

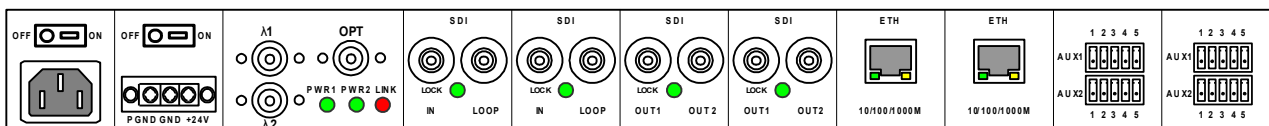
QUESTTEL

Broadcast Systems

8Ch CWDM 3G-SDI + Gigabit Ethernet Fiber Extender kit - Transmitter & Receiver

User Manual

L-XSDI-CWDM-3G-GE-TX/RX



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Chapter 1. Introduction

1.1 Overview

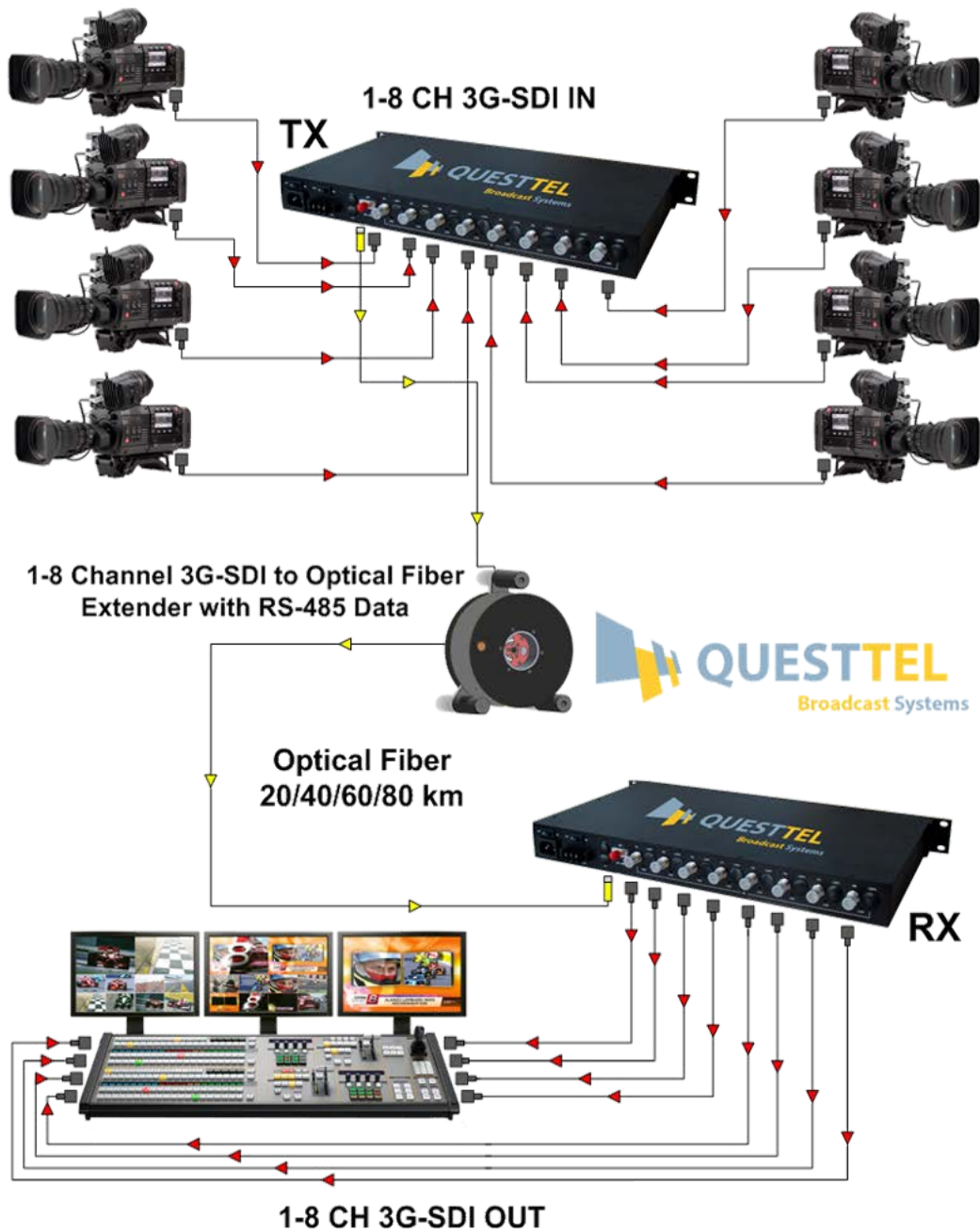
The L-XSDI-CWDM-3G-GE-TX/RX is a high performance, and reliable, 1~8 3G/HD/SD-SDI multi-service optical transceiver, which is designed as a modular system to support up to 8 3G/HD/SD-SDI, up to 2 gigabit Ethernet, up to 8 phoenix terminal groups for audio, RS232, RS422, RS485 and contact closure, up to 2 optical wavelength signal for outside device.

The RV6X1 can be widely used in TV live broadcast, high-definition video conference, high-definition video monitoring, intelligent transportation system and public security system.

1.2 Feature

- Compact design with 1U height, 19 inch, which can be installed on standard rack
- Optical port
 - Supports optical signal loss indication
 - With APC circuit to achieve stable output optical power
 - Two reserved optical ports for cascaded application. The available wavelength can be ordered. Supports FC/SC/ST-PC connector
- SDI
 - Supports 1485Mb/s and 270Mb/s, complying with SMPTE-292M and SMPTE-259M
 - Supports DVB-ASI at 270M/b
 - As an option, supports 2970M/b, complying with SMPTE-424M 3G-SDI
 - SDI loop out and dual SDI output can be selected at the transmission and receiving terminals respectively
 - Supports 1080P@60, 50, 1080P@30, 29.97, 25, 24, 23.98, 1080I@60, 59.94, 50, 720P@60, 59.94, 50, 30, 29.97, 25, 24, 23.98, and 625i, 525i
 - With integrated SDI re-clocker and cable equalizer
 - Built-in ESD and surge protection facility to prevent damage from external strikes
 - Supports lock status indication of SDI input and output
- Gigabit Ethernet
 - Complying with IEEE 802.3, auto negotiation for 10M/100M/1000M
 - One RJ45 connector for one gigabit Ethernet, support auto MDI/MDIX function
 - Indicators for LINK/ACT and bit rate status
- Auxiliary service
 - Phoenix terminal interface, every five terminals are used as a group and the service type can be configured for every group independently
 - supports audio, RS232, RS422, RS485 and contact closure
- Provides dual power redundancy: AC220V/AC110V, DC-48V and DC+24V can be selected

1.3 Application



<p>OFF <input type="checkbox"/> ON <input type="checkbox"/></p>	<p>OFF <input type="checkbox"/> ON <input type="checkbox"/></p> <p>PGND GND +24V</p>	<p>λ1 OPT</p> <p>λ2</p> <p>PWR1 PWR2 LNK</p>	<p>SDI</p> <p>LOCK IN LOOP</p>	<p>SDI</p> <p>LOCK IN LOOP</p>	<p>SDI</p> <p>LOCK OUT1 OUT2</p>	<p>SDI</p> <p>LOCK OUT1 OUT2</p>	<p>ETH</p> <p>10/100/1000M</p>	<p>ETH</p> <p>10/100/1000M</p>	<p>AUX1 1 2 3 4 5</p> <p>AUX2 1 2 3 4 5</p>	<p>AUX1 1 2 3 4 5</p> <p>AUX2 1 2 3 4 5</p>
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Chapter 2. Equipment View

2.1 Front Panel



Figure 2-1-1 Front Panel of Transmitter and Receiver

Table 2-1-1 Indicators on Front Panel

Name	Description
LINK	Receiving status at optical port. Red ON: No optical signal. Green ON: Normal.
PWR1,PWR2	Dual power supply indicator: ON: Power works normally. OFF: Power is abnormal or absence.

2.2 Rear Panel

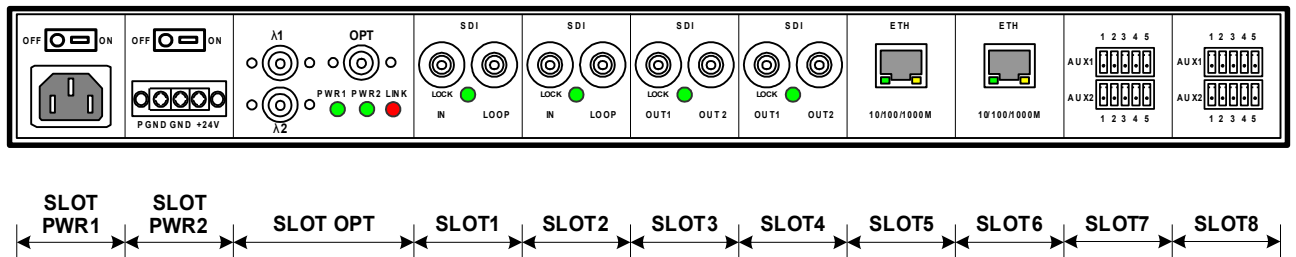


Figure 2-2-1 Rear Panel

Note: The actual rear panel will be according to the order and may be different from Figure 2-2-1.

Table 2-2-1 Slots on Rear Panel

Name	Description
SLOT PWR1	Power slot1, 110/220VAC, 48VDC, 24VDC can be selected
SLOT PWR2	Power slot2, 110/220VAC, 48VDC, 24VDC can be selected
SLOT OPT	Optical slot, one common optical port(OPT) and two cascade optical ports(λ1-λ2)
SLOT1	Service slot1, supports 3G/HD/SD-SDI
SLOT2	Service slot2, supports 3G/HD/SD-SDI
SLOT3	Service slot3, supports 3G/HD/SD-SDI

SLOT4	Service slot4, supports 3G/HD/SD-SDI	
SLOT5	Service slot5, supports 3G/HD/SD-SDI, GE, AUX	Note: if AUX interface is selected, both SLOT5 and SLOT6 must be AUX interface
SLOT6	Service slot6, supports 3G/HD/SD-SDI, GE, AUX	
SLOT7	Service slot7, supports 3G/HD/SD-SDI, GE, AUX	Note: if AUX interface is selected, both SLOT7 and SLOT8 must be AUX interface
SLOT8	Service slot8, supports 3G/HD/SD-SDI, GE, AUX	

Table 2-2-2 Interfaces on Rear Panel

Name	Description		
OPT	Common optical interface, bi-directional, FC/SC/ST-PC can be selected.		
λ1-λ2	Optional cascade optical interfaces, λ1-λ2 are wavelength division multiplexed into the common optical interface. The wavelength should be described in the order item. The λ1 will be the shorter wavelength and the λ2 will be the longer wavelength.		
SDI IN	3G/HD/SD-SDI input.		
SDI LOOP	Optional 3G/HD/SD-SDI loop out.		
SDI OUT1	3G/HD/SD-SDI output1.		
SDI OUT2	Optional 3G/HD/SD-SDI output2.		
ETH 10/100/1000M	Gigabit Ethernet		
AUX1/AUX2	Auxiliary service interfaces. every five terminals are used as a group and the service type can be configured for every group independently including audio, RS232, RS422, RS485 and contact closure. See for details.		
Power	Support 220VAC/110VAC,48VDC or 24V DC power supply. Any two of them can be selected and installed.		
	~220V AC	~220V	AC power input. 100VAC~240VAC
	-48V DC	PGND	Earth ground (connects to the chassis).
		GND	Ground
		-48V	48VDC. 36VDC ~72VDC.
	+24V DC	PGND	Earth ground (connects to the chassis).
		GND	Ground
+24V		24VDC power. 18VDC~36VDC.	

Table 2-2-3 Indicators on Rear Panel

Name	Description
LINK	Optical port status indicator. RED/GREEN. RED ON: Optical signal loss is detected at the port. GREEN ON: Normal.
PWR1,PWR2	Power1/Power2 indicators, GREEN ON: the power works normally OFF: the power is abnormal or absence.
LOCK	SDI input/output lock indicator, GREEN. ON: SDI input/output normal. OFF: SDI input/output abnormal.
ETH GREEN	Ethernet link/active indicator, GREEN. ON: Normal link but no data transmit or receive; BLINK: Normal link and there are data transmitting and receiving; OFF: No link or the interface is damaged
ETH YELLOW	Ethernet speed indicator, YELLOW. For ETH 10/100/1000M, ON: operating at 1000Mb/s OFF: operating at 100/10Mb/s



Table 2-2-5 AUX on Rear Panel

AUX interface	No.	Pin Name	Description	Note
2-channel bi-directional audio AUX213	1	OUT1	Audio channel -1 output	Use AUX213-AUX213 in pairs
	2	OUT2	Audio channel -2 output	
	3	G	Ground	
	4	IN1	Audio channel -1 input	
	5	IN2	Audio channel -2 input	
4-channel unidirectional audio Input AUX211	1	IN1	Audio channel -1 input	Use AUX211-AUX212 in pairs
	2	IN2	Audio channel -2 input	
	3	G	Ground	
	4	IN3	Audio channel -3 input	
	5	IN4	Audio channel -4 input	
4-channel	1	OUT1	Audio channel -1 output	

unidirectional audio Output AUX212	2	OUT2	Audio channel -2 output	
	3	G	Ground	
	4	OUT3	Audio channel -3 output	
	5	OUT4	Audio channel -4 output	
2-channel unidirectional audio input AUX208	1	IN1	Audio channel -1 input	Use AUX207- AUX208 in pairs
	2	IN2	Audio channel -2 input	
	3	G	Ground	
	4	-	--	
	5	-	--	
2-channel unidirectional audio Output AUX207	1	OUT1	Audio channel -1 output	
	2	OUT2	Audio channel -2 output	
	3	G	Ground	
	4	-	--	
	5	-	--	
2-channel contact closure input AUX201	1	IN1	The first channel contact closure input	Use AUX200- AUX201 in pairs
	2	COM1	Command contact of the first channel contact closure	
	3	IN2	The second channel contact closure input	
	4	COM2	Command contact of the second channel contact closure	
	5	--	--	
2-channel contact closure output AUX200	1	OUT1	The first channel contact closure output No alarm: the contact is normally-closed (NC) Alarm: the contact is open	
	2	COM1	Command contact of the first channel contact closure	
	3	OUT2	The second channel contact closure output No alarm: the contact is normally-closed (NC) Alarm: the contact is open	

	4	COM2	Command contact of the second channel contact closure	
	5	--	--	
2-channel bi-directional RS485 AUX204	1	A1	RS485 channel-1 differential signal A	Use AUX204- AUX204 in pairs
	2	B1	RS485 channel-1 differential signal B	
	3	A2	RS485 channel-2 differential signal A	
	4	B2	RS485 channel-2 differential signal B	
	5	G	Ground	
2-channel bi-directional RS232 AUX205	1	OUT1	RS232 signal output 1	Use AUX205- AUX205 in pairs
	2	IN1	RS232 signal input 1	
	3	G	Ground	
	4	OUT2	RS232 signal output 2	
	5	IN2	RS232 signal input 2	

Table 2-2-6 RS422 on Rear Panel

1-channel bi-directional RS422 AUX204(Transmitter)			Signal Direction	1-channel bi-directional RS422 AUX204(Receiver)		
Description	No.	Pin Name		Pin Name	No.	Description
Differential signal output A	1	OUTA		INA	1	Differential signal input A
Differential signal output B	2	OUTB		INB	2	Differential signal input B
Differential signal input A	3	INA		OUTA	3	Differential signal output A
Differential signal input B	4	INB		OUTB	4	Differential signal output B
Ground	5	G		G	5	Ground

Chapter 3. Technical Specification

Table 3-1 Technical Specification

Item	Typical Value
SDI Interface	
Connector	BNC
Bit rate	2970Mb/s, 1485Mb/s and 270Mb/s auto adaptive
Standard	Comply with SMPTE-424M 3G-SDI, SMPTE-292M HD-SDI and SMPTE-259M SD-SDI
Impedance	75Ω
Return loss	>15dB
Output level	800mVp-p±10%
Rise and fall time (3G-SDI)	≤135ps
Rise and fall time (HD-SDI)	≤270ps
Rise and fall time (SD-SDI)	≤1.50ns
SD-SDI alignment jitter (1KHz)	≤0.2UI
SD-SDI timing jitter (10Hz)	≤0.2UI
HD-SDI alignment jitter (100KHz)	≤0.2UI
HD-SDI timing jitter (10Hz)	<1.0UI
3G-SDI alignment jitter(100KHz)	≤0.3UI
3G-SDI timing jitter(10Hz)	≤2.0UI
Optical Interface	
Connector	Optional SC/FC/ST-PC connector
Distance	40Km
Receive sensitivity	-21dBm
Overload optical power	0dbm
Sending optical power	-3~+3dBm
Connector of cascaded ports	Optional SC/FC/ST-PC connector
GE Interface	
Connector	RJ45
Frame length	From 64 to 2036 bytes

Default working mode	Auto-negotiation
Bit rate	10/100/1000Mb/s
Duplex	Half/full duplex
Flow Control	Enable as default
Standard	IEEE802.3ab 1000Base-T / IEEE802.3u 100Base-TX / IEEE802.3 10Base-T
Analog Audio Interface	
Connector	Phoenix connector
Input impedance	10KΩ
Output impedance	75Ω
Sample rate	48KHz
Coding bits	24 bit
Input/output level	2Vp-p
RS485 Interface	
Connector	Phoenix connector
Baud rate	0~115.2Kbps
Working mode	Bi-direction, half duplex
RS422/RS232 Interface	
Connector	Phoenix connector
Baud rate	0~115.2Kbps
Working mode	Bi-direction, full duplex
Power Supply	
Power supply	AC220 /DC48 /DC24V
220VAC input voltage range	100~240V AC
48VDC input voltage range	36~72V DC
24VDC input voltage range	18~36V DC
Environment Requirements	
Working temperature	-30~60°C
Relative Humidity	≤95%, no condensation
Storage temperature	-40~85°C
Mechanical Dimension	
Dimension	434mm(L)×44mm(H)×250mm(W)

Note:

1. The default transmission distance is 20Km. Please declare when ordering if longer distance is required.
2. In order to prevent the damage of optical modules, an attenuator(10dB in general) must be inserted into the short fiber tail that sometimes used to connects the two devices for test purposes.

Read before operating equipment.

1. **Cleaning** - Unplug this product from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.
2. **Power Sources** - Use supplied or equivalent UL/CSA approved low voltage DC plug-in transformer.
3. **Outdoor Antenna Grounding** - If you connect an outside antenna or cable system to the product, be sure the antenna or cable system is grounded so as to provide some protection against voltage surges and built-up static charges. Section 810 of the National Electrical Code, ANSI/NFPA No. 70, provides information with respect to proper grounding of the mast and supporting structure, grounding of the lead-in wire to an antenna discharge unit, size of grounding conductors, location of antenna discharge unit, connection to grounding electrodes, and requirements for the grounding electrode.
4. **Lightning** - Avoid installation or reconfiguration of wiring during lightning activity.
5. **Power Lines** - Do not locate an outside antenna system near overhead power lines or other electric light or power circuits or where it can fall into such power lines or circuits. When installing an outside antenna system, refrain from touching such power lines or circuits, as contact with them might be fatal.
6. **Overloading** - Do not overload wall outlets and extension cords as this can result in a risk of fire or electric shock.
7. **Object and Liquid Entry** - Never push objects of any kind into this product through openings as they may touch dangerous voltage points or short out parts, resulting in a fire or electric shock. Never spill liquid of any kind on the product.
8. **Servicing** - Do not attempt to service this product yourself as opening or removing covers may expose you to dangerous voltage or other hazards. Refer all servicing to qualified service personnel.
9. **Damage Requiring Service** - Unplug this product from the wall outlet and refer servicing to qualified service personnel under the following conditions:
 - When the power supply cord or plug is damaged.
 - If liquid spills or objects fall into the product.
 - If the product is exposed to rain or water.
 - If the product does not operate normally by following the operating instructions. Adjust only those controls that are covered by the operating instructions. An improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the product to its normal operation.
 - If the video product is dropped or the cabinet is damaged.
 - When the video product exhibits a distinct change in performance, this indicates a need for service.

WARNING!

This unit outputs continuous invisible light, which may be harmful to the eyes; use with caution. For additional safety, plug the attached dust caps into the optical transceivers when the fiber optic cable is unplugged. Direct viewing into optical connectors should be avoided at all times!