SubMenu

NOKIA

Hardware Configuration Management

Contents

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Summary of changes

Changes between document issues are cumulative. Therefore, the latest document issue contains all changes made to previous issues.

Changes made between issues 11 and 10a

Information on Gb over IP feature removed.

Changed CCS7 to SS7.

Added examples to Creating units for a CLAB and an SBUS, Creating a unit for a BCSU and Creating a plug-in unit for a BCSU.

Changed CP550_b to CP710_A.

Editorial corrections.

Changes made between issues 10a and 10

Layout corrections.

Changes made between issues 10 and 9

The document has been updated because of changes due to the BSC3i

- Subsection Hardware coordinates has been added to section Introduction to hardware configuration management
- Subsection Configuring Fan Trays for a BSC3i has been added to section Configuring a BSC or BSC3i
- Information on PCU-B and Gb over IP feature, as well as restrictions concerning AS7 and CCS7, have been added to subsection Configuring BSCUs

In addition, minor content changes have been made in sections

- Adding racks, cartridges, plug-in units and functional units
- Deleting racks or cabinets, cartridges, plug-in units, and functional units
- Changing plug-in unit(s)

Changes in other sections are editorial.

Changes made between issues 9 and 8

ANSI and ETSI versions have been combined, ANSI information added into this document. Due to removing of the *Hardware Configuration Management*, Functional Description, relevant information has been moved into this document.

The document has been revised throughout to comply with the latest documentation standards.

Changes made between issues 8 and 7

Changes due to GPRS

Due to the feature BSS9006: GPRS and the new PCU plug-in unit, references to the Operating Manual *GPRS Handling in BSC* have been added where hardware configuration management coincides. Such an instance is the configuring and connection of BCSU. In addition, in the WUC command the user has the option of choosing the Gb interface while connecting the ET.

As an additional change the WDDC track numbering in *Configuring of I/O devices* has been corrected.

1 Introduction to hardware configuration management

At the initial building and commissioning stage of an exchange, the customer needs services which enable him to build a site-specific hardware configuration around "the core exchange". These services are also needed during the operation of the exchange, for example, when capacity is increased or when new facilities are taken into use. These services are provided by hardware configuration management that is used to parameterise the hardware data into the basic software of the exchange. The software build usually contains data corresponding to the hardware delivered at the same time.

Hardware configuration management concerns the creating and deleting of racks or cabinets, cartridges, functional units, and plug-in units, as well as listing the configuration data. It also has to do with the connecting and disconnecting of functional units and time-slot-based plug-in units (for example ET and AS7), and thus the administration of the circuit groups, and D-channel of a plug-in unit. The handling of wired alarms is also closely related to hardware configuration management.

A related feature is BSS7200: Transcoder Configuration.

1.1 Hardware configuration management MML commands

Hardware configuration management provides the operator with services through an MML interface. The operator gives certain parameters to the MML commands on the basis of which the MML program writes the required hardware data to the databases of the exchange. The hardware configuration data is used, for example, by the fault diagnosis function, the recovery function, the alarm function and the maintenance supervision function.

With the recovery commands, the user can shift the unit created by means of the hardware configuration management commands into working state TE (Test). The unit can then be tested by running the fault diagnosis test programs. When the unit is found to be in working order, it is shifted into the active working state.

The hardware configuration MML commands belong to the System Configuration Administration command class W. The command groups are Equipment Management (WT), Unit Connections Handling (WU), Internal PCM Circuits Configuration (WI), and Wired Alarm Connections Handling (WA). In addition, commands from several other command groups are needed in relation to certain tasks.

When the capacity is increased, the new units are usually connected in the following order:

- installation of the hardware
- creation of the hardware configuration
- creation of necessary connections
- shifting of the unit into working state TE (Test)
- running of the fault diagnosis programs
- shifting of the unit into the active working state

The actual installation of hardware can also take place after the creation of the hardware configuration, as the new unit is always automatically shifted into working state SE-NH (Separated-No Hardware), when the hardware configuration is created. Neither recovery measures nor traffic control measures can be directed at the unit which is in working state SE-NH.

Equipment Management (command group WT)

You can use the commands of the Equipment Management MML to create and delete the equipment descriptions of

- racks or cabinets
- cartridges
- functional units
- plug-in units

With the commands you can also interrogate about equipment data in the Equipment Database (EQUIPM).

The equipment data of the cartridge is updated in the EQUIPM. For functional units the data is updated in the EQUIPM and in the Working State and Configuration File (SCDFLE). The equipment data of a plug-in unit is updated in the EQUIPM and in the PCM Configuration File (PCMCON).

The `WTF` and `WTG` commands are not in use in the BSC. Refer to *Equipment Management* for more information on the use of the commands.

Unit Connections Handling (command group WU)

Connecting a unit means using MML commands to connect a plug-in unit equipped with a PCM interface to serve as a part of the hardware so that the unit can be identified by the BSC software. Moreover, this means that once the unit has been connected, it can be used by some other service block feature.

The Unit Connections Handling (UNICON) consists of configuration handling MML commands that you can use to create a connection description of a functional unit in a system file or a database, or to remove an existing description.

Thus you administer circuit groups, connections, and D-channels of a plug-in unit with the commands of the command group WU.

The UNICON updates several file groups located in several units. If the update chain breaks during the updating of a file group, the user is notified which updating procedures were not completed. Using this above information, it is possible — by means of other commands — to restore the condition prevailing before command execution.

The UNICON uses the Equipment Database (EQUIPM).

The general initial conditions of MML programs apply to the Unit Connections Handling commands. The commands are used to modify several files in several units, so in order to ensure the successful execution of the commands, the modifications should be performed during low-traffic hours.

Refer to *Unit Connections Handling* for more information on the use of the commands.

Internal PCM Circuits Configuration (command group WI)

An internal PCM circuit of an exchange is a PCM circuit that connects, for example, two time-slot-based plug-in units.

The functions of the Internal PCM Circuits Configuration (INTPCM) enable you to interrogate and output data on PCM circuits connected to switching networks — either all circuits in use or PCM circuits controlled by a specified computer unit or program block, or both. You can, for example, check to which interface an ET is connected, or which BCSU is controlling it, or which PCMs are free to connect to.

The INTPCM uses the PCM Configuration File (PCMCON).

Refer to *Internal PCM Circuits Configuration* for more information on the use of the commands.

Wired Alarms Connections Handling (command group WA)

You can use the Wired Alarms Connections Handling commands to

- open or close an alarm input
- modify the parameters of an alarm input
- print the alarm parameters of alarm connections and inputs
- create and remove external alarms
- modify the device type or alarm text of external alarms
- print the external alarms
- test the alarms of a cartridge(s) or all the hardware alarms of a rack or cabinet

In the cartridge construction wired alarms are defined with the commands of the command group WT when the cartridge and rack are created.

In the cartridge construction the MML program can be used only to define external alarms. The cartridge construction alarms are wired to the HWAT plug-in unit of the OMU. The alarms are configured in the normal working state of the OMU.

Alarms can be tested with the MML program, although external alarms cannot be tested with MML commands.

Refer to *Wired Alarms Connections Handling* for more information on the use of the commands.

1.2 Hardware capacity

The capacity of an exchange can be increased or, during the operation of an exchange, new features can be taken into use in a controlled manner by means of hardware configuration management and other maintenance functions. New units can be installed into the existing hardware without running the risk of functional disturbances in the traffic-transmitting part of the exchange. In this case, hardware redundancy makes it possible for the operator to install the hardware of a new unit first into the control part which is separated from the normal operation by software management. This is necessary, for instance, when processor units are connected to the message bus.

In general, hardware extensions can be made at any time. However, major configuration modifications cause complicated file update and file distribution operations in several different units. In some cases, these operations may temporarily decrease the performance of an exchange.

The commands of a given command group can simultaneously be executed from one MML session only. The data is updated on the disk immediately after the execution of a command. At the initial building and commissioning phase of an exchange it is often necessary to use command mass processing.

1.3 Hardware error conditions

When a command is entered, the syntax analyser of the MMI system verifies that the parameters entered are correct. Before allowing the command to be executed, the MML program itself performs some verifications. For instance, it verifies whether the unit already exists or whether a control unit is found in the configuration.

As a general rule, the creation of faulty configurations is possible, because, depending on the application field and the circumstances, different hardware configurations are allowed. However, the system guides the user to create hardware configuration appropriate to the hardware release description.

The hardware configuration data is stored in the Equipment Database and in several files.

The hardware configuration management programs update the configuration data phase by phase in the files and in the databases. If a phase ends up producing an error, the cause of the error is output. After this, the modifications performed during the operation in question are cancelled and the situation is restored to the level preceding the entered command.

In the file updating phase, when all the preceding phases have succeeded, the data is written on the disk. The database transactions are updated directly on the disk.

However, if the cancel function returns an error acknowledgement, the cancellation is discontinued and the operator receives a corresponding error notice and a list of the operations that had been made before the error.

1.4 Hardware coordinates

The WT command group uses hardware coordinates as parameters. The figure below shows the coordinate system in cabinets.

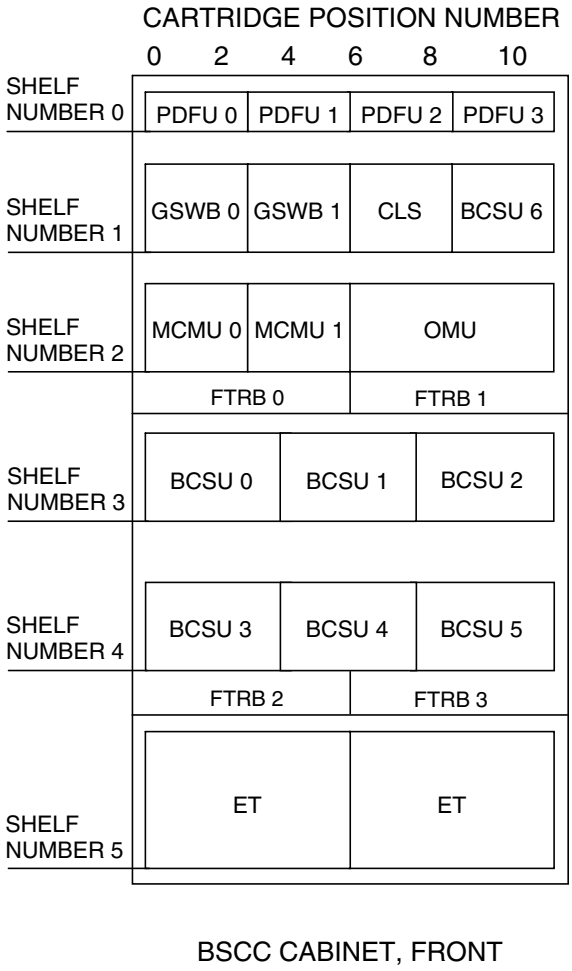

Figure 1. Hardware coordinates in cartridge construction

In the BSC3i, M98 hardware mechanics is used. The cabinet in the figure is a BSCC. Its coordinate is 1A, where 1 indicates the cabinet row and A indicates the cabinet position. The shelves are numbered from 0 to 5, from the top down, and cartridge positions from 0 to 10 from left to right on each shelf.

The cartridge marked in the figure, on shelf 1, then occupies position 1A001–00. This position can also be marked 1A1–0. Both formats can be used in the equipment management commands.

In racks the shelves are not numbered. Instead, vertical coordinates are marked as the height of the lower edge of the shelf. There is a scale on the rack frame where numbering starts from 0 at the bottom of the rack.

Note

The command examples in the instructions use coordinates of both equipment levels and they are given as examples only.

For more information on the BSC3i, refer to BSC3i Product Description.

1.5 General preconditions for configuring a BSC

Take the following general preconditions into consideration before you start to configure a new BSC configuration or to modify an existing configuration.

1. Have the following documents available:
   - Site-specific Documents: Equipment List, Interconnection cables, Use of PCM Links in GSWB, Additional Wiring Instructions, DX 200 BSC Strappings of Plug-in units and location of read-only memory circuits
   - BSC Commissioning Manual and TCSM Commissioning Manual
   - List of the message bus addresses according to the extent of the work. (See Message bus addresses)
   - Engineering of BSC, Engineering Descriptions
   - In addition to the above, make sure that you have access to the instructions and references in the BSC library.
2. Note that you have options in the order of installing hardware and software.

   The recommended option is that you install the hardware before starting the software operations.

   The other option is to enter all creation and deletion commands without the hardware, provided that the concerned functional units are out of use. This means they are in the state Separated-No Hardware (SE-NH). Before you change the working state from SE-NH to another, you must install the hardware.
3. Note the following configuration requirements:

   When you are creating racks or cabinets, cartridges, and functional units (command group WT), the minimum configuration consists of the OMU.

The commands work even when the OMU is in the test state. However, when the OMU is in the test state, equipment management is allowed only in situations where incorrectly created equipment has caused a state change. As soon as you have removed the incorrectly created equipment, change the state of the OMU to WO-EX before continuing the creation of the equipment.

When you are creating a functional plug-in unit, you also need the MCMU to update the PCMCON.

Do not create a trial configuration when you create or delete equipment with the commands of the command group WT. For more information refer to Software configuration management overview in Software Configuration Management.

When you are creating a functional unit that uses the D-channel (for example CLS, ET), check that the processor unit that provides the D-channel service is in the WO-EX or SE-NH state, and that it is properly equipped. The AS7 preprocessor unit implementing the D-channel must be equipped and connected.

When you are creating an ET controlled through an AFS, check that the processor unit that provides the ET-control service is in the WO-EX or SE-NH state, and that it is equipped properly. The AFS must be equipped and connected.

4. Check that the software build is prepared to connect new units and to add new features. Check that a backup copy of the software build exists (at least an up-to-date FALLBACK build). For more information, refer to *Software Package Management* and to *Safecopy Instructions of the DX 200 BSC*.

5. Check that both disks of the BSC are equipped and in an active working state. Check that the software build of both disks are identical. For more information refer to *I/O Device Working States* and *Disk File and Directory Handling*.

2 Configuring a BSC

At the commissioning stage, a customer-specific hardware configuration is created from empty file templates with MML commands. This stage is normally taken care of by the supplier of the BSC.

The BSC is configured in a certain logical order. The equipment is created first. The equipment is created in hierarchical order: first the racks or cabinets and the cartridges, then their functional units, and finally the plug-in units of the functional unit.

In the creation of racks or cabinets and cartridges, the equipment list and cable equipment list as well as the section Defining the alarm group are good sources for the parameters needed in the commands. The coordinates of the cartridges of the power sources supplying the cartridges are given as one parameter. Note that the power sources themselves are not described here, only the cartridges where the power sources are situated. If the cartridge has n power sources, the coordinate will also be given n times. The cartridges receive their supply through the CVK/CVL power supply cables which can be found in the cable equipment list.

As an initial condition for creating plug-in units the functional unit must exist. If the state of the functional unit for which the plug-in unit was created was SP-EX or WO-EX during the creation, restart it. When the object unit is the OMU, it is maintained in the WO-EX-state during the creation. However, note that you have to restart the OMU after the plug-in unit has been created.

A function is always defined for the plug-in unit, otherwise its PCM interface cannot be described in the EQUIPM. The plug-in units are also connected according to certain rules: first the plug-in units (preprocessor units) of the processor units are connected, and after that the plug-in units of the functional units controlled by the processor unit. When the configuration of a functional unit has been completed, it is tested with the commands of the diagnostics command group UD (refer to *Diagnostics Handling* and Diagnostics and testing overview in Diagnostics and Testing). Testing is performed on both GSWs so that one MCMU is active. After this the functional unit is taken into use.

In the creation of plug-in units, sources for parameters are the Equipment list, Strapping instructions of plug-in units, and the I/O and memory addresses of the plug-in unit. They can be found in the Site documentation. The command group WT has built-in defaults (shown in the guides) for the I/O and memory addresses and the interrrupt levels, so it is not necessary to give them as parameters. If the defaults deviate from the corresponding I/O and memory addresses in the plug-in units or the defaults from the interrupt levels deviate from those in the preprocessor plug-in unit, they are given as parameters. Refer to *Equipment Management* for instructions on the use of PCM circuits.

Time-slot-based plug-in units can be connected if a function has been defined for the plug-in units in the EQUIPM. Without the connection the software will not find the time slots used by the plug-in unit, and the plug-in unit is thus "unknown" to it.

These tasks are described in detail in the following sections.

2.1 Configuring racks or cabinets

Before you start

The equipment data of the rack or cabinet is updated in the equipment database.

To be able to configure the racks or cabinets you need to have the following information available:

1. the type and coordinates of the BCBE and BCEE racks or BSCC cabinets
2. coordinates of the CLAC/CLOC responsible for wired alarms of the rack or cabinet
3. the alarm group for the rack or cabinet
4. the number of power supply fuse panels (PSFP), (not in BSC3i)
5. the number of power supply adapters (PSA), (not in BSC3i)
6. the number of PDFUs, (in BSC3i)
7. the type and coordinates of the TC2E rack

You find the information in the Equipment list and cable equipment.

Refer to Defining the alarm group for the alarm group of the rack or cabinet. The alarm group of the rack or cabinet is defined similarly to the alarm group of the cartridge.

The functionalities of PSFP and PSA are integrated in the PDFU.

2.1.1 Creating a CLAC/CLOC cartridge

Before you start

Note

Note that as an initial condition the CLAC must be created before racks or cabinets or any other cartridges are created. Note that also the CLOC cartridge can be used in the place of the CLAC cartridge.

Steps

1. Create a CLAC/CLOC cartridge (WTC)

   ```
   WTC:<cartridge type>,<cartridge coordinate>;
   ```

   The power source is not given because the plug-in units equipped to the CLAC form the voltages they require.

2. If you have a second rack, create another cartridge for it

3. Check that the creation was successful (WTI)

   ```
   WTI:C;
   ```

2.1.2 Creating a rack or cabinet in the equipment database

Steps

1. For implementing this step you have the following alternatives:

   a. Create the rack (WTJ)

   ```
   WTJ:<rack or cabinet type>,<rack or cabinet
   coordinate>:AL, PSFP, PSA;
   ```

   b. Create the cabinet (WTJ)

   ```
   WTJ:<rack or cabinet type>,<rack or cabinet
   coordinate>:AL, PDFU;
   ```

2. Create a rack also for the TC2E

3. Check that the creation was successful (WTI)

```
ZWTI:J;
```

Further information

Example 1. Creating a CLAC/CLOC cartridge and a rack in the equipment database

```
ZWTC:CLOC,1A120-37:;

WTI:C;

ZWTJ:BCBE,1A:AL=1A120-37-1,PSFP=2,PSA=2;

ZWTJ:TC2E,1C;

ZWTI:J;
```

Example 2. Creating a CLAC/CLOC cartridge and a cabinet in the equipment database in BSC3i

```
ZWTC:CLOC_B,1A1-6:;

ZWTI:C;

ZWTJ:BSCC,1A:AL=1A1-6-4R1,PDFU=4;

ZWTJ:TC2E,1C;

ZWTI:J;
```

2.2 Configuring Fan Trays (FTRB) for a BSC3i

The IC209-A cabinet contains four Fan Trays (FTRB) for forced cooling. These are located in special slots contained in shelves 2 and 4.

2.2.1 Creating an FTRB

Note

You create a Fan Tray in the same way as you create a cartridge.

Steps

1. Create the FTRB (WTC)

```
WTC:<cartridge type>,<cartridge coordinate>:P1, AL;
```

2. Check that the creation was successful (WTI)

```
WTI
```

2.3 Configuring MCMUs

Before you start

The BSC has two MCMUs. Thus the following steps need to be made for both MCMUs. The states cannot be changed until the GSW has been created.

2.3.1 Creating a cartridge for an MCMU

Steps

1. Create the cartridge (WTC)

```
WTC:<cartridge type>,<cartridge coordinate>:P1, AL;
```

2. Check that the creation was successful (WTI)

```
WTI
```

Further information

Example 3. Creating a cartridge for an MCMU

```
ZWTC:MC1C,1A088-01:P1=1A088-01,AL=1A120-37-2;
```

```
ZWTC:MC1C,1A088-27:P1=1A088-27,AL=1A120-37-3;
```

Example 4. Creating a cartridge for an MCMU in BSC3i

```
ZWTC:CC4C_A,1A2-0:P1=1A2-0,AL=1A1-6-2R3;

ZWTC:CC4C_A,1A2-3:P1=1A2-3,AL=1A1-6-4R3;
```

2.3.2 Creating a unit for an MCMU

Steps

1. Create the unit (WTU)

   ```
   WTU:<unit identification>:<coordinate of
   cartridge>:<unit attributes>;
   ```

   Identify the message bus address with the parameter `unit attributes`. The value ranges between 0–70H. For more information on the values, refer to Message bus addresses.

2. Check that the creation was successful (WTI)

   ```
   WTI
   ```

Further information

Example 5. Creating a unit for an MCMU

```
ZWTU:MCMU,0:1A088-01:MB=4;

ZWTU:MCMU,1:1A088-27:MB=5;
```

Example 6. Creating a unit for an MCMU in BSC3i

```
ZWTU:MCMU,0:1A2-0:MB=4;

ZWTU:MCMU,1:1A2-3:MB=5;
```

2.3.3 Creating a plug-in unit for an MCMU

Steps

1. Create the plug-in unit (WTP)

   ```
   WTP:<unit identification>:<piu identification>:;
   ```

2. Check that the creation was successful (WTI)

   ```
   WTI
   ```

Further information

Example 7. Creating a plug-in unit for an MCMU

```
ZWTP:MCMU,0:CP6LX,0,2:;

ZWTP:MCMU,0:MBIF_UA,0,3:;

ZWTP:MCMU,0:MBIF_UA,1,4:;

ZWTP:MCMU,0:SWCOP_S,0,9:;

ZWTP:MCMU,0:PSC3,0,10;
```

Example 8. Creating a plug-in unit for an MCMU in BSC3i

```
ZWTP:MCMU,0:PSC6_A,0,1:;

ZWTP:MCMU,0:MBIF_B,0,5:;

ZWTP:MCMU,0:MBIF_B,1,6:;

ZWTP:MCMU,0:SWCOP_A,0,4:;

ZWTP:MCMU,0:CP710_A,0,7:;
```

2.4 Configuring a GSW

Before you start

Note

As there are two GSW cartridges, you have to make the following tasks twice.

2.4.1 Creating a cartridge for a GSW

Steps

1. Create the cartridge (WTC)

   ```
   WTC:<cartridge type>,<cartridge coordinate>:P1;
   ```

2. Check that the creation was successful (WTI)

   ```
   WTI
   ```

Further information

Example 9. Creating a cartridge for a GSW

```
ZWTC:SW1C,1A120-01:P1=1A120-01;

ZWTC:SW1C,1A120-19:P1=1A120-19;
```

Example 10. Creating a cartridge for a GSW in BSC3i

```
ZWTC:SW1C_C,1A1-0:P1=1A1-0;

ZWTC:SW1C_C,1A1-3:P1=1A1-3;
```

2.4.2 Creating a unit for a GSW

Steps

1. Create the unit (WTU)

   ```
   WTU:<unit identification>:<coordinate of
   cartridge>:<unit attributes>;
   ```

2. Check that the creation was successful (WTI)

   ```
   WTI
   ```

Further information

Example 11. Creating a unit for a GSW

```
ZWTU:GSW,0:1A120-01:MAS=MCMU;

ZWTU:GSW,1:1A120-19:MAS=MCMU;
```

Example 12. Creating a unit for a GSW in BSC3i

```
ZWTU:GSW,0:1A1-0:MAS=MCMU;

ZWTU:GSW,1:1A1-3:MAS=MCMU;
```

2.4.3 Creating a plug-in unit for a GSW

Steps

1. Create the plug-in unit (WTP)

   ```
   WTP:<unit identification>:<piu identification>;
   ```

2. Check the plug-in units you created (WTI)

   ```
   WTI
   ```

Further information

Example 13. Creating a plug-in unit for a GSW

```
ZWTP:GSW,0:SW64B,0,2;

ZWTP:GSW,0:SW64B,1,3;

ZWTP:GSW,0:SW64B,2,4;

ZWTP:GSW,0:SW64B,3,5;

ZWTP:GSW,0:PSC1,0,6;

ZWTP:GSW,1:SW64B,0,2;

ZWTP:GSW,1:SW64B,1,3;

ZWTP:GSW,1:SW64B,2,4;

ZWTP:GSW,1:SW64B,3,5;

ZWTP:GSW,1:PSC1,0,6;
```

Example 14. Creating a plug-in unit for a GSW in BSC3i

```
ZWTP:GSW,0:SW64B,0,2:;

ZWTP:GSW,0:SW64B,1,3:;

ZWTP:GSW,0:SW64B,2,4:;

ZWTP:GSW,0:SW64B,3,5:;

ZWTP:GSW,0:PSC1_S,0,6:;

ZWTP:GSW,1:SW64B,0,2:;

ZWTP:GSW,1:SW64B,1,3:;

ZWTP:GSW,1:SW64B,2,4:;

ZWTP:GSW,1:SW64B,3,5:;

ZWTP:GSW,1:PSC1_S,0,6:;
```

2.4.4 Changing the state of an MCMU

Before you start

Note

Now that you have created the GSW, this is the phase where you must change the MCMU state.

Steps

- Change the state of the MCMUs from the SE-state through the TE-state to the WO-state (USC)

  ```
  USC
  ```

  Note that the MCMU can go by itself from the TE to the WO-state. Before changing the state from TE to SP, wait until the unit is in the TE-state. This may take a while.

Further information

Example 15. Changing the states of the MCMUs

```
ZUSC:MCMU,0:SE;

ZUSC:MCMU,0:TE;

ZUSC:MCMU,0:WO;

ZUSC:MCMU,1:SE;

ZUSC:MCMU,1:TE;

ZUSC:MCMU,1:SP;
```

2.4.5 Testing an MCMU

Steps

1. Change the state of the MCMU to be tested to the TE-EX-state (USC)

```
USC:<unit type>,<unit index>:<working state>;
```

2. Run the diagnostics (UDU)

```
UDU:<unit identification>;
```

The diagnostics testing takes a few minutes.

3. If you wish to test the other MCMU, interchange the states of the MCMUs (USC) and run the diagnostics to the other MCMU (UDU)

```
USC:<unit type>,<unit index>:<working state>;
```

```
UDU:<unit identification>;
```

Further information

Example 16. Testing the MCMUs

```
ZUSC:MCMU,0:TE;
```

```
ZUDU:MCMU,0;
```

```
ZUSC:MCMU,1:TE;
```

```
ZUDU:MCMU,1;
```

For more information on testing, refer to Diagnostics and testing overview.

2.5 Configuring the OMU

Before you start

Note

Restart the OMU after it is configured to activate the AS7 plug-in unit.

2.5.1 Creating a cartridge for the OMU

Steps

1. Create the cartridge for the OMU (WTC)

```
WTC:<cartridge type>,<coordinate of cartridge>:P1,AL;
```

2. Check that the creation was successful (WTI)

```
WTI
```

Further information

Example 17. Creating a cartridge for the OMU

```
ZWTC:MC1C,1A058-27:P1=1A058-27,AL=1A120-37-5;
```

Example 18. Creating a cartridge for the OMU in BSC3i

```
ZWTC:CM2C_A,1A2-6:P1=1A2-6,AL=1A1-6-4S3;
```

2.5.2 Creating a unit for the OMU

Steps

1. Create the OMU (WTU)

```
WTU:<unit identification>:<coordinate of
cartridge>:<unit attributes>;
```

Identify the message bus address with the parameter `unit attributes`. The value ranges between 0-70H. For more information on the values, refer to Message bus addresses.

2. Check that the creation of the OMU was successful (WTI)

```
WTI
```

Further information

Example 19. Creating a unit for the OMU

```
ZWTU:OMU:1A058-27:MB=0;
```

Example 20. Creating a unit for the OMU in BSC3i

```
ZWTU:OMU:1A2-6:MB=0;
```

2.5.3 Creating a plug-in unit for the OMU

Before you start

Typically the following plug-in units are needed: processor unit, MBIF, SERO, HWAT, COCEN, AS7, AC25, and PSC. The use of COCEN, AS7, and AC25 depends on the connection type needed. Refer to Site documentation for more information.

Note

The indexing of AS7 compatible plug-in units (HWAT, COCEN, AS7, AC25) must be unique inside a functional unit.

Steps

1. Create the plug-in unit (WTP)

   ```
   WTP:<unit identification>:<piu identification>;
   ```

2. Check that the creation was successful (WTI)

   ```
   WTI
   ```

Further information

Example 21. Creating a plug-in unit for the OMU

```
ZWTP:OMU:CP6LX,0,2;

ZWTP:OMU:MBIF_UA,0,3;

ZWTP:OMU:MBIF_UA,1,4;

ZWTP:OMU:SERO_T,0,6;

ZWTP:OMU:HWAT,4,9;

ZWTP:OMU:COCEN,3,8:;
```

```
ZWTP:OMU:AS7_V,0,5::LAPD,4,2,TSL,0&&31:LAPD,4,3,TSL,0&&31;

ZWTP:OMU:AC25_S,2,7;

ZWTP:OMU:PSC3,0,10;
```

Example 22. Creating a plug-in unit for the OMU in BSC3i

```
ZWTP:OMU:CP710_A,0,10;

ZWTP:OMU:MBIF_B,0,8;

ZWTP:OMU:MBIF_B,1,9;

ZWTP:OMU:HWAT_A,3,7;

ZWTP:OMU:SERO_A,0,6;

ZWTP:OMU:AS7_B,0,3::LAPD,4,2,TSL,0&&31:LAPD,4,3,TSL,0&&31:;

ZWTP:OMU:AS7_B,2,4::X25,4,1,TSL,0&&3:;

ZWTP:OMU:AS7_B,3,5::X25,4,1,TSL,15&&18:;

ZWTP:OMU:PSC6_A,0,1;
```

2.5.4 Connecting a functional unit to the OMU

Steps

1. Check that the OMU is in the WO-EX-state (USI)

   When the object unit is the OMU, it is maintained in the WO-EX-state during the creation. However, note that you have to restart the OMU after all the plug-in units have been created. The working states of other units have no significance. Give the following command to check the state:

   ```
   USI:OMU;
   ```

2. Connect the functional unit (WUC)

   ```
   WUC:<unit type>,<unit index>:<plug-in unit type>,<plug-in unit index>:<connection information>:<controlling unit type>,<controlling unit index>;
   ```

3. Check in the disk update queue that the disk update has been done (DUQ)

Resetting is not possible until the disk update has been done. Use the DUQ command to check the disk update queue state.

```
DUQ:<unit type>,<pair number>:<unit state>;
```

4. Restart the OMU to activate the AS7 (USU)

   This takes a few minutes.

   ```
   USU:OMU;
   ```

Further information

Example 23. Connecting a functional unit to the OMU

```
ZUSI:OMU;

ZWUC:OMU:AS7_V,0;

ZUSU:OMU;
```

Example 24. Connecting a functional unit to the OMU in BSC3i

```
ZUSI:OMU;

ZWUC:OMU:AS7_B,0;

ZUSU:OMU;
```

2.6 Configuring I/O devices

Before you start

Check which equipment you need. The following steps are the same for each device, but the examples are given only for a few I/O devices.

Note

In BSC3i, there is no I/O cartridge. The I/O devices are located in the OMU cartridge.

2.6.1 Creating a cartridge for I/O devices

Steps

1. Create a cartridge (WTC)

```
WTC:<cartridge type>,<coordinate of cartridge>:;
```

2. Check that the creation was successful (WTI)

```
WTI
```

2.6.2 Creating a unit for I/O devices

Steps

1. Create the unit (WTU)

```
WTU:<unit identification>:<coordinate of
cartridge>:<unit attributes>;
```

2. Check that the creation was successful (WTI)

```
WTI
```

Further information

Example 25. Creating a unit for I/O devices

```
ZWTC:WDDC,1A058-13:;

ZWTC:WDDC,1A058-01:;

ZWTU:FDU,0:1A058-13:MAS=OMU;

ZWTU:WDU,0:1A058-13:MAS=OMU;

ZWTU:WDU,1:1A058-13:MAS=OMU;

ZWTU:CTU,0:1A058-01:MAS=OMU;

ZWTU:LPT;
```

```
ZWTU:VDU;
```

Example 26. Creating a unit for I/O devices in BSC3i

```
ZWTU:WDU,0:1A2-6:MAS=OMU;

ZWTU:WDU,1:1A2-6:MAS=OMU;

ZWTU:FDU,0:1A2-6:MAS=OMU;

ZWTU:LPT,0;

ZWTU:LPT,1;

ZWTU:VDU,0;

ZWTU:VDU,1;
```

2.6.3 Creating a plug-in unit for I/O devices

Steps

1. Create the plug-in unit (WTP)

   ```
   WTP:<unit identification>:<piu identification>;
   ```

2. Check that the creation was successful (WTI)

   ```
   WTI
   ```

Further information

Example 27. Creating a plug-in unit for I/O devices

```
ZWTP:FDU,0:FDAD,0,1;

ZWTP:WDU,0:PSC4,0,2;

ZWTP:WDU,1:PSC4,0,3;

ZWTP:WDU,0:WDAD,0,4;

ZWTP:WDU,1:WDAD,0,5;
```

```
ZWTP:CTU,0:CTAD,0,4;

ZWTP:CTU,0:PSC4,0,2;
```

Example 28. Creating a plug-in unit for I/O devices in BSC3i

```
ZWTP:OMU:FDD,0,12;

ZWTP:OMU:WDD,0,13;

ZWTP:OMU:WDD,1,14;
```

2.7 Configuring CLSs

Before you start

Note

The CLS data transfer connection has been implemented on the D-channel. Before you create the CLS, check with the `WTI` command that the preprocessor (AS7) to which the data transfer connection is set is equipped and connected. A CLS implemented on the D-channel is connected to the OMU.

Note

Remember that there are two clock units, and thus you have to give the following commands twice.

2.7.1 Creating a CLS unit

Steps

1. Create the CLS unit (WTU)

   ```
   WTU:<unit identification>:<coordinate of cartridge>;
   ```

2. Check that the creation was successful (WTI)

   ```
   WTI
   ```

2.7.2 Creating a plug-in unit for a CLS

Steps

1. Create the plug-in unit for the CLS (WTP)

   ```
   WTP:<unit identification>:<piu identification>:<piu
   attributes>:<piu PCM attributes>;
   ```

2. Check that the creation was successful (WTI)

   ```
   WTI
   ```

Further information

Example 29. Creating a plug-in unit for a CLS

```
ZWTU:CLS,0:1A120-37;

ZWTU:CLS,1:1A120-37;

ZWTP:CLS,0:CL2TG_S,0,0::GENERAL,4,0,TSL,30;

ZWTP:CLS,1:CL2TG_S,0,3::GENERAL,4,0,TSL,31;
```

Example 30. Creating a plug-in unit for a CLS in BSC3i

```
ZWTU:CLS,0:1A1-6:;

ZWTU:CLS,1:1A1-6:;

ZWTP:CLS,0:CL3TG,0,0::GENERAL,4,0,TSL,30:;

ZWTP:CLS,1:CL3TG,0,3::GENERAL,4,0,TSL,31;
```

2.7.3 Connecting a functional unit to a CLS

Steps

1. Connect the CLS (WUC)

```
WUC:<unit type>,<unit index>:<plug-in unit type>,<plug-
in unit index>:<connection information>:<controlling
unit type>,<controlling unit index>;
```

2. Check that the connection of the functional unit was successful (WTI)

```
WTI
```

2.7.4 Changing the state of a CLS

You can change the states of the CLSs either at this point or wait until all the following steps are taken and then change all the states. The change of the states is explained in section Changing states of CLSs.

Steps

1. Change the states of the CLSs (USC)

```
USC
```

2. If the clock does not change to the WO-state, try the other unit

   You can check the state of the unit in the lights on the front panel.

Further information

Example 31. Changing the state of a CLS

```
ZWUC:CLS,0:CL2TG_S,0;

ZWUC:CLS,1:CL2TG_S,0;
```

Example 32. Changing the state of a CLS in BSC3i

```
ZWUC:CLS,0:CL3TG,0;
```

```
ZWUC:CLS,1:CL3TG,0;
```

2.8 Configuring a CLAB and an SBUS

If you have an extra rack, you have to configure the CLAB and the SBUS at this point.

If you do not have an extra rack, you can move on to Configuring BCSUs to configure the BCSUs.

Note

A CLAB and an SBUS are not included in the BSC3i.

Before you start

Check that you have created the cartridge. Use the `WTI` command to check your configuration.

2.8.1 Creating units for a CLAB and an SBUS

Steps

1. Create the unit for the CLAB (WTU)

   Note that there are two units.

   ```
   WTU:<unit identification>:<coordinate of cartridge>;
   ```

2. Create the unit for the SBUS (WTU)

   ```
   WTU
   ```

3. Create the plug-in units for the CLAB (WTP)

   ```
   WTP
   ```

4. Check that the creation was successful (WTI)

   ```
   WTI
   ```

Further information

Example 33. Creating a cartridge for the CLAC units (WTC)

```
ZWTC:CLAC,1B120-01;
```

Example 34. Creating the units for the CLAB

```
ZWTU:CLAB,0:1B120-01;

ZWTU:CLAB,1:1B120-01;
```

Example 35. Creating the units for the SBUS

```
ZWTU:SBUS,0:;

ZWTU:SBUS,1:;
```

Example 36. Creating the plug-in units for the CLAB

```
ZWTP:CLAB,0:CLAB,0,4;

ZWTP:CLAB,1:CLAB,0,5;
```

Example 37. Checking the creation was successful

```
ZWTI:C:;

ZWTI:U:CLAB:;

ZWTI:P:CLAB:CLAB;
```

2.9 Configuring BCSUs

In a BSC it is possible to have one to nine BCSUs. Usually there are three or nine.

As for the task of configuring BCSUs, you have two alternatives. You can first create the cartridges and plug-in units for all of them, and then connect them all at the same time. The other alternative is to create and connect them one at a time.

2.9.1 Creating a cartridge for a BCSU

Steps

1. Create the cartridge (WTC)

   ```
   WTC:<cartridge type>,<coordinate of cartridge>:P1, AL;
   ```

2. Check that the creation was successful (WTI)

   ```
   WTI
   ```

Further information

Example 38. Creating a cartridge for a BCSU

```
ZWTC:MC1C,1A030-27:P1=1A030-27,AL=1A120-37-4;

ZWTC:MC1C,1A002-01:P1=1A002-01,AL=1A120-37-7;

ZWTC:MC1C,1A002-27:P1=1A002-27,AL=1A120-37-8;
```

Example 39. Creating a cartridge for a BCSU in BSC3i

```
ZWTC:CC3C_A,1A3-0:P1=1A3-0,AL=1A1-6-4R5;

ZWTC:CC3C_A,1A3-4:P1=1A3-4,AL=1A1-6-2R7;

ZWTC:CC3C_A,1A3-8:P1=1A3-8,AL=1A1-6-4R7;
```

2.9.2 Creating a unit for a BCSU

Steps

1. Create the unit (WTU)

   ```
   WTU:<unit identification>:<coordinate of
   cartridge>:<unit attributes>;
   ```

   For information on the values of the `unit attributes`, refer to Message bus addresses.

2. Check that the creation was successful (WTI)

```
WTI
```

Further information

Example 40. Creating a unit (WTU)

```
ZWTU:BCSU,0:1A3-0:MB=30;
```

2.9.3 Creating a plug-in unit for a BCSU

Before you start

The use of a PCU depends on whether GPRS is enabled. Refer to GPRS Handling in BSC if you only need to configure a new PCU to the BSC to enable the use of GPRS.

Note that some plug-in unit variants differ in ETSI and ANSI environments.

In the BSC3i, a PCU-B plug-in unit is used instead of the PCU. The PCU-B is created as two plug-in units (also know as logical PCUs) with separate plug-in unit indexes and the same track number. See example Creating a PCU-B for a BCSU.

Note

Possible combi AS7 link configurations are the following (the bitrate of the links is 64 kbit/s):

- 64 LAPD - 0 SS7
- 60 LAPD - 1 SS7
- 56 LAPD - 2 SS7
- 52 LAPD - 3 SS7
- 48 LAPD - 4 SS7
- 32 LAPD - 8 SS7

- 16 LAPD - 12 SS7
- 0 LAPD - 16 SS7

Basic ratio: 1 SS7 link = 4 LAPD channels

Note that all the above mentioned configurations are not relevant for BSC3i. The maximum number of SS7 signalling links per BSC is 16, since there can be in one signalling link set of 16 SS7 signalling links. SS7 signalling capacity can be increased by using wide SS7 signalling links. Wide SS7 signalling links do not cause any extra load; it can be directly calculated that, for example, the load of one 256 kbit/s link is 4 x load of a 64 kbit/s link.

Steps

1. Create plug-in units (WTP)

   ```
   WTP:<unit identification>:<piu identification>:<piu
   attributes>:<piu PCM attributes>;
   ```

   The parameters `piu attributes` can be skipped for this command.

Note

If you have an old BSC (BSCE) then the AFS is the plug-in unit instead of the AS7. The AFS is situated in track 8.

2. Check that the creation was successful (WTI)

   ```
   WTI
   ```

Further information

Example 41. Creating units and plug-in units for a BCSU

```
ZWTU:BCSU,0:1A030-27:MB=30;

ZWTP:BCSU,0:CP6LX,0,2:;

ZWTP:BCSU,0:MBIF_UA,0,3:;

ZWTP:BCSU,0:MBIF_UA,1,4:;

ZWTP:BCSU,0:AS7_V,0,5::SS7,4,4,TSL,0&&3;
```

```
ZWTP:BCSU,0:AS7_V,1,6::LAPD,4,4,TSL,4&&31:LAPD,4,5,TSL,0&&3
1;

ZWTP:BCSU,0:AS7_V,2,7::LAPD,4,6,TSL,0&&31:LAPD,4,7,TSL,0&&3
1;

ZWTP:BCSU,0:PCU,4,9::PCUDSP,4,156,TSL,0&&31:PCUDSP,4,157,TS
L,0&&31:PCUPPC,4,158,TSL,0&&31:PCUPPC,4,159,TSL,0&&31;

ZWTP:BCSU,0:PSC3,0,10;
```

Example 42. Creating plug-in units with BSC3i

```
ZWTP:BCSU,0:PSC6_A,0,1:;

ZWTP:BCSU,0:MBIF_B,0,8:;

ZWTP:BCSU,0:MBIF_B,1,9:;

ZWTP:BCSU,0:AS7_B,0,3::CCS7,4,4,TSL,0&&3:LAPD,4,4,TSL,4&&19
:LAPD,4,5,TSL,0&&31:;

ZWTP:BCSU,0:AS7_B,1,4::LAPD,4,6,TSL,0&&31:LAPD,4,7,TSL,0&&3
1;

ZWTP:BCSU,0:AS7_B,2,5::LAPD,4,64,TSL,0&&31:LAPD,4,65,TSL,00
&&31;

ZWTP:BCSU,0:CP710_A,0,10:;

ZWUC:BCSU,0.AS7_B,0;

ZWUC:BCSU,0.AS7_B,1;

ZWUC:BCSU,0.AS7_B,2;
```

2.9.4 Connecting a functional unit to a BCSU

Steps

1. Connect the functional unit (WUC)

```
WUC:<unit type>,<unit index>:<plug-in unit type>,<plug-
in unit index>:<connection information>:<controlling
unit type>,<controlling unit index>;
```

2. Check that the connection was successful (WTI)

```
WTI
```

You will notice that the bits changed from 0 to 1.

Further information

Example 43. Connecting a functional unit to a BCSU

```
ZWUC:BCSU,0:AS7_V,0;

ZWUC:BCSU,0:AS7_V,1;

ZWUC:BCSU,0:AS7_V,3;

ZWUC:BCSU,0:PCU,4;
```

Example 44. Connecting a functional unit to a BCSU in BSC3i

```
ZWUC:BCSU,0:AS7_B,0;

ZWUC:BCSU,0:AS7_B,1;

ZWUC:BCSU,0:AS7_B,2;

ZWUC:BCSU,0:PCU_B,3;

ZWUC:BCSU,0:PCU_B,4;

ZWUC:BCSU,0:PCU_B,5;

ZWUC:BCSU,0:PCU_B,6;
```

2.9.5 Configuring BCSUs for an extra rack

If you have an extra rack, remember to configure the BCSUs for that also. If you do not have an extra rack, then move on to the next section Configuring ETs/ET2s to configure the ETs.

It is not possible to have an extra rack in the BSC3i.

Steps

1. Repeat the steps from creating a cartridge, a unit, and a plug-in unit for a BCSU

2. Connect the functional unit (WUC)

   ```
   WUC
   ```

2.10 Configuring ETs/ET2s

Before you start

Equipping and connecting the ET2E plug-in unit differs from connecting of the ET1E plug-in unit. The ET2 connects two 2-Mbit/s PCM circuits to the exchange. Each of the 2-Mbit/s PCM circuits is controlled by one ET unit, which means that one ET2 plug-in unit is associated with two ETs. The indexes of the ETs using the same ET2 must be in sequential order, and further, the even index must be smaller, for example ET-72 and ET-73. In addition, the computer controlling the ET must be the same for both ETs.

Refer to GPRS Handling in BSC if you only need to configure ETs for the new PCU plug-in unit to enable GPRS.

Note

Note that the odd ET must be given exactly the same plug-in unit type, index, and track number as was given to the even one.

Note

Note that in ANSI configuration ET2A plug-in units are used instead of ET2E plug-in units.

The ETT00-function must be equipped to both ETs. When the ET is connected, the LAPD-connection is established to time slot 0 of the even ET.

Note

It is recommended that you follow these principles when configuring ETs:

- first connect the even ET and only after that the odd ET.
- both ETs must be connected to the same control computer.
- the connection is removed in the opposite order to the creation: first the odd ET, then the even one.
- ET2s are distributed evenly between each BCSU.
- one BCSU can control only one ET that has been connected to ISDN Abis (ISDN Abis not in use in ANSI environment).

2.10.1 Creating a cartridge for an ET

Steps

1. Create the cartridge (WTC)

```
WTC:<cartridge type>,<coordinate of cartridge>:AL;
```

2. Check that the creation was successful (WTI)

```
WTI
```

Further information

Example 45. Creating a cartridge for an ET

```
ZWTC:ET5C,1A030-01:AL=1A120-37-9;
```

Example 46. Creating a cartridge for an ET in BSC3i

```
ZWTC:ET4C_B,1A5-0,:AL=1A1-6-2S5,;
```

2.10.2 Creating a unit for an ET

Steps

1. Create a unit (WTU)

   ```
   WTU:<unit identification>:<coordinate of cartridge>;
   ```

2. Check that the creation was successful (WTI)

   ```
   WTI
   ```

Further information

Example 47. Creating a unit for an ET

```
ZWTU:ET,32:1A030-01;
```

Example 48. Creating a unit for an ET in BSC3i

```
ZWTU:ET,32:1A5-0:;
```

2.10.3 Creating a plug-in unit for an ET

Steps

1. Create a plug-in unit (WTP)

   ```
   WTP:<unit identification>:<piu identification>:<piu
   attributes>:<piu PCM attributes>;
   ```

2. Check that the creation was successful (WTI)

   ```
   WTI
   ```

Further information

Example 49. Creating a plug-in unit for an ET

```
ZWTP:ET,32:ET2E,0,0::ETT00,4,32,TSL,0;
```

Example 50. Creating a plug-in unit for an ET in BSC3i

```
ZWTP:ET,32:ET2E_S,0,0::ETT00,4,32,TSL,0:;
```

2.10.4 Connecting a functional unit to an ET

Steps

1. Connect the functional unit (WUC)

   ```
   WUC:<unit type>,<unit index>:<plug-in unit type>,<plug-
   in unit index>:<connection information>:<controlling
   unit type>,<controlling unit index>;
   ```

2. Check that the ET2E was connected (WTI)

   ```
   WTI
   ```

Further information

Example 51. Connecting a functional unit to an ET

```
ZWUC:ET,32:ET2E,0:IF=A:BCSU,5;
```

2.10.5 Changing control parameters

Steps

- If necessary, change the control parameters of the ET (YEC)

  Refer to *Exchange Terminal Supervision Handling* for more information on the `YEC` command.

2.10.6 Repeating the creation of a unit and a plug-in unit and the connection of a functional unit

Steps

1. Create another ET (WTU)

   ```
   WTU
   ```

2. Create another plug-in unit (WTP)

   ```
   WTP
   ```

3. Connect the functional unit (WUC)

   ```
   WUC
   ```

4. Repeat these steps for each ET

2.10.7 Configuring ETs/ET2s for an extra rack

Steps

1. If you have an extra rack, remember to configure the ETs/ET2s for that also

   If you do not have an extra rack, move on to Configuring a TCSM to configure the TCSM.

   It is not possible to have an extra cabinet in the BSC3i.

2. Repeat the steps from first creating a cartridge (WTC), then creating the unit (WTU)

   ```
   WTC
   ```

   ```
   WTU
   ```

3. Create the plug-in unit (WTP)

   ```
   WTP
   ```

   Remember to give the coordinates of the cartridge in question.

4. Connect the functional unit (WUC)

```
WUC
```

2.11 Configuring a TCSM

The plug-in units TR16 and ET2E are used in ETSI environment and TR12 and ET2A in ANSI environment.

2.11.1 Creating a TCSM cartridge

Steps

1. Create a cartridge (WTC)

   ```
   WTC:<cartridge type>,<coordinate of cartridge>:P1;
   ```

2. Check that the creation was successful (WTI)

   ```
   WTI
   ```

Further information

Example 52. Creating a TCSM cartridge

```
ZWTC:ET1TC,1C120-01:;

ZWTC:TC1C,1C088-01:P1=1C088-01;
```

2.11.2 Creating a TCSM unit

Before you start

Caution

The index of the TCSM unit is the same as the index of the A interface ET.

Steps

1. Create the unit (WTU)

```
WTU:<unit identification>:<coordinate of cartridge>;
```

2. Check that the creation was successful (WTI)

```
WTI
```

Further information

Example 53. Creating a TCSM unit

```
ZWTU:TCSM,32:1C088-01;

ZWTU:TCSM,32:1C120-01;
```

2.11.3 Creating a TCSM plug-in unit

Steps

1. Create the plug-in unit (WTP)

```
WTP:<unit identification>:<piu identification>:<piu
attributes>:<piu PCM attributes>;
```

2. Check that the creation was successful (WTI)

```
WTI
```

Further information

Example 54. Creating a TCSM plug-in unit

```
ZWTP:TCSM,32,1C088-01:TRCO,0,0::GENERAL,2,32,TSL,1;

ZWTP:TCSM,32,1C088-01:TR16,0,1;

ZWTP:TCSM,32,1C088-01:TR16,1,2;
```

```
ZWTP:TCSM,32,1C120-01:ET2E,0,0:;

ZWTP:TCSM,32,1C120-01:ET2E,1,0:;

ZWTP:TCSM,32,1C088-01:PSC1,0,15;
```

2.11.4 Connecting a functional unit to a TCSM

Steps

- Connect the TRCO (WUC)

  ```
  WUC:<unit type>,<unit index>:<plug-in unit type>,<plug-
  in unit index>:<connection information>:<controlling
  unit type>,<controlling unit index>;
  ```

Note

Refer to *Transcoder Configuration* and BSS Transmission Management for instructions and information on TC_PCMs and transcoder through connections.

Further information

Example 55. Connecting a functional unit to a TCSM

```
ZWUC:TCSM,32:TRCO,0;
```

2.12 Changing the states of CLSs, BCSUs, ETs, and TCSMs

Before you start

Note

You can change the states of the units to the WO-state only after the reset is over. The reset is over when the software has been loaded.

2.12.1 Changing the states of CLSs

Steps

1. Check the states by giving the following command:

   ```
   USI:CLS;
   ```

2. Change the state of the CLSs so that one is SEPARATED and the other one is WORKING (USC)

   ```
   USC
   ```

3. If the clock does not change to the WO-state, try the other one

   Check the state in the lights on the front panel; if the top green LED is on, then it is not possible to change to the WO state.

2.12.2 Changing the states of BCSUs

Steps

1. Change the states of the BCSUs so that all the units go through the TESTING state to the SPARE state (USC)

Note

If an ET has been connected to a BCSU, then the BCSU goes automatically to the WO-state, but it may take a few seconds between the SP-EX and WO-states.

Note

Note that at least two BCSUs must be in the TE-EX-state before changing the unit to the WO-EX-state. It is recommended to change all the units to the TE-EX-state before changing them to the WO-EX-state.

---

2. Check the states by giving the following command:

   ```
   ZUSI:COMP;
   ```

2.12.3 Changing the states of ETs

Steps

- Change the states of all ETs from SEPARATED through TESTING to WORKING (USC)

```
USC
```

2.12.4 Changing the states of a TCSM

Steps

- Change the state of a TCSM through TESTING to WORKING (USC)

```
USC
```

Note

This step may take some time as the software is loaded from the BSC.

2.12.5 Final checking

Steps

- Check what you have created and in which states the units are (USI)

```
ZUSI;
```

Further information

Example 56. Changing the states of CLSs, BCSUs, ETs, and TCSMs

```
ZUSI:COMP;

ZUSC:CLS,0:SE;
```

```
ZUSC:CLS,0:TE;

ZUSC:CLS,0:WO;

ZUSC:CLS,1:SE;

ZUSC:CLS,1:TE;

ZUSC:CLS,1:SP;

ZUSC:BCSU,0:SE;

ZUSC:BCSU,0:TE;

ZUSC:BCSU,0:SP;

ZUSC:ET,32:SE;

ZUSC:ET,32:TE;

ZUSC:TCSM,36:SE;

ZUSC:TCSM,36:TE;

ZUSC:TCSM,36:WO;

ZUSI;
```

3 Adding racks, cartridges, plug-in units and functional units

You can modify an existing cartridge construction configuration by adding racks, cartridges, units, or plug-in units — either all or only plug-in units. In cabinet construction, you can add cartridges, plug-in units, or functional units. Modifying in this context means increasing the capacity of a BSC or modifying the existing properties. Faults in the functioning of hardware, for example plug-in units, may also require modifications.

MML commands are used to create, delete or modify the required hardware.

Note

This section does not instruct the use of the High Capacity BSC feature, for more information on the feature refer to *Product Descpriptions*. Neither is it instructed how to enable GPRS in a BSC if the basic hardware configuration has been made; refer to GPRS Handling in BSC for more detailed instructions. However, if you start configuring a BSC from the start, then proceed as instructed in Configuring a BSC. In that way, you can take into consideration the hardware configuration requirements of GPRS as well.

Before you start

When you need to add racks, cartridges, plug-in units or functional units to an existing configuration, note the following order:

- first add the rack and the cartridge, if they are needed
- then add the plug-in units and functional units as required, making sure that a functional unit exists for a plug-in unit before adding the plug-in unit

3.1 Checking database for information on equipment

Before you start

Before you add any kind of equipment it is recommended to use the WTI command to check the equipment database for information on the existing equipment. You can interrogate information on all the racks, cartridges, operating units, and plug-in units, or alternatively, information on specified operating units or plug-in units in the EQUIPM at any time.

Steps

- Check the equpment database (WTI)

  ```
  WTI:<information type>:<unit identification>:<piu
  identification>;
  ```

3.2 Adding a rack

Before you start

If you have no need to add a rack, move to the procedure Adding cartridge(s).

Steps

1. Create the CLAC/CLOC cartridge (WTC)

Note

If you have a TC2E rack, you will not need a CLAC/CLOC cartridge. See Configuring racks or cabinets for more information.

   ```
   WTC: <cartridge type>, <cartridge coordinate>;
   ```

   The power source is not given, because the plug-in units equipped to the CLAC form themselves the required voltages.

2. Add a rack (WTJ)

```
WTJ: <rack or cabinet type>,<rack or cabinet
coordinate>:AL, PSFP, PSA;
```

Further information

Example 57. Adding a rack

```
ZWTC:CLAC,1B120-01;

ZWTJ:BCEE,1B:AL=1B120-01-1,PSFP=2,PSA=2;
```

3.3 Adding cartridge(s)

Before you start

The most common cartridges that you may need to add are BCSU, ET, and TCSM cartridges. If you have no need to add a cartridge, continue to Adding functional unit(s).

Steps

- Create the needed cartridge (WTC)

  ```
  WTC:<cartridge type>,<coordinate of cartridge>:P1,AL;
  ```

  Refer to Configuring a BSC for detailed instructions on creating cartridges for MCMUs, GSWs, OMU, I/O devices, BCSUs, ETs, and TCSM.

Further information

Example 58. Adding a cartridge

```
ZWTC:MC1C,1B088-01:P1=1B088-01,AL=1B120-01-7;
```

Example 59. Adding a cartridge in BSC3i

```
ZWTC:CC3C_A,1A3-4:P1=1A3-4,AL=1A1-6-2R7;
```

3.4 Adding functional unit(s)

Before you start

A BCSU is perhaps the most common, if not the only, functional unit you may need to add. If you have no need to add a functional unit, continue to the procedure Adding plug-in unit(s).

Steps

- Add a functional unit (WTU)

  ```
  WTU:<unit identification>:<coordinate of
  cartridge>:<unit attributes>;
  ```

  Refer to Configuring a BSC for detailed instructions on creating units for MCMUs, GSWs, OMU, I/O devices, BCSUs, ETs, and TCSM.

  The message bus address value ranges between 0–70H.

Further information

Example 60. Adding a functional unit

```
ZWTU:BCSU,3:1B088-01:MB=33;
```

Example 61. Adding a functional unit in BSC3i

```
ZWTU:BCSU,1:1A3-4:MB=31;
```

3.5 Adding plug-in unit(s)

Before you start

Before creating a plug-in unit, ensure that it has a functional unit. Use the `WTI` command to check information on the equipment in the database.

A function is always defined for the time-slot-based plug-in units, otherwise their PCM interface cannot be described in the equipment database. Several functions can be defined for the plug-in unit, if needed. One function can contain 0–32 time slots of one 2-Mbit/s PCM circuit. Note that the indexing of the multi-use track places must be continuous even between plug-in units of different types.

The most common plug-in units that you may need to add are processor unit, MBIF, AS7, and PSC. Note also that some plug-in unit variants differ in ETSI and ANSI environments.

Note

Adding PCUs for GPRS use is instructed in GPRS Handling in BSC.

Steps

1. Create a plug-in unit (WTP)

   ```
   WTP:<unit identification>:<piu identification>:;
   ```

   Refer to Configuring a BSC for more specific information on the creation of plug-in units.

2. Check that the plug-in units were created (WTI)

   ```
   WTI
   ```

3. Connect the unit (WUC)

   ```
   WUC:<unit type>,<unit index>:<plug-in unit type>,<plug-
   in unit index>:<connection information>:<controlling
   unit type>,<controlling unit index>;
   ```

   Time-slot-based plug-in units can be connected if a function has been defined for the plug-in unit in the equipment database.

4. Check that the unit was connected (WTI)

   ```
   WTI
   ```

   You will see that the routed bits changed from 0 to 1.

5. Restart the unit if its state was SP-EX or WO-EX during the creation of the plug-in unit (USU)

   ```
   USU
   ```

Further information

Example 62. Adding and connecting plug-in units

```
ZWTP:BCSU,3:CP6LX,0,2;

ZWTP:BCSU,3:MBIF_UA,0,3;

ZWTP:BCSU,3:MBIF_UA,1,4;

ZWTP:BCSU,3:AS7_V,0,5::SS7,4,16,TSL,0&&3;

ZWTP:BCSU,3:AS7_V,1,6::LAPD,4,16,TSL,4&&31:LAPD,4,17,TSL,0&
&31;

ZWTP:BCSU,3:AS7_V,2,7::LAPD,4,18,TSL,0&&31:LAPD,4,19,TSL,0&
&31;

ZWTP:BCSU,3:PSC3,0,10;

ZWUC:BCSU,3:AS7_V,0;

ZWUC:BCSU,3:AS7_V,1;

ZWUC:BCSU,3:AS7_V,2;
```

Example 63. Adding and connecting plug-in units in BSC3i

```
ZWTP:BCSU,3:PSC6_A,0,1:;

ZWTP:BCSU,3:MBIF_B,0,8:;

ZWTP:BCSU,3:MBIF_B,1,9:;

ZWTP:BCSU,3:AS7_B,0,3::SS7,4,16,TSL,0&&3:LAPD,4,16,TSL,4&&1
3:LAPD,4,17,TSL,0&&31:;

ZWTP:BCSU,3:AS7_B,1,4::LAPD,4,18,TSL,0&&31:LAPD,4,19,TSL,0&
&31;

ZWTP:BCSU,3:AS7_B,2,5::LAPD,4,76,TSL,0&&31:LAPD,4,77,TSL,00
&&31;

ZWTP:BCSU,3:PCU_B,3,6::PCUDSP,4,140,TSL,0&&31:PCUDSP,4,141,
TSL,0&&31;

ZWTP:BCSU,3:PCU_B,4,6::PCUDSP,4,142,TSL,0&&31:PCUDSP,4,143,
TSL,0&&31:;
```

```
ZWTP:BCSU,3:PCU_B,5,7::PCUDSP,4,200,TSL,0&&31:PCUDSP,4,201,
TSL,0&&31;

ZWTP:BCSU,3:PCU_B,6,7::PCUDSP,4,202,TSL,0&&31:PCUDSP,4,203,
TSL,0&&31:;

ZWUC:BCSU,3:AS7_B,0;

ZWUC:BCSU,3:AS7_B,1;

ZWUC:BCSU,3:AS7_B,2;

ZWUC:BCSU,3:PCU_B,3;

ZWUC:BCSU,3:PCU_B,4;

ZWUC:BCSU,3:PCU_B,5;

ZWUC:BCSU,3:PCU_B,6;
```

3.6 Testing a unit

Steps

1. Change the unit to be tested to the TE-EX-state (USC)

   ```
   USC
   ```

2. Run the diagnostics programs (UDU)

   ```
   UDU
   ```

   Refer to Diagnostics and Testing for more information on diagnostics.

3. Change the unit to WO-EX or SP-EX-state (USC)

```
USC
```

Note

Note that the unit controlling the exchange terminal (ET) enters the WO-state only when the first ET unit has been equipped and configured to it. If a signalling channel has been defined for the BCSU, the BCSU enters the WO-EX-state, even though no ETs were created for it. Refer to *Recovery and Unit Working State Administration* for more information.

4. Monitor the operation of the functional unit, and control possible alarms and reports

4 Deleting racks or cabinets, cartridges, plug-in units, and functional units

When you need to delete racks or cabinets, cartidges, plug-in units or functional units, keep in mind the reversed order compared to adding equipment. That is, in order to delete a rack or a cabinet, you will first have to delete plug-in units, then functional units, and then cartridges. The procedures below instruct you through the process all the way to the deletion of a rack or a cabinet. If you only need to delete, for example functional units, you can stop after that procedure has been finished.

Note

For information on deleting PCUs in connection with disabling GPRS, see Disabling GPRS in GPRS Handling in BSC.

4.1 Interrogating information on equipment

Before you start

It is recommended to check the equipment database for existing equipment before deleting any equipment.

Steps

1. Check the equipment database (WTI)

   ```
   WTI: <information type>:<unit identification>:<piu
   identification>;
   ```

2. Check that the signalling terminal does not have active signalling channels

   Refer to, for example, the commands of the DS command group.

4.2 Disconnecting unit(s)

Steps

- Disconnect the unit (WUD)

```
WUD:<unit type>,<unit index>:<plug-in unit type>,<plug-in unit index>;
```

Further information

Example 64. Disconnecting a unit

```
ZWUD:BCSU,3:AS7_V,2;
```

Example 65. Disconnecting a unit in BSC3i

```
ZWUD:BCSU,3:AS7_B,2;
```

4.3 Deleting plug-in unit(s)

Before you start

If you need to delete a functional unit, a cartridge, a rack or a cabinet, follow the steps 1 and 2 and skip the step 3.

Steps

1. Check the booked and routed time slots of a time-slot-based plug-in unit (WTI)

   ```
   WTI
   ```

   If the unit is a time-slot-based plug-in unit, it must not be connected.

2. Delete the plug-in unit (WTQ)

   ```
   WTQ:<unit identification>:<piu identification>;
   ```

3. Check that the plug-in unit description was deleted from the equipment database (WTI)

   ```
   WTI
   ```

   If you need to delete a functional unit, a cartridge, a rack or a cabinet, go directly to the next procedure.

Note

The working state of the functional unit must be SE-NH. However, the OMU is maintained in the WO-EX-state during the deletion. Note that you have to restart the OMU after the functional unit is deleted. It is also possible to disconnect other units, apart from the OMU, in the WO-EX-state but only after confirmation. Also in this case the unit must be manually restarted.

Further information

Example 66. Deleting a plug-in unit

```
ZWTQ:BCSU,3:AS7_V,3;
```

Example 67. Deleting a plug-in unit in BSC3i

```
ZWTQ:BCSU,3:AS7_B,3;
```

4.4 Deleting functional unit(s)

Steps

1. Check that no plug-in units exist (WTI)

   ```
   WTI
   ```

   If any plug-in units still exist, delete them as instructed in Deleting plug-in unit(s).

2. Check that the master unit is in the SE-NH-state (USI)

   ```
   USI
   ```

If not, change the state with the USC command.

3. Delete functional units (WTV)

```
WTV:<unit identification>;
```

If you deleted the last functional unit or you need to delete a cartridge, a rack or a cabinet, proceed to the next step of Deleting cartridges.

4. Check that the plug-in unit and functional unit descriptions were deleted from the equipment database (WTI)

```
WTI
```

Further information

Example 68. Deleting a functional unit

```
ZWTV:BCSU,3;
```

4.5 Deleting cartridge(s)

Steps

1. Delete a cartridge (WTD)

```
WTD:<coordinate of cartridge>;
```

If you need to delete a rack or a cabinet, or if you deleted the last cartridge, proceed to the next step of Deleting rack(s) or cabinet(s).

2. Finally, check that the plug-in unit, functional unit, and cartridge descriptions were deleted from the equipment database (WTI)

```
WTI
```

Further information

Example 69. Deleting a cartridge

```
ZWTD:1B088-01;
```

Example 70. Deleting a cartridge in BSC3i

```
ZWTD:1A3-4;
```

4.6 Deleting rack(s) or cabinet(s)

Steps

1. Delete a rack or a cabinet (WTK)

   ```
   WTK:<coordinate of rack or cabinet>;
   ```

2. Check that the plug-in units, functional units, cartridges, and racks or cabinets you deleted no longer exist in the equipment database (WTI)

   ```
   WTI
   ```

Further information

Example 71. Deleting a rack or a cabinet

```
ZWTK:1B;
```

5 Changing plug-in unit(s)

The steps below instruct you to replace a plug-in unit — for example, when a new variant replaces an existing one, as is the case with the AS7-U and the AS7-V. Note that some plug-in unit variants differ in ETSI and ANSI environments.

5.1 Deleting a plug-in unit

Steps

1. Check the database for information on existing equipment (WTI)

   ```
   WTI
   ```

2. Change the state of the functional unit to SE-NH (USC)

   ```
   USC
   ```

Note

This step does not apply to the OMU.

---

3. Disconnect the unit (WUD)

   ```
   WUD
   ```

4. Delete the plug-in unit (WTQ)

   ```
   WTQ:<unit identification>:<piu identification>;
   ```

Further information

Example 72. Deleting a plug-in unit

```
ZWTQ:BCSU,3:AS7_U,1;
```

5.2 Adding plug-in unit

Steps

1. Create the plug-in unit (WTP)

   ```
   WTP:<unit identification>:<piu identification>;
   ```

2. Change the plug-in unit as instructed in *Instructions for Replacing Plug-in units*

   Change the state and reset the OMU.

3. Connect the unit (WUC)

   ```
   WUC
   ```

Further information

Example 73. Adding plug-in unit

```
ZWTP:BCSU,3:AS7_V,1,6::LAPD,4,16,TSL,4&&31:LAPD,4,17,TSL,0&
&31;
```

Example 74. Adding plug-in unit in BSC3i

```
ZWTP:BCSU,3:AS7_B,1,4::LAPD,4,18,TSL,0&&31:LAPD,4,19,TSL,0&
&31;
```

6 Adding a TCSM

The steps below instruct you to add a new Transcoder Submultiplexer (TCSM) to the BSC.

6.1 Checking the initial conditions

A TCSM is connected to the OMU through the D-channel.

Steps

1. Check that the preprocessor unit (AS7) to which the LAPD-connection is set is equipped and connected (WTI)

   ```
   WTI:<information type>:<unit identification>:<piu
   identification>;
   ```

2. Before you connect, check that the BSC site ET is equipped to the A-interface and connected (WIP and WIL)

   ```
   WIP:<switch type>:<PCM circuit number>;
   ```

   ```
   WIL:<switch type>:<program block name>,<program block
   identifier>,<message bus address>;
   ```

6.2 Creating a rack and a cartridge/an extension cartridge

Steps

1. If necessary, create a rack for the TCSM (WTJ)

   ```
   WTJ:<rack or cabinet type>,<rack or cabinet
   coordinate>: AL, PSFP, PSA;
   ```

   Refer to Configuring racks or cabinets for more information on the procedure.

2. Create the cartridge and the extension cartridge (WTC)

   ```
   WTC: <cartridge type>,<cartridge coordinate>:P1;
   ```

Further information

Example 75. Creating a rack and a cartridge

```
ZWTJ:TC2E,1D;

ZWTC:ET1TC,1D120-01;

ZWTC:TC1C,1D088-01:P1=1D088-01;
```

6.3 Creating a TCSM

Steps

- Create the TCSM (WTU)

Note

The indexes of the BSC site ET and the TCSM have to be the same.

```
WTU:<unit identification>:<coordinate of cartridge>;
```

Further information

Example 76. Creating a TCSM

```
ZWTU:TCSM,72:1D088-01;

ZWTU:TCSM,72:1D120-01;
```

6.4 Creating plug-in units of the TCSM

Steps

- Create the plug-in units of the TCSM (WTP)

  The ET2E plug-in units of the TCSM are created to the extension cartridge.

  ```
  WTP:<unit identification>:<piu identification>:<piu
  attributes>:<piu PCM attributes>;
  ```

Further information

Example 77. Creating plug-in units of the TCSM

```
ZWTP:TCSM,72,1D088-01:TRCO,0,0::GENERAL,2,72,TSL,1;

ZWTP:TCSM,72,1D088-01:TR16,0,1;

ZWTP:TCSM,72,1D088-01:TR16,1,2;

ZWTP:TCSM,72,1D120-01:ET2E,0,0;

ZWTP:TCSM,72,1D120-01:ET2E,1,0;

ZWTP:TCSM,72,1D088-01:PSC1,0,15;
```

6.5 Connecting the TRCO plug-in unit of the TCSM

Steps

1. Connect the TRCO (WUC)

   ```
   WUC:<unit type>,<unit index>:<plug-in unit type>,<plug-in unit index>:<connection information>:<controlling unit type>,<controlling unit index>;
   ```

2. Continue configuring the TCSM

   Continue configuring the TCSM as instructed in Configuring a TCSM unit (TCSM2) in BSS Transmission Management.

Further information

Example 78. Connecting the TRCO plug-in unit of the TCSM

```
ZWUC:TCSM,72:TRCO,0;
```

6.6 Testing the TCSM

Steps

1. Change the TCSM state to TE-EX (USC)

   ```
   USC
   ```

2. Run the diagnostics programs (UDU)

   ```
   UDU
   ```

   This may take some time.

3. Change the TCSM to WO-EX again (USC)

   ```
   USC
   ```

4. Monitor the operation of the functional unit

7 Deleting a TCSM

Steps

1. Change the state of the TCSM to SE-NH (USC)

   ```
   USC
   ```

2. Disconnect the TRCO plug-in unit of the TCSM (WUD)

   ```
   WUD:<unit type>,<unit index>:<plug-in unit type>,<plug-
   in unit index>;
   ```

3. Delete the plug-in unit (WTQ)

   ```
   WTQ:<unit identification>:<piu identification>;
   ```

4. Delete the TCSM-unit (WTV)

   ```
   WTV:<unit identification>;
   ```

5. If you deleted the last TCSM, then delete the cartridge (WTD)

   ```
   WTD:<coordinate of cartridge>;
   ```

6. If you deleted the last cartridge, then delete the rack (WTK)

   ```
   WTK:<coordinate of rack or cabinet>;
   ```

7. Check that the deletion was successful (WTI)

   ```
   WTI
   ```

Further information

Example 79. Disconnecting a TRCO

```
ZWUD:TCSM,72:TRCO,0;
```

Example 80. Deleting a plug-in unit

```
ZWTQ:TCSM,72,1D088-01:TRC0,0;
```

Example 81. Deleting a TCSM

```
ZWTV:TCSM,72:1D088-01;

ZWTD:1D088-01;

ZWTK:1D;
```

8 Adding an ET

Before you start

Refer to Enabling GPRS in BSC in GPRS Handling in BSC if you are adding PCUs and ETs only to enable GPRS. Another option in defining ETs to enable GPRS is to change the interface of an existing ET. Changing ET-interface is instructed in Changing an ET from one interface to another.

8.1 Check the initial conditions

Steps

1. Check that the BCSU to which the ETs will be connected exists (WTI)

   ```
   WTI
   ```

2. Check that the state of the BCSU is either SE-NH or WO-EX (USI)

   ```
   USI
   ```

   If necessary, use the `USC` command to change the states.

Note

The unit controlling the ET enters the WO-state only when the first ET-unit has been equipped and configured to it. If a signalling channel has been defined for the BCSU, the BCSU enters the WO-EX-state even though no ETs were created for it.

8.2 Creating a rack or a cabinet and a cartridge

Steps

1. Check if you need a rack or a cabinet and/or a cartridge (WTI)

   ```
   WTI
   ```

2. If necessary, create a rack or a cabinet (WTJ)

   ```
   WTJ:<rack or cabinet type>,<rack or cabinet
   coordinate>: AL, PSFP, PSA;
   ```

   Refer to Configuring ETs/ET2s for more information on the procedure.

3. If necessary, create a cartridge (WTC)

   ```
   WTC:<cartridge type>,<coordinate of cartridge>:AL;
   ```

Further information

Example 82. Creating a cartridge

```
ZWTC:ET5C,1B120-13:AL=1B120-01-2;
```

Example 83. Creating a cartridge in BSC3i

```
ZWTC:ET4C_B,1A5-0,:AL=1A1-6-2S5,;
```

8.3 Creating an ET

Steps

- Create the ET (WTU)

  ```
  WTU:<unit identification>:<coordinate of cartridge>;
  ```

Further information

Example 84. Creating an ET

```
ZWTU:ET,72:1B120-13;
```

Example 85. Creating an ET in BSC3i

```
ZWTU:ET,63:1A5-0:;
```

8.4 Creating the plug-in units of the ET

Steps

- Create the plug-in units (WTP)

  ```
  WTP:<unit identification>:<piu identification>:<piu
  attributes>:<piu PCM attributes>;
  ```

Further information

Example 86. Creating the plug-in units of the ET

```
ZWTP:ET,72:ET2E,0,0::ETT00,4,72,TSL,0;
```

Example 87. Creating the plug-in units of the ET in BSC3i

```
ZWTP:ET,63:ET2E_S,0,15::ETT00,4,63,TSL,0;
```

8.5 Connecting the plug-in units of the ET

Before you start

Note

Remember the equipping rules for ET2s — the even ET must be connected first, then the odd ET. The ETT00 function must be equipped to both ETs. When the ET is connected, the LAPD connection is established to time slot 0 of the even ET.

Steps

- Connect the plug-in units of the ET (WUC)

```
WUC:<unit type>,<unit index>:<plug-in unit type>,<plug-
in unit index>:<connection information>:<controlling
unit type>,<controlling unit index>;
```

Further information

Example 88. Connecting the plug-in units of the ET

```
ZWUC:ET,72:ET2E,0:IF=ABIS:BCSU,3;
```

Example 89. Connecting the plug-in units of the ET in BSC3i

```
ZWUC:ET,63:ET2E,0:IF=ABIS:BCSU,3;
```

8.6 Changing the control parameters

Steps

- If necessary, change the control parameters (YEC)

```
YEC
```

8.7 Testing the ET

Steps

1. Change the state of the ET to TE (USC)

   ```
   USC
   ```

2. Run the diagnostics programs (UDU)

   ```
   UDU
   ```

3. Change the state of the ET to WO (USC)

   ```
   USC
   ```

9 Deleting an ET

Before you start

Refer to Enabling GPRS in BSC in GPRS Handling in BSC if you are deleting PCUs and ETs only to disable GPRS.

Steps

1. Check that the ET is not in use

   This depends on the interface the ET is connected to. Use, for example, the `DSB`, `DSI`, `WGO`, `NCI`, and `RCI` commands.

2. Check that the state of the controlling BCSU is either SE-NH or WO-EX (USI)

   ```
   USI
   ```

   If necessary, use the `USC` command to change the state

3. Change the state of the ET to SE-NH (USC)

   ```
   USC
   ```

4. Disconnect the plug-in unit of the ET (WUD)

Note

If an ET2 is in question, remember to first disconnect the odd ET, then the even one.

```
WUD:<unit type>,<unit index>:<plug-in unit type>,<plug-
in unit index>;
```

5. Delete the plug-in unit (WTQ)

```
WTQ:<unit identification>:<piu identification>;
```

6. Delete the ET (WTV)

```
WTV:<unit identification>;
```

7. Delete the cartridge if you have deleted the last ET (WTD)

```
WTD:<coordinate of cartridge>;
```

8. Delete the rack if you have deleted the last cartridge (WTK)

```
WTK:<coordinate of rack>;
```

9. Check that the deletions were successful (WTI)

```
WTI
```

Further information

Example 90. Disconnecting a unit

```
ZWUD:ET,72:ET2E,0;
```

Example 91. Disconnecting a unit in BSC3i

```
ZWUD:ET,63:ET2E_S,0;
```

Example 92. Deleting a plug-in unit

```
ZWTQ:ET,72:ET2E,0;
```

Example 93. Deleting a plug-in unit in BSC3i

```
ZWTQ:ET,63:ET2E_S,0;
```

Example 94. Deleting an ET

```
ZWTV:ET,72;

ZWTD:1B120-13;

ZWTK:1B;
```

Example 95. Deleting an ET in BSC3i

```
ZWTV:ET,63;

ZWTD:1A5-0;
```

10 Changing an ET from one interface to another

The following steps instruct you to change the ET from the Abis interface to the A-interface. The same procedure is applicable for changing from the A-interface to the Abis interface.

Before you start

Note

Changing an ET to the Gb interface to enable the use of GPRS can be done in two ways. You can follow the instructions here but choose the GB value for the `WUC` command parameter `interface`. Another and a more recommended way, especially when starting the use of GPRS, is to follow the instructions in Enabling GPRS in BSC in GPRS Handling in BSC.

Steps

1. Change the state of the ET to SE-NH (USC)

   ```
   USC
   ```

2. Disconnect the plug-in unit of the ET (WUD)

Note

If an ET2 is in question, remember to first disconnect the odd ET, then the even one.

```
WUD:<unit type>,<unit index>:<plug-in unit type>,<plug-
in unit index>;
```

3. Connect the ET to the A-interface (WUC)

```
WUC:<unit type>,<unit index>:<plug-in unit type>,<plug-
in unit index>:<connection information>:<controlling
unit type>,<controlling unit index>;
```

4. Change the state of the ET to WO (USC)

```
USC
```

5. Interrogate PCM circuits (WIP)

   You can also use the WIL command to interrogate PCM circuits of a computer or program block.

```
WIP:<switch type>:<PCM circuit number>;
```

```
WIL:<switch type>:<program block name>,<program block
identifier>,<message bus address>;
```

   GSW (group switch) is an obligatory value. If you use the parameter `switch type` alone, the command prints out the connection information on all the PCM circuits in use.

Further information

Example 96. Interrogating PCM circuits

```
ZWUD:ET,72:ET2E,0;

ZWUC:ET,72:ET2E,0:IF=A:BCSU,3;

ZUSC:ET,72:SE;

ZUSC:ET,72:TE;

ZUSC:ET,72:WO;
```

11 Creating an external alarm

In the cartridge construction you can handle the external alarms with the commands of the MML command group WA. You can create and connect an external alarm to alarm input after which the alarm is recognised by supervision and by the alarm system. These are alarms concerning supervised external devices located outside the network element. Refer to *Wired Alarms Connections Handling* for more information on the commands and command parameters.

The alarms are configured in the normal working state of the OMU.

External alarms cannot be tested with the MML program. Instead, they can be tested by creating a real situation, for example 'door open'. The wired alarms of a cartridge and a rack or cabinet can be tested with MML commands.

Steps

1. Output data on alarm inputs (WAT)

   ```
   WAT:<alarm number>;
   ```

   The parameter `alarm number` refers to the alarms in Alarm documentation. The numbers of the external alarms range from 4000 to 5999.

2. Select a free alarm number and give the device type and text of alarm (WAA)

   ```
   WAA:<alarm number>:<device type>:<alarm text>;
   ```

   The parameter `alarm number` refers to the alarms in the Alarm documentation. The numbers of the external alarms range from 4000 to 5999. The parameter `alarm text` corresponds to the alarm number.

3. Check the alarm you created (WAT)

   ```
   WAT
   ```

Further information

Example 97. Creating an external alarm

```
ZWAA:4000:EX:”ALARM1”;
```

12 Opening an external alarm in an alarm input

Refer to Creating an external alarm for information on wired alarms.

Before you start

Note

The opened alarm input is under supervision immediately after the `WAI` command has been executed.

Steps

1. Check that you have created the external alarm (WAA) and check the data (WAT)

   ```
   WAA
   ```

   ```
   WAT
   ```

2. Check the alarm connection situation (WAP)

   ```
   WAP:<connection plug-in unit>,<index>:<unit
   type>:<input number>;
   ```

   Only the parameters indicated in the table are needed.

3. Perform the required wiring in the free alarm input you have selected

4. Open the alarm input (WAI)

   ```
   WAI:<connection plug-in unit>:<connection unit>:<alarm
   input>,<alarm number>,<alarm concerned text>:< source
   unit>;
   ```

5. If necessary, change the polarity of the external alarm input (WAX)

```
WAX:<connection plug-in unit>:<connection unit>:<alarm
input>:<polarity of the alarm input>,<alarm concerned
text>;
```

The possible values for the parameter `polarity of the alarm input` are 0 and 1.

Further information

Example 98. Opening an external alarm in an alarm input

```
ZWAI:HWAT:OMU:0,4000,"TEST1":OMU;
```

13 Modifying an external alarm or alarm input

Refer to Creating an external alarm for information on wired alarms.

Before you start

The alarm number cannot be modified, instead you must first delete it and then create a new one. Refer to Deleting an external alarm and Creating an external alarm for more information on the procedures.

To modify the device type or the alarm text follow the steps described in the following procedures.

13.1 Modifying an external alarm

Steps

1. Check the existing data on external alarms (WAT)

   ```
   WAT
   ```

2. Modify either the device type or the alarm text (WAM)

   ```
   WAM:<alarm number>:<device type>,<alarm text>;
   ```

   The parameter `alarm number` refers to the alarms in the Alarm documentation. The numbers of the external alarms range from 4000 to 5999. The parameter `alarm text` corresponds to the alarm number.

3. Check your modifications (WAT)

   ```
   WAT
   ```

13.2 Modifying the polarity of an external alarm

Steps

1. Check the polarity of the alarm input (WAP)

   ```
   WAP:<connection plug-in unit>:<connection unit>:<alarm
   inputs>;
   ```

2. Check your modifications (WAP)

   ```
   WAP
   ```

   Depending on the polarity, setting or cancelling of the alarm input is ouput on the alarm printer.

14 Deleting an external alarm

Refer to Creating an external alarm for information on wired alarms.

You need to delete an external alarm when the equipment it is connected to does not need supervision anymore.

Also, if you wish to change the alarm number you have to delete it first and then create it again, as instructed in Creating an external alarm.

Steps

1. Check the alarm connections (WAP)

   Ensure that the alarm you will delete is not connected to an active alarm input.

   ```
   WAP:<connection plug-in unit>:<connection unit>:<alarm inputs>;
   ```

2. If necessary, close the alarm input (WAD)

   ```
   WAD:<connection plug-in unit>:<connection unit>:<alarm input>;
   ```

3. Delete the external alarm (WAR)

   ```
   WAR:<alarm number>;
   ```

   The `alarm number` refers to the alarm numbers in Alarm documentation and is the number of the alarm you wish to delete. The numbers of the external alarms range from 4000 to 5999.

4. Check that the deletion was successful (WAT)

   ```
   WAT
   ```

Further information

Example 99. Deleting an external alarm

```
ZWAD:HWAT:OMU:0;

ZWAR:4000;
```

15 Testing a wired alarm

Refer to Creating an external alarm for information on wired alarms.

It is recommended to test alarms regularly, for example, once a month, and when the hardware is modified.

Steps

- Test the cartridge alarms (WAE)

  ```
  WAE:<rack coordinates>,<rss name>:<alarm group>;
  ```

  The parameter `rss name` is not needed in the BSC.

  In the parameter `alarm group` values 1–15 are used for the HWAT and the CLAB. Values 1–11 are used for the RSAI, and values 1–8 for the CLET.

16 Message bus addresses

Unit name	Number	Address
OMU	0	00
MCMU	0	04
MCMU	1	05
BCSU	0	30
BCSU	1	31
BCSU	2	32
BCSU	3	33
BCSU	4	34
BCSU	5	35
BCSU	6	36
BCSU	7	37
BCSU	8	38
BCSU	9	39
BCSU	10	3A
BCSU	11	3B
BCSU	12	3C
BCSU	13	3D
BCSU	14	3E
BCSU	15	3F

17 Defining the alarm group

Alarm group	Location of subconnector in CLAC	Location of subconnector in CLOC/CLOC-B
1	04R1	04R1
2	03R3	02R3
3	04R3	04R3
4	03R5	02R5
5	04R5	04R5
6	03R7	02R7
7	04R7	04R7
8	03S1	02S1
9	04S1	04S1
10	03S3	02S3
11	04S3	04S3
12	03S5	02S5
13	04S5	04S5
14	03S7	02S7
15	04S7	04S7

Defining an alarm group for a cartridge

1. Find the alarm/clock signal cable (CFB cable) for the cartridge to be created in the Cable Equipment List

2. See the connector definition for the cable in the CLAC/CLOC/CLOC-B cartridge.

3. Now using the connector definition and its last four characters (subconnector) find the corresponding alarm group from the table above.

Example 100.

Your connector definition in CLAC is 04S5. Locating 04S5 from the right-hand column, you will see that the corresponding alarm group is 13.

Glossary

Abbreviations

AS7	AS7 is a plug-in unit which provides multichannel signalling terminal functionalities to the G.703 physcal layer G.703.
AC25	The AC25 plug-in unit is an adapter which implements an X.25 communication interface with the BSC, meeting the ITU-T Recommendation.
BCSU	Base Station Controller Signalling Unit performs those BSC functions that are highly dependent on the volume of traffic. It consists of two parts corresponding to the A and Abis interfaces.
BSC	Base Station Controller. The term BSC is used to refer to both the BSC and the BSC3i if not mentioned otherwise.
CLAC	The CLAC is the cartridge for the Clock and Alarm Buffer Unit and the Clock and Synchronisation Unit.
CLAB	The CLAB is the plug-in unit in the CLAC cartridge. Not included in the BSC3i.
CLOC	The CLOC is the cartridge for the Clock and Synchronisation Unit.
CLS	The Clock and Synchronisation Unit is a functional unit that provides the synchronisation for the BSC.
COCEN	COCEN is a plug-in unit which provides a LAN interface. Uses LLC1 protocol for data link layer.
ET	The Exchange Terminal is a functional unit for supervising electrical synchronisation and adaptation of an external 2 Mbit/s link.
ET2E	The ET2E plug-in units are situated in the ET or TCSM functional unit.
FU	A functional unit is an entity consisting of the hardware and the software. A functional unit may also be only of the hardware, which implements a defined part of the tasks in the system. The following are functional units: all processor units, ET, CLS, TCSM, and CLAB. Also networks, buses, and peripheral devices are functional units (GSW, MB and SBUS, CTU, FDU, LPT, VDU, and WDU).
GSW	Group Switch, switching network unit for 64 kbit/s channels.
GSWB	Group Switch, switching network unit for 8 kbit/s channels.
HWAT	The Hardware Alarm Terminal conveys the hardware alarms to the OMU.
MB	Message Bus.
MBIF	The Message Bus Interface is a bi-directional interface between the Control Processor and the parallel Message Bus.

MCMU	The Marker and Cellular Management Unit controls and supervises the Group Switch, the cellular network and handovers.
OMU	The Operation and Maintenance Unit acts as an interface between the user and the exchange. Its tasks include traffic control functions, maintenance, system configuration administration and system management.
PCU	The Packet Control Unit takes care of channel allocation functions and radio channel management functions, for example power control. The PCU implements the Gb and the RLC/MAC interface in the BSC.
SM2M	The 2 Mbit/s Submultiplexer combines 90 16 kbit/s subrate channels into one 2 Mbit/s transmission bus.
TCSM1	The first generation transcoder consists of either one to three TRCU units and one SM2M unit (submultiplexed first generation transcoder) or of only a TRCU unit (not submultiplexed first generation transcoder). At a maximum it is only able to code and submultiplex one to three full rate TC_PCMs.
TCSM2	The second generation transcoder submultiplexer is a transcoder with an integrated multiplexing function. The TCSM2 offers more flexible channel allocations in the Ater interface. The second generation transcoder can code and submultiplex one to seven different types of TC_PCMs. The second generation transcoder is a functional unit (TCSM) whereas the TCSM1 is not.
TRCO	The Transcoder Controller Plug-in Unit is the controller in the TCSM2 unit and it supervises the operation of the TCSM2.
TRCU	The TRCU converts 30 GSM type 16 kbit/s subrate channels into 30 64 kbit/s PCM channels.

Concepts

Cabinet	A cabinet is a self-supporting frame of standard dimension into which the cartridges are installed, made of steel sheets and provided with doors. It is used in the BSC3i.
Cartridge	A cartridge is a mechanical construction, which forms a solid framework for plug-in units and other equipment. The cartridge also includes everything that is needed to connect the plug-in units to the cartridge.
Connecting	Connecting or making a connection refers to the creation of plug-in unit routing (internal routing of the exchange), and PCM data, among others, to various files with the commands of the command group WU.
Equipping	Equipping is used in the sense of creating a hardware description to the equipment database with the commands of the command group WT.

Plug-in unit	Plug-in units are replaceable hardware units that contain electronic components. They can be connected to a cartridge or to a subrack, for example.
Rack	A rack is a case-type frame of standard dimension into which the cartridges are installed. A rack consists of a rack body, side plates, a top plate, and doors. The equipped rack contains rack-specific cartridges, cables, and other equipment.