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Nokia BSC/TCSM S11 Product Documentation

BSS Transmission Management

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Summary of changes

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 6 and 5V

Changed due to Q1 Protection in BSC

The need for creating a secondary Q1 channel for those Q1 channels the user wants protected noted in the *Creating Q1 channel configurations* chapter.

The syntax for command QWC changed throughout.

Layout changes

The descriptive introductory chapter has been removed from these instructions. Descriptive information about BSS Transmission Management can be found in *Transmission Management in BSS.*

Other changes

All mentions of fetching through connections from the TCSM removed.

Changes made between issues 5 and 5V

Information on Nokia ConnectSite 10 and Nokia ConnectSite 100 base stations has been added.

Changes made between issues 5 and 4a

Subsection *Checking build state ACT CORRUPTED and CORRUPTED* has been removed. Other subsections in section *Software download and activation troubleshooting* have been modified.

An example *Configuring a TRCU with non-smuxed A interface* has been added to *Configuring a TRCU (TCSM1)* .

1 Creating Q1 channel configurations

Q1 service channels are used in message transfer between the BSC and the transmission equipment. The following procedures describe how to create and delete Q1 channels between the BSC and the transmission equipment, and how to modify the data of a Q1 channel.

Refer to Q1 Interface Handling (QW) for more information on the use of the commands of the command group and the related parameters.

Steps

1. **Check the Q1 channel configuration and which pieces of equipment are on the channels (QWI)**

   ```
   ZQWI:<service channel number>:<output width>;
   ```

2. **Create a Q1 channel (QWC)**

   ```
   ZQWC:<service channel number>,<channel type>:<baud
   rate>,<bandwidth>,<used bits>:<external PCM-TSL>,
   <sub-tsl>;
   ```

3. **Create the required number of channels (QWC)**

   If necessary and if the maximum number of Q1 channels has not been exceeded, use the QWC command until you have created the required number of channels.

   If you want to utilise the feature Q1 Protection in BSC, you must create secondary channels for all the primary Q1 channels that are to be protected.

4. **Check that the creation was successful (QWI)**

   ```
   ZQWI;
   ```

5. **Add the necessary equipment to the Q1 channel (QWA)**

```
ZQWA:<service channel number or BCF number>,<TRX
number>:<transmission equipment>:<alarm unit
address>;
```

6. Add the required amount of equipment (QWA)

If necessary and if the maximum amount of equipment has not been exceeded, use the `QWA` command until you have added the required amount of equipment.

7. Check that the equipment were added successfully (QWI)

```
ZQWI;
```

8. Set the Q1 channel state to AL (QWS)

```
ZQWS:<service channel number>:<state>;
```

9. Check that the service channel configuration and the pieces of equipment on the service channels are as you created them (QWI)

```
ZQWI;
```

Further information:

Example 1. Creating a Q1 channel configuration and adding equipment

```
ZQWI::ALL;

ZQWC:1:2400,64,LS:72-31;

ZQWC:1,S::73-30;

ZQWA:CH=1:DMR=2:1;

ZQWS:1:AL;
```

For more information on transmission management, see *BSS transmission management overview.*

2 Modifying service channel configurations

This procedure gives instructions needed when performing the various modifications you can make to the service channel configuration. Each modification task is a separate task, that is if you, for example, need to add equipment to Q1 channels, you only need to follow the steps listed under that task.

Note

Equipment cannot be added to Nokia 2nd Generation or Nokia InSite BTSs or to Nokia Talk-family, or Nokia PrimeSite BTSs with a software build older than DF6.0.

For more information on transmission management, see *BSS transmission management overview.*

2.1 Changing the Q1 channel state

Steps

1. **Check the Q1 channel configuration and the number of the Q1 channel for which you will change the state (QWI)**

   ```
   ZQWI:<service channel number>:<output width>;
   ```

2. **Change the Q1 channel state (QWS)**

   ```
   ZQWS:<service channel number>:<state>;
   ```

3. **Check that the state change was successful (QWI)**

```
ZQWI;
```

Further information:

Example 2. Changing the Q1 channel state

```
ZQWS:1:AD;
```

2.2 Adding equipment to Q1 channels

Steps

1. **Check the state of the Q1 channel to which you will add equipment (QWI)**

   ```
   ZQWI;
   ```

2. **If necessary, set the Q1 channel state to AD (QWS)**

   ```
   ZQWS:<service channel number>:<state>;
   ```

3. **Add the necessary equipment to the Q1 channel (QWA)**

   ```
   ZQWA:<service channel number or BCF number>,<TRX
   number>:<transmission equipment>:<alarm unit
   address>;
   ```

4. **If necessary, set the Q1 channel state to AL (QWS)**

   ```
   ZQWS:<service channel number>:<state>;
   ```

5. **Check that the equipment was added to the service channel configuration (QWI)**

   ```
   ZQWI:<service channel number>:<output width>;
   ```

   The `QWI` command shows the equipment supervised by the BSC.

Further information:

Example 3. Adding equipment to Q1 channels

```
ZQWS:1:AD;

ZQWA:CH=1:DMR=2:1;
```

```
ZQWS:1:AL;

ZQWI:1;
```

2.3 Adding equipment to Q1 bus

Before you start

Note

Equipment cannot be added to Nokia 2nd Generation or Nokia InSite BTSs or to Nokia Talk-family, or Nokia PrimeSite BTSs with a software build older than DF6.0.

Steps

1. **Check the configuration of transmission equipment on the Q1 bus (QWL)**

   ```
   ZQWL:<service channel or BCF number>,<TRX number>:
   <transmission equipment>:<format>;
   ```

2. **Add equipment to the Q1 bus (QWA)**

   ```
   ZQWA:<service channel or BCF number>,<TRX number>:
   <transmission equipment>:<alarm unit address>;
   ```

3. **Check that the addition was successful (QWL)**

   The `ZQWL` command shows the equipment supervised by the BSC and BTS.

Further information:

Example 4. Adding equipment to Q1 bus

```
ZQWA:BCF=1:TRE=2:2;
```

2.4 Removing equipment from Q1 channels

Steps

1. **Check the state of the Q1 channel from which you remove equipment (QWI)**

   ```
   ZQWI:<service channel number>:<output width>;
   ```

2. **If necessary, set the Q1 channel state to AD (QWS)**

   ```
   ZQWS:<service channel number>:<state>;
   ```

3. **Remove the necessary equipment from the Q1 channel (QWR)**

   ```
   ZQWR:<service channel number or BCF number>,<TRX
   number>:<transmission equipment>;
   ```

4. **If necessary, set the Q1 channel state to AL (QWS)**

   ```
   ZQWS:<service channel number>:<state>;
   ```

5. **Check that the equipment was removed from the service channel configuration (QWI)**

   ```
   ZQWI:<service channel number>:<output width>;
   ```

   The `QWI` command shows the equipment supervised by the BSC.

Further information:

Example 5. Removing equipment from Q1 channels

```
ZQWS:1:AD;

ZQWR:CH=1:DMR=2;

ZQWS:1:AL;

ZQWI;
```

Note

You cannot delete a piece of equipment from the Q1EQUI if the equipment is attached to a download. Refer to Q1 Interface Handling (QW) for more information on the restrictions.

2.5 Removing equipment from Q1 bus

Before you start

Note

Equipment cannot be removed from the Nokia 2nd Generation or Nokia InSite BTSs, nor from Nokia Talk-family, or Nokia PrimeSite BTSs with a software build older than DF6.0.

Steps

1. **Check the configuration of the transmission equipment on the Q1 bus (QWL)**

   ```
   ZQWL:<service channel or BCF number>,<TRX number>:
   <transmission equipment>:<format>;
   ```

2. **Remove equipment from the Q1 bus (QWR)**

   ```
   ZQWR:<service channel or BCF number>,<TRX number>:
   <transmission equipment>;
   ```

3. **Check that the deletion was successful (QWL)**

   The QWL command shows the equipment supervised by the BSC and the BTS.

Further information:

Example 6. Removing equipment from Q1 bus

```
ZQWL:BCF=1;
```

```
ZQWR:BCF=1:TRE=2;

ZQWL:BCF=1;
```

2.6 Changing BTS-supervised equipment to BSC supervision

Steps

1. **Check the service channel configuration and equipment configuration on the channels (QWL)**

   ```
   ZQWL:<service channel or BCF number>,<TRX number>:
   <transmission equipment>:<format>;
   ```

   The `QWL` command shows the equipment supervised by the BSC and the BTS.

2. **Check that the BTS site type is Nokia MetroSite or Nokia UltraSite (EFO)**

   ```
   ZEFO:<BCF identification>:<parameter group>;
   ```

3. **Modify the equipment information (QWG)**

   ```
   ZQWG:<service channel or BCF number>,<TRX number>:
   <transmission equipment>:<alarm unit address>;
   ```

Note

The address should be under 4000.

Note

The address change of TRE-1 equipment with an address 4080 under Nokia MetroSite or UltraSite BTSs is not allowed if another transmission equipment exists under the same BTS. In this case the command fails with the error code 242 (CHANGE IS NOT ALLOWED).

Note

The address change of TRU-1 equipment with an address 4080 under Nokia Talk-family or Nokia PrimeSite with the software version DF 6.0 or newer is not allowed if another transmission equipment exists under the same BTS. In this case the command fails with the error code 242 (CHANGE IS NOT ALLOWED).

The address change of TRU-1 equipment with an address 4080 under Nokia Talk-family or Nokia PrimeSite with the software version DF 6.0 or newer is not recommended if no transmission equipment other than TRU-1 exists under the same BTS.

4. If necessary, create the Q1 channel (QWC)

```
ZQWC:<service channel number>,<channel type>:<baud
rate>,<bandwidth>,<used bits>:<external PCM-TSL>,
<sub-tsl>;
```

5. Add the equipment to the channel (QWA)

```
ZQWA:<service channel number>:<transmission
equipment>:<Q1 address>;
```

Note

The address must be the same as was given in the `QWG` command. The index can be selected freely.

6. Change the channel state to AL (QWS)

```
ZQWS:<service channel number>:<state>;
```

7. Check that the change was successful (QWI)

```
ZQWI:<service channel number>:<output width>;
```

8. Perform the necessary changes to the equipment according to the instructions of the equipment

Further information:

Example 7. Changing BTS-supervised equipment to BSC supervision

```
ZEFO:1:IDE;

ZQWG:BCF=1:TRE=1:10;

ZQWA:CH=5:TRE=2:10;

ZQWS:5:AL;
```

2.7 Decreasing the number of Q1 channels or increasing the number of TCSM2s

Before you start

The default setting is that you can connect 10 TCSM2 (TRCO) and create 18 Q1 channels, that is when the NUMBER_OF_Q1_CHANNELS parameter value is 12H. In case you need more than 10 TCSM2 units, you must decrease the parameter NUMBER_OF_Q1_CHANNELS value. With the WOI command you can check the default setting for the maximum number of Q1 channels, 12H = 18 channels. An example case printout is as follows:

```
ZWOI:9;
00075          NUMBER_OF_Q1_CHANNELS              0012       YES
```

Steps

1. **Check how many TCSM2s have been created and connected (USI, WTI, DSF)**

   ```
   ZUSI

   ZWTI

   ZDSF
   ```

   Refer to Q1 Interface Handling (QW) for more information on the command parameters.

2. **Check that the total number of Q1 channels does not exceed 13 (QWI)**

   ```
   ZQWI
   ```

3. **Change the** NUMBER_OF_Q1_CHANNELS **parameter from 12H to DH (=13) (WOC)**

   ZWOC

   Now only 13 Q1 channels can be created and used but it is possible to take the rest of the OMU AS7 D-channel capacity to the TCSM2-use.

4. **Check the** NUMBER_OF_Q1_CHANNELS **parameter value (WOI)**

   In the example case the printout will be as follows:

```
ZWOI:9;
00075          NUMBER_OF_Q1_CHANNELS    000D    YES
```

5. **Restart OMU (USU)**

   ZUSU

   Before the new NUMBER_OF_Q1_CHANNELS parameter value will be used, OMU must be restarted.

6. **Now you can connect more TCSM2s, but the number of Q1 channels has been decreased**

Note

After the OMU restarts the TCSM2 LAPD and Q1 channels internal PCMs time slot can be changed. New PCMs time slot can be checked with the DSF and ZQWI commands:

---

7. **Check that the procedure was successful (QWI)**

   ZQWI

Further information:

Example 8. Decreasing the number of Q1 channels or increasing the number of TCSM2

```
ZWOI:9;

ZUSI:TCSM;
```

```
ZWTI:P:TCSM:TRCO;

ZDSF:TCSM:OMU;

ZQWI::CHA;

ZWOC:9,75,D:;

ZWOI:9;

ZUSU:OMU:;

ZDSF:TCSM:OMU;

ZQWI::CHA;
```

2.8 Modifying BTS Q1 bus parameters

Before you start

Note

BTS Q1 parameters can only be modified to Nokia MetroSite, Nokia UltraSite, Nokia InSite, Nokia ConnectSite 10, and Nokia ConnectSite 100 BTS site types.

Steps

1. **List the configuration of the transmission equipment on the Q1 bus (QWL)**

   ```
   ZQWL
   ```

2. **Modify the Q1 bus baud rate (QWF)**

   ```
   ZQWF:<BCF number>:<Q1 bus baud rate>;
   ```

3. **Check that the modification was successful (QWL)**

   ```
   ZQWL
   ```

Note

The Q1 bus baud rate for the BTS is displayed next to the TRE-1.

Note

The baud rates for all equipment on the same Q1 bus have to be the same. Otherwise, when the Q1 bus baud rate is modified, the connection to another equipment on the same Q1 bus is lost.

Further information:

Example 9. Modifying BTS Q1 bus parameters

```
ZQWF:BCF=2:BR=9600;
```

2.9 Modifying 1200 bit/s Q1 channel bandwidth from 64 kbit/s to 16 kbit/s

Steps

1. **Check that the Q1 channel baud rate is 1200 and bandwidth is 64 kbit/s (QWI)**

   ```
   ZQWI
   ```

2. **If necessary, change the state of the Q1 channel to AD (QWS)**

   ```
   ZQWS:<service channel number>:<state>;
   ```

3. **Modify the Q1 channel bandwidth (QWM)**

   ```
   ZQWM:<service channel number>:<baud rate>,
   <bandwidth>,<used bits>,<external PCM-TSL>,<sub-
   tsl>;
   ```

4. **If necessary, change the state of the Q1 channel to AL (QWS)**

   ```
   ZQWS
   ```

5. Check that the modification was successful (QWI)

```
ZQWI
```

Further information:

Example 10. Modifying 1200 bit/s Q1 channel bandwidth from 64 kbit/s to 16 kbit/s

```
ZQWS:1:AD;

ZQWM:1:BW=16;

ZQWS:1:AL;
```

3 Managing the transmission equipment configuration remotely

You can manage transmission equipment remotely from the BSC site by using BSS Transmission Equipment Handling MML (QU command group). With the QU command group you can perform configuration management and performance management operations and basic fault management operations. Thus, QU commands emulate the functions of the hand-held service terminal. See BSS Transmission Equipment Handling (QU) for more information on the use of the commands of the command group.

For more information on transmission management, see *BSS transmission management overview.*

Before you start

Starting remote sessions (QUS command) and executing a remote command (QUE command) are optional features. If this option is not enabled, the commands do not appear on the menu.

3.1 Starting a remote service terminal session to the equipment at a BTS site

The following procedure instructs how to start a remote service terminal session to transmission equipment at a BTS site. This type of equipment is supervised by the BTS.

Steps

1. **Check that the BCF exists and find out the BCF's D-channel link set name (EFO)**

   ZEFO:<identification of BCF>:<parameter group>;

Refer to Base Control Function Handling (EF command group) and *Radio Network Configuration Management* for more information on the EF command group commands.

2. Check the state of the D-channel (DTI)

The O & M link in should be in the WO-EX state.

```
ZDTI:<D-channel link set names or numbers>;
```

Refer to Primary Rate Access D-Channel State Handling for more information on the DT command group commands.

3. Start the remote session (QUS)

```
ZQUS:<base control function number>,<transmission
equipment>:<functional entity number>;
```

Note

Functional entity number exceeding 0 is not supported if the BTS site type is Nokia 2nd Generation, or if Nokia Talk-family or Nokia PrimeSite BTSs have a software build older than DF5.1.

Note

The equipment does not have to exist in the BSC database (equipment in the BSC database can be seen with the QWL command) if the BTS site type is Nokia 2nd Generation, or Nokia Talk-family or Nokia PrimeSite with a software build older than DF6.0.

---

4. Use the service terminal command interactively

You can move upwards by one menu level with the command 'UP' and go back to the main menu with the command 'TOP'. The present menu can be printed out with the command '?'

The main menu of the service terminal is presented below:

Operation:

1 Fault display

2 Local alarm cancel

3 Reset local cancel

4 Identifications

5 Controls (temporary)

6 Settings (permanent)

7 Measurements

8 Statistics

9 Testing

10 User privileges

11 Miscellaneous

5. Give the 'EXIT' command to end the remote session

Further information:

Example 11. Starting a remote session

```
ZQUS:BCF=128,DMR=1;
```

Note

You can also execute one service terminal command with the QUE command. The remote session is active only until the given command has been executed. You cannot manipulate the execution of the command (except by using the BREAK key to end the MML session). The command parameters are the same as for the QUS command, but you also need to define the service terminal command string before executing the command:

```
QUE:<base control function number>,<transmission
equipment>:<functional entity number>:<service terminal
command string>;
```

Example 12.

```
ZQUE:BCF=10::"4,1";
```

3.2 Starting a remote service terminal session to the equipment through a Q1 channel

This procedure instructs how to start a remote service terminal session to transmission equipment supervised by the BSC.

Steps

1. **If the transmission equipment is connected to the Q1 channel, check that the channel exists and what the configuration is on the channels (QWI)**

   ```
   ZQWI:<service channel number>:<output width>;
   ```

2. **Start a remote session (QUS)**

   ```
   ZQUS:<base control function number>,<transmission
   equipment>:<functional entity number>;
   ```

3. **Now you can use the service terminal commands interactively**

   You can move upwards by one menu level with the command 'UP' and go back to the main menu with the command 'TOP'. The present menu can be printed out with the command '?'.

   The main menu of the service terminal is presented below:

   Operation:

   1 Fault display

   2 Local alarm cancel

   3 Reset local cancel

   4 Identifications

   5 Controls (temporary)

   6 Settings (permanent)

7 Measurements

8 Statistics

9 Testing

10 User privileges

11 Miscellaneous

4. Give the 'EXIT' command to end the remote session

Note

You can also execute one service terminal command with the `QUE` command. The remote session is active only until the given command has been executed. You cannot manipulate the execution of the command (except by using the BREAK key to end the MML session). The command parameters are the same as for the `QUS` command, but you also need to define the service terminal command string before executing the command:

```
ZQUE:<base control function number>,<transmission
equipment>:<functional entity number>:<service terminal
command string>;
```

Note

Remote session opening to transmission equipment may fail because the number of concurrent remote sessions is exceeded. In this case there are too many other users using these resources, for example Node Manager software. If this kind of situation occurs, try again later.

Further information:

Example 13. Checking the channels and the configuration

```
ZQWI::ALL;
```

Example 14. Starting a remote session

```
ZQUS:SSS=10:3;
```

4 Configuring a new transcoder

The Transcoder Configuration MML (WG command group) is used when a new transcoder is introduced to the BSC or an existing transcoder configuration is modified. The WG command group offers commands for creating, deleting and modifying transcoder PCMs (TC_PCMs), adding and removing through connections to the transcoder unit, and outputting the transcoder configuration. The WG command group also offers commands for handling TCSM routine test data and parameters.

Refer to Transcoder Configuration (WG) for more information on the use of the commands of the command group.

For more information on transmission management, see *BSS transmission management overview.*

4.1 Configuring a TCSM unit (TCSM2)

Steps

1. **Check that the TCSM unit has been equipped and connected (WGO and WTI)**

   ```
   ZWGO:<highway PCM number>:<output mode>;
   ```

   ```
   ZWTI:<information type>:<unit identification>:
   <plug-in unit identification>;
   ```

   If it does not exist, create and connect it with the WT and WU command group commands as instructed in *Hardware configuration management overview.*

2. **Check that a controlling unit for the TC_PCM has been created and that the state of the controlling unit is WO-EX or SE-NH (USI)**

   ```
   ZUSI:BCSU;
   ```

If it does not exist, create and connect it with the WT and WU command group commands as instructed in *Hardware configuration management overview.*

3. If needed, set the number of through connected channels (WGS)

```
ZWGS:<highway pcm number>:<number of through
connected channels>;
```

Define the number of time slots with the parameter number of through connected channels from the end of the highway PCM that will be left unrouted when creating a TC_PCM that would overlap these time slots. The possible values range from 0 to 30 in ETSI, and 0 to 23 in ANSI environment.

4. Create TC_PCMs (WGC)

```
ZWGC:<highway pcm number>,<tc_pcm number>:<tc_pcm
pool>:<controlling unit type>,<controlling unit
index>;
```

5. Create possible through connections (WGA)

```
ZWGA:<highway pcm circuit>:<TC_PCM circuit>;
```

6. Check that the creation was successful (WGO)

```
ZWGO:<highway PCM number>:<output mode>;
```

Further information:

Example 15. Configuring a TCSM unit (TCSM2)

```
ZWGO;

ZWGS:72:1;

ZWGC:72::BCSU,0;

ZWGC:72::BCSU,0;

ZWGC:72::BCSU,0;

ZWGC:72:POOL=3:BCSU,0;

ZWGA:72-31:1-16;
```

```
ZWGO;
```

Note

After you have configured the TCSM2, continue with the tasks described in *BSS integration overview* .

4.2 Configuring a TRCU (TCSM1)

Before you start

Note

The BSC3i does not support the first generation Transcoder Submultiplexer (TCSM1).

Note

The TRCU also needs an A interface ET and a controlling unit. However, a non-submultiplexed TRCU does not need a controlling unit, only the A interface ET.

Steps

1. **Check that the A interface ET has been created and the TCSM unit with the same index as the A interface ET does not exist (WGO)**

   If the A interface ET does not exist, create and connect it with the `WT` and `WU` command group commands as instructed in *Hardware configuration management.*

   ```
   ZWGO:<highway PCM number>:<output mode>;
   ```

2. **Check that a controlling unit for the TC_PCM has been created, and that the state of the controlling unit is WO-EX or SE-NH (USI)**

   ```
   ZUSI:BCSU;
   ```

If it does not exist, create and connect it with the WT and WU command group commands as instructed in *Hardware configuration management.*

3. Create a Q1 channel as was instructed in Q1 Interface Handling (QWC)

```
ZQWC:<service channel number>,<channel type>:<baud
rate>,<bandwidth>,<used bits>:<external PCM-TSL>,
<sub—time—slot>;
```

4. Add the TRCU or SM2M and 1–3 TRCUs to the channel as was instructed in Q1 Interface Handling (QWA)

```
ZQWA:<service channel number>:<transmission
device>:<alarm unit address>;
```

5. Create TC_PCMs (WGC)

```
ZWGC:<highway PCM number>,<TC_PCM number>:<TC_PCM
type or pool>:<controlling unit type>,<controlling
unit index>;
```

It is possible to create one TC_PCM per one TRCU. Repeat the WGC command as many times as needed (that is 1–3 times).

Refer to Transcoder Configuration (WG) for more information on the command parameters.

6. Check that the creation was successful (WGO)

```
ZWGO;
```

Further information:

Example 16. Configuring a TRCU

```
ZWGO;

ZQWC::2400,64,ALL:72-31;

ZQWA:CH=1:TRCU=72-1:1;

ZQWA:CH=1:TRCU=72-2:2;

ZQWA:CH=1:TRCU=72-3:3;
```

```
ZQWA:CH=1:SM2M=72:4;

ZWGC:72::BCSU,0;

ZWGC:72::BCSU,0;

ZWGC:72::BCSU,0;

ZWGO;
```

Note

After you have configured the TCSM1 or TRCU, continue with the tasks described in the *BSS integration overview* .

5 Modifying an existing transcoder configuration

The Transcoder Configuration MML (WG command group) is used when an existing transcoder configuration is modified. The WG command group offers commands for creating, deleting and modifying transcoder PCMs (TC_PCMs), adding and removing through connections to the transcoder unit, and outputting the transcoder configuration. The WG command group also offers commands for handling TCSM routine test data and parameters.

See Transcoder Configuration (WG) for more information on the use of the commands of the command group.

This section presents three procedures for modifying existing transcoder configurations: first, adding a through connected channel, second, modifying the TC_PCM type with manual circuit transfer and, third, modifying the TC_PCM type with automatic circuit transfer.

For more information on transmission management, see *BSS transmission management overview.*

5.1 Adding a through connected channel — example case

In the following steps, the Ater time slot, to which the through connection will be added, is used by the last TC_PCM. If the TCSM2 is in the WO-EX state, configuration changes may require restarting of the TCSM. That is indicated with MML commands.

Steps

1. **Check the state of the TCSM (USI)**

   ```
   ZUSI:<TCSM>;
   ```

2. **Check the TC_PCM configuration (WGO)**

```
ZWGO:<highway PCM number>:<output mode>;
```

3. Check the TCSM circuit configuration (RCI)

```
ZRCI:<searching criteria>:<identify circuit group>:
<displaying type>;
```

4. Change the last TC_PCM circuit state to NU-US (CEC)

```
ZCEC:<circuit>:<state>;
```

Refer to Circuit State Handling (CE) for more information on the command parameters.

5. Delete the circuits of the last TC_PCM (RCR)

```
ZRCR:<circuit group name>:<etpcm>,<circuit(s)>;
```

Refer to Circuit Group Handling (RC) for more information on the command parameters.

6. Delete the last TC_PCM (WGD)

```
ZWGD:<highway PCM number>,<TC_PCM number>;
```

7. Restart the TCSM2 (USU), if the system recommends it in the WGD command output

```
ZUSU:<unit type>,<unit index>;
```

8. Set the number of through connected channels (WGS)

```
ZWGS:<highway PCM number>:<number of through
connected channels>;
```

Define the number of time slots with the parameter `number of through connected channels` from the end of the highway PCM that will be left unrouted when creating a TC_PCM that would overlap these time slots. The possible values range from 0 to 30 in ETSI, and 0 to 23 in ANSI environment.

Refer to Transcoder Configuration (WG command group) for more information on the command parameters.

9. Create the last TC_PCM (WGC)

```
ZWGC:<highway PCM number>,<TC_PCM number>:<TC_PCM
pool>:<controlling unit type>,<controlling unit
index>;
```

Refer to Transcoder Configuration (WG command group) for more information on the command parameters.

10. Restart the TCSM2 (USU), if the system recommends it in the WGC command output

```
ZUSU:<unit type>,<unit index>;
```

11. Add the through connection (WGA)

```
ZWGA:<highway PCM circuit>,<TC_PCM circuit>;
```

12. Add the circuits to the circuit group (RCA)

```
ZRCA:<circuit group name>:<etpcm>,<circuit(s)>:
<number of PCM-system>;
```

Refer to Circuit Group Handling (RC) for more information on the command parameters.

13. Change the last TC_PCM circuit state to the WO state (CEC)

```
ZCEC:<circuit>:<state>;
```

Refer to Circuit State Handling (CE) for more information on the command parameters.

14. Check the TC_PCM configuration (WGO)

```
ZWGO
```

Further information:

Example 17. Adding a through connected channel

```
ZUSI:TCSM;

ZWGO;

ZRCI:SEA=3:CGR=3:PRINT=4;

ZCEC:ETPCM=72,CRCT=4-1&&-27:BL;
```

```
ZCEC:ETPCM=72,CRCT=4-1&&-27:NU;

ZRCR:CGR=3:ETPCM=72,CRCT=4-1&&-27;

ZWGD:72;

ZUSU:TCSM,32;

ZWGS:72:1;

ZWGC:72::BCSU,0;

ZUSU:TCSM,72;

ZWGA:72-31:4-16;

ZRCA:CGR=3:ETPCM=72,CRCT=4-1&&-15&-17&&-23:CCSPCM=3;

ZCEC:ETPCM=72,CRCT=4-1&&-15&-17&&-23:BL;

ZCEC:ETPCM=72,CRCT=4-1&&-15&-17&&-23:WO;

ZWGO;
```

5.1.1 Modifying the TC_PCM type with manual circuit transfer

Before you start

Note

Certain TC_PCM types can only be modified with TCSM2. Refer to Transcoder Configuration (WG) for more information.

Note

When modifying the TC_PCM type with automatic circuit transfer the target circuit group has to exist before entering the WGM command. Refer to Transcoder Configuration (WG) for more information.

Steps

1. **Check the TC_PCM configuration (WGO)**

   ZWGO:<highway pcm number>:<output mode>;

2. **Check the TCSM circuit configuration (RCI)**

   ZRCI:<searching criteria>:<identify circuit group>:
   <displaying type>;

3. **Change the TC_PCM circuit state to NU-US (CEC)**

   ZCEC:<circuit>:<state>;

   Refer to Circuit State Handling (CE) for more information on the command parameters.

4. **Delete the circuits of TC_PCM (RCR)**

   ZRCR:<circuit group name>:<etpcm>,<circuit(s)>;

   Refer to Circuit Group Handling (RC) for more information on the command parameters.

5. **Modify the TC_PCM type (WGM)**

   ZWGM:<highway PCM number>,<TC_PCM number>:<new
   TC_PCM pool>;

   Refer to Transcoder Configuration (WG) for more information on the command parameters.

6. **Restart the TCSM2 (USU), if the system recommends it in the WGM command output**

   ZUSU:<unit type>,<unit index>;

   Refer to Working State And Restart Handling (US) for more information on the command parameters.

7. **Check the TCSM circuit configuration (RCI)**

   ZRCI:<searching criteria>:<identify circuit group>:
   <displaying type>;

8. Add the circuits to the circuit group (RCA)

```
ZRCA:<circuit group name>:<etpcm>,<circuit(s)>:
<number of PCM-system>;
```

Refer to Circuit Group Handling (RC) for more information on the command parameters.

9. Change the TC_PCM circuit state to the WO state (CEC)

```
ZCEC:<circuit>:<state>;
```

Refer to Circuit State Handling (CE) for more information on the command parameters.

10. Check the TC_PCM configuration (WGO)

```
ZWGO
```

Further information:

Example 18. Modifying TC_PCM type with manual circuit transfer

```
ZWGO;

ZRCI:SEA=1:CGR=1:PRINT=4;

ZCEC:ETPCM=72,CRCT=1-1&&-31:BL;

ZCEC:ETPCM=72,CRCT=1-1&&-31:NU;

ZRCR:CGR=1:ETPCM=72,CRCT=1-1&&-31;

ZWGM:72,1:POOL=3;

ZUSU:TCSM,72;

ZRCI:SEA=3:CGR=3:PRINT=4;

ZRCA:CGR=3:ETPCM=72,CRCT=1-1&&-31,CCSPCM=3;

ZCEC:ETPCM=72,CRCT=1-1&&-31:BL;

ZCEC:ETPCM=72,CRCT=1-1&&-31:WO;

ZRCI:SEA=3:CGR=3:PRINT=4;
```

ZWGO;

5.1.2 Modifying the TC_PCM type with automatic circuit transfer

Before you start

Note

Certain TC_PCM types can only be modified in TCSM2. Refer to Transcoder Configuration (WG) for more information.

Note

When modifying the TC_PCM type with automatic circuit transfer the target circuit group has to exist before entering the WGM command. Refer to Transcoder Configuration (WG) for more information.

Steps

1. Check the TC_PCM configuration (WGO)

ZWGO:<highway pcm number>:<output mode>;

2. Change the TC_PCM circuit state to BA-US or BL-US (CEC)

ZCEC:<circuit>:<state>;

If the circuit type is internal, use the state BL-US, if the type is external, use the state BA-US.

Refer to Circuit State Handling (CE) for more information on the command parameters.

3. Check the TCSM circuit configuration (RCI)

ZRCI:<searching criteria>:<identify circuit group>:<displaying type>;

4. Modify the TC_PCM type (WGM)

```
ZWGM:<highway PCM number>,<TC_PCM number>:<new
TC_PCM pool>:<target circuit group>;
```

Refer to Transcoder Configuration (WG) for more information on the command parameters.

5. Restart the TCSM2 (USU), if the system recommends it in the WGM command output

```
ZUSU:<unit type>,<unit index>;
```

Refer to Working State And Restart Handling (US) for more information on the command parameters.

6. Change the TC_PCM circuit state to the WO state (CEC)

```
ZCEC:<circuit>:<state>;
```

Refer to Circuit State Handling (CE) for more information on the command parameters.

7. Check the TC_PCM configuration (WGO)

```
ZWGO
```

8. Check that the modifying was successful (RCI)

```
ZRCI:<searching criteria>:<identify circuit group>:
<displaying type>;
```

Refer to Circuit Group Handling (RC) for more information on the command parameters.

Further information:

Example 19. Modifying the TC_PCM type with automatic circuit transfer

```
ZWGO;

ZCEC:ETPCM=72,CRCT=1-1&&-31:BA;

ZRCI:SEA=3:CGR=3:PRINT=4;

ZWGM:72,1:POOL=3:CGR=3;

ZUSU:TCSM,72;
```

```
ZCEC:ETPCM=72,CRCT=1-1&&-31:WO;

ZWGO;

ZRCI:SEA=3:CGR=3:PRINT=4;
```

5.2 Removing an existing transcoder configuration

The following two procedures instruct how to remove an existing transcoder configuration in the cases of TCSM2 and TCSM1.

Note

The BSC3i does not support the first generation Transcoder Submultiplexer.

5.2.1 Removing a TC_PCM from a TCSM2

Before you start

Note

Before removing a TC_PCM ensure that the circuits of the TC_PCM are not routed in any circuit group.

Steps

1. **Check the information on the transcoder configuration (WGO)**

   ```
   ZWGO:<highway PCM number>:<output mode>;
   ```

2. **If necessary, remove the through connection used by the TC_PCM to be removed from the transcode (WGR)**

   ```
   ZWGR:<highway PCM circuit>:<TC_PCM circuit>;
   ```

3. **Delete a TC_PCM (WGD)**

   ```
   ZWGD:<highway PCM number>,<TC_PCM number>;
   ```

4. Check that the deletion was successful (WGO)

ZWGO

5. Restart the TCSM2 (USU), if the system recommends it in the WGM command output

ZUSU:<unit type>,<unit index>;

Refer to Working State And Restart Handling (US) for more information on the command parameters.

Further information:

Example 20. Removing a TC_PCM from a TCSM2

```
ZWGR:72-31;

ZWGD:72;

ZUSU:TCSM;
```

5.2.2 Removing a TRCU (TCSM1)

Before you start

Note

The BSC3i does not support the first generation Transcoder Submultiplexer.

Note

Before removing a TC_PCM ensure that the circuits of the TC_PCM are not routed in any circuit group.

Steps

1. Check TC_PCM configuration (WGO)

ZWGO

2. Check Q1 channel state, number and equipment (QWI)

```
ZQWI
```

3. Delete TC_PCMs (WGD)

```
ZWGD:<highway PCM number>,<TC_PCM number>;
```

4. Change the state to AD if it is AL (QWS)

```
ZQWS
```

5. Remove the equipment from the Q1 channel (QWR)

```
ZQWR:<service channel or BCF number><TRX number>:
<transmission device>;
```

6. Delete the Q1 channel (QWD)

```
ZQWD:<service channel number>;
```

7. Check that the deletion was successful (WGO, QWI)

```
ZWGO
```

```
ZQWI
```

Further information:

Example 21. Removing a TRCU (TCSM1)

```
ZQWS:1:AD;
```

```
ZWGD:72;
```

```
ZWGD:72;
```

```
ZWGD:72;
```

```
ZQWR:CH=1;
```

```
ZQWD:1;
```

5.3 Managing TCSM optional features

An optional TCSM feature state is stored in the BSC files, from which the configuration is loaded into the TCSM. As soon as the TCSM knows that the feature is active in the BSC it can be activated with the TCSM service terminal commands. The features developed before BSC release S10 cannot be managed with the BSC MML commands.

Features developed in or after release S10 can be managed with the BSC MML commands and the user does not need to manage them with the TCSM service terminal commands. These features are active after the TCSM has loaded the configuration.

The TCSM2 software versions supporting each optional feature are displayed in the table *TCSM2 softwares and optional features supported in and after S10* .

5.3.1 Managing optional features developed before S10

Optional features developed before release S10 are, for example, the Acoustic Echo Cancellation (AEC), the Tandem Free Operation (TFO), and the Noise Suppression (NS) features.

Before you start

The TCSM features must be active in the BSC.

Steps

1. Change the LAPD-channel of the TCSM to BL-US state (DTT)

```
ZDTT:<functional unit type>,<functional unit index>:
<working state>;
```

2. Change the LAPD-channel of the TCSM back to WO-EX (DTT)

```
ZDTT:<functional unit type>,<functional unit index>:
<working state>;
```

3. To implement this step, choose one of the following alternatives:

a. Start a remote session from the BSC (DDT)

```
ZDDT:<unit type>,<unit index>;
```

b. Use a local terminal session

4. Activate the feature with a TCSM service terminal command

Note

Note that the following commands are optional and available for those customers who have purchased the option.

- Use the command ZRU to activate the Acoustic Echo Cancellation (AEC) feature.

  ZRU: PCM circuit index (,timeslot):codec=setting (,codec= setting, ...);

  ZRU: PCM circuit index (,timeslot):delay=AEC delay;
- Use the command ZRN to activate the Tandem Free Operation (TFO) feature.

  ZRN: PCM circuit index (,timeslot):codec=setting (,codec= setting, ...);
- Use the command ZRY to activate the Noise Suppression (NS) feature.

  ZRY: PCM circuit index (,timeslot):codec=setting (,codec= setting, ...);

  ZRY: PCM circuit index (,timeslot): ns=suppression;

Further information:

For more information on the service terminal commands, see TCSM2 User Commands.

For more information on configuring the optional TCSM features, see *Commissioning TCSM2* .

5.3.2 Managing optional features developed in or after S10

An optional TCSM feature available in and after release S10 is, for example, the Text Telephony (TTY) feature.

Note

TTY is used only in the ANSI environment.

Steps

1. Interrogate TTY feature parameters of class 2 (WOS)

```
ZWOS:<parameter class>,<parameter number>;
```

This command shows TTY_USAGE as a parameter.

2. Activate TTY (WOA)

```
ZWOA:<parameter class>,<parameter number>,
<activation status>;
```

3. Restart TCSM(s) (USU)

```
ZUSU:<unit type>,<unit index>;
```

Further information:

Example 22. Taking TTY functionality into operation in TCSM-32

```
ZWOS:2,702;

ZWOA:2,702,A;

ZUSU:TCSM,32;
```

Table 1. TCSM2 softwares and optional features supported in and after S10

TCSM2 software	Supported features	Supported A-interface pools	Supported codecs	Type in TCSM2
TDL_PXMX	AEC, NS	3 (DR), 7 (EFR&DR), 10 (HS2), 13 (HS4), 20 (EFR&DR&D144), 21 (HS2&D144), 22 (HS4&D144)	FR, HR, EFR, HSCSD	C, D, E
TD1_PXMX	AEC, TFO, NS	1 (FR), 5 (EFR&FR)	FR, EFR	A
TD2_PXMX	AEC, TFO, NS	2 (HR)	HR	B
TD3_PXMX	AEC, NS	23 (AMR)	AMR	F

Table 1. TCSM2 softwares and optional features supported in and after S10 (cont.)

TCSM2 software	Supported features	Supported A-interface pools	Supported codecs	Type in TCSM2
TD4_PXMX	TTY, AEC	3 (DR), 7 (EFR&DR), 10 (HS2), 13 (HS4) 20 (EFR&DR&D144), 21 (HS2&D144), 22 (HS4&D144)	FR, HR, EFR, HSCSD	C, D, E
TD5_PXMX	TTY, AEC, TFO	1 (FR), 5 (EFR&FR)	FR, EFR	A
TD6_PXMX	TTY, AEC	23 (AMR)	AMR	F

AEC	Acoustic Echo Cancellation
NS	Noise Suppression
TFO	Tandem Free Operation
TTY	Text Telephony
DR	Dual Rate
FR	Full Rate
HR	Half Rate
EFR	Enhanced Full Rate Codec
HSCSD	High Speed Circuit Switched Data
AMR	Adaptive Multi Rate

For more information on pool and codec types, see *TCSM configuration management* in *TCSM Support in BSC*.

6 Routine testing of TCSM2

The following two procedures instruct how to output information on routine test results and parameters and how to delete routine test results or modify routine test parameters.

For more information on transmission management, see *BSS transmission management overview.*

6.1 Interrogating routine test information

Steps

1. Interrogate about routine test data and parameters (WGI)

```
ZWGI:<output type>:<test specification>:<test
information>;
```

Further information:

Example 23. Interrogating summary of routine test data

```
ZWGI;
```

Example 24. Interrogating routine test data of TCSM-72

```
ZWGI:DATA:TC=72;
```

Example 25. Interrogating routine test parameters

```
ZWGI:PARAM;
```

6.2 Modifying routine test data and parameters

Steps

1. **Interrogate about routine test data and parameters (WGI)**

   ```
   ZWGI
   ```

2. **Clear routine test data or modify parameters (WGT)**

   ```
   ZWGT:<operation>:<test specification>;
   ```

Further information:

Example 26. Setting routine testing on for all circuit groups

```
ZWGT:PARAM:TEST=ON;
```

Example 27. Clearing all routine test data of the first TC_PCM of TCSM-72

```
ZWGT:DATA:TCPCM=72-1;
```

Example 28. Setting routine testing threshold value for circuit group number 1 to be 50%

```
ZWGT:PARAM:CGR=1,THRESHOLD=50;
```

7 Managing the transmission equipment statistics collection information

This procedure gives instructions on how to add, modify and delete transmission equipment statistics collection information, and how to start transmission equipment collection and checksum polling. In addition, the following tasks describe how to add Nokia Q1 transmission equipment to the selective statistics collection (TRE_SEL) information and how to delete the equipment from it.

The command group used in managing the transmission equipment statistics collection information is QU . See BSS Transmission Equipment Handling (QU) for more information on the use of the commands of the command group.

For more information on transmission management, see *BSS transmission management overview.*

7.1 Adding, modifying, and deleting the transmission equipment statistics collection information

Steps

1. No modifications are required

The default values are such that no modifications should be required.

Refer to BSS Transmission Equipment Handling (QU) for more information on the commands and parameters.

7.2 Starting the transmission equipment collection and checksum polling

Steps

1. **Start equipment collection from the BTS sites or start checksum polling (QUF)**

   To update the transmission equipment data to the BSC and the Nokia network and service management system (Nokia NetAct) immediately, use the `QUF` command to start the equipment collection from the BTS sites or to start the checksum polling. Otherwise, the default is that data is updated once a day.

   For more information on the BTS software requirements, refer to *Hardware and software requirements* in *Transmission Management in BSS.*

   `ZQUF:<operation>:<action>:<service channel or BCF number>,<TRX number>:<transmission equipment>;`

   The equipment collection can also be done to a selected BCF. The checksum polling can be done to a selected BCF or a Q1 channel and to selected transmission equipment.

2. **If necessary, check by using the default value INQ that the operation was started (QUF)**

   `ZQUF`

Further information:

Example 29. Starting the transmission equipment collection to the whole BSS under one BSC

```
ZQUF:EQC:START;

ZQUF;
```

Example 30. Starting the transmission equipment collection to a selected BTS

```
ZQUF:EQC:START:BCF,1;

ZQUF:EQC:;
```

Example 31. Starting the checksum polling to selected transmission equipment

```
ZQUF:CSP:START:CH,2:TRE,3;

ZQUF:CSP:;
```

Note

Transmission equipment collection (EQC) can be done to the 2nd generation BTSs and Nokia Talk-family and Nokia PrimeSite BTSs with the software version older than DF 6.0. Functional description on EQC can be found in *Hardware and software requirements* in Transmission Management in BSS.

Note

Checksum polling (CSP) cannot be done to Nokia Talk-family and Nokia PrimeSite BTSs with a software version older than DF 5.1 or to Nokia 2nd Generation BTSs. CSP can be done only to Nokia Q1 equipment. Functional description on CSP can be found in *Hardware and software requirements* in Transmission Management in BSS.

Note

You can also force equipment initialisation to update equipment generation information if this has not happened automatically. For more information on forced equipment initialisation, see *Checksum polling troubleshooting.*

7.3 Adding Nokia Q1 transmission equipment to the selective statistics collection information

Before you start

Note

Selective statistics collection (TRE_SEL) is possible to get from Nokia Q1 equipment if the equipment supports G.826 counter collection. TRE_SEL statistics collection cannot be done from Nokia 2nd Generation, Talk-family BTS- (with a software version older than DF 5.1) or PrimeSite BTS- (with a software version older than DF 5.1) supervised transmission equipment.

Steps

1. Check that the TRE_SEL measurement is not started (TPI)

If the measurement is in the UNLOCKED state, change it to LOCKED with the `TPE` command.

```
ZTPI:<measurement group>:<measurement type>;
```

Refer to GSM Measurement Handling (`TP`) for more information on the command parameters.

2. Check the transmission equipment from the selective statistics collection (QUI)

```
ZQUI:<base control function number>,<transmission
equipment>;
```

3. Check that the transmission equipment is initialised and exists, and that the generation is Nokia Q1 (QWL)

```
ZQWL:<service channel or BCF number>,<TRX number>:
<transmission equipment>:<format>;
```

4. Add Nokia Q1 transmission equipment to the selective statistics collection information (QUB)

```
ZQUB:<base control function number>,<transmission
equipment>:<functional entity number>,<supervision
block number>;
```

5. Check that the transmission equipment was added to the selective statistics collection (QUI)

```
ZQUI:<base control function number>,<transmission
equipment>;
```

6. Start selective statistics collection (TPS)

```
ZTPS:<measurement group>,<measurement type>:<start
date>,<stop date>;
```

Further information:

Example 32. Adding Nokia Q1 transmission equipment to the selective statistics collection information

```
ZQUB:BCF=1,DMR=4:1&&5,3;

ZQUB:TRE=4;
```

Note

Transmission measurement creation is done with the command `ZTPM:<measurement group>,<measurement type>:<measurement day>,<measurement interval>,<output interval>:<additional measurement/observation parameters>;`

7.4 Deleting Nokia Q1 transmission equipment from the selective statistics collection information

Steps

1. Check that the TRE_SEL measurement is not started (TPI)

Use the `TPI` command to check that the TRE_SEL measurement is not started. If the measurement is in the UNLOCKED state, change it to LOCKED with the `TPE` command.

```
ZTPI:<measurement group>:<measurement type>;
```

Refer to GSM Measurement Handling (`TP`) for more information on the command parameters.

2. Check the transmission equipment from the selective statistics collection (QUI)

```
ZQUI:<base control function number>,<transmission
equipment>;
```

3. Delete Nokia Q1 transmission equipment from the selective statistics collection information (QUR)

```
ZQUR:<base control function number>,<transmission
equipment>:<functional entity number>,<supervision
block number>;
```

4. Check with the QUI command that the transmission equipment was deleted from the selective statistics collection

```
ZQUI:<base control function number>,<transmission
equipment>;
```

Further information:

Example 33. Deleting Nokia Q1 transmission equipment from the selective statistics collection information

```
ZQUR:BCF=1,DMR=4:1&&5,3;

ZQUR:TRE=1&&4;
```

8 Checksum polling troubleshooting

Transmission equipment connected to TalkFamily BTS and supporting Q1E, for example FlexiHopper, are supposed to change the equipment generation information automatically from TMS to Q1E when the TalkFamily BTS software is upgraded from DF5.1 to DF6.0 or newer.

If there is a disturbance in the network when the BTS software is upgraded, it may be that equipment generation information is not correctly updated to Q1E, but instead the generation remains as TMS.

In these cases, checksum polling can be started with forced equipment initialisation, which "forces" the BSC to check and, if needed, to update transmission equipment generation information, even if generation information does exist.

Note

The equipment generation does not change to Q1E with forced equipment initialisation if the equipment does not support Q1E.

Steps

1. **Update generation information with forced equipment initialisation (QUF)**

   Forced equipment initialisation can be started using MML-command `QUF` with action `INIT`.

   ```
   ZQUF:CSP:INIT;
   ```

Further information:

For more information on transmission management, see *BSS transmission management overview.*

9 Software downloading

This procedure gives intructions on how to download software to transmission equipment remotely from the BSC site.

The command group used in software download is QU . See BSS Transmission Equipment Handling (QU) for more information on the use of the commands of the command group.

For more information on transmission management, see *BSS transmission management overview.*

9.1 Downloading and activating software

The software download is a two-phase process where you first download the software and then activate it. You create the build, then attach the equipment to it, after which you download the software to the equipment before activating the software and before activating the checksum polling.

When the software download state is COMPLETED you can continue with activating the software. You can, however, define the activation start time before the download is completed, in which case the activation starts immediately after download if the given time has already passed.

The easiest way is to activate the software right after the download. However, as the activation resets the equipment and it is off from the network for a moment, you may wish to move the activation to a time with less traffic, for example the night time.

Before you start

Note

One piece of equipment can only be attached to one build.

Steps

1. **Check that the software build files exist and that the software is the one you need to download (IWX). Check the software build masterfile information (QUL)**

   ```
   ZIWX::<drive>,<default subdir in use>:<path>:
   <filename>,<extension>;

   ZQUL::DSK;
   ```

2. **Create the transmission equipment software build (QUC)**

   ```
   ZQUC:<build id>:<master file name>,<master file
   extension>,<subdirectory>;
   ```

3. **Attach the equipment to the SW build (QUT)**

   ```
   ZQUT:<build id>:<CH or BCF>,<service channel or BCF
   number>, <transceiver unit index>:<transmission
   equipment type>, <transmission equipment
   identification>;
   ```

   The recommended way to attach equipment is one piece of equipment at a time. Repeat as many times as needed. The maximum is 200 pieces of equipment.

Note

Attach only when the software download is in the CREATED state. In addition, the equipment has to be initialised and it has to be Nokia Q1 equipment — use the `QWL` command and the EQU GEN field in the printout to view this.

---

4. **Start the SW download (QUH)**

   ```
   ZQUH:<build id>:START;
   ```

   This step takes time.

5. **You can check the state of the download (QUL)**

   ```
   ZQUL:<build id>:STATUS;
   ```

If you wish, you can also check the state of the download with the QUL command. QUL shows the SW download state, and when successfully completed the state is COMPLETED. Give either of the following commands:

```
ZQUL:<build id>:EQU;
```

```
ZQUL:<build id>:BUILD;
```

When the SW download state is COMPLETED, you can continue with activating the software in the next step. If the software download state is CORRUPTED, the activation can still be started with the forced parameter.You can proceed to the next step earlier as well, and define with the QUH command an activation start time. In that case the activation starts immediately, if the given time has already passed.

Refer to BSS Transmission Equipment Handling (QU) and Q1 Interface Handling (QW) for more information on the command.

6. Activate the software (QUH)

```
ZQUH:<build id>:ACT:<activation start time>:<forced
parameter>;
```

The activation means that the time has been sent to the equipment, but the activation itself does not necessarily start immediately. The BSC forwards the activation time to the equipment and after that the BSC does not supervise the activation.

7. You can check the state of the download (QUL)

```
ZQUL:<build id>:STATUS;
```

Again, if you wish, you can check the state of the download with the QUL command. QUL shows the software download state, and when the activation is successfully completed the state is ACTIVATED. Give either of the following commands:

```
ZQUL:<build id>:EQU;
```

```
ZQUL:<build id>:BUILD;
```

8. Activate the checksum polling (QUF)

```
ZQUF:CSP:START;
```

Wait until the polling is OK before proceeding. View the polling status with the QUF command and its INQ parameter:

```
ZQUF:CSP:INQ;
```

9. Check that the SW information is downloaded to the equipment (QWL)

```
ZQWL:::SW;
```

10. Change the state of the software build to CREATED (QUH)

```
ZQUH:<build id>:START::FCD;
```

11. If you need the build for another piece of equipment, detach the equipment from the SW build (QUU)

```
ZQUU:<build id>:<CH or BCF>,<service channel or BCF
number>, <transceiver unit index>:<transmission
equipment type>, <transmission equipment
identification>;
```

If you need to attach additional equipment to the build, then the SW build information can remain and you can now proceed with other operations or start a new download or a new activation.

Further information:

Example 34. Downloading and activating software

```
ZIWX::WS,NODEF:TRE_PACK:%,%,:;

ZQUL::DSK;

ZQUC:FLEX10:FLEXIHOP,A10,BUILD_5;

ZQUT:FLEX10:BCF,80:TRE,1;

ZQUH:FLEX10:START;

ZQUL:FLEX10:STATUS;

ZQUL:FLEX10;

ZQUL:FLEX10:EQU;
```

```
ZQUH:FLEX10:ACT:2000-01-02,12-00;

ZQUL:FLEX10:STATUS;

ZQUL:FLEX10;

ZQUF:CSP:START;

ZQUF:CSP:INQ;

ZQWL:::SW;

ZQUH:FLEX10:START::FCD;

ZQUU:FLEX10:BCF,80:TRE,1;
```

9.2 Detaching transmission equipment from SW build

Before you start

Detach the equipment from the SW build only if you do not need the build for other equipment. If you need the build for attaching to additional equipment, then the SW build information can remain in the file. You cannot delete a piece of equipment if the equipment is attached to a download.

Note

Deleting the software build also detaches the equipment attached to it.

Steps

1. **Check that the existing software build is in the CREATED state (QUL)**

   ```
   ZQUL:<build id>;
   ```

   If necessary, use the `QUH` command to change the state.

2. **Detach the equipment from the SW build (QUU)**

   If you want to delete the software build, move directly to step 5.

```
ZQUU:<build id>:<CH or BCF>,<service channel or BCF
number>, <transceiver unit index>:<transmission
equipment type>, <transmission equipment
identification>;
```

3. **Repeat the DETACH command as many times as necessary**

4. **Check that the detach was successful (QUL)**

```
ZQUL:<build id>:EQU;
```

5. **You can now delete the software build (QUG)**

```
ZQUG:<build id>:<deleting mode>;
```

6. **Repeat the DELETE command as many times as necessary**

7. **Check that the deletion was successful (QUL)**

```
ZQUL;
```

Further information:

Example 35. Detaching equipment from the software build

```
ZQUL:FLEX09;

ZQUU:FLEX09:BCF,80:TRE,1;

ZQUL:FLEX09:EQU;
```

Example 36. Deleting a software build

```
ZQUL:FLEX09;

ZQUG:FLEX09:;

ZQUL;
```

10 Software download and activation troubleshooting

The QUH command is used to handle the states of the software download and the software activation. The figure below shows the command parameters needed to move from state to state in a normal download and activation situation. The tables indicate other possible download and activation states and how they change with each command — induced either by the user or the system. Later in this section, several instances are described with instructions how to handle the states.

Refer also to BSS Transmission Equipment Handling (QU) for more information on the use of the QUH command and its parameters.

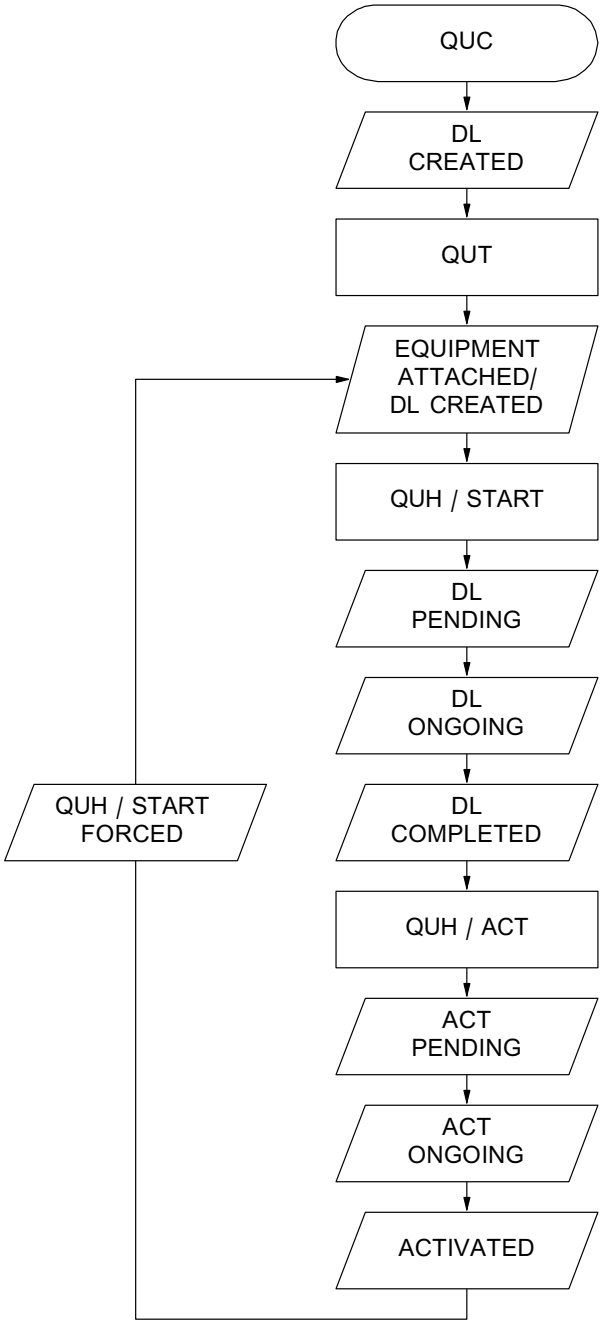

Figure 1. Software download and activation

Table 2. User induced SW download state transitions — without forced parameter. Note that these state transitions succeed also with the forced (FCD) parameter.

SW download state	START	STOP	ACT
created	pending		created
pending		created	pending
ongoing			ongoing
stopped	stopped -pending		stopped
stopped- pending		stopped	stopped -pending
completed			act pending
corrupted			
act pending		completed	
act ongoing			
act stopped			act pending
act stopped -pending		act stopped	
activated			
act corrupted			

Table 3. User induced SW download state transitions — with forced parameter. (* = cancelling of activation)

SW download state	START FCD	STOP FCD	ACT FCD
created			
pending			
ongoing		stopped	
stopped		created	
stopped- pending			

Table 3. User induced SW download state transitions — with forced parameter. (* = cancelling of activation) (cont.)

SW download state	START FCD	STOP FCD	ACT FCD
completed	created	created	
corrupted	created	created	act pending
act pending			
act ongoing		act stopped	
act stopped		completed	
act stopped -pending			
activated	created	completed (*	act pending
act corrupted	created	completed (*	act pending

Table 4. System induced SW download state transitions

SW download state	DL started	DL succeeded	DL failed
pending	ongoing		
stopped- pending	ongoing		
ongoing		completed	corrupted

Table 5. System induced SW activation state transitions

SW download state	ACT started	ACT succeeded	ACT failed
completed	act ongoing		
act pending	act ongoing		
act stopped- pending	act ongoing		
act ongoing		activated	act corrupted

Note

The equipment states change separately. The possible equipment states for download are ONGOING, NOT_SUPPORT, CRITICAL, and COMPLETED. For activation the states are ACT_ONGOING, NOT_SUPPORT, ACT_CRITICAL, and ACTIVATED.

The following are individual instances where software download or activation state management is needed from the user. Each instance is presented with action describing how to handle the states.

For more information on transmission management, see *BSS transmission management overview.*

10.1 Checking build state CORRUPTED

If the download is not successful, the build state is CORRUPTED. If the software download does not succeed, you have two options on how to proceed — either force the activation or retry downloading. If the software is not downloaded for every piece of equipment, then retrying downloading is a good option. The operation does not download to the pieces of equipment to which the download was successful.

Steps

1. **To implement this step, choose one of the following alternatives:**

   a. **Force the activation**

   ```
   ZQUH:<build id>:ACT::FCD;
   ```

   b. **Retry downloading**

   ```
   ZQUH:<build id>:START;
   ```

10.2 Checking build state ACT CORRUPTED or CORRUPTED

If the software build state moves to ACT CORRUPTED or CORRUPTED state, follow these steps:

Steps

1. **Check the connection to the equipment and the state of equipment and channels (QWI, QUS)**

   ZQWI:<service channel number>:<output width>;

   ZQUS:<base control function number>,<transmission equipment>:<functional entity number>;

2. **Start the download (QUH)**

   Use the QUH command's forced parameter to start the download.

   ZQUH:<build id>:START::FCD;

10.3 Checking build state change from PENDING to ONGOING

The download moves from the PENDING state to ONGOING in time on its own. You cannot interfere with the state change in any other way, except to stop a download that is already in the ONGOING state. Follow these steps:

Steps

1. **Move the download from ONGOING to STOP state (QUH)**

   Use the QUH command's forced parameter:

   ZQUH:<build id>:STOP::FCD;

2. **Move the download from STOP through ONGOING-PENDING to CREATED (QUH)**

   ZQUH:<build id>:<sw dl operation>:<activation start time>:<forced parameter>;

   Continue the download and activation process from step 5 in *Downloading and activating software* .

10.4 Checking build state ACTIVATED or ACT CORRUPTED

When the software has been activated and the state of the activation is ACTIVATED or ACT CORRUPTED, you have three possibilities to proceed:

Steps

1. **To implement this step, choose one of the following alternatives:**

   a. **Cancel the activation by giving the QUH/STOP FORCED command**

      This cancels the activation time from the equipment and the equipment state is then the same.

      ```
      ZQUH:<build id>:STOP::FCD;
      ```

   b. **Give the QUH/ACT FORCED command to activate the software again**

      ```
      ZQUH:<build id>:ACT::FCD;
      ```

   c. **Give the QUH/START FORCED command to download software and activate it**

      ```
      ZQUH:<build id>:START::FCD;
      ```

Example 37. Moving download from CORRUPTED state to CREATED state

```
ZQUL:FLEX10; (CORRUPTED)

ZQUH:FLEX10:START::FCD; (->CREATED)
```