Fiber Service Platform 3000R7 (FSP 3000R7)

Detailed Procedures

Document Version 7.1 (March 2007)

Product Release 7.1

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Table of Contents

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Preface

The Preface gives general information for the effective use of the Fiber Service Platform (FSP 3000R7) *Detailed Procedures*.

This publication is provided "as is" without express or implied warranty for accuracy and completeness.

Note

The FSP 3000F7 Detailed Procedures replaces the FSP 3000R7 Procedure Guide (Part II of the Reference Guide).

Purpose and Scope

The purpose of this documentation is to provide descriptions of the FSP 3000R7 management tools and configuration instructions.

Audience

This documentation is primarily intended to be read by any persons who are not familiar with the FSP 3000R7 system. It is also intended for trained persons requiring details on software configuration and for readers who want to achieve better understanding of the management components.

Organization

This documentation is organized as follows:

"Preface"

The Preface describes the purpose, audience, organization and the conventions, that are used throughout this documentation. It also provides important ADVA Optical Networking AG (ADVA) contact details as well as further useful information.

"Document Revision History"

This section lists significant changes (additions, corrections, etc.) made in the separate issues of this documentation.

Chapter 2 “Using Craft and Web Consoles”

This chapter describes management of the FSP system using the Craft Console and Web Console.

Chapter 3 “Procedures”

This chapter provides information for the user regarding the configuration details set for a network element (NE).

“Document Revision History”

This is the first version of this document, but the contents were transferred from the previous Reference Guide. The entries in this history show the changes that were made to the contents compared to the Reference Guide.

Document Conventions

Typographic Conventions

The documentation follows these typographic conventions:

Convention	Description
boldface font	Indicates keywords and emphasized words when appearing in main text areas. All warnings are in **boldface** font.
italic font	Indicates a reference to a chapter, section, figure, table or related documentation when appearing in main text areas. All notes and side heads are in *italic* font.
boldface italic font	All cautions and side head titles are in ***boldface italic*** font.
`courier`	Everything you have to type into your computer is in `courier`.
[ ]	Elements in square brackets are optional.
|	Alternative elements are separated by a vertical bar.
^	The symbol ^ represents the key labeled Control - for example, the key combination ^D means that you have to hold down the Control key while you press the D key.
< >	References are enclosed in angle brackets, for example: <Esc> The escape key, marked Esc <Enter> The Enter key, marked ↵ <username> This reference, including the angle brackets, is replaced by the appropriate user name. Nonprinting characters, such as passwords.
" "	Double inverted commas are used to enclose quoted text or a cross-reference title.
• (bullet symbol)	Used in bulleted list of items where the sequence of items is not relevant.
1., 2., 3. ...or a., b., c. ...	These numbering styles are used in lists of items where the sequence of items is relevant, e.g. the steps listed in a procedure
* or [1, 2] etc.	Are used to point to table footnotes. The markers in the text are arranged as continuous superscript numbers. Footnote text (in smaller typeface) is placed at the bottom of a table and starts with a superscript number.
Change bar (vertical black line usually in the margin)	Visually identifies new or changed material (text, figures, tables etc.)
->	Refers you to additional information.

Safety Symbol and Message Conventions

The safety alert symbols with the appropriate signal words and the note signs below are used throughout this documentation to identify warnings, cautions and notes.

WARNING

This symbol accompanies any instruction that draws attention to the risks caused by electricity. These risks could result in death or serious injury if the instruction is ignored or not followed correctly.

Caution

This symbol accompanies any instruction that draws attention to a potentially hazardous situation/condition. This situation/condition, may result in minor or moderate injury, if the instruction is ignored or not followed correctly.

Caution

This symbol accompanies any instruction that draws attention to the risk of possible laser radiation. This risk may result in serious eye injury, if the instruction is ignored or not followed correctly.

Caution

This symbol accompanies any instruction that draws attention to the possibility of equipment damage due to electrostatic discharge (ESD). Damage can occur, if the ESD-prevention instructions are ignored or not followed correctly.

Caution

This symbol accompanies any instruction that draws attention to the risk of equipment damage, malfunction, process interruption or negative impacts on surroundings. These events can occur, if the instruction is ignored or not followed correctly.

Notice

A symbol that draws attention to the necessity and importance of carefully reading all instructions before any installation or operation takes place. Failure to do so may result in personal injury or damage to equipment.

Notice

This symbol accompanies any instruction that draws attention to the proper disposal of waste electrical or electronic equipment and its components. Disregard of the instruction can threaten the environment.

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Note

This symbol accompanies any statement that the user should make a note of.

A symbol that draws attention to supplemental information and helpful recommendations that should be observed to ensure smooth operation of the equipment.

Related Documentation

Refer to the following documents for additional information about the FSP 3000R7 system:

- *FSP 3000R7 Safety Guide*
- *FSP 3000R7 Installation Guide*
- *FSP 3000R7 User Guide*
- *FSP 3000R7 Troubleshooting Guide*
- *FSP 3000R7 Module and System Specification*
- *FSP 3000R7 Hardware Description*
- *FSP 3000R7 Product Description*
- *FSP 3000R7 Detailed System Description*
- *FSP 3000R7 Entity Properties and Parameters*
- *FSP 3000R7 Deployment Rules*

Obtaining Documentation

World Wide Web

You can access the most current ADVA documentation on the World Wide Web via your partner login at:

`http://www.advaoptical.com/`

Documentation CD-ROM

The above mentioned documentation set is available on a CD-ROM which is delivered with your product. The documentation CD-ROM is updated with each product release and may be more current than printed documentation.

Ordering Documentation

ADVA Partners can order the FSP 3000R7 documentation set and additional literature through a local ADVA Optical Networking AG sales representative. For more current product release information, please refer

to ADVA's home page, or contact ADVA's Technical Support. See *sections "Obtaining Technical Assistance", p. x and "Contact ADVA", p. xi* for contact details.

Documentation Feedback

We want our FSP 3000R7 documentation to be as helpful as possible. Feedback regarding the guide is therefore always welcome.

You can e-mail your comments/suggestions to:

global-techdocu@advaoptical.com

To submit your comments/suggestions by mail, use the following address:

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We appreciate and value your comments/suggestions to improve the quality of the guide.

Obtaining Technical Assistance

Product Maintenance Agreements and other customer assistance agreements are available for ADVA Optical Networking AG products through your ADVA distribution channel. Our service options include:

- 7 X 24 telephone support
- Web-based support tools
- On-site support
- Technical training, both on-site and at ADVA facilities in Germany and the USA
- Expedited repair service
- Extended hardware warranty service

Partner Login

ADVA's partner login provides a suite of interactive, networking services that provide immediate access to ADVA information and resources at any time, from anywhere in the world. This highly integrated internet application is a powerful, easy-to-use tool for doing business with ADVA.

The partner login's broad range of features and services help customers and partners to streamline business processes and improve productivity. Through your partner login, you will find information tailored especially for you, including networking solutions, services, and programs. In addition, you can resolve technical issues with online support services, download and test software packages, and order ADVA training materials.

Access your partner login via the ADVA home page at:

http://www.advaoptical.com

E-mail questions regarding the partner login to:

Support@advaoptical.com

Technical Support

Technical support is available to warranty or maintenance contract customers who need technical assistance with an ADVA product that is under warranty or covered by a maintenance contract. To display ADVA's Technical Support web site that includes all contact information, go to ADVA's home page at:

http://www.advaoptical.com

and select the "Support" button.

To contact ADVA by E-mail, use one of the following addresses:

Europe, Middle East, Africa:	`Support@advaoptical.com`
North America:	`Support-usa@advaoptical.com`
Asia:	`Support-asia@advaoptical.com`

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Document Revision History

This is the first version of this document, but the contents were transferred from the previous *Reference Guide*. The following entries in this history show the changes that were made to the contents compared to the Reference Guide.

This document revision history lists the locations of, and the descriptions of significant document changes (additions, corrections, etc.) made in the separate issues of this documentation. They reflect the corresponding product release. When the changes are extensive, a general statement giving the nature of the revisions is provided.

Document Version No.	Issue Date	Details of Issue/Revision	Reference	Product Releases
7.1	March 2007	This manual is based on the previous Procedure Guide and parts of the Reference Guide		7.1
		Reference to new ***Entity Properties and Parameters*** document can be found throughout the procedures.		
		Equipment View - graphical overview of equipment through the Web Console	*Chapter 2, Section 2.2.2 "Equipment View", p. 2-3*	
		Update on command buttons used in the Craft Console	*Chapter 2, Section Table 2-1: "Craft Console Command Buttons", p. 2-6*	
		Creating a module - there are two possibilities to add to database	*Chapter 3, Section 3.1.1.1 "Creating a Module", p. 3-3*	
		Creating a channel includes description on how to find trace configuration	*Chapter 3, Section 3.1.1.3 "Creating a Channel", p. 3-5*	
		Creating a Virtual Channel - this has changed	*Chapter 3, Section 3.1.1.4 "Creating a Virtual Channel", p. 3-8*	
		Administrative state - Automatic in Service	*Chapter 3, Section Table 3-2: "Administrative States", p. 3-13*	

Document Version No.	Issue Date	Details of Issue/Revision	Reference	Product Releases
		DCN - updated text	*Chapter 3, Section 3.3 "Configuring DCN Related Settings", p. 3-14*	
		Protection - updated text	*Chapter 3, Section 3.6 "Configuring Protection", p. 3-25*	
		Loopbacks - updated text	*Chapter 3, Section 3.9 "Configuring Internal Loopbacks", p. 3-41*	
		Configuring Trace	*Chapter 3, Section 3.11 "Configuring Trace", p. 3-50*	
		Configuring Tandem Connection Monitoring	*Chapter 3, Section 3.12 "Configuring Tandem Connection Monitoring (TCM)", p. 3-51*	

Chapter 2

Using Craft and Web Consoles

This chapter describes management of the FSP system using the Craft Console and Web Console.

2.1 Entering and Exiting

2.1.1 Entering the Craft Console

Step 1 Connect to the NCU using either a serial or Ethernet connection as already described in the *User Guide, Chapter 1, Connecting to the Network ELement*.

Step 2 Choose the appropriate terminal emulation program (see the *User Guide, Chapter 1*).

Step 3 Log into the NCU with the appropriate user account. See the *Detailed System Description, Security Management*.

The Craft Console will appear as follows:

```
- FSP 3000R7 Rel.7.1.0X_2007_03_13_1152
1 + Service Overview
2 + Service Management
3 + Service Logging
4 + System Management
5 + System Security Management
6 + External Applications
R . Reboot NCU
q . Quit
```

The menu options available depend upon which user account is used.

2.1.2 Exiting the Craft Console

To exit the Craft Console type **<q>** or select **Quit** from the FSP Craft Console main menu. This will close the connection automatically.

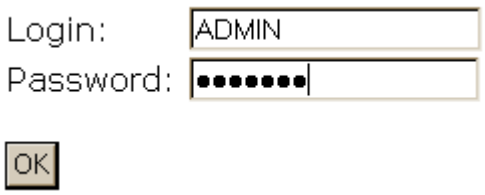
2.1.3 Entering the Web Console

This section describes how to login to the FSP using the Web Console.

Step 1 Open your browser (e.g. Explorer, Netscape) and enter the IP address in the address line:

http://<IP address of the FSP>

The login prompt appears in the main dialog window on the right side.



- Enter the username in the **Login** field.
- Enter the corresponding password in the “Password” field.
- Click **OK** or press **<Return>** to continue.

Step 2 You will now have entered the Web Console. The left side menu of commands is shown in an Explorer tree fashion.

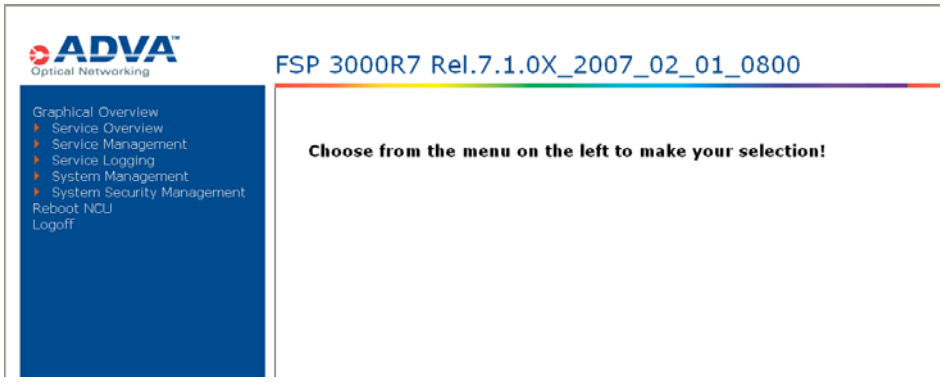


Fig. 2-1: Web Console - Screen After Login

Use your mouse pointer to choose commands from the menu on the left. This functions the same as for any Windows application. “Index cards” appear on the right side showing details depending on the command that has been selected from the menu.

Step 3 If you need to change user accounts, see the *Detailed System Description, Managing User Accounts*.

2.1.4 Exiting the Web Console

To exit the Web Console select **Logoff**. The session to this interface will then be timed out.

2.2 User Interaction

This section describes the appearance of and how to navigate within the FSP Craft and Web Consoles.

2.2.1 FSP Craft Console Menus

First there is a main menu of user selectable items. Module information and other settings are visible on index cards.

A main menu item may contain a submenu. This is indicated by a plus sign (+) to the left of the main menu item.

There are two ways of selecting menu items:

- key selection
- numeric selection.

Refer to *Section 2.2.4 "Navigation", p. 2-7* for details about navigating.

Key Selection Navigate to the appropriate item using the cursor arrow keys or the tab key and press **<Return>**.

Numeric Selection (Hotkeys) Type the number that appears to the left of the option. These are also described as hotkeys. The index card or submenu associated with the option will open.

0 (zero) *will close a previously opened window or submenu and functions as the Cancel button (Status Windows, p. 2-5).*

2.2.2 Equipment View

The Equipment View is a graphical representation of the network element. Shelves, fans and modules are selectable.

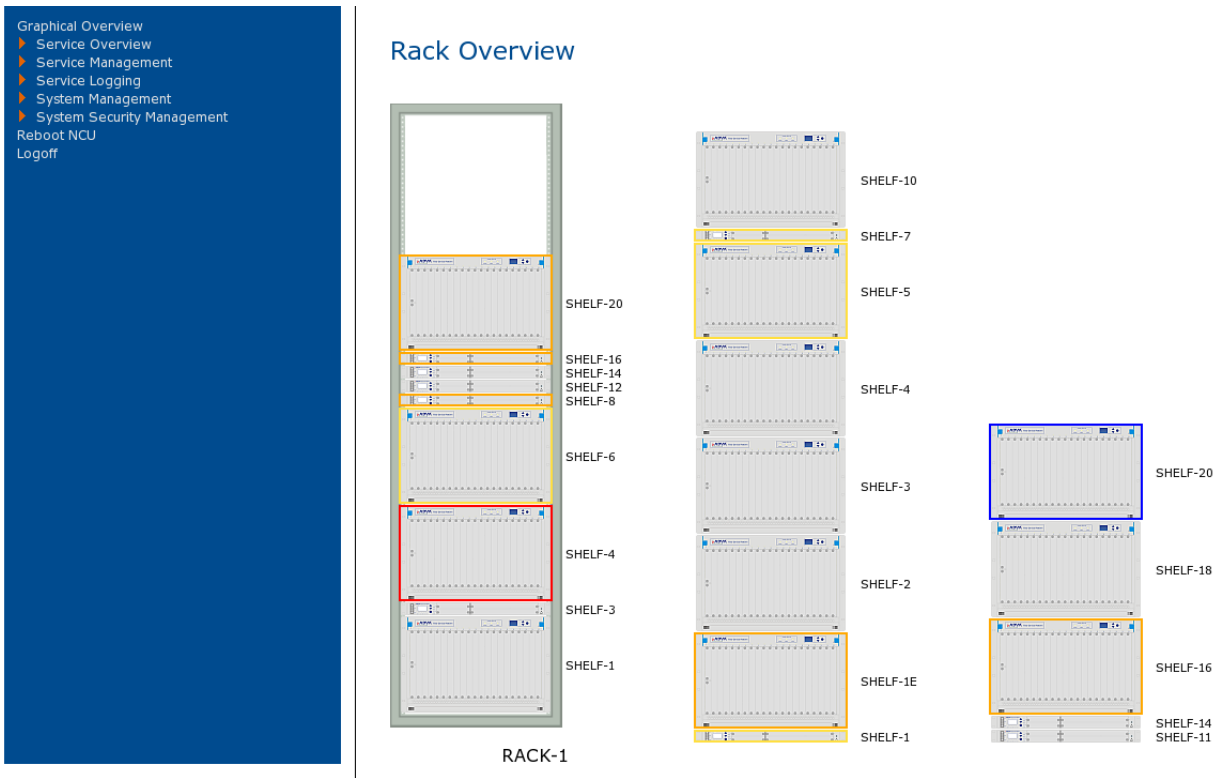


Fig. 2-2: Rack Overview

Here you can see all of the provisioned, but not necessarily equipped, shelves that make up the network element. They are in order by their addresses. Potential failures and other alarms (conditions) associated with a shelf (or its decendents) are marked in the form of a colored frame around the shelf image. The types of alarms that may be indicated by a color are as follows:

- critical - red
- major - orange
- minor - yellow
- not-alarmed - blue

Additionally, each shelf image has a pop-up tool tip that contains shelf address, shelf type and eventually alarm type. The Autorefresh button is used to reload the web page and automatically update the information after a certain amount of time. The box needs to be checked for this feature.

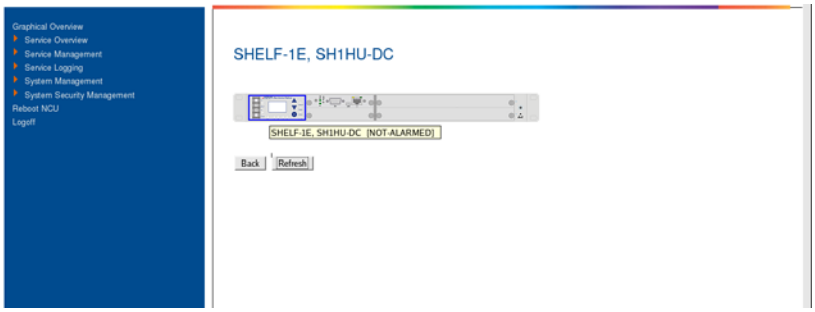


Fig. 2-3: Shelf View

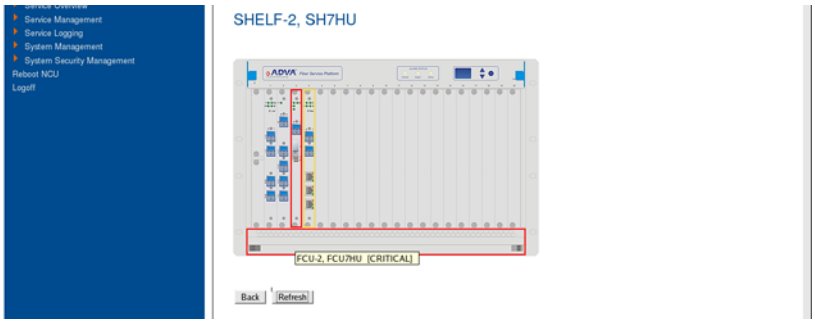


Fig. 2-4: Equipment View Showing Status of Modules

By 'Clicking' on a module within the equipment view you will open a fault table showing the alarms present on the selected module.

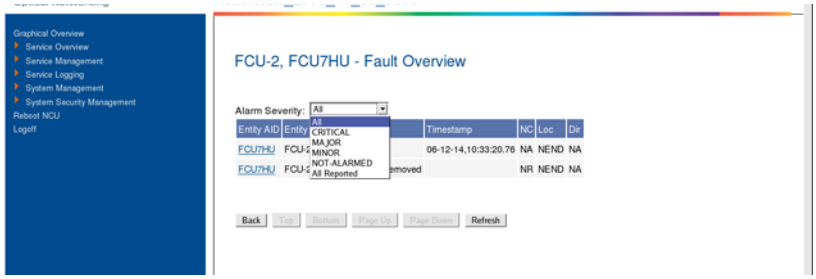


Fig. 2-5: Equipment View Fault Information

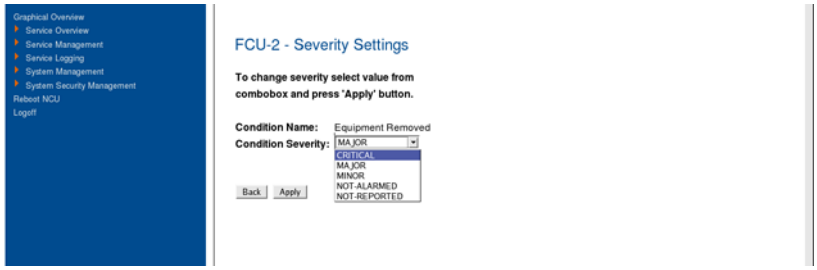


Fig. 2-6: Equipment View Severity Settings

2.2.3 Status Windows

When a menu option is selected, a window will appear that looks like an index card with tab headings. The information on this card is displayed using a series of fields. Each field either gives information about the operation of the FSP or enables you to input or select data that is required for operation.

Actions such as **OK**, **Save** and **Apply** are selected via command buttons at the bottom of the card. Each field type and action is described in the following.

Field Types

All fields are selected by navigating (see Navigation, p. 17-5) to the field and then pressing **<Return>**. For fields that may be edited, Input Mode is entered upon selection. When you have finished editing the field you exit Input Mode by pressing **<Return>** or the tab button.

The field types that may appear within an index card:

Display only **[]**

Such fields display status information or an option that is not selectable (behind such fields there are square or round brackets with no space in between i.e **[]**or **()**). These fields cannot be selected or changed.

[Selection**]**

Such fields are surrounded by square or round brackets and one space in between (i.e **[ ]** or **( )**).

- Round brackets simulate a toggle button, by selecting the field you cause an “on” or “off”/enable or disable.
- Square brackets have several uses, they represent:
  - a command button, by selecting the field you select the button
  - a check box, by selecting the field you toggle the check box
  - indicate that the field may be selected for further processing or
  - indicate that this field can be edited after selection by direct data input or by scrolling through an options drop-down list.

Command Buttons

These commands can also be activated by hotkeys. These are represented by an underlined letter in the Craft window.

For example: **Next**. Select the letter <n> to activate this command.

Table 2-1 lists the command buttons that may be available.

Table 2-1: Craft Console Command Buttons

Command Button	Description
OK	Apply the information on an index card and close current card.
Cancel	Cancel any changes that have been made to the information on this card, close current card and go to the upper menu.
Refresh	Reread data from database.
Apply	Apply (save) any changes that have been made to information on an index card without closing.
Page Up	Scroll to the previous page in a list of data, providing the information are presented over a number of pages.
Page Down	Scroll to the next page in a list of data, providing the information are presented over a number of pages.
Save	Save any changes or parameters that have been applied to the information on the status window.
Yes	Enable the user to answer “Yes” when prompted for an answer to a query.
No	Enable the user to answer “No” when prompted for an answer to a query.
Restore current settings	Change settings back to currently operating ones.
Delete	Delete a specified configuration. Delete user/entity/file.
Add	Add a new configuration.
Back	Close subdialog and return to the previous dialog window.
Frcd Delete	Removes planned entity and its decendents independent of their Admin State.
Create Connection...	Go to the subdialog window to create a Physical Cross Connection.
Dependencies...	Go to subdialog to see the dependencies of the current entity.
Reinit	Warm restart of the current module
Severities...	Go to the subdialog to change severity
Prev	(used in context dialog windows) Go to the previous context, e.g. during creation of an entity.
Next	(used in context dialog windows) Go to the next context, e.g. during creation of an entity.
Create	Create an entity.
Reset	Reset values to zeros (used in configuration of traces).
Accept	Set values (used in configuration of traces).
TCM	Go to the TCM configuration subdialog.
Trace.../Traces	Go to the trace configuration.
Connections...	Go to subdialog to see created physical connections.
Protection...	Go to the subdialog to see/create protection.
Top	Go to the top of a list.
Bottom	Go to the bottom of a list.
Page Up	Go to the previous page (in list).
Page Down	Go to the next page (in list).
Backup from ACT to RDISK	Save the database in RDISK.

Table 2-1: Craft Console Command Buttons

Command Button	Description
Copy from RDISK to STBY	Copy the PGM/database from RDISK to the STBY location.
Change Comments	Change or set comments.
Edit Comments	Go to the edit comments mode.
Activate STBY	Activate the software from the STBY location (causes a reboot).
Reset to Factory Default	Reset the database settings to factory defaults (causes a reboot).
Download	Download the file to RDISK.
Upload	Upload the file from RDISK.
Properties	See the properties of the selected file.
Keylist	See the information on SSH keys.

2.2.4 Navigation

2.2.4.1 Navigating in FSP Craft Console Menus

A number of keys on the PC keyboard can be used to navigate within the FSP Craft Console menus for item selection and within index cards for field input and selection.

The function of the keys available for navigation within the FSP Craft Console menus are outlined below. The same keys are used to navigate within the menus and index cards, however, as outlined in *Table 2-2* and *Table 2-3*, the right and left cursor arrow keys perform different operations.

Table 2-2: Navigating within the Menus

Key	Function
Return	**Select.** Select a highlighted menu option and open the appropriate window.
Up arrow Down arrow	**Move.** Move up and down (scroll) through FSP Craft Interface menu options to highlight the option required.
Right arrow	**Expand.** View a submenu. If a submenu is available to a main menu item it is indicated by a plus sign (+) to the left of that item. The main menu item must be highlighted before attempting to view its submenu.
Left arrow	**Collapse.** Close a submenu. A minus sign (-) to the left of a main menu item indicates that the item's submenu is open. The main menu item must be highlighted before attempting to close the submenu.
0	**Cancel.** Closes up opened submenu.

In the FSP Craft Console all modules and interfaces are referenced according to the following:

Table 2-3: Navigating within Index Cards

Key	Function
Return	**Select.** The highlighted field is selected so information may be entered, a highlighted option from an options list or a highlighted command button is selected.
Up arrow Down arrow Right arrow Left arrow Tab	**Move.** Navigate to editable fields or command buttons of an index card in order to highlight the field required.
numerical keys	Select. Numerical hotkeys to select tab headings.
0	**Cancel.** Closes up opened submenu.

Access Identifiers (AIDs)

All equipment is referenced by an access identifier (AID) address.

An existing AID address is a well-formed address whose supporting entity (from addressing point of view) is assigned in the NE database.

Example AIDs

Module: MOD-<FSP 3000R7 Rel.7.1 Detailed Proceduresmmunication Channel: ECH-<shelf#>-<slot#>-<C#>

This identification method is used in the Craft and Web Consoles:

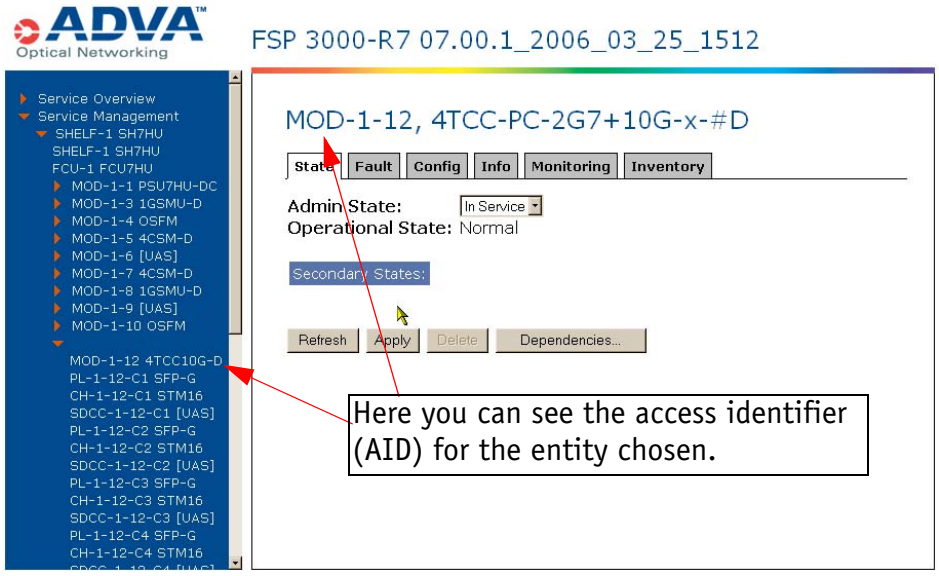


Fig. 2-7: Identifying Entities According to the AID

2.2.4.2 Navigating in FSP Web Console Menus

The FSP Web Console is used the same as any browser application. The main menu for the interface is displayed on the left-hand side of the browser screen. The main window is used to display the configuration windows.

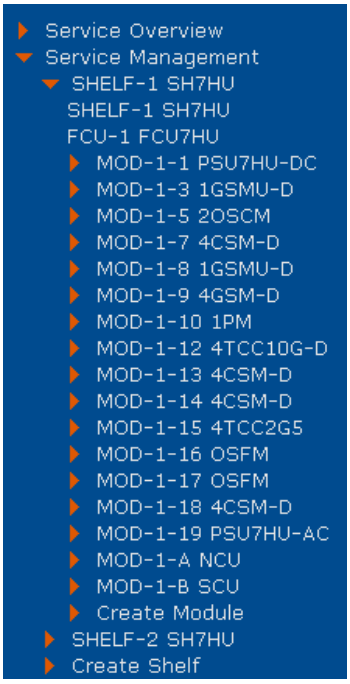
Navigation The mouse is the only means of navigating and selecting within this interface. A submenu is indicated by a red arrow. Use the mouse to click this menu heading to reveal the underlying menu items.

When a menu option is selected the main window will display the index card. Here you can use the mouse to select fields, tab headings or choose command buttons.

2.2.5 Index Cards

This section describes how management information is organized in the Craft and Web Consoles. The information is set up in exactly the same way in both consoles. The Craft Console shows it in a simpler text fashion. The Web Console displays it as illustrated here.

To monitor and configure equipment, select the equipment from the Service Management menu according to the AID. First select the shelf. Then all available modules of this shelf are listed as illustrated in *Table 2-8*.



Select the AID from the menu on th left to open the set of information i dex cards.

"MOD" means module (slot inclusive)

Fig. 2-8: Available Modules in a Shelf

Selecting a module you will see the equipment available on this module. The downward arrow shows that this entity is selected. You can choose from the following equipment shown in *Table 2-9*.

- "PL" means plug (socket cage inclusive, which is a pluggable transceiver (SFP or XFP)
- "CH" means channel facility (network or local)
- "VCH" means virtual channel facility
- "LDCC", "SDCC" and "GCCO" are facilities

For a complete list of possible AID names refer to *Section "Provisioning"*.

Fig. 2-9: Equipment Available for a Selected Module

This address and the name of the equipment is listed above each information index card, as shown in *Table 2-10*

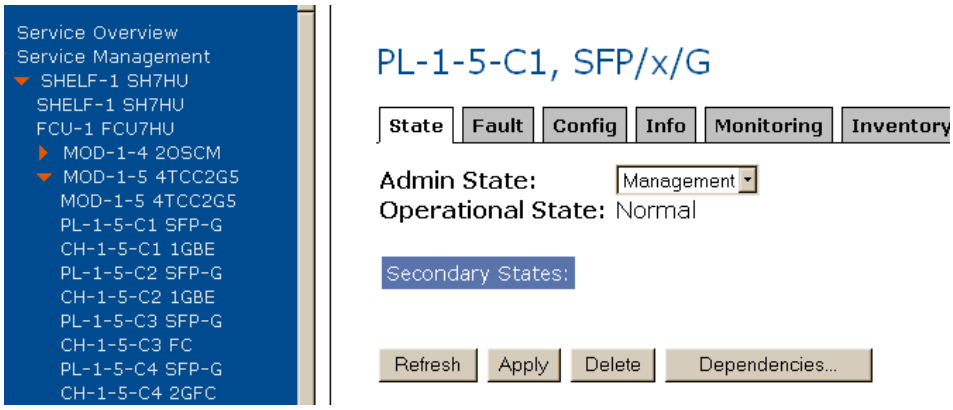


Fig. 2-10: State Index Card for an SFP

You can now view the index cards available for the equipment you have selected.

2.2.5.1 State

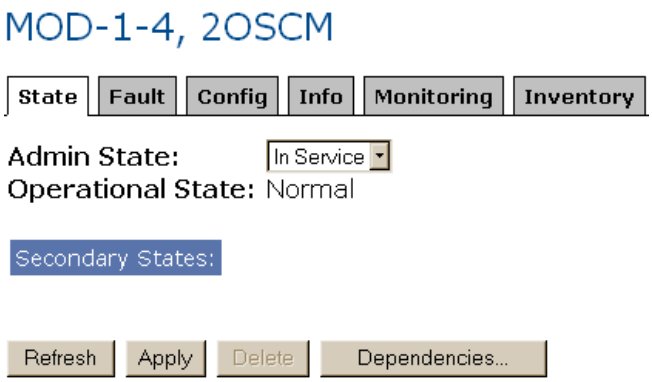


Fig. 2-11: State Index Card for a Module

The first index card of the console, State, provides the following information for all entities:

Admin State

The possible settings are:

- Automatic in Service
  AIS; alarms are not reported but service-affecting operations cannot be performed.
- In Service
  “IS”; the module is in service, and thus in normal operation. When in this administrative state, the module cannot be configured.
- Management
  “MGT”; the module is not in normal operation, so configuration can take place
- Maintenance
  “MT”; the module is not in normal operation, so maintenance can take place
- Disabled
  “DSBLD”; the module is disabled, and cannot be used or configured
- Unassigned
  (“UAS”; the module has not been provisioned to the NE database, or it has been deleted from the NE database. There is no visible dialog window for this entity.)

Operational State

The possible states are:

- Normal
- Abnormal
- Outage
- Unavailable

Secondary State

This field shows the state of a facility only (see see Figure 17-7, p. 17-10 for an example). Table 17-4 shows the possible states and provides a description.

Table 2-4. Secondary States

Name of State	Description
Unequipped	no equipment is installed
Mismatch of Equipment	equipment does not match provisioned hardware
Supporting Entity Outage	
Loopback	used in testing
Auto Locked-Out	autonomously suspended
Forced ON	used in testing
Facility Failure	
Equipment Failure	
Active	this facility provides service status in a protection group
Standby Hot	providing hot standby status in protection group
Protection Switch Inhibited	when switch from working (WKG) facility to protection (PROTN) facility is inhibited
Protection Release Inhibited	when switch from protection (PROTN) facility to working (WKG) facility is inhibited
Diagnostic	service affecting diagnostic activity is currently being performed on the entity
Busy	cross-connected. For example: to a LINK entity [by a chain of fiber connections linking provisioned and autoprovisioned ports]. Visible only if NE does not support fiber connections.
Idle	not cross-connected to a LINK Entity [by a chain of fiber connections linking provisioned and autoprovisioned ports]. Visible only if NE does support fiber connections

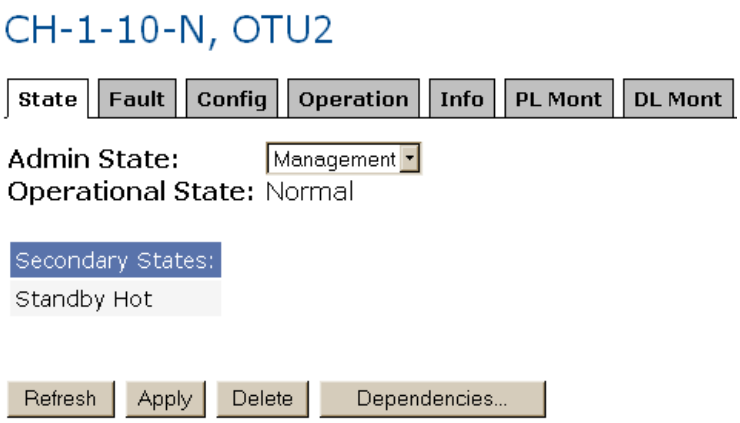
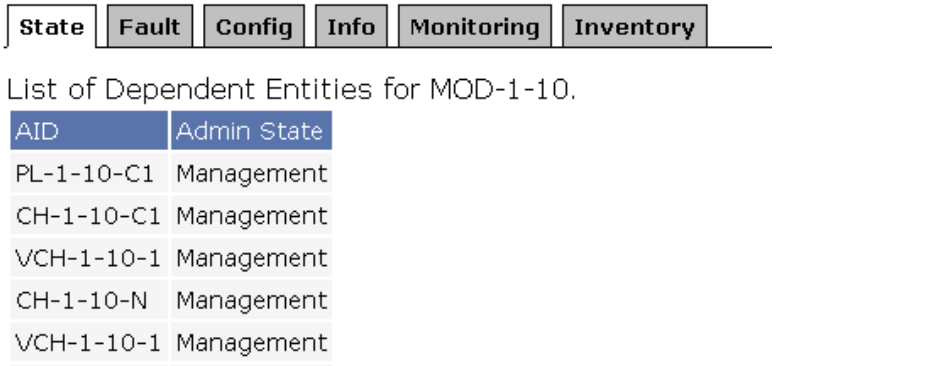


Fig. 2-12: State Index Card for a Channel

Dependencies Selecting **Dependencies** you can view a list of dependent entities for this equipment. They are listed according to their AIDs. The Admin State is also shown.



Now select **OK** for returning to the **State** menu or select **Frcd Delete** to delete the module.

2.2.5.2 Fault

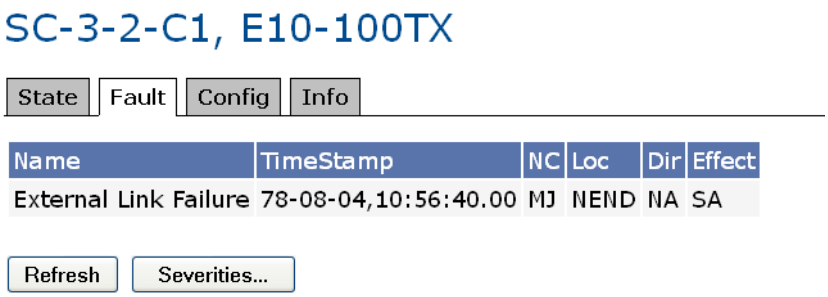


Fig. 2-13: Fault Index Card

The index card **Fault** provides the following information for all entities:

Name This shows the name of the fault that occurred. See the *User Guide* for a list of traps.

TimeStamp This shows the date and time that the fault occurred.

NC This indicates the severity for the alarm. It is possible to have the setting: critical (CR), major (MJ), minor (MR), not-alarmed (NA) or not-reported (NR).

Loc This shows the location that the fault occurred; at the near-end or far-end NE.

Dir This shows in which direction the fault occurred; transmit or receive.

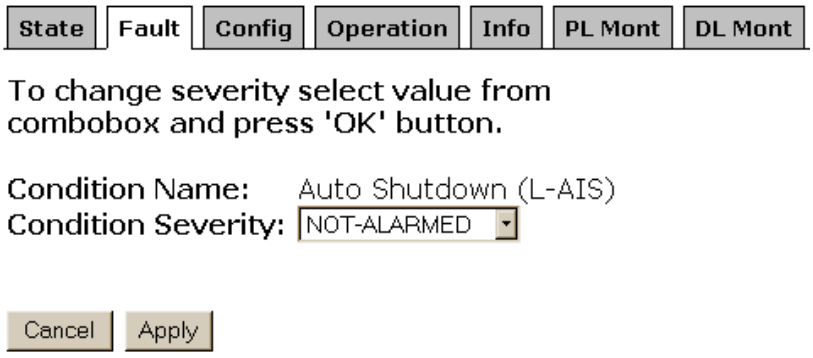
Effect This shows if the fault is service affecting (SA) or not.

Severities Here it is possible to set the severity for each alarm for each entity.

They can be set to:

- Critical
- Major
- Minor
- Not-Alarmed
- Not-Reported

To change severities select the **Severities** button. A list of possible faults with their current severities is provided. Choose the fault you want to change from the list. The following screen appears:



Change the severity and select **Apply**.

See the *User Guide, Chapter 3 f*or an explanation of severities and how to configure them.

2.2.5.3 Config

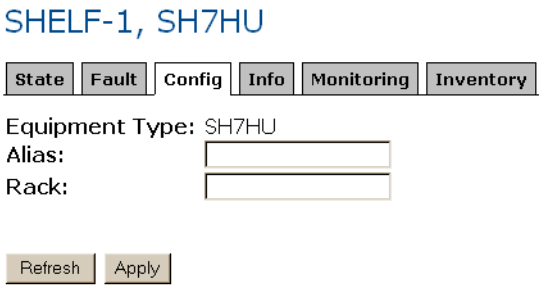


Fig. 2-14: Config Index Card for a Shelf

The index card **Config** provides the following informationÖ

For a Shelf

Equipment Type This shows the name of the selected equipment. If you have selected a shelf you will be shown the type of the selected shelf (SH7HU).

Alias You can assign a symbolic name for the shelf. This is a user-defined string to describe the shelf.

Rack You can name the rack according to the requirements of your organization to identify which rack you are monitoring.

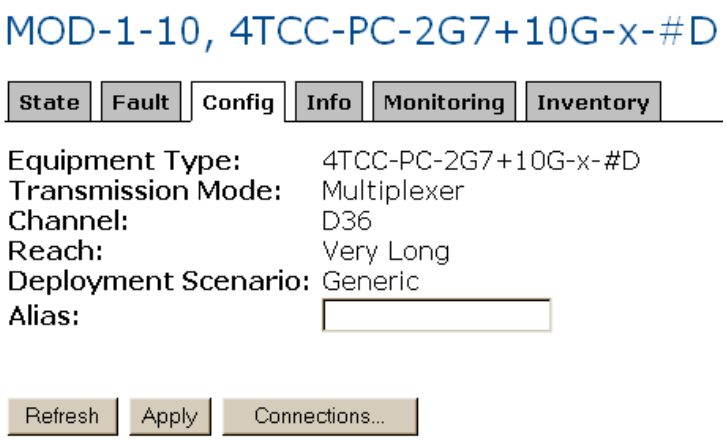


Fig. 2-15: Config Index Card for a Module

For a Module

Equipment Type This shows the name of the selected module.

Transmission Mode This shows in which working mode the module runs. Possible transmission modes are:

- Transponder (Transponder East, Transponder West, Transponder HST)
- Multiplexer (Multiplexer East, Multiplexer West, Multiplexer HST)
- Regenerator (Regenerator 1WAY or Regenerator 2WAY)

Channel This shows which wavelength the channel module transmits/receives.

Reach This shows the type of reach for this module. Possible reaches are:

- "Intra Office": for intra office distances 0 - 5 km
- "SHORT": for short distances 5 - 30 km
- "LONG": for long distances 30 - 70 km
- "VERY LONG": for very long distances 70 - 120 km
- "ULTRA LONG": for ultra long distances 120 - 240 km
- "REGIONAL": for regional distances 240 - 360 km
- "EXTRA LONG": for extra long distances 360 - 600 km.

Deployment Scenario This shows the deployment scenario of this module. Possible deployment scenarios are:

- Generic (no further deployment info is supplied)
- Back To Back (the channel module is to be used as a regenerator together with another channel module, where the regenerator type Back-to-Back is used)
- Client Layer Protection (channel is protected by client layer protection)
- Pass through (channel is not protected by any supported methode)

Alias You can assign a symbolic name for the module.

Further parameters (depending on the module type)

Channel Group This shows which channel group is splitted/combined (CSMs) if you have selected a filter module ... D25-D28 (C) (for CSM)

OM-Band The optical multiplex (OM) band options depend on the module. The possibilities are: C-Band, L-Band, A-Band or B-Band

Output Power Rating This is shown for EDFAs and depends on the EDFA module. The value (in dBm) can be 10, 17, 18 or 20.

Topology Type Monitored topology type. This can be LAD, Ring, point-to-point or Unknown.

Fiber Type Single mode or multi-mode for the fiber type is indicated.

Connections To see a list of existing physical connections for a module, select the Connections button. You can create new connections by selecting the Create Connection button.

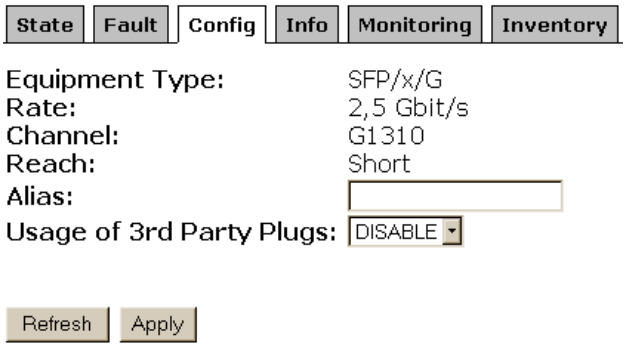


Fig. 2-16: Config Index Card for SFPs/XFPs

For SFPs/XFPs

Equipment Type This shows the name of the selected SFP or XFP.

Rate This shows the data rate which the SFP/XFP transmits/receives.

Channel This shows the channel which the SFP/XFP transmits/receives.

Reach This shows the reach of this SFP/XFP.

Alias You can assign a symbolic name for this SFP/XFP.

Usage of 3rd Party Plugs You can define if 3rd party plugs might be used. Choose in the drop down menu “Enabled” or “Disabled”.

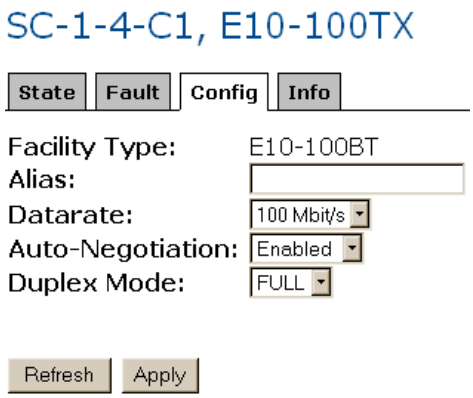


Fig. 2-17: Config Index Card for a Facility

For Facilities (Channels and Virtual Channels)

Facility Type This indicates the name of facility.

Alias You can assign a symbolic name for this facility.

Datarate You can choose the datarate in which the facility shall transmit data.

Auto-Negotiation You can enable or disable auto negotiation.

Duplex Mode You can set full duplex mode or half duplex mode.

Further parameters and settings (depending on the facility type)

Termination Level You can set the termination level.

Stuffing This shows if bit/byte stuffing is used in the transport signal.

ALS Mode Set the ALS type (SDH ALS) or “None”.

Timing You can set the timing to “Intern” or “Loop”.

SDH MS-SD Definition Block-Error-Based Degradation Definition for SDH (standard integration period). Defined as percentage Background Block Errors (30% default) evaluated over a defined period (SDPER-RS).

Flow Control You can enable or disable the flow control mechanism.

Forward Error Correction Set the type of FEC you wish to enable. Possible settings are:

- G709 Standard FEC
- No FEC
- Enhanced FEC
- Enhanced FEC (INTEL)
- Enhanced FEC (AMCC)

Error Forwarding Mode

You can set the Error Forwarding Mode. Possible Settings are:

- AIS (setting of all-ones AIS)
- EPC (Error Propagation Code is set)
- IDLE (in the absence of any other indication, such as ALS, this implies a typical ADVA network-side facility behaviour)
- OFF (no Error Propagation Code is available)
- LSRBRK (laser break)

Laser-Off Delay

You can enable or disable the possibility to delay turning off the laser. This applies to the case when turning off the laser is done as an error forwarding mechanism.

VCG Type

You can set the virtual container group type. Possible settings are:

- VC4
- VC3
- STS1

Bundle VC List

This shows the List of VC4/VC3/STS1 containers used in the BUNDLE.

The parameters provided by the Config index card depend on the module. Not all possibilities are covered here, this is only a selection.

Protection

If you select the Protection button you can see the parameters of network port protection for this channel.

9an

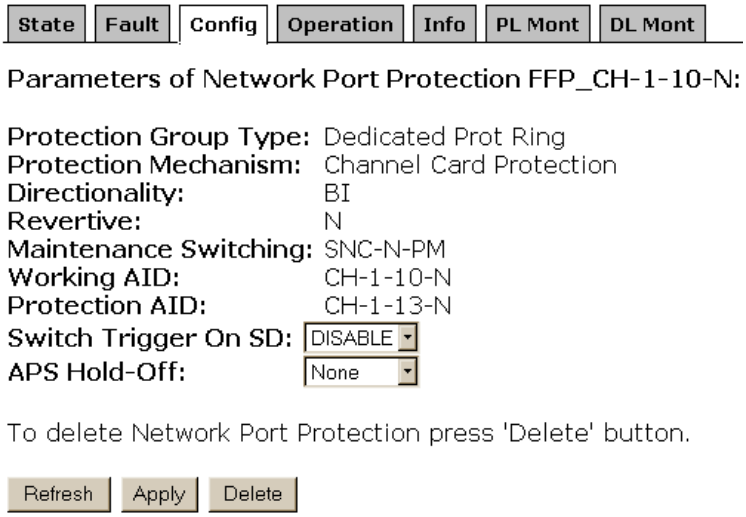


Fig. 2-18: Config Index Card - Protection Button

Protection Group Type

This shows the type of protection group.

Protection Mechanism This shows what protection mechanism is set. Possible settings are:

- Optical Switch Protection
- Channel Protection and
- Channel Card Protection

Directionality This shows in which direction the protection works. Possible settings are:

- "BI" for bidirectional or
- "UNI" for unidirectional

Revertive This shows which protection in revertive direction works.

- "N" for nonrevertive

Maintenance Switching This shows how maintanance switching is performed. This can be:

- LINE/MSP (SONET Linear APS, SDH Multiplex Section Protection)
- SNC-N (if facility type is OTN)
- SNC-I (if facility type is OTN)
- SNC-S (if facility type is OTN)
- ETH (Ethernet)
- PHYS (based on physical layer only)
- SNC-N-PM (SDH Multiplex Section Protection if facility type is SDH)
- SNC-N-TCM (SDH Multiplex Section Protection if facility type is SDH)
- SNC-I-SM (N/A)

Working AID This shows through which channel the working path is realized. AID of working port involved in protection group.

Protection AID This shows which channel the protection path provides. AID of protection port involved in protection group.

Switch Trigger On SD Enable or Disable Signal Degrade trigger.

APS Hold-Off You can set a hold off time for APS. Also known as the soak period before switching on the trigger, this value can be set from none, 20 ms, 100 ms up to 10000 ms.

2.2.5.4 Info

The index card Info provides the following information:

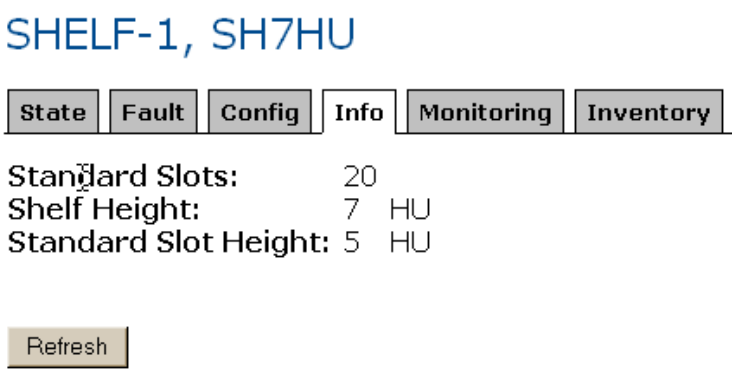


Fig. 2-19: Info Index Card for a Shelf

For a shelf

Standard Slots This shows the number of module slots in this shelf.

Shelf height This shows the height of the shelf in HU (High Units).

Standard Slot Height This shows the height of the module slots in HU.

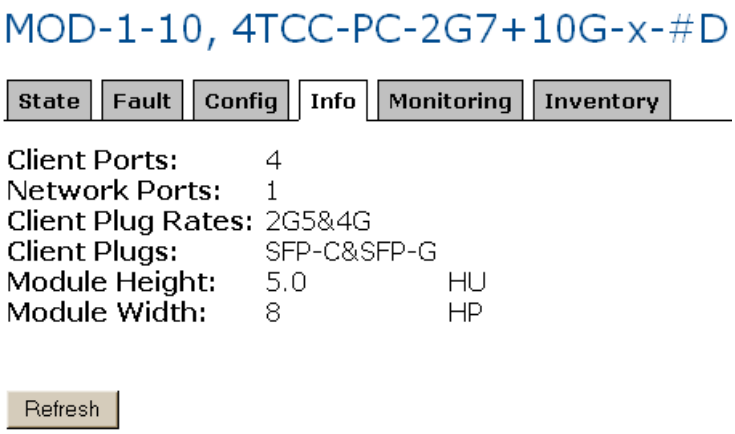


Fig. 2-20: Example for an Info Index Card for a Module

For a Module

Client Ports This shows how many client ports are provided by this module.

Network Ports This shows how many network ports are provided by this module.

Client Plug Rates This shows the data rates of the client ports.

Client Plugs This shows the SFP/XFP types which are available in the client ports.

Module Height This shows the module height in HU.

Module Width This shows the module width in HP (Horizontal Pitch).

Serial Ports This shows how many serial ports the module provides (for example: the NCU provides 1 serial port).

Upgrade Ports This shows how many upgrade ports the module provides (for example the 4CSM+ provides 1 upgrade port).

Channel This shows which wavelength the channel module transmits/receives.

Reach This shows the type of reach for this module.

For SFPs/XFPs

Fiber Type This shows the fiber type supported by this SFP/XFP.

Connector This shows the connector type supported by this SFP/XFP.

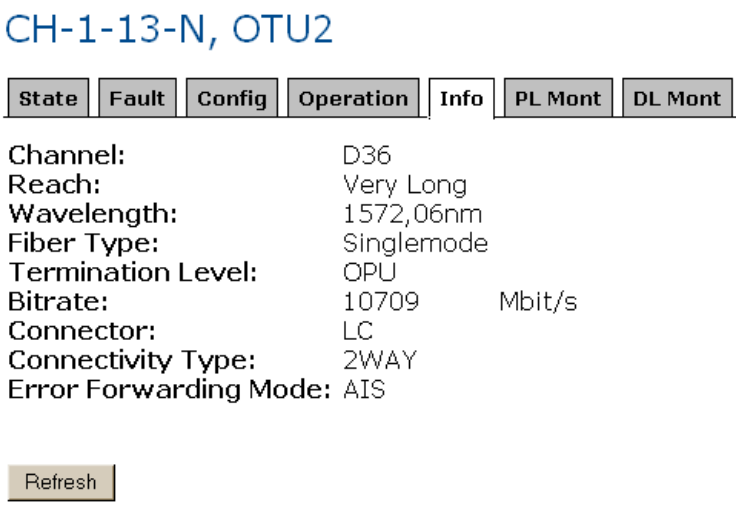


Fig. 2-21: Info Index Card for a Channel

For Facilities and Channels

Channel This indicates the name of this channel.

Reach This shows the achieved reach of this channel.

Wavelength This indicates the used wavelength (assigned to this channel).

Fiber Type This shows the used fiber type.

Termination Level This shows the termination level. Possible termination levels are:

- None
- OTU
- ODU
- OPU
- Section/RS
- Line/MS
- Path

Bitrate This shows the transmitted/received bit rate.

Connector This shows the available connector type.

Connectivity Type This shows what type of connection is done (1WAY or 2WAY).

Error Forwarding Mode This shows what Error Forwarding Mode is set.

Further possible indications

Clock Frequency If there is a clock set, the clock frequency is indicated.

ECC Protection This shows if embedded communications channel protection is configured.

Maximum ECC Bitrate This shows the maximum bitrate for the embedded communications channel.

PPPIP AID This is the access identifier address for the PPP IP interface.

Virtual Channel AID This is the access identifier address for the virtual channel.

2.2.5.5 Monitoring

Select the corresponding AID for the entity from the Service Management menu. See *page 1-1*.

The index card Monitoring is available for shelves, modules and SFPs/XFPs and provides the following information:

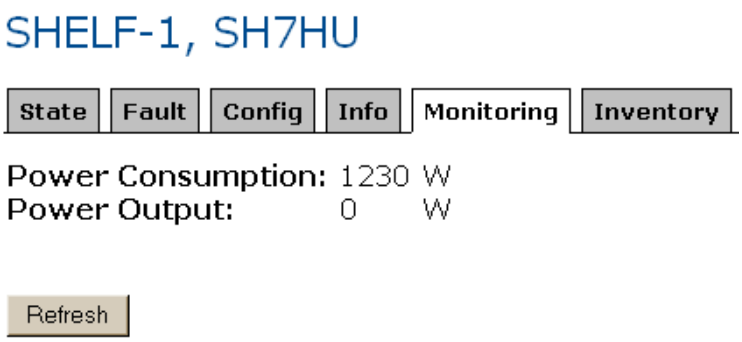


Fig. 2-22: Monitoring Index Card for a Shelf

For a Shelf

Power Consumption This shows the max. power consumption of this shelf (with all equipment).

Power Output This shows the maximum power provided by the shelf to be consumed by the modules.

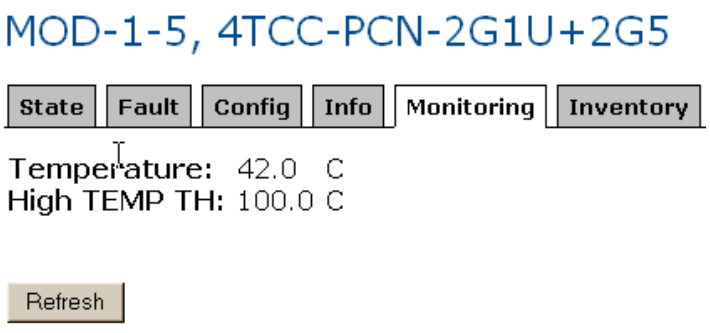


Fig. 2-23: Monitoring Index Card for a Module

For a Module

Temperature This shows the current temperature of the module.

High TEMP TH This shows the setting for the maximum board temperature threshold.

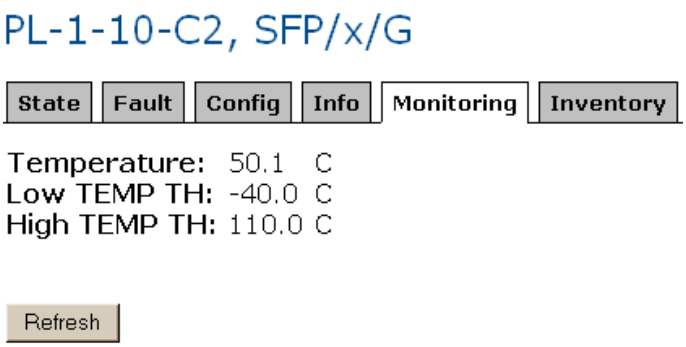


Fig. 2-24: Monitoring Index Card for SFPs/XFPs

For Pluggable Transceivers (SFPs/XFPs)

Temperature This shows the current temperature of this SFP/XFP.

Low TEMP TH This shows the minimum temperature threshold setting for this SFP/XFP.

High TEMP TH This shows the maximum temperature threshold setting for this SFP/XFP.

For channels and virtual channels, two other index cards are provided,

- PL Mont and
- DL Mont.

For further information see sections *2.2.5.8 and 2.2.5.9*.

2.2.5.6 Inventory

The index card Inventory is available for shelves, modules and SFPs/XFPs and provides for all the following information:

Part Number This indicates the part number of this equipment.

Official Name This shows the name of the selected equipment.

Hardware Revision This shows the hardware revision of the selected equipment.

FW Package Revision This shows the firmware package revison number.

FPGA Revision If available the FPGA revision is indicated. If there is no FPGA present, a zero is shown.

µCM Revision If available the µCM revision is shown, otherwise n/a is indicated.

Serial Number This shows the serial number of the selected equipment.

Vendor Code This shows the vendor code of the equipment.

CLEI Code If available the CLEI Code for this equipment is shown.

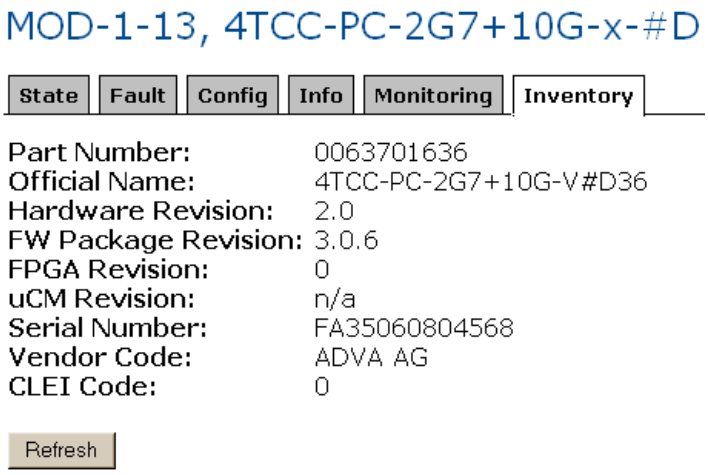


Fig. 2-25: Example of an Inventory Index Card for a Channel Module

2.2.5.7 Operation (available for channels only)

The index card Operation is available only for channels appears and provides the following information:

Fig. 2-26: Example of an Operation Index Card

Protection Switch This shows what type of switch is used to switch protection.

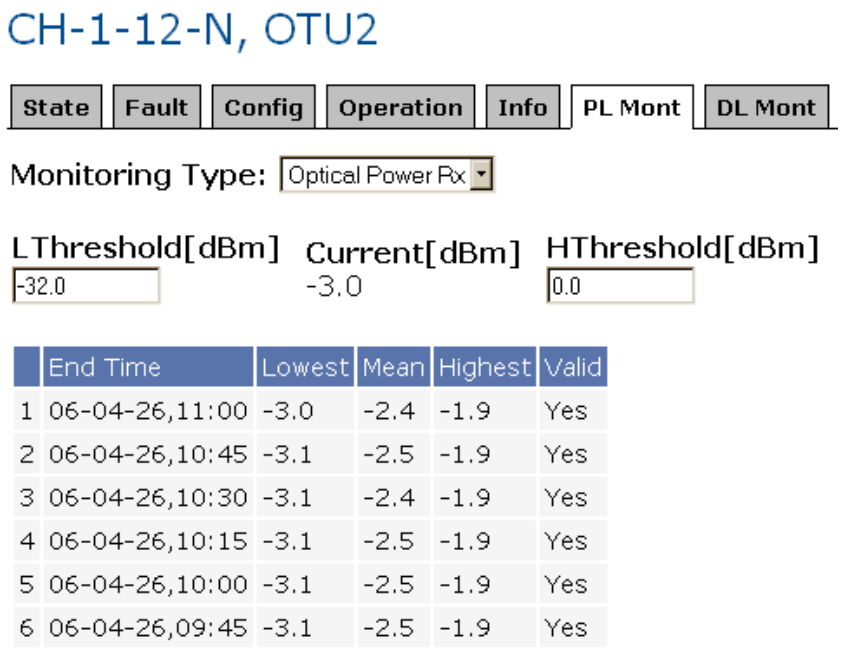
Inhibit Switch to WKG This shows if there is a inhibition set for the switch.

Laser Forced ON This shows what laser is forced on. Possible indications are: RLS for released or OPR for total optical input power received.

Loopback This shows the status of the loopback. This can be RLS for released (or no loop), OPR-Facility or OPR-Terminal.

2.2.5.8 PL Mont (available for channels and facilities) Physical Line Layer Monitoring

The index card PL Mont provides the following information:

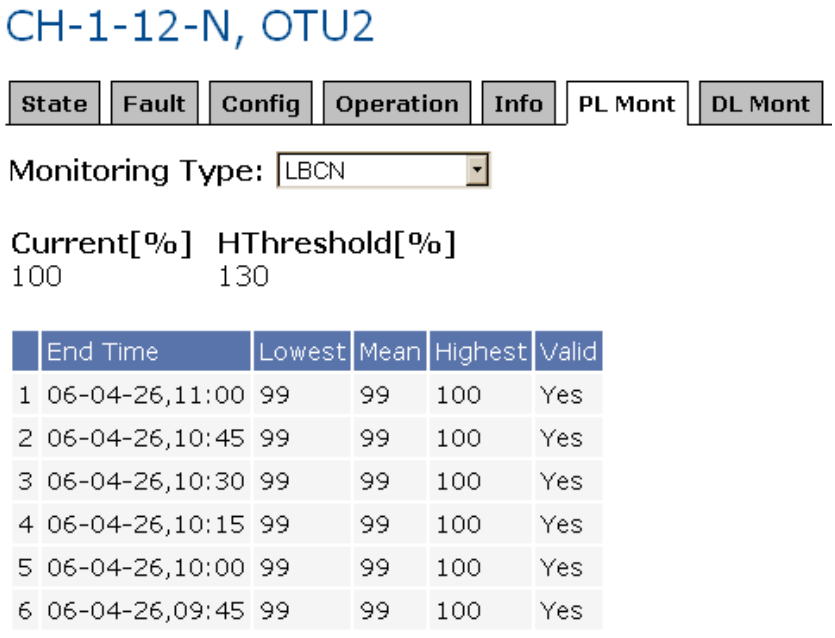


	End Time	Lowest	Mean	Highest	Valid
1	06-04-26,11:00	-3.0	-2.4	-1.9	Yes
2	06-04-26,10:45	-3.1	-2.5	-1.9	Yes
3	06-04-26,10:30	-3.1	-2.4	-1.9	Yes
4	06-04-26,10:15	-3.1	-2.5	-1.9	Yes
5	06-04-26,10:00	-3.1	-2.5	-1.9	Yes
6	06-04-26,09:45	-3.1	-2.5	-1.9	Yes

Fig. 2-27: Example of a PL Mont Index Card with monitoring type OPR

Monitoring Type The supported monitoring type depends on the module. Choose the monitoring type you wish to see the records on physical line layer monitoring for. Possible monitoring types are for example:

- Optical Power Rx (total optical input power received)
- Optical Power Tx (instantaneous optical power transmitted (output))
- LBCN (instantaneous laser bias current normalized), see



	End Time	Lowest	Mean	Highest	Valid
1	06-04-26,11:00	99	99	100	Yes
2	06-04-26,10:45	99	99	100	Yes
3	06-04-26,10:30	99	99	100	Yes
4	06-04-26,10:15	99	99	100	Yes
5	06-04-26,10:00	99	99	100	Yes
6	06-04-26,09:45	99	99	100	Yes

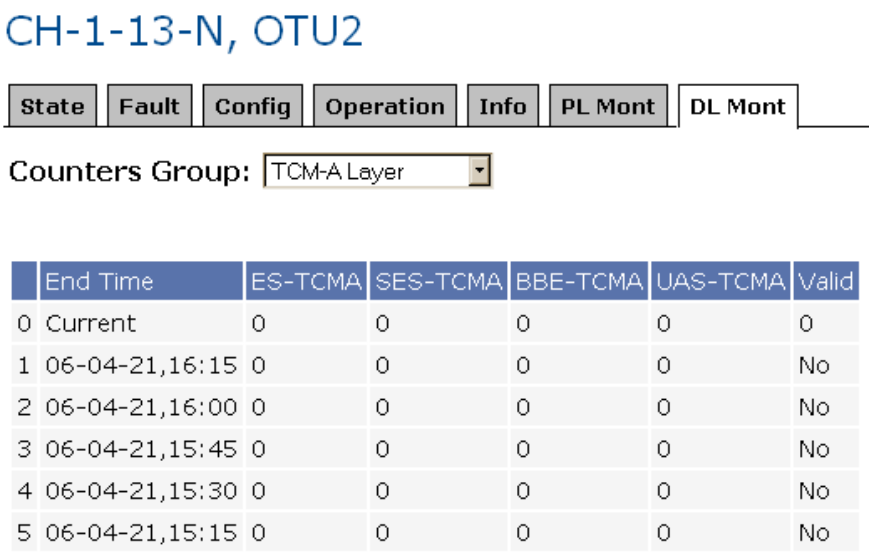
Fig. 2-28: Example of a PL Mont Index Card with monitoring type LBCN

L Threshold and H Treshold [dBm] You can enter the lowest and highest threshold for this channel if the monitoring type is Optical Power RX.

Time Period Choose the time period you wish to see the records for.

2.2.5.9 DL Mont (available for channels and facilities) Data Layer Monitoring

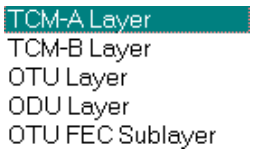
The index card DL Mont provides the following information:



	End Time	ES-TCMA	SES-TCMA	BBE-TCMA	UAS-TCMA	Valid
0	Current	0	0	0	0	0
1	06-04-21,16:15	0	0	0	0	No
2	06-04-21,16:00	0	0	0	0	No
3	06-04-21,15:45	0	0	0	0	No
4	06-04-21,15:30	0	0	0	0	No
5	06-04-21,15:15	0	0	0	0	No

Fig. 2-29: Data Layer Monitoring Index Card

Counters Group Choose the counters group where you wish to see the records on data layer monitoring for. Possible counters groups are:



Then a list of records on data layer monitoring will be provided

The record shows the date and time of errored seconds, etc.

Time Period Choose the time period you wish to see the records for.

Chapter 3

Procedures

This chapter provides information for the user regarding the configuration details set for a network element (NE). The management system allows the user to set certain parameters and reconfigure certain settings, as required. The following instructions are provided:

3.1 Provisioning

The basis for Fiber Service Platform management is the network element database. The database is a virtual representation of equipment and facilities provisioned into the system. This section describes the basics of how these entities are recognized by the database and represented in the management tools.

This section gives an overview of what modeling practice is used in this Fiber Service Platform. Certain rules have been laid out for handling modules, transceivers and facilities such as channels, also referred to as entities on the whole. First, one must understand the naming practice for these entities. Then adding and removing equipment is described.

3.1.1 Creating Entities Manually

AID = <AIDname-shelf-slot-inst>

An existing AID address is a well-formed address whose supporting entity is assigned in the NE database.

Examples for AIDs:

- module: MOD-<shelf#>-<slot#>
- plugs: PL-<shelf#>-<slot#>-<port#>
- optical channel: CH-<shelf#>-<slot#>-<port#>

The following table shows the types of AIDs that are available:

The AID name "MOD" covers all of the following equipment: NCU (network element control unit with external interfaces), SCU (shelf control unit with internal interfaces), PSU, DCN (optical supervisory channel module with optical Ethernet interfaces, router module, both with external electrical Ethernet interfaces), filter module or other passive module, optical protection switch module, amplifier module, channel module.

Description	AID Name
System	NE
Shelf	SHELF
Fan control unit	FCU
Module (slot inclusive)	MOD
Plug (socket cage inclusive)	PL
Fan	FAN
Optical line (virtual)	OL
Optical multiplex	OM
Channel facility (remote or local)	CH
Virtual channel facility	VCH
WDM-slot on the OL	WCH
Virtual STS-1 container	STS1
Virtual VC-3 container	VC3
Virtual VC-4 container	VC4
Section DCC	SDCC
Line DCC	LDCC
Path DCC (F2 bit)	PDCC
ADVA proprietary ECC	EOC
SC-slot on the OL	WSC
GCC0 (OTN)	GCC0

Description	AID Name
GCC1 (OTN)	GCC1
GCC2 (OTN)	GCC2
Supervisory channel (Ethernet)	SC
IP point-to-point interface or pure SER/USB	LINK
IP broadcast interface (e.g. Ethernet port)	IP
External input	TIFI
External output	TIFO
Internal inter-shelf connection interface on the SCU card of the shelf	SH
Group of SC entities	LAN
Group of connected physical ports	CONN
Group of two channels protecting each other	FFP_CH
Group of two optical multiplex facilities protecting each other	FFP_OM
DCN cross-connect	CRS_DCN
Entry in Static Routing Table	STRTR
Entry in OSPF Dynamic Routing Table	RTR

Table 3-1: Available AID Names

3.1.1.1 Creating a Module

There are two variations of creating a module. You can either create the module that is inserted but has not been entered into the database or you can create the module in an unequipped slot.

```
- Service Management
  - SHELF-1 SH7HU
  1 . SHELF-1 SH7HU
  2 . FCU-1 FCU7HU
  3 + MOD-1-1 PSU7HU-DC
  4 + MOD-1-3 WCC10G-C
  5 + MOD-1-4 4TCC2G5
  6 + MOD-1-5 WCC2G7-C
  7 + MOD-1-6 [UAS]
  8 + MOD-1-17 4TCA1G3-D
  9 + MOD-1-19 PSU7HU-DC
  a + MOD-1-A NCU
  b + MOD-1-B SCU
  c + Create Module
  + Create Shelf
+ Service Logging
+ System Management
+ System Security Management
+ External Applications
. Reboot NCU
. Quit
```

Select an AID to create (provision in the database) the module that is physically inserted in a slot.

Select the option *Create Module* to create a module in an unequipped slot.

Step 1 Select **Service Management > SHELF 1 >**

a. **> MOD-1-x > Create.** Choose this to create a module that is physically inserted in the slot but not registered in the database.

```
- MOD-1-17 [UAS]
 1 . Create
```

b. **> Create Module** then select the AID address for the module to be inserted. Choose this to create a module in an unequipped slot.

```
- Create Module
. MOD-1-11 [UEQ]
. MOD-1-12 [UEQ]
. MOD-1-13 [UEQ]
. MOD-1-14 [UEQ]
```

The following window will appear:

```
+-------------Create: MOD-1-9-------------+
|  Enter relevant values                  |
|                                         |
| Equipment Type: [--choose--           ] |
|                                         |
| [ Cancel  ] [ Refresh ] [  Next   ]     |
+-----------------------------------------+
```

Choose the appropriate equipment from the drop-down list.

Step 2 Choose the equipment type for the new module from the drop-down list.

Step 3 Select **[Next]**.

Step 4 Enter all of the parameters required for this module. The entries will vary according to the chosen type of module. For more information on these parameters, refer to the *Entity Properties and Parameters*.

```
+-----------------Create: MOD-1-3-----------------+
¦  Enter relevant values                          ¦
¦                                                 ¦
¦ Transmission Mode:   [Multiplexer]              ¦
¦ Channel Number:      [--choose--]               ¦
¦ Laser Reach:         [Very Long]                ¦
¦ Deployment Scenario: [Generic               ]  ¦
¦ Admin State:         [Management        ]       ¦
¦                                                 ¦
¦ [ Cancel  ] [ Refresh ] [  Prev   ] [  Apply  ] ¦
+-------------------------------------------------+
```

Step 5 Choose **[Apply]** to save the settings. The message "Entity was successfully created" will appear:

```
+---------------------------------+
| Entity was successfully created. |
|                                 |
|           [   OK    ]           |
+---------------------------------+
```

Step 6 Continue top-down to create the dependents for the module. Select the corresponding AID address for the entity required and choose the values accordingly.

3.1.1.2 Creating a Plug

Step 1 Select the unassigned plug from the module submenu.

```
- MOD-1-1 4TCC2G5
       . MOD-1-1 4TCC2G5
       . PL-1-1-C1 SFP-C
       . CH-1-1-C1
       . PL-1-1-C2 [UAS] [UEQ]   <-- select the plug
       . CH-1-1-C2
```

Step 2 Choose the equipment type from the drop-down menu.

```
+----------Create: PL-1-1-C1-----------+
|   Enter relevant values              |
|                                      |
| Equipment Type: [--choose--]         |
|                                      |
|                                      |
| [ Cancel  ] [ Refresh ] [  Next   ]  |
+--------------------------------------+
```

Step 3 Choose **[Next]** to continue through the required settings.

Step 4 Enter all of the parameters required for this plug. The following screen-shots demonstrate the types of settings that could be required, depending on the plug. For more information on these parameters, refer to the *Entity Properties and Parameters*.

```
+-----------------Create: PL-1-3-C------------------+
¦  Enter relevant values                            ¦
¦                                                  ¦
¦ Equipment Type:           XFP/x/G                ¦
¦ Rate:                     [--choose--          ] ¦
¦ Channel:                  [--choose--]           ¦
¦ Usage of 3rd Party Plugs: DISABLE                ¦
¦                                                  ¦
¦ [ Cancel  ] [ Refresh ] [  Next   ]              ¦
+--------------------------------------------------+
```

```
+----------------Create: PL-1-B-N----------------+
¦ Enter relevant values                          ¦
¦                                                ¦
¦ Equipment Type           +-------------+       ¦
¦ Rate                     ¦Coupling Link¦       ¦
¦ Usage of 3rd Party Plugs ¦High Speed   ¦       ¦
¦                          ¦2,1 Gbit/s   ¦       ¦
¦                          ¦2,5 Gbit/s   ¦       ¦
¦                          ¦4 Gbit/s     ¦       ¦
¦ [ Cancel  ] [ Refresh ] [¦ANY          ¦       ¦
+--------------------------+-------------+-------+
```

```
+---------------Create: PL-1-3-C-----------------+
¦  Enter relevant values                         ¦
¦                                               ¦
¦ Reach:       Short                            ¦
¦ Admin State: [Management ]                    ¦
¦                                               ¦
¦ [ Cancel  ] [ Refresh ] [  Prev   ] [  Apply  ] ¦
+-----------------------------------------------+
```

Step 5 Choose **[Apply]** to save the settings. The message “Entity was successfully created” will appear.

Step 6 Repeat Steps 1 - 5 for all required plugs.

Step 7 Continue top-down to create the channels.

3.1.1.3 Creating a Channel

Step 1 Select the unassigned channel from the module submenu.

```
- Service Management
 - SHELF-1 SH7HU
   . SHELF-1 SH7HU
   . FCU-1 FCU7HU
   + MOD-1-1 PSU7HU-DC
   - MOD-1-2 4TCC10G-D
     . MOD-1-2 4TCC10G-D
     . PL-1-2-C1 SFP-C
     . CH-1-2-C1 STM16 [SGEO]   <-- select the channel
     . PL-1-2-C2 [UAS] [UEQ]
```

Step 2 Choose the facility type from the drop-down menu.

```
+-----------Create: CH-1-2-C1------------+
|                                        |
| Enter relevant values                  |
|                                        |
| Facility Type:         [STM-16]        |
| ALS Mode:              [NONE   ]       |
| Error Forwarding Mode: [AIS]           |
|                                        |
| [ Cancel  ] [ Refresh ] [  Next   ]    |
|                                        |
+----------------------------------------+
```

Refer to the *Entity Properties and Parameters* for more information on these parameters.

Step 3 Choose **[Next]** to continue through the required settings.

Step 4 Enter all parameters required for the facility.

```
+-----------------Create: CH-1-2-C1-----------------+
|                                                   |
| Enter relevant values                             |
|                                                   |
| Termination Level:    [Phys      ]                |
| MS SD Integr. Period: [7   ]                      |
| MS Signal Degrade:    [30  ]                      |
|                                                   |
| [ Cancel  ] [ Refresh ] [  Prev   ] [  Next   ]   |
|                                                   |
+---------------------------------------------------+
```

Select **[Next]** until all parameters have been entered. For channel modules that support trace, you will at this point be asked to enter trace messages.

```
+----------------------Create: CH-1-2-C1----------------------+
|                                                             |
| Select 'Traces' to edit traces or 'Next' to use defaults.   |
|                                                             |
|                                                             |
| [ Cancel  ] [ Refresh ] [  Prev   ] [  Next   ] [ Traces  ] |
|                                                             |
+-------------------------------------------------------------+
```

Select **[Traces]** to configure all trace settings, if applicable. Refer to the *Entity Properties and Parameters* for information on trace settings.

```
+---------------------- Create: CH-1-2-C1 - Traces ---------------------+
|                                                                        |
| Layer:        [SDH/SONET RS]                                           |
| Trace format: [16 Byte]                                                |
| TIM Mode:     [Disabled           ]                                    |
|                                                                        |
|  Trace:       [Expected (EXP)]                                         |
| (+) ASCII [ ] G.831                                                    |
| CRC7 [               ]                                                 |
|                                                                        |
|                                                                        |
| ( ) HEX                                                                |
| xx  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00                    |
|                                                                        |
|                                                                        |
| [  Back   ] [  Reset  ] [ Refresh ] [ Accept  ]                        |
+------------------------------------------------------------------------+
```

- To save trace settings, select **[Accept]**. To go back to the previous screen select **[Back]**.

Step 5

Choose **[Next]** to continue creating the channel. Enter all required parameters.

```
+-----------------Create: CH-1-2-C1-----------------+
|                                                   |
| Enter relevant values                             |
|                                                   |
| Admin State: [Automatic in Service]               |
|                                                   |
| [ Cancel  ] [ Refresh ] [  Prev   ] [  Apply  ]   |
|                                                   |
+---------------------------------------------------+
```

Step 6 Choose **[Apply]** to save the settings. The message “Entity was successfully created” will appear.

Step 7 Repeat Steps 1 - 5 for all required channels.

Configuring WCC-PC-10G-U Ports

There is a difference in the configuration of the ports for this type of module. When the client port is first configured and then the network port, the choices of configuration are different than if the network port is configured first.

3.1.1.4 Creating a Virtual Channel

Step 1 Select the unassigned virtual channel (VCH) from the module submenu.

```
- MOD-1-7 4TCC2G5
  . MOD-1-7 4TCC2G5
  . PL-1-7-C1
  . PL-1-7-C2 SFP-C
  . CH-1-7-C2 FC [SGEO]
  . PL-1-7-C3
  . PL-1-7-C4]
  . PL-1-7-NE SFP-D
  . CH-1-7-NE STM16 [SGEO]
  . SDCC-1-7-NE
  . LDCC-1-7-NE]
  . PL-1-7-NW SFP-D
  . CH-1-7-NW STM16 [SGEO]
  . VCH-1-7-2 [UAS]
+ MOD-1-10 4TCC10G-D [MEA]
```

Select the AID for the virtual channel to be created.

Step 2 Choose the facility type from the drop-down menu.

```
+----------Create: VCH-1-7-2-----------+
| Enter Relevant values                |
|                                      |
| Facility Type: [GFP Transparent]     |
|                                      |
| [ Cancel  ] [ Refresh ] [  Next   ]  |
+--------------------------------------+
```

From the drop-down list, select the appropriate facility type for the virtual channel.

Step 3 Choose **[Next]** to continue through the required settings.

Step 4 Enter all parameters required for the facility. Refer to the *Entity Properties and Parameters* for more information on these parameters.

Step 5 Choose **[Apply]** to save the settings. The message “Entity was successfully created” will appear.

3.1.2 Enabling Auto-Provisioning

A module is inserted (equipped) without being provisioned (unassigned); **auto-provisioning on**:

- Equipment (i.e. module, plugs) is assigned to the database with default configuration settings stored on the NCU
- Permanent provisioning data (e.g. channel number at fixed interfaces) is retrieved from the module and stored in the database
- Facility/service (e.g. CH) is assigned if there is only one supported
- Default configuration from database is passed down to the module
- Option: If more facilities/ services are supported they will need to be provisioned separately.

To set auto-provisioning:

Step 1 Select **System Management > System General Settings**

Step 2 Go to the **DB** index card

Step 3 To allow auto-provisioning of equipment, set Auto-Provisioning to Yes.

```
+--------------------- System General Settings ----------------------+
|| 1 NE | 2 DB | 3 SES Definitions | 4 Application Control |         |
|+------+      +-------------------------------------------------+|
|| Database Type:              NORM                                ||
|| Database Serial Number:     FA35061902389                       ||
||                                                                 ||
|| Auto-Provisioning:          [Yes]                               ||
|| Preferred Facility Type:    [SDH  ]                             ||
|| Force Delete:               [Enabled ]                          ||
|| AINS Enabled:               [Yes]                               ||
|| AINS Default Timer(hh-mm):  [08-00]                             ||
||                                                                 ||
|| [   OK    ] [ Cancel  ] [ Refresh ] [Severities...] [  Apply  ]  ||
|+-----------------------------------------------------------------+|
+-------------------------------------------------------------------+
```

3.1.3 Deleting Equipment from the Database

Deletion of the equipment from the NE database is done from the bottom up: Take all dependent facilities (e.g. ECC) out of service and afterwards delete them.

To delete a module:

First take all dependencies out of service.

Step 1 Choose the lowest level assigned dependent, for example, a facility from the module submenu.

```
- MOD-1-1 4TCC2G5
1 . MOD-1-1 4TCC2G5
2 . PL-1-1-C1 SFP-C
3 . CH-1-1-C1 1GBE
4 . PL-1-1-C2
5 . CH-1-1-C2
```

Step 2 The **State** index card for this facility will appear.

```
+--------------------------CH-1-12-N, OTU2---------------------------+
¦¦1 State¦2 Fault¦3 Config¦4 Operation ¦5 Info ¦6 PL Mont ¦7 DL Mont ¦ ¦
¦¦       +-----------------------------------------------------------+¦
¦¦                                                                    ¦¦
¦¦ Admin State:        [Maintenance       ]                          ¦¦
¦¦ Operational State:  INVALID                                       ¦¦
¦¦                                                                    ¦¦
¦¦  Secondary States:                                                 ¦¦
¦¦ +-------------------------+                                        ¦¦
¦¦ ¦                         ¦                                        ¦¦
¦¦ +-------------------------+                                        ¦¦
¦¦                                                                    ¦¦
¦¦ [ Cancel  ] [ Refresh ] [  Apply  ] [ Delete  ] [Dependencies...]  ¦¦
¦+-----------------------------------------------------------------+¦
+-------------------------------------------------------------------+
```

Step 3 Choose **[Delete]** from the command buttons. If there are no dependencies on this entity you will be able to delete it.

Step 4 To delete this dependent entity, press **[OK]** to confirm.

Step 5 Repeat this procedure for all dependent entities and then the module.

3.1.4 Forced Delete

The forced delete command is activated by default. It is possible to do a forced delete for the module and all of its dependent entities. This function can be enabled and disabled.

This action is not sensitive to the administrative state of the dependent entities. Only the administrative state of the module itself is relevant for the availability of this feature. To disable this, see Section 3.1.4.2.

3.1.4.1 Applying Forced Delete

To use the forced delete function, carry out the following steps:

Step 1 Select the module to be deleted from the **Service Management** menu. This will open the **State** index card for that module.

Step 2 Choose **[Dependencies...]** from the command buttons.

```
+----------------------MOD-1-12, 4TCC-PC-2G7+10G-x-#D-----------------------+
¦¦ 1 State ¦ 2 Fault ¦ 3 Config ¦ 4 Info ¦ 5 Monitoring ¦ 6 Inventory ¦       ¦
¦¦         +-------------------------------------------------------------+¦
¦¦                                                                         ¦¦
¦¦ List of Dependent Entities for MOD-1-12.                               ¦¦
¦¦  AID       Admin State                                                  ¦¦
¦¦ +--------------------+                                                  ¦¦
¦¦ ¦CH-1-12-N Maintenance¦                                                  ¦¦
¦¦ ¦                    ¦                                                  ¦¦
¦¦ +--------------------+                                                  ¦¦
¦¦                                                                         ¦¦
¦¦ If you want to delete Module in MOD-1-12 and all the dependent          ¦¦
¦¦ entities regardless of their Admin states push "Frcd Delete" button.    ¦¦
¦¦                                                                         ¦¦
¦¦ [   OK    ] [Frcd Delete]                                               ¦¦
¦+-------------------------------------------------------------------------+¦
+---------------------------------------------------------------------------+
```

Step 3 To delete the module and all of its dependent entities, select **[Frcd Delete]**.

Step 4 To exit this menu without deleting, choose **[OK]**.

If the module has been deleted from the database and not physically removed it will be displayed as unassigned (UAS)

Step 5 After selecting **[Frcd Delete]** there will be a message again to confirm that you do wish to delete the module and all of its dependencies. Press **[OK]** to confirm.

The follow message with be displayed:

```
+------------------------------------------------+
| The entity in MOD-1-11 was successfully deleted. |
|                                                |
|                  [   OK    ]                   |
+------------------------------------------------+
```

3.1.4.2 Disabling Forced Delete

If the deletion shortcut is unwanted, this feature can be deactivated for the common user.

Step 1 Select S**ystem Management** from the main menu.

Step 2 Go to **System General Settings**.

Step 3 Select the second index card **DB**.

```
+--------------------- System General Settings ----------------------+
|| 1 NE | 2 DB | 3 SES Definitions | 4 Application Control |         |
|+------+      +-------------------------------------------------+|
|| Database Type:              NORM                                ||
|| Database Serial Number:     FA35061902389                       ||
||                                                                 ||
|| Auto-Provisioning:          [Yes]                               ||
|| Preferred Facility Type:    [SDH  ]                             ||
|| Force Delete:               [Disabled ]                         ||
|| AINS Enabled:               [Yes]                               ||
|| AINS Default Timer(hh-mm):  [08-00]                             ||
||                                                                 ||
||                                                                 ||
||                                                                 ||
||                                                                 ||
|| [   OK    ] [ Cancel  ] [ Refresh ] [Severities...] [  Apply  ]  ||
|+-----------------------------------------------------------------+|
+-------------------------------------------------------------------+
```

Step 4 To disable the Forced Delete feature, navigate to the drop-down list to “Force Delete”.

Step 5 Use the cursor to highlight “Disable” and **<Return>**. When this is set to “Disable” the user cannot carry out the Forced Delete command.

Step 6 Select **[Apply]** to save this setting or **[Cancel]** to abort and return to the main menu.

3.2 Configuring Administrative States

This section describes how to obtain and configure information about the administrative status of all equipment.

Step 1 From the Craft Console main menu, expand the item **Service Management** by pressing the right arrow or **<Return>**. In the Web Console, click on this menu item.

3.2.1 Configure the Shelf Administrative State

From the **Service Management** submenu select the shelf to be configured. This will open a shelf submenu.

It is only possible to change the administrative state of the shelf when all dependencies are not in service.

Step 2 By selecting the shelf from the submenu, you can view the first index card **State**. The administrative state is illustrated here.

```
+------------------------------SHELF-1, SH7HU--------------------------------+
|| 1 State | 2 Fault | 3 Config | 4 Info | 5 Monitoring | 6 Inventory |       |
||         +-------------------------------------------------------------------+|
|| Admin State:        [In Service]                                           ||
|| Operational State:  Normal                                                 ||
||                                                                            ||
||  Secondary States:                                                         ||
|| +--------------------------+                                              ||
|| |                          |                                              ||
|| |                          |                                              ||
|| +--------------------------+                                              ||
||                                                                            ||
||                                                                            ||
|| [ Cancel  ] [ Refresh ] [  Apply  ] [ Delete  ] [Dependencies...]          ||
|+----------------------------------------------------------------------------+|
+------------------------------------------------------------------------------+
```

Step 3 Tab to the Admin State drop-down menu in brackets and **<Return>**. In the Web Console just click on this field to open the menu. This will open the drop-down list. See *Table 3-2, p. 3-13* for an explanation of administrative states.

Step 4 Scroll through the list and press **<Return>** to select the desired administrative state.

Step 5 Press **[Apply]** to save or **[Cancel]** to abort any settings and return to the shelf submenu.

3.2.2 Configure the Module Administrative State

Step 1 From the **Service Management** menu, select the module from the respective shelf.

```
+ Service Overview
- Service Management
  - SHELF-1 SH7HU
    . SHELF-1 SH7HU
    . FCU-1 FCU7HU
    + MOD-1-1 PSU7HU-DC
    - MOD-1-2 4TCC10G-D
      . MOD-1-2 4TCC10G-D
      . PL-1-2-C1 SFP-C
      . CH-1-2-C1 STM16 [SGEO]
```

Step 2 From the module submenu, select the module to view the first index card **State**. The administrative state is displayed on this index card.

```
+-----------------------MOD-1-8, 4TCC-PC-2G7+10G-x-#D-----------------------+
¦¦ 1 State ¦ 2 Fault ¦ 3 Config ¦ 4 Info ¦ 5 Monitoring ¦ 6 Inventory ¦       ¦
¦¦         +-------------------------------------------------------------+¦
¦¦                                                                        ¦¦
¦¦ Admin State:        [In Service]                                       ¦¦
¦¦ Operational State:  Normal                                             ¦¦
¦¦                                                                        ¦¦
¦¦  Secondary States:                                                     ¦¦
¦¦ +--------------------------+                                           ¦¦
¦¦ ¦                          ¦                                           ¦¦
¦¦ ¦                          ¦                                           ¦¦
¦¦ +--------------------------+                                           ¦¦
¦¦                                                                        ¦¦
¦¦ [ Cancel  ] [ Refresh ] [  Apply  ] [ Delete  ] [Dependencies...]      ¦¦
¦+------------------------------------------------------------------------+¦
+--------------------------------------------------------------------------+
```

Step 3 Tab to the Admin State field in brackets and press **<Return>**. In the Web Console just click on this field to open the menu. This will open the drop-down list. See *Table 3-2, p. 3-13* for an explanation of these states.

Step 4 Scroll through the list and press **<Return>** to select the desired administrative state.

Step 5 Press **[Apply]** to save or **[Cancel]** to abort any settings and return to the shelf submenu.

Table 3-2: Administrative States

Admin State Name	Behavior	Abbreviation
In Service; alarms are reported	in service	IS
Automatic In Service; alarms are not reported but service-affecting operations cannot be performed	out of service	AINS
Management; alarms are not reported, service affecting operations are allowed	out of service	MGT

Table 3-2: Administrative States

Admin State Name	Behavior	Abbreviation
Maintenance; alarms are not reported, service affecting operations are allowed	out of service	MT
Disabled; alarms are suppressed, service affecting operations are allowed	out of service	DSBLD

*This is an editable parameter and can be changed at any time. This must be changed to anything other than **Automatic In Service** or **In Service** if the entity is to be configured or removed from the NE.*

3.2.3 Configure the Plug Administrative State

To configure the administrative state for the plug (transceiver), follow the same instructions as for configuring the module.

Step 1 From the submenu of the module select the respective plug to be configured. The index card for this entity will correspond to the module and shelf **State** index cards.

Step 1 Follow Step 3 - Step 5 as shown in Section *3.2.2*.

3.2.4 Configure the Channel Administrative State

To configure the administrative state for the channel, follow the same instructions as for configuring the module.

Step 1 From the submenu of the module select the respective channel to be configured. The index card for this entity will correspond to the module and shelf State index cards.

Step 2 Follow Step 3 - Step 5 as shown in Section *3.2.2*.

3.3 Configuring DCN Related Settings

3.3.1 Configure Serial Port Settings

Set the serial line to communicate with the NE.

Step 1 From the Craft Console main menu, navigate to **Service Management** and press **<Return>**.

Step 2 Select `Shelf 1 SH7HU` and then `Mod-1-A-NCU` and press **<Return>**.

```
- FSP 3000R7 Rel.7.1
  + Service Overview
  - Service Management
    - SHELF-1 SH7HU
      . SHELF-1 SH7HU
      . FCU-1 FCU7HU
      + MOD-1-1 2ABSM-C [UEQ]
      + MOD-1-2 4TCC2G5 [UEQ]
      + MOD-1-3 4TCC2G5 [UEQ]
      + MOD-1-4 2OSCM [UEQ]
      + MOD-1-5 4TCC2G5 [UEQ]
      + MOD-1-6 VSM [UEQ]
      + MOD-1-17 2OSCM [UEQ]
      + MOD-1-A NCU
      + MOD-1-B SCU
```

Step 3 Select `LINK-1-A-SER [UAS]` from the submenu.

```
- MOD-1-A NCU
  . MOD-1-A NCU
  . LINK-1-A-SER SERIAL [UAS]
  . SC-1-A-C LANIP
  . LINK-1-A-1 [UAS]
  . LINK-1-A-2 [UAS]
  . LINK-1-A-3 [UAS]
```

For an already existing serial port, the Admin State must be changed to Maintenance to be able to make the port settings.

Make the required settings. The usual settings are suggested here:

Facility Type Choose **Serial** from the drop-down list for the required facility type.

Baud The recommended setting is 19200. Possible settings for this are:

- 2400
- 4800
- 9600
- 19200
- 38400 and
- 57600
- 115200

Flow Control No flow control is the default. Possible settings for this are:

- None
- Hardware Control
- Pause

Admin State Automatic in Service is the default. Possible settings for this are:

- In Service
- Automatic in Service
- Management
- Maintenance
- Disabled

Step 4 Select **[Apply]** to confirm the configuration. A message will appear that you successfully created the serial port.

3.3.2 Configure Ethernet Address for Ethernet Port

This describes how to make IP settings for the NCU Ethernet port:

Step 1 From the Craft Console main menu, navigate to **Service Management** and press **<Return>**.

Step 2 Select `Shelf 1 SH7HU` and then `Mod-1-A-NCU` and press **<Return>**.

Step 3 Select the entity from the submenu.

```
- MOD-1-A NCU
         . MOD-1-A NCU
         . LINK-1-A-SER SERIAL
         . SC-1-A-C LANIP
         . LINK-1-A-1 [UAS]
         . LINK-1-A-2 [UAS]
```

Consult the DCN plan for the information required. In a typical configuration, all NCUs should have the same IP netmask and gateway.

Step 4 Select the **Config** tab.

```
+------------------------------SC-1-A-C, LANIP-------------------------------+
|| 1 State | 2 Fault | 3 Config | 4 Info |                                    |
|+-------------------+          +-----------------------------------------+|
|| Facility Type:         LANIP                                            ||
|| Monitored Bitrate:     2                                                ||
|| Monitored Duplex Mode: FULL                                             ||
|| Alias:                 [                                    ]           ||
|| IP Address:            [172. 18. 70. 14 ]                               ||
|| IP Mask:               [255.255.  0.  0 ]                               ||
|| OSPF Routing:          [Disabled]                                       ||
|| Routing Metric:        [100   ]                                         ||
|| Auto-Negotiation:      [Enabled ]                                       ||
|| AREA ID:               [  0.  0.  0.  0 ]                               ||
|| DHCP Start Address:    [  0.  0.  0.  0 ]                               ||
|| DHCP Stop Address:     [  0.  0.  0.  0 ]                               ||
|| DHCP Local Interface:  [DHCP on eth port 2    ]                         ||
||                                                                         ||
||                                                                         ||
|| [ Cancel  ] [ Refresh ] [  Apply  ]                                     ||
|+-------------------------------------------------------------------------+|
+---------------------------------------------------------------------------+
```

Facility Type This shows how the port was provisioned upon creation.

IP Address Enter this address according to the DCN plan.

IP Mask Enter this address according to the DCN plan.

OSPF Routing Set to enable if the DCN plan shows that OSPF shall be used for this IP connection.

Routing Metric You must enter this value.

Area ID If the DCN plan specifies that OSPF shall be used for this interface, enter an area ID.

DHCP If the DCN plan specifies that DHCP shall be used for this interface, enter the relevant information.

Refer to the *Entity Properties and Parameters* for information on all parameter settings.

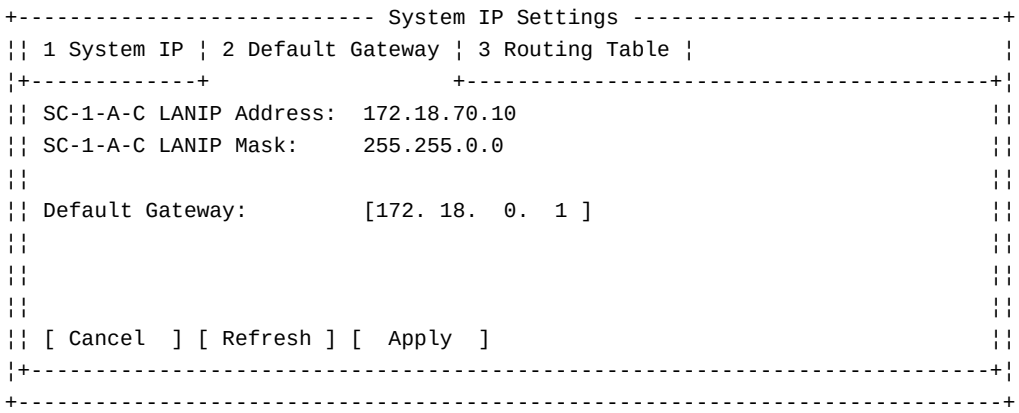
Step 5 Press **[Apply]**. You will be asked to reboot the system. Press **[OK]** for changes to take effect.

3.3.3 Configure Default Gateway for Ethernet Port

This step is unnecessary in a fully OSPF enabled network, but is necessary as an intermediate step. It may be useful as a backup in case OSPF fails.

Requirement Connect using either the serial line or direct Ethernet. The IP host needs to be in the same subnet.

Step 1 Select **System Management > System IP Settings > Default Gateway** to configure the default gateway using the Craft or Web Console.



Step 2 Enter the IP address of the default gateway.

The default gateway of an IP host must always be directly reachable over one of its IP interfaces. The default gateway must be in the same IP subnet as the Ethernet interface. Otherwise the configuration attempt will be rejected by the system.

Note: This rejection is done at the lower system levels and is not shown by the Craft Console. In such a case of erroneous default gateway configuration, the Craft Console will just reboot, and no default gateway entry will be added to the routing table.

```
+--------------------------- System IP Settings ----------------------------+
¦¦ 1 System IP ¦ 2 Default Gateway ¦ 3 Routing Table ¦                       ¦
¦+-------------------------------+                 +----------------------+¦
¦¦ Select item to delete entry.                                            ¦¦
¦¦                                                                         ¦¦
¦¦  Destination Gateway      Mask        Flag Metric Device                ¦¦
¦¦ +-----------------------------------------------------------------------+ ¦¦
¦¦ ¦172.18.0.0  172.18.70.10 255.255.0.0 UG   0      SC-1-A-C             ¦ ¦¦
¦¦ ¦172.18.0.0  *            255.255.0.0 U    0      SC-1-A-C             ¦ ¦¦
¦¦ ¦default     172.18.0.1   0.0.0.0     UG   0      SC-1-A-C             ¦ ¦¦
¦¦ ¦                                                                       ¦ ¦¦
¦¦ +-----------------------------------------------------------------------+ ¦¦
¦¦                                                                         ¦¦
¦¦ [ Cancel  ] [ Refresh ] [   Add   ]                                     ¦¦
¦+-------------------------------------------------------------------------+¦
+---------------------------------------------------------------------------+
```

3.3.4 Configure OSPF for Ethernet

OSPF is a dynamic routing protocol: each router keeps track of the neighboring routers, exchanges the IP networks and hosts that are reachable through each router, calculates the shortest path to all the reachable IP destinations, and adds routes in its routing table accordingly.

For OSPF to work, all IP addresses in the DCN must be unique, the system IP address, the Ethernet interface IP address and all PPP IP interfaces.

It is important to note that:

- OSPF is enabled per router interface
- only for networks that are communicated by OSPF enabled routers, routes may be added in the routing table. Any IP subnet that is not attached to an OSPF enabled interface of a router, will not be reachable as such. Hence the need for a (manually added) default gateway entry in the routing table may still exist.

Step 1 Go to **System Management > System IP Settings > 1 System IP**:

System IP: this will set the OSPF Router ID

Please note: the System IP will only take effect as OSPF Router ID after the NE has been rebooted.

Please note: Please reboot manually for the System IP to take effect as OSPF Router ID.

```
+--------------------------- System IP Settings ----------------------------+
¦¦ 1 System IP ¦ 2 Default Gateway ¦ 3 Routing Table ¦                       ¦
¦¦             +-------------------------------------------------------------+¦
¦¦                                                                           ¦¦
¦¦ IP Address:  [192.168.  1.  1 ]                                          ¦¦
¦¦ IP Mask:     [255.255.255.  0 ]                                          ¦¦
¦¦                                                                          ¦¦
¦¦                                                                          ¦¦
¦¦ [ Cancel  ] [ Refresh ] [  Apply  ]                                      ¦¦
¦+---------------------------------------------------------------------------+¦
+-----------------------------------------------------------------------------+
```

It is important to note that the Router ID needs to be set to a different ID for each router. Routers that have the same Router ID will ignore each other's Hello packets, and therefore will not form adjacencies, and therefore will not exchange routes. Moreover, having multiple routers with the same Router ID may cause difficulties as the OSPF routing information may not converge.

In the case that OSPF is enabled on SC-1-A-C, the LANIP address should be different from the Router ID. In general: all IP interfaces on which OSPF is enabled should have a different IP address.

3.3.4.1 Ethernet IP Interfaces

There are three OSPF configurable parameters at the LANIP level:

- OSPF routing: this will enable/disable OSPF on the IP interface
- Routing Metric: this is a weight for the OSPF interface in the OSPF calculation (the higher this number, the more expensive a route becomes when using this link). Changing the routing metric will be taken into account immediately.
- AREA ID: this reduces the resources needed for the OSPF calculation by segmenting the routing domain into areas where routing information is exchanged (routing information exchange between areas is limited).

Changing the AREA ID is only possible (the change will only be accepted and saved) if OSPF Routing is set to DISABLE.

To change the AREA ID, do as follows:

Step 1 Disable OSPF Routing.

Step 2 Select **[Apply]**.

Step 3 Change the AREA ID.

Step 4 Select **[Apply]**.

Step 5 Now you must set OSPF Routing to **Enable** again.

Step 6 Select **[Apply]**

```
+------------------------------SC-1-A-C, LANIP-------------------------------+
¦¦ 1 State ¦ 2 Fault ¦ 3 Config ¦ 4 Info ¦                                     ¦
¦+-----------------------------+        +-----------------------------------+¦
¦¦ Facility Type:        LANIP                                               ¦¦
¦¦ Alias:                [                      ]                           ¦¦
¦¦ IP Address:           [172. 16. 70.181  ]                                 ¦¦
¦¦ IP Mask:              [255.255.255.  0  ]                                 ¦¦
¦¦ OSPF Routing:         [ENABLE  ]                                          ¦¦
¦¦ Routing Metric:       [100                   ]                            ¦¦
¦¦ Datarate:             [100 Mbit/s ]                                       ¦¦
¦¦ Autonegotiation:      [Enabled ]                                          ¦¦
¦¦ Duplex Mode:          [FULL]                                              ¦¦
¦¦ AREA ID:              [  1.  1.  1.  1  ]                                 ¦¦
¦¦                                                                           ¦¦
¦¦                                                                           ¦¦
¦¦ [ Cancel  ] [ Refresh ] [  Apply  ]                                       ¦¦
¦+-----------------------------------------------------------------------------+¦
+-------------------------------------------------------------------------------+
```

3.3.4.2 PPP IP Interfaces

The same three OSPF configurable parameters exist on the PPPIP level as on the LANIP level, and with the same remarks. The OSPF parameters are offered for configuration at PPPIP creation time, but may be re-configured later.

```
+----------------------------LINK-1-A-1, PPPIP--------------------------------+
¦¦ 1 State ¦ 2 Fault ¦ 3 Config ¦ 4 Info ¦                                     ¦
¦+-----------------------------+        +-----------------------------------+¦
¦¦ Facility Type:          PPPIP                                             ¦¦
¦¦ IP Address:             10.216.78.181                                     ¦¦
¦¦ Far End IP Address:     0.0.0.0                                           ¦¦
¦¦ Use As Default Gateway: N                                                 ¦¦
¦¦ Enable Proxy ARP:       N                                                 ¦¦
¦¦ Alias:                  [                       ]                         ¦¦
¦¦ OSPF Routing:           [ENABLE  ]                                        ¦¦
¦¦ Routing Metric:         [100                    ]                         ¦¦
¦¦ Max Tx Rate:            [100                    ]                         ¦¦
¦¦ AREA ID:                [  1.  1.  1.  1  ]                               ¦¦
¦¦                                                                           ¦¦
¦¦ ECC AID: [LDCC-1-15--NE]                                                  ¦¦
¦¦                                                                           ¦¦
¦¦                                                                           ¦¦
¦¦ [ Cancel  ] [ Refresh ] [  Apply  ]                                       ¦¦
¦+-----------------------------------------------------------------------------+¦
+-------------------------------------------------------------------------------+
```

All IP interfaces on which OSPF is enabled must have a different IP address in order for OSPF to work.

3.4 Configuring SNMP

When the network element is commissioned for SNMP, a network management system (NMS) can handle log events (i.e. specified changes in the NE, also referred to as traps) and is able to monitor the state of the system. In order to do this, the NMS is supplied with FSP structural information in an MIB. The MIB describes the logical structure of the FSP and the events and states that are to be supported. In order to use the functionality provided by SNMP, the NE must first be commissioned to do so. For example, at least one trap recipient must be defined before SNMP traps can be sent across the management network. The SNMP agent of the FSP supports SNMPv1 and SNMPv3. SNMPv3 provides the most secure access features to the management system.

The following sections are described:

General SNMP Configuration

Adding or Deleting a Community

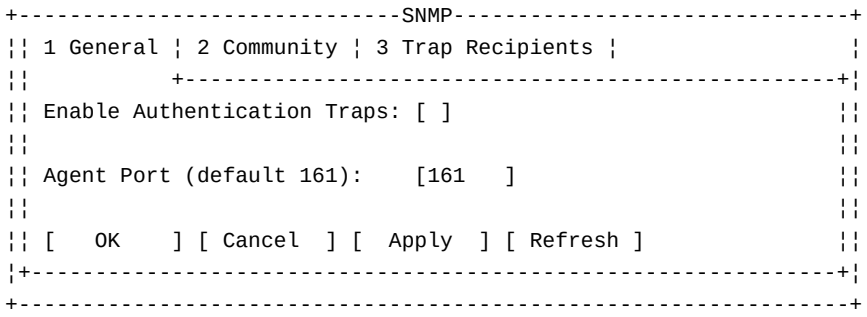
Configuring Trap Recipients

Disabling SNMP Access to the Interface

3.4.1 General SNMP Configuration

Step 1 From the Craft Console main menu, expand **System Management** by pressing the right arrow or **<Return>**. In the Web Console, click on this menu item.

Step 2 Select **SNMP Configuration** from the **System Management** menu.

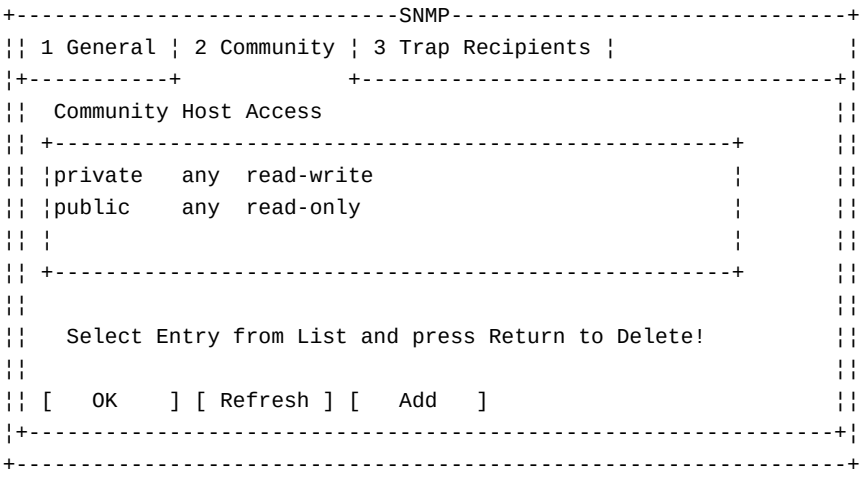


Enable Authentication Traps Standard authentication failure traps are sent if the wrong community is used in SNMP requests. This trap can be switched on and off. Enable these by selecting the check box. An “x” will appear in the check box when enabled. Note that a specific ADVA trap is always sent.

Agent Port Choose the port to which traps will be sent. The default port is 161.

Step 3 Choose **[Apply]** to confirm your configurations and remain within the General SNMP configuration. Press **[OK]** to confirm your settings or **[Cancel]** to abort them and then automatically return to the main menu.

Step 4 To view community settings, navigate to the index card heading **Community**. In the Web Console, click on this menu item.

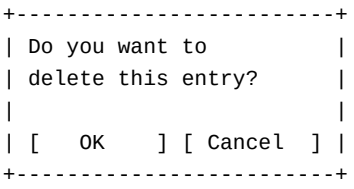


Community Host Access

The list of case-sensitive names defines read-write or read-only communities, which has to be used for accessing the NE via SNMP.

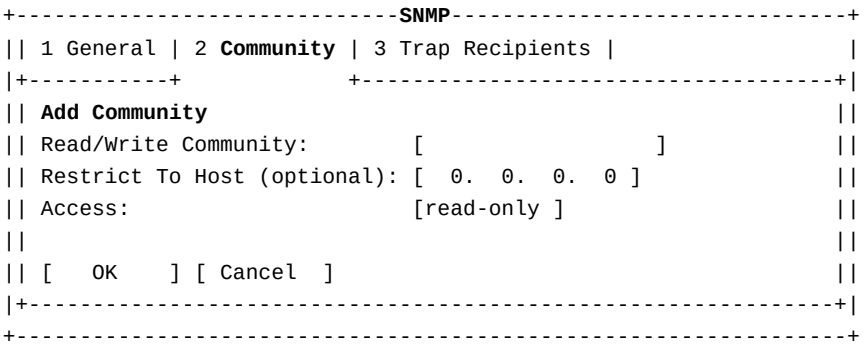
3.4.2 Adding or Deleting a Community

Step 1 To delete a community, use the cursor keys to move to the list of designated communities in the index card **Community.** You will be asked if you really want to delete this setting.



Choose **[OK]** to confirm or **[Cancel]** to abort and press **<Return>**.

Step 2 To add a new community to the SNMP configuration choose **Add** from the list of commands. The following card will allow you to enter the name of the new community and decide on the access (read-only or read-write) from the drop-down list.



Step 3 Choose **[OK]** to confirm settings.

SNMP messages are authenticated by using community strings. The community string functions as a password and every message (e.g. Get, Set, Trap) from an NMS to an SNMP agent includes the community string. A message is assumed to be authentic if the community string is correct.

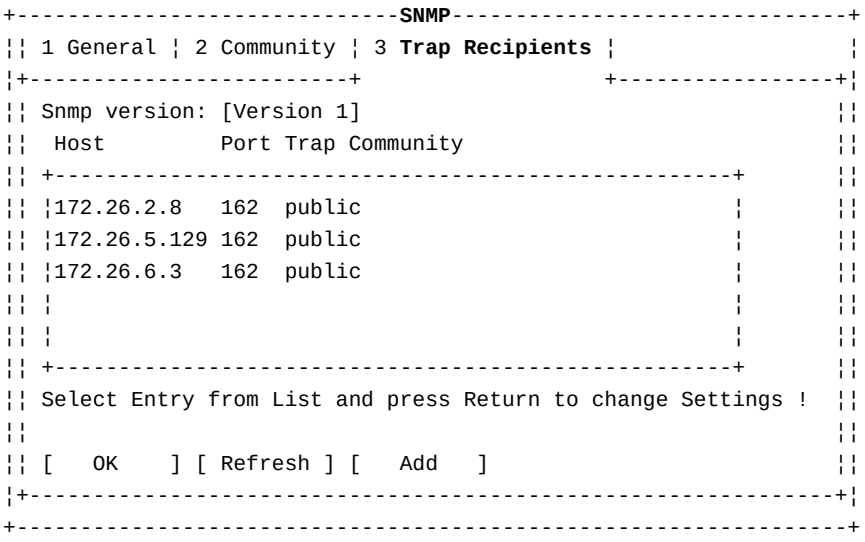
Access read-only Community string for Get requests.

Access read-write Community string for Set and Get requests.

Restrict to Host Community can be restricted to one IP address only. Enter the IP address here and press **<Return>** to confirm.

3.4.3 Configuring Trap Recipients

Step 1 To configure trap recipients first navigate to the index card **Trap Recipients** or choose the numerical hotkey "3". In the Web Console, click on this menu item. The following allows you to view the list of all management stations that are to receive traps from this NE.



SNMP Version You can choose between Version 1 and Version 3 from the drop-down menu. The difference between the two protocols is the type of authentication used.

- Version 1 uses community strings to match for authentication
- Version 3 uses a user name match for authentication. This version will display user and security level information in the main trap recipient window.

3.4.4 Disabling SNMP Access to the Interface

It is possible to disable SNMP access to the interface.

Step 1 To view external access settings, navigate to the **System Management** menu.

Step 2 Select System General settings.

Step 3 Go to the index card **Application Control**.

```
+------------------- System General Settings -------------------+
¦¦ 1 NE ¦ 2 DB ¦ 3 SES Definitions ¦ 4 Application Control ¦    ¦
¦+-------------------------------+                        +---+¦
¦¦ WEB Server:  [Enable ]                                     ¦¦
¦¦                                                            ¦¦
¦¦ SNMP Agent:  [Enable ]                                     ¦¦
¦¦                                                            ¦¦
¦¦ TL1 Server:  [Disable]                                     ¦¦
¦¦                                                            ¦¦
¦¦ [   OK    ] [ Cancel  ] [ Refresh ] [  Apply  ]            ¦¦
¦+------------------------------------------------------------+¦
+--------------------------------------------------------------+
```

Step 4 Tab to the SNMP Agent and **<Return>** to select Enable or Disable. For access via SNMP ensure that this setting is “Enable”.

Step 5 Save settings with **[Apply]** and remain in this window. Select **[OK]** to save settings or **[Cancel]** to not save changes and exit to the main menu.

3.5 Configuring Date and Time

It is common practice in enterprise networks to synchronize system clocks via the network time protocol (NTP). For the FSP 3000R7 to operate more effectively the correct date, time and time zone should be set on each NE. All of these settings are available from the main menu and via the Web Interface.

Step 1 From the Craft Console main menu, expand **System Management** by pressing the right arrow, or **<Return>**. In the Web Console, click on this menu item.

```
- System Management
1 . System General Settings
2 . System Date&Time
3 . System IP Settings
4 . SNMP Configuration
5 . Software & Database Control
```

Step 2 Select the item **System Date&Time**.

```
+---------------------------- Date & Time ----------------------------+
¦ Date (dd/mm/yyyy)                                                   ¦
¦ [23/05/2006 ]                                                       ¦
¦                                                                     ¦
¦ Time (hh:mm:ss on a 24h clock)                                      ¦
¦ [11:29:37 ]                                                         ¦
¦                                                                     ¦
¦ Time Zone                                                           ¦
¦ [MET         ]                                                      ¦
¦                                                                     ¦
¦ NTP Servers (optional) [  0.  0.  0.  0 ]                           ¦
¦                        [  0.  0.  0.  0 ]                           ¦
¦                        [  0.  0.  0.  0 ]                           ¦
¦                                                                     ¦
¦ [   OK    ] [ Cancel  ] [  Apply  ] [ Refresh ] [Check NTP Server(s)]¦
+-----------------------------------------------------------------------+
```

Step 3 There are two possibilities for setting the time:

- Enter the correct date and time in the formats shown, or
- Enter the IP address of the time server(s) to be used for synchronization in the “NTP Server” field. When adding more than one server the connection will try to be established in that order.

The NTP protocol cannot be activated through the TL1 interface.

Step 4 It is possible to check for servers by selecting the command button Check NTP Server(s). The following screen appears after selecting this:

```
+----------------------------+
| This will take few seconds. |
| Do you want this?          |
|                            |
|   [   OK    ] [ Cancel  ]  |
+----------------------------+
```

Choose **[OK]** to continue.

Step 5 Now select the time zone by moving the cursor to the drop-down list and pressing **<Return>** or just click on Time Zone for the Web Console.

Step 6 Scroll to the required time zone and press **<Return>**.

New daylight savings time rules have already been implemented.

Step 7 Select **[OK]** to apply your changes or **[Cancel]** to abort them. You will be returned to the console main menu.

Step 8 You will need to reboot the NCU to synchronize the system clock. To reboot go to the **Craft Main Menu** and select **Reboot NCU**.

Step 9 Confirm the reboot question with **[OK]**.

3.6 Configuring Protection

For configuring protection you have to login at least with user rights for “Provision”.

3.6.1 Configuring Optical Switch Protection (VSM Protection)

To use the optical switch protection provided by the VSM module, you must create the OM facilities.

Step 1 To create the facilities required, select the VSM module from the management menu.

Step 2 Create two identical network side facilities by selecting the corresponding AIDs from the VSM submenu.

```
- FSP 3000R7 Rel.7.1.0X_2007_03_13_1152
  + Service Overview
  - Service Management
    - SHELF-1 SH7HU
      . SHELF-1 SH7HU
      . FCU-1 FCU7HU
      + MOD-1-1 PSU7HU-AC
      + MOD-1-3 EDFA-DGC
      + MOD-1-5 [UAS]
      + MOD-1-6 EDFA-SGC
      + MOD-1-7 EDFA-DGC
      + MOD-1-8 WCC10G-D
      + MOD-1-9 4TCC2G5
      + MOD-1-10 WCC2G7-D
      + MOD-1-11 4CSM-D
      + MOD-1-12 4GSM-D
      + MOD-1-13 [UAS]
      - MOD-1-17 VSM
      1 . MOD-1-17 VSM
      2 . OM-1-17-NE [UAS]
      3 . OM-1-17-NW [UAS]
      + MOD-1-18 2OSCM
      + MOD-1-19 PSU7HU-AC
      + MOD-1-A NCU
```

The facility type is **Switch**.

```
+-----------Create: OM-1-17-NE-----------+
¦ Enter relevant values                  ¦
¦                                        ¦
¦ Facility Type: SWITCH                  ¦
¦ Admin State:   [Management          ]  ¦
¦                                        ¦
¦ [ Cancel  ] [ Refresh ] [  Apply  ]    ¦
+------------------------------------------+
```

Step 3 Choose **[Apply]** to create each facility. Apply for each facility.

```
 +---------------------------------+
 ¦ Entity was successfully created. ¦
 ¦                                  ¦
 ¦           [   OK    ]            ¦
 +---------------------------------+
```

Step 4 From the VSM submenu, select the facility to be the Working AID.

```
+----------------------------OM-1-17-NW, SWITCH-----------------------------+
¦¦ 1 State ¦ 2 Fault ¦ 3 Config ¦ 4 Info ¦ 5 PL Mont ¦                       ¦
¦+-------------------+          +-----------------------------------------+¦
¦¦ Facility Type:   SWITCH                                                 ¦¦
¦¦ Protection Role: NA                                                     ¦¦
¦¦ Alias:           [                                    ]                 ¦¦
¦¦                                                                         ¦¦
¦¦ [ Cancel  ] [ Refresh ] [  Apply  ] [Protection...]                     ¦¦
¦+-------------------------------------------------------------------------+¦
+---------------------------------------------------------------------------+
```

Step 5 Choose **[Protection...]**

```
+----------------------------OM-1-17-NW, SWITCH-----------------------------+
¦¦ 1 State ¦ 2 Fault ¦ 3 Config ¦ 4 Info ¦ 5 PL Mont ¦                       ¦
¦+------------------+          +-----------------------------------------+¦
¦¦ Create Network Port Protection FFP_OM-1-17-NW:                          ¦¦
¦¦                                                                        ¦¦
¦¦ Working AID:              OM-1-17-NW                                   ¦¦
¦¦ Protection AID:           OM-1-17-NE                                   ¦¦
¦¦ Protection Mechanism:     Versatile Protection                         ¦¦
¦¦ Far End IP Address:       [  0.  0.  0.  0 ]                           ¦¦
¦¦ Signal Degrade Switching: [Disabled]                                   ¦¦
¦¦ PEER-AID:                 MOD-1-18                                     ¦¦
¦¦                                                                        ¦¦
¦¦                                                                        ¦¦
¦¦ [ Cancel  ] [ Refresh ] [ Create  ]                                    ¦¦
¦+------------------------------------------------------------------------+¦
+--------------------------------------------------------------------------+
```

Step 6 Now you can see the AID of the working AID and the AID of the protection AID. Versatile protection is set. Furthermore, the following values are settable:

Far End IP Address Enter the system IP address. You can look up the system IP address in **System Management > System IP Settings**.

Signal Degrade Switching This is shown when Maintenance Switching is set to LINE/MSPor SNC_N_PM. You can enable the Signal Degrade Switching. By default it is disabled.

Step 7 Select **[Create]**.

Now you will get the message that your setting is carried out.

```
+----------------------------------+
¦ Entity was successfully created. ¦
¦                                  ¦
¦          [   OK    ]             ¦
+----------------------------------+
```

Step 8 Now the facilities can be viewed. Select the **Config** index card of the facility and select **[Protection]** to view the parameter settings.

```
+----------------------------OM-1-16-NE, SWITCH-----------------------------+
¦¦ 1 State ¦ 2 Fault ¦ 3 Config ¦ 4 Operation ¦ 5 Info ¦ 6 PL Mont ¦         ¦
¦+------------------+          +-----------------------------------------+¦
¦¦ Facility Type:   SWITCH                                                ¦¦
¦¦ Protection Role: WKG                                                   ¦¦
¦¦ Alias:           [                                      ]              ¦¦
¦¦                                                                        ¦¦
¦¦ [ Cancel  ] [ Refresh ] [  Apply  ] [Protection...]                    ¦¦
¦+------------------------------------------------------------------------+¦
+--------------------------------------------------------------------------+
```

```
+----------------------------OM-1-16-NE, SWITCH-------------------------------+
¦¦ 1 State ¦ 2 Fault ¦ 3 Config ¦ 4 Operation ¦ 5 Info ¦ 6 PL Mont ¦          ¦
¦+------------------+          +-----------------------------------------+¦
¦¦ Parameters of Network Port Protection FFP_OM-1-16-NE:                    ¦¦
¦¦                                                                         ¦¦
¦¦ Protection Group Type:    Dedicated Prot Ring                           ¦¦
¦¦ Protection Mechanism:     Versatile Protection                          ¦¦
¦¦ Directionality:           BI                                            ¦¦
¦¦ Revertive:                N                                             ¦¦
¦¦ Signal Failure Switching: Enabled                                       ¦¦
¦¦ Working AID:              OM-1-16-NE                                    ¦¦
¦¦ Protection AID:           OM-1-16-NW                                    ¦¦
¦¦ Far End IP Address:       [172. 18. 71. 19 ]                            ¦¦
¦¦ Signal Degrade Switching: [Disabled]                                    ¦¦
¦¦ PEER-AID:                 MOD-1-17                                      ¦¦
¦¦                                                                         ¦¦
¦¦ To delete network port protection, select 'Delete'.                     ¦¦
¦¦                                                                         ¦¦
¦¦ [ Cancel  ] [ Refresh ] [  Apply  ] [ Delete  ]                         ¦¦
¦+-------------------------------------------------------------------------+¦
+---------------------------------------------------------------------------+
```

If you want to delete your setting, first you have to set the admin state of the entity to "Management" or "Maintenance".

Step 9 Select **Service Overview** from the main menu to see the protection tables (for an explanation of the headings in this table see *Section 3.6.2 "Viewing Protection Settings", p. 3-36*).

```
- Service Overview
  . Fault Management Table
  . Inventory Table
  - Protection Groups
  1 . Channel Protection Table
  2 . Channel Group Protection
  + Data Communication Network
  . Physical Connections Table
```

```
+---------------------- Channel Group Protection -----------------------+
¦                                                                       ¦
¦  Working        Protection Far End IP   OSCM                         ¦
¦ +-----------------------------------------------------------+        ¦
¦ ¦OM-1-16-NE ACT OM-1-16-NW 172.18.71.19 MOD-1-17           ¦        ¦
¦ ¦                                                          ¦        ¦
¦ ¦                                                          ¦        ¦
¦ ¦                                                          ¦        ¦
¦ +-----------------------------------------------------------+        ¦
¦                                                                       ¦
¦ [ Cancel  ] [   Top   ] [ Bottom  ] [ Page Up ] [Page Down] [ Refresh ] ¦
+-----------------------------------------------------------------------+
```

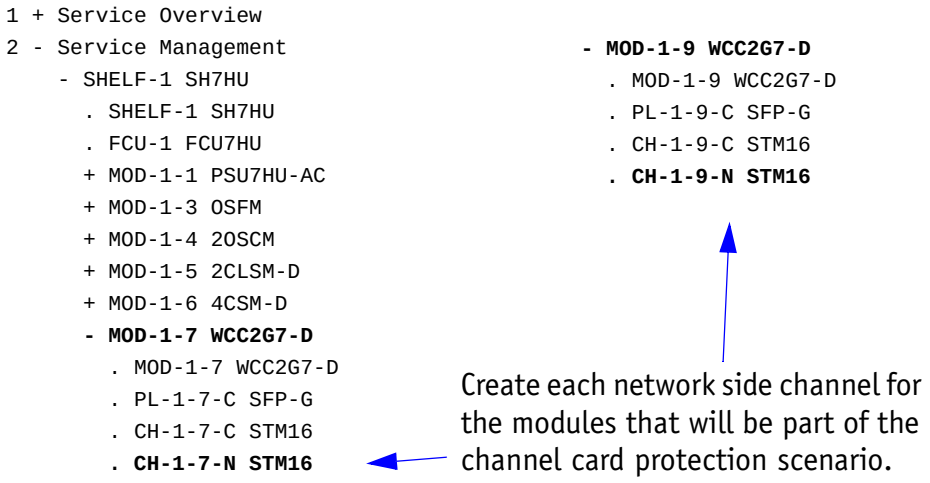
The parameters that can be set at a group level are:

- Link LOS
- Link degradation
- Hold-off period

Deletion of a VSM in a protection setting means first deleting the FFP protection group, then the OM facilities and then the module can be deleted. See *Provisioning* for information on creating and deleting modules.

3.6.1.1 Configuring Channel Card Protection

From the appropriate channel modules submenu, create the network side channel necessary for channel card protection and then do the same for the other channel module.



Step 1 Start configuring the network side channel that you want to be the working section. Select the AID of that network side channel. The corresponding AID will automatically be defined as the protection AID.

All parameters must be identical for the network side channels of both channel modules. If it is already created, the set of index cards will open for this entity.

Step 2 Select the **Config** index card.

```
+------------------------------CH-1-7-N, STM16------------------------------+
¦¦ 1 State ¦ 2 Fault ¦ 3 Config ¦ 4 Operation ¦ 5 Info ¦ 6 PL Mont ¦7 DL Mont¦¦
¦+------------------+          +-----------------------------------------+¦
¦¦ Facility Type:         STM-16                                          ¦¦
¦¦ Termination Level:     Phys                                            ¦¦
¦¦ Protection Role:       NA                                              ¦¦
¦¦ Alias:                 [                                  ]            ¦¦
¦¦ Error Forwarding Mode: AIS                                             ¦¦
¦¦ MS SD Integr. Period:  7                                               ¦¦
¦¦ MS Signal Degrade:     30                                              ¦¦
¦¦ Laser-Off Delay:       Enabled                                         ¦¦
¦¦                                                                        ¦¦
¦¦ [ Cancel  ] [ Refresh ] [  Apply  ] [Protection...]                    ¦¦
¦+-----------------------------------------------------------------------+¦
+---------------------------------------------------------------------------+
```

Step 3 Select **[Protection...]**.

```
+------------------------------CH-1-7-N, STM16------------------------------+
¦¦ 1 State ¦ 2 Fault ¦ 3 Config ¦ 4 Operation ¦ 5 Info ¦ 6 PL Mont ¦7 DL Mont¦¦
¦+------------------+          +-----------------------------------------+¦
¦¦ Create Network Port Protection FFP_CH-1-7-N:                            ¦¦
¦¦                                                                        ¦¦
¦¦ Working AID           CH-1-7-N                                         ¦¦
¦¦ Protection AID        CH-1-9-N                                         ¦¦
¦¦ Maintenance Switching [PHYS    ]                                       ¦¦
¦¦ APS Hold-Off          [None    ]                                       ¦¦
¦¦                                                                        ¦¦
¦¦ [ Cancel  ] [ Refresh ] [  Next   ]                                    ¦¦
¦+------------------------------------------------------------------------+¦
+--------------------------------------------------------------------------+
```

You can now select the maintenance switching and the APS hold-off time (select a time from the drop-down menu).

Step 4 Select **[Next]**.

```
+------------------------------CH-1-7-N, STM16------------------------------+
¦¦ 1 State ¦ 2 Fault ¦ 3 Config ¦ 4 Operation ¦ 5 Info ¦ 6 PL Mont ¦7 DL Mont¦¦
¦+------------------+          +-----------------------------------------+¦
¦¦ Create Network Port Protection FFP_CH-1-7-N:                            ¦¦
¦¦                                                                        ¦¦
¦¦ Protection Mechanism Channel Card Protection                           ¦¦
¦¦                                                                        ¦¦
¦¦ [ Cancel  ] [ Refresh ] [  Prev   ] [ Create  ]                        ¦¦
¦+------------------------------------------------------------------------+¦
+--------------------------------------------------------------------------+
```

Step 5 Select **[Create]**. You will get the following message:

```
+----------------------------------+
¦ Entity was successfully created. ¦
¦                                  ¦
¦           [   OK    ]            ¦
+----------------------------------+
```

Step 6 Select the **Config** index card of the channel again to view the protection parameter settings.

```
+------------------------------CH-1-7-N, STM16------------------------------+
¦¦ 1 State ¦ 2 Fault ¦ 3 Config ¦ 4 Operation ¦ 5 Info ¦ 6 PL Mont ¦7 DL Mont¦¦
¦+------------------+          +-----------------------------------------+¦
¦¦ Parameters of Network Port Protection FFP_CH-1-7-N:                     ¦¦
¦¦                                                                        ¦¦
¦¦ Protection Group Type: Dedicated Prot Ring                             ¦¦
¦¦ Protection Mechanism:  Channel Card Protection                         ¦¦
¦¦ Directionality:        BI                                             ¦¦
¦¦ Revertive:             N                                              ¦¦
¦¦ Working AID:           CH-1-7-N                                       ¦¦
¦¦ Protection AID:        CH-1-9-N                                       ¦¦
¦¦ Maintenance Switching: [PHYS    ]                                      ¦¦
¦¦ APS Hold-Off:          [None    ]                                      ¦¦
¦¦                                                                        ¦¦
¦¦ To delete Network Port Protection press 'Delete' button.               ¦¦
¦¦                                                                        ¦¦
¦¦ [ Cancel  ] [ Refresh ] [  Apply  ] [ Delete  ]                        ¦¦
¦+------------------------------------------------------------------------+¦
```

```
+-------------------------------------------------------------------------+
```

If you want to delete your setting you have to set the admin state of the entity to "Management" or "Maintenance".

You can see the following:

Protection Group Type In this example it was set up for a dedicated protection ring.

Protection Mechanism This shows the protection mechanism chosen, in this case it is channel card protection.

Directionality This example shows that it is set up for bidirectional protection.

Revertive N indicates non-revertive protection. Revertive protection is not supported.

Working AID This shows which channel is the working channel in the protection scheme.

Protection AID This shows which channel is the protecting channel.

Maintenance Switching This shows the termination level of the switch. Possible settings are

- PHYS (physical): the switch triggers are LOS and LOC
- LINE/MSP (multiplexer section protection): SDH protocol alarms will be evaluated as the switch triggers
- SNC_N_PM (subnetwork connection with nonintrusive OTUk path performance monitoring): the switch triggers are OTU alarms

APS Hold-Off This shows the hold-off time before automatic protection switching due to the signal fail (SF) alarm takes place. This value can be set here.

Step 7 Select **Service Overview** from the main menu to see the protection tables .

```
- Service Overview
  . Fault Management Table
  . Inventory Table
  - Protection Groups
  1 . Channel Protection Table
  2 . Channel Group Protection
```

```
+---------------------- Channel Protection Table ------------------------+
|                                                                         |
|  Working      Protection   Mech Prot SD Trg Holdoff                     |
| +-------------------------------------------------------+               |
| |CH-1-7-N     CH-1-9-N     CARD PHYS        None         |              |
| | |                                                     |              |
| | |                                                     |              |
| +-------------------------------------------------------+              |
|                                                                         |
| [ Cancel  ] [   Top   ] [ Bottom  ] [ Page Up ] [Page Down] [ Refresh ] |
+-------------------------------------------------------------------------+
```

The pluggable transceivers for this protection scheme do not have to be the same. They may differ in:

- Channel (C or D)
- Rate (but they both must support the type of facility)
- REACH

3.6.1.2 Configuring Channel Protection

Requirements To configure protection, the relevant modules must have the correct transmission mode. The transmission mode must be set while creating the module (refer to *Section 3.1.1.1 "Creating a Module", p. 3-3*). The transmission mode that must be set for channel protection is either "Multiplexer HST" or "Transponder HST".

```
+-----------------Create: MOD-1-10------------------+
¦ Enter relevant values                             ¦
¦                                                   ¦
¦ Transmission Mode: [Multiplexer HST ]             ¦
¦                                                   ¦
¦ [ Cancel  ] [ Refresh ] [  Prev   ] [  Next   ]   ¦
+-----------------------------------------------------+
```

From the appropriate channel module submenu, create the network side channels necessary for channel protection.

```
- MOD-1-10 4TCC2G5
  . MOD-1-10 4TCC2G5
  . PL-1-10-C1 [UAS] [UEQ]
  . PL-1-10-C2 [UAS] [UEQ]
  . PL-1-10-C3 [UAS] [UEQ]
  . PL-1-10-C4 [UAS] [UEQ]
  . PL-1-10-NE SFP-D
  . CH-1-10-NE STM16
  . SDCC-1-10-NE [UAS]
  . LDCC-1-10-NE [UAS]
  . PL-1-10-NW SFP-D
  . CH-1-10-NW STM16
  . SDCC-1-10-NW [UAS]
```

Step 1 Start configuring the network side channel that you want to be the working section. Select the AID of that network side channel. The corresponding AID will automatically be defined as the protection AID.

All parameters must be identical for the network side channels of both channel modules. If it is already created, the set of index cards will open for this entity.

Step 2 Select the **Config** index card.

```
+-----------------------------CH-1-10-NE, STM16-----------------------------+
¦¦ 1 State ¦ 2 Fault ¦ 3 Config ¦ 4 Operation ¦ 5 Info ¦ 6 PL Mont ¦7 DL Mont¦¦
¦+------------------+          +-----------------------------------------+¦
¦¦ Facility Type:        STM-16                                            ¦¦
¦¦ Protection Role:      NA                                                ¦¦
¦¦ Alias:                [                                    ]            ¦¦
¦¦ Timing:               INTERN                                            ¦¦
¦¦ ALS Mode:             ALS                                               ¦¦
¦¦ MS SD Integr. Period: 7                                                 ¦¦
¦¦ MS Signal Degrade:    30                                                ¦¦
¦¦                                                                         ¦¦
¦¦ [ Cancel  ] [ Refresh ] [  Apply  ] [Trace... ] [Protection...]         ¦¦
¦+-------------------------------------------------------------------------+¦
+---------------------------------------------------------------------------+
```

Step 3 Select **[Protection...]**

```
+-----------------------------CH-1-10-NE, STM16-----------------------------+
¦¦ 1 State ¦ 2 Fault ¦ 3 Config ¦ 4 Operation ¦ 5 Info ¦ 6 PL Mont ¦7 DL Mont¦¦
¦+------------------+          +-----------------------------------------+¦
¦¦ Create Network Port Protection FFP_CH-1-10-NE:                          ¦¦
¦¦                                                                         ¦¦
¦¦ Working AID:          CH-1-10-NE                                        ¦¦
¦¦ Protection AID:       CH-1-10-NW                                        ¦¦
¦¦ Protection Mechanism: [--choose--            ]                          ¦¦
¦¦ Switch Trigger On SD: [Disabled]                                        ¦¦
¦¦ APS Hold-Off:         [None    ]                                        ¦¦
¦¦                                                                         ¦¦
¦¦ [ Cancel  ] [ Refresh ] [ Create  ]                                     ¦¦
¦+-------------------------------------------------------------------------+¦
+---------------------------------------------------------------------------+
```

You have these possibilities:

```
+----------------------+
¦--choose--            ¦
¦Path Protection       ¦
¦Channel Card Protection¦
¦Channel Protection    ¦
¦Versatile Protection  ¦
+----------------------+
```

Step 4 Select Channel Protection from the drop-down menu in the line Protection Mechanism.

```
+-----------------------------CH-1-10-NE, STM16-----------------------------+
¦¦ 1 State ¦ 2 Fault ¦ 3 Config ¦ 4 Operation ¦ 5 Info ¦ 6 PL Mont ¦7 DL Mont¦¦
¦+------------------+          +-----------------------------------------+¦
¦¦ Create Network Port Protection FFP_CH-1-10-NE:                          ¦¦
¦¦                                                                         ¦¦
¦¦ Working AID:          CH-1-10-NE                                        ¦¦
¦¦ Protection AID:       CH-1-10-NW                                        ¦¦
¦¦ Protection Mechanism: [Channel Protection    ]                          ¦¦
¦¦ Switch Trigger On SD: [Disabled]                                        ¦¦
¦¦ APS Hold-Off:         [None    ]                                        ¦¦
¦¦                                                                         ¦¦
¦¦ [ Cancel  ] [ Refresh ] [ Create  ]                                     ¦¦
¦+-------------------------------------------------------------------------+¦
+---------------------------------------------------------------------------+
```

You can also enable “Switch Trigger on SD”(disabled by default) and set an APS hold-off time.

Step 5 Select **[Create]**.

The following message will be displayed.

```
+---------------------------------+
¦ Entity was successfully created. ¦
¦                                 ¦
¦           [   OK    ]           ¦
+---------------------------------+
```

Step 6 Select the **Config** index card of this channel again to view the protection parameter settings.

```
+-----------------------------CH-1-10-NE, STM16-----------------------------+
¦¦ 1 State ¦ 2 Fault ¦ 3 Config ¦ 4 Operation ¦ 5 Info ¦ 6 PL Mont ¦7 DL Mont¦¦
¦+------------------+          +-----------------------------------------+¦
¦¦ Parameters of Network Port Protection FFP_CH-1-10-NE:                    ¦¦
¦¦                                                                         ¦¦
¦¦ Protection Group Type: Dedicated Prot Ring                              ¦¦
¦¦ Protection Mechanism:  Channel Protection                               ¦¦
¦¦ Directionality:        BI                                              ¦¦
¦¦ Revertive:             N                                               ¦¦
¦¦ Maintenance Switching: LINE/MSP                                        ¦¦
¦¦ Working AID:           CH-1-10-NE                                      ¦¦
¦¦ Protection AID:        CH-1-10-NW                                      ¦¦
¦¦ Switch Trigger On SD: [Disabled]                                       ¦¦
¦¦ APS Hold-Off:         [None    ]                                       ¦¦
¦¦                                                                         ¦¦
¦¦ To delete network port protection, select 'Delete'.                     ¦¦
¦¦                                                                         ¦¦
¦¦ [ Cancel  ] [ Refresh ] [  Apply  ] [ Delete  ]                         ¦¦
¦+-------------------------------------------------------------------------+¦
+---------------------------------------------------------------------------+
```

If you want to delete your setting you have to set the admin state of the entity to “Management” or “Maintenance”.

You can see the following:

Protection Group Type In this example it was set up for a dedicated protection ring.

Protection Mechanism This shows the protection mechanism chosen, in this case it is channel protection.

Directionality This example shows that it is set up for bidirectional protection.

Revertive N indicates non-revertive protection. Revertive protection is not supported.

Maintenance Switching This shows the termination level of the switch. Possible settings are

- PHYS (physical): the switch triggers are LOS and LOC
- LINE/MSP (multiplexer section protection): SDH protocol alarms will be evaluated as the switch triggers
- SNC_N_PM (subnetwork connection with nonintrusive OTUk path performance monitoring): the switch triggers are OTU alarms

Working AID This shows which channel is the working channel in the protection scheme.

Protection AID This shows which channel is the protecting channel.

Switch Trigger on SD This shows whether the signal degrade trigger is enabled or disabled. By default it is disabled. It can be enabled here.

APS Hold-Off This shows the hold-off time before automatic protection switching due to the signal fail (SF) alarm takes place. This value can be set here.

Step 7 Select **Service Overview** from the main menu to see the protection tables (for an explanation of the headings in this table see *Section 3.6.2 "Viewing Protection Settings", p. 3-36*).

```
- Service Overview
  . Fault Management Table
  . Inventory Table
  - Protection Groups
  1 . Channel Protection Table
  2 . Channel Group Protection
```

```
+----------------------- Channel Protection Table -------------------------+
¦                                                                          ¦
¦  Working      Protection   Mech Prot SD Trg Holdoff                      ¦
¦ +-----------------------------------------------------------+            ¦
¦ ¦CH-1-7-N     CH-1-9-N     CARD PHYS        None           ¦            ¦
¦ ¦                                                          ¦            ¦
¦ ¦                                                          ¦            ¦
¦ +-----------------------------------------------------------+            ¦
¦                                                                          ¦
¦ [ Cancel  ] [   Top   ] [ Bottom  ] [ Page Up ] [Page Down] [ Refresh ] ¦
+--------------------------------------------------------------------------+
```

The pluggable transceivers for this protection scheme do not have to be the same. They may differ in:

- Channel (C or D)
- Rate (but they both must support the type of facility)
- REACH

3.6.2 Viewing Protection Settings

Step 1 To view already existing protection groups, select **Service Overview.**

```
- Service Overview
     . Fault Management Table
     . Inventory Table
     - Protection Groups
     1 . Channel Protection Table
     2 . Channel Group Protection
     . Data Communication Network
     . Physical Connections Table
```

Step 2 Choose **Protection Groups** to view a table of either:

- Channel Group Protection, or
- Channel Protection.

The information provided in these tables includes:

Working This field shows the AID of the working port involved in the protection group.

Protection This field shows the AID of the protection port involved in the protection group.

Mech This refers to the protection mechanism, which can be channel, card (for module) or switch.

Prot This shows the protection mechanism chosen.

SD Trg This refers to the signal degrade trigger and indicates if this is enabled or disabled. By default it is disabled.

Holdoff This field displays the hold-off time before automatic protection switching due to the signal fail (SF) alarm takes place. There is no hold-off time before switching due to signal degrade (SD).

Far End IP This is the IP address assigned to the PPP termination point on the far-end NE.

OSCM This shows optical supervisory channel module (OSCM) that is used for protection switching.

3.6.3 Enabling and Disabling Protection Switching Criteria

Use either the Craft Console or Web Console to make protection switching settings.

Requirements You must have at least PROVISION user rights to make these settings.

Step 1 Open the **Service Management** menu and select the required shelf.

```
- FSP 3000R7 Rel.7.1.0X_2007_03_05_1450
  + Service Overview
  - Service Management
    + SHELF-1 SH7HU
    + SHELF-2 SH7HU
    + Create Shelf
  + Service Logging
  + System Management
  + System Security Management
  + External Applications
  . Reboot NCU
  . Quit
```

Select the module that is to be a part of a protection scheme.

Step 2 Provision the modules for protection according to the criteria for the protection scheme at hand. In general they must be of the same type.

Step 3 Provision the plugs according to the protection scheme at hand. This may mean that they must be of the same type, but that depends on the type of protection.

Step 4 Provision the channel facilities according to the protection scheme requirements.

Step 5 Select the **Config** index card of the module.

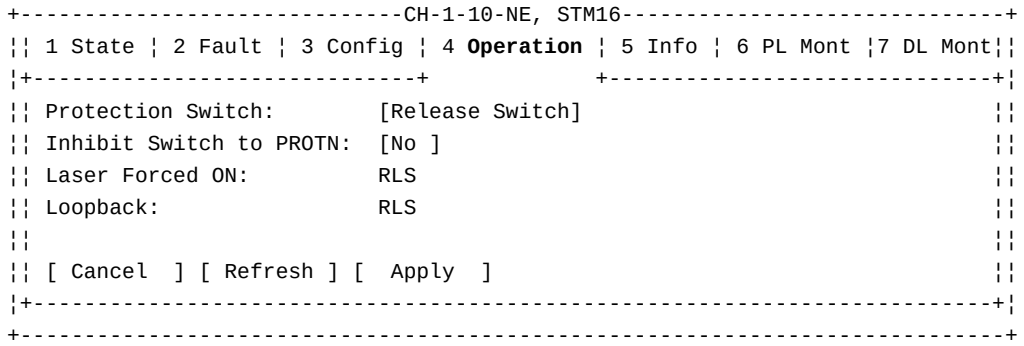
```
+------------------------------CH-1-16-N, OTU2-------------------------------+
¦¦ 1 State ¦ 2 Fault ¦ 3 Config ¦ 4 Operation ¦ 5 Info ¦ 6 PL Mont ¦7 DL Mont¦¦
¦+------------------+          +-----------------------------------------+¦
¦¦ Create Network Port Protection FFP_CH-1-16-N:                           ¦¦
¦¦                                                                        ¦¦
¦¦ Working AID:    CH-1-16-N                                              ¦¦
¦¦ Protection AID: [--choose--]                                           ¦¦
¦¦                                                                        ¦¦
¦¦ [ Cancel  ] [ Refresh ] [  Next   ]                                    ¦¦
¦+------------------------------------------------------------------------+¦
+--------------------------------------------------------------------------+
```

The working channel was selected during provisioning, and cannot be changed. You can select a protection path if this is relevant.

```
+------------------------------CH-1-16-N, OTU2-------------------------------+
¦¦ 1 State ¦ 2 Fault ¦ 3 Config ¦ 4 Operation ¦ 5 Info ¦ 6 PL Mont ¦7 DL Mont¦¦
¦+------------------+          +-----------------------------------------+¦
¦¦ Create Network Port Protection FFP_CH-1-16-N:                           ¦¦
¦¦                                                                        ¦¦
¦¦ Working AID:    +----------+                                           ¦¦
¦¦ Protection AID: ¦--choose--¦                                           ¦¦
¦¦                 ¦CH-1-4-N  ¦                                           ¦¦
¦¦                 ¦CH-1-8-N  ¦                                           ¦¦
¦¦                 +----------+                                           ¦¦
¦¦ [ Cancel  ] [ Refresh ] [  Next   ]                                    ¦¦
¦+------------------------------------------------------------------------+¦
+--------------------------------------------------------------------------+
```

3.6.4 Forcing Protection Switch

It is possible to disable protection switching for the active line. To disable protection, select the index card **Operation**.



Now you can make the following settings:

Protection Switch The protection switch can be set to “Manual Switch”. That results in the normal traffic being switched to the protection section. The switchover will be rejected if the protection section has a fault condition.

Inhibit Switch to PROTN Setting this to “Yes” results in protection being inhibited. Regardless of failure conditions on the section that is currently in use, no switch from this section will take place.

3.7 Configuring Transmission Mode

Upon creating a module, or assigning a slot with specific parameters, one of the values to be set regards transmission mode. Depending on the module to be created, the software automatically lists the possible transmission modes for that type of module. As an example:

3.7.1 Setting Transmission Mode

This procedure describes how to set transmission mode for a module that is not previously auto-provisioned or otherwise assigned to an address. Refer to the *Section 3.1 “Provisioning”, p. 3-1* for more information on the internal database.

Step 1 Select **Create Module** from the **Service Management** menu.

Step 2 Select the module from the **Equipment Type** drop-down list.

Step 3 Choose **[Next]** to be able to set parameters regarding this module. In this case, transmission mode.

Step 4 Choose the required transmission mode from the Transmission Mode drop-down list. Here is a list of possible transmission modes:

Multiplexer
Multiplexer East
Multiplexer West
Multiplexer HST
Regenerator 1WAY
Transponder East
Transponder West
Transponder HST
Regenerator 2WAY

Step 5 Select **[Apply]** to save settings.

Transmission Mode Options The transmission mode setting is supported for channel modules, and decides whether the module shall be used as a transponder, multiplexer or a regenerator.

Transponders Transponders convert the client side signal wavelength to a network side CWDM or DWDM wavelength. The transponder options are:

"Transponder": for channel modules with one network interface. This is the default setting for channel modules with one network interface.

"Transponder East": for channel modules with two network interfaces, where the CH-NE port is used.

"Transponder West": for channel modules with two network interfaces, where the CH-NW port is used.

"Transponder HST": for channel modules with two network interfaces, where channel protection is used. This is the default setting for transponder channel modules with two network interfaces.

Multiplexers Multiplexers (Muxponders) aggregate several client side wavelengths onto a network side CWDM or DWDM wavelength. The multiplexer options are:

"Multiplexer": for channel modules with one network interface.

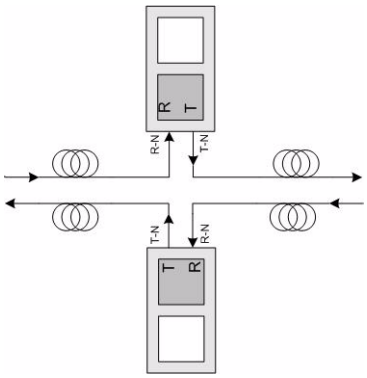
"Multiplexer East": for channel modules with two network interfaces, where the CH-NE port is used.

"Multiplexer West": for channel modules with two network interfaces, where the CH-NW port is used.

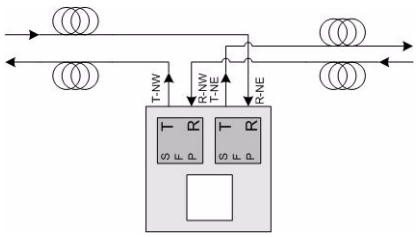
"Multiplexer HST": for channel modules with two network interfaces, where channel protection is used. This is the default setting for multiplexer channel modules with two network interfaces.

Regenerators A regenerator consists of two channel modules operating in regenerator mode. Together the modules regenerate a network signal. The regenerator options are:

"Regenerator 1Way": the channel module is connected to the other channel module for unidirectional (dual or single) regeneration.

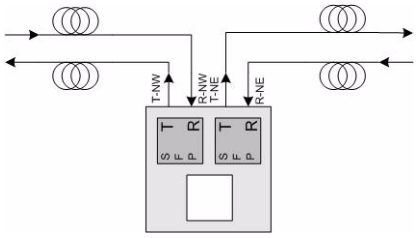


Unidirectional Regenerator
- two modules

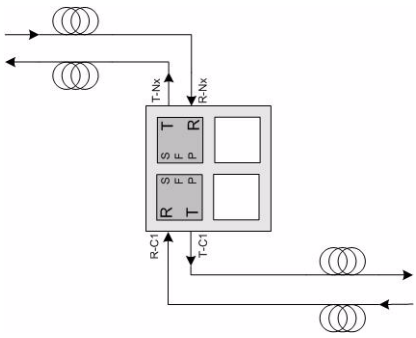


Unidirectional Regenerator
- single module

"Regenerator 2Way": the channel module is connected to the other channel module for bidirectional (network to network side or network to client side) regeneration.



Bidirectional Regenerator
network to network



Bidirectional Regenerator
network to client

3.7.2 Modifying Transmission Mode

Step 1 Take the module and all dependencies out of service by changing the administrative state, see *Section 3.2*, *Configuring Administrative States* for details.

Step 2 Delete all entities for this AID from the bottom up. First all facilities, then the plugs and finally the module itself. Refer to *Section 3.1*, *Provisioning* for details on deleting entities.

Step 3 This can also be done with the Forced Delete command.

Step 4 Follow Steps 1 - 5 from *Setting Transmission Mode*.

3.8 Configuring EDFAs

This sections describes the configuration of EDFA parameters.

Read and understand the user manual, Safety Guide as well as the Deployment Rules before installing and using this device. Failure to follow operating instructions could result in personal injury or damage to the equipment.

Setting EDFA parameters for an unassigned AID

Step 1 Select **Create Module** from the **Service Management** menu.

Step 2 Select the correct EDFA module from the Equipment Type drop-down list.

Step 3 Choose **[Next]** to be able to set parameters regarding the module. Here is the list of possible parameters to set for EDFA-SCG or EDFA-DCG:

- OM Band: C-Band or L-Band; A-Band or B-Band
- Optical Output Power Rating: This depends on the EDFA module. This value (in dBm) can be 10, 17, 18 or 20.

Once the EDFAs are created, the OM facilities must also be created. This supporting entity requires the following parameters to be set:

- Gain (24 or 25 dB)
- Tilt (is an integer, the units are in dB)

Step 4 Select **[Apply]** to save settings.

Setting EDFA parameters for an already assigned AID

If the EDFA is already assigned, all dependents of the entity must be taken out of service and deleted before you can make any changes to the EDFA.

Step 1 Take the module and all dependencies out of service by changing the administrative state, see the *Section 3.2 "Configuring Administrative States", p. 3-12,* for details.

Step 2 Delete all entities for this AID from the bottom up. Then delete the module itself. Refer to the *Section 3.1.3 "Deleting Equipment from the Database", p. 3-9* for details on deleting entities.

Step 3 Follow Steps 1 - 4 in *Setting EDFA parameters for an unassigned AID*.

3.9 Configuring Internal Loopbacks

Loopbacks are a temporary maintenance setting. They cannot be set by editing a parameter in the configuration database nor can the status be retrieved as a parameter from the configuration database because it does not belong to the database of provisioned equipment and services.

Four different internal loopback settings can be activated, deactivated, and monitored through the software interfaces provided by the NCU or through the *FSP 3000R7 Element Manager (EM)*. Further information can be found in the *FSP 3000R7 Element Manager User Manual*. For information on external loopbacks see the *Detailed System Description* or the *Hardware Description*.

Be aware that loopback testing is intrusive to the relative optical link. Therefore, while you test a portion of a network or only a circuit, you will be unable to pass traffic across that link.

Begin loopback tests on the Customer Premises Equipment (CPE) with client port loopback tests. Then proceed on to loopback tests that involve other selected portions of the link. The following sections are provided:

Prerequisite for Configuring Loops

Client Interface Facility Loopback

Network Interface Terminal Loopback

Network Interface Facility Loopback

Client Interface Terminal Loopback

3.9.1 Prerequisite for Configuring Loops

Before configuring a loop, the protection settings of the module must be identified.

Identifying the protection settings.

Loops cannot be set on the channel module that are in a protection group. To identify if the corresponding module is a part of a protective setting review the protection group tables:

Step 1 From the Craft or Web Console main menu, select **Service Overview > Protection Groups**.

Step 2 Compare to see if the corresponding module AID is in either one of the protection tables:

- Channel Protection Table
- Channel Group Protection

If the module is in a protection setting, the protection has to be changed from protected to unprotected before continuing. Refer to *Section 3.6 "Configuring Protection", p. 3-25* for information on releasing the modules from protected mode.

3.9.2 Client Interface Facility Loopback

This section describes how to activate a facility loopback on the client interface. Refer to the Detailed System Description and the User Guide for further information on loopbacks.

Only core type WDM channel modules (WCCs) and core type TDM channel modules (TCCs) support facility loopbacks on their client interfaces.

When a facility loopback is activated, the incoming signal at the client port receiver Rx is looped back to the client port transmitter output Tx and directly retransmitted to the CPE.

Step 1 From the Craft or Web Console main menu, expand the menu **Service Management**.

Step 2 From the shelf submenu, select the respective client interface for which loopbacks are to be set.

Such channels are named: CH-<shelf #>-<slot #>-C|C1.C8 or CH-<shelf #>-<slot #>-N|NE|NW.

For example, from the submenu select the channel to be configured according to the appropriate AID.

```
. SHELF-1 SH7HU
     . FCU-1 FCU7HU
     + MOD-1-1 2ABSM-C
     + MOD-1-2 4TCC2G5
     - MOD-1-3 4TCC2G5
       . MOD-1-3 4TCC2G5
       . PL-1-3-C1 SFP-C [SGEO]
       . CH-1-3-C1 FC [SGEO]
       . PL-1-3-C2 SFP-C [SGEO]
       . CH-1-3-C2 FC [SGEO]
       . PL-1-3-C3 [UAS] [UEQ]
       . PL-1-3-C4 [UAS] [UEQ]
       . PL-1-3-NE [UAS] [UEQ]
```

Select the client interface for the loopback

Fig. 3-1: Select the AID of the Channel for the Loopback

Step 3 Set the administrative state for this interface to Maintenance on the first index card **State**. It is a good idea to note what the admin state is originally.

```
+------------------------------CH-1-3-C, FC--------------------------------+
|| 1 State | 2 Fault | 3 Config | 4 Operation | 5 Info | 6 PL Mont |7 DL Mont||
||         +-------------------------------------------------------------+|
|| Admin State:                [Maintenance]                              ||
|| Operational State:          Outage                                     ||
|| Valid Signal Timer(hh-mm):  00-00                                      ||
||                                                                        ||
|| +--------------------------+                                           ||
|| |Supporting Entity Outage  |                                           ||
|| |                          |                                           ||
|| +--------------------------+                                           ||
||                                                                        ||
|| [ Cancel  ] [ Refresh ] [  Apply  ] [ Delete  ] [Dependencies...]      ||
|+------------------------------------------------------------------------+|
+--------------------------------------------------------------------------+
```

Fig. 3-2: Change Administrative State to Maintenance

Step 4 Select the index card **Operation**. Select the appropriate setting from the drop-down list:

- RLS - this setting clears the active loopback
- OPR-FACILITY - select this to perform the facility or external type of loopback on this link
- OPR-FACILITY - select this to perform the terminal or internal type of loopback on this link.

If the interface is a member of a protection group this command will be denied.

This example shows that the facility loopback has been selected:

```
+--------------------------------CH-1-3-C, FC--------------------------------+
¦¦ 1 State ¦ 2 Fault ¦ 3 Config ¦ 4 Operation ¦ 5 Info ¦ 6 PL Mont ¦7 DL Mont¦¦
¦+----------------------------+             +----------------------------+¦
¦¦ Laser Forced ON:  [RLS]                                               ¦¦
¦¦ Loopback:         [OPR-FACILITY]                                      ¦¦
¦¦                                                                       ¦¦
¦¦                                                                       ¦¦
¦¦ [ Cancel  ] [ Refresh ] [  Apply  ]                                   ¦¦
¦+-------------------------------------------------------------------------+¦
+--------------------------------------------------------------------------+
```

Fig. 3-3: Configure Loopback Command

Step 5 Select **[Apply]** to set the loopback, or **[Cancel]** to discard it.

Step 6 Select the **State** index card to verify the setting and set the administrative state to its original state before testing with loops. For more information about administrative states, refer to *Section 3.2*.

Step 7 To release the loopback, repeat Steps 1 to 4. In this case select **RLS** from the index card **Operation**. This will release the internal loopback.

Step 8 If this interface had previously been a part of a protection group, see *Section 3.6 "Configuring Protection", p. 3-25* for instructions on setting up protection.

3.9.3 Network Interface Terminal Loopback

The terminal loopback on a network interface can be used to test the connection between the CPE and the network port of the channel module. Terminal loopbacks are executed individually for each network port (channel modules with dual network interfaces). Refer to the *Detailed System Description* to identify the module types that can be configured with these settings.

If a terminal loopback on the network port is initiated, data traffic will be interrupted.

Step 1 From the Craft or Web Console main menu, expand the item **System Management**.

Step 2 From the shelf submenu, select the respective network interface for which loopbacks are to be set.

For example, from the submenu select the channel to be configured according to the appropriate AID.

```
. CH-1-5-C1 1GBE
        . PL-1-5-C2 SFP-G
        . CH-1-5-C2 1GBE
        . PL-1-5-C3 [UAS]
        . PL-1-5-C4 [UAS]
        . PL-1-5-NE SFP-D
        . CH-1-5-NE STM16
        . SDCC-1-5-NE SDCC
        . LDCC-1-5-NE [UAS]
        . PL-1-5-NW SFP-D
        . CH-1-5-NW STM16
        . SDCC-1-5-NW [UAS]
```

Select the network interface for the loopback

Fig. 3-4: Select Network Interface from the Craft Console

Step 3 Set the administrative state for this interface to Maintenance on the first index card **State** (see *Section 3.9.2, Step 3*).

Step 4 Select the index card **Operation**. You will see that because of the maintenance state, it is now possible to set the loopback. Select the appropriate setting from the drop-down list:

- RLS - this setting clears the active loopback
- OPR-FACILITY - this command will perform the facility or external type of loopback on this link
- OPR-TERMINAL - this command will perform the terminal or internal type of loopback on this link

If the interface is a member of a protection group this command will be denied.

This example shows that the terminal loopback has been selected:

```
+------------------------------CH-1-5-C1, 1GBE------------------------------+
¦¦ 1 State ¦ 2 Fault ¦ 3 Config ¦ 4 Operation ¦ 5 Info ¦ 6 PL Mont ¦7 DL Mont¦¦
¦+----------------------------+             +----------------------------+¦
¦¦ Laser Forced ON:  [RLS]                                               ¦¦
¦¦ Loopback:         [OPR-TERMINAL]                                      ¦¦
¦¦                                                                       ¦¦
¦¦                                                                       ¦¦
¦¦ [ Cancel  ] [ Refresh ] [  Apply  ]                                   ¦¦
¦+-------------------------------------------------------------------------+¦
+---------------------------------------------------------------------------+
```

Step 5 Select **[Apply]** to set the loopback, or **[Cancel]** to discard it.

Step 6 Select the **State** index card to verify the setting and set the administrative state to the original state before testing with loops. For more information about administrative states, refer to *Section 3.2*.

Step 7 To release the loopback, repeat Steps 1 to 4. In this case select **RLS** from the index card **Operation**. This will release the internal loopback.

Step 8 If this interface had previously been a part of a protection group, see *Section 3.6 "Configuring Protection", p. 3-25* for instructions on setting up protection.

3.9.4 Network Interface Facility Loopback

Caution

When setting a facility loopback on a network port, verify the operating status of the equipment and the present hazard level. If any module in the FSP 3000R7 system is operating in "Forced On" mode, the hazard level of any network element could be affected.

If a facility loopback on a network port is initiated, data traffic will be interrupted.

A facility loopback is initiated on a network interface of a far-end channel module. This loopback enables the testing of the connection between the CPE and the network port of the far-end channel module. Refer to the *Detailed System Description* to identify the module types that can be configured with these settings.

If channel modules with dual network interfaces are used, both network lines need to be tested separately. In this case facility loopbacks are executed individually for each network port.

Step 1 To configure a facility loopback on a network interface of a far-end channel module, carry out *Steps 1 - 3* of *Section 3.9.3* for terminal loopbacks on a network interface.

Step 2 Select the index card **Operation**. You will see that because of the maintenance state, it is now possible to set the loopback. Select the appropriate setting from the drop-down list:

- RLS - this setting clears the active loopback
- OPR-FACILITY - this command will perform the facility or external type of loopback on this link
- OPR-TERMINAL - this command will perform the terminal or internal type of loopback on this link.

If the interface is a member of a protection group this command will be denied.

Step 3 Select OPR-FACILITY for the loopback setting.

This example shows that the facility loopback has been selected:

```
+------------------------------CH-1-5-C1, 1GBE-------------------------------+
¦¦ 1 State ¦ 2 Fault ¦ 3 Config ¦ 4 Operation ¦ 5 Info ¦ 6 PL Mont ¦7 DL Mont¦¦
¦+----------------------------+             +-----------------------------+¦
¦¦ Laser Forced ON:  [RLS]                                                 ¦¦
¦¦ Loopback:         [OPR-FACILITY]                                        ¦¦
¦¦                                                                         ¦¦
¦¦ [ Cancel  ] [ Refresh ] [  Apply  ]                                     ¦¦
¦+-------------------------------------------------------------------------+¦
+---------------------------------------------------------------------------+
```

Step 4 Select the **State** index card to verify the setting and set the administrative state to the original state before testing with loops. For more information about administrative states, refer to *Section 3.2*.

Step 5 To release the loopback, repeat Steps 1 and 2. In this case select **RLS** from the index card **Operation**. This will release the internal loopback.

Step 6 If this interface had previously been a part of a protection group, see *Section 3.6 "Configuring Protection", p. 3-25* for instructions on setting up a protection setting.

3.9.5 Client Interface Terminal Loopback

A terminal loopback is initiated on a client interface of a far-end channel module. This loopback enables the testing of the complete communications link between the CPE and the client port of the far-end channel module. Refer to the *Detailed System Description* to identify the module types that can be configured with these settings.

If the interface is a member of a protection group this command will be denied.

Step 1 From the Craft or Web Console main menu, expand the item **Service Management**.

Step 2 From the shelf submenu, select the client interface of the far-end channel for which the loopback is to be set. See *Section 3.9.2* about selecting the respective channel.

Set the administrative state for this interface to Maintenance on the first index card **State** (refer to *Section 3.9.2* for details).

Step 3 Select the index card **Operation**. You will see that because of the maintenance state, it is now possible to set the loopback. Select the appropriate setting from the drop-down list:

- RLS - this setting clears the active loopback
- OPR-FACILITY - this command will perform the facility or external type of loopback on this link
- OPR-TERMINAL - this command will perform the terminal or internal type of loopback on this link.

Step 4 Select OPR-TERMINAL for the loopback setting.

This example shows that the terminal loopback has been selected:

```
+------------------------------CH-1-5-C1, 1GBE-------------------------------+
¦¦ 1 State ¦ 2 Fault ¦ 3 Config ¦ 4 Operation ¦ 5 Info ¦ 6 PL Mont ¦7 DL Mont¦¦
¦+----------------------------+             +-----------------------------+¦
¦¦ Laser Forced ON:  [RLS]                                                 ¦¦
¦¦ Loopback:         [OPR-TERMINAL]                                        ¦¦
¦¦                                                                         ¦¦
¦¦ [ Cancel  ] [ Refresh ] [  Apply  ]                                     ¦¦
¦+-------------------------------------------------------------------------+¦
+---------------------------------------------------------------------------+
```

Step 5 Select the **State** index card to verify the setting and set the administrative state tothe original state before testing with loops. For more information about administrative states, refer to *Section 3.2*.

Step 6 To release the loopback, repeat Steps 1 to 4. In this case select **RLS** from the index card **Operation**. This will release the internal loopback.

Step 7 If this interface had previously been a part of a protection group, see *Section 3.6 "Configuring Protection", p. 3-25* for instructions on setting up protection.

3.10 Configuring Condition Preferences

This section describes how to change the preferences for conditions in FSP 3000R7.

3.10.1 Changing a Condition's Notification Code/Severity

This procedure describes how to change the severity of a condition on an entity, using the Craft Console or Web Console. The Reference Guide contains an introduction to using these tools.

Step 1 Open the **Fault** tab for the entity that can raise the relevant condition you want to change severity for. See *Chapter 2, Section 2.2.5.2 "Fault", p. 2-13*.

Step 2 Select the **Severities** button.

In response, the Fault page displays a list of all conditions that can be raised by this entity is displayed, together the current notification code/severity.

Step 3 Select the relevant condition that you wish to disable reporting for.

In response, the Fault page displays the **Condition Severity** drop-down list.

Step 4 Use the **Condition Severity** drop-down list to select the relevant severity for this condition; **Critical**, **Major**, **Minor**, **Not Alarmed** or **Not Reported**.

Step 5 Apply the new setting.

3.10.2 Setting TCA Thresholds

This procedure describes how to specify thresholds for Threshold Crossing Alerts, using the Craft Console or Web Console.

Step 1 Open the **PL Mont** tab of the entity for which you wish to set thresholds for performance measurements. See *2.2.5.8 "PL Mont (available for channels and facilities) Physical Line Layer Monitoring", p. 2-24*.

See the User Guide, Chapter 3, for a description of the performance record page.

Step 2 Select which performance measurement to set thresholds for from the **Monitoring Type** drop-down list.

Step 3 Set the threshold values in dBm as follows:

- For the low threshold, enter the threshold value in the **LThreshold** field.
- For the high threshold, enter the threshold value in the **HThreshold** field.

Step 4 Apply the new setting.

3.11 Configuring Trace

This procedure describes how to configure the settings for trace messages. Trace is a way to ensure connectivity within a network. Refer to the User Guide and Detailed System Description for further information on trace.

Step 1 From the Craft or Web Console open the **Service Management** menu and navigate to the relevant module. See *Chapter 2, Section 2.2.4 "Navigation", p. 2-7* for a description of how to do this.

Step 2 From the module submenu, select the relevant channel entity.

Step 3 Select the **Config** index card. In response, the index card will be displayed resembling *Figure 3-5*.

```
+------------------------------CH-1-11-C, OTU2------------------------------+
|| 1 State | 2 Fault | 3 Config | 4 Operation | 5 Info | 6 PL Mont |7 DL Mont||
|+------------------+          +-----------------------------------------+|
|| Facility Type:            OTU2                                         ||
|| Termination Level:        OTU                                          ||
|| Stuffing:                 Yes                                          ||
|| Alias:                    [                                    ]       ||
|| OTU BBE Signal Degrade:   15                                           ||
|| OTU SD Integr. Period:    7                                            ||
|| ODU BBE Signal Degrade:   15                                           ||
|| ODU SD Integr. Period:    7                                            ||
|| Forward Error Correction: G709 Standard FEC                            ||
|| ALS Mode:                 NONE                                         ||
|| Error Forwarding Mode:    AIS                                          ||
|| Laser-Off Delay:          Disabled                                     ||
||                                                                        ||
||                                                                        ||
|| [ Cancel  ] [ Refresh ] [  Apply  ] [   TCM   ] [Trace... ]            ||
||                                                                        ||
||                                                                        ||
|+------------------------------------------------------------------------+|
+--------------------------------------------------------------------------+
```

Fig. 3-5: Configuring Trace

Step 4 Select [Trace...] to open the trace configuration window. The following screen is an example of this. There is another variant to trace, refer to the *Entity Properties and Parameters* for information on these parameters:

```
+------------------------------CH-1-5-N, STM64------------------------------+
|| 1 State | 2 Fault | 3 Config | 4 Operation | 5 Info | 6 PL Mont |7 DL Mont||
|+------------------+          +-----------------------------------------+|
|| Layer:        [SDH/SONET RS]                                           ||
|| Trace format: [16CRC7]                                                 ||
|| TIM Mode:     [DISABLED           ]                                    ||
||                                                                        ||
||  Trace:       [Expected (EXP)]                                         ||
|| (+) ASCII [ ] G.831                                                    ||
|| CRC7 [               ]                                                 ||
||                                                                        ||
||                                                                        ||
|| ( ) HEX                                                                ||
|| xx  20 20 20 20 20 20 20 20 20 20 20 20 20 20 20                       ||
||                                                                        ||
||                                                                        ||
||                                                                        ||
|| [ Cancel  ] [Copy RCV to EXP] [  Reset  ] [ Refresh ] [  Apply  ]      ||
||                                                                        ||
|+------------------------------------------------------------------------+|
+--------------------------------------------------------------------------+
```

Fig. 3-6: Trace Configuration Window

Step 5 Use the cursor to navigate to the individual fields for configuration.

Step 6 Press **<Return>** to select fields.

For information on the parameter details, refer to the *Entity Properties and Parameters*.

Step 7 Select **[Apply]** to save your settings or **[Cancel]** to return to the main **Config** index card.

3.12 Configuring Tandem Connection Monitoring (TCM)

This procedure describes how to activate tandem connection monitoring (TCM) for a connection. You may activate up to three TCMs for each connection: TCM A, TCM B or TCM C.

Before you activate TCM, you must have a description of which module and port that carries the connection to activate TCMs for, how many TCMs to activate for this connection and which of the six supported TCMs to use for each TCM. This information must be coordinated across the network, and should be available.

Step 1 From the Craft or Web Console open the **Service Management** menu and navigate to the relevant module. See *Chapter 2, Section 2.2.4 "Navigation", p. 2-7* for a description of how to do this.

Step 2 From the moudule submenu, select the relevant channel entity, either the client or network CH facility.

Step 3 Select the **Config** index card. In response, the index card will be displayed resembling *Figure 3-7*.

```
+------------------------------CH-1-11-C, OTU2-------------------------------+
|| 1 State | 2 Fault | 3 Config | 4 Operation | 5 Info | 6 PL Mont |7 DL Mont||
|+------------------+         +-----------------------------------------+|
|| Facility Type:            OTU2                                        ||
|| Termination Level:        OTU                                         ||
|| Stuffing:                 Yes                                         ||
|| Alias:                    [                                    ]      ||
|| OTU BBE Signal Degrade:   15                                          ||
|| OTU SD Integr. Period:    7                                           ||
|| ODU BBE Signal Degrade:   15                                          ||
|| ODU SD Integr. Period:    7                                           ||
|| Forward Error Correction: G709 Standard FEC                           ||
|| ALS Mode:                 NONE                                        ||
|| Error Forwarding Mode:    AIS                                         ||
|| Laser-Off Delay:          Disabled                                    ||
||                                                                       ||
||                                                                       ||
|| [ Cancel  ] [ Refresh ] [  Apply  ] [   TCM   ] [Trace... ]           ||
||                                                                       ||
|+-----------------------------------------------------------------------+|
+-------------------------------------------------------------------------+
```

Fig. 3-7: Configuring TCM

Step 4 To be able to configure TCMs, first set the channel to maintenance mode. To do this, select the **State** card and navigate to the **Admin State**. Change the setting to **Maintenance**. Make a note of the administrative state that the channel was in originally.

```
|| 1 State | 2 Fault | 3 Config | 4 Operation | 5 Info | 6 PL Mont |7 DL Mont||
||         +-------------------------------------------------------------+|
|| Admin State:               [Maintenance]                              ||
```

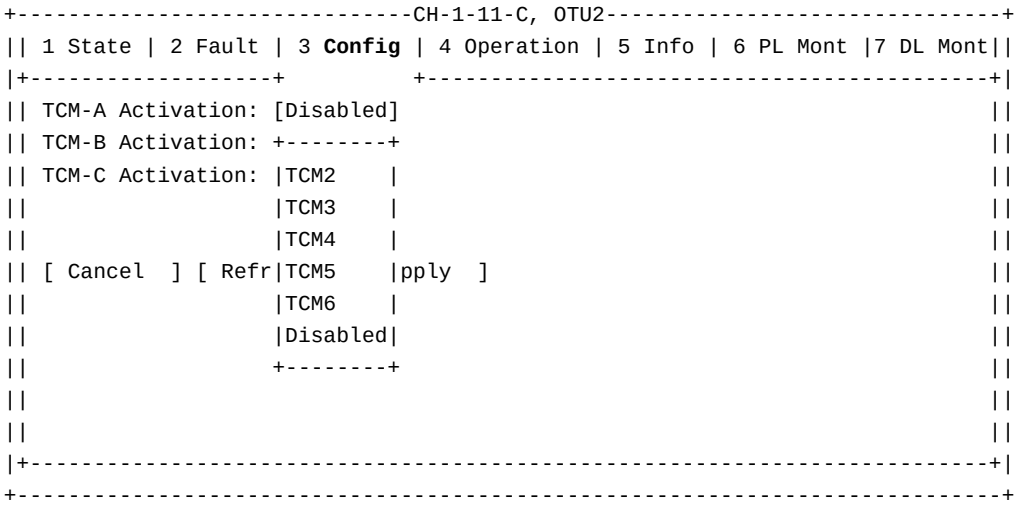
Step 5 Press **[Apply]** to save this setting.

Step 6 To activate a TCM:

a. Select the TCM-A Activation, TCM-B Activation or TCM-C Activation field.

```
+------------------------------CH-1-11-C, OTU2-------------------------------+
|| 1 State | 2 Fault | 3 Config | 4 Operation | 5 Info | 6 PL Mont |7 DL Mont||
|+------------------+         +-----------------------------------------+|
|| TCM-A Activation: [Disabled ]                                         ||
|| TCM-B Activation: [Disabled ]                                         ||
|| TCM-C Activation: [Disabled ]                                         ||
||                                                                       ||
||                                                                       ||
|| [ Cancel  ] [ Refresh ] [  Apply  ]                                   ||
||                                                                       ||
||                                                                       ||
|+-----------------------------------------------------------------------+|
+-------------------------------------------------------------------------+
```

b. From the drop-down list that appears, select the relevant TCMi for this TCM.



c. Select **[Apply]** to apply your choices.

d. Select **[Cancel]** to return to the main **Config** index card.

Step 7 To disable TCM:

a. Select the TCM-A Activation, TCM-B Activation or TCM-C Activation field.

b. From the drop-down list that appears, select **Disabled**.

c. Select **[Apply]** to apply your choice.

d. Select **[Cancel]** to return to the main **Config** index card.

Step 8 After configuring TCM you must put the entity back to the administration state that it was originally. Select the **State** index card and set the Admin State to the original setting.

Step 9 Select **[Apply]** to save the Admin State setting.

Step 10 Select **[Cancel]** to return to the **Service Management** menu.