

System HD Single Channel Optical Receiver Operation Manual

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Introduction to this Operation Manual

This manual covers the operation and use of the modules described below.

WARNING...

THE FRONT PANEL OF THE UNIT MUST NOT BE OPENED BY THE OPERATOR. ACCESS IS ONLY PERMITTED TO FULLY QUALIFIED INSTALLATION ENGINEERS.

System HD Modules must only be installed and/or replaced by qualified service personnel, with reference to the System HD Installation guide. Refer all installation and servicing to qualified personnel only.

All laser transmitters used in this product are Class 1 in accordance with EN60825-1 as well as 21CFR 1040.10 and 1040.11

**Class 1
Laser Product**

- 1. Laser light can be damaging to the eyes. Optical fibres and Uniteres should be handled with great care.**
- 2. System HD Modules which incorporate Fibre Optic elements, are designed for use with Class 1 laser systems only. Ensure that all inputs do NOT exceed Class 1 as doing so will impair the safety of the system and may result in damage to the equipment.**
- 3. Active fibres should not be handled unless their source can be positively identified as not exceeding Class 1 limits.**

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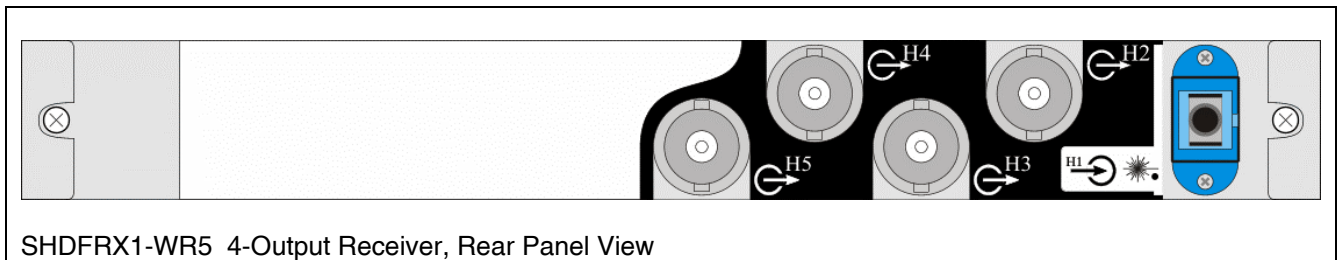
No responsibility is taken by the manufacturer or supplier for any non-compliance to EMC standards due to incorrect installation.

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Scope of this Operation Manual

This is the operation manual for the System HD Fibre Optic Receiver module. It covers the modules ordered under the following codes :

SHDFRX1-WR5 – Standard Single Input Receiver with 4 electrical outputs



SHDFRX1-WR5 4-Output Receiver, Rear Panel View

Module Description

The Single Channel Optical Receiver receives a single optical high-definition serial digital (HD-SDI) bitstream and provides four identical electrical HD-SDI outputs.

The input is via the SMPTE 292M recommended SC/PC singlemode fibre optic connector situated on a rear panel interface board. The SC/PC connector is robust and easy to use, a simple snap-fit into the backplane unit enables a reliable connection to be made in a matter of seconds.

The HD-SDI input signal is fed from the interface board into an optical receiver on the main board which converts the optical signal back into the electrical domain. This electrical HD-SDI signal output is then amplified and reclocked before being split to provide four identical coaxial HD-SDI outputs for the user on the backpanel of the interface board.

When used in conjunction with the HD Optical Transmitter boards (and depending on the fibre interconnect used) the sensitivity of the optical receiver is sufficient to recover a signal transmitted from up to 20km away.

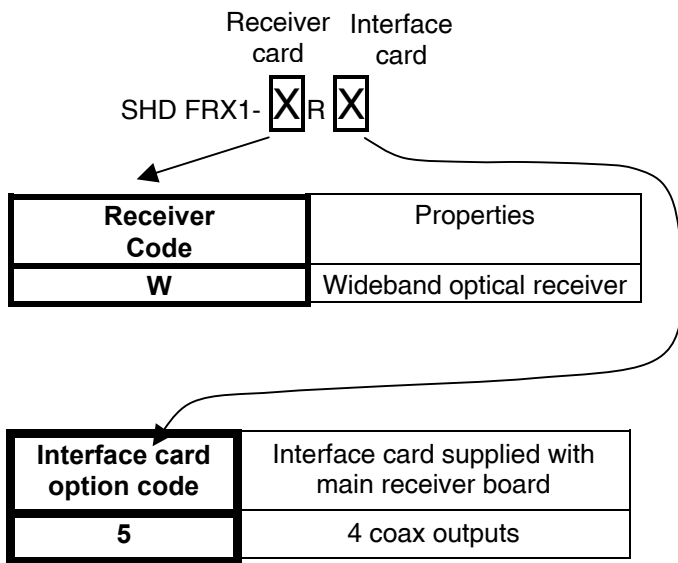
LEDs mounted at the front of the main board allow monitoring of the receiver performance. More detailed performance information can be obtained via the RollCall interface.

The standard rear panel interface board accepts any optical signal in the wavelength range 1200-1600nm

WARNING...

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Quick guide to order codes:



Codes other than those listed refer to custom laser options.

Features

- SMPTE 292M 1.485Gbit/s HD-SDI data rate supported
- SMPTE 292M recommended SC/PC singlemode user interface connector
- Four coaxial outputs from single optical input
- Recovery after distances up to 20km
- Wavelength input range of 1200nm to 1600nm
- Bit error rate (BER) $<10^{-12}$
- Optical data transport offering:
 - EMI immunity
 - No earth loops
 - Small, lightweight, flexible cabling
 - Easy to locate and repair cable breaks
- Alarm functions for poor quality input signals and device malfunction
- Stand-alone or RollCall™ operation
- Incoming signal analysis is available as an option, it includes:
 - CRC status
 - Line standard
 - Frame rate
 - Error rate

Note:

RollCall™ enabled for remote system control & monitoring.

Technical Profile

INPUT

Optical Connector Format	1.485Gbit/s HD-SDI SC/PC singlemode panel uniter
Back reflection	<-25dB
Input wavelength range	Min. 1200nm Max. 1600nm
Optical power input range	< -3dBm > -23dBm
Detector damage threshold	+10dBm

OUTPUTS

Electrical Connector Format	1.485Gbit/s HD-SDI BNC 75ohm panel jack
Outputs	4
Output Cable Length	>100m
Peak-to-peak signal amplitude	800mV \pm 10%
D.C. offset	0V \pm 0.5V
Rise time (20-80%)	< 270ps
Fall time (20-80%)	< 270ps
Difference	\leq 100ps
Return loss	<-15dBm

INDICATOR LEDS

Power	Power supplies valid
Fault	Board fault
CPU	Valid CPU activity
P _{in}	Input of sufficient power present
PLL Lock	Output locked to input standard
CRC Error	Error
Line and frame rate	Indicates line and frame rate
Prog/Int	Indicates progressive or interlaced frames

RollCall™

RollCall monitoring options:	General alarm Supply voltage levels Board temperature CRC status Line standard Field frequency Error rate
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POWER CODE 1

WEIGHT <820gm (Main Board plus Interface Board)

OPTIONS See page 5

Notes...

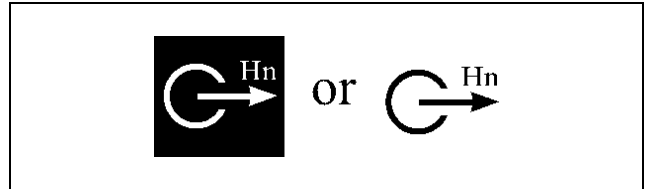
1. Each receiver board has a wideband optical receiver device. The receiver can be used to recover wavelengths in the range 1.2 to 1.6 μ m
2. A 'standard' interface card for a single channel receiver board will provide four coax outputs from the one optical input.
3. Codes in the ORDER NUMBER other than those listed page 5 will refer to custom interface card options. Additional information should have been delivered with the cards. If further information is required please contact the factory.

Rear Interface Connections

Rear Interface Notation Guide

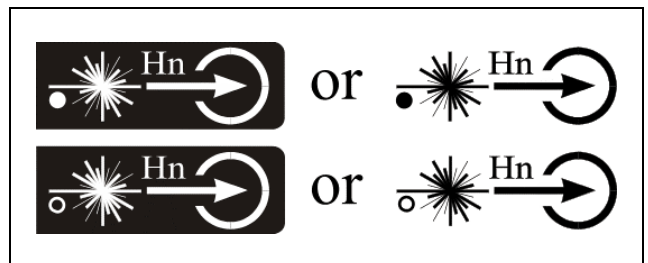
Electrical HD-SDI Output

A High Definition Serial Digital electrical output through a 75Ω BNC connector is denoted in the way shown opposite. The “H” denotes the High Definition element and the “n” is the connection number for that particular rear interface.



Optical HD-SDI Input

A High Definition Serial Digital optical input through a SC/PC single mode panel uniter is denoted in the way shown opposite. The “H” denotes the High Definition element and the “n” is the connection number for that particular rear interface. The solid “dot” indicates that only a single wavelength can be presented through the connector. A hollow circle indicates multiple wavelengths are permissible.



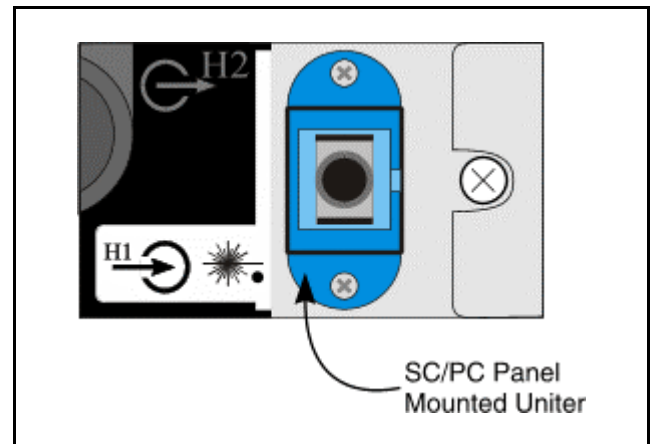
Standard Receiver Input

Optical HD-SDI Input

Used On : SHDFRX1-WR5

The high definition serial digital optical input is connected to an SC/PC single mode panel uniter. This connector is shown opposite and is labelled **H1** on the rear panel. This is a single optical wavelength interface in these cases.

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3. **Active fibres should not be handled unless their source can be positively identified as not exceeding Class 1 limits.**

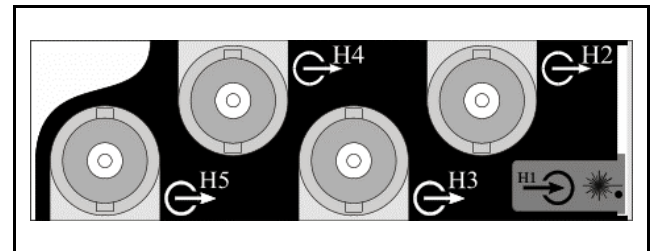


Standard Receiver Outputs

Electrical HD-SDI : Quad Outputs

Used On : SHDFRX1-WR5

The four high definition serial digital electrical outputs are available from four 75Ω BNC connectors. The same digital bitstream is provided by all four connectors. This bitstream is a reclocked version of the optical signal provided to the optical receiver. These electrical outputs are labelled as **H2**, **H3**, **H4**, and **H5**. The annotations on the rear panel are illustrated in the diagram opposite.



Notes...

1. Optical uniteres have plastic covers to prevent the ingress of dust. These covers should only be removed when connecting optical fibres. A uniter should never be left open without a cover or a fibre connector
2. The ends of optical fibres should be cleaned with a liquid fibre cleaner, using a cotton bud, to ensure that there is no dust present, before they are plugged in (the uniter is polarised).
3. Observe the warning about not viewing live optical sources.

Rollcall Menu System

When a System HD Control and Monitor board is fitted in the enclosure a range of monitoring information is available to RollCall™

External Monitoring	Description
General alarm	Input power fault or overcurrent trip or system failure
Supply voltage levels	Actual voltage levels
Board temperature	Actual board temperature
Bit error rate	Error rate over defined time period

Rollcall Monitoring Features

- Module Infrastructure:
 - General Alarm
 - Supply Voltage Levels
 - Board Temperature
- Incoming Signal analysis:
 - Input Status
 - Line standard
 - Frame Type
 - Frame Rate
- CRC Error analysis:
 - CRC Error Count
 - CRC Error Total
 - CRC Reset

Received Laser Power (dBm) – This is the amount of Laser power being received. It indicates how much attenuation has been applied to the signal.

