

System HD Single Channel Multi-Rate Optical Receiver Operation Manual

CONTENTS

INTRODUCTION TO THIS OPERATION MANUAL.....	2
SCOPE OF THIS OPERATION MANUAL	4
MODULE DESCRIPTION	4
FEATURES.....	6
TECHNICAL PROFILE.....	7
INPUT	7
OUTPUTS.....	7
SWITCHES, BOARD EDGE	7
INDICATOR LEDs	7
ROLLCALL™	7
OPTIONS.....	7
REAR INTERFACE CONNECTIONS.....	8
REAR INTERFACE NOTATION GUIDE.....	8
STANDARD RECEIVER INPUT	9
STANDARD RECEIVER OUTPUTS.....	9
ROLLCALL MENU SYSTEM	10
ROLLCALL MONITORING FEATURES.....	11

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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Important Notice

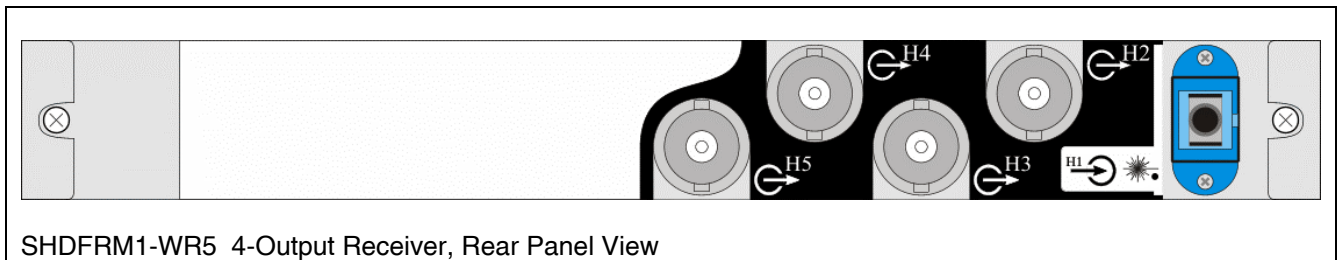
No responsibility is taken by the manufacturer or supplier for any non-compliance to EMC standards due to incorrect installation.

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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 :

SHDFRM1-WR5 – Standard Single Input Receiver with 4 electrical outputs



Module Description

The Single Channel Optical Receiver receives either a single optical high-definition serial digital (HD-SDI / SMPTE292M) or a single optical standard-definition serial digital (SD-SDI / SMPTE259M) bitstream and provides four identical electrical HDSDI or SDSDI outputs.

The input is via the SMPTE292M recommended SC/PC single mode 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.

When used in conjunction with the 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.

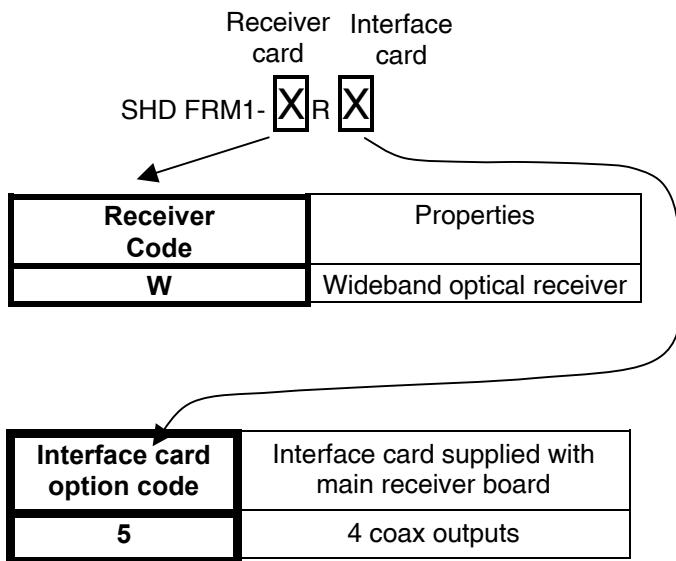
LEDs mounted at the front of the main board allow monitoring of the receiver performance. More detailed performance information can be obtained via the RollCall interface.

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

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Quick guide to order codes:



Codes other than those listed refer to custom laser options.

Features

- SMPTE292M 1.485Gbit/s HD-SDI data rate supported
- SMPTE259M 270Mbit/s SD-SDI data rate supported
- Async mode of operation. For use with D2, DVB-ASI, MPEG streams, AES-EBU, etc.
- 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 HD 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.

In Async mode some SDI outputs may not be compatible with certain equipment due to the use of complimentary outputs. e.g. Some ASI streams are not inversion compatible.

Technical Profile

INPUT

Optical	1.485Gbit/s HD-SDI 270Mbit/s SD-SDI
Connector Format	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	1.485Gbit/s HD-SDI 270Mbit/s SD-SDI
Connector Format	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
Rate mode	SD Rate mode
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 Rate Selection – HD / SD / Async
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POWER CODE 1

WEIGHT <820gm (Main Board plus Interface Board)

OPTIONS See page 5

Notes...

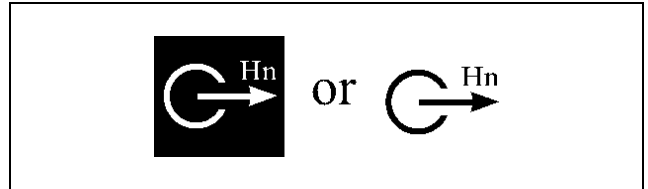
1. Each receiver board has a wideband optical receiver device. The receiver can be used to recover wavelengths in the range 1.2 to 1.6 μ m.
2. A 'standard' interface card for a single channel receiver board will provide four coax outputs from the one optical input.
3. Codes in the ORDER NUMBER other than those listed on 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

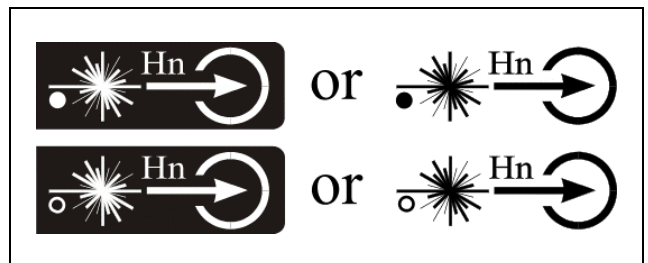
Electrical SDI Output

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



Optical SDI Input

A Serial Digital optical input through a SC/PC single mode panel unit is denoted in the way shown opposite. The “**H**” denotes the High Definition capable 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.



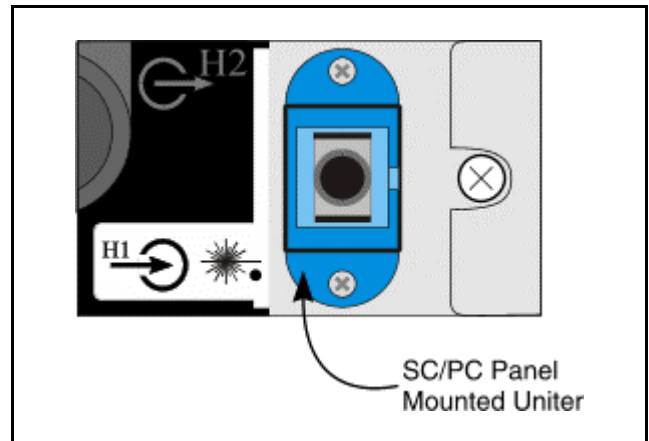
Standard Receiver Input

Optical SDI Input

Used On : SHDFRM1-WR5

The 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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Standard Receiver Outputs

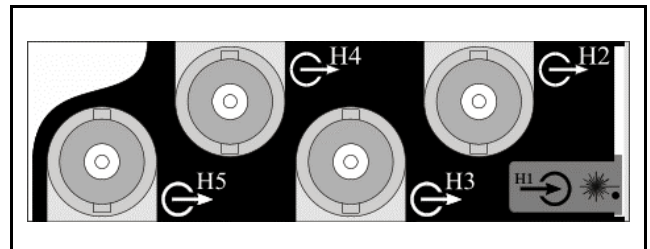
Electrical SDI : Quad Outputs

Used On : SHDFRM1-WR5

The four serial digital electrical outputs are available from four 75 Ohm 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. (Note: In Async mode the bitstream is not reclocked.)

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 uniter 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
- Rate Sel:
 - HD – HD-SDI Reclocking mode.
 - SD – SD-SDI Reclocking mode.
 - Async – Asynchronous mode.

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

