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Communications

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MANUAL

for

Controller HCS3-FO

Controller for Fiber Optic Transmitter / Receiver Modules
of the SatLight Series

Module Types:

**7000
7225
7310
7320
7410
7490
7830
7870**

Date: 12.08.2008

Rev.: E



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CE Declaration of Conformity

MANUFACTURER	Hiltron GmbH Stuttgarter Str.4, D 71522 Backnang
MODEL NUMBER	HCS3.FO
DESCRIPTION	Hiltron Controller System
YEAR WHICH THE CE-MARK WAS AFFIXED	2007
DATE OF ISSUE	13 March 2008
PLACE OF ISSUE	Backnang, Germany

A handwritten signature in black ink, appearing to read "H. Hayer".

Helmut Hayer
Quality Manager

Date: 12.08.2008		Rev.: E

The Hiltron Controller System HCS is considered as ITE equipment.
 This Control Unit has been shown to comply with the following standard:

1. CE safety (according to CE Low Voltage Directive) according to EN60950-1
2. CE EMC (according to CE EMC Directive)
- 2.1 Emissions : EN 55022 Class B – ‘Limits and methods of measurement of radio interferences characteristics of Information Technology Equipment’.
- 2.2 Immunity : EN 50024 – ‘Information technology equipment immunity characteristics’.
- 2.3 Limits: EN61000-3-2 – ‘ Limits for harmonic current emissions (I=16A)’
- 2.4 Limits : EN61000-3-3 – ‘ Limitation of voltage fluctuation and flicker in low-voltage supply systems for equipment I < = 16 A ‘

Extensive testing has been performed to ensure that the unit meets these specifications when configured with any or all of its available hardware options.



To ensure that the Control Unit maintains compliance with electromagnetic compatibility standards please observe the following points:

The equipment must be operated with its cover on at all times. If it is necessary to remove the cover for any reason, then you must ensure that the cover is correctly refitted before normal operation.

For the base-band data interfaces, all ‘D’ type connectors must have grounding fingers on the plug shell to guarantee continuous shielding. The back-shells must comply with the requirements of VDE 0871 and FCC 20708, providing at least 40 dB of attenuation from 30 MHz to 1 GHz. A good quality cable with a continuous outer shield , correctly grounded, must be used.

Connections to IF interfaces must be made with appropriate coaxial cable and no connectors shall be left without termination.

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1 Overview

The controller HCS3 is a highly modular monitoring and control unit.

It comprises a 19"/2U modular mainframe with 13 interface connection slots designated A1 to A13 located at the rear of the unit (refer to fig 1-1).

It can be equipped with two AC or DC power supplies for redundancy. The user interface comprises a touch sensitive LCD display at the front panel and two communication card modules type HCS3.PSC in slots A1 and A13 providing each a RS422 serial interface for remote control. Alternatively, slot A1 can be equipped with a network interface card (NIC) module type HCS3.PSN instead of HCS3.PSC providing both an Ethernet interface and a serial interface. In addition, it is possible to renounce on the LCD display for cost reasons. In this case, only remote control is available.

The remaining 11 interface connection slots (A2 to A12) can be equipped with different hot-pluggable functional card modules like switch cards, I/O cards, signal I/O cards, etc whose designation is HCS3.xxx where xxx defines the module type. This results in a very high flexibility. Thus, the controller is available in different versions by selection of the appropriate functional card modules. The card modules are programmable to provide the functionality for the various controller versions. Presently, the following versions are available:

1. Monitoring, control and power supply for fiber optic modules
2. Fiber optic N:1 switchover systems
3. LNB redundancy systems for C- and Ku-Band
4. HPA redundancy systems
5. Redundancy systems for DVB MPEG encoders/modulators/IRDs
6. Other applications for monitor&control

Each card module in the controller can be identified by its own ID-number used to access and configure the module. Each HCS3 controller comes with an attached configuration sheet showing the actual module configuration.

In the following, only the fiber optic controller version is described.

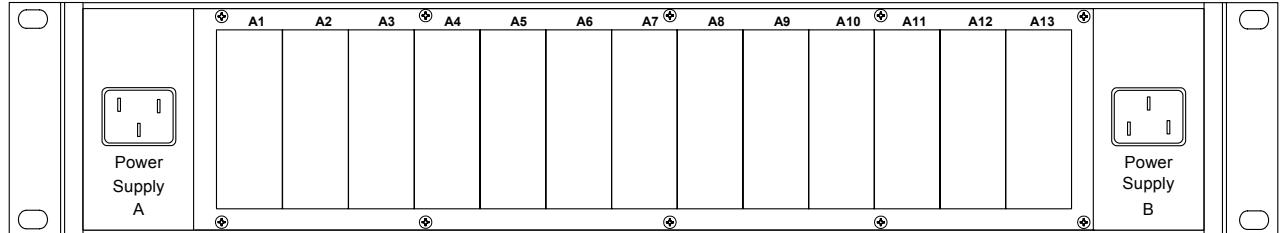


Fig 1-1 HCS3 controller, rear view

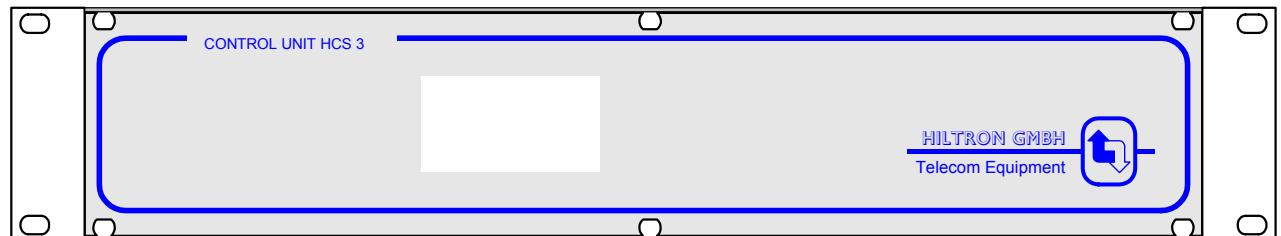


Fig 1-2, HCS3 controller, front view

2 Design

2.1 Mainframe

The mainframe of the HCS3 controller is a 19"/2U unit. Normally, front panel control is provided via a touch-sensitive LCD display type HCS3.TS. Alternatively, the controller can be delivered without the LCD display.

As a standard, the controller is equipped with two hot-pluggable AC power supplies units with IEC320 mains connectors located at the rear for power supply redundancy. As an option, DC power supplies (24/48 VDC) are also available.

A sub chassis with a backplane interconnects all card modules via a serial bus. The following bus lines are provided: data line, logic voltage +5V, supply voltage +26V and ground.

2.1.1 Schematic Diagram of the Controller

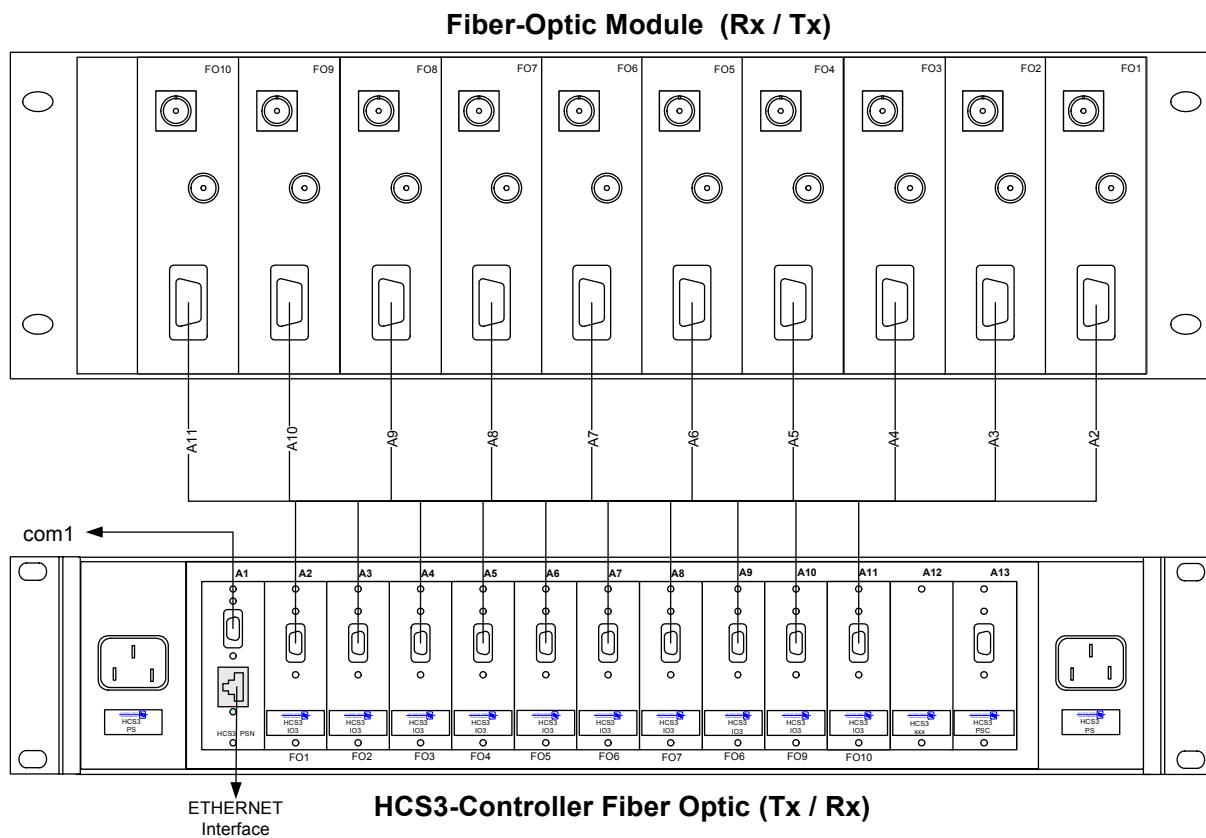


Fig 2.1.1-1: HCS3 Fiber Optic Controller and Frame for Fiber Optic Modules

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2.1.2 Technical Data

Size:

Width: 19" rack-mountable
 Height: 89 mm (3.5", 2U)
 Depth: 500 mm (20", including connectors)

Temperature:

Operating: 0°C to +50°C
 Non operating: -20°C to +80°C

Humidity:

Operating: 5% to 95% non condensing
 Non operating: 0% to 100% non condensing

Power (per Input):

AC input: 95-245V; 47-63Hz; PFC
 Consumption: max. 1A at 230V (dependent on configuration)

Max. Output Power (total): 90W

Serial Data Interfaces: (available on HCS3.PSC and HCS3.PSN)
 RS422

Ethernet Interface: (only available if equipped with HCS3.PSN)

2.2 Display

The front panel LCD display (if fitted) is used for monitor and control of the controller and of the devices connected thereto (e.g. fiber optic modules).

Rather than pressing buttons the operator has to touch the sensitive areas on the display. The displayed icons and text based status messages vary with the specific configuration. By means of a configuration program that comes with the controller the event handling, the sensitive areas and special text messages are widely configurable.

2.2.1 Technical Data

Size

Width: 128 Pixel LCD
 Height: 64 Pixel LCD
 Touch field 8 x 4 Pixel

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3 Card assignment

The controller HCS3 in the standard fiber optic version is only equipped with input/output card modules type HCS3.IO3 (in the freely configurable slots A2 to A11) used for monitor& control of fiber optic (FO) modules of the SatLight series (refer to section 4.2 below). Slot A12 is reserved for special versions with redundancy.

Usually, the FO modules are grouped together in a separate 19"/3U rack mountable frame with 10 slots. Each FO module shall be connected one-by-one (by means of cable with 9-pin Sub-D connectors on both sides provided as an accessory) to its corresponding input/output card module. Thus, the number of FO modules and input/output cards shall match.

The various functionalities of the input/output card module are described in section 4.3 below.

3.1 Card assignment for Fiber Optic Controller Version of HCS3

Example of a controller configuration

Card Nr	Card Type	Function	FO-Module Type
A01	HCS3.PSN	Supply and Communication#	
A02	HCS3.IO5	HCS3 IO5-Card Module, supply and monitor function	7000R/7000T
A03	HCS3.IO5	HCS3 IO5-Card Module, supply and monitor function	7225R/7225T
A04	HCS3.IO5	HCS3 IO5-Card Module, supply and monitor function	7310R/7310T
A05	HCS3.IO5	HCS3 IO5-Card Module, supply and monitor function	7320R/7320T
A06	HCS3.IO5	HCS3 IO5-Card Module, supply and monitor function	7410R/7410T
A07	HCS3.IO5	HCS3 IO5-Card Module, supply and monitor function	7490R/7490T
A08	HCS3.IO5	HCS3 IO5-Card Module, supply and monitor function	7830R/7830T
A09	HCS3.IO5	HCS3 IO5-Card Module, supply and monitor function	7870R/7870T
A10	HCS3.IO5	HCS3 IO5-Card Module, supply and monitor function	7830R/7830T
A11	HCS3.IO5	HCS3 IO5-Card Module, supply and monitor function	7830R/7830T
A12		Only used for special versions with redundancy	
A13	HCS3.PSC	Supply and Communication#	

#) can be used for remote monitor&control

The as-built configuration can be found in the attached separate HCS3 configuration sheet

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4 Modules

4.1 Communication (COM) Card Module (HCS3.PSN)

The COM card module type HCS3.PSN provides three functionalities.

1. Generates the internal DC voltage of 5V used as logic voltage.
2. Ethernet network interface card (NIC) to connect the controller to external network equipment like switches, hubs or computers.
3. Serial interface according to RS422 standard.

Remark: The protocol for the remote control via the serial interface is described in chapter 14

The Ethernet interface can be used in two ways:

1. Web interface (refer to section 11)
2. Remote control interface via UDP/IP protocol. It allows to integrate the controller in an external network management system. The details of the remote control protocol are published separately.

In most applications, the internal logic voltage and the 26V driver voltage shall be redundant. Thus, two hot-pluggable COM card modules can be installed in each mainframe, type HCS3.PSN or HCS3.PSC in slot A1 and type HCS3.PSC in slot A13. The 5V logic voltage as well as the 26V driver voltage are constantly monitored.

4.1.1 Location of Module

The modules are always located in:

- Slot A1: card module HCS3.PSN (with Ethernet and serial interface) or HCS3.PSC (serial interface only)

4.1.2 Technical Data RS422

Communication Type RS422

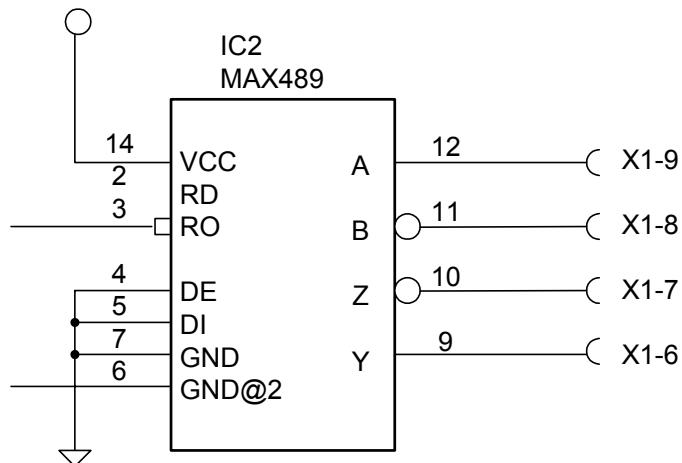
Baud rate	configurable
Data Bit	configurable
Parity	configurable
Stop bit	configurable

The purpose of this serial interface is the connection of an extension module type RIO.8I providing 8 digital inputs. Normally, it is not configured for serial remote control.

4.1.3 Pinout for 9-pin Sub-D Connector male

Pin	Function	Comment
1	+5V Aux Voltage	max. current 100mA
2	GND	Connected with Pin 3+4
3	GND	Connected with Pin 2+4
4	GND	Connected with Pin 2+3
5	+5V Aux Voltage	Connected with Pin 1
6	TX +	RS 422
7	TX -	RS 422
8	RX -	RS 422
9	RX +	RS 422

4.1.4 Input Interface Diagram / Electrical Diagram



4.1.5 Technical Data Ethernet

Communication Type Ethernet

Bus interface IEEE802.3 (10BaseT)

Data transfer rate 10 Mbit/s

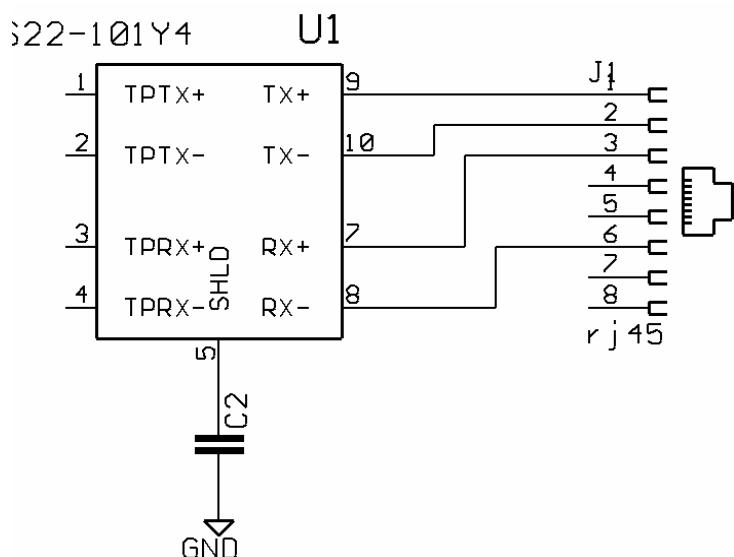
Connector RJ45

Max. length of cable 100m

4.1.6 Pinout for Ethernet Connector RJ45

Pin	Function	Comment
1	TD+	Transmit +
2	TD-	Transmit -
3	RD+	Receive +
4	not used	
5	not used	
6	RD-	Receive -
7	not used	
8	not used	

4.1.7 Ethernet Interface Diagram





4.2 Communication (COM) Card Module (HCS3.PSC)

The COM card module type HCS3.PSC provides dual functionality.

- 1) Generates the internal DC voltage of 5V used as logic voltage.
- 2) Serial interface according to RS422 standard.

The serial interface can be used in two ways:

- Serial interface for configuration of the controller with a software called HCS3.Opto to be installed on an external Windows PC connected to the controller via the serial interface (please refer to section 10). This is the method to configure the controller if the card module HCS3.PSN with its Web interface is not available.
- Serial remote control interface if a module card HCS3.PSN with Ethernet interface is not available. It allows to integrate the controller in an external network management system. The details of the remote control protocol are published separately.

In most applications, the internal logic voltage and the 26V driver voltage shall be redundant. Thus, two hot-pluggable COM card modules can be installed in each mainframe, type HCS3.PSN or HCS3.PSC in slot A1 and type HCS3.PSC in slot A13. The 5V logic voltage as well as the 26V driver voltage are constantly monitored.

4.2.1 Location of Module

The modules are always located in:

- Slot A1: card module HCS3.PSN (with Ethernet and serial interface) or HCS3.PSC (serial interface only)
- Slot A13: card module HCS3.PSC (serial interface only).

4.2.2 Technical Data

Communication Type RS422

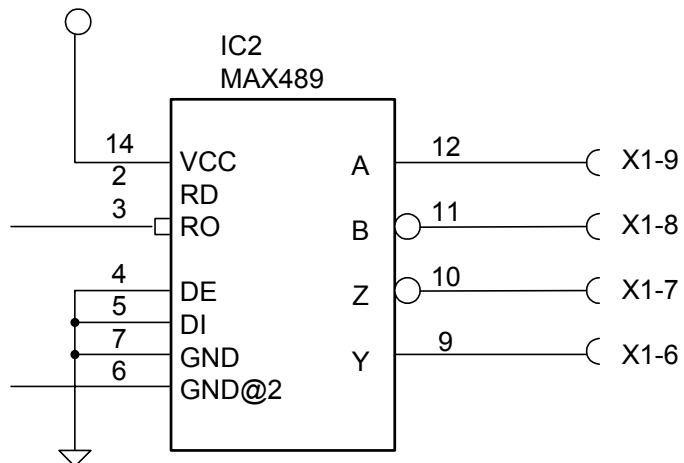
Baud rate 9600 Baud
Data Bit 8 data
Parity no parity
Stop bit 1

Note: The serial remote control interface is only available if the HCS3.PSN Ethernet communication card module is not fitted in slot A1.

4.2.3 Pinout of 9-pin Sub-D Connector male

Pin	Function	Comment
1	+5V Aux Voltage	max. current 100mA
2	GND	Connected with Pin 3+4
3	GND	Connected with Pin 2+4
4	GND	Connected with Pin 2+3
5	+5V Aux Voltage	Connected with Pin 1
6	TX +	RS 422
7	TX -	RS 422
8	RX -	RS 422
9	RX +	RS 422

4.2.4 Input Interface Diagram / Electrical Diagram



4.3 Input / Output Card Module (HCS3.IO5)

The input/output card module type HCS3.IO5 has the following functionalities:

- Provides the DC power for the FO module and for the LNB (if required)
- Measures the physical parameters of the module by digitizing the analog control voltages provided by the fiber optic module
- Senses FO module alarms. The alarm levels are freely configurable via the Web interface or the software HCS3.Opto
- Serial communication with the fiber optic RGC module.

The input/output card module type HCS3.IO5 has 2 programmable power supplies with current control and 6 inputs for monitoring. The input ranges and alarm limits are adjustable. The supply outputs are protected against short circuit.

Each module shall be connected one-by-one to its corresponding FO module.

4.3.1 Location of Module

The modules are located in:

- Slots A02 to A11 (the actual configuration can be read from the attached HCS3 configuration sheet)

4.3.2 Technical Data

Supply FO Module (Pin1):	5.2 .. 24V 0.75A max.
Supply LNB (Pin 9):	5.2 .. 24V 0.75A max.
Measurement Input:	1% FSR

Pinout 9-pin Sub-D Connector female for FO TX Module

Pin	Function	Comment
1	+5.2V.. +24 V	max. current 750mA**
2	Serial I/O	Communication with RGC
3	GND	Ground; DC return
4	Laser Drive Level	Input Range 0..+10V*
5	RF Input Power	Input Range -5..+10V*
6	Not used	Input Range -5..+4V*
7	RF-Alarm	Input Range -5..+4V*
8	Laser Alarm	Input Range -5..+4V*
9	+5.2V.. +24 V	max. current 750mA**

* for detailed range specifications refer to the interface diagram in the SatLight Manual

** max controller load 90W



Pinout 9-pin Sub-D Connector female for FO RX Module

Pin	Function	Comment
1	+5.2V – 24 V	max. current 750mA**
2	Serial I/O	Communication with RGC
3	GND	Ground; DC return
4	RF Output Power	Input Range 0..+10V*
5	OP Input Level	Input Range -5..+10V*
6	Not used	Input Range -5..+4V*
7	RF-Alarm	Input Range -5..+4V*
8	OP-Alarm	Input Range -5..+4V*
9	+5.2V – 24 V	max. current 750mA**

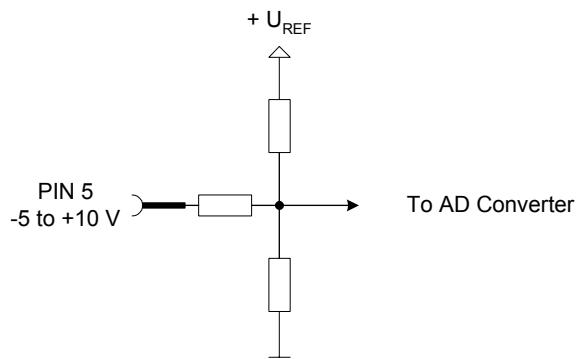
* for detailed range specifications refer to the interface diagram in the SatLight Manual

** max controller load 90W

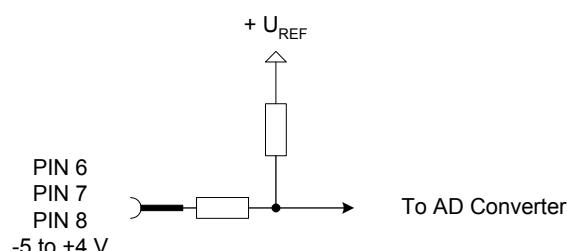
4.3.3 Input Interface Diagram



To AD Converter



To AD Converter



To AD Converter

5 Operation of the Controller via Front Panel

5.1 Menu Tree

Whenever the controller is fitted with a LCD display type HCS3.TS front panel control is available as described below. Otherwise, only remote control is available.

In fig. 5.1-1 the menu tree for monitor&control of TX and RX FO modules is depicted.

The menu tree consists of 3 level:

- Main Menu
- Screen_1 (level 1)
- Screen_2 (level 2)

After powering the controller the nominal operation mode (powering and monitoring FO modules) is started. The main start menu is depicted on the LCD display.

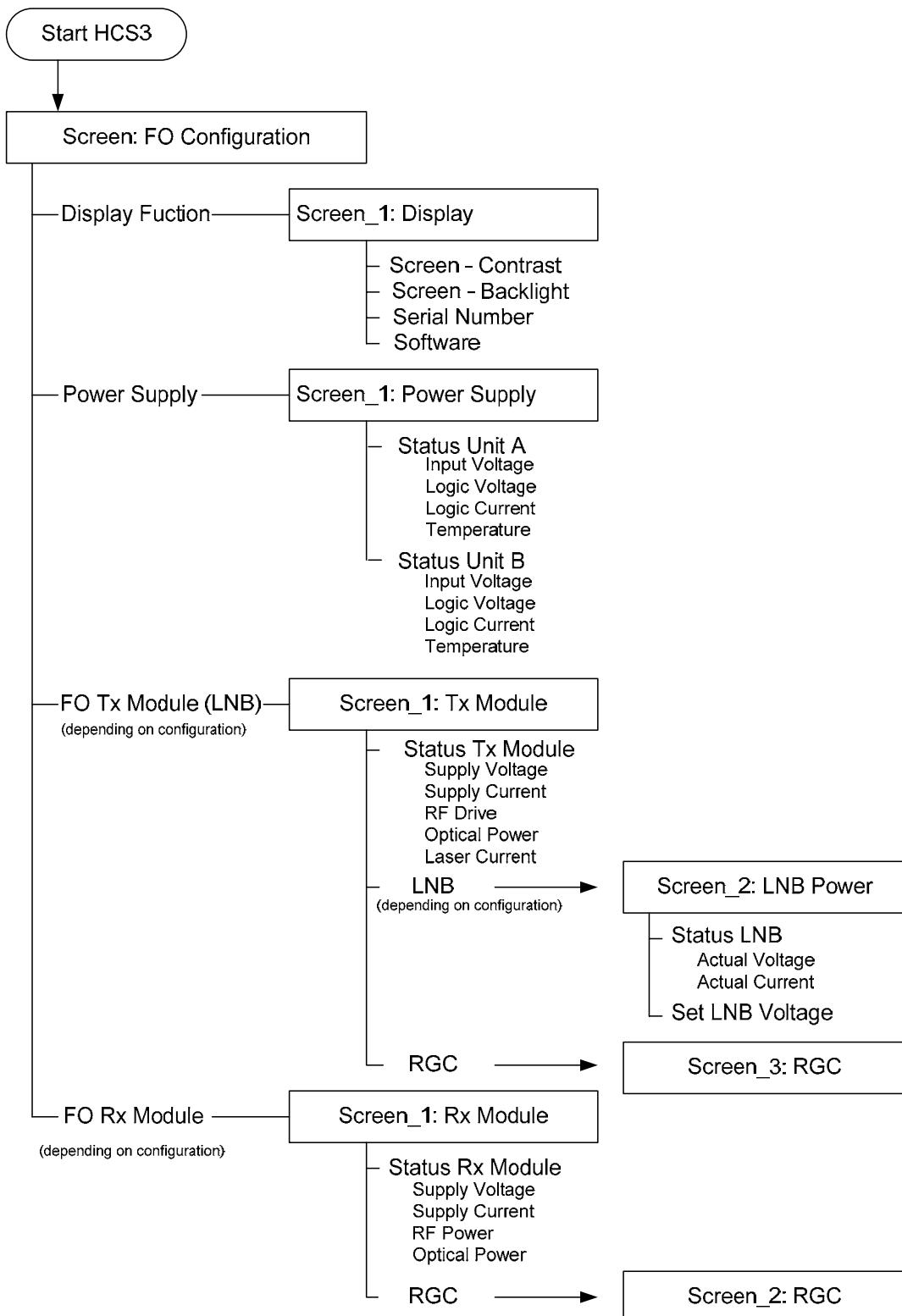
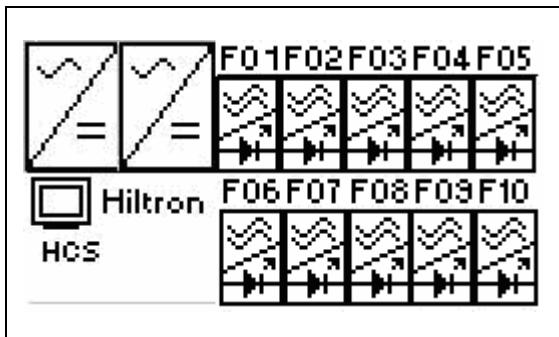


Fig. 5.1-1: Menu Tree – local mode operation – HCS3-FOTx and/or HCS3-FORx

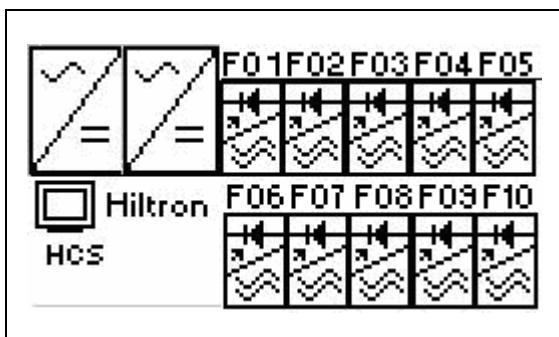
5.2 Screen: FO Configuration (Start)

After powering the controller starts depicting the main menu on the LCD display.

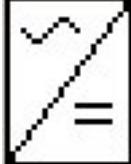
For HCS3-FOTxnn (equipped with FO TX modules)



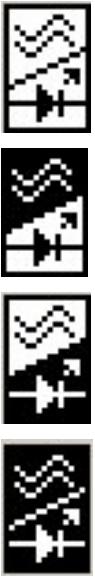
For HCS3-FORxnn (equipped with FO RX modules)



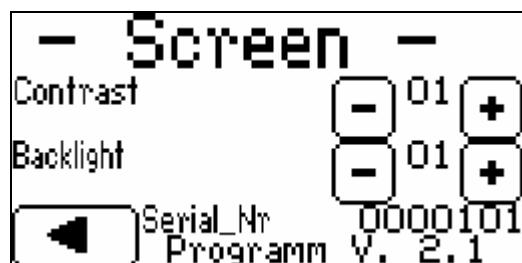
5.2.1 Explanation of icons:

Icon	Description	Comments
	Power supply of controller: Flashing when power supply is faulty, left hand icon refers to power supply A (slot A01), right hand icon refers to power supply B (slot A13)	By touching the icon the sub screen „Power Supply“ is selected
	Icon in case of faulty power supply	



	Gives information on serial number, database, unit-application, program version	By touching the icon the sub screen „Display“ is selected
A02	Indicates the slot to which the relevant TX or RX module is fitted.	If eg. only 4 modules fitted only slots A02, A03, A04, A05 visible on screen.
	The icon is representing the FOTx module and its status. Flashing in case of power supply or equipment failure or not connected equipment. Flashing in case of low RF input signal. Flashing in case of low optical output power. Flashing in case of both, low RF input signal and low optical power	By touching the icon the sub screen „Tx Module“ is selected
LNB	In case LNB supply voltage or current are out of limit.	
	The icon is representing the FORx module and its status. Flashing in case of power supply or equipment failure or not connected equipment. Flashing in case of low optical input power. Flashing in case of low RF output signal. Flashing in case of both, low optical input power and low RF output signal.	By touching the icon the sub screen „Rx Module“ is selected

5.3 Screen_1: „Display“



5.3.1 Explanation of Screen

Icon	Description	Comment
Contrast	The contrast can be adjusted in the sub screen "Display" by using the +/- buttons	Variation in range of 20 to 49 possible.
Backlight	The backlight can be adjusted in the sub screen "Display" by using the +/- buttons	Variation in range of 00 to 62 possible.
	Increases the numerical value	
	reduces the numerical value	
	Leads back to the sub screen	
HCS3 Serial-Nr.	e.g. 0025555	
HCS3 Program-version.	Info on implemented software e.g. Program V.2.1	

Remark:

Setting the numeric value for contrast from 49 (see comments) to 50. (limits). The new value will (instead of 50) start with 30 again. This will lead to a very weak picture. Stepping this process several times will yield to satisfying results. On technical reasons this function could not be prevented.

5.4 Screen_1: Power Supply

PwrSupp	Unit A	Unit B
InpVolt	00.2V	00.2V
LogVolt	0.05V	0.05V
LogCurr	005mA	005mA
Temp.	-01°C	-01°C

[< back]

Example for nominal operation

PwrSupp	Unit A	Unit B
InpVolt	30.0V	30.0V
LogVolt	5.35V	5.35V
LogCurr	120mA	000mA
Temp.	45°C	43°C

[< back]

5.4.1 Explanation of Screen

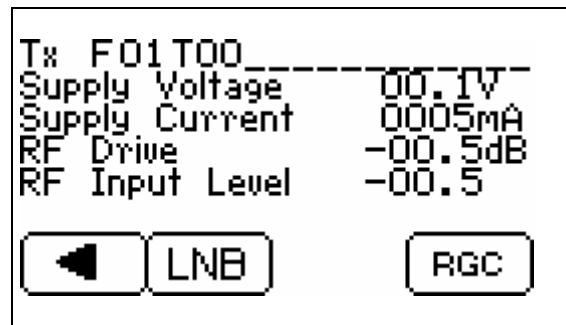
Icon	Description	Comment
PwrSupp	Designation of sub screen	Display of power supply values
Unit A	Values of this column refer to power supply A (HCS3.PSN or HCS3.PSC)	
Unit B	Values of this column refer to power supply B (HCS3.PSC)	
InpVolt	Input voltages of power supply unit	Voltage shall be between 28.0 and 32.0 V
LogVolt	Voltage of logic voltage supply in front of the diode. Voltage across the diode is approx. 0.4 V at 200 mA current.	Voltage shall be between 4.8V and 5.5V
LogCurr	Current of logic voltage supply	Depending on the power supply tolerances, current will be supplied by only one unit or by both units by load sharing.
Temp.	Temperature of power supply card	The temperature is approx. 20 degrees above the ambient temperature. The card temperature shall not exceed 85°C.
[< back]	Back to main screen	

5.4.2 Status Messages of a Power Supply Module (example 7225 ASR)

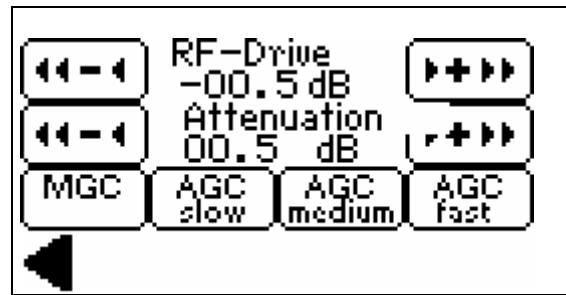
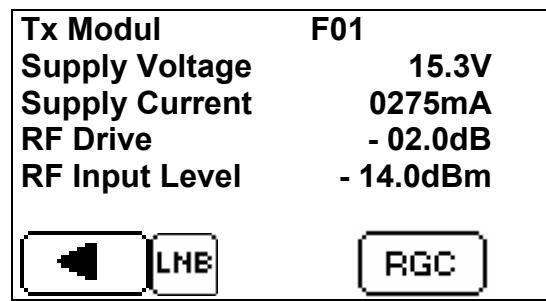
Display	Comment	Range
Main Module 11 (12) 30 V	Supply voltage of Main Power supply 1 (2)	30 V +/- 1V
Logic Voltage 5.2V	Supply voltage of Com Power supply 1 (2)	5.3 V +/- 0.25V
Logic Current 200 mA	Current consumption of the controller	< 250 mA
Card Temp +35°C	Internal Controller Temperature	< 65° C

In case of failure, the line corresponding to the problem is periodically inverted.

5.5 Screen_1: Tx Module



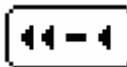
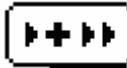
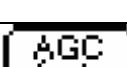
Example for nominal operation



5.5.1 Explanation of the Screen (LNB)

Icon	Description	Comment
Supply Voltage	The voltage and the current of the Tx-FO are displayed in the relevant columns	The voltage shall be in the range of 15 V to 18 V. The current shall be between 170 and 230 mA at nominal operation.
RF Drive	RF drive level	The RF Drive level should be in the range of +3 to -10dBm
P-Optic	Laser diode optical power	The optical power of laser diode is expected in the range of 0.5 to 5mW
	Path to sub menu_2 "LNB"	By touching the icon the sub screen „LNB module” which is supplied by the relevant FO-Tx module is selected
	Back to main screen	

5.5.2 Explanation of the Screen (RGC)

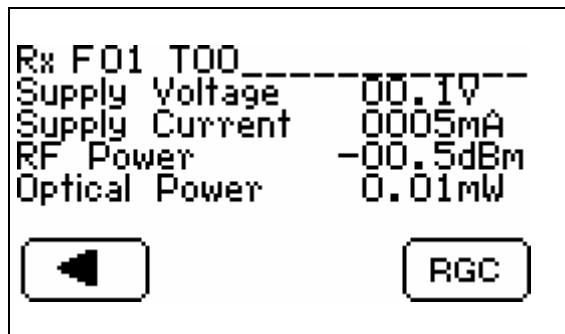
	Description	Comment
	Reduces the numerical value (slow / fast)	
	Increases the numerical value (slow / fast)	
	Manual Gain Control	Touching the button “MGC” the Manual Gain Control mode is selected which allows to set the gain manually
	Automatic Gain Control “slow”	Touching the button “AGC slow” an Automatic Gain Control mode with slow control response is selected.
	Automatic Gain Control “medium”	Touching the button “AGC medium” an Automatic Gain Control mode with medium control response is selected.
	Automatic Gain Control “fast”	Touching the button “AGC fast” an Automatic Gain Control mode with fast control response is selected.
	Back to main screen	

5.5.3 Status Messages of Transmitter Module (example 7225 AST)

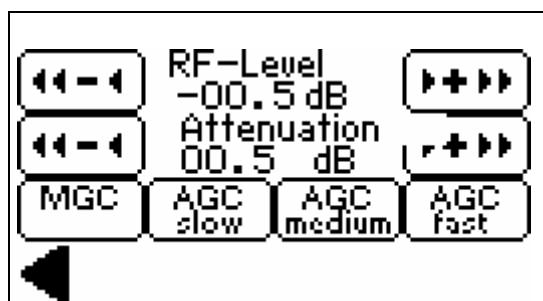
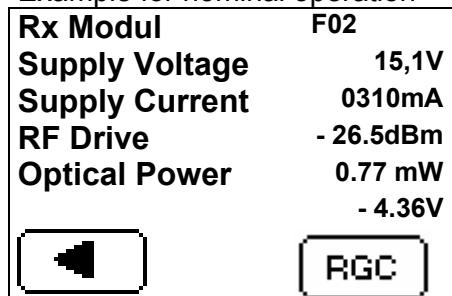
Display	Comment	Range
TX Module 01 for Link 01	Module No. and Link No.	
Supply Voltage 15.2V	Power supply voltage in V	15V +/- 1V*
Supply Current 140mA	Current in mA	100..500mA*
RF Drive 0.0dB	RF Drive level to the Laser (relative to 4V)	0 +/- 2dB*

In case of failure, the line corresponding to the problem changes periodically to inverse.
 * configurable depending on SatLight module specification

5.6 Screen_1 Rx Module



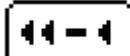
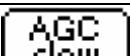
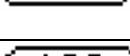
Example for nominal operation



5.6.1 Explanation of the Screen (LNB)

	Description	Comment
Supply Voltage	The voltage and the current of the Rx-FO module are displayed in the relevant columns	The voltage shall be in the range of 15 V to 18 V. The current shall be between 170 and 230 mA at nominal operation.
Supply current		
RF Power	RF output power	The RF output power should be <-20dBm
Optical Power	Optical receive power	The expected range is 0.2 to 1.0mW
	Back to main screen	

5.6.2 Explanation of the Screen (RGC)

	Description	Comment
	Reduces the numerical value (slow / fast)	
	Increases the numerical value (slow / fast)	
	Manuel Gain Control	Touching the button "MGC" the Manual Gain Control mode is selected which allows to set the gain manually
	Automatic Gain Control "slow"	Touching the button "AGC slow" an Automatic Gain Control mode with slow control response is selected.
	Automatic Gain Control "medium"	Touching the button "AGC medium" an Automatic Gain Control mode with medium control response is selected.
	Automatic Gain Control "fast"	Touching the button "AGC fast" an Automatic Gain Control mode with fast control response is selected.
	Back to main screen	

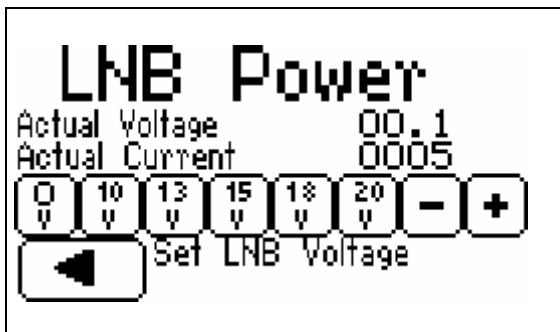
5.6.3 Status Messages of Receiver Module (example 7225 ASR)

Display	Comment	Range
RX Module 01 for Link 01	Module No. and Link No.	
Supply Voltage 15.2V	Power supply voltage in V	15V +/- 1V*
Supply Current 140mA	Current in mA	100..500 mA*
RF Power - 25.0dBm	RF output power	-40..-20 dBm*
Optical Power 0.68mW	Optical input power	0.3..1.0mW*

In case of failure, the line corresponding to the problem changes periodically to inverse.

* configurable depending on SatLight module specification

5.7 Screen_2: LNB Module



5.7.1 Explanation of Screen

Icon	Description	Comment
Supply Voltage Supply current	The voltage and the current of the LNB are displayed	For dual output LNBs, the voltage shall be adjusted such that one TX module provides the DC voltage for the HB LNB and a second TX module the DC voltage for the LB LNB. This allows power supply redundancy.
	Button to increase and decrease supply voltage.	Fine adjustment

	Button for coarse setting of supply voltage.	Coarse adjustment
	Back to main screen	

6 Level Adjustments

6.1 Drive Level Adjustment of TX Module

Optimum Performance of a fiber optic link is achieved by driving the laser with an RF level of 0 dB. An internal detector in the FO-Module measures the drive level and converts it to a DC voltage at pin 4 (Laser Drive Level). For the 7225AS Modules as an example, this voltage shall be 4 V.

The input/output card module type HCS3.IO5 measures the input voltage and converts it to a dB-linear value where **4V is equal to the laser drive level 0 dB**. In case of TX modules with manual gain control (MGC), the gain potentiometer shall be turned until **0.0 dB** can be read at the display of the controller.

Adjusting the drive level is always a compromise between CNR and intermodulation. Higher drive level increases the CNR but also increases the intermodulation distortion, lower drive level decreases the CNR and also decreases the intermodulation distortion.

In some cases it could be recommendable to adjust the transmitter to **-1.0 dB** or -2.0 dB to have some headroom for increasing sum-levels at the input to the transmitter module.

Module Types	Gain Control	Frequency Range	Input signal
7000	AGC MGC	950 – 2150 MHz (2500 MHz optional)	Operate within the limits -40 to -20 dBm
7070	AGC MGC	10 - 200 MHz	Operate within the limits -40 to -20 dBm
7225	MGC	950 - 2150 MHz (3000 MHz optional)	Operate within the limits -40 to -20 dBm
7225HE 7226H	MGC	950 - 2150 MHz (2500 MHz optional)	Operate within the limits -25 to -5 dBm
7310	MGC	10 – 2200 MHz (2500 MHz optional)	Operate within the limits -25 to -5 dBm
7310D	MGC	10 - 2150 MHz (2500 MHz optional)	Operate within the limits -20 to 0 dBm
7320	MGC	950 - 2150 MHz	Operate within the limits -40 to -20 dBm
7410F	AGC	950 - 2150 MHz	input power ≤ -20 dBm operation limits (-40 to -20 dBm)
7490	MGC	950 - 2150 MHz (3000 MHz optional)	Operate within the limits 40 to -20 dBm
7830 7830D	----	10 - 200 MHz	Operate within the limits -25 to -5 dBm
7870	---	10 - 200 MHz	Operate within the limits -25 to -5 dBm

Operational parameters of the Fiber Optic Transmitter Modules of the SatLight Series

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6.2 Output Level Adjustment of RX Module

The procedure of adjusting the output level of RX modules is very similar to the above mentioned procedure for TX modules.

The output level of the FO-Receive module can be adjusted to a value range specified in the FO product specification.

The input/output card module type HCS3.IO5 measures the RF detector voltage and converts it to a dBm value equal the actual RF output power. In case of RX modules with manual gain control (MGC), the gain potentiometer shall be turned until the desired RF output level is reached on the display of the controller.

Module Types	Gain Control	Gain	Output signal range
7000	AGC MGC	Link gain within total power range: ± 10 dB	-40 to -20 dBm (nom. -30 dBm)
7070	AGC MGC	Link gain within total power range: ± 10 dB	-45 to -15 dBm
7225	MGC	0 ± 10 dB (within total power range)	-40 to -20 dBm Setting range with Gain Control Potentiometer
7225HE 7226H	MGC	0 ± 10 dB (within total power range)	-25 to -5 dBm Setting range with Gain Control Potentiometer
7310	MGC	0 ± 10 dB (within total power range)	-25 to -5 dBm Setting range with Gain Control Potentiometer
7310D	MGC	0 ± 10 dB (within total power range)	-20 to 0 dBm Setting range with Gain Control Potentiometer
7320	MGC	0 ± 10 dB (within total power range)	-40 to -15 dBm Setting range with Gain Control Potentiometer
7410F	MGC	0 ± 10 dB (within total power range)	-40 to -15 dBm Setting range with Gain Control Potentiometer
7490	MGC	0 ± 10 dB (within total power range)	-40 to -20 dBm Setting range with Gain Control Potentiometer
7830 7830D	MGC	adjustable ± 10 dB	-25 to -5 dBm Setting range with Gain Control Potentiometer
7870	MGC	adjustable ± 10 dB	With the Gain Control Potentiometer the desired output power -25 to -5 dBm is set.

Operational parameters of the Fiber Optic Receive Modules of the SatLight Series

Remark:

All Foxcom Fiber Optic transmitter and receiver can additionally fitted out with an additional module replacing the Gain Control Potentiometer to enable a remote gain control RGC.
(see para. 8.2. and 8.3 Web-Interface of FO Transmit / Receive Module.)

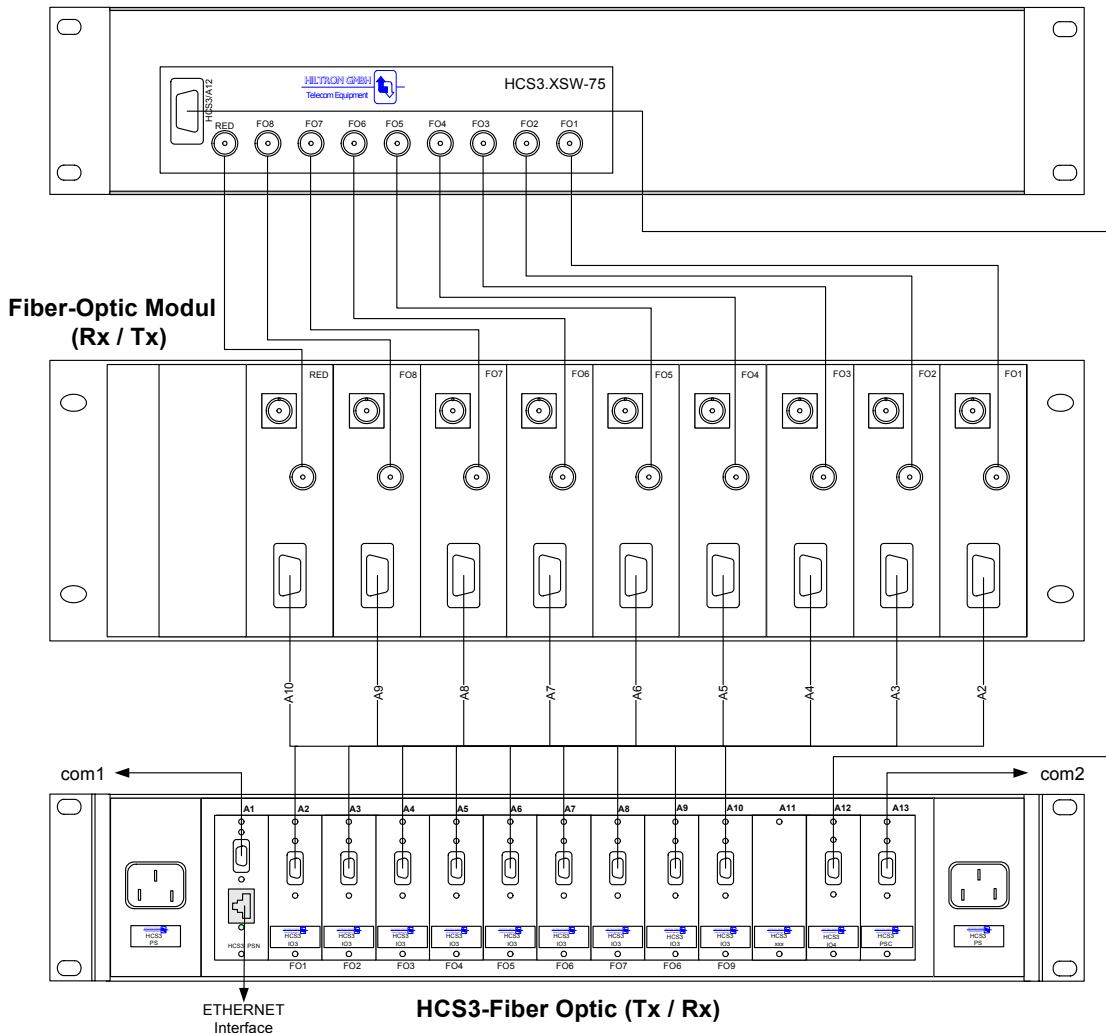
Date: 12.08.2008		Rev.: E

7 Red-Switching of FO Modules with Red-Switch Unit

7.1 Redundancy System

The figure below shows a special version of the fiber optic controller where slot A12 is used to control an external 8+1 IF redundancy switch providing Hilttron's solution for a 8+1 redundant fiber optic system. The external redundancy switch unit is designated HCS3.XSW-75. The switch unit can be delivered in different versions

- L-band or IF (70/140 MHz)
- Redundancy from 4+1 to 8+1
- Connectors BNC 75 Ohm, SMA 50 Ohm



7.2 HCS3.IO4 Card Module – Interface to HCS.XSW-75

The input/output card module type HCS3.I04 has 2 programmable power supplies with current control, 6 inputs for monitoring and 4 TTL-compatible outputs to control peripheral devices. The input range and alarm limits are adjustable. The supply outputs are protected against short circuit.

The module is used for supply as well as monitor&control of equipment like redundancy switches, etc.

7.2.1 Location of Module

The module is located in:

- Slot A12

7.2.2 Technical Data:

Supply Switch (Pin1): 5.2 .. 24V 0.75A max.

Supply Switch, red (Pin 9): 5.2 .. 24V 0.75A max.

Measurement Input: 1% FSR

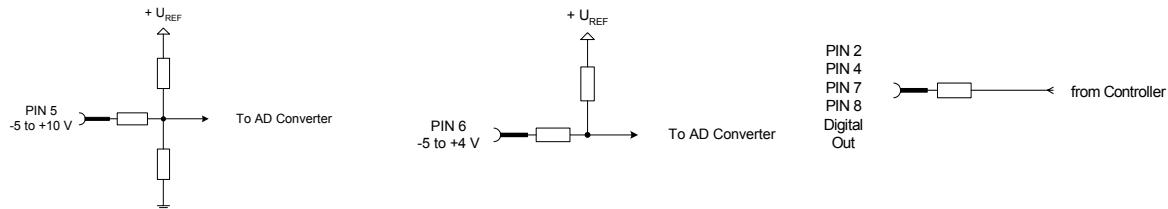
7.2.3 Pin- Out 9-pin Sub- D- Connector female for I/O Module

Pin	Function	Comment
1	+5.2V.. +24 V max. current 750mA**	
2	Digital Output 7	Control Output
3	Ground; DC return	GND
4	Digital Output 4	Control Output
5	monitoring Input Range adjustable e.g. -5..+10V*	Not used
6	monitoring Input Range adjustable e.g. -5..+4V*	Not used
7	Digital Output 6	Control Output
8	Digital Output 5	Control Output
9	+5.2V.. +24 V max. current 750mA**	15V DC Supply for G2 resp. G2, G3

Remark: Voltage and current of are controlled



7.2.4 Input Interface Diagram



7.3 Red-Switch Unit

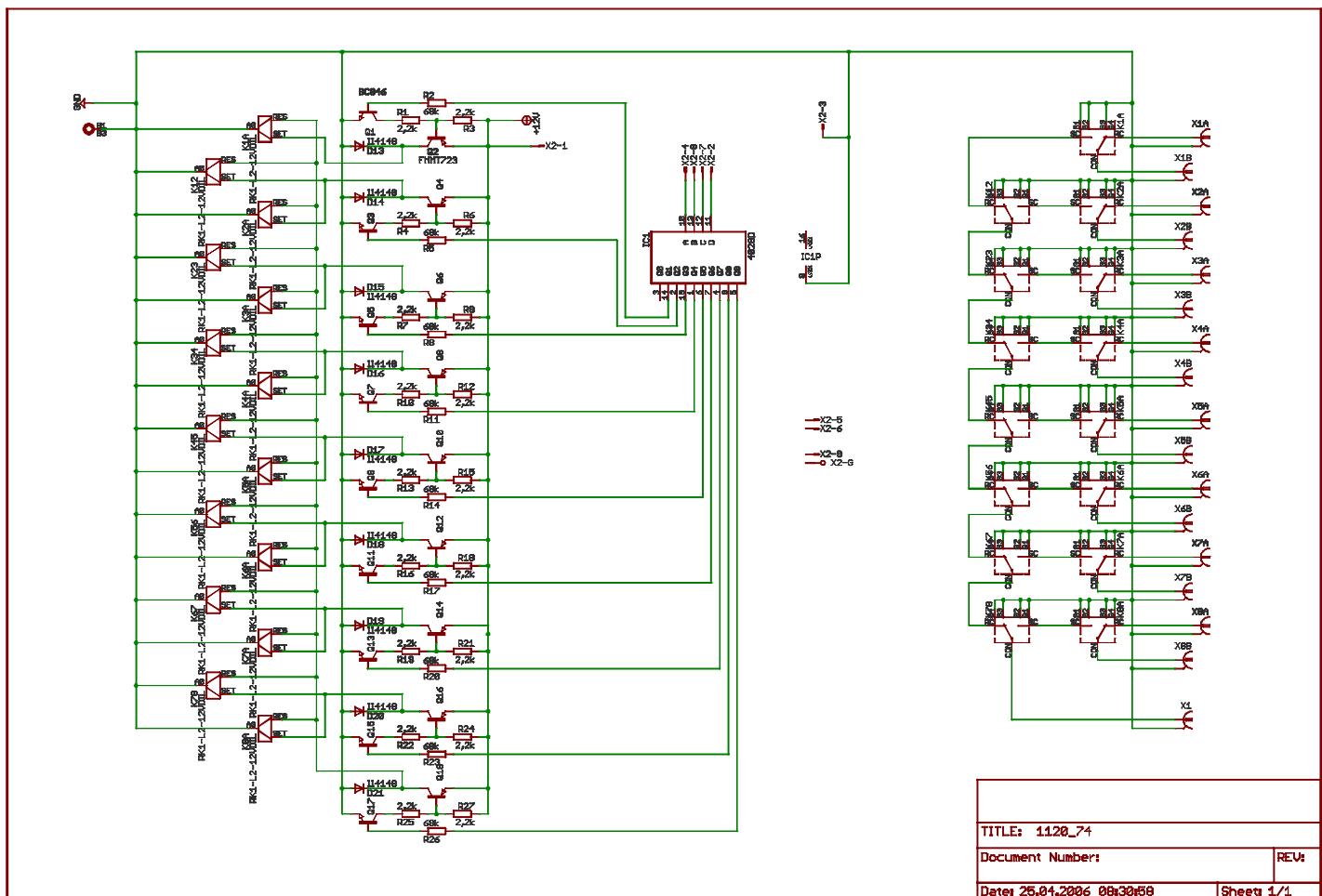


Fig: 7.3-1: Block diagram of Red-Switch

8 HCS-Opto Software

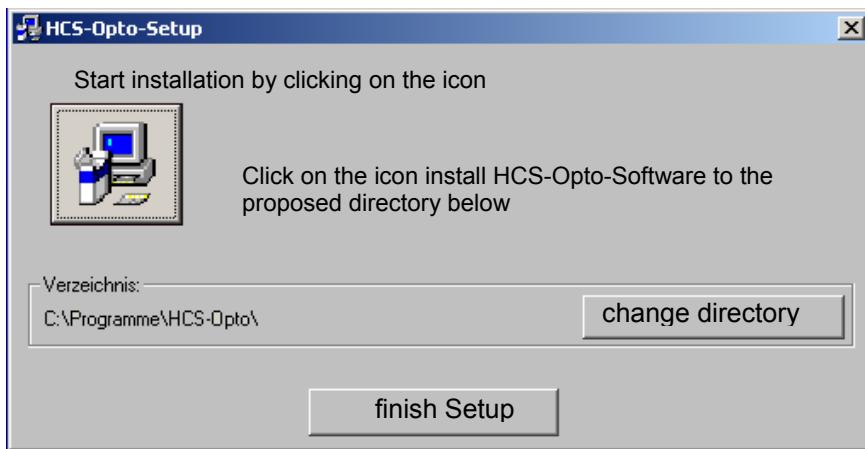
8.1 Installation

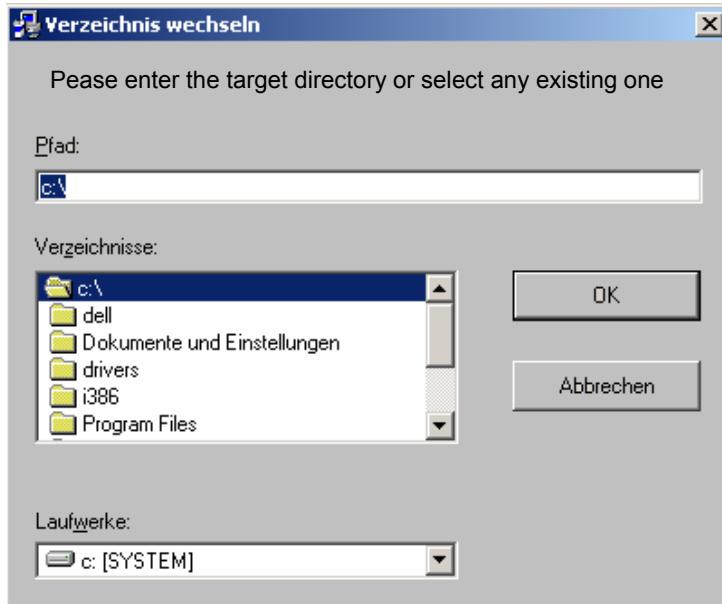
In order to configure the input/output card modules type HCS3.IO an additional software tool designated "HCS-Opto Configuration Program" is required unless the HCS3.PSN card module with Web interface is fitted.

For installation of the program please introduce the CD-ROM provided with each controller and select "Fiber-Optic". Go to folder "HCS-Opto" and select file "Setup.exe" Double click on "Setup.exe" for starting the installation.

Remark: Whenever the controller is fitted with the HCS3.PSN Web interface the above mentioned "HCS-Opto Configuration Program" cannot be used. All configurations are exclusively set via the Web interface.

Setup.Exe

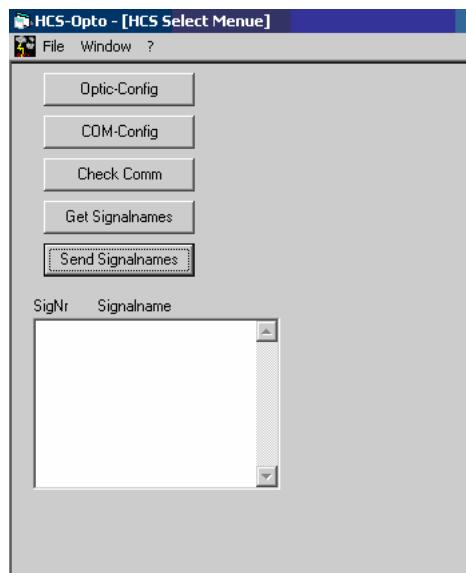




When Setup.exe is installed successfully the program can be started by.

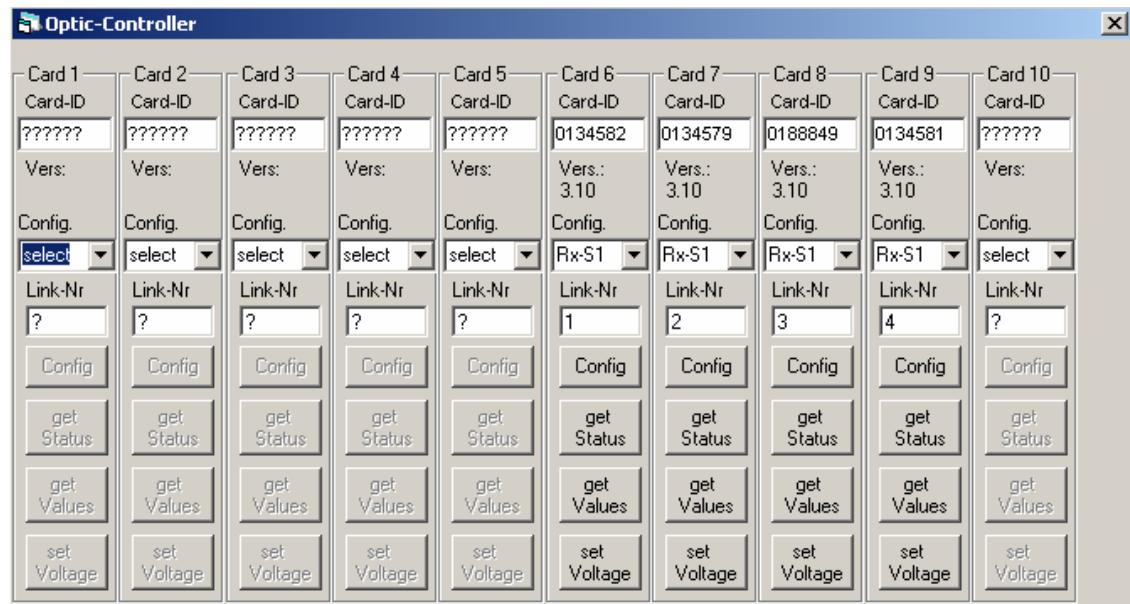


After the start of the “HCS-Opto Configuration Program” following selection screen is opening:



8.2 Configuration of a Spare HCS3.IO Card

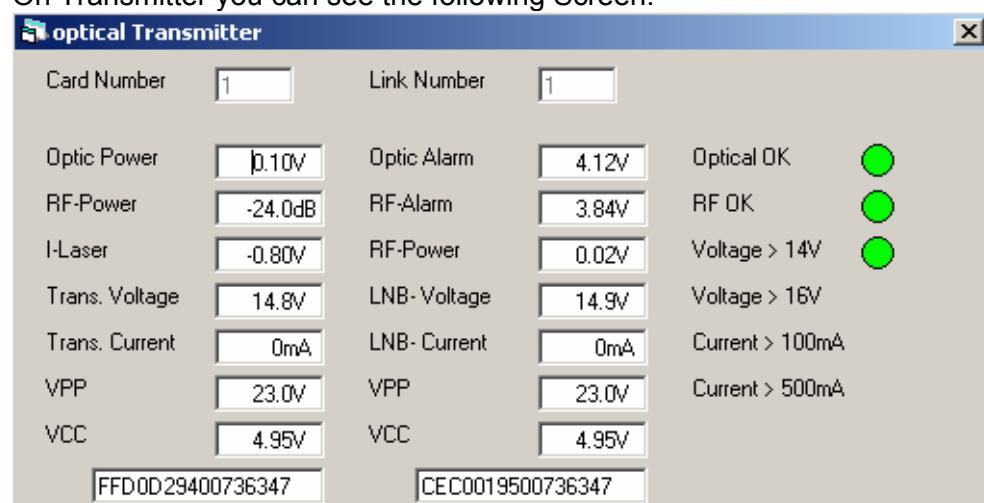
Click on Button “Optic-Config”. The following window pops up.



Input the card id at the right slot number. Select Config. “Rx-S1”. Input Link-Nr. as 1 to n as shown on the screen shot above. Click on the Config-button. If no error message appears, the card is properly configured. Remove the card from the programming tool and install it at the right slot inside the controller.

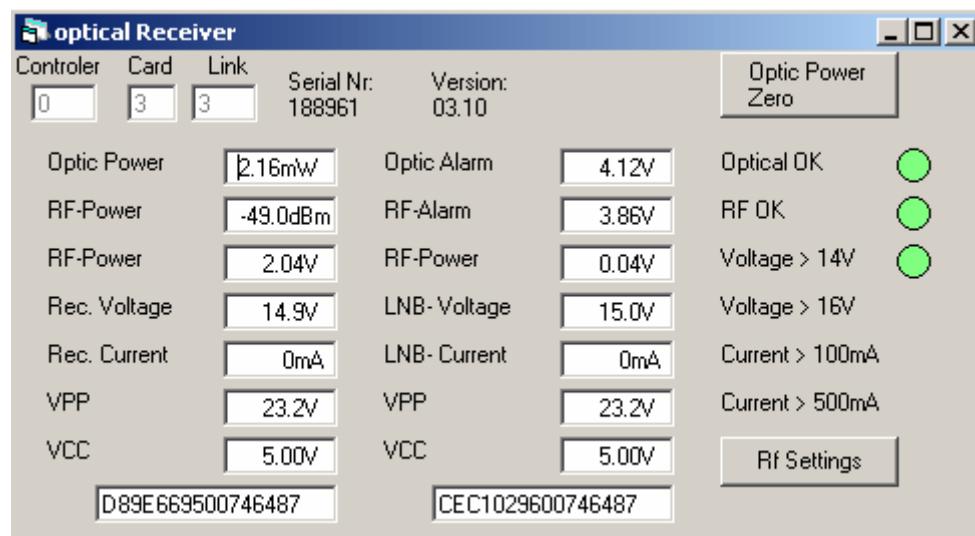
8.2.1 Monitor the optical Transmitter

On all active Cards you can Click the Button  to Show the Link information
 On Transmitter you can see the following Screen:



8.2.2 Monitor the optical Receiver

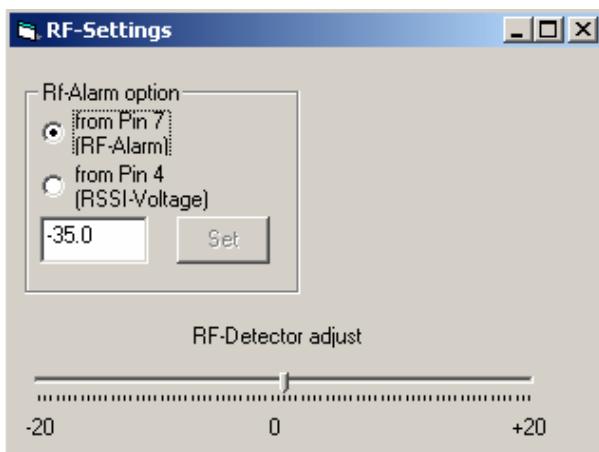
On Receiver you can see the following Screen.



On this screen you can set the optical power to zero or you can set the RF parameters on the Receiver.

In this Case you click the  Button and on the Dialog:

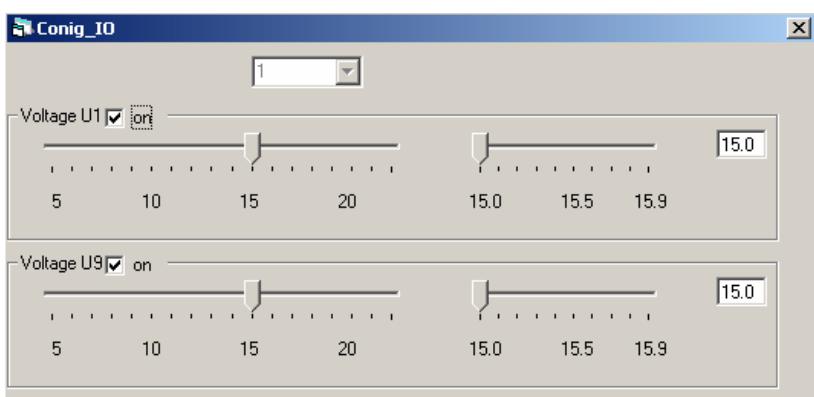
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On this Dialog you can Adjust the Display-Value of the RF-Power and Select the Alarm Option

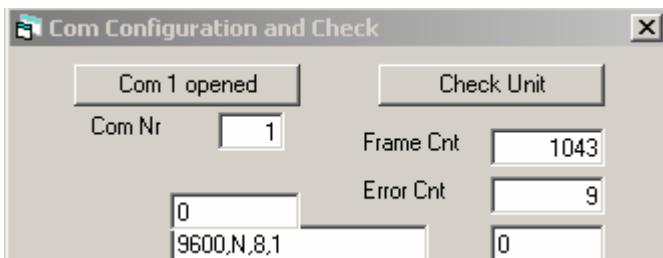
8.2.3 Set the output Voltage

If you click the -Button on the optic-Screen you can adjust the Voltage on Pin 1 and Pin 9 of the HCS3.IO Card.



8.2.4 COM Configuration

Click on Button "COM-Config". The following window pops up.



Configure the COM parameters for the Computer COM port.

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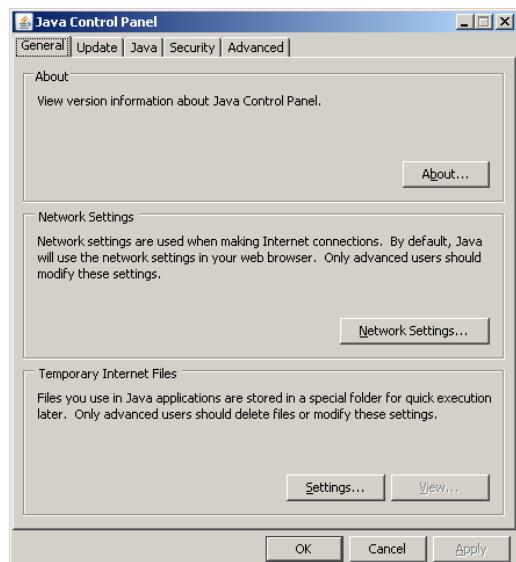
9 Web-Interface for HCS3

If the controller HCS3 is equipped with a COM card module type HCS3.PSN in slot A1, it can be completely monitored and controlled via its Web interface. The following section describes this interface in detail.

In order to use the Web interface, the following prerequisites must be met:

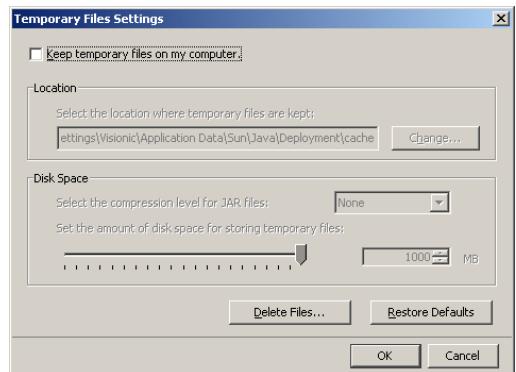
- A PC directly connected to the controller or via an IP network (please refer to section 13 below)
- A standard web browser (e.g. Internet Explorer version 6 or higher) installed on this PC
- Java™ platform standard edition with the Runtime Environment Version 5 (Release 1.5.x.x or higher) installed
This Java Runtime Environment can be downloaded from www.sun.com.
- Appropriate IP settings of the COM card module (please refer to section 13 below)

Remarks to the correct setting of Java Runtime Environment:



When the Java™ platform standard edition with the Runtime Environment Version 6 (Release 1.6.x.x or higher) is installed special attention should be payed to the correct setting of Java Runtime Environment.

Opening the Java Control Panel on the first tab "General" you will find under "Temporary Internet Files" the button "Settings..." .



Clicking on this button the window "Temporary Files Settings" is opening. Make sure that the option "keep temporary files on my computer" is **not** enabled.



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Manual_HCS3_FO_E.doc

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The Web interface is started by typing the correct IP address into the Web browser.

A screenshot of the Hilttron HCS Web Interface in Microsoft Internet Explorer. The title bar says "Hilttron HCS Web Interface - Microsoft Internet Explorer". The menu bar includes "Datei", "Bearbeiten", "Ansicht", "Favoriten", "Extras", and "?". The toolbar includes standard icons for back, forward, search, and file operations. The address bar shows "http://". Below the toolbar, there's a printer icon labeled "Canon Easy-WebPrint" and other print-related buttons. The main content area has a green header bar with the text "Hilttron" and "Web Interface for HCS3". Below this, a message says "For specific card information please click on the respective button on the left side." To the left of the message is a vertical list of buttons corresponding to the cards shown in the green header bar. The buttons are: F01:none, F02:none, F03:none, F04:none, F05:none, F06:none, F07:none, F08:none, F09:none, F10:none, and PSC/PSC. The "PSC/PSC" button is highlighted in green, while the others are grey. The bottom of the window shows the Windows taskbar with various open application icons.

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9.1 Help for HCS Web-Interface

PSA:PSN
FO_RGC_PSN
F01:F05TX
F01_Tx_RGC
F02:F05RX
F02_Rx_RGC
F03:none
F04:none
F05:none
F06:none
F07:none
F08:none
F09:none
F10:none
PSB:PSC
FO_RGC_PSC

The Cards

After start of the web interface, a list of all cards plugged into the HCS are displayed. Each card is represented by a button containing important information to identify the card.

The first text line shows the slot number of the controller chassis into which the card is plugged in, a colon, and the type of the card.

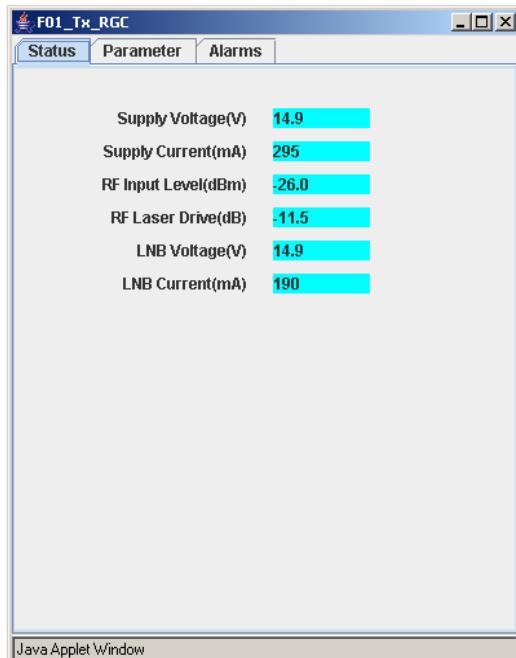
The second line shows the link name, which can be set by the user (see below). This link name is a unique name of the card which should be chosen according to the application.

The buttons are displayed in one of three colours: white, green or red. When the button is white no card is plugged into this slot. When the button is green the card is ready for use and has no alarms. When the button is red, an alarm occurred for this card. The alarms are explained later.

By clicking on a button, a new window opens with specific card information enabling the user to set and read parameters available for this card type.



9.2 Web-Interface for FO Transmit Module (FOTx)

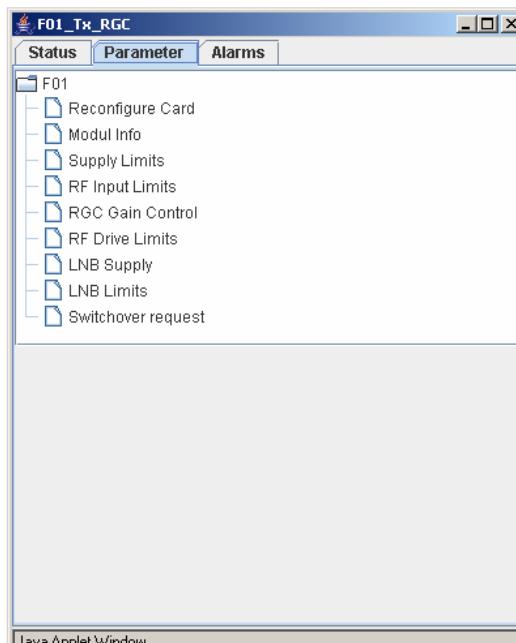


The specific information of a card

The information window of the card comprises three tabs: Status, Parameter and Alarms.

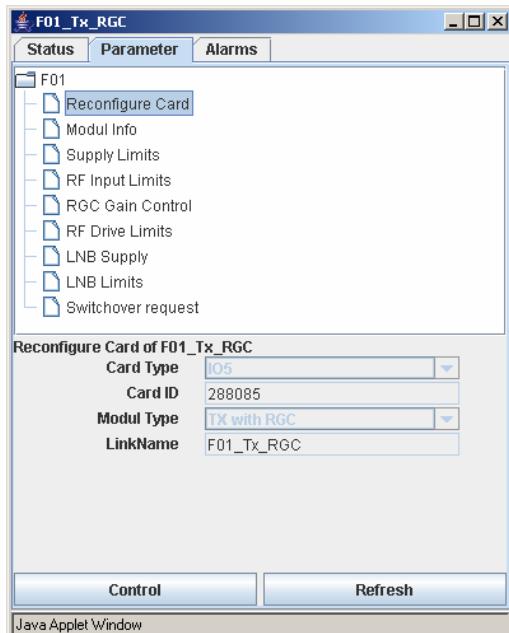
The status tab

The status tab comprises the basic card parameters like voltage and current. These values can also be read from the local display of the HCS if available. It is not possible to change any parameters in this tab.



The parameter tab

In the parameter tab you can set and change the parameter values of the card. For this click on the respective nodes at the upper part of the window. All parameters are displayed, but some of them are read only. As an example all parameters under "CardInfo" are read only, but the parameters under "Reconfigure_Card" can be changed. Some parameters like "LNB_Voltage" and "LNB_Limits" only exist for specific cards. When you want to change a parameter first click on the button "Control". Then you will be asked for a password, which is the same for all parameters and which you only have to enter once per open web interface. This protects the system against unauthorized parameter changes. After authorization, click again on the button "Control", type in the new value and click the "OK" button to activate the changes. Whenever you change the configuration of a card, a restart of the Web interface is required.



Parameter Group **Reconfigure Card**

By clicking on the parameter group "Reconfigure Card" the parameters belonging to this group are presented on the window.

CardID:

This value is unique and cannot be changed.

CardType: (see Remark 1)

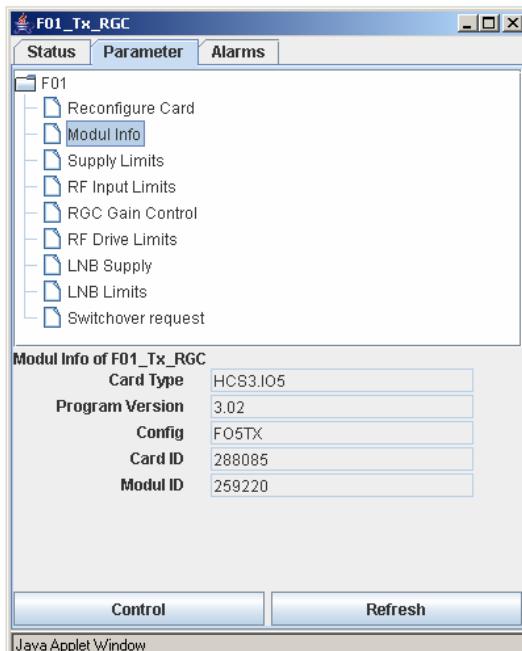
There are 3 settings: Tx-, Rx- and None
 The required card type for communication with an Rx- or Tx-FO module can be set.
 If no module available select "none".

LinkName: (see Remark 2).

The link name can be set or changed.

Remark

- 1) According to the selected card type the parameters presented in the tab Status are changed and further command lines in the tab Parameters are added or removed.
- 2) The link name is shown on the active box (2nd text line) and as the headline of the window.



Parameter Group **Modul Info**

By clicking on the parameter group "Modul Info" the parameters belonging to this group are presented on the window.

Modul Type

Type of the card module

ProgramVersion

Version of the card specific software

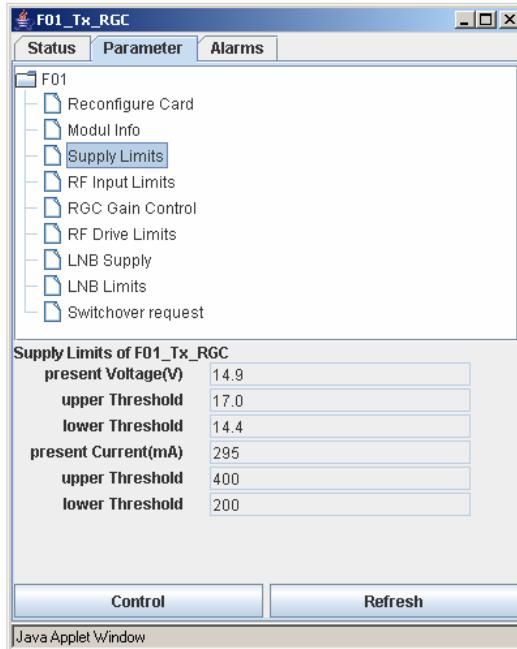
Config

Selected card module: FORX, FOTX or none

CardID

Unique card module identification no.

All parameter values are read only values and cannot be changed.



Parameter Group Supply Limits

By clicking on the parameter group "Supply Limits" the parameters belonging to the group become visible.

Present Voltage [V]

Present supply voltage of the FO module connected to the card module HCS3.IOx.

upper Threshold

Setting of the upper threshold of the supply voltage for the FO module (alarm limit)

lower Threshold

Setting of the lower threshold of the supply voltage for the FO module (alarm limit)

Present Current [mA]

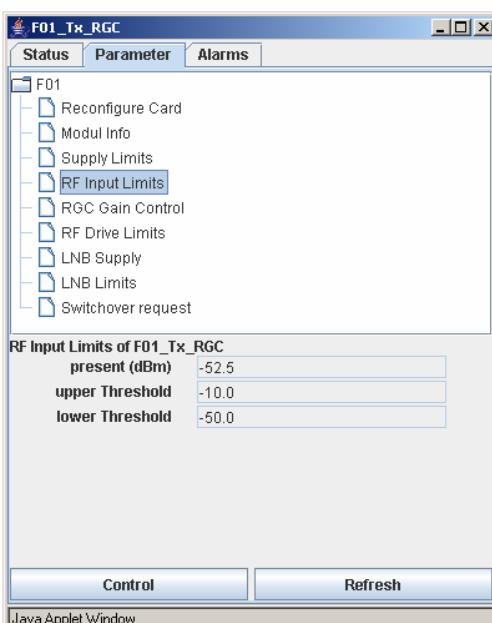
Present supply current for the FO module.

upper Threshold

Setting of the upper threshold of the supply current for the FO module (alarm limit)

lower Threshold

Setting of the lower threshold of the supply current for the FO module (alarm limit)



Parameter Group RF Input Limits

By clicking on the parameter group "RF Input Limits" the parameters belonging to this group become visible.

present [dBm]

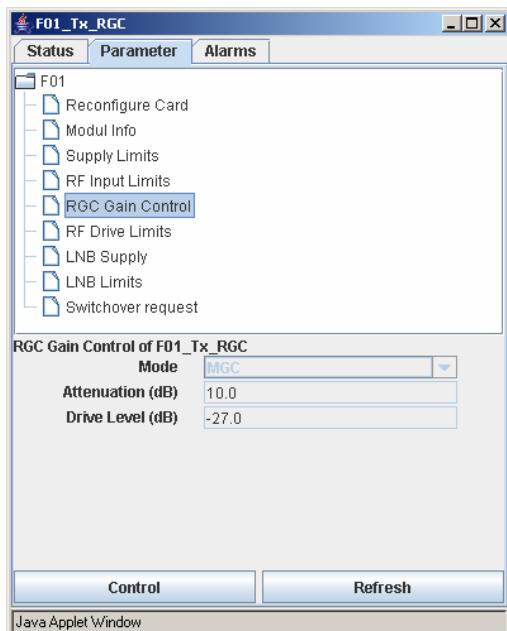
Present RF input power.

upper Threshold

Setting of the upper threshold of the input power for the FO module (RF alarm limit)

lower Threshold

Setting of the lower threshold of the input power for the FO module (RF alarm limit)



Parameter Group RGC Gain Control

Mode

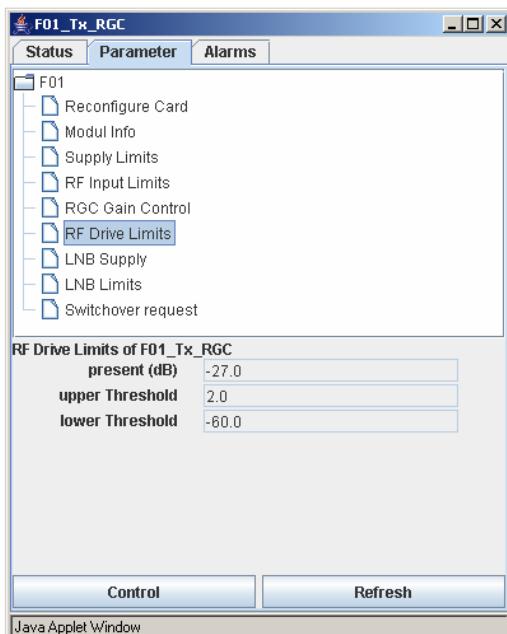
The operation modes AGC (automatic gain control) or MGC (manual gain control) can be selected and set.

Attenuation (dB)

The attenuation of the Tx module can be adjusted (to balance the levelling).

Drive Level (dB)

This parameter sets the drive level to be controlled when AGC is selected.



Parameter Group RF Drive Limits

By clicking on the parameter group "RF Drive Limits" the parameters belonging to the group become visible.

preset [dB]

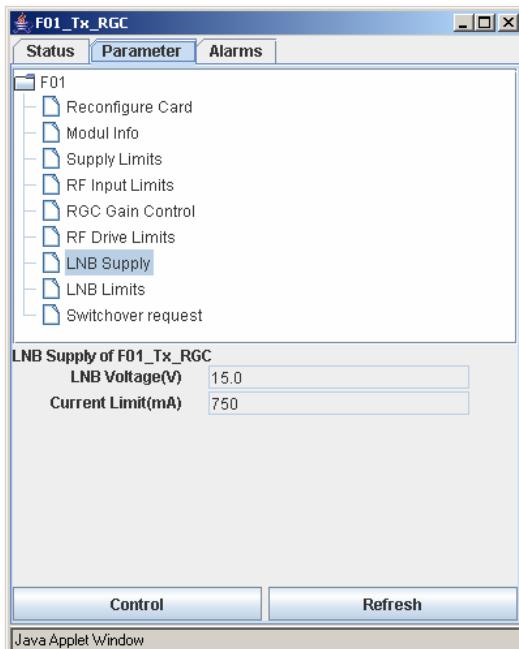
Present RF Drive level.

upper Threshold

Setting of the upper threshold of the RF Drive level (RF alarm)

lower Threshold

Setting of the lower threshold of the RF Drive level (RF alarm)



Parameter Group LNB Supply

By Clicking on the parameter group "LNB Supply" the parameters belonging to the group become visible.

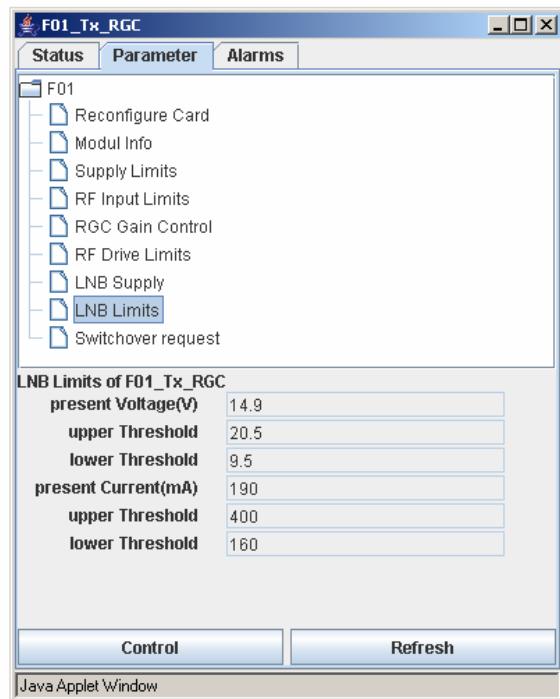
LNB_Voltage

This value shall be set according to the supply voltage requirement of the LNB (typically 15.0 V) connected to the FO TX module. In case that there is no LNB to be supplied this value shall be set to 0 V.

Current Limits (mA)

With this parameter the max. permitted supply current in case of a short circuit on LNB or its supply cables can be adjusted.

Parameter Group LNB Limits



By clicking on the parameter group "LNB Limits" the parameters belonging to this group become visible.

Present Voltage [V] (read only)

Present supply voltage for the LNB.

upper Threshold

Setting of the upper threshold of the supply voltage for the LNB.

lower Threshold

Setting of the lower threshold of the supply voltage of the LNB.

Present Current [mA] (read only)

Present supply current for the LNB.

upper Threshold

Setting of the upper threshold of the supply current for the LNB.

lower Threshold

Setting of the lower threshold of the supply current for the LNB.

Parameter Group Switchover request

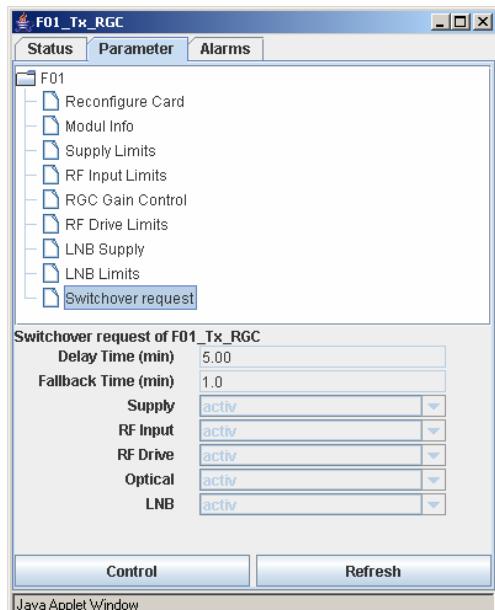
By Clicking on the parameter group "Switchover request" the parameters belonging to this group become visible. It is only relevant for systems with automatic redundancy switching.

Delay Time [min]

Setting of the delay period between the occurrence of an alarm and the triggering of the message „Switchover request“ to initiate a switchover to a redundant link.

This parameter is considered an alarm filter to prevent a switchover in case of an intermittent short alarm message.

A "Switchover request" initiates the control mechanism for a redundant system.



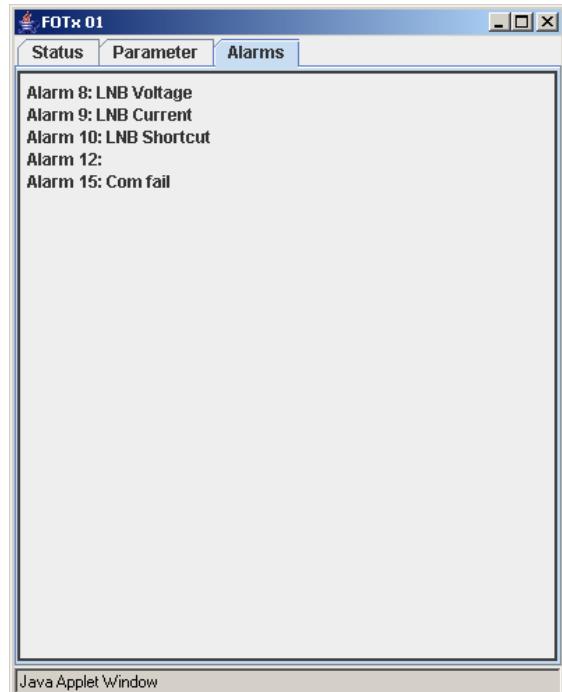
Fallback Time [min]

Setting of the period (window) during which the alarm on the main fibre optic link (which failed before) is maintained to disable the switch-back to main during this period.

This **Fallback Time** is considered an alarm filter to prevent an immediate switch-back to main in case of a short duration alarm in the main reception link.

The criteria for a switchover can be set with following parameters:

FO module FOTx nn		
Parameter	Setting	Remark on failure criteria
Supply:	active/inactive	Alarm, supply voltage of the module is out of tolerances
RF input:	active/inactive	Alarm, RF input is out of tolerances
RF Drive:	active/inactive	Alarm, RF Drive level is out of tolerances
Optical:	active/inactive	Alarm. Optical power is out of tolerances
LNB:	active/inactive	Alarm on LNB



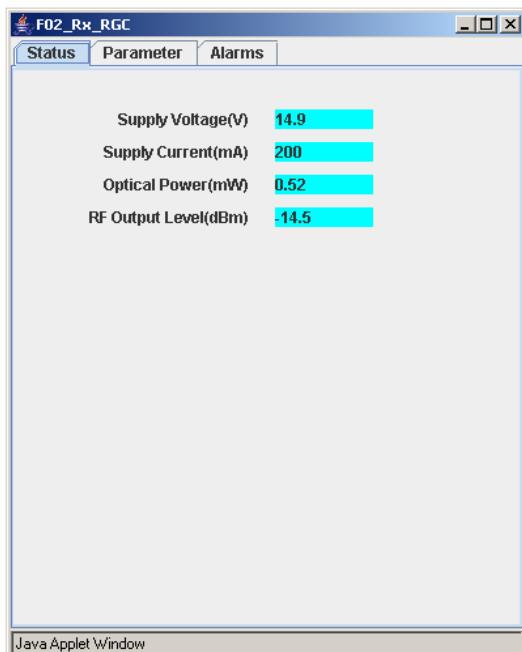
The Alarms tab

In the alarm tab the alarms of the card are displayed if any.

The format of an alarm message is as follows: alarm number, colon, name of the alarm. The alarm name enables the operator to determine whether it is only a wrong parameter setting or the card itself is corrupt.



9.3 Web-Interface for FO Receive Module (FORx)

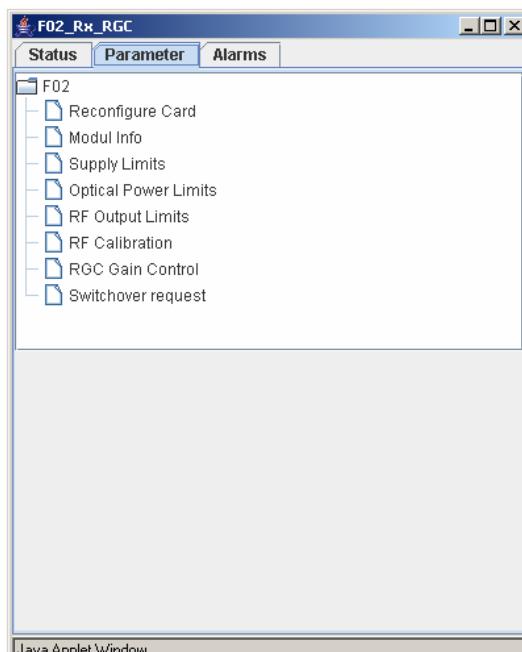


The specific information of a card

The information window of the card comprises three tabs: Status, Parameter and Alarms.

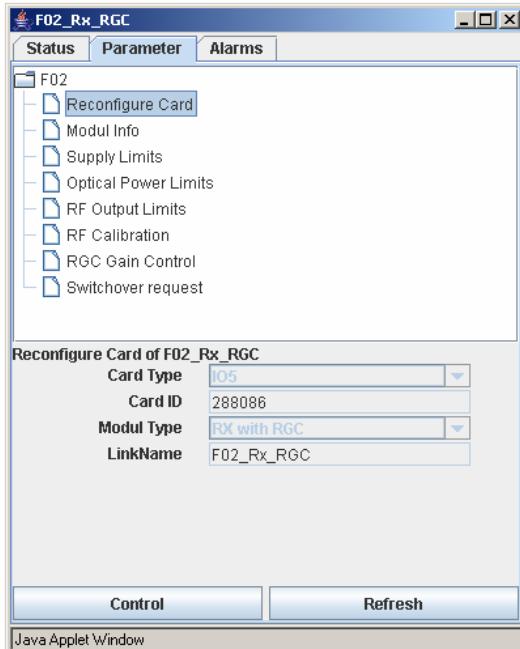
The status tab

The status tab comprises the basic card parameters like voltage and current. These values can also be read from the local display of the HCS if available. It is not possible to change any parameter in this tab.



The parameter tab

In the parameter tab you can set and change the parameter values of the card. For this click on the respective nodes at the upper part of the window. All parameters are displayed, but some of them are read only. As an example all parameters under "CardInfo" are read only, but the parameters under "Reconfigure_Card" can be changed. Some parameters like "LNB_Voltage" and "LNB_Limits" only exist for specific cards. When you want to change a parameter first click on the button "Control". Then you will be asked for a password, which is the same for all parameters and which you only have to enter once per open web interface. This protects the system against unauthorized parameter changes. After authorization, click again on the button "Control", type in the new value and click the "OK" button to activate the changes. Whenever you change the configuration of a card, a restart of the Web interface is required.



Parameter Group Reconfigure Card

By clicking on the parameter group "Reconfigure Card" the parameters belonging to this group are presented on the window.

CardID:

This value is unique and cannot be changed.

CardType: (see Remark 1)

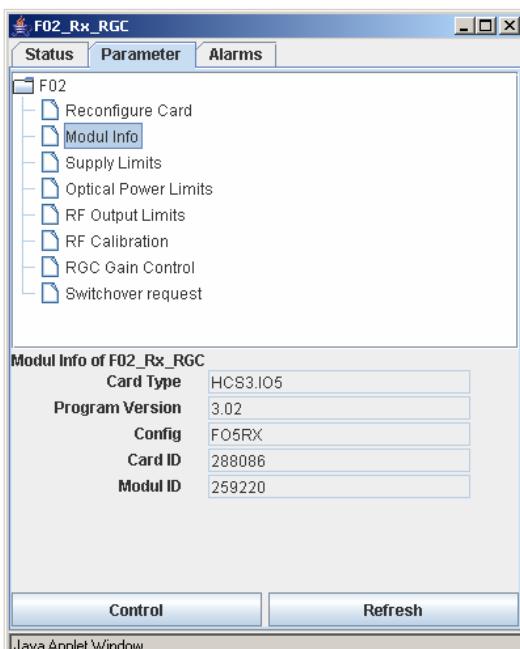
There are 3 settings: Tx, Rx and None
 The required card type for communication with an Rx- or Tx-FO module can be set.
 If no module available select "none".

LinkName: (see Remark 2).

The link name can be set or changed.

Remark

- 1) According to the selected card type the parameters presented in the tab Status are changed and further command lines in the tab Parameters are added or removed.
- 2) The link name is shown on the active box (2nd text line) and as the headline of the window.



Parameter Group Modul Info

By clicking on the parameter group "ModulInfo" the parameters belonging to this group are presented on the window.

ModulType

Type of the card module

ProgramVersion

Version of the card specific software

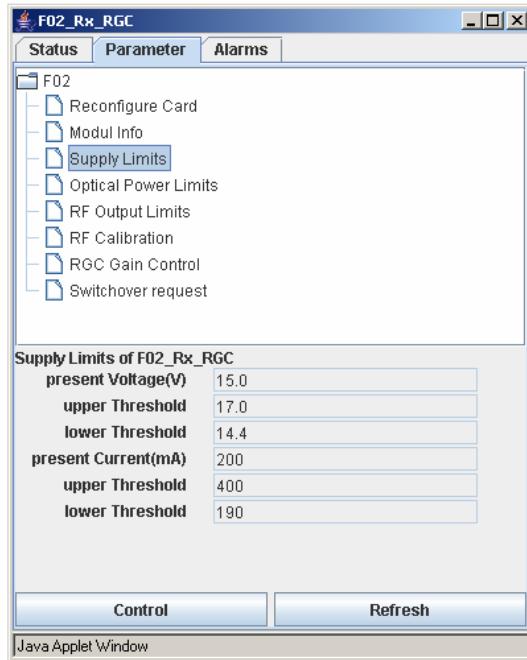
Config

Selected card module: FORX, FOTX or none

CardID

Unique card module identification no.

All parameter values are read only values and cannot be changed.



Parameter Group Supply Limits

By clicking on the parameter group "Supply Limits" the parameters belonging to the group become visible.

Present Voltage [V]

Present supply voltage of the FO module connected to the card module HCS3.IOx.

upper Threshold

Setting of the upper threshold of the supply voltage for the FO module (alarm limit)

lower Threshold

Setting of the lower threshold of the supply voltage for the FO module (alarm limit)

Present Current [mA]

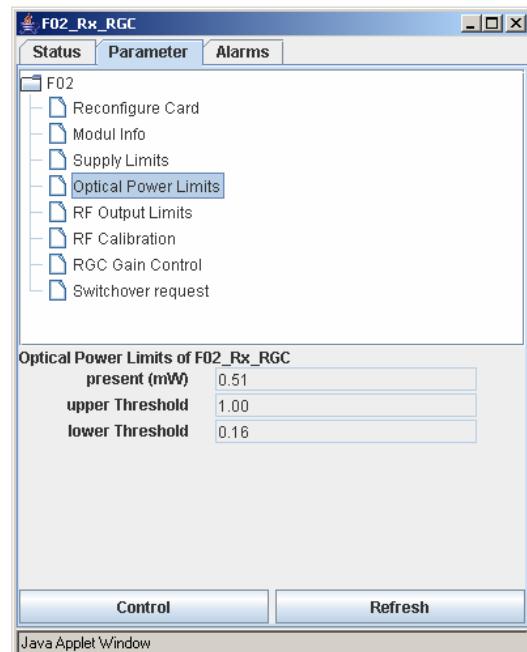
Present supply current for the FO module.

upper Threshold

Setting of the upper threshold of the supply current for the FO module (alarm limit)

lower Threshold

Setting of the lower threshold of the supply current for the FO module (alarm limit)



Parameter Group Optical Power Limits

By clicking on the parameter group "Optical power limits" the parameters belonging to this group become visible.

present [mW]

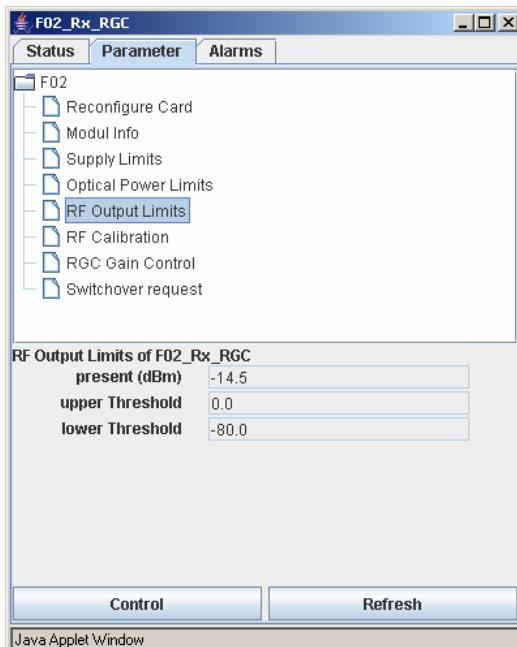
Present optical input power level.

upper Threshold

Setting of the upper threshold of the optical input power level (RF alarm)

lower Threshold

Setting of the lower threshold of the optical input power level (RF alarm)



Parameter Group RF Output Limits

By clicking on the parameter group "RF Output Limits" the parameters belonging to this group become visible.

present [dBm]

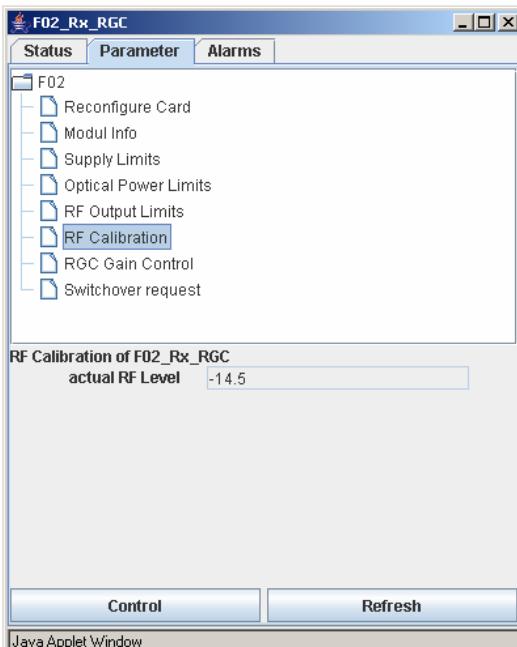
Present RF output power.

upper Threshold

Setting of the upper threshold of the output power for the FO Rx module (RF alarm)

lower Threshold

Setting of the lower threshold of the output power for the FO Rx module (RF alarm).



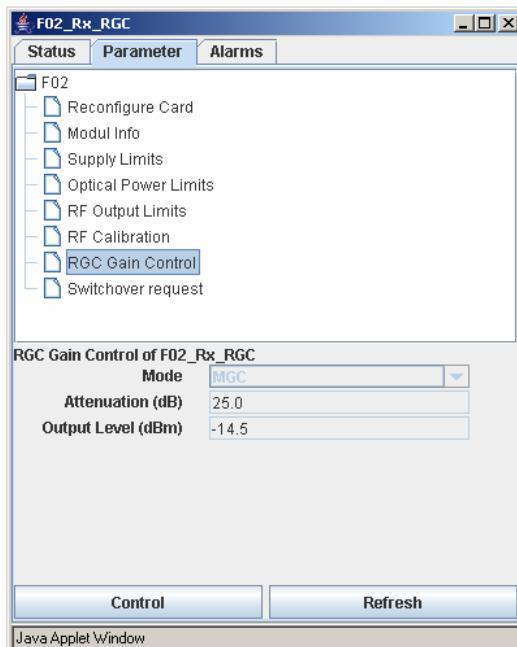
Parameter Group RF Calibration

By clicking on the parameter group "RF Calibration" the parameters belonging to this group become visible.

Actual RF Level [dBm]

This value is used to adjust the measured output power level to the value displayed in this window.

This process is very useful to compensate for the individual tolerances of the RF detector device within the FO RX module.



Parameter Group **RGC Gain Control**

Mode

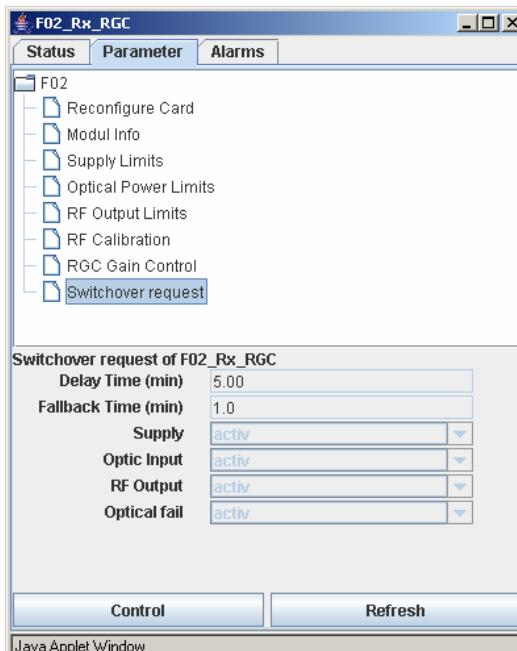
The operation modes AGC (automatic gain control) or MGC (manual gain control) can be selected and set.

Attenuation (dB)

The attenuation of the Rx module can be adjusted (to balance the levelling).

Output Level (dB)

This parameter sets the output level to be controlled when AGC is selected.



Parameter Group **Switchover request**

By Clicking on the parameter group "Switchover request" the parameters belonging to this group become visible. It is only relevant for systems with automatic redundancy switching.

Delay Time [min]

Setting of the delay period between the occurrence of an alarm and the triggering of the message „Switchover request“ to initiate a switchover to a redundant link.

This parameter is considered an alarm filter to prevent a switchover in case of an intermittent short alarm message.

A "Switchover request" initiates the control mechanism for a redundant system.

Fallback Time [min]

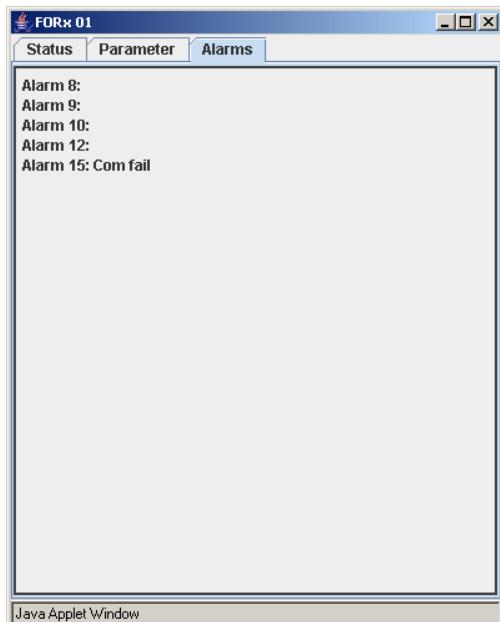
Setting of the period (window) during which the alarm on the main fibre optic link (which failed before) is maintained to disable the switch-back to main during this period.

This **Fallback Time** is considered an alarm filter to prevent an immediate switch-back to main in case of a short duration alarm in the main reception link.

The criteria for a switchover can be set with following parameters:

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FO module FORx nn		
Parameter	Setting	Remark on failure criteria
Supply:	Active/inactive	Alarm, supply voltage of the module is out of tolerance
Optic input:	Active/inactive	Alarm, Optic input is out of tolerance
RF Output:	Active/inactive	Alarm, RF Output level is out of tolerance
Optical fail:	Active/inactive	Alarm. Optical system is failing



The alarms tab

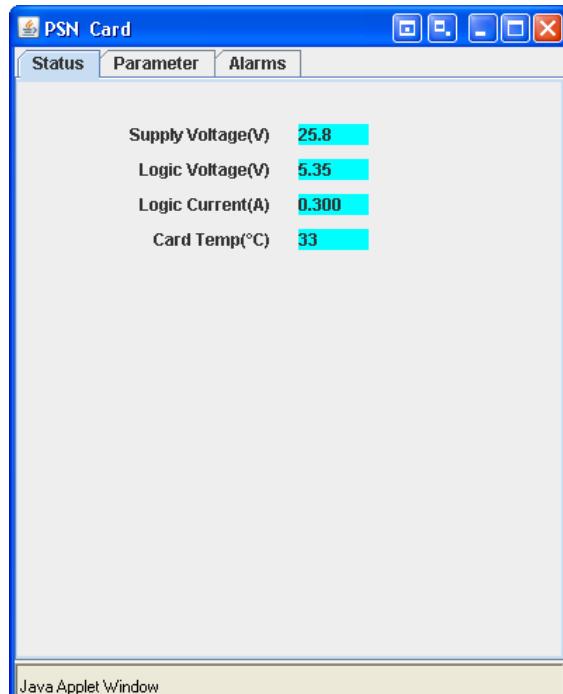
In the alarms tab the alarms of the card are displayed if any.

The format of an alarm message is as follows: alarm number, colon, name of the alarm. The alarm name enables the operator to determine whether it is only a wrong parameter setting or the card itself is corrupt.

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9.4 Web-Interface for Communication Card Module (HCS3. PSN)

9.4.1 Standard Operation

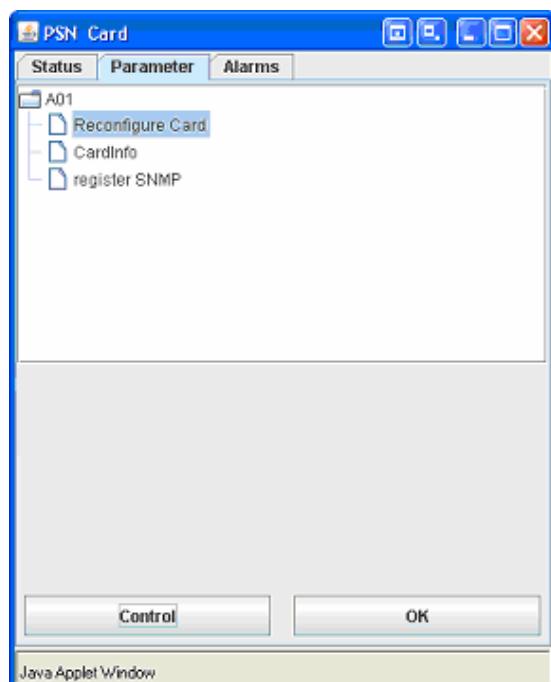


The specific information of a card

The information window of the COM card module type HCS3.PSN comprises three tabs: Status, Parameter and Alarms.

The status tab

The status tab comprises the basic card parameters like voltage and current. These values can also be read from the local display of the HCS if available. It is not possible to change any parameter in this tab.



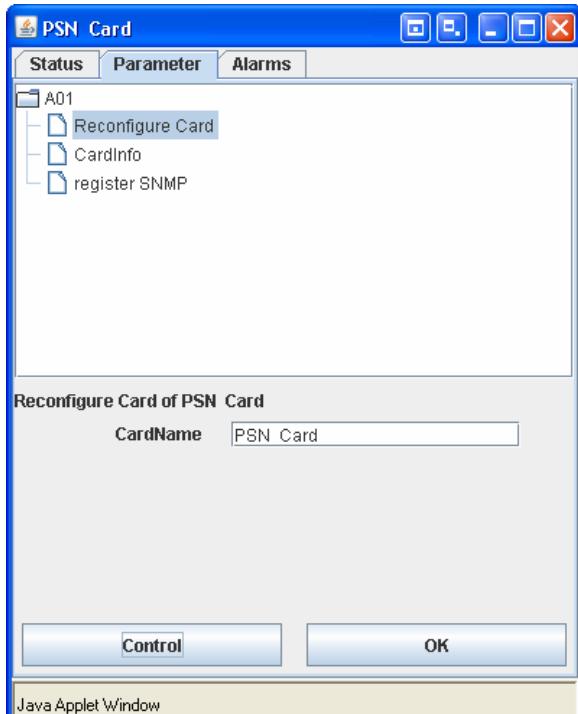
The parameter tab (without SNMP option)

In the parameter tab you can set and change the parameter values of the card. For this click on the respective nodes at the upper part of the window. All parameters are displayed, but some of them are read only. As an example all parameters under "CardInfo" are read only, but the parameters under "Reconfigure_Card" can be changed. With "register SNMP" the SNMP communication can be registered.

When you want to change a parameter first click on the button "Control". Then you will be asked for a password, which is the same for all parameters and which you only have to enter once per open web interface. This protects the system against unauthorized parameter changes.



After authorization, click again on the button "Control", type in the new value and click the "OK" button to activate the changes. Whenever you change the configuration of a card, a restart of the Web interface is required.

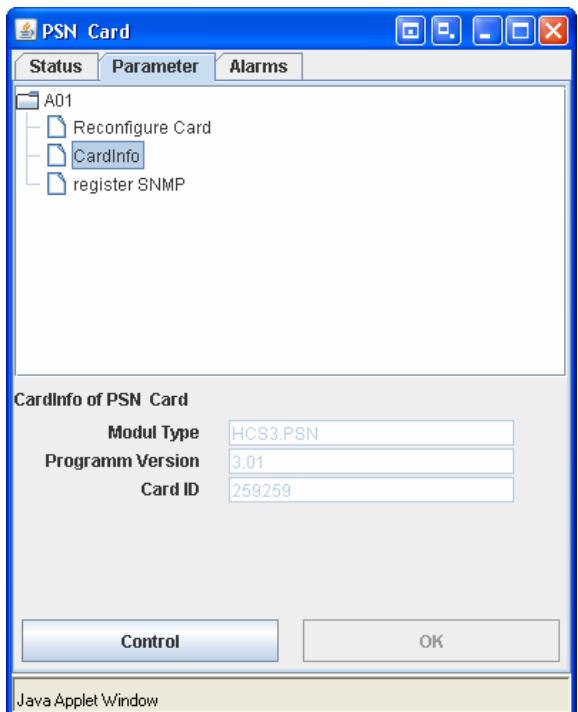


Parameter Group Reconfigure Card

By clicking to the parameter group "Reconfigure Card" the parameters belonging to this group are visible.

CardName

Setting of an individual card name.



Parameter Group CardInfo

By clicking on the parameter group "CardInfo" the parameters belonging to this group are presented on the window.

Module Type

Type of the card module (here HCS3.PSN)

Program Version

Version of card specific software

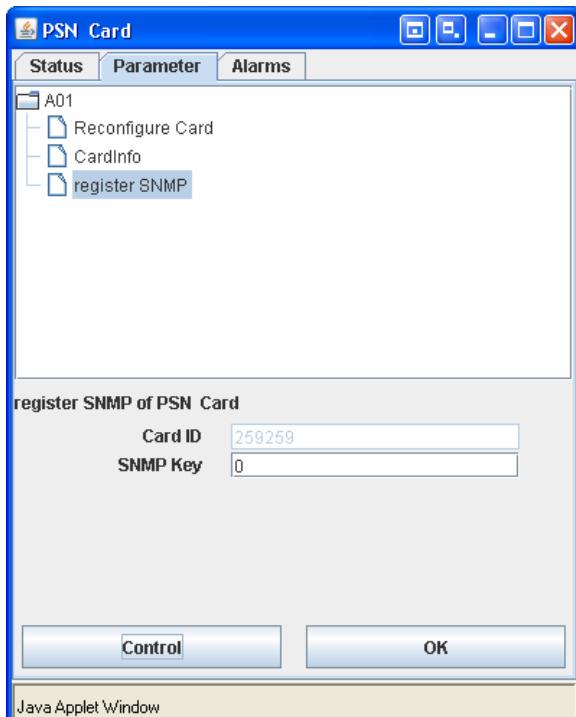
Card ID

Unique card module identification no.

All parameter values are read only values and cannot be changed.



9.4.2 Option SNMP



Parameter Group Register SNMP

By clicking on the parameter group "Register SNMP" the parameters belonging to this group are presented on the window.

Card ID

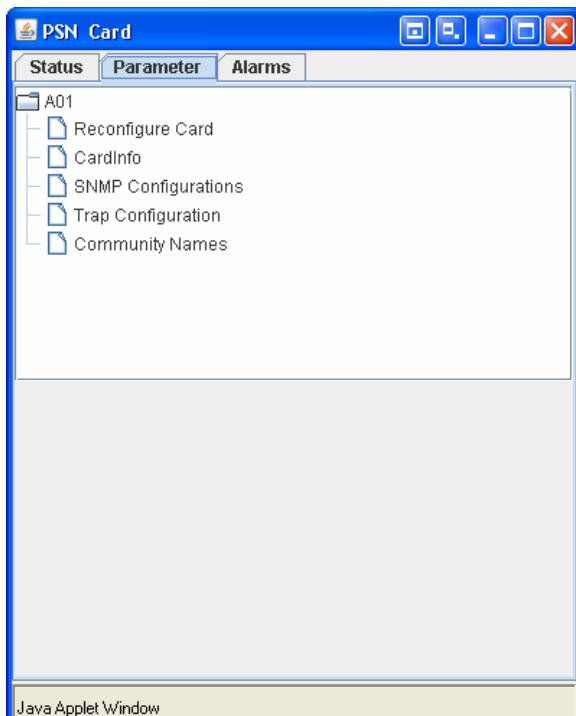
Unique card module identification no.

SNMP Key

This key is required to activate the SNMP operation mode.

This key is related to specific card ID.

In case of the customer orders the option for SNMP operation after the delivery of a HCS3 controller, the card ID is required to generate the SNMP key. Setting the correct key and confirming with "OK" the SNMP option is enabled and permanently activated.



The parameter tab (with enabled SNMP option)

When the SNMP option is enabled an enhanced tree of parameter groups becomes visible when the operator clicks on the tab "Parameters".

Following parameter groups are visible when the SNMP option is enabled:

Parameter Group **Reconfigure Card**

Parameter Group **Cardinfo**

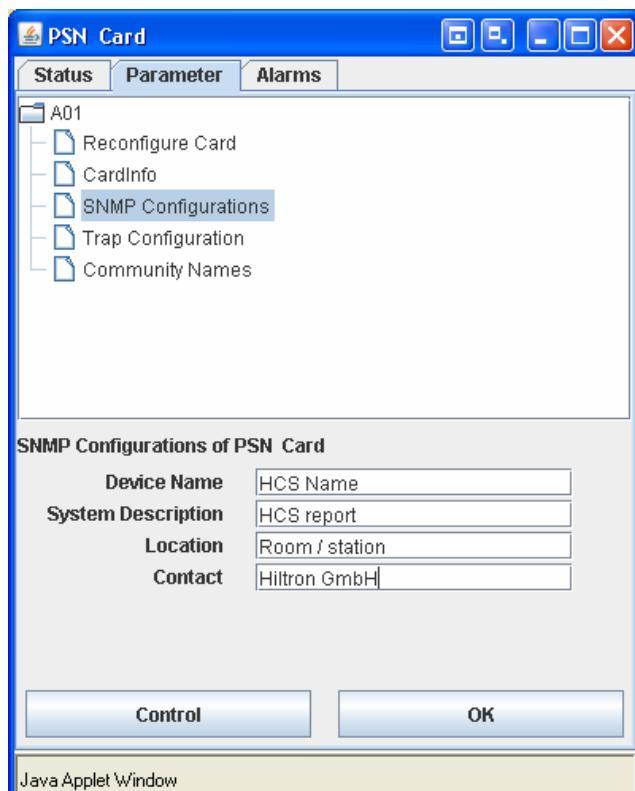
See chapter standard operation

Parameter Group **SNMP Configuration**

Parameter Group **Trap Configuration**

Parameter Group **Community Names**

see next pages



Parameter Group SNMP Configuration

By clicking on the parameter group “SNMP Configuration” the parameters belonging to this group are presented on the window.

Devise Name

Input for the HCS / controller name.

System Description

Input for system information

Location

Input for information on location of the equipment.

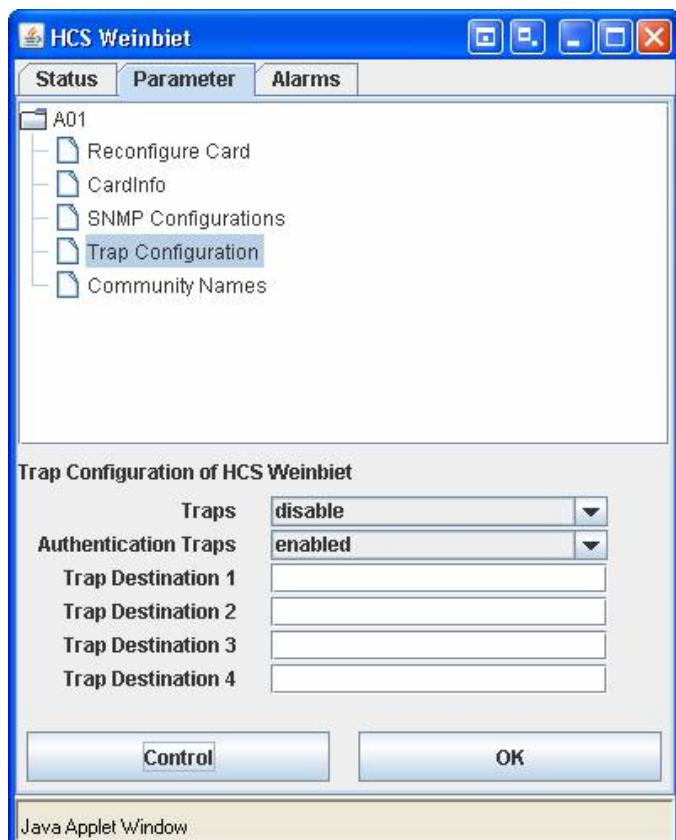
Contact

Input for contact information (address).

e.g. in case of malfunctions

This parameter are sent in the trap message in case of a malfunction or change of setting. Therefore they are important.

This information can be also be retrieved from the SNMPv2-MIB



Parameter Group

Trap Configuration

By clicking on the parameter group "Trap Configuration" the parameters belonging to this group are presented on the window.

Traps

The sending of traps can be enabled or disabled. The SNMP-version can be set.



Authentication Traps

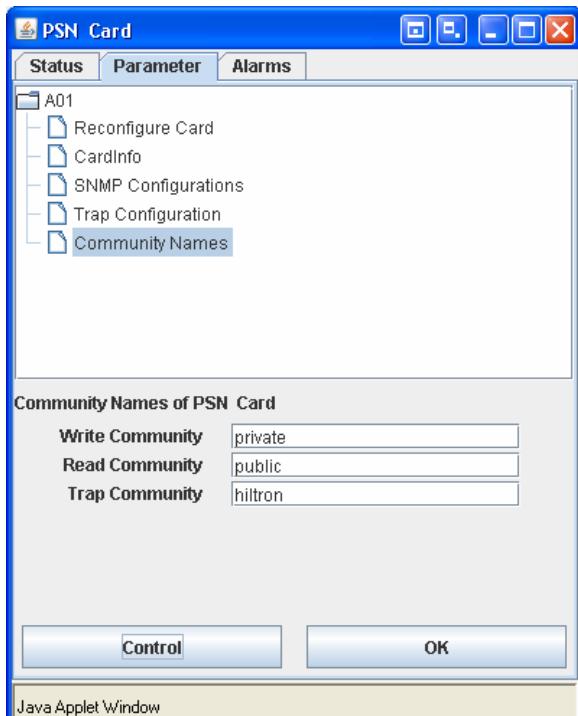
When enabled an additional warning trap message is generated in when a wrong community name is set.



When disabled no authentication trap will be sent.

Trap Destination 1 ...4

Inputs for up to 4 IP-addresses for trap destinations.



Parameter Group

Community Names

By clicking on the parameter group "Community Names" the parameters belonging to this group are presented on the window.

Write Community

Definition of the community (private or public) for setting of parameters.

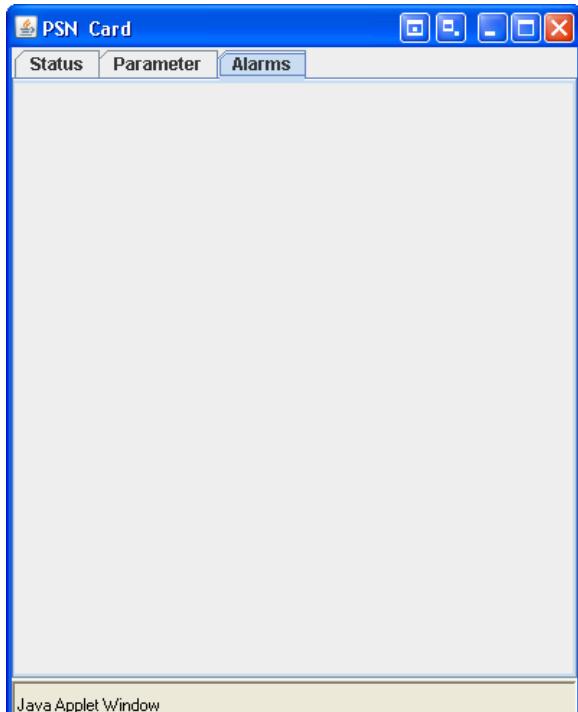
Read Community

Definition of the community (private or public) for getting of parameters.

Trap Community

The Trap Community will only sent by traps.

The Community names should fit exactly to the names used in the system. Please mind big and small letters.



The alarms tab

In the alarms tab the alarms of the card are displayed if any.

The format of an alarm message is as follows: alarm number, colon, name of the alarm. The alarm name enables the operator to determine whether it is only a wrong parameter setting or the card itself is corrupt.

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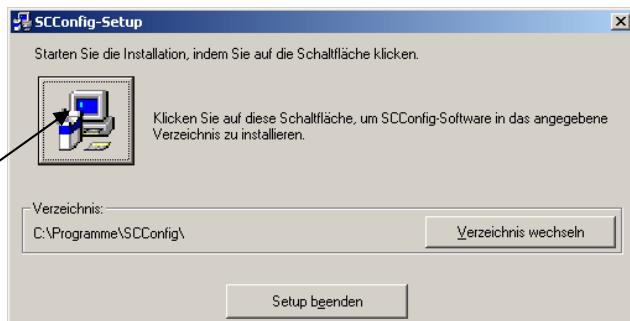
10 Setting the IP-Address

Prior to operation of the network interface card (NIC) type HCS3.PSN , the operator shall set the NIC's IP address. There is a special configuration program on the CD provided with the controller. In order to configure the card, the following equipment is required:

- The **HCS3 Controller** with the NIC type HCS3.PSN fitted in slot A1.
- A PC running Microsoft Windows operating system equipped with CD-ROM drive and Ethernet network interface card.
- A CAT5/6 crossover network cable or a Ethernet hub/switch and two standard network cables to connect the HCS3.PSN to the PC.
- The CD-ROM shipping with the **HCS3 Controller**.

On the CD-ROM you will find in the directory the folder **SCConfig**.

Select the file **setup.exe** and start the installation. The installation assistant will guide you through the installation steps.



By default a new folder **SCConfig** will be generated. Click on the button to confirm the proposed directory.



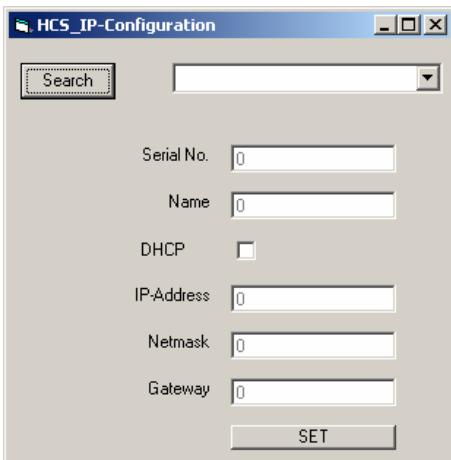
After the successful installation a shortcut **SCConfig** has been generated and installed in the windows main menu "Programs".

Follow the recommendation and restart the Windows program.

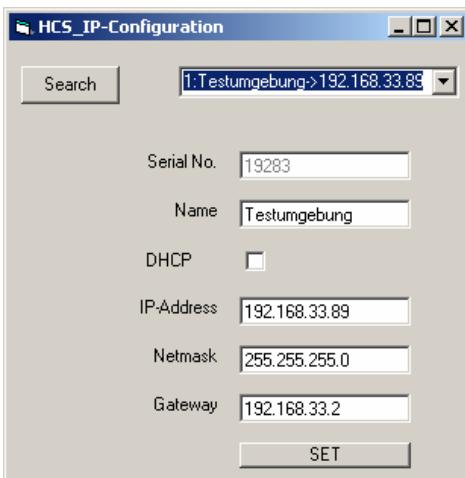
Setting the NIC's IP parameters is easily done within a few minutes.

1. Install the network cable between the NIC and your PC. Simply connect them directly with a crossover cable. Alternatively, connect both, the PC and the NIC to the same network hub/switch by using two straight network cables. It is essential that the computer and the NIC are connected to the same network segment. Otherwise, the configuration program is not able to find the NIC.

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- Click on the button "Search" and the program is searching for the NIC.



- Select in the Windows menu Programs the folder **SCConfig**.

Double-click on the 'SCConfig' program.

The configuration program for the NIC is started and opens with following window:..

- Click on the button "Search" and the program is searching for the NIC.
- The program shows in the combo box at least one entry describing the actual network configuration of the NIC. The network parameters of the NIC are presented in the dialog boxes below.
- Fill in the dialog the fields IP Address, Network mask and, if necessary, Gateway with appropriate values. Make sure, that the 'DHCP' box is unchecked
- In case of a DHCP configuration is required enable DHCP.
- Press the **SET** button to apply the new settings to your NIC.

Now the IP configuration of the HCS3.PSN is completed. You may finally want to test if the card is accessible now. Start your web browser and type the NIC's IP address into the URL field of the browser. The NIC should reply with its main page, provided the NIC and your PC are configured for the same subnet.

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11 Protocol Serial Interface

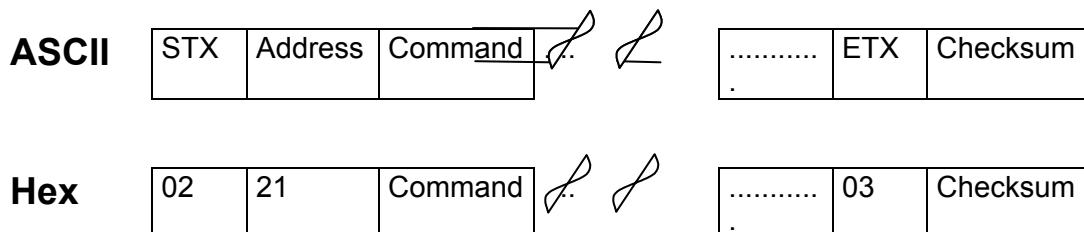
11.1 Pin- Out 9-pin Sub- D- Connector male

Pin	Function	Comment
1	+5V Aux Voltage	max. current 50mA
2	GND	Connected with Pin 3+4
3	GND	Connected with Pin 2+4
4	GND	Connected with 2+3
5	+5V Aux Voltage	Connected with Pin 1
6	TX +	RS 422
7	TX -	RS 422
8	RX -	RS 422
9	RX +	RS 422

11.2 Data Format:

Communication Typ RS422
 Baud rate 9600 Baud
 Data Bit 8 data
 Parity no parity
 Stop bit 1

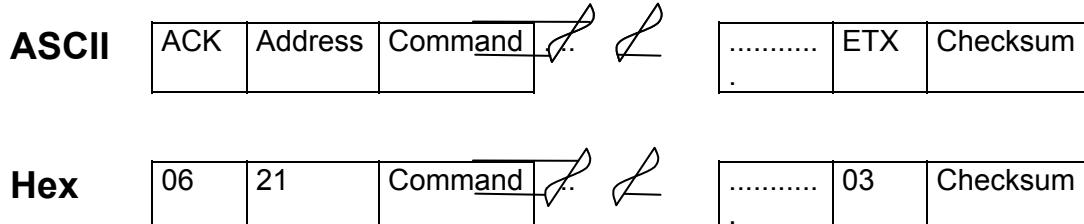
11.3 Command format Host-Computer → Controller



The checksum is a bit-wise EXOR function of all data bytes starting with STX and ending with ETX



11.4 Response format Controller → Host-Computer



In case of distorted communication or a wrong data format the controller will respond with a „NAK„ (15h) instead of the „ACK„ (06h)

The checksum is a bit- wise EXOR function of all data bytes starting with ACK/NAK and ending with ETX.

Address is the bus address of the controller. Address numbers can start with 20h.
Broadcast address is 20h. Default address is 21h; (in ASCII ! ; Decimal 33)

11.5 Command Structure:

	Start				END	
Request	STX	ADR	Cmd	cData	ETX	BCC
Response	ACK	ADR	Resp	rData	ETX	BCC

ADR Address of the controller; Address 20h is used as broadcast address. By using this global address together with the I Command and the Link N° nn one is able to reach all controllers in the system. Response comes from those controllers where the corresponding Link is installed.

Cmd Command, one character

cData Argument of Command

Resp Response

cData Argument of response

BCC Block check character (Checksum)

11.6 Valid User Commands for FO-Controller

Command	Description
	Read status information

11.7 Status Read Command:

		Start	1	2	Link Nr	Argument	Parameter 0	Parameter 1	END	BCC
Request	ASC	STX	ADR	'1'	'0'	'1'	'0'	'2'	'0'	'0'
	HEX	02	20	49	30	31	30	37	30	03
Response		ACK	ADR	'A'		
		06	21	41					ETX	BCC

ADR Address of the controller; Address 20H is used as global address. By using this address together with the I Command and the Link No. nn you will reach all controllers in the system. Response comes from those controllers where a corresponding Link is installed
 Link Nr Valid Link No. must be configured by means of the configuration program
 Argument 2-two digits for definition,
 first digit = module No.. -> 0 = Transmitter, 1 = Receiver, 2 = Receiver on optical Splitter
 second digit 1= Status1; 2= Status2
 Parameter Not used for the I command, all parameters set to zero (30h)s

11.7.1 Command Inn01 > Read Transmitter Status 1

Response for Command Inn010000 = Read Transmit Status 1

Byte	Unit	Value	Status	Scale	Range	
0	Optical Power	HEX	Optical Power on Laser	0.02V	-5.00..+0.10V	
1	RF-Power	HEX	RF Power on Laser	0.5dBm	-64.00..+63.5 dB	
2	I-Laser	0	Laser Current	0.02V	inactive	
3	Transmitter Voltage	HEX	Supply Voltage on Transmitter	0.1V	0..25.4V	
4	Transmitter Current	HEX	Supply Current on Transmitter	5mA	0..1250mA	
5	VPP	0	System Voltage	0.2V	inactive	
6	VCC	0	System Voltage	0.05V	inactive	
7	State	Bit Field	Status of Transmitter Module			



11.7.2 Command Inn02 > Read Transmitter Status 2

Response for Command Inn020000 = Read Transmit Status 2

Byte	Unit	Value	Status	Scale	Range	
0	Optical Alarm	0	Voltage on Alarm Pin 8	0.02V	inactive	
1	RF-Alarm	0	Voltage on Alarm Pin 7	0.02V	inactive	
2	RF-Power as V	0	Voltage on RF Monitor Pin 4	0.05V	inactive	
3	LNB- Voltage	HEX	Supply Voltage for LNB	0.1V	0..25.4V	
4	LNB Current	HEX	Supply Current on LNB	5mA	0..1250mA	
5	VPP	0	System Voltage	0.2V	inactive	
6	VCC	0	System Voltage	0.05V	inactive	
7	State	Bit Field	Status of Transmitter Module			

11.7.3 Command Inn11 > Read Receiver Status 1

Response for Command I01020000 = Read Receiver Status

Byte	Unit	Value	Status	Scale	Range	
0	Optical Power	HEX	Optical Power on Receiver diode	0.01mW	0..2.54mW	
1	RF-Power	HEX	RF Power on Output	0.5dBm	-100.0..+27.5 dBm	
2	RF-Power	HEX	RF Power on Output	0.5dBm	-100.0..+27.5 dBm	
3	Receiver Voltage	HEX	Supply Voltage on Receiver	0.1V	0..25.4V	
4	Receiver Current	HEX	Supply Current on Receiver	5mA	0..1250mA	
5	VPP	0	System Voltage	0.2V	inactive	
6	VCC	0	System Voltage	0.05V	inactive	
7	State	Bit Field	Status of Receiver Module			

11.7.4 Command Inn12 > Read Receiver Status 2

Response for Command I01020000 = Read Receiver Status

Byte	Unit	Value	Status	Scale	Range	
0	Optical Alarm	0	Voltage on Alarm Pin 8	0.02V	inactive	
1	RF-Alarm	0	Voltage on Alarm Pin 7	0.02V	inactive	
2	RF-Power as V	0	Voltage on RF Monitor Pin 4	0.05V	inactive	
3	Voltage on Pin 9	0	Voltage on Pin 9	0.1V	inactive	
4	Current on Pin 9	0	Current on Pin 9	5mA	inactive	
5	VPP	0	System Voltage	0.2V	inactive	
6	VCC	0	System Voltage	0.05V	inactive	
7	State	Bit Field	Status of Receiver Module			

11.7.5 Decoding the State-Bit field

Bit No	Signal	Comment	normally state
0	Optical OK	Set if optical Power in Range	1
1	RF OK	Set if RF in Range	1
2	Voltage fail	Set if Voltage on Pin 1 out of Range	1
3	Voltage fail	Set if Voltage on Pin 1 out of Range	0
4	Current fail	Set if Current on Pin 1 out of Range	1
5	Current fail	Set if Current on Pin 1 out of Range	0
6	is a Transmitter		
7	is a Receiver		