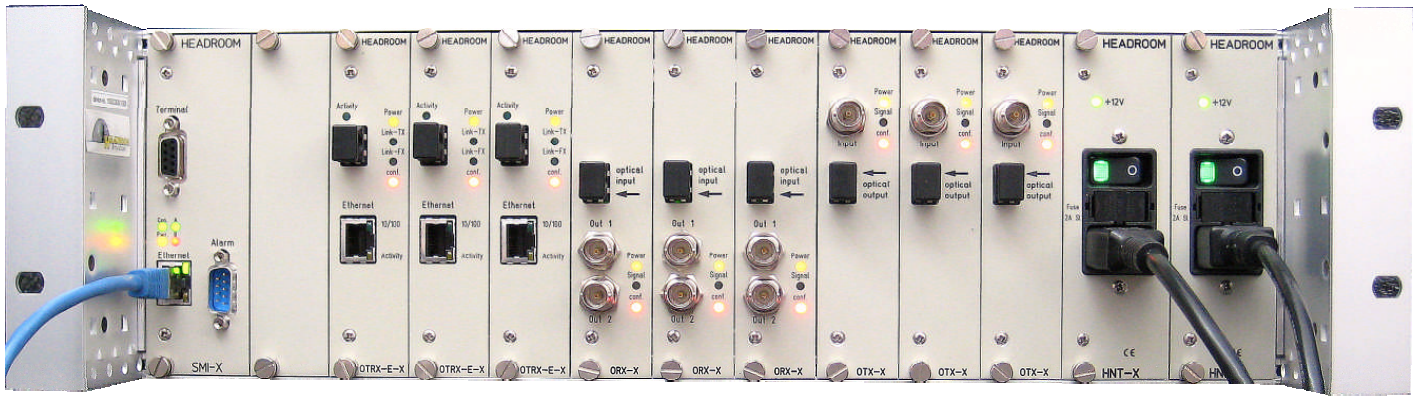
HSM-X

HEADROOM Broadcast

Next Generation Signal Manager

Full Manual



Preface

This document covers the full HEADROOM Broadcast HSM-X system manual including all available modules in their respective hardware and firmware version per 1st of December 2012.

All software features, web-interface and SNMP
as per SMI-X firmware version 3.0 and MIB version 1.13
or firmware 3.1 and MIB 1.14 or later when using the FES-X module
or firmware 3.2 and MIB 1.15 or later when using the OVR-X module.

Further downloads at: http://www.headroom.de/downloads

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Content

1 GENERAL SYSTEM DESCRIPTION AND USAGE 1

1.1 HBB3-X 19-inch Rack Housing 1

1.2 Switching and Groups 2

1.2.1 Groups 2

1.2.2 Automatic and Manual Switching 2

1.2.3 Switching Mode (Mono- or Bistable) 2

1.2.4 Switching Delays 3

2 SYSTEM MANAGEMENT MODULE SMI-X 4

2.1 Quick Start Guide 4

2.2 Connectors 6

2.3 LEDs 6

2.4 Alarm Port Specifications 6

2.5 Management Interfaces 7

2.5.1 Terminal/Telnet 7

2.5.2 SNMP 7

2.5.3 Web Interface (http) 8

3 WEB INTERFACE 9

3.1 Layout 9

3.1.1 Main Menu 9

3.2 Page description 10

3.2.1 SMI-X 10

3.2.2 SMI-X Settings 12

3.2.3 Inventory 16

3.2.4 Slots 17

3.2.5 18

3.2.6 Groups 20

3.2.7 Configuration 21

4 SNMP 23

4.1 MIB 23

4.1.1 hsmxNetworkSettings 23

4.1.2 hsmxControl 23

4.2 Traps 24

5 POWER SUPPLY MODULES 25

5.1 HNT-X 25

5.2 HNT48-X 25
6 FUNCTIONAL MODULES 26
6.1 Overview 26
6.2 OVS-X Optical Video Switch 28
6.2.1 Connectors 28
6.2.2 LEDs 28
6.2.3 Settings (Web interface) 28
6.2.4 29
6.3 EVS-X Electrical Video Switch 30
6.3.1 Connectors 30
6.3.2 LEDs 30
6.3.3 Settings (Web interface) 30
6.4 DAS-44u-X Digital Audio Switch 32
6.4.1 Connectors 32
6.4.2 LEDs 32
6.4.3 Settings (Web interface) 32
6.5 DAS-44s-X Digital Audio Switch 35
6.5.1 Connectors 35
6.5.2 LEDs 35
6.5.3 Settings (Web interface) 35
6.6 DAV-4u-X Digital Audio Switch 37
6.6.1 Connectors 37
6.6.2 LEDs 37
6.6.3 Settings (Web interface) 37
6.7 DAV-4s-X Digital Audio Switch 39
6.7.1 Connectors 39
6.7.2 LEDs 39
6.7.3 Settings (Web interface) 39
6.8 ASI-S-X ASI Switch 41
6.8.1 Connectors 41
6.8.2 LEDs 41
6.8.3 Settings (Web interface) 41
6.9 ASI-V-X ASI Splitter 43
6.9.1 Connectors 43
6.9.2 LEDs 43
6.9.3 Settings (Web interface) 43

6.10 DVV-X Digital Video Splitter (SD) 45
6.10.1 Connectors 45
6.10.2 LEDs 45
6.10.3 Settings (Web interface) 45
6.11 EVV-X Electrical Video Splitter 46
6.11.1 Connectors 46
6.11.2 LEDs 46
6.11.3 Settings (Web interface) 46
6.12 OSP1.5-X Optical Video Splitter 48
6.12.1 Connectors 48
6.12.2 LEDs 48
6.12.3 Settings (Web interface) 48
6.13 OSP-MM-X Optical Multimode Splitter (MADI) 49
6.13.1 Connectors 49
6.13.2 LEDs 49
6.13.3 Settings (Web interface) 49
6.14 OTRXMADI-X 50
6.14.1 Connectors 50
6.14.2 LEDs 50
6.14.3 Settings (Web interface) 50
6.15 OTX-8A-X 52
6.15.1 Connectors 52
6.15.2 LEDs 52
6.15.3 Settings (Web interface) 52
6.16 ORX-8A-X 53
6.16.1 Connectors 53
6.16.2 LEDs 53
6.16.3 Settings (Web interface) 53
6.17 OTX-8As-X 54
6.17.1 Connectors 54
6.17.2 LEDs 54
6.17.3 Settings (Web interface) 54
6.18 ORX-8As-X 56
6.18.1 Connectors 56
6.18.2 LEDs 56
6.18.3 Settings (Web interface) 56

6.19 OTX270-X 58
6.19.1 Connectors 58
6.19.2 LEDs 58
6.19.3 Settings (Web interface) 58
6.20 ORX270-X 59
6.20.1 Connectors 59
6.20.2 LEDs 59
6.20.3 Settings (Web interface) 59
6.21 OTX1.5-X 60
6.21.1 Connectors 60
6.21.2 LEDs 60
6.21.3 Settings (Web interface) 60
6.22 ORX1.5-X 61
6.22.1 Connectors 61
6.22.2 LEDs 61
6.22.3 Settings (Web interface) 61
6.23 OVR-X 62
6.23.1 Connectors 62
6.23.2 LEDs 62
6.23.3 Settings (Web interface) 62
6.24 OTX-ASI-X 63
6.24.1 Connectors 63
6.24.2 LEDs 63
6.24.3 Settings (Web interface) 63
6.25 ORX-ASI-X 64
6.25.1 Connectors 64
6.25.2 LEDs 64
6.25.3 Settings (Web interface) 64
6.26 OTRX-E-X 65
6.26.1 Connectors 65
6.26.2 LEDs 65
6.26.3 Settings (Web interface) 65
6.27 OSM-2-X 66
6.27.1 Connectors 66
6.27.2 LEDs 66
6.27.3 Settings (Web interface) 66

6.28 FES-X 68
6.28.1 Connectors 68
6.28.2 LEDs 68
6.28.3 Settings (Web interface) 68
6.29 SES155-X 70
6.29.1 Connectors 70
6.29.2 LEDs 70
6.29.3 Settings (Web interface) 70
6.30 SEV155-X 71
6.30.1 Connectors 71
6.30.2 LEDs 71
6.30.3 Settings (Web interface) 71
6.31 SOS155-X 72
6.31.1 Connectors 72
6.31.2 LEDs 72
6.31.3 Settings (Web interface) 72
6.32 ORX155-X 73
6.32.1 Connectors 73
6.32.2 LEDs 73
6.32.3 Settings (Web interface) 73
6.33 OTX155-X 74
6.33.1 Connectors 74
6.33.2 LEDs 74
6.33.3 Settings (Web interface) 74
6.34 HS2(s/u)-X 75
6.34.1 Connectors 75
6.34.2 LEDs 75
6.34.3 Settings (Web interface) 75
6.35 HV2(s/u)-X 77
6.35.1 Connectors 77
6.35.2 LEDs 77
6.35.3 Settings (Web interface) 77
7 APPENDIX A: MIB TABLE 79
7.1 Textual Conventions: 83
8 APPENDIX B: TRAP TABLE 84
8.1 Textual Conventions 85

9 APPENDIX C: E1 MODULES RJ45 CONNECTOR PIN CONFIGURATION 87
9.1 HS2s-X 87
9.2 HV2s-X 88
10 APPENDIX D: PIN OUT BALANCED AUDIO MODULES 90

1 General System Description and Usage

The HSM-X is a highly modular system for redundancy or signal interfacing tasks. It is consisting of a 19-inch rack housing of three rack units height. In a standard system a rack would be configured with two independent power supplies, a system controller module called SMI-X and at least one or up to ten signal interfacing modules.

The SMI-X and its SNMP features and Web-interface is described and explained in chapter 2, chapter 3 and chapter 4.

The power supply units are explained in chapter 5.

The HSM-X signal interfacing modules, in this document called functional modules offer a broad range of functions from splitting, automatic switching, converting to embedding.

All HSM-X modules are hot-plug-able.

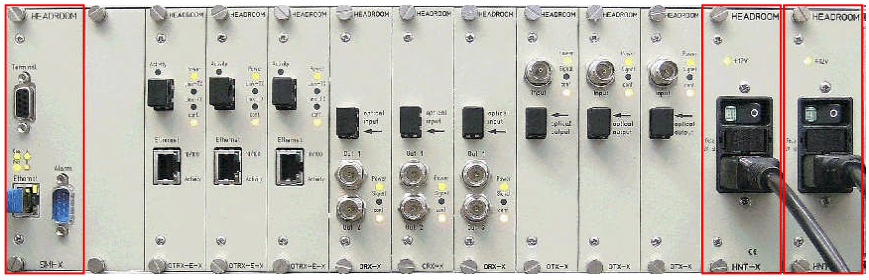
All switches and splitters offer a power fail safety feature in hardware. If there is a problem with the power supply on a module or on a power supply failure of the whole rack the active components will be bypassed. In case of splitters the input signal will be passively connected to the output 1 of the splitter. In case of switches the last switching direction will be held.

The choice of functional modules is steadily growing, so please make sure you have the latest version of this document or contact HEADROOM Broadcast when you are looking for a functional module not covered by this document.

1.1 HBB3-X 19-inch Rack Housing

The HBB3-X offers ten slots for functional modules, one slot for the SMI-X system controller and two slots for redundant power supply units.

All modules are front-connecting, so there are no slots on the backside of the rack housing.
The modules are placed vertically into the rack.
The SMI-X is only allowed to be placed on the most left slot, called slot zero.
The two slots on the very right side of the rack are reserved for the power supplies.
A functional module is allowed in any slot from number one to slot number ten.



Picture 1 HHB3-X Example Configuration

1.2 Switching and Groups

Many of the functional modules of the HSM-X system are switches for audio, video or telecommunication signals. Those switches are used for automatic switching between two redundant signals (main and reserve) or remote switching. All switches share the same basic functionality.

1.2.1 Groups

Switches can be grouped into up to 5 groups[1] per rack, so that correspondent video and audio signals can be switched simultaneously when one of the signals within the group fails. A group with concurrent input failures will remain in the last position until the failure on the other direction is removed. (Example: a group consisting of modules X and Y switched to B after input A on module X failed. The group remains at B even if input B on module Y fails until the failed signal on input A of module X is “fixed”).

See section 3.2.6

1.2.2 Automatic and Manual Switching

All switches work autonomously, independently and automatically granting the most failsafe and fastest reaction on input failures. The switches however can be set to manual mode so no automatic switching on input signal failure occurs.
The switch direction is selectable in both modes via web interface or SNMP. While in automatic mode the switch will not be able to be forced to switch on a failed input. In non-automatic mode the switch will remain on a input even if the signal fails and will also switch to a input with failed signal when forced.

This applies to single switch units as well as to groups.

See section 3.2.4.2 and section 3.2.5.1

1.2.3 Switching Mode (Mono- or Bistable)

Single switch modules, units within a module or groups can be configured to be mono- or bistable.
If a switch or group is configured monostable input A becomes dominant, so that as long as input A is o.k. the switch will be in position A or return to a position A if the signal on input A is “fixed”.
If a switch or group is configured bistable input A and input B become equal, so the switch or group will remain in the last switching position as long as its input is o.k..

See section 3.2.4.2 and section 3.2.6.2

[1] Modules with more than one switch unit are only allowed in one group. Each switch unit can be configured independently to be in this group or not.

1.2.4 Switching Delays

All Switches offer delays for their automatic function, so smaller discontinuities in the signal will not lead to an over-reactive behaviour. Such discontinuities can sometimes be very short failures of the signal, but very often just caused by program changes like changeover of sources. In the least case there will be a very short signal disruption (which is not a failure) but will be detected by the input monitor of a switch. Switching delays will filter such events and keep the system stable.
All switches offer independent settings for switching from input A to B and back.

This applies to single switch units as well as to groups.

See section 3.2.4.2 and section 3.2.6.2

2 System Management Module SMI-X

2.1 Quick Start Guide

1. Insert SMI-X into slot 0 from HSM-X rack. Slot 0 is the most left slot. Do not insert SMI-X in any other slot.

2. If HSM-X is switched off, switch it on.

3. Use a crossed serial cable (RS232) to connect your PC to the "Terminal" SUB-D port on the SMI-X. You have to use a 1:1 cable if you have the new SMI-X, please refer to Pict 1 on page 5 to find which version you have.

4. Open a terminal program like "HyperTerminal" and make following settings:

```
Baud rate: 9600
Data bits: 8
Parity: none
Stop bits: 1
Handshaking: none
```

5. If your terminal program has a connection to SMI-X, press "Enter". You will get a prompt '#>'. Now type 'info' and a command list will be displayed. To get settings only type the command. The shown values are status values. If values in brackets '(value)' are displayed, these are the configured values. If you want to change settings type the command and additional options. Type the command with a '?' to get a list of options for this command. For example: network?

6. Make following settings:

1. Set IP address, subnet mask, gateway

```
example:    network ip=192.168.100.25
```

2. If you want to synchronize system time with a sntp server make corresponding settings

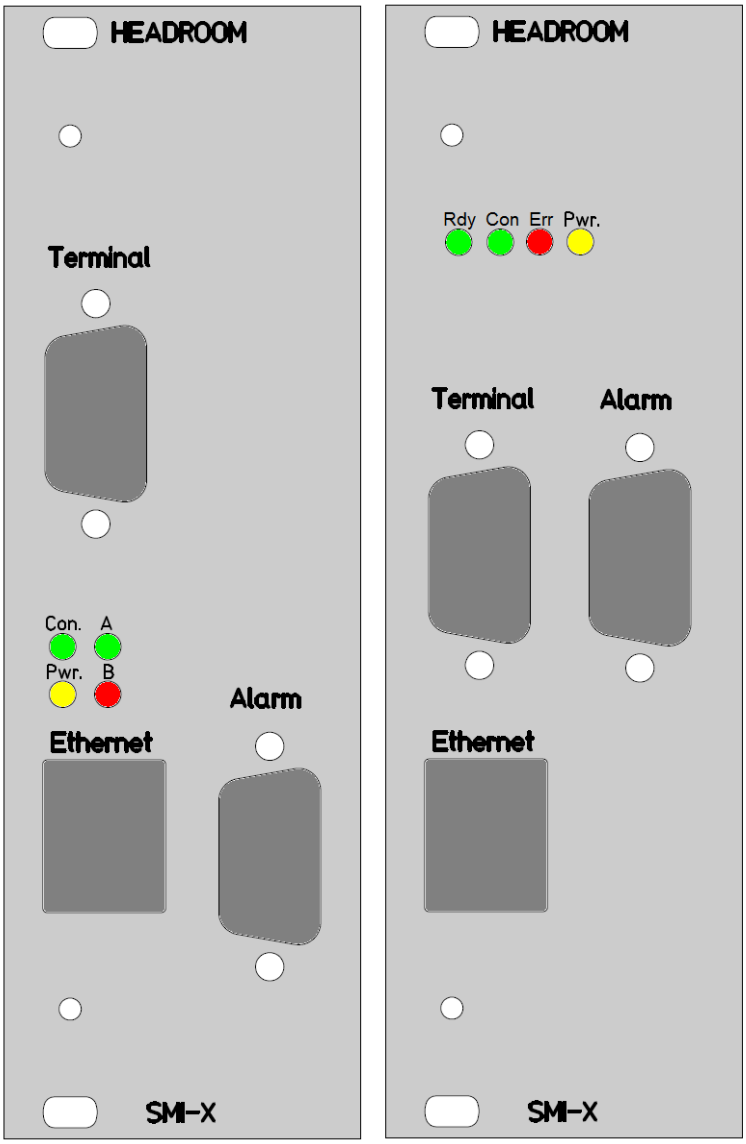
3. Set local time difference to GMT (Default: +1h for Berlin/Germany)

4. Set all SNMP settings you want. To change the read and write community you always have to know the old one. Factory settings are:

```
read community:   public
write community:  private
```

7. When you finished configuring all settings reboot SMI-X by typing '`reboot`'. After the reboot check your settings for confirmation! If everything is set correct go ahead, if not please try again.

8. Connect the SMI-X to your network. The HSM-X system is now manageable via telnet, http and SNMP.



Pict 1: Old (left) and new (right) SMI-X front

2.2 Connectors

Terminal: RS-232 SUB-D 9 Connector for basic settings
(see “First Steps”)

Ethernet: Ethernet Port 100/10 Mbit

Alarm: SUB-D 9 Connector for basic monitoring of the HSM-X rack. Three Relays providing alarm loops for

Relay 1: power supply unit 1 fail/ok
Relay 2: power supply unit 2 fail/ok
Relay 3: network connection fail/ok
(corresponds to LED “Con.”)

2.3 LEDs

"Con." (green):
On: SMI-X is connected to network
Off: no cable connection, no valid IP address or
IP address conflict

"Pwr." (yellow):
On: Power On
Off: Power Off

A (green):
On: SMI-X is ready, initialisation done
Off: SMI-X is not ready

B (red):
On: Alarm (power supply, module alarm or signal alarm of any module)
Off: No Alarm

2.4 Alarm Port Specifications

All relay loops consist of 3 pins: common, open and closed. Their pin positions within the Sub-D Alarm Port are described in Table 1.

Their functionality is described in Table 2. The table shows the state fore the default-opened pin of each relay loop, the default-closed pin will act in inverted manner.

The resistance per loop is approximately 50 Ω.

Table 1 Pin Assignment

Pin Name	Relay 1	Relay 2	Relay 3
Common (input)	6	3	9
Opened* (output)	1	7	4
Closed* (output)	2	8	5

Table 2 Relay States

State	Relay 1 (power supply 1)	Relay 2 (power supply 2)	Relay 3 (ethernet connection)
OK	Closed	Closed	Opened
Fail	Opened	Opened	Closed
SMI-X powerless	Opened	Opened	Opened

2.5 Management Interfaces

Login: For Telnet and Web Interface username and password are required. The default setting is:

Username: smixadmin

Password: smixadmin

You are able to modify these setting via the web interface.

2.5.1 Terminal/Telnet

The Terminal is required to make first settings, see above.
If the SMI-X is connected to Ethernet and a correct IP address is set, you can reach the terminal console via Telnet too.

2.5.2 SNMP

Load the SMI-X-MIB into your SNMP-Manager. If SMI-X is connected to a network, you can check the current status of the HSM-X and its modules.

When status changes occur the SMI-X sends corresponding traps to up to three different trap target addresses. These addresses should be those of your SNMP-Manager(s) with loaded SMI-X MIB. Please contact HEADROOM Broadcast[2] if you don't have the HSM-X MIB.

* in powerless state
[2] mib@headroom.de

Community passwords:

```
Default read community: public
Default write community: private
```

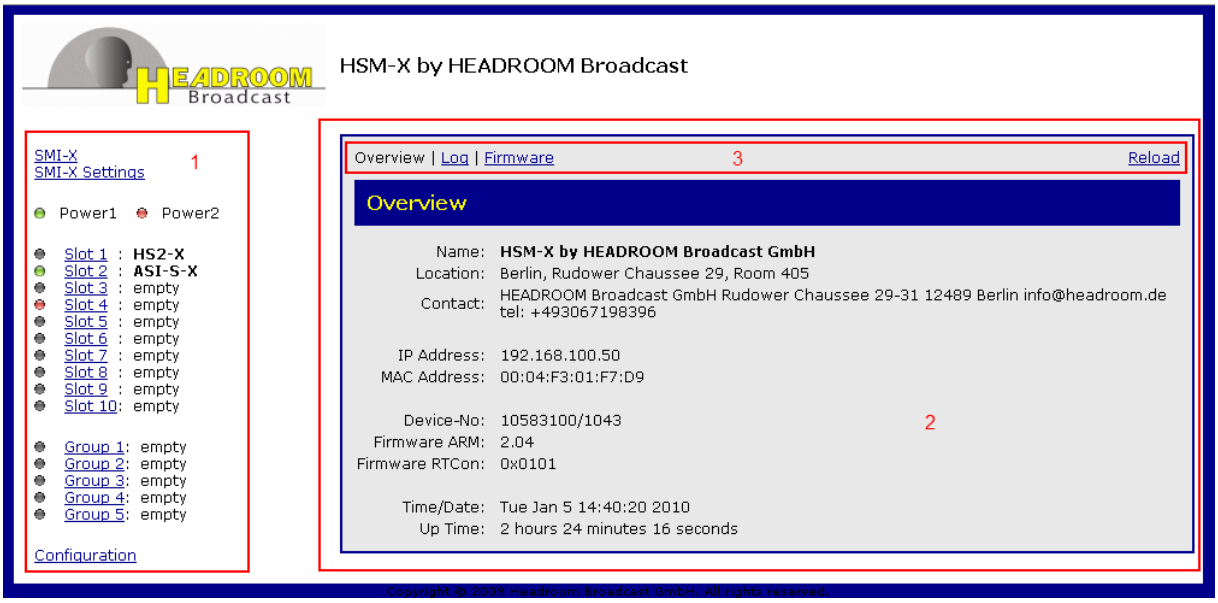
See Chapter 4 for further explanations.

2.5.3 Web Interface (http)

All settings for SMI-X and modules can be done here. See Chapter 3 for further explanations.

3 Web interface

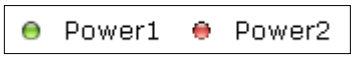
3.1 Layout



The SMI-X page layout is divided in three parts:
1: Main Menu with main links, status LEDs and slot/group overview
2: Main Window for controlling, monitoring and configuring
3: Sub Menu for different subsections

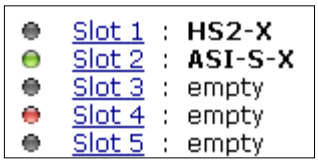
3.1.1 Main Menu

3.1.1.1 Power LEDs



Green: OK
Red: Error

3.1.1.2 Subrack Slot LEDs and Links



Off:	No module or module does not belong to current configuration
Green:	Module belongs to current configuration and has no alarms
Red:	Missing or wrong module

Red blinking: Module belongs to current configuration but has alarms (not shown here)

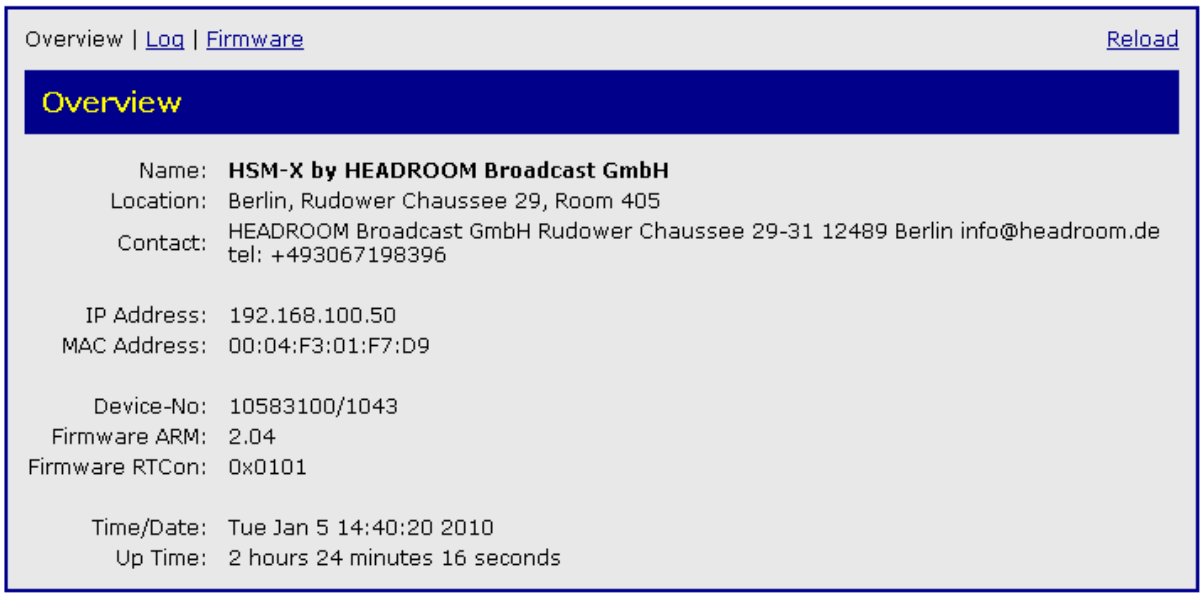
3.1.1.3 Module Group LEDs and Links

Off: Group does not belong to current configuration
Green: Group belongs to current configuration and has no alarms
Red: Group belongs to current configuration but its modules are missing
Red blinking: Group belongs to current configuration but has alarms (not shown here)

3.2 Page description

3.2.1 SMI-X

3.2.1.1 Overview



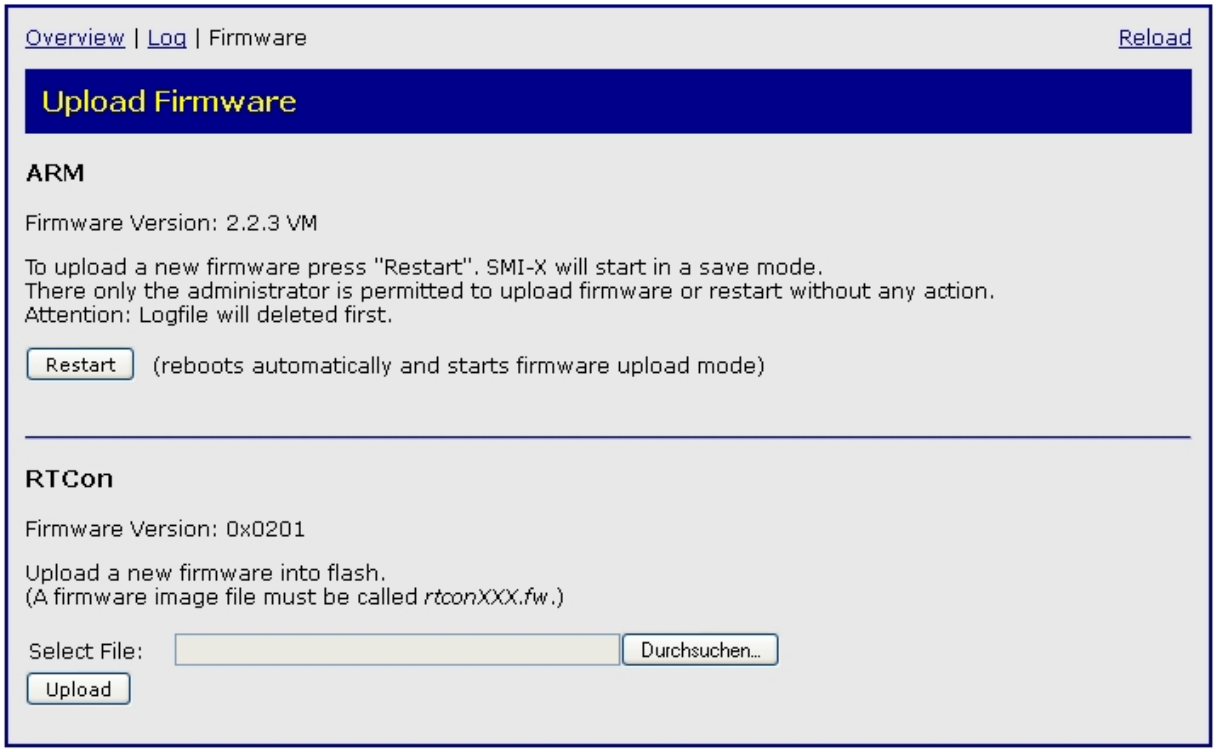
Name, Location and *Contact* are individually and can be set at "SMI-X Settings->SNMP". *Name* and *Location* (and additional *Description*) are sent with each SNMP trap.
The unique *Device-No* can also be found at the SMI-X module circuit board
The *Firmware ARM* number is the current version of the main controller firmware. The Firmware RTCon number is the current version of the real time controller handling the module communication.

The Overview page refreshes automatically.

3.2.1.2 Log

The Log page contains a link to download the system log file. You have the generate a link each time you want to download the log. It will create unique file name which prevents caching algorithms of your browser to falsely give you an old cached copy of the log.

3.2.1.3 Firmware



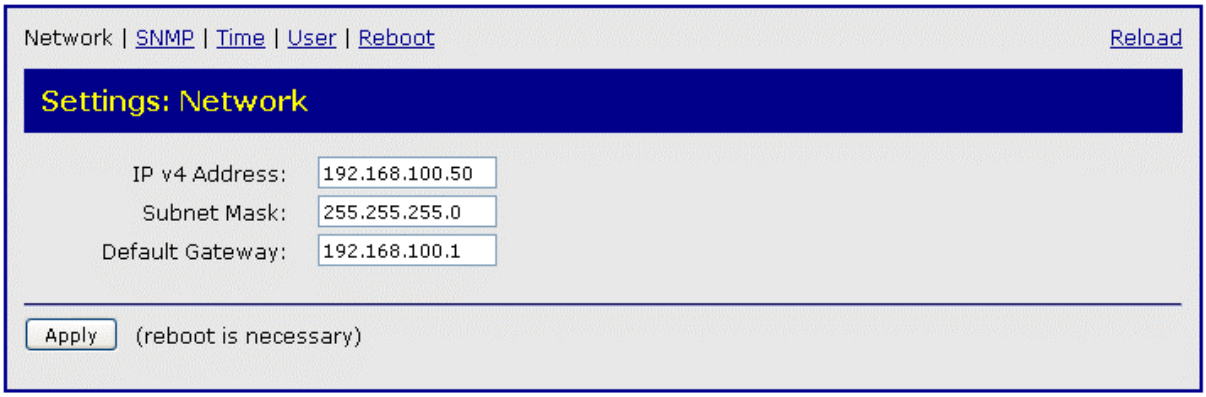
To upgrade the main controller “ARM” you have to reboot into a special upgrade mode. Click restart to do so. In upgrade mode select and upload the provided firmware file “image.bin”. Please be careful and patient. Uploading the ARM firmware file can take some minutes.

Downgrading to a lower version is never recommended. Please contact HEADROOM Broadcast if you are troubled with the current firmware version.

After uploading the RTCon firmware a reboot is not required but recommended.

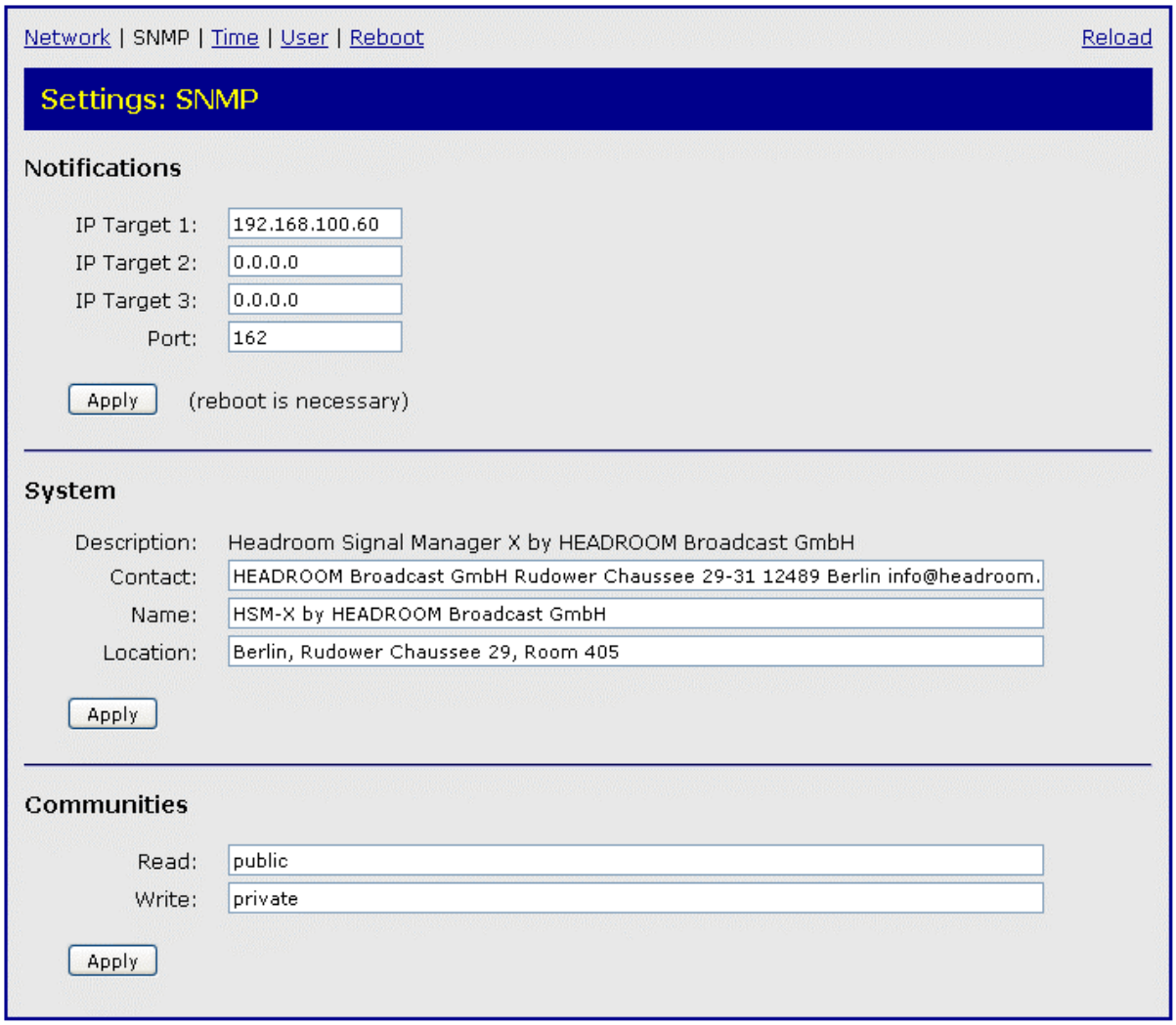
3.2.2 SMI-X Settings

3.2.2.1 Network



Apply your network settings here.

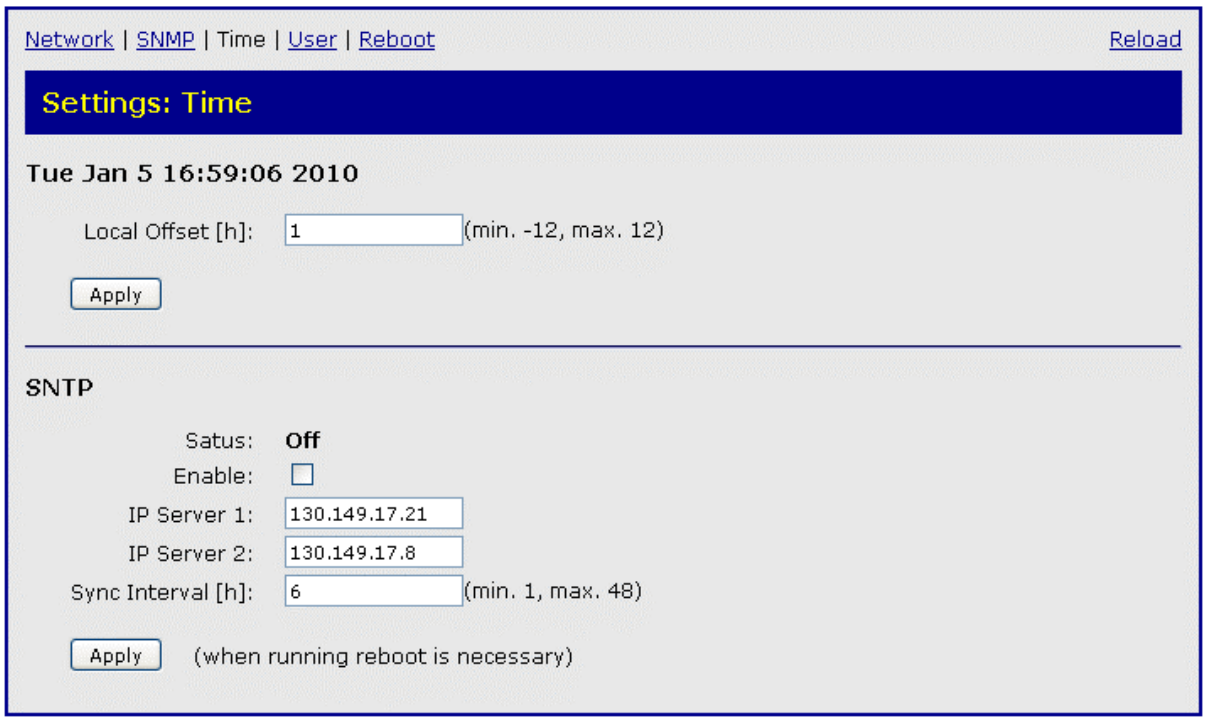
3.2.2.2 SNMP



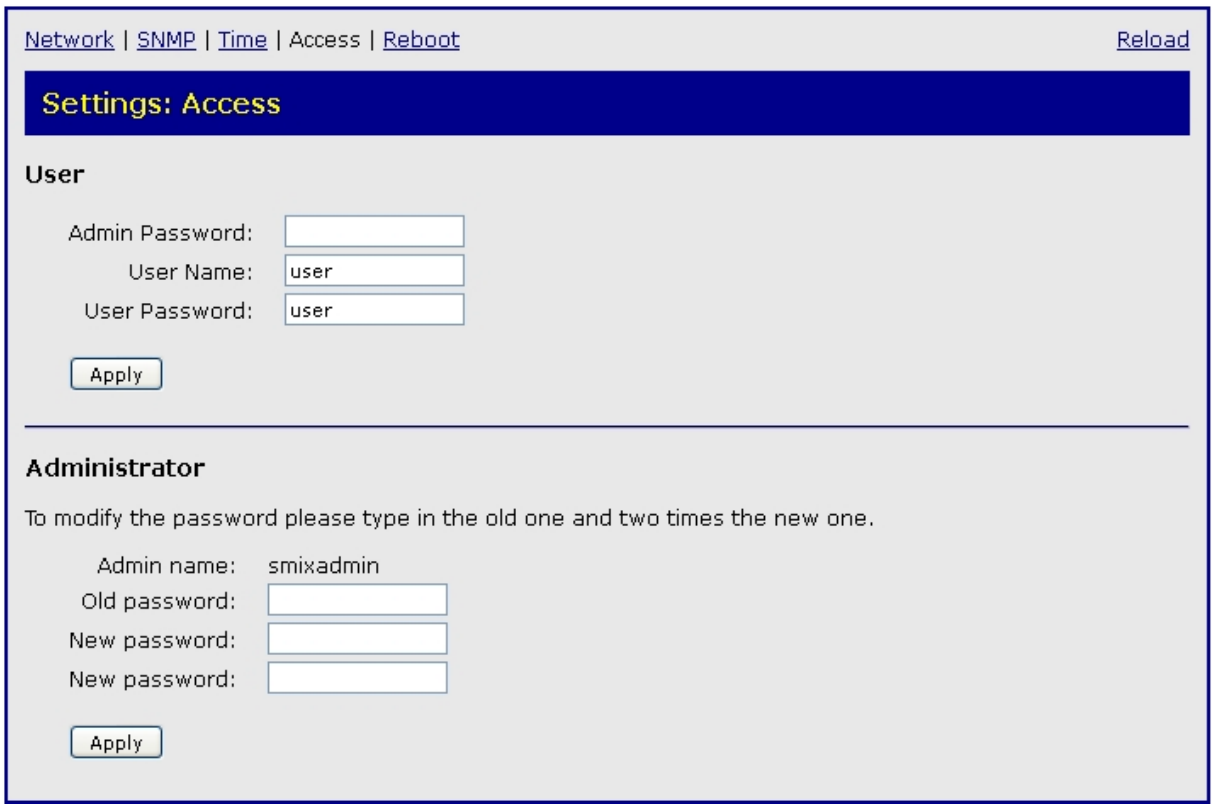
System Description, Name and *Location* are sent with each notification (trap).

3.2.2.3 Time

Local Offset is the time difference to UTC (GMT).



3.2.2.4 Access



The default password is “smixadmin” and should be modified.

The user account offers read-only access to the status pages of the web interface. You can set the name and password here.

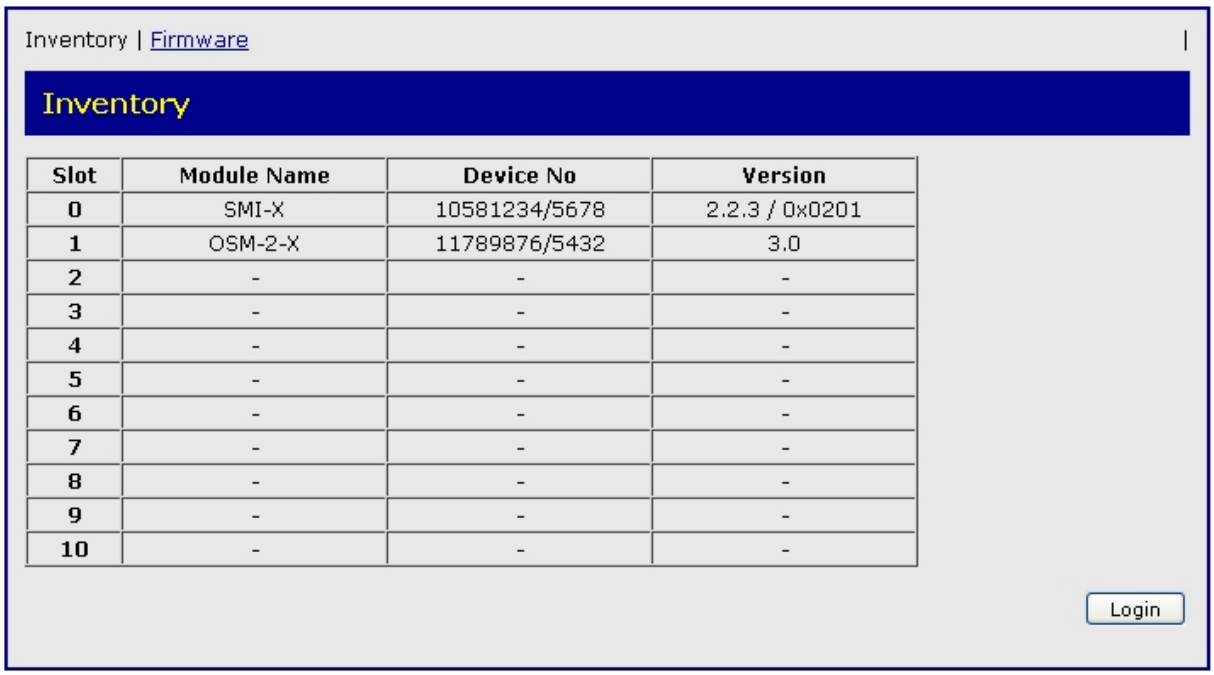
3.2.2.5 Reboot

A button for rebooting the SMI-X.

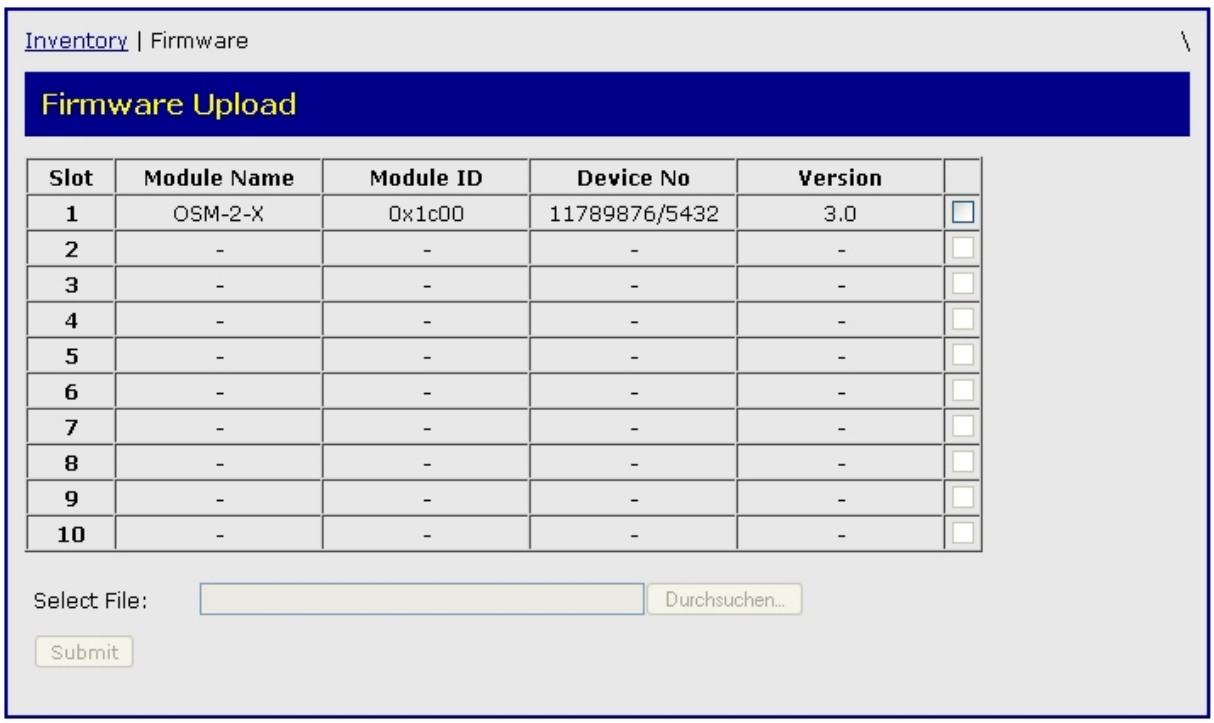
3.2.3 Inventory

3.2.3.1 Inventory Page

The inventory page gives an overview of all modules by name sorted after their location in the rack, with their correspondent serial number and firmware version.



3.2.3.2 Module firmware upgrade



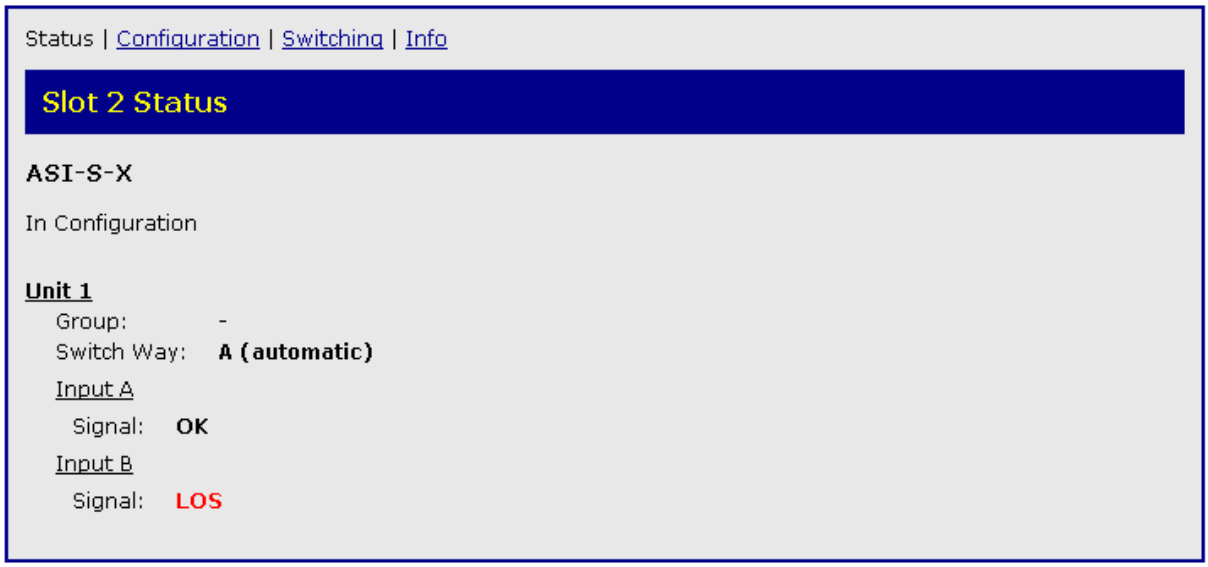
Modules can be upgraded if their version is newer than 3.0. You can select the module you want to upgrade and then select the firmware file that was given to you. You can select multiple modules and upgrade them at once if they are of the same kind.

Please do not pull the network connection or a module out of the sub rack when upgrading modules. Modules might be damaged in the process!
Modules whose firmware upgrade was unsuccessfully will read "No valid Firmware!" in the inventory. You can retry to upgrade them as described.

3.2.4 Slots

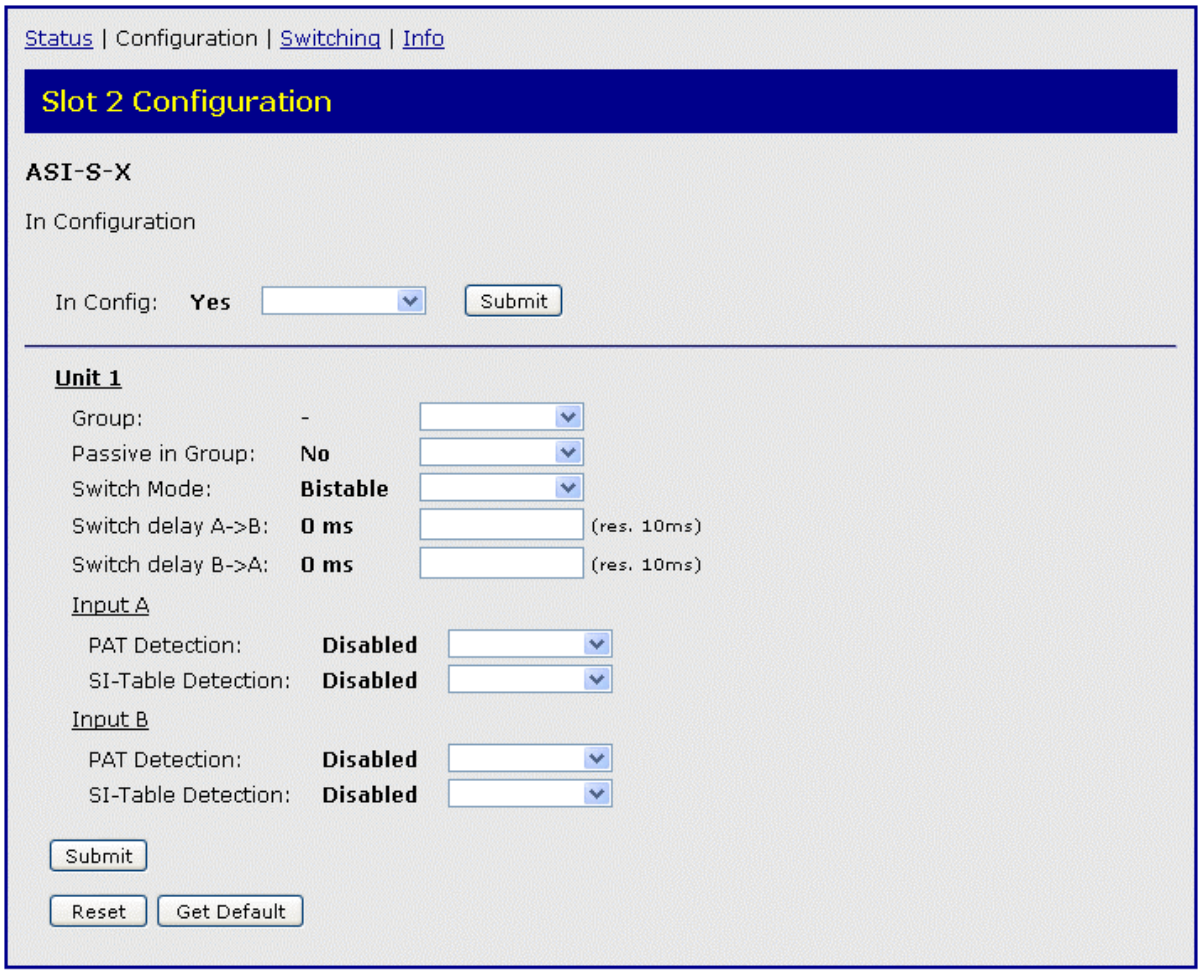
This example shows an ASI-Switch (ASI-S-X) module in slot 2.

3.2.4.1 Slot Status



All status pages and the SMI-X Overview page refresh after status changes.

3.2.4.2 Slot Configuration



3.2.5

In Config: To drop the module from configuration, select this point with drop down button and press submit. A module has to be added to the configuration so its errors generate SNMP notifications.
Group: Module can be assigned to a group.
Passive in Group: A passive module in a group does not cause the group to switch, but switches with the group. This parameter has no effect, if the module is not assigned to a group.
Switch Mode: In “Monostable” mode, module switches always to input A if signal A is valid (has no errors). In “Bistable” mode, switch hold its last valid input position.
Switch delay A->B: The time a signal error at input A has to be present before switching to input B. Minimum 0, maximum 655 350ms
Switch delay B->A: The time a signal error at input B has to be present before switching to input A. Minimum 0, maximum 655 350ms

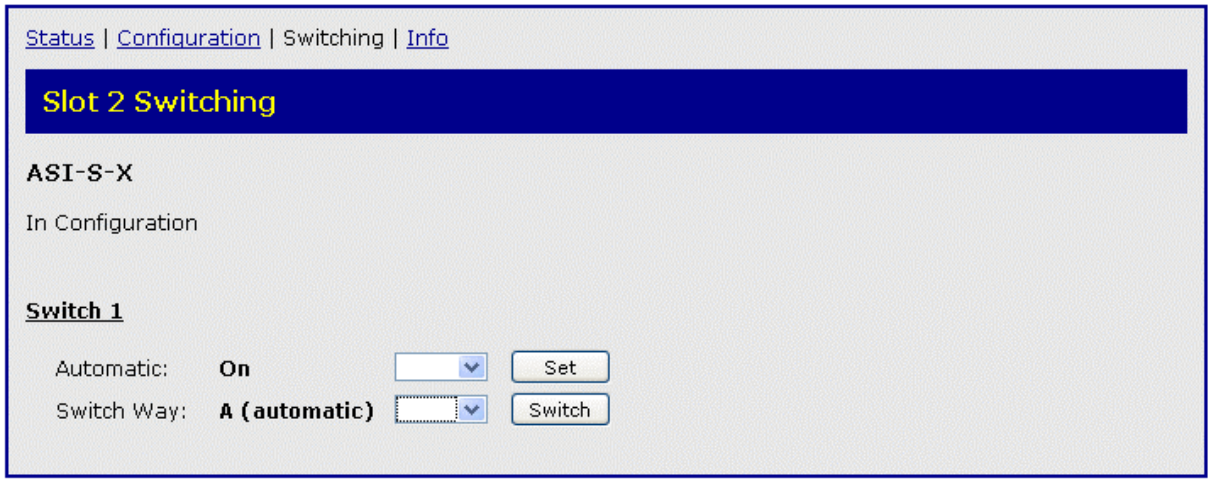
Buttons:
Submit: sends entered or selected values to module and configuration
Reset: resets only displayed values, configuration is not changed

Get Default: displays all default values, configuration is not changed

3.2.5.1 Slot Switching (Switches only)

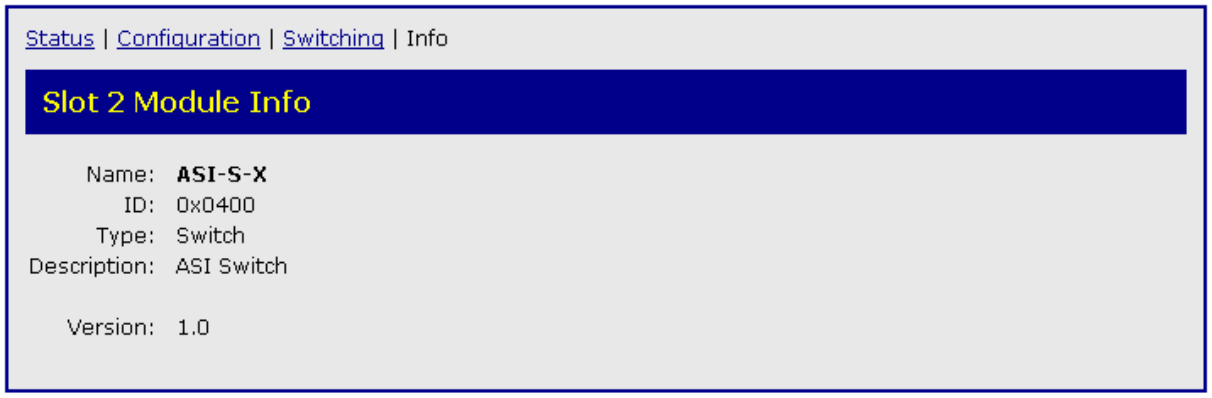
This page refers to for manually switching only. These parameters are only sent to module and are not part of the configuration (are not stored).

Automatic: If automatic is on, it is only possible to select an input with a valid signal.
Switch Way: Switch to input A or B. If automatic is off, switch will never change its position by itself.



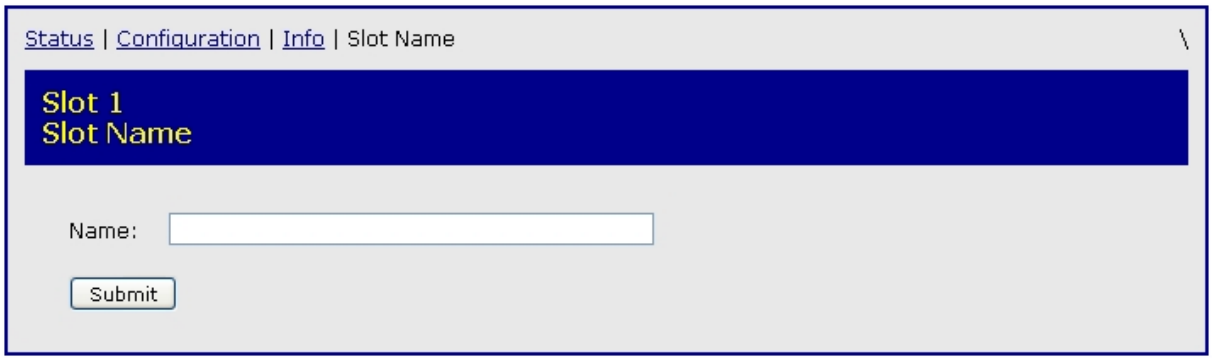
3.2.5.2 Slot Info

This page displays some information about the module.



Name: Name of the module
ID: Internal module ID, important for bug report
Type: Type of the module. Can be: Switch, Splitter, Converter, Other
Description: Short module description
Version: Module firmware version

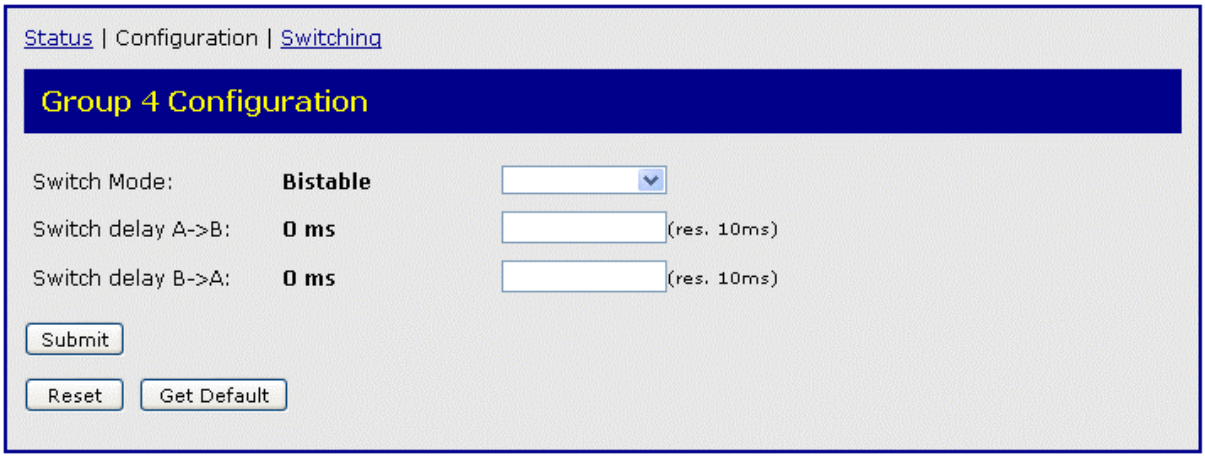
3.2.5.3 Slot Name



You can set a useful name for the slot (for instance network or service name that is managed in the corresponding slot).

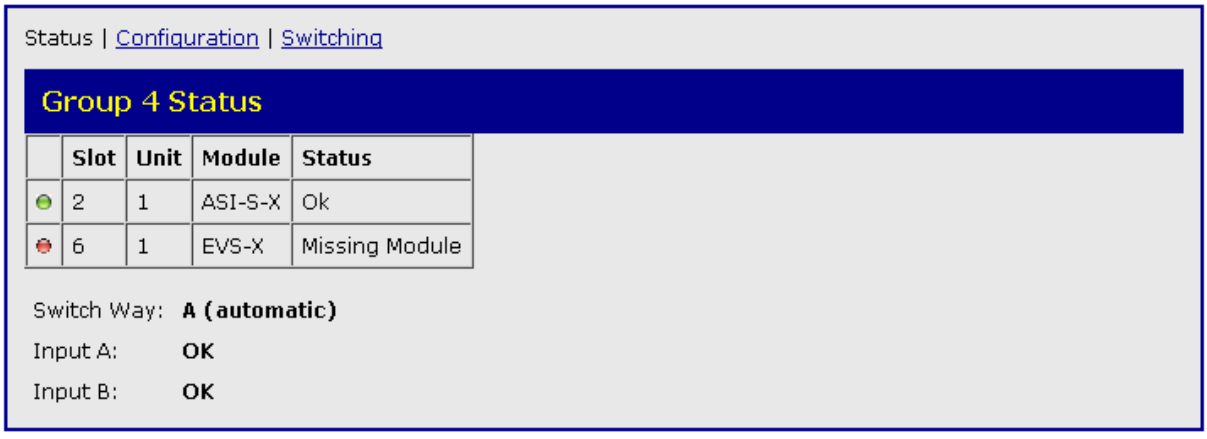
3.2.6 Groups

3.2.6.1 Group Status



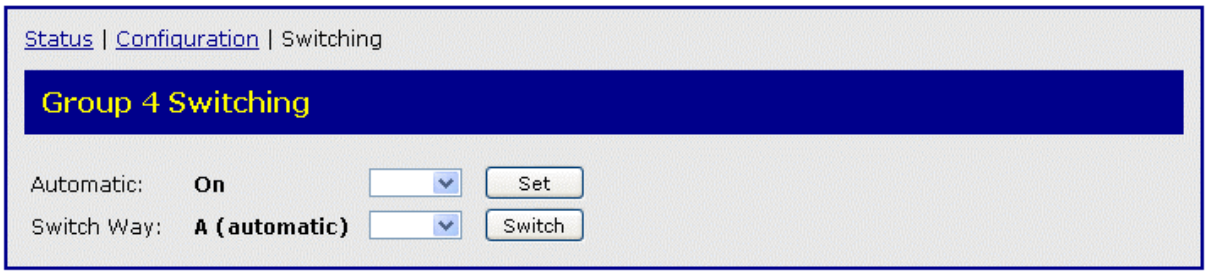
This is the status of group 4. It contains two modules, ASI-S-X and EVS-X. ASI-S-X has valid signals, EVS-X is missing.

3.2.6.2 Group Configuration



Switch Mode: In “Monostable” mode, group switches always to input A if signal A is valid (has no errors). In “Bistable” mode, switch hold its last valid input position.
Switch delay A->B: The time a signal error at input A has to be present before switching to input B. Minimum 0, maximum 655 350ms
Switch delay B->A: The time a signal error at input B has to be present before switching to input A. Minimum 0, maximum 655 350ms

3.2.6.3 Group Switching

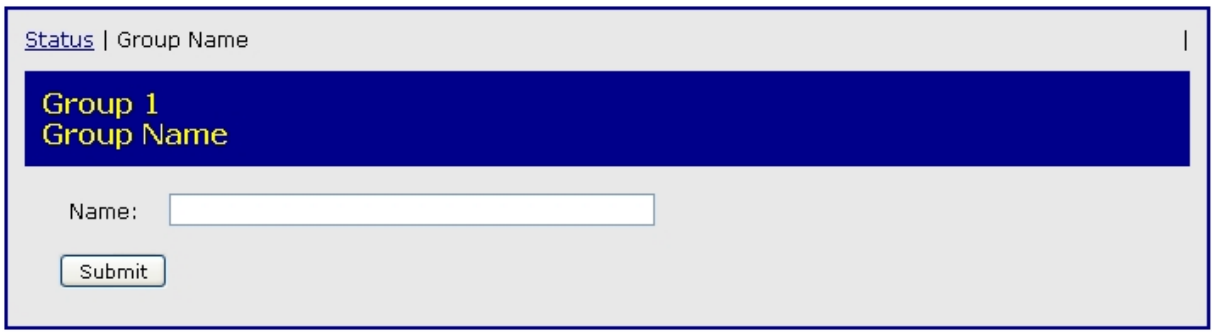


This page refers to for manually switching only. These parameters are only sent to modules in group and are not part of the configuration (are not stored).

Automatic: If automatic is on, it is only possible to select an input with a valid signal.
Switch Way: Switch to input A or B. If automatic is off, switch will never change its position by itself.

3.2.6.4 Group Name

You can set a useful name for the group (for instance network or service name that is managed in the corresponding group).



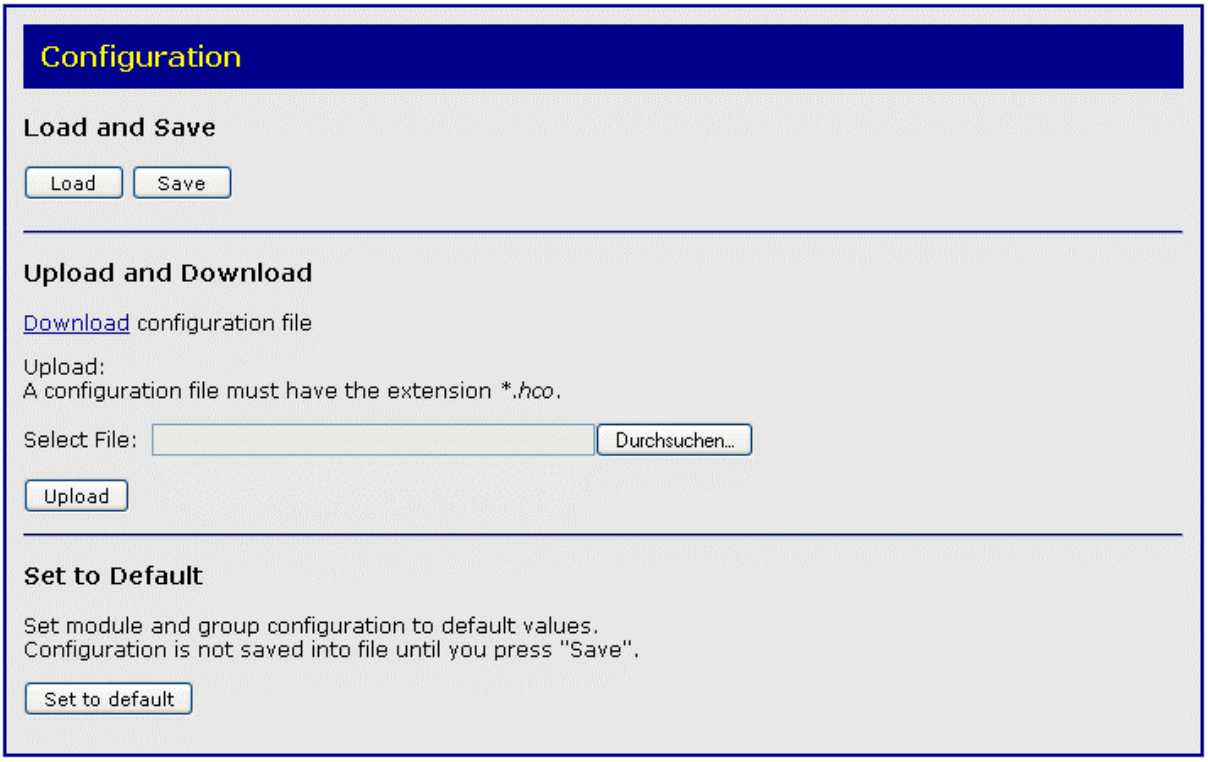
3.2.7 Configuration

Load and Save
When pressing “Load” the current configuration is overwritten by the content of the internal configuration file.
When pressing “Save” the current configuration is stored in the configuration file.

Upload and Download

Pressing “Download” saves the binary configuration file to the PC.
After uploading a binary configuration file, “Load” has to be pressed for reading the file and replacing the current configuration.

Set to Default
Sets the whole configuration - including all slot/module and group settings - to default values (empty). The configuration file is not modified.



4 SNMP

The SMI-X supports SNMP V.2c.

SNMP can be used to monitor system status, checking parameters and manual switch inputs on switch modules or groups.

For all SNMP settings see section 3.2.2.2

4.1 MIB

If you do not have the HEADROOM-HSMX-MIB (filename HEADROOM-HSMX-MIB_V1.15.my) please contact: mib@headroom.de.

Please make sure you have the current version[3] of the MIB installed.

The MIB is consists of three parts. Beside the traps you will find hsmxNetworkSettings and hsmxControl.
See APPENDIX A for detailed representation of the HEADROOM-HSMX-MIB

4.1.1 hsmxNetworkSettings

All items are READ-only, settings can only be made in the Web-interface.

4.1.2 hsmxControl

4.1.2.1 rack

State of the power supply modules

4.1.2.2 smix

not implemented yet

4.1.2.3 hsmxSlotTable

best viewed in table view
overview for functional modules in the rack
input states
switch settings and states, settings for the switches are READ/WRITE (automatic on/ off and forced switching via SNMP)

4.1.2.4 hsmxGroupTable

best viewed in table view
overview for groups
input states
group settings and states, settings for the switch groups are READ/WRITE (automatic on/ off and forced switching via SNMP)

[3] HEADROOM-HSMX-MIB Version 1.15 from the 1st of December 2012

4.2 Traps

All SMI-X traps are notifications. A typical trap looks like this example

OID	Name	Objects, Values
.25362.15.0.3	hsmxTrapSwitch	slotNumber, evSwitch, evSwitchStatus, sysDescr, sysName, sysLocation, evDateAndTime

In this case a notification will be sent telling a switch event occurred with the values slotNumber i.e. which module, evSwich i.e. which switch unit of the module, evSwitchStatus i.e. what happened (Example: the module in slot *10*, unit *1* switched automatically to *A*)

You'll find all notifications and their values as string representation in Appendix B.

5 Power supply modules

A HSM-X is powered by two independent and decoupled power supply modules. Only one power supply is needed thus the second offering redundancy in function. In case of failure of a single power supply module a SNMP trap will be issued[4].

5.1 HNT-X

Connector	IEC-plug
Input:	85-272 V AC
(System internal output:	12V DC)

The fuse housing door is accessible from the module front. It holds two fuses (2A slow each) in neutral and live wire.

5.2 HNT48-X

Connector	D-Sub 3 Mixed Power
Input	32-75 V DC
(System internal output:	12V DC)

[4] See Section 4.2Traps

6 Functional Modules

6.1 Overview

Converters
- Audio
  - ORX8-As-X, single opt. to 8x el. AES3 56
  - ORX8-A-X, single opt. to 8x el. AES3(i) 53
  - OTRXMADI-X, MADI bi.dir. e/o/e-Converter 50
  - OTX-8As-X, 8x el. AES3 to single opt. 54
  - OTX8-A-X, 8x el. AES3(i) to single opt. 52
- Network
  - ORX155-X, STM1 155Mbit o/e Conv. 73
  - OTRX-E-X, 100Mbit bidirect. opt./ el. 65
  - OTX155-X, STM1 155Mbit e/o Conv. 74
- Video
  - ORX1.5-X, SDI HD/SD opt. to el. 61
  - ORX270-X, SDI opt. to el. 59
  - ORX-ASI-X, ASI opt. to el. 64
  - OTX1.5-X, SDI HD/SD el. to. opt. 60
  - OTX270-X, SDI el. to. opt. 58
  - OTX-ASI-X, ASI el. to. opt. 63

Monitor
- Network
  - OSM-2-X, dual Monitor for optical Links 66

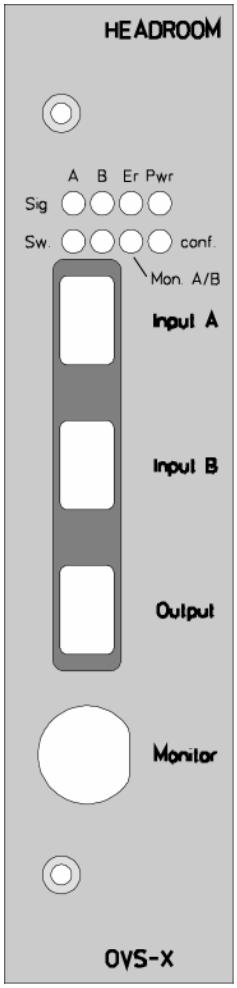
Repeaters
- Video
  - OVR-X, SDI HD/SD, ASI opt. Repeater 62

Splitters
- Audio
  - DAV-4s-X, Digital Audio Splitter, sym. 39
  - DAV-4u-X, Digital Audio Splitter, unsym. coaxial 37
  - OSP-MM-X, Optical MADI Splitter, Multimode 49
- Network
  - HV2(s/u)-X, E1 2Mbit Splitter bal./unbal. 77
  - SEV155-X, STM1 155Mbit Splitter 71
- Video
  - ASI-V-X, ASI Splitter 43
  - DVV-X, Digital Video Splitter, SD 45
  - EVV-X, Electrical Video Splitter, HD/SD 46
  - OSP1.5-X, Optical Video Splitter, HD/SD 48

Switches
- Audio
  - DAS-44s-X, Digital Audio Switch, sym. 35
  - DAS-44u-X, Digital Audio Switch, unsym. coaxial 32

Network
FES-X, 100Mbit electrical Backup Switch 68
HS2(s/u)-X, E1 2Mbit Switch bal./unbal. 76
SES155-X, STM1 155Mbit electr. Switch 70
SOS155-X, STM1 155Mbit optical Switch 72
Video
ASI-S-X, ASI Switch 41
EVS-X, Electrical Video Switch, HD/SD 30
OVS-X, Optical Video Switch, HD/SD 28

6.2 OVS-X Optical Video Switch



This optical SDI switch provides optical switching of the video signals.
Both inputs signals are split 50:50, where the 10% signal is used for status detection.
Optional one electrical output for monitoring can be used.
In case of power fail the last switching path will be hold.
The switching delay can be set by software.

6.2.1 Connectors

Input A and Input B opt. HD-/SD-SDI signal acc. to. SMPTE 292M / 259M
1,485Gbps / 270 Mbps LC-connector

Output opt. HD-/SD-SDI signal acc. to. SMPTE 292M / 259M
1,485Gbps / 270 Mbps LC-connector

Monitor el. HD-/SD-SDI signal acc. to. SMPTE 292M / 259M
1,485Gbps / 270 Mbps BNC 75 Ω

6.2.2 LEDs

Signal A; green input A is locked to SDI, TRS-Detection
Signal B; green input B is locked to SDI, TRS-Detection

Error; red lit on input signal failure or missing embedded AES (audio detection enabled)
Power; yellow indicates power supply o.k.

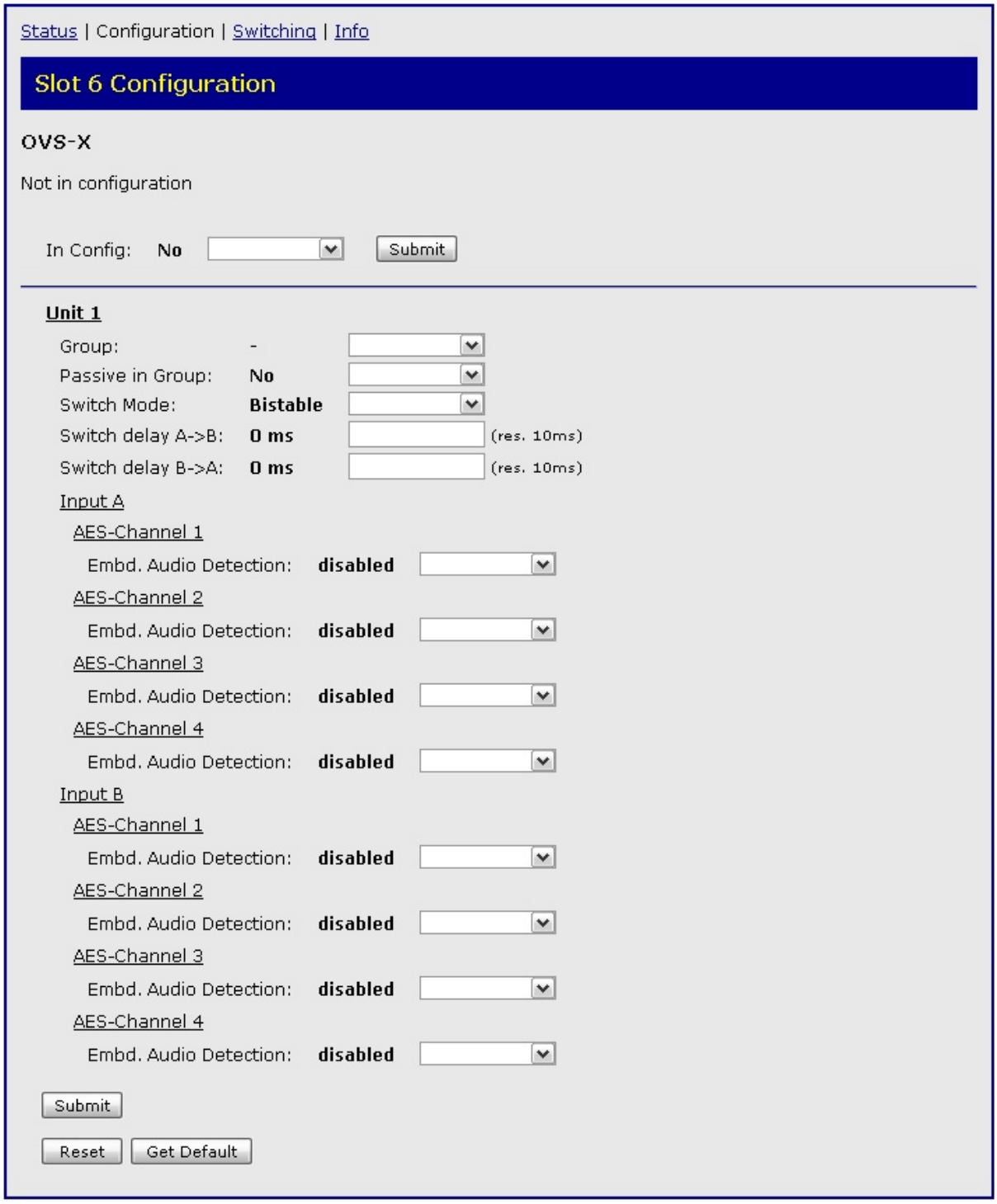
Switch A; green
Switch B; green either signal A or B, indicating the switch position

Monitor A/B; green monitor output is set to input A when lid
Configured; orange lit when module is in the configuration (monitored via SNMP)

6.2.3 Settings (Web interface)

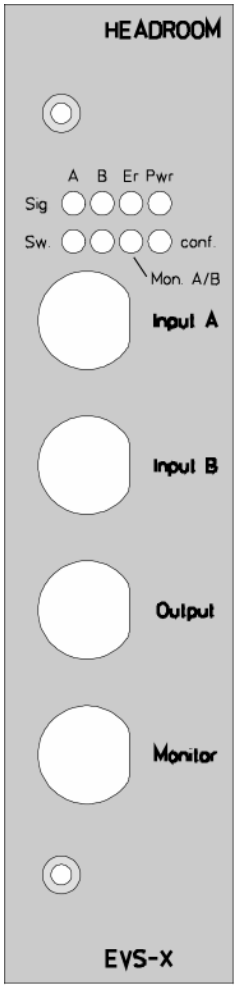
All non module specific settings are described in section 3.2.4.2

All embedded audio channels of HD/SD-SDI signals can be used as switch criteria. Therefore audio channel detection can be enabled individually per channel and input.


Status | Configuration | Switching | Info
Slot 6 Configuration
OVS-X
Not in configuration
In Config: No
Submit
Unit 1
Group: -
Passive in Group: No
Switch Mode: Bistable
Switch delay A->B: 0 ms (res. 10ms)
Switch delay B->A: 0 ms (res. 10ms)
Input A
AES-Channel 1
Embd. Audio Detection: disabled
AES-Channel 2
Embd. Audio Detection: disabled
AES-Channel 3
Embd. Audio Detection: disabled
AES-Channel 4
Embd. Audio Detection: disabled
Input B
AES-Channel 1
Embd. Audio Detection: disabled
AES-Channel 2
Embd. Audio Detection: disabled
AES-Channel 3
Embd. Audio Detection: disabled
AES-Channel 4
Embd. Audio Detection: disabled
Submit
Reset
Get Default

6.2.4

6.3 EVS-X Electrical Video Switch



Both input signals A and B pass automatic cable equalizers to cope with long coaxial cables.

A PLL based re-timer circuitry re-clocks input A resp. input B signal, providing standard compliant signals to the internal selector switch.
All internal status/ alarm signals, as well as results of measurements, are processed by a micro controller. Based on programmable parameters, the uC controls the swich , the relays, drives the indication LED and communicates with the system controller module SMI-X.
In case of power failure the last switching path will be held.
The switching delay can be set by software.

6.3.1 Connectors

Input A and Input B	el. HD-/SD-SDI signal acc. to. SMPTE 292M / 259M 1,485Gbps / 270 Mbps BNC 75 Ω
Output	el. HD-/SD-SDI signal acc. to. SMPTE 292M / 259M 1,485Gbps / 270 Mbps BNC 75 Ω
Monitor	el. HD-/SD-SDI signal acc. to. SMPTE 292M / 259M 1,485Gbps / 270 Mbps BNC 75 Ω

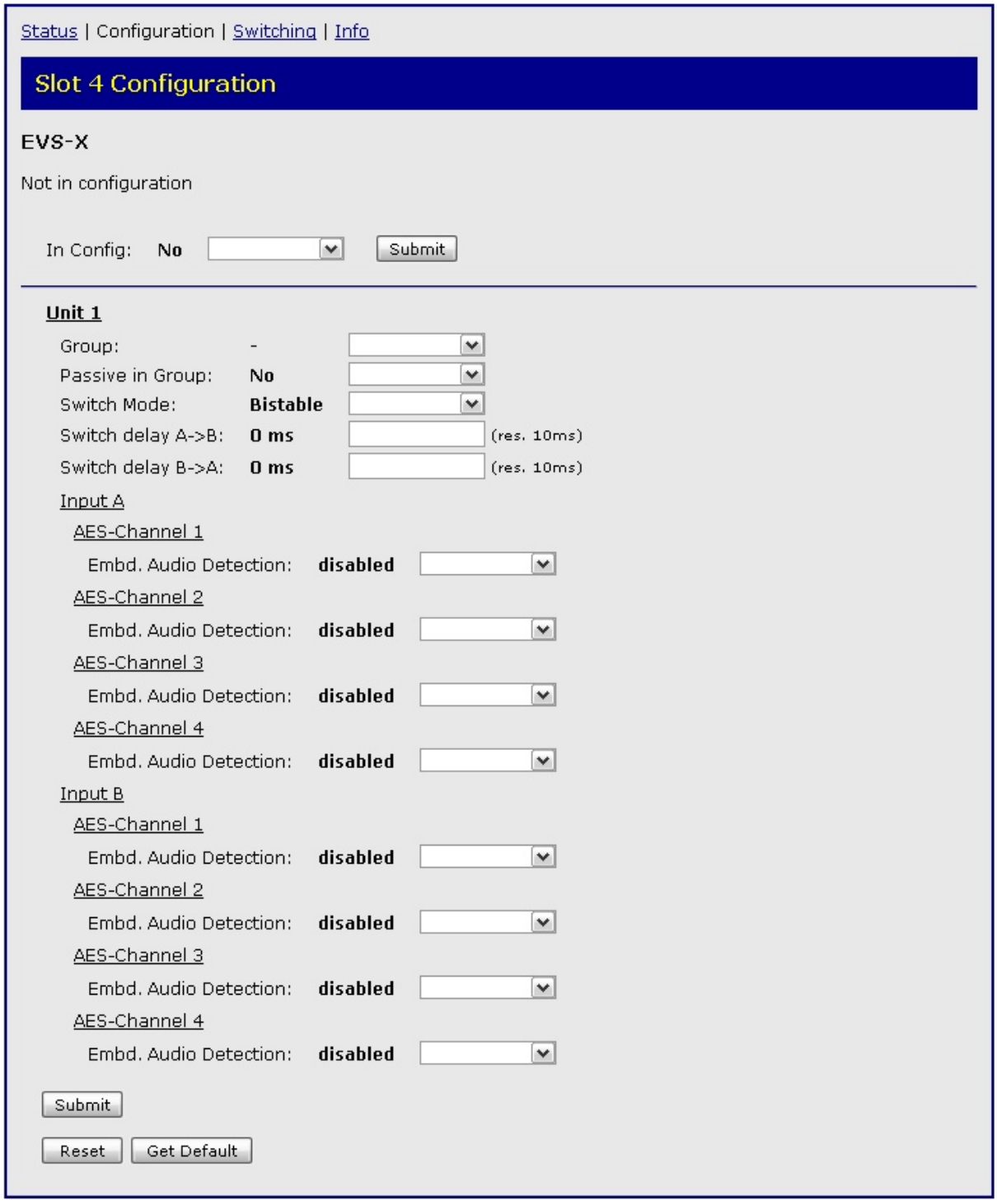
6.3.2 LEDs

Signal A; green	input A is locked to SDI, TRS-Detection
Signal B; green	input B is locked to SDI, TRS-Detection
Error; red	lit on input signal failure or missing embedded AES (audio detection enabled)
Power; yellow	indicates power supply o.k.
Switch A; green Switch B; green	either signal A or B, indicating the switch position
Monitor A/B; green	monitor output is set to input A when lid
Configured; orange	lit when module is in the configuration (monitored via SNMP)

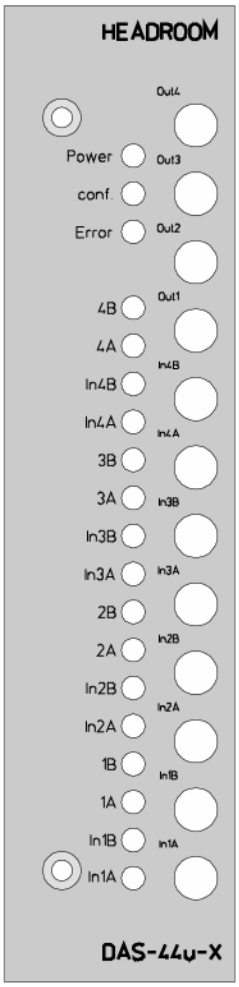
6.3.3 Settings (Web interface)

All non module specific settings are described in section 3.2.4.2

All embedded audio channels of HD/SD-SDI signals can be used as switch criteria. Therefore audio channel detection can be enabled individually per channel and input.


Status | Configuration | Switching | Info
Slot 4 Configuration
EVS-X
Not in configuration
In Config: No
Submit
Unit 1
Group: -
Passive in Group: No
Switch Mode: Bistable
Switch delay A->B: 0 ms (res. 10ms)
Switch delay B->A: 0 ms (res. 10ms)
Input A
AES-Channel 1
Embd. Audio Detection: disabled
AES-Channel 2
Embd. Audio Detection: disabled
AES-Channel 3
Embd. Audio Detection: disabled
AES-Channel 4
Embd. Audio Detection: disabled
Input B
AES-Channel 1
Embd. Audio Detection: disabled
AES-Channel 2
Embd. Audio Detection: disabled
AES-Channel 3
Embd. Audio Detection: disabled
AES-Channel 4
Embd. Audio Detection: disabled
Submit
Reset
Get Default

6.4 DAS-44u-X Digital Audio Switch



Four individual switches for 1-out of -2 switching. Every (partial) switch has independent switching criteria and switches individually.
Every switch can be configured into a group or switch freely. Only one group for one module is allowed, but every partial switch is allowed to be in this group or switch freely.

A PLL based re-timer circuitry re-clocks input A resp. input B signal of every switch input, providing standard compliant signals to the internal selector switch.

All internal status/ alarm signals, as well as results of measurements, are processed by a micro controller. Based on programmable parameters, the uC controls the swich , the relays, drives the indication LED and communicates with the system controller module SMI-X.
In case of power failure the last switching path will be held.
The switching and silence detection delays can be set by software.

6.4.1 Connectors

Inputs 1a, 1b to 4a, 4b	1.0/2.3 connectors for coaxial cable 75 Ω, AES3(i)
Output 1 to 4	1.0/2.3 connectors for coaxial cable 75 Ω, AES3(i)

6.4.2 LEDs

Signal *x*A; green	input A is locked to AES, quality criteria met
Signal *x*B; green	input B is locked to AES, quality criteria met

Switch *x*A; green
Switch *x*B; green — either signal A or B, indicating the switch position

Configured; orange — lit when module is in the configuration (monitored via SNMP)

Error; red — lit on input signal failure
Power; yellow — indicates power supply o.k.

6.4.3 Settings (Web interface)

All non module specific settings are described in section 3.2.4.2
All settings can be done per input and switch unit independently.

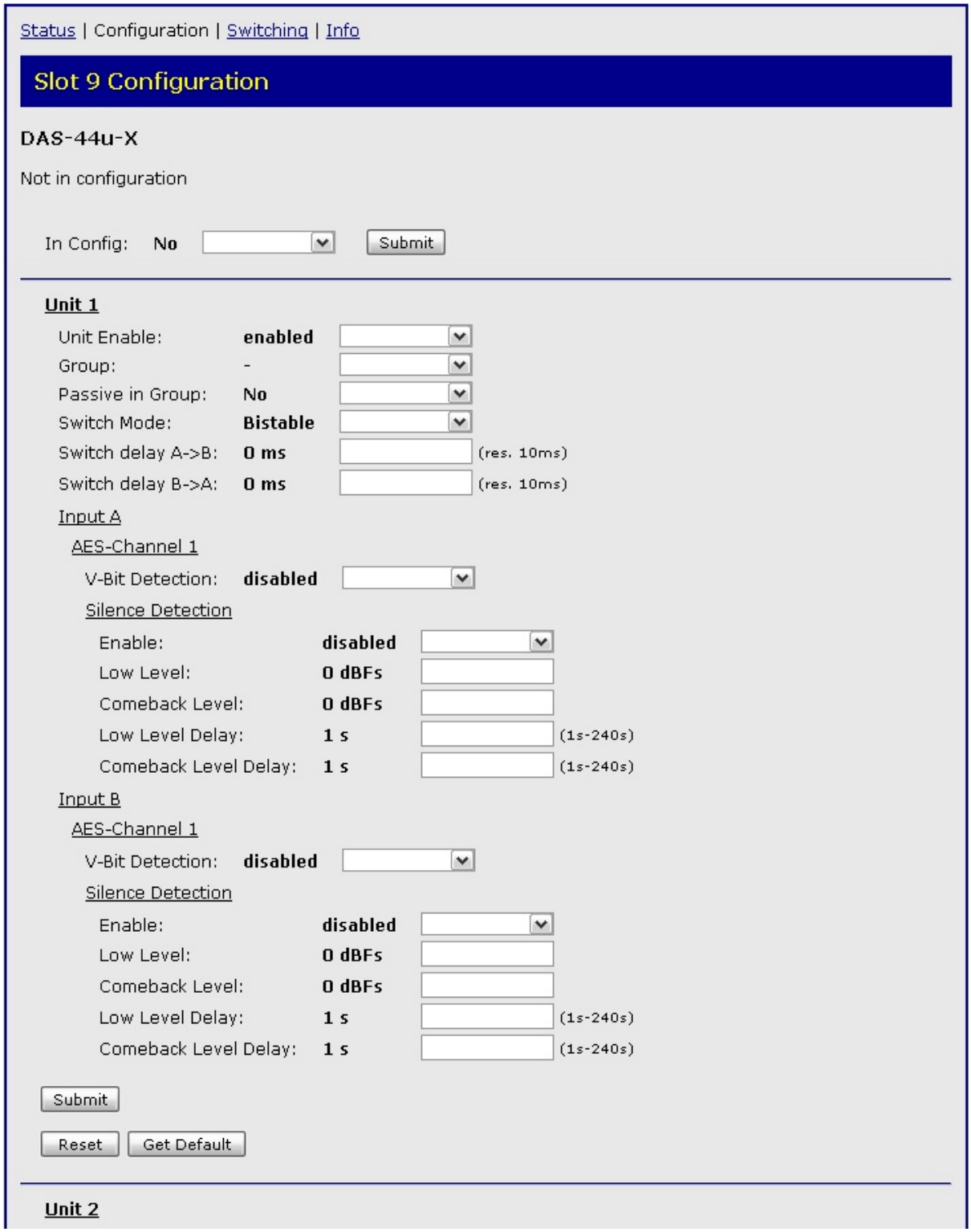
V-Bit Detection En-/Disable: Use the Validity-Bit of the incoming AES/EBU signals as signal quality criteria.

Silence Detection En/Disable: Use the level of the audio data in incoming AES/EBU signals as signal quality criteria.

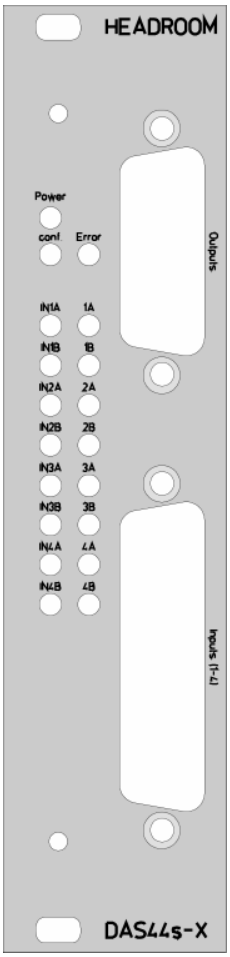
Low Level: Level that has to be under-run for “silence”
Low Level Delay: Time the audio level has to be under “Low Level” for “silence”

Comeback Level: Level that has to be matched or over-run after “silence”

Comeback Level Delay: Time the audio level has to be at or over the Comeback Level to be “non-silent”


Status | Configuration | Switching | Info
Slot 9 Configuration
DAS-44u-X
Not in configuration
In Config: No
Submit
Unit 1
Unit Enable: enabled
Group: -
Passive in Group: No
Switch Mode: Bistable
Switch delay A->B: 0 ms (res. 10ms)
Switch delay B->A: 0 ms (res. 10ms)
Input A
AES-Channel 1
V-Bit Detection: disabled
Silence Detection
Enable: disabled
Low Level: 0 dBFs
Comeback Level: 0 dBFs
Low Level Delay: 1 s (1s-240s)
Comeback Level Delay: 1 s (1s-240s)
Input B
AES-Channel 1
V-Bit Detection: disabled
Silence Detection
Enable: disabled
Low Level: 0 dBFs
Comeback Level: 0 dBFs
Low Level Delay: 1 s (1s-240s)
Comeback Level Delay: 1 s (1s-240s)
Submit
Reset
Get Default
Unit 2

6.5 DAS-44s-X Digital Audio Switch



Four individual switches for 1-out of -2 switching. Every (partial) switch has independent switching criteria and switches individually.
Every switch can be configured into a group or switch freely. Only one group for one module is allowed, but every partial switch is allowed to be in this group or switch freely.

A PLL based re-timer circuitry re-clocks input A resp. input B signal of every switch input, providing standard compliant signals to the internal selector switch.

All internal status/ alarm signals, as well as results of measurements, are processed by a micro controller. Based on programmable parameters, the uC controls the swich , the relays, drives the indication LED and communicates with the system controller module SMI-X.
In case of power failure the last switching path will be held.
The switching and silence detection delays can be set by software.

6.5.1 Connectors

Inputs 1A,B to 4A,B	Sub-D 25, symmetrical 110 Ω AES3, (Tascam wiring, see Appendix D: Pin Out Balanced Audio Modules)
Outputs 1 to 4	Sub-D 15, symmetrical 110 Ω AES3 (Tascam wiring, see Appendix D: Pin Out Balanced Audio Modules)

6.5.2 LEDs

Signal *x*A; green	input A is locked to AES, quality criteria met
Signal *x*B; green	input B is locked to AES, quality criteria met
Switch *x*A; green Switch *x*B; green	either signal A or B, indicating the switch position
Configured; orange	lit when module is in the configuration (monitored via SNMP)
Error; red	lit on input signal failure
Power; yellow	indicates power supply o.k.

6.5.3 Settings (Web interface)

All non module specific settings are described in section 3.2.4.2
All settings can be done per input and switch unit independently.

V-Bit Detection En-/Disable: Use the Validity-Bit of the incoming AES/EBU signals as signal quality criteria.

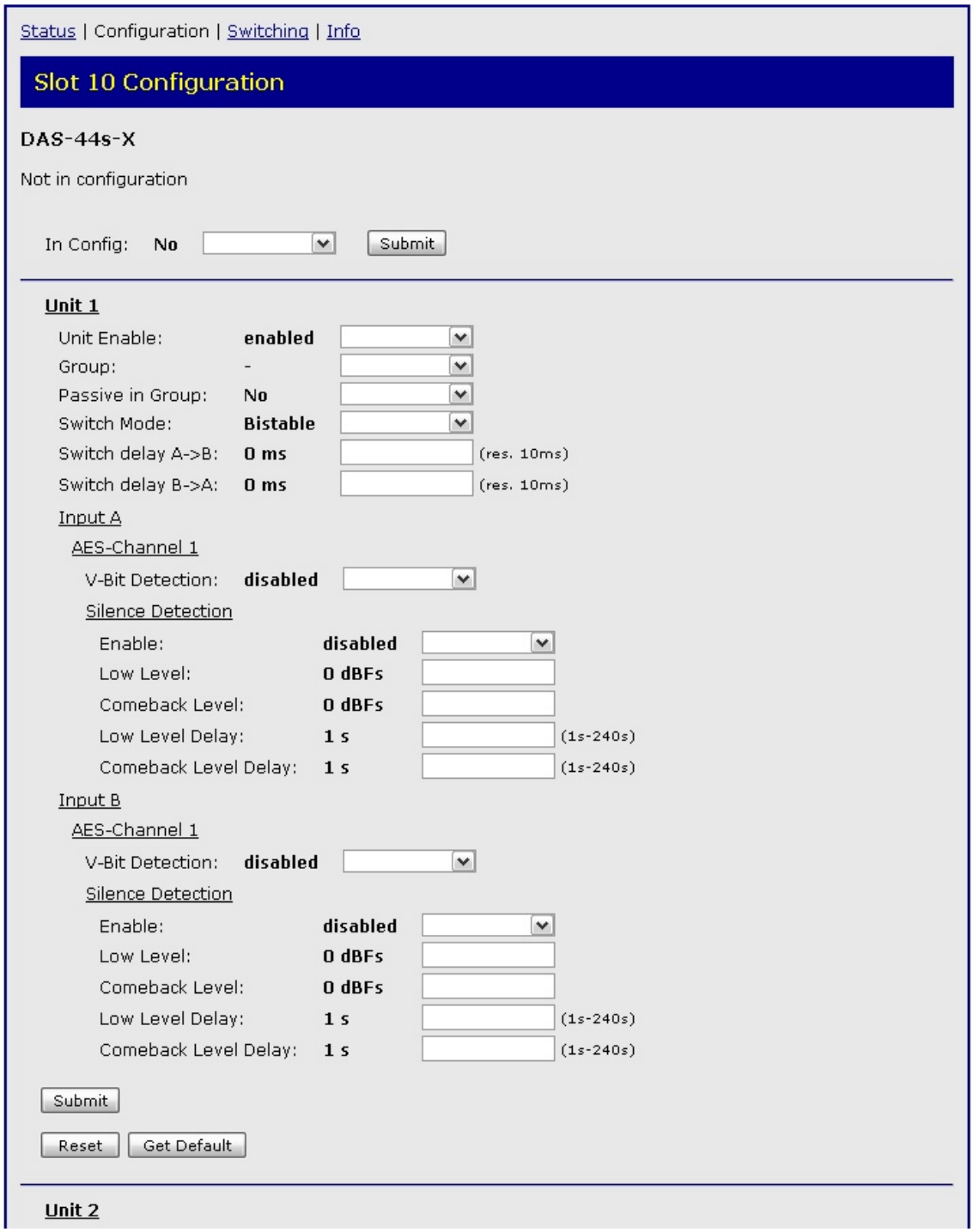
Silence Detection En/Disable: Use the level of the audio data in incoming AES/EBU signals as signal quality criteria.

Low Level: Level that has to be under-run for “silence”

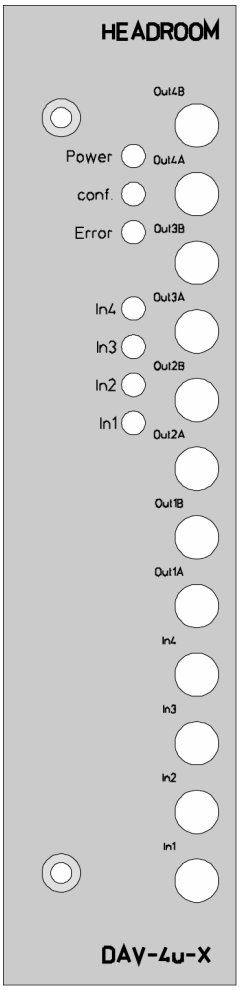
Low Level Delay: Time the audio level has to be under “Low Level” for “silence”

Comeback Level: Level that has to be matched or over-run after “silence”

Comeback Level Delay: Time the audio level has to be at or over the Comeback Level to be “non-silent”



6.6 DAV-4u-X Digital Audio Switch



Four independent 1-to-2 splitters for AES/EBU digital audio signals.

A PLL based re-timer circuitry re-clocks input signal, providing standard compliant signals to the output.
All internal status/ alarm signals, as well as results of measurements, are processed by a micro controller.
In case of power fail a relay bypass to output no. 1 is set.

6.6.1 Connectors

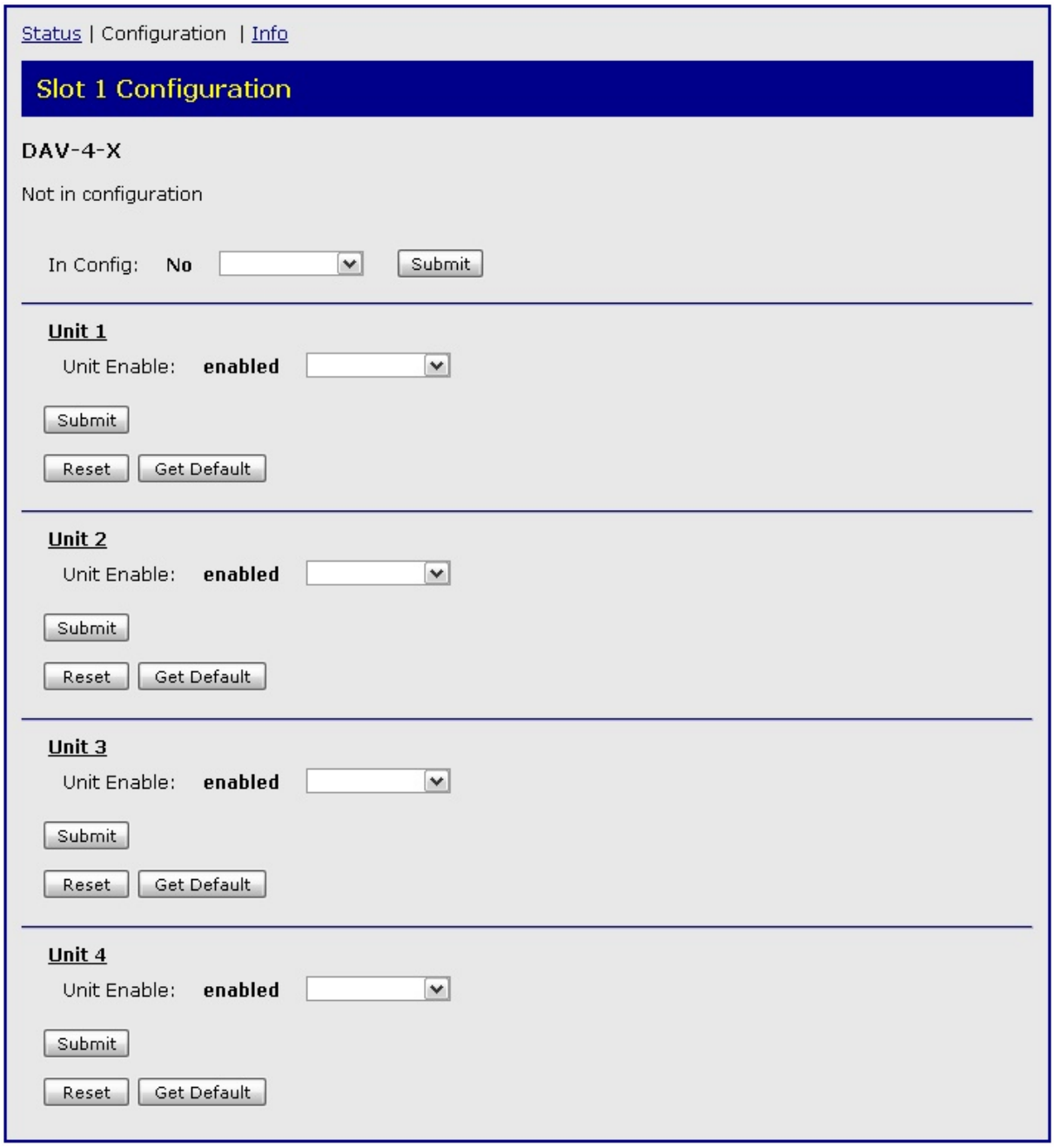
Inputs 1 to 4	1.0/2.3 connectors for coaxial cable 75 Ω, AES3(i)
Output 1A,B to 4A,B	1.0/2.3 connectors for coaxial cable 75 Ω, AES3(i)

6.6.2 LEDs

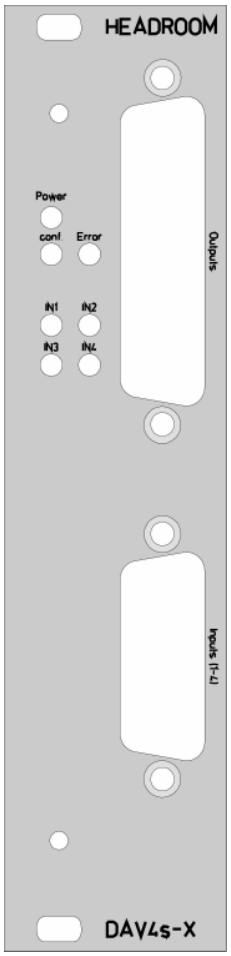
Input *x*; green	input *x* is locked to AES, quality criteria met
Configured; orange	lit when module is in the configuration (monitored via SNMP)
Error; red	lit on input signal failure
Power; yellow	indicates power supply o.k.

6.6.3 Settings (Web interface)

All non module specific settings are described in section 3.2.4.2
All settings can be done per input and splitter unit independently.


Status | Configuration | Info
Slot 1 Configuration
DAV-4-X
Not in configuration
In Config: No
Submit
Unit 1
Unit Enable: enabled
Submit
Reset
Get Default
Unit 2
Unit Enable: enabled
Submit
Reset
Get Default
Unit 3
Unit Enable: enabled
Submit
Reset
Get Default
Unit 4
Unit Enable: enabled
Submit
Reset
Get Default

6.7 DAV-4s-X Digital Audio Switch



Four independent 1-to-2 splitters for AES/EBU digital audio signals.

A PLL based re-timer circuitry re-clocks input signal, providing standard compliant signals to the output.
All internal status/ alarm signals, as well as results of measurements, are processed by a micro controller.
In case of power fail a relay bypass to output no. 1 is set.

6.7.1 Connectors

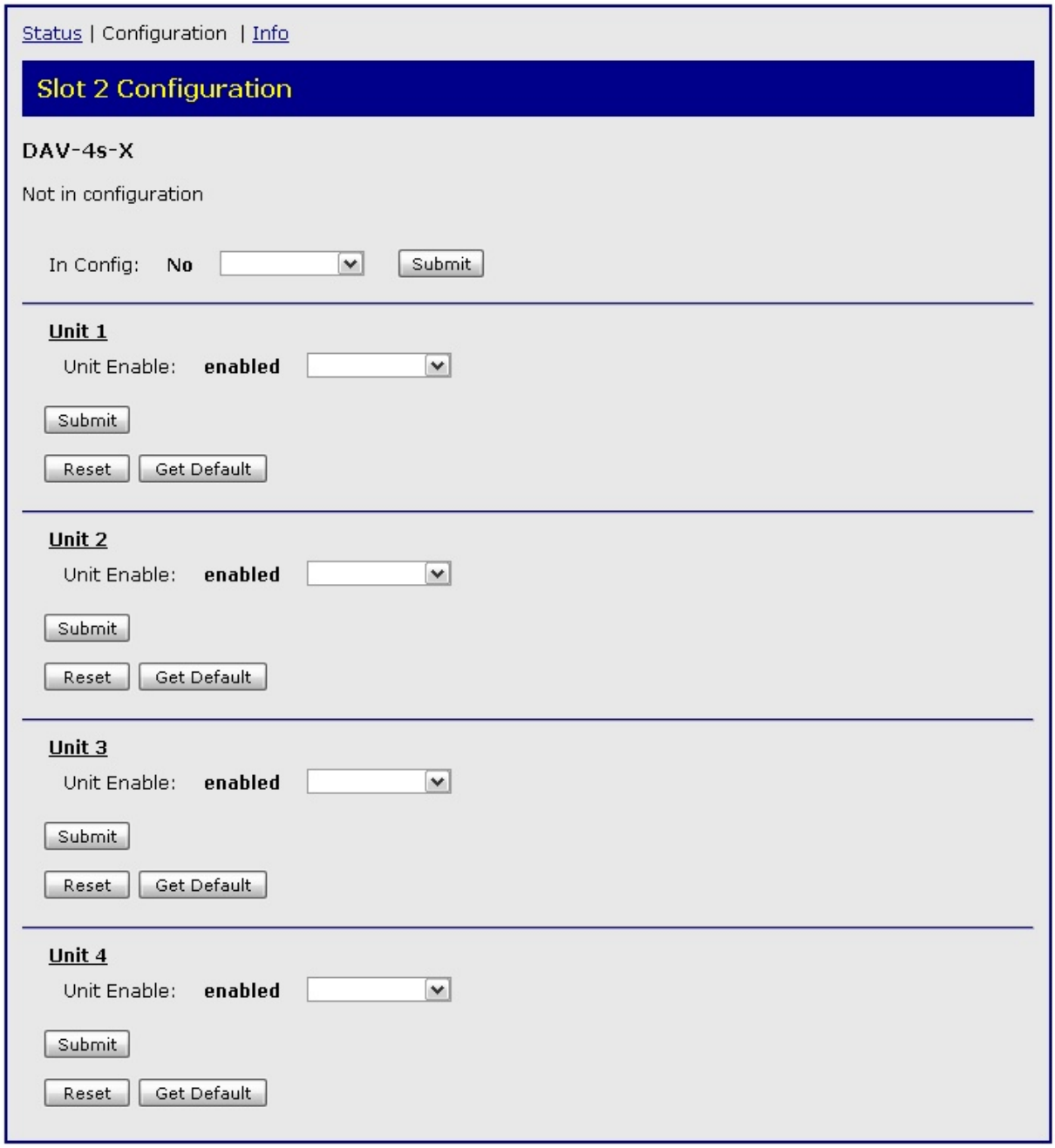
Inputs 1 to 4	Sub-D 15, symmetrical 110 Ω AES3, (Tascam wiring, see Appendix D: Pin Out Balanced Audio Modules)
Outputs 1A,B to 4 A,B	Sub-D 25, symmetrical 110 Ω AES3 (Tascam wiring, see Appendix D: Pin Out Balanced Audio Modules)

6.7.2 LEDs

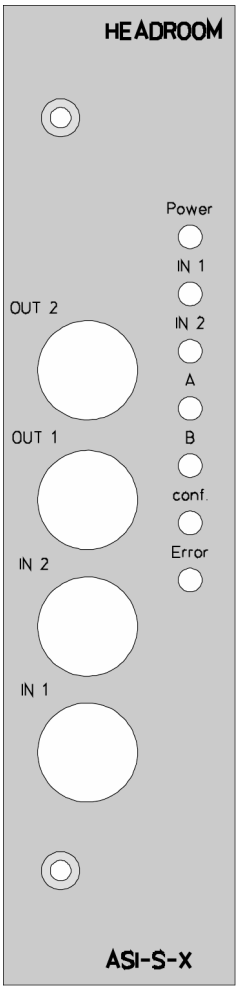
Input *x*; green	input *x* is locked to AES, quality criteria met
Configured; orange	lit when module is in the configuration (monitored via SNMP)
Error; red	lit on input signal failure
Power; yellow	indicates power supply o.k.

6.7.3 Settings (Web interface)

All non module specific settings are described in section 3.2.4.2
All settings can be done per input and splitter unit independently.


Status | Configuration | Info
Slot 2 Configuration
DAV-4s-X
Not in configuration
In Config: No
Submit
Unit 1
Unit Enable: enabled
Submit
Reset
Get Default
Unit 2
Unit Enable: enabled
Submit
Reset
Get Default
Unit 3
Unit Enable: enabled
Submit
Reset
Get Default
Unit 4
Unit Enable: enabled
Submit
Reset
Get Default

6.8 ASI-S-X ASI Switch



Both input signals A and B pass automatic cable equalizers to cope with long coaxial cables.

A PLL based re-timer circuitry re-clocks input A resp. input B signal, providing standard compliant signals to the internal selector switch. Both the cable equalizer and the PLL circuitry provide status and alarm signals, based on the quality of the applied signals A resp. B.
All internal status/ alarm signals, as well as results of measurements, are processed by a micro controller. Based on programmable parameters, the uC controls the swich , the relays, drives the indication LED and communicates with the system controller module SMI-X.
In case of power fail the last switching pass will hold.
The switching delay can be set by software.

6.8.1 Connectors

Input 1 and 2	Serial DVB/ASI signal acc. to. EN 50083, Pt. 9 / 270bit/s; 75Ω BNC
Output 1 and 2	Serial DVB/ASI signal acc. to. EN 50083, Pt. 9 / 270bit/s; 75Ω BNC

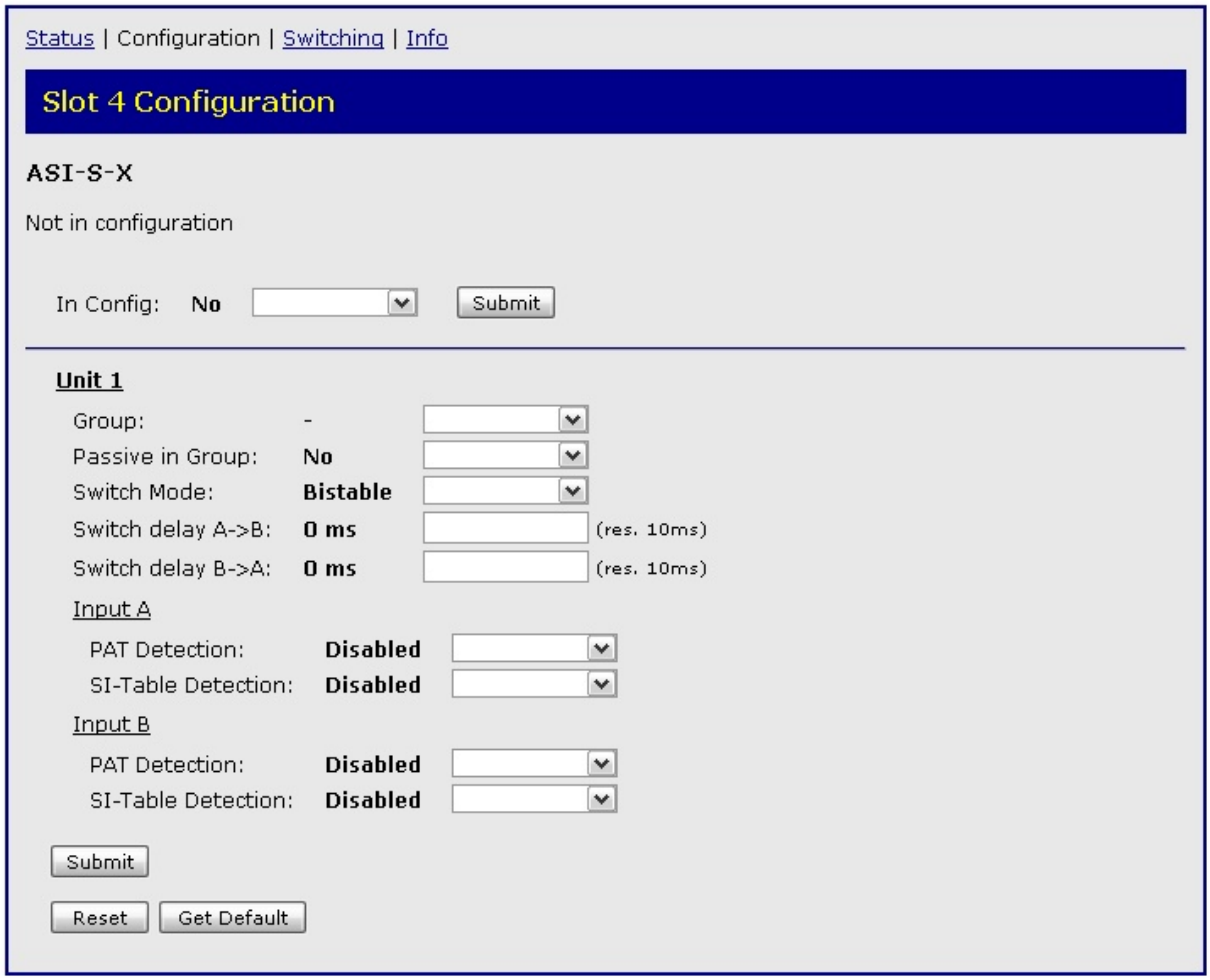
6.8.2 LEDs

Input 1; green	input A is locked
Input 2; green	input B is locked
Error; red	lit on input signal failure
Power; yellow	indicates power supply o.k.
Switch A (1); green Switch B (2); green	either signal A or B, indicating the switch position
Configured; orange	lit when module is in the configuration (monitored via SNMP)

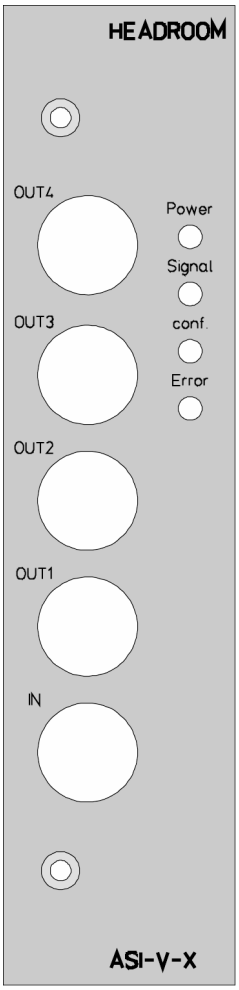
6.8.3 Settings (Web interface)

All non module specific settings are described in section 3.2.4.2

Detection of PAT and SI-Tables can be en- or disabled individually per input.


Status | Configuration | Switching | Info
Slot 4 Configuration
ASI-S-X
Not in configuration
In Config: No
Submit
Unit 1
Group: -
Passive in Group: No
Switch Mode: Bistable
Switch delay A->B: 0 ms (res. 10ms)
Switch delay B->A: 0 ms (res. 10ms)
Input A
PAT Detection: Disabled
SI-Table Detection: Disabled
Input B
PAT Detection: Disabled
SI-Table Detection: Disabled
Submit
Reset
Get Default

6.9 ASI-V-X ASI Splitter



The input signal pass automatic cable equalizers to cope with long coaxial cables.

A PLL based re-timer circuitry re-clocks input signal, providing standard compliant signals to the output.
All internal status/ alarm signals, as well as results of measurements, are processed by a micro controller.
In case of power fail a bypass to output 1 is set.

6.9.1 Connectors

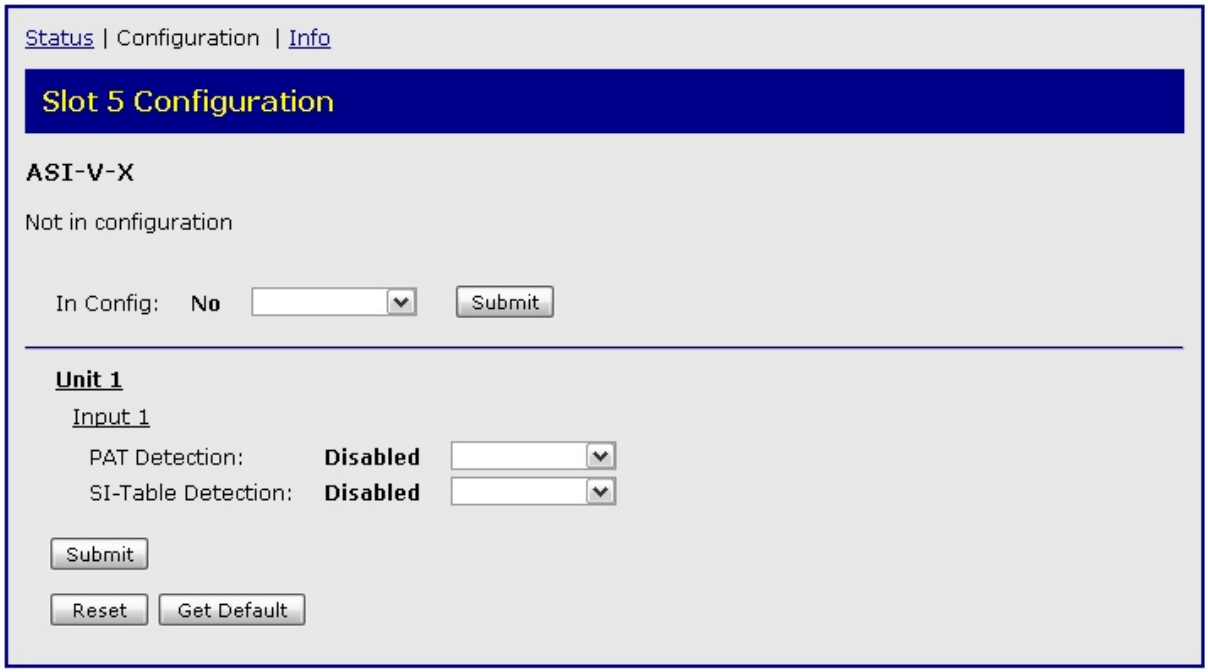
Input	Serial DVB/ASI signal acc. to. EN 50083, Pt. 9 / 270bit/s; 75Ω BNC
Output 1 to 4	Serial DVB/ASI signal acc. to. EN 50083, Pt. 9 / 270bit/s; 75Ω BNC

6.9.2 LEDs

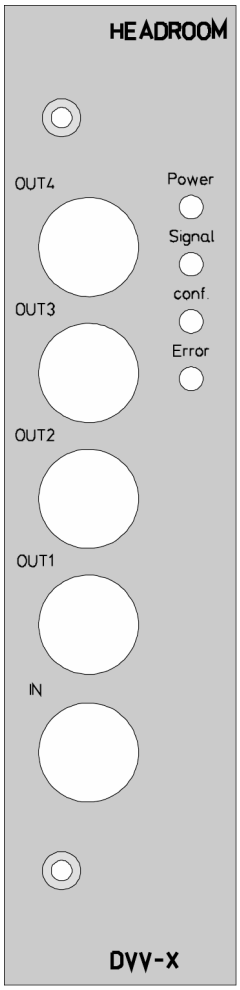
Input; green	input A is locked
Error; red	lit on input signal failure
Power; yellow	indicates power supply o.k.
Configured; orange	lit when module is in the configuration (monitored via SNMP)

6.9.3 Settings (Web interface)

All non module specific settings are described in section 3.2.4.2
Detection of PAT and SI-Tables can be en- or disabled.


Status | Configuration | Info
Slot 5 Configuration
ASI-V-X
Not in configuration
In Config: No
Submit
Unit 1
Input 1
PAT Detection: Disabled
SI-Table Detection: Disabled
Submit
Reset
Get Default

6.10 DVV-X Digital Video Splitter (SD)



The input signal pass automatic cable equalizers to cope with long coaxial cables.

A PLL based re-timer circuitry re-clocks input signal, providing standard compliant signals to the output.
All internal status/ alarm signals, as well as results of measurements, are processed by a micro controller.
In case of power fail a bypass to output 1 is set.

6.10.1 Connectors

Input	BNC 75 Ω, el. SD-SDI SMPTE 259M / 270 Mbps
Output 1 to 4	BNC 75 Ω, el. SD-SDI SMPTE 259M / 270 Mbps

6.10.2 LEDs

Signal; green	input A is locked to SDI
Error; red	lit on input signal failure
Power; yellow	indicates power supply o.k.
Configured; orange	lit when module is in the configuration (monitored via SNMP)

6.10.3 Settings (Web interface)

All non module specific settings are described in section 3.2.4.2

6.11 EVV-X Electrical Video Splitter

HD/SD-SDI splitter 1-to-2. The input signal pass automatic cable equalizers to cope with long coaxial cables.
A PLL based re-timer circuitry re-clocks input signal, providing standard compliant signals to the output.
All internal status/ alarm signals, as well as results of measurements, are processed by a micro controller.
In case of power fail a bypass to output 1 is set.

6.11.1 Connectors

Input	el. HD-/SD-SDI signal acc. to. SMPTE 292M / 259M 1,485Gbps / 270 Mbps BNC 75 Ω
Output 1 and 2	el. HD-/SD-SDI signal acc. to. SMPTE 292M / 259M 1,485Gbps / 270 Mbps BNC 75 Ω

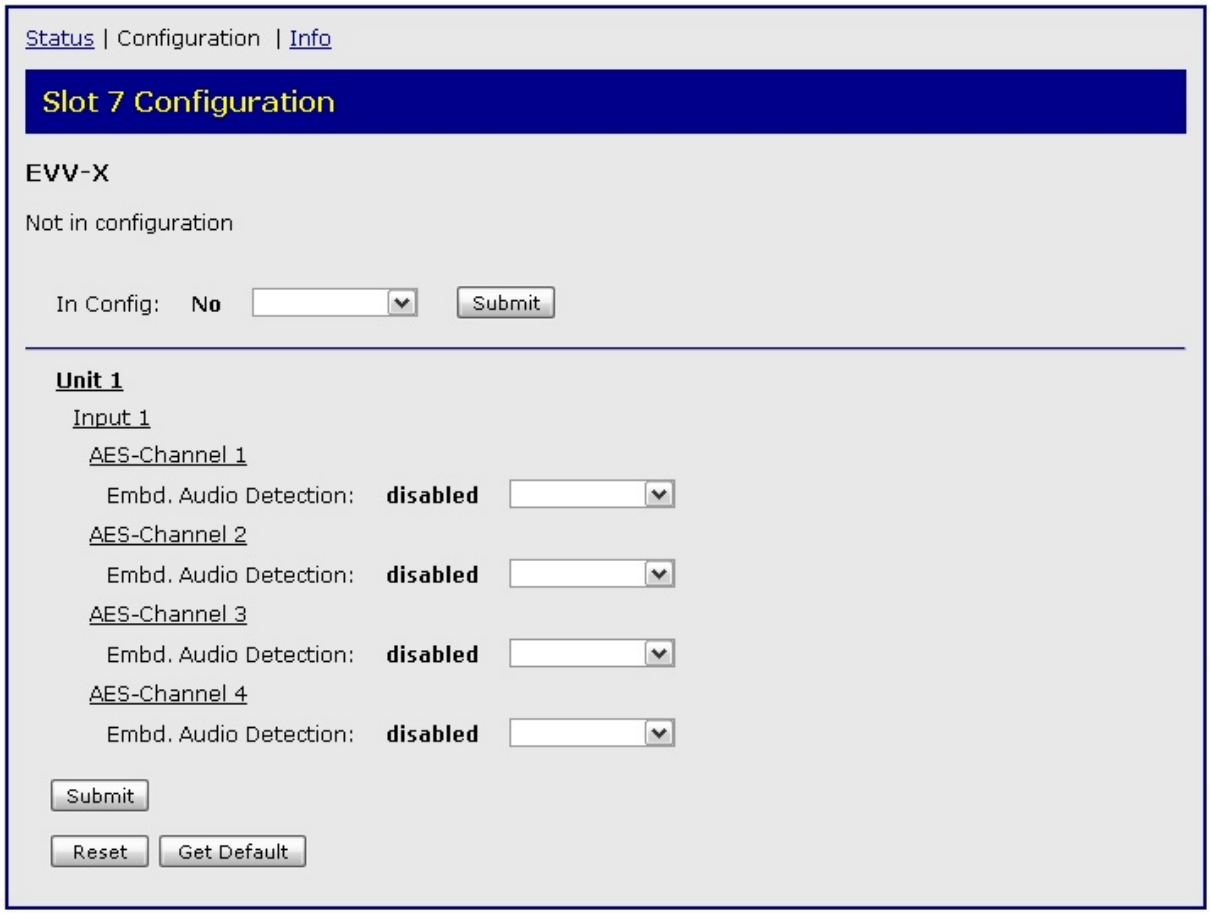
6.11.2 LEDs

Signal; green	input A is locked to SDI
Error; red	lit on input signal failure
Power; yellow	indicates power supply o.k.
Configured; orange	lit when module is in the configuration (monitored via SNMP)

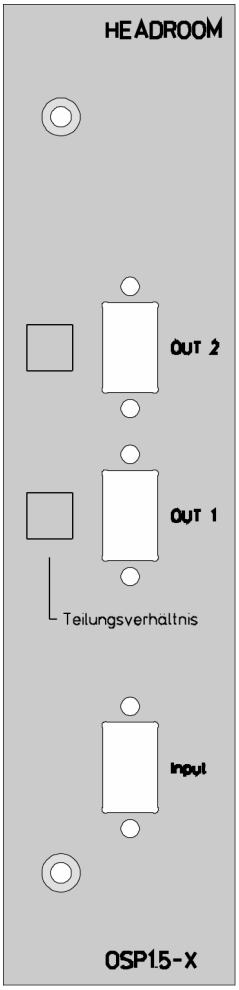
6.11.3 Settings (Web interface)

All non module specific settings are described in section 3.2.4.2

All embedded audio channels of HD/SD-SDI signals can be used as switch criteria. Therefore audio channel detection can be enabled individually per channel.


Status | Configuration | Info
Slot 7 Configuration
EVV-X
Not in configuration
In Config: No
Submit
Unit 1
Input 1
AES-Channel 1
Embd. Audio Detection: disabled
AES-Channel 2
Embd. Audio Detection: disabled
AES-Channel 3
Embd. Audio Detection: disabled
AES-Channel 4
Embd. Audio Detection: disabled
Submit
Reset
Get Default

6.12 OSP1.5-X Optical Video Splitter



Passiv optical splitter for signals up to 3GBps.
The OSP1.5 cannot be detected and managed by the system controller.
The splitting ratio can be selected when ordering the OSP-X.

6.12.1 Connectors

Input: optical; LC-connector (PC) any wavelength

Output 1 and 2: optical; LC-connector (PC) any wavelength

6.12.2 LEDs

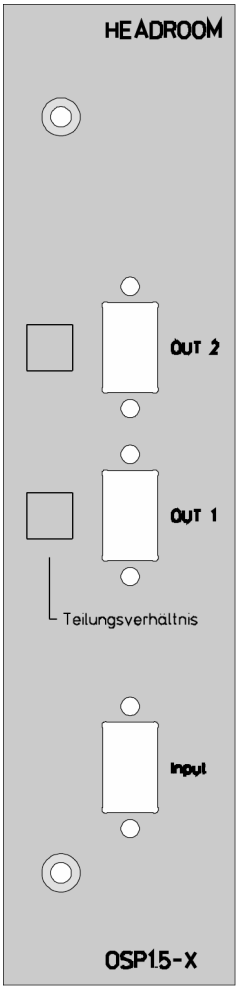
No LEDs

6.12.3 Settings (Web interface)

The module is passive and has no controls or monitors.

Hint: you can set slot names on empty slots too. So you can mark the slots that are actually occupied by OSP1.5-X.

6.13 OSP-MM-X Optical Multimode Splitter (MADI)



Passive optical splitter for multimode fiber.
The OSP-MM-X cannot be detected and managed by the system controller.
The splitting ratio can be selected when ordering the OSP-MM-X.

6.13.1 Connectors

Input: optical; LC-connector (PC) MM any wavelength

Output 1 and 2: optical; LC-connector (PC) MM any wavelength

6.13.2 LEDs

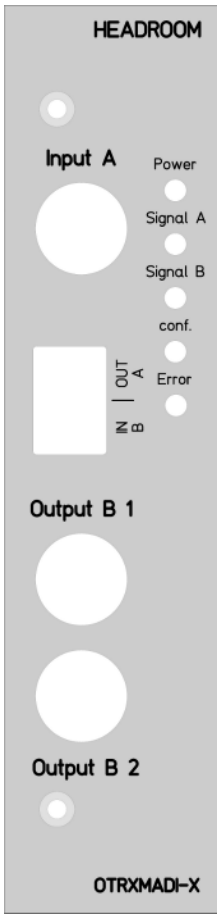
No LEDs

6.13.3 Settings (Web interface)

The module is passive and has no controls or monitors.

Hint: you can set slot names on empty slots too. So you can mark the slots that are actually occupied by OSP-MM-X.

6.14 OTRXMADI-X



Bi-directional MADI e/o and o/e converter.

6.14.1 Connectors

Input A:	MADI 75 Ω, AES10
Output A:	Optical LC-connector (PC) 1300nm MM
Input B:	Optical LC-connector (PC) 1300nm MM
Output B 1 & 2:	MADI 75 Ω, AES10

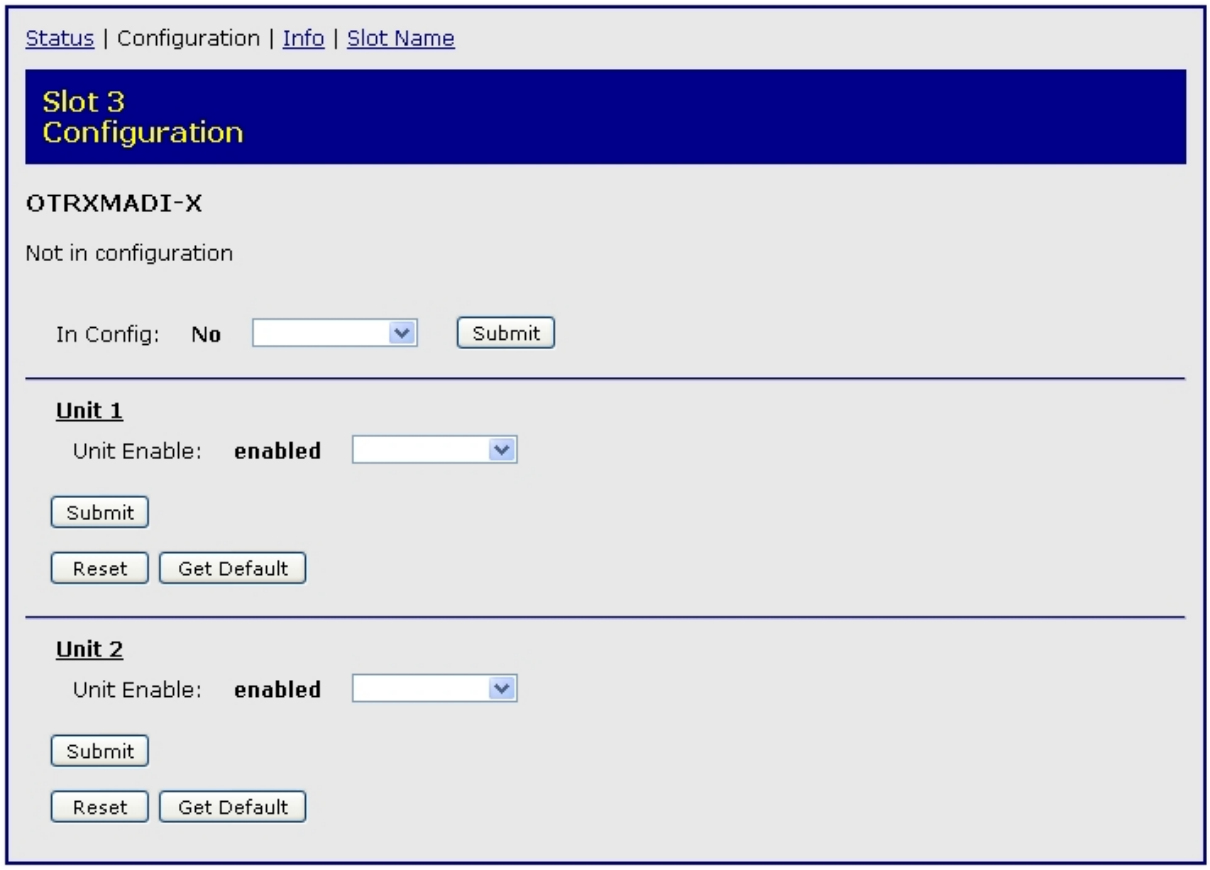
6.14.2 LEDs

Input A & B; green	Inputs locked to MADI
Error; red	lit on input signal failure
Power; yellow	indicates power supply o.k.
Configured; orange	lit when module is in the configuration (monitored via SNMP)

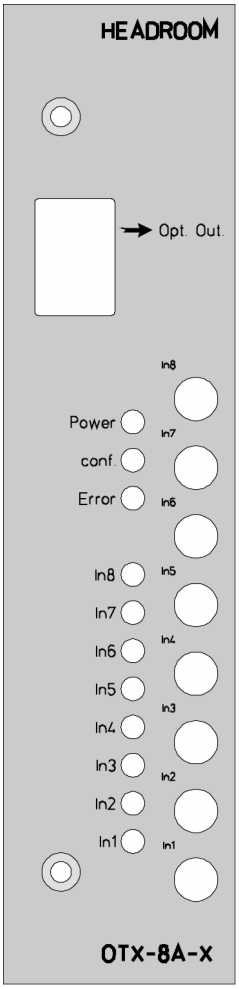
6.14.3 Settings (Web interface)

All non module specific settings are described in section 3.2.4.2

Units can be enabled individually, so unidirectional usage without permanent alarms can be achieved.


Status | Configuration | Info | Slot Name
Slot 3
Configuration
OTRXMADI-X
Not in configuration
In Config: No
Submit
Unit 1
Unit Enable: enabled
Submit
Reset
Get Default
Unit 2
Unit Enable: enabled
Submit
Reset
Get Default

6.15 OTX-8A-X



Bit-transparent transmission of up to eight AES3 signals of independent sources and clock domains.

6.15.1 Connectors

Inputs 1 to 8:	1.0/2.3 connectors for coaxial cable 75 Ω, AES3(i)
Output:	Optical LC-connector (PC) 1310nm

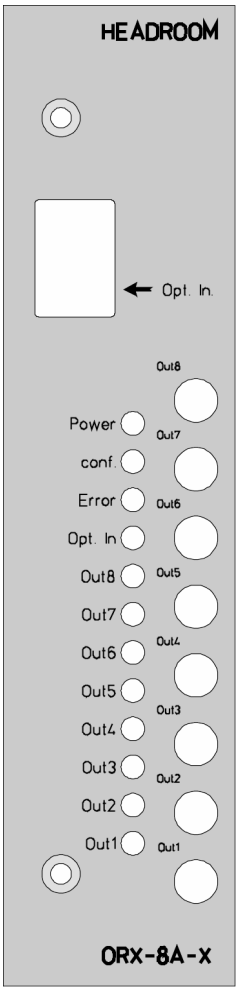
6.15.2 LEDs

Input 1 to 8; green	Inputs locked to AES/EBU
Error; red	lit on input signal failure
Power; yellow	indicates power supply o.k.
Configured; orange	lit when module is in the configuration (monitored via SNMP)

6.15.3 Settings (Web interface)

All non module specific settings are described in section 3.2.4.2

6.16 ORX-8A-X



Back convertion from optical to 8 independent AES3 signals, see section 6.15

6.16.1 Connectors

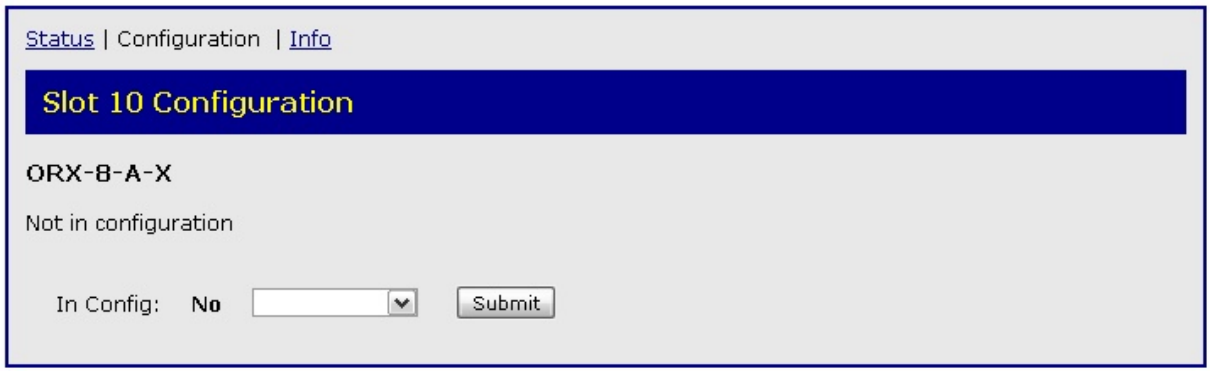
Input:	Optical LC-connector (PC) 1310nm
Outputs 1 to 8:	1.0/2.3 connectors for coaxial cable 75 Ω, AES3(i)

6.16.2 LEDs

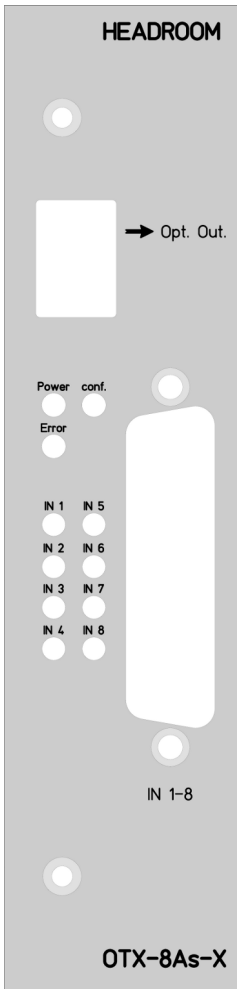
Output 1 to 8; green	Active AES/EBU on output *x*
Error; red	lit on input signal failure
Power; yellow	indicates power supply o.k.
Configured; orange	lit when module is in the configuration (monitored via SNMP)

6.16.3 Settings (Web interface)

All non module specific settings are described in section 3.2.4.2



6.17 OTX-8As-X



Bit-transparent transmission of up to eight AES3 signals of independent sources and clock domains.

6.17.1 Connectors

Inputs 1 to 8:	SUB-D 25 balanced AES3 (Tascam wiring, see Appendix D: Pin Out Balanced Audio Modules)
Output:	Optical LC-connector (PC) 1310nm

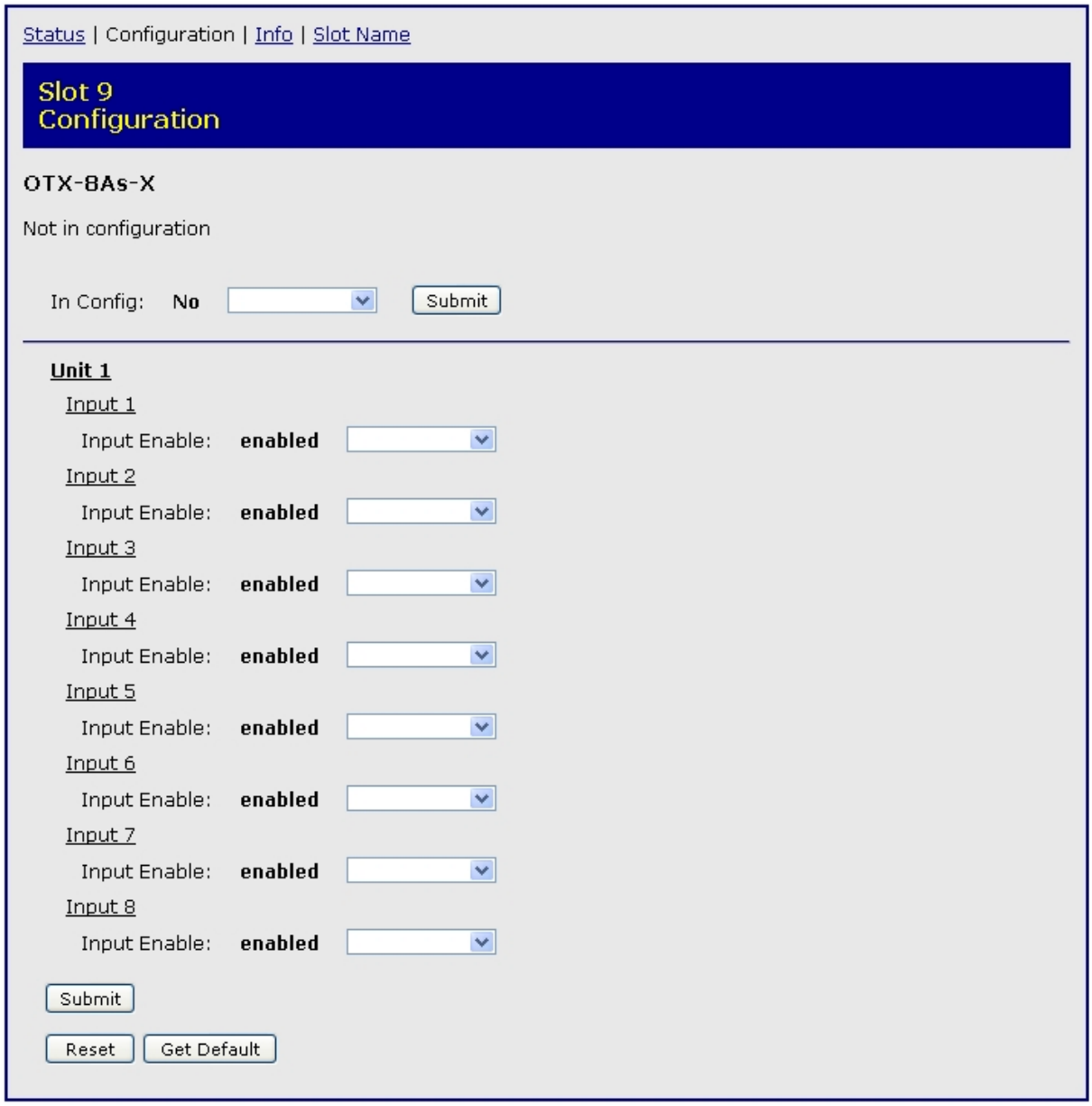
6.17.2 LEDs

Input 1 to 8; green	Inputs locked to AES/EBU
Error; red	lit on input signal failure
Power; yellow	indicates power supply o.k.
Configured; orange	lit when module is in the configuration (monitored via SNMP)

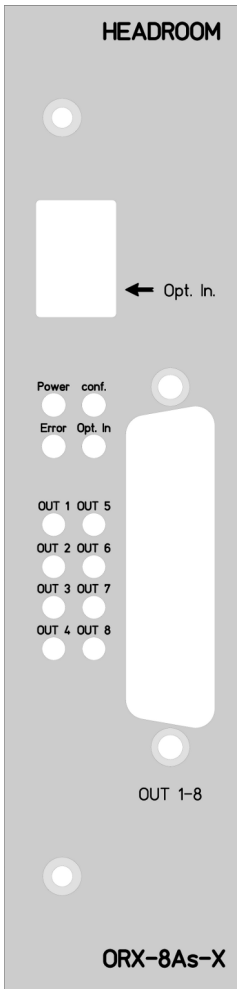
6.17.3 Settings (Web interface)

The monitoring of each audio channel can be en- or disabled individually.

All non module specific settings are described in section 3.2.4.2


Status | Configuration | Info | Slot Name
Slot 9
Configuration
OTX-8As-X
Not in configuration
In Config: No
Submit
Unit 1
Input 1
Input Enable: enabled
Input 2
Input Enable: enabled
Input 3
Input Enable: enabled
Input 4
Input Enable: enabled
Input 5
Input Enable: enabled
Input 6
Input Enable: enabled
Input 7
Input Enable: enabled
Input 8
Input Enable: enabled
Submit
Reset
Get Default

6.18 ORX-8As-X



Back convertion from optical to 8 independent AES3 signals, see section 6.15

6.18.1 Connectors

Input:	Optical LC-connector (PC) 1310nm
Outputs 1 to 8:	SUB-D 25 balanced AES3 (Tascam wiring, see Appendix D: Pin Out Balanced Audio Modules)

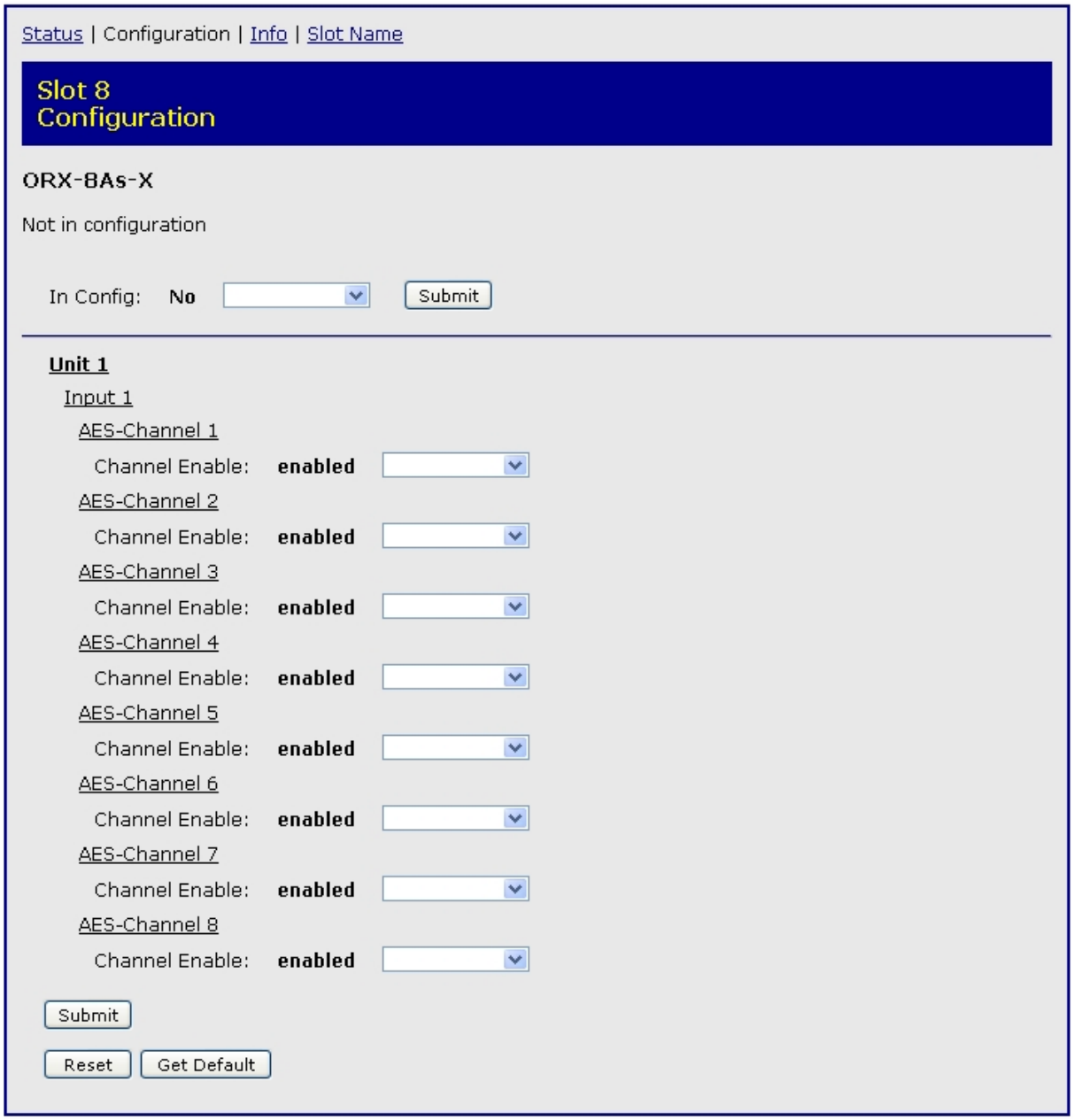
6.18.2 LEDs

Output 1 to 8; green	Active AES/EBU on output *x*
Error; red	lit on input signal failure
Power; yellow	indicates power supply o.k.
Configured; orange	lit when module is in the configuration (monitored via SNMP)

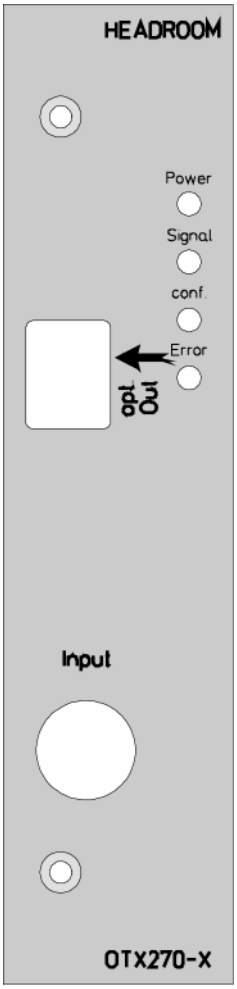
6.18.3 Settings (Web interface)

The monitoring of each audio channel can be en- or disabled individually.

All non module specific settings are described in section 3.2.4.2


Status | Configuration | Info | Slot Name
Slot 8
Configuration
ORX-8As-X
Not in configuration
In Config: No
Submit
Unit 1
Input 1
AES-Channel 1
Channel Enable: enabled
AES-Channel 2
Channel Enable: enabled
AES-Channel 3
Channel Enable: enabled
AES-Channel 4
Channel Enable: enabled
AES-Channel 5
Channel Enable: enabled
AES-Channel 6
Channel Enable: enabled
AES-Channel 7
Channel Enable: enabled
AES-Channel 8
Channel Enable: enabled
Submit
Reset
Get Default

6.19 OTX270-X



The OTX270 is an electro-optical converter for SD-SDI signals.
All internal status/ alarm signals, as well as results of measurements, are processed by a micro controller.

6.19.1 Connectors

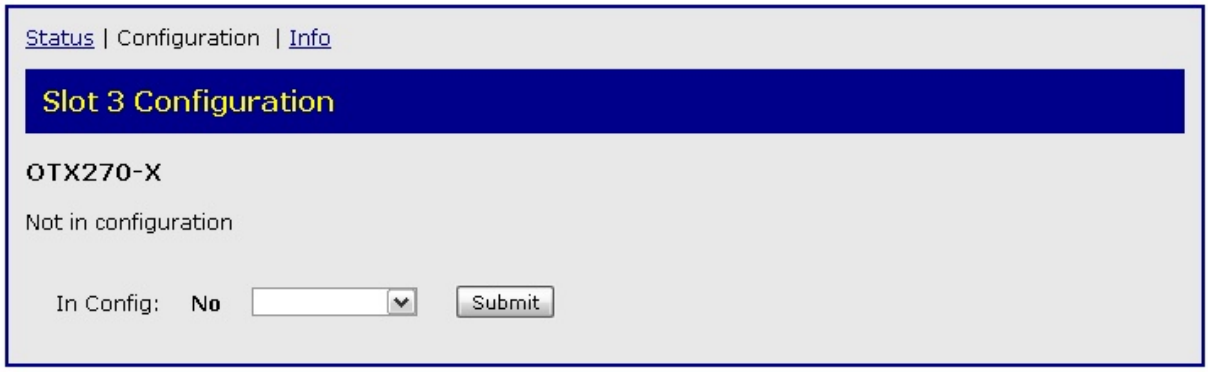
Inputs:	BNC 75 Ω, el. SD-SDI SMPTE 259M / 270 Mbps
Output:	Optical LC-connector (PC) 1310nm

6.19.2 LEDs

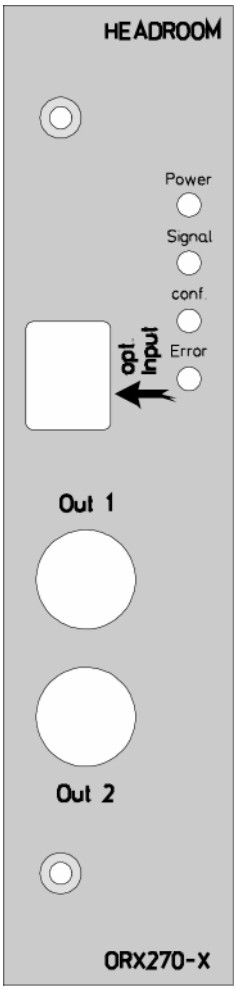
Signal; green	Input locked to SDI
Error; red	lit on input signal failure
Power; yellow	indicates power supply o.k.
Configured; orange	lit when module is in the configuration (monitored via SNMP)

6.19.3 Settings (Web interface)

All non module specific settings are described in section 3.2.4.2



6.20 ORX270-X



The ORX270 is an opto/electrical converter for SD-SDI signals.
All internal status/ alarm signals, as well as results of measurements, are processed by a micro controller.

6.20.1 Connectors

Input:	Optical LC-connector (PC) 1310nm
Outputs:	BNC 75 Ω, el. SD-SDI SMPTE 259M / 270 Mbps

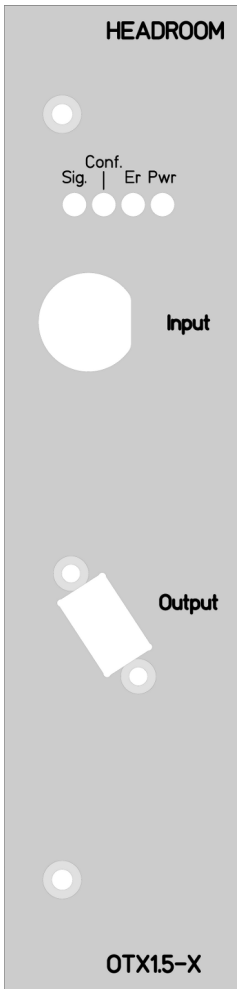
6.20.2 LEDs

Signal green	optical input o.k.
Error; red	lit on input signal failure
Power; yellow	indicates power supply o.k.
Configured; orange	lit when module is in the configuration (monitored via SNMP)

6.20.3 Settings (Web interface)

All non module specific settings are described in section 3.2.4.2

6.21 OTX1.5-X



The OTX1.5-X is an electro-optical converter for SD and HD SDI signals. All internal status/ alarm signals, as well as results of measurements, are processed by a micro controller.

6.21.1 Connectors

Input:	el. HD-/SD-SDI signal acc. to. SMPTE 292M / 259M 1,485Gbps / 270 Mbps BNC 75 Ω
Output:	Optical LC-connector (PC) 1310nm
Monitor:	el. HD-/SD-SDI signal acc. to. SMPTE 292M / 259M 1,485Gbps / 270 Mbps BNC 75 Ω ***(Optional)***

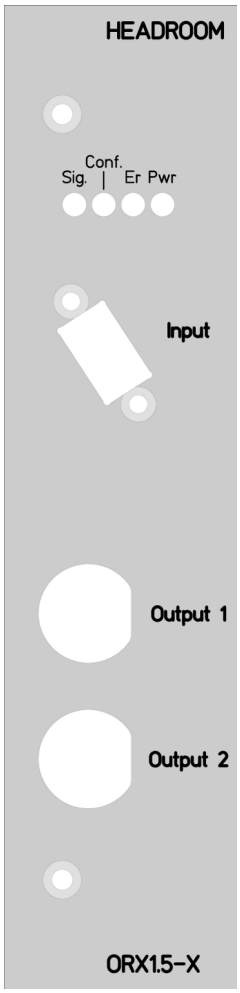
6.21.2 LEDs

Signal; green	Input locked to SDI
Error; red	lit on input signal failure
Power; yellow	indicates power supply o.k.
Configured; orange	lit when module is in the configuration (monitored via SNMP)

6.21.3 Settings (Web interface)

All non module specific settings are described in section 3.2.4.2

6.22 ORX1.5-X



The ORX1.5-X is an opto/electrical converter for SD and HD SDI signals. All internal status/ alarm signals, as well as results of measurements, are processed by a micro controller.

6.22.1 Connectors

Input:	Optical LC-connector (PC) 1310nm
Outputs:	el. HD-/SD-SDI signal acc. to. SMPTE 292M / 259M 1,485Gbps / 270 Mbps BNC 75 Ω

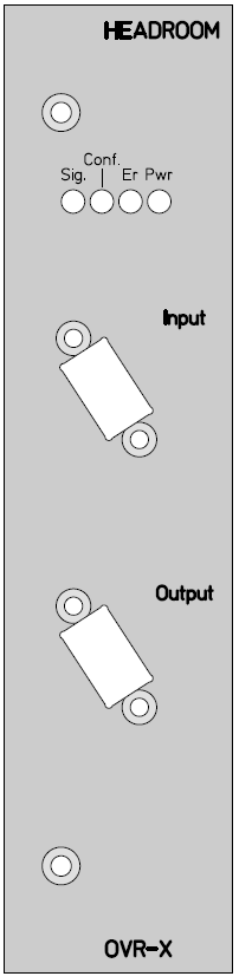
6.22.2 LEDs

Signal green	optical input o.k.
Error; red	lit on input signal failure
Power; yellow	indicates power supply o.k.
Configured; orange	lit when module is in the configuration (monitored via SNMP)

6.22.3 Settings (Web interface)

All non module specific settings are described in section 3.2.4.2

6.23 OVR-X



The OVR-X is an optical repeater for SD, HD SDI and ASI signals.
All internal status/ alarm signals, as well as results of measurements, are processed by a micro controller.

6.23.1 Connectors

Input:	Optical LC-connector (PC) 1310nm
Outputs:	Optical LC-connector (PC) 1310nm

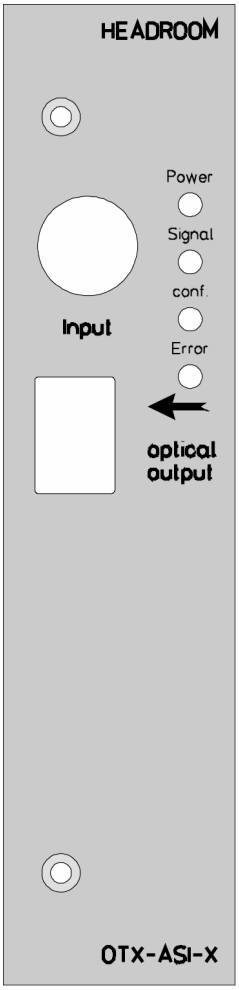
6.23.2 LEDs

Signal green	optical input o.k.
Error; red	lit on input signal failure
Power; yellow	indicates power supply o.k.
Configured; orange	lit when module is in the configuration (monitored via SNMP)

6.23.3 Settings (Web interface)

All non module specific settings are described in section 3.2.4.2

6.24 OTX-ASI-X



The OTX270 is an electro-optical converter for SD-SDI signals.
All internal status/ alarm signals, as well as results of measurements, are processed by a micro controller.

6.24.1 Connectors

Inputs:	Serial DVB/ASI signal acc. to. EN 50083, Pt. 9 / 270bit/s; 75Ω BNC
Output:	Optical LC-connector (PC) 1310nm

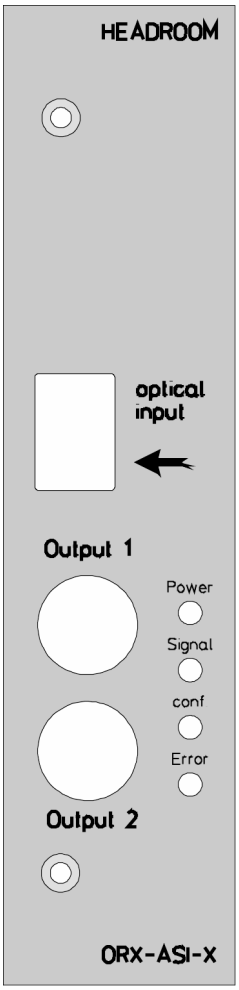
6.24.2 LEDs

Signal; green	Input locked to ASI, quality criteria met
Error; red	lit on input signal failure
Power; yellow	indicates power supply o.k.
Configured; orange	lit when module is in the configuration (monitored via SNMP)

6.24.3 Settings (Web interface)

All non module specific settings are described in section 3.2.4.2
Detection of PAT and SI-Table can be en- or disabled.

6.25 ORX-ASI-X



The ORX270 is an opto/electrical converter for SD-SDI signals.
All internal status/ alarm signals, as well as results of measurements, are processed by a micro controller.

6.25.1 Connectors

Input:	Optical LC-connector (PC) 1310nm
Outputs:	Serial DVB/ASI signal acc. to. EN 50083, Pt. 9 / 270bit/s; 75Ω BNC

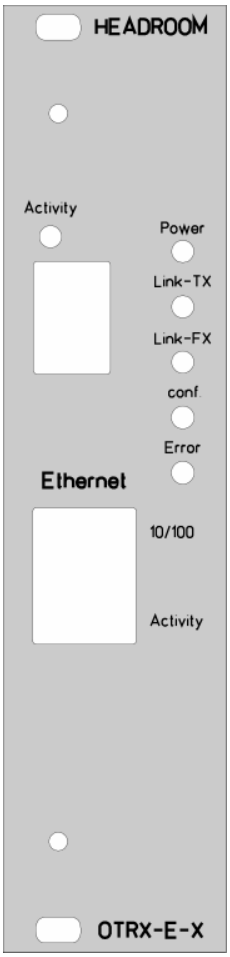
6.25.2 LEDs

Signal green	optical input o.k. ASI quality criteria met
Error; red	lit on input signal failure
Power; yellow	indicates power supply o.k.
Configured; orange	lit when module is in the configuration (monitored via SNMP)

6.25.3 Settings (Web interface)

All non module specific settings are described in section 3.2.4.2
Detection of PAT and SI-Table can be en- or disabled.

6.26 OTRX-E-X



A transparent bidirectional 100Base-T Ethernet to optical (Base-F) media converter.

6.26.1 Connectors

Ethernet:	100Base-T RJ45
Optical:	LC-Connector (PC) 1310nm

6.26.2 LEDs

Link-TX; green 100Base-T link o.k.

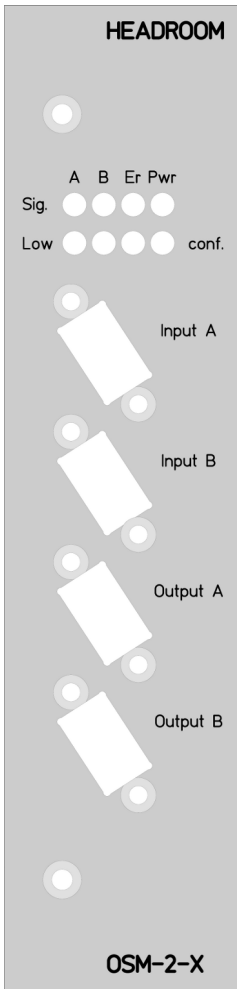
Link-FX; green optical link o.k.

Error; red	lit on input signal failure
Power; yellow	indicates power supply o.k.
Configured; orange	lit when module is in the configuration (monitored via SNMP)

6.26.3 Settings (Web interface)

All non module specific settings are described in section 3.2.4.2

6.27 OSM-2-X



A monitoring module for optical links of any kind (STM, 10GE etc.). Configurable with SFP modules.

6.27.1 Connectors

All connectors: LC-Connector (PC) wavelength of choice

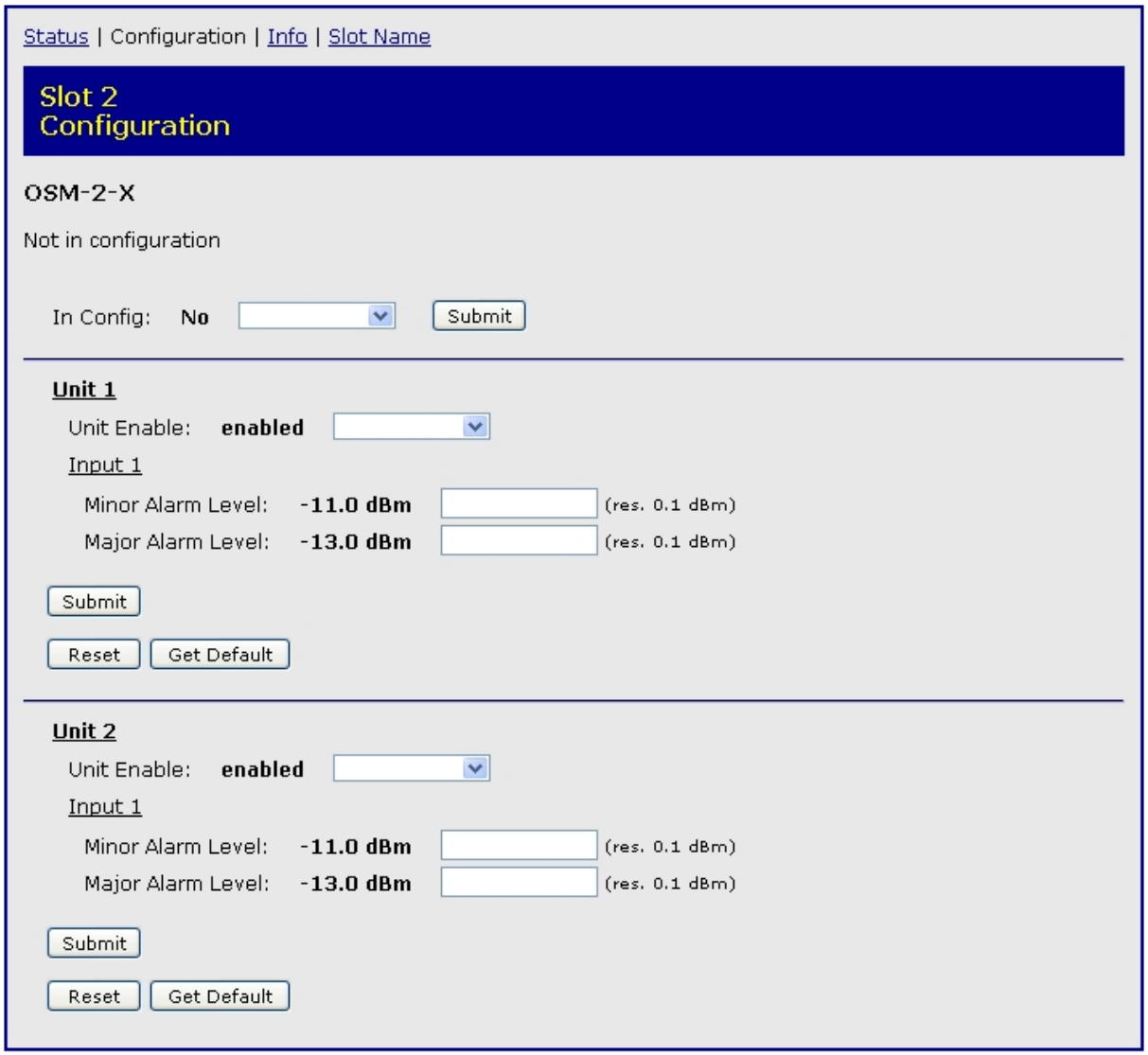
6.27.2 LEDs

Sig A & B; green	no LOS
Low A & B; red	signal level under threshold
Error; red	lit on input signal failure
Power; yellow	indicates power supply o.k.
Configured; orange	lit when module is in the configuration (monitored via SNMP)

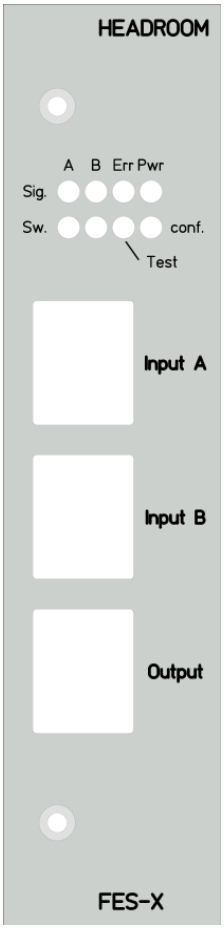
6.27.3 Settings (Web interface)

All non module specific settings are described in section 3.2.4.2

Enable and disable per unit. Minor and major alarm thresholds are selectable in dBm.


Status | Configuration | Info | Slot Name
Slot 2
Configuration
OSM-2-X
Not in configuration
In Config: No
Submit
Unit 1
Unit Enable: enabled
Input 1
Minor Alarm Level: -11.0 dBm
(res. 0.1 dBm)
Major Alarm Level: -13.0 dBm
(res. 0.1 dBm)
Submit
Reset
Get Default
Unit 2
Unit Enable: enabled
Input 1
Minor Alarm Level: -11.0 dBm
(res. 0.1 dBm)
Major Alarm Level: -13.0 dBm
(res. 0.1 dBm)
Submit
Reset
Get Default

6.28 FES-X



An electrical 2-to-1 Fast Ethernet backup switch (not in terms of an Ethernet switch but a real physical Layer input to output selector) with power-fail-bypass relais.

6.28.1 Connectors

All Connectors RJ45 100Base-T, Auto-Neg, Auto Xover

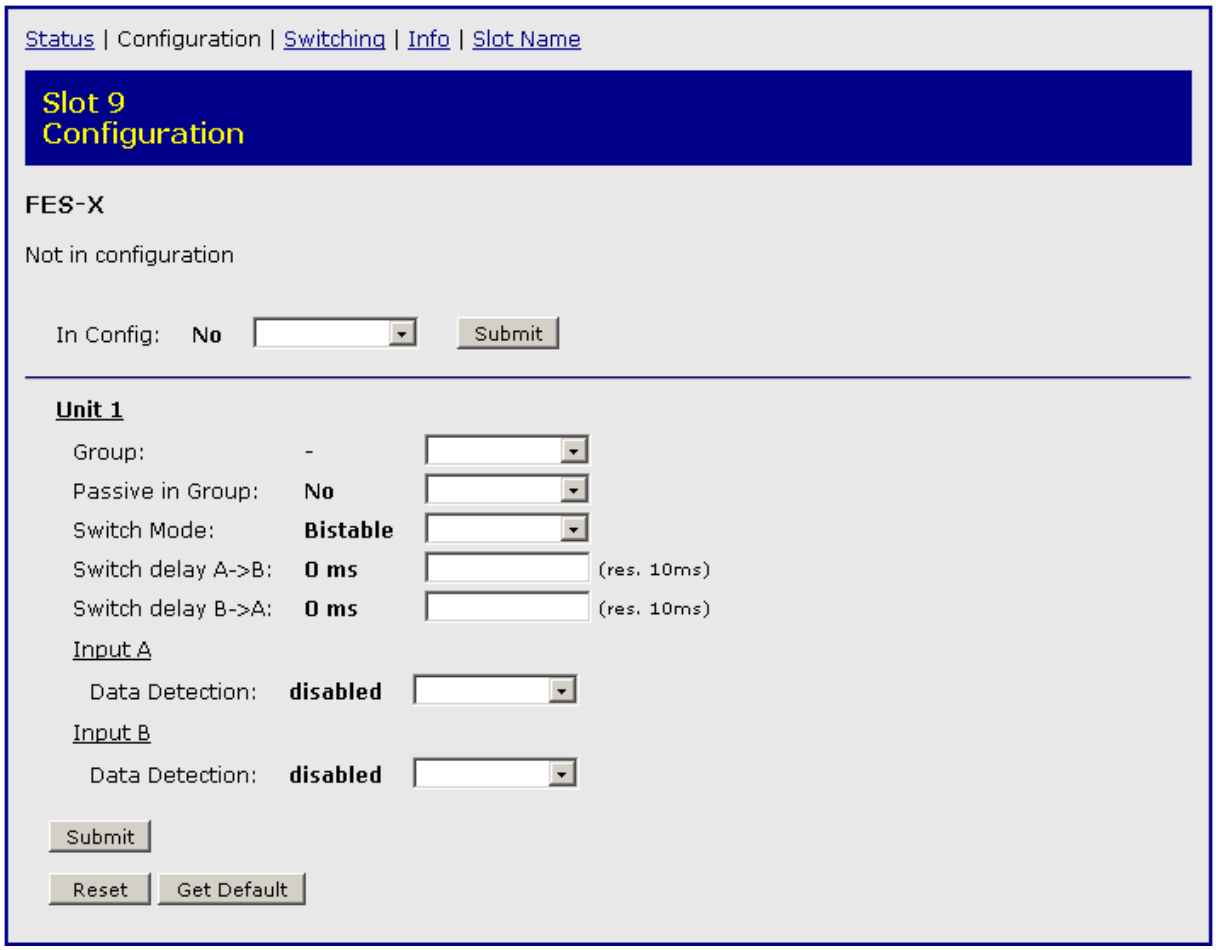
6.28.2 LEDs

Sig. A & B; green	input signal ok; off no link; red link o.k. but no data activity
Error; red	lit on input signal failure
Power; yellow	indicates power supply o.k.
Sw A; green Sw B; green	either signal A or B, indicating the switch position
Test; green/red	reserved for future use
Configured; orange	lit when module is in the configuration (monitored via SNMP)

6.28.3 Settings (Web interface)

All non module specific settings are described in section 3.2.4.2

Data detection can be enabled for Input A or B individually. The underlying algorithm can be adjusted to the customer's needs prior ordering i.e. minimal data bandwidth allowed.


Status | Configuration | Switching | Info | Slot Name
Slot 9
Configuration
FES-X
Not in configuration
In Config: No
Submit
Unit 1
Group: -
Passive in Group: No
Switch Mode: Bistable
Switch delay A->B: 0 ms
(res. 10ms)
Switch delay B->A: 0 ms
(res. 10ms)
Input A
Data Detection: disabled
Input B
Data Detection: disabled
Submit
Reset
Get Default

6.29 SES155-X

6.29.1 Connectors

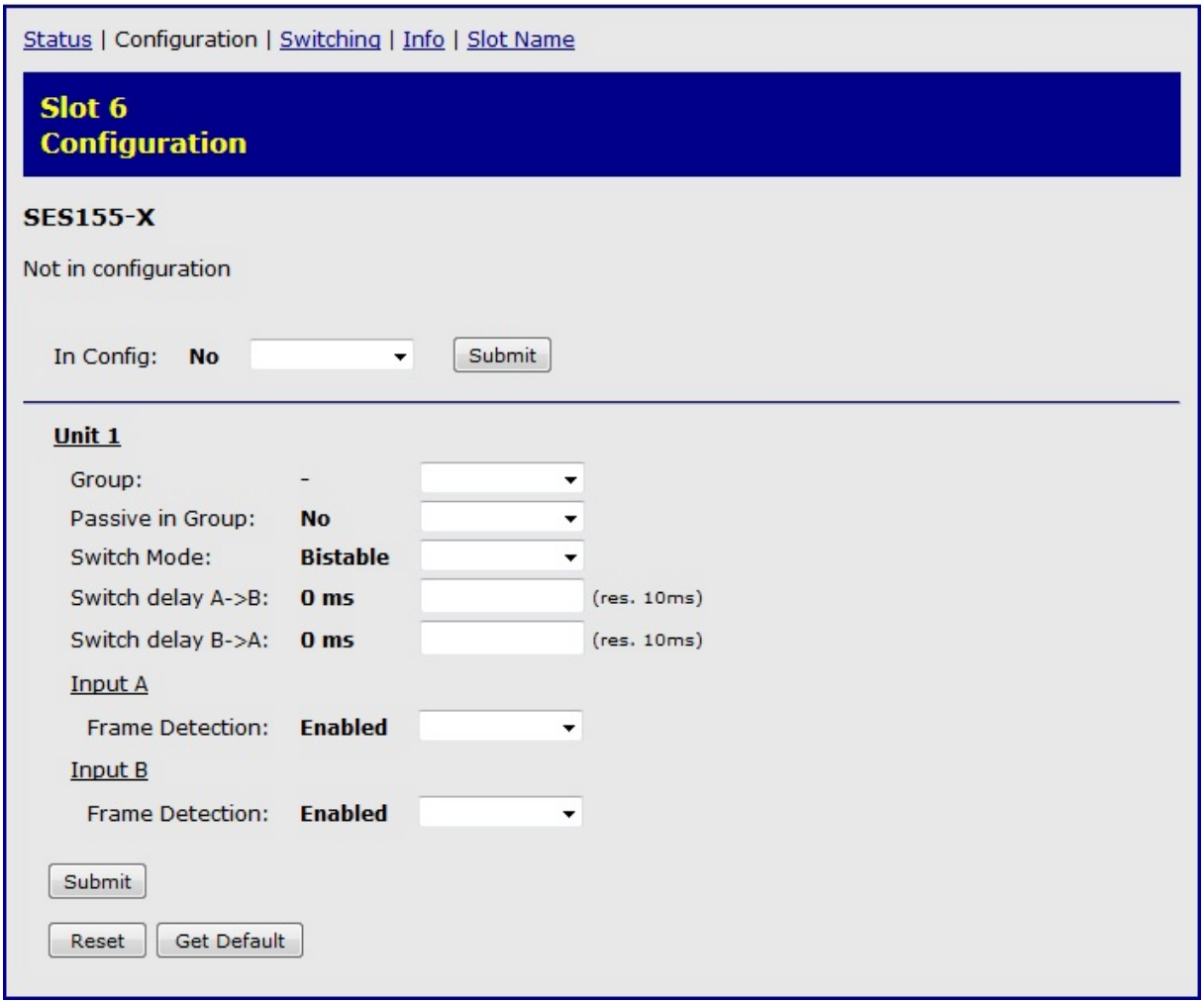
All Connectors BNC 75Ω.

6.29.2 LEDs

Sig. A & B; green	input signal ok
Error; red	lit on input signal failure
Power; yellow	indicates power supply o.k.
Sw A; green Sw B; green	either signal A or B, indicating the switch position
Configured; orange	lit when module is in the configuration (monitored via SNMP)

6.29.3 Settings (Web interface)

All non module specific settings are described in section 3.2.4.2



6.30 SEV155-X

6.30.1 Connectors

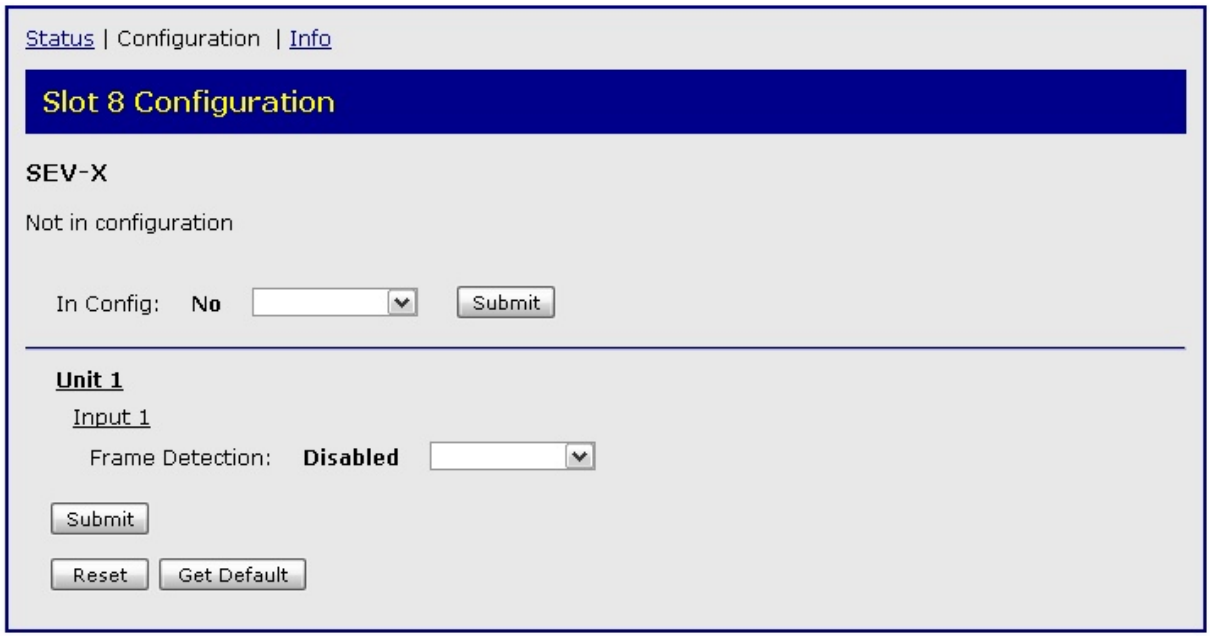
All Connectors BNC 75Ω

6.30.2 LEDs

Signal	input signal ok
Error; red	lit on input signal failure
Power; yellow	indicates power supply o.k.
Configured; orange	lit when module is in the configuration (monitored via SNMP)

6.30.3 Settings (Web interface)

All non module specific settings are described in section 3.2.4.2



6.31 SOS155-X

6.31.1 Connectors

All Connectors SM-LC

6.31.2 LEDs

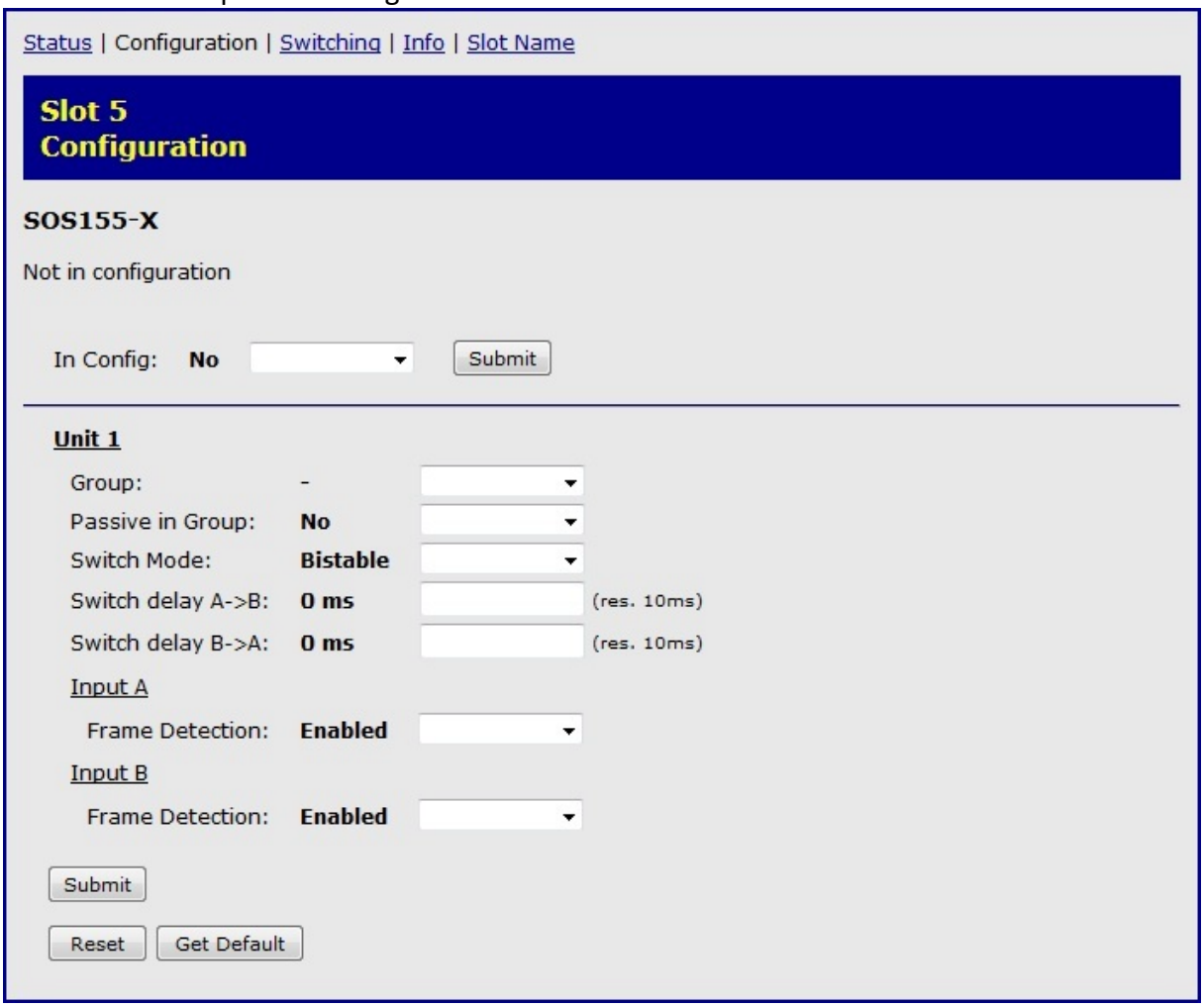
Sig. A & B; green	input signal ok; off	no link; red	link o.k. but no data activity

Error; red lit on input signal failure
Power; yellow indicates power supply o.k.

Sw A; green
Sw B; green either signal A or B, indicating the switch position
Configured; orange lit when module is in the configuration (monitored via SNMP)

6.31.3 Settings (Web interface)

All non module specific settings are described in section 3.2.4.2



6.32 ORX155-X

6.32.1 Connectors

Input connector SM-LC, Output connector BNC 75Ω

6.32.2 LEDs

Signal	input signal ok
Error; red	lit on input signal failure
Power; yellow	indicates power supply o.k.
Configured; orange	lit when module is in the configuration (monitored via SNMP)

6.32.3 Settings (Web interface)

All non module specific settings are described in section 3.2.4.2

6.33 OTX155-X

6.33.1 Connectors

Input connector BNC 75Ω, Output connector SM-LC

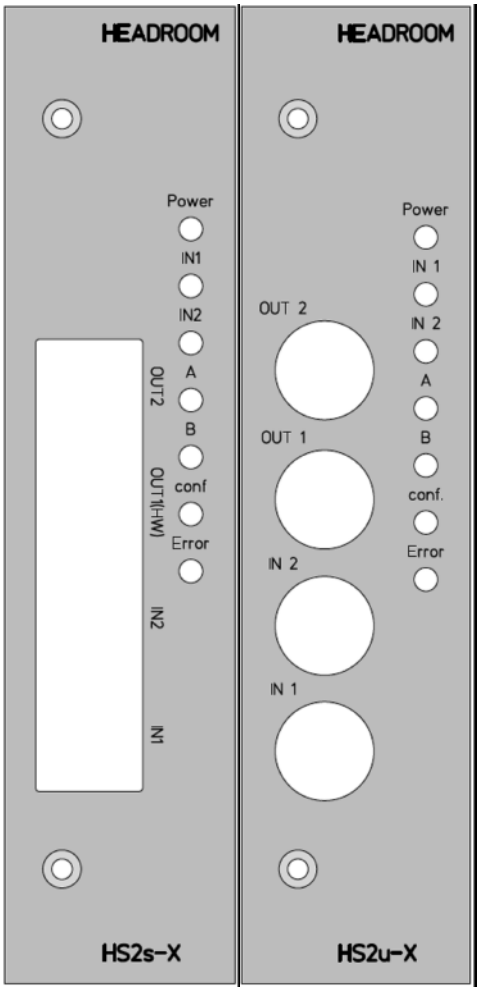
6.33.2 LEDs

Signal	input signal ok
Error; red	lit on input signal failure
Power; yellow	indicates power supply o.k.
Configured; orange	lit when module is in the configuration (monitored via SNMP)

6.33.3 Settings (Web interface)

All non module specific settings are described in section 3.2.4.2

6.34 HS2(s/u)-X



The HS2(s/u)-X is a backup switch for E1 connection acc. G.703. The HS2s-X is the balanced version with RJ45 connectors and the HS2u-X is the unbalanced version with BNC.
It has power-fail bypass relays from the last chosen input to output 1.

6.34.1 Connectors

HS2u-X all connectors BNC
HS2s-X all connectors RJ45, see Appendix C: E1 Modules RJ45 Connector Pin Configuration

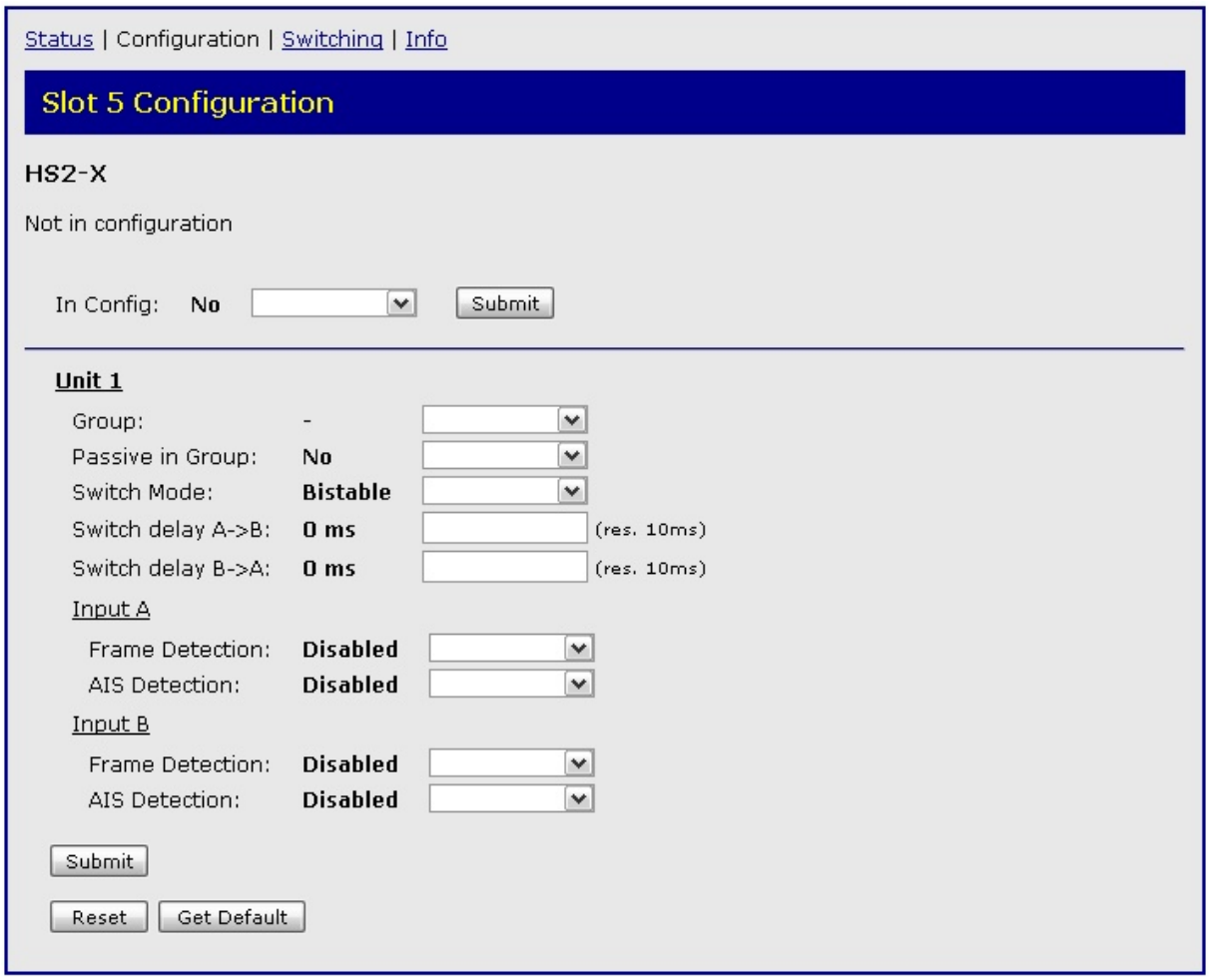
6.34.2 LEDs

In. 1 & 2; green	input signal ok; off LOS (or OOF);
Error; red	lit on input signal failure
Power; yellow	indicates power supply o.k.
A; green B; green	either signal A or B, indicating the switch position
Configured; orange	lit when module is in the configuration (monitored via SNMP)

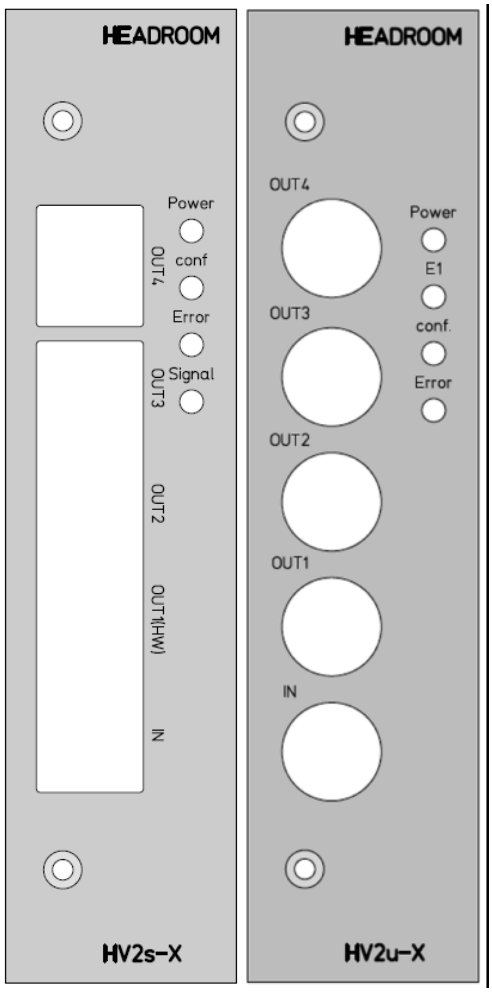
6.34.3 Settings (Web interface)

All non module specific settings are described in section 3.2.4.2

Frame detection and AIS detection are separate features for indentifying valid input signals. Each input can be configured individually.
The frame detection checks for minimal framing with TS0 acc. G.704 and AIS detection declares the signal invalid when there is a AIS detected acc. G.775.


Status | Configuration | Switching | Info
Slot 5 Configuration
HS2-X
Not in configuration
In Config: No
Submit
Unit 1
Group: -
Passive in Group: No
Switch Mode: Bistable
Switch delay A->B: 0 ms
(res. 10ms)
Switch delay B->A: 0 ms
(res. 10ms)
Input A
Frame Detection: Disabled
AIS Detection: Disabled
Input B
Frame Detection: Disabled
AIS Detection: Disabled
Submit
Reset
Get Default

6.35 HV2(s/u)-X



The HV2(s/u)-X is a spiltter for E1 connection acc. G.703. The HV2s-X is the balanced version with RJ45 connectors and the HV2u-X is the unbalanced version with BNC.
It has power-fail bypass relays from the input to output 1.

6.35.1 Connectors

HV2u-X all connectors BNC
HV2s-X all connectors RJ45, see Appendix C: E1 Modules RJ45 Connector Pin Configuration

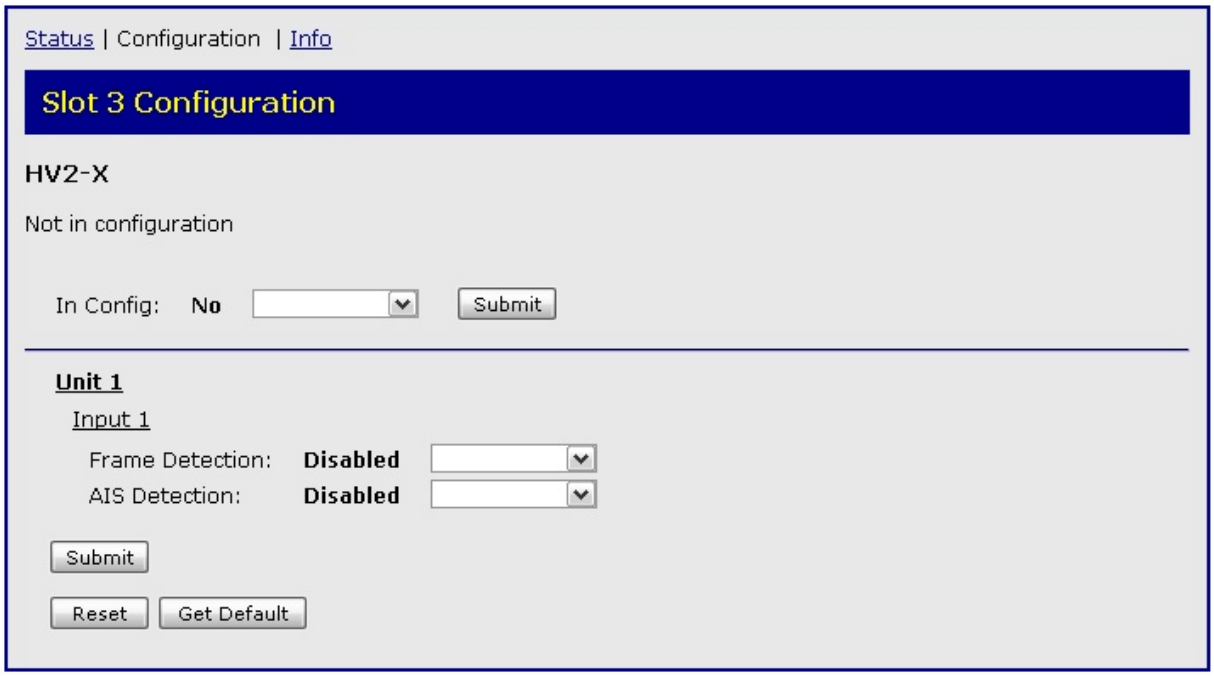
6.35.2 LEDs

E1/Signal; green	input signal ok; off LOS (or OOF);
Error; red	lit on input signal failure
Power; yellow	indicates power supply o.k.
Configured; orange	lit when module is in the configuration (monitored via SNMP)

6.35.3 Settings (Web interface)

All non module specific settings are described in section 3.2.4.2

Frame detection and AIS detection are separate features for indentifying valid input signals. The frame detection checks for minimal framing with TS0 acc. G.704 and AIS detection declares the signal invalid when there is a AIS detected acc. G.775.


Status | Configuration | Info
Slot 3 Configuration
HV2-X
Not in configuration
In Config: No
Submit
Unit 1
Input 1
Frame Detection: Disabled
AIS Detection: Disabled
Submit
Reset
Get Default

7 APPENDIX A: MIB Table

OID	Name	Syntax	read / write	Trap
.25362	Headroom			
.25362.15	HSM-X			
.25362.15.1	Info			
.25362.15.1.1	IpAddress	ipaddr	r	no
.25362.15.1.2	SubnetMask	ipaddr	r	no
.25362.15.1.3	IpGateway	ipaddr	r	no
.25362.15.1.4	IpTrapTarget1	ipaddr	r,w	no
.25362.15.1.5	IpTrapTarget2	ipaddr	r,w	no
.25362.15.1.6	IpTrapTarget3	ipaddr	r,w	no
.25362.15.2	Control			
.25362.15.2.1	Rack			
.25362.15.2.1.1	PowerSupply1	0: na; 1: error; 2:ok	r	yes
.25362.15.2.1.2	PowerSupply2	0: na; 1: error; 2:ok	r	yes
.25362.15.2.2	SMI-X (Controller)	(not implemented)		
.25362.15.2.2.1	Admin loged in	0: na; 1: yes; 2:no	r	yes
.25362.15.2.2.2	User loged in	No, Yes	r	yes
.25362.15.2.3	SlotTable			
.25362.15.2.3.1	SlotTableEntry			
.25362.15.2.3.1.1	SlotNumber			
.25362.15.2.3.1.1.1-10	SlotNumber Slot1-10	1-10	r	no
.25362.15.2.3.1.2	ModuleName			
.25362.15.2.3.1.2.1-10	ModuleName Slot1-10	20 byte string	r	no
.25362.15.2.3.1.3	ModuleStatus			
.25362.15.2.3.1.3.1-10	ModuleStatus Slot1-10	0:noModule; 1:ok; 2:wrongModule;	r	yes
		3:missingModule; 4:notObserved		

.25362.15.2.3.1.4	Input1A			
.25362.15.2.3.1.4.1-10	Input1A Slot1-10	InputStatus *	r	yes
.25362.15.2.3.1.5	Input1B			
.25362.15.2.3.1.5.1-10	Input1B Slot1-10	InputStatus *	r	yes
.25362.15.2.3.1.6	switch1Status			
.25362.15.2.3.1.6.1-10	switch1Status Slot1-10	SwitchStatus *	r	yes
.25362.15.2.3.1.7	switch1SetAuto			
.25362.15.2.3.1.7.1-10	switch1SetAuto Slot1-10	SwitchAutoSetting *	r,w	yes
.25362.15.2.3.1.8	switch1Set			
.25362.15.2.3.1.8.1-10	switch1Set Slot1-10	SwitchSetting *	r,w	yes
.25362.15.2.3.1.9	Input2A			
.25362.15.2.3.1.9.1-10	Input2A Slot1-10	InputStatus *	r	yes
.25362.15.2.3.1.10	Input2B			
.25362.15.2.3.1.10.1-10	Input2B Slot1-10	InputStatus *	r	yes
.25362.15.2.3.1.11	switch2Status			
.25362.15.2.3.1.11.1-10	switch2Status Slot1-10	SwitchStatus *	r	yes
.25362.15.2.3.1.12	switch2SetAuto			
.25362.15.2.3.1.12.1-10	switch2SetAuto Slot1-10	SwitchAutoSetting *	r,w	yes
.25362.15.2.3.1.13	switch2Set			
.25362.15.2.3.1.13.1-10	switch2Set Slot1-10	SwitchSetting *	r,w	yes
.25362.15.2.3.1.14	Input3A			
.25362.15.2.3.1.14.1-10	Input3A Slot1-10	InputStatus *	r	yes

.25362.15.2.3.1.15	Input3B			
.25362.15.2.3.1.15.1-10	Input3B Slot1-10	InputStatus *	r	yes
.25362.15.2.3.1.16	switch3Status			
.25362.15.2.3.1.16.1-10	switch3Status Slot1-10	SwitchStatus *	r	yes
.25362.15.2.3.1.17	switch3SetAuto			
.25362.15.2.3.1.17.1-10	switch3SetAuto Slot1-10	SwitchAutoSetting *	r,w	yes
.25362.15.2.3.1.18	switch3Set			
.25362.15.2.3.1.18.1-10	switch3Set Slot1-10	SwitchSetting *	r,w	yes
.25362.15.2.3.1.19	Input4A			
.25362.15.2.3.1.19.1-10	Input4A Slot1-10	InputStatus *	r	yes
.25362.15.2.3.1.20	Input4B			
.25362.15.2.3.1.20.1-10	Input4B Slot1-10	InputStatus *	r	yes
.25362.15.2.3.1.21	switch4Status			
.25362.15.2.3.1.21.1-10	switch4Status Slot1-10	SwitchStatus *	r	yes
.25362.15.2.3.1.22	switch4SetAuto			
.25362.15.2.3.1.22.1-10	switch4SetAuto Slot1-10	SwitchAutoSetting *	r,w	yes
.25362.15.2.3.1.23	switch4Set			
.25362.15.2.3.1.23.1-10	switch4Set Slot1-10	SwitchSetting *	r,w	yes
.25362.15.2.3.1.24	Input5			
.25362.15.2.3.1.24.1-	Input5 Slot1-10	InputStatus *	r	yes

10				
.25362.15.2.3.1.25	Input6			
.25362.15.2.3.1.25.1-10	Input6 Slot1-10	InputStatus *	r	yes
.25362.15.2.3.1.26	Input7			
.25362.15.2.3.1.26.1-10	Input7 Slot1-10	InputStatus *	r	yes
.25362.15.2.3.1.27	Input8			
.25362.15.2.3.1.27.1-10	Input8 Slot1-10	InputStatus *	r	yes
.25362.15.2.3.1.28	Input1ASignalLevel			
.25362.15.2.3.1.28.1-10	Input1ASignalLevel Slot 1-10	Integer (* -0,1 dBm)	r	no
.25362.15.2.3.1.29	Input1BSignalLevel			
.25362.15.2.3.1.29.1-10	Input1BSignalLevel Slot 1-10	Integer (* -0,1 dBm)	r	no
.25362.15.2.4	GroupTable			
.25362.15.2.4.1	GroupTableEntry			
.25362.15.2.4.1.1	groupNumber			
.25362.15.2.4.1.1.1-5	groupNumber Group1-5	1-5	r	no
.25362.15.2.4.1.2	groupStatus			
.25362.15.2.4.1.2.1-5	groupStatus Group1-5	0:na; 1:ok; 2:wrongModule;	r	yes
		3:missingModule		
.25362.15.2.4.1.3	inputA			
.25362.15.2.4.1.3.1-5	inputA Group1-5	GroupInputStatus *	r	yes
.25362.15.2.4.1.4	inputB			
.25362.15.2.4.1.4.1-5	inputB Group1-5	GroupInputStatus *	r	yes
.25362.15.2.4.1.5	switchStatus			

.25362.15.2.4.1.5.1-5	switchStatus Group1-5	GroupSwitchStatus *	r	yes
.25362.15.2.6.1.6	switchSetAuto			
.25362.15.2.4.1.6.1-5	SwitchSetAuto Group1-5	SwitchAutoSetting *	r,w	yes
.25362.15.2.4.1.7	switchSet			
.25362.15.2.4.1.7.1-5	SwitchSet Group1-5	SwitchSetting *	r,w	yes

7.1 Textual Conventions:

See 8.1

8 APPENDIX B: Trap Table

OID	Name	Objects/Values
.25362	Headroom	
.25362.15	HSM-X	
.25362.15.0	Notifications	
First 4 objects of all notifications are: sysDescr, sysName, sysLocation, evDateAndTime The last object of each notification is: evSeverity		
.25362.15.0.1	hsmxTrapInputSignal	slotNumber, evInput, evInputSignalStatus
.25362.15.0.2	hsmxTrapInputAesChannel	slotNumber, evInput, evInputAesChannelNb,
		evInputAesChannelStatus
.25362.15.0.3	hsmxTrapSwitch	slotNumber, evSwitch, evSwitchStatus
.25362.15.0.4	hsmxTrapGroupInput	groupNumber, evGroupInput, evGroupInputStatus
.25362.15.0.5	hsmxTrapGroupSwitch	groupNumber, evSwitchStatus
.25362.15.0.6	hsmxTrapPowerSupply1	hsmxPowersupply1
.25362.15.0.7	hsmxTrapPowerSupply2	hsmxPowersupply2
.25362.15.0.8	hsmxTrapAdminIsLogedIn	hsmxAdminIsLogedIn
not implemented		
.25362.15.0.9	hsmxTrapUserIsLogedIn	hsmxUserIsLogedIn
.25362.15.0.10	hsmxTrapModule	slotNumber, moduleStatus
.25362.15.0.11	hsmxTrapGroup	groupNumber,groupStatus

Objects		Values
.25362.15.0.50	evDateAndTime	DateAndTime*
.25362.15.0.51	evInput	InputType*
.25362.15.0.52	evInputSignalStatus	InputStatus*
.25362.15.0.53	evSwitch	SwitchType*
.25362.15.0.54	evSwitchStatus	SwitchStatus*
.25362.15.0.55	evGroupInput	0:na; 1:inputA; 2:inputB;
.25362.15.0.56	evGroupInputStatus	GroupInputStatus*
.25362.15.0.57	evInputAesChannelNb	0:na; 1:channel1; ...8:channel8
.25362.15.0.58	evInputAesChannelStatus	*
.25362.15.0.59	evSeverity	EventSeverity*

8.1 Textual Conventions

DateAndTime
Module: SNMPv2-TC

InputType	
0	na
1	input1A
2	input1B
3	input2A
4	input2B
5	input3A
6	input3B
7	input4A
8	input4B
9	input5
10	input6
11	input7
12	input8

SwitchType	
0	na
1	switch1
2	switch2

SwitchStatus		
Nb	Value	Severity
0	na	indeterminate
1	wayAautomatic	information
2	wayBautomatic	information
3	wayAstatic	warning
4	wayBstatic	warning
5	wayAgroup	information
6	wayBgroup	information
7	switchingNotPossible	information

GroupInputStatus		
Nb	Value	Severity
0	na	indeterminate
1	error	critical
2	ok	cleared

evInputAesChannelStatus		
Nb	Value	Severity
0	ok	cleared
1	errorSilenceLeft	critical

3	switch3
4	switch4

EventSeverity	
0	indeterminate
1	critical
2	major
3	minor
4	warning
5	cleared
6	information

InputStatus		
Nb	Value	Severity
0	na	indeterminate
1	disabled	indeterminate
2	ok	cleared
3	errorLOS	critical
4	errorAIS	critical
5	errorNoFrame	critical
6	errorNoAudioVbit	critical
7	errorNoPCMAudio	critical
8	errorAudio	critical
9	errorPAT	critical
10	errorCAT	critical
11	errorNIT	critical
12	errorSDT	critical
13	errorEIT	critical
14	errorTDT	critical
15	errorLowMinor	critical
16	errorLowMajor	critical
17	noLink	critical
18	dataError	critical
19	okHD	cleared
20	okSD	cleared
21	okASI	cleared

2	errorSilenceRight	critical
3	errorSilenceLeftRight	critical
4	errorNoVbit	critical
8	errorNoAudio	critical

HsmxPowersupply1/2		
Nb	Value	Severity
0	na	indeterminate
1	error	critical
2	ok	cleared

moduleStatus		
Nb	Value	Severity
0	noModule	information
1	ok	cleared
2	wrongModule	critical
3	missingModule	critical
4	notObserved	information

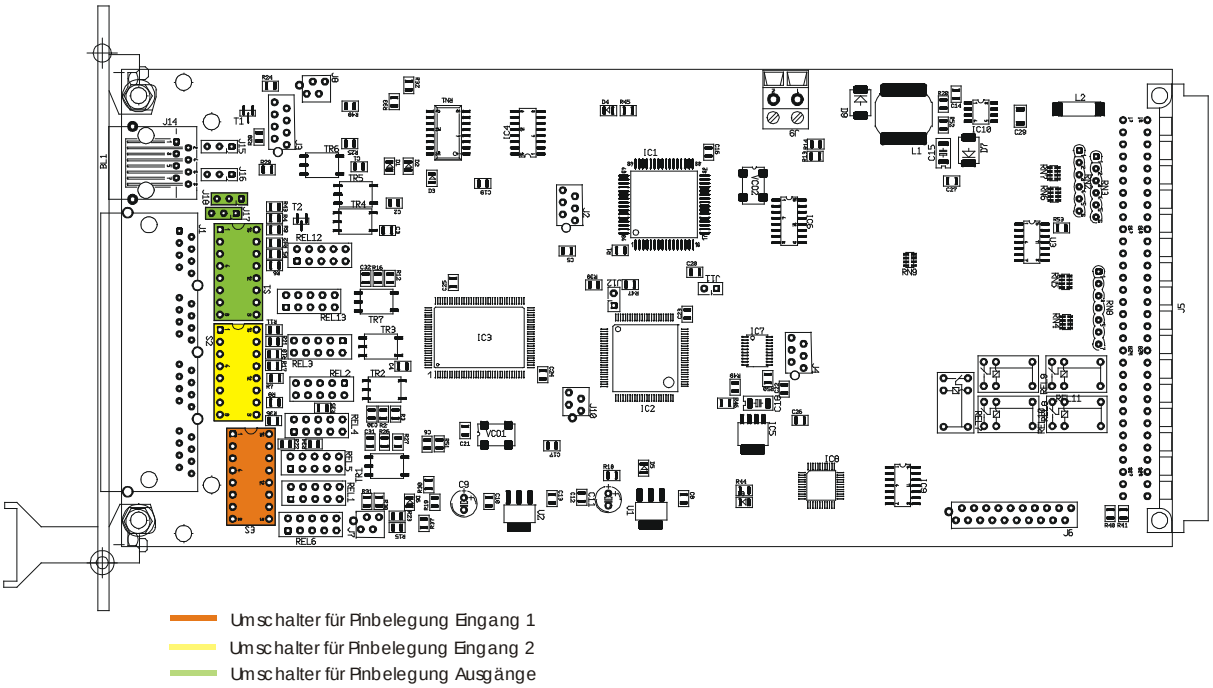
groupStatus		
Nb	Value	Severity
0	na	information
1	ok	cleared
2	wrongModule	critical
3	missingModule	critical

9 Appendix C: E1 Modules RJ45 Connector Pin Configuration

The Pinout of all inputs and outputs can be changed individually. So RX+/- and TX+/- can be either pins 1 and 2 or pins 4 and 5.

9.1 HS2s-X

You can see the location of the switches and jumpers for the balanced E1 Switch HS2s-X in Pict 2. The orange marked switch is for the configuration of input 1, the yellow marked switch for input 2, the green marked switch for output 1 and the green marked jumpers for output 2.



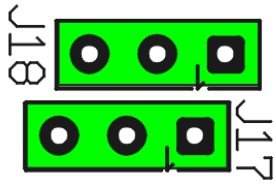
Pict 2 HS2s-X Location of configuration jumpers and switches

Switch setting for input 1,2 and output 1

Setting	Pinout
Setting "1"	
RX+, RX- (Inputs)	1,2
TX+,TX- (Output)	4,5
GND	
Setting "2"	
RX+, RX- (Inputs)	4,5
TX+,TX- (Output)	1,2
GND	8

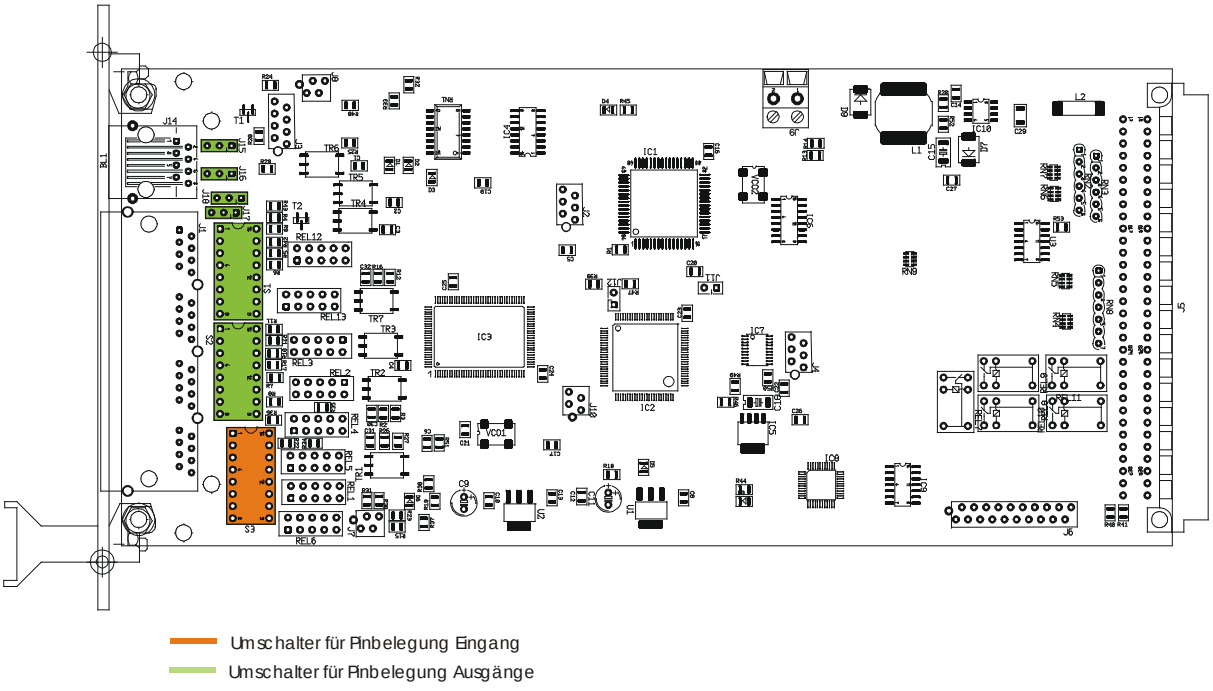
Jumper setting for output 2

Pin 1 is on the right side, pin 3 is closest to the RJ45 connector. The jumper must be placed over either pins 1 and 2 or pins 2 and 3. Both jumpers J18 and J17 have to be placed equally.



Jumper setting	**Pinout**
<u>Jumpers over 2 - 1:</u>	
TX+, TX-	1,2
GND	8
<u>Jumpers over 2 - 3:</u>	
TX+, TX-	4,5
GND	8

9.2 HV2s-X

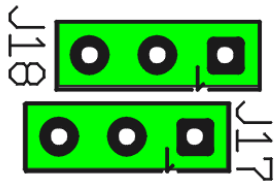


Switch setting for input 1 and output 1 and 2

Setting	Pinout
Setting "1"	
RX+, RX- (Inputs)	1,2
TX+,TX- (Output)	4,5
GND	
Setting "2"	
RX+, RX- (Inputs)	4,5
TX+,TX- (Output)	1,2
GND	8

Jumper setting for output 3 & 4

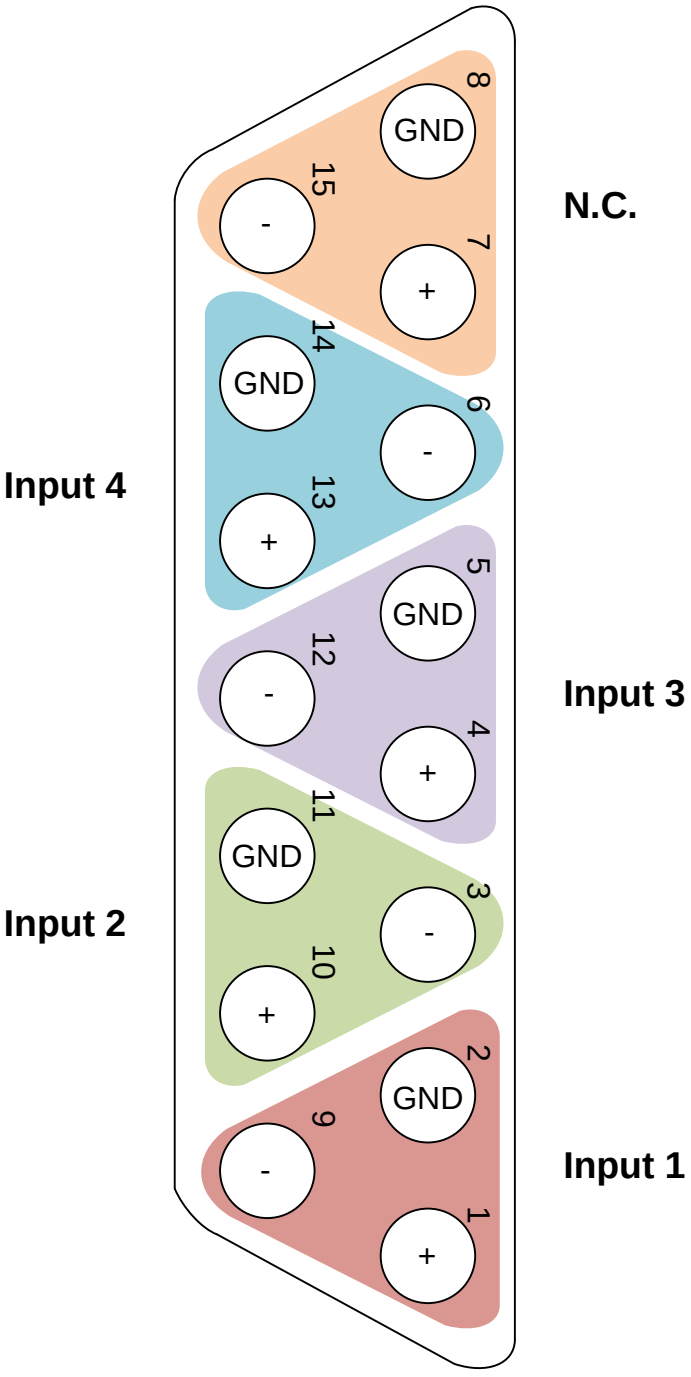
Pin 1 is on the right side, pin 3 is closest to the RJ45 connector. The jumper must be placed over either pins 1 and 2 or pins 2 and 3. Both jumpers J18 and J17 have to be placed equally.



Jumper setting	Pinout
Jumpers over 2 - 1:	
TX+, TX-	1,2
GND	8
Jumpers over 2 - 3:	
TX+, TX-	4,5
GND	8

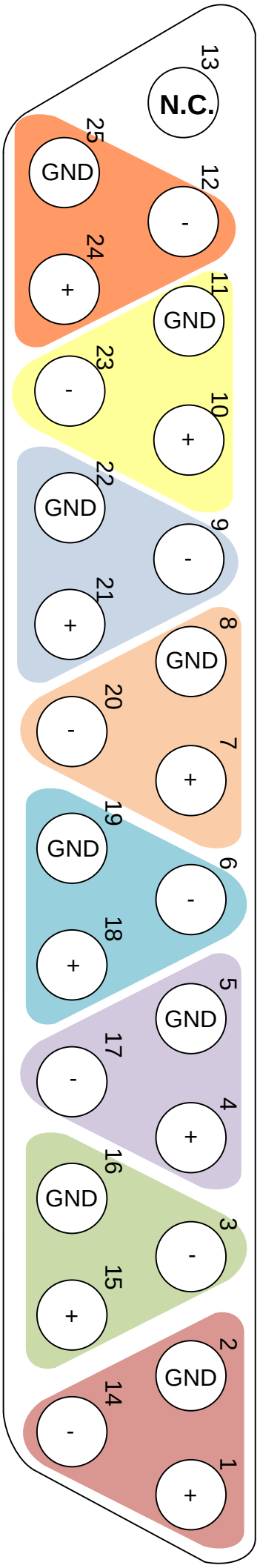
10 Appendix D: Pin Out Balanced Audio Modules

DAV-4s-X Digital Audio Verteiler symm. (HSM-X)
Input-Buchse SUB-D-15-f



DAV-4s-X
Digital Audio Verteiler
symm. (HSM-X)
Output-Buchse SUB-D-25-f

Bei dem DAV-4s-X sind
die a-Ausgänge mit
Power-Fail-Bypass-Relais
gebrückt (markiert mit HW)



Output 4b

Output 3b

Output 2b

Output 1b

Output 4a (HW)

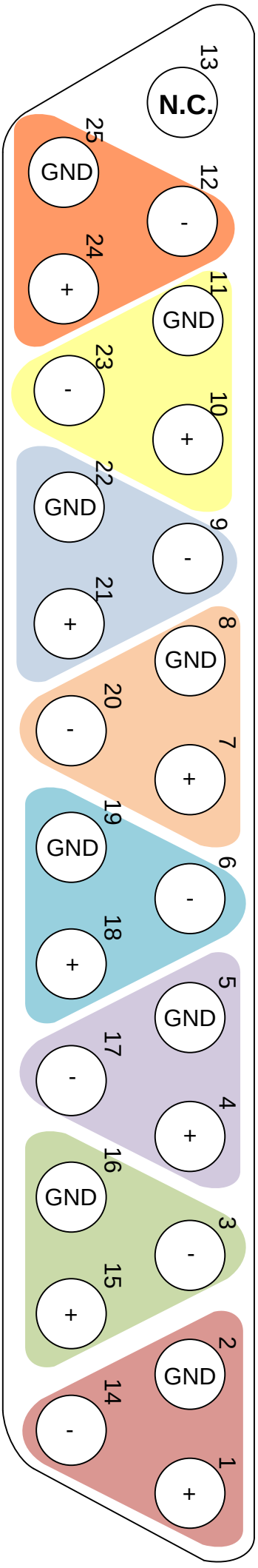
Output 3a (HW)

Output 2a (HW)

Output 1a (HW)

HEADROOM Broadcast

DAS-44s-X DAS-4s-X
Digital Audio Schalter
symm. (HSM-X)
Input-Buchse SUB-D-25-f



Input 4b

Input 4a

Input 3b

Input 3a

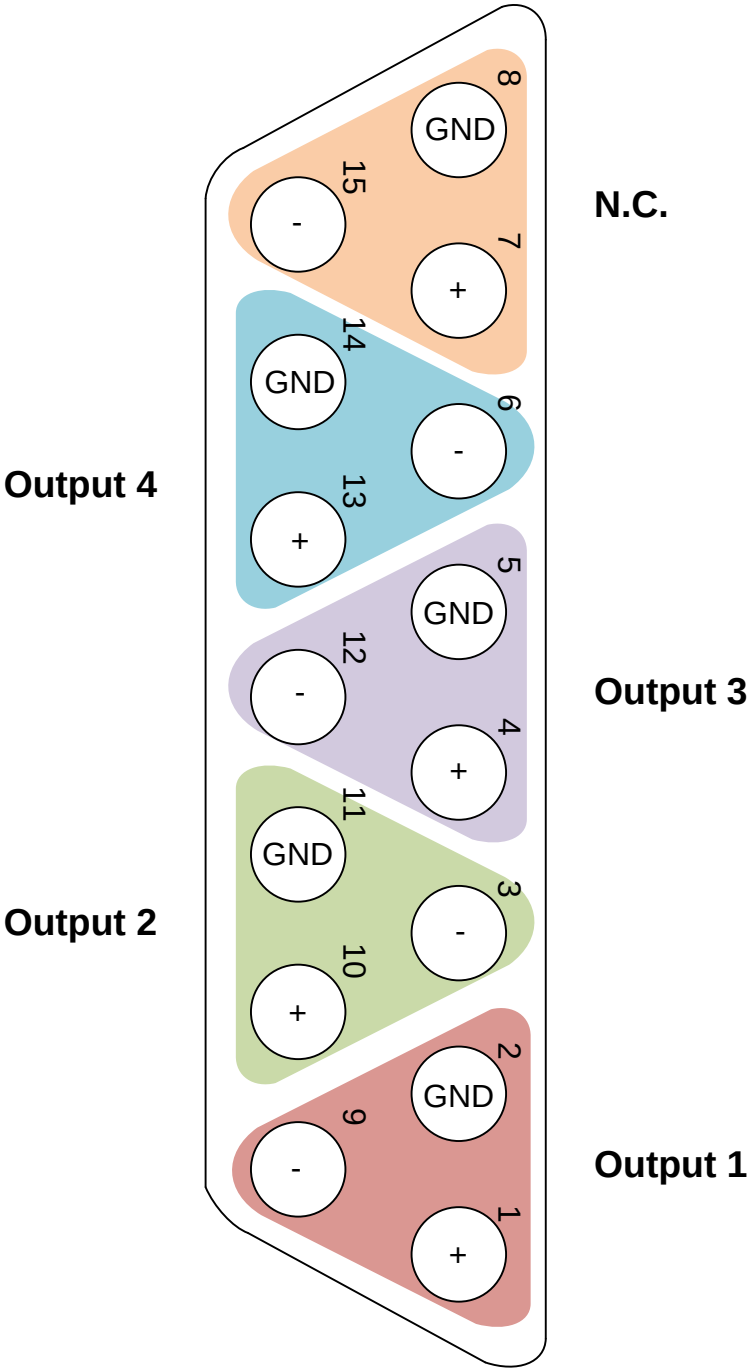
Input 2b

Input 2a

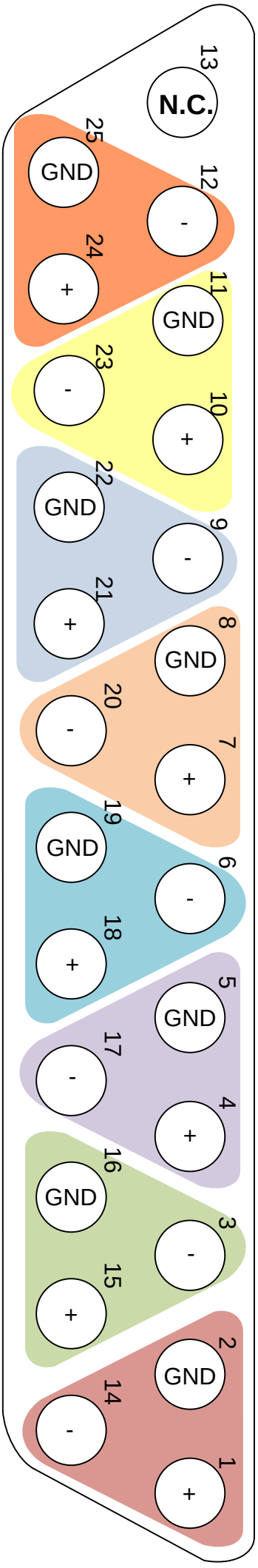
Input 1b

Input 1a

DAS-44s-X / DAS-4s-X Digital Audio Schalter symm. (HSM-X)
Output-Buchse SUB-D-15-f



OTX-8As-X
Digital Audio E/O-Wandler
symm. (HSM-X)
Input-Buchse SUB-D-25-f



Input 8

Input 7

Input 6

Input 5

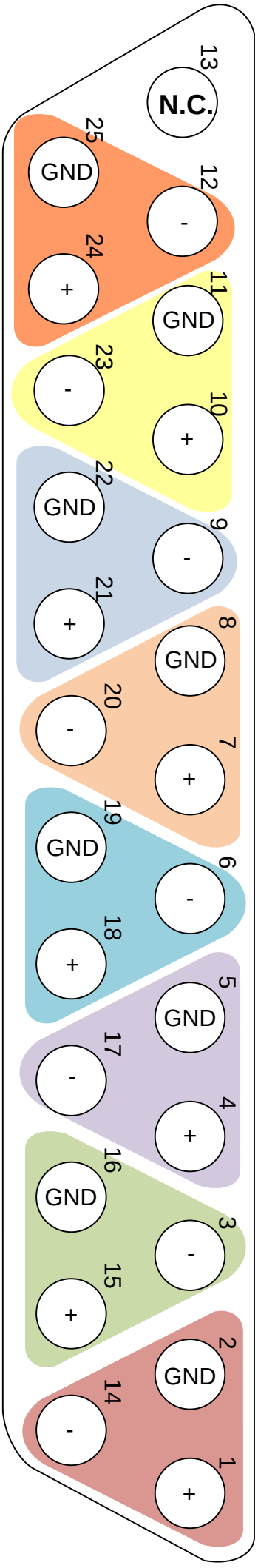
Input 4

Input 3

Input 2

Input 1

ORX-8As-X
Digital Audio O/E-Wandler
symm. (HSM-X)
Input-Buchse SUB-D-25-f



Ouput 8

Output 7

Output 6

Output 5

Output 4

Output 3

Output 2

Output 1

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