



XL-INV8E1

Ethernet over 8 - E1
Interface Converter

User's Guide



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1. Product overview

The XL-INV8E1 is an inverse E1 multiplexer that will multi-link up to 8 E1 lines and offers simple, cost-effective connection between E1 service and 10/100Base-T LANs. The XL-INV8E1 inverse multiplexer transmits a 16Mbps Ethernet bridge channel over 8 E1 links. The XL-INV8E1 supports 8*2.048Mbps G.703 E1 lines, for a line attenuation of up to 43 dB on twisted pair or coax cable.

The XL-INV8E1 fully meets E1 specifications including ITU-T G.703 and G.823. The Ethernet interface supports auto-negotiation, allowing plug-and-play Ethernet connection without any additional configuration

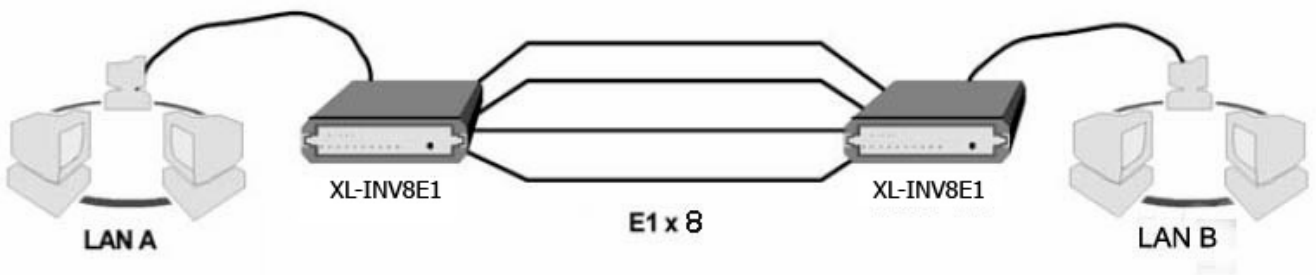
2. Features

- Provides two 10/100M Base-T ports, supports 10/100M full-duplex, half-duplex and auto-negotiation.
- Provide eight E1 data ports, impedance 75Ω/BNC
- No time delay requirement of E1 channel
- Auto-detect E1 line loop back status, auto-shut or auto-run when E1 line broken or connected well, avoid block network
- Supports flux control based on 802.3x
- Supports 802.1p preference function
- Supports VLAN Ethernet frame transparent transmission
- Adaptive to various power environment

3. Typical application

The XL-INV8E1 is not capable of fractional E1 operation or timeslot assignment. It should be used where only unframed, transparent 2.048Mbps transmissions are available.

In the following application, the XL-INV8E1 is connected in a point-to-point application. One unit is set to 'Internal' clock while the other is set to 'Line' clock.



In the following application, the XL-INV8E1 is connected in an E1 network application. Both units are able to sync to the network timing with clock setting for both units set to 'Line' clock.



4. Technical specification

4.1 E1 Interface

Framing	Unframed (transparent)
Line Code	HDB3
Bit Rate	2.048Mbps x 84 (16Mbps total)
Line Impedance	75 Ohms for BNC
Relative Receive Level	0 to -43dB
'Pulse' Amplitude	$\pm 2.37V \pm 10\%$ for 75 Ohms, $3.00V \pm 10\%$ for 120 Ohms
Transmit Frequency	2.048Mhz
Allowance	$\pm 50\text{ppm}$
Interface characteristics	Complies with ITU-T G.703
Jitter Performance	According to ITU-T G.823
Interface Connectors	BNC (Unbalanced)

4.2 Console interface

The CONSOLE interface is network management interface, and it is limited to be used by manufacturers only.

4.3 Ethernet interface(PORT1 and PORT2)

- Interface: 10/100Base-TX, Full Duplex or Half Duplex
- Interface Standard: complies with IEEE-802.3u standard
- Interface rate: 10/100M auto-negotiation
- Interface connector: RJ-45
- Supports Auto-MDI/MDIX

4.4 General specification

Environmental Requirements	Work temperature	$0^{\circ}\text{C} \sim +45^{\circ}\text{C}$
	Humidity	$\leq 90\%$ non-condensing
Power Supply	-48VDC	-36VDC ~ -72VDC
	220AC	220VAC $\pm 20\%$
Power consumption		<10W
Dimension (mm)		485 (W) × 195 (D) × 45 (H)

5. Configuration

5.1 Front panel

5.1.1 Labels, LED indicators and dip switches on the front panel are shown in Figure 5-1 below:

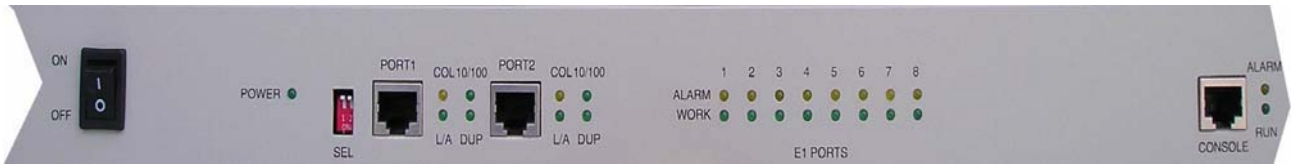


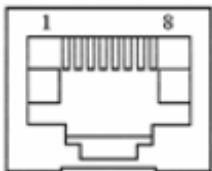
Figure 5-1

5.1.2 LED indicators & dip switches on the front panel are defined as below:

- Description of indicators:

Definition	Description
POWER	Green. On indicates power supply is ok
10/100	Green. On indicates the data rate of Ethernet port is 100Mbps
COL	Yellow. Flashing indicates Ethernet port signal interference
DUP	Green. On indicates Ethernet port under full-duplex work mode
L/A	Green. On indicates Ethernet port connection is OK. Flashing indicates Ethernet port is receiving data
ALARM	Yellow. On indicates malfunction in the device
E1 ALARM	Yellow. On indicates the device has received AIS signal. Flashing indicates malfunction in E1 channels
WORK	Green. On indicates E1 channels are receiving data
RUN	Green. Flashing indicates the device is working under correct status
CONSOLE	Management interface (Not open, used by manufacturer only)

- PORT1 and PORT2 interface definition:



Pin	1	2	3	4	5	6	7	8
Function	TX+	TX-	RX+	NC	NC	RX-	NC	NC-

▼ NC means “ no connection available”

- Description of DIP switch(SEL):



Switch Position	Function Description
1: ON	LAN interface data package length : 1536/1536
1: OFF	LAN interface data package length : 1518/1522
2: ON	Line clock mode
2: OFF	Internal clock mode

5.2 Rear panel

5.2.1 Interface and connector on the rear panel are shown in Figure 5-2.



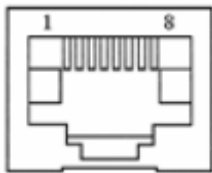
Figure 5-2

- Interface Description

Interface Type	Description
TX1~ TX8	E1 output tributaries: 1~8
RX1~ RX8	E1 input tributaries: 1~8
POWER	AC power supply jack

Note: If user want to use **Balanced E1 interface**, please install accessories **Balun RSC703**

- Balun RSC703 definition:



RJ-45 Pinout	Signal	Description
1	S2	Receive Ground
2	RX+	Receive Input, Positive(+)
3	RX-	Receive Input, Negative(-)
5	S1	Transmit Ground
6	TX+	Transmit Output, Positive(+)
7	TX-	Transmit Output, Negative(-)

Note:

- Power input (PWR): XL-INV8E1 interface converters support three kinds of voltage, 220VAC, -48VDC and +24VDC.

Please pay attention to the DC input and it's negative polarities. It is better to use a multimeter to check if the power polarity and voltage value are according with those mark on equipment.

- Ensure to fix a reliable grounding wire at the grounding point on the equipment.

5.3 Default setting

PORT1 and PORT2 are auto-negotiation, the maximum transmission package length 1518/1522, E1 chosen internal clock, no priority for the system.

6. Installation

- Open the carton and check whether the inner package is complete and correct according to the Packing List of XL-INV8E1.
- Check whether the equipment is in good condition, and inspect the power status.
- Take out the equipment and fix it tightly onto the rack mount or other devices.
- Choose a correct power supply according to the equipment setup, electrify the equipment to see whether the power supply and the system are in normal working condition. (Power indicator on and RUN indicator flashing represent a normal working condition).

- Ethernet interface: Use cross-connected cable to connect the 10/100Base-Tx interface with two PC to test whether the transmission is normal.

7. Troubleshooting

Phenomenon	Cause	Solution
Abnormal power supply	Power supply doesn't comply with the requirement.	Replace a power supply.
	Power switch is off	Turn on the power switch
	Power junction stud is loosing	Screw it
E1 link Malfunction	Value of the impedance doesn't match with the E1 interface.	Check the impedance setup of the equipment which is connected with XL-INV8E1.
	E1 interface has been wrongly connected.	Connect it in a correct way.
	Malfunction of the connected equipment.	Ensure the equipment which is connected with XL-INV8E1 is working normally.
Ethernet port malfunction	The manufacture of network access line is not according to standard sequence.	Make sure the network access line is produced according to the standard sequence.
	Malfunction of uplink equipment or working status.	Make sure the setup of the uplink equipment or working status is ok.

8. Accessories

Description	Quantity
XL-INV8E1	1
User manual	1
BNC	16(only for 75 ohm)
RSC703	8(only for 120ohm)
AC power cord	1(only for AC type)