold circuit packs and connect them to power, the TDM bus, and the packet bus. There are five types:

- Control carrier (PPN cabinet only)
- Optional duplicated control carrier (PPN cabinet only)
- Optional port carrier (PPN and/or EPN cabinets)
- Optional expansion control carrier (EPN cabinets only)
- Optional switch node carrier (PPN and/or EPN cabinets)

## Cabinets

The system cabinets contain the carriers and all other components, including the power supply. A cabinet contains at least one carrier in an enclosed shelf with vertical slots to hold circuit packs. The circuit packs fit into connectors that attach to the rear of the slots. There are two cabinet types:

- Single-carrier cabinet (SCC1)
- Multicarrier cabinet (MCC1)

### Single-carrier cabinets

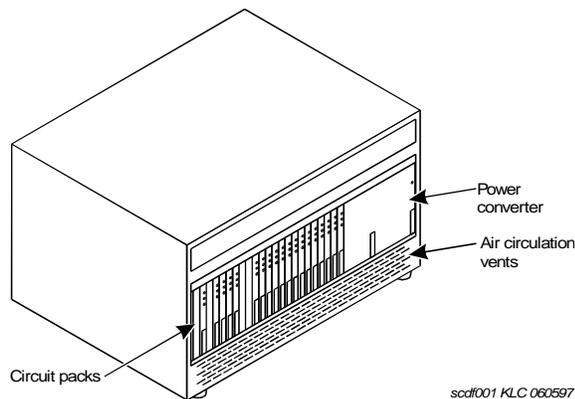
Up to three single-carrier cabinets (SCC1s) can be stacked to form a single PN. Refer to the following figure.

Single-carrier cabinets come in any of four configurations:

- A basic control cabinet that contains a TN2404 processor, tone clock, and a power converter
- An expansion control cabinet that contains additional port circuit packs, interfaces to the PPN, a maintenance interface, and a power converter
- A duplicated control cabinet that contains the same equipment as the basic control cabinet
- A port cabinet that contains port circuit packs and a power converter

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**Figure 40: Typical single-carrier cabinet (SCC1)**

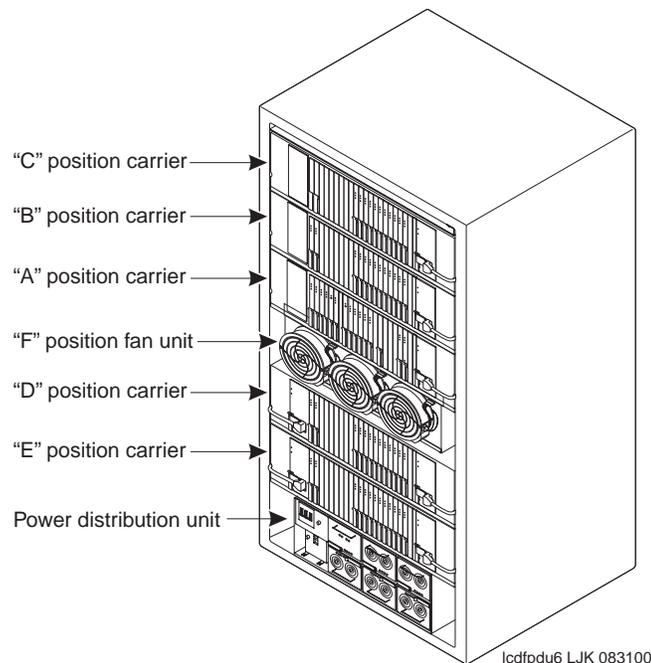


## Multicarrier cabinets

A multicarrier cabinet (MCC1) is a 70-in. (178-cm) cabinet that has up to five carriers. See the following figure for an example of an MCC1. The following are the three types of multicarrier cabinets:

- A PPN cabinet that contains the ports, SPE, an interface to an EPN cabinet, and/or a CSS.
- An EPN cabinet that contains additional ports, interfaces to the PPN and other EPN cabinets, the maintenance interface, optional interfaces to other EPN cabinets, a switch node (in an SN in a CSS-connected system), or an ATM switch.
- An auxiliary cabinet that contains that is equipment used for optional, system-related hardware, such as rack-mounted equipment.

**Figure 41: Typical multicarrier cabinet (MCC1)**



## Network Control and Packet Interface

The Network control and Packet interface communicates control channel messages between the processor circuit pack and the distributed network of port circuit packs on the TDM bus. The NetPkt circuit pack (TN2401) provides eight asynchronous data channels that process and route information directly from the processor circuit pack to customer-connected equipment.

## Options

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### Expansion Port Network

An Expansion Port Network (**EPN**) contains additional ports that increase the number of connections to trunks and lines.

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### IP Media Processor

The IP Media Processor provides voice over internet protocol (VoIP) audio access to the switch for local stations and outside trunks. The IP Media Processor provides audio processing for between 32 and 64 voice channels and supports hairpin connections, as well as shuffling of calls between IP direct connections. The IP Media Processor can perform echo cancellation, silence suppression, FAX relay service, and DTMF detection. The IP Media Processor can be updated using the firmware download feature.

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## DEFINITY IP Solutions

DEFINITY IP Solutions brings together the flexibility of IP networks with the full feature functionality of Communication Manager. IP Solutions provides:

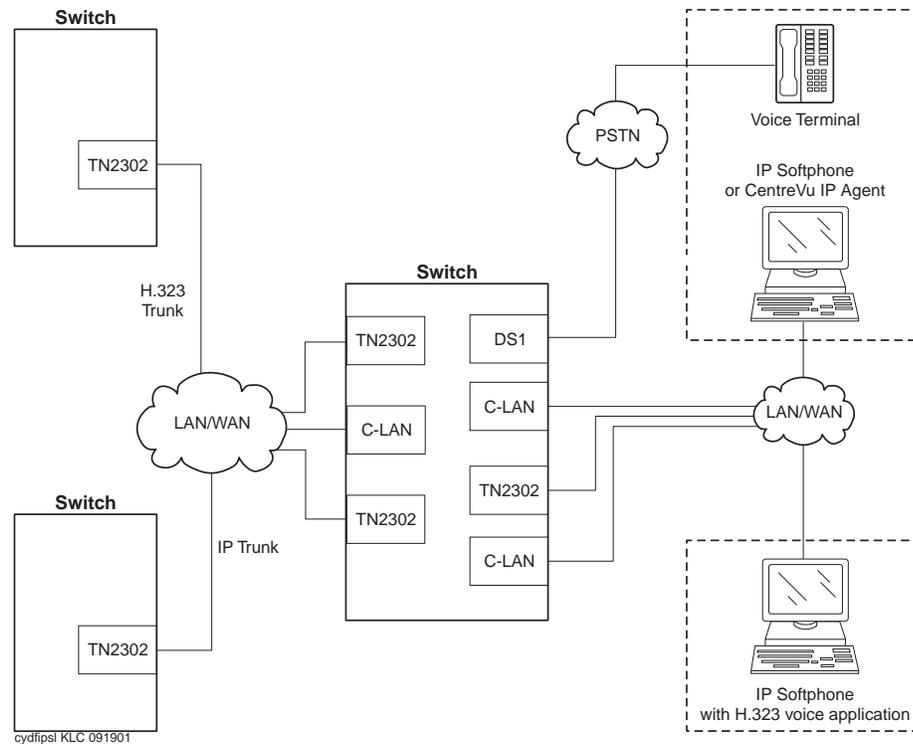
- Investment protection and optimization in IP and PSTN networks.
- Full software applications, features, and management capabilities are carried into the IP environment using Communication Manager.
- Enhanced quality of service
- Remote workers have full access to Communication Manager features from their PCs.

IP Solutions offers a feature that enables users to specify the quality of voice communications. With the Quality of Service feature, users can administer and download the Differentiated Services Type-of-Service value to optimize voice quality. The Quality of Service feature implements buffers in the audio-processing circuit pack to reduce latency and helps some routers to prioritize audio traffic.

IP Solutions also introduces hairpin and IP-IP direct connections, two features that make voice communications more efficient. Hairpin connections route the voice channel connecting two IP endpoints so that the voice goes through the IP Media Processor circuit pack in IP format, thereby bypassing the TDM bus. IP-IP direct connections route the voice channel connecting two IP endpoints by sending the voice directly through the LAN or WAN between the two endpoints, instead of carrying a mixed connection of IP signaling and TDM bus signaling

The following figure shows the trunk connects and line connections available with IP Solutions.

**Figure 42: IP Solutions**



The figure shows IP Solutions supports connectivity for IP trunks, IP softphones, and IP telephones.

DEFINITY IP Solutions is implemented using the TN2302AP, an IP Media Processor circuit pack inside the switch. The TN2302AP IP Media Processor provides H.323 trunk connections and H.323 voice processing for IP telephones. The features that use the TN2302AP circuit pack also require the TN799 C-LAN circuit pack.

**Note:**

The IP trunk that is used in R7 and the current TN2302AP H.323 trunks are not interoperable. The TN2302AP H.323 in trunk mode cannot communicate with an R7 IP trunk. However, the TN2302AP H.323 trunk can communicate with a TN802B circuit pack.

## Trunks

DEFINITY IP Solutions supports two trunk configurations:

- H.323 IP trunk (IP Solutions mode)
- IP trunk mode

IP trunks reduce expenses for long distance voice and FAX, facilitating global communications, provide a full-function network with data and voice convergence, and use available network resources to optimize investments.

### H.323 IP Trunk (IP Solutions mode)

The IP Media Processor circuit pack (TN2302AP) supports the H.323 version 2 protocol and operates with H.323 version 2 endpoints, including stations, trunks, and gateways. An IP Media Processor circuit pack uses IP connectivity between two DEFINITY or Avaya servers to enable H.323 trunk service using IP connectivity. H.323 trunk groups can be configured as DEFINITY-specific tie trunks that support:

- ISDN trunk features such as DCS+ and QSIG
- Generic tie trunks that permit interconnection with H.323 v2-compliant switches from other vendors
- Direct-inward-dial (DID) type of “public” trunks providing access to the switch for unregistered users.

The TN2302AP requires the TN799 for signaling.

The TN2302AP IP Media Processor is also used for H.323 VoIP applications.

### IP Trunk mode

The IP Trunk mode allows trunk groups to be defined as DS1 tie lines between DEFINITY systems over a customer’s data network. Each IP Interface circuit pack in IP Trunk mode provides a basic 12-port package that can be expanded up to 30 ports.

Each TN802 or TN802B circuit pack in IP Trunk mode requires:

- A connection to a modem
- An incoming line for Avaya remote access
- Direct access to the NT server on the hard disk using pcANYWHERE, version 8 or later.

The TN2302AP circuit pack does not require:

- A connection to a modem
- An incoming line
- Access using pcANYWHERE.
- A TN799B circuit pack

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## Connectivity

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### LAN Gateway

With the optional J58890MA-1List 2 LAN Gateway circuit pack assembly installed, the switch works with PC/LAN-based communications applications that support the CallVisor Adjunct-Switch Application Interface (ASAI).

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### C-LAN

TCP/IP connectivity is provided over Ethernet or Point-to-Point Protocol (PPP) to adjuncts such as CMS or INTUITY™ AUDIX®, and for DCS connectivity. The C-LAN circuit pack (TN799DP) provides a “bridge” from the TDM bus to the packet bus on a DEFINITY server.

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### IP Asynchronous Links using C-LAN

The IP Asynchronous Links feature enables the switch to transfer existing asynchronous adjunct connectivity to an Ethernet network using TCP/IP protocol. IP Asynchronous Links is a simple, session-layer, proprietary protocol that creates value for the customer in the following ways:

- Reduces the cost to connect the switch to various adjuncts
- Allows for an open architecture to transport information and increases the speed at which data is transferred
- Allows customers to manage applications from both on site and remote locations
- Allows for several system management applications to run on a single PC and thus reducing hardware requirements
- Provides “IP Services” forms to support more flexible administration
- Guarantees data delivery through a reliable session-layer protocol
- Supports customers’ existing investment in serial hardware through use of Network Terminal Servers

IP Asynchronous Links supports switch client applications and server applications as described in the following sections.

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## Switch Client Applications

Client applications with Asynchronous Links allow you to use TCP/IP to connect adjunct equipment to the switch via the C-LAN board.

Asynchronous TCP/IP links can be used to connect call detail recording (CDR) devices, property management systems (PMS) and printers. Maintenance parameters can be set to allow the switch to report alarms over a TCP/IP link.

A device that does not support a direct TCP/IP connection, but that does support an RS232 interface, can connect to the C-LAN board through a terminal server or router.

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## Switch Server Applications

IP Asynchronous Links provides a telnet server to interconnect C-LAN Ethernet clients to system management applications on the switch via TCP/IP or TCP/IP and RS232 signals. IP Asynchronous Links supports the following server applications:

- System administration terminal (SAT)
- Avaya Site Administration (formerly DEFINITY Site Administration, or DSA)
- DEFINITY Network Management (DNM)
- Proxy Agent
- Enterprise Directory Gateway

Server applications send data to the switch, and the telnet server supports 80 kbps data throughput. Current application screen interactions, and current simultaneous session limits on the switch are also supported. The telnet server satisfies all current terminal emulation modes for example, 51x, 4410, 4425, vt220, hp262x, and pctt.

Access security for system management applications over TCP/IP is provided by the existing Access Security Gateway (ASG) feature. Through either a local or a remote node or port, users can specify the remote client IP address and port number from which the switch can accept service requests. ASG must be enabled on the system-parameters customer-options form. ASG must also be enabled for at least one customer login. The user can administer a timeout period that ranges from 5 to 999 minutes, but there is currently no provision for data encryption over the LAN.

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## Reliability

Duplication is a strategy to create fully redundant systems that are highly reliable. Duplication minimizes single failure points that can interrupt call processing. Three options are available for system reliability and duplication:

- Standard reliability – does not duplicate the tone clocks, the control carrier, or any inter-PN connectivity.
- High reliability – duplicates the hardware that is associated with the SPE. The Control Carrier is duplicated, which provides duplicate SPEs and tone clocks. Inter-PN connectivity and EPN tone clocks are not duplicated. The strategy is to duplicate items that are associated with the SPE so that a single fault will not cause the loss of the SPE.
- Critical reliability – requires the full duplication of the SPE, inter-PN connectivity, and the tone clocks.

As duplication increases, the maximum number of port carriers and port circuit packs per cabinet decreases.

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## BHCCI

The following table shows busy-hour call completion capacities for DEFINITY Server SI.

Type of call	DEFINITY Server SI
All analog	20,000
General business	20,000
ISDN	20,000
ACD	20,000
ICM	20,000
OCM	20,000
CTI/ASAI	20,000
Wireless	20,000
IP telephones, non-IP trunks	18,000
DCP telephones, IP trunks	13,500
IP telephones, IP trunks	7,500

## Adjuncts

The following is a partial list of the adjuncts that Avaya provides:

- Voice messaging and response such as INTUITY AUDIX
- Call center tools such as Avaya Call Management System, NICE Analyzer, Avaya Call Recording, Avaya Visual Vectors and Avaya Basic Call Management System Reporting Desktop
- System printer
- Journal printer
- Call Accounting Systems
- Call Detail Recording (CDR)
- Avaya Site Administration (ASA)
- DEFINITY Network Management (DNM)
- DEFINITY Translator ATM Manager (DTA)

# DEFINITY Server CSI

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## Overview

Avaya's Communication Manager on a DEFINITY<sup>®</sup> Server CSI is a solution for a medium-sized office location that has from 50 to 900 stations. This solution uses DEFINITY TN circuit packs, Avaya Communication Manager, and the CMC1 Media Gateway. It is easy and cost-effective for a company to migrate from the DEFINITY Server CSI to another Avaya solution as the company grows. Initial investment is protected since every DEFINITY CSI application and most of the hardware can still be re-used.

The DEFINITY Server CSI can be used at a single site or be networked in multiple locations. For example, DEFINITY Server CSI might provide a solution for a satellite office within a larger business or a branch locations around the world. Multisite companies can use remote diagnostics and alarming to maintain the DEFINITY Server CSI from a central location. An administrator can centrally administer the system from a central location by using a system administration tool.

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## Detailed description

High-level description of the DEFINITY Server CSI:

- Ideal for small single sites, multi-site locations, and branch locations
- Supports up to 1300 ports
- Supports 400 trunks and 900 stations
- Uses Avaya Communication Manager
- Consistent administration over a customer's network when using an all-Avaya solution
- Consistent user interface over a customer network when using an all-Avaya solution

## Configuration information

A DEFINITY Server CSI consists of the following main components:

- TN2402 Processor board
- TN2182 Tone Clock
- CMC1 Media Gateway

The following sections describe each component.

### TN2402 Processor board

A TN2402 Processor board resides in slot one of cabinet A. This board contains 32 MB of DRAM memory and 32 MB of flash memory. The software is stored on flash memory and on removable memory through Flash-ROM that plugs directly into the TN2402 processor board. The memory on the Processor board contains the generic program and the system translations. The cartridge contains a copy of the system translations and error log. The TN2402 also provides:

- A 5-volt ATA PC-card Memory Card interface
- Three external RS232 interfaces [CD1]
- A SAT terminal interface
- An SMDR/Printer or other DTE interface
- A connection for an external modem to dial out alarms

### Tone-Clock (TN2182)

For any system-reliability configuration, a TN2182B Tone-Clock integrates the tone-generation, tone-detection/call-classification, system-clocking, and synchronization functions onto a single circuit pack. The TN2182 supports eight ports for tone detection and allows gain or loss applied to PCM signals that are received from the bus.

### CMC1 Media Gateway

A CMC1 Media Gateway has the following characteristics:

- The size is 25.5 inches wide, 24.5 inches high, and 11.3 inches deep. It is designed for wall mounting. Mounted on the floor or on a table where required.
- Ten universal port slots plus one power supply slot per CMC1.
- Standard-reliability option only.

- Is limited to one PN that is made up of a maximum of three CMC1 Media Gateways. A PN consists of a control CMC1 that is designated "A". The second and third CMC1s are optional and are designated cabinets "B" and "C" respectively. Cabinet address ID within the PN is set using the DIP switch on the backplane.
- Circuit packs are inserted and removed from the left side. Cabinet I/O is from the right side.
- The CMC1s in a port network are interconnected via shielded TDM/LAN bus cables.
- The CMC1 is AC-powered only. There are no internal batteries, and no DC power option.
- Two 12-volt DC variable-speed fans integrated into the bottom of the cabinet provide CMC1 cooling. The fans force air through a filter and up through the cabinet. Air exits from the back of the cabinet. Speed control is provided by the 650A Global Power supply. The 650A varies the fan input voltage between 8VDC and 14VDC depending on a temperature sensor that is mounted in the power supply. The fan assembly includes the two fans, a frame to which the fans are attached, wiring, and a connector that plugs into the backplane. The assembly is easily installed and removed. The entire assembly must be replaced as a unit if a fan fails.

A fan failure will result in the following conditions:

- An alarm through the power supply that will appear to the system
- The remaining fan goes to high speed
- The red LED on the 650A Global Power supply faceplate lights

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## Reliability and recovery

DEFINITY Server CSI provides the following capabilities:

- Can survive minor power surges, including lightning-induced surges up to 2500 Volts peak, without service interruption. Surge protectors can be purchased for increased coverage
- Can operate in conditions that include above-average temperatures and humidity.
- In case of a power failure, automatically restores the last saved version of user translations and runs them at system restart.
- Supports the remote diagnostics capability, which enables quick troubleshooting and maintenance.
- Conducts self-diagnostics and can self corrects many system errors. If further technical assistance is required, DEFINITY Server CSI uses an external modem to place a call for support.
- Conducts standard maintenance routines automatically.
- Backs up all the user translations every day at midnight by default.
- The single-processor configuration provides 99.9% reliability.

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## System capacity

Type	Capacity
Maximum trunks	400
Maximum stations	900
Maximum ports	1300 (limited by slots, not software)
Maximum IP endpoints	390

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## Avaya Communication Manager

The DEFINITY Server CSI uses Avaya Communication Manager for call processing solutions in large and small customer environments. For more information on these solutions, see the Overview for Avaya Communication Manager.

Avaya Communication Manager is an open, scalable, highly reliable and secure telephony software application. Avaya Communication Manager provides user functionality, and system management functionality, intelligent call routing, application integration and extensibility, and enterprise communications networking. Communication Manager offers over 500 features, in the following categories.

- Call center
- Telephony features
- Localization
- Collaboration
- Mobility
- Messaging
- Telecommuting
- System management
- Reliability
- Security, privacy and safety
- Hospitality
- Attendant features
- Networking
- Intelligent call routing
- Application programming interfaces

## Adjuncts

The following is a partial list of the adjuncts that Avaya provides:

- Voice messaging and response such as INTUITY AUDIX
- Call center tools such as Avaya Call Management System, NICE Analyzer, Avaya Call Recording, Avaya Visual Vectors and Avaya Basic Call Management System Reporting Desktop
- System printer
- Journal printer
- Call Accounting Systems
- Call Detail Recording (CDR)
- Avaya Site Administration (ASA)
- DEFINITY Network Management (DNM)
- DEFINITY Translator ATM Manager (DTA)s

# Avaya Converged Communications Server (for SIP)

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## What is the Converged Communications Server?

An Avaya Converged Communications Server is dedicated to providing a variety of converged communications services based on the SIP (Session Initiation Protocol), a standard that is defined by the Internet Engineering Task Force (IETF). A Converged Communications Server provides the necessary proxy, registrations, and redirection tasks necessary for SIP applications, such as Instant Messaging (IM) and presence to be used by SIP end points. A Converged Communications Server is configured as a solution with Avaya Communication Manager to provide communications and services between SIP end points (Avaya 4602 SIP Telephone and Avaya IP Softphone Release 5 and later) registered with a Converged Communications Server and existing non-SIP end points supported by Communication Manager (analog, DCP, or H.323 stations and analog, digital, or IP trunks). Among other features, the Converged Communications Server proxies instant messages and will provide presence functionality to support the Avaya IP Softphone, while Avaya Communication Manager handles the voice and telephony features in the Avaya IP Softphone R5. Avaya Communication Manager provides added value to SIP end points by extending the SIP telephony feature set.

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## System Architecture

Avaya's SIP architecture supports Converged Communications Servers of different types.

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## Types of CCS Hosts

### Edge

The Edge server handles SIP requests from all domains, forwarding requests received from Home servers (from within the enterprise's domain) and from other SIP proxies outside of the enterprise's domain. If an Edge server is used, then one or more Home servers must also exist in this architecture. Only one Edge server (or combined Home/Edge server) is allowed for any one domain.

## Home

A Home server handles SIP requests for the specific domain assigned for this server, and it forwards any requests pertaining to other domains to the Edge server. One to ten Home servers and exactly one Edge server is required in this scenario. Each Home server can support up to 15,000 SIP users.

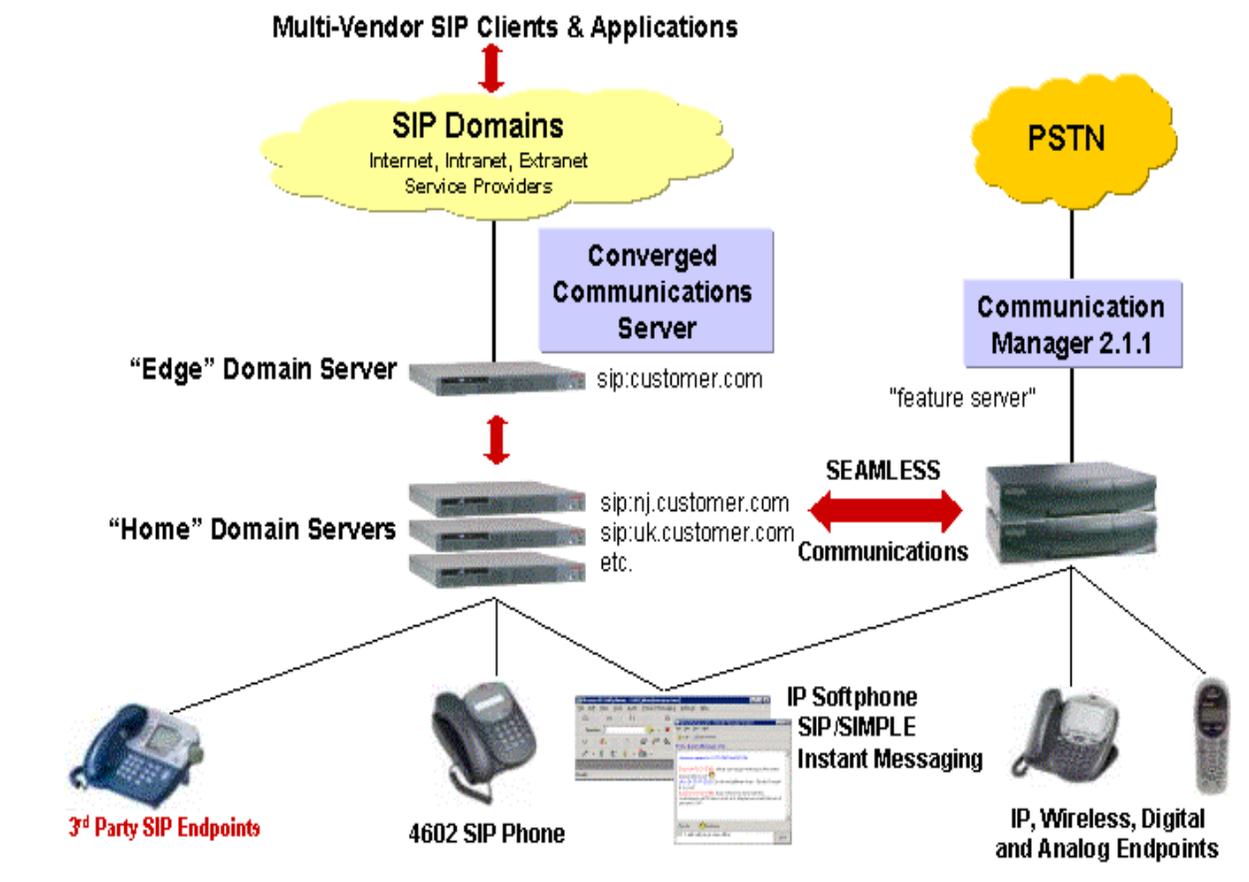
## Home/Edge

A combined Home/Edge server performs the functions of both a Home server and an Edge server for an enterprise. This is a single-server scenario; that is, no other Home or Edge servers may exist in this architecture.

**Note:**

It is best to architect your system (i.e., a combined server, or multiple servers) with scalability in mind, as this release does not support non-disruptive database migration.

**Figure 43: SIP Architecture**



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## Local Failover Option

An optional local failover option may be configured to replicate the CCS database and server software for any particular system node (home, edge, or combination home/edge). In this duplicated (duplex) configuration, one server is active and the other is in standby mode. If the active server (Server A) fails or is taken out of service, it "fails-over" to the duplicated server (Server B), which then becomes active and maintains uninterrupted service. When the originally-active server (Server A) is put back into service, it goes into standby mode. The duplicated server (Server B) continues in active mode, providing service to the SIP endpoints.

In each server in a duplex server configuration, a dual-port NIC card must be installed. One port of the dual-port NIC card on each server is then connected to that of the other server with a CAT5 cable. The servers use this link to maintain database synchronization. Additionally, an RS-232 serial port on each of the servers must be cabled together. Each server uses this link for monitoring the status of the other server.

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## Administrative Interfaces

All Avaya Converged Communications Servers support a secure web interface for maintenance and administration. One server, typically the Edge server, also hosts the Master Administrator web interface. The Master Administrator interface is used to administer SIP users and their associated media server extensions. The Master Administrator interface distributes user updates to all Home servers.

The Avaya Converged Communications Server also supports SNMP alarming and SNMP network management reporting.

## Requirements for the SIP server

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### Hardware

The server hardware required for an Avaya Converged Communications Server is the IBM e-server xSeries 305 Type 8673, hereafter referred to as the x305. The x305 package also contains a series of CDs supplied by IBM.



**CAUTION:**

The IBM CDs are not used for installation of the Converged Communications Server.

An IBM Installation Guide is provided with the x305. The installation guide includes detailed instructions for installing the IBM RSA module on page 7 of the guide and for installing DIMM (on page 10).

Note this memory must be added before use. To be used as a Converged Communications Server, the x305 needs one additional 512MB DIMM (part number 33L5038) of PC2100 266MHz CL2.5 ECC DDR SDRAM added to the existing 512MB installed by default, to yield a total installed RAM of 1GB. For detailed documentation on installing and using the RSA, refer to the "Job Aid: Replacing the RSA," 555-245-759, and "The Avaya RSA User's Guide," 555-245-702.

Avaya requires a universal serial bus (USB) modem be connected to the x305 for remote access. The RSA module requires that a serial modem be connected, also for remote access. Implementation and maintenance services require remote access to both the server and the RSA module. If remote access to the server fails, RSA remote access provides for continued, though limited, remote maintenance capability.

The x305 ships with a blank, unpartitioned hard-disk drive, and without an operating system or any Avaya server software installed. These must be installed and configured properly before use. IP connectivity must be configured correctly. For more details on configuring your IP system, refer to "Administration for Network Connectivity for Avaya Communication Manager, 555-233-504".

For a duplex server configuration, each server must also have a dual-port NIC card connected to the other server with a CAT5 cable. An RS-232 serial port on each server must also be connected to the serial port on the duplicated server.

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## Software

The Avaya Converged Communications Server uses several software components, including:

- Linux
- WebLM for licensing purposes
- Proxy, IM Logger and Trace Logger services provided by Avaya
- PostgreSQL database
- Apache web server (for providing access to the administrative interface).

Support for SIP is enabled in Avaya Communication Manager running on any one of the Linux-based media servers (e.g., the Avaya S8700, S8710, S8500 or S8300 Media Server).

---

## Firmware

Refer to the "SIP Support in Avaya Communication Manager 2.1.1" document for more details on what firmware vintages are required in certain Avaya products to ensure interoperability in a SIP environment.

**Note:**

Firmware updates should be obtained only through Avaya Inc., or from its authorized Business Partners. You should never install e-server updates obtained directly from IBM.

---

## Related Systems

Refer to the "SIP Support in Avaya Communication Manager 2.1.1" document for more details on media server administration requirements for SIP. Refer to the documentation and online help files which came with your Avaya IP Softphone R5 and/or Avaya 4602SIP Telephone for details on the client hardware requirements for using instant messaging (through the former) and SIP voice calling (through the latter).



# Media gateways

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## G150 Media Gateway

The G150 Media Gateway is a high-performance converged telephony and networking device that sits in a small branch location. The G150 Media Gateway provides local trunk and telephone exchange and data networking. The G150 integrates seamlessly with a remote server running Avaya Communication Manager, Release 2.2 or later, call processing software. The remote server can be one of the following:

- DEFINITY Server CSI
- DEFINITY Server SI
- S8700 Media Server
- S8710 Media Server
- S8500 Media Server
- S8300 Media Server in a G700 Media Gateway configuration

**Note:**

The S8300 Media Server running in a G350 Media Gateway does *not* support the G150 Media Gateway.

The G150 Media Gateway provides an effective way to connect IP phones, analog phones, and trunks at a remote site to a Communication Manager server. The G150 Media Gateway provides full Communication Manager functionality and features to the remote site either through a WAN or LAN using the IP protocol.

In addition, the G150 can enter a survivable mode when service from the remote Communication Manager server fails. See [Survivable Mode](#) on page 144.

Finally, the G150 can be configured for the following:

- [G150 WAN Expansion Interfaces](#) on page 143
- [Optional Wireless LAN Card & Access Point](#) on page 146.

**Note:**

The G150 Media Gateway uses the basic hardware and design of the IP Office product. However, unlike the IP Office, the G150 Media Gateway normally serves as an H.323 gateway in accordance with the Communication Manager Remote Office group. As such, the G150 Media Gateway is managed by the Communication Manager media server. The G150 Media Gateway operates as a standalone gateway only when it enters survivable mode.

## Capacities

**Note:**

For the most up-to-date list of capacities on Communication Manager, media servers, and the G150 Media Gateway, see *Avaya Communication Manager System Capacities*, 555-245-601, available at <http://avaya.com/support>.

Communication Manager servers can simultaneously support a maximum number of G150 Media Gateways as shown in the following table:

Server	Number of G150 Media Gateways Supported
S8700/S8710 Media Server	250
S8500 Media Server	250
S8300 Media Server (in a G700 Media Gateway)	50
DEFINITY Server SI	80
DEFINITY Server CSI	80

Each G150 Media Gateways supported by a media server uses IP stations, IP trunks, and signaling groups. This usage counts against the following maximum capacities:

Capacity limit	S8700/ S8710	S8500	S8300	DEF SI	DEF CSI
Total IP stations (max)	12000	2400	450	1500	390
Total IP trunks (max)	8000	800	450	400	400
Number of signaling groups (max)	650	650	650	110	110

## Effect on station and trunk limits on Communication Manager

Each G150 Media Gateway affects the system capacity limits of the controlling media server in the following ways:

- Each analog port on a G150 Media Gateway counts as one IP station against the media server's capacity limits.
- Each analog trunk and each DS0 channel on a BRI or T1 digital trunk connected to a G150 Media Gateway counts as one IP trunk against the media server's capacity limits.
- Each G150 Media Gateway requires a signaling group on the media server to handle traffic over the G150 Media Gateway's analog trunks. These G150 trunks appear to Communication Manager as a group of virtual trunks.
- Each G150 Media Gateway requires a signaling group on the media server to handle traffic over the G150 Media Gateway's digital trunks. These G150 trunks also appear to Communication Manager as a group of virtual trunks.

## Two models

The G150 Media Gateway is available in two fixed-configuration variants which provide a different mix of analog trunks, analog extensions, and Voice-over-IP capacity. Depending on the model chosen, up to a maximum of 20 extensions can be supported (4 Analog and 16 IP).

The two pre-defined configurations are detailed in the following table.

G150 Model	Analog Trunks+	Analog Extensions	Voice Over IP Channels
<a href="#">G150 2T + 4A (4 VoIP)</a>	2	4	4
<a href="#">G150 4T+4A+8DS (16 VoIP)</a>	4	4	16

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## G150 2T + 4A (4 VoIP)

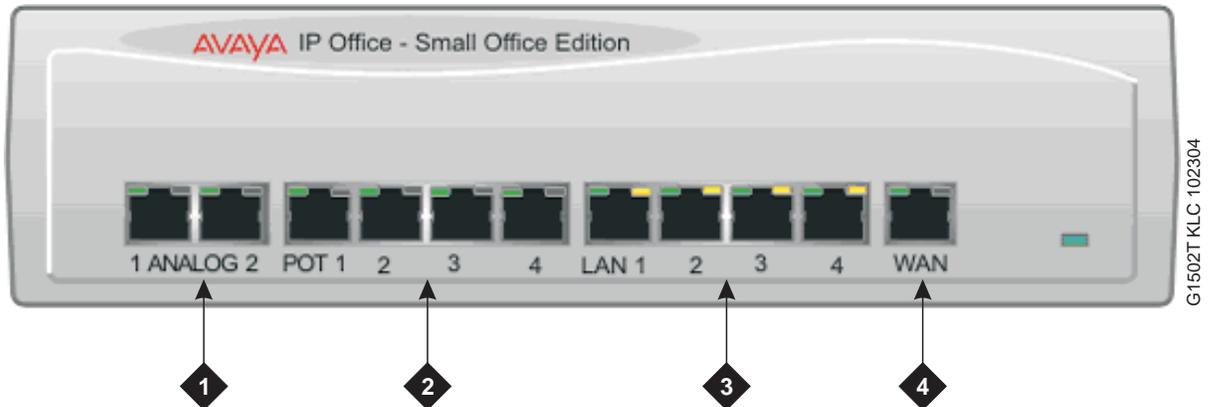
The G150 2T+4A (4 VoIP) provides:

- Two Analog Loop Start Trunks (Caller ID enabled).
- Four analog extension interfaces.
- Three VoIP Codecs (G.723.1, G.711 and G.729a).
- 4 Switched Ethernet ports (Layer 2).
- Dedicated Switched Ethernet WAN port (Layer 3).
- Built-in DHCP and TFTP servers
- Two PCMCIA slots for wireless and flash card support.

## Media gateways

- A 64 MB Flash Card for IP phone file storage and TFTP server download to IP phones.
- WAN slot for optional WAN card (V.35, V.24, X.21, BRI, T1 PRI).
- DTE port.
- Audio port for external music on hold source.
- Two relay switch port for door entry systems (External O/P socket) —. currently not used.

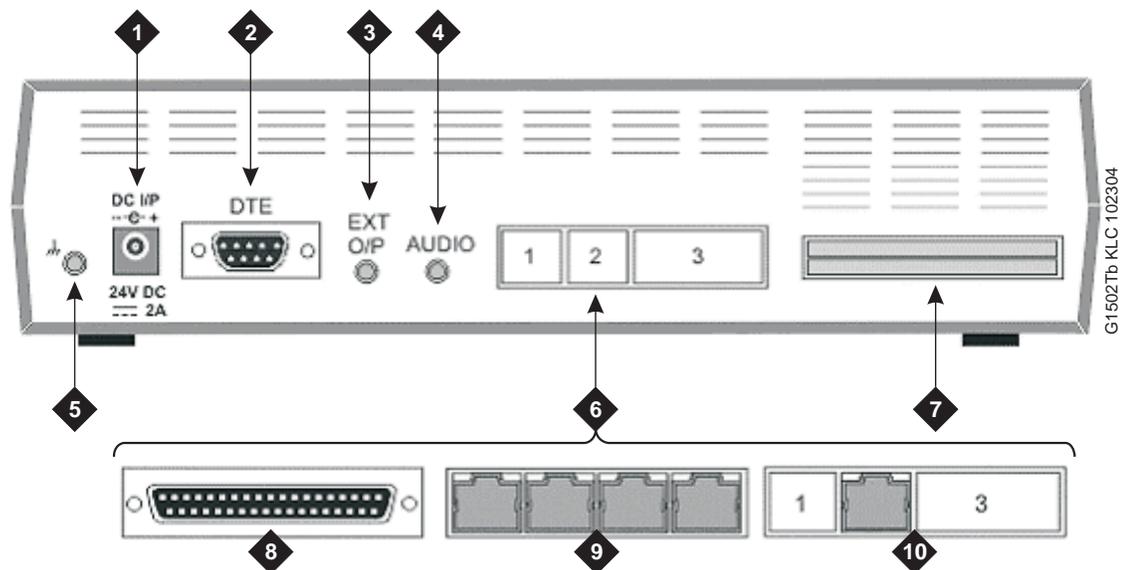
**Figure 44: G150 2T+4A (4 VoIP) Front Panel**



**Figure notes:**

Number	Description of Device
1.	2 x analog trunk ports
2.	4 x analog extension ports (POT)
3.	4 x switched LAN ports
4.	Ethernet WAN port (at default LAN2)

Figure 45: G150 2T+4A (4 VoIP) Front Panel



## Figure notes:

Number	Description of Device
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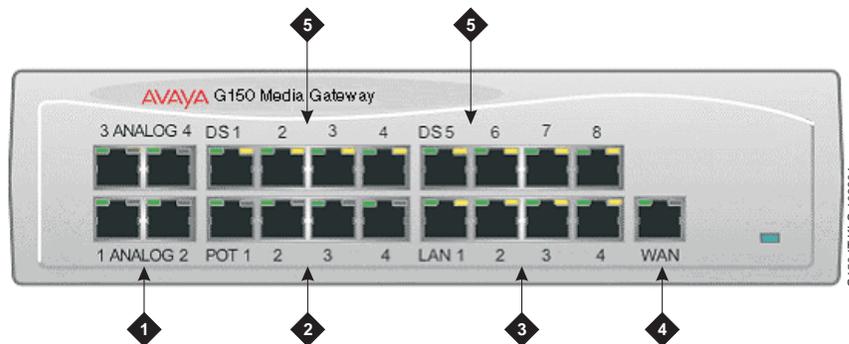
- |     |  |
|-----|--|
| 1.  | DC power I/P socket                                    |
| 2.  | DTE port   |
| 3.  | External O/P socket (not used)                         |
| 4.  | Audio I/P socket                                       |
| 5.  | Functional Earth jack socket                           |
| 6.  | Knockout panel(s) for trunk module kits                |
| 7.  | 2 x PCMCIA slots for wireless and memory card support. |
| 8.  | WAN X.21/V.35 trunk module                             |
| 9.  | Quad BRI trunk module                                  |
| 10. | PRI trunk module                                       |

## G150 4T+4A+8DS (16 VoIP)

The G150 4T+4A+8DS (16 VoIP) provides:

- Four Analog Loop Start Trunks (Caller ID enabled).
- Four analog Extension interfaces.
- Sixteen VoIP Codecs (G.723.1, G.711 and G.729a).
- 4 Switched Ethernet ports (Layer 2).
- Dedicated Switched Ethernet WAN port (Layer 3).
- Built-in DHCP and TFTP servers
- 2 x PCMCIA Slots for Wireless and Memory card support.
- A 64 MB Flash Card for IP phone file storage and TFTP server download to IP phones.
- WAN Slot for Optional WAN card (V35, X.21, quad-BRI, T1 PRI).
- DTE port.
- Audio port for external music on hold source.
- Two relay switch port for door entry systems (External O/P socket) — currently not used.

**Figure 46: G150 4T+4A +8DS (16 VoIP) Front Panel**



**Figure notes:**

Number	Description of Device
1.	4 x analog trunk ports
2.	8 x analog extension ports (POT)
3.	4 x switched LAN ports
4.	Ethernet WAN port (at default LAN2)
5.	8 x digital station ports (not currently used)

Figure 47: G150 4T+4A +8DS (16 VoIP) Back Panel

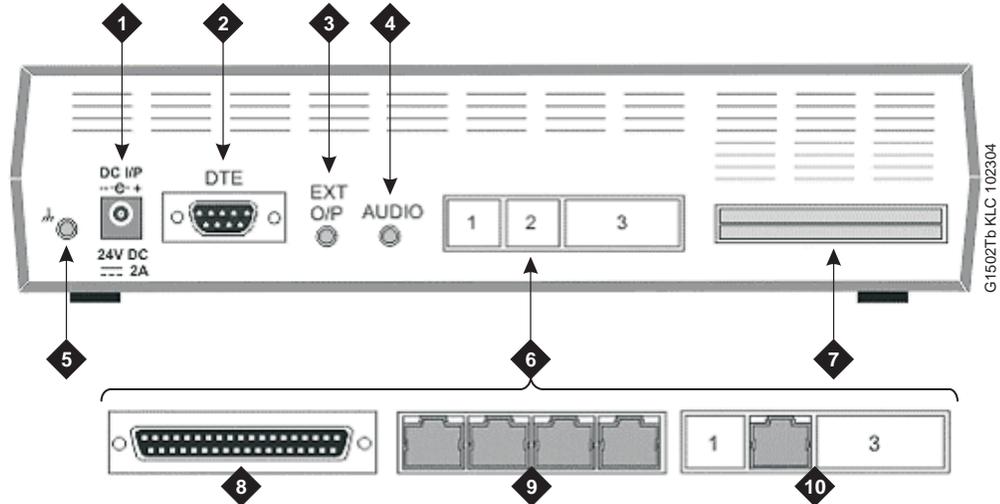


Figure notes:

Number	Description of Device
1.	DC power I/P socket
2.	DTE port
3.	External O/P socket (not used)
4.	Audio I/P socket
5.	Functional Earth jack socket
6.	Knockout panel(s) for trunk module kits
7.	2 x PCMCIA slots for wireless and memory card support.
8.	WAN X.21/V.35 trunk module
9.	Quad BRI trunk module
10.	PRI trunk module

## G150 WAN Expansion Interfaces

All G150 units include an expansion slot for an optional WAN interface of the following types (check locally for availability). Each of these interface cards are now described in more detail.

## G150 WAN Expansion Module

This expansion card provides a single WAN connection (X21 or V35) via a standard 37-way D-Type socket. For details of the relevant cable specifications and pin-outs, please refer to the Getting Started with the G150 Media Gateway document. Line speeds up to and including 2Mbps are supported on the interface. The carrier providing the line dictates the actual operating speed, i.e. in some territories the maximum speed may be 1.544Mbps.

## G150 BRI Module

The G150 Media Gateway supports the standard a Basic Rate ISDN (BRI) trunk module, which provides 4 European Basic Rate ISDN S/T-Bus interfaces (8 trunks).

Details of the supported supplementary services on BRI interfaces are given in the 'Public and Private Voice Networks' section.

**Note:**

This module is not available in all territories. Check for availability.

## G150 PRI Module

The G150 Media Gateway also supports the PRI module, which provides a single primary rate trunk interface for supporting voice services and fractional leased lines, of up to 256kbps bandwidth on IP and Frame Relay services.

**Note:**

This module is not available in all territories. Check for availability.

---

## Survivable Mode

If, for any reason, communication stops between a G150 Media Gateway and the media server running Communication Manager, the G150 Media Gateway automatically assumes control of call processing for local extensions and trunks. The G150 Media Gateway enables a built-in H.323 gatekeeper, which allows collocated branch office IP telephones to register with the G150 Media Gateway. Once the IP telephones are registered, the G150 Media Gateway assumes control of all lamps, displays, and buttons on the IP telephones. Only IP-to-IP shuffled calls are preserved during the transition of control to the G150 Media Gateway. Any other calls end.

**Note:**

The IP address of the G150 survivable gatekeeper is the last entry in the alternate gatekeeper list for any IP telephone that was originally registered with Communication Manager.

## Operation in survivable mode

In survivable mode, a G150 Media Gateway uses the parameters that the system administrator administers in the G150 administration interface. These parameters, which should match as closely as possible those established on the Communication Manager server, include the following:

- Dial plan
- Trunk access codes
- System parameters
- Feature assignments

In survivable mode, the G150 allows locally-connected endpoints to:

- Call other locally-connected endpoints
- Make and receive external calls over the public network.
- Use the following features:
  - Called List Identification (CLI) and Automatic Number Identification (ANI)
  - Hold
  - Transfer
  - Call waiting indication
  - Last number redial
  - Drop call

In addition, G150 Media Gateway assumes control of the front panel LEDs of the G150 Media Gateway. As a result, G150 LED indications in survivable mode differ from those when the G150 Media Gateway is under control of the remote server.

While in survivable mode, incoming calls that go to voice mail coverage connect to the G150 voice mail cache, which the G150 Media Gateway uses to capture and store voice messages. Once service to the media server running Communication Manager is restored, the G150 Media Gateway forwards the messages to the server's central messaging system (for example, Modular Messaging). Users can then get their messages.

## Return of control to server

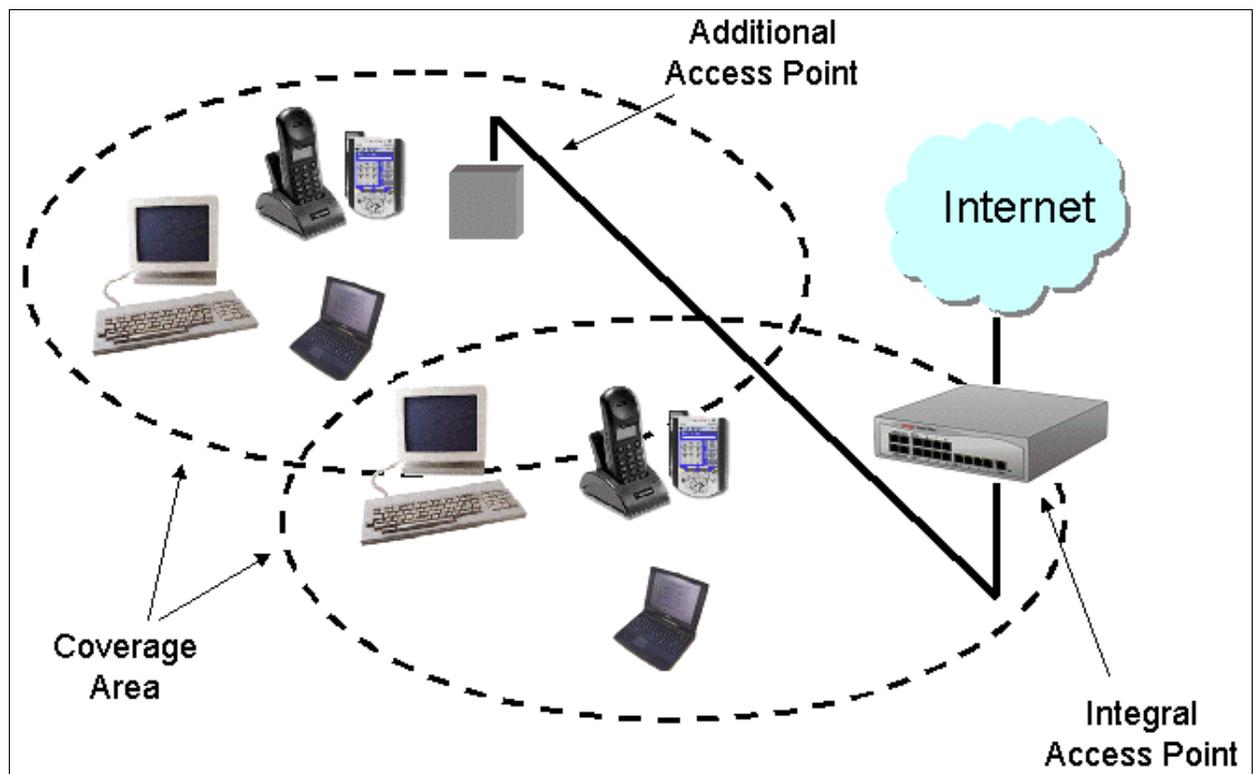
In survivable mode, the G150 Media Gateway can continue to support calls indefinitely. However, while in survivable mode, the G150 Media Gateway attempts to reregister with the remote server according to administered time intervals. When the G150 Media Gateway successfully reregisters with the remote server, the G150 Media Gateway exits survivable mode and relinquishes call processing control to the remote server. The G150 forces the local endpoints to also reregister with the remote server. Active calls are preserved when call processing control returns to the remote server. Any endpoint that is on an active call reregisters with the remote server when the call is completed.

## Optional Wireless LAN Card & Access Point

All G150 units can be configured to support connectivity to an 802.11 Wireless LAN infrastructure. This is enabled using the combination of the PCMCIA-format Wireless LAN Card and the Access Point License Key.

An Access Point acts as a Hub in a wireless network providing connectivity between devices in the vicinity. In ideal conditions a range of up to 550m (1,750 ft) is achievable although this range will be decreased if walls and other obstacles are present. This capability is used where local conditions impair coverage and additional Access Points are needed to cover the black spots.

**Figure 48: G150 WiFi Access Point**



When deployed as part of a wireless network, access to the G150 Media Gateway can be secured against intruders using either the Wired Equivalent Privacy (WEP) or RC4. WEP uses 64 bit encryption key and RC4 uses a 128 bit encryption key. Only devices with a matching security key can participate in the network.

The Wireless Access Point that can be enabled on the G150 Media Gateway complies to the IEEE 802.11 and IEEE 802.11b standards meeting the Wireless Ethernet Compatibility Alliance (WECA) Wireless Fidelity Wi-Fi™ requirements for interoperability.

## Summary

- 2.4 GHz to 2.5 GHz band.
- Automatic fallback 11Mbps, 5.5Mbps, 2Mbps or 1Mbps.
- IEEE 802.11 and IEEE 802.11b Compliance.
- Wireless Fidelity Wi-Fi™ Compliance.
- Interoperable with other 802.11b compliant devices.
- WEP or RC4 security.
- Range up to 550M (1750ft).

**Table 4: G150 WiFi ranges**

Range (meters/ft)	11Mbps	5.5Mbps	2Mbps	1Mbps
<b>Open</b>	160m/252ft	270m/885ft	400m/1300ft	550m/1750ft
<b>Semi-Open</b>	50m/165ft	70m/230ft	90m/300ft	115m/375ft
<b>Closed</b>	25m/80ft	35m/115ft	40m/130ft	50m/165ft
<b>Receiver Sensitivity dBm</b>	-82	-87	-91	-94
<b>Delay Spread (at FER of &lt;1%)</b>	65ns	225ns	400ns	500ns

For wireless operation, G150 must be fitted with a Wireless LAN card and a valid Wireless LAN Access Point license key must be enabled.

---

## Avaya G350 Media Gateway

The Avaya G350 Media Gateway forms part of Avaya Enterprise Connect, Avaya's solution for extending communication capabilities from the headquarters of an organization to all collaborative branch locations. Avaya Enterprise Connect helps you provide the same high quality services to all organization members regardless of their location.

The G350 is a high-performance converged telephony and networking device that sits in a small branch location, providing all infrastructure needs in one box — telephone exchange and data networking. The G350 is designed for branch offices with up to 40 users. The G350 features a VoIP engine and WAN router and provides full support for legacy digital and analog telephones.

The G350 integrates seamlessly with Avaya media servers S8700, S8710, S8500, and S8300 running Avaya Communication Manager call processing software to provide the same top quality telephony services to the small branch office as to the headquarters of the organization. The media server can be located at the headquarters and serve the G350 remotely.

## Media gateways

The G350 can optionally house an internal Avaya S8300 media server as a local survivable processor or as the main media server for standalone deployment.

In addition to advanced and comprehensive telephony services, the G350 provides full data networking services, precluding the need for a WAN router or LAN switch.

The G350 is a modular device, adaptable to support different combinations of endpoint devices. Pluggable media modules provide interfaces for different types of telephones and trunks. A combination is selected to suit the needs of the branch.

A LAN media module with PoE standard compliant Ethernet ports provides support for IP telephones as well as all other types of data devices. A range of telephony modules provides full support for legacy equipment such as analog and digital telephones.

---

## Feature highlights

The G350 features:

- VoIP Media Gateway services, including bearer and control encryption
- Survivability features for continuous voice services
- WAN connectivity and routing
  - E1/T1, V.35/X.21, and Ethernet
  - Link-layer protocols — PPP, PPP over Ethernet, Ethernet, and Frame-Relay
  - RIPv2 and OSPFv2 routing protocols and VRRP redundancy
- Power-over-Ethernet LAN switching
- Support for SSHv2 for authenticated and encrypted management channels
- Support for RADIUS for authentication
- Support for traditional telephones and trunks
- SNMP v3
- SNMP traps (v1 and v2 only) sent to the primary controller
- VLANs
- WAN Quality of Service (QoS)
- Weighted Fair Queuing (WFQ)
- Dynamic Call Admission Control (CAC) for Fast Ethernet, Serial, and GRE tunnel interfaces.

Dynamic CAC informs the primary controller of the actual bandwidth of the interface and tells the controller to block calls when the bandwidth is exhausted.

- Policy-based routing
- Spanning Tree Protocols IEEE 802.1D (STP) and IEEE 802.1w (RSTP)

- Port mirroring
- Port redundancy
- Support for remote administration access using a modem
- Firewall support, with stateless access lists that filter traffic based on IP and Protocol headers
- Built-in TFTP server from which IP phones may download firmware and configuration files
- Point-to-point protocol over Ethernet (PPPoE) support
- WAN backup with xDSL modem
- IPsec Virtual Private Network (VPN), which supports the following:
  - Standards-based IPsec implementation [RFC 2401-RFC 2412...]
  - Standard encryption and authentication algorithms for IKE and ESP: DES, TDES, AES (128bit), MD5-HMAC, SHA1-HMAC, IKE DH groups 1 & 2.
  - ESP for data protection and IKE (main mode) for key exchange.
  - Quick Mode key negotiation with Perfect Forward Secrecy (PFS).
  - IKE peer authentication through pre-shared secret.
  - Multiple IPsec peers (up to 50) for Mesh and hub-and-spoke IPsec topologies.
  - IPsec protection can be applied on any output port and on many ports concurrently, for maximum installation flexibility.
  - Per-interface security policy with bypass capability.
  - IPsec is integrated into the router and can be used with other features such as GRE tunneling.
  - Random pre-shared key generation service
  - Load Balancing and resiliency achievable through integration with core routing features (backup interface, GRE, and so on)
- Management Information Base (MIB) and threshold alarming support for monitoring VoIP quality
- Compliance with Federal Information Processing Standards (FIPS-140-2) for secure communications. In addition to IPsec VPN and other network capabilities, current FIPS compliance includes the following:
  - Shutdown of various encryptions, including media, signaling, ASG, SSHv2, modem, USB port, and CHAP encryptions
  - Restriction of telnet, SNMPv3, and TFTP/FTP file transfer to an IPsec tunnel
- DHCP Server for providing IP addresses to IP hosts (for example, to IP Phones)
- Integrated packet Sniffer for capturing IP traffic for later analysis and troubleshooting (for example, by an Ethereal analyzer)

## Media gateways

- Compressed RTP, for improved utilization of WAN uplinks
- Syslog support, to an external or internal logger
- 802.1X Port Based access control, available on the switched 10/100 Power over Ethernet ports
- Generic Route Encapsulation (GRE) Tunnels
- Transport, using its VoIP services, of the following:
  - Faxes over a corporate IP intranet

**Note:**

The path between endpoints for fax transmissions must use Avaya telecommunications and networking equipment.

 **SECURITY ALERT:**

Faxes sent to non-Avaya endpoints cannot be encrypted.

- T.38 Fax over the Internet (including endpoints connected to non-Avaya systems)
- Modem tones over a corporate IP intranet

**Note:**

The path between endpoints for modem tone transmissions must use Avaya telecommunications and networking equipment.

See the *Administrator's Guide for Avaya Communication Manager*, 555-233-506, for more information.

## Deployment modes

The G350 is a modular device with multiple configuration possibilities to meet specific individual needs. Six slots in the G350 chassis house a customized selection of media modules, which connect to different types of circuit switched phones, trunks and data devices. One of the slots can house an internal media server. A major configuration choice is of which type of media server to deploy. The media server may be a media module or a standalone device.

The G350 can be deployed in one of two basic working modes:

- **Distributed Avaya Enterprise Connect.** In this mode, the G350 is controlled by an external media server. This may be a standalone media server, such as the S8500 or the S8700/S8710, or a separate media gateway in a standalone configuration.

The G350 may also house an S8300 Media Server module to function as a Local Survivable Processor (LSP), which can take over control of the G350 if the external media server stops serving the G350. For a summary of how the LSP in a G350 works, see [S8300 Media Server in an LSP configuration](#) on page 46

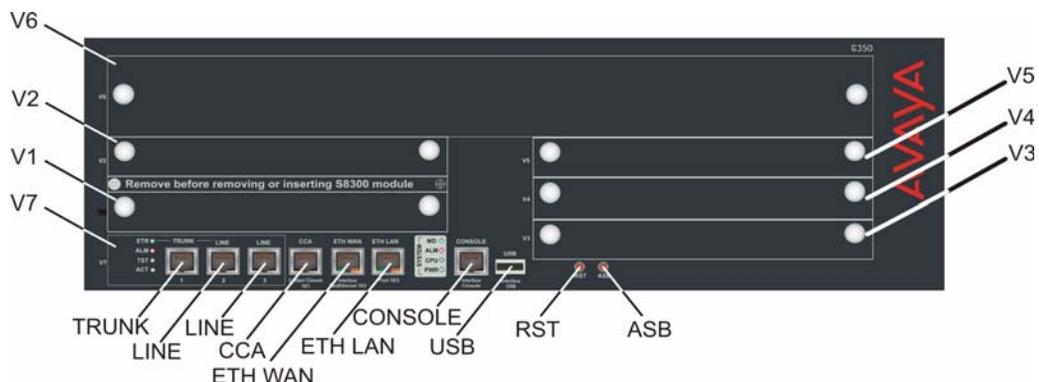
- **Standalone.** In this mode, the G350 is controlled by an internally housed S8300 Media Server module. See [Avaya S8300 Media Server and an Avaya G700 Media Gateway](#) on page 29.

Multiple G350s may be deployed in many remote branches of a large organization. Large branches or main offices may deploy an Avaya G700 Media Gateway, which provides similar functionality to the G350 for a larger number of users. Up to 50 G350 and G700 Media Gateways may be controlled by a single S8300 Media Server. Up to 250 G350 and G700 Media Gateways may be controlled by a single external S8500, S8700, or S8710 Media Server.

## Physical description

The following figure shows the G350 chassis.

**Figure 49: G350 chassis**



## Media gateways

The G350 Media Gateway chassis has the following dimensions:

**Table 5: Dimensions of the G350 chassis**

Description	Value
Height	13.3 cm (5.24 in.)
Width	48.3 cm (19 in.)
Depth	40 cm (15.7 in.)
Weight of empty chassis	9-10 kg (19.8 - 22 lb)

The chassis features:

- Six media module slots, V1 to V6.
- Fixed ports and buttons, including embedded analog media module V7.

**Table 6: Ports on the G350 chassis**

Port	Description
TRK	An analog trunk port. Part of an integrated analog media module.
LINE 1, LINE 2	Analog telephone ports of the integrated analog media module. An analog relay between TRK and LINE 1 provides Emergency Transfer Relay (ETR) feature.
CC	RJ-45 port for ACS (308) contact closure adjunct box.
WAN 1	RJ-45 10/100 Base TX Ethernet port.
LAN 1	RJ-45 Ethernet LAN switch port.
CON	Console port for direct connection of CLI console. RJ-45s connector.
USB	USB port for remote access modem.

**Table 7: Buttons on the G350**

Button	Description
RST	Reset button. Resets chassis configuration.
ASB	Alternate Software Bank button. Reboots the G350 with the software image in the alternate bank.

## G350 capabilities

The following table outlines the capacities of various G350 services.



### CAUTION:

Some capacities may change. For the most up-to-date list, see *System Capacities Table for Avaya Communication Manager on Avaya Media Servers*, 555-245-601.

Description	Capacity*	Comments
<b>Media Gateway Limits</b>		
Maximum number of G350 Media Gateways controlled by an external S8300, S8500, S8700, or S8710 Media Server	250	This number also applies if a combination of Avaya G700 Media Gateways and G350 Media Gateways are controlled by the same external media server.
Maximum number of G350 Media Gateways controlled by a S8300 media server installed in an external media gateway.	50	
Maximum total number of telephones supported by the G350	40	
Maximum number of IP telephones	40	Limited by the number of VoIP resources used and the calling patterns (VoIP to VoIP conferencing, VoIP to non-VoIP etc.)
Maximum number of analog phones	18	Using the 16 available analog ports, when two MM711 media modules are combined, and the two built-in LINE ports on the chassis front panel.
Maximum number of DCP phones	40	Using 40 of the available 48 ports when an MM312 and an MM717 DCP media module are combined.
Maximum number of DCP and analog phones	40	Using 38 or 39 of the available 48 ports, when an MM312 and an MM717 DCP media module are combined, and one or two of the built-in LINE ports on the chassis front panel for the analog phones.

## Media gateways

Description	Capacity*	Comments
Simultaneous two-way conversations from IP phone to legacy telephone or trunk.	32 – G.711 16 – G.729a/ G723	Simultaneous two-way conversations limited by the VoIP engine, including call progress tones.
Transcoding from G.711 to G.729 for IP phones	16	Simultaneous 2-way conversations
Transcoding from TDM phones to G.729 IP phones	16	Simultaneous 2-way conversations. The quantity of 16 applies to conversations where one end of each conversation is on a G350 and transcoding occurs for that endpoint on the G350. If transcoding must occur on both ends of the conversation, the quantity of conversations is 10.
Maximum number of PSTN trunks	17 (analog) 15 (digital)	A full E1/T1 trunk group is supported for PSTN. An additional 15 IP trunks are also supported.
<b>Miscellaneous</b>		
Fax capacity	8	Simultaneous fax transmissions using VoIP resources
Touch-tone recognition (TTR)	15	
Tone Generation	15	
Announcements (VAL)	6 Playback, 1 Record	

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## Media modules

Avaya media modules convert the voice path of the traditional circuits (such as analog trunk, T1/E1, and DCP) to a TDM bus. The VOIP engine then converts the voice path from the TDM bus to packetized VoIP (compressed or uncompressed) on an Ethernet connection.

The media modules reside in the G350 Media Gateway and interact with the motherboard and backplane.

**Note:**

For standalone mode, the S8300 Media Server is inserted into slot 1. See [Avaya S8300 Media Server and an Avaya G700 Media Gateway](#) on page 29.

There are eight telephony media modules:

- MM710 T1/E1 ISDN PRI – For information, see [MM710 T1/E1 media module](#) on page 250.
- MM711 Analog – For information, see [MM711 Analog media module](#) on page 253.
- MM712 DCP – For information, see [MM712 DCP media module](#) on page 255.
- MM714 Analog – For information, see [MM714 Analog media module](#) on page 256.
- MM717 DCP – For information, see [MM712 DCP media module](#) on page 255.
- MM720 BRI – For information, see [MM710 T1/E1 media module](#) on page 250.
- MM722 BRI – For information, see [MM714 Analog media module](#) on page 256.
- MM312 DCP – For information, see [MM312 DCP media module](#) on page 247.

There are two WAN media modules:

- MM340 T1/E1 WAN – For information, see [MM340 E1/T1 media module](#) on page 249.
- MM342 USP WAN – For information, see [MM342 USP WAN media module](#) on page 249.

There is one LAN media module:

- MM314 – For information, see [MM314 LAN media module](#) on page 248.

 **CAUTION:**

The MM312, MM314, MM340, and MM342 are not supported by the Avaya G700 Media Gateway. Do not insert an MM312, MM314, MM340, or MM342 media module into an Avaya G700 Media Gateway.

For more information about the G350 Media Gateway, see 555-245-201, "Overview of the Avaya G350 Media Gateway."

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## G600 Media Gateway

The Avaya G600 Media Gateway is used in upgrades to an S8700 or S8710 Media Server and the S8100 Media Server, and in migrations to the S8500 Media Server. The G600 Media Gateway has the following characteristics:

- There is a maximum of 64 port networks when used with the S8700/S8710 and the S8500.
- A maximum of four G600 Media Gateways can be in each Port Network (PN) with the S8700/S8710 and S8500 media servers. The four G600 Media Gateways must be in one data rack due to TDM cable length.
- The S8100 Media Server can support up to three G600 Media Gateways in a single port network.
- A PN consists of a control G600 Media Gateway that is designated A, and second, third, and fourth optional G600 Media Gateways that are designated as B, C, and D, respectively.
- The dimensions of the G600 Media Gateway is 19 inches wide, 13 inches high and 21 inches deep.
- There are 10 universal slots plus one power supply.
- Circuit packs are inserted and removed from the front of the cabinet. Cabinet I/O is through the back and through a front cable pass-through slot.
- G600 Media Gateway is AC powered only. There are no internal batteries. DC power is not an option.
- An RJ45 patch panel is recommended for cross-connecting to a LAN or a wall field.

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## G600 Media Gateway cooling

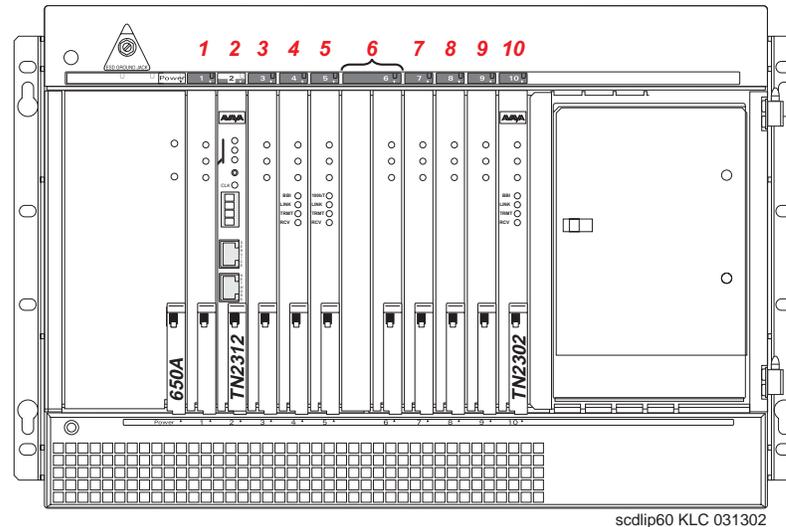
Cooling for the G600 Media Gateway is provided by three 12-volt DC variable-speed fans that are integrated into the back of the cabinet. The fans pull air through the front and left sides and up through the cabinet. Air exits from the back of the cabinet. The 650A Global Power supply controls the speed. The 650A Global Power supply varies the fan input voltage between 8VDC and 14VDC depending on a temperature sensor that is mounted in the power supply.

The fan assembly includes the three fans, a base plate to which the fans are attached, wiring, and an AMP connector that plugs into a cable that connects to the backplane. The assembly is easily installed and removed. You must replace the entire assembly if a fan fails. If a fan fails the following events will take place:

- An alarm through the power supply is detected as a power alarm.
- The remaining fans go into high speed.
- The red LED on the 650A Global Power supply faceplate lights up.

See the following figure for an example of the G600 Media Gateway.

**Figure 50: G600 Media Gateway**



## Required circuit packs for a G600 Media Gateway and an S8700/S8710 Media Server

When the G600 Media Gateway is connected to an S8500 Media Server or an S8700/S8710 Media Server, the following circuit packs are required:

### IP Server Interface (TN2312BP)

The IP Server Interface (IPSI) provides transport of control messages over IP allowing the media server to communicate with the PNs. The IPSI is required to provide control network signaling over the customer's LAN and WAN. Tone generation, tone detection, global call classification, as well as stratum 4 type clock generation are provided on the IPSI board.

### C-LAN (TN799DP)

The C-LAN circuit pack, TN799DP provides call control for every IP endpoints that is connected to the media server in an IP Connect configuration. A maximum number of 64 C-LANs per configuration is supported. The number of C-LANs that are required depends on the number of devices that are connected and the options that the endpoint is using. It might be advantageous to segregate IP voice control traffic from device control traffic as a safety measure.

## Media gateways

To determine the default value for C-LAN socket usage of H.323 tie trunks, you must divide the total number of H.323 Tie Trunk that use sharing by 31. Each IP endpoint requires the use of some number of C-LAN sockets, which is the software object that is used to connect a TN799 board to the IP network. The TN799DP circuit pack supports up to 500 sockets.

The C-LAN differs from an IP Media Processor in that the C-LAN controls the call and the processor provides the codecs used for the audio on the call.

To take advantage of downloadable firmware capability there must be at least one TN799DP C-LAN and access to the public Internet for firmware downloads to other downloadable circuit packs. Downloads and instructions are posted to:

<http://www.avaya.com/support/>

Click on Online Services > Download Software Needed.

## IP Media Processor (TN2302AP)

The media server in an IP Connect configuration requires resources on a IP Media Processor (TN2302AP) circuit pack for bearer communications within the same PN. The TN2302AP is also used for bearer communications with IP endpoints on both systems. The TN2302AP includes a 10/100 BaseT Ethernet interface to support H.323 endpoints for IP trunks and H.323 end-points. The TN2302AP can perform echo cancellation, silence suppression, dual-tone multi-frequency (DTMF) detection, and conferencing.

The TN2302AP, beginning with vintage 32, supports the following conversion resources for codec for voice, conversion between codecs, and FAX detection:

- G.711 (A- or  $\mu$ -law, 64 kbps)
- G.723.1 (6.3 kbps or 5.3 kbps audio)
- G.729A (8 kbps audio)
- G.729, G.729B, G.729AB

---

## Required circuit packs for a G600 Media Gateway and an S8100 Media Server

When the G600 Media Gateway is connected to the S8100 Media Server the following circuit packs are required:

## TN2314 Processor (S8100)

The S8100 Media Server supports voice stations with co-resident voice switching, voice and FAX messaging and system applications run on a Microsoft Windows 2000 operating system. The communication between the firmware and the software is done by an Ethernet connection. An Intel processor Message Link (IML) is the Ethernet control link between the Pentium processor and the MPC860 processor. The link allows for the message based communication between the two processors.

The S8100 Media Server has the following characteristics:

- Processor – The processor is a 500-MHz Pentium III.
- RAM – There are two slots for SDRAM memory modules, with a minimum of 256-MB of RAM and a maximum of 512-MB of RAM.
- Front panel ethernet access – Services can access the switch via an RJ45 Ethernet jack on the circuit pack faceplate.
- Hard disk – The circuit pack has a 20-GB hard disk.

## TN744E Call Classifier and Tone Detector

The TN744 call classifier and tone detector circuit pack has eight ports of tone detection on the **TDM** bus. The TN744 circuit pack does not support call progress tone generation or clocking. The tone detectors are used in vector prompting, outgoing call management (**OCM**), and call prompting applications in the United States and Canada and call classifier options for various countries. The TN744 detects special intercept tones used in network intercept tone detection in OCM. The TN744 circuit pack also detects tones when a **CO** answers a call.

The TN744 circuit pack provides tone generation and detection for R2-MFC **DID** signaling that is used in non-United States installations. The TN744 circuit pack also allows gain or loss to be applied to pulse code modulation (PCM) signals that are received from the bus and supports A-Law and  $\mu$ -Law companding. The TN744 circuit pack detects 2025-Hz, 2100-Hz, or 2225-Hz modem answerback tones and provides normal broadband and wide broadband dial tone detection.

The TN744 circuit pack supports digital signal processing of **PCM** signals on each port to detect, recognize, and classify tones and other signals. Generation of signaling tones is also supported for applications such as R2-MFC, Spain MF, and Russia MF. Gain or loss and conferencing can be applied to **PCM** signals received from the **TDM** bus. Additional support includes **DTMF** detectors to collect address digits during dialing, and A-Law and  $\mu$ -Law companding.

In normal operation, a port on the TN744 circuit pack can serve as an incoming register for Russia MFR (multi-frequency shuttle register signaling). Use the TN744 with the TN429C analog line central office trunk for CAMA/E911.

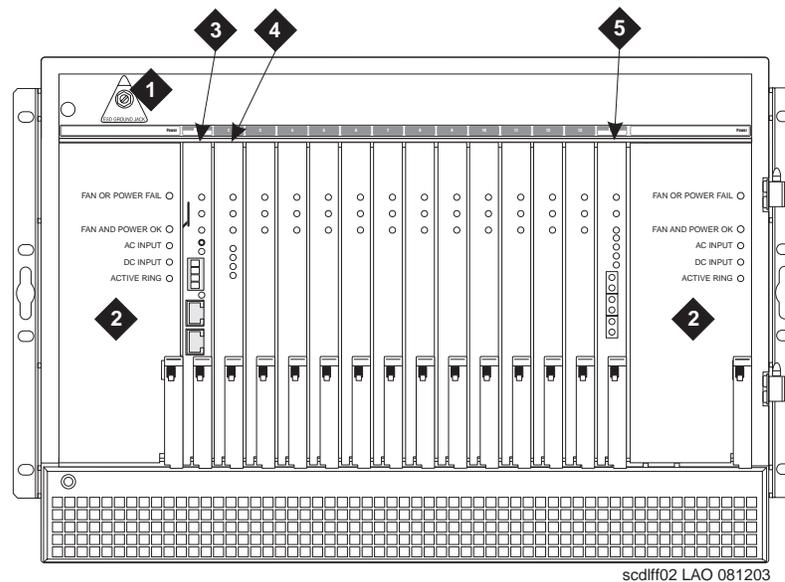
# Avaya G650 Media Gateway

## Overview

The Avaya G650 Media Gateway, is a fourteen slot, rack mounted carrier configured for TN format circuit packs. The G650 is 8U high (14 inches (35.6 centimeters)) and mounts in standard 19 inch (48.3 centimeters) data racks. The G650 can use one or two 655A power supplies that can have both AC and DC input power present. Either power supply can provide all the power needed by the G650.

See [Figure 51](#) for an example of the G650 Media Gateway.

**Figure 51: G650 Media Gateway**



**Figure notes:**

Number	Description
1.	EDS ground jack
2.	655A power supply
3.	TN2312BP IP server interface (IPSI)
4.	TN799DP CLAN
5.	TN2302 IP media processor

---

## Mounting G650s

The G650 can be rack mounted or, in single G650 configurations, table or floor mounted. Multiple G650s (up to five) can be mounted in a rack and connected by TDM cables to create a G650 stack.

The G650 is mounted in industry standard EIA-310 19 inch open racks. The G650 provides options for front or mid mounting. Although the G650 can be mounted in a 19 inch (48.3 centimeters) four-post data rack it does not mount simultaneously to all four posts. When mounted in a four-post rack, the G650 uses the front mounting position.

### Mounting a single G650

A single G650, equipped with feet, can be table or floor mounted. Side-by-side G650s, connected by TDM cables, are not supported. In a single configuration, the G650 always has an A carrier address.

### Mounting multiple G650s

Multiple G650s (up to five) can be mounted in a rack and connected by TDM cables to create a G650 stack. Multiple G650s must be vertically adjacent and their front panels must align in the same vertical plane. For example, carrier A is always below carrier B, which is always below carrier C, and so on through carrier E. Note that existing TDM cables used for the G600 cabinets are not compatible with the G650.

Multiple G650s (up to five) can be mounted in a rack but **not** connected by TDM cables. In this case each G650 is defined as a media gateway (a cabinet or port network) and each requires its own interface hardware (EI, ATM-EI, TN2312BP IPSI). Note that with this configuration, all of the G650s have a carrier address of A.

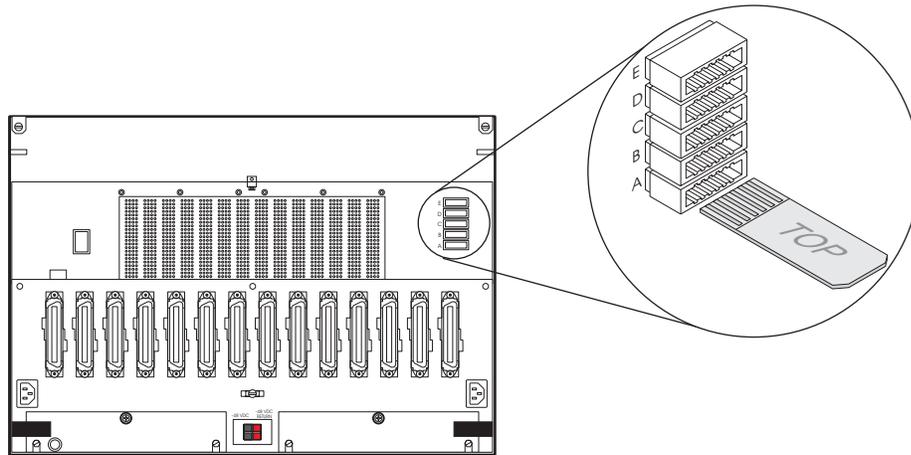
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## Carrier addressing

The carrier position (A through E) must be set on all G650s. The carrier address is set using a small printed circuit card that is plugged into one of five (A through E) connectors inside the carrier.

See [Figure 52: Printed circuit card](#) on page 162 for an example and location of the printed circuit card.

**Figure 52: Printed circuit card**



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When five G650s in a rack are connected together with TDM cables, the G650 in the bottom position in the rack has a carrier address of A, and the G650 in the top position in the rack has a carrier address of E. When the five G650s in a rack are not connected together with TDM cables, each G650 has a carrier address of A.

Multiple G650s can be rack mounted with some connected by TDM cables, and others not connected by TDM cables. For example, a customer can request that the G650 in the bottom of the rack not be connected to another G650. The carrier address of the G650 in the bottom of the rack is A. The customer can request that the next two G650s in the rack be connected together by a TDM cable. The carrier address of the lower of these two G650s is A, and the address of the upper G650 is B. And the customer can request that two additional G650s be placed in the rack and be connected by a TDM cable. The carrier address of the lower of these two G650s is A and the address of the upper G650 is B. In this example, the rack has one G650 with an A carrier address, and two G650 stacks with both an A and B carrier address.

The carrier address of an individual rack mounted, table mounted, or floor mounted G650 is A.

See [Figure 53: G650 stack](#) on page 163 for an example of a G650 stack.

Figure 53: G650 stack

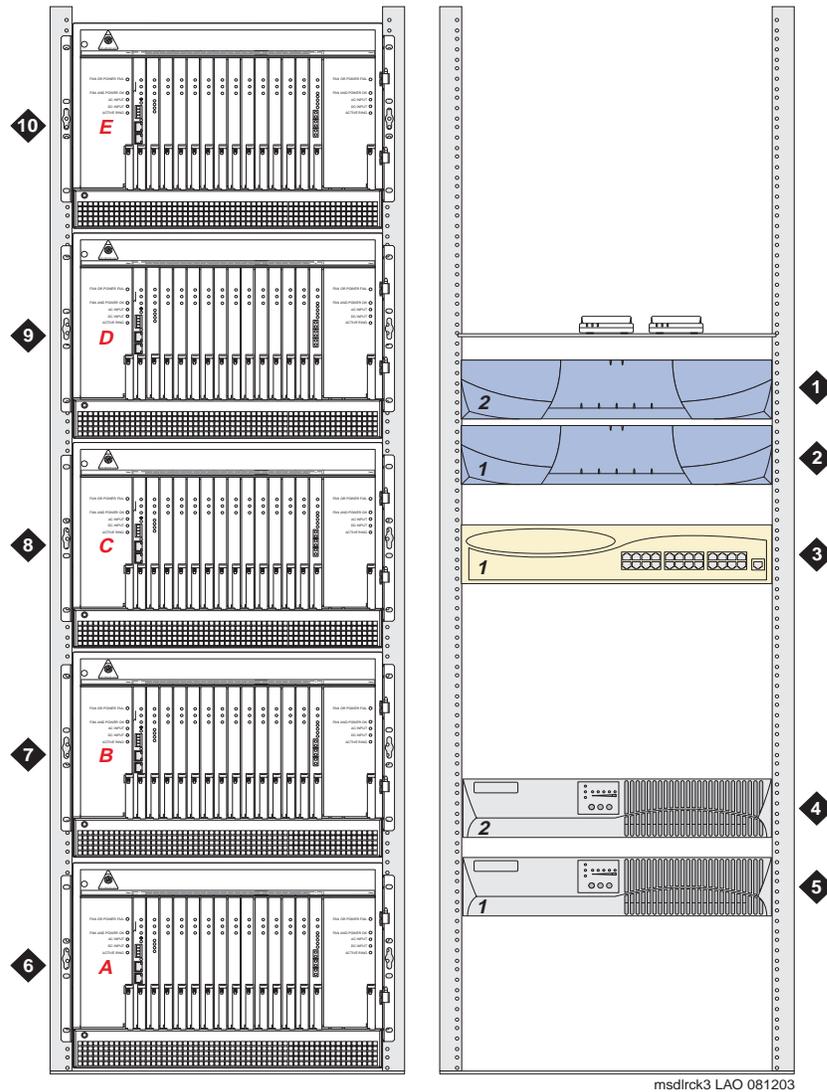


Figure notes:

Number	Description
1 & 2	S8700/S8710 Media Servers
3	Ethernet switch
4 & 5	UPS units: one for each server
6	G650 Media Gateway: Carrier position "A"
7	G650 Media Gateway: Carrier position "B"
8	G650 Media Gateway: Carrier position "C"
9	G650 Media Gateway: Carrier position "D"
10	G650 Media Gateway: Carrier position "E"

### I/O connections

The fourteen slots of the G650 are equipped with twisted pair cables from the backplane to the 25-pair type D, metal shelled I/O connector panel mounted on the rear of the carrier. The power supply slots (0 and 15) do not provide external I/O connections.

### I/O adapters

You can use any existing adapter for input and output if the associated TN circuit pack is supported in the G650.

---

### Fan assembly

The three-fan unit can operate at two different speeds:

- Mid speed for normal cooling
- High speed when a temperature threshold is exceeded or a fan failure is detected

---

### 655A power supply

The G650 can use one or two 655A power supplies that can have both AC and DC input power present. Either power supply can provide all the power needed by the G650. When there are two power supplies, they share the power load. One power supply can operate on AC power and the other on DC power, although if AC power is available, the system always uses AC power. The 655A power supply is:

- The only power supply supported in the G650
- Not backward compatible to other carrier types

If you use only one 655A power supply, place it in slot 0. If you are using two power supplies, place them in slots 0 and 15.

**Note:**

You can insert or remove a **redundant** power supply and not affect the G650 if the other 655A power supply is operating.

## Input power

The 655A power supply is capable of operating on either AC or DC input power, although AC power is always used if it is available. One power supply can operate on AC power, and the other on DC power. The power supplies use AC power first and switch to DC power if AC power fails or is not present.

### AC power

Commercial AC is the primary input power source. Both slot 0 and slot 15 have dedicated AC input. The 655A power supply can operate on AC input of 90 to 264 VAC at 47 to 63 Hz. The nominal ranges for AC power are:

- 100 to 120 VAC at 50 or 60 Hz
- 200 to 240 VAC at 50 or 60 Hz

### DC power

Minus 48VDC power can be supplied simultaneously as backup power. One -48VDC power input point is provided on the G650 backplane and is distributed through the backplane to each power supply.

### Required input current

The following tables show the worst case current levels for a fully-loaded G650 Media Gateway. Each empty slot reduces the required input current by 1/4 A.

Input Volts AC	Required Amps AC
90	7.2
100	6.4
120	5.4
230	2.8
255	2.5

Input Volts DC	Required Amps DC
40	16.7
42	15.9
48	13.9
54	12.4
60	11.1

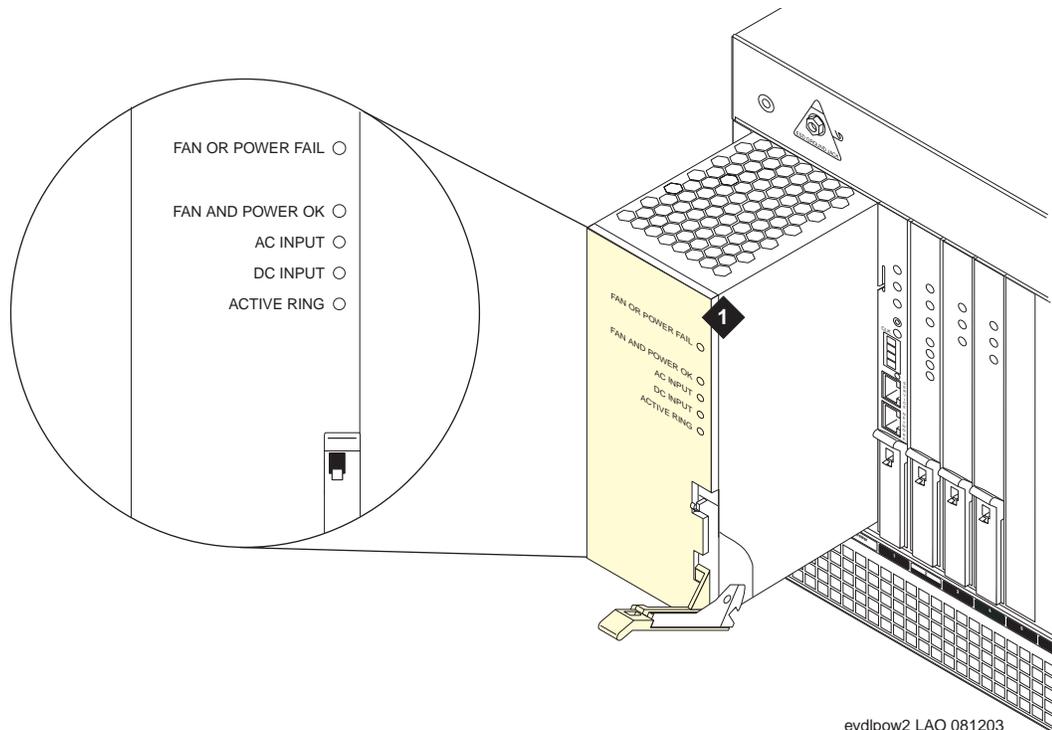
## 655A faceplate LEDs

The five LEDs on the faceplate of the 655A power supply are in a vertical line with the red LED on top. These five LEDs provide the following status:

- Red - This LED:
  - Lights when there is a failure in either the power supply or the fans. (For a G650 with redundant power supplies, a failure in the fan assembly results in this LED being lit on **both** power supplies.)
  - Flashes off once per second when the software shuts down the ring voltage output of a power supply
- Yellow - This LED:
  - Lights when the status of the power supply and fans is OK
  - Flashes once per second when the software shuts down a single power supply, in a carrier with operational redundant power supplies
- Green - Lights when there is AC power applied to the power supply
- Green - Lights when there is DC power applied to the power supply
- Green - Lights when the power supply is supplying ringing to the G650

See [Figure 54: 655A faceplate LEDs](#) on page 166 for an example of 655A faceplate LEDs

**Figure 54: 655A faceplate LEDs**



## 655A ring generation

The 655A provides either North American ringing (20Hz) or European/International (25Hz) ringing. It also has a setting to provide no ringing when the customer supplies a ring generator that is external to the power supply. A TN2202 (French ringing circuit pack) is an example of an external ring generator.

The 655A power supply provides a physical slide switch to select the frequency of the ring generator. The options are:

- 20Hz — North American
- 25Hz — European and international
- Other — No ringing output when an external ring generator is used such as the TN2202 French ringing circuit pack.

You must remove the power supply from the G650 when you change the ringing frequency selection. **The ringing frequency selection switch is on the back of the power supply.**

Only one 655A supplies ringing to the G650. The power supply in slot 0 in the G650 with an A carrier address is the default for ringing. The system uses this default 655A unless it has failed or the software has commanded it to shut down. When a G650 carrier has redundant power supplies, one supply automatically supplies ringing if the other power supply fails.

A 655A provides ringing to only one G650 carrier. For example, the 655A power supplies in carrier A supply ringing to carrier A only, and the power supplies in carrier D supply ringing to carrier D only. If the ring generation in both of a carrier's power supplies fail, no other power supply provides ringing for the carrier.

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## Avaya G700 Media Gateway

The G700 Media Gateway is designed to be scalable and offer options. It is functional on its own or with other G700 Media Gateways. The G700 is also functional in a stack that is mixed with selected Avaya P330 and Avaya C360 devices.

**Note:**

There may be stacking restrictions associated with the P330- and C360-series switches. For more information, see *C360 Installation and Configuration Guide*, 10-300125, or the appropriate user guide for the P330 switch.

A maximum of 50 G700 Media Gateways can be supported using the S8300 Media Server. A maximum of 250 G700 Media Gateways can be supported using the S8700/S8710 Media Server or the S8500 Media Server.

To power IP telephones without additional cables, stack the G700 Media Gateways with the Avaya P333T-PWR, C363T-PWR, or C364T-PWR.

The following list describes the basic architecture of the G700 Media Gateway:

- Intel i960 controller that hosts all of the base switch-control and management software.
- Fits in an EIA-310-D standard 19-inch rack.
- Supports 15 ports of tone detection.
- Contains four media-module slots.
- One P330 expansion-module slot.
- One slot for the Octaplane stacking fabric.
- Can sit on a desktop or be rack-mounted.
- Contains an internal motherboard. For more information, see [Motherboard](#).
- Standard based 10/100 Ethernet Interface connection types. A wall field or breakout panel is not required.
- Internal AC/DC power supply that provides low-voltage DC power to the fans, motherboard, and media modules.
- Four internal fans that provide cooling for the internal components.
- A LED board that indicates system-level status.
- A serial port for command-line access.
- Eight-port layer-2 switch or two 10/100BaseT external ports.

**Note:**

An expansion module can be ordered for additional 10/100T, 100FX, ATM, or Gigabit Ethernet ports.

- A VoIP engine that supports up to 64 G.711 single-channel calls. In addition to voice calls, it supports transport of the following:
  - Teletypewriter device (TTY) tone relay over the Internet
  - Faxes over a corporate IP intranet

**Note:**

The path between endpoints for fax transmissions must use Avaya telecommunications and networking equipment.

**▲ SECURITY ALERT:**

Faxes sent to non-Avaya endpoints cannot be encrypted.

- T.38 Fax over the Internet (including endpoints connected to non-Avaya systems)
- Modem tones over a corporate IP intranet

**Note:**

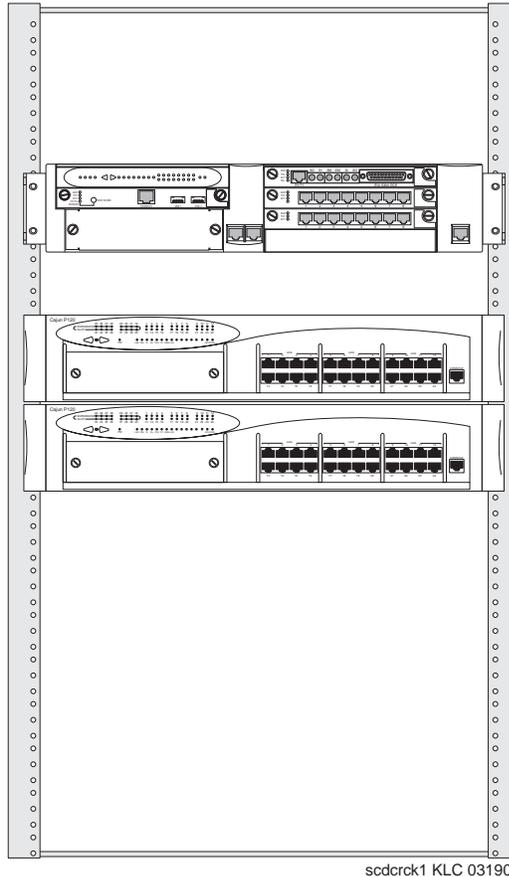
The path between endpoints for modem tone transmissions must use Avaya telecommunications and networking equipment.

See [MM760 VoIP media module](#) on page 259 or the *Administrator's Guide for Avaya Communication Manager*, 555-233-506, for more information.

The G700 Media Gateway has a physical design that is similar to the Avaya stackable switching products. The following figure shows the G700 Media Gateway with two Avaya P330 switches. The G700 is shown at the top of the stack.

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**Figure 55: G700 Media Gateway with two Avaya P330 switches**



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## Expansion modules

The G700 Media Gateway is architecturally based on the Avaya P330 switches. Therefore, customers can use selected P330 expansion modules with the G700 Media Gateway. The P330 local-area network (LAN) and wide-area network (WAN) expansion modules connect directly to the G700 Media Gateway without requiring additional hardware. Two types of expansion modules are available from Avaya:

- X330 WAN Access routing modules
- P330 LAN expansion modules

## X330 WAN Access routing module

Customers with multiple branch offices need network solutions that are simple flexible and scalable. The Avaya X330 WAN Access routing module allows customers to deploy a unified, high-performance LAN/WAN infrastructure in one data stack.

Highlights of the Avaya X330 WAN Access Router

- Provides integrated WAN access that can be used with external firewalls or VPN Gateways
- Works with the following WAN and routing protocols
  - Point-to-Point (PPP) over channeled E1/T1
  - Frame Relay
  - Routing Information Protocol (RIP) v1/v2
  - Single-Area Open Shortest Path First (OSPF)
  - VRRP Redundancy
  - Throughput: wire-speed WAN routing

## Avaya P330 LAN expansion modules

Highlights of the Avaya P330 LAN expansion modules

- Maximum flexibility to the data stack
- Standard auto-negotiation
- Link Aggregation Group (LAG)
- LAG redundancy
- Link redundancy
- Congestion control
- 802.1Q/p VLAN and priority

 **CAUTION:**

Avaya expansion modules and Octaplane stacking modules are not hot-swappable. The system must be turned off to before you remove or insert an expansion module.

## C360 Converged Stackable Switches

For information about C360 converged stackable switches, see [Avaya C360 Ethernet Switches](#) on page 362.

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## Octaplane stacking fabric

"Octaplane" is a name for an Avaya hardware capability to bundle stackable components using 4-Gbps communication in each direction. This technology combines separate units into a larger logical switch using different lengths of cables that are connected to the expansion slots in the rear of the units. These cables are wired in a ring configuration, providing redundancy to the stack. In the event that a single unit should fail, the stack integrity is maintained. You can remove, or replace, any single unit without disrupting operation or performing stack-level reconfiguration.

**Table 8: Octaplane cabling**

Cable	Description and function	Length	Length (metric)
X330SC Short Octaplane cable (30 cm)	Short Octaplane cable – light-colored, used to connect adjacent switches or switches separated by one backup universal power supply (BUPS) unit.	12 inches	30 cm
X330LC Long Octaplane cable (2 m)	Long Octaplane cable – light-colored, used to connect switches from two different physical stacks	6 feet	2 m
X330RC Redundant Octaplane cable (2 m)	Redundant cable – black, used to connect the top and bottom switches of a stack.	6 feet	2 m
X330L-LC Extra Long Octaplane cable (8 m)	Extra-long Octaplane cable – light-colored, used to connect switches from two different physical stacks	24 feet	8 m
X330L-RC Long redundant Octaplane cable (8 m)	Long redundant cable – black, used to connect the top and bottom switches of a stack.	24 feet	8 m

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## Power supply

The G700 Media Gateway uses an AC/DC power supply. A power supply located in the G700 Media Gateway converts AC or DC input power to voltages needed by the system.

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## Motherboard

The motherboard resides within the G700 Media Gateway. This board controls the following:

- The VoIP Engine which performs IP/UDP/RTP processing, echo cancellation, G.711 A-/ $\mu$ -law, G.729 and G723.1 encode/decode, FAX relay, silence suppression, jitter buffer management, and packet-loss concealment. The VoIP Engine supports 64 channels. If more than 64 channels are needed, a VoIP Media Module is required.
- The Gateway Processor complex, which controls all the resources inside the Gateway. The Gateway Processor functions include the Media Module Manager, Tone-Clock, and H.248 signaling to the Gateway Controller.
- An Avaya P330 processor complex is based on the on the Avaya P330 switch architecture. This complex provides an 8-port layer-2 switch function and manages the Expansion and Cascade modules.
- Provides the electrical and physical connectivity for the four media-module slots.

**Note:**

The motherboard cannot be replaced in the field.

For more information about the VoIP Media Module, see [MM760 VoIP media module](#) on page 259.

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## Fans

The G700 Media Gateway contains four 12-volt fans. These fans are monitored and can be reported by SNMP to a management station.

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## LEDs

The S8300 Media Server with the G700 Media Gateway uses two types of LEDs:

- Media module
- System-level

### Media module LEDs

Media-module LEDs have the following characteristics:

- Each media module has at least three LEDs to indicate module and port status or maintenance and administration modes.
- The location, spacing, and labeling is fixed for all LEDs on every media module.
- The LEDs are mounted on the media module's printed wiring board, and placed so that they show through an opening.

### System-level LEDs

An LED board visually indicates both system and Ethernet-port status by allowing customers to change between these status-indication modes. The LEDs reside in the board's oblong fascia panel. In turn, the LED board resides in the upper-left front of each G700 Media Gateway.

You must remove the LED board when you install or remove either the active or standby S8300 Media Server. The two components must be installed or removed as a unit.

**Note:**

The LED panel is not the same size as a standard media module. You cannot insert a media module into the LED board's slot, or vice versa.

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## Gateway software

Gateway software is responsible for:

- Individual media-gateway operations
- Terminating H.248 on the G700 Media Gateway
- Interacting with maintenance operations.

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## Maintenance software

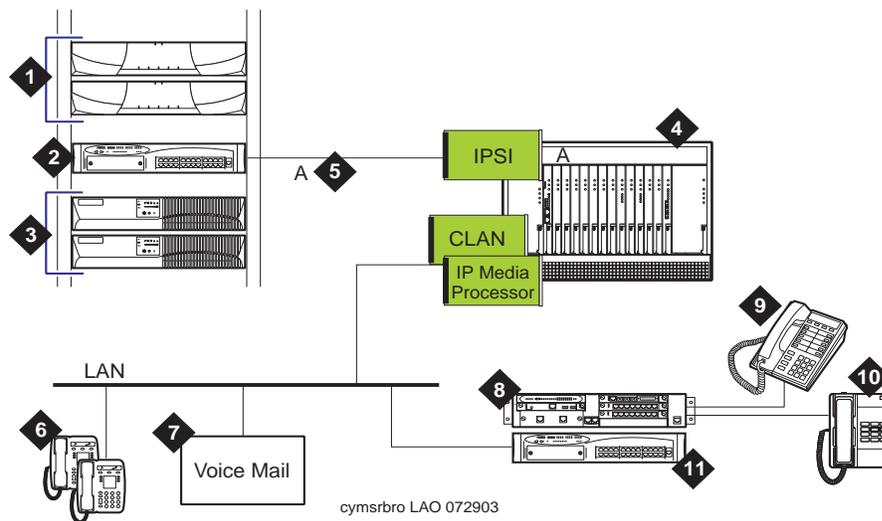
An Avaya media server with a G700 Media Gateway has a dual maintenance strategy. Maintenance software runs on both the G700 Media Gateway's and the media server's platform for each platform's subsystems.

The G700 media gateway's maintenance software performs its own initialization and motherboard maintenance, along with internal environmental monitoring. Whereas, after the G700 Media Gateway registers with the media server, the server's maintenance software tests and initializes the gateway's media modules. Although the media gateway's maintenance software is aware of its own media modules, these modules and their associated ports are controlled by the media server. Error logs are also maintained on the media server.

## Connectivity

The G700 Media Gateway connects through a LAN to a TN799DP C-LAN circuit board mounted in a media gateway. The following figure is an example of G700 Media Gateway connectivity.

**Figure 56: The G700 Media Gateway connecting to the S8700/S8710 Media Server**



### Figure notes:

Number	Description
1.	Two S8700/S8710 Media Servers
2.	Ethernet switch – Must be Avaya-provided
3.	Two UPS units – One for each server
4.	G650 Media Gateway
5.	Dedicated LAN connectivity to the media gateway's IPSI board
6.	IP phones off the customer's LAN
7.	Voice Mail – INTUITY™ AUDIX® is shown connected via IP.
8.	A G700 Media Gateway is connected via the LAN to the C-LAN board located in a G650 Media Gateway. The S8300 Media Server in an LSP configuration is located in the G700 Media Gateway. In the event of a loss in communication between the S8700/S8710 and the G700, the LSP will provide a backup for its registered endpoints.
9.	DCP Phones – Avaya multifunction digital phones
10.	Analog connectivity – Including analog telephones, lines, and trunks
11.	Ethernet switch (optional)

### Media modules

Avaya media modules convert the voice path of the traditional circuits (such as analog trunk, T1/E1, and DCP) to a TDM bus. The VOIP engine then converts the voice path from the TDM bus to packetized VoIP (compressed or uncompressed) on an Ethernet connection.

The media modules reside in the G700 Media Gateway and interact with the motherboard and backplane.

There are eight media modules:

- MM710 T1/E1 ISDN PRI – For information, see [MM710 T1/E1 media module](#) on page 250.
- MM711 Analog – For information, see [MM711 Analog media module](#) on page 253.
- MM712 DCP – For information, see [MM712 DCP media module](#) on page 255.
- MM714 Analog – For information, see [MM714 Analog media module](#) on page 256.
- MM717 DCP – For information, see [MM712 DCP media module](#) on page 255.
- MM720 BRI – For information, see [MM710 T1/E1 media module](#) on page 250.
- MM722 BRI – For information, see [MM714 Analog media module](#) on page 256.
- MM760 VoIP – For information, see [MM760 VoIP media module](#) on page 259.

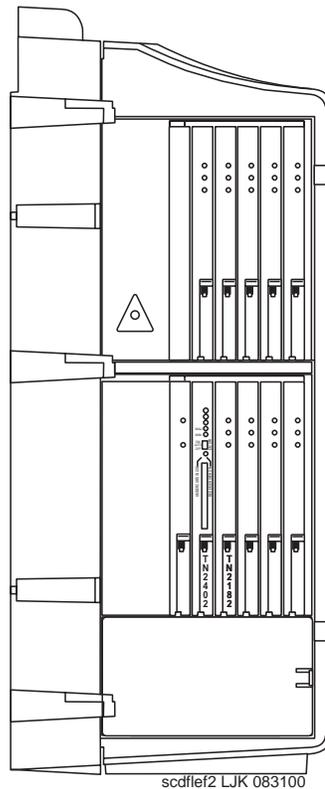
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## CMC1 Media Gateway

The CMC1 Media Gateway supports the DEFINITY® Server CSI and Avaya S8700/S8710, and S8500 Media Servers. It can be mounted on a wall or on the floor, and uses an AC-only power supply. The control carrier contains two control slots, one for the processor and the other for the tone clock. Slots 3 to 10 can contain optional port circuit packs and service circuit packs. See the following figure for an example of the CMC1 Media Gateway.

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**Figure 57: CMC1 Media Gateway, left side**

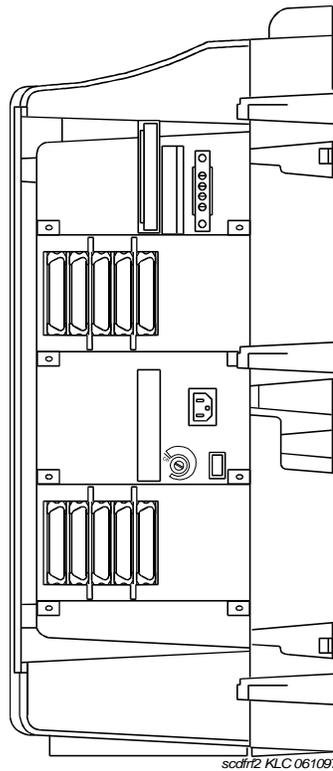


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The following figure shows the connections on the right side of the cabinet. From 1 to 10 25-pair connectors provide an interface between port circuit packs and the cross-connect field or a cable access panel.

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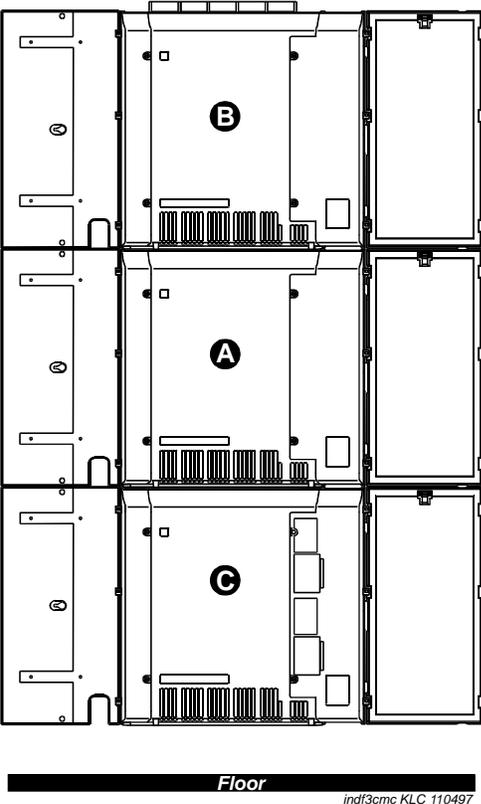
**Figure 58: CMC1 Media Gateway, right side**



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A DEFINITY Server CSI can support up to three CMC1 Media Gateways. In the CMC1 Media Gateway that contains the server and Tone-Clock circuit packs, some slots are unavailable for port and service circuit packs. Whereas, in every other connected CMC1 Media Gateway, every slot is available for a port or service circuit pack.

Figure 59: Typical vertical installation, front view of the CMC1 Media Gateway



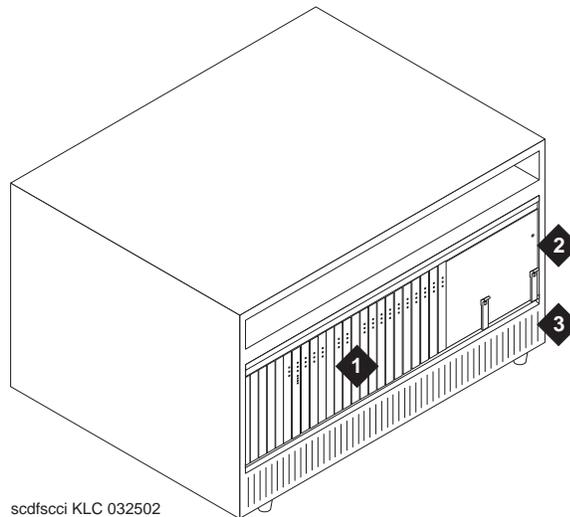
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## SCC1 Media Gateway

This section describes the SCC1 Media Gateway. Each SCC1 Media Gateway has vertical slots that hold circuit packs. A blank faceplate covers each unused slot. The following figure shows a typical SCC1 Media Gateway.

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**Figure 60: Typical SCC1 Media Gateway**



scdfsccl KLC 032502

**Figure notes:**

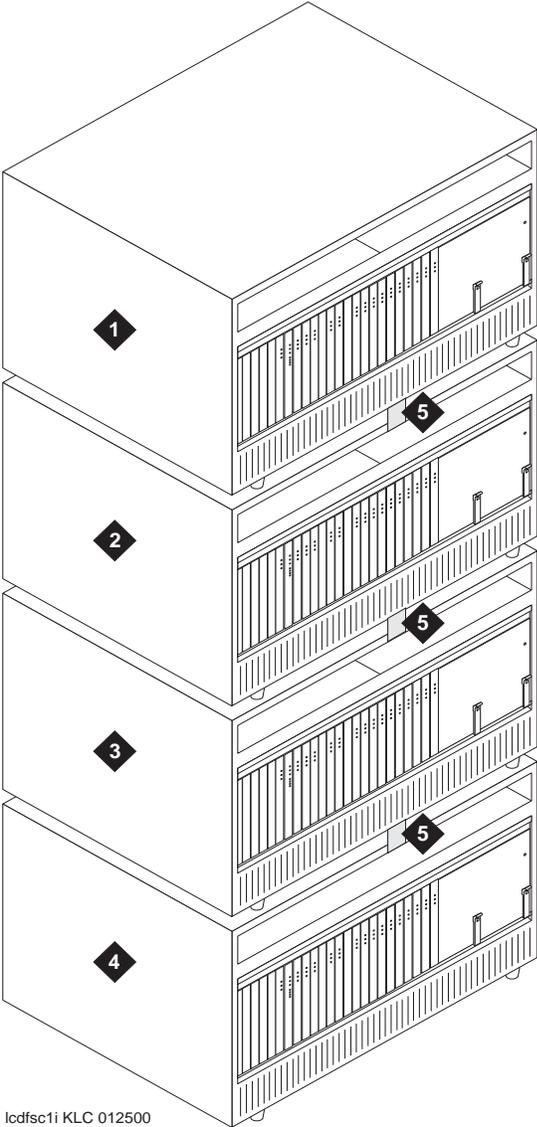
Number	Description
1.	Circuit packs
2.	Power converter
3.	Air circulation vents

---

A maximum of four SCC1 Media Gateways can be stacked on top of each other. The cabinet positions are labeled A through D. The position of the basic control cabinet or expansion control cabinet is always labeled A. Additional port-cabinet positions are labeled B, C, and D, sequentially.

The duplicated control cabinet used for the DEFINITY servers is labeled B. See the following figure for an example of a stack of SCC1 Media Gateways.

Figure 61: Typical SCC1 stack



lcdfsc1i KLC 012500

Figure notes:

Number	Description
1.	Port cabinet in the D position
2.	Port cabinet in the C position
3.	Port cabinet or duplicated control cabinet in the B position
4.	Basic control cabinet or expansion control cabinet
5.	Cabinet clips

## Media gateways

For DEFINITY Servers:

- Each stack of SCC1 Media Gateways requires one basic or expansion control cabinet at the bottom of the stack.
- A maximum number of three SCC1 Media Gateway stacks or port networks:

Cabinet clips connect the cabinets together. At the rear of the cabinets, a ground plate connects between cabinets for ground integrity.

For Avaya Media Servers:

- S8500 - SCC1 Media Gateways are supported for migrations only
  - Maximum number of SCC1 stacks or PNs is 64.
- S8700/S8710 - SCC1 Media Servers are supported in a multi-connect configuration only
  - Maximum number of SCC1 stacks or PNs is 64.

**Table 9: Cabinet circuit-pack slots**

Type	Description	Server
Port	A port slot is colored purple or labeled with a gray rectangle. A port slot can accept any purple or gray-labeled circuit pack	DEFINITY Server SI, S8700/S8710 Media Server, and S8500 Media Server
Control	A control slot is colored white or labeled with a outlined white rectangle. A port slot can accept any purple or gray-labeled circuit pack.	DEFINITY Server SI
Service	A service slot is colored purple or labeled with a gray rectangle. A service slot accepts a special type of circuit pack that does not have an I/O connector	DEFINITY Server SI, S8700/S8710 Media Server, and S8500 Media Server

The purple- and white-colored circuit packs and slots have been replaced by circuit packs and slots that are labeled with gray and white rectangles, respectively. A label with a solid gray rectangle indicates a slot for a port circuit pack. A label with an outlined white rectangle indicates a slot for a control circuit pack.

Each port slot in a port carrier, an expansion control carrier, or a control carrier attaches to a 25-pair connector on the carrier's rear panel. A cable attaches to each connector and routes to the cross-connect field.



## Media gateways

The following table describes the connectors in the basic control carrier.

Connector	Function
1 to 16 (A1 to A16)	25-pair connectors that provide interfaces between connect port circuit packs and the cross-connect field or a fiber transceiver
AUX (auxiliary)	Provides interfaces for customer alarms, attendant console power, emergency power-transfer panels, and an internal modem that is used for remote maintenance.
PI (processor interface)	Provides a BX.25 protocol interface for communication between the circuit pack and external DCE equipment. This connection is only used with the standard-reliability option.
DCE	Connects the processor to CDR equipment, a system printer, or an external modem that is used for remote maintenance. This connector can be used with any reliability option.
TERMINAL	Connects an administration terminal to the processor circuit pack in standard-reliability systems. The terminal connector always connects to the processor in the carrier of the terminal.
DOT (duplication option terminal)	Used in a high- or critical-reliability configuration to connect an administration terminal to the active processor via the duplication interface slot. The DOT connector can be used to connect to the processor in another carrier.

## Duplicated control cabinet for a DEFINITY Server SI

The optional duplicated control cabinet only resides in the PN for the DEFINITY Servers. A duplicated control cabinet contains ports and a duplicated control complex.

A duplicated control cabinet has dedicated white-colored circuit-pack slots for designated control circuit packs. A port circuit-pack slot can contain any port circuit pack.

An AC or DC power supply resides in the right side of the cabinet. The cabinet contains a duplication interface circuit pack in slot DUPN INTFC. The following figure shows an example of a duplicated control cabinet.



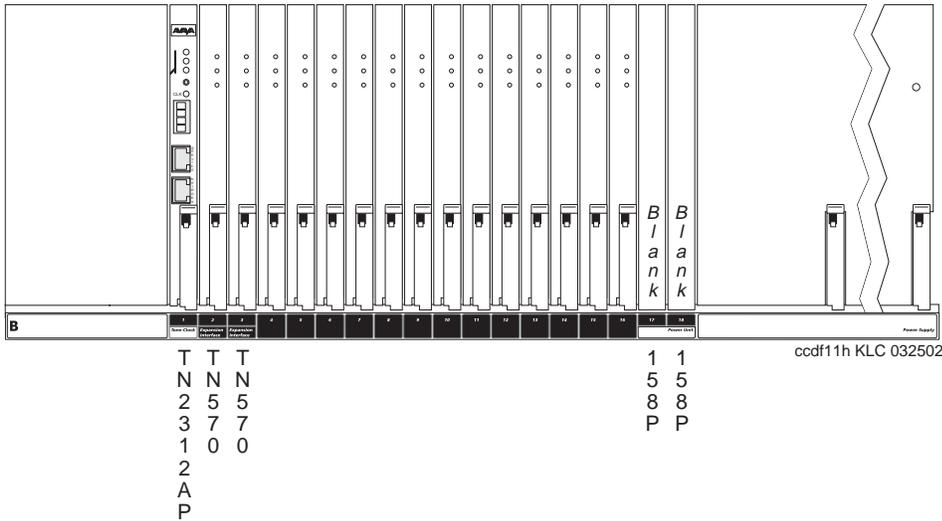


**Port cabinet for a DEFINITY Server SI,  
S8700 Media Server, S8710 Media Server, or S8500 Media Server**

Port cabinets reside in the PN and in expansion PNs. A port cabinet contains ports and an interface to an expansion control cabinet. A port cabinet has optional port circuit packs in port slots 1 to 18. In a critical-reliability system, these can include a Tone-Clock circuit pack in slot 1 and an expansion interface circuit packs in slots 2 and 3. A neon power unit can be installed in slots 17 and 18.

An AC or DC power supply resides in the right side of each cabinet. The following figure shows an example of a port cabinet.

**Figure 65: Port cabinet**



The following table describes the connectors to the port cabinet.

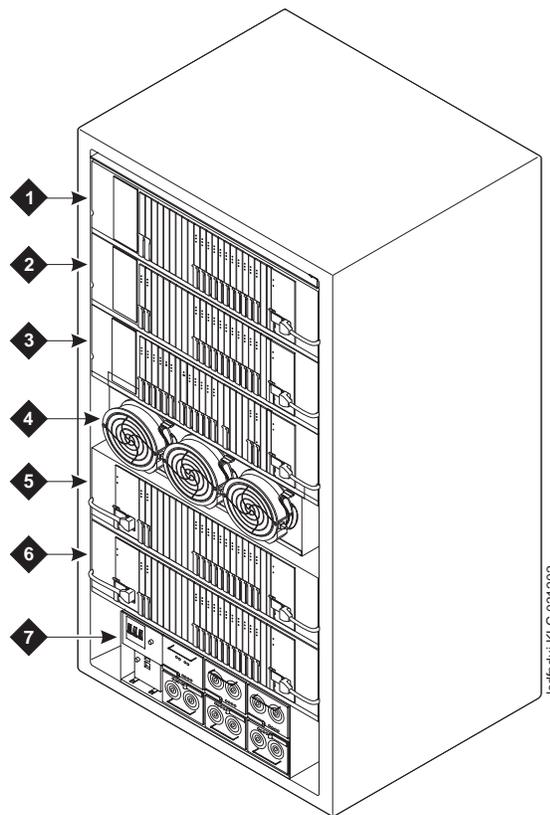
Connector	Function
2 to 3 (B2 to B3)	An Expansion Interface port that provides an interface for a fiber-optic cable that runs either to an Expansion Interface circuit pack in another PN or a Switch Node Interface circuit pack in a center-stage switch. For an ATM configuration, these slots contain an ATM interface circuit pack, and a fiber-optic cable connects to an ATM data switch.
1 to 18 (B1 to B18)	25-pair connectors that provide interfaces between the port circuit packs and the cross-connect field or a fiber transceiver.

## MCC1 Media Gateway

An MCC1 Media Gateway can be used as a port network (PN) cabinet. Doors in front of and behind the MCC1 Media Gateway protect the internal equipment and allow easy access to the circuit packs. Each MCC1 Media Gateway contains casters. Leveling feet keep the cabinet from rolling. Each lower corner of a MCC1 Media Gateway can bolt to the floor, if required.

See [Figure 66: Typical MCC1 Media Gateway layout](#) on page 188 for an example of the MCC1 Media Gateway layout.

**Figure 66: Typical MCC1 Media Gateway layout**



**Figure notes:**

Number	Description	Number	Description
1.	Carrier in position C	5.	Carrier in position D
2.	Carrier in position B	6.	Carrier in position E
3.	Carrier in position A	7.	Power-distribution unit
4.	Fan unit		

---

## Auxiliary cabinet

The auxiliary cabinet contains the hardware to install optional equipment. The cabinet allows carrier, rack (width: 23 in.; 58.4 cm), and panel types of mounting. An auxiliary cabinet contains the following:

- A fuse panel (J58889AB) that distributes -48 VDC to fused cabinet circuits
- An AC power receptacle strip that provides switched and unswitched 120-VAC receptacles
- A DC connector block for cabinets powered by either an external DC source or by an AC-to-DC converter that:
  - Accepts AC power from a switched outlet of an AC power strip
  - Sends converted DC power onto the required DC connector block

---

## Port network cabinet for DEFINITY Server SI

A port network cabinet for a DEFINITY Server SI contains the following components:

- One to four port carriers (J58890BB)
- One control carrier (J58890AH)
- One duplicated control carrier (J58890AJ) in a high- or critical-reliability configuration

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## Port network cabinet for Avaya S8700 Media Server or S8710 Media Server

- One to four port carriers (J58890BB)
- In a configuration with Asynchronous Transfer Mode (ATM), an ATM Interface card
- Minimum of one switch node (SN) carrier (J58890SA) in a standard- or high-reliability configuration with a center stage switch (CSS). Minimum of 2 SN carriers in a critical-reliability configuration

See [Figure 67: Typical PN Cabinet for all server models](#) on page 190 for an example of a typical PN cabinet.

Figure 67: Typical PN Cabinet for all server models

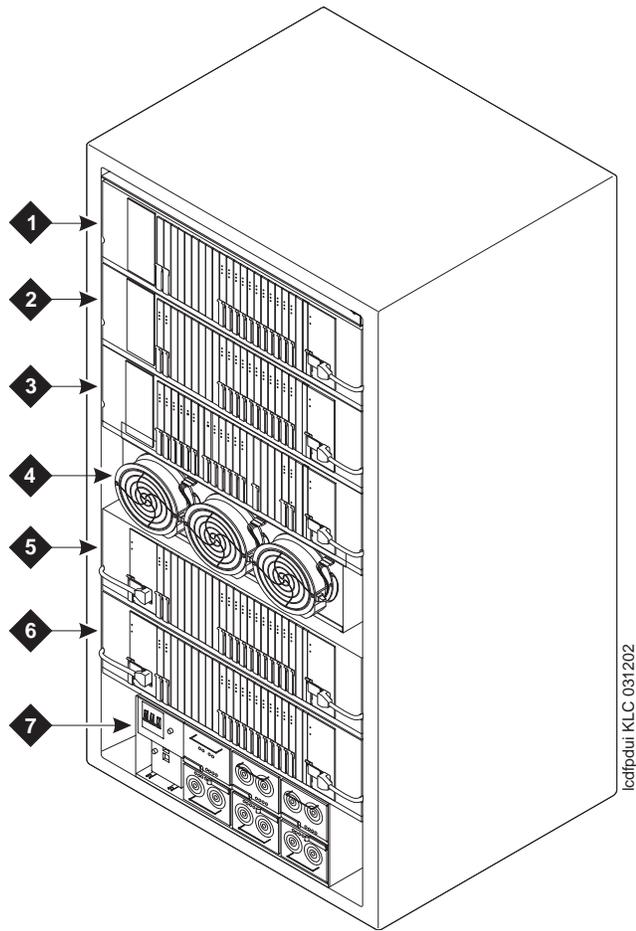


Figure notes:

Number	Description
1.	Port carrier in position C
2.	Port, control, or processor carrier in position B
3.	Control, processor, or expansion control carrier in position A
4.	Fan units
5.	Port or switch node (SN) carrier in position D
6.	Port or SN carrier in position E
7.	Power-distribution unit

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## Port network cabinet for Avaya S8500 Media Server

The Avaya S8500 Media Server supports the MCC1 Media Gateway in migrations from a DEFINITY R simplex configuration. A maximum of three Port Networks are supported in a direct connect configuration only.

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## Expansion port network cabinet for DEFINITY Server SI

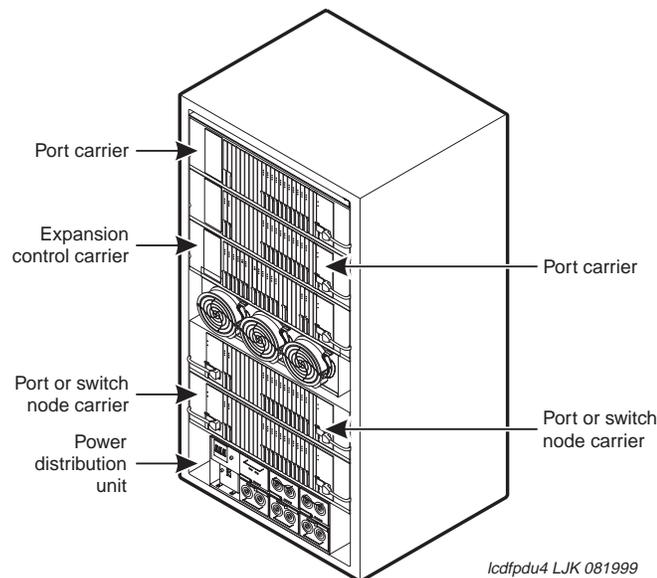
An expansion port network (EPN) cabinet contains the following carriers:

- One to four port carriers (J58890BB)
- One expansion control carrier (J58890AF)
- Zero, one, or two SN carriers (J58890SA) in CSS-connected R model as required

See [Figure 68: MCC1 EPN cabinet](#) on page 191 for an example of an MCC1 EPN cabinet.

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**Figure 68: MCC1 EPN cabinet**




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In a minimal dual-EPN cabinet configuration, the A, B, and C carrier positions are intended for the first port network in the cabinet. The D and E carrier positions are intended for the second port network in the cabinet. When a cabinet has two PNs, carrier position E must be used and populated first. Carrier position D is added and populated second.

## Carriers

The following table lists the types of carriers that can be installed in the MCC1 Media Gateway with the DEFINITY Server SI, the S8700 Media Server, the S8710 Media Server, and the S8500 Media Server. Each carrier will be described in greater detail later in this section.

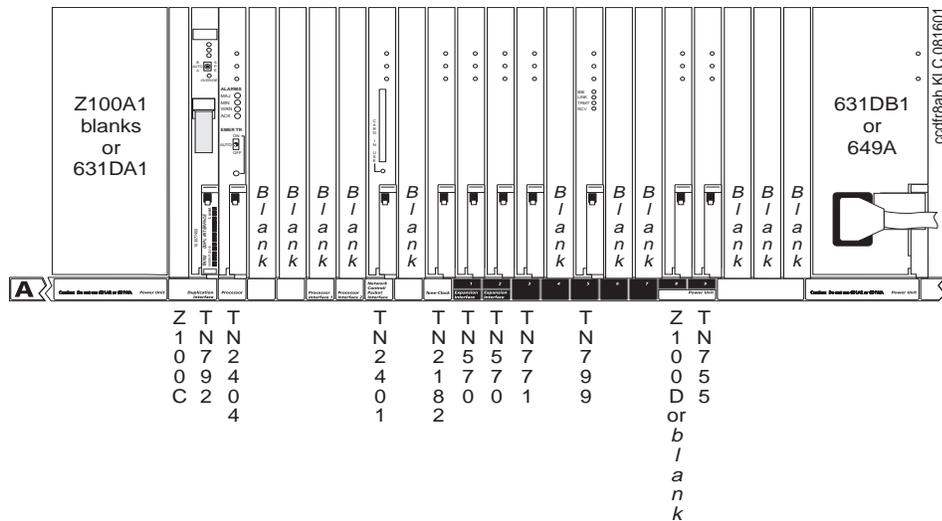
Description	Cabinet	Server
Control Carrier – Contains the processor circuit packs to perform call processing and maintenance	PN	DEFINITY Server SI
Processor Carrier – Contains the processing circuit packs to perform call processing, maintenance, and administration. These carriers do not contain port circuit packs. Two J58890AP carriers are in the PN for high- and critical-reliability, duplicate processor, systems.	PN	DEFINITY Server SI
Port Carrier (optional) – Contains the port, service, Tone-Clock, and EI circuit packs.	PN or EPN	DEFINITY Server SI
Expansion control carrier – Contains extra port Tone-Clock, maintenance interface, and EI circuit packs.	EPN	DEFINITY Server SI, S8700/S8710 Media Server, and S8500 Media Server
Switch node carrier – Contains the SNI circuit packs that make up the CSS.	EPN or PPN	S8700/S8710 Media Server
Duplicated control carrier (optional) – Contains the duplicate processor circuit packs to perform call processing, maintenance, and administration identical to that of the control carrier. This carrier can also contain port circuit packs.	PN	DEFINITY Server SI

## Control carrier for DEFINITY Server SI

The control carrier is used for a DEFINITY Server SI. This carrier is not used for an S8700/S8710 Media Server or an S8500 Media Server.

See [Figure 69: Control carrier \(front\)](#) on page 193 for an example of a control carrier.

**Figure 69: Control carrier (front)**



The control carrier (J58890AH) has dedicated white-colored circuit pack slots that always contain specific control circuit packs. Dual-colored slots can contain any port circuit pack or the designated white circuit pack, such as an EI or power unit. AC or DC power units supply power to the carrier.

The following table describes the connectors in the control carrier.

Connector	Function
1 to 9 (A1 to A9)	25-pair connectors provide interfaces between port circuit packs and the cross-connect field or fiber transceiver.
AUX (Auxiliary)	Provide an interface for alarms, attendant console power, emergency power transfer panels, and an internal modem that is used for remote maintenance.
Processor interface for standard-reliability configurations	Connects directly to the PI circuit pack. Provides a BX.25 protocol interface for communication between the circuit pack and external DCE equipment.

## Media gateways

Connector	Function
Duplication option terminal	Used in high- and critical-reliability systems to connect an administration terminal to the active processor from the duplication interface slot position.
Terminal	Connects a management terminal to the processor in a standard-reliability system. In a critical-reliability system, connects a terminal to the processor in the control carrier.
P1	Provides a position indicator of the carrier, power to fans, and access to alarm and control circuits
P2	Provides control signals to the carrier
Data communications equipment	Connects the processor to CDR equipment, a system printer, or an external modem that is used for remote maintenance. This connector can be used with any reliability option.

## Duplicated control carrier for DEFINITY Server SI

A duplicated control carrier (J58890AJ) contains the following colored slots:

- Dedicated white-colored circuit-pack slots that always contain specific control circuit packs.
- Gray and purple slots can contain port circuit packs.
- Dual-colored slots of white, gray, or purple can contain port circuit packs or designated white circuit packs, such as an expansion interface or power unit.

AC or DC power units reside at each end of a duplicated control carrier.

The following table describes the connectors in a duplicated control carrier.

Connector	Function
1 to 9 (B1 to B9)	25-pair connectors provide interfaces between port circuit packs and the cross-connect field or fiber transceiver.
Terminal	Connects a management terminal to the processor in the duplicated control carrier
P1	Provides a position indicator of the carrier, and access to alarm and control circuits

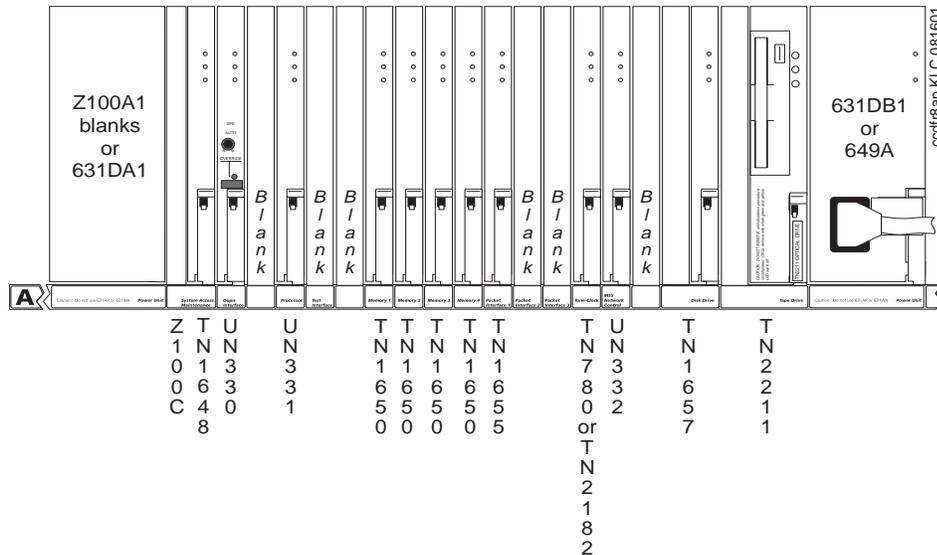
## Processor carrier for DEFINITY Server SI

The processor carrier contains only dedicated slots for control circuit packs. A processor carrier does not contain slots for port circuit packs. The following figure shows an example.

This carrier always contains four memory circuit packs and one Packet Interface circuit pack. AC or DC power units reside at each end of a processor carrier.

See [Figure 70: Processor Carrier](#) on page 195 for an example of a processor carrier.

**Figure 70: Processor Carrier**



The following table describes the connectors in a processor carrier.

Connector	Function
Clock (Stratum-3)	The stratum-3 clock provides an interface for digital frame timing. (This is not a time-of-day clock.)
AUX (Auxiliary)	The AUX carrier provides an interface for customer alarms, attendant console power, emergency power-transfer panels, and an internal modem interface for remote maintenance.
Terminal active	Connects a management terminal to the system access and maintenance (SYSAM) circuit pack in the active processor carrier.
Terminal standby	Used only with duplicated processors to connect a management terminal to the standby processor carrier.



The following table describes the connectors of an expansion control carrier.

Connector	Function
1 and 2 A1 and A2	Provides a fiber-optic cable interface to an Expansion Interface (EI) circuit pack in slot 1 <sup>1</sup> or a copper cable interface for a DS1 converter
1 to 19 A1 to A19	25-pair connectors provide interfaces between port circuit packs and the cross-connect field or fiber transceiver
Auxiliary (AUX)	Provides interfaces for customer alarms, attendant console power, and emergency power transfer panels
TERMINAL	Connects a management terminal to the Maintenance circuit pack in an expansion control carrier
P1	Provides a position indicator of the carrier and access to alarm and control circuits
P2	Connects ringing voltage from the ring generator to the carrier and produces control signals

1. In systems that use ATM-PNC, the fiber connectors for the OC-3/STM-1 interfaces to the ATM switches reside on the faceplates of the TN2305 or the TN2306 circuit packs.

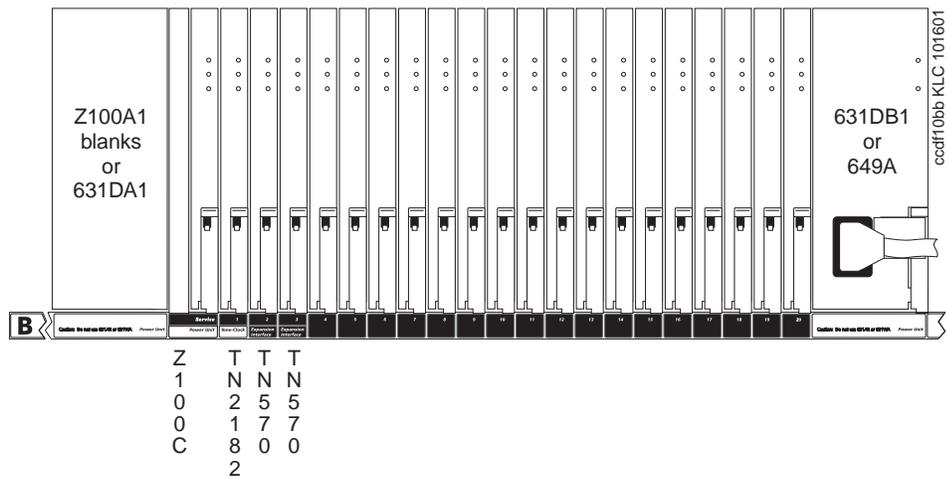
## Port carrier for DEFINITY Server SI, S8700 Media Server, S8710 Media Server, or S8500 Media Server

A port carrier contains the following slots:

- Port slot locations 1 to 20 for the port circuit packs. Slot 1 might contain a Tone-Clock circuit pack when the port carrier is in the B position of an EPN cabinet in a critical-reliability system. Slot 2 contains an optional EI or ATM Interface circuit pack for a critical-reliability system.
- A power unit service slot in which a power unit circuit pack or service circuit pack can be installed.
- AC or DC power units reside at each end of the carrier.

See [Figure 72](#) for an example of a port carrier.

**Figure 72: Port carrier (front)**



The following table describes the connectors in the processor carrier.

Connector	Function
1 to 20	25-pair connectors that provide interfaces between port circuit packs and the cross-connect field or fiber transceiver
P1	Provides a position indicator of the carrier and access to alarm and control circuits

### Switch node carrier for S8700 Media Server or S8710 Media Server

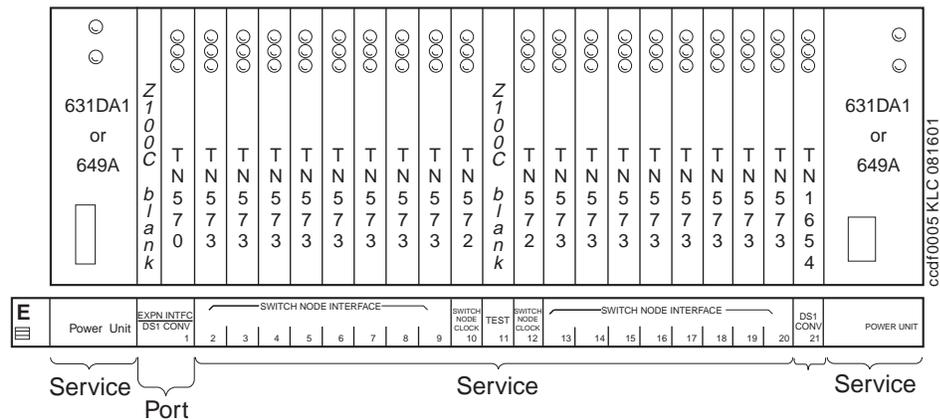
The switch node carrier (SNC) (J58890SA) can contain:

- One or two switch node clocks
- Up to 16 Switch Node Interface (SNI) circuit packs
- One or two DS1 converter circuit packs
- One EI circuit pack
- Two AC or DC power units

An AC or DC power unit resides at each end of an SNC. An SNC can be used when connecting from one to 44 PNs, but must be used when connecting three or more EPNs.

See [Figure 73](#) for an example of a switch node carrier.

Figure 73: Switch node carrier (front)



The following table describes the connectors in a switch node carrier.

Connector	Function
1 (E1)	EI connector for the cable between the EI circuit pack in slot 1 and the Switch Node Interface (SNI) circuit pack in slot 2 for a duplicated PN only. Also used for a DS1 Converter circuit pack in slot 1.
2 to 9 and 13 to 20 (E2 to E19 and E13 to E20)	SN ports that are fiber-optic cabling interfaces to the SNI circuit packs and other circuit packs that are connected to SN ports or circuit packs in expansion PNs.
21 (E21)	Interface to connect the DS1 Converter circuit pack to the cross-connect field and an SNI circuit pack.
P1	Provides the position indicator of the SN carrier and provides access to alarm circuits and control circuits.

**Table 10: Carrier circuit pack slots**

Type	Description	Server
Port	A port slot is colored purple or labeled with a gray rectangle. A port slot can accept any purple- or gray-labeled circuit pack.	DEFINITY Server SI and S8700/S8710 Media Server
Control	A control slot is colored white or labeled with a outlined white rectangle. A port slot can accept any purple- or gray-labeled circuit pack.	DEFINITY Server SI
Service	A service slot is colored purple or labeled with a gray rectangle. A service slot accepts special circuit packs that do not have an I/O connector.	DEFINITY Server SI and S8700/S8710 Media Server

The purple- and white-colored circuit packs and slots have been replaced by circuit packs and slots that are labeled with gray and white rectangles, respectively. A label with a solid gray rectangle indicates a slot for a port circuit pack. A label with an outlined white rectangle indicates a slot for a control circuit pack. Each port slot attaches to a 50-pin (25-pair) connector on the rear panel of the carrier. A cable attaches to each connector and is routed to the cross-connect field. Each slot that contains a fiber-optic interface circuit pack (EI or SNI) uses a fiber-optic transceiver on the rear panel of the carrier.

A current limiter board (CFY1B) plugs into the backplane of the carrier located in the A position. The board supplies the following:

- Emergency transfer logic
- Current-limited power
- 5 VDC to trip the main circuit breaker in an over-temperature condition
- The ringing transfer relay

Terminators on the backplane terminate each end of the processor expansion bus.

The following apparatus blank faceplates (with widths) cover unused circuit pack slots in the carriers to maintain proper air flow:

- Z100A1, 0.75 inches (1.9 cm)
- Z100C, 0.5 inches (1.27 cm)
- Z100D, 0.25 inches (0.64 cm)

# Circuit packs and power supplies

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## Power supplies and adapters

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### 1217B AC power supply

A 1217B power supply is used only with an SCC1 Media Gateway. This power supply provides additional protection to your equipment in the event of an overload. An overload triggers a power-supply alarm, but the system's cooling fans continue to run, and the power supply continues to function. This power supply replaces the 1217A, WP-91153 L3 and L4-25 and is fully backward compatible.

This power factor-corrected supply accepts 50- or 60-Hz AC input, while auto-ranging between 90- and 264-VAC input. This multiple-output power supply provides regulated DC outputs and AC ringer outputs that are switch-selectable 20- or 25-Hz AC. The 1217B power supply meets the:

- Harmonic-distortion requirements of IEC1000-3-2 (PFC)
- Immunity requirements of IEC 1000-4
- Safety requirements of IEC 950
- Current UL requirements and CSA requirements

The 1217B power supply mounts in a carrier's power supply slot. A power cord with a 3-prong plug on one end connects the supply to a dedicated AC power source.

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### 631DA1 AC power unit

A 631DA1 power unit accepts 60-Hz, 120-VAC input power and provides DC power at +5V and up to 60A for the backplanes of an MCC1 Media Gateway's carriers.

If **AC** input power fails, the power unit can convert 144 VDC from optional batteries in an **AC** power-distribution unit to +5 VDC. A circuit in the optional battery charger detects the higher equivalent (**AC**- or **DC**-input) voltage and switches in the correct input voltage.

---

### 631DB1 AC power unit

A 631DB1 power unit accepts 60-Hz, 120-VAC input power and provides DC power at both:

## Circuit packs and power supplies

- –48 V at 8 A
- –5 V at 6 A

for the backplanes of an MCC1 Media Gateway's carriers. The DC output of –48 V also drives the cabinet's fans.

If **AC** input power fails, the power unit can convert 144 VDC from optional batteries in an **AC** power-distribution unit to +5 VDC. A circuit in the optional battery charger detects the higher equivalent (**AC**- or **DC**-input) voltage and switches in the correct input voltage.

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## 649A DC power unit

A 649A power converter converts a DC input of –48 V into DC outputs of:

- –48 V at 10 A
- ±5 V at 6 A

for an MCC1 Media Gateway. Within a carrier, these outputs are distributed to the circuit packs' slots. Only one 649A converter is required per carrier except for SN carriers. SN carriers require two converters, one on each end. The use of the 649A power unit also allows an increase in the number of telephones supported by each carrier.

---

## 650A AC power unit

This global power factor-corrected supply accepts 47- to 63-Hz AC input, while auto-ranging between 85- and 264-VAC input. While providing 330 Watts of total output, the 650A power unit provides multiple DC outputs as follows:

- +5.1 VDC at 28 A
- –5.1 VDC at 1.0 A
- –48 VDC at 4.5 A
- +8- to +14 VDC at 1.6 A (fan-speed control)

This output (+12 VDC nominal) controls the fans' speed. The voltage varies with the temperature of the ambient air at the inlet below the power supply. If this voltage reaches +14 VDC, the system activates a FANALM signal.

- –115 to –150 VDC at 200 mA (neon bus)

The 650A power unit has three switch-selectable outputs for ringing:

- 20-Hz AC output at 85 V RMS and 80 mA, — centered about –48 VDC at 180 mA
- 25-Hz AC output at 72 V RMS and 8 to 80 mA, — centered about –48 VDC at 180 mA
- Two 50-Hz AC outputs at 28 V RMS (effectively 56 V) and 220 mA, — biased about –48 and 0 VDC at 70 mA balanced

---

## 655A power supply

The G650 can use one or two 655A power supplies. Either power supply can provide all the power needed by the G650. When there are two power supplies, they share the power load. The 655A power supply is:

- The only power supply supported in the G650
- Not backward compatible to other carrier types

If one G655A power supply is used it will be located in slot 0 of the G650 Media Gateway. If two G655A power units are used, they will be located in slots 0 and 15.

**Note:**

You can insert or remove a **redundant** power supply and not affect the G650 if the other 655A power supply is operating.

## Input power

The 655A power supply is capable of operating on either AC or DC input power. AC power is always used if available. One power supply can operate on AC power, and the other on DC power. The power supplies use AC power first and switch to DC power if AC power fails or is not present.

### AC power

Commercial AC is the primary input power source. Both slot 0 and slot 15 have dedicated AC input. The 655A power supply can operate on AC input of 90- to 264-VAC at 47 to 63 Hz. The nominal ranges for AC power are:

- 100- to 120-VAC at 50 or 60 Hz
- 200- to 240-VAC at 50 or 60 Hz

### DC power

Minus 48VDC power can be supplied simultaneously as backup power. One -48VDC power input point is provided on the G650 backplane and is distributed through the backplane to each power supply.

## Circuit packs and power supplies

**Required input current** - The following tables show the worst case current levels for a fully-loaded G650 Media Gateway. Each empty slot reduces the required input current by 1/4 A.

Input Volts AC	Required Amps AC
90	7.2
100	6.4
120	5.4
230	2.8
255	2.5

Input Volts DC	Required Amps DC
40	16.7
42	15.9
48	13.9
54	12.4
60	11.1

### I2C bus

The 655A power supply interfaces to the I<sup>2</sup>C bus that is implemented on the G650 cabinet backplane. The 655A responds to commands and queries from the TN2312BP IPSI I<sup>2</sup>C bus master.

### 655A faceplate LEDs

The five LEDs on the faceplate of the 655A power supply are in a vertical line with the red LED on top. These five LEDs provide the following status:

- Red – This LED:
  - Lights when there is a failure in either the power supply or the fans. (For a G650 with redundant power supplies, a failure in the fan assembly results in this LED being lit on **both** power supplies.)
  - Flashes off once per second when the software shuts down the ring voltage output of a power supply
- Yellow – This LED:
  - Lights when the status of the power supply and fans is OK

- Flashes once per second when the software shuts down a single power supply, in a carrier with operational redundant power supplies
- Green – Lights when there is AC power applied to the power supply
- Green – Lights when there is DC power applied to the power supply
- Green – Lights when the power supply is supplying ringing to the G650

## 655A ring generation

The 655A provides either North American ringing (20 Hz) or European/International (25 Hz) ringing. It also has a setting to provide no ringing when the customer supplies a ring generator that is external to the power supply. A TN2202 (French ringing circuit pack) is an example of an external ring generator.

The 655A power supply provides a physical slide switch to select the frequency of the ring generator. The options are:

- 20 Hz – North American
- 25 Hz – European and international
- Other – No ringing output when an external ring generator is used such as the TN2202 French ringing circuit pack.

You must remove the power supply from the G650 when you change the ringing frequency selection.

Only one 655A supplies ringing to the G650. The power supply in slot 0 in the G650 is the default for ringing. The system uses this default 655A unless it has failed or the software has commanded it to shut down. When a G650 carrier has redundant power supplies, one supply automatically supplies ringing if the other power supply fails.

A 655A provides ringing to only one G650 carrier. For example, the 655A power supplies in carrier A supply ringing only to carrier A, and the power supplies in carrier D supply ringing only to carrier D. If the ring generation in both of a carrier's power supplies fail, no other power supply provides ringing for the carrier.

## 655A replaceable DC-input fuse

The 655A provides a replaceable 25 ADC-input fuse that protects the DC input from reverse voltage on the -48Vdc input. If reverse voltage is applied to the G650 and 655A power supply, the 655A fuse will blow open protecting the 655A from damage.

If the G650 will not operate on DC input (only), the fuse should be inspected by removing the 655A power supply from the G650 and inspecting the protection fuse.

The fuse is located on the rear surface of the 655A power supply. A spare fuse is also located on the rear surface.

## 676D DC power supply

A –48 VDC source supplies power to the **DC** power supply at up to 25 A. The 676D power supply for the SCC1 Media Gateway, produces **DC** outputs of +5, –5, –48, and +12 VDC. The **DC** outputs are distributed across the cabinet's backplane to each circuit pack's slot. The output value and frequency of the **AC** ringing voltage depend on the country of use. The power supply has circuit breakers and electromagnetic interference (**EMI**) filtering.

This multiple-output power supply provides regulated DC outputs and AC ringer outputs that are switch-selectable 20- or 25-Hz AC.

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## 982LS current limiter

The 982LS current limiter connects behind the Processor circuit pack's slot only in the processor port network (PPN) of a DEFINITY SI system. The 982LS provides current-limited accessory 48-VDC, emergency transfer logic, current-limited 5-VDC to trip main circuit breaker if high temperature is detected, and duplicated 48-VDC to fans in the **PPN** cabinet.

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## CFY1B current limiter

The CFY1B current limiter is used only with the S8700 Media Server.

The CFY1B circuit pack supports the processor port network (PPN) and the MCC1 and SCC1 Media Gateway expansion port networks (**EPNs**). The CFY1B current limiter connects behind the Maintenance circuit pack's slot and provides current-limited accessory 48-VDC, emergency transfer logic, current-limited 5-VDC to trip the main circuit breaker if high temperature is detected, and duplicated 48-VDC to fans in an **EPN** cabinet.

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## ED-1E546 — DEFINITY AUDIX R3 System (TN2169, TN2170, TN566, TN567)

ED-1E546 is supported. However, it is no longer available for purchase.

The DEFINITY AUDIX R3 system allows a person to record and exchange voice messages over the telephone when direct communication is inconvenient or unnecessary. The unit installs in 5 adjacent slots in a carrier and contains 8 ports (2 ports are used for each voice terminal).

The TN566/B Alarm and TN567 multifunction circuit pack holds the CPU, controllers, memory devices, and signal processors. TN566/B circuit pack operates with the TN2169 alarm circuit pack to provide monitoring for system power and environmental status, –48 VDC to +12 VDC power conversion for the disk drive and tape drive, and remote terminal access. The TN2170

alarm circuit pack provides a connection to an external LAN in addition to all of the functions provided by the TN2169.

The 160 Mbyte or 600 Mbyte tape drive data cassette recorder distributes software onto a disk, stores periodic backups of data, installs software releases, and removes core dumps and other maintenance information. A 148, 248, 456, 800 Mbyte, or 1 Gbyte disk drive stores customer data, boots the system, and logs system error information. Depending on the disk drive sizes, the unit can handle from 300 to 2000 local and remotely administered subscribers.

Refer to the *DEFINITY AUDIX System, System Description*, 585-300-205, for more information.

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## ED-1E568 DEFINITY AUDIX R4

For information about ED-1E568 DEFINITY AUDIX R4, see [TN568 DEFINITY AUDIX 4.0 Voice Mail System \(part of ED-1E568\)](#) on page 212.

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## J58890MA-1 Multiapplication Platform for DEFINITY (MAPD)

The J58890MA-1 is a variation of the MAPD platform that transports ASAI links between a DEFINITY **LAN** gateway system and an Ethernet LAN. The J58890MA-1 circuit-pack assembly uses the TN801B MAPD (LAN Gateway Interface) which is a circuit pack that is built from industry-standard PC processors, interfaces, buses, and ISA/PCI expansion boards. The J58890MA-1 takes up three adjacent slots in the carrier. In a CMC1 Media Gateway the J58890MA uses only two slots if placed in slot six or seven. There are different lists of the J58890MA which is indicated by a number at the end after the dash. A list represents different hardware configurations of the same board.

The following describes the capabilities of the different lists for the J58890MA:

- J58890MA-2 supports CallVisor ASAI and LAN Gateway
- J58890MA-10 supports IP trunking
- J58890MA-20 supports CallVisor ASAI, Avaya Computer Telephony, and Basic Call Management System Reporting Desktop
- J58890MA-30 supports IP solutions

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## NAA1 fiber-optic cable adaptor

The NAA1 adapter reroutes fiber-optic cable from the front of an ATM circuit pack to the rear of a CMC1 Media Gateway. While the NAA1 fiber-optic cable adaptor looks like a circuit pack, it is electrically and optically passive.

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## Circuit Packs

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### TN429D Incoming Call Line Identification (ICLID)

The TN429 Incoming Call Line Identification (ICLID) circuit pack provides eight ports for direct inward/outward dialing (**DIOD**) trunks. Each port provides a 2-wire interface to the central office (CO) public exchange for incoming calls and outgoing calls. The CO provides caller names and numbers to the circuit pack, which displays them on digital telephones (DCP and BRI) equipped with a 32- or 40-character alphanumeric display. In the United States the ICLID supports name and number. In Japan, and other countries that comply with requirements the ICLID displays the number only.

This ICLID is required for the Japan ANI feature where the calling number passes through to the switch. An in-band detector/converter may be required. Contact your Avaya representative for more information.

The ICLID provides the required CO disconnect functions as well as the interface to CAMA/E911.

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### TN433 Speech Synthesizer

The TN433 speech synthesizer for Italian provides four ports that retrieve fixed messages for leave word calling, automatic wake up, and attendant console features for the visually impaired. These fixed messages include: good morning, time-of-day, and extension number. Each of the ports has touch-tone detection. The TN433 speech synthesizer has administrable A- and  $\mu$ -Law companding capabilities.

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### TN436B Direct Inward Dialing Trunk (8 ports)

The TN436B Direct Inward Dialing (DID) trunk for Australia provides eight ports for DID. These ports are independently connected to a public network. Each port is an interface between a 2-wire analog line from a **CO** and the 4-wire **TDM** network in the system. The TN436B DID for Australia has administrable timers.

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### TN438B Central Office Trunk (8 ports)

The TN438B CO trunk for Australia provides eight ports for loop-start **CO** trunks. Each of the eight ports has tip and ring signal lead. The TN438B can detect 12-kHz and 50-Hz periodic

metering pulses from the **CO**. Additional features include call still held timing and automatic guard fault-detection circuitry.

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## TN439 Tie Trunk (4 ports)

The TN439 Tie Trunk circuit pack for Australia and Japan provides four ports for 2-wire tie trunks with loop disconnect signaling. The TN439 has administrable A- and  $\mu$ -Law companding and administrable timers.

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## TN457 Speech Synthesizer

The TN457 speech synthesizer or British English provides four ports that retrieve fixed messages for leave word calling, automatic wake up, and attendant console features for the visually impaired, that are spoken with a UK accent. Examples of messages are: good morning, time-of-day, and extension number. Each of the ports has touch-tone detection. The TN457 has administrable A- and  $\mu$ -Law companding capabilities.

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## TN459B Direct Inward Dialing Trunk (8 ports)

The TN459B DID circuit pack for the United Kingdom provides eight ports for immediate- or wink-start **DID** trunks. Each port has tip and ring signal leads. Each port is an interface between a 2-wire analog line from a **CO** and the 4-wire **TDM** network in the system. The TN459B has administrable timers and a backward busy circuit that complies with signaling requirements.

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## TN464GP DS1 Interface, T1 (24 channels) or E1 (32 channels)

The TN464GP circuit pack provides:

- Board-level, administrable A- or  $\mu$ -Law companding
- CRC-4 generation and checking (E1 only)
- Stratum-3 clock capability
- ISDN-**PRI T1** or E1 connectivity
- Line-out (LO) and line-in (LI) signal leads (unpolarized, balanced pairs)
- Support for **CO**, **TIE**, **DID**, and off-premises station (**OPS**) port types that use robbed-bit signaling protocol, proprietary bit-oriented signaling (**BOS**) 24<sup>th</sup>-channel signaling protocol, or DMI-BOS 24<sup>th</sup>-channel signaling protocol
- Support for Russian incoming ANI

## Circuit packs and power supplies

- Support for universal, digital, signal level-1 equipment in wideband ISDN-PRI applications
- Test-jack access to the **DS1** or E1 line and support of the 120A integrated channel-service unit (**ICSU**) module
- Support for the enhanced maintenance capabilities of the **ICSU**. These circuit packs can communicate with CONVERSANT<sup>®</sup>. See [TN2185B ISDN-BRI S/T-TE Interface \(4-wire, 8 ports\)](#) on page 230.
- Downloadable firmware
- Support for echo cancellation. To enable this capability, the customer must purchase an Echo Cancellation Software Right-to-Use feature in addition to the hardware.

The echo cancellation capability of the TN464GP is selectable on a per-channel basis. The TN464GP DS1 interface automatically turns off echo cancellation when it detects a 2100-Hz phase-reversed tone generated by high-speed modems (56-kbps), but not when it detects a 2100-Hz straight tone generated by low-speed modems (9.6-kbps). Echo cancellation improves a low-speed data call.

The TN464GP DS1 interface is intended for customers who are likely to encounter echo over circuits that are connected to the public network. The occurrence of echo is higher if the switch is configured for ATM, IP, or other complex services and interfaces to local service providers who do not routinely install echo cancellation equipment in all their circuits. A common source of echo is “hybrid” circuits, where conversions between 2-wire analog and 4-wire digital circuits take place. The TN464GP DS1 interface cancels echo with delays of up to 96 ms.

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## TN465C Central Office Trunk (8 ports)

The TN465C CO Trunk circuit pack supports multiple countries.

This circuit pack contains eight analog **CO** trunk ports, loop-start trunk signaling, 12- and 16-kHz periodic pulse metering (**PPM**) detection and counting, administrable timers, battery-reversed signaling, and multicountry selectable signaling. For more information about a TN465C, contact your Avaya representative.

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## TN479 Analog Line (16 ports)

The TN479 analog line circuit pack has 16 ports and supports three ringer loads and three simultaneous ringing ports. Only one telephone can have an **LED** message-waiting indicator (neon message-waiting indicators are not supported). The TN479 supports  $\mu$ -Law companding.

The following table lists the TN479-supported telephones and shows each of their wiring sizes and ranges.

Telephone	Wire size (metric area/ diameter)	Maximum range (feet)
500-type	24 AWG (0.2 mm <sup>2</sup> /0.5 mm)	3,000 (914 m)
2500-type	24 AWG (0.2 mm <sup>2</sup> /0.5 mm)	3,000 (914 m)
7100-series	24 AWG (0.2 mm <sup>2</sup> /0.5 mm)	3,000 (914 m)
7101A	not supported	not supported
7103A	not supported	not supported
8100-series	24 AWG (0.2 mm <sup>2</sup> /0.5 mm)	2,500 (762 m)
9100-series	24 AWG (0.2 mm <sup>2</sup> /0.5 mm)	2,500 (762 m)

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## TN497 Tie Trunk (4 ports)

The TN497 tie trunk circuit pack for Italy has four ports for 2-wire tie trunks with loop disconnect signaling. Each port can be administered for A- or  $\mu$ -Law companding, timers, Translate Giunzione Unscnte (TGU) (outgoing tie), Translate Giunzione Entrante (TGE) (incoming tie), and Translate Giunzione Interno (TGI) (internal tie).

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## TN556D ISDN-BRI 4-Wire S/T-NT Interface (12 ports)

The TN556D ISDN-BRI circuit pack has 12 ports that connect to ISDN-**BRI** terminals. Each port on a TN556 ISDN-BRI circuit pack has TXT, TXR, PXT, and PXR signal leads. Up to eight ports can be used for Adjunct Switch Application Interface (**ASAI**) links. Each port operates at 192 kbps and has 2 B channels and 1 D channel.

The TN556D ISDN-BRI circuit pack has a maximum range of up to 1900 feet (579 m) from the system to the telephone when connected with 24-AWG (0.20 mm<sup>2</sup>/0.51 mm) wire, and uses standard ANSI T1.605 protocol. Up to 24 terminals can be connected, where each terminal uses 1 B channel and shares the D channel. The TN556 also has multipoint support. Capacity for the multipoint support depends on the protocol. In countries that do not support Service Profile Identifier (SPID) there is a limitation of one BRI phone per port.

The TN556D ISDN-BRI circuit pack supports A- or  $\mu$ -Law companding. The TN556D ISDN-BRI circuit pack also functions as a trunk when connecting to a TE interface, for example a TN2185B in another switch. It can be used for lines and trunks simultaneously. The TN556D ISDN-BRI circuit pack provides end-to-end outpulse signaling when the circuit pack is in tie-trunk mode with a [TN2185B ISDN-BRI S/T-TE Interface \(4-wire, 8 ports\)](#).

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## TN568 DEFINITY AUDIX 4.0 Voice Mail System (part of ED-1E568)

The TN568 circuit pack is a component of the ED-1E568 that supports an DEFINITY AUDIX voice mail system using an embedded 386EX processor. The DEFINITY AUDIX systems can be interconnected to create large voice-mail networks that support up to 100,000 subscribers and store up to 100 hours of messages. Each circuit pack has eight ports available for calls when networking is enabled. Without networking, 12 ports are available.

The TN568 DEFINITY AUDIX voice mail system takes up two adjacent slots.

The TN568 DEFINITY AUDIX circuit pack includes a writable magneto-optical disk drive for backing up and upgrading system software and a hard disk for storing messages. The TN568 DEFINITY AUDIX circuit pack also includes an RS-232 connection for a maintenance and administration terminal, an Ethernet port (for the Message Manager PC desktop application), an Amphenol connection to the switch, and an RS-232 port for an external modem that is used for maintenance.

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## TN570D Expansion Interface

The TN570 Expansion Interface (**EI**) is an interface between the **TDM** bus and packet bus, and fiber-optic links that interconnect the cabinets. The TN570D circuit pack is used in a port network (**PN**) between a **PN** and another **PN** in a direct-connect system, and between a **PN** and an **SNI** in a switch node carrier in a CSS-connected system.

The TN570 circuit pack provides control-channel applications and time-slot interchanging between the **PPN** and **EPNs**. It is used when ISDN-**BRI** and/or **ASAI** is connected in an **EPN**.

The TN570 circuit pack carries circuit-switched data, packet-switched data, network control, timing control, and **DS1** control. The TN570 circuit pack also communicates with an **EPN's** TN775B Maintenance circuit pack to send the **EPN's** environmental and alarm status to the **SPE**.

The TN570 circuit pack is replaced by the TN2305 circuit pack or TN2306 circuit pack when an ATM switch replaces the CSS.

The TN570 circuit pack is used in an EPN that is supported by a Survivable Remote Processor (SRP).

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## TN572 Switch-Node Clock

The TN572 switch-node clock circuit pack is used with the S8700 Media Server only.

The TN572 circuit pack distributes the timing signals that synchronize the **SN** carrier. The TN572 circuit pack also receives maintenance data.

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## TN573B Switch-Node Interface

The TN573B Switch Node Interface (SNI) routes circuit, packet, and control messages. The TN573B circuit pack is an interface that is installed in an **SN** carrier in a **CSS**. The **TN573B circuit pack** terminates a fiber-optic link from:

- A **SNI** in an **SN** carrier to an **SNI** in another SN carrier
- An **EI** in a processor port network (**PPN**), and an **EI** in an **expansion port network (EPN)**.

The TN573B circuit pack vintage B and higher provides an interface to the single-mode fiber optic transceiver and supports the TN1654 circuit pack and TN574 DS1 converter circuit pack. One TN573B is used per **PN**.

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## TN574 DS1 Converter — T1, 24 Channel

The TN574 is supported. However, it has been replaced by TN1654.

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## TN725B Speech Synthesizer

The TN725B speech synthesizer supports English and is used in the United States.

The TN725B speech synthesizer circuit pack has four ports that send voice message information to telephones to activate leave word calling, automatic wake up, voice message retrieval, and Do Not Disturb features. The ports can detect tones.

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## TN726B Data Line (8 ports)

The TN726B data line circuit pack has eight serial asynchronous EIA ports with modem interfaces that are connected through asynchronous data units (**ADUs**) to **EIA** ports (such as RS-232) on **DTE**. The TN726B circuit pack uses Mode 2 or Mode 3 data transfer protocol. The **DTE** can be adjuncts and peripheral equipment such as data terminals, printers, host computers, personal computers (**PCs**), graphics and facsimile systems, and call detail acquisition and processing systems (**CDAPSs**).

With software-administered system access ports, a TN726B circuit pack connects through a **cross-connect field** to a TN553 packet data line circuit pack. The TN553 circuit pack then converts mode 2 protocol to mode 3 protocol that transfers the TN726B circuit pack from the packet bus to the **TDM** bus for **EIA** connections.

Each port on a TN726B circuit pack has TXT (terminal, transmit, and tip), TXR (terminal, transmit, and ring), PXT (port, transmit, and tip), and PXR (port, transmit, and ring) signal leads.

## TN735 MET Line (4 ports)

The TN735 MET line circuit pack has four ports that connect to multibutton electronic telephone (**MET**) sets. Each port has tip and ring (analog voice) and digital signals to control terminals such as BT, BR, LT and LR.

---

## TN744E Call Classifier and Tone Detector (8 ports)

The TN744 call classifier and tone detector circuit pack has eight ports of tone detection on the **TDM** bus. The TN744 circuit pack does not support call progress tone generation or clocking. The tone detectors are used in vector prompting, outgoing call management (**OCM**), and call prompting applications in the United States and Canada and call classifier options for various countries. The TN744 detects special intercept tones used in network intercept tone detection in OCM. The TN744 circuit pack also detects tones when a **CO** answers a call.

The TN744 circuit pack provides tone generation and detection for R2-MFC **DID** signaling that is used in non-United States installations. The TN744 circuit pack also allows gain or loss to be applied to pulse code modulation (PCM) signals that are received from the bus and supports A- and  $\mu$ -Law companding. The TN744 circuit pack detects 2025-, 2100-, or 2225-Hz modem answerback tones and provides normal broadband and wide broadband dial-tone detection.

The TN744 circuit pack supports digital signal processing of **PCM** signals on each port to detect, recognize, and classify tones and other signals. Generation of signaling tones is also supported for applications such as R2-MFC, Spain MF, and Russia MF. Gain or loss and conferencing can be applied to **PCM** signals received from the **TDM** bus. Additional support includes **DTMF** detectors to collect address digits during dialing, and A- and  $\mu$ -Law companding.

In normal operation, a port on the TN744 circuit pack can serve as an incoming register for Russia MFR (multifrequency shuttle register signaling). Use the TN744 with the TN429C analog line central office trunk for CAMA/E911.

---

## TN746B Analog Line (16 ports)

The TN746B analog line circuit pack has 16 ports. Each port supports one telephone. Auxiliary equipment such as FAX machines, answering machines, modems, and amplifier handsets is supported.

The TN746B circuit pack supports on-premises building wiring with either touch-tone or rotary dialing and with or without the **LED** and neon message waiting indicators. The TN746B circuit pack supports off-premises wiring (out-of-building only with certified protection equipment) with either **DTMF** dialing or rotary dialing. **LED** or neon message waiting indicators are not supported off-premises. The TN746B circuit pack provides -48 V DC current in the off-hook state. Ringing voltage is -90 V DC.

The TN746B, along with a TN755B neon power unit per carrier or per single-carrier cabinet, supports on-premises telephones that are equipped with neon message waiting indicators. The TN746B circuit pack supports three ringer loads, only one telephone can have an **LED** or neon message waiting indicator.

TN746B supports A- and  $\mu$ -Law companding and administrable timers. The TN746B supports:

- Queue warning-level lights associated with the DDC features and the UCD features
- Recorded announcements associated with the Intercept Treatment feature
- PagePac paging system for the Loudspeaker Paging feature.

Additional support is provided for external alerting devices associated with the TAAS feature, neon message waiting indicators, and modems. Secondary lightning protection is provided on the TN746B circuit pack. The TN746B circuit pack supports up to eight simultaneous ports ringing; four on ports one through eight, and four on ports 9 through 16.

Combined conversion of Modem Pooling requires a port on a TN754 and a port on a TN742, TN746B or TN769 Analog circuit pack for each combined resource that is to be supported.

The following table lists the TN746B-supported telephones and shows each of their wiring sizes and ranges.

Telephone	Wire size (AWG)	Maximum range (feet)
500-type	24 (0.2 mm <sup>2</sup> /0.5 mm)	20,000 (6,096 m)
2500-type	24 (0.2 mm <sup>2</sup> /0.5 mm)	20,000 (6,096 m)
7100-series	24 (0.2 mm <sup>2</sup> /0.5 mm)	20,000 (6,096 m)
7101A	24 (0.2 mm <sup>2</sup> /0.5 mm)	15,200 (4,633 m)
7103A	24 (0.2 mm <sup>2</sup> /0.5 mm)	15,200 (4,633 m)
8100-series	24 (0.2 mm <sup>2</sup> /0.5 mm)	12,000 (3,657 m)
9100-series	24 (0.2 mm <sup>2</sup> /0.5 mm)	12,000 (3,657 m)

## TN747B Central Office Trunk (8 ports)

The TN747B CO trunk circuit pack has eight ports for loop- or ground-start **CO**, foreign exchange (FX), and wide area telecommunications service (WATS) trunks. Each port has tip and ring signal leads. A port can connect to a PagePac paging system. The TN747B supports the abandoned call search feature in automatic call distribution (**ACD**) applications (if the **CO** has this feature). Vintage 12 or greater of the TN747B circuit pack also provides battery-reversed signaling.

---

## TN750C Recorded Announcement (16 channels)

**Note:**

The TN2501AP circuit pack has replaced the TN750 circuit pack. However, the TN750 circuit pack is still supported in the DEFINITY SI and CSI servers.

The TN750 recorded announcement circuit pack records and stores announcements to be played back on demand as part of a calling feature. The TN750 circuit pack has sampling rates of 16, 32, or 64 kbps. The TN750 circuit pack records announcement messages from on-premises or off-premises telephones and can store up to 128 recorded announcements of a maximum of eight minutes total. The TN750 circuit pack has 16 channels and each can play any announcement. Up to 25 call connections can listen to each channel.

A total of 10 TN750C circuit packs in a system provides an announcement capacity of 42.6 minutes (at 32 kbps) and 160 ports. In other words, 160 announcements can play simultaneously. The 16 kbps compression rate, which is adequate for VDN of origin announcements, provides a total capacity of 85.3 minutes. Use of multiple TN750C circuit packs allows a more efficient method of providing many kinds of announcements and provides improved management of integrated announcements.

---

## TN753B Direct Inward Dialing Trunk (8 ports)

The TN753B DID trunk circuit pack has eight ports used for immediate- or wink-start direct inward dialing (**DID**) trunks. Each port has tip and ring signal leads. For the Slovak Republic, vintage 17 (or greater) is required. The TN753B circuit pack supports A- and  $\mu$ -Law companding with vintage 17 or greater.

The TN753B circuit pack is required to support Brazil Block Collect Call.

---

## TN754C DCP Digital Line (4-wire, 8 ports)

The TN754C DCP digital line circuit pack has eight asynchronous, 4-wire DCP ports that can connect to 7400- and 8400-series digital telephones, 302A/B/C attendant consoles, or data modules. The TN754 circuit pack has administrable A- and  $\mu$ -Law companding.

The following table lists the TN754-supported equipment and shows each of their wiring sizes and ranges.

**Table 11: Maximum range of 7400- and 8400-series equipment**

Supported equipment	Wire sizes (AWG)	Maximum range (feet)
7400 data modules	24 (0.2 mm <sup>2</sup> /0.5 mm)	5000 (1524 m)
7400 data modules	26	4000 (1219 m)
7400-series telephones	24 (0.2 mm <sup>2</sup> /0.5 mm)	3500 (1067 m)
7400-series telephones	26	2200 (670 m)
8400-series data modules	24 (0.2 mm <sup>2</sup> /0.5 mm)	3500 (1067 m)
8400-series telephones	24 (0.2 mm <sup>2</sup> /0.5 mm)	3500 (1067 m)

The TN754 circuit pack provides greater call-handling capacity for high-traffic applications and supports the group paging feature.

Combined conversion of Modem Pooling requires a port on a TN754 circuit pack and a port on a TN746B circuit pack or TN769 analog circuit pack for each combined resource that is to be supported.

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## TN755B Neon Power Unit

The TN755B neon power unit circuit pack is used in with all DEFINITY servers except the DEFINITY CSI server and the G600 Media Gateway, which have neon built into their 650 power supplies. The TN755B circuit pack produces 150 VDC to operate neon message waiting lights on terminals that are connected to TN746B analog line circuit packs.

A TN755B circuit pack is required for each carrier where neon message waiting indicators are connected.

This circuit pack and the neon message waiting function are not available on systems that use the TN2202 ring generator circuit pack for France balanced-ringing.

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## TN758 Pooled Modem (2 ports)

The TN758 pooled modem circuit pack has two conversion resources ports (such as a trunk data module) for switched connections between digital data endpoints (data modules) and analog data endpoints (modems). A TN758 circuit pack is required for each two conversion resources provided with the integrated type of modem pool. The TN758 circuit pack supports  $\mu$ -Law companding only.

## TN760E Tie Trunk (4-wire, 4 ports)

The TN760 tie trunk circuit pack has four ports that are used for Type 1 or Type 5 4-wire E & M lead signaling tie trunks. Trunk types include automatic, immediate-start, wink-start, and delay-dial. Each port on a TN760 circuit pack has T, R, T1, R1, E, and M signal leads. The TN760 circuit pack provides release link trunks required for the CAS feature and has administrable A- and  $\mu$ -Law companding. The TN760 circuit pack supports outgoing, Multilevel Precedence and Preemption (MLPP).

Option switches on each TN760 circuit pack port can select connections to Type 1 E & M standard unprotected format, Type 1 E & M compatible unprotected format, Type 1 E & M compatible protected format, and Type 5 simplex format.

For Belgium, Czech Republic of Slovakia, the Commonwealth of Independent States, and the Netherlands, vintage 11 or greater is required.

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## TN762B Hybrid Line (8 ports)

The TN762B hybrid line circuit pack has eight ports that connect to multiappearance hybrid analog and digital telephones. The TN762B can connect to 7300-series telephones, an MDC-9000 cordless telephones, and an MDW-9000 cordless telephone with separate base station and charging stations.

Each port on a TN762B circuit pack has VT and VR (analog voice), CT, CR, P-, and P+ (digital signals that control terminals) signal leads.

**Note:**

This circuit pack is not used in a G650 Media Gateway.

---

## TN763D Auxiliary Trunk (4 ports)

The TN763 auxiliary trunk has four ports. Each port has T, R, SZ, SZ1, S, and S1 signal leads. The TN763D circuit pack is used to access on-premises applications such as music on hold, loudspeaker paging, code calling, and recorded telephone dictation. The TN763 circuit pack supports external recorded announcement equipment, and is administrable to select A- or  $\mu$ -Law companding.

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## TN767E DS1 Interface, T1 (24 channels)

**Note:**

This circuit pack is not used in a G650 Media Gateway.

The TN767 DS1 interface circuit pack provides a DSX1-level physical interface to the **DS1** facility. The TN767 circuit pack has unpolarized line out (LO) and line in (LI) signal lead pairs.

The TN767 circuit pack supports **DS1** rate digital facility connectivity. The circuit pack supports **CO**, Tie, **DID**, and off-premises stations (OPS) port types that use the robbed-bit signaling protocol. On DEFINITY CSI and SI Media Servers, this circuit pack supports ISDN-PRI connectivity. For these applications, the signaling D channel can connect from the TN767 circuit pack to the processor interface by a permanent switched call over the **TDM** bus.

On S8500, S8700, and S8710 Media Servers, this circuit pack does not directly support D-channel signaling and thus does not directly support ISDN-**PRI** connectivity. However, the TN767 circuit may indirectly support D-channel signaling provided that the central office supports non-facility associated signaling (NFAS). In this case, you use NFAS administration on the server to associate the D-channel of another T1/E1 circuit pack (normally a TN464) with the TN767 circuit pack.

The TN767 circuit pack is used to communicate with Avaya Interactive Response and to provide the enhanced maintenance capabilities of the 120A channel-service unit (CSU) and the enhanced integrated channel-service unit (**ICSU**).

DS1 tests include loopback tests at the DS1 board edge or the 120A (if used), bit error rate (BER) loopback tests at the far-end **CSU**, and BER 1-way **DS1** facility tests. Other tests include loopback testing specifically designed to locate **DS1** facility faults.

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## TN769 Analog Line (8 ports)

The TN769 analog line circuit pack has eight ports, each with tip and ring signal leads. The TN769 circuit pack supports:

- On-premises or off-premises wiring with either touch-tone or rotary dialing and with or without **LED** or neon message waiting indicators
- Three ringer loads, such as three telephones with one ringer load each
- Up to four simultaneous ports ringing
- Queue warning-level lights that are associated with the **DDC** feature and **UCD** feature
- Recorded announcements for the intercept treatment feature
- Dictation machines for the recorded telephone dictation access feature
- PagePac paging system for the loudspeaker paging feature
- External alerting devices for the trunk answer any station (TAAS) feature
- Modems

The TN769 circuit pack does not support off-premises message waiting indicators.

The TN769 circuit pack provides secondary lightning protection, and supports  $\mu$ -Law companding.

## Circuit packs and power supplies

Each carrier with neon message indicators requires the TN769 circuit pack, along with a TN755B neon power circuit pack to support neon message waiting indicators. Only one telephone can have an **LED** or neon message waiting indicator.

Combined conversion of Modem Pooling requires a port on a TN754B circuit pack and a port on a TN746B circuit pack or TN769 analog circuit pack for each combined resource that is to be supported.

The following table lists the TN769-supported telephones and shows each of their wiring sizes and ranges.

Telephone	Wire size (AWG)	Maximum range (feet)
500-type	24 (0.2 mm <sup>2</sup> /0.5 mm)	20,000 (6,096 m)
2500-type	24 (0.2 mm <sup>2</sup> /0.5 mm)	20,000 (6,096 m)
7102-series	24 (0.2 mm <sup>2</sup> /0.5 mm)	20,000 (6,096 m)
7101A	24 (0.2 mm <sup>2</sup> /0.5 mm)	15,200 (4,633 m)
7103A	24 (0.2 mm <sup>2</sup> /0.5 mm)	15,200 (4,633 m)
8100-series	24 (0.2 mm <sup>2</sup> /0.5 mm)	10,000 (3,048 m)
9100-series	24 (0.2 mm <sup>2</sup> /0.5 mm)	10,000 (3,048 m)

---

## TN771DP Maintenance and Test

The TN771DP maintenance test circuit pack performs maintenance functions. These functions include packet bus reconfiguration that allows diagnosis and correction of recoverable packet bus failures before the link access procedure on the D channel (**LAPD**) links fail. LAPD is a link-layer protocol on the ISDN-**BRI** and ISDN-**PRI** data link layer (level 2). **LAPD** provides data transfer between two devices and error and flow control on multiple logical links. LAPD swaps spare leads with the malfunctioning leads to recover packet bus failures involving up to three malfunctioning leads (1 or 2 data or parity leads and one control lead).

Other maintenance functions include ISDN-PRI testing that originates and terminates loopback tests on ISDN facilities. The testing provides bit and block error rate information indicating ISDN facility quality.

The TN771DP circuit pack can be updated using the firmware download feature, which requires use of the TN799 C-LAN circuit pack interface.

A TN771DP circuit pack is required:

- Any CSI system that is using a TN2198 BRI circuit pack. Otherwise, a TN771DP circuit pack is not required.
- An SI system PPN that is equipped with packet endpoints (ISDN-BRI lines or trunks, ISDN-PRI trunks, IP trunks, IP stations, ATM-CES, and ASAI) or is a critical-reliability (or

fully duplicated) system. A critical-reliability system with packet endpoints requires a TN771DP circuit pack in each EPN. Otherwise, a TN771DP circuit pack is not required.

- All R system PPNs. A critical-reliability R system requires a TN771DP circuit pack in each EPN. An R system with ATM network duplication requires a TN771DP circuit pack in each PPN and EPN.
- All CSI models when using a TN2198 BRI circuit pack

A maximum of one TN771DP circuit pack is allowed in any port network.

A TN771DP circuit pack is never used with the S8100 Media Server.

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## TN775C Maintenance

### Note:

This circuit pack is not used in a G650 Media Gateway.

The TN775C circuit pack is used in maintenance to monitor power failure signals in an EPN cabinet. The TN775C circuit pack also monitors the clock, monitors and controls the power supplies and battery charger, and monitors air flow and high-temperature sensors. The TN775C circuit pack provides two serial links to communicate with Expansion Interface (**EI**) circuit packs, and provides an RS-232 interface for connection to an administration terminal. Each circuit pack contains a 3-position switch to control emergency power transfer.

The TN775C contains a DC-to-DC power converter and is used in maintenance to monitor the processor in an EPN that is supported by a Survivable Remote Processor (SRP).

---

## TN780 Tone Clock

### Note:

This circuit pack is not used in a G650 Media Gateway.

The TN780 tone clock circuit pack connects to and monitors an optional external stratum-3 clock for digital frame timing. The TN780 circuit pack also couples the clock output to local clocks. The TN780 circuit pack supplies master timing to the system and produces the following tones: call-progress tones, touch tones, answer-back tones, and trunk-transmission test tones. The TN780 circuit pack has 2-MHz, 160-kHz, and 8-kHz clocks. The TN780 circuit pack can transmit the system clock and tones on either **TDM** bus A, **TDM** bus B, or both.

The TN780 circuit pack is administrable to produce five tone plans. For countries outside the United States six tones can be customized in each plan. The TN780 circuit pack supports A- or  $\mu$ -Law companding.

A TN780 circuit pack is never used with the S8100 Media Server.

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## TN787K Multimedia Interface

**Note:**

This circuit pack is not used in a G650 Media Gateway.

The TN787 multimedia interface circuit pack is used in conjunction with the TN788 multimedia voice conditioner circuit pack to provide service circuit functionality for the Multimedia Call Handling (MMCH) feature. This feature provides both voice and multimedia data service between multimedia complex endpoints. Up to six endpoints can conference to a single multimedia call occurrence.

The TN787 circuit pack provides a TDM-bus interface and a DS1 adjunct cable interface. The TN787 circuit pack routes the H.221 multimedia information to the DS1 interface to free more TDM-bus timeslots. Freeing more timeslots allows the system to carry more audio, video, and data bit streams between multimedia complex endpoints. The TN787 circuit pack provides support for multiple PNs.

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## TN788C Multimedia Voice Conditioner

**Note:**

This circuit pack is not used in a G650 Media Gateway.

The TN788C multimedia voice conditioner circuit pack is used in conjunction with the TN787F/G multimedia interface circuit pack to provide service circuit functionality for the MMCH feature. This feature provides both voice service and multimedia data service between multimedia complex endpoints.

**Note:**

A TN788C V1 circuit pack only supports  $\mu$ -Law companding. A TN788C V2 or later supports A- and  $\mu$ -Law.

The TN788C circuit pack is the audio processor for the Px64 multimedia conference bridge. The TN788C circuit pack contains eight digital signal processors; four for encoding and four for decoding. Each encoder/decoder pair is assigned to a Px64 endpoint to process its audio channel. Connection to and from the endpoint's audio is by way of a TN787 multimedia interface port. This connection is through the TDM-bus timeslots.

Each of the eight digital signal processors communicate with the main on-board processor through eight individual dual-port random access memory (DPRAMs). No read-only memory (ROM) is available on this circuit pack. The DPRAM is used for program download.

---

## TN789B Radio Controller

The TN789B radio controller circuit pack is an interface between a switch and two Wireless Fixed Base (**WFB**) radio units for the DEFINITY Wireless Business System. The TN789B circuit pack contains a main processor to handle data line circuit (**DLC**) and upper medium access (**MAC**) layers of firmware. The TN789B circuit pack also contains two lower **MAC** processors, one processor for each radio interface. Each radio interface is referred to as an I2 interface.

The I2 link is the connection between the Radio Controller (**RC**) and the **WFB**. The RC supports up to two I2 links, each link consisting of three pairs of twisted-pair cable: the transmit pair, the receive pair, and the local power pair. The transmit pair transfers WFB control and frame information from the **RC** to the **WFB**. The receive pair transfers status and frame information from the **WFB** to the **RC**. If the **RC** cannot provide power to the **WFB**, a third pair (to the **WFB**) can supply local power. When possible, the transmit pair and the receive pair provide phantom power from the **RC** to the **WFB**.

Each TN789B circuit pack includes a standard **TDM-bus** interface from a system, two radio interfaces to two separate radio units, and two synchronization ports. In addition, two RS-232 interfaces provide for a debug terminal and for setting up the wireless terminal.

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## TN791 Analog Guest Line (16 ports)

### Note:

This circuit pack is not used in a G650 Media Gateway.

The TN791 is a 16 port analog guest line circuit pack that is used for international offers, United States and Canada in offer category B only. Each of the 16 ports support one telephone, such as 500 (rotary dial) and 2500 terminals (**DTMF** dial). **LED** and neon message waiting indicators are supported. A separate power supply is required for neon message indicators.

The TN791 circuit pack supports on-premises wiring with either touch-tone or rotary dialing and with or without the **LED** and neon message waiting indicators.

The TN791 circuit pack supports three ringer loads. Only one telephone can have an **LED** or neon message waiting indicator. The TN791 supports up to eight simultaneous ports ringing; four on ports one through eight, and four on ports 9 through 16.

The TN791 circuit pack supports A- and  $\mu$ -law companding and administrable timers. Secondary lightning protection is provided. The TN791 circuit pack supports up to eight simultaneous ports ringing.

## Circuit packs and power supplies

The following table lists the TN791-supported telephones and shows each of their wiring sizes and ranges.

Telephone	Wire size (AWG)	Maximum range (feet)
500-type	24 (0.2 mm <sup>2</sup> /0.5 mm)	20,000 (6,096 m)
2500-type	24 (0.2 mm <sup>2</sup> /0.5 mm)	20,000 (6,096 m)
6200-type	24 (0.2 mm <sup>2</sup> /0.5 mm)	12,000 (3,657 m)
7100-series	24 (0.2 mm <sup>2</sup> /0.5 mm)	20,000 (6,096 m)
7101A	24 (0.2 mm <sup>2</sup> /0.5 mm)	15,200 (4,633 m)
7103A	24 (0.2 mm <sup>2</sup> /0.5 mm)	15,200 (4,633 m)
8100-series	24 (0.2 mm <sup>2</sup> /0.5 mm)	12,000 (3,657 m)
9100-series	24 (0.2 mm <sup>2</sup> /0.5 mm)	12,000 (3,657 m)

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## TN792 Duplication Interface

In a high- or critical-reliability DEFINITY SI system, a duplication interface copies the contents of memory from the primary **Switch Processing Element (SPE)** to a standby SPE, so that the latter can take over immediately when the former fails. The TN792 duplication interface (DUPINT) uses the Enhanced M-Bus of the DEFINITY SI TN2404 processor for this memory shadowing function. The Enhanced M-bus supports 32-bit addressing and data access (vs. 16-bit for the M-bus), so it transfers data faster and shadows a larger area of memory than the older bus. The M-bus is still supported.

You need two TN792 circuit packs, one for the primary control carrier and one for the standby. You can replace TN772 duplication interfaces with TN792s, but you must replace them in pairs. A TN772 circuit pack cannot communicate with a TN792 circuit pack.

A new duplex optical cable connects the TN792 circuit packs. This cable eliminates the additional electromagnetic emissions that would otherwise result from the doubled data rate on the bus. The optical cable interface to the new DUPINT is on the front faceplate of the circuit pack.

The TN792 circuit pack is compatible with existing duplication cables.

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## TN793B Analog Line with Caller ID (24 ports)

The TN793B analog line 24-port circuit pack supports Caller ID telephones and Caller ID devices. Each port supports one telephone, such as 500 (rotary dial) and 2500 telephones (DTMF dial). Use TN793B Vintage 1 or greater.

The TN793B supports on-premises (in-building) wiring with either touch-tone or rotary dialing and with or without the LED and neon Message Waiting Indicators. The TN793B circuit pack supports off-premises wiring with either **DTMF** or rotary dialing, but **LED** or neon message waiting indicators are not supported off-premises.

The TN793B circuit pack, along with a TN755B neon power circuit pack supports on-premise telephones that are equipped with neon message waiting indicators. The TN793B supports three ringer loads, only one telephone can have an **LED** or neon message waiting indicator. The TN793B circuit pack allows a maximum of 12 simultaneous ports ringing; four on ports 1 through 8, four on ports 9 through 16, and four on ports 17 through 24.

The TN793B circuit pack supports A- and  $\mu$ -law companding and administrable timers. The TN793 circuit pack supports queue warning level lights associated with the DDC and the UCD features, recorded announcements associated with the Intercept Treatment feature, and PagePac paging system for the Loudspeaker Paging feature. Additional support is provided for external alerting devices that are associated with the TAAS feature, neon message waiting indicators, and modems. The TN793B also supports secondary lightning protection. The TN793B provides -48 V DC current in the off-hook state. Ringing voltage is -90 VDC.

The following table lists the TN793B-supported telephones and shows each of their wiring sizes and ranges.

Telephone	Wire size (AWG)	Maximum range (feet)
500-type	24 (0.2 mm <sup>2</sup> /0.5 mm)	20,000 (6,096 m)
2500-type	24 (0.2 mm <sup>2</sup> /0.5 mm)	20,000 (6,096 m)
6200-type	24 (0.2 mm <sup>2</sup> /0.5 mm)	12,000 (3,657 m)
7100-series	24 (0.2 mm <sup>2</sup> /0.5 mm)	20,000 (6,096 m)
8100-series	24 (0.2 mm <sup>2</sup> /0.5 mm)	12,000 (3,657 m)
9100-series	24 (0.2 mm <sup>2</sup> /0.5 mm)	12,000 (3,657 m)

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## TN797 Analog Trunk or Line Circuit Pack (8 ports)

Provides a combination 8-port analog trunk and line circuit pack for the United States, Canada, and other countries that have the same analog standards. The TN797 circuit pack provides you with the capability to administer any of the eight ports as a loop start of ground start CO trunk, a CAMA E911 trunk, a wink- or immediate-start DID trunk, or as an on or off-premises analog line with or without LED Message Waiting Indication. It does not support ICLID on the analog trunk to the CO, nor Caller ID on the line side to the telephone.

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## TN799DP Control LAN (C-LAN) Interface

The TN799DP control LAN (C-LAN) interface provides TCP/IP connectivity over Ethernet or Point to Point Protocol (PPP) to adjuncts such as Avaya CMS, INTUITY AUDIX, DCS, printers, call detail recording (CDR), and property management systems (PMS). The C-LAN is required to support the TN2302AP IP Media Processor for H.323 functionality, and to support ATM interfaces and WAN PNC.

The C-LAN operates at 10 or 100 Mbps and full or half duplex, both of which are administrable. The C-LAN provides connectionless UDP sockets for IP solutions support. The C-LAN will also support 500 remote sockets, with support for 4-Kbyte UDP sockets. The C-LAN supports variable-length ping and the **tracert** and **netstat** network testing commands.

The C-LAN circuit pack provides call control for every IP endpoint that is connected to the S8700/S8710 Media Server using the G600 Media Gateway. A maximum number of 64 C-LANs can be used for each configuration. The number of C-LANs that are required depends on the number of devices that are connected as well as the options that are being utilized by the endpoint. It might be advantageous to segregate IP voice control traffic from device control traffic as a safety measure.

To determine the default value for C-LAN socket usage of H.323 Tie Trunks divide the total number of H.323 Tie Trunk that use sharing by 31. Each IP endpoint requires the use of some number of C-LAN sockets, which is the software object that is used to connect a C-LAN to the IP Network. The C-LAN circuit pack supports a maximum of 500 sockets.

The C-LAN differs from an IP Media Processor in that the C-LAN controls the call and the IP Media Processor provides the codecs that are used for the audio on the call.

To take download firmware there must be at least one C-LAN and access to the public Internet.

Downloads and instructions have been posted to:

<http://www.avaya.com/support/>

Click on Online Services and then Download Software needed.

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## TN801B MAPD (LAN Gateway Interface)

The TN801 LAN gateway interface is part of the Multiapplication Platform DEFINITY (MAPD). It allows direct integration of PC-based application into the switch. The TN801 circuit pack works as the interface for solutions such as CTI, CallVisor and PC/LAN. The TN801 circuit pack provides packet bus and TDM-bus interfacing, physical mounting for a CPU, external interfaces, and mapping of circuit-switched connections between the TDM bus and the expansion circuit pack.

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## TN802B MAPD (IP Interface Assembly)

The TN802 IP interface circuit pack is still supported, but has been replaced with the [TN2302AP IP Media Processor](#) on page 235. The IP trunking software runs on an embedded PC that runs Windows NT. The TN802 circuit pack supports IP Solutions including IP trunking and MedPro (H.323) with IP softphones.

The TN802 IP Interface operates in two modes: IP Trunk and Media Processor (MedPro/H.323). The TN802 defaults to IP Trunk mode. To use it in MedPro mode, you activate it through administration to use the H.323 trunking feature related to IP softphones.

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## TN1654 DS1 Converter, T1 (24 channels) and E1 (32 channels)

### Note:

This circuit pack is not used in a G650 Media Gateway.

The TN1654 converter installs in place of the conventional fiber and supports from one to four T1 or E1 facilities, providing a total of 92 T1 channels, or 120 E1 channels, in each direction between the center stage switch (CSS) and a port network (PN). This capacity is enough for the PN to easily support several hundred stations.

The switch architecture provides for PNs that are remotely located from the CSS. A PN within five miles (8 km) of the CSS may be coupled using multimode fiber-optic cable or within 22 miles (35.4 km) of the CSS using single-mode fiber-optic cable. Connect using a DS1 converter complex when the distance between the CSS and an PN exceeds five miles (8 km) for multimode cable, or 22 miles (35.4 km) for single-mode cable, or private right-of-way is unavailable. One DS1 circuit pack is placed on each end of the DS1 converter complex.

The TN1654 DS1 converter requires a new set of Y-cables to connect to a TN570D Expansion Interface circuit pack.

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## TN1655 Packet Interface

The TN1655 packet interface provides the communication path between the SPE and the packet bus in the **PPN for DEFINITY R configurations**. The packet bus connects to EI circuit packs in the PPN that communicate with EPNs and the CSS.

The TN1655 provides the link access procedure on the D channel (**LAPD**) for up to 8,192 links at a sustained rate of 2 Mbps. The link access is the digital multiplexed interface (**DMI**) mode-3 terminations of communication links across the packet bus that link to the processor circuit pack. Some data communication will use the X.25 data phase protocol at level 3.

The TN1655 provides termination for **ISDN-BRI** and **ISDN-PRI** signaling links, expansion archangel links that connect the processor to the expansion archangels on **EI** circuit packs in

## Circuit packs and power supplies

each **PN**, and center stage control network links that connect the processor with **SNI** circuit packs in the **CSS**.

The TN1655 supports firmware downloading. It also provides X.25 termination to the **DCS** links and to adjuncts such as CDR and **AUDIX**.

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### TN2138 Central Office Trunk (8 ports)

The TN2138 central office trunk circuit pack provides eight analog loop start **CO** trunk ports for Italy. Each port has a tip and ring signal lead. The TN2138 has 50-Hz, 12-kHz, and 16-kHz periodic pulse metering (**PPM**).

---

### TN2139 Direct Inward Dialing Trunk(8 ports)

The TN2139 direct inward dialing trunk for Italy provides eight analog direct inward dialing (**DID**) trunk ports for analog **DID** signaling. Each of the eight ports has a tip and ring signal lead.

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### TN2140B Tie Trunk (4-wire, 4 ports)

The TN2140B tie trunk is used in Hungary and Italy. The TN2140B provides four ports for 4-wire E&M lead signaling tie trunks. The TN2140 provides continuous E&M signaling and discontinuous E&M signaling. Administrable A- and  $\mu$ -Law companding and standard Type 1 and Type 5 signaling is provided. The TN2140B is required for Hungary.

---

### TN2146 Direct Inward Dialing Trunk (8 ports)

**Note:**

This circuit pack is not used in a G650 Media Gateway.

The TN2146 provides eight analog **DID** trunk ports for Belgium and the Netherlands. Each of the eight ports has tip and ring signal lead. The TN2146 uses four Dual Subscriber Line Audio processing Circuits (DSLACs). One DSLAC is used for each pair of ports. The circuits are administered to meet trunk transmission characteristics. The DSLACs can be set to either a resistive or complex balance impedance in the voice or **AC** talk path on the trunk interfaces. The DSLACs convert analog signals to digital signals and vice-versa to match the analog **DID** trunks to the system's digital **TDM** bus. The TN2146 circuit pack can provide either A-Law or  $\mu$ -Law companding.

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## TN2147C Central Office Trunk (8 ports)

The TN2147 has eight analog **CO** trunk ports. Each port has tip and ring signal leads. The TN2147 uses four (1 for each pair of ports) Dual Subscriber Line Audio processing Circuits (DSLACs) to be administered to meet a given transmission and impedance requirement. The DSLACs convert analog signals to digital signals and digital signals to analog signals to interface the analog CO trunks to the system's digital **TDM** bus.

The TN2147C provides multicountry signaling based on trunk type of either: loop-start, ground start, or battery reverse loop-start.

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## TN2181 DCP Digital Line (2-wire, 16 ports)

The TN2181 circuit pack has 16 DCP ports that can connect to 2-wire terminals such as the 6400-, 8400-, and 9400-series digital telephones and the 302C and 302D attendant console. The maximum range of the 8400- and 9400-series terminals using 24-AWG (0.5 mm) wire is 3,500 feet (1067 m).

The TN2181 circuit pack supports either A- or  $\mu$ -Law companding. The TN2181 also supports 8400-series data modules.

---

## TN2182 Tone Clock, Tone Detector, and Call Classifier (8 ports)

### Note:

This circuit pack is not used in a G650 Media Gateway.

The TN2182 tone clock integrates the tone generator, tone detection-call classifier, system clock, and synchronization functions onto one circuit pack for all system-reliability configurations. The TN2182 supports 8 ports for tone detection and allows gain or loss applied to **PCM** signals received from the bus. The TN2182 provides stratum-4 enhanced clock accuracy, supports MFC signaling (such as Russia MF), supports Russia MFR (multifrequency shuttle register signaling), and supports A- and  $\mu$ -Law companding.

The TN2182 provides continuous cadenced and mixed tones, allows administrable setting of tone frequency and level, detects 2025-Hz, 2100-Hz, or 2225-Hz modem answerback tones, and provides normal and wide broadband dial-tone detection.

In most configurations, the 2- or 3-circuit pack combination of tone generator, tone detector, and/or call classifier can be replaced with this one circuit pack to free one or two port slots.

Use the TN2182 circuit pack with the TN429D analog line central office trunk for CAMA/E911 and ICLID. A TN2182 is required for the on-board tone detection or for additional tones to support CCRON, Russian ANI, and others.

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## TN2183/TN2215 Analog Line for multiple countries (16 ports)

See [TN2215/TN2183 Analog Line for Multiple Countries \(16 ports\) \(International Offers or US and Canada Offer B only\)](#) on page 234.

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## TN2184 DIOD Trunk (4 ports)

**Note:**

This circuit pack is not used in a G650 Media Gateway.

The TN2184 is a Direct Inward/Outward Dialing (**DIOD**) trunk circuit pack used for Germany. The TN2184 circuit pack contains four port circuits. Each circuit interfaces a 2-wire analog **CO** trunk with the **TDM** switching network of the system. Each port allows incoming calls and outgoing calls to include addressing information that is being received from the **CO** for incoming calls and addressing information that is being sent to the **CO** for outgoing calls. The TN2184 detects periodic pulse metering (**PPM**) signals for call-charge accounting on outgoing calls.

The TN2184 combines the features of both a **CO** trunk and a DID trunk to provide both outgoing and incoming calls with addressing information in both directions.

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## TN2185B ISDN-BRI S/T-TE Interface (4-wire, 8 ports)

The TN2185B supports eight 4-wire ISDN BRI line S interfaces. Each interface operates at 192 kbps, with two B channels (64 kbps) and one D channel (16 kbps). The TN2185B interfaces to the LAN bus and to the TDM bus to provide the TE side of the BRI interface.

The TN2185B is similar to the TN2198 except that the TN2185B is a 4-wire S-interface instead of a 2-wire U-interface. Another difference is the function of the SCOTCH/NPE and SAKI are replaced by the network control element (NCE).

For each port, information communicates over two 64-kbps bearer channels called B1 and B2, and over a 16-kbps channel called the demand channel, or D channel. The D channel is used for signaling. Channels B1 and B2 can be circuit-switched simultaneously, or either of them may be packet-switched, but not both at once. The D channel is always packet-switched. The circuit-switched connections have a  $\mu$ -Law or A-Law option on a per-board basis, for voice operation and operate as 64-kbps clear channels when in the data mode. The packet-switched channels support the LAPD protocol. However, the TN2185B does not terminate on LAPD protocol. The S-interface does not support switching of both B channels together as a 128-kbps wideband channel.

The TN2185B has a maximum range up to 18,000 feet (5486 m) from the system to the NT1 device. In a environment with multiple telephones, the B channels are shared only on a per-call basis. For example, if Channel B2 is for data, then the use of this channel by one telephone excludes the others from having access to it. When a used device communicates over the D

channel to access B1 or B2, that channel is owned until the call is taken down. The D channel is always shared among the terminals. The TN2185B circuit pack can be used as an alternative to the TN464 circuit pack or the TN2464 circuit pack.

The ability of outpulse in-band DTMF signals or end-to-end signaling is supported by the TN2185B.

QSIG Call Completion is supported, however, QSIG Supplementary Services are not. ISDN-BRI trunks can be used as inter-PBX tie lines that use the QSIG peer protocol.

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## TN2198 ISDN-BRI U Interface (2-wire, 12 ports)

The TN2198 circuit pack allows connection to the **ANSI** standard 2-wire U-Interface. The 2-wire interface from the TN2198 connects to an NT1 network interface. The 4-wire interface on the other side of the NT1 may connect to one or two telephones. The TN2198 does not provide a trunk-side interface. Unlike the TN2185 circuit pack.

The TN2198 contains 12 ports that interface at the ISDN U reference point. For each port, information communicates over two 64-kbps bearer channels called B1 and B2, and over a 16-kbps channel called the demand channel, or D channel. The D channel is used for signaling. Channels B1 and B2 can be circuit-switched simultaneously. The D channel is always packet-switched. The TN2198 requires a packet control circuit pack. Each port supports one telephone, such as the 500 rotary dial analog telephone and 2500 DTMF dial telephones.

The D channel supports the **LAPD** protocol and is consistent with the CCITT Q.920 recommendations for D-channel signaling.

In an environment with multiple telephones, the B channels are shared only on a per-call basis. For example, if the B2 channel is used for data, then the use of B2 by one telephone excludes the other telephones from having access to it. When a device communicates over the D channel to access B1 or B2, that channel is owned until the call is taken. The D channel is always shared among the telephones. The TN2198 interfaces with the **TDM** bus and the packet bus in the switch backplane and terminates with 12 **ISDN** basic access ports.

The TN2198 has a maximum range of 18,000 feet (5486 m) from the system to the NT1 device and uses standard protocol **ANSI** T1.601. The TN2198 has a 160-kbps line rate, that consists of:

- Two bearer channels at 64 kbps each
- A D channel at 16 kbps
- Framing at 12 kbps
- Maintenance at 4 kbps

The TN2198 supports a maximum of 24 telephones or data modules.

The TN2198 is not offered as a BRI Tie Trunk.

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## TN2199 Central Office Trunk (3-wire, 4 ports)

The TN2199 central office trunk circuit pack is designed for use in Russia.

The TN2199 is a 4-port, 3-wire, loop-start trunk circuit pack that can be used as:

- A **DID** trunk
- A 2-way, 1-way incoming, or 1-way outgoing **CO** trunk

The TN2199 combines the functionality of a **DID** trunk and a 1-way outgoing **CO** trunk (**DIOD** trunk). To accomplish MF shuttle signaling, the TN2199 circuit pack must be combined with a TN744D Call Classifier circuit pack.

The TN2199 circuit pack supports incoming ANI.

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## TN2202 Ring Generator

The TN2202 ring generator circuit pack is designed for use in France.

The TN2202 ring generator circuit pack supplies 50-Hz ringing power. The TN2202 supplies balanced ringing, by a modified backplane, to telephones that connect to the TN2183 multi country analog line circuit pack when administered for France analog transmission.

The TN2202 plugs into the power unit slot and is required for each carrier that contains analog lines. A 1-lead modification is required in a carrier backplane that uses the TN2202. This modification is required for all products made for France. The TN2202 produces two symmetrical voltages (typically 28V RMS) with respect to ground, and takes -48 VDC, -5 VDC, and ground from the backplane and generates 2 x 28V RMS with added -48 VDC.

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## TN2207 DS1 Interface, T1 (24 channels) and E1 (32 channels)

**Note:**

This circuit pack is not used in a G650 Media Gateway.

The TN2207 circuit pack supports digital signal level 1 (**DS1**) rate (24-channel) and E1 rate (32-channel) digital facility connectivity. All TN2207 suffixes support **CO**, Tie, **DID**, and off-premises station (**OPS**) port types that use the following protocols:

- Robbed-bit signaling
- Proprietary bit-oriented signaling (**BOS**) 24<sup>th</sup>-channel signaling
- DMI-BOS 24<sup>th</sup>-channel signaling

The circuit packs also support ISDN-**PRI** connectivity **T1** or E1.

In a **24-channel DS1** mode, a DS1 interface is provided to the **DS1** facility. The TN2207 circuit packs provide board-level administrable A- and  $\mu$ -Law companding, CRC-4 generation and checking for E1 only, and stratum-3 clock capability.

The TN2207 provides test jack access to the **DS1** or E1 line and supports the 120A integrated channel-service unit (**CSU**).

All suffixes have line-out (LO) and line-in (LI) signal leads. The line-out and line-in leads are unpolarized balanced pairs.

The TN2207 has additional hardware to support direct cabling to a TN787 MMI circuit pack.

## TN2209 Tie Trunk (4-wire, 4 ports)

The TN2209 tie trunk was designed for use in Russia.

The TN2209 tie trunk has four ports used for Type 1 or Type 5 4-wire E&M lead signaling tie trunks. The tie trunks can be one of four types: automatic, immediate-start, wink-start, and delay-dial. The TN2209 provides an interface between these four frequency signaling tie trunk lines and the switch TDM network. Based on a TN760D each port has modified E&M signal leads for universal hardware compatibility. The TN2209 provides release link trunks required for the CAS feature and has administrable A- and  $\mu$ -Law companding.

## TN2214CP DCP Digital Line (2-wire, 24 ports)

The TN2214CP is designed to be used in the United States, Canada and international countries for offer B only.

The TN2214 has 24 DCP ports that can connect to 2-wire digital telephones such as 2400- and 6400-series telephones, the 302C and the 302D attendant console, and the Callmaster IV, V, and VI.

The TN2214 supports either A- or  $\mu$ -Law companding.

The following table lists the TN2214CP-supported telephones and shows each of their wiring sizes and ranges.

Telephone	Wire size (AWG)	Maximum range (feet)
302C/D console	24 (0.2 mm <sup>2</sup> /0.5 mm)	3,500 (1,067 m)
Callmaster-series	24 (0.2 mm <sup>2</sup> /0.5 mm)	3,500 (1,067 m)
2400-series	24 (0.2 mm <sup>2</sup> /0.5 mm)	3,500 (1,067 m)
6400-series	24 (0.2 mm <sup>2</sup> /0.5 mm)	3,500 (1,067 m)

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## TN2215/TN2183 Analog Line for Multiple Countries (16 ports) (International Offers or US and Canada Offer B only)

The TN2215 and the TN2183 analog line circuit pack is designed for international, United States and Canada for offer B only.

The TN2215 and the TN2183 provide 16 analog port interfaces. Each port supports one telephone, such as 500 (rotary dial) and 2500 telephones (**DTMF** dial) from a tip/ring pair. Each port also sends or receives signaling to and from a device, such as an analog telephone, answering machine, FAX and loop-start CO port. The TN2215 and the TN2183 provides rotary digit 1 recall, ground-key recall, and programmable flash timing. Additional support is provided for selectable ringing patterns, **LED** message waiting, and secondary lightning protection.

The TN2215 and TN2183 supports on-premises wiring with either touch-tone or rotary dialing and with or without the **LED** message waiting indicators. The TN2215 and TN2183 supports off-premises wiring with either **DTMF** or rotary dialing. **LED** message waiting indicators are not supported off-premises. Neon message waiting indicators are not supported.

A maximum of six to eight simultaneous ringing ports is allowed depending on the ringing cadence selected. The TN2215 and the TN2183 supports A- and  $\mu$ -Law companding and administrable timers.

The TN2215 and the TN2183 also supports balanced ringing. When balanced ringing is configured for France the TN2202 ring generator circuit pack must be used.

The TN2215 and the TN2183 supports **DTMF** sending levels appropriate for Avaya IVR.

The TN2215 and the TN2183 is impedance and gain selectable for multiple countries. For more information, contact your Avaya representative.

The following table lists the TN2215- and TN2183-supported telephones and shows each of their wiring sizes and ranges.

Telephone	Wire size (AWG)	Maximum range (feet)
500-type	24 (0.2 mm <sup>2</sup> /0.5 mm)	20,000 (6,096 m)
2500-type	24 (0.2 mm <sup>2</sup> /0.5 mm)	20,000 (6,096 m)
6200-type	24 (0.2 mm <sup>2</sup> /0.5 mm)	12,000 (3,657m)
7102A-series	24 (0.2 mm <sup>2</sup> /0.5 mm)	3,100 (945 m)
8100-series	24 (0.2 mm <sup>2</sup> /0.5 mm)	12,000 (3,657m)

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## TN2224CP DCP Digital Line (2-wire, 24 ports)

The TN2224CP has 24 DCP ports that can connect to 2-wire digital telephones such as the 6400-, 8400-, or 9400-series telephones and the 302C or 302D attendant console.

The TN2224 circuit pack supports either A-Law or  $\mu$ -Law companding.

The following table lists the TN2224-supported telephones and shows each of their wiring sizes and ranges.

Telephone	Wire size (AWG)	Maximum range (feet)
302C/D console	24 (0.2 mm <sup>2</sup> /0.5 mm)	3,500 (1,067 m)
Callmaster-series	24 (0.2 mm <sup>2</sup> /0.5 mm)	3,500 (1,067 m)
2400-series	24 (0.2 mm <sup>2</sup> /0.5 mm)	3,500 (1,067 m)
6400-series	24 (0.2 mm <sup>2</sup> /0.5 mm)	3,500 (1,067 m)

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## TN2242 Digital Trunk

The TN2242 digital trunk circuit pack supports versions of channel-associated signaling and ISDN-PRI signaling that are peculiar to the TTC private networking environment used in Japan. It supports the special line-coding and framing used on 2.048-Mbps Japanese trunks. The TN2242 connects the switch with other vendor equipment and with other DEFINITY switches via the TDM device that is commonly used throughout Japan for this purpose.

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## TN2301 Logic Switch

The TN2301 provides service to the customer when the link to the main processor fails or is severed, or when the processor or Center Stage Switch (CSS) fails. The TN2301 Survivable Remote Switch (SRS) circuit pack connects the EPN links (fiber or T1/E1) to the appropriate PPN for call processing. It does this under control of the TN775C Maintenance circuit pack which monitors the health of the expansion interface TN570B.

The TN2301 logic switch circuit pack is not used in an ATM-PNC.

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## TN2302AP IP Media Processor

The TN2302AP provides VoIP audio access to the switch for local stations and for outside trunks. The TN2302AP can perform echo cancellation, silence suppression, and DTMF

## Circuit packs and power supplies

detection. The TN2302AP is the H.323 audio platform, includes a 10/100 BaseT Ethernet interface, and is firmware downloadable.

The TN2302AP provides audio processing for between 32 and 64 voice channels, depending on the CODECs in use. The TN2302AP supports hairpin connections and shuffling of calls between TDM connections and IP-to-IP direct connections.

The TN2302AP also supports transport of the following:

- Teletypewriter device (TTY) tone relay over the Internet
- Faxes over a corporate IP intranet

**Note:**

The path between endpoints for fax transmissions must use Avaya telecommunications and networking equipment.



**SECURITY ALERT:**

Faxes sent to non-Avaya endpoints cannot be encrypted.

- T.38 Fax over the Internet (including endpoints connected to non-Avaya systems)
- Modem tones over a corporate IP intranet

**Note:**

The path between endpoints for modem tone transmissions must use Avaya telecommunications and networking equipment.

See the Administrator's Guide for Avaya Communication Manager, 555-233-506 for more information.

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## TN2305B ATM-CES Trunk/Port-Network Interface for multimode fiber

The TN2305 provides an ATM-based replacement for the [TN570D Expansion Interface](#). The interface uses OC-3c or STM-1 155-Mbps multimode fiber. The TN2305 supports both trunk and port-network connectivity. As a trunk, the TN2305 uses Circuit Emulation Service (CES) to emulate up to eight ISDN-PRI trunks on an ATM facility. As a port-network expansion interface, the TN2305 connects port networks to an ATM switch that provides port-network connectivity. The TN2305 provides echo cancellation.

The TN2305 does not support hybrid port networks that use both ATM and CSS simultaneously. TN2305s must connect all port networks through the ATM switch. Direct connect EPNs are not supported. Category B offers are not supported.

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## TN2306B ATM-CES Trunk/Port-Network Interface for single-mode fiber

The TN2306 circuit pack has the same features as the [TN2305B ATM-CES Trunk/Port-Network Interface for multimode fiber](#) but supports single-mode fiber. The TN2306B is not available with Category B offers.

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## TN2308 Direct Inward Dialing Trunk (8 ports)

The TN2308 uses eight ports for immediate- or wink-start direct inward dialing (**DID**) trunks for Brazil. Each port has tip and ring signal leads.

The switch requires the TN2308 to support Brazil Block Collect Call. The TN2308 transmission characteristics comply with Brazilian telecom standards for PBXs.

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## TN2312BP IP Server Interface

The TN2312BP IP Server Interface (IPSI) provides environmental maintenance and is the only IP server interface that is supported in the G650. A TN2312BP IPSI placed in a G650 with a carrier address set to A acts as the I<sup>2</sup>C bus master. (A TN2312BP IPSI can only be placed in a G650 with a carrier address set to A or B. Only a TN2312BP IPSI in a G650 with a carrier address set to A can function as an I<sup>2</sup>C bus master).

The TN2312BP IPSI is backward compatible with other media gateways, but provides environmental maintenance only when used in a G650. The TN2312BP IPSI always provides tone detection, call classification, tone generation, and clock functions.

When the TN2312BP IPSI is used in an MCC1 or SCC1, a TN755D provides the environmental maintenance.

The TN2312BP IPSI provides environmental maintenance for the G650. This includes:

- Power supply, cabinet, and ring generator maintenance
- External device alarm detection
- Emergency transfer control
- Customer-provided alarm device control

The TN2312BP IPSI and the 655A power supply provide the following information to the G650:

- **Environment maintenance**
  - Inlet temperature – Inlet temperature of the G650 (sensor is in the 655A power supply)
  - Exhaust temperature – G650 carrier exhaust air sensor

## Circuit packs and power supplies

- Hot Spot temperature status – 655A power supply sensor
  - Voltage
    - +5VDC
    - 5VDC
    - 48VDC
  - Fan Control – The speed at which the fans are operating:
    - Undr – indicates that the fan voltage is under 12VDC.
    - Mid (normal) – indicates that the fan voltage is +12VDC.
    - High – indicates that the fan voltage is +14VDC.
    - Over – indicates that the fan voltage is above 14 to 15VDC.
  - Fan Alarm – Detection of a blocked or failed fan
  - Ring Status – OK, overload, shorted, or failed
  - Ring Control – Active, standby, disabled, off (shorted or failed)
  - Ringer Setting – 20Hz, 25Hz, or other
  - Ring Detection – Reports if the power supply detects ring on the backplane ring leads
  - Input Power – Indicates the type of power present and in use, AC or DC
- **External device alarm detection**

The external device alarm detection uses two external leads. External devices such as an uninterruptible power supply (UPS) or voice messaging system can use these leads to generate alarms using the Avaya Communication Manager alarm reporting capability. Ground potential on either of these leads results in an alarm being generated. You can administer the alarm level (major, minor, or warning), product ID, alternate name, and alarm description for each lead.

- **Emergency transfer control**

Emergency transfer control provides -48VDC to operate an external emergency transfer panel. The Communication Manager controls the state of the emergency transfer. (Note that, in the past, hardware boards or alarm panels provided a 3-position physical switch to control emergency transfer.)

You can use the following Communication Manager SAT commands for emergency transfer:

- set emergency-transfer on|off|auto – Use this to set emergency transfer to **on** (not in emergency transfer), **off** (in emergency transfer), or **auto** (emergency transfer is controlled by Communication Manager).
- status cabinet nn – Use this to verify the current setting of emergency transfer.

When the emergency transfer is set to other than **auto** an alarm is generated.

- **Customer-provided alarm device (CPAD) control**

CPAD provides a contact closure across a pair of external leads that can be used to control a customer-provided alarm device or an alarm indicator. The level of alarm (major, minor, warning, or none) that causes a contact closure can be administered system wide. When the alarm level matches the alarm level that was administered, the TN2312BP IPSI closes this contact for all G650s with a carrier address set to A. When the TN2312BP IPSI is in emergency transfer, this contact is closed to activate the CPAD.

- **Tone Detection / Call Classification**

The TN2312BP IPSI provides eight ports of tone detection and call classification. The TN2312AP IPSI provides the same.

- **Tone/Clock functions**

The TN2312BP generates tones and provides clock functions for the port network in which it is placed. This functionality is equivalent to the TN2182B Tone/Clock circuit pack.

## I/O adapters

The TN2312BP IPSI requires a new adapter that provides for the alarm input, CPAD, and emergency transfer leads. This adapter, like the existing TN2312AP IPSI adapter, also allows the IPSI Ethernet connection to be made to the back of the IPSI slot.

## Compatibility

The TN2312BP IPSI can replace the TN2312AP IPSI in the SCC1, MCC1, CMC1, and G600. However, the TN2312PB IPSI acts only as a tone clock for these media gateways. It does not provide environmental maintenance.

When the TN2312BP is installed in a CMC1 or G600 media gateway with Communication Manager 2.0 cabinet environment maintenance is provided by monitoring of the AuxSig backplane lead. This lead is asserted if a failure is detected in either the power supply or fan assembly. The CMC1 and G600 are only supported in an IP connect configuration with Communication Manager 2.0.

See the following table for IPSI and media gateway compatibility.

Media Gateway	Communication Manager 1.x	Communication Manager 2.0	DEFINITY R10	Environmental maintenance provided by:
SCC1	Yes	Yes	Yes	TN775D
MCC1	Yes	Yes	Yes	TN775D
CMC1		Yes		Monitoring the AuxSig backplane lead

## Circuit packs and power supplies

Media Gateway	Communication Manager 1.x	Communication Manager 2.0	DEFINITY R10	Environmental maintenance provided by:
G600		Yes		Monitoring the AuxSig backplane lead
G650		Yes		TN2312BP IPSI

## Number of IPSI circuit packs per configuration

For configurations where voice bearer is over CSS or ATM, each IPSI typically controls five port networks by tunneling control messages over the bearer network to PNs that do not have IPSIs. An IPSI cannot be placed in:

- A PN that has a Stratum-3 clock interface
- A remote PN that is using a DS1 converter
- A Survivable Remote Expansion Port Network (SREPN)

To determine the number of IPSI-connected PNs that are recommended to support a S8700/S8710 configuration divide the total number of PNs in the configuration by five and add one. The additional IPSI provides fault tolerance.

For example, if you have 20 PNs, divide 20 by 5 to get 4, then add 1. You need a minimum of five IPSIs to support the 20 PNs.

For configurations where voice bearer is over IP, there must be one IPSI in each PN.

A direct connect configuration only supports one IPSI connected PN.

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## TN2313AP DS1 Interface (24 channels)

The TN2313AP DS1 port board interfaces a DS1 trunk to the switch backplane via port slots that are standard for DEFINITY products. The TN2313AP is compatible with previous 24-channel DS1 circuit packs, including the TN464F (V19 and below), the TN2464 (V19 and below), and the TN767E DS1, except that it does not provide for packet adjunct capabilities. The TN2313AP supports a variety of applications, including networking of DEFINITY switches, international trunk types, video teleconferencing, and wideband data transmission.

On S8500, S8700, and S8710 Media Servers, this circuit pack does not directly support D-channel signaling and thus does not directly support ISDN-**PRI** connectivity. However, the TN767 circuit may indirectly support D-channel signaling provided that the central office supports non-facility associated signaling (NFAS). In this case, you use NFAS administration on the server to associate the D-channel of another T1/E1 circuit pack (normally a TN464) with the TN767 circuit pack.

The TN2313AP DS1 interface can be configured as 24 channels at 1.544 Mbps. The TN2313 can supply two 8-kHz reference signals to the switch backplane for optional use by the tone clock board in synchronizing the system clock to the received line clock.

The TN2313AP is firmware downloadable.

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## TN2314 S8100 Media Server

The S8100 Media Server supports voice stations with co-resident voice switching, voice and FAX messaging and system applications run on a Microsoft Windows 2000 operating system. The communication between the firmware and the software is done by an Ethernet connection. An Intel processor Message Link (IML) is the Ethernet control link between the Pentium processor and the MPC860 processor. The link allows for the message-based communication between the two processors.

The S8100 Media Server has the following characteristics:

- Processor – The processor is a 500-MHz Pentium III.
- RAM – There are two slots for SDRAM memory modules, with a minimum of 256-MB of RAM and a maximum of 512-MB of RAM.
- Front panel ethernet access – Services can access the switch via an RJ45 Ethernet jack on the circuit pack faceplate.
- Hard disk – The circuit pack has a 20-GB hard disk.

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## TN2401 Network Control/Packet Interface for SI

The TN2401 network control and packet interface is used with DEFINITY SI only.

The TN2401 Net/Pkt interface circuit pack provides the network control interface (NETCON), the packet interface (PACCON), and, if BX.25 connectivity is not required, the processor interface (PI). The TN2401 provides eight asynchronous data channels. The TN2401 does not include modems. The TN2401 is required for the SI model to save translations to the 5-volt ATA flash memory card.

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## TN2401/TN2400 Network Packet Interface complex assembly for SI upgrades

The TN2401/TN2400 network packet interface complex provides:

- A network control interface (NETCON)
- A packet interface (PACCON)

## Circuit packs and power supplies

- A processor interface (PI) if BX.25 connectivity is not required
- Eight asynchronous data channels

The TN2401/TN2400 does not include modems.

The TN2401/TN2400 is required for the SI model to save translations to the 5-volt ATA flash memory card.

The TN2401/TN2400 complex and the TN2404 processor is required for the following upgrades:

- A G1 or G3iV1 MCC1 with a TN773 Processor
- An SI system with a TN786B Processor when reusing the existing control carrier cabinet
- An SI system with a TN790 or 790B Processor. Any R5 or R6 system will have the old control carrier backplane and will require the TN2401/TN2400. For R7 and R8 systems, it is possible to have the old control carrier backplane or the new control carrier backplane. The backplane type must be verified before the upgrade order is placed so that the right characteristic selection can be made. If the type of carrier is not known, a visual inspection of the R7 or R8 system will be required. The old backplane is being used if the system has a TN794/TN2400 in the Network Control and Packet Control Slots. If nothing is in the Packet Control Slot the new backplane exists.

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## TN2402 Processor

The TN2402 processor platform runs at 25 MHz. The TN2402 includes a 32-bit RISC CPU complex and a maintenance processor complex that provides serial communications and maintenance functions for DEFINITY CSI. In addition, the TN2402 also terminates ISDN LAPD signaling over the TDM bus from PRI and BRI trunk circuit packs.

The RISC CPU complex provides four to 32 MB of Flash PROM. The DRAM is provided via one SIMM. The TN2402 contains 32 MB of DRAM. The flash is not interleaved. The TN2402 processor does not provide X.25 communications or a duplication option. The TN2402 does not contain an on-board modem. Instead, an external modem must be connected to the RS-232E port that was previously used for the internal modem.

The TN2402 is required for the CSI model to save translations to the 5-Volt ATA flash memory card.

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## TN2404 Processor

The TN2404 processor circuit pack has 32 MB of DRAM memory and flash memory. The TN2404 processor for DEFINITY SI is designed to handle errors that are associated with the EM-BUS and must be used with the C-LAN (TN799) and the Net/Pkt (TN2401) in DEFINITY SI configurations.

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## TN2464BP DS1 Interface with Echo Cancellation, T1/E1

The TN2464BP DS1 circuit pack is designed for international use in both category A and category B. The TN2464BP has echo cancellation circuitry and firmware download capability. The TN2464BP supports T1 (24-channel) and E1 (32-channel) digital facilities. In ISDN-PRI applications, the ISDN D channel connects the [TN1655 Packet Interface](#) via the LAN bus. The TN2464BP has the same functionality as the TN464GP, which is for US and Canada offers only.

The TN2464BP circuit pack provides:

- Test jack access to the T1/E1 line
- Board-level administrable A- $\mu$ -Law companding
- CRC-4 generation and checking (E1 only)
- Stratum-3 clock capability
- Support for the 120A channel service unit module
- **CO**, TIE, **DID**, off-premises station (**OPS**) port types that use robbed-bit signaling protocol, proprietary bit-oriented signaling (**BOS**) 24<sup>th</sup>-channel signaling protocol, or DMI-BOS 24<sup>th</sup>-channel signaling protocol
- Unpolarized, balanced-pair, line-out (LO) and line-in (LI) signal leads
- Support for Russian incoming ANI
- Support for the enhanced maintenance capabilities of the enhanced integrated channel service unit (**ICSU**)
- Support for Avaya IVR
- Channel-associated signaling protocols for many countries (for details, contact your Avaya representative)

The TN2464BP can be updated using the firmware download feature, which requires use of the TN799 C-LAN interface.

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## TN2501AP Voice Announcements over LAN (VAL)

The TN2501AP is an integrated announcement circuit pack that:

- Offers up to 1 hour of announcement storage capacity
- Provides shorter backup and restore times
- Is firmware downloadable
- Plays announcements over the TDM bus, similar to the TN750C circuit pack
- Has 33 ports, including

## Circuit packs and power supplies

- One dedicated telephone access port for recording and playing back announcements using port number 1
- One Ethernet port using port number 33
- 31 playback ports using ports 2 through 32
- Uses a 10-/100-Mbps ethernet interface to allow portability of announcements and firmware files over LAN
- Uses announcement files that are in ".wav" format (CCITT A- and  $\mu$ -law, 8 kHz, 8-bit mono)

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## TN2793B Analog Line with Caller ID (24 ports)

The TN2793B is a dual coded, analog line 24-port circuit pack. Each port supports one telephone, such as the rotary dial 500 telephone and the DTMF dial 2500 telephones.

The TN2793B supports on-premises wiring with either touch-tone or rotary dialing and with or without the **LED** and neon message waiting indicators. The TN2793B supports off-premises wiring with either **DTMF dialing** or rotary dialing. **LED** or neon message waiting indicators are not supported off-premises.

Along with a TN755B neon power unit per carrier or per single-carrier cabinet, the TN2793B supports telephones equipped with neon message waiting indicators (on-premises use only). The TN2793B supports three ringer loads, only one telephone can have an **LED** or neon message waiting indicator. The TN2793B allows a maximum of 12 simultaneous ports ringing; four on ports 1 through 8, four on ports 9 through 16, and four on ports 17 through 24.

The TN2793B supports A- and  $\mu$ -law companding and administrable timers. The TN2793B supports queue warning level lights associated with the DDC and the UCD features, recorded announcements associated with the Intercept Treatment feature, and PagePac paging system for the Loudspeaker Paging feature. Additional support is provided for external alerting devices associated with the TAAS feature, neon message waiting indicators, and modems. The TN2793B also supports secondary lightning protection. The TN2793B provides -48 VDC current in the off-hook state and -90 VDC ringing voltage.

The following table lists the TN2793B-supported telephones and shows each of their wiring sizes and ranges.

Telephone	Wire size (AWG)	Maximum range (feet)
500-type	24 (0.2 mm <sup>2</sup> /0.5 mm)	20,000 (6,096 m)
2500-type	24 (0.2 mm <sup>2</sup> /0.5 mm)	20,000 (6,096 m)
6200-type	24 (0.2 mm <sup>2</sup> /0.5 mm)	12,000 (3,657 m)

Telephone	Wire size (AWG)	Maximum range (feet)
7102A-series	24 (0.2 mm <sup>2</sup> /0.5 mm)	20,000 (6,096 m)
8100-series	24 (0.2 mm <sup>2</sup> /0.5 mm)	12,000 (3,657 m)

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## TNCCSC-1 PRI to DASS Converter

The TNCCSC-1 circuit pack converts **ISDN-PRI** to a DASS interface. DASS is a 2-Mbps interface that uses a 75-Ohm coaxial transmission facility. One TNCCSC-1 circuit pack can support up to two TN464 **DS1** interface circuit packs. A Y-cable and an 888B 75-Ohm coaxial adapter connect to the public network facility.

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## TNCCSC-2 PRI to DPNSS Converter

The TNCCSC-2 circuit pack converts **ISDN-PRI** to a DPNSS interface. DPNSS is a 2-Mbps interface that uses a 75-Ohm coaxial transmission facility. One TNCCSC-2 circuit pack can support up to two TN464 **DS1** interface circuit packs. A Y-cable connects to the public network facility.

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## TNCCSC-3 PRI to DPNSS Converter

The TNCCSC-3 circuit pack is the same as the TNCCSC-2 circuit pack with a 120-Ohm twisted pair interface.

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## TN-C7 PRI to SS7 Converter

The TN-C7 Provides a gateway interface between the TN464 circuit pack and the public signaling network. The TN-C7 integrates DASS, DPNSS and SS7 into a single board type. The TN-C7 supports international service provider call center customers. It is not designed for operation in the US or Canada.

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## TN-CIN Voice, FAX and Data Multiplexer

The TN-CIN Provides QSIG and private networking transparency on demand across a switched network. The TN-CIN integrates up to three G.728 LD-CELP voice or FAX circuits, six CAFT voice or FAX and two data circuits over a single separate digital link. The three or six voice or

## Circuit packs and power supplies

FAX circuits are presented as a G.703 E1 data stream that uses either QSIG peer-to-peer or channel-associated signaling.

All voice or FAX circuits support low bit rate voice compression at 8 to 16 kbps when they use CAFT, or at 16 kbps when they use LD-CELP. LD-CELP voice compression supports FAX at V.29 (7200 bps). CAFT voice compression supports FAX at V.27ter (4800 bps). The Composite port supports V.11 and V.35 at speeds up to 128 kbps.

The TN-CIN features an on-demand voice networking mode for use with time-based communications links like ISDN. A high-speed data port using V.24 or V.11 or V.35 at up to 115.2 kbps synchronous or V.24 at up to 115.2 kbps asynchronous, that incorporates dynamic bandwidth allocation (variable data clocking) is available for data applications. A low-speed V.24 data port of up to 96 kbps synchronous or 57.6 kbps asynchronous is available for data applications.

# Media modules

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## MM312 DCP media module

The Avaya MM312 Media Module provides 24 Digital Communications Protocol (DCP) ports with RJ-45 jacks. The MM312 supports simultaneous operation of all 24 ports. Each port can be connected to a 2-wire DCP telephone. The MM312 does not support 4-wire DCP telephones.

**Note:**

The MM312 is not supported in the G700 Media Gateway.



The MM312 will support a loop length of 3500 feet over 0.5 mm (.02 in.) wire (24 AWG).

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## MM314 LAN media module

The Avaya MM314 Media Module provides:

- 24 Ethernet 10/100 Base-T Ethernet access ports with inline Power over Ethernet (PoE).
- One Gigabit Ethernet Small Form-Factor Pluggables (SFP) GigaBit Interface Converter (GBIC) slot which supports any of the following SFP GBICs: 1000-SX, 1000-LX, 1000-ELX or 1000-TX.

**Note:**

The MM314 is not supported in the G700 Media Gateway.

The MM314 supports 48V DC inline power provided over standard category 5 UTP cables (up to 100-m range) on each PoE port.

The MM314 features:

- Priority power budgeting with configurable priorities
- Automatic load detection on ports
- Automatic device discovery
- Enable/disable port powering option
- Port monitoring
- Automatic recovery from overload shutdown
- Automatic recovery from no-load shutdown

See the following figure for an example of the MM314.



---

## MM340 E1/T1 media module

The Avaya MM340 Media Module provides one WAN access port for the connection of an E1 or T1 WAN.

**Note:**

The MM340 is not supported in the G700 Media Gateway.

See the following figure for an example of the MM340.



---

## MM342 USP WAN media module

The Avaya MM342 Media Module provides one USP WAN access port. MM342 supports the following WAN protocols:

- EIA530
- V.35/ RS449
- X.21

For these connections, one of the following cables is necessary:

- Avaya Serial Cable DTE V.35 (USP to V.35)
- Avaya Serial Cable DTE X.21 (USP to X.21)

See the following figure for an example of the MM342.



**Note:**

The MM324 is not supported in the G700 Media Gateway.

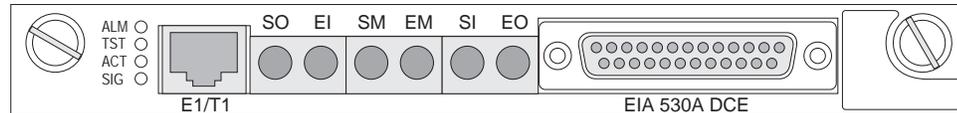
---

## MM710 T1/E1 media module

The Avaya MM710 Media Module terminates a T1/E1 connection. The MM710 has a built-in Channel Service Unit (CSU) so that an external CSU is not necessary. See the following figure for an example of the MM710.

---

**Figure 74: Avaya MM710 T1/E1 Media Module**



mmdc710 KLC 020402

---

**Note:**

The MM710 is supported in both the G700 and G350 Media Gateways.

Highlights of the MM710:

- Software selectable T1 or E1 operation
- An integrated CSU
- Both A-law (E1) and  $\mu$ -law (T1) gain control and echo cancellation ability
- D4, ESF, or CEPT framing
- ISDN PRI capability (23B + D or 30B + D)
- AMI, ZCS, B8ZS (T1) or HDB3 (E1) line coding
- Trunk signaling to support US and international CO or tie trunks
- Echo cancellation in either direction
- Fractional T1 support
- An OIC DB 25-pin interface
- A Bantam loopback jack that is used for testing of T1 or E1 circuits.

The MM710 supports the universal DS1 that conforms to the ANSI T1.403 1.544 Mbps T1 standard and to the ITU-T G.703 2.048 Mbps E1 standard.

**Note:**

The MM710 does not support Code Mark Inversion line coding used in Japan.

---

## Echo cancellation

The MM710 can cancel echoes in either direction for any DS0. The MM710 can cancel echoes with tail-end delays up to 96 milliseconds. It is compatible with either A- or  $\mu$ -law code.

---

## CSU function

The CSU functionality built into the MM710 has the following capabilities:

- Capable of long-haul or short-haul transmission
- Can receive signals as low as -36 dB
- Can compensate for distances up to 655 feet in short-haul operation
- Attenuation up to -22.5 dB can be programmed when driving repeaters for long-haul transmission.

---

## Loopback/BERT functions

The loopback/BERT functionality in the MM710 has the following characteristics:

- Provides a passive loopback for the far-end in an un-powered state
- Can be set up for line or payload loopbacks.
- Supports incoming and outgoing ESF FDL requests
- Can generate and respond to in-band loop up and loop down codes per ANSI-T1.403
- Supports the generation and detection of test patterns as well as injection of bit errors for Bit Error Rate Testing

---

## E1 impedance

By itself, the MM710 can be configured for balanced 120-ohm E1 operation. An external balun is required for 75-ohm unbalanced operation.

## Bantam jacks

Six bantam jacks on the faceplate provide access to the incoming and outgoing T1 signals or E1 signals:

- SM permits passive monitoring of the incoming line.
- EM permits passive monitoring of the outgoing line.
- SO permits intrusive monitoring of the incoming signal from the network. When used, the SO jack breaks the connection of that signal to the framer.
- EI permits injection of a signal towards the framer. When used, the EI jack isolates the network Rx signal.
- SI permits injection of a signal towards the network. When used, the SI jack isolates the framer Tx signal from going out to the network.
- EO permits intrusive monitoring of the signal from the framer. When used, the EO jack breaks the connection of that signal to the network jack, RJ48C.

---

## LEDs

Four LEDs are supported on the faceplate. These include the three standard Media Module LEDs and the SIG LED that indicates the MM710 Media Module is receiving a valid signal

---

## DB 25 DCE connector

This connector can be used to connect a DSU (data service unit) in a future release.

---

## Loopback jack

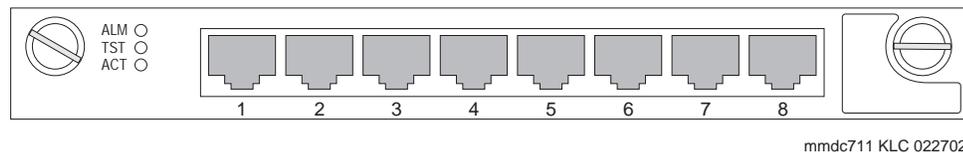
When your order a MM710, Avaya recommends that you include the optional 700A loop back jack. With the loop back jack installed you can loop back the T1 up to the network facility without a dispatch. If the MM710 is sold with an Avaya Service Agreement, the jack must be ordered and installed to save time and money on service calls.

The jack is typically used for CO trunk installations. The jack is inserted as close to the network or telco T1 facility as possible. When the jack is activated from the G700 Media Gateway, it sets up loopbacks in both directions. The G700 Media Gateway can then send and receive a test pattern to verify the function of the MM710 and T1 cable up to the network T1 facility. In normal operation, the jack passes the T1 signals through undisturbed in both directions.

## MM711 Analog media module

The Avaya MM711 Media Module provides analog trunk and telephone features and functionality. See the following figure for an example of the MM711.

**Figure 75: Avaya MM711 Analog Media Module**



**Note:**

The MM711 is supported in both the G700 and G350 Media Gateways.

The MM711 provides the administrator with the capability to configure any of the eight ports of this analog circuit pack as:

- A loop start or a ground start central office trunk
  - Loop current 18-60mA
- A wink start or a immediate start Analog Direct Inward Dialing (DID) trunk
- A 2-wire analog Outgoing CAMA E911 trunk, for connectivity to the PSTN
  - MF signaling is supported for CAMA ports
- Analog, tip/ring devices such as single-line telephones with or without LED message waiting indication

The MM711 Analog Media Module also supports:

- Three ringer loads (ringer equivalency number) for up to 2000 feet for all eight ports
- Up to eight simultaneously-ringing ports

**Note:**

The media gateway achieves this number of ports by staggering the ringing and pauses between two sets of up to four ports.

If it has more than four ports, the MM711 also supports:

- Type 1 caller ID and Type 2 caller ID
- Ring voltage generation for a variety of international frequencies and cadences

A hard-wired ground wire is added for each IROB-to-earth ground

---

## External interfaces: CO trunk side

The following requirements apply to the external interfaces on the CO trunk side:

- The tip and ring default input impedance is 600 ohms. The default impedance can be configured to accommodate other tip and ring impedances such as 900 ohms used in Brazil and the complex impedance that is used in the European Union.
- A hard-wired ground wire is added for each IROB-to-earth ground.
- The MM711 supports DTMF, MF, and Pulsing.
- The MM711 supports R2MFC address signaling, and provides -48 VDC for ports that are set up as DID.
- CO trunk acceptable loop range is 18-60 mA
- The MM711 supports DIOD for Japan.

The following trunk types are supported:

- Loop start and ground start CO trunks
- DID
- CAMA

---

## Caller ID

The MM711 supports ICLID on analog CO loop-start trunks for all supported countries that require this feature. It supports Type 1 CID devices, and firmware signaling requirements are implemented on a per-port basis. The firmware supports these formats:

- Single Data Message Format (SDMF)
- Multiple Data Message Format (MDMF)
- Caller ID generation on Line Ports

The MM711 accommodates on-hook transmission, necessary to receive caller ID signals.

On an ICLID administered trunk, absence of ICLID information or error in transmission of ICLID information will not prevent the call from being terminated, with the exception of Japan.

---

## Analog line interface requirements

The MM711 provides pass through for FAX signals.

The MM711 supports analog telephone sets with:

- An impedance range of Rs: 215 to 300 ohms; Rp: 750 to 1000 ohms; Cp: 115 to 220pF
- A ringing frequency range of 20 Hz, 25 Hz, or 50 Hz
- A DC current range of 20 to 60 mA
- A hook flash range of 90 to 1000 ms

---

## Companding

MM711 allows for A- or  $\mu$ -law selection at installation. This is a software-selectable capability that applies to every port on the MM711.

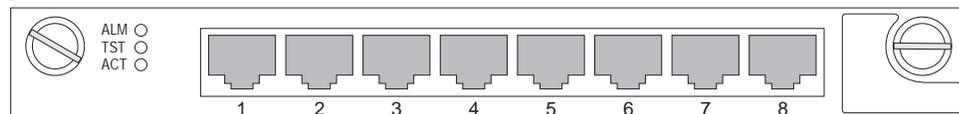
---

## MM712 DCP media module

The Avaya MM712 Media Module allows connectivity of up to eight 2-wire Digital Communications Protocol (DCP) voice terminals. See the following figure for an example of the MM712.

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**Figure 76: Avaya MM712 DCP Media Module**



mmdc712 KLC 022702

---

**Note:**

The MM712 is supported in both the G700 and G350 Media Gateways.

---

## Hardware interface

Signal timing specifications for the MM712 support TDM Bus Timing in receive and transmit modes. The G700 Media Gateway supplies only +5 VDC and –48 VDC to the MM712 Media Module. Any other required voltages must be derived on the module.

Loop range secondary protection is provided on the MM712. The MM712 is also self-protecting from an over current condition on a tip and ring interface. The MM712 will support a loop length of 3500 feet over 0.5 mm (.02 in.) wire (24 AWG).

---

## MM714 Analog media module

The Avaya MM714 Media Module provides four analog telephone ports and four analog trunk ports.

**Note:**

The four analog trunk ports can *not* be used for analog DID trunks. Instead, the four analog line ports must be used for analog DID trunks.

See the following figure for an example of the MM714.



**Note:**

The MM714 is supported in both the G700 and G350 Media Gateways.

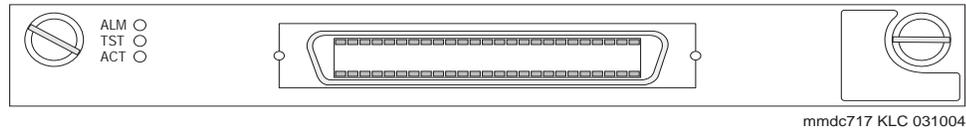
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## MM717 DCP media module

The Avaya MM717 Media Module provides 24 Digital Communications Protocol (DCP) ports connected through an RJ21X Amphenol connector. The MM717 supports simultaneous operation of all 24 ports. Each port can be connected to a 2-wire DCP telephone. The MM717 does not support 4-wire DCP telephones.

---

**Figure 77: Avaya MM717 DCP Media Module**




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**Note:**

The MM717 is supported in both the G700 and G350 Media Gateways.

---

## Hardware interface

Signal timing specifications for the MM717 support TDM Bus Timing in receive and transmit modes. The G700 and G350 Media Gateways supply only +5 VDC and -48 VDC to the MM717 Media Module.

Loop range secondary protection is provided on the MM717. The MM717 is also self-protecting from an over current condition on a tip and ring interface. The MM717 will support a loop length of 3500 feet over 0.5 mm (.02 in.) wire (24 AWG).

The MM717 Media Module connects to the wall field or breakout box using a B25A unshielded 25-pair cable.

---

## MM720 BRI media module

The Avaya MM720 Media Module contains eight ports that interface to the central office at the ISDN T reference point. Information is communicated in two ways:

- Over two 64-kbps channels called B1 and B2
  - Can be circuit-switched simultaneously
- Over a 16-kbps channel called the D channel
  - Used for signaling
  - Occupies one time slot for all eight D channels

The circuit-switched connections have an A- or  $\mu$ -law option for voice operation. The circuit-switched connections operate as 64-kbps clear channels when in the data mode.

**Note:**

The MM720 is supported in both the G350 and the G700 Media Gateways.

The MM720 does not support the following:

- BRI stations
- Combining both B channels together to form a 128-kbps channel

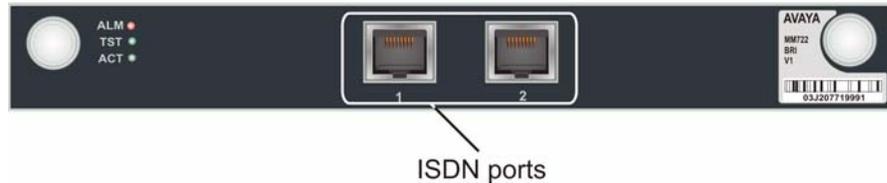
See the following figure for an example of the MM720.



---

## MM722 BRI media module

The Avaya MM722 Media Module provides two 4-wire S/T ISDN BRI (Basic Rate Interface) 2B+D access ports with RJ-45 jacks. Each port interfaces to the central office at the ISDN T reference point. Information is communicated in the same manner as for the MM720.



**Note:**

The MM722 is supported in both the G700 and G350 Media Gateways.

---

## MM760 VoIP media module

The Avaya MM760 Media Module is a clone of the motherboard VoIP engine. The MM760 provides an additional 64 VoIP channels with G.711 compression.

**Note:**

The MM760 is not supported in the G350 Media Gateway.

See the following figure for an example of a MM760.

---

**Figure 78: Avaya MM760 VoIP Media Module**



mmdc760 KLC 022702

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The capacity of the MM760 is 64 G.711 TDM/IP simultaneous calls, or 32 compression codec, G.729 or G.723, TDM/IP simultaneous calls. These call types can be mixed on the same resource. In other words, the simultaneous call capacity of the resource is 64 G.711 Equivalent Calls.

**Note:**

Customers who want an essentially non-blocking system must add an additional MM760 Media Module if they use more than two MM710 Media Modules in a single chassis. The additional MM760 provides an additional 64 channels.

---

## Ethernet interface

The MM760 must have its own Ethernet address. The MM760 requires a 10/100 Base T Ethernet interface to support H.323 endpoints for DEFINITY® IP trunks and stations from another G700 Media Gateway.

---

## Voice compression

The MM760 supports on-board resources for compression and decompression of voice for G.711 (A- and  $\mu$ -law), G.729 and 729B, and G.723 (5.3K and 6.3K).

The VoIP engine supports the following functionality:

- RTP and RTCP interfaces
- Dynamic jitter buffers
- DTMF detection
- Hybrid echo cancellation
- Silence suppression
- Comfort noise generation
- Packet loss concealment

The MM760 also supports transport of the following:

- Teletypewriter device (TTY) tone relay over the Internet
- Faxes over a corporate IP intranet

**Note:**

The path between endpoints for fax transmissions must use Avaya telecommunications and networking equipment.

 **SECURITY ALERT:**

Faxes sent to non-Avaya endpoints cannot be encrypted.

- T.38 Fax over the Internet (including endpoints connected to non-Avaya systems)
- Modem tones over a corporate IP intranet

**Note:**

The path between endpoints for modem tone transmissions must use Avaya telecommunications and networking equipment.

See the Administrator's Guide for Avaya Communication Manager, 555-233-506 for more information.

# Optional components: S8300 Media Server with a G700 or G350 Media Gateway

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## Media gateways

[Avaya G700 Media Gateway](#) on page 168

[Avaya G350 Media Gateway](#) on page 147

---

## Media modules for a G700 Media Gateway

[MM710 T1/E1 media module](#) on page 250.

[MM711 Analog media module](#) on page 253.

[MM712 DCP media module](#) on page 255.

[MM714 Analog media module](#) on page 256.

[MM712 DCP media module](#) on page 255.

[MM710 T1/E1 media module](#) on page 250.

[MM714 Analog media module](#) on page 256.

[MM760 VoIP media module](#) on page 259.

## Media modules for a G350 Media Gateway

- [MM312 DCP media module](#) on page 247.
- [MM314 LAN media module](#) on page 248.
- [MM340 E1/T1 media module](#) on page 249.
- [MM342 USP WAN media module](#) on page 249.
- [MM710 T1/E1 media module](#) on page 250.
- [MM711 Analog media module](#) on page 253.
- [MM712 DCP media module](#) on page 255.
- [MM714 Analog media module](#) on page 256.
- [MM712 DCP media module](#) on page 255.
- [MM710 T1/E1 media module](#) on page 250.
- [MM714 Analog media module](#) on page 256.

---

## Avaya telephones

---

### IP telephones

- [Avaya IP Softphone](#) on page 301
- [Avaya IP Softphone for Pocket PC](#) on page 302
- [Avaya 4601 IP telephone](#) on page 304
- [Avaya 4602 IP telephone](#) on page 305
- [Avaya 4602SW IP telephone](#) on page 306
- [Avaya 4606 IP telephone](#) on page 306
- [Avaya 4610SW IP telephone](#) on page 307
- [Avaya 4620SW IP telephone](#) on page 309
- [Avaya 4624 IP telephone](#) on page 310
- [Avaya 4630SW IP Screenphone](#) on page 311
- [Avaya 4690 IP conference telephone](#) on page 313

---

## Digital telephones

- [Avaya 2402 Digital Telephone](#) on page 314
- [Avaya 2410 digital telephone](#) on page 315
- [Avaya 2420 digital telephone](#) on page 315
- [Avaya 6402 and 6402D digital telephones](#) on page 316
- [Avaya 6408D+ digital telephone](#) on page 317
- [Avaya 6416D+M digital telephone](#) on page 318
- [Avaya 6424D+M digital telephone](#) on page 319
- [Avaya Callmaster IV \(603H\) digital telephone](#) on page 321
- [Avaya Callmaster V \(607A\) digital telephone](#) on page 321
- [Avaya Callmaster VI \(606A\) digital telephone](#) on page 322
- [Avaya 302D attendant console](#) on page 323

---

## Analog telephones

- [Avaya 2500 and 2554 analog telephones](#) on page 325
- [Avaya 6211 Analog Telephone](#) on page 326
- [Avaya 6219 analog telephone](#) on page 327
- [Avaya 6221 analog telephone](#) on page 328
- [AT&T TTY 8840 Analog Telephone](#) on page 328
- [AT&T 958 Analog Telephone Caller ID and Speakerphone](#) on page 329

---

## Wireless telephone

- [Avaya TransTalk 9040](#) on page 330
- [Avaya 3410 wireless telephone](#) on page 331
- [Avaya 3606 wireless VoIP telephone](#) on page 331
- [Avaya 3616 wireless VoIP telephone](#) on page 333
- [Avaya 3626 wireless VoIP telephone](#) on page 334
- [Motorola CN620 Mobile Office Device](#) on page 335

---

## Speakerphones

[3127 SoundPoint Speakerphone](#) on page 339

[3127 SoundStation speakerphone](#) on page 340

---

## Consoles

[Avaya 302D attendant console](#) on page 323

[Avaya Softconsole](#) on page 324

# Optional components: S8500 Media Server

---

## Media gateways

[Avaya G650 Media Gateway](#) on page 160

[Avaya G650 Media Gateway](#) on page 160

[G600 Media Gateway](#) on page 156

[Avaya G700 Media Gateway](#) on page 168

[Avaya G350 Media Gateway](#) on page 147

[CMC1 Media Gateway](#) on page 177

[MCC1 Media Gateway](#) on page 188

[SCC1 Media Gateway](#) on page 180

---

## Circuit packs

---

## Power

[1217B AC power supply](#) on page 201

[655A power supply](#) on page 203

[649A DC power unit](#) on page 202

[676D DC power supply](#) on page 206

[CFY1B current limiter](#) on page 206

[TN755B Neon Power Unit](#) on page 217

[TN2202 Ring Generator](#) on page 232

## Line circuit packs

[TN479 Analog Line \(16 ports\)](#) on page 210

[TN556D ISDN-BRI 4-Wire S/T-NT Interface \(12 ports\)](#) on page 211

[TN746B Analog Line \(16 ports\)](#) on page 214

[TN754C DCP Digital Line \(4-wire, 8 ports\)](#) on page 216

[TN762B Hybrid Line \(8 ports\)](#) on page 218 (not used in a G650 Media Gateway)

[TN769 Analog Line \(8 ports\)](#) on page 219

[TN791 Analog Guest Line \(16 ports\)](#) on page 223 (not used in a G650 Media Gateway)

[TN793B Analog Line with Caller ID \(24 ports\)](#) on page 224

[TN797 Analog Trunk or Line Circuit Pack \(8 ports\)](#) on page 225

[TN2181 DCP Digital Line \(2-wire, 16 ports\)](#) on page 229

[TN2183/TN2215 Analog Line for multiple countries \(16 ports\)](#) on page 230

[TN2185B ISDN-BRI S/T-TE Interface \(4-wire, 8 ports\)](#) on page 230

[TN2198 ISDN-BRI U Interface \(2-wire, 12 ports\)](#) on page 231

[TN2214CP DCP Digital Line \(2-wire, 24 ports\)](#) on page 233

[TN2215/TN2183 Analog Line for Multiple Countries \(16 ports\) \(International Offers or US and Canada Offer B only\)](#) on page 234

[TN2224CP DCP Digital Line \(2-wire, 24 ports\)](#) on page 235

[TN2793B Analog Line with Caller ID \(24 ports\)](#) on page 244

---

## Trunk circuit packs

- [TN429D Incoming Call Line Identification \(ICLID\)](#) on page 208
- [TN459B Direct Inward Dialing Trunk \(8 ports\)](#) on page 209
- [TN464GP DS1 Interface, T1 \(24 channels\) or E1 \(32 channels\)](#) on page 209
- [TN465C Central Office Trunk \(8 ports\)](#) on page 210
- [TN747B Central Office Trunk \(8 ports\)](#) on page 215
- [TN753B Direct Inward Dialing Trunk \(8 ports\)](#) on page 216
- [TN760E Tie Trunk \(4-wire, 4 ports\)](#) on page 218
- [TN763D Auxiliary Trunk \(4 ports\)](#) on page 218
- [TN767E DS1 Interface, T1 \(24 channels\)](#) on page 218 (not used in a G650 Media Gateway)
- [TN1654 DS1 Converter, T1 \(24 channels\) and E1 \(32 channels\)](#) on page 227
- [TN2140B Tie Trunk \(4-wire, 4 ports\)](#) on page 228
- [TN2146 Direct Inward Dialing Trunk \(8 ports\)](#) on page 228 (not used in a G650 Media Gateway)
- [TN2147C Central Office Trunk \(8 ports\)](#) on page 229
- [TN2184 DIOD Trunk \(4 ports\)](#) on page 230 (not used in a G650 Media Gateway)
- [TN2199 Central Office Trunk \(3-wire, 4 ports\)](#) on page 232
- [TN2207 DS1 Interface, T1 \(24 channels\) and E1 \(32 channels\)](#) on page 232 (not used in a G650 Media Gateway)
- [TN2209 Tie Trunk \(4-wire, 4 ports\)](#) on page 233
- [TN2242 Digital Trunk](#) on page 235
- [TN2308 Direct Inward Dialing Trunk \(8 ports\)](#) on page 237
- [TN2313AP DS1 Interface \(24 channels\)](#) on page 240
- [TN2464BP DS1 Interface with Echo Cancellation, T1/E1](#) on page 243

## Control circuit packs

[TN570D Expansion Interface](#) on page 212

[TN744E Call Classifier and Tone Detector \(8 ports\)](#) on page 214

[TN771DP Maintenance and Test](#) on page 220

[TN775C Maintenance](#) on page 221 (not used in a G650 Media Gateway)

[TN780 Tone Clock](#) on page 221 (not used in a G650 Media Gateway)

[TN799DP Control LAN \(C-LAN\) Interface](#) on page 226

[TN2182 Tone Clock, Tone Detector, and Call Classifier \(8 ports\)](#) on page 229 (not used in a G650 Media Gateway)

[TN2301 Logic Switch](#) on page 235

[TN2312BP IP Server Interface](#) on page 237

---

## Service circuit packs

[TN433 Speech Synthesizer](#) on page 208

[TN725B Speech Synthesizer](#) on page 213

[TN744E Call Classifier and Tone Detector \(8 ports\)](#) on page 214

[TN787K Multimedia Interface](#) on page 222 (not used in a G650 Media Gateway)

[TN788C Multimedia Voice Conditioner](#) on page 222 (not used in a G650 Media Gateway)

[TNCCSC-1 PRI to DASS Converter](#) on page 245

[TNCCSC-2 PRI to DPNSS Converter](#) on page 245

[TNCCSC-3 PRI to DPNSS Converter](#) on page 245

[TN-C7 PRI to SS7 Converter](#) on page 245

[TN-CIN Voice, FAX and Data Multiplexer](#) on page 245

---

## Application circuit packs

[TN568 DEFINITY AUDIX 4.0 Voice Mail System \(part of ED-1E568\)](#) on page 212

[TN801B MAPD \(LAN Gateway Interface\)](#) on page 226

[TN2501AP Voice Announcements over LAN \(VAL\)](#) on page 243

---

## Port circuit packs

[TN2302AP IP Media Processor](#) on page 235

[TN789B Radio Controller](#) on page 223

---

## Avaya telephones

---

### IP telephones

[Avaya IP Softphone](#) on page 301

[Avaya IP Softphone for Pocket PC](#) on page 302

[Avaya 4601 IP telephone](#) on page 304

[Avaya 4602 IP telephone](#) on page 305

[Avaya 4602SW IP telephone](#) on page 306

[Avaya 4606 IP telephone](#) on page 306

[Avaya 4610SW IP telephone](#) on page 307

[Avaya 4620SW IP telephone](#) on page 309

[Avaya 4624 IP telephone](#) on page 310

[Avaya 4630SW IP Screenphone](#) on page 311

[Avaya 4690 IP conference telephone](#) on page 313

## Digital telephones

- [Avaya 2402 Digital Telephone](#) on page 314
- [Avaya 2410 digital telephone](#) on page 315
- [Avaya 2420 digital telephone](#) on page 315
- [Avaya 6402 and 6402D digital telephones](#) on page 316
- [Avaya 6408D+ digital telephone](#) on page 317
- [Avaya 6416D+M digital telephone](#) on page 318
- [Avaya 6424D+M digital telephone](#) on page 319
- [Avaya Callmaster IV \(603H\) digital telephone](#) on page 321
- [Avaya Callmaster V \(607A\) digital telephone](#) on page 321
- [Avaya Callmaster VI \(606A\) digital telephone](#) on page 322
- [Avaya 302D attendant console](#) on page 323

---

## SoundStation speakerphones

- [3127 SoundPoint Speakerphone](#) on page 339
- [3127 SoundStation speakerphone](#) on page 340
- [3127 SoundStation Premier audioconferencing speakerphone](#) on page 341

---

## Analog telephones

- [Avaya 2500 and 2554 analog telephones](#) on page 325
- [Avaya 6211 Analog Telephone](#) on page 326
- [Avaya 6219 analog telephone](#) on page 327
- [Avaya 6221 analog telephone](#) on page 328
- [AT&T TTY 8840 Analog Telephone](#) on page 328
- [AT&T 958 Analog Telephone Caller ID and Speakerphone](#) on page 329

---

## Avaya Explosive Atmosphere telephone

[Avaya EA401 and EA401A Explosive Atmosphere telephones](#) on page 329

---

## Wireless telephone

[Avaya TransTalk 9040](#) on page 330

[Avaya 3410 wireless telephone](#) on page 331

[Avaya 3606 wireless VoIP telephone](#) on page 331

[Avaya 3616 wireless VoIP telephone](#) on page 333

[Avaya 3626 wireless VoIP telephone](#) on page 334

[Motorola CN620 Mobile Office Device](#) on page 335

---

## Consoles

[Avaya 302D attendant console](#) on page 323

[Avaya Softconsole](#) on page 324

**Optional components: S8500 Media Server**

# Optional components for an S8700/S8710 Media Server in an IP Connect configuration

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## Media gateways

[Avaya G650 Media Gateway](#) on page 160

[G600 Media Gateway](#) on page 156

[Avaya G700 Media Gateway](#) on page 168

[Avaya G350 Media Gateway](#) on page 147

[CMC1 Media Gateway](#) on page 177

## Circuit packs

---

### Line circuit packs

[TN479 Analog Line \(16 ports\)](#) on page 210

[TN556D ISDN-BRI 4-Wire S/T-NT Interface \(12 ports\)](#) on page 211

[TN746B Analog Line \(16 ports\)](#) on page 214

[TN754C DCP Digital Line \(4-wire, 8 ports\)](#) on page 216

[TN762B Hybrid Line \(8 ports\)](#) on page 218

[TN769 Analog Line \(8 ports\)](#) on page 219

[TN791 Analog Guest Line \(16 ports\)](#) on page 223

[TN793B Analog Line with Caller ID \(24 ports\)](#) on page 224

[TN797 Analog Trunk or Line Circuit Pack \(8 ports\)](#) on page 225

[TN2181 DCP Digital Line \(2-wire, 16 ports\)](#) on page 229

[TN2183/TN2215 Analog Line for multiple countries \(16 ports\)](#) on page 230

[TN2185B ISDN-BRI S/T-TE Interface \(4-wire, 8 ports\)](#) on page 230

[TN2198 ISDN-BRI U Interface \(2-wire, 12 ports\)](#) on page 231

[TN2214CP DCP Digital Line \(2-wire, 24 ports\)](#) on page 233

[TN2215/TN2183 Analog Line for Multiple Countries \(16 ports\) \(International Offers or US and Canada Offer B only\)](#) on page 234

[TN2224CP DCP Digital Line \(2-wire, 24 ports\)](#) on page 235

[TN2793B Analog Line with Caller ID \(24 ports\)](#) on page 244

---

## Trunk circuit packs

- [TN429D Incoming Call Line Identification \(ICLID\)](#) on page 208
- [TN459B Direct Inward Dialing Trunk \(8 ports\)](#) on page 209
- [TN464GP DS1 Interface, T1 \(24 channels\) or E1 \(32 channels\)](#) on page 209
- [TN465C Central Office Trunk \(8 ports\)](#) on page 210
- [TN747B Central Office Trunk \(8 ports\)](#) on page 215
- [TN753B Direct Inward Dialing Trunk \(8 ports\)](#) on page 216
- [TN760E Tie Trunk \(4-wire, 4 ports\)](#) on page 218
- [TN763D Auxiliary Trunk \(4 ports\)](#) on page 218
- [TN767E DS1 Interface, T1 \(24 channels\)](#) on page 218
- [TN1654 DS1 Converter, T1 \(24 channels\) and E1 \(32 channels\)](#) on page 227
- [TN2140B Tie Trunk \(4-wire, 4 ports\)](#) on page 228
- [TN2146 Direct Inward Dialing Trunk \(8 ports\)](#) on page 228
- [TN2147C Central Office Trunk \(8 ports\)](#) on page 229
- [TN2184 DIOD Trunk \(4 ports\)](#) on page 230
- [TN2199 Central Office Trunk \(3-wire, 4 ports\)](#) on page 232
- [TN2207 DS1 Interface, T1 \(24 channels\) and E1 \(32 channels\)](#) on page 232
- [TN2209 Tie Trunk \(4-wire, 4 ports\)](#) on page 233
- [TN2242 Digital Trunk](#) on page 235
- [TN2308 Direct Inward Dialing Trunk \(8 ports\)](#) on page 237
- [TN2313AP DS1 Interface \(24 channels\)](#) on page 240
- [TN2464BP DS1 Interface with Echo Cancellation, T1/E1](#) on page 243

---

## Control circuit packs

- [TN771DP Maintenance and Test](#) on page 220
- [TN799DP Control LAN \(C-LAN\) Interface](#) on page 226
- [TN2301 Logic Switch](#) on page 235
- [TN2312BP IP Server Interface](#) on page 237

## Service circuit packs

[TN433 Speech Synthesizer](#) on page 208

[TN725B Speech Synthesizer](#) on page 213

[TN744E Call Classifier and Tone Detector \(8 ports\)](#) on page 214

[TNCCSC-1 PRI to DASS Converter](#) on page 245

[TNCCSC-2 PRI to DPNSS Converter](#) on page 245

[TNCCSC-3 PRI to DPNSS Converter](#) on page 245

[TN-C7 PRI to SS7 Converter](#) on page 245

[TN-CIN Voice, FAX and Data Multiplexer](#) on page 245

---

## Application circuit packs

[TN801B MAPD \(LAN Gateway Interface\)](#) on page 226

[TN2501AP Voice Announcements over LAN \(VAL\)](#) on page 243

---

## Port circuit packs

[TN2302AP IP Media Processor](#) on page 235

[TN789B Radio Controller](#) on page 223

---

# Avaya telephones

---

## IP telephones

- [Avaya IP Softphone](#) on page 301
- [Avaya IP Softphone for Pocket PC](#) on page 302
- [Avaya 4601 IP telephone](#) on page 304
- [Avaya 4602 IP telephone](#) on page 305
- [Avaya 4602SW IP telephone](#) on page 306
- [Avaya 4602SW IP telephone](#) on page 306
- [Avaya 4606 IP telephone](#) on page 306
- [Avaya 4610SW IP telephone](#) on page 307
- [Avaya 4620SW IP telephone](#) on page 309
- [Avaya 4624 IP telephone](#) on page 310
- [Avaya 4630SW IP Screenphone](#) on page 311
- [Avaya 4690 IP conference telephone](#) on page 313

---

## Digital telephones

- [Avaya 2402 Digital Telephone](#) on page 314
- [Avaya 2410 digital telephone](#) on page 315
- [Avaya 2420 digital telephone](#) on page 315
- [Avaya 6402 and 6402D digital telephones](#) on page 316
- [Avaya 6408D+ digital telephone](#) on page 317
- [Avaya 6416D+M digital telephone](#) on page 318
- [Avaya 6424D+M digital telephone](#) on page 319
- [Avaya Callmaster IV \(603H\) digital telephone](#) on page 321
- [Avaya Callmaster V \(607A\) digital telephone](#) on page 321
- [Avaya Callmaster VI \(606A\) digital telephone](#) on page 322

## SoundStation speakerphones

[3127 SoundPoint Speakerphone](#) on page 339

[3127 SoundStation speakerphone](#) on page 340

[3127 SoundStation Premier audioconferencing speakerphone](#) on page 341

---

## Analog telephones

[Avaya 2500 and 2554 analog telephones](#) on page 325

[Avaya 6211 Analog Telephone](#) on page 326

[Avaya 6219 analog telephone](#) on page 327

[Avaya 6221 analog telephone](#) on page 328

[AT&T TTY 8840 Analog Telephone](#) on page 328

[AT&T 958 Analog Telephone Caller ID and Speakerphone](#) on page 329

---

## Avaya Explosive Atmosphere telephone

[Avaya EA401 and EA401A Explosive Atmosphere telephones](#) on page 329

---

## Wireless telephone

[Avaya TransTalk 9040](#) on page 330

[Avaya 3410 wireless telephone](#) on page 331

[Avaya 3606 wireless VoIP telephone](#) on page 331

[Avaya 3616 wireless VoIP telephone](#) on page 333

[Avaya 3626 wireless VoIP telephone](#) on page 334

[Motorola CN620 Mobile Office Device](#) on page 335

---

## Consoles

[Avaya 302D attendant console](#) on page 323

[Avaya Softconsole](#) on page 324

---

# Optional components: S8700/S8710 – Voice Bearer Over CSS or ATM

---

## Media gateways

- [G600 Media Gateway](#) on page 156
  - [Avaya G650 Media Gateway](#) on page 160
  - [Avaya G700 Media Gateway](#) on page 168
  - [Avaya G350 Media Gateway](#) on page 147
  - [CMC1 Media Gateway](#) on page 177
  - [MCC1 Media Gateway](#) on page 188
  - [SCC1 Media Gateway](#) on page 180
- 

## Circuit packs

### Power

- [655A power supply](#) on page 203
- [1217B AC power supply](#) on page 201
- [649A DC power unit](#) on page 202
- [676D DC power supply](#) on page 206
- [TN755B Neon Power Unit](#) on page 217
- [CFY1B current limiter](#) on page 206
- [ED-1E568 DEFINITY AUDIX R4](#) on page 207
- [TN2202 Ring Generator](#) on page 232

## Line circuit packs

[TN479 Analog Line \(16 ports\)](#) on page 210

[TN556D ISDN-BRI 4-Wire S/T-NT Interface \(12 ports\)](#) on page 211

[TN735 MET Line \(4 ports\)](#) on page 214

[TN746B Analog Line \(16 ports\)](#) on page 214

[TN754C DCP Digital Line \(4-wire, 8 ports\)](#) on page 216

[TN762B Hybrid Line \(8 ports\)](#) on page 218

[TN769 Analog Line \(8 ports\)](#) on page 219

[TN791 Analog Guest Line \(16 ports\)](#) on page 223

[TN793B Analog Line with Caller ID \(24 ports\)](#) on page 224

[TN797 Analog Trunk or Line Circuit Pack \(8 ports\)](#) on page 225

[TN2181 DCP Digital Line \(2-wire, 16 ports\)](#) on page 229

[TN2183/TN2215 Analog Line for multiple countries \(16 ports\)](#) on page 230

[TN2185B ISDN-BRI S/T-TE Interface \(4-wire, 8 ports\)](#) on page 230

[TN2198 ISDN-BRI U Interface \(2-wire, 12 ports\)](#) on page 231

[TN2214CP DCP Digital Line \(2-wire, 24 ports\)](#) on page 233

[TN2215/TN2183 Analog Line for Multiple Countries \(16 ports\) \(International Offers or US and Canada Offer B only\)](#) on page 234

[TN2224CP DCP Digital Line \(2-wire, 24 ports\)](#) on page 235

[TN2793B Analog Line with Caller ID \(24 ports\)](#) on page 244

---

## Trunk circuit packs

- [TN429D Incoming Call Line Identification \(ICLID\)](#) on page 208
- [TN436B Direct Inward Dialing Trunk \(8 ports\)](#) on page 208
- [TN438B Central Office Trunk \(8 ports\)](#) on page 208
- [TN439 Tie Trunk \(4 ports\)](#) on page 209
- [TN459B Direct Inward Dialing Trunk \(8 ports\)](#) on page 209
- [TN464GP DS1 Interface, T1 \(24 channels\) or E1 \(32 channels\)](#) on page 209
- [TN465C Central Office Trunk \(8 ports\)](#) on page 210
- [TN497 Tie Trunk \(4 ports\)](#) on page 211
- [TN574 DS1 Converter — T1, 24 Channel](#) on page 213
- [TN747B Central Office Trunk \(8 ports\)](#) on page 215
- [TN753B Direct Inward Dialing Trunk \(8 ports\)](#) on page 216
- [TN760E Tie Trunk \(4-wire, 4 ports\)](#) on page 218
- [TN763D Auxiliary Trunk \(4 ports\)](#) on page 218
- [TN767E DS1 Interface, T1 \(24 channels\)](#) on page 218
- [TN1654 DS1 Converter, T1 \(24 channels\) and E1 \(32 channels\)](#) on page 227
- [TN2140B Tie Trunk \(4-wire, 4 ports\)](#) on page 228
- [TN2146 Direct Inward Dialing Trunk \(8 ports\)](#) on page 228
- [TN2147C Central Office Trunk \(8 ports\)](#) on page 229
- [TN2184 DIOD Trunk \(4 ports\)](#) on page 230
- [TN2199 Central Office Trunk \(3-wire, 4 ports\)](#) on page 232
- [TN2207 DS1 Interface, T1 \(24 channels\) and E1 \(32 channels\)](#) on page 232
- [TN2209 Tie Trunk \(4-wire, 4 ports\)](#) on page 233
- [TN2242 Digital Trunk](#) on page 235
- [TN2305B ATM-CES Trunk/Port-Network Interface for multimode fiber](#) on page 236
- [TN2306B ATM-CES Trunk/Port-Network Interface for single-mode fiber](#) on page 237
- [TN2308 Direct Inward Dialing Trunk \(8 ports\)](#) on page 237
- [TN2313AP DS1 Interface \(24 channels\)](#) on page 240
- [TN2464BP DS1 Interface with Echo Cancellation, T1/E1](#) on page 243

## Control circuit packs

[TN570D Expansion Interface](#) on page 212

[TN572 Switch-Node Clock](#) on page 212

[TN573B Switch-Node Interface](#) on page 213

[TN744E Call Classifier and Tone Detector \(8 ports\)](#) on page 214

[TN771DP Maintenance and Test](#) on page 220

[TN775C Maintenance](#) on page 221

[TN780 Tone Clock](#) on page 221

[TN799DP Control LAN \(C-LAN\) Interface](#) on page 226

[TN2182 Tone Clock, Tone Detector, and Call Classifier \(8 ports\)](#) on page 229

[TN2301 Logic Switch](#) on page 235

[TN2312BP IP Server Interface](#) on page 237

---

## Service circuit packs

[TN433 Speech Synthesizer](#) on page 208

[TN457 Speech Synthesizer](#) on page 209

[TN725B Speech Synthesizer](#) on page 213

[TN787K Multimedia Interface](#) on page 222

[TN788C Multimedia Voice Conditioner](#) on page 222

[TNCCSC-1 PRI to DASS Converter](#) on page 245

[TNCCSC-2 PRI to DPNSS Converter](#) on page 245

[TNCCSC-3 PRI to DPNSS Converter](#) on page 245

[TN-C7 PRI to SS7 Converter](#) on page 245

[TN-CIN Voice, FAX and Data Multiplexer](#) on page 245

---

## Application circuit packs

[J58890MA-1 Multiapplication Platform for DEFINITY \(MAPD\)](#) on page 207

[TN568 DEFINITY AUDIX 4.0 Voice Mail System \(part of ED-1E568\)](#) on page 212

[TN801B MAPD \(LAN Gateway Interface\)](#) on page 226

[TN2501AP Voice Announcements over LAN \(VAL\)](#) on page 243

---

## Port circuit packs

[TN2302AP IP Media Processor](#) on page 235

[TN789B Radio Controller](#) on page 223

---

## Avaya telephones

---

### IP telephones

[Avaya IP Softphone](#) on page 301

[Avaya IP Softphone for Pocket PC](#) on page 302

[Avaya 4601 IP telephone](#) on page 304

[Avaya 4602 IP telephone](#) on page 305

[Avaya 4602SW IP telephone](#) on page 306

[Avaya 4602SW IP telephone](#) on page 306

[Avaya 4606 IP telephone](#) on page 306

[Avaya 4610SW IP telephone](#) on page 307

[Avaya 4620SW IP telephone](#) on page 309

[Avaya 4624 IP telephone](#) on page 310

[Avaya 4630SW IP Screenphone](#) on page 311

[Avaya 4690 IP conference telephone](#) on page 313

## Digital telephones

- [Avaya 2402 Digital Telephone](#) on page 314
- [Avaya 2410 digital telephone](#) on page 315
- [Avaya 2420 digital telephone](#) on page 315
- [Avaya 6402 and 6402D digital telephones](#) on page 316
- [Avaya 6408D+ digital telephone](#) on page 317
- [Avaya 6416D+M digital telephone](#) on page 318
- [Avaya 6424D+M digital telephone](#) on page 319
- [Avaya Callmaster IV \(603H\) digital telephone](#) on page 321
- [Avaya Callmaster V \(607A\) digital telephone](#) on page 321
- [Avaya Callmaster VI \(606A\) digital telephone](#) on page 322

---

## SoundStation speakerphones

- [3127 SoundPoint Speakerphone](#) on page 339
- [3127 SoundStation speakerphone](#) on page 340
- [3127 SoundStation Premier audioconferencing speakerphone](#) on page 341

---

## Analog telephones

- [Avaya 2500 and 2554 analog telephones](#) on page 325
- [Avaya 6211 Analog Telephone](#) on page 326
- [Avaya 6219 analog telephone](#) on page 327
- [Avaya 6221 analog telephone](#) on page 328
- [AT&T TTY 8840 Analog Telephone](#) on page 328
- [AT&T 958 Analog Telephone Caller ID and Speakerphone](#) on page 329

---

## Avaya Explosive Atmosphere telephone

[Avaya EA401 and EA401A Explosive Atmosphere telephones](#) on page 329

---

## Wireless telephone

[Avaya TransTalk 9040](#) on page 330

[Avaya 3410 wireless telephone](#) on page 331

[Avaya 3606 wireless VoIP telephone](#) on page 331

[Avaya 3616 wireless VoIP telephone](#) on page 333

[Avaya 3626 wireless VoIP telephone](#) on page 334

[Motorola CN620 Mobile Office Device](#) on page 335

---

## Consoles

[Avaya 302D attendant console](#) on page 323

[Avaya Softconsole](#) on page 324

**Optional components: S8700/S8710 – Voice Bearer Over CSS or ATM**

# Optional components for DEFINITY Server CSI

---

## Media gateways

[CMC1 Media Gateway](#) on page 177

---

## Circuit packs for DEFINITY Server CSI

---

### Power circuit packs

[650A AC power unit](#) on page 202

## Line circuit packs

[TN479 Analog Line \(16 ports\)](#) on page 210

[TN746B Analog Line \(16 ports\)](#) on page 214

[TN762B Hybrid Line \(8 ports\)](#) on page 218

[TN769 Analog Line \(8 ports\)](#) on page 219

[TN791 Analog Guest Line \(16 ports\)](#) on page 223

[TN793B Analog Line with Caller ID \(24 ports\)](#) on page 224

[TN797 Analog Trunk or Line Circuit Pack \(8 ports\)](#) on page 225

[TN2181 DCP Digital Line \(2-wire, 16 ports\)](#) on page 229

[TN2183/TN2215 Analog Line for multiple countries \(16 ports\)](#) on page 230

[TN2185B ISDN-BRI S/T-TE Interface \(4-wire, 8 ports\)](#) on page 230

[TN2198 ISDN-BRI U Interface \(2-wire, 12 ports\)](#) on page 231

[TN2214CP DCP Digital Line \(2-wire, 24 ports\)](#) on page 233

[TN2215/TN2183 Analog Line for Multiple Countries \(16 ports\) \(International Offers or US and Canada Offer B only\)](#) on page 234

[TN2224CP DCP Digital Line \(2-wire, 24 ports\)](#) on page 235

[TN2793B Analog Line with Caller ID \(24 ports\)](#) on page 244

---

## Trunk circuit packs

- [TN429D Incoming Call Line Identification \(ICLID\)](#) on page 208
- [TN459B Direct Inward Dialing Trunk \(8 ports\)](#) on page 209
- [TN464GP DS1 Interface, T1 \(24 channels\) or E1 \(32 channels\)](#) on page 209
- [TN465C Central Office Trunk \(8 ports\)](#) on page 210
- [TN747B Central Office Trunk \(8 ports\)](#) on page 215
- [TN753B Direct Inward Dialing Trunk \(8 ports\)](#) on page 216
- [TN760E Tie Trunk \(4-wire, 4 ports\)](#) on page 218
- [TN763D Auxiliary Trunk \(4 ports\)](#) on page 218
- [TN767E DS1 Interface, T1 \(24 channels\)](#) on page 218
- [TN1654 DS1 Converter, T1 \(24 channels\) and E1 \(32 channels\)](#) on page 227
- [TN2140B Tie Trunk \(4-wire, 4 ports\)](#) on page 228
- [TN2146 Direct Inward Dialing Trunk \(8 ports\)](#) on page 228
- [TN2147C Central Office Trunk \(8 ports\)](#) on page 229
- [TN2184 DIOD Trunk \(4 ports\)](#) on page 230
- [TN2199 Central Office Trunk \(3-wire, 4 ports\)](#) on page 232
- [TN2207 DS1 Interface, T1 \(24 channels\) and E1 \(32 channels\)](#) on page 232
- [TN2209 Tie Trunk \(4-wire, 4 ports\)](#) on page 233
- [TN2242 Digital Trunk](#) on page 235
- [TN2305B ATM-CES Trunk/Port-Network Interface for multimode fiber](#) on page 236
- [TN2306B ATM-CES Trunk/Port-Network Interface for single-mode fiber](#) on page 237
- [TN2308 Direct Inward Dialing Trunk \(8 ports\)](#) on page 237
- [TN2313AP DS1 Interface \(24 channels\)](#) on page 240
- [TN2464BP DS1 Interface with Echo Cancellation, T1/E1](#) on page 243

---

## Control circuit packs

- [TN744E Call Classifier and Tone Detector \(8 ports\)](#) on page 214
- [TN799DP Control LAN \(C-LAN\) Interface](#) on page 226
- [TN2182 Tone Clock, Tone Detector, and Call Classifier \(8 ports\)](#) on page 229
- [TN2402 Processor](#) on page 242

## Service circuit packs

- [TN433 Speech Synthesizer](#) on page 208
- [TN725B Speech Synthesizer](#) on page 213
- [TN788C Multimedia Voice Conditioner](#) on page 222
- [TNCCSC-1 PRI to DASS Converter](#) on page 245
- [TNCCSC-2 PRI to DPNSS Converter](#) on page 245
- [TNCCSC-3 PRI to DPNSS Converter](#) on page 245
- [TN-C7 PRI to SS7 Converter](#) on page 245
- [TN-CIN Voice, FAX and Data Multiplexer](#) on page 245

---

## Application circuit packs

- [TN568 DEFINITY AUDIX 4.0 Voice Mail System \(part of ED-1E568\)](#) on page 212
- [TN750C Recorded Announcement \(16 channels\)](#) on page 216
- [TN801B MAPD \(LAN Gateway Interface\)](#) on page 226
- [TN2501AP Voice Announcements over LAN \(VAL\)](#) on page 243

---

## Port circuit packs

- [TN2302AP IP Media Processor](#) on page 235
- [TN789B Radio Controller](#) on page 223

---

## Adapter

- [NAA1 fiber-optic cable adaptor](#) on page 207

---

# Avaya telephones for DEFINITY Server CSI

---

## IP telephones

- [Avaya IP Softphone](#) on page 301
- [Avaya IP Softphone for Pocket PC](#) on page 302
- [Avaya 4601 IP telephone](#) on page 304
- [Avaya 4602 IP telephone](#) on page 305
- [Avaya 4602SW IP telephone](#) on page 306
- [Avaya 4602SW IP telephone](#) on page 306
- [Avaya 4606 IP telephone](#) on page 306
- [Avaya 4610SW IP telephone](#) on page 307
- [Avaya 4620SW IP telephone](#) on page 309
- [Avaya 4624 IP telephone](#) on page 310
- [Avaya 4630SW IP Screenphone](#) on page 311
- [Avaya 4690 IP conference telephone](#) on page 313

---

## Digital telephones

- [Avaya 2402 Digital Telephone](#) on page 314
- [Avaya 2410 digital telephone](#) on page 315
- [Avaya 2420 digital telephone](#) on page 315
- [Avaya 6402 and 6402D digital telephones](#) on page 316
- [Avaya 6408D+ digital telephone](#) on page 317
- [Avaya 6416D+M digital telephone](#) on page 318
- [Avaya 6424D+M digital telephone](#) on page 319
- [Avaya Callmaster IV \(603H\) digital telephone](#) on page 321
- [Avaya Callmaster V \(607A\) digital telephone](#) on page 321
- [Avaya Callmaster VI \(606A\) digital telephone](#) on page 322

## SoundStation speakerphones

[3127 SoundPoint Speakerphone](#) on page 339

[3127 SoundStation speakerphone](#) on page 340

[3127 SoundStation Premier audioconferencing speakerphone](#) on page 341

---

## Analog telephones

[Avaya 2500 and 2554 analog telephones](#) on page 325

[Avaya 6211 Analog Telephone](#) on page 326

[Avaya 6219 analog telephone](#) on page 327

[Avaya 6221 analog telephone](#) on page 328

[AT&T TTY 8840 Analog Telephone](#) on page 328

[AT&T 958 Analog Telephone Caller ID and Speakerphone](#) on page 329

---

## Explosive Atmosphere telephones

[Avaya EA401 and EA401A Explosive Atmosphere telephones](#) on page 329

---

## Wireless telephone

[Avaya TransTalk 9040](#) on page 330

[Avaya 3410 wireless telephone](#) on page 331

[Avaya 3606 wireless VoIP telephone](#) on page 331

[Avaya 3616 wireless VoIP telephone](#) on page 333

[Avaya 3626 wireless VoIP telephone](#) on page 334

[Motorola CN620 Mobile Office Device](#) on page 335

---

## Consoles

[Avaya 302D attendant console](#) on page 323

[Avaya Softconsole](#) on page 324

---

# Optional components for DEFINITY Server SI

---

## Media gateways

[SCC1 Media Gateway](#) on page 180

[MCC1 Media Gateway](#) on page 188

---

## Circuit packs for DEFINITY Server SI

---

### Power Circuit Packs

[1217B AC power supply](#) on page 201

[631DA1 AC power unit](#) on page 201

[631DB1 AC power unit](#) on page 201

[649A DC power unit](#) on page 202

[676D DC power supply](#) on page 206

[982LS current limiter](#) on page 206

[TN755B Neon Power Unit](#) on page 217

[CFY1B current limiter](#) on page 206

[ED-1E568 DEFINITY AUDIX R4](#) on page 207

[TN2202 Ring Generator](#) on page 232

## Line Circuit Packs

- [TN479 Analog Line \(16 ports\)](#) on page 210
- [TN556D ISDN-BRI 4-Wire S/T-NT Interface \(12 ports\)](#) on page 211
- [TN746B Analog Line \(16 ports\)](#) on page 214
- [TN754C DCP Digital Line \(4-wire, 8 ports\)](#) on page 216
- [TN762B Hybrid Line \(8 ports\)](#) on page 218
- [TN769 Analog Line \(8 ports\)](#) on page 219
- [TN791 Analog Guest Line \(16 ports\)](#) on page 223
- [TN793B Analog Line with Caller ID \(24 ports\)](#) on page 224
- [TN797 Analog Trunk or Line Circuit Pack \(8 ports\)](#) on page 225
- [TN2181 DCP Digital Line \(2-wire, 16 ports\)](#) on page 229
- [TN2183/TN2215 Analog Line for multiple countries \(16 ports\)](#) on page 230
- [TN2185B ISDN-BRI S/T-TE Interface \(4-wire, 8 ports\)](#) on page 230
- [TN2198 ISDN-BRI U Interface \(2-wire, 12 ports\)](#) on page 231
- [TN2214CP DCP Digital Line \(2-wire, 24 ports\)](#) on page 233
- [TN2215/TN2183 Analog Line for Multiple Countries \(16 ports\) \(International Offers or US and Canada Offer B only\)](#) on page 234
- [TN2224CP DCP Digital Line \(2-wire, 24 ports\)](#) on page 235
- [TN2793B Analog Line with Caller ID \(24 ports\)](#) on page 244

---

## Trunk Circuit Packs

- [TN429D Incoming Call Line Identification \(ICLID\)](#) on page 208
- [TN459B Direct Inward Dialing Trunk \(8 ports\)](#) on page 209
- [TN464GP DS1 Interface, T1 \(24 channels\) or E1 \(32 channels\)](#) on page 209
- [TN465C Central Office Trunk \(8 ports\)](#) on page 210
- [TN747B Central Office Trunk \(8 ports\)](#) on page 215
- [TN753B Direct Inward Dialing Trunk \(8 ports\)](#) on page 216
- [TN760E Tie Trunk \(4-wire, 4 ports\)](#) on page 218
- [TN763D Auxiliary Trunk \(4 ports\)](#) on page 218
- [TN767E DS1 Interface, T1 \(24 channels\)](#) on page 218
- [TN1654 DS1 Converter, T1 \(24 channels\) and E1 \(32 channels\)](#) on page 227
- [TN2140B Tie Trunk \(4-wire, 4 ports\)](#) on page 228
- [TN2146 Direct Inward Dialing Trunk \(8 ports\)](#) on page 228
- [TN2147C Central Office Trunk \(8 ports\)](#) on page 229
- [TN2184 DIOD Trunk \(4 ports\)](#) on page 230
- [TN2199 Central Office Trunk \(3-wire, 4 ports\)](#) on page 232
- [TN2207 DS1 Interface, T1 \(24 channels\) and E1 \(32 channels\)](#) on page 232
- [TN2209 Tie Trunk \(4-wire, 4 ports\)](#) on page 233
- [TN2242 Digital Trunk](#) on page 235
- [TN2305B ATM-CES Trunk/Port-Network Interface for multimode fiber](#) on page 236
- [TN2306B ATM-CES Trunk/Port-Network Interface for single-mode fiber](#) on page 237
- [TN2308 Direct Inward Dialing Trunk \(8 ports\)](#) on page 237
- [TN2313AP DS1 Interface \(24 channels\)](#) on page 240
- [TN2464BP DS1 Interface with Echo Cancellation, T1/E1](#) on page 243

## Control Circuit Packs

[TN570D Expansion Interface](#) on page 212

[TN744E Call Classifier and Tone Detector \(8 ports\)](#) on page 214

[TN771DP Maintenance and Test](#) on page 220

[TN775C Maintenance](#) on page 221

[TN780 Tone Clock](#) on page 221

[TN792 Duplication Interface](#) on page 224

[TN799DP Control LAN \(C-LAN\) Interface](#) on page 226

[TN2182 Tone Clock, Tone Detector, and Call Classifier \(8 ports\)](#) on page 229

[TN2301 Logic Switch](#) on page 235

[TN2401 Network Control/Packet Interface for SI](#) on page 241

[TN2404 Processor](#) on page 242

---

## Service Circuit Packs

[TN433 Speech Synthesizer](#) on page 208

[TN725B Speech Synthesizer](#) on page 213

[TN787K Multimedia Interface](#) on page 222

[TN788C Multimedia Voice Conditioner](#) on page 222

[TNCCSC-1 PRI to DASS Converter](#) on page 245

[TNCCSC-2 PRI to DPNSS Converter](#) on page 245

[TNCCSC-3 PRI to DPNSS Converter](#) on page 245

[TN-C7 PRI to SS7 Converter](#) on page 245

[TN-CIN Voice, FAX and Data Multiplexer](#) on page 245

---

## Application Circuit Packs

[TN568 DEFINITY AUDIX 4.0 Voice Mail System \(part of ED-1E568\)](#) on page 212

[TN750C Recorded Announcement \(16 channels\)](#) on page 216

[TN801B MAPD \(LAN Gateway Interface\)](#) on page 226

[TN2501AP Voice Announcements over LAN \(VAL\)](#) on page 243

---

## Port Circuit Packs

[TN2302AP IP Media Processor](#) on page 235

[TN789B Radio Controller](#) on page 223

---

## Avaya telephones for DEFINITY Server SI

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### IP telephones

[Avaya IP Softphone](#) on page 301

[Avaya IP Softphone for Pocket PC](#) on page 302

[Avaya 4601 IP telephone](#) on page 304

[Avaya 4602 IP telephone](#) on page 305

[Avaya 4602SW IP telephone](#) on page 306

[Avaya 4602SW IP telephone](#) on page 306

[Avaya 4606 IP telephone](#) on page 306

[Avaya 4610SW IP telephone](#) on page 307

[Avaya 4620SW IP telephone](#) on page 309

[Avaya 4624 IP telephone](#) on page 310

[Avaya 4630SW IP Screenphone](#) on page 311

[Avaya 4690 IP conference telephone](#) on page 313

## Digital telephones

- [Avaya 2402 Digital Telephone](#) on page 314
- [Avaya 2410 digital telephone](#) on page 315
- [Avaya 2420 digital telephone](#) on page 315
- [Avaya 6402 and 6402D digital telephones](#) on page 316
- [Avaya 6408D+ digital telephone](#) on page 317
- [Avaya 6416D+M digital telephone](#) on page 318
- [Avaya 6424D+M digital telephone](#) on page 319
- [Avaya Callmaster IV \(603H\) digital telephone](#) on page 321
- [Avaya Callmaster V \(607A\) digital telephone](#) on page 321
- [Avaya Callmaster VI \(606A\) digital telephone](#) on page 322

---

## Soundstation speakerphones

- [3127 SoundPoint Speakerphone](#) on page 339
- [3127 SoundStation speakerphone](#) on page 340
- [3127 SoundStation Premier audioconferencing speakerphone](#) on page 341

---

## Analog phones

- [Avaya 2500 and 2554 analog telephones](#) on page 325
- [Avaya 6211 Analog Telephone](#) on page 326
- [Avaya 6219 analog telephone](#) on page 327
- [Avaya 6221 analog telephone](#) on page 328
- [AT&T TTY 8840 Analog Telephone](#) on page 328
- [AT&T 958 Analog Telephone Caller ID and Speakerphone](#) on page 329

---

## Avaya Explosive Atmosphere telephones

[Avaya EA401 and EA401A Explosive Atmosphere telephones](#) on page 329

---

## Wireless

[Avaya TransTalk 9040](#) on page 330

[Avaya 3410 wireless telephone](#) on page 331

[Avaya 3606 wireless VoIP telephone](#) on page 331

[Avaya 3616 wireless VoIP telephone](#) on page 333

[Avaya 3626 wireless VoIP telephone](#) on page 334

[Motorola CN620 Mobile Office Device](#) on page 335

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## Consoles

[Avaya 302D attendant console](#) on page 323

[Avaya Softconsole](#) on page 324



# Telephones and speakerphones

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## Avaya telephones

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### Avaya IP Softphone

Avaya IP Softphone is a collection of computer telephony integration (CTI) applications that enables you to control telephone calls (both incoming and outgoing) directly from your personal computer (PC). From the IP Softphone window, you can

- Make calls
- Answer calls
- View the calling/called party information for each call (commonly known as caller ID), if available
- Take notes during calls
- Place calls on hold
- Hang up calls
- Transfer calls
- Set up and manage conference calls
- Program speed dial buttons
- Invoke Communication Manager feature buttons
- Send and receive messages using Session Initiation Protocol (SIP)
- Use clipboard dialing
- Rename features on an IP telephone or features downloaded from the switch
- Use SIP-based URI dialing
- Define and use screen pops associated with various call events
- Maintain and use a contact directory and LDAP client directory
- Use another TAPI application to control calls from your PC
- Use an H.323 PC audio application such as Microsoft NetMeeting 3.0x to hear and speak to the other party on a call
- G.711, G.729a, G.723.1a audio voice codecs

## Telephones and speakerphones

- Secure IP Softphone calls with a variety of VPN solutions, including Avaya VPNremote client software and Avaya SG200/203/208 security gateways
- Advance Encryption Standard (AES) encryption of digits
- Use iClarity IP Audio for endpoint registration and audio paths
- Share call control with the 4601, 4602, 4602SW, 4606, 4610SW, 4612, 4620, 4624, 4620SW, and 4630 IP telephones
- Share call control with the 6402, 6402D, 6408, 6408D, 6416D, 6424D, and 2420 DCP telephones
- Use languages requiring multi-byte fonts (for example, Simplified Chinese, Japanese, and Korean)

You can run IP Softphone with the following:

- Microsoft Windows 2000 Professional or Server for Intel x86 with Service Pack 3 or later
- Microsoft Windows XP Home or Professional for Intel x86 with Service Pack 1 or later

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## Avaya IP Softphone for Pocket PC

The Avaya IP Softphone for Pocket PC brings full-featured enterprise-grade telephony to hand-held computers running the Microsoft Pocket PC 2002 and Pocket PC 2003 operating systems. This enables mobile workers to access enterprise telephony functions from a meeting room down the hall or from any location around the world in the exact manner and with the same full feature functionality as if they were at their office desks. Avaya IP Softphone for Pocket PC provides this capability via standard, off the shelf Pocket PC devices and standard 802.11 wireless interfaces. No specialized hardware is required.

IP Softphone for Pocket PC has the following characteristics:

- Able to share call control with the 4601, 4610SW, 4620SW, and 4630 IP telephones
- Able to share call control with the 6402D, 6408D, 6416D, 6424D, and 2420 DCP telephones
- Internationalization - Able to support multiple languages through the installation of language packs, including multi-byte fonts
- Emergency Call Handling 911 feature
- Swap Skins Tool
- Call Log History
- Voice over IP configuration (road warrior)
- Dual connection (telecommuter) for toll quality audio
- Easy-to-use graphical user interface

- Access to Communication Manager station features and buttons programmed on the user's telephone extension
- Multiple call appearances and line status indicators
- Conference, Transfer, Hold, Mute, Drop buttons
- Message indicator
- Email integration button
- Network diagnostic tools
- Dial from Microsoft Outlook Contact List
- G.711 Mu-Law and A-law

IP Softphone for Pocket PC requires the following software and hardware:

- Avaya Communication Manager software
- Avaya media server
- Avaya IP Softphone license
- Microsoft Pocket PC 2000 (with the H3600 Series Pocket PC ROM Update) or Microsoft Pocket PC 2002
- Compaq iPAQ or Hewlett Packard Jornada with minimum of 206 MHz Strong Arm processor
- 802.11 Wireless LAN connectivity
- For telecommuter mode - CDPD service and second telephone line
- PDA headphones

Audio quality varies from toll quality to less than cell phone quality depending on:

- Pocket PC processor performing simultaneous tasking of other applications during the call
- Bandwidth of the wireless connectivity
- Ambient noise (current supported PDAs have external microphones)
- Network performance and quality of service

## Avaya IP telephones

### Avaya 4601 IP telephone

The Avaya 4601 is an entry-level IP telephone with 2 call appearances.

The following are characteristics of an Avaya 4601 IP telephone:

- 2 call appearances with LEDs
- Fixed button with LED for voice mail retrieval
- Five fixed feature buttons that include the following:
  - Hold
  - Transfer
  - Conference
  - Drop
  - Redial
- Supports power over Ethernet
- Supports Quality-of-Service features including RTCP and RSVP
- Wall or desk mount
- 10/100Base-T Ethernet network connection with RJ-45 interface
- Supports G.711, G.729A, and G.729B audio voice codecs
- Supports H.323 V2
- IP address assignment using DHCP
- Downloadable firmware for future upgrades
- Native support that provides the user with the capability to administer and maintain the 4601 IP telephone without using an alias
- 12-button touch-tone dial pad with raised bar on the button labeled five for the visually impaired
- Message waiting light (LED)
- Hearing aid compatible
- Adjustable volume control
- Available in dark gray
- Ready to be sold and used world wide

## Avaya 4602 IP telephone

The Avaya 4602 is an entry-level IP telephone with 2 call appearances.

The following are characteristics of an Avaya 4602 IP telephone:

- 2 × 24-character display
- 2 call appearances
- Ready to be sold and used world wide
- Fixed button for voice mail retrieval
- 1-way speaker
- Seven fixed feature buttons that include the following:
  - Speaker
  - Mute
  - Hold
  - Transfer
  - Conference
  - Drop
  - Redial
- Supports power over Ethernet
- Supports Quality-of-Service features including RTCP and RSVP
- Wall or desk mount
- 10/100Base-T Ethernet network connection with RJ-45 interface
- Supports G.711, G.729A, and G.729B audio voice codecs
- Supports H.323 V2
- Send and receive messages using Session Initiation Protocol (SIP)

**Note:**

SIP support requires SIP firmware to be installed. The 4602 IP telephone cannot be administered for SIP and H.323 at the same time.

- Supports Web interface for phone settings (SIP-enabled only)
- IP address assignment using DHCP or statically configured
- Downloadable firmware for future upgrades
- Native support that provides the user with the capability to administer and maintain the 4602 IP telephone without using an alias
- 12-button touch-tone dial pad with raised bar on the button labeled five for the visually impaired

## Telephones and speakerphones

- Message waiting light (LED)
- Hearing aid compatible
- Adjustable volume control
- Available in dark gray

### Avaya 4602SW IP telephone

The 4602SW IP telephone has the same feature set as the 4602 with the addition of a built-in Ethernet switch.

### Avaya 4606 IP telephone

The 4606 IP telephone is a fully Internet-capable set supporting Internet Protocol (IP) standards, providing extensive telephone features and functionality in both the handset and speakerphone.

The following are characteristics of the Avaya 4606 IP telephone:

- Six programmable appearance or feature buttons with dual red and green LEDs
- Five fixed feature buttons that include: the speaker button, the mute button, the hold button, the volume button
- Three fixed feature buttons under display which include: the conference button, the transfer button, and the redial button
- 2-line by 16-character LCD display
- Full duplex speakerphone with echo cancellation
- 10/100Base-T Ethernet network connection with RJ-45 interface
- Integrated Ethernet repeater hub for optional PC connection
- Supports G.711, G.729A, and G.729B audio voice coders
- Supports H.323 V2
- IP address assignment using DHCP or statically configured
- Infrared port to support IR dialing and other applications
- Downloadable firmware for future upgrades
- Supports CTI applications from the Avaya Softphone, and is CTI ready for other applications
- Supports power over Ethernet
- Supports Quality of Service features including RTCP and RSVP
- Hearing aid compatible

- 12-button touch-tone dial pad with raised bar on the button labeled five for the visually impaired
- Message waiting light (LED)
- Integrated modular headset jack for direct connection of headset
- Adjustable volume control for the handset, speaker, and ringer
- Eight personalized ringing options
- K-style handset with 9-foot modular cord
- 14-foot modular line cord
- Available in black only

Optional available components:

- 12-foot modular handset cord
- 25-foot modular line cord
- Base stand (15-degree angle)
- Avaya headsets
- Amplifier handset
- Noisy environment handset
- Push-to-talk handset

## Avaya 4610SW IP telephone

The Avaya 4610SW IP telephone provides advanced feature functionality with an intuitive and innovative user interface. The Avaya 4610SW provides telephony, speed dial, call log, and Web browsing functionality.

The following are characteristics of the Avaya 4610SW IP telephone:

- High-end feature set
- Medium screen graphic display (168 x 80 pixel, 4 grayscale)
- Advanced user interface that supports 48 speed dialing buttons, 45 call log entries, and up to three redial buttons on display
- Avaya Call Processing label editing
- Speed Dial entry editing
- User screen options
- Call log
- WML browser capability
- Full-duplex speakerphone with echo cancellation

## Telephones and speakerphones

- 10/100Base-T Ethernet network connection with RJ-45 interface
- Integrated Ethernet switch for optional PC connection
- Supports G.711, G.729A, and G.729B audio voice coders
- Supports H.323 V2
- Able to receive and display extensible markup language (XML) page content that is pushed from an application server
- Able to receive and play streaming audio that is pushed from an application server
- IP address assignment using DHCP or statically configured
- Downloadable firmware for future upgrades
- 12 call appearance or feature buttons with downloadable labels
- Adjustable desk stand
- Global icons
- Hearing aid compatible
- 12-button touch-tone dial pad with raised bar on the button labeled five for the visually impaired
- Message waiting light (LED)
- Adjustable volume control
- Supports CTI applications from the Avaya Softphone and is CTI-ready for other applications
- Supports power over Ethernet
- Supports Quality of Service features including RTCP and RSVP
- Can display network audio quality information during calls
- Support of multi-byte fonts
- Native support that will give the customer the ability to administer and maintain the telephone without using an alias
- Four softkeys, located under the display, that enhance the user interface
- Available in dark gray

## Avaya 4620SW IP telephone

Avaya 4620SW IP telephone provides advanced feature functionality with an intuitive and innovative user interface. The Avaya 4620SW can provide telephony, speed dial, call log, and Web browsing functionality.

The following are characteristics of the Avaya 4620SW IP telephone:

- High-end feature set
- Large screen graphic display (168-by-132 pixel 4-grayscale)
- Support of multi-byte fonts
- Advanced user interface, supporting 108 speed dialing buttons, 90 call log entries and up to six redial buttons on the display
- Avaya Call Processing label editing
- Speed Dial entry editing
- EU24 button label editing
- User screen options
- WML browser capability
- Full duplex speakerphone with echo cancellation
- 10/100Base-T Ethernet network connection with RJ-45 interface
- Supports G.711, G.729A, and G.729B audio voice coders
- H.323 V2
- IP address assignment using DHCP or statically configured
- Able to receive and display extensible markup language (XML) page content that is pushed from an application server
- Able to receive and play streaming audio that is pushed from an application server
- Infrared port to support IR dialing and other applications
- Downloadable firmware for future upgrades
- 24 call appearance or feature buttons with downloadable labels
- Integrated Ethernet switch
- Adjustable desk stand
- Function key expansion unit jack to support optional 24 button feature expansion unit (EU24)
- Global Icons
- Hearing aid compatible
- A 12-button touch-tone dial pad with raised bar on the button labeled five for the visually impaired.

## Telephones and speakerphones

- A message waiting light (LED)
- Adjustable volume control
- Supports CTI applications from the Avaya Softphone and is CTI ready for other applications
- Supports power over Ethernet
- Supports Quality of Service features including RTCP and RSVP
- Can display network audio quality information during calls
- Native support that will give the customer the capability to administer and maintain the 4620 IP telephone
- Four softkeys that reside under the display to enhance the user interface
- Available in dark gray.

## Avaya 4624 IP telephone

The 4624 IP telephone is a fully Internet-capable set supporting IP standards, providing extensive telephone features and functionality.

The following are characteristics of the Avaya 4624 IP telephone:

- 24 Programmable appearance or feature buttons with dual red and green LEDs
- Eight fixed feature buttons which include: the speaker button, the mute button, the hold button, the transfer button, the conference button, the redial button, and volume control button
- Four fixed navigation buttons which include: the menu button, the exit button, the previous and next buttons
- Four softkeys that reside under the display
- Full duplex speakerphone with echo cancellation
- 10/100 Base-T Ethernet network connection with RJ-45 interface
- Integrated ethernet repeater hub for optional PC connection
- G.711, G.729A, and G.729B audio voice coders
- H.323 V2
- Supports CTI applications from the Avaya Softphone and is CTI ready for other applications
- Supports power over Ethernet
- Supports Quality of Service features including RTCP and RSVP
- Supports external 30A Switched Hub adapter
- IP Address assignment using DHCP or statically configured

- Infrared port to support IR dialing and other applications
- Downloadable firmware for future upgrades
- Hearing aid compatible
- 12-button touch-tone dial pad with raised bar on the number five for the visually impaired
- Message waiting light (LED)
- Integrated modular headset jack for direct connection of headset
- Adjustable volume control for the handset, speaker, and ringer
- Eight personalized ringing options
- K-style handset with 9-foot modular cord
- 14-foot modular line cord
- Available in black only

Optional available components:

- 12-foot modular handset cord
- 25-foot modular line cord
- Base stand (15-degree angle)
- Avaya headsets
- Amplifier handset
- Noisy environment handset
- Push-to-talk handset

## Avaya 4630SW IP Screenphone

The Avaya 4630SW IP Screenphone is a fully Internet-capable IP appliance that supports IP standards. The Avaya 4630SW IP Screenphone provides a user-friendly window into IP enabled applications, a full suite of Communication Manager features, Lightweight Directory Access Protocol (LDAP) directory, and INTUITY™ AUDIX® voice mail features. Up to six telephony related applications are provided through a unique user interface, developed with ease-of-use and minimal touch access in mind.

The following are characteristics of the Avaya 4630SW Screenphone:

- 1/4 VGA color touch-screen display with user screen options
- Five fixed feature buttons which include: the speaker button, the mute button, the hold button, the headset button, and the volume control button
- Full duplex speakerphone with echo cancellation
- 120 total speed dial buttons organized into groups for easier access
- 100 total entries in the call log of incoming and outgoing calls
- Up to eight redial buttons can be presented on the display

## Telephones and speakerphones

- 10/100 Base-T Ethernet network connection with RJ-45 interface
- Directory access to corporate telephone directory information on a LDAP server
- Voice mail access to Web based voice mail messaging capabilities of Avaya Web Messaging
- User-customizable stock ticker
- Access to Web-based information, including support for downloading Java applets
- G.711, G.729A, and G.729B audio voice coders
- H.323 V2
- IP address assignment using DHCP or statically configured
- Infrared port to support IR dialing and other applications
- Supports CTI applications from the Avaya Softphone and is CTI ready to other applications
- Supports power over Ethernet
- Supports Quality of Service features including RTCP and RSVP
- Can display network audio quality information during calls
- Downloadable firmware for future upgrades
- A built-in Ethernet switch
- Hearing-aid compatible
- 12-button touch-tone dial pad with raised bar on the number five for the visually impaired
- Message waiting light (LED)
- Integrated modular headset jack for direct connection of headset
- Adjustable volume control for the handset, speaker, and ringer
- K-style handset with 9-foot modular cord
- 14-foot modular line cord
- Available in black or white

### Optional available components:

- 12-foot modular handset cord
- 25-foot modular line cord
- Base stand
- Avaya headsets
- Amplifier handset
- Noisy environment handset
- Push-to-talk handset

## Avaya 4690 IP conference telephone

The Avaya 4690 IP Speakerphone provides the convenience and productivity benefits inherent in a purpose-built hands-free conference phone. It also delivers the extensive set of Avaya Communication Manager features directly to the conference room. It offers many of the same features as other Avaya Speakerphones (360 degree coverage, two optional extended microphones for expanded coverage, full-duplex operation) and adds to them some additional capabilities. These include downloadable software upgrades and simplified wiring to IP network via ethernet LAN connectivity.

The following are characteristics of the Avaya 4690 IP Speakerphone:

- 3 soft keys to give access to common telephony features, automatically labeled from the system
- 5 fixed feature and navigation keys: On/Off Hook, Redial, Mute and Volume Up & Down
- 5 menu and navigation keys
- 12 key telephone keypad
- Graphical display (248 x 68 pixels)
- Full duplex Ethernet connectivity with auto-negotiation, 802.3 flow control, VLAN support
- G.711, G.729A voice codecs
- QoS Options of Diffserv and 802.1p/q
- Support for Simple Network Management Protocol (SNMP) version 2
- DHCP client and statically (manual) configurable IP Addressing
- AC powered with power brick (provided)
- Downloadable software for future upgrade capability
- Icon button labeling with English printing on the housing
- 5 personalized ring patterns
- Must be administered as a 4620 IP telephone

## Avaya digital telephones

### Avaya 2402 Digital Telephone

The Avaya 2402 is a low-cost, low function, 2-wire digital telephone. The 2402 can be aliased as a 6402 telephone.

The following are characteristics of the Avaya 2402 telephone:

- 2 line × 24 character LCD
- 2 call appearance buttons
- Handset and 12-button dialpad
- Wall mountable
- Display of downloaded extension number
- Highly visible message-waiting indicator
- Message button for expedited access to voice mail
- Conference, transfer, drop, hold, and redial buttons
- Built-in one-way speaker with group listen operation
- Speaker, feature, and mute buttons, each with LED indicators
- Feature button allows access, by way of the dialpad, to 12 Communication Manager features that do not require indicators
- Volume up or down buttons for handset, speaker, and ringer
- Electronically stored part ID and serial number for use with Automatic Customer Telephone Rearrangement
- 9-foot phone cord and 14-foot gray, modular line cord
- Stand included
- Native support that will give the customer the ability to administer and maintain the telephone without using an alias

## Avaya 2410 digital telephone

The Avaya 2410 is a 2-wire digital telephone. The display of the Avaya 2410 consists of a monochrome liquid crystal display (LCD) which is 29 characters wide by 5 lines tall. Display characters are defined by a 5-column by 8-row matrix of dots which is used to support 5- x 7-dot European or Katakana characters.

The following are characteristics of the Avaya 2410 telephone:

- 5-line x 29 character LCD
- Handset and 12-button dialpad
- Adjustable viewing angle
- Wall mountable
- Six general purpose buttons to access up to 12 system call appearance or features
- Downloaded call appearance or feature button labels
- Four local softkey feature buttons
- Exit, previous, and next buttons for display navigation
- Highly visible message waiting indicator
- Message button for expedited access to voice mail
- Conference, transfer, drop, hold, and redial buttons
- Headset jack that is separate from the handset jack
- Built-in speakerphone with group listen operation
- Speaker, headset, mute buttons, each with LED indicators
- Volume up or down buttons for handset, headset, speakerphone and ringer
- 48 Entry Call Log (total incoming answered, incoming unanswered, and outgoing calls)
- Downloadable firmware for future upgrades
- Automatic Gain Control on all audio interfaces
- Electronically stored part ID and serial number for use with Automatic Customer Telephone Rearrangement
- Native support that will give the customer the ability to administer and maintain the telephone without using an alias

## Avaya 2420 digital telephone

The Avaya 2420 is a 2-wire digital telephone. The display of the Avaya 2420 consists of a monochrome liquid crystal display (LCD) which is 29 characters wide by 7 lines tall. Display characters are defined by a 5-column by 8-row matrix of dots which is used to support 5- x 7-dot European or Katakana characters.

## Telephones and speakerphones

The following are characteristics of the Avaya 2420 telephone:

- 7-line x 29 character LCD
- Handset and 12-button dialpad
- Adjustable viewing angle
- Wall mountable
- Eight general purpose buttons to access up to 24 system call appearance or features
- Downloaded call appearance or feature button labels
- Four local softkey feature buttons
- Exit, previous, and next buttons for display navigation
- Highly visible message waiting indicator
- Message button for expedited access to voice mail
- Conference, transfer, drop, hold, and redial buttons
- Headset jack that is separate from the handset jack
- Built-in speakerphone with group listen operation
- Speaker, headset, mute buttons, each with LED indicators
- Volume up or down buttons for handset, headset, speakerphone and ringer
- 100 Entry Call Log (total incoming answered, incoming unanswered, and outgoing calls)
- Downloadable firmware for future upgrades
- Automatic Gain Control on all audio interfaces
- Electronically stored part ID and serial number for use with Automatic Customer Telephone Rearrangement
- Optional 24 button feature key expansion unit
- Optional analog interface application module
- Native support that allows users the capability to administer and maintain the 2420 using the associated Feature Expansion Module

## Avaya 6402 and 6402D digital telephones

The Avaya 6402 and 6402D are single-line digital telephones. The difference between the Avaya 6402 and the 6402D is the Avaya 6402D is equipped with a 2-line by 24-character display.

The following are characteristics of the Avaya 6402 telephone:

- Built-in group listening speaker
- Six Fixed buttons which include: the speaker button, the feature button, the hold button, the redial button, the transfer button, and the conference button

- The feature button allows access by way of the dialpad, to 12 Communication Manager features that do not require indicators or display messages.
- Adjustable volume control for the handset, speaker, and ringer.
- 2-wire connectivity through a digital line circuit packs.
- Internal self test for the LEDs.
- Choice of eight ringing patterns.
- Can be used with or without the stand.
- Desk or wall mountable.
- Matching 9-foot (2.7-m) handset cord and a 7-foot (2.1-m) modular line cord.
- Available in dark gray and white.
- No Adjunct jack interface for external speakerphones or headset modules
- Headsets must be connected through the handset.

## Avaya 6408D+ digital telephone

The 6408D+ is a digital telephone with eight buttons.

The following are characteristics of the 6408D+ telephone:

- 2-line by 24-character LCD display showing time and date when the telephone is in an idle status
- Tiltable display with three viewing angles.
- Eight call appearance and feature buttons with dual LEDs (two color buttons).
- Built-in 2-way speakerphone which can also be optioned as a 1-way group listening speaker.
- Six fixed buttons which include: the speaker button, the mute button, the hold button, the redial button, the transfer button, and the conference button.

### **Note:**

Drop must be administered on a softkey.

- Twelve system features can be administered on softkeys associated with the display.
- Four buttons to access softkey features such as: the menu button, the exit button, the previous button, and the next button
- When the headset feature is administered, it is no longer necessary to take handset off hook to answer a call.
- Adjustable volume control for the handset, speaker, and ringer.
- Message Waiting Light (LED)
- 2-wire connectivity through 2-wire Digital line circuit packs only.

## Telephones and speakerphones

- Accepts download from Communication Manager of voice and touchtone transmission parameters as required by each country
- Internal self test to determine if LEDs light
- Choice of eight ringing patterns
- Line powered
- Can be used with or without stand.
- Desk or wall mountable
- Matching 9-foot (2.7-m) handset cord and a 7-foot (2.1-m) modular line cord.
- Available in dark gray and white.

### Avaya 6416D+M digital telephone

The Avaya 6416D+M telephone is a multi-appearance digital telephone with 16 call appearances or feature buttons.

The Avaya 6416D+M comes equipped with a modular plug that allows you to install a 100A tip and ring module to the desktop stand on the telephone for increased set functionality. The 100A tip and ring module provides a connection to adjuncts such as answering machines, FAX machines, modems, analog speakerphones, and hearing impaired TDD machines.

A XM24 expansion module can be connected to any Avaya 6416D+M telephone to expand the number of buttons you can use. However, when the expansion module is connected you must connect an auxiliary power supply to the telephone. An 1151B1 local power supply or an 1151B2 local power supply with battery holdover is recommended.

The following are characteristics of the Avaya 6416D+M telephone:

- 10 fixed features buttons which include: the speaker button, the mute button, the conference button, the transfer button, the hold button, the redial button, the menu button, the exit button, the previous button, and the next button
- 12 assignable soft key features associated with the display
- A built-in two-way programmable speakerphone can be optioned by user on an individual call basis for group listening
- Headset jack for direct connection of headset
- Adjustable volume control for the handset, speaker, and ringer
- 12-button touch-tone dial pad with raised bar for the visually impaired
- Message waiting light (LED)
- Eight personalized ringing options
- K-style handset with 9-foot modular cord
- 14-foot modular line cord
- Pull-out feature reference card tray

- Can be wall or desk mounted
- International portability
- Downloadable transmission parameters
- Available in gray or white
- Meets Class B requirements for use in residential locations

Optional available components:

- 12-foot modular handset cord
- 25-foot modular line cord
- HIC-1 headset interface cord
- Headset modular base unit M12LUCM
- Avaya headset
- Amplifier handset
- Noisy environment handset

The approximate dimensions of the 6416D+M are:

- Width = 10.35 inches (26.35 cm)
- Depth (front to back) = 8.5 inches (21.59 cm)
- Height (with deskstand and handset in place) = 4.75 inches (12.07 cm)

## Avaya 6424D+M digital telephone

The Avaya 6424D+M telephone is a multi-appearance digital telephone with 24 call appearances and feature buttons.

The Avaya 6424D+M comes equipped with a modular plug that allows you to install a 100A tip and ring module to the desktop stand on the telephone for increased set functionality. Through the 100A tip and ring module you can connect adjuncts such as, answering machines, FAX machines, modems, analog speakerphones, and hearing impaired TDD machines.

A XM24 expansion module can be connected to any Avaya 6416D+M telephone to expand the number of buttons you can use. However, when the expansion module is connected you must connect an auxiliary power supply to the telephone. An 1151B1 local power supply or an 1151B2 local power supply with battery holdover is recommended.

**The following are characteristics of the 6424D+M telephone:**

- 2-line x 24-character LCD display showing time and date when the telephone is in an idle status.
- A tiltable display with three viewing angles.
- Built-in 2-way speakerphone which can also be optioned as 1-way group listening speaker

## Telephones and speakerphones

- Six fixed feature buttons which include: the speaker button, the mute button, the hold button, the redial button, the transfer button, and the conference buttons.
- Twelve system features that can be administered on the softkeys associated with the display.
- Four buttons to access softkey features such as menu, exit, previous, and next.
- Only one next button that is used with the softkeys and the directory function.
- A ribbon connector under the telephone to connect optional modules that fit into the stand.
- Headset jack under telephone, next to handset jack, for direct connection of headset.
  - When the headset feature is administered, it is not necessary to take handset off hook to answer telephone when using a headset.
  - When using headset via headset feature button, handset becomes listen-only for monitoring until headset button turned off.
- No adjunct jack interface for external S201/S203 speakerphone adjuncts or headset adjuncts
- When system administrator provides the user with permission, a user may add, remove or rearrange the certain features on their call appearance and feature buttons.
- Adjustable volume control for the handset, speaker and ringer.
- Message waiting light
- Supports optional XM24 expansion module that allows for an additional 24 call appearance and feature buttons with dual LEDs.
- 2-wire connectivity through 2-wire digital line circuit packs only
- Internal self test
- Choice of eight ringing patterns
- Can be used with or without stand when the 100A Analog Interface module not in stand.
- Desk or wall mountable. If 100A Analog Interface Module is connected, the telephone can not be wall mounted.
- Available in dark gray and white.
- Meets Class B requirements for use in residential location.

The Avaya 6424D+M telephone is powered from the system it is connected to. Adjunct station or closet power is necessary only when connecting an XM24 expansion module or the 100A Analog Interface Module. If both modules are connected to the 6424D+M, only one power supply is necessary. The 6424D+M will continue to work if the auxiliary power is interrupted, but the modules will not work.

## Avaya Callmaster IV (603H) digital telephone

The Avaya Callmaster IV is engineered to support applications involving the Automatic Call Distribution (ACD) feature. The ergonomic design of the Avaya Callmaster IV enables agents to handle large volumes of calls more quickly and efficiently. VuStats, a display of agent and call center statistics on the Avaya Callmaster IV, provides agents with real-time information.

The Avaya Callmaster IV will work in a 2-wire environment. The older Avaya Callmaster IV (603F) has a separate jack for the older 4-wire environment, as well as reduced wiring expenses and installation change adjustments.

The Avaya Callmaster IV includes as standard a built-in Recorder Interface Module (RIM) that supports connections to agent recording equipment.

The Avaya Callmaster IV may be used in home office environments with a DEFINITY Extender.

The following are characteristics of the Avaya Callmaster IV:

- Six rubber-domed administrable call appearance or flexible feature buttons
- 15 rubber-domed administrable flexible feature buttons
- Eight fixed feature buttons such as: the conference button, the transfer button, the drop button, the hold button, the mute button, the volume button, the release button, and the login button
- 80-character alphanumeric LCD display
- 12-button touch-tone dial pad with raised bar on the number five for the visually impaired
- Message waiting light (LED)
- Recorder interface module
- Dual headset jacks
- Eight personalized ringing options
- Receiver and ringer volume control
- Stand for desk
- International portability
- Amplifier handset

## Avaya Callmaster V (607A) digital telephone

The Avaya Callmaster V has been specially designed to support applications involving the ACD feature. The ergonomic design of the Avaya Callmaster V enables agents to handle large volumes of calls more quickly and efficiently. VuStats display of agent and call center statistics on the Avaya Callmaster V provides agents with real-time information.

## Telephones and speakerphones

The Avaya Callmaster V has the same look and feel of the 6400-series telephones. There are two significant additional features that maximize the value of this telephone in a Call Center environment:

- **2 built-in headset jacks**
- **Built-in Recorder Interface Module (RIM) with Warning Tone.** The RIM will support recording of both the agent's and caller's voice on a voice activated analog tape recorder. A soft beep warning tone is repeated every 13.5 seconds to notify the agent and calling party that the call is being recorded. The warning tone may be de-activated by the user.

The Avaya Callmaster V may be used in home office environments with a DEFINITY Extender.

### **The following are characteristics of the Callmaster V telephone:**

- 16 dual-LED call appearance or feature buttons
- An adjustable 48-character liquid crystal display
- 10 fixed feature buttons such as: the speaker button, the mute button, the conference button, the transfer button, the hold button, the redial button, the menu button, the exit button, the previous button, and the next button
- 12 assignable soft key features associated with the display
- One-way listen-only speaker for group listening, dialing while the handset in place, or hands free listening
- Adjustable volume control for the handset, speaker, and ringer
- Works in a 2-wire environment

## **Avaya Callmaster VI (606A) digital telephone**

The Callmaster VI is a small digital voice telephone used with the application software running on a PC. Powered from the PBX, the Callmaster VI connects to the PC by way of a standard EIA or TIA-574 serial port interface.

The following are the characteristics of the Avaya Callmaster VI:

- Two headset input jacks, both usable at the same time
- Optional headset with custom cable
- Message waiting indicator
- Five pre-set buttons:
  - Headset on and off
  - Mute
  - Two call appearances
  - Release
- Three administrable feature buttons

- Voice announcement recording feature:
  - Up to six announcements that are 9.6 seconds in length
  - Announcements can be played automatically for incoming calls

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## Avaya attendant consoles

### Avaya 302D attendant console

The Avaya 302D Attendant Console is a 2-wire unit with an optional 26C expansion module. The Avaya 302D cannot be used in a 4-wire environment.

The following are characteristics of the Avaya 302D attendant console:

- Comes in three colors: dark gray, black and white
- Power is required from the desktop or the telephone closet
- All 302D Attendant Consoles are desk mounted only.
- Supports optional 26C Selector Console:
  - Each button provides attendants access to the thousands and hundreds digit for one hundred extension numbers
  - Busy or idle status display for each button
- The display is 1 × 40 and supports Katakana, Roman and Euro font Character set. Label Languages are Japanese, English, French, Dutch, Spanish Latin America, Italian, German, Canadian French, Brazilian Portuguese. Two labels are included with each 302D console.
- Handset/Headset connection is moved to the front and is a single modular plug. For headset an H1C or M12LUCM is Optional.
- Service observing must be done through the Communication Manager via the feature of Service Observing. An optional Training-Y connector can be used in conjunction with headset connection for desktop listen only supervisor support.

### Avaya Softconsole

Avaya Softconsole is a software attendant console solution. Avaya Softconsole is available for industry standard IP and Avaya Digital Communications Protocol (DCP). IP connectivity is available in both Voice over IP configuration (road warrior) and dual connection (telecommuter) for toll quality audio.

The following are characteristics of the Avaya Softconsole:

- Busy Lamp Fields (BLF), directory and display windows may all be on the same screen and the same time.
- Flexible screen arrangement for the attendant that is saved from session to session.
- Application window scales intelligently from a minimum useful size to full screen. Useful information is added to the display as the attendant increases the window size.
- On request line status such as on and off-hook displayed for the selected entry in the directory window.
- Queue status display
- Feature buttons offered as tools in multiple tool bars with pop-up, full word, tool tip displays for each.
- 32-bit Application
- Maximum of 100 directories
- Ability to generate e-mail to users at the click of a tool bar button or keyboard command
- Step-by-step wizard for both installation and initial administration with help and warning text presented with each step.
- Targeted to reduce service call volumes for installation assistance.

### MasterDirectory Data Manager

MasterDirectory Data Manager is included as part of Avaya Softconsole. It is a database application that is specifically designed for directory data management. It serves as an information management tool—importing and consolidating directory information from voice and data systems, and exporting it to directory-enabled applications. MasterDirectory can import/export and transfer data via standards-based protocols, including the following:

- ODBC – Open Data Base Connectivity
- LDAP – Lightweight Directory Access Protocol
- FTP – File Transfer Protocol
- SMTP – Simple Mail Transfer Protocol
- CSV – text delimited files

Using these protocols MasterDirectory can:

- Extract data from multiple sources
- Apply filters and business logic to consolidate data
- Populate directory services and databases for use by applications

For example, MasterDirectory can collect information from multiple Avaya Media Servers, consolidate the data with Human Resource databases, and send the processed data to an LDAP directory service used by phone attendant applications, Internet white and yellow pages, and other applications.

## Avaya analog telephones

### Avaya 2500 and 2554 analog telephones

The Avaya 2500 and the Avaya 2554-series telephones are made up of several analog telephones that are basically the same but are equipped with small different attributes. These models include:

- 2500 MMGN desk model telephone
- 2500 YMPG desk model telephone
- 2554 MMGN wall model telephone
- 2554 YMPG wall model telephone

All Avaya 2500 and 2554 telephones are single appearance analog telephones with conventional touch-tone dialing. The 2554 YMPG telephones are equipped with a flash button, a message waiting light, a redial button, a hold button and a mute button. All four of these telephone models provide access to features through the use of the \* or # dial pad keys and the appropriate feature access codes.

The following are physical features of the Avaya 2500 and Avaya 2554 telephones:

- The 2500 MMGN and 2554 MMGN telephones are manufactured without Positive Disconnect and without a FLASH button. The 2500 YMPG and 2554 YMPG have Positive Disconnect permanently enabled. When the FLASH button is depressed, access is provided to switch features. When the switchhook is depressed, the call is automatically disconnected and a dial tone is provided for a completely new call. Older models have a Positive Disconnect switch on the bottom of the telephone with two positions: ON and OFF:
  - The ON position hangs up the telephone for approximately two seconds, even if the switchhook depression is less. This prevents inadvertent switchhook flashes. To initiate switchhook flash in this mode, press the FLASH button.
  - In the OFF position, the switchhook will function normally
- K-type handset

## Telephones and speakerphones

- All of the 2500-series telephones are equipped with a 12-button touch-tone dial pad.
- All of the 2500-series telephones contain two jacks. The handset cord jack is on the left side of the telephone. The line cord jack is on the right rear of the set.
- All of the 2554-series telephones have one jack and one mounting cord. The handset cord jack is on the bottom of the telephone. The line cord is on the rear of the telephone to plug into the wall outlet.
- Two cords are supplied with all four of these 2500-series model telephones: a coiled 6-foot modular handset cord and a 7-foot modular line cord. Optional longer cords are available: a 12-foot handset cord, and 14-foot and 25-foot line cords. Two cords are supplied with 2554-series model telephones: a coiled 6-foot modular handset cord and a permanently attached 4-inch modular mounting cord. An optional longer 12-foot handset cord is available.
- All of the 2500-series telephones have an electronic tone ringer. There is a 3-position ringer volume control located on the bottom of the 2500 telephone and the side of the 2554 telephone.
- The 2500 YMPG telephones can only be desk-mounted. They cannot be wall-mounted. The 2554 YMPG telephones are wall-mounted telephones. They cannot be desk-mounted.
- All of the 2500-series telephones are available in black or misty cream.
- All of the Avaya 2500- and 2554-series telephones are powered by the tip and ring leads. The telephones do not require any external power supply.
- All of the Avaya 2500- and 2554-series telephones can be used as an emergency station during power failure transfer conditions. The 2554 sets can ONLY be used as a Power Failure set in a Loop Start environment; the 2500 sets can be used as a Power Failure set in either a Loop Start or a Ground Start environment. Use in a Ground Start environment required the optional Modular Ground Start button.
- These 2500 and 2554 telephones are FCC-registered.

## Avaya 6211 Analog Telephone

The Avaya 6211 telephone is a single line analog telephone.

The following are characteristics of the Avaya 6211 telephone:

- 7-foot modular line cord
- Handset volume control
- Ringer volume control
- Message waiting light
- Flash button
- Set hold button with LED Indicator
- Last number re-dial button

- A 12-button touch-tone dial pad with raised bar on the number five for the visually impaired
- Positive disconnect via switchhook
- Can be desk or wall mounted
- RJ-11 data jack
- FCC approved for emergency power failure transfers
- Line powered
- Available in gray or white

Optional available components:

- A 12-foot handset cord
- A 14-foot line cord
- A 25-foot line cords
- Avaya headsets

## Avaya 6219 analog telephone

The Avaya 6219 telephone is a single line analog telephone.

The following are characteristics of the Avaya 6219 telephone:

- A 7-foot modular line cord
- Handset volume control
- Ringer volume control
- Message waiting light
- Flash button
- Set hold button with LED Indicator
- Last number redial button
- A 12-button touch-tone dial pad with raised bar on the number five for the visually impaired
- Positive disconnect via switchhook
- Desk and wall mounting available
- RJ-11 Data jack
- FCC approved for emergency power failure transfers
- Line powered
- Available in gray or white
- Ten repertory dialing buttons
- Personalized ringing

## Telephones and speakerphones

Optional available components:

- 2-foot handset cord
- 14- and 25-foot modular line cords
- Avaya headsets

### Avaya 6221 analog telephone

The Avaya 6221 telephone is a single line analog telephone.

The following are characteristics of the Avaya 6221 telephone:

- Handset volume control
- Ringer volume control
- Message waiting light
- Flash button
- Set hold button with LED Indicator
- Mute button
- Last number redial button
- RJ-11 Data jack
- Available in gray or white
- Ten programmable dialing buttons
- Personalized ringing
- Built-in speakerphone (accessed with the SPEAKER button)

### AT&T TTY 8840 Analog Telephone

The TTY 8840 is an analog single line telephone that is specifically designed for the communications needs of either the Hearing or Speech Impaired. It can make voice telephone calls or TTY calls. Features include a 2-line by 24 character LCD display, Fastdial directory, Handset Volume control, visual Ring Flash, Ringer, Auto Answer, Auto Greeting, Tone or Pulse dialing and a TTY On/Off button to switch between TTY and Tone dialing. Can be installed behind a digital phone with a tip/ring module. This telephone also provide access to switch features through the use of the \* or # keypad access, and the appropriate feature access codes, when in the touch-tone mode.

## AT&T 958 Analog Telephone Caller ID and Speakerphone

The 958 Caller ID Telephone is a single-line analog set that is desk/wall convertible and requires one tip and ring pair for operation. It features Caller ID/Call Waiting Capability, 99 Name/ Number Caller ID History, a Remove button, Message Waiting/New Call Light, and a 3 line by 15 character Display that supports Call display in English/Spanish/French. It can be used on Avaya PBXs or Central Office lines. The 958 telephones are equipped with a Hands Free Speakerphone, 50 Name/Number Directory, a data port, receiver/speaker volume control, a Hold buttons, a FLASH button, a REDIAL button, ringer volume control, power failure operation, memory Loss Protection and is Hearing Aide Compatible. This telephone model also provides access to switch features through the use of the \* or # dial pad keys and the appropriate feature access codes.

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## Avaya EA401 and EA401A Explosive Atmosphere telephones

These Explosive Atmosphere telephones are listed by Underwriters Laboratories, Inc. (UL) for the following explosive atmosphere classifications and conditions:

- Class I explosive gas or vapors, group B, C, and D
- Class II combustible dusts, group E, F, and G



### **DANGER:**

They are not to be installed in locations where acetylene gas may become present in the atmosphere.

The EA401 Explosive Atmosphere telephone provides safe and reliable communication in hazardous locations, up to and including Class I Division 1. Only standard wiring and fittings are required to connect the telephone to the system. No barrier is necessary. Since the heavy duty cast aluminum enclosure is basically soundproof, an external device to signal incoming calls, such as the EA20R Explosive Atmosphere Line Powered Telephone Ringer, is required. Additionally, the EA10 Explosive Atmosphere handset is required.

### **Note:**

The EA401A Explosive Atmosphere telephone is an EA401 telephone that comes already assembled with an EA20R ringer and EA10 handset.

The following are characteristics of the EA401 Explosive Atmosphere telephone:

- A 10-foot handset cord
- Standard 12-button configuration, with an additional row of buttons for Last Number Redial, Link/Flash to access PABX features and Line Release to duplicate hanging up the handset
- No handset volume control, in compliance with the FCC Waiver
- Designed for wall mounting
- Cast copper free aluminum with powder coat finish

## Telephones and speakerphones

- One-inch diameter buttons for gloves-on operation
- Magnetic Reed Hook Switch, with no moving parts, that activates when the handset is removed from or placed in the telephone cradle
- Circuit boards with a UV cured epoxy coating, which provides protection from corrosive agents such as H<sub>2</sub>S, SO<sub>2</sub>, and NH<sub>3</sub>, and environments with high humidity
- A fitting in the bottom of the enclosure for access to the fuse
- Uses an EA10 handset, which is compatible with inductively coupled hearing-aid devices

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## Avaya wireless telephones

### Avaya TransTalk 9040

The Avaya TransTalk 9040 is a small wireless telephone with a full feature set, and alphanumeric display give users complete control of their wireless communications.

The following are characteristics of the TransTalk 9040:

- A 1 × 16 alphanumeric display shows internal calling party information and the external called number.
  - The backlit display includes three rows for line or intercom terminations and one-button feature access.
  - Icons such as out-of-range, low battery, and message waiting are visible on the display.
- Weighs just eight ounces
- Dimensions are 6" × 2" × 1"
- A maximum of 12 virtual button appearances for lines, intercoms, and features.
- Redial button: fixed redial for busy numbers.
- Replaceable Antenna: customers can replace their own antennas in case of breakage.
- Headset Option: works with the Supra (over-the-head) or Radium (over-the-ear) mobility headsets. Can be used with the wireless headset for the MDW 9000 and MDW 9010 with an adaptor. New 2.5-mm jack makes connecting a headset to the 9040 easier than ever.
- Backlit display: for easier use in poorly lit areas such as warehouses and manufacturing plants.
- Vibrator Alert: for times when a ringing telephone would be intrusive (standard on all Pocket Phones).
- Field registration: If a handset becomes needs to be replaced, only the handset needs to be returned (i.e. the corresponding Radio Module does not have to be shipped back with the handset). When a new handset is received, the user or technician simply registers it with the appropriate Dual Radio Module (DRM).

The following are the characteristics of the battery charge

- Batteries charge fully in 1.5 hours
- Batteries are discharged and recharged, which eliminates the memory effect that reduces battery life (spare is automatically reconditioned; handset battery is reconditioned in the cradle if manually selected)
- Users get 3.5 hours of talk time, and over 22 hours of standby time
- Users can continue to screen calls because the upright position keeps the display clearly visible
- An optional extended-use battery, will provide up to eight hours of talk time and 72 hours of standby time.

## Avaya 3410 wireless telephone

The 3410 wireless telephone solution consists of the 3410 handsets, line-powered four-channel wireless base stations, and a Master Control Unit (MCU). The 3410 wireless telephone solution requires one DCP port per handset, has up to six line appearances and twelve feature buttons, and emulates an 8410D desk telephone.

Then MCU has two scalable configurations:

	<b>Link 3000</b>	<b>Link 150</b>
Wireless phones	3200	64
Base stations	1000	16
Simultaneous calls	1600	32
Coverage (in million sq. ft.)	100	1.5

The 3410 wireless telephone solution uses 902-928 MHz spread spectrum frequency hopping radio technology with a high level of integration with enterprise telephone switching to provide an advanced wireless telephone system.

## Avaya 3606 wireless VoIP telephone

The 3606 wireless VoIP telephone solution is an IEEE 802.11b standards-based, 2.4 GHz wireless LAN telephone system. Using voice over IP (VoIP) technology, the 3606 wireless VoIP telephone solution provides high quality mobile voice communications throughout the workplace.

The following are characteristics of the 3606 telephone:

- A 2 × 16 alphanumeric display, plus line and status indicators
- Weighs just 6.4 ounces

## Telephones and speakerphones

- Dimensions are 6" x 2" x 1"
- DHCP or static IP addressing
- AWTTS Open Application Interface (OAI) gateway that enables third-party software applications to communicate with the telephone
- Downloadable upgrade firmware from a TFTP server
- Text messaging support
- Hold button
- A maximum of 6 button appearances that can be used for call appearances and features.
- Four fixed feature buttons (mute, last number dialed, transfer, and conference)
- Headset Option: works with the Supra (over-the-head) or Radium (over-the-ear) mobility headsets. Can be used with the wireless headset for the MDW 9000 and MDW 9010 with an adaptor. New 2.5-mm jack makes connecting a headset to the 9040 easier than ever. Backlit display: for easier use in poorly lit areas such as warehouses and manufacturing plants.
- Vibrator Alert: for times when a ringing telephone would be intrusive (standard on all Pocket Phones).

The 3606 wireless VoIP telephone solution, which supports the G.711 codec, requires one IP port per handset and emulates a 4606 IP desk telephone. The 3606 wireless VoIP telephone solution also requires the following four components:

- 3606 wireless telephones
- A SpectraLink Voice Priority (SVP) server
- An Avaya Voice Priority Processor
- An 802.11b wireless LAN with SVP-enabled access points (such as the Avaya AP-1, AP-2, AP-3 AP-4, or AP-6 access point)

The following are the characteristics of the battery charge

- Batteries charge fully in 1.5 hours.
- Batteries are discharged and recharged, which eliminates the memory effect that reduces battery life (spare is automatically reconditioned; handset battery is reconditioned in the cradle if manually selected). Batteries cannot be manually reconditioned.
- Users get 2.0 hours of talk time, and over 80 hours of standby time
- Users can continue to screen calls because the upright position keeps the display clearly visible
- An optional extended-use battery, will provide up to eight hours of talk time and 72 hours of standby time.

## Avaya 3616 wireless VoIP telephone

The 3616 wireless VoIP telephone solution is an IEEE 802.11b standards-based, 2.4 GHz wireless LAN telephone system. Using voice over IP (VoIP) technology, the 3616 wireless VoIP telephone solution provides high quality mobile voice communications throughout the workplace.

The following are characteristics of the 3616 telephone:

- A 2 × 16 alphanumeric display, plus line and status indicators
- Weighs just 4.2 ounces
- Dimensions are 5.5" × 2.0" × 0.9"
- Supports the G.711 and G.729 codecs
- A maximum of 10 virtual button appearances for lines and features.
- Five fixed functions (mute, last number dialed, hold, transfer, and conference)
- An Avaya Voice Priority Processor
- DHCP or static IP addressing
- AWTSS Open Application Interface (OAI) gateway that enables third-party software applications to communicate with the telephone
- Downloadable upgrade firmware from a TFTP server
- Text messaging support
- Headset Option: works with the RF Supra Monaural Noise Canceling Headset with a 2.5mm QD adapter cable. Also works with the Avaya AMX-100 Cellphone Headset
- Vibrator Alert: for times when a ringing telephone would be intrusive (standard on all Pocket Phones).

The 3616 wireless VoIP telephone solution requires one IP port per handset and emulates a 4606 IP desk telephone. The 3616 wireless VoIP telephone solution also requires the following four components:

- 3616 wireless telephones
- Avaya Voice Priority Processor
- An 802.11b wireless LAN with SVP-enabled access points (such as the Avaya AP-1, AP-2, AP-3, AP-4, or AP-6 access point)

The following are the characteristics of the battery charge

- Batteries charge fully in 1.5 hours.
- Batteries are discharged and recharged, which eliminates the memory effect that reduces battery life (spare is automatically reconditioned; handset battery is reconditioned in the cradle if manually selected). Batteries cannot be manually reconditioned.

## Telephones and speakerphones

- Users get 4.0 hours of talk time, and over 80 hours of standby time.
- Users can continue to screen calls because the upright position keeps the display clearly visible.

## Avaya 3626 wireless VoIP telephone

The 3626 wireless VoIP telephone solution is an IEEE 802.11b standards-based, 2.4 GHz wireless LAN telephone system. Using voice over IP (VoIP) technology, the 3626 wireless VoIP telephone solution provides high quality mobile voice communications throughout the workplace.

The following are characteristics of the 3626 telephone:

- A 2 × 16 alphanumeric display, plus line and status indicators
- Weighs just 6.0 ounces
- Dimensions are 5.9" × 2.2" × 1.0"
- Supports the G.711 and G.729 codecs
- A maximum of 10 virtual button appearances for lines, intercoms, and features
- A push-to-talk radio capability and push-to-talk radio button for use as a walkie-talkie
- An Avaya Voice Priority Processor
- DHCP or static IP addressing
- AWTS Open Application Interface (OAI) gateway that enables third-party software applications to communicate with the telephone
- Text messaging support
- Downloadable upgrade firmware from a TFTP server
- Headset Option: works with the RF Supra Monaural Noise Canceling Headset with a 2.5mm QD adapter cable. Also works with the Avaya AMX-100 Cellphone Headset
- Vibrator Alert: for times when a ringing telephone would be intrusive (standard on all Pocket Phones)

The 3626 wireless VoIP telephone solution requires one IP port per handset and emulates a 4606 IP desk telephone. The 3626 wireless VoIP telephone solution also requires the following four components:

- 3626 wireless telephones
- Avaya Voice Priority Processor
- An 802.11b wireless LAN with SVP-enabled access points (such as the Avaya AP-1, AP-2, AP-3, AP-4, or AP-6 access point)

The following are the characteristics of the battery charge

- Batteries charge fully in 1.5 hours.
- Batteries are discharged and recharged, which eliminates the memory effect that reduces battery life (spare is automatically reconditioned; handset battery is reconditioned in the cradle if manually selected). Batteries cannot be manually reconditioned.
- Users get 4.0 hours of talk time, and over 80 hours of standby time.
- Users can continue to screen calls because the upright position keeps the display clearly visible.
- A gang charger that can charge up to 4 batteries is available.

## Motorola CN620 Mobile Office Device

The Motorola CN620 Mobile Office Device is a small wireless telephone that supports Seamless Communication solutions. The CN620 has dual network functionality. Within the enterprise/company workplace, the phone uses Wireless Local Area Network (WLAN) as the on-campus wireless data network. Outside the range of the enterprise's WLAN, the phone seamlessly transitions to a Global System for Mobile Communication (GSM) cellular network of the user's selected wireless carrier. The phone keeps its enterprise phone number and key phone functionality as the user travels.

The following are characteristics of the CN620:

- Weight: 145 grams
- Dimensions: 97 x 52 x 29 mm
- Three fixed feature buttons:
  - Mute Hold, Speaker
- Push-to-talk button
- 8-segment navigation dial for selecting applications from the internal display
- Menu key
- Two smart context-aware soft keys
- The following built-in feature options:
  - Call transfer
  - Conference
  - Call forwarding
  - Speed dial
  - Four line appearances
  - Message waiting indication

## Telephones and speakerphones

- Internal Display:
  - 65K active color display
  - 176 x 220 pixels
  - 34.8 x 43.6 mm active area
- External display:
  - 2 line black and white
  - 96 x 32 pixels
  - One line for ICONs and one line for text
  - Earpiece 7 volume levels for tone/voice plus vibrate mode.
  - -30dB attenuation from speaker to microphone.
- Speakerphone with 7 volume levels.
- Volume control for the handset, speaker, and ringer.
- Smart network sensing that routes calls over preferred networks.
- A single enterprise voice mailbox for WLAN and GSM calls.
- Enterprise voice quality.
- Multiple simultaneous active calls: up to two in the GSM network and up to four in the WLAN network
- Internet/intranet access.
- Text messaging support.
- Built-in email POP3/IMAP4 client.
- 25-call call log.
- 1000 contacts.
- Calendar.
- Synchronization of calendar, contacts and tasks to Microsoft Outlook.
- Call timers and meters.
- Feature-named extensions, which are Direct-Inward-Dial numbers that access Communication Manager features otherwise not available over wireless connections (for example, Call Pickup, Group Page, and Whisper Page).
- E911 location reporting with Emergency Location Identification Number (ELIN).
- Multiple Headset Options: contact your sales representative for specific options.
- TTY device support.
- Vibrate and ring options for incoming calls.
- Voice-activated dialing using contacts directory.

- HTML 4.0 and WAP 2.0 browsers.
- Microsoft Windows CE.NET operating system with .NET application framework.
- IPSec-based VPN client on GSM utilizing username and password challenge.
- Theft protection with user-managed phone lock password challenge.
- Dynamic memory.
- Bands/Modes:
  - GSM/GPRS — 850/1900 Mhz.
  - WLAN — 802.11a.
- Vcoders: GSM — AMR, EFR; VoIP — G.711 and G.729.
- DHCP IP addressing.
- Upgradable firmware
- 802.11 WPA-based security solution utilizing 802.x.
- 802.11 EAP-TLS based 2 factor authentication.
- GSM/GPRS security utilizing standard SIM-based authentication.

The following are the characteristics of the battery:

- Batteries: 800 mAHr Lithium ION Slim or 1100 mAHr Lithium Ion High Performance.
- Battery charge time is 2.5 hours for the Slim battery and 3.5 hours for the High Performance battery.
- 150 - 190 minutes of talk time, and over 50 - 80 hours of standby time.

**Note:**

For more information on the CN620 feature capabilities, see the *Seamless Communication Total Solution Guide*, 21-300041.

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## Power for Avaya IP telephones

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### Power for Avaya IP telephones

With limited exceptions Avaya IP telephones are powered through the RJ45 jack that resides on the telephone. There are two methods of powering the telephone through the RJ45 jack:

- Power supplies that are designed to the IEEE 802.3af-2003 Power over Ethernet standard, which can include either of the following:
  - Avaya PoE switches, which includes the C364T-PWR, C363T-PWR and P333T-PWR switches, for new Ethernet network installations.
  - The 1152A1 mid-span power-distribution unit is used for configurations that use existing Ethernet network.
- Local power using the 1151B1 or 1151B2 power supply

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### Power for First Generation Avaya IP telephones (4606, 4612, and 4624)

There are two generations of Avaya 4606, 4612, and 4624 IP telephones. The first generation (Gen-1) IP telephones support local power over pins 7 and 8 using the 1151B1 or 1151B2 power supply. The second generation (Gen-2) IP telephones are designed to the IEEE 802.3af-2003 Power over Ethernet specifications.

There are two ways to identify the first generation of an Avaya IP telephone:

- Label identification — The product label beneath an IP telephone contains a 12-character (US only), or 16-character (international) model number or apparatus code. The model number indicates the generation by either a 01A (Gen-1) or 02A (Gen-2) identifier.
- Display identification — The model for an IP telephone can be retrieved via the display after the telephone has been powered up.

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### Power for Avaya 4630 IP telephones

An Avaya 4630 IP telephone must be powered locally using the barrel connector beneath the telephone. The power supply for an Avaya 4630 is provided with the telephone.

**Note:**

The 4620SW IP telephone does *not* use the barrel connector.

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## Power for Avaya 4690 IP telephones

An Avaya 4690 IP telephone must be powered locally using the power brick (provided).

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## SoundPoint and SoundStation speakerphones

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### 3127 SoundPoint Speakerphone

The SoundPoint speakerphone adjunct connects to a telephone and provides high quality audioconferencing for desktop environments. The Analog version plugs into any standard analog phone jack. The DCP version plugs into the adjunct port of the 7400-, 7500-, 8400-, and 8500-series terminals.

The full-duplex operation eliminates the clipping of speech and the de-reverberation technology helps to reduce the hollow, “bottom of the well” sound associated with common speakerphones.

SoundPoint automatically adapts itself to both the room and line conditions in order to ensure the best full-duplex operation. This is especially critical when you have multi-party international conference calls operating over a bridge. Additionally, this adaptation is an automatic and continuous process to accommodate for changing room conditions.

### Highlights

- 180° of microphone coverage – ideal for desktop applications
- Tabletop, user installable solution for ease of setup and use
- Neodymium speaker tuned to reproduce the human voice
- Avaya DM1000 Directional Microphone for best voice clarity
- Auto Answer capable for hands free applications
- Microphone muting for privacy
- Dual color LED for on and mute display lights

### Models

#### 3127-ATR: AVAYA SOUNDPOINT ANALOG

The analog version of SoundPoint plugs into any analog port or terminal and comes with all appropriate cabling. In addition, the analog version of SoundPoint can automatically answer (Auto-Answer) calls placed to its extension.

#### 3127-DCP: AVAYA SOUNDPOINT DCP

Connects to the adjunct port of the 7400-, 7500-, 8400-, and 8500-series terminals for added convenience. Comes with all appropriate cabling.

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## 3127 SoundStation speakerphone

The SoundStation speakerphone has three microphones providing 360 degree of coverage for offices and small conference rooms. The amplified speaker provides enough audio for groups of up to 10 people. The analog version plugs into any standard analog phone jack. The DCP version plugs into the adjunct port of the 7102, 8102, and 7400- and 8400-series terminals.

The full-duplex operation eliminates the clipping of speech and the Acoustic Clarity Technology helps to eliminate background noise. SoundStation automatically adapts itself to both the room and line conditions in order to ensure the best full-duplex operation. This is especially critical when you have multi-party international conference calls operating over a bridge. Additionally, this adaptation is an automatic and continuous process to accommodate for changing room conditions.

### Highlights

- 360° of microphone coverage – ideal for desktop applications
- Digitally tuned speaker with Acoustic Clarity Technology™
- Full Duplex Operation – talk and listen at the same time
- Tabletop, user installable solution for ease of setup and use
- Extension microphones available for up to 20 people
- Integrated dial pad
- Microphone muting for privacy
- Dual color LED for on and mute display
- Wireless, lapel microphone available for stand-up presenters

## Models

### 3127-STD: AVAYA SOUNDSTATION ANALOG

The analog version of SoundStation plugs into any analog port or terminal and comes with all appropriate cabling. Requiring just an analog line and a power outlet, this system is easy to install and use. Good for groups of up to 10 people.

### 3127-EXP: AVAYA SOUNDSTATION EX ANALOG

This analog version of SoundStation includes two extension microphones, which can be used to enhance the room coverage to support up to 15 people. Plugs directly into an analog port.

### 3127-DCS: AVAYA SOUNDSTATION DCP

The DCP version connects to the adjunct port of the 7102, 8102, and 7400- and 8400-series terminals. **This SoundStation does not work with a 6400-series terminal.** Comes with all appropriate cabling and is user installable. Good for groups of up to 10 people.

### 3127-DCE: AVAYA SOUNDSTATION EX DCP w/Mics

This DCP version of SoundStation includes two extension microphones, which can be used to enhance the room coverage to support up to 15 people. The DCP version connects to the adjunct port of the 7102, 8102, and 7400- and 8400-series terminals. **This SoundStation does not work with a 6400-series terminal.** Comes with all appropriate cabling and is user installable.

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## 3127 SoundStation Premier audioconferencing speakerphone

The SoundStation Premier speakerphone has three microphones providing 360° of coverage for offices and small conference rooms. The amplified speaker provides enough audio for groups of up to 25 people.

The analog version plugs into any standard analog phone jack, the DCP version plugs into the adjunct port of the 7102, 8102, and 7400- and 8400-series terminals and the 6400-SSDP version plugs directly into a DCP jack.

The full-duplex operation eliminates the clipping of speech and the Acoustic Clarity Technology helps to eliminate background noise. In addition, SoundStation Premier focuses a microphone on the main speaker, effectively eliminating the hollow sound common with standard speakerphones. Also included is a full feature remote control and Display.

SoundStation Premier automatically adapts itself to both the room and line conditions in order to ensure the best full-duplex operation. This is especially critical when you have multi-party international conference calls operating over a bridge. This adaptation is an automatic and continuous process to accommodate for changing room conditions.

### Highlights

- 360° of microphone coverage – ideal for desktop applications
- Digitally tuned speaker accurately reproduces the human voice
- Full Duplex Operation – talk and listen at the same time
- De-reverberation – reduces the hollow, bottom of the well sound
- Tabletop, user installable solution for ease of setup and use
- Extension microphones available to support up to 25 people
- Integrated dial-pad and full-featured remote control
- Microphone muting for privacy
- Dual color LED for on and mute display
- Wireless, lapel microphone optional for stand-up presenters

### Models

#### 3127-APE: AVAYA SOUNDSTATION PREMIER EX ANALOG

The analog version of SoundStation Premier plugs into any analog port or terminal and comes with all appropriate cabling. Expansion ports are available for adding on the optional extension microphones. Requiring just an analog line and a power outlet, this system is easy to install and use. Good for groups of up to 15 people.

#### 3127-APX: AVAYA SOUNDSTATION PREMIER EX/MICS ANALOG

This analog version of SoundStation Premier EX/Mics includes two extension microphones, which can be used to enhance the room coverage to support up to 25 people. Plugs directly into an analog port.

#### 3127-DPE: AVAYA SOUNDSTATION PREMIER DCP EX

A DCP version of SoundStation Premier EX connects to the adjunct port of the 7102, 8102, and 7400- and 8400-series terminals. **(Does not work with a 6400-series terminal.)** Expansion ports are available for adding on the optional extension microphones. Comes with all appropriate cabling and is user installable. Good for groups of up to 15 people.

#### 3127-DPX: AVAYA SOUNDSTATION PREMIER DCP EX w/Mics

This DCP version of SoundStation Premier EX includes two extension microphones, which can be used to enhance the room coverage to support up to 25 people. The DCP version connects to the adjunct port of the 7102, 8102, and 7400- and 8400-series terminals. **(Does not work with a 6400-series terminal.)** Comes with all appropriate cabling and is user installable. Good for groups of up to 25 people.

#### 3127-DDP: AVAYA 6400-SSDP – SOUNDSTATION DCP PREMIER EX

A DCP version of SoundStation Premier EX that connects directly into a DCP jack. It can work with or without a terminal. It can work with any 6400-, 7400-, or 8400-series terminal. Expansion ports are available for adding on the optional extension microphones. Comes with all appropriate cabling and is user installable. Good for groups of up to 15 people.

**3127-DDX: AVAYA 6400-SSDP – SOUNDSTATION DCP PREMIER w/Mics**

This 6400-SSDP includes two extension microphones, which can be used to enhance the room coverage to support up to 25 people. The 6400-SSDP connects directly into a DCP jack. It can work or without a terminal. It can work with any 6400-, 7400- or 8400-series terminal. Comes with all appropriate cabling and is user installable.

**3127-MIC: AVAYA SOUNDSTATION WIRELESS LAPEL MIC**

This clip-on microphone is designed for stand-up presenters. Consisting of a small transmit/receive pack that clips onto your belt and collar, this microphone has a 100' range and comes in two individual frequencies.

**3127-PMI: EXTENSION MICROPHONES FOR SOUNDSTATION PREMIER**

Two extension microphones to enhance and expand room coverage. Compatible with 3127-APE, 3127-DPE and 3127-DDP



# Avaya UPS Units

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## Avaya Series 1 (AS1) UPS

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### AS1 1000 VA 120 V Online Uninterruptible Power Supply (UPS)

The 1000 VA 120 V Online UPS provides 1000 VA/490 Watts/8.3 Amps at 120 Volts AC and battery holdover of five minutes at full load. Two optional Extended Battery Modules (EBM24) extend the run time to 104 minutes at full load. The UPS groups the six available 5-15R receptacles into two groups of three to make it possible for users to shutdown one set of loads to allow longer run times for more critical loads during a power failure. Power management is included. The UPS chassis can be installed in a tower or mounted in a data rack. Serial interface capabilities and DEFINITY alarm contacts are standard.

#### 1000 VA 120 V models include the following accessories:

- Extended Battery Module (EBM24)
- Bypass Distribution Module 1000-1500VA 120V
- SNMP Module

**Safety Compliance:** UL, CSA, NOM

**EMC Compliance:** FCC Class B, VCCI Class II.

**Input:** 120 Vac, 45-65 Hz, auto sensing; user-selectable 100 or 127 VAC; 6-foot attached cord with 5-15 P

**Output:** Six 5-15 R receptacles in two load segments; sine wave; voltage +/- 3% of nominal.

**Battery:** Two 12 V 9 A/H sealed, lead-acid; maintenance free

**Dimensions:** (H x W x D) 89 mm x 432 mm x 494 mm = 3.5" x 17" x 19.4"

**Weight:** 15 kg = 34 pounds

## AS1 1000VA 230V Online UPS

The 1000 VA 230 V Online UPS provides up to 700 Watts and basic battery holdover of five minutes at full load. Output current for 208/220/230/240 volts is 4.8/4.5/4.3/4.2 Amps. Two optional Extended Battery Modules (EBM24) extend the run time to 104 minutes at full load. By grouping the six available 5-15 R receptacles into two groups of three, the UPS allows users to shutdown one set of loads to allow longer run times for more critical loads during a power failure. Power management is included. The UPS can be installed as a tower or mounted in a data rack. Serial interface capabilities and DEFINITY alarm contacts are standard.

### 1000VA 230 V models include the following accessories:

- Extended Battery Module (EBM24)
- Bypass Distribution Module 700-2000 VA 230 V >
- SNMP Module

**Safety Compliance:** UL, CSA, NOM, CE

**EMC Compliance:** FCC Class B, EN 50091-2, VCCI Class II, IECS-003

**Input:** 230Vac, 50/60 Hz, auto sensing, user-selectable 220, 240; 2-meter cord with unterminated plug-end.

**Output:** Six 5-15 R receptacles in two load segments; sine wave; voltage +/- 3% of nominal.

**Battery:** Two 12V 9 A/H sealed, lead-acid; maintenance free

**Dimensions:** (H x W x D) 89 mm x 432 mm x 494 mm = 3.5" x 17" x 19.4"

**Weight:** 15 kg = 34 pounds

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## AS1 1500VA 120V Online UPS

The AS1 1500 VA 120 V Online UPS provides 1500 VA/1050 Watts/12.5 Amps at 120 Volts AC and battery holdover of eight minutes at full load. Four optional Extended Battery Modules-EBM48 extend the run time to 144 minutes at full load. By grouping the six available 5-15 R receptacles into two groups of three, the UPS allows users to shutdown one set of loads to allow longer run times for more critical loads during a power failure. Power management software is included. The UPS can be installed as a tower or mounted in a data rack. Serial interface capabilities and DEFINITY alarm contacts are standard.

### The AS1 1500 VA model includes the following accessories:

- Extended Battery Module (EBM48)
- Bypass Distribution Module AS1 1000-1500 VA 120 V >
- SNMP Module

**Safety Compliance:** UL, CSA, NOM

**EMC Compliance:** FCC Class B, VCCI Class II.

**Input:** 120 Vac, 45-65Hz, auto sensing; user-selectable 110, 127 VAC; 6-foot attached cord with 5-15P.

**Output:** Six 5-15 R receptacles in two load segments; sine wave; voltage +/- 3% of nominal.

**Battery:** Four 12V 9 A/H sealed, lead-acid; maintenance free

**Dimensions:** (H x W x D) 89 mm x 432 mm x 494 mm = 3.5" x 17" x 19.4"

**Weight:** 23 kg = 50 pounds

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## AS1 1500VA 230V Online UPS

The AS1 1500 VA 230 V Online UPS provides up to 1050 Watts and basic battery holdover of eight minutes at full load. Output current for 208/220/230/240 volts is 7.2/6.8/6.5/6.2 Amps. Four optional Extended Battery Modules (EBM48) extend the run time to 144 minutes at full load. By grouping the six available 5-15 R receptacles into two groups of three, the UPS allows users to shutdown one set of loads to allow longer run times for more critical loads during a power failure. Power management is included. The UPS can be installed as a tower or mounted in a data rack. Serial interface capabilities and DEFINITY alarm contacts are standard.

### 1500 VA 230 V models include the following accessories:

- Extended Battery Module (EBM48)
- Bypass Distribution Module 1000-2000VA 230V
- SNMP Module

**Safety Compliance:** UL, CSA, NOM, CE

**EMC Compliance:** FCC Class B, EN 50091-2, VCCI Class II, IECS-003

**Input:** 230 Vac, 50/60 Hz, auto sensing, user-selectable 220, 240; 2-meter cord with unterminated plug-end.

**Output:** Six 5-15 R receptacles in two load segments; sine wave; voltage +/- 3% of nominal.

**Battery:** Four 12V 9 A/H sealed, lead-acid; maintenance free

**Dimensions:** (H x W x D) 89 mm x 432 mm x 494 mm = 3.5" x 17" x 19.4"

**Weight:** 23 kg = 50 pounds

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## UPS Add-on Modules

### Extended Battery Module-EBM24 1000 VA

The Extended Battery Module-EBM24 supports the 1000 VA Online UPS with a 24v battery string to extend the run time (see table for run times). The EBM chassis is suitable for tower and rack-mounted installations in a compact 2U height. No other battery module or cabinet is compatible with the 1000 VA Online UPS.

## Avaya UPS Units

**Maximum:** Up to two Extended Battery Module (EBM24) per 1000VA Online UPS.

**Safety Compliance:** UL, CSA, NOM.

**EMC Compliance:** FCC Class B, VCCI Class II.

**Dimensions:** (H x W x D) 89 mm x 432 mm x 494 mm = 3.5" x 17" x 19.4"

**Weight:** 29.5 kg = 65 pounds

## UPS Extended Battery Module-EBM48 1500-2000 VA

The UPS Extended Battery Module-EBM48 supports the 1500 VA and 2000 VA online UPS with a 48v battery string to extend the run time up to 144 minutes at full load. The EBM chassis is suitable for tower and rack-mounted installations in a compact 2U height.

**Maximum:** Up to four Extended Battery Module-EBM48 per 1500 or 2000 VA Online UPS.

**Safety Compliance:** UL, CSA, NOM.

**EMC Compliance:** FCC Part 15 (Class B) and VCCI Class II.

**Dimensions:** (H x W x D) 89 mm x 432 mm x 494 mm = 3.5" x 17" x 19.4"

**Weight:** 29kg = 65 pounds

## SNMP MODULE 1000-2000 VA

The SNMP module is included in the 1000 VA package, adding direct control and monitoring capabilities in SNMP-based networks. The module is hot-swappable with the standard serial interface module.

**Dimensions:** (H x W X D) 4.5" x 4" x 1"

**Weight:** 0.2 pounds

## BYPASS DISTRIBUTION MODULE 120V 1000-1500 VA

The bypass distribution module (BDM) allows for replacement of the UPS or internal batteries without shutting down the connected load.

**Dimensions:** (H x W X D) 12" x 5" x 4"

**Weight:** 5.0 pounds

## PWR UPS BYPASS DISTR MOD S1 1000VA-2K VA

The bypass distribution module (BDM) allows for replacement of the UPS or internal batteries without shutting down the connected load.

**Dimensions:** (H x W X D) 12" x 5" x 4"

**Weight:** 5.0 pounds

# Avaya Wireless Solutions

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## W310 WLAN Gateway

The W310 WLAN Gateway, using Light Access Points, provides a standards-based infrastructure and a new solution for wireless applications. The W310 Mobility Gateway provides a rich feature set in the security, mobility and management area and also provides a lower overall cost of ownership for medium/large enterprise or a hotspot service provider. Instead of adding functionality to the Access Point, the W310 serves as a WLAN Gateway that centralizes the Access Point features, while the Access Points are reduced to simpler, cheaper devices, responsible for only basic functions.

**Note:**

The W310 WLAN Gateway also supports AP600 (an AP-4, AP-5, or AP-6 that has been upgraded for Light AP support) access points if the access points have the most recent firmware.

**⚠ CAUTION:**

The W310 WLAN Gateway provides wireless mobility service totally independent of Communication Manager and the media servers that support Communication Manager. The W310 WLAN Gateway has *no* interactions with Communication Manager-based systems. For wireless applications that use Communication Manager for call-handling, see [W310 WLAN Gateway for Seamless Communications](#) on page 351 or [Extension to Cellular and Off-PBX Station](#) on page 355.

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**Figure 79: W310 WLAN Gateway**



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The chassis features:

- 16 10/100BaseT Ethernet ports (ports 1 through 16), connected with Category 5 copper cable with RJ-45 termination for 100Base-T ports. Use all eight wires in the cable. The maximum copper cable length connected to a 10/100Base-T port is 100m (328 ft.)
- Two SFP GBIC Gigabit copper or fiber ports
- A console port.

## Avaya Wireless Solutions

- Fixed ports and buttons, including:
  - Port LEDs for each Ethernet port
  - 11 additional system function LEDs
  - Left and right LED select buttons.

The following customer-supplied equipment is also required:

- An SFP GBIC (Small Form Factor Pluggable Gigabit Interface Converter), using LC or MT-RJ fiber cables or RJ copper cables, depending on the GBIC type.
- APC (Advanced Power Conversion PLC) Front End AC-DC Power Shelf
- One APC 800W PSUs
- 2 Power cables (20AWG or thicker) to connect the APC Power Shelf to W310 switches. Cables must have terminals suitable for M3.5 screws

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## Voice-Enabled Wireless Local Area Network (WLAN) Infrastructure

The Avaya infrastructure centralizes much of the WLAN intelligence in a gateway platform. This provides better integration into the enterprise network and solves the problems that plague wireless today:

- Management: Reduces deployment complexities / management
- Security: Increases security by maintaining a single entry point

## Superior infrastructure for Voice over IP (VoIP)

- Supports subnet and Virtual Local Area Network (VLAN) roaming for better inbuilding mobility and higher voice quality
- Low-cost Avaya W110 LAPs (Light Access Points) enable dense deployments required for in-building mobility

## Investment Protection

- New features can be centrally stored for easy W110 upgrades

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## Avaya W310 WLAN Gateway Features

- IP Multicast filtering
- Terminal and modem interface

- Wireless Services
- LAN Services
- Multiple Virtual Local Area Networks (VLANs) per port
- RADIUS protocol for security
- 802.1w Rapid Spanning Tree Protocol
- 802.1X PBNAC (Port Based Network Access Control)
- 802.3af-2003 Power over Ethernet
- Seamless Roaming
- Policy Management
- Stations Power Saving
- MAC Access Control List
- Multiple Service Set Identifiers (SSIDs)
- User Group Monitoring
- W110 Controller
- Wireless Applications

For more information, see the following:

- *Avaya W310 WLAN Gateway Installation and Configuration Guide*, 21-300041
- *Avaya W310/W110 Quick Setup Guide Using the CLI*, 21-300178
- *Avaya W310/W110 Quick Setup Guide Using the W310 Device Manager*, 21-300179
- *Wireless AP-4, AP-5, and AP-6 User Guide*, 555-301-708, Issue 3

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## W310 WLAN Gateway for Seamless Communications

The W310 WLAN Gateway supports the Seamless Communications offer on an S8300, S8500, S8700, or S8710 Media Server. Seamless Communications offers converged cellular, Wireless Local Area Network (WLAN), Internet Protocol (IP), and Session Initiation Protocol (SIP) phone service. As a result, Seamless Communications enables users to use the Motorola CN620 Mobile Office Device (see [Motorola CN620 Mobile Office Device](#) on page 335) to experience seamless wireless phone mobility between on-premises and off-premises use. The W310 WLAN Gateway, along with the Wireless Services Manager and W110 Lite Access Points (LAPs), combine with a Communication Manager media server and a Global System for Mobile Communication (GSM) cellular network to provide Seamless Communications service.

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**Figure 80: W310 WLAN Gateway**



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An S8500, S8700, or S8710 Media Server can support a maximum of 64 W310 WLAN Gateways. An S8300 Media Server can support up to 50 W310 WLAN Gateways. Each W310 WLAN Gateway can, in turn, support up to 16 W110 LAPs. One W310 WLAN Gateway can support up to 1024 users. However, the actual number of Seamless Communications users that a media server can support is limited to its SIP trunk capacities and licensing of SIP and CCS users.

The W310 WLAN Gateway centralizes and performs many of the functions of the access points, such as seamless mobility, security policy enforcements, enforcement of QoS, and the supply of Power over Ethernet (PoE).

In addition, the W310 WLAN Gateway has the following characteristics:

- Dimensions (H x W x D): 1.75 inches (44 mm) x 19 inches (48.3 cm) x 17.7 inches (45 cm)
- Layer 2 switching
- Fits in a EIA-310-D standard 19-inch rack.
- 16 10/100 Ethernet ports with PoE (802.3af)
- 8 10/100 Ethernet ports without PoE (not currently available for use)
- Supports up to 16 non-LAP "heavy" access points, such as Avaya's AP-4, AP-5, and AP-6 models once the device has been migrated to LAP functionality

**Note:**

The W310 WLAN Gateway can support only 10 heavy access points at 15 Watts per port.

- One 2-Gb Ethernet port to support redundancy or stacking (not currently available for use)
- One RS-232 serial port for command-line access
- Supports 64 wireless endpoints per LAP
- Supports 320 simultaneous voice sessions
- Supports 20 simultaneous VoIP (802.11a) calls per LAP
- 100 meter maximum distance to access points
- Two LEDs per 10/100 port to indicate PoE status and link status
- One LED for power and one LED for the 2-Gb Ethernet port
- Supports RADIUS server and Active Directory authentication
- Supports firmware download to the W310 WLAN Gateway and from the W310 WLAN Gateway to the W110 LAP

The following additional devices are used with the W310 WLAN Gateway Seamless Communications support:

- Wireless Services Manager
- W110 Lite Access Points

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## Wireless Services Manager (for Seamless Communications)

The Wireless Services Manager (WSM) handles Dispatch calling (communication between walkie talkies), a function allows Motorola CN620 handsets to communicate using the “push to talk” communications style while in the WLAN. The WSM also manages the CN620 handset administration and initialization sequences and serves as a SIP proxy and registrar for WLAN SIP signalling. The WSM consists of the WSM SIP Proxy/Registrar software, Dispatch software, and a V120 Sun server.

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**Figure 81: Wireless Services Manager (WSM)**



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The V210 Sun server has the following characteristics:

- 650 MHz ultraSPARC server
- 4 GB memory
- Two 36 GB hard drives

The WSM communicates with the media server over SIP trunk groups. For the S8500, S8700, and S8710 Media Servers, the SIP trunk groups are connected over the CLAN board. For the S8300 Media Server, the SIP trunk groups are connected over a G700 Ethernet port.

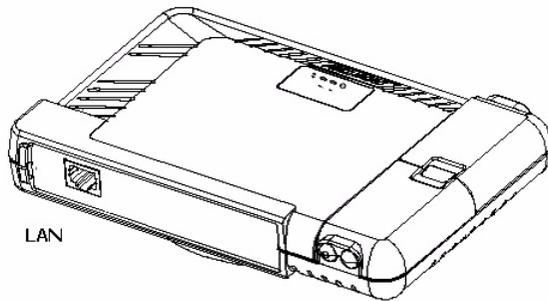
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## W110 Light Access Point (for Seamless Communications)

The W110 Light Access Point (LAP) is an access point that operates the radio cards necessary for wireless transmission and reception. The W110 supports Seamless Communications and can be used only with a W310 WLAN Gateway.

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**Figure 82: W110 Light Access Point**



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The W110 LAP has the following characteristics:

- Can be mounted on a wall, ceiling, or desktop
- LEDs to indicate power, LAN traffic, and wireless traffic
- Support 802.3af-2003 PoE
- Firmware downloadable from the W310 WLAN Gateway
- Up to 16 LAPs for one W310 WLAN Gateway
- Supports 802.11a and 802.11b/g radios

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## **Additional documentation for Seamless Communications**

For information on installing Seamless Communications, see the *Seamless Communications Total Solution Guide*, 21-300041, and the *Seamless Communications Configuration Guide*. Additionally, see the following:

*Avaya W310 WLAN Gateway Installation and Configuration Guide*, 21-300041

*Avaya W310/W110 Quick Setup Guide Using the CLI*, 21-300178

*Avaya W310/W110 Quick Setup Guide Using the W310 Device Manager*, 21-300179

*Wireless AP-4, AP-5, and AP-6 User Guide*, 555-301-708, Issue 3

*Motorola NMS User Guide*

*Motorola WSN User Guide*

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## Extension to Cellular and Off-PBX Station

Avaya Extension to Cellular and Off-PBX Stations (OPS) provides users with the capability to have one administered phone that supports Avaya Communication Manager features for both an office phone and one outside phone. Extension to Cellular/OPS allows users to receive and place office calls anywhere, any time. People calling into an office phone can reach users even if they are not in the office. Users could receive the call on their cell phone, for example. This added flexibility also allows them to use certain Communication Manager features from a phone that is outside the phone network.

The following phone types may be administered as the “host phone” using Extension to Cellular/OPS:

<b>2420</b>	<b>4612</b>	<b>6402</b>	<b>6408D</b>
<b>4602</b>	<b>4620</b>	<b>6402D</b>	<b>6408D+</b>
<b>4606</b>	<b>4624</b>	<b>6408</b>	<b>6416D+</b>
<b>4610</b>	<b>4630</b>	<b>6408+</b>	<b>6424D+</b>

The previously-listed phones all support the Motorola CN620 Mobile Office Device, as well as other wireless telephones. In support of the CN620, these desk phones may be administered using the Administration without Hardware feature. In this way, the actual desk phone does not need to be physically connected.

Except for the purchase of cellular phones and cellular service by a public service provider, neither you nor users need any additional hardware for use of the Extension to Cellular/OPS feature. You simply administer the feature on the media server running Communication Manager.



# Avaya Ethernet Switches

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## Avaya P330 Ethernet Switches

The Avaya P330 family of stackable Ethernet workgroup switches include:

- A range of modules with 10/100/1000 Mbps ports
- Multilayer capabilities

An Avaya P330 stack can contain up to 10 switches and up to three backup power supply units. The stacked switches connect using the Avaya X330STK stacking sub-modules that plug into a slot in the back of the Avaya P330. If the stack is split between two racks you can connect the P330 by using the X330SC or X330LC cables. The Avaya X330RC cable connects the top and bottom switches in the stack and provides redundancy and hot-swappability in the same way that modules can be swapped in a modular switching chassis.

The Avaya P330 is fully compliant with IEEE standards for VLAN Tagging, Gigabit Ethernet, Spanning Tree and Flow Control. This full standards-compliance, combined with auto-negotiation for 10/100/1000 Mbps and half/full duplex facilitates the expansion of your network to match your company's growing needs.

Each P330 switch has:

- A fixed number of Ethernet ports
- A front panel expansion slot which allows the addition of further ports (except P330-ML models).
- A rear panel option slot which allows the addition of the Octaplane™ stacking bus module.
- An integrated network management agent.

The family of P330 Ethernet switches includes the following models:

- P333T Ethernet switch

This switch has 24 10/100BASE-T Ethernet ports, an expansion slot, and a stacking slot.

- P333R Multilayer Ethernet switch

This multilayer switch has 24 10/100BASE-T Ethernet ports, an expansion slot, and a stacking slot.

- P333T-PWR Power Over Ethernet switch

This switch has 24 10/100BASE-T ports with Power Over Ethernet, an expansion slot, and a stacking slot. This switch complies with the 802.3af-2003 Power over Ethernet standard.

- P334T Ethernet switch

This switch has 48 10/100BASE-T Ethernet ports, an expansion slot, and a stacking slot.

## Avaya Ethernet Switches

- P332MF Ethernet switch

This switch has 12 100BASE-FX (MT-RJ) Ethernet ports, an expansion slot, and a stacking slot.

- P333R-LB Multilayer and Load Balancing Ethernet switch

This multilayer and Load Balancing Ethernet switch has 24 10/100BASE-T Ethernet ports, an expansion slot, and a stacking slot.

- P332G-ML Multilayer Ethernet switch

This multilayer switch has 12 GBIC SFP Ethernet ports and a stacking slot.

- P332GT-ML Multilayer Ethernet switch

This Multilayer switch has 10 100/1000 BASE-T and 2 GBIC SFP Ethernet ports and a stacking slot.

- P334T-ML Multilayer Ethernet switch

This multilayer switch has 48 10/100 BASE-T and 2 GBIC SFP Ethernet ports and a stacking slot.

The P330 switches support the following expansion modules: X330T16, X330F2, X330S1, X330S2, X330L1, X330L2, X330GT2, and X330G2. The P330 switches also support ATM modules and the X330W WAN expansion module.

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## Features of the Avaya P330 Stackable Switches

The P330 Stackable switches offer features in the following categories:

- [Stacking](#)
- [Layer 2 Features](#)
- [Layer 3 Features](#)
- [Management](#)
- [Power over Ethernet \(PoE\)](#)

### Stacking

- Up to 10 switches can be stacked together.
- Features such as Spanning Tree, redundancy, VLANs, and SMON are common to the stack.
- The Octaplane stacking system provides 8 Gbps stacking bandwidth to all switches in the stack.
- P330 stacks continue to function even if one switch or link fails.
- Switches in the stack can be added, removed, and replaced without disrupting operation.

- An advanced election algorithm ensures optimal stack master selection.
- P330-BUPS and P330-ML-BUPS can support BUPS functionality for up to 4 switches

## Layer 2 Features

- Auto-sensing simplifies configuration of LAN connections by automatically selecting the port speed for devices — either 10Mb or 100Mb.
- Auto-negotiation simplifies configuration of LAN connections by automatically selecting the port transmission mode for devices — either half- or full-duplex.
- Traffic prioritization (802.1p) allows real-time traffic classification into 8 priority levels mapped to 4 queues.
- The use of the IEEE 802.1Q tagging for VLANs and per-port VLAN is supported.
- Multiple VLANs per port allow access to shared resources by stations that belong to different VLANs.
- The use of the IEEE 802.1w standard for Rapid Spanning Tree Protocol (RSTP) provides rapid convergence of the spanning tree in case of link failure.
- The use of the IEEE 802.1x standard for port-based network security ensures that only authorized clients get network access.
- MAC security is supported.
- Port redundancy is supported to increase link resiliency.
- Inter-module redundancy is supported with one pair in a stack.
- Link Aggregation Group (LAG) support provides resiliency, load balancing, and bandwidth expansion.
- LAG redundancy is supported through resiliency between two LAG groups.
- Port mirroring of any switch port is supported.
- RMON/SMON port statistics provide real-time top-down analysis of network traffic.
- IP multicast filtering (snooping) filters multicast traffic to optimize network bandwidth.
- Classification of ports as regular or valuable is supported so that if a link fails, notification is generated for valuable ports only.

## Layer 3 Features

**Note:**

Layer 3 features are available only on the P333R and P330-ML switches.

- Static, RIPv1, RIPv2, OSPF IP routing protocols are supported.
- Equal cost routing is used for load balancing and redundancy.
- Router redundancy (VRRP) is supported.

## Avaya Ethernet Switches

- NetBIOS rebroadcasting is available for applications such as WINS that use broadcasting but may need to also communicate with stations on other subnets or VLANs.
- ICMP and ARP protocols are supported.
- DHCP/BootP relay allows broadcast requests to be forwarded to servers.
- Policy-based routing of packets provides enforcement of QoS and ACL rules.

## Management

- Access to the management interfaces are password-protected at three levels (read-only, read-write access and supervisor) to prevent unauthorized configuration changes.
- You can access to the Command Line Interface (CLI) in the following ways:
  - Direct console or modem connection
  - Telnet (up to five simultaneous connections) over the IP network
- You can use TFTP for the download/upload of configuration files or the download of firmware files
- A Java-based Device Manager provides an intuitive Web-based interface for access
- SNMPv1 is supported.
- Simple network time protocol (SNTP) or TIME protocols are available to provide a consistent timestamp to all switches from an external source.
- You can use all appropriate tools of the Avaya Integrated Management suite for administration.
- You can restrict access to management interfaces by IP address.

## Power over Ethernet (PoE)

- PoE is supported on the P333T-PWR switch.
- PoE is fully compliant with the 802.3af-2003 standard.
- PoE provides up to 15.4W per port (on 10/100 ports) over Ethernet cables to power IP phones, wireless access points, and other end-points using 802.3af-2003 standards.
- PoE automatically detects device connections and removal.
- PoE automatic load detection does the following:
  - Tests whether the device connected to the port requires remote powering.
  - Controls the power injection to the wires.
- Power is distributed between the 24/48 PoE ports according to priorities that you configure. Power priority can be configured on each port. Distribution is calculated from actual power consumption.
- BUPS (Back up power supply) can be used to improve switch availability

---

## Physical Characteristics

The P330 switches have the following characteristics:

- Dimensions (h, w, d): 2U (3.5"/88mm) x 19" (482.6mm) x 17.7" (450mm)
- Weight: max 8.5Kg (18.7 lb)

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## Environmental Conditions

The P330 switches have the following environmental conditions:

- Operating temperature: 23 to 122° F (-5 to 50° C)
- Humidity: 5% to 95% non-condensing

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## Power Requirements

- Power entry: 100-240 VAC, 50/60 Hz
- Power consumption: Max. 150 W (except for P333T-PWR, with Max. 400 W)
- Input Current (P330 AC Version): 2 A @ 100 VAC or 1 A @ 200 VAC
- Inrush Current (P330 AC Version): 25 A @ 100 VAC (max.) or 50 A @ 200 VAC (max)
- Input Current (P330-ML AC Version): 2.2 A @ 100 VAC or 1.1 A @ 200 VAC
- Inrush Current (P330-ML AC Version): 15 @ 100 VAC (max.) or 35 @ 230 VAC (max)

---

## Agency Approval

The P330 switches meet the following safety and quality requirements:

- EMC Emissions:
  - US - FCC Part 15, Subpart B, Class A
  - Europe - EN55022 class A and EN61000-3-2
  - Japan - VCCI-A
- Immunity: Approved according to EN55024 and EN61000-3-3
- Safety:
  - UL (for US) approved according to the UL60950 Std.
  - C-UL (for Canada) approved according to C22.2 No.950 Std.
  - CE (for Europe) approved according to EN 60950 Std.

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## Avaya C360 Ethernet Switches

The Avaya C360 family of converged stackable switches includes:

- A range of modules with 24 or 48 10/100 Mbps ports supporting PoE or non PoE and two GBIC SFP slots for Gigabit Ethernet connections
- A Layer 3 capability

The available C360 switch models are as follows:

- C363T converged stackable switch

This switch has 24 10/100 Mbps ports and two GBIC SFP ports.

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**Figure 83: C363T Converged Stackable switch**



- 
- C363T-PWR converged stackable switch

This switch has 24 10/100 Mbps ports with Power over Ethernet (PoE) and two GBIC SFP ports.

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**Figure 84: C363T-PWR Converged Stackable switch**



- 
- C364T converged stackable switch

This switch has 48 10/100 Mbps ports and two GBIC SFP ports.

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**Figure 85: C364T Converged Stackable switch**



- 
- C364T-PWR converged stackable switch

This switch has 48 10/100 Mbps ports with Power over Ethernet (PoE) and two GBIC SFP ports.

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**Figure 86: C364T-PWR Converged Stackable switch**

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A C360 switch can coreside in a stack with G700 media gateways and with selected P330 switches. A C360 stack can contain up to 10 switches and up to three backup power supply units. The stacked switches connect using the stacking sub-modules that plug into a slot in the back of the C360. The X330RC cable connects the top and bottom switches in the stack and provides redundancy and hot-swappability in the same way that modules can be swapped in a modular switching chassis.

Avaya C360 switches are multilayer switches and can be upgraded with a license to provide routing (Layer3) functionality.

---

## Features of the Avaya C360 Converged Stackable Switches

The C360 Converged Stackable switches offer features in the following categories:

- [Stacking](#)
- [Layer 2 Features](#)
- [Layer 3 Features](#)
- [Management](#)
- [Power over Ethernet \(PoE\)](#)

### Stacking

- Up to 10 switches can be stacked together.
- Features such as Spanning Tree, redundancy, VLANs, and SMON are common to the stack.
- The Octaplane stacking system provides 8 Gbps stacking bandwidth to all switches in the stack.
- C360 stacks continue to function even if one switch or link fails.
- Switches in the stack can be added, removed, and replaced without disrupting operation.
- An advanced election algorithm ensures optimal stack master selection.

## Layer 2 Features

- Auto-sensing simplifies configuration of LAN connections by automatically selecting the port speed for devices — either 10Mb or 100Mb.
- Auto-negotiation simplifies configuration of LAN connections by automatically selecting the port transmission mode for devices — either half- or full-duplex.
- Auto-MDIX automatically adjusts for straight-through or crossover cables on all 10/100-TX ports.
- Traffic prioritization (802.1p) allows real-time traffic classification into 8 priority levels mapped to 4 queues.
- There are four egress queues on all switch ports. The queues can be configured with the WRR (Weighted Round Robin) or strict priority scheduling algorithm.
- The use of the IEEE 802.1Q tagging for VLANs and per-port VLAN is supported.
- Multiple VLANs per port allow access to shared resources by stations that belong to different VLANs.
- The use of the IEEE 802.1w standard for Rapid Spanning Tree Protocol (RSTP) provides rapid convergence of the spanning tree in case of link failure.
- The use of the IEEE 802.1x standard for port-based network security ensures that only authorized clients get network access.
- Up to 20 redundant-port pairs are supported to increase link resiliency.
- Inter-module redundancy is supported with one pair in a stack. The switching time is approximately 1 second.
- Link Aggregation Group (LAG) support of up to 7 trunks, with each trunk having up to 8 10/100 links or 2 GB links, provides resiliency, load balancing, and bandwidth expansion.
- LAG redundancy is supported through resiliency between two LAG groups.
- Port mirroring of any switch port is supported.
- RMON/SMON port statistics provide real-time top-down analysis of network traffic.
- IP multicast filtering (snooping) filters multicast traffic to optimize network bandwidth.
- Classification of ports as regular or valuable is supported so that if a link fails, notification is generated for valuable ports only.
- The L2 CAM table contains 16K MAC addresses.

## Layer 3 Features

**Note:**

An additional license is required for Layer 3 features.

- Static, RIPv1, RIPv2, OSPF IP routing protocols are supported.
- Equal cost routing is used for load balancing and redundancy.
- Router redundancy (VRRP) is supported.
- NetBIOS rebroadcasting is available for applications such as WINS that use broadcasting but may need to also communicate with stations on other subnets or VLANs.
- ICMP and ARP protocols are supported.
- DHCP/BootP relay allows broadcast requests to be forwarded to servers.
- Policy-based routing of packets provides enforcement of QoS and ACL rules.
- The L3 CAM table contains 4K IP addresses.

## Management

- Access to the management interfaces are password-protected at three levels (read-only, read-write access and supervisor) to prevent unauthorized configuration changes.
- You can access to the Command Line Interface (CLI) in the following ways:
  - Direct console or modem connection
  - Telnet (up to five simultaneous connections) or SSHv2 (up to two simultaneous connections) over the IP network
- You can use TFTP for the download/upload of configuration files or the download of firmware files
- You can use SCP (Secure Copy Protocol) for secure download/upload of configuration files
- You can use SSH encrypted login sessions as a secure way to manage the switches remotely.
- A Java-based Device Manager provides an intuitive Web-based interface for access
- SNMPv1 is supported.
- Simple network time protocol (SNTP) or TIME protocols are available to provide a consistent timestamp to all switches from an external source.
- Radius authentication enables centralized user management.
- You can use all appropriate tools of the Avaya Integrated Management suite for administration.
- System logging can occur by terminal, internal file, or Syslog server.

## Avaya Ethernet Switches

- Switch access can be restricted to specified protocols or services.
- You can restrict access to management interfaces by IP address.
- You can invoke a telnet client from the CLI.

## Power over Ethernet (PoE)

- PoE is supported on the C363T-PWR and C364T-PWR switches.
- PoE is fully compliant with the 802.3af-2003 standard.
- PoE provides up to 15.4W per port (on 10/100 ports) over Ethernet cables to power IP phones, wireless access points, and other end-points using 802.3af-2003 standards.
- PoE automatically detects device connections and removal.
- PoE automatic load detection does the following:
  - Tests whether the device connected to the port requires remote powering.
  - Controls the power injection to the wires.
- Power is distributed between the 24/48 PoE ports according to priorities that you configure. Power priority can be configured on each port. Distribution is calculated from actual power consumption.
- BUPS (Back up power supply) can be used to improve switch availability

---

## Physical Characteristics

The C360 converged stackable switches have the following characteristics:

- Dimensions (h, w, d): 1U (44.45 mm, 1.75") x 17" (431 mm) x 14.4" (365 mm)
- Weight:
  - C363T: 4.9 kg (10.8 lb)
  - C364T: 5.0 kg (11 lb)
  - C363T-PWR: 5.5 kg (12.1 lb)
  - C364T-PWR: 6.8 kg (15 lb)

---

## Environmental Conditions

The C360 converged stackable switches have the following environmental conditions:

- Operating temperature: 32 to 104<sup>o</sup> F (0 to 40<sup>o</sup> C)
- Humidity: 5% to 95% non-condensing

---

## Power Consumption

The C360 converged stackable switches have the following power requirements:

- Power entry: 100-240 VAC, 50/60 Hz
- Power consumption:
  - C363T: 60 W max
  - C363T-PWR: 420 W max
  - C364T: 90 W max
  - C364T-PWR: 760 W max
- AC Input current:
  - C363T: 1.3A max
  - C363T-PWR: 4.2A max
  - C364T: 1.3A max
  - C364T-PWR: 7.6A max
- DC Input current:
  - C363T: 2 A max
  - C363T-PWR: 8 A max
  - C364T: 2 A max
  - C364T-PWR: 15 A max

---

## Agency Approval

The C360 converged stackable switches meet the following safety and quality requirements:

- EMC Emissions:
  - US - FCC Part 15, Subpart B, Class A
  - Europe - EN55022 class A and EN61000-3-2
  - Japan - VCCI-A
- Immunity: Approved according to EN55024 and EN61000-3-3
- Safety:
  - UL (for US) approved according to the UL 60950 Std.
  - C-UL (for Canada) approved according to C22.2 No.950 Std.
  - CE (for Europe) approved according to EN 60950 Std.

## Avaya P130 Ethernet Switches

The Avaya P133G2 and P134G2 are part of the Avaya Switch Portfolio line of cost effective Workgroup Ethernet switches. The Avaya P133G2 and P134G2 provide all the features needed at the network to implement emerging applications and yet are simple to install, operate and manage.

Installing the Avaya P133G2 and P134G2 Ethernet switches at the network edge or a small enterprise allows customers to easily build a network fully featured to meet their requirements. The switch's integrated uplinks enable connectivity to the network Backbone and you can scale up as you grow: stack up to four P130 switches to create a single logical switch.

For the P133G2 and P134G2 products, application configuring, network operation and network monitoring are straightforward tasks due to the user-friendly Web management capabilities. The P133G2 and P134G2 products have the same management and monitoring capabilities as other Avaya Cajun switches and therefore can also be centrally managed by the widely acclaimed Network Management suite of applications.

Like all Avaya MultiService Network products, the new P133G2 and P134G2 products are DayOne Ready for Voice, Video and Data Networking; Day One Ready means these products offer application optimization for converged voice, video and data networks. These products are designed to support a superior data network environment with capabilities for QoS, Policy Management and redundancy support that provides superior operational reliability and network availability.

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### Avaya P133G2

The P133G2 is a workgroup switch with 24 Fast Ethernet and 2 SFP GBIC slots for uplink and cascading. This unit has a 8.8 Gbps wire speed switching and forwarding rate.

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### Avaya P134G2

The P134G2 configuration provides 48 Fast Ethernet ports and 2 SFP GBIC slots.

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## General Features of the P133G2 and P134G2 Switches

- 802.3 compliant ports for full/half duplex traffic, auto-negotiation, and flow control
- Port-based and 802.1Q VLAN
- QoS Support
- Priority per-port and 802.1p support
- Congestion control
- Port redundancy
- Link Aggregate Group (LAG) Supports both load sharing and redundancy as an incremental way to scale link bandwidth
- LAG Redundancy
- Support for Spanning Tree Protocol
- Load-Sharing Back-up Power Supply (BUPS)
- Port mirroring
- SMON (RFC2613) IETF SMON standard for Layer 2

## Interfaces

- 24 x 10/100Base-TX ports with RJ connectors
- 2 x SFP GBIC connectors
- RS-232 for terminal setup/modem and PPP

## Standards Supported

- IEEE 802.3x Flow control on all ports
- IEEE 802.1Q/p VLAN Tagging and priority on all ports
- IEEE 802.1D Spanning Tree protocol
- IEEE 802.3z Gigabit Ethernet ports
- IETF MIB-II, Bridge MIB, RMON, SMON

## Physical Characteristics

- Dimensions (h, w, d): 2U (3.5"/88 mm) x 19" (482.6 mm) x 13.8" (350 mm)
- Weight
  - P133G2: 11.4 lb (5.2 Kg)
  - P134G2: 13.2 lb (6 Kg)

## Environmental Conditions

- Operating Temp: 23 to 122<sup>o</sup> F (-5 to 50<sup>o</sup> C)
- Humidity: 5% to 95% non-condensing

## Power Consumption

- Power Entry (AC): 100-240 VAC, 1A, 50/60 Hz
- Power Consumption: 75W maximum

## Agency Approval

- EMC Emission:
  - US - FCC Part 15, Subpart B, Class A
  - Europe - EN55022 class A and EN61000-3-2
  - Japan - VCCI-A
- Immunity: Approved according to EN55024 and EN61000-3-3
- Safety:
  - UL for US approved according to UL1950 Std.
  - C-UL (UL for Canada) approved according to C22.2 No.950 Std.
  - CE for Europe approved according to EN 60950 Std

# Site requirements

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## Rack mounting, temperature and humidity information for the G600 Media Gateway

The G600 Media Gateway can be mounted in a standard 19-inch data rack that has been properly pre-installed and secured as per the EIA 464 (or equivalent) standards. The G600 Media Gateway can be front mounted (as shipped) or mounted at its midpoint.

The customer must provide the rack and have it installed and secured prior to the G600 Media Gateway installation. The customer must also provide AC power to the rack. The technicians who install the G600 Media Gateway do not typically have the tools or proper training for data rack installation.

Installation requires 1 foot (30 cm) of clearance in the rear, and 18 inches (45 cm) of clearance in the front, which is consistent with the EIA 310 standards. In a 2-cabinet configuration, the dimensions of the TDM/LAN cable require that you mount the B cabinet directly over the A cabinet.

The G600 Media Gateway must be installed in a well-ventilated area. Maximum equipment performance is achieved at an ambient temperature between 40 and 120° F (4 and 49° C) for a short-term operation of not more than 72 consecutive hours or 15 days in one year. A continuous operation requires up to 110° F (43° C).

The relative humidity range is 10 to 95% at up to 84° F (29° C). Above this, maximum relative humidity decreases from 95% down to 32% at 120° F (49° C). Installations outside these limits may reduce system life or affect operation. The recommended temperature and humidity range is 65 to 85° F (18 to 29° C) at 20 to 60% relative humidity.

**Table 12: Cabinet power source information**

Cabinet style and power-distribution unit	Power sources	Power input receptacles
G600 Media Gateway – *AC power supply (650A integrated power supply)	Single-phase 120-VAC with neutral Single-phase 240-VAC with neutral	120-VAC, 60-Hz NEMA 5-15R 24-VAC, 50-Hz IEC 320 Japan installations use country-specific receptacles for 100 VAC and 200 VAC, 50/60 Hz

\*There is no integrated DC power supply. DC rectifiers can be used if desired; follow manufacturer’s instructions.

**Table 13: Circuit breakers for AC-powered G600 Media Gateway**

G600 Media Gateway	Circuit Amperes
120 VAC, 60 Hz	15
240 VAC, 50 Hz	10

---

## Heat dissipation for the G600 Media Gateway

The amount of heat dissipated required by a G600 Media Gateway configuration is described below. These estimates are highly dependent on the inclusion of telephones with the Media Gateways as well as the amount of time that the telephones are off-hook.

**Note:**

Typical systems assume typical trunking, sparing, call rate, and a typical mixture of high-function and low function telephones. The following table shows estimates of heat dissipation for the G600 Media Gateway. Worst-case systems assumes typical trunking and call rate, but no spare slots and all ports configured with high functioning terminals. The G600 Media Gateway that was tested used the worst case of 16 port analog circuit packs fully populated with analog sets.

---

## Typical G600 Media Gateway heat-dissipation specifications

BTU per hour	# of G600 Media Gateways only	G600 with terminals
1	400	1000
2	900	2200
3	1400	3475
4	1900	4700
Worst case	3200	5150

---

## G650 specifications

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### Power requirements

#### AC power

Commercial AC is the primary input power source. Both slot 0 and slot 15 have dedicated AC input. The 655A power supply can operate on AC input of 90 - 264VAC at 47 - 63Hz. The nominal ranges for AC power are:

- 100 - 120VAC at 50 or 60Hz
- 200 - 240VAC at 50 or 60Hz

#### DC power

Minus 48VDC power can be supplied simultaneously as backup power. One -48VDC power input point is provided on the G650 backplane and is distributed through the backplane to each power supply.

#### Power output

Power supply output voltage measurements—+5VDC, -5VDC, and -48VDC

## Site requirements

See the following table for power source information.

**Table 14: Chassis power source information for the G650**

Chassis style and power-distribution unit	Power source options	Power input receptacles
<ul style="list-style-type: none"><li>● AC or DC power supply (Apparatus Code 655A)</li><li>● A 655A power supply is required in slot 0.</li><li>● A 655A power supply is optional in slot 15.</li></ul>	<ul style="list-style-type: none"><li>● Single phase 120 VAC with neutral wire</li><li>● Single phase 240 VAC with neutral wire</li><li>● -48VDC</li></ul>	<ul style="list-style-type: none"><li>● 120 VAC, 60 Hz NEMA 5-15R</li><li>● 240 VAC, 50 Hz IEC 320</li><li>● When installing G650s in Japan, use country specific receptacles for 100 and 200 VAC, 50/60 Hz.</li><li>● When installing G650s in Mexico, use country specific receptacles for 127 VAC.</li></ul>

See [Table 15: Circuit breakers for AC-powered chassis](#) on page 374 for circuit breaker information for AC-powered chassis

**Table 15: Circuit breakers for AC-powered chassis**

Chassis type	Circuit breaker size
Rack mount chassis (120 VAC) 60 Hz	15 A
Rack mount chassis (240 VAC) 50 Hz	10 A

---

## Dimensions

The G650 Media Gateway has the following dimensions:

- 14h x 22d x 19w (inches)
- 36h x 56d x 48w (centimeters)
- height in rack: 8 U
- weight: 35 - 39 pounds, 16 - 18 kg

The G650 requires 12 inches (30 centimeter) of clearance in the rear and 18 inches (45 centimeters) of clearance in the front for adequate ventilation and to conform with EIA3 10D data rack standards. In a multiple G650 configuration, the G650s are placed in a rack without any space between them. If the G650s are not correctly placed in the rack, the TDM/LAN cables cannot connect them.

---

## Operating conditions

The normal operating conditions for the G650 are the following:

- 41° Fahrenheit (5° Celsius) to 104° Fahrenheit (40° Celsius)
- 10 percent to 90 percent relative humidity, non-condensing below 10,617 feet (3,236 meters).

---

## G350 Site Requirements

The table below shows you the site requirements of the G350 Media Gateway.

**Table 16: G350 specifications.**

Description	Value
Ambient working temperature	0-40°C
Operation altitude	up to 2000 m
Front clearance	12 in. (30 cm.)
Rear clearance	18 in. (45 cm.)
Humidity	20-60% relative humidity

---

## Power Cord Specifications

Following are specifications for power cords suitable for use with the G350:

**For North America:** The cordset must be UL Listed/CSA Certified, 16 AWG, 3-conductor (3rd wire ground), type SJT. One end is to be terminated to an IEC 60320, sheet C13 type connector rated 10A, 250V. The other end is to be terminated to either a NEMA 5-15P attachment plug for nominal 125V applications or a NEMA 6-15P attachment plug for nominal 250V applications.

**For Outside North America:** The cord must be VDE Certified or Harmonized (HAR), rated 250V, 3- conductor (3rd wire ground), 1.0 mm<sup>2</sup> minimum conductor size. The cord is to be terminated at one end to a VDE Certified/CE Marked IEC 60320, sheet C13 type connector rated 10A, 250V and the other end to a 3-conductor grounding type attachment plug rated at a minimum of 10A, 250V and a configuration specific for the region/country in which it will be used. The attachment plug must bear the safety agency certifications mark(s) for the region/country of installation.

## Site requirements

The G350 Media Gateway relies on two ground connections (mains plug with an earth contact and a permanent Supplementary Ground Conductor). Because of unreliable earthing concerns in Finland, Norway, and Sweden, the G350 Media Gateway must be installed in a Restricted Access Location (RAL). An RAL is defined as an access that can be gained only by trained service personnel or customers who have been instructed about the reasons for the restricted access and any safety precautions that must be taken. In these cases, access to the G350 Media Gateway is gained by the use of a tool (such as a lock and key) or other means of security.

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## Environmental considerations for the G700 Media Gateway

The following table lists the environmental considerations for the G700 Media Gateway.

**Table 17: Environmental considerations for the G700 Media Gateway 1 of 2**

Consideration	Description
Heat dissipation	The unit uses global AC, 100-240 VAC, 50/60 Hz, 1.5 to 4.9 A, which translates to 360 to 400 Watts. However, some is passed out the front, via -48VDC (up to 32 ports at 1.5 Watts each for a total of 48 Watts).
Altitude and air pressure	Functions at altitudes of minus 197 feet to 10,000 feet. Air pressure is not specified.
Temperature and humidity	Long term operation at +5 to +40 C at 5 to 85% humidity. Short term operation at -5 to 50 C, at 5 to 90% humidity, non condensing.
Air purity	Indoor environments that are suitable for continuous human occupancy.
Lightning	The user is protected under the UL codes against over voltage in the system. However, the system itself is susceptible to over voltage (i.e. lightning) depending on the configuration. The loss of service due to an over voltage condition can result in the loss of one or more of the following: <ul style="list-style-type: none"><li>● Terminal loss</li><li>● Port loss</li><li>● Media Module loss</li><li>● Power supply within the G700</li></ul>

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**1 of 2**

**Table 17: Environmental considerations for the G700 Media Gateway 2 of 2**

Consideration	Description
Acoustic noise generated by unit	50dBA maximum
Electromagnetic compatibility standards	Conforms to the electromagnetic compatibility standards for the countries in which it operates.
European union standards	Approved to Safety Standard EN60950.
Air flow with a single fan failure	In front of the backplane is 264 linear feet per minute average. If a fan fails in front of the backplane, 174 lfpm average, with a range from 42 to 340 lfpm.
Air flow with the power supply fan failure	Minimal air flow at power supply if power supply fan fails.
<b>2 of 2</b>	

---

## Power requirements for the G700 Media Gateway

The power supply complies with FCC Part 15, Subpart B Class B and EN55022 Class B requirements for conducted and radiated electromagnetic interferences (EMI). When you use the power supply in a single or multiple G700 Media Gateway system, the power supply must allow the system to comply with Class B requirements with +6 dB of margin.

This power unit can be a single power supply or multiple modules that are sized and scalable for the load. The Avaya Ethernet switches have a power unit that meets the 802.3 AF standard and provides remote power for the telephone. The power supply meets all applicable global standards for safety, immunity, and emissions, and is verified by in-country testing.

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## Thermal Protection

Thermal protection shuts down the power supply if the internal temperature exceeds the maximum rated safe operating temperature. The minimum thermal shutdown point is determined at an ambient temperature of 50 degrees C at 10,000 feet elevation or 60 degrees C at sea level under all input and load conditions. You must consider the effects of component tolerances when defining the shutdown point. This consideration ensures that the supply does not shut down at ambient temperatures that are less than those specified above, with forced air flowing from input to output at a nominal rate of 46 CFM (300 LFM).

## Manual Reset

The power supply requires reset when it manually when it shuts down because of over voltage or overheating. To reset the power supply recycle the AC input power.

---

## AC and Load Center Circuit Breakers

For AC power, each of the G700 Media Gateways has a detachable AC power cord that plugs into a wall socket or into a power strip on the rack. This circuit must be protected by a circuit breaker for the panel that serves the outlet.

As a result, the G700 Media Gateway itself does not have circuit breakers or on/off switches. However, any customer AC load center must have circuit breakers protecting the power feeds to the G700 Media Gateways as required by electric codes.

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## AC power distribution

AC power distribution is plugged into an outlet or power strip and can be backed up by an optional UPS

---

## AC Grounding/Protective Grounds

The G700 Media Gateway contains a grounding screw on the back of the chassis. You must maintain ground connection whether you connect the G700 Media Gateway directly to the branch circuit or to a power distribution strip. The G700 Media Gateway also requires a cabinet ground connection directly to an approved ground.

## S8500 Media Server environmental specifications

The following table outlines the environmental specifications of the S8500 Media Server. For a complete feature and specification table refer to the S8500 Installation Manual.

**Note:**

Some values are shown at maximum configuration. Avaya values will be slightly lower than maximum.

**Table 18: S8500 Environmental Specifications 1 of 2**

Type	Description
Acoustical Noise Emissions	<ul style="list-style-type: none"> <li>● Sound power, idling: 6.5 bel maximum</li> <li>● Sound power, operating: 6.5 bel maximum</li> </ul>
Environment: Air Temperature	Server on: <ul style="list-style-type: none"> <li>● 10 to 35 degrees C (50.0 to 95.0 degrees F)</li> <li>● Altitude: 0 to 914 m (2998.7 ft)</li> </ul> Server off: <ul style="list-style-type: none"> <li>● -40 to 60 degrees C (-104 to 140 F)</li> <li>● Maximum altitude: 2133 m (6998.0 ft)</li> </ul>
Environment: Humidity	Server on: <ul style="list-style-type: none"> <li>● 8% to 80%</li> </ul> Server off: <ul style="list-style-type: none"> <li>● 8% to 80%</li> </ul>

**1 of 2**

**Table 18: S8500 Environmental Specifications 2 of 2**

Type	Description
Heat Output	BTU output per hour (approximate): <ul style="list-style-type: none"> <li>● Maximum configuration: 512 BTU (150 watts)</li> </ul>
Electrical Input	<ul style="list-style-type: none"> <li>● Sine-wave input (47-63 Hz) required</li> <li>● Input voltage low range:                             <ul style="list-style-type: none"> <li>● Minimum: 100 V ac</li> <li>● Maximum: 127 V ac</li> </ul> </li> <li>● Input voltage high range:                             <ul style="list-style-type: none"> <li>● Minimum: 200 V ac</li> <li>● Maximum: 240 V ac</li> </ul> </li> <li>● Input kilovolt-amperes (kVA) (approximate):                             <ul style="list-style-type: none"> <li>● Minimum: 0.0870 kVA</li> <li>● Maximum: 0.150 kVA</li> </ul> </li> <li>● Receptacle U.S.: XXXX 87=NEMA 5-15</li> <li>● Circuit breaker: XXXX 87=15 amp</li> <li>● Pole: XXXX 87=1</li> <li>● Amp Draw: XXXX 87=3</li> </ul>

2 of 2

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## Altitude, air pressure and air purity for the S8700 Media Server or S8710 Media Server

The normal operating air pressure for the S8700/S8710 Media Server is from 9.4 to 15.2 psi (648 to 1048 millibars). For altitudes above 5,000 feet, reduce the maximum short-term temperature limit by 1° F or for 1,000 feet of elevation above 5,000 feet. At 10,000 feet, for example, the maximum short-term temperature limit is 115° F.

---

## Air Purity

Do not install the equipment in an area where the air may be contaminated with any of the following:

- Excessive dust, lint, carbon particles, paper fiber contaminants, or metallic contaminants
- Corrosive gases, such as sulfur and chlorine

Contaminant	Average
Particulate matter	185 microgram/m <sup>3</sup>
Nitrate in particulate matter	12 microgram/m <sup>3</sup>
Total hydrocarbons equivalent to methane	10 ppm
Sulfur dioxide	0.20 ppm
Oxides of nitrogen	0.30 ppm
Total oxidants equivalent to ozone	0.05 ppm
Hydrogen sulfide	0.10 ppm

**Note:**

Avaya recommends that the S8700/S8710 Media Server and related equipment not be collocated with copiers, printers, or plain paper FAX machines because of the fine dust these devices produce.

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## Temperature and humidity for the S8700 Media Server or S8710 Media Server

The S8700/S8710 Media Server should be installed in an area that is well-ventilated. Maximum equipment performance is obtained at an ambient temperature between 40 to 110 degrees Fahrenheit (4 and 43 degrees Celsius) for continuous operation and between 40 and 120 degrees Fahrenheit (4 and 49 degrees Celsius) for short term operation. The system equipment can operate at the short-term operational limits for a period not to exceed 72 consecutive hours or a total of not more than 15 days in a year.

The relative humidity range is 10 to 95 percent up to 84 degrees Fahrenheit (29 degrees Celsius). Above 84 degrees Fahrenheit (29 degrees Celsius), maximum relative humidity decreases from 95 percent down to 32 percent at 120 degrees Fahrenheit (49 degrees Celsius). Installations outside these limits may reduce system life or impede operation.

## Site requirements

The following table correlates room temperature with allowable relative humidity.

<b>Recommended temperature range (degrees Fahrenheit)</b>	<b>Recommended temperature range (degrees Celsius)</b>	<b>Recommended humidity range (in %)</b>
65 to 85	18 to 29	20 to 60
40 to 84	4.4 to 28.8	10 to 95
86	30.0	10 to 89
88	31.1	10 to 83
90	32.2	10 to 78
92	33.3	10 to 73
94	34.4	10 to 69
96	35.6	10 to 65
98	36.7	10 to 61
100	37.8	10 to 58
102	38.9	10 to 54
104	40.0	10 to 51
106	41.1	10 to 48
108	42.2	10 to 45
110	43.3	10 to 43
112	44.4	10 to 40
114	45.6	10 to 38
116	46.7	10 to 36
118	47.8	10 to 34
120	48.9	10 to 32

---

## EMI and RFI specifications for the S8700 Media Server or S8710 Media Server

Country	Specification
USA	FCC74 CFR Parts 2 and 15 Verified Class A limit
Canada	IC ICES-003 Class A limit
Europe	EMC Directive, 89/336/EEC; EN55022, Class A Limit, Radiated and Conducted Emissions; EN55024, Immunity Standard for Information Technology Equipment; EN61000-3-2 Harmonic Currents; EN61000-3-3 Voltage Flicker
Australia and New Zealand	AS/NZS 3548 Class A limit
Japan	VCCI, Class A ITE (CISPR 22, Class A Limit); IEC 1000-3-2; Harmonic Currents
Taiwan	BSMI Class A (CISPR 22)
Russia	Gost approval
International	CISPR-22 Class A limit

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## Power supply specifications for the S8700 Media Server or S8710 Media Server

Power	Voltage and frequency
AC	100 to 127 VAC 200 to 240 VAC
DC	200 Watts
+5 VDC	22 A maximum
+5 VDC standby	1.0 A maximum
+12 VDC	3.5 A maximum
+3.3 VDC	13.0 A maximum
-12 VDC	0.25 A maximum

---

## BTU

British thermal units (BTUs) are standard for measuring the thermal output of a device. One BTU equals the heat that will raise the temperature of one pound of water by one degree Fahrenheit. In physical terms, one BTU equals 1054 joules. The maximum BTU output of the Intel SRTR1 server is 988 BTU's. This rating represents a SRTR1 with the following components:

- SRTR1 server board
- Front panel board
- PCI riser board
- One 80-mm fan
- Three 40-mm fans
- 850-MHz Pentium III with heat sink fan
- Four Micron 32-Mb x 72 (256-Mb) DIMM modules
- IDE hard drive
- Slimline CD-ROM drive
- Slimline floppy drive
- Three PCI cards

**Note:**

The BTU number is rated at the lowest efficiency or worst case of the power supply. Under normal conditions the power supply should perform above the 70% efficiency level, which will lower the BTU ratings.

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## Regulatory certification for an S8700 Media Server or S8710 Media Server

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### Product-safety standards and approvals

Country	Safety standards and approval summary
US and Canada	UL 1960, CSA 22.2, No. 950M95, 3 <sup>rd</sup> edition
Europe	Low Voltage Directive, 73/23/EEC TUV/GS to EN60950 2 <sup>nd</sup> Edition with Amendments, A1 + A2 + A3 + A4 + A11
International	CB Certificate and Report to IEC 60950, 2 <sup>nd</sup> edition including EMKO-TSE (74-SEC) 207/94 and other national deviations

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### Electromagnetic-compatibility (EMC) standards and approvals

Country	EMC standards and approvals
US	FCC 47 CFR Parts 2 and 15, Verified Class A Limit
Canada	IC ICES-003 Class A Limit
Europe	EMC Directive, 89/336/EEC EN55022, Class A Limit, Radiated and Conducted Emissions EN55024, Immunity Standard for Information Technology Equipment EN61000-3-2 Harmonic Currents EN61000-3-3 Voltage Flicker

## Site requirements

Country	EMC standards and approvals
Australia and New Zealand	C-Tick; AS/NZS 3548, Class A Limit
Japan	VCCI Class A ITE (CISPR 22, Class A Limit) IEC 61000-3-2; Harmonic Currents
Taiwan	BSMI Class A (CISPR 222)
Russia	Gost Approval
International	CISPR 22, Class A Limit

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## Data rack mounting and media gateway floor loading for an S8700/S8710 Media Server with voice bearer over ATM and CSS

Hardware components of the S8700/S8710 Media Server with voice bearer over ATM/CSS are, the S8700/S8710 Media Servers, an Ethernet Switch, a modem and the two UPS units. All components are installed in a 19 inch open data rack.

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### 19-Inch Rack

The customer provides a data rack that is used to hold equipment not necessarily specified or provided by Avaya. The footprint of the data rack is 19 inches by 21 inches.

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### S8700/S8710 Media Server

The two S8700/S8710 Media Servers are designed for mounting in an open 19-inch data rack. S8700 Media Servers weigh approximately 25 pounds. S8710 Media Servers weigh approximately 60 pounds.

## Avaya 700VA or 1500VA UPS Units

For configurations that require 28 to 410 minutes of battery holdover the Avaya 700VA UPS can be used. The 700VA is available in the following voltages:

- 700VA 120-V for US and Canada
- 700 VA 230-V Online for International
- 700 VA 100-V and 200-V for Japan

The physical characteristics of the Avaya 700VA are:

- Width: 17 inches (43.2 cm)
- Depth: 19 inches (48.2 cm)
- Height: 3.5 inches (8.9 cm)
- Weight: 34 pounds (15 kg)

For configurations that require 411 to 480 minutes of battery holdover the Avaya 1500VA UPS can be used. The 1500VA is available in the following voltages:

- 1500VA 120 V for US and Canada
- 1500 VA 230 V Online for International
- 1500 VA 100V and 200V for Japan

The physical characteristics of the Avaya 1500VA are:

- Width: 17 inches (43.2 cm)
- Depth: 24 inches
- Height: 3.5 inches (8.9 cm)
- Weight: 50 pounds

---

## Avaya Ethernet switches

The P133G2 and the P134G2 equipped with CCS PNC:

- The height, weight, and length of the P133G2 and the P134G2 is:  
2 $\mu$  (3.5"/88 mm)  $\times$  19" (482.6 mm)  $\times$  13.8" (350 mm)
- The weight of the P133G2 is 11.4 pounds (5.2 kg)
- The weight of the P134G2 is 13.2 pounds (6.0 kg)

## Site requirements

The P333T and the P334T equipped with ATM PNC:

- The height, weight and length of the P333T and the P334T is:  
2μ (3.5"/88 mm) × 19 inches (482.6 mm) × 17.7 inches (450 mm)
- The weight of the P333T and the P334T is 16.5 pounds (7.5 kg)

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## Media gateways

The floor of the equipment room must meet the loading code of a commercial floor of at least 50 pounds per square foot (242 kg per square meter). Floor plans typically allocate space around the front, the ends, and the rear of the cabinets, for maintenance access. Additional equipment room floor support may be required if the floor load is greater than 50 pounds per square foot (242 kg per square meter).

The following table shows the weight and floor loading of the media gateways.

Media gateway	Weight	Floor loading
SCC1	125 lb. (56 kg)	31 lb./sq. ft. (148.9 kg/m <sup>2</sup> )
MCC1	200 to 800 lb. (90 to 363 kg)	130 lb./sq. ft. (624.2 kg/m <sup>2</sup> )
G700	16.5 lbs (7.5 kg)	19-inch rack-mounted – floor loading depends on load on the rack

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## Site requirements for DEFINITY

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### Altitude, air pressure, and air purity for DEFINITY

#### Altitude and air pressure

At altitudes above 5,000 feet (1,525 meters), the maximum short-term temperature limit reduces by 1° Fahrenheit for each 1,000 feet (305 meters) of elevation above 5,000 feet (1,525 meters). For example: at sea level, the maximum short-term temperature limit is 120° F (49° Celsius). At 10,000 feet (3,050 meters), the maximum short-term temperature limit is 115° F (46° C).

The normal operating air pressure range is: 9.4 to 15.2 psi (pounds per square inch) (648 to 1,048 millibars).

## Air purity

The CMC1, SCC1, and MCC1 Media Gateways contain an air filter to reduce the flow of particulates through the equipment. Do not install the Media Gateways where the air might be contaminated by excessive dust, lint, carbon particles, paper fiber contaminants, or metallic contaminants. For example, do not install the cabinet near paper handling equipment such as copiers and high-speed printers, which introduce paper dust and print particles into the environment. Avoid Corrosive gases above the levels in the following table.

**Table 19: Allowable concentrations of atmospheric contaminants**

Contaminant	Average concentration not to exceed
All particulate matter	185 micrograms/cubic meter
Nitrate	12 micrograms/cubic meter
Total hydrocarbons equivalent to methane	10 ppm (parts per million)
Sulphur dioxide	0.20 ppm (parts per million)
Oxides of nitrogen	0.30 ppm (parts per million)
Total oxidants equivalent to ozone	0.05 ppm (parts per million)
Hydrogen sulfide	0.10 ppm (parts per million)

---

## Cabinet dimensions and clearances

Floor plans typically allocate space around the front, ends, and rear of the cabinets for maintenance purposes. Floor area requirements vary between cabinets. The following table lists the dimensions and clearances for the SCC1 Media Gateway and the MCC1 Media Gateway.

**Table 20: Dimensions and clearance for the MCC1 Media Gateway and the SCC1 Media Gateway**

Cabinet type	Height	Width	Depth	Clearance
SCC1 1-cabinet	20 in. (51 cm)	27 in. (69 cm)	22 in. (56 cm)	38 inch (97 cm) between cabinet and wall
2-cabinets	39 in. (99 cm)	27 in. (69 cm)	22 in. (56 cm)	
3-cabinets	58 in. (1.5 m)	27 in. (69 cm)	22 in. (56 cm)	
4-cabinets	77 in. (2 m)	27 in. (69 cm)	22 in. (56 cm)	
MCC1 <sup>1</sup>	70 in. (1.8 m)	32 in. (81 cm)	28 in. (71 cm)	Rear 38 in. (97 cm) Front 36 in. (91 cm)
Cable slack manager <sup>2</sup>	7 in. (18 cm)	32 in. (81 cm)	38 in. (97 cm)	
DC power cabinet <sup>3</sup>	20 in. (51 cm)	27 in. (69 cm)	22 in. (56 cm)	38 in. (97 cm) Front and Rear
Large battery cabinet 100 Amp	27 in. (69 cm)	55 in. (140 cm)	21 in. (53 cm)	38 in. (97 cm) Front and Rear
200 Amp	42 in. (107 cm)	55 in. (140 cm)	21 in. (53 cm)	
300 Amp	42 in. (107 cm)	55 in. (140 cm)	21 in. (53 cm)	
400 Amp	57 in. (145 cm)	55 in. (140 cm)	21 in. (53 cm)	

1. This row includes the auxiliary cabinet, the global AC cabinet, and the global DC cabinet.

2. Cable slack manager is used with MCC1 Media Gateway and the SCC1 Media Gateway.

3. DC power cabinet requires a floor area of eight square feet (0.74 square inches). The DC power cabinet also requires 38 inches (97 cm) between the cabinet and the wall.

---

## Floor load requirements

The equipment room floor must meet the commercial floor loading code of at least 50 pounds per square foot (242 kg per square meter). Floor plans typically allocate space around the front, ends, and rear (if necessary) for maintenance access of the Media Gateways. Additional equipment room floor support may be required if the floor load is greater than 50 pounds per square foot (242 kg per square meter). See the following table for Media Gateway and battery information concerning weight and floor loading.

Type	Weight	Floor loading	Remarks
SCC1 Media Gateway	125 pounds (56 kg)	31 pounds per square foot (148.9 kg/m <sup>2</sup> )	
MCC1 Media Gateway	200-800 pounds (90-363 kg)	130 pounds per square foot (624.2 kg/m <sup>2</sup> )	Includes auxiliary, global AC and global DC cabinets
100-A battery	maximum 400 pounds (181 kg)	180 pounds per square foot (871.2 kg/m <sup>2</sup> )	
200-A battery	maximum 815 pounds (370 kg)	328 pounds per square foot (1587.5 kg/m <sup>2</sup> )	
300-A battery	maximum 1480 pounds (671 kg)	476 pounds per square foot (2303.8 kg/m <sup>2</sup> )	
400-A battery	maximum 1580 pounds (717kg)	625 pounds per square foot (3025 kg/m <sup>2</sup> )	

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## Power requirements

This section describes **AC**-power and **DC**-power source requirements for the cabinet.

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### Global AC MCC power supply

The Global MCC (GMCC) power supply is for use in both US and international systems. The GMCC replaces the existing AC MCC1 cabinet configuration that is used in the US, and thus reducing the number of power supplies and distribution units that are associated with the MCC1 platform.

## Site requirements

The GMCC automatically accepts 200- to 240-VAC power at 50 or 60 Hz. The GMCC complies with all emissions and safety requirements for customer applications worldwide. the GMCC power system consists of:

- NP850 rectifier that consists of cabinet-level power units located in the power-distribution unit at the bottom of the MCC1
- 649A power supplies that are DC/DC converters that provide carrier-level power
- One battery interface and alarm unit
- Battery connections
- Alarm outputs
- One cabinet input cord, NEMA 6-30P in the US.

The GMCC power architecture offers both short-term and long-term power backup. Batteries inside the MCC1 provide short-term backup. External battery cabinets provide long-term backup. Because of its long-term power backup capabilities, the GMCC significantly reduces or eliminates the need for UPS and DC battery plants for most customer applications.

---

## AC power

Power feeders from a dedicated power source that is typically located outside the building connect to an **AC** load center. These feeders do not provide power to other equipment. The AC load center distributes the power to receptacles. The power cords from the **AC** power supply in each SCC1 plugs into a receptacle.

### 60-Hz power sources

Each of the following power sources can supply 60-Hz power to the **AC** load. See the following figures for information on 120- to 240-VAC power sources.

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**Figure 87: Single-phase, 120- to 240-VAC, 60-Hz source**

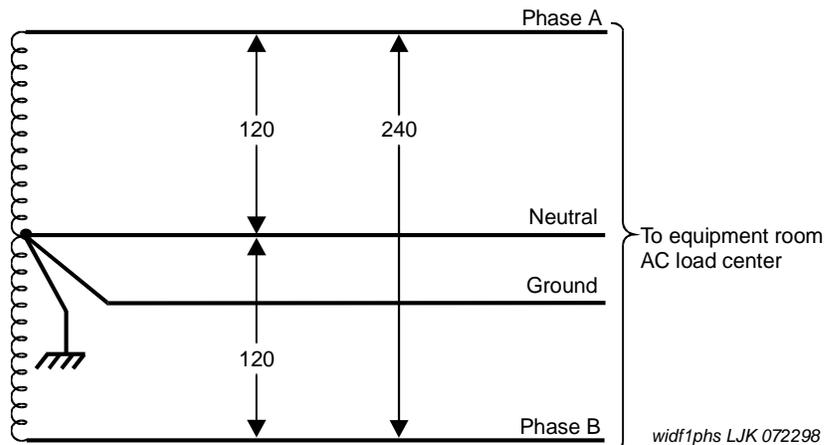
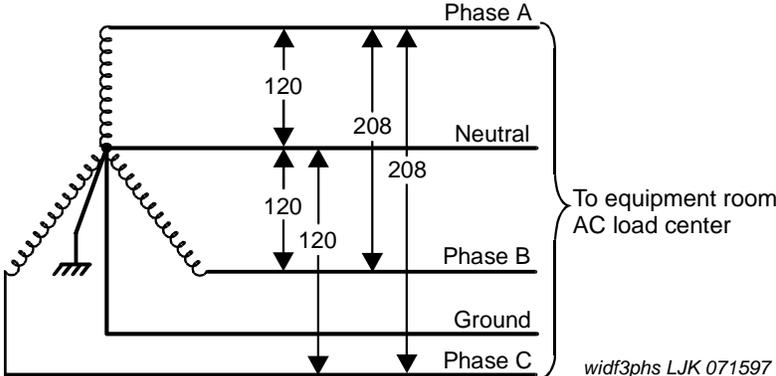


Figure 88: 3-phase, 120- to 208-VAC, 60-Hz source



### 50-Hz power sources

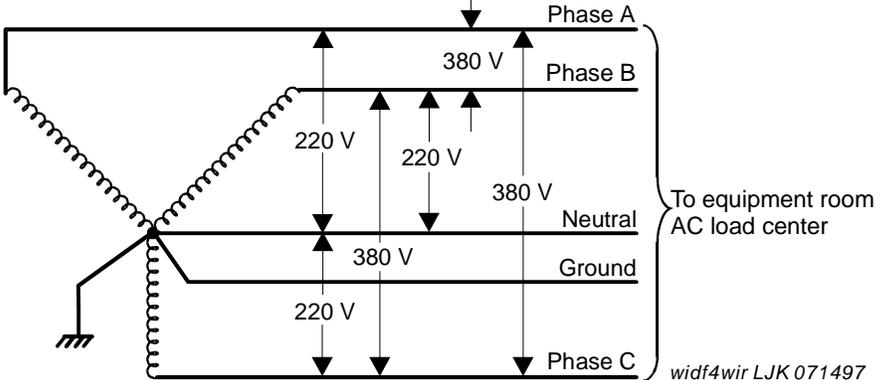
Either of the following power sources can supply 50-Hz power to the **AC** load. See the following figures for 220-VAC power source.

**Note:**

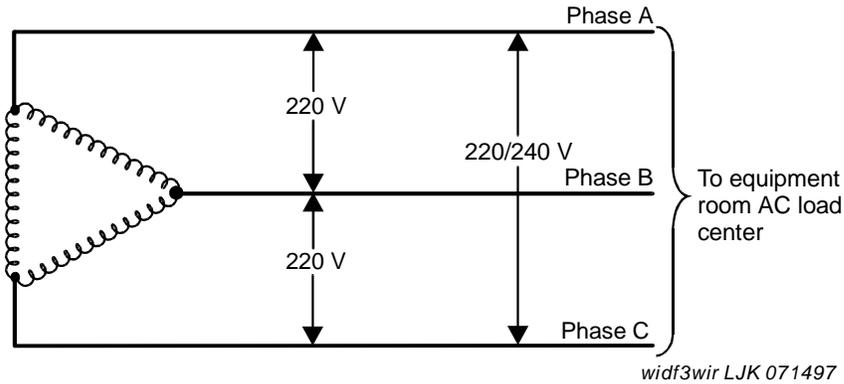
For type of power see:

- SCC1 is shown on the cabinet's rear cover
- CMC1 is shown on the right door

Figure 89: International, 3-phase, 220- to 380-VAC, 50-Hz source



**Figure 90: International delta, 220- or 240-VAC, 50-Hz source**



The following table lists the **AC** power sources that can supply power to an AC load in a cabinet. A **NEMA** receptacle or it's equivalent, connects to the wires from the unit. The **AC** power cord from the power input of each unit plugs into a receptacle.

Contact your Avaya representative for ordering information.

**Table 21: Cabinet AC power sources 1 of 2**

Cabinet style and power-distribution unit	Power sources	Power input receptacles
CMC AC power supply (650A power unit)	Single phase 120 VAC with neutral	120 VAC, 60 Hz NEMA 5-15R
	Single phase 240 VAC with neutral	240 VAC, 50 Hz IEC 320 Note: Configurations installed in Japan use country specific receptacles for 100 and 200 VAC, 50/60 Hz
MCC1 <b>AC</b> power distribution	Single phase 120 VAC with neutral	120 VAC, 60 Hz NEMA 5-50R
	Single phase 240 VAC with neutral, or single phase of three-phase, 208 VAC with neutral	or 208/240 VAC, 60 Hz NEMA

Table 21: Cabinet AC power sources 2 of 2

Cabinet style and power-distribution unit	Power sources	Power input receptacles
MCC1 AC power distribution	Single phase 176-264 VAC	200 volts to 240 volts, 50-60 Hz NEMA L6-30R. Configurations that are installed outside the US require a receptacle suitable that is for use in the country of installation.
SCC1 AC power supply (1217A power unit)	Single phase 120 VAC with neutral Single phase of 220 VAC or Single phase of 240 VAC	120 VAC, 60 Hz NEMA 5-20R or 5-15R 220-VAC to 240-VAC at a country-specific receptacle
		<b>2 of 2</b>

---

## DC power

DC-powered cabinets that contains a J58890CF power-distribution unit require a -42.5 to -56 VDC source at up to 75 A.

## Circuit-breaker sizes for AC and DC cabinets

The following tables list the circuit-breaker sizes for every AC- and DC-powered cabinet.

**Table 22: Circuit breakers for AC-powered cabinets**

Cabinet	Circuit breaker size (A)
CMC1 (120 VAC) 60 Hz	15
CMC1 (240 VAC) 50 Hz	10
SCC1 (120 VAC)	15 or 20
Auxiliary cabinet (120 VAC)	20

**Table 23: Circuit breakers for DC-powered cabinets**

Cabinet (-48 VDC)	Circuit breaker size (A)
SCC1	25
Auxiliary	20

---

## MCC1 power system

The MCC1 power system consist of an **AC power** or **DC** power-distribution unit in the bottom of each cabinet and cables to distribute output voltages to power unit circuit packs in the carriers. These power systems also consist of power-converter circuit packs in the carriers. These circuit packs supply **DC** power to the circuit pack slots. The following tables list the input voltages and the output voltages of power unit circuit packs in the carriers of MCC1s.

**Table 24: Power Units in the MCC1: Inputs**

Model	Inputs		
	120 VAC	144 VDC	-48 VDC
<b>AC</b> 631DA1	Yes	Yes	No
<b>AC</b> 631DB1	Yes	Yes	No
<b>DC</b> 644A	No	No	Yes
<b>DC</b> 645B	No	No	Yes
<b>DC</b> 649A	No	No	Yes

Table 25: Power Units in the MCC1: Outputs

Model	Outputs		
	+5 VDC 60 A	-5 VDC 6 A	-48 VDC 8 A
AC 631DA1	Yes	No	No
AC 631DB1	No	Yes	Yes
DC 644A	Yes	No	No
DC 645B	No	Yes	Yes
DC 649A	Yes	Yes	10 A

## AC power distribution

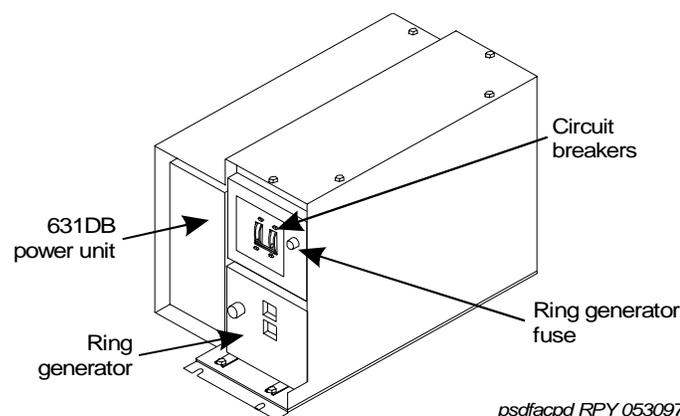
A typical AC power-distribution unit for an MCC1 contains:

- Circuit breakers
- Ring generator
- Optional batteries
- Optional battery charger

The power distribution cables carry 120-VAC during normal operation and 144-VDC from optional batteries if **AC** power fails. Another cable connects 120-VAC to the battery charger.

The following figure shows an AC power-distribution unit and battery charger (J58890CE-2 List 15 or later). The AC power-distribution unit and the battery charger sits at the bottom of some MCC1s.

Figure 91: AC power-distribution unit (J58890CE-2) (front)



psdfacpd RPY 053097

## Site requirements

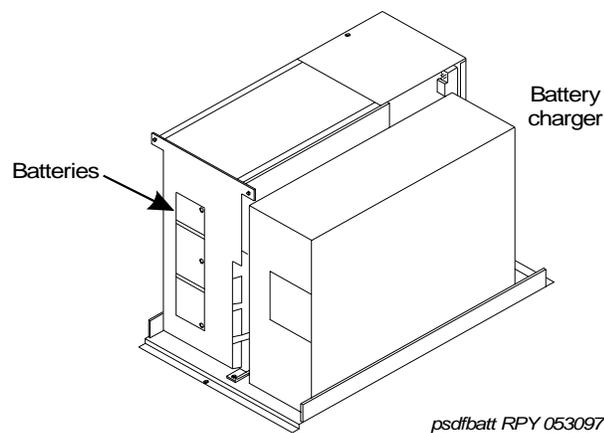
The AC power-distribution unit contains the following additional components that are not shown in the figure:

- Electromagnetic interference (**EMI**) filter
- AC input fuse
- Five circuit breakers (1 for each carrier)
- 20-A fuses
- A signal connector
- -48 VDC fan power

The optional battery charger sits at the bottom of some MCC1s.

---

**Figure 92: Battery Charger (Optional Part of J58890CE-2) (Front)**



The battery charger is used only without an uninterruptible power supply (**UPS**). The charger contains:

- Three 48-VDC batteries for backup power to the cabinet
- A **DC**-power relay to connect the batteries into the power circuit if a main power failure is detected

## Circuit breaker

The circuit breaker protects the **AC** input power to the cabinet and serves as the main **AC** input disconnect switch. The circuit breaker has two poles for 120-VAC or three poles for 208/240 VAC. If a problem develops, the circuit breaker automatically opens and removes the **AC** power input.

## 48-VDC batteries

The three series-connected 48-VDC batteries produce a nominal 144-VDC that is fused at 20 A. The batteries are trickle-charged from the battery charger.

## Battery charger

When **AC** power restores after an outage, the battery charger converts a 120-VAC input to a **DC** voltage that recharges the batteries. The batteries typically recharge within 24 hours.

## DC power relay

The DC power relay disconnects the batteries from a system that is using **AC** power. The relay also disconnects the batteries if power fails for more than:

- 10 minutes in a standard-reliability system
- 5 minutes in high- and critical-reliability systems
- 10 minutes in an expansion port network (**EPN**)

This protects the batteries from over discharging.

## EMI filters

The Electromagnetic interference (EMI) filters suppress noise voltage on the **AC** input line to the MCC1 cabinet.

## Ring generator

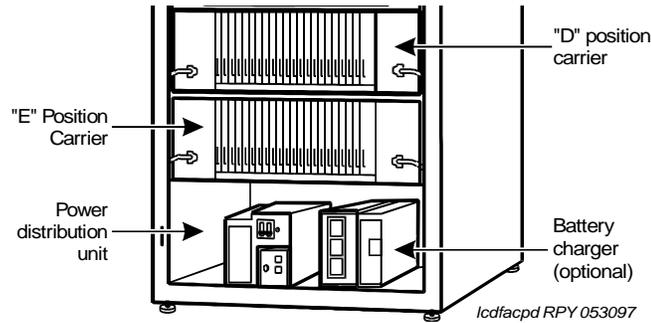
The ring generator converts the -48 VDC input to a 67 to 100-VAC, 20 or 25-Hz ringing voltage. The analog line circuit packs use this **AC** voltage output to ring telephones. The **AC** outputs are routed from the ring generator to port carriers, expansion control carriers, and control carriers.

## Fuses

20-A fuses protect the power on each cable that goes from the **AC** power-distribution unit to power converters in the carriers.

The following figure shows **AC** power distribution in some MCC1s. The DC power-distribution cables are on both sides of the cabinet. These cables supply power to each of the carriers. The optional battery charger is at the right side of the power-distribution unit.

**Figure 93: AC power distribution in MCC1 cabinets**



## Power backup

If **AC** power fails, three 48-VDC batteries power the system for:

- 10 seconds in a **PPN** cabinet
- 15 seconds in an **EPN** cabinet
- 10 minutes in the control carrier of a standard-reliability system
- 5 minutes in a control carrier of a high- or critical-reliability system

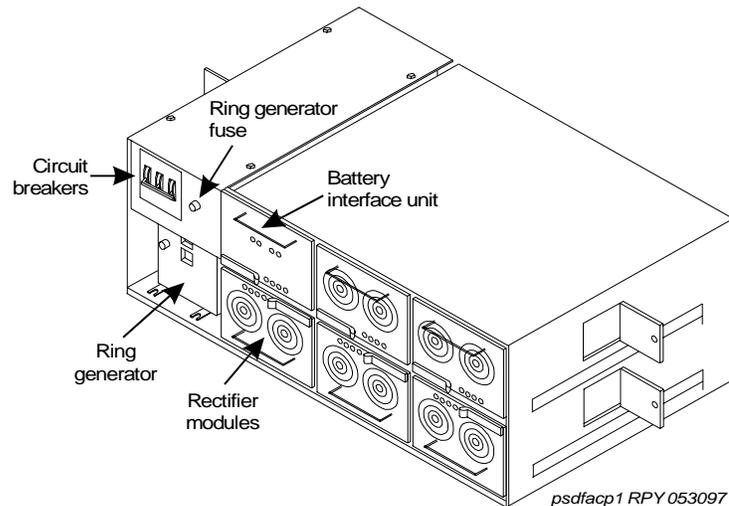
## UPS

An external, uninterruptible power supply (**UPS**) provides a longer backup time than holdover batteries which have holdover times that vary from less than 10 minutes to up to 8 hours. The UPS can replace the batteries and battery charger. The UPS connects from the **AC** power source to a **AC** power cord on the cabinet. If **AC** power fails, the UPS supplies its own **AC** power to the cabinet.

## AC power-distribution unit (J58890CH-1)

The following figure shows a typical AC power-distribution unit that is used in some MCC1 cabinets. The AC power-distribution unit sits at the bottom of an MCC1 cabinet.

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**Figure 94: AC power-distribution unit (J58890CH-1) (front)**

## Power backup

There are 2 types of battery assemblies used for power backup: small and large. The small batteries are typically located at the center rear of a MCC1 gateway. The large batteries are typically located inside the battery cabinet.

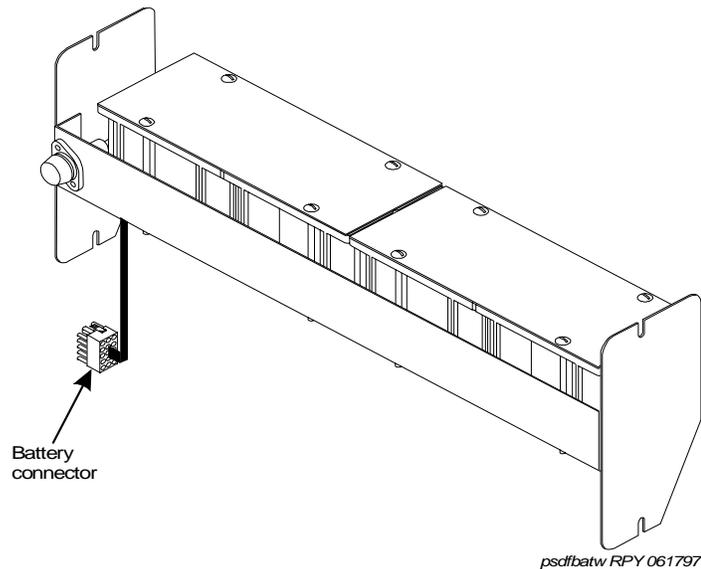
### Small batteries

The small batteries are an 8 AH (Amp-hour) batteries fused for short circuit protection and charged by the J58890CH-1. The batteries also contain a thermal sensor that changes the charging voltage depending on battery temperature. See the following figure for an example of the small batteries.

The small batteries provide short-term battery holdover. If **AC** power fails, 48 VDC batteries supply system power for:

- 10 seconds in a **PPN** cabinet
- 15 seconds in an **EPN** cabinet
- 10 minutes in the control carrier in a standard-reliability system
- 5 minutes in the control carrier in high and critical-reliability systems

**Figure 95: Small Battery Assembly**



## Large batteries

The large batteries provide holdover times of 2 to 8 hours, depending on the number of batteries. To use large battery holdover one battery cabinet is required per system. The 24-cell battery cabinet must have a float voltage of 54.2-VDC. The 23-cell battery cabinet must have a float voltage of 51.75-VDC. The batteries are circuit breaker protected and are charged by the J58890CH-1.

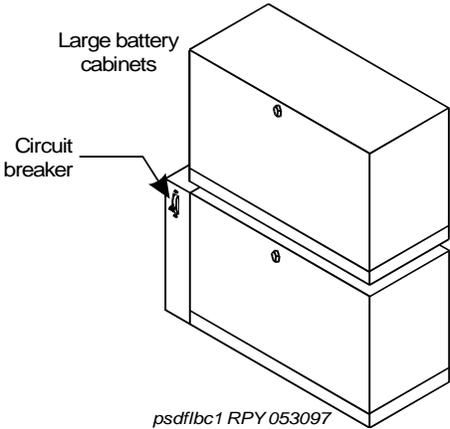
The batteries also contain a thermal sensor that changes the charging voltage, depending on the battery temperature. The following table shows the battery holdover and recharge times for a typical 2500-Watt load.

**Table 26: Battery holdover and recharge times**

Battery cabinet (A)	Holdover time (hours)	Recharge time (hours)
100	2	7
200	4	13
300	6	20
400	8	26

The following figure shows a typical large battery cabinet, (200 A).

Figure 96: Typical large battery cabinets



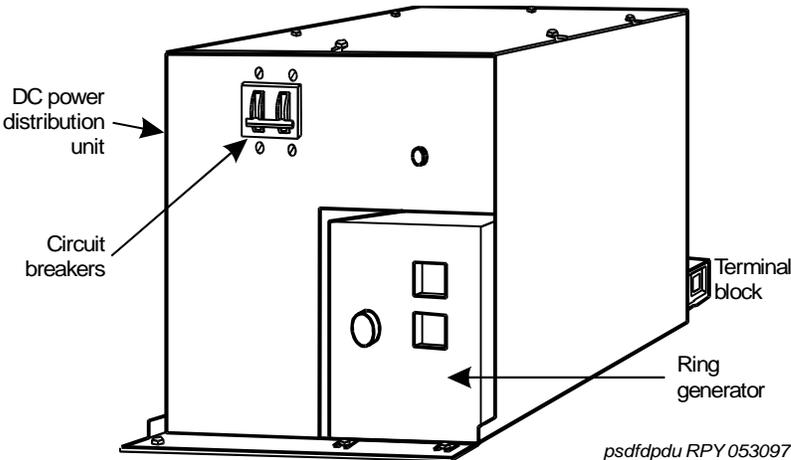
### DC power distribution

The typical DC distribution system has a DC power converter and cables to provide the power to the system circuit packs. **DC-powered** cabinets require -42.5 to -56-VDC.

### DC power-distribution unit (J58890CF-2)

The following figure shows a power-distribution unit that is used in some DC-powered MCC1 cabinets. The DC power unit sits at the bottom of the MCC1 cabinet and contains the ring generator, 20-amp circuit breakers, terminal blocks, and system fan power.

Figure 97: DC power-distribution unit (J58890CF-2) (front view))



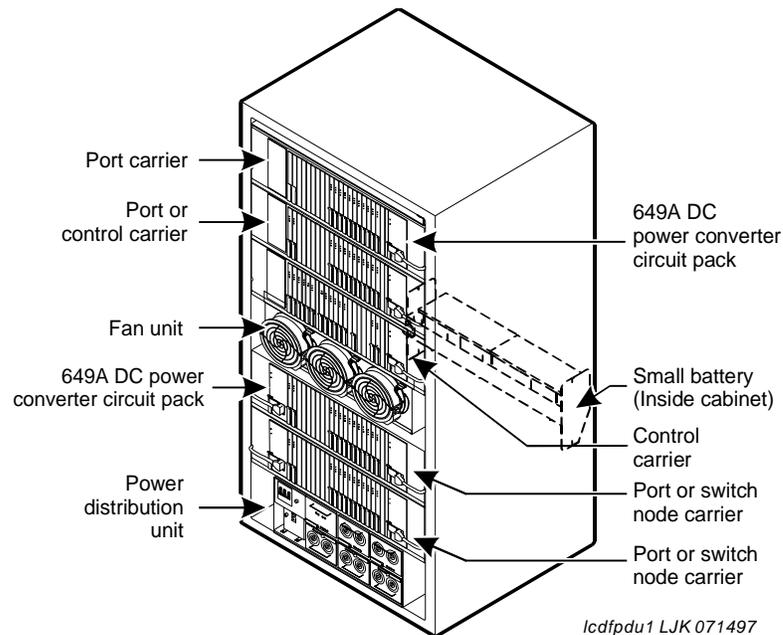
## Ground isolation

Each peripheral device that is connected to a system by the asynchronous (**EIA**) RS-232 interface, requires either a 105C, a 105D, or a 116A isolator interface. The interface isolates ground between the system and external adjuncts.

The isolator interface sits behind a **PPN** control carrier or behind an **EPN** expansion control carrier. The isolator interface is installed at the RS-232 interface between the peripheral equipment and the interface connector.

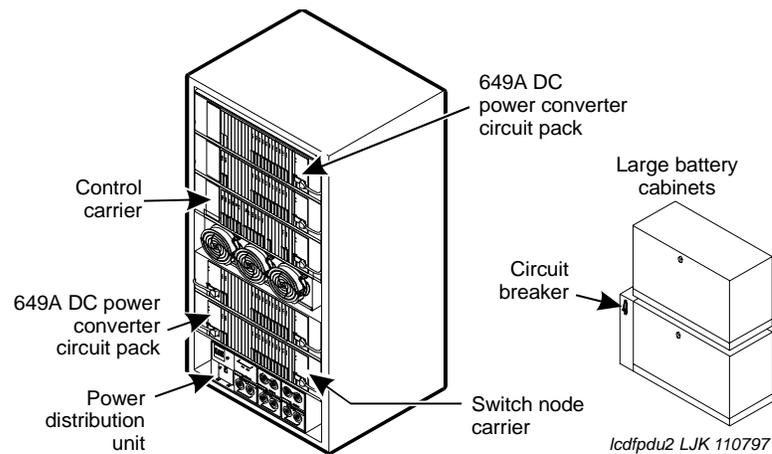
The following figure shows the power distribution in some MCC1s with small battery, short term battery holdover.

**Figure 98: Power distribution in MCC1**



The following figure shows the **DC**-power distribution in some MCC1s with large batteries or extended battery backup. Switch node (SN) carriers require two 649 DC power converters and two cables.

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**Figure 99: DC power distribution in MCC1s**



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## DC power converter (649A)

The 649A converts the  $-48$  VDC from the power-distribution unit to outputs of  $-48$  VDC at 10 A,  $+5$  VDC at 60 A, and  $-5$  VDC at 6 A. These outputs distribute power to circuit pack slots in the carriers.

---

## AC and DC grounding

### Approved grounds

An approved ground is the closest acceptable medium for grounding the building entrance protector or the entrance cable shield, or for a single-point ground of the system.

If more than one type of approved ground is available on the premises, bond the grounds together. Follow the instructions in Section 250-81 of the National Electrical Code, or the applicable electrical code in the country where the equipment is installed.

## Protective grounds

### Acceptable grounds include the following:

- **Grounded building steel** — The metal frame of the building where it is grounded by one of the following: acceptable metallic water pipe, concrete encased ground, or a ground ring.
- **Acceptable Water Pipe** — An underground water pipe, at least 1/2 inch (1.3 cm) in diameter, and in direct contact with the earth for at least 10 feet (3 meters). The pipe must be electrically continuous to the point where the protector ground wire is connected. The pipe can also be or made electrically continuous by bonding around insulated joints, plastic pipe, or plastic water meters.
- **Concrete encased ground** — An electrode that is encased by at least 2 in. (5 cm) of concrete and located within and near the bottom of a concrete foundation or footing in direct contact with the earth. The electrode must be at least 20 feet (6 meters) of one or more steel reinforcing bars or rods 1/2 inch (1.3 cm) in diameter, or at least 20 feet (6 meters) of bare, solid copper, 4 AWG (26 mm<sup>2</sup>) wire.
- **Ground ring** — A buried ground that encircles a building or structure at a depth of at least 2.5 feet (0.8 meter) below the surface of the earth. The ground ring must be at least 20 feet (6 meters) of 2AWG (35 mm<sup>2</sup>), bare, copper wire.

If these grounds are not available, the water pipe ground can be supplemented by one of the following types of grounds:

- Other local metal underground systems or structures — Local underground structures such as tanks and piping systems
- Rod and pipe electrodes — A 5/8 inch (1.6 cm) solid rod or 3/4-inch (1.9-cm) conduit or pipe electrode that is driven to a minimum depth of 8 feet (2.5 meters)
- Plate electrodes — Must have a minimum of two square feet (0.18 square meters) of metallic surface exposed to the exterior soil

A metallic underground water pipe must be supplemented by the metal frame of the building, a concrete-encased ground, or a ground ring.

## Approved floor grounds

### **WARNING:**

If you can only access the approved ground or approved floor ground from within a dedicated power equipment room, then a licensed electrician must make the connections.

Approved floor grounds are those grounds on each floor of a high-rise building that are suitable for connection to the ground terminal in the riser closet and to the cabinet equipment single-point ground terminal. Approved floor grounds might include the following:

- Building steel
- The grounding conductor for the secondary side of the power transformer that feeds the floor
- Metallic water pipes
- Power feed metallic conduit that supplies panel boards on the floor
- A point that is specifically provided in the building design for grounding

### **Note:**

You must ensure that you electrically connect all protective grounds together to form a single grounding electrode system.

## Coupled bonding conductor

When you use a coupled bonding conductor (**CBC**) grounding in an AC-powered cabinet, you must maintain a minimum 1 ft. (0.3 m) space between the **CBC** power and other power and ground leads.

In AC-powered systems, locate the system single-point ground terminal block on the **AC** load or **AC** protector cabinet.

---

## SCC1 power systems

Each SCC1 has one **AC** or one **DC** power supply that distributes **DC** power and **AC** ringing voltage to the circuit pack slots in the cabinet.

### AC power supply (1217A)

In an AC-powered cabinet, the power supply slot contains, a single, plug-in, multi-output **AC** power supply. A power cord, with a three-prong plug on one end and an appliance connector on the other end, connects the supply to a dedicated **AC** power source.

The 1217A power supply is a global power unit for SCC1s. The 1217A power supply has a wide input voltage operating range of 90 to 264-VAC and a 50 or 60 Hz auto-ranging input, multi-output power supply that provides regulated DC output. The 1217A also has a selectable 20 or 25 Hz AC ringer.

The 1217A power supply uses one of the following inputs, depending on the version:

- 120-VAC, 60-Hz, 15-A to 20-A; three wires in the power cord: one hot wire, one neutral wire, and one ground wire
- 220-VAC or 240-VAC, 50-Hz, 10-Amp; three wires in the power cord: one hot wire, one neutral wire, and one ground wire

The **AC** power supply produces the following **DC** outputs: +5 VDC, -5 VDC, -48 VDC, +12 VDC, and a battery-charging voltage. The DC outputs distribute power on the cabinet backplane to the circuit pack slots. Additionally, the -48 VDC output current capacity has been increased from 6.85 amps to 8.25 A. A 50 A load inrush requirement has been added to the -48 VDC output

A holdover circuit in the power supply allows a system to operate normally during **AC** power interruptions. If **AC** input power fails, reserve batteries supply power to the memory and processor circuit packs and fans for two minutes. All port circuit packs are inactive during this time. The power supply contains a battery charger to charge the holdover batteries.

### DC power supply (676C)

In a DC-powered SCC, the power slots contain a single, plug-in multi-output DC power supply.

The 676C DC power supply has a wide input voltage operating range of -42 to -60 VDC at up to 22 A. The 676C power supply produces the following outputs: +5.1 VDC at 0 to 55 A, -5.1 VDC at 0 to 5.5A, +12 VDC at 0 to 2 A (surge to 2.8 A for 350 ms), -48 VDC at 0 to 8.25 A. The outputs distribute power on the cabinet backplane to the slots for the circuit packs. The value and frequency of the **AC** ringing voltage output value depend on the country of use. The power supply has circuit breakers and **EMI** filtering.

### DC power-distribution unit (J58890CG)

The J58890CG is used with SCC1s. Individual DC output connectors can power up to four SCC1s. Each output connector is separately fused at 25 A. The fuses are inside the unit the DC power-distribution unit. The input for the DC distribution unit is from the DC power cabinet.

The J58890CG DC power-distribution unit is required when the distance between the DC power cabinet and the cabinet stack is greater than 30 feet (9 m).

## Enhanced DC rectifier cabinet (J58890R)

The J58890R enhanced DC rectifier cabinet is used with SCC1s. Each rectifier assembly in the DC rectifier cabinet can supply up to 50 A of DC current. You can install a minimum of two rectifiers in each DC cabinet to supply a total of 100 A. A third rectifier assembly is used as a backup only.

Each SCC1 can draw up to 15 A. Up to three DC cabinets can be stacked to supply power to single-carrier cabinets stacks.

Each output connector is separately fused at 25 A. The fuses are inside each **DC** rectifier assembly.

### Note:

A J58890CG DC power-distribution unit is required if the distance between the DC cabinet and the cabinet stack is greater than 30 feet (9 m).

## CMC1 AC power supply (650A)

In the CMC1, a power cord with a 3-prong plug on one end and an appliance connector on the other end that connects the supply to a dedicated **AC** power source. The power supply is a global power factor corrected AC/DC converter that provides multiple DC outputs and AC ring outputs. It is auto ranging 85 to 264 VAC, 47 to 63 Hz, at 330 Watts, 4.5 A (100 to 120-VAC) or 2.3 A (200 to 240-VAC) at 500-VA.

The inputs to the power supply can be:

- 120 VAC, 50-Hz to 60-Hz, 6-Amp; 3 wires in the power cord: 1 hot wire, 1 neutral wire, and 1 ground wire
- 220 VAC or 240 VAC, 50-Hz to 60-Hz, 3-Amp; 3 wires in the power cord: 1 hot wire, 1 neutral wire, and 1 ground wire

The **AC** power supply produces the following outputs: +5 VDC, -5 VDC, and -48 VDC. The outputs distribute power on the cabinet backplane to the circuit pack slots. The **AC** ringing voltage output value and frequency depend on the country of use. The 650A also supplies power for neon message-waiting lamps (150 VDC). The power supply has **EMI** filtering.

## CMC1 UPS

The uninterruptible power supply (UPS) provides surge protection for all connected cabinets.

- Connect the UPS to an electrical outlet that can handle the power requirements of all cabinets. To calculate the number of amps drawn, use the following formulas.
  - a. For 100 to 200-VAC, multiply 3.5 A times the number of cabinets.
  - b. For 200 to 240-VAC, multiply 1.8 A times the number of cabinets.
- Cabinet A (control carrier) is always connected to an *unswitched* or *always on* electrical outlet on the UPS.

## Cabinet cooling fans

### CMC1 fan unit

Two variable-speed fans are at the bottom of the cabinet. The fans receive +8 to +14 VDC from the power supply. An air filter, which can be removed and cleaned or replaced, is located above the fans. Air flows from the outside, into the bottom of the cabinet, around the circuit packs, and out through the top of the cabinet.

If the cabinet temperature reaches 158° F (70° C), the temperature sensor in the power supply shuts the system down and invokes the emergency transfer.

### MCC1 fans

A fan unit that consists of six fans is mounted near the center of the cabinet. The three front fans blow up, and the three rear fans blow down. A removable air filter is provided above and below each fan unit. Four sensors monitor the cabinet temperature. Three sensors are inside the cabinet top and one sensor is inside the cabinet bottom. One of the top sensors affects the speed of the front fans and the bottom sensor affects the speed of the rear fans. A speed control and thermal alarm circuit in each fan monitors the sensors. When a sensor indicates a change in cabinet temperature, the circuit in a fan changes the speed for that fan.

A power cable from the power-distribution unit connects -48 VDC to each fan, +5 VDC to the speed control and thermal alarm circuit in each fan, and temperature sensor signals to the equivalent circuit in each fan. One pair of wires is routed to each fan circuit. Alarm signals are also routed to the equivalent circuit in each fan. One pair of wires is routed to each fan circuit.

A minor alarm is sent to the processor circuit pack in the **PPN** cabinet and the maintenance circuit pack in an **EPN** cabinet if the speed of any fan drops below minimum. A minor alarm occurs if a fan stops due to loss of -48 VDC. One of the cabinet top thermal sensors sends an alarm if the exhaust temperature reaches 149° F (65° C).

Another cabinet top sensor senses if the exhaust temperature reaches 158° F (70° C). If the temperature reaches 158° F the system shuts down, and the Emergency Transfer is invoked.

### SCC1 fan unit

Four constant-speed fans at the top rear of the cabinet receive -48 VDC from the backplane. An air filter is located below the fan unit. Air flows down through the filter over the circuit packs. The filter is removable and can be cleaned or replaced when necessary.

If the cabinet temperature reaches 158° F (70° C), the temperature sensor in the power supply causes the system to shut down and invokes the Emergency Transfer.

---

## System protection

Protections are established to keep the switch active and on line. The following 4 types of system protection are provided:

- Overvoltage
- Sneak current
- Lightning
- Earthquake

## Protection from hazardous voltages

Protection from hazardous voltages and currents is required for all off-premises trunks, lines, and terminal installations. Both over-voltage protection from lightning, power induction, and so on, and sneak current protection are required.

## Overvoltage protection

The following devices protect the system from over voltages:

- Analog trunks use the 507B Sneak Protector. The local telephone company normally provides over voltage protection.
- Analog voice and 2-wire DCP terminals can use one of the following types of combined protection against over voltage and sneak current or the equivalent of one of the following types:
  - Carbon block with heat coil for **UL** code 4B1C
  - Gas tube with heat coil for **UL** code 4B1E-W
  - Solid state with heat coil for **UL** code 4C1S
- **DCP** and ISDN-BRI terminals use the solid state 4C3S-75 with heat coil protector, or equivalent.
- DS1/E1/T1 circuits require isolation from exposed facilities. A CSU (T1), LIU (E1), or other equipment provides this isolation.

### Sneak current protection

Sneak current protection uses fuses to protect building wiring between the network interface and trunk circuits when exposed to extraneous power. The fuses also protect the circuit packs.

All incoming trunks and outgoing trunks and off-premises station lines pass through the sneak fuses. 507B Sneak fuse panels. These panels are install on the system side of the network interface.

Sneak current protectors must be either UL-listed or CSA-certified or must comply with local safety standards. Sneak current protectors must have a maximum rating of 350 mA and a minimum voltage rating of 600 V, or as required by local regulations.

### Lightning protection

A Coupled Bonding Conductor (**CBC**) in the cabinet ground wiring protects the system from lightning. The **CBC** runs adjacent to wires in a cable and causes mutual coupling between itself and the wires. The mutual coupling reduces the voltage difference between ground and the switch.

Be sure that the CBC connects to telecommunication cable that is firmly connected to an approved ground. In multiple-story buildings, be sure to connect the CBC to an approved ground at each floor.

The CBC can be a 10 AWG (5.3 mm<sup>2</sup>/2.6 mm) ground wire, a continuous cable sheath surrounding wires within a cable, or six unused pairs of wire within a cable that are twisted and soldered together. The **CBC** connects from the cabinet single-point ground bar in an AC-powered cabinet or the ground discharge bar in a DC-powered cabinet to the terminal bar at the **cross-connect field**.

When there is an auxiliary cabinet, a 6 AWG (13.3 mm<sup>2</sup>/4.1 mm) wire connects the system cabinet single-point ground block to the Auxiliary cabinet ground block. The ground wire routes as closely as possible to the cables that connect the system cabinet to the Auxiliary cabinet.

If equipment is not present in the Auxiliary cabinet, plug the power supply for this equipment into one of the two convenience outlets on the rear of the MCC1, to preserve ground integrity. The convenience outlets are fused at 5 A. A dedicated maintenance terminal plugs into the other convenience outlet.

### Earthquake protection

For earthquake or disaster bracing, the cabinets bolt to the floor. Other areas may require additional bracing. Contact your Avaya representative for earthquake requirements at the location of the system installation.

## Temperature and humidity for DEFINITY

Install the DEFINITY equipment in a well-ventilated area. Maximum equipment performance is achieved at an ambient room temperature between 40 and 120° Fahrenheit (4° and 49° Celsius) for short term operation (not more than 72 consecutive hours or 15 days in a year) and up to 110° Fahrenheit (43° Celsius) for continuous operation.

The relative humidity range is 10 to 95 percent at up to 84° Fahrenheit (29° Celsius). Above 84 degrees Fahrenheit the maximum relative humidity decreases from 95 percent down to 32 percent at 120° Fahrenheit (49° Celsius). Installations outside these limits may reduce system life or impede operations. The recommended temperature and humidity range is 65° to 85° Fahrenheit (18° to 29° Celsius) at 20 to 60 percent relative humidity.

The following table correlates room temperature with allowable relative humidity.

**Table 27: Temperature and relative humidity 1 of 2**

Recommended room temperature (degrees Fahrenheit)	Recommended room temperature (degrees Celsius)	Recommended relative humidity (%)
40 to 84	4.4 to 28.8	10 to 95
86	30.0	10 to 89
88	31.1	10 to 83
90	32.2	10 to 78
92	33.3	10 to 73
94	34.4	10 to 69
96	35.6	10 to 65
98	36.7	10 to 61
100	37.8	10 to 58
102	38.9	10 to 54
104	40.0	10 to 51
106	41.1	10 to 48
108	42.2	10 to 45
110	43.3	10 to 43
112	44.4	10 to 40
<b>1 of 2</b>		

**Table 27: Temperature and relative humidity 2 of 2**

Recommended room temperature (degrees Fahrenheit)	Recommended room temperature (degrees Celsius)	Recommended relative humidity (%)
114	45.6	10 to 38
116	46.7	10 to 36
118	47.8	10 to 34
120	48.9	10 to 32
<b>2 of 2</b>		

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## W310 Site Requirements

The table below shows you the site requirements of the W310 WLAN Gateway.

**Table 28: W310 specifications**

Description	Value
Ambient working temperature	0-40°C (32 - 104°F)
Humidity	5-95% relative humidity (non-condensing)
DC input voltage	50 to 57 VDC
DC input current	8 A
DC isolation	1500 V RMS with respect to protective ground
AC input voltage	100 to 240 VAC, 50/60 Hz
AC input current	4 A
AC power dissipation	400 W maximum

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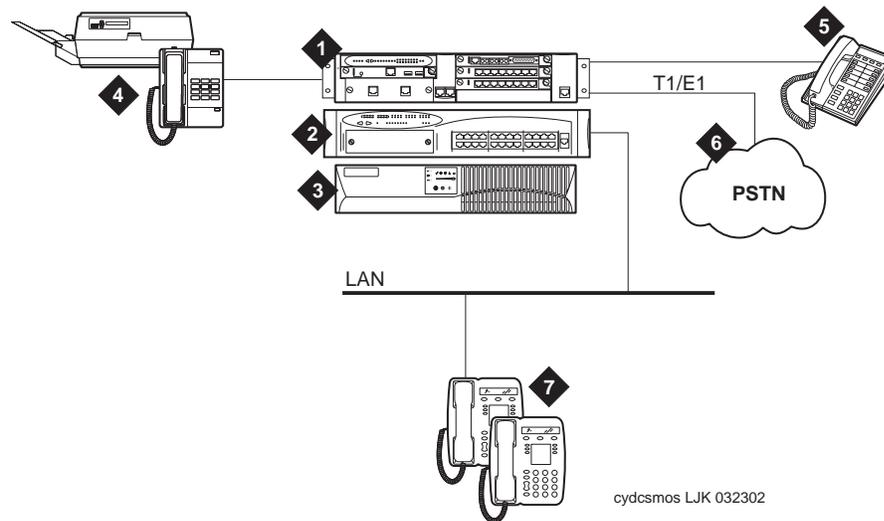
## Overcurrent Protection

A readily accessible listed safety-approved protective device with a 15A rating must be incorporated in series with building installation AC power

# Customer configurations

## Small businesses

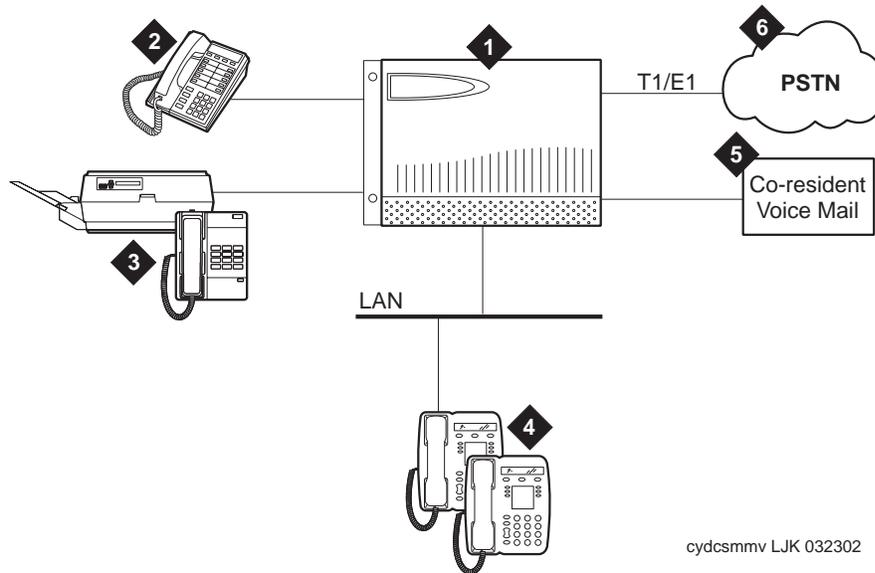
**Figure 100: Small-business solution using the Avaya S8300 Media Server in the G700 Media Gateway**



### Figure notes:

Number	Description
1.	This figure shows a G700 Media Gateway with a S8300 Media Server installed in the upper right hand slot. This configuration is using the T1/E1, DCP and analog media modules.
2.	Ethernet Switch: Can be customer provided or Avaya provided. This device provides for port multiplication by having more than one network segment.
3.	UPS: Avaya suggests a UPS be provided to allow for a graceful shutdown of the server during a power outage.
4.	Analog connectivity such as, analog trunks, stations and lines.
5.	DCP phones: Avaya multifunction digital phones.
6.	T1/E1 connectivity: <ul style="list-style-type: none"><li>● The T1 (or T-1) carrier is the most commonly used digital line in the United States, Canada and Japan.</li><li>● The E1 (or E-1) is a European digital transmission format. It is the equivalent of the North American T-carrier system format.</li></ul>
7.	Avaya IP telephones

**Figure 101: Small-business solution using the Avaya S8100 Media Server and the G600 Media Gateway**



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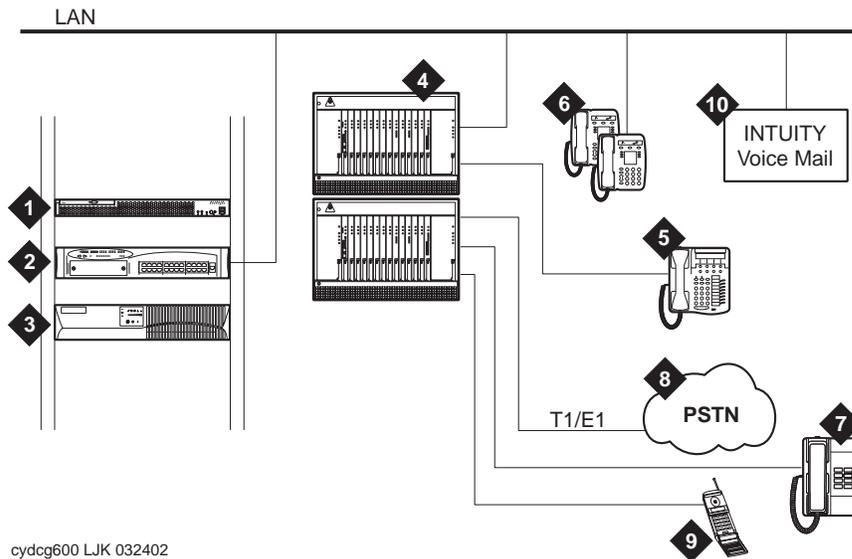
**Figure notes:**

Number	Description
--------	-------------

- |    |  |
|----|--|
| 1. | This figure shows the S8100 Media Server with a G600 Media Gateway: The S8100 Media Server is a two slot processor running the WINDOWS 2000 operating system with co-resident applications such as Communication Manager, INTUITY AUDIX and Avaya Site Administration.   |
| 2. | DCP phones: Supports 2- and 4-wire Avaya multifunction phones.   |
| 3. | Analog connectivity such as, analog trunks, stations and FAX machines.   |
| 4. | IP phones: Avaya 4600-series phones.   |
| 5. | Voice Mail: Co-resident INTUITY AUDIX eight port voice mail or an external Voice Mail system (external shown).   |
| 6. | <b>T1/E1 Capability:</b> <ul style="list-style-type: none"><li>• The T1 (or T-1) carrier is the most commonly used digital line in the United States, Canada, or Japan.</li><li>• The E1 (or E-1) carrier is a European digital transmission format. It is the equivalent of the North American T-carrier system format.</li></ul> |

# Medium-sized business solution

**Figure 102: Medium-sized business solution using the Avaya S8500 Media Server and the G650 Media Gateway**



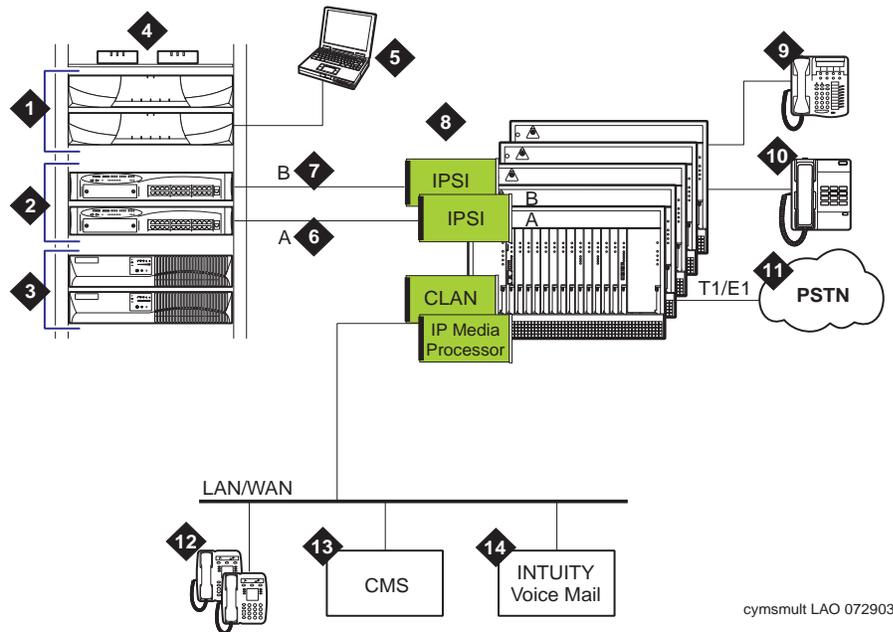
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**Figure notes:**

Number	Description
1.	S8500 Media Server
2.	Ethernet Switch: A device that provides for port multiplication by having more than one network segment. The Ethernet Switch could be provided by Avaya or already exist in the customer's network.
3.	UPS: Used to provide power during an outage and allow for a graceful shutdown of the server.
4.	G650 Media Gateways: Connected to the S8500 Media Server by IP.
5.	DCP phones: Supports 2- and 4-wire Avaya multifunction phones.
6.	IP phones: Avaya 4600-series IP phones.
7.	Analog connectivity such as analog stations, lines, trunks and FAX machines
8.	T1/E1 Connectivity: <ul style="list-style-type: none"> <li>● The T1 (or T-1) carrier is the most commonly used digital line in the United States, Canada, and Japan.</li> <li>● The E1 (or E-1) carrier is a European digital transmission format. It is the equivalent of the North American T-carrier system format.</li> </ul>
9.	Wireless
10.	Voice Mail System: INTUITY™ AUDIX® is shown connecting via IP.

## Large businesses

**Figure 103: Large-business solution using the Avaya S8700/S8710 Media Server and the MCC1 Media Gateway (S8700 shown)**



**Figure notes:**

Number	Description
1.	The S8700/S8710 Media Server and a MCC1 Media Gateway
2.	Ethernet must be Avaya provided.
3.	UPS: Provides power hold over when commercial power shuts down. The UPS units are duplicated in this configuration (one for each server).
4.	Modems for services access.
5.	Services connectivity.
6.	Dedicated LAN A for control data.
7.	Dedicated LAN B for control data.
8.	Port networks consisting of G650 Media Gateways.
9.	DCP Phones: Avaya multifunction digital terminals.
10.	Analog connectivity such as, analog phones, FAX machines and trunks.
11.	T1/E1 Connectivity: <ul style="list-style-type: none"> <li>• The T1 (or T-1) carrier is the most commonly used digital line in the United States, Canada and Japan.</li> <li>• The E1 (or E-1) carrier is a European digital transmission format. It is the equivalent of the North American T-carrier system format.</li> </ul>

### Figure notes:

Number	Description
12.	IP phones: Avaya 4600-series IP phones.
13.	Avaya Call Management System (CMS): Used in a call center environment to collect and store data for reports and management.
14.	Voice Mail: INTUITY™ AUDIX® shown in this configuration connecting via IP.

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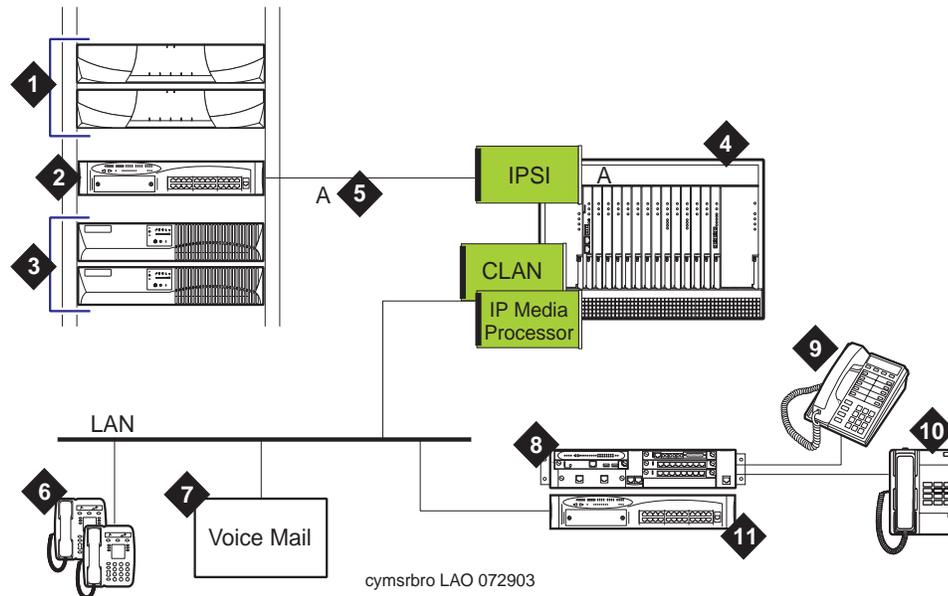
## Branch Office and Multi-Site Configurations

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### Branch Office Configuration

A remote branch office location is a part of a larger enterprise network. In this configuration the S8700/S8710 Media Server resides in the main location and controls the G700 Media Gateway in the remote location. It is highly desirable for the branch office to be survivable in the event of lost connectivity to the S8700/S8710 Media Server. Survivability is accomplished with the use of the S8300 Media Server in an LSP configuration

**Figure 104: Branch Office Configuration**



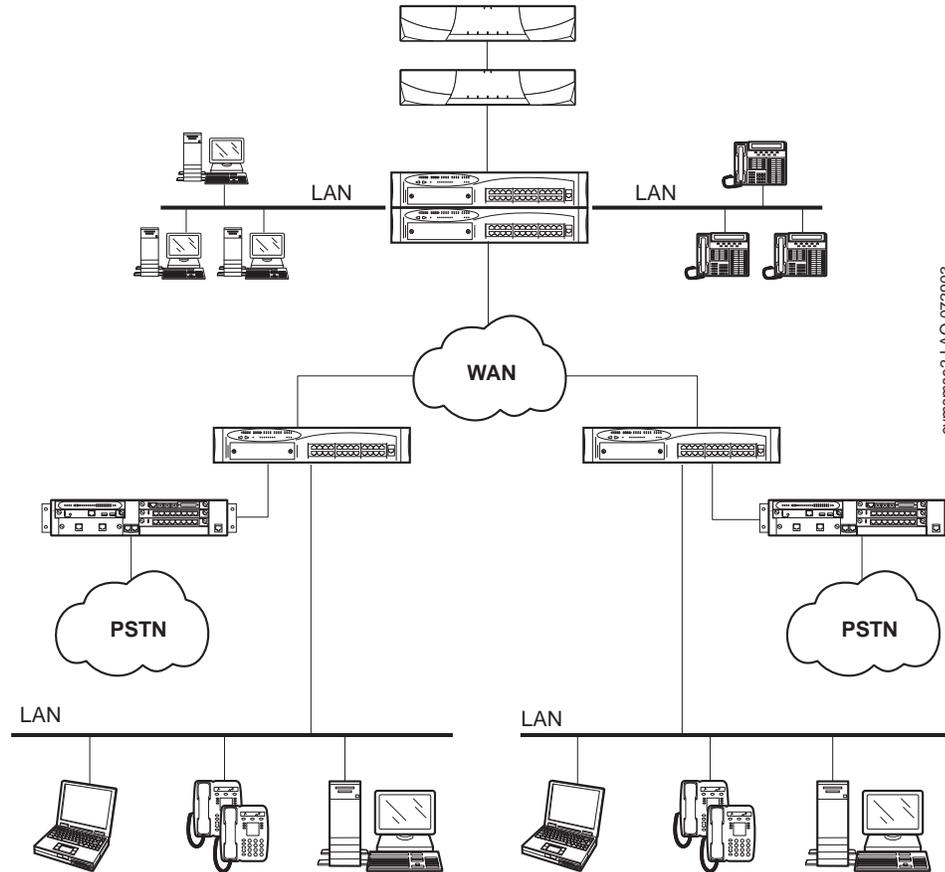
**Figure notes:**

Number	Description
1.	Duplicated S8700/S8710 Media Servers
2.	Ethernet switch must be Avaya provided.
3.	UPS units: Two UPS units one for each server.
4.	G650 Media Gateways
5.	LAN connectivity to the IPSI in the G650 Media Gateway.
6.	IP Phones off of the customer's LAN
7.	Voice Mail: INTUITY™ AUDIX® shown connected via IP.
8.	The G700 Media Gateway is connected via the LAN to the C-LAN board located in the G650 Media Gateway. The S8300 Media Server in an LSP configuration is located in the G700 Media Gateway. In the event of a loss in communication between the S8700/S8710 and the G700 the LSP will provide a backup for the endpoints that register with it.
9.	DCP Phones: Avaya Multi-Function Digital Phones.
10.	Analog connectivity such as, analog phones, lines and trunks.

## Multi-Site Environment

The following figure shows the S8700/S8710 Media Server (top middle) connected to two sites with S8300 Media Servers in G700 Media Gateways.

**Figure 105: Multi-Site Configuration**



In a multi-site environment there are a number of standalone solutions connected together using protocols such as QSIG or DCS. Each location has its own processing capability and separate managed configurations. These configurations can be a mix of different solutions. Voice mail can be shared or connected to a network.



# Index

## Numerical

4-wire S/T-NT interfaces . . . . .	<a href="#">211</a>
4C3S-75 solid state protectors . . . . .	<a href="#">411</a>
1217A Power Supply. . . . .	<a href="#">201</a>
48-VDC batteries . . . . .	<a href="#">399</a>
2402 digital telephone . . . . .	<a href="#">314</a>
2410 digital telephone . . . . .	<a href="#">315</a>
2420 digital telephone . . . . .	<a href="#">315</a>
2500 and 2554 analog telephones . . . . .	<a href="#">325</a>
507B sneak fuse panels . . . . .	<a href="#">411</a> , <a href="#">412</a>
631DA1/B1 AC power units. . . . .	<a href="#">201</a> , <a href="#">396</a>
649A DC power units. . . . .	<a href="#">202</a> , <a href="#">405</a>
676B DC power units. . . . .	<a href="#">408</a>
302D attendant console . . . . .	<a href="#">323</a>
3410 wireless telephone . . . . .	<a href="#">331</a>
3606 wireless VoIP telephone . . . . .	<a href="#">331</a>
3616 wireless telephone . . . . .	<a href="#">333</a>
3616 wireless VoIP telephone . . . . .	<a href="#">333</a>
3626 wireless telephone . . . . .	<a href="#">334</a>
3626 wireless VoIP telephone . . . . .	<a href="#">334</a>
4601 IP telephone . . . . .	<a href="#">304</a>
4602 IP telephone . . . . .	<a href="#">305</a>
4602SW IP telephone . . . . .	<a href="#">306</a>
4606 IP telephone . . . . .	<a href="#">306</a>
4610SW IP telephone . . . . .	<a href="#">307</a>
4620SW IP telephone . . . . .	<a href="#">309</a>
4624 IP telephone . . . . .	<a href="#">310</a>
4630SW IP screenphone. . . . .	<a href="#">311</a>
4690 IP conference telephone . . . . .	<a href="#">313</a>
6211 analog telephone . . . . .	<a href="#">326</a>
6219 analog telephone . . . . .	<a href="#">327</a>
6221 analog telephone . . . . .	<a href="#">328</a>
6402 and 6402D digital telephones . . . . .	<a href="#">316</a>
6408+ digital telephone. . . . .	<a href="#">317</a>
6416D digital telephone . . . . .	<a href="#">318</a>
6424D+M . . . . .	<a href="#">319</a>
676C DC Power . . . . .	<a href="#">206</a>
8840 TTY analog telephone . . . . .	<a href="#">328</a>
9040 wireless telephone . . . . .	<a href="#">330</a>
958 analog telephone . . . . .	<a href="#">329</a>
982LS Current Limiter for DEFINITY SI . . . . .	<a href="#">206</a>

## A

AC power	
battery chargers . . . . .	<a href="#">397</a>
circuit breakers . . . . .	<a href="#">396</a>
distribution units. . . . .	<a href="#">397</a>
grounding. . . . .	<a href="#">405</a>
power feeders. . . . .	<a href="#">392</a>
supply	
WP-91153 . . . . .	<a href="#">408</a>
units	
631DA1/B1 . . . . .	<a href="#">201</a> , <a href="#">396</a>
acoustic noise levels . . . . .	<a href="#">391</a>
Adjunct Systems . . . . .	<a href="#">52</a>
alarm circuit packs . . . . .	<a href="#">206</a>
alarm with ethernet (TN2170) . . . . .	<a href="#">206</a>
Analog	
media modules . . . . .	<a href="#">43</a>
Analog media module. . . . .	<a href="#">256</a>
Analog Trunk/Telephone Media Module (MM711). . . . .	<a href="#">42</a>
approved grounds . . . . .	<a href="#">405</a>
AS1 UPS	
1500VA 120V . . . . .	<a href="#">346</a>
1500VA 230V . . . . .	<a href="#">347</a>
700 VA 120V . . . . .	<a href="#">345</a>
700VA 230V . . . . .	<a href="#">346</a>
Add-on Modules. . . . .	<a href="#">347</a>
ASB button. . . . .	<a href="#">152</a>
ATM	
switch . . . . .	<a href="#">103</a>
auxiliary cabinets . . . . .	<a href="#">117</a>
Avaya Solutions	
Large Business . . . . .	<a href="#">418</a>
Medium Sized Business . . . . .	<a href="#">416</a> , <a href="#">417</a>
Small Business . . . . .	<a href="#">415</a>
Avaya Telephones	
Analog . . . . .	<a href="#">325</a>
2500 and 2554. . . . .	<a href="#">325</a>
6211 . . . . .	<a href="#">326</a>
6219 . . . . .	<a href="#">327</a>
6221 . . . . .	<a href="#">328</a>
8840 TTY . . . . .	<a href="#">328</a>
958 . . . . .	<a href="#">329</a>
TTY 8840 . . . . .	<a href="#">328</a>
Attendant Consoles . . . . .	<a href="#">323</a>
302D . . . . .	<a href="#">323</a>
Softconsole . . . . .	<a href="#">324</a>

## Index

### Avaya Telephones, (continued)

Digital Communications Protocol (DCP) Telephone	
2402	<a href="#">314</a>
Digital Telephones	<a href="#">314</a>
2410	<a href="#">315</a>
2420	<a href="#">315</a>
6402 and 6402D	<a href="#">316</a>
6408D+	<a href="#">317</a>
6416D+M	<a href="#">318</a>
6424D+M	<a href="#">319</a>
Callmaster IV	<a href="#">321</a>
Callmaster V	<a href="#">321</a>
Callmaster VI	<a href="#">322</a>
Explosive atmosphere telephone	<a href="#">329</a>
IP Telephones	
4601	<a href="#">304</a>
4602	<a href="#">305</a>
4602SW	<a href="#">306</a>
4606	<a href="#">306</a>
4610SW	<a href="#">307</a>
4620SW	<a href="#">309</a>
4624	<a href="#">310</a>
4630SW screenphone	<a href="#">311</a>
4690	<a href="#">313</a>
IP Softphone for Pocket PC	<a href="#">302</a>
Wireless	<a href="#">330</a>
3410	<a href="#">331</a>
3606	<a href="#">331</a>
3616	<a href="#">333</a>
3626	<a href="#">334</a>
Motorola CN620 Mobile Office Device	<a href="#">335</a>
Transtalk 9040	<a href="#">330</a>

## B

backup power	<a href="#">399</a> , <a href="#">401</a>
batteries	
48 VDC	<a href="#">399</a>
chargers	<a href="#">399</a>
small assemblies	<a href="#">401</a>
BCCs (J58890L)	<a href="#">116</a>
BRI	
media module	<a href="#">259</a>
media modules	<a href="#">45</a>

## C

C360 Ethernet Switches	<a href="#">362</a>
cabinets	
AC-powered	<a href="#">408</a>
auxiliary (J58886N)	<a href="#">189</a>
CBCs	<a href="#">407</a>
cooling fans	<a href="#">410</a>
DC-powered	<a href="#">412</a>
dimensions/clearances	<a href="#">389</a>

### cabinets, (continued)

earthquake protections	<a href="#">412</a>
lightning protection	<a href="#">412</a>
power sources	<a href="#">391</a>
Callmaster IV digital telephone	<a href="#">321</a>
Callmaster V digital telephone	<a href="#">321</a>
Callmaster VI digital telephone	<a href="#">322</a>
CallVisor ASAI	<a href="#">183</a> , <a href="#">207</a>
CBCs	<a href="#">407</a> , <a href="#">412</a>
CC port	<a href="#">152</a>
center stage switches	<a href="#">103</a>
CFY1B Current Limiter for DEFINITY R	<a href="#">206</a>
CFY1B current limiters	<a href="#">200</a>
circuit breakers	<a href="#">396</a> , <a href="#">398</a>
circuit packs	
sneak current protection	<a href="#">412</a>
CMC1 Media Gateway	<a href="#">177</a>
CMC1 Media Gateway for DEFINITY CSI	<a href="#">126</a>
CMCs (J58890T)	<a href="#">116</a>
dimensions	<a href="#">390</a>
fan units	<a href="#">410</a>
CN620 Mobile Office Device	<a href="#">335</a>
commercial floor loading code	<a href="#">391</a>
CON port	<a href="#">152</a>
concrete encased grounds	<a href="#">406</a>
conduit, as ground	<a href="#">407</a>
Configuration	
possibilities	<a href="#">151</a>
cooling fans	<a href="#">410</a>
corrosive gas contaminants	<a href="#">389</a>
coupled bonding conductor (for grounding)	<a href="#">407</a>
Current Limiter	<a href="#">206</a>
current limiters	
CFY1B	<a href="#">200</a>
Customer Configuration Options for the S8300 Media Server with G700 Media Gateway	<a href="#">51</a>

## D

DC power	
circuit breakers	<a href="#">396</a>
distribution units	
J58890CF	<a href="#">403</a>
J58890CG	<a href="#">408</a>
grounding	<a href="#">405</a>
relays	<a href="#">398</a> , <a href="#">399</a>
requirements	<a href="#">395</a> , <a href="#">403</a>
units	
649A	<a href="#">202</a> , <a href="#">405</a>
676B	<a href="#">408</a>
DCP	
media modules	<a href="#">247</a>
DCP Media Module (MM712)	<a href="#">43</a>
DEFINITY AUDIX R3 port assemblies (ED-1E546)	<a href="#">206</a>

DEFINITY CSI			
Detailed description . . . . .		<a href="#">125</a>	
Overview . . . . .		<a href="#">125</a>	
overview . . . . .		<a href="#">125</a>	
Reliability and recovery . . . . .		<a href="#">128</a>	
Required System Components . . . . .		<a href="#">126</a>	
CMC1 Media Gateway . . . . .		<a href="#">126</a>	
TN2182 Tone Clock . . . . .		<a href="#">126</a>	
TN2402 Processor board . . . . .		<a href="#">126</a>	
DEFINITY Server CSI			
Adapter . . . . .		<a href="#">290</a>	
Avaya Telephones . . . . .		<a href="#">291</a>	
Analog . . . . .		<a href="#">292</a>	
Consoles . . . . .		<a href="#">292</a>	
Digital . . . . .		<a href="#">291</a>	
Explosive Atmosphere . . . . .		<a href="#">292</a>	
IP . . . . .		<a href="#">291</a>	
SoundStation . . . . .		<a href="#">292</a>	
Wireless . . . . .		<a href="#">292</a>	
Circuit Packs . . . . .		<a href="#">287</a>	
Application . . . . .		<a href="#">290</a>	
Control . . . . .		<a href="#">289</a>	
Line . . . . .		<a href="#">288</a>	
Port . . . . .		<a href="#">290</a>	
Power . . . . .		<a href="#">287</a>	
Service . . . . .		<a href="#">290</a>	
Trunk . . . . .		<a href="#">289</a>	
Media Gateways . . . . .		<a href="#">287</a>	
DEFINITY Server SI			
Avaya Telephones . . . . .		<a href="#">297</a>	
Analog . . . . .		<a href="#">298</a>	
Consoles . . . . .	<a href="#">264</a> , <a href="#">299</a>		
Digital . . . . .		<a href="#">298</a>	
Explosive Atmosphere . . . . .		<a href="#">299</a>	
IP . . . . .		<a href="#">297</a>	
SoundStation . . . . .		<a href="#">298</a>	
Wireless . . . . .		<a href="#">299</a>	
Circuit Packs . . . . .		<a href="#">293</a>	
Application . . . . .		<a href="#">296</a>	
Control . . . . .		<a href="#">296</a>	
Line . . . . .		<a href="#">294</a>	
Port . . . . .		<a href="#">297</a>	
Power . . . . .		<a href="#">293</a>	
Service . . . . .		<a href="#">296</a>	
Trunk . . . . .		<a href="#">295</a>	
Media Gateways . . . . .		<a href="#">293</a>	
DEFINITY SI			
Adjunct Systems . . . . .	<a href="#">110</a> , <a href="#">124</a> , <a href="#">130</a>		
Cabinets . . . . .		<a href="#">116</a>	
Multicarrier cabinets (MCC1s) . . . . .		<a href="#">117</a>	
Single-carrier cabinet (SCC1) . . . . .		<a href="#">116</a>	
Carriers . . . . .		<a href="#">115</a>	
DEFINITY SI, (continued)			
Connectivity . . . . .		<a href="#">121</a>	
C-LAN . . . . .		<a href="#">121</a>	
IP Asynchronous Links . . . . .		<a href="#">121</a>	
TCP/IP . . . . .		<a href="#">121</a>	
Detailed description . . . . .		<a href="#">112</a>	
H.323 IP Trunk . . . . .		<a href="#">120</a>	
IP Trunk . . . . .		<a href="#">120</a>	
Network Control/Packet Interface . . . . .		<a href="#">117</a>	
Optional Components . . . . .		<a href="#">118</a>	
Expansion Port Network . . . . .		<a href="#">118</a>	
IP Media Processor . . . . .		<a href="#">118</a>	
IP Solutions . . . . .		<a href="#">118</a>	
Port Network . . . . .		<a href="#">114</a>	
Processor Port Network and Switch Processing Element . . . . .		<a href="#">113</a>	
Reliability . . . . .		<a href="#">123</a>	
Required System Components . . . . .		<a href="#">112</a>	
System capacity . . . . .		<a href="#">123</a>	
Digital Communications Protocol, see DCP			
Digital telephones . . . . .		<a href="#">314</a>	
disk drives . . . . .		<a href="#">207</a>	
DS! Converter (TN574) . . . . .		<a href="#">213</a>	
duplicated control cabinets (J58890M) . . . . .		<a href="#">116</a>	
<hr/>			
<b>E</b>			
E1/T1			
media module . . . . .		<a href="#">249</a>	
EA401 Explosive Atmosphere telephone . . . . .		<a href="#">329</a>	
earth . . . . .		<a href="#">406</a>	
earthquake protections . . . . .		<a href="#">412</a>	
EC500 (Extension to Cellular) . . . . .		<a href="#">355</a>	
ED-1E546 port assemblies . . . . .		<a href="#">206</a>	
EIA 530			
media module . . . . .		<a href="#">249</a>	
electrical components, power distribution units . . . . .		<a href="#">398</a>	
EMI filters . . . . .		<a href="#">399</a>	
enhanced DC rectifier cabinet . . . . .		<a href="#">409</a>	
EPN cabinets (J58890A) . . . . .	<a href="#">117</a> , <a href="#">191</a>		
EPNs . . . . .		<a href="#">118</a>	
Ethernet			
media module . . . . .		<a href="#">248</a>	
Ethernet switch			
C360 . . . . .		<a href="#">362</a>	
P133 . . . . .		<a href="#">368</a>	
P134 . . . . .		<a href="#">368</a>	
P330 . . . . .		<a href="#">357</a>	
Ethernet Switch for S8700 Multi-Connect . . . . .		<a href="#">84</a>	
expansion control cabinets			
J58890AF . . . . .		<a href="#">191</a>	
SCCs . . . . .		<a href="#">116</a>	
expansion port carriers (J58890BB) . . . . .		<a href="#">191</a>	
Explosive atmosphere telephone . . . . .		<a href="#">329</a>	
Extension to Cellular . . . . .		<a href="#">355</a>	

## Index

### F

Features	<a href="#">148</a>
Fixed ports	
CC	<a href="#">152</a>
CON	<a href="#">152</a>
LAN 1	<a href="#">152</a>
LINE 2	<a href="#">152</a>
LINE1	<a href="#">152</a>
TRK	<a href="#">152</a>
USB	<a href="#">152</a>
WAN 1	<a href="#">152</a>
floor grounds	<a href="#">407</a>
floor loads	<a href="#">391</a>
Front panel buttons	<a href="#">152</a>
fuse panels (J58889AB)	<a href="#">189</a>
fuses	
20-amp	<a href="#">399</a>
sneak current protectors	<a href="#">412</a>

### G

G150 2T+4A (4 VoIP) Back Panel	<a href="#">141</a>
G150 2T+4A (4 VoIP) Front Panel	<a href="#">140</a>
G150 Media Gateway	<a href="#">137</a>
capacities	<a href="#">138</a>
G150 2T+4A (4 VoIP) BackPanel	<a href="#">141</a>
G150 2T+4A (4 VoIP) Front Panel	<a href="#">140</a>
Model G150 2T + 4A (4 VoIP)	<a href="#">139</a>
trunk and station limits	<a href="#">139</a>
G350	
Applications	<a href="#">151</a>
features	<a href="#">148</a>
standalone configuration	<a href="#">151</a>
G350 Media Gateway	
Site requirements	<a href="#">375</a>
G350 Media Gateway for S8700 Configurations	<a href="#">93</a>
G600 Media Gateway	<a href="#">156</a>
G700 Media Gateway	<a href="#">32, 168</a>
Cabling	<a href="#">36, 172</a>
Expansion Module	<a href="#">34, 170</a>
Gateway Software	<a href="#">38, 174</a>
LEDs	<a href="#">38, 173</a>
Maintenance Software	<a href="#">39, 174</a>
Media Modules	<a href="#">39</a>
Motherboard	<a href="#">37, 173</a>
Power Supply	<a href="#">36, 172</a>
Stacking Module	<a href="#">36, 172</a>
System-Level LEDs	<a href="#">38, 174</a>
G700 Media Gateway for S8700 Configurations	<a href="#">93</a>
ground isolation	<a href="#">404</a>
ground ring	<a href="#">406</a>
ground wiring	<a href="#">396</a>
grounding, AC and DC	<a href="#">405, 406, 407</a>

### H

hardware	
center stage switches	<a href="#">103</a>
humidity	<a href="#">413</a>

### I

international requirements	<a href="#">395, 403</a>
IP Server Interface for S8700 Media Server	<a href="#">83</a>
IP Server Interface for S8710 Media Server	<a href="#">83</a>
IP Softphone	<a href="#">301, 302</a>
IP Solutions	<a href="#">118</a>
implementation	<a href="#">119</a>
trunks	
H.323	<a href="#">120</a>
IP Telephones	<a href="#">304</a>
IPSI for S8700 Media Server	<a href="#">83</a>
IPSI for S8710 Media Server	<a href="#">83</a>
ISDN	
media module	<a href="#">45, 259</a>
isolator interfaces	<a href="#">404</a>

### J

J58886N auxiliary cabinets	<a href="#">189</a>
J58889AB fuse panels	<a href="#">189</a>
J58890A EPN/PPN cabinet	<a href="#">191</a>
J58890AF expansion control cabinets	<a href="#">191</a>
J58890AP processor carriers	<a href="#">195</a>
J58890BB port carriers	<a href="#">189, 191</a>
J58890CE-2 AC power distribution units/battery chargers	<a href="#">397</a>
J58890CF-2 DC power distribution units	<a href="#">403</a>
J58890CG DC power distribution units	<a href="#">408</a>
J58890CH-1 AC power distribution units	<a href="#">400</a>
J58890H port cabinets	<a href="#">116</a>
J58890L BCCs	<a href="#">116</a>
J58890R enhanced DC rectifier cabinets	<a href="#">409</a>
J58890SA SN carriers	<a href="#">192</a>

### K

KS-21906, L9 48 VDC battery	<a href="#">399</a>
-----------------------------	---------------------

### L

LAN	
media module	<a href="#">248</a>
LAN 1 port	<a href="#">152</a>
large battery power backup	<a href="#">402</a>
lightning protection	<a href="#">412</a>
LINE 1 port	<a href="#">152</a>
LINE 2 port	<a href="#">152</a>
Local Survivable Processor (LSP)	<a href="#">46</a>

**M**

Master Control Unit (MCU)	<a href="#">331</a>
MCC1 Media Gateway	<a href="#">188</a> , <a href="#">192</a>
MCC1 Media Gateway for S8700 Multi-Connect	<a href="#">88</a>
MCCs (multicarrier cabinets)	
auxiliary cabinets	<a href="#">189</a>
carrier types	<a href="#">117</a>
DC power distribution	<a href="#">404</a>
ground integrity	<a href="#">412</a>
power distribution	<a href="#">399</a> , <a href="#">400</a>
Media Gateway	
CMC1	<a href="#">177</a>
G600	<a href="#">156</a>
G700	<a href="#">168</a>
MCC1	<a href="#">188</a>
SCC1	<a href="#">180</a>
Media Gateways for S8700 Multi-Connect	<a href="#">86</a>
Media Module	
312 DCP	<a href="#">247</a>
314 LAN	<a href="#">248</a>
710 T1/E1	<a href="#">250</a>
711 Analog	<a href="#">253</a>
712 DCP	<a href="#">255</a>
717 DCP	<a href="#">257</a>
720 BRI	<a href="#">258</a>
760 VoIP	<a href="#">259</a>
Media module	
340 E1/T1	<a href="#">249</a>
analog	<a href="#">256</a>
BRI	<a href="#">259</a>
E1/T1	<a href="#">249</a>
ISDN	<a href="#">259</a>
MM340	<a href="#">249</a>
MM342 USP WAN	<a href="#">249</a>
MM714 analog	<a href="#">256</a>
MM722 BRI	<a href="#">259</a>
USP	<a href="#">249</a>
WAN	<a href="#">249</a>
Media Module LEDs	<a href="#">38</a> , <a href="#">174</a>
Media Modules	<a href="#">39</a>
Analog Trunk/Telephone Media Module (MM711)	<a href="#">41</a> , <a href="#">42</a>
DCP Media Module (MM712)	<a href="#">43</a>
MM722	<a href="#">45</a>
T1/E1 Media Module (MM710)	<a href="#">41</a>
VoIP Media Module (MM760)	<a href="#">45</a>
Media modules	
analog	<a href="#">43</a>
BRI	<a href="#">45</a>
ISDN	<a href="#">45</a>
LAN	<a href="#">248</a>
MM312	<a href="#">247</a>
MM314	<a href="#">248</a>
MM714	<a href="#">43</a>

MM 712 DCP Media Module	<a href="#">43</a>
MM312 DCP media module	<a href="#">247</a>
MM312 media module	<a href="#">247</a>
MM314 LAN media module	<a href="#">248</a>
MM314 media module	<a href="#">248</a>
MM340 E1/T1 media module	<a href="#">249</a>
MM342 USP WAN media module	<a href="#">249</a>
MM710 media module	<a href="#">250</a>
MM710 T1/E1 Media Module	<a href="#">41</a>
MM711 analog media module	<a href="#">253</a>
MM711 Analog Trunk/Telephone Media Module	<a href="#">42</a>
MM712 DCP media module	<a href="#">255</a>
MM714 analog media module	<a href="#">256</a>
MM714 media module	<a href="#">43</a>
MM717 DCP media module	<a href="#">257</a>
MM720 BRI media module	<a href="#">258</a>
MM722 BRI media module	<a href="#">259</a>
MM722 media module	<a href="#">45</a>
MM760 VoIP Media Module	<a href="#">45</a>
MM760 VoIP media module	<a href="#">259</a>
modem	
SAMP	<a href="#">67</a>
Modem for S8700 Multi-Connect	<a href="#">85</a>
Motorola CN620 Mobile Office Device	<a href="#">335</a>
multifunction circuit packs	
TN567	<a href="#">206</a>

**N**

NAA1 Fiber Optic Cable Adaptor (CMC1 Media Gateway)	<a href="#">207</a>
non-US power requirements	<a href="#">395</a> , <a href="#">403</a>

**O**

Off-PBX station	<a href="#">355</a>
overvoltage protections	<a href="#">411</a>

**P**

P133G2 and P134G2	
Features	<a href="#">369</a>
Agency Approval	<a href="#">370</a>
Environmental Information	<a href="#">370</a>
Interfaces	<a href="#">369</a>
Physical Characteristics	<a href="#">370</a>
Power Consumption	<a href="#">370</a>
Supported Standards	<a href="#">369</a>
Overview	<a href="#">368</a>
P133G2 Ethernet Switch	<a href="#">368</a>
P134G2 Ethernet Switch	<a href="#">368</a>
P330 Ethernet Switch	<a href="#">357</a>
Features	<a href="#">358</a> , <a href="#">363</a>
peripherals, ground isolation	<a href="#">404</a>
pipe grounds	<a href="#">406</a>

## Index

Pocket PC . . . . .	<a href="#">302</a>
PoE	
media module . . . . .	<a href="#">248</a>
port cabinets . . . . .	<a href="#">116</a>
port carriers . . . . .	<a href="#">189, 191</a>
Port networks	
S8500 Media Server . . . . .	<a href="#">68</a>
Ports	
4-wire ISDN . . . . .	<a href="#">45, 259</a>
analog media module . . . . .	<a href="#">43, 256</a>
PoE . . . . .	<a href="#">248</a>
power	
backup . . . . .	<a href="#">400, 401</a>
current limited . . . . .	<a href="#">200</a>
DC requirements . . . . .	<a href="#">395, 403</a>
feeders . . . . .	<a href="#">392</a>
global requirements . . . . .	<a href="#">395, 403</a>
outages . . . . .	<a href="#">104</a>
sources . . . . .	<a href="#">391</a>
transformers . . . . .	<a href="#">407</a>
Power Backup for S8700 Multi-Connect . . . . .	<a href="#">85</a>
power converters	
631DA1/B1 . . . . .	<a href="#">201, 396</a>
649A . . . . .	<a href="#">202, 405</a>
Power Supply, AC, WP-1217A . . . . .	<a href="#">201</a>
power units	
AC	
631DA1/B1 . . . . .	<a href="#">201, 396</a>
J58890CE-2 . . . . .	<a href="#">397</a>
DC	
649A . . . . .	<a href="#">202, 405</a>
676B . . . . .	<a href="#">408</a>
distribution . . . . .	<a href="#">398</a>
distribution (J58890CH-1) . . . . .	<a href="#">400</a>
electrical components . . . . .	<a href="#">398</a>
inputs . . . . .	<a href="#">396</a>
outputs . . . . .	<a href="#">397</a>
PPNs	
cabinets . . . . .	<a href="#">117</a>
processors	
J58890AP carriers . . . . .	<a href="#">195</a>
protections, system . . . . .	<a href="#">411</a>
protective grounds . . . . .	<a href="#">406</a>

## R

RAM disk . . . . .	<a href="#">73</a>
relays, DC power . . . . .	<a href="#">398, 399</a>
Remote Supervisor Adapter . . . . .	<a href="#">60</a>
requirements	
international . . . . .	<a href="#">395</a>
ring generators . . . . .	<a href="#">399</a>
RS449	
media module . . . . .	<a href="#">249</a>
RSA . . . . .	<a href="#">60</a>

RST button . . . . .	<a href="#">152</a>
Russia	
MFR (TN2182C) . . . . .	<a href="#">229</a>
MFR (TN744B/C/D) . . . . .	<a href="#">159, 214</a>

## S

S8300 Media Server	
Avaya Telephones . . . . .	<a href="#">262</a>
Analog Telephones . . . . .	<a href="#">263</a>
IP Telephones . . . . .	<a href="#">262</a>
SoundStation . . . . .	<a href="#">264</a>
Wireless . . . . .	<a href="#">263</a>
Media Gateways . . . . .	<a href="#">261</a>
S8300 Media Server in a Local Survivable Processor Mode with an S8700 Multi-Connect . . . . .	<a href="#">104</a>
S8300 Media Server in an LSP Configuration . . . . .	<a href="#">46</a>
S8300 Media Server Web Interface . . . . .	<a href="#">52</a>
S8300 Media Server with G700 Media Gateway	
Configuration Description . . . . .	<a href="#">30</a>
Customer Configuration Options . . . . .	<a href="#">51</a>
Detailed Description . . . . .	<a href="#">30</a>
Media Server Web Interface . . . . .	<a href="#">52</a>
Overview . . . . .	<a href="#">29</a>
S8300 Media Server in an LSP Configuration . . . . .	<a href="#">46</a>
System Management . . . . .	<a href="#">51</a>
S8500 Media Server . . . . .	<a href="#">57</a>
Avaya Telephones . . . . .	<a href="#">269</a>
Analog . . . . .	<a href="#">270</a>
Consoles . . . . .	<a href="#">271</a>
Digital . . . . .	<a href="#">270</a>
Explosive Atmosphere . . . . .	<a href="#">271</a>
IP . . . . .	<a href="#">269</a>
SoundStation . . . . .	<a href="#">270</a>
Wireless . . . . .	<a href="#">271</a>
Back . . . . .	<a href="#">59</a>
Backing up . . . . .	<a href="#">68</a>
capabilities . . . . .	<a href="#">74</a>
Circuit Packs . . . . .	<a href="#">265</a>
Application . . . . .	<a href="#">268</a>
Control . . . . .	<a href="#">268</a>
Line . . . . .	<a href="#">266</a>
Port . . . . .	<a href="#">269</a>
Service . . . . .	<a href="#">268</a>
Trunk . . . . .	<a href="#">267</a>
components . . . . .	<a href="#">59</a>
detailed description . . . . .	<a href="#">57</a>
Front . . . . .	<a href="#">58</a>
G650 media gateway . . . . .	<a href="#">69</a>
media gateways . . . . .	<a href="#">69</a>
modems . . . . .	<a href="#">62</a>
port network connectivity . . . . .	<a href="#">68</a>
reliability . . . . .	<a href="#">70</a>
RSA . . . . .	<a href="#">60</a>
SAMP . . . . .	<a href="#">66</a>

S8500 Media Server, (continued)		
system management . . . . .	<a href="#">75</a>	
Web interface . . . . .	<a href="#">76</a>	
S8500B Media Server		
back . . . . .	<a href="#">65</a>	
components . . . . .	<a href="#">65</a>	
detailed description . . . . .	<a href="#">64</a>	
front . . . . .	<a href="#">64</a>	
S8700 Configuration		
G350 Media Gateway . . . . .	<a href="#">93</a>	
G700 Media Gateway . . . . .	<a href="#">93</a>	
S8700 Media Server		
Circuit Packs		
Line . . . . .	<a href="#">274</a>	
Trunk . . . . .	<a href="#">275</a>	
components . . . . .	<a href="#">78</a>	
Detailed Description . . . . .	<a href="#">77</a>	
IP Server Interface (TN2312AP) . . . . .	<a href="#">83</a>	
Media Gateways . . . . .	<a href="#">265</a>	
Overview . . . . .	<a href="#">77</a>	
Required System Components . . . . .	<a href="#">78</a>	
S8700 Media Server components . . . . .	<a href="#">78</a>	
S8700 Media Server IP Connect		
Avaya Telephones . . . . .	<a href="#">277</a>	
Analog . . . . .	<a href="#">278</a> , <a href="#">284</a>	
Consoles . . . . .	<a href="#">278</a> , <a href="#">285</a>	
Explosive Atmosphere . . . . .	<a href="#">278</a> , <a href="#">285</a>	
IP . . . . .	<a href="#">277</a> , <a href="#">283</a>	
SoundStation . . . . .	<a href="#">278</a> , <a href="#">284</a>	
Wireless . . . . .	<a href="#">278</a> , <a href="#">285</a>	
Circuit Packs . . . . .	<a href="#">274</a>	
Application . . . . .	<a href="#">276</a>	
Control . . . . .	<a href="#">275</a>	
Port . . . . .	<a href="#">276</a>	
Service . . . . .	<a href="#">276</a>	
Media Gateways . . . . .	<a href="#">273</a>	
S8700 Media Server Multi-Connect		
Avaya Telephones . . . . .	<a href="#">283</a>	
Circuit Packs . . . . .	<a href="#">279</a>	
Application . . . . .	<a href="#">283</a>	
Control . . . . .	<a href="#">282</a>	
Line . . . . .	<a href="#">280</a>	
Port . . . . .	<a href="#">283</a>	
Power . . . . .	<a href="#">279</a>	
Service . . . . .	<a href="#">282</a>	
Trunk . . . . .	<a href="#">281</a>	
S8700 Multi-Connect		
Communication Complex Configuration . . . . .	<a href="#">79</a>	
Connectivity . . . . .	<a href="#">102</a>	
ATM Network . . . . .	<a href="#">103</a>	
CSS Network . . . . .	<a href="#">103</a>	
Ethernet Switch . . . . .	<a href="#">84</a>	
High-level capabilities . . . . .	<a href="#">105</a>	
MCC1 Media Gateway . . . . .	<a href="#">88</a>	
Media Gateways . . . . .	<a href="#">86</a>	
S8700 Multi-Connect, (continued)		
Recoverability . . . . .	<a href="#">104</a>	
Reliability . . . . .	<a href="#">97</a> , <a href="#">102</a> , <a href="#">103</a>	
Critical Reliability . . . . .	<a href="#">102</a>	
Duplex Reliability . . . . .	<a href="#">97</a>	
High Reliability . . . . .	<a href="#">99</a>	
S8300 Media Server in a Local Survivable Processor Mode . . . . .	<a href="#">104</a>	
SCC1 Media Gateway . . . . .	<a href="#">90</a>	
Survivable Remote EPN . . . . .	<a href="#">104</a>	
System Capacity . . . . .	<a href="#">107</a>	
System Management . . . . .	<a href="#">109</a>	
UPS or Power Backup . . . . .	<a href="#">85</a>	
USB Modem . . . . .	<a href="#">85</a>	
S8700 Multi-Connect Connectivity . . . . .	<a href="#">102</a>	
ATM Network . . . . .	<a href="#">103</a>	
CSS Network . . . . .	<a href="#">103</a>	
S8700 Multi-Connect Recoverability . . . . .	<a href="#">104</a>	
S8700 Multi-Connect Reliability . . . . .	<a href="#">97</a> , <a href="#">102</a> , <a href="#">103</a>	
Critical Reliability . . . . .	<a href="#">102</a>	
Duplex Reliability . . . . .	<a href="#">97</a>	
High Reliability . . . . .	<a href="#">99</a>	
S8700 Required System Components . . . . .	<a href="#">78</a>	
S8710 Media Server		
components . . . . .	<a href="#">80</a>	
Detailed Description . . . . .	<a href="#">77</a>	
IP Server Interface (TN2312AP) . . . . .	<a href="#">83</a>	
Overview . . . . .	<a href="#">77</a>	
Required System Components . . . . .	<a href="#">78</a>	
S8710 Media Server components . . . . .	<a href="#">80</a>	
S8710 Required System Components . . . . .	<a href="#">78</a>	
SAMP . . . . .	<a href="#">66</a>	
modem . . . . .	<a href="#">67</a>	
SCC1 Media Gateway . . . . .	<a href="#">180</a>	
SCC1 Media Gateway for S8700 Multi-Connect . . . . .	<a href="#">90</a>	
SCCs (single carrier cabinets)		
acoustic noise levels . . . . .	<a href="#">391</a>	
DC power supply (676B) . . . . .	<a href="#">408</a>	
fan units . . . . .	<a href="#">410</a>	
power systems . . . . .	<a href="#">407</a>	
Seamless Communication . . . . .	<a href="#">351</a>	
Motorola CN620 Mobile Office Device . . . . .	<a href="#">335</a>	
W110 Light Access Point . . . . .	<a href="#">353</a>	
Wireless Services Manager . . . . .	<a href="#">353</a>	
WSM . . . . .	<a href="#">353</a>	
Server Availability Management Processor . . . . .	<a href="#">66</a>	
single point ground terminals . . . . .	<a href="#">407</a>	
small battery power backup . . . . .	<a href="#">401</a>	
SN carriers . . . . .	<a href="#">192</a>	
SN clock circuit packs . . . . .	<a href="#">212</a>	
sneak fuse panels (507B) . . . . .	<a href="#">412</a>	
sneak protectors . . . . .	<a href="#">411</a>	
SNIs (TN573/B) . . . . .	<a href="#">198</a> , <a href="#">213</a>	
Softconsole . . . . .	<a href="#">324</a>	
Softphone . . . . .	<a href="#">301</a>	
Softphone for Pocket PC . . . . .	<a href="#">302</a>	

## Index

solid state voltage protection . . . . .	<a href="#">411</a>
SPEs . . . . .	<a href="#">114</a>
Survivable Remote EPN in an S8700 Multi-Connect system protections . . . . .	<a href="#">104</a> <a href="#">411</a>

## T

T1/E1 Media Module (MM710) . . . . .	<a href="#">41</a>
tape drives, data cassettes . . . . .	<a href="#">207</a>
TCP/IP	
connectivity	
C-LAN . . . . .	<a href="#">226</a>
Telephones	
2500 and 2554 . . . . .	<a href="#">325</a>
3410 . . . . .	<a href="#">331</a>
3606 . . . . .	<a href="#">331</a>
3616 . . . . .	<a href="#">333</a>
3626 . . . . .	<a href="#">334</a>
6211 . . . . .	<a href="#">326</a>
6219 . . . . .	<a href="#">327</a>
6221 . . . . .	<a href="#">328</a>
6402 and 6402D . . . . .	<a href="#">316</a>
8840 TTY . . . . .	<a href="#">328</a>
9040 . . . . .	<a href="#">330</a>
958 . . . . .	<a href="#">329</a>
analog . . . . .	<a href="#">325</a>
Attendant console (302D) . . . . .	<a href="#">323</a>
Callmaster IV (603H) . . . . .	<a href="#">321</a>
Callmaster V (607A) . . . . .	<a href="#">321</a>
Callmaster VI (606A) . . . . .	<a href="#">322</a>
CN620 . . . . .	<a href="#">335</a>
EA401 and EA401A . . . . .	<a href="#">329</a>
Softconsole . . . . .	<a href="#">324</a>
wireless . . . . .	<a href="#">330</a>
3410 . . . . .	<a href="#">331</a>
3606 VoIP . . . . .	<a href="#">331</a>
3616 VoIP . . . . .	<a href="#">333</a>
3626 VoIP . . . . .	<a href="#">334</a>
CN620 . . . . .	<a href="#">335</a>
terminals	
grounding . . . . .	<a href="#">407</a>
TN1654 DS1 Converter, T1 (24 channel) and E1 (32 channel) . . . . .	<a href="#">227</a>
TN1655 Packet Interface for DEFINITY R . . . . .	<a href="#">227</a>
TN2138 CO Trunk for Italy (8 ports) . . . . .	<a href="#">228</a>
TN2139 DID Trunk for Italy (8 ports) . . . . .	<a href="#">228</a>
TN2140BTie Trunk for Hungary and Italy (4-wire, 4 ports) . . . . .	<a href="#">228</a>
TN2146 DID Trunk for Belgium and the Netherlands (8 port) . . . . .	<a href="#">228</a>
TN2147C CO Trunk for Multiple Countries (8 ports) . . . . .	<a href="#">229</a>
TN2181 DCP Digital Line (2-wire, 16 ports) . . . . .	<a href="#">229</a>
TN2182C Tone-Clock, Tone Detector, and Call Classifier (8 ports) . . . . .	<a href="#">229</a>
TN2183/TN2215 Analog Line for Multiple Countries (16 ports) . . . . .	<a href="#">234</a>
TN2184 DIOD Trunk for Germany (4 ports) . . . . .	<a href="#">230</a>
TN2185 ISDN-BRI S/T-TE Interface (4-wire) . . . . .	<a href="#">230</a>
TN2198 ISDN-BRI U Interface (2-wire) . . . . .	<a href="#">231</a>
TN2199 CO Trunk for Russia (3-wire, 4 ports) . . . . .	<a href="#">232</a>
TN2202 Ring Generator for France . . . . .	<a href="#">232</a>
TN2207 DS1 Interface, T1 (24-channel) and E1 (32-channel) . . . . .	<a href="#">232</a>
TN2209 Tie Trunk for Russia (4-wire, 4 ports) . . . . .	<a href="#">233</a>
TN2214B DCP Digital Line (2-wire, 24 ports) . . . . .	<a href="#">233</a>
TN2215/TN2183 Analog Line for Multiple Countries (16 ports) . . . . .	<a href="#">234</a>
TN2224B DCP Digital Line (2-wire, 24 ports) . . . . .	<a href="#">235</a>
TN2242 Digital Trunk (Japan 2MB TTC) . . . . .	<a href="#">235</a>
TN2301 Logic Switch for DEFINITY R . . . . .	<a href="#">235</a>
TN2302 IP media processor . . . . .	<a href="#">235</a>
TN2302AP IP Media Processor . . . . .	<a href="#">235</a>
TN2305 ATM-CES Trunk/Port-Network Interface for Multi-Mode Fiber . . . . .	<a href="#">236</a>
TN2306 ATM-CES Trunk/Port-Network Interface for Single-Mode Fiber . . . . .	<a href="#">237</a>
TN2308 DID Trunk for Brazil (8 ports) . . . . .	<a href="#">237</a>
TN2313AP DS1 interface . . . . .	<a href="#">240</a>
TN2313AP DS1 Interface (24-channel) . . . . .	<a href="#">240</a>
TN2314 S8100 Media Server . . . . .	<a href="#">159</a> , <a href="#">241</a>
TN2401 Net/Pkt . . . . .	<a href="#">241</a>
TN2401 Network Control/Packet Interface for DEFINITY SI . . . . .	<a href="#">241</a>
TN2401/2400 Net/Pkt sandwich board . . . . .	<a href="#">241</a>
TN2401/TN2400 Net/Pkt Interface sandwich board assembly for DEFINITY SI/I upgrades . . . . .	<a href="#">241</a>
TN2402 Processor for DEFINITY CSI . . . . .	<a href="#">242</a>
TN2404 Processor for DEFINITY SI . . . . .	<a href="#">242</a>
TN2464BP DS1 Interface with Echo Cancellation, T1/E1 . . . . .	<a href="#">243</a>
TN2501AP Voice Announcements over LAN (VAL) . . . . .	<a href="#">243</a>
TN2793B Analog Line with Caller ID (24 ports) . . . . .	<a href="#">244</a>
TN566/B alarm . . . . .	<a href="#">206</a>
TN567 multifunction . . . . .	<a href="#">206</a>
TN572 SN clock . . . . .	<a href="#">212</a>
TN573/B SNI . . . . .	<a href="#">213</a>
TN2169 alarm . . . . .	<a href="#">206</a>
TN2170 alarm/ethernet . . . . .	<a href="#">206</a>
TN2202 ring generator . . . . .	<a href="#">399</a>
TN429D DIOD or Central Office Trunk (8 ports) . . . . .	<a href="#">208</a>
TN433 speech synthesizer Italy . . . . .	<a href="#">208</a>
TN436B DID Trunk for Australia (8 ports) . . . . .	<a href="#">208</a>
TN438B CO trunk for Australia (8 port) . . . . .	<a href="#">208</a>
TN439 Tie Trunk for Australia and Japan . . . . .	<a href="#">209</a>
TN457 Speech Synthesizer for British English . . . . .	<a href="#">209</a>
TN459B DID Trunk for the United Kingdom . . . . .	<a href="#">209</a>
TN464C/D/E/F DS1 Interface . . . . .	<a href="#">209</a>
TN465C CO Trunk for Multiple Countries (8 port) . . . . .	<a href="#">210</a>
TN479 Analog Line (16 ports) . . . . .	<a href="#">210</a>
TN497 Tie Trunk for Italy TGU, TGE, and TGI (4 ports) . . . . .	<a href="#">211</a>
TN556D ISDN-BRI 4-Wire Interface (12 ports) . . . . .	<a href="#">211</a>

TN568 DEFINITY AUDIX 4.0 Voice Mail System . . .	<a href="#">212</a>
TN570D Expansion Interface . . . . .	<a href="#">212</a>
TN572 Switch-Node Clock for DEFINITY R . . . . .	<a href="#">212</a>
TN573/B SNI . . . . .	<a href="#">198</a>
TN573B Switch Node Interface . . . . .	<a href="#">213</a>
TN574 DS1 Converter . . . . .	<a href="#">213</a>
TN725B Speech Synthesizer for United States English	<a href="#">213</a>
TN726B Data Line (8 ports). . . . .	<a href="#">213</a>
TN735 MET Line (4 ports) . . . . .	<a href="#">214</a>
TN744E Call Classifier Tone Detector for Multiple Countries (8 ports) . . . . .	<a href="#">159</a> , <a href="#">214</a>
TN746B Analog Line (16 ports) . . . . .	<a href="#">214</a>
TN747B CO Trunk (8 ports) . . . . .	<a href="#">215</a>
TN750C Recorded Announcement (16 channels) . . .	<a href="#">216</a>
TN753B DID Trunk (8 ports) . . . . .	<a href="#">216</a>
TN755B Neon Power Unit . . . . .	<a href="#">217</a>
TN758 Pooled Modem . . . . .	<a href="#">217</a>
TN760E Tie Trunk (4-wire, 4 ports) . . . . .	<a href="#">218</a>
TN762B Hybrid Line (8 ports). . . . .	<a href="#">218</a>
TN763D Auxiliary Trunk (4 ports) . . . . .	<a href="#">218</a>
TN767E DS1 Interface, T1 (24 channel). . . . .	<a href="#">219</a>
TN769 Analog Line (8 ports) . . . . .	<a href="#">219</a>
TN771DP Maintenance/Test . . . . .	<a href="#">220</a>
TN771DP maintenance/test board with firmware download . . . . .	<a href="#">220</a>
TN775C Maintenance board . . . . .	<a href="#">221</a>
TN780 Tone Clock . . . . .	<a href="#">221</a>
TN787K Multimedia Interface . . . . .	<a href="#">222</a>
TN788C Multimedia Voice Conditioner . . . . .	<a href="#">222</a>
TN789B Radio Controller . . . . .	<a href="#">223</a>
TN791 Analog Guest Line (16 ports) . . . . .	<a href="#">223</a>
TN792 Duplication Interface for TN2404 Processor for DEFINITY SI . . . . .	<a href="#">224</a>
TN793B Analog Line with Caller ID (24 ports) . . .	<a href="#">224</a>
TN797 US Analog Trunk or Line Circuit Pack (8 ports)	<a href="#">225</a>
TN799/B/C CLAN interface . . . . .	<a href="#">226</a>
TN801 LAN Gateway interface . . . . .	<a href="#">226</a>
TN801 MAPD (LAN Gateway Interface) . . . . .	<a href="#">226</a>
TN801B MAPD LAN Gateway Interface . . . . .	<a href="#">207</a>
TN802B MAPD IP Interface Assembly. . . . .	<a href="#">227</a>
TN-C7 ISDN-PRI to SS7 Converter . . . . .	<a href="#">245</a>
TNCCSC-1 ISDN-PRI to DASS Converter . . . . .	<a href="#">245</a>
TNCCSC-2 ISDN-PRI to DPNSS Converter . . . . .	<a href="#">245</a>
TNCCSC-3 ISDN-PRI to DPNSS Converter . . . . .	<a href="#">245</a>
TN-CIN Voice/Fax/Data Multiplexer . . . . .	<a href="#">245</a>
Topologies . . . . .	<a href="#">151</a>
TRK port . . . . .	<a href="#">152</a>
trunks	
H.323 . . . . .	<a href="#">120</a>

---

**U**

UPS . . . . .	<a href="#">399</a> , <a href="#">401</a>
UPS for S8700 Multi-Connect . . . . .	<a href="#">85</a>
USB Modem for S8700 Multi-Connect . . . . .	<a href="#">85</a>
USB port. . . . .	<a href="#">152</a>
USP	
media module . . . . .	<a href="#">249</a>

---

**V**

V.35	
media module . . . . .	<a href="#">249</a>
VoIP Media Module (MM760) . . . . .	<a href="#">45</a>

---

**W**

W110 Light Access Point	
Seamless Communication . . . . .	<a href="#">353</a>
W310 WLAN Gateway . . . . .	<a href="#">349</a> , <a href="#">350</a>
Seamless Communication . . . . .	<a href="#">351</a>
Site requirements . . . . .	<a href="#">414</a>
WAN	
media module . . . . .	<a href="#">249</a>
WAN 1 port . . . . .	<a href="#">152</a>
Wireless	
Extension to Cellular. . . . .	<a href="#">355</a>
telephones	
3410 . . . . .	<a href="#">331</a>
3606 VoIP . . . . .	<a href="#">331</a>
3616 VoIP . . . . .	<a href="#">333</a>
3626 VoIP . . . . .	<a href="#">334</a>
CN620 . . . . .	<a href="#">335</a>
W310 WLAN Gateway. . . . .	<a href="#">349</a> , <a href="#">350</a>
Wireless Services Manager	
Seamless Communication . . . . .	<a href="#">353</a>
WP-1217A Power Supply . . . . .	<a href="#">201</a>
WP-91153 AC power . . . . .	<a href="#">408</a>

---

**X**

X.21 media module . . . . .	<a href="#">249</a>
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