
Meridian 1

QMT21 High Speed Data Module

Description, installation, and operation

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Introduction

The QMT21 High Speed Data Module (HSDM) is a stand-alone desktop data module that provides an RS-232C/V.35 interface between compatible asynchronous or synchronous data terminal equipment (DTE) and the switching network. The HSDM provides connectivity to the DTE for intra-switch communications, as well as for wide area communications over Digital Trunk Interface (DTI) or Primary Rate Interface (PRI) links to other Northern Telecom switches. The HSDM does not interface directly to Data Communication Equipment (DCE) such as modems. The QMT8 (ADM) or QMT12 (SADM) are used for that purpose.

The HSDM functions are based on the QMT11 Asynchronous/Synchronous Interface Module (ASIM). The HSDM provides a V.35 interface and allows synchronous data transmission at up to 64,000 bits per second. The HSDM V.35 interface conforms electrically to the CCITT V.35 standard and mechanically to ISO-2110. When HSDM is used as a V.35 interface unit, an adapter cable is required to convert the ISO-2110 (DB-25) into an ISO-2593 (34-pin rectangular connector).

The HSDM has the same profile as the ASIM but is packaged in a Meridian gray plastic housing. It weighs approximately 3 lb.

An external power supply is provided for each HSDM. The power supplies are assembled with the units and it is not recommended to order them separately.

When the HSDM is used as an RS-232 interface unit it can replace an ASIM. The HSDM meets the data terminal equipment/data communication equipment (DTE/DCE) interface requirements of the Electronics Industries Association (EIA) RS-232C standard. The electrical characteristics of the interface to the Data Line Card (DLC) or to a 4-Port Data Line Card (4PDLC) are the same as for the ASIM.

Features

A light emitting diode (LED), next to the legend V.35 on the front face plate, is lit continuously if the HSDM is configured internally for V.35 interface.

The HSDM can originate outgoing data calls by either keyboard dialing or keypad dialing. Keyboard (KBD) or keypad dialing may be used in the asynchronous mode. Only keypad dialing is permitted in the synchronous mode.

A standard 500/2500, SL-1, or digital telephone may be plugged into the phone jack of the HSDM. This telephone then operates through the HSDM line cord to a standard 500/2500 SL-1 line card or Integrated Services Digital Line Card (ISDLC) in the Meridian 1.

The following features are supported by the HSDM:

- RS-232C/V.35 interface
- Up to 64 kbps in synchronous mode
- Hot Line
- Auto/Speed Call
- Ring Again (RGA)
- Remote Loopback
- Echo (automatically with KBD)
- Originate/Answer Data Calls
- Outbound Modem Pool Call
- Forced Data Terminal Ready (DTR)
- Virtual Leased Line (VLL)
- Self diagnostics
- Automatic Set Relocation
- Public Switched Data Service (PSDS)
- Echo Canceller Disabler Tone

Related documents

For complete descriptions of the Meridian data features, refer to these documents.

- *QPC723 RS-232 Interface Line Card description, installation, and operation (553-2731-106)*
- *QPC918 High Speed Data Card description, installation, and operation (553-2731-108)*
- *Meridian data features traffic engineering and configuration (553-2731-151)*
- *Enhanced Asynchronous Interface Line Unit description and formats (553-2731-203)*
- *Meridian data features operation and tests (553-2731-300)*
- *NT7D16 Data Access Card description and operation (553-3001-191)*
- *X11 input/output guide (553-3001-400)*

Note: For the purposes of this document, Meridian 1 refers to Meridian SL-1 ST, NT, RT, and XT machines as well as Meridian 1 system options 21, 51, 61, and 71.

Description

The High Speed Data Module (HSDM) is packaged in a Meridian gray plastic housing that is 12.5 in. (317.5 mm) long and 7.5 in. (190 mm) wide. The module has a 4 degree slope with a front height of 1.75 in. (44.5 mm) and a rear height of 2.75 in. (70 mm).

Controls and indicators

The HSDM is equipped with a synchronous speed switch, two eight-mode switches, a keypad dial, data status lamps, and eight feature keys.

The data control switches are in a recessed area covered with a flip-up lid. User instructions are provided on the underside of the lid. These controls allow the user to choose a data mode and a data speed.

The 12-button dial pad plus feature keys and data status lamps are located in front of the flip-lid.

Keypad dialing

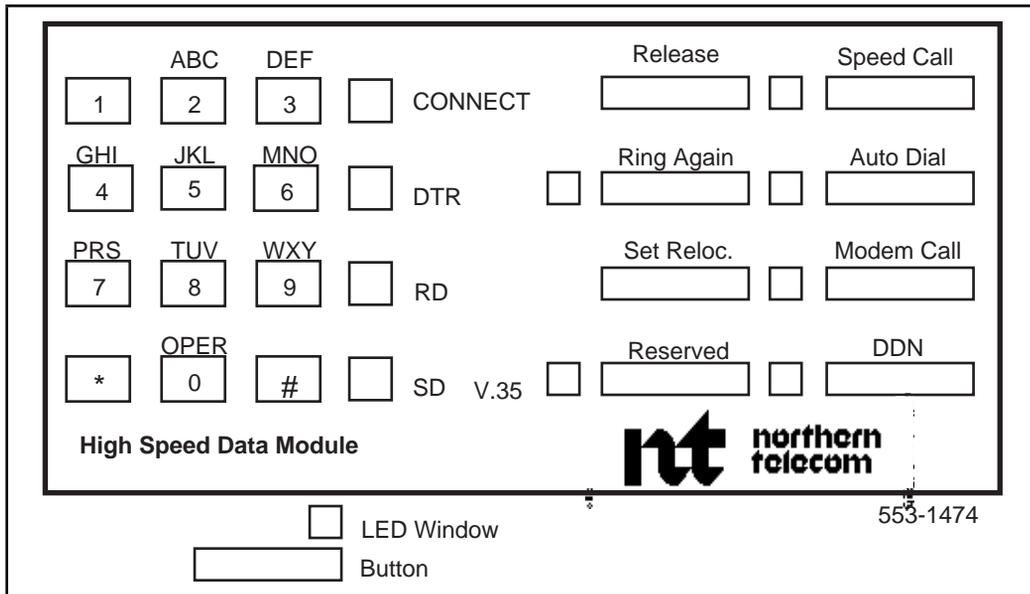
Keypad dialing allows the user to initiate asynchronous or synchronous data calls on the module to in-house or remote hosts. [Figure 1](#) shows the keypad layout.

Keypad dialing capability is provided by a standard 12-button dial pad that has the digits 0 through 9 plus the asterisk (*) and the octothorpe (#).

Keypad dialing operation

[Procedure 1 on page 14](#) details the keypad dialing operations of the HSDM.

Figure 1
Keypad layout



Keyboard dialing

Keyboard dialing allows the user to initiate data calls to in-house or remote hosts using the terminal keyboard of a DTE without the use of the keypad.

Keyboard dialing capability is provided only for asynchronous terminals connected to the HSDM.

Keyboard dialing is supported for ASCII, asynchronous, character mode, interactive terminals equipped with an EIA RS-232-C interface. It is not supported for synchronous or block mode terminals.

Keyboard dialing operation

[Procedure 2 on page 25](#) details the keyboard dialing operations of the HSDM.

Mode switches

The HSDM has two recessed 8-position DIP mode switches ([Figures 2 and 3](#)).

SW1		SW2	
S 1:	Hot Line	S 1:	SL-1 or DMS/SL-100
S 2:	Forced DTR	S 2:	Terminal/Host
S 3:	HDX/FDX	S 3:	PSDS
S 4:	Async/Sync	S 4:	Echo Canceller Disabler
S 5:	Ext/Int Clock	S 5:	Reserved
S 6:	Modem/Network	S 6:	Reserved
S 7:	Manual/Auto Answer	S 7:	Reserved
S 8:	Loopback	S 8:	Reserved

An Echo mode is not provided as an option (but characters will be echoed during keyboard dialing). To disable echo cancellers in the public digital network, the SW2-4 DIP switch must be set to ON.

Figure 2
Switch plate layout

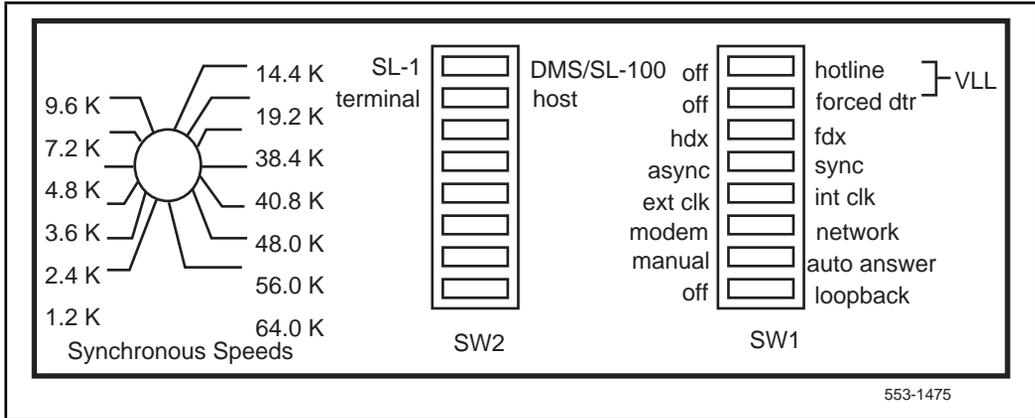
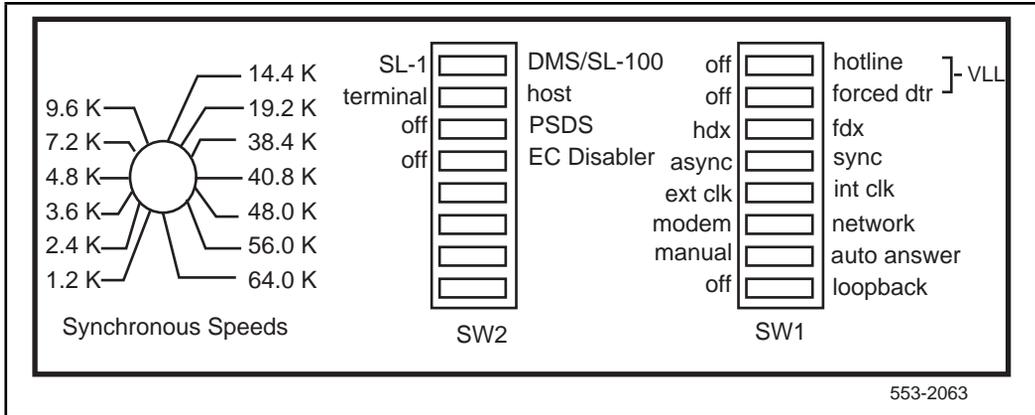


Figure 3
QMT21C switch plate layout



Virtual Leased Line

The Virtual Leased Line (VLL) mode is controlled by operating the switch to the Hot Line and Forced DTR position. In the Virtual Leased Line mode, the HSDM waits for 1.5 seconds after the call is disconnected and begins to hot line continuously until the call is reestablished. If a call is not connected within 40 seconds, the call is aborted and the sequence starts over. It can be stopped by setting either the Hot Line or Forced DTR switch to the OFF position.

SW1 definitions

Hot Line allows the user to always access a particular data station. An autodial is initiated whenever the Data Terminal Ready (DTR) lead goes from OFF to ON.

Forced DTR allows the HSDM to originate or answer a call in the absence of a true hardware DTR.

HDX/FDX is provided for the half duplex or full duplex data transmission.

Async/Sync is provided for the asynchronous or synchronous data transmission.

Ext/Int Clock External clock is used when the device connected to the HSDM controls the transmit clock signal. Internal clock is used when the system controls the transmit clock signal. The receive clock is always controlled by the HSDM.

Modem/Network Modem is used for all connections except for connections to a digital network. Network is used when the transmit and receive clocks are jointly synchronous as from a digital service unit (DSU).

Manual/Auto Answer is provided for the user to answer an incoming call manually or automatically; manual answer of an incoming call is performed by either entering a carriage-return (in asynchronous mode only) or pressing the Data Directory Number (DDN) key.

Loopback will permit the local calling HSDM to force the far end data module into a Remote Loopback test mode. This switch is provided for diagnostic purposes and used by maintenance personnel.

SW2 definitions

SL-1 or DMS/SL-100 Half duplex synchronous is provided to the user from the HSDM when the DMS/SL-100 switch is set. At 56 or 64 kbps, only full duplex is available. When the switch is set at SL-1, the HSDM interprets the protocol from the network as used by all other data modules. When a call from DMS/SL-100 in the synchronous half duplex mode is expected, the switch should be set to the DMS/SL-100 position.

Terminal/Host In the asynchronous mode, the Host setting suppresses all the prompts to the DTE. Blind dialing is still allowed.

Public Switched Data Service (PSDS) To activate the X11 release 16 Switched 56 kbps or Switched 64 kbps service, set this switch to ON before pressing the DDN key. In this mode, the HSDM accepts or originates calls only at a synchronous speed of 56 kbps or 64 kbps.

Echo Canceller Disabler This feature can be engaged only if the HSDM is in Public Switched Data Service (PSDS) mode (SW2-3 is ON). To implement this feature the DIP switch must be set to ON before the DDN key is pressed.

Positions 5 to 8 are reserved for future use and should be set to the OFF position.

Synchronous speeds switch

This switch sets the synchronous speeds and assists in determining the asynchronous autobaud rate. See specifications for more details on speeds available.

Function switches

The following function switches are used to originate, answer, and release data calls:

- Speed Call
- Autodial
- Modem Call
- Ring Again
- Data Directory Number (DDN)
- Set Relocation
- Release

Functional switch definitions

Speed Call allows the station user to place calls to a directory number by dialing a 1-, 2-, or 3-digit code. The DN may be for stations, CO trunks, or Direct Inward Dialing (DID) numbers. Speed call lists of 10, 100, or 1000 entries are assigned to a speed call controller who may use or change any entry in the list at any time. Any number of users may be assigned to any list. Combined voice and data entries with the same Speed Call list are not recommended.

Autodial allows the user to program the module with a frequently used number, so that it can be automatically dialed.

Modem Call allows nondedicated, dial-up access through a data line card to voice-grade modems required for outgoing data calls to remote facilities over analog trunks.

Ring Again allows queuing of calls made to a busy Directory Number (DN) within the customer group, alerts the user when the busy DN becomes free, and provides automatic callback to the DN.

Data Directory Number (DDN) allows the user to answer an incoming call manually or to initiate a data call using the keypad dialing.

Set Relocation is described in the following section.

Release allows the user to initiate disconnect procedures.

Automatic Set Relocation

The Set Relocation key in conjunction with the asterisk (*) and octothorpe (#) keys provides for the HSDM automatic relocation feature. This feature allows the HSDM user to move sets to another location without the intervention of a craftsperson. Directory numbers and features assigned to the set are maintained.

Data Status Lamps

The definitions of the Data Status Lamps are as follows:

Indicator	Description
CONNECT	The CONNECT LED lights when a call is connected from the Meridian 1 through the HSDM to the attached device.
DTR	The DTR LED lights to indicate that DTR is on from the attached device or is forced on by the forced DTR setting.
RD	The RD LED lights when data is received by the external DTE.
SD	The SD LED lights when data is transmitted by the external DTE.
V.35	The V.35 LED lights when the HSDM is internally configured for the V.35 interface.

Keypad dialing from an HSDM data station

Keypad dialing is applicable to asynchronous or synchronous data terminal equipment equipped with an EIA RS-232-C or V.35 interface.

The HSDM and Keypad dialing provides the following capabilities:

- Call origination to local and remote hosts
- Manual or Auto Answer
- Ring Again capability
- Autodial data calling to local hosts
- Speed Calling
- Automatic Set Relocation
- Asynchronous data baud rate of 110, 150, 300, 600, 1200, 2400, 4800, 9600, and 19200 bps
- Synchronous data baud rate of 1200, 2400, 3600, 4800, 7200, 9600, 19200, 38400, 40800, 56000, and 64000 bps
- Two stop-bits for 110 baud and one bit for all other baud rates

Miscellaneous information

Ensure that the data terminal is online and that both the terminal and the HSDM are turned on.

The call is dialed from the standard dial pad on the HSDM. The asterisk (*) and octothorpe (#) are accepted as is and treated as touch pad items.

For set relocation, the off hook and on hook are simulated as follows:

- Off hook: press the set relocation key and then the asterisk (*) key.
- On hook: press the set relocation key and then the octothorpe (#) key.

Use the RELEASE key if it is necessary to abandon a call during call setup.

Procedure 1
Keypad dialing (Part 1 of 5)

Step	Action	Prompt/Indicator	Comment
Start condition			Data station idle. Terminal and HSDM power on.
1	Data Autodial active?		If yes, go to Step 18. If not, go to Step 3 (Note 8).
2	Speed Calling active?		If yes, go to Step 20. If not, go to Step 3 (Note 8).
3	Operate DDN key.	DDN lamp on.	
Call to local host or smart modem pool calling			
4	Enter number.		All numeric input, #, and * are accepted. HSDM sends digits to the Meridian 1, which places call to host.
5	Called host answer (if busy see Steps 14 or 17).	CALL CONNECTED SESSION STARTS Connect lamp on.	Data modules perform handshake and data channel becomes transparent (Note 2).
6	Follow login procedures.		Data session begins.
7	Proceed with data session.		Host echoes all typed input. Go to Step 23 for disconnect procedures.
Call to remote host			Multiple hosts
8	Enter modem number xxxx.	DDN and Modem Call lamps wink.	Wait until modem is reserved.
9	Enter remote number digits.		
10	Press Modem Call key.	Modem Call lamp on; DDN lamp winks.	The switch places a call to the remote number.

Procedure 1
Keypad dialing (Part 2 of 5)

Step	Action	Prompt/Indicator	Comment
11	Remote host answers.	CALL CONNECTED SESSION STARTS. DDN, Connect, and Modem Call lamps on.	The call is connected. (If busy, go to Steps 14 or 17.)
12	Follow login procedures.		Data session begins.
13	Proceed with data session.		Host echoes all typed input. Go to Step 23 for disconnect procedures.
Host Busy — Ring Again active?			(See Notes 1 and 2)
14	Called host busy.	RING AGAIN PLACED RELEASED. Ring Again lamp on; DDN lamp off.	The HSDM uses Ring Again to retry the call (Note 7).
15	Called port becomes free.	A STATION NOW AVAILABLE ENTER (CR) Ring Again lamp winks.	HSDM sends BELL characters from terminal.
16	Operate DDN and Ring Again keys in sequence.	CALL CONNECTED SESSION STARTS DDN and Connect lamps on; Ring Again lamp off.	Go to Steps 5 or 11.
Host Busy — No Ring Again			
17	Called host busy.	DDN lamp flashes.	Release DDN key.
Data Autodial active?			Local host only (Note 1)
18	Operate DDN key.		DDN lamp on.
19	Operate Auto Dial key.		The Meridian 1 places the call to the predesignated number. Return to Step 5.

Procedure 1
Keypad dialing (Part 3 of 5)

Step	Action	Prompt/Indicator	Comment
	Speed Calling active?		All speed call numbers must be programmed in database against the user DDN.
20	Operate DDN key. DDN lamp on.		
21	Operate Speed Call key.	Speed Call lamp on.	
22	Enter 1-, 2-, or 3-digit code for the number to be stored.	Speed Call lamp off.	The Meridian 1 places the call to the predesignated number. Return to Step 5.
Call disconnect procedures			
23	Enter a disconnect command to terminate session and to initiate call disconnect by the host terminal.		This causes host to drop DTR and release the connection (Note 9).
	OR		
	Operate the HSDM Release key.		
	OR		
	Operate break key for 1.6 s (asynch only). For terminals with overlapping timed breaks, operate the break key several times.		This method does not work on terminals with nonoverlapping timed breaks.
	OR		
	At the terminal, turn Line/Local to Local, or turn Power switch to Power Off.		

Procedure 1
Keypad dialing (Part 4 of 5)

Step	Action	Prompt/Indicator	Comment
	OR		
	Power down HSDM for about 1.6 s.		
24	Call Disconnect.	CALL RELEASED. DDN lamp off.	The prompt appears only if HSDM is on (Note 10).
Program or modify Autodial			
25	Press Auto Dial key. (Do not press DDN key.)	Auto Dial lamp flashes.	
26	Enter new number.		
27	Press Auto Dial key.	Auto Dial lamp off.	Auto Dial number is changed.
Program or modify Speed Call			
28	Press Speed Call key. (Do not operate DDN key.)	Speed Call lamp flashes.	If lamp does not flash, this station is not a Speed Call Controller and cannot store numbers.
29	Dial 1- to 3-digit access code.		
30	Dial Speed Call number.		Include * and # where necessary.
31	Press Speed Call key.	Speed Call lamp off.	Speed Call List is now updated with entry.

Procedure 1
Keypad dialing (Part 5 of 5)

Step	Action	Prompt/Indicator	Comment
32	Repeat Steps 28-31 to program more numbers.	Use a different access code for each different number.	
Automatic Set Relocation			
33	Press DDN key.	DDN lamp on.	
34	Dial the Special Prefix code plus the set relocation access code 81.		
35	Dial Security code (if required).		
36	Dial 4-digit identification code.		After a few seconds, the DDN lamp goes dark.
37	Unplug HSDM and plug it in at a location equipped with a TN of the same type.		
38	Press Set Reloc key and * key.		This provides an off hook indication.
39	Dial 4-digit identification code.		This must be the same 4-digit code as in Step 36. A 2-second tone is heard, after a slight pause, to indicate that the set has been successfully relocated.
40	Press Set Reloc key and # key.		This provides an on hook indication.

Note 1: The Autodial and Speed Call numbers can be modified from the DTE keypad (Steps 25 through 32) or with a service change to the database.

Note 2: No call progress tones are provided during call setup.

Note 3: If the user wants to abandon the call during the setup stage, operate the Release key.

Note 4: During call setup, there is a limit to the number of characters that can be used. If this limit is exceeded, the HSDM uses only the number it requires.

Note 5: If a remote terminal is calling via the incoming modem pool to multiple hosts, the ADM serving the modems must be set up in the nonautodial (nonhotline) mode and the caller must enter the DN of the called host (Step 12). If the remote terminal is calling a single host, the ADM serving the modem must be set up in the autodial (hotline) mode with the DN programmed to the DN of the called host (skip Step 12).

Note 6: Auto or Manual Answer: The terminal and the HSDM must be powered up with the terminal online. An incoming call is answered automatically or manually by selecting either Auto or Manual mode. When Auto is selected, an incoming call is answered automatically after a single Bell Character sounds.

Note 7: When Ring Again has been placed, no further action should be taken unless the user wants to cancel Ring Again.

Note 8: If Speed Call or Autodial features are denied to the DN, attempts to use them perform no function.

Note 9: For disconnection by a local host, the device (ADM, MCDS) connected to the host must be configured to monitor the data terminal ready (DTR) signal from the host. For disconnection by a remote host, the modem connected to the host must be configured to monitor the DTR signal from the host.

Note 10: When the HSDM is connected to a VT100 terminal, a break on the terminal drops DTR and sends a long break. HSDM does not display a released message. The prompt can be displayed by forcing

DTR on HSDM. When the HSDM is connected to a VT102 terminal, a break on the terminal drops DTR. HSDM does not display a released message unless the call is released from the keypad. When HSDM is associated with a printer, configure the printer for mark and space parity.

Note 11: The call is dropped immediately if SADM calls HSDM, MCDS, or AIM and the baud rate plus parity do not match. The SADM releases the call (after 1 to 2 minutes for low baud rates, for example, 300 bps).

Note 12: When a call is connected between two modules, power failure or removal of power from one data module does not release the connection until the power is restored to the data module.

Note 13: When a modem is reserved (during a call to a remote host) and the remote number is misdialled, operate the release key to release the remote modem (DDN lamp flashes) and then operate the DDN and Release keys to release the reserved modem and the call. This condition applies particularly to synchronous half-duplex operation mode.

Keyboard dialing from the HSDM data station

Keyboard dialing is applicable only to ASCII, asynchronous start stop character mode, interactive terminals equipped with an EIA RS-232-C interface. It is not available for synchronous or block mode terminals.

The HSDM and KBD provide the following capabilities:

- Call origination to local and remote hosts
- Ring Again capability
- Autodial data calling to local hosts
- Speed calling
- Auto Answer (see Note 6 on page 32)
- Manual answering of information calls (see Note 10 on page 33)
- Asynchronous Mode Autobauding. (On initial power up, a default speed, as selected by the Sync speed switch setting, of 1200, 2400, 4800, 9600, or 19200 bps is used. If the switch is not set to any of the five speed settings, HSDM defaults to 9600 bps. Once autobauded, HSDM remembers the current speed and, if not again autobauded, continues to use the speed.)

- Asynchronous Mode Autoparity. The HSDM detects the speed on the carriage-return (<CR>) character. If the parity of the terminal matches the default (8 bit, no parity), HSDM echoes a legible prompt on the screen. If parity does not match, an illegible prompt appears on the screen. When this happens, the user should enter a period (.) and a carriage-return (<CR>) to force the HSDM to detect the parity and to echo a legible prompt on the screen.
- HSDM returns to the default mode
 - When the terminal is powered off and on
 - After Control Z, break, release, DTR off, and call disconnections
- Asynchronous data baud rate of 110, 150, 300, 600, 1200, 2400, 4800, 9600, and 19200 bps
- Synchronous data baud rate of 1200, 2400, 3600, 4800, 7200, 9600, 19200, 38400, 48000, 56000, and 64000 bps
- Two stop-bits for 110 baud and one bit for all other baud rates
- Menu information: HSDM with keyboard dialing is easy to use because the user-friendly prompts guide you through the operating steps. Two menus provide a choice of call or function operation.

The help menu as shown below appears on the screen when the first carriage-return (<CR>) is entered:

ENTER NUMBER OR H (FOR HELP):

The main menu as shown below appears on the screen when H is selected from the help menu:

A—AUTO DIAL	D—DISPLAY
(CR)—AUTO DIAL	S—SPEED CALL
C—CALL	M—MODIFY

The modify menu as shown below appears on the screen when M is selected from the main menu:

A—AUTO DIAL NUMBER	D—DISPLAY
S—SPEED NUMBER	Q—QUIT MODIFY

SELECT:

Each menu item for call setup and display or modify functions is shown separately in this chart.

Miscellaneous information

Ensure that the data terminal is online and that both the terminal and the HSDM are powered on.

User inputs may be in either lowercase or uppercase and must be terminated by a carriage-return (<CR>), enter, or an equivalent command.

The call may be dialed by using the numeric combinations of the keyboard. The asterisk (*) and octothorpe (#) are accepted as is and treated as touch pad items. Illegal characters (for example, spaces) result in an error message Invalid Number.

All inputs are echoed on the terminal screen.

The input may be edited with the backspace (BS) or delete line (DEL) keys, or their equivalents.

All prompts during call setup are in uppercase and are preceded by a line feed. Those that need input are followed by a colon and space while others are followed by a semicolon or carriage-return (<CR>) and line feed.

Use Control Z (while holding down the Control key, press the Z key) if it is necessary to abandon an asynchronous call during call setup.

If the call cannot be completed and the station is not busy, SERVICE UNAVAILABLE CALL RELEASED is the only prompt provided.

If the prompt REENTER is received at any time, return to the Menu.

When the Digit Display feature is assigned to the DN, the digits *nnnn* are displayed as the system sends them.

Procedure 2
Keyboard dialing (Part 1 of 8)

Step	Action	Terminal Echo	Prompt/Indicator	Comment
	Start condition			Data station idle. Terminal and HSDM power on.
1	Enter <CR>.		ENTER NUMBER OR H (FOR HELP):	Go to Step 6 or 10 if a number is to be entered instead of H. If you are familiar with the menu, you may use a command (C, <CR>, A, S, etc.) instead of H. Go to Steps 3, 4, or 5 if MENU command is entered instead of H.
<p>This first (<CR>) also causes the HSDM to autobaud to the SYNC speed switch setting or to the default of 9600 bps or to the previous rate.</p>				
2	Enter H <CR>.		A – AUTO DIAL D – DISPLAY <CR> – AUTO DIAL S – SPEED CALL C – CALL M – MODIFY SELECT:	
3	Data Auto Dial Active?			If Yes, go to Step 22. If not continue (Note 8).
4	Speed Call Active?			If yes, go to Step 23. If not continue (Note 8).
5	Enter C <CR>.	C	ENTER NUMBER:	

Procedure 2
Keyboard dialing (Part 2 of 8)

Step	Action	Terminal Echo	Prompt/Indicator	Comment
Call to local host or smart modem pooling				Go to Step 10 for call to remote host.
6	Enter number xxxx <CR>.	XXXX	CALLING NNNN DDN lamp on.	All numeric input, #, and * are accepted. During call setup all legal user input appears on terminal screen (Note 4). HSDM sends digits to the switch which places call to host. The switch sends digits NNNN back to the HSDM.
7	Called host answers (if busy, see Step 16 or 21).		CALL CONNECTED SESSION STARTS Connect lamp on; Ring Again lamp off.	Data modules perform handshake and data channel becomes transparent (Note 2).
8	Follow login procedures.			Data session begins.
9	Proceed with data session.			Host echoes all typed input. Go to Step 35 for disconnect procedures.
Call to remote host using manual modem pooling				Multiple hosts
10	Enter Modem Number xxxx <CR>.	All digits typed.	Calling NNNN DDN lamp on.	
11	ADM connected to modem answers.		MODEM RESERVED ENTER REMOTE NUMBER:	Modem is reserved (Note 5).
12	Enter remote number digits <CR>.	All digits typed.	CALLING NNNNNNN;	The switch places a call to the remote number.

Procedure 2
Keyboard dialing (Part 3 of 8)

Step	Action	Terminal Echo	Prompt/Indicator	Comment
13	Remote modem answers.		CALL CONNECTED SESSION STARTS Connect lamp on; Ring Again lamp off.	The call is connected. (If busy, go to Step 16 or 21.)
14	Follow login procedures.			Data session begins.
15	Proceed with data session.			Host echoes all typed input. Go to Step 35 for disconnect procedures.
Host Busy — Ring Again Active?				(See Notes 1 and 2)
16	Called host busy.	Number digits	CALLING NNNN BUSY RING AGAIN (Y/N)? Ring Again lamp on.	
17	Enter Y <CR>.	Y	RING AGAIN PLACED RELEASED Ring Again lamp off; DDN lamp off.	The HSDM uses Ring Again to retry the call (Note 7).
18	Enter <CR>.			Necessary to autobaud HSDM.
19	Called port becomes free.		DATA STATION NOW AVAILABLE RING AGAIN (Y/N) Ring Again lamp winks.	If the DTE accepts bell characters, bell in DTE rings.
20	Enter Y <CR>.		DDN lamp on.	The Meridian 1 places call (go to Step 7 or 13).

Procedure 2
Keyboard dialing (Part 4 of 8)

Step	Action	Terminal Echo	Prompt/Indicator	Comment
Host Busy — No Ring Again				
21	Called host busy.		SERVICE UNAVAILABLE CALL RELEASED	
Data Autodial Active?				
22	Enter A <CR> or <CR>.		CALLING NNNN DDN lamp on.	Local host only (Note 1) HSDM sends DDN and Auto Dial indication. The switch places the call to the predesignated number. Return to Step 7.
Speed Calling Active?				
23	Enter S <CR>.	S	ENTER ACCESS CODE:	All speed call numbers must be programmed in database against the user DDN.
24	Enter X <CR>.	X	CALLING N>NNNNNNN DDN lamp on.	HSDM sends DDN and Speed Call Index. Return to Step 7 or 13.

Procedure 2
Keyboard dialing (Part 5 of 8)

Step	Action	Terminal Echo	Prompt/Indicator	Comment
	Display Active?			To display terminal parameters of the user DDN.
25	Enter D <CR>.	D	BAUD RATE (110-9600) = NNN REMOTE LOOPBACK (Y/N)/(CR) = N AUTO DIAL NO = NNN A — AUTO DIAL D — DISPLAY <CR> — AUTO DIAL S — SPEED CALL C — CALL M — MODIFY SELECT:	The baud rate must be manually reset at the DTE (see User Guide). Power down HSDM and DTE (or enter break or drop DTR). Change baud rate at DTE. Power up HSDM and DTE. Enter <CR> to auto baud.
	It may be verified after resetting by autobauding again with <CR> and again using the D command. The other parameters are modified as shown in the following steps.			
	Modify Active?			Used to modify HSDM settings to match terminal parameters.
26	Enter M <CR>.	M	A — AUTO DIAL NUMBER R — REMOTE LOOPBACK S — SPEED NUMBER Q — QUIT MODIFY SELECT:	If you enter A go to Step 27 S go to Step 29 R go to Step 32 Q go to Step 34

Procedure 2
Keyboard dialing (Part 6 of 8)

Step	Action	Terminal Echo	Prompt/Indicator	Comment
Modify Auto Dial				
27	Enter A <CR>.	A	AUTO DIAL NO =	
28	Enter new number <CR>.	New number	A – AUTO DIAL NUMBER R – REMOTE LOOPBACK S –SPEED NUMBER Q – QUIT MODIFY SELECT:	Auto dial number is changed.
				List controller only
29	Enter S <CR>.	S	ENTER ACCESS CODE:	
30	Enter X <CR>.	X	SPEED NUMBER:	
31	Enter new number <CR>.	New number	A – AUTO DIAL NUMBER R – REMOTE LOOPBACK S -SPEED NUMBER Q – QUIT MODIFY SELECT:	New number is set.
Modify Remote Loopback				
32	Enter R <CR>.	R	REMOTE LOOPBACK Y or N <CR>:	
33	Enter Y or N <CR>.	Y or N	A – AUTO DIAL NUMBER R – REMOTE LOOPBACK S -SPEED NUMBER Q – QUIT MODIFY SELECT:	Remote Loopback is Y or N.

Procedure 2
Keyboard dialing (Part 7 of 8)

Step	Action	Terminal Echo	Prompt/Indicator	Comment
Quit Modify				
34	Enter Q <CR>.	Q	A – AUTO DIAL NUMBER R – REMOTE LOOPBACK S -SPEED NUMBER Q – QUIT MODIFY SELECT:	Try any other feature, or place a Data Call.
Call Disconnect Procedure				
35	Enter a disconnect command to terminate session and to initiate call disconnect by the host terminal.			This causes host to drop DTR and release the connection (Note 9).
	OR			
	Operate the HSDM RELEASE key.			
	OR			
	At the terminal, turn Line/Local to Local, or Power switch to Power Off.			
	OR			

Procedure 2
Keyboard dialing (Part 8 of 8)

Step	Action	Terminal Echo	Prompt/Indicator	Comment
	Power down HSDM for about 1.6 s.			
	OR			
	In asynch operation, press the break key for 1.6 s. (For terminals with overlapping timed breaks, press the break key several times.)			
36	Call Disconnect.		CALL RELEASED	The prompt appears only if HSDM is on (Note 11).

Note 1: The Auto Dial and Speed Call numbers can be modified from the keyboard or with a service change to the database. Ring Again can be activated and originated from the terminal keyboard.

Note 2: No call progress tones are provided during call setup.

Note 3: If the user wants to abandon the call during the setup stage, use Control Z (while holding down the Control key, press the Z key).

Note 4: During call setup, there is a limit to the number of characters that can be used in a line. If this limit is exceeded, the HSDM considers the line as invalid input and prompts the user to retype the last line.

Note 5: If a remote terminal is calling via the incoming modem pool to multiple hosts, the ADM serving the modems must be set up in the nonautodial (nonhotline) mode and the caller must enter the DN of the called host (Step 12). If the remote terminal is calling a single host, the ADM serving the modem must be set up in the autodial (hotline) mode with the DN programmed to the DN of the called host (skip Step 12).

Note 6: Auto Answer: The terminal and the HSDM must be powered up with the terminal online. The HSDM Auto Answer switch must be set to On. An incoming call is answered automatically if the HSDM is not in the process of establishing a call or in the Modify Display feature mode. If the terminal is autobauded before the incoming asynchronous call is received (or has a default or previous speed set), mismatching of the baud rate between the incoming call and the local terminal causes the call to be released. If the calling party issues re-down-line-load, HSDM treats it as a new incoming call and gives the appropriate prompts, for example, INCOMING CALL CONNECTED, UNDER TEST, INCOMPATIBLE INCOMING CALL RELEASED, and so on.

(a) Terminal not Autobauded:

Action	Prompt	Comment
Incoming Call	NNNN INCOMING CALL CONNECTED OR NNNN UNDER TEST	NNNN is calling DDN Call is set up even though baud rate does not match. With no match, illegible information is received.

(b) Terminal Autobauded:

Action	Prompt	Comment
Call comes in with matching baud rate.	NNNN INCOMING CALL CONNECTED OR NNNN UNDER TEST	NNNN is calling DDN. Data Call established.
Call comes in mismatching baud rate.	NNNN INCOMPATIBLE INCOMING CALL RELEASED	NNNN is calling DDN. Data call not set up. Cannot transmit data.

Note 7: When Ring Again has been placed, no further action should be taken unless the user wants to cancel Ring Again.

Note 8: If Speed Call or Auto Dial features are denied to the DN, attempts to use them will result (after a pause) in the prompt SERVICE UNAVAILABLE, REENTER.

Note 9: For disconnection by a local host, the device (ADM, MCDS) connected to the host must be configured to monitor the data terminal ready (DTR) signal from the host. For disconnection by a remote host, the modem connected to the host must be configured to monitor the DTR signal from the host.

Note 10: Manual Answer: The terminal and the HSDM must be powered up with the terminal online. The HSDM Manual Answer switch must be set to ON. An incoming call is answered manually from the terminal keyboard by pressing carriage-return (<CR>).

(a) Terminal Autobauded:

Action	Prompt	Comment
Call comes in.	DDN lamp winks. INCOMING CALL ANSWER Y/N?	
Enter Y.	NNNN INCOMING CALL CONNECTED OR NNNN INCOMPATIBLE CALL RELEASED OR NNNN UNDER TEST	NNNN is calling DDN Matching baud rate OR NNNN is calling DDN Mismatching baud rate OR NNNN is calling DDN

Note 11: When the HSDM is connected to a VT100 terminal, a break on the terminal drops the DTR signal and sends a long break. HSDM does not display the released message. The prompt can be displayed by forcing DTR on HSDM. When the HSDM is connected to a VT102 terminal, a break on the terminal drops the DTR signal. HSDM does not display RELEASED MESSAGE unless the call is released from the keypad.

HSDM troubleshooting procedures

If the HSDM does not operate properly, perform the following checks:

- Ensure that the Data Station is ready for data transmission with the proper speed and other parameters set on the terminal.
 - Ensure that the HSDM power supply is plugged in. Operate the force DTR key on the HSDM and verify that the DTR lamp lights. Replace the HSDM if the lamp does not light.
 - The power supply is not a recommended field-replaceable item, and the whole HSDM, including the power supply, should be returned to Northern Telecom for repair.
- Is the data terminal power on and the ON-LINE/OFF-LINE (LINE/LOCAL) switch (if equipped) set to ON-LINE (LINE)?

The call is connected but the station is not sending or receiving data.

- Is the Monitor Send lamp on DTE (if equipped) or the SD lamp on the HSDM flashing while sending data?
- If they do not flash:
 - Ensure that the RS-232 interface cable is properly connected to the HSDM and DTE.
 - Ensure that the ON-LINE/OFF-LINE (LINE/LOCAL) switch is set to ON-LINE (LINE).

The call is connected but illegible characters appear on the screen.

- When calling another data service, ensure that the operating controls of both data devices connected to the switch device match.
- Ensure that the terminal is set so that it does not check parity or that it is set to 8 bits (no parity). If it is set for seven bits, even or odd parity, enter a period (.) and carriage-return <CR> to force HSDM to calculate parity and to provide legible prompts.

If problems occur during call setup, disconnect and attempt to place the call again. Place the call from a regular phone to ensure that the receiving station is working before calling for service.

If pseudorandom pattern 511 data is sent in the idle mode, the keypad is made inoperative. Use the break or release keys to clear the condition.

Specifications

RS-232 interface

When a High Speed Data Module (HSDM) is used as an RS-232 interface unit, the HSDM replaces an Asynchronous/Synchronous Interface Module (ASIM) completely. The HSDM meets the DTE/DCE interface requirements of the EIA RS-232-C standard. The electrical characteristics of the interface to the Data Line Card (DLC) or to a 4-Port Data Line Card (4PDLC) are the same as for the ASIM.

V.35 interface

The HSDM V.35 interface conforms electrically to the CCITT V.35 standard and mechanically to ISO-2110. When HSDM is used as a V.35 interface unit, an adapter cable is needed to convert the ISO-2110 (DB-25) into an ISO-2593 (34-pin rectangular connector).

The HSDM interfaces with the network through a DLC or 4PDCL.

Telephone interface

A standard 500/2500 telephone, SL-1, or digital set may be connected to the phone jack on the rear of the HSDM telephone ([Figure 4 on page 44](#)). This telephone then operates through the HSDM line cord to a standard 500/2500, SL-1, or Integrated Services Digital Line Card (ISDLC) in the system.

The connection to the DLC or 4PDLC is made via a miniature 6-position jack mounted on the rear of the housing labeled “line.” Two wires are used for digital transmission and four wires may be used to connect to a telephone. The module is equipped with a 7-ft (3.1-m) 6-conductor cord that is terminated with miniature 6-position plugs on each end.

The connection to the power supply is made with a 5-conductor cord equipped with a connector that plugs into the main assembly of the HSDM. The power supply is an integral part of the HSDM and cannot be separated.

Synchronous mode

In Synchronous mode, the HSDM transmits data at 1200, 2400, 3600, 4800, 7200, 9600, 14400, 19200, 28800, 38400, 40800, 48000, 56000, or 64000 bits per second (bps). These speeds are selected by the synchronous speed switch setting (see [Figures 2 and 3](#) on [page 8](#)).

Asynchronous mode

In Asynchronous mode, the HSDM transmits data at 110, 150, 300, 600, 1200, 2400, 4800, 9600, or 19200 bits per second (bps). The HSDM selects a default of 1200, 2400, 4800, 9600, or 19200 bps as determined by the synchronous switch setting. If the switch is not set to any of these speeds, a default speed of 9600 bps is selected at the start-up of the HSDM. After start-up, speeds and parity are determined by an autobauding and autoparity routine in the firmware.

Power supply

An external power supply is provided for each HSDM. The power supplies are assembled with the units, and it is not recommended to order them separately.

An optional 220 V/50 Hz powered HSDM (A0318291) is available for the international market.

An optional 100 V/50 Hz powered HSDM (A0336890) is available for the Japanese market.

EIA RS-232 leads

Table 1 shows the EIA leads supported by the HSDM.

Table 1
EIA signals supported by HSDM (Part 1 of 2)

Circuit number		HSDM DB-25	Signal source		Abbrev.	Description
EIA	CCITT	Pin No.	DTE	HSDM		
AA	101	1				Protective Ground *
BA	103	2	X		SD	Transmitted Data
BB	104	3		X	RD	Received Data
CA	105	4	X		RTS	Request to Send
CB	106	5		X	CTS	Clear to Send
CC	107	6		X	DSR	Data Set Ready
AB	102	7		X		Signal Ground
CF	109	8		X	CD	Carrier Detect
		9/10				no connection
SBA	118	11	X			Sec. Trans Data
SBB	119	12		X		Sec. Rec. Data
		13/14				no connection
DB	113	15		X	SCT	Received Data
		16				no connection

Table 1
EIA signals supported by HSDM (Part 2 of 2)

Circuit number		HSDM DB-25	Signal source		Abbrev.	Description
EIA	CCITT	Pin No.	DTE	HSDM		
DD	128	17		X	SCR	Received Clock
		18/19				no connection
CD	108.2	20	X		DTR	Data Terminal Ready
		21				no connection
CE	125	22		X	RI	Ring Indicator
CH/CI	126	23	X			Data Rate Select
DA		24	X			External Transmit Clock
BO		25	X			Busy Out **

* Pin 1 is connected to the MCDS shelf frame.

** Pin 25 is connected to an RS-232 receiver on the HSDM, but is ignored by the HSDM controller.

CCITT V.35 leads

Table 2 shows the CCITT V.35 leads supported by the HSDM. An adapter cable is needed to convert the ISO-2110 (DB-25) into an ISO-2593 (34-pin cable).

Table 2
V.35 CCITT signals supported by HSDM (Part 1 of 2)

V.35 CCITT	HSDM DB-25 Pin No.	Abbrev.	Adapter cable		Signal Source		Description
			DB-25 Pin No.	V.35 Pin No.	DTE	HSDM	
101	1	DG	1	A			Protective Ground *
103A	2	SDA	2	P	X		Transmit Data A
104A	3	RDA	3	R		X	Receive Data A
105	4	RTS	4	C	X		Request to Send
106	5	CTS	5	D		X	Clear to Send
107	6	DSR	6	E		X	Data Set Ready
102	7	S	7	B			Signal Ground
109	8	CD	8	F		X	Carrier Detect
—	9/10	—	9/10	CC/L			no connection
—	11	—	11	K	X		**
115B	12	SCRB	12	X		X	Serial Clock Receive B
103B	13	SDB	13	S	X		Transmit Data B
114B	14	SCTB	14	AA		X	Serial Clock Transmit B
114A	15	SCTA	15	Y		X	Serial Clock Transmit A
104B	16	RDB	16	T		X	Receive Data B

Table 2
V.35 CCITT signals supported by HSDM (Part 2 of 2)

V.35 CCITT	HSDM DB-25 Pin No.	Abbrev.	Adapter cable		Signal Source		Description
			DB-25 Pin No.	V.35 Pin No.	DTE	HSDM	
115A	17	SCRA	17	V		X	Serial Clock Receive A
—	18/19	—	18/19	M/HH			no connection
108.2	20	DTR	20	H	X		Data Terminal Ready
—	21	—	21	EE			no connection
125	22	RI	22	J		X	Ring Indicator
113B	23	SCTEB	23	W	X	X	Tran Sign Elemt Time B
113A	24	SCTEA	24	U	X	X	Tran Sign Elemt Time A
—	25	—	25	MM	X		**

* Pin 1 is connected to the MCDS shelf frame.

** These leads are ignored by the HSDM controller.

The HSDM may be placed as far from its associated data terminal or computer port as is consistent with EIA RS-232 or V.35 lead specifications.

Power requirements

The HSDM is powered from an external power supply. The power requirements are as follows:

Voltage	Tolerance	Current	
		Nominal	Maximum
+5 V dc	±5%	1.0 amp	0.8 amp
+12 V dc	±10%	0.2 amp	85 mA
-12 V dc	±10%	0.2 amp	35 mA

A total of 1.0 A is required from the 110 V ac power receptacle.

Environmental

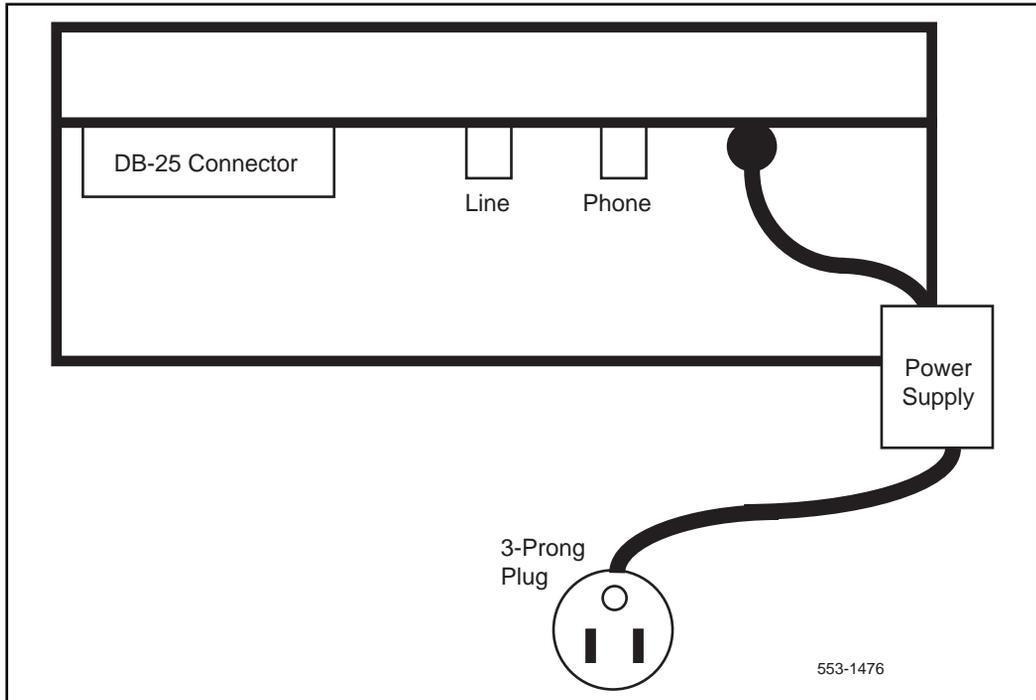
The HSDM is designed to operate without degradation under the following conditions:

Specification	Operating	Storage
Ambient Temperature	0° to 40°C	-40° to 70°C
Relative Humidity (noncondensing)	5% to 85%	0% to 95%

Reliability

The HSDM has a predicted mean time between failures (MTBF) of 10 years at 40 °C.

Figure 4
High Speed Data Module Rear View



Specifications

RS-232 interface

When a High Speed Data Module (HSDM) is used as an RS-232 interface unit, the HSDM replaces an Asynchronous/Synchronous Interface Module (ASIM) completely. The HSDM meets the DTE/DCE interface requirements of the EIA RS-232-C standard. The electrical characteristics of the interface to the Data Line Card (DLC) or to a 4-Port Data Line Card (4PDLC) are the same as for the ASIM.

V.35 interface

The HSDM V.35 interface conforms electrically to the CCITT V.35 standard and mechanically to ISO-2110. When HSDM is used as a V.35 interface unit, an adapter cable is needed to convert the ISO-2110 (DB-25) into an ISO-2593 (34-pin rectangular connector).

The HSDM interfaces with the network through a DLC or 4PDCL.

Telephone interface

A standard 500/2500 telephone, SL-1, or digital set may be connected to the phone jack on the rear of the HSDM telephone ([Figure 4 on page 44](#)). This telephone then operates through the HSDM line cord to a standard 500/2500, SL-1, or Integrated Services Digital Line Card (ISDLC) in the system.

The connection to the DLC or 4PDLC is made via a miniature 6-position jack mounted on the rear of the housing labeled “line.” Two wires are used for digital transmission and four wires may be used to connect to a telephone. The module is equipped with a 7-ft (3.1-m) 6-conductor cord that is terminated with miniature 6-position plugs on each end.

The connection to the power supply is made with a 5-conductor cord equipped with a connector that plugs into the main assembly of the HSDM. The power supply is an integral part of the HSDM and cannot be separated.

Synchronous mode

In Synchronous mode, the HSDM transmits data at 1200, 2400, 3600, 4800, 7200, 9600, 14400, 19200, 28800, 38400, 40800, 48000, 56000, or 64000 bits per second (bps). These speeds are selected by the synchronous speed switch setting (see [Figures 2 and 3](#) on [page 8](#)).

Asynchronous mode

In Asynchronous mode, the HSDM transmits data at 110, 150, 300, 600, 1200, 2400, 4800, 9600, or 19200 bits per second (bps). The HSDM selects a default of 1200, 2400, 4800, 9600, or 19200 bps as determined by the synchronous switch setting. If the switch is not set to any of these speeds, a default speed of 9600 bps is selected at the start-up of the HSDM. After start-up, speeds and parity are determined by an autobauding and autoparity routine in the firmware.

Power supply

An external power supply is provided for each HSDM. The power supplies are assembled with the units, and it is not recommended to order them separately.

An optional 220 V/50 Hz powered HSDM (A0318291) is available for the international market.

An optional 100 V/50 Hz powered HSDM (A0336890) is available for the Japanese market.

EIA RS-232 leads

Table 1 shows the EIA leads supported by the HSDM.

Table 1
EIA signals supported by HSDM (Part 1 of 2)

Circuit number		HSDM DB-25	Signal source		Abbrev.	Description
EIA	CCITT	Pin No.	DTE	HSDM		
AA	101	1				Protective Ground *
BA	103	2	X		SD	Transmitted Data
BB	104	3		X	RD	Received Data
CA	105	4	X		RTS	Request to Send
CB	106	5		X	CTS	Clear to Send
CC	107	6		X	DSR	Data Set Ready
AB	102	7		X		Signal Ground
CF	109	8		X	CD	Carrier Detect
		9/10				no connection
SBA	118	11	X			Sec. Trans Data
SBB	119	12		X		Sec. Rec. Data
		13/14				no connection
DB	113	15		X	SCT	Received Data
		16				no connection

Table 1
EIA signals supported by HSDM (Part 2 of 2)

Circuit number		HSDM DB-25	Signal source		Abbrev.	Description
EIA	CCITT	Pin No.	DTE	HSDM		
DD	128	17		X	SCR	Received Clock
		18/19				no connection
CD	108.2	20	X		DTR	Data Terminal Ready
		21				no connection
CE	125	22		X	RI	Ring Indicator
CH/CI	126	23	X			Data Rate Select
DA		24	X			External Transmit Clock
BO		25	X			Busy Out **

* Pin 1 is connected to the MCDS shelf frame.

** Pin 25 is connected to an RS-232 receiver on the HSDM, but is ignored by the HSDM controller.

CCITT V.35 leads

Table 2 shows the CCITT V.35 leads supported by the HSDM. An adapter cable is needed to convert the ISO-2110 (DB-25) into an ISO-2593 (34-pin cable).

Table 2
V.35 CCITT signals supported by HSDM (Part 1 of 2)

V.35 CCITT	HSDM DB-25 Pin No.	Abbrev.	Adapter cable		Signal Source		Description
			DB-25 Pin No.	V.35 Pin No.	DTE	HSDM	
101	1	DG	1	A			Protective Ground *
103A	2	SDA	2	P	X		Transmit Data A
104A	3	RDA	3	R		X	Receive Data A
105	4	RTS	4	C	X		Request to Send
106	5	CTS	5	D		X	Clear to Send
107	6	DSR	6	E		X	Data Set Ready
102	7	S	7	B			Signal Ground
109	8	CD	8	F		X	Carrier Detect
—	9/10	—	9/10	CC/L			no connection
—	11	—	11	K	X		**
115B	12	SCRIB	12	X		X	Serial Clock Receive B
103B	13	SDB	13	S	X		Transmit Data B
114B	14	SCTB	14	AA		X	Serial Clock Transmit B
114A	15	SCTA	15	Y		X	Serial Clock Transmit A
104B	16	RDB	16	T		X	Receive Data B

Table 2
V.35 CCITT signals supported by HSDM (Part 2 of 2)

V.35 CCITT	HSDM DB-25 Pin No.	Abbrev.	Adapter cable		Signal Source		Description
			DB-25 Pin No.	V.35 Pin No.	DTE	HSDM	
115A	17	SCRA	17	V		X	Serial Clock Receive A
—	18/19	—	18/19	M/HH			no connection
108.2	20	DTR	20	H	X		Data Terminal Ready
—	21	—	21	EE			no connection
125	22	RI	22	J		X	Ring Indicator
113B	23	SCTEB	23	W	X	X	Tran Sign Elemt Time B
113A	24	SCTEA	24	U	X	X	Tran Sign Elemt Time A
—	25	—	25	MM	X		**

* Pin 1 is connected to the MCDS shelf frame.

** These leads are ignored by the HSDM controller.

The HSDM may be placed as far from its associated data terminal or computer port as is consistent with EIA RS-232 or V.35 lead specifications.

Power requirements

The HSDM is powered from an external power supply. The power requirements are as follows:

Voltage	Tolerance	Current	
		Nominal	Maximum
+5 V dc	±5%	1.0 amp	0.8 amp
+12 V dc	±10%	0.2 amp	85 mA
-12 V dc	±10%	0.2 amp	35 mA

A total of 1.0 A is required from the 110 V ac power receptacle.

Environmental

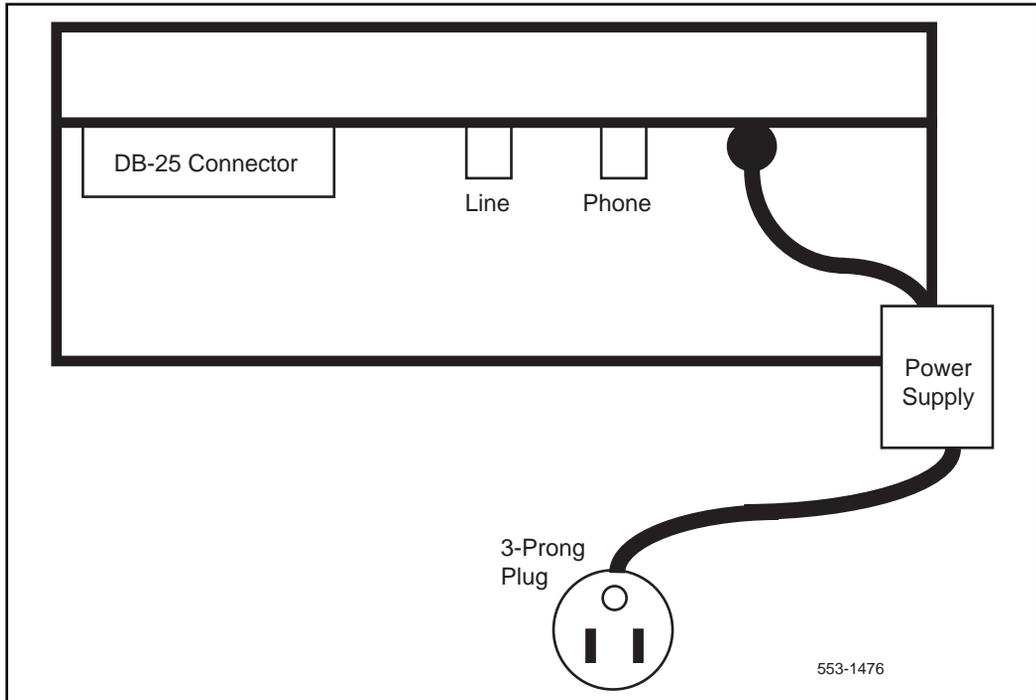
The HSDM is designed to operate without degradation under the following conditions:

Specification	Operating	Storage
Ambient Temperature	0° to 40°C	-40° to 70°C
Relative Humidity (noncondensing)	5% to 85%	0% to 95%

Reliability

The HSDM has a predicted mean time between failures (MTBF) of 10 years at 40 °C.

Figure 4
High Speed Data Module Rear View



Installation

Hardware configuration

[Procedure 3 on page 53](#) details the materials and describes how to install the HSDM. It details the connection between the HSDM and the DLC.

[Procedure 4 on page 55](#) describes how to remove the HSDM.

For the V.35 interface configuration, a 10-pin DIP jumper plug inside the HSDM must be removed from the RS-232-C socket and installed in the V.35 socket. These sockets are located on the QPC824, the main circuit board inside the HSDM. [Figure 5](#) shows the locations of these two sockets.

The HSDM is shipped from the factory configured for the RS-232 interface. The HSDM should be configured for the V.35 interface only in the field at installation time.

Adapter cable

An adapter cable is also needed to convert from the ISO-2110 connector to an ISO-2593 (34-pin connector). [Figures 6 and 7](#) show the details and the connection of the adapter cable. An extension cable could be added to the length of the adapter cable as shown in [Figure 7](#).

- A DTE equipped with female ISO-2593 requires adapter cable number A0300752.
- A DTE equipped with male ISO-2593 requires adapter cable number A0300753.

Figure 5
V.35 and RS-232 socket location on the QPC824

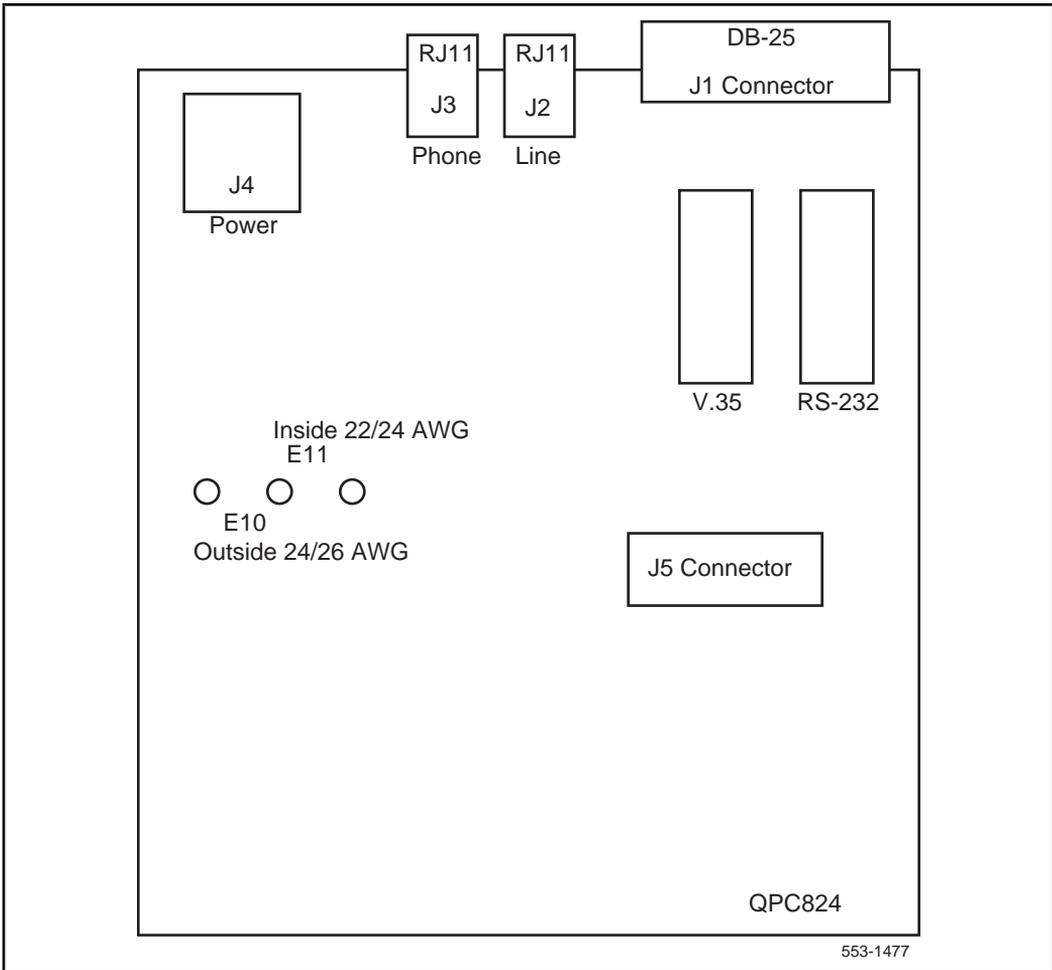


Figure 6
QMT21 with adapter cable for V.35

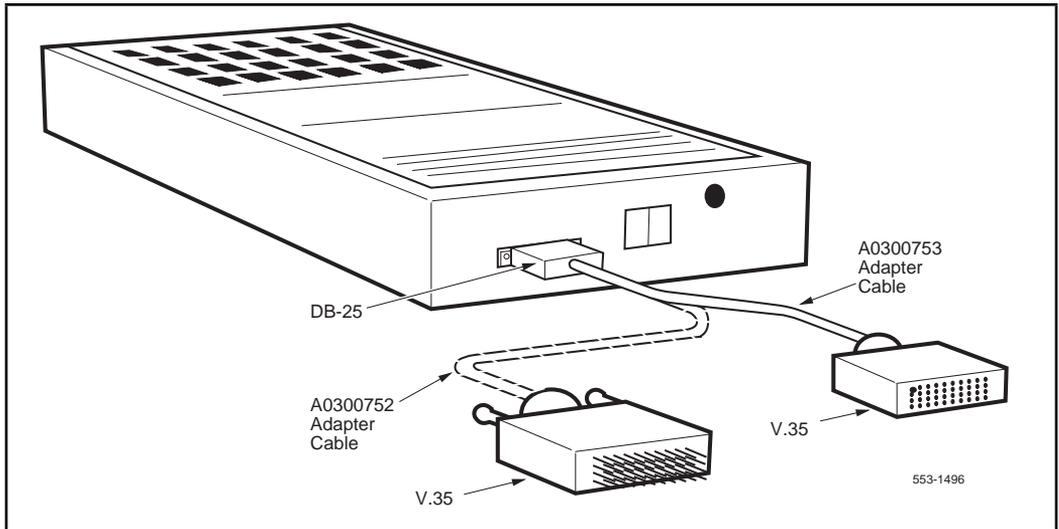
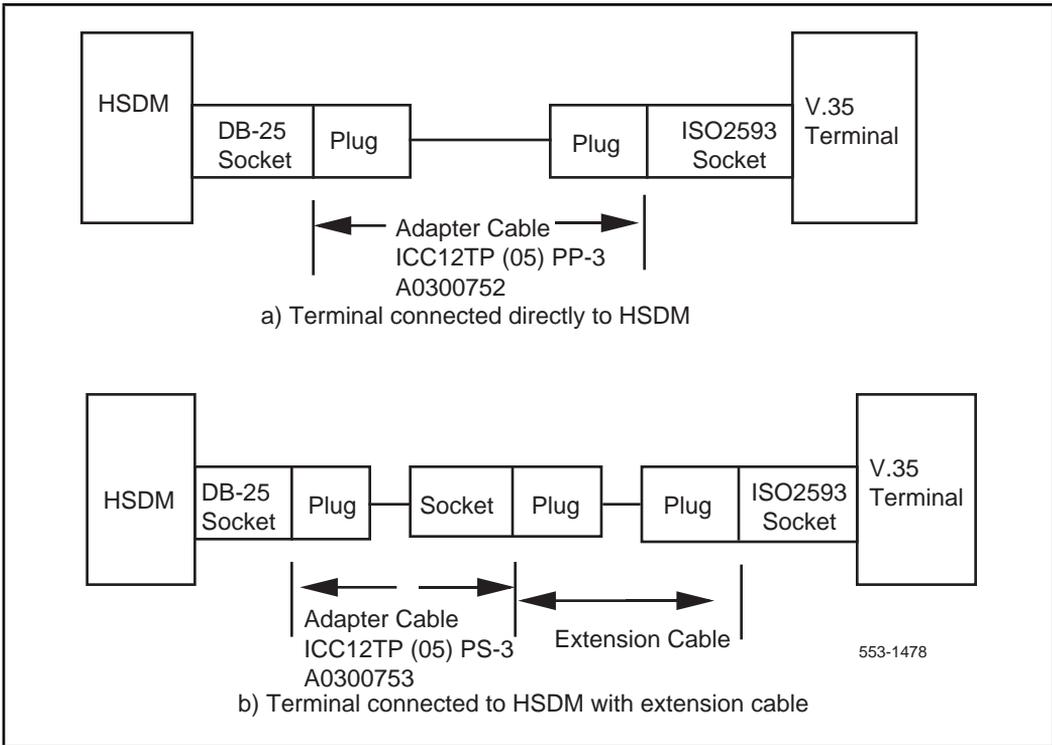


Figure 7
QMT21 with adapter cable connection for V.35



Wire gauge setting

A jumper inside the HSDM is provided to select 22/24-gauge inside wire or 26-gauge outside wire (see **Figure 5** for the locations of the straps).

Designation	Setting
E10, E11	E11 (inside 22/24 AWG) E10 (outside 24/26 AWG)

Cabling

The physical capacities and provisioning requirements of data feature hardware must be met upon installation. **Table 3** lists cabling and environmental requirement and limitations. All hardware is installed using basic installation tools.

Table 3
Cabling capabilities

Allowable cabling	Type D PVC inside wiring cable PIC for outside use only		
Maximum separation distances			
HSDM to DTE	Distance consistent with EIA RS-232 cable loading specifications.		
	Note that in some cases the above limitations may be exceeded with no adverse effect on HSDM operation.		
Distance (by cable type)			
HSDM to DLC	PIC outside	PVC inside	Gauge
	4000 ft. (1220 m)	4000 ft. (1220 m)	22 AWG
	3500 ft. (1070 m)	2900 ft. (884 m)	24 AWG
	2000 ft. (610 m)		26 AWG
	2500 ft. (760 m)	2500 ft. (760 m)	22/24 mixed
	1500 ft. (460 m)	1200 ft. (370 m)	24/26 mixed

DTE interface

The HSDM provides a 25-pin connector that conforms to ISO-2110 mounted in the rear on the housing.

Note 1: If an RS-232C cable is used to connect the HSDM to an ADM3 terminal, pin 22 should be disconnected. If a full RS-232-C cable is used without pin 22 disconnected, the ADM3 goes into test mode.

Note 2: When the HSDM is connected to a VT100 terminal, a break on the terminal drops the DTR signal and sends a long break. The HSDM does not display RELEASED MESSAGE. The prompt can be displayed by forcing DTR on the HSDM.

Note 3: When the HSDM is connected to a VT102 terminal, a break on the terminal drops the DTR signal. The HSDM does not display RELEASED MESSAGE. The prompt is displayed if the call is released from the keypad.

Note 4: If pseudorandom pattern 511 data is sent in the idle mode, keypad dialing is made inoperative. Use the break or release keys to clear the condition.

Configuration

Hardware provisioning capacities follow:

QTY	Item	Comments
1	HSDM	Each HSDM is connected to a data port of a DLC or a 4PDLC.
2	HSDM terminating on each DLC	TN must be L-S-C-1 and/or L-S-C-3 for QPC311 or could be L-S-C-0, 1, 2, or 3 for QPC432.

Field-replaceable items

Field-replaceable items are listed in [Table 4](#).

The related hardware is installed in different basic configurations with equipment allocated as follows:

- 1 QMT21 HSDM
- 1 DLC or 4PDLC port
- 1 (Note) NE 25MQA2A (A0237451) RS-232 cable (HSDM – DTE)
- 1 NPS50318-L1, 6-conductor Teladapt cord (HSDM – DLC)

Note: If the HSDM is specifically configured for V.35 interface, an adapter cable is needed (see [Figures 6 and 7](#)).

- Plug-to-plug adapter cable ICC12TP (05) PP-3, 5 ft (1.5 m), A0300752
- Plug-to-socket adapter cable ICC12TP (05) PS-3, 5 ft (1.5 m), A0300753

Table 4
Field-replaceable/orderable items

Items	CPC number
High Speed Data Module (HSDM) (110 V ac, 60 Hz)—QMT21A	A0342672
HSDM (220 V ac, 50 Hz)—QMT21A1	A0347343
HSDM (100 V ac, 50 Hz)—QMT21A2	A0347344
RS-232 Cord Assembly, 16 ft. (4.8 m) HSDM to DTE (NE-25MQ2A)	A0237451
NE D4B4-87, 7 ft. (2 m)—Telephone to HSDM	A0248297
NPS50318—HSDM to wall jack, 7 ft. (2 m)	A0301005
Adapter cable to HSDM (Plug to plug) ICC12TP (05) PP-3, 5 ft. (1.5 m)	A0300752
Adapter cable to HSDM (Plug to socket) ICC12TP (05) PS-3, 5 ft. (1.5 m)	A0300753

Service change

The SL-1 recognizes the HSDM port as an SL-1 telephone set; the DLC and 4PDLC as an SL-1 line card. LD11 is used to enter the DATA hardware information into the office memory.

Installing and removing the HSDM

Installation and removal procedures are provided in detail in [Procedure 3](#) and [Procedure 4](#). The HSDM can be disconnected from the network by disabling the port in the database with LD32.

Installation and removal procedures

The following materials are required for this procedure:

- QMT21 equipped with an external power supply.
- DLC or one 4PDLC port
- NE D4B4 cord to connect telephone to HSDM (optional)
- NPS50318-L1 line cord HSDM to wall jack (supplied with HSDM)
- NE 25MQA2A cord HSDM to DTE (Note 2)

Note 1: Locate the HSDM close to the terminal.

Note 2: To connect the HSDM to an ADM3 terminal, use an RS-232 cable without pin 22. If a full RS-232 cable with pin 22 is used, the ADM3 goes into test mode.

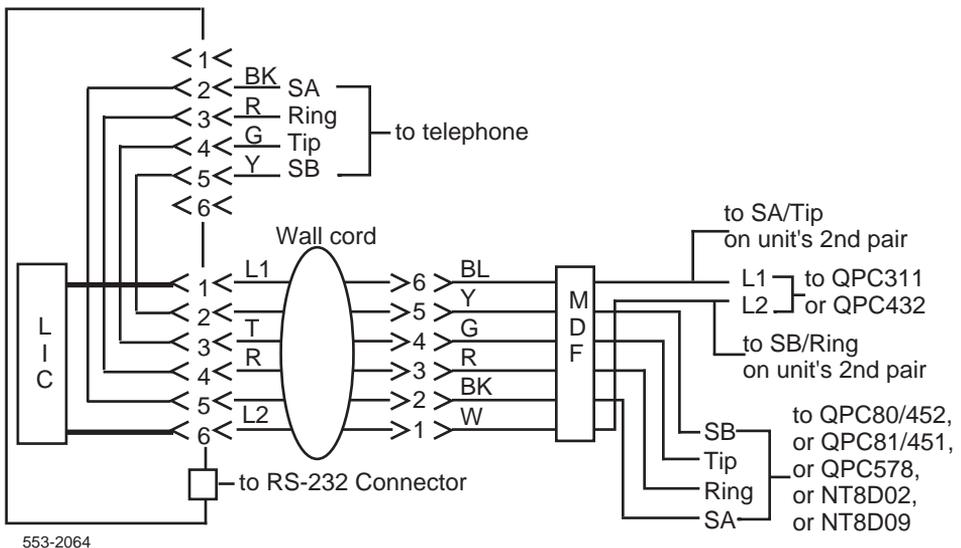
Note 3: QMT21 to QMT8 connections exhibit excessive errors at 19.2 kbps in the asynchronous mode. It is recommended that only QMT21 to QMT21 or QMT8 to QMT8 configurations be used when operating at 19.2 kbps.

Note 4: QMT21 to QMT7 connections exhibit excessive errors at 9.6 kbps in the asynchronous mode. It is recommended that QMT8 be used instead of QMT7 for this configuration.

Note 5: The QPC432 is wired out as an eight-unit card. However, only the first four units are available.

Procedure 3
Installing the HSDM (Part 1 of 3)

Step	Procedure	Reference
1	Ensure that the HSDM is not powered up.	
2	Connect one end of the supplied 7-ft (2.1 m) 6-conductor cord to the miniature line jack closest to the RS-232 connector on the rear of the HSDM. (The supplied cord is terminated at each end with a miniature 6-position plug.)	
3	Connect the other end through house wiring or cabling to the DLC data port. (See sketch and ensure that the wire continuity is maintained.)	



Note: For SA and SB connections, the QPC311 supports data connections on ports 1 and 3. The QPC432 supports data connections on ports 0, 1, 2, and 3.

- 4 Use an RS-232 NE-25MQA2A cable or a V.35 adapter cable to connect the female connector on the rear of HSDM to a supplied DTE.

Procedure 3
Installing the HSDM (Part 2 of 3)

Step	Procedure	Reference
5	If a telephone is to be associated with the HSDM, use a 4-conductor NE D4B4 cord to connect it to the miniature phone jack on the rear of the HSDM.	Figure 4
6	Verify that the external power supply is attached to the HSDM (via the 5-conductor power cord that exits from the rear of the HSDM).	Figure 4
7	Install DLC in the PE shelf.	
8	Make the MDF cross-connections and ensure that the pin numbers are correctly connected. Connect the talking pair in the usual manner. Note: There should be no bridge taps, and so on the line.	
9	Designate the cross-connections.	
10	Use LD11 to update system memory for the HSDM or the DLC.	<i>X11 input/output guide</i> (553-3001-400)
	Note: Ensure that the following restrictions are observed.	
	WTD Warning Tone Denied	
	Key 0 DN	
	Key 1 Secondary DN (Required only for modem pool dialing.)	
	Key 2 * Call Transfer (optional)	

Procedure 3
Installing the HSDM (Part 3 of 3)

Step	Procedure	Reference
	Key 3 ** Dial Calling (optional)	
	Key 4 Again (optional)	
	Key 6 Speed Call (optional)	
	Key 7 *** Display (DSP) (optional)	
	Key 9 RLS	
	* Key 2 is required to provide access to a manual outbound modem pooling.	
	** Key 3 is required to operate the autodial or the Hot Line feature.	
	*** DSP requires the class of service be updated to DDS or ADD.	
11	Plug the power supply into a commercial 110 V ac outlet.	
12	Test the HSDM.	Procedure 1

Procedure 4
Removing the HSDM

Step	Procedure	Reference
1	Use overlay 32 to disable the port connected to the HSDM.	
2	Unplug and disconnect the power supply.	
3	Remove the connections from the HSDM to the Meridian 1 equipment telephone DTE	Procedure 3 Step 3
4	Remove the HSDM.	
5	Pack and ship the equipment.	

Meridian 1

QMT21 High Speed Data Module

Description, installation, and
operation

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