F-SUPERMUX-8

1~8 Channel Optical universal CWDM Multiplexer for SDI / Video /Audio / RS Data / Ethernet

User Handbook

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Contents

Chapter 1. Introduction

1.1 Overview

The F-SUPERMUX-8 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 4 gigabit Ethernet, up to 8 XLR interfaces for unidirectional analog audio or AES/EBU digital audio, up to 16 phoenix terminal groups for audio, RS232, RS422, RS485 and contact closure, up to 2 optical wavelength signal for outside device.
The F-SUPERMUX-8 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 - per request
- 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
- Analog or AES/EBU Audio（XLR interface）
  - Up to 8 balanced XLR interfaces
  - Supports AES/EBU or S/PDIF audio format transparent transmit with bit rate of 3.072Mb/s
  - Supports AES/EBU or S/PDIF audio lock status indication
- 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

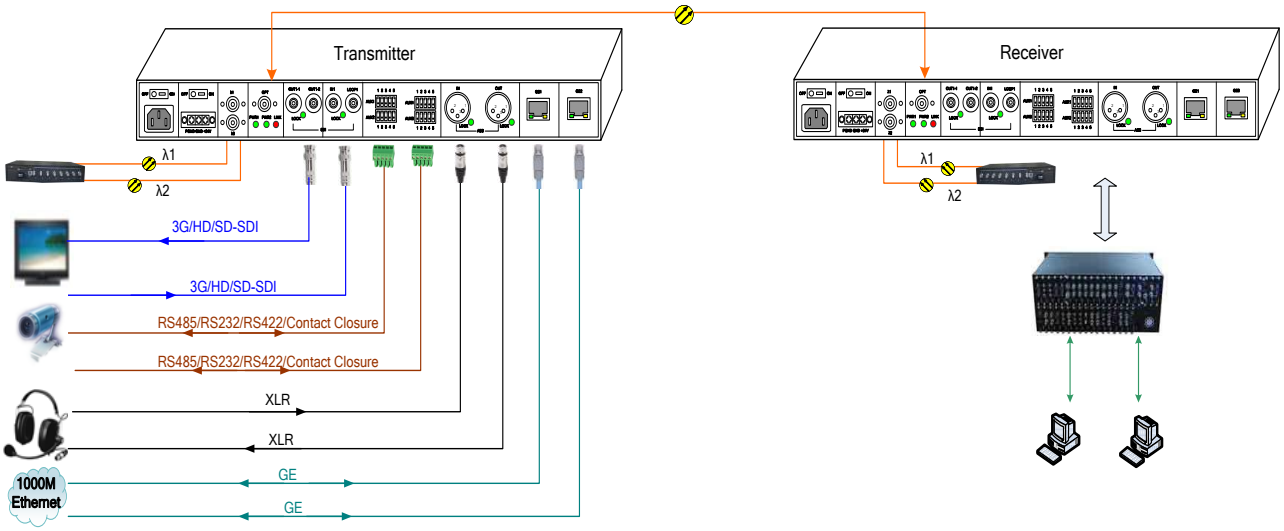

Figure 1-3-1 Application Diagram

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

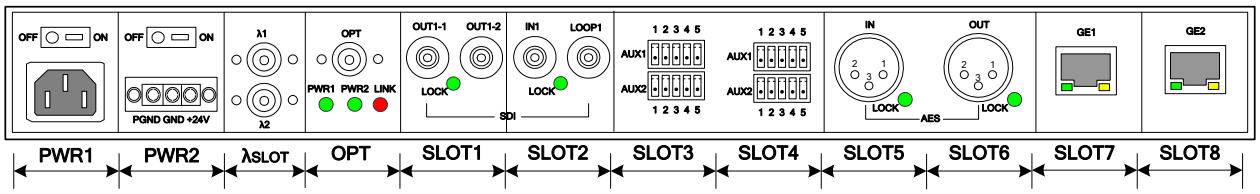

Figure 2-2-1 Rear Panel

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

MODULE		SLOT										
Item	MAX	PWR 1	PWR 2	λ SLOT	SLOT1	SLOT2	SLOT3	SLOT4	SLOT5	SLOT6	SLOT7	SLOT8
AC220V	2	√	√	-	-	-	-	-	-	-	-	-
DC48V		√	√	-	-	-	-	-	-	-	-	-
DC24V		√	√	-	-	-	-	-	-	-	-	-
λ	1	-	-	√	-	-	-	-	-	-	-	-
SDI IN	8	-	-	-	√	√	√	√	√	√	√	√
SDI OUT		-	-	-	√	√	√	√	√	√	√	√
XLR IN/OUT	4	-	-	-	√		√		√		√	
GIGABIT ETHERNET		-	-	-	√		√		√		√	
5 PIN INDUSTRIAL TERMINAL		-	-	-	√		√		√		√	

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 descript 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 unidirectional audio Output AUX212	1	OUT1	Audio channel -1 output	
	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	1	OUT1	The first channel contact closure output No alarm: the contact is normally-closed	

AUX200			(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
XLR Interface	
Connector	XLR
The maximum differential input level	+18dBu
Impedance	Input impedance：2.2KΩ@1KHz
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℃
Relative Humidity	≤95％, no condensation
Storage temperature	-40～85℃
Mechanical Dimension	
Dimension	482mm(L)×44mm(H)×250mm(W)

Note:

1. The default transmission distance is 40Km. 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.

Chapter 4. Device Dimension

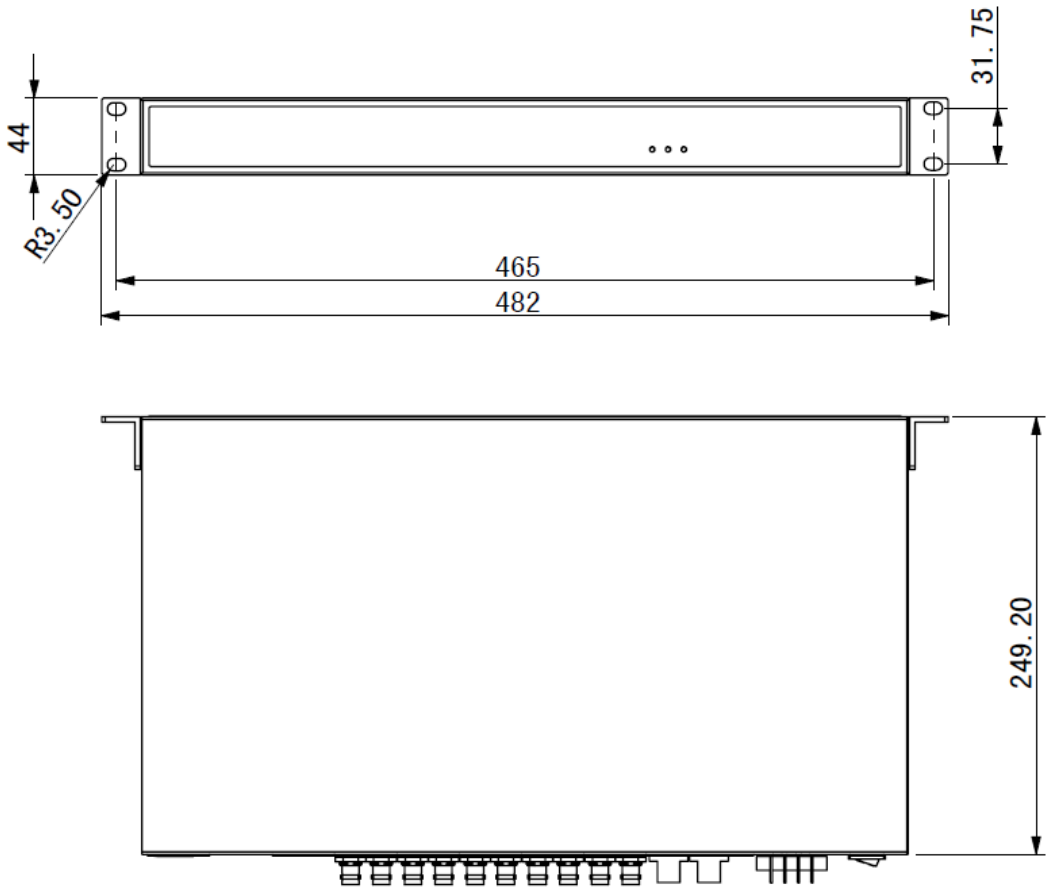

Figure 4-1 Device Dimension (unit: mm)