



Just for Faster Network

PC-C200B EOP 4E1/Ethernet Protocol Converter

User Manual

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I. Brief System Instruction

1.1 Summarize

PC-C200B EOP 4E1/Ethernet converter realizes Ethernet transmission over 1~4E1 with maximum transmission rate of 7.92Mb/s. EOP adopts international standard protocol (G.7041、G.7042、G.7043、G.8040) at all layers and able to intercommunicate with third party device followed same standard. The device not only provides perfect alarm/status indication for E1 and Ethernet, but with senior management function such as Ethernet data traffic statistics etc. The device is with high integration, low power consumption, stable performance and easy to use.

1.2 Features

Transmission interface

- Realize 1~4 Ethernet transmission over 1~4E1
- Support auto delete the fault E1 channels (BER more than $1E^{-6}$ or a serious warning LOS/AIS/LOF or the signal loop back). Auto-restore the use of E1 after eliminating the failure.
- For 4 E1 channels, the maximum tolerable time delay difference between any two channels can be up to 220ms. The alarm will be occurred when exceeding the time delay difference limit over 220ms. Meanwhile, the jitter tolerance will be interrupted. The jitter transfer characteristics comply with ITU-T G.823.
- E1 can supply 75ohm unbalance and 120ohm balance interfaces.

Ethernet interface

- Provide maximum 4 shared Ethernet interfaces. Support VLAN division based on interface. Fully comply with IEEE 802.1Q standard
- Provide 1024 pieces MAC address table. The local data stream will not send to the remote side.
- Support frame length: minimum: 64 bytes, maximum: 1916 bytes.
- Provide flux statistics for each Ethernet interface, such as the fault package number and total package number etc.
- Provide PAUSE flux control function. Network management optional.

Management interface

- Support hyper terminal or SNMP network management (optional).
In line with ITU-T standard protocol:
- GFP-F encapsulation suggestion G.7041
- VCAT and LCAS suggestion G.7042
- Ethernet to nxE1 map suggestion G.7043
- Ethernet to E1 map suggestion G.8040

The Ethernet data will not be damaged if enlarge or reduce the transmission bandwidth.

The E1 spur track on both sides can be connected not according to the serial number. When a single direction spur track E1 fails, the other direction can still work.

Automatically cut off the E1 when there is E1 loop back. Auto-restore the use of E1 after recovery. This function avoid the network storm without stopping operations.

Perfect alarm indication. Choose display local or remote status available.

Support local E1 circuit loop back function for easy E1 circuits test.

II. System Application

The typical application shows in the figure 2-1 below. Local 4E1 to Ethernet converter connects with the local Ethernet and access to PDH/SDH network by E1 interface. In the remote side, using another EOP 4E1 to Ethernet converter or third party converter followed same protocol to realize the point to point communication.



Figure 2-1 EOP 4E1 to Ethernet converter application

III. Panel Description

3.1 Front Panel

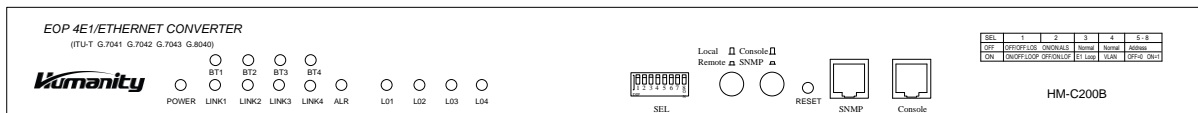






Figure 3-1 Front panel

Table 3-1 Front panel indicator light, switch and button illumination

SN	Appellation	Illumination
1	POWER	Power indicator lights. This device provides various power supplies: Single AC, single DC, dual AC, dual DC, one AC and one DC. The dual power is with hot standby. The device keeps in work when one power failure
2	LINK1-4	1-4 channel Ethernet indicator light. ON indicates in connection, flicker indicates data transceiving.
3	ALR	General indicator. ON when there is alarm in the circuit (LOS、AIS、LOF、LOOP). If no E1 spur track alarms, please refer to SEL switch illumination for details and adjust SEL:1-2 status.
4	L01-L4	1~4 channel E1 spur track alarm indicator. Indicates 4 statuses: signal lose(LOS), alarm(AIS), loss frame(LOF), loop

		back(LOOP). RED means alarm, GREEN means work normal.
5	BT1-BT4	Ethernet rate indicators. ON indicates work in 100Mbps mode. OFF indicates work in 10Mbps mode. This indicator takes effect when the reference Ethernet port is in connection.
6	SEL	Control switches SEL1-2: control L01-L04 indicator status. SEL:1-2 OFF/OFF: indicates LOS SEL:1-2 ON/ON: indicates AIS SEL:1-2 ON/OFF: indicates LOOP SEL:1-2 OFF/ON: indicates LOF SEL:3 loop back control switch. OFF: work normal. ON: E1 loop from local to external. SEL:4 VLAN division control switch. When switches on both ends in ON status, it's in VLAN division status. Otherwise, the Ethernet interfaces are in intercommunication status. SEL:5-8 reserved as address switch, OFF is"0", ON is"1"
7	Local/Remote	Alarm option switch When the button in  (pop up) status, the local device indicators indicates local device alarm. When the button in  (press down) status, the local device indicators indicates remote device alarm(at least one circuit is in use)
8	Console/SNMP	Network management control switch When the button in  (pop up) status, Console management can be used. When the button in  (press down) status, SNMP network management can be used.
9	SNMP	SNMP network management interface. Please refer to the reference contents.
10	Console	Console network management interface. Please refer to the reference contents.

3.2 Rear Panel

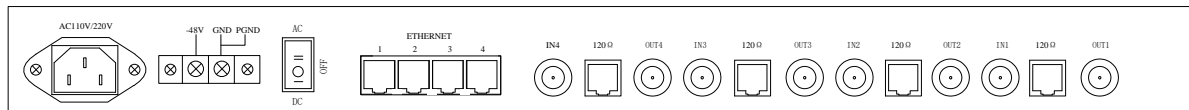


Figure 3-2 Rear Panel

- AC110V/AC220V: AC220V power input with range of 90V~260V
- GND-48V, DC-48V power input
- Switch: Dial to “AC” means use AC220V. Dial to “DC” means use DC-48V(no need to differ anode or cathode. Dial to “OFF” means shut off the power.

► IN1 120 Ω OUT1: separately indicates the first channel E1 unbalanced 75 Ω input, the first channel balanced 120 Ω input and output, the first channel unbalanced 75 Ω output.

► IN2 120 Ω OUT2: separately indicates the second channel E1 unbalanced 75 Ω input, the second channel balanced 120 Ω input and output, the second channel unbalanced 75 Ω output.

► IN3 120 Ω OUT3: separately indicates the third channel E1 unbalanced 75 Ω input, the third channel balanced 120 Ω input and output, the third channel unbalanced 75 Ω output.

► IN4 120 Ω OUT4: separately indicates the fourth channel E1 unbalanced 75 Ω input, the fourth channel balanced 120 Ω input and output, the fourth channel unbalanced 75 Ω output.

IV. Network Management

EOP 4E1 to Ethernet converter supports Console network management (hyper terminal).

EOP 4E1 to Ethernet converter also supports SNMP network management to offer various configuration, alarm inquiry and monitor(optional). The default IP address of the device: 200.168.1.101. Default subnet mask:255.255.255.0. Default gateway: 200.168.1.254.

Please note: The hyper terminal network management will not be available if the device supports SNMP network management.

V. Installation

1. Open the package, check the device, accessory and quantity. Please contact the supplier if there is any lose or damage.

2. The device should be installed in 19-inch standard rack.

3. Connect interfaces.

Connect LAN with RJ45 interface by net cable, MDI/MDI-X available.

If network management is required, connect control terminal with Console interface or connect the SNMP management station with SNMP interface in the front panel.

4. Connect power

Make sure the power switch is in OFF status before connecting the power.

When using DC power, connect “GND” of the rear panel to the ground in the computer lab safely. Please note the power polarity and access the power according to the requirement.

When using AC power, using the three-core power cord in the accessory bag.

Please ensure the ground of the three-core power cord is connected with ground safely.

VI. Technical Parameters

Table 6-1 Ethernet electrical interface

ITEM	INDEX
connector	RJ-45
Comply with IEEE802.3 protocol, 10Base-T and IEEE802.3u PROTOCOL, 100 Base-Tx fast Ethernet protocol.	

Table 6-2 E1 spur track electrical interface

ITEM	INDEX
rate	2.048Mb/s±50ppm
coding mode	HDB3
Impedance	E1 interface can supply 75ohm unbalance and 120ohm balance at the same time
Transmit feature, jitter tolerance comply with ITU-T G..703, G.704, G.823.	

Table 6-3 Ethernet parameters

SN	ITEM	PARAMETERS	REMARK
1	MAC address table capability	1024	
2	MAC address table aging time	5 minutes	
3	minimum frame length	64 bytes	
4	maximum frame length	1916 bytes	
6	Working mode	Support 10M/100M auto-negotiation complied with IEEE802.3u. Default setting: auto-negotiation.	
7	VLAN	Default setting: closed	
8	Traffic control	Default setting: open	
9	bandwidth	≈n×E1 (n=0~4) Default setting: 4×E1 ≈7.92Mbps	

Table 6-4 Dimension, weight and power consumption

ITEM	INDEX
Chassis dimension	Net dimension: 432mm×44mm×175mm Package dimension: 505mm×108mm×270mm
Net weight	Net weight: 2.2 kg, gross weight: 3.2kg
Power consumption	Less than 10W

Table 6-5 Environment requirement

ITEM	INDEX
Work temperature	-5°C~50°C
Storage temperature	-40°C~70°C
Relative humidity	≤95%, non-condensing

VII. Packing List

1. PC-C200B EOP 4E1/4Ethernet Converter 1pcs
2. one power cord for AC power (no power cord for -48V)
3. BNC 8pcs
4. RJ45 9pcs
5. Mount kits 2pcs
6. User Manual 1pc

VIII. Hyper terminal Network Management Operation Instructions

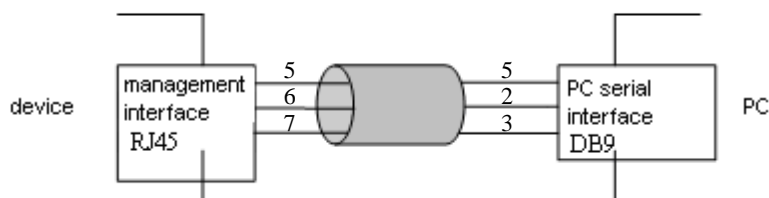
8.1 Hyper terminal network management feature

Use Human-Computer Interface, operation is easy and convenient, without installing any other software. When the hardware is in normal connection, it's able to use after setting the open Hyper terminal software. Network management window is able to overall supervise the local and terminal device status to facilitate finding malfunction, able to set up working mode, able to memory when power off, no need to reset when power up.

8.2 Hyper terminal interface connection and configuration

Use serial asynchronous transmission mode for the intercommunication between computer and network management card. Baud rate: 9600bps, no parity mode, data bit number: 8, stop bit number: 1

Management interface use the simplified RS232 interface to connect with serial interface in the computer. Only need to connect three signal wires as RXD, TXD, GND, the connection as below figure.



Open the operation system's own Hyper terminal after confirming the right software connection between PC and network management card as steps below.

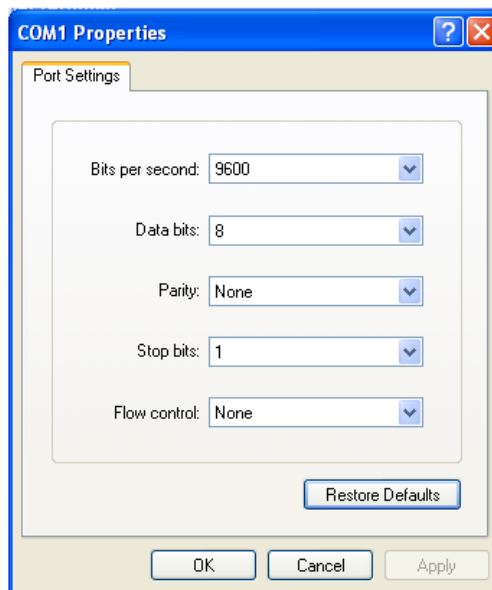
- a. **【Start】 - 【Program】 - 【Accessories】 - 【communication】 - 【Hyper terminal】** , input any appellation in the popping **【Connection Description】** window.



b. Choose "COM1" from the drop-down window of **【Connect to】** (choose by the practical COM number in hardware connection) and click **【OK】** for the confirmation.

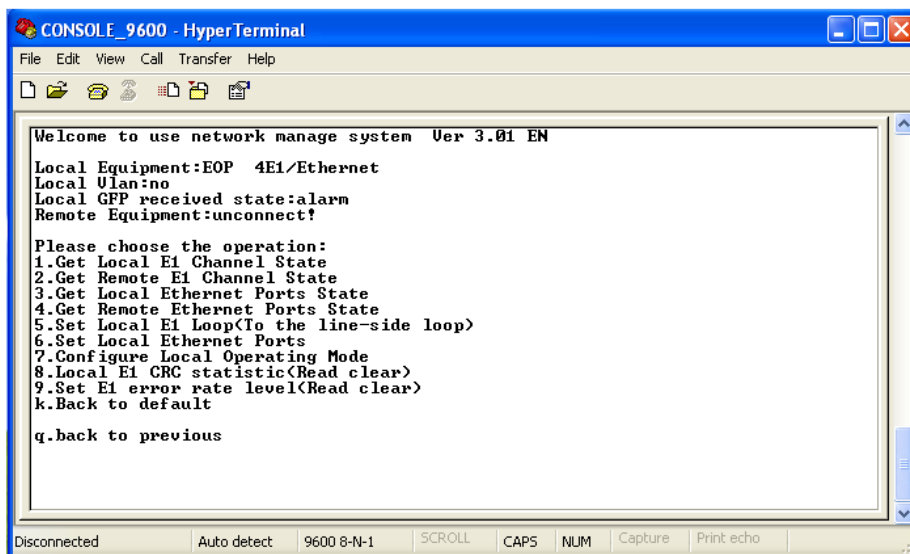


c. Choose "9600" from the drop-down window **【Bits per second】**, choose "8" from the drop-down window **【Data bits】**, choose "none" from the drop-down window **【Parity】**, choose "1" from the drop-down window **【Stop bits】**, choose **【none】** for **【Flow control】** and click **【OK】** after all the configuration.



8.3 Hyper terminal network management window operation instructions

After the above steps, we will come to the hyper terminal window to start the management. Make sure the keyboard input is in lowercase letter status. Press "q", network management main menu shows as below.



The main menu includes local device working status and remote device connecting status. The current status can be refreshed by press"q".

The reference operation is as below:

1.Press "1" in the main menu as figure below to display the local E1 status. If refresh is required, press "q" to the top menu and then press "1".

```

Local E1 State:

Channel  LOS      AIS      LOF      LOOP
1        alarm    N/A      N/A      normal
2        alarm    N/A      N/A      normal
3        alarm    N/A      N/A      normal
4        alarm    N/A      N/A      normal

```

2. Press "2" in the main menu to display remote E1 status. Operation is similar as 1.
3. Press "3" in the main menu to display local Ethernet status. Operation is similar as 1.
4. Press "4" in the main menu to display remote Ethernet status. Operation is similar as 1.
5. Press "5" in the main menu to configure local E1 loop as below configure shows:

```

Please choose E1 Loop channel:

Channel
a.  1
b.  2
c.  3
d.  4

```

Press "a" in this menu to choose the first E1 spur track (Operation to choose another E1 spur track is similar as the first E1 spur track). Press "y" in the coming menu to make the first spur track loop back. (Please note: this loop means loop forward to circuit. The remote E1 loop back status will be alarm if loop back successfully. The local will not alarm). Press "n" to cancel the spur track loop back.

```

loop channel:1

y. loop
n.noloop

q.back to previous

```

6. Press "6" in the main menu to enter into local Ethernet working mode configuration menu. The operation is similar as 5.
7. Press "7" in the main menu to enter into CMOS chip working mode menu as figure 9 below. We suggest not using this configuration in normal case.

```

Please configure local operating mode:
1.GFP send header scrambler:enable
2.GFP send payload scrambler:enable
3.GFP send frame use payload FCS:diabile
4.VCAT send mode:VCAT
5.LCAS send mode:enable
6.GFP receive header scrambler:enable
7.GFP receive payload scrambler:enable
*.GFP receive frame use payload FCS:diabile(readonly)
8.VCAT receive mode:VCAT
9.LCAS receive mode:enable

q.back to previous

```

CMOS chip working mode menu illumination as below:

①.GFP send header scrambler mode, the setting is in enable mode when leaving out of the factory, press “1” to enter the reference setting menu.

```

1.GFP send header scrambler:
a.enable
b.diabile
q.back to previous

```

In this menu, press “b” to set the GFP send header scrambler mode as “disable” and press “a” to set the mode as “enable”.

②. GFP send payload scrambler mode. The setting is in enable mode when leaving out of the factory. Operation is similar as ① above.

③. GFP send payload FCS parity mode. The setting is in enable mode when leaving out of the factory. Operation is similar as ①.

④. VCAT send mode and single channel mode optional. The setting is VCAT when leaving out of the factory. Press “4” to enter the submenu as figure below.

```

4.VCAT send mode:
a.VCAT
b.single channel
c.choice single channel number: (valid in
q.back to previous

```

Press “a” to set as VCAT mode and press “b” to set as single channel mode. The default single channel is the first E1 spur track. If change the spur track is required,

please press “c” to enter the submenu for setting.

⑤. VCAT send link capability adjust mode. The setting is in enable mode when leaving out of the factory. Operation is similar as ①

The send side setting is corresponding to the receiving side.

8. Press “8” in the main menu to show CRC error code number of E1 spur track. Operation is similar as 1.

9. Press “9” in the main menu and comes the following menu, press “y” to recover to the leaving out of factory status.

```
Warning!
y.back to default
q.back to previous
```

Please operate according to the operation instruction.

Appendix A cable making

Table A-1 coaxial cable making

When use 75 Ω interface, the coaxial cable making way as below:
1. Poke a certain length of coaxial cable(75-2-2 cable is preferred)
2. Screw the BNC connector in the package and press fit by dedicated compression crimping pliers.
3. Check whether there is any short meet or short circuit

Table A-2 120Ω balanced E1 interface (RJ45) pin number illumination.

PIN NO.	DEFINITION	REMARK
PIN1	RXD+	Balanced E1 interface input P
PIN2	RXD-	Balanced E1 interface input N
PIN3	-	null
PIN4	TXD+	Balanced E1 interface output P
PIN5	TXD-	Balanced E1 interface output N
PIN6	-	null
PIN7	-	null
PIN8	-	null

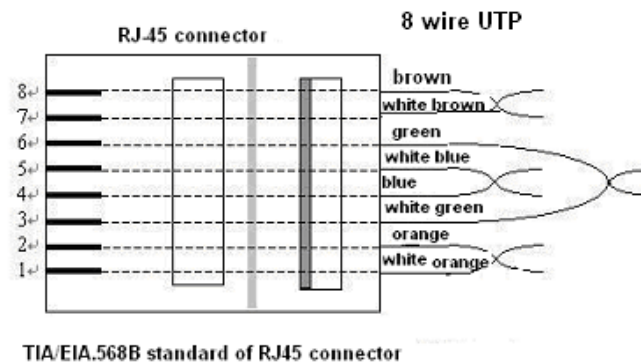
Table A-3 serial network management (RJ45) cable PIN number illumination

PIN NO.	DEFINITION	REMARK
PIN1	-	null
PIN2	-	null
PIN3	-	null
PIN4	-	null
PIN5	GND	Data signal ground
PIN6	RSNM-OUT	Serial network channel output(RS232 electric level)

PIN7	RSNM-IN	Serial network channel input(RS232 electric level)
PIN8	-	null

Table A-4 net cable making

There are two ways to make net cable: TIA/EIA 568B and TIA/EIA 568A, the normal way is TIA/EIA 568B. The collocation shows the figure below.



In the 10M or 100M network, only four wires 1 2 3 6 is in use. It's called direct cable when using the same standard on the both two sides. This cable is used in connecting PC to HUB normal interface, connecting HUB normal interface to HUB uplink interface. It's called across cable when using different standards on the two ends. This cable is used in connecting PC to PC or between normal HUB interfaces. If the cable is not made according to the standard, because of the big interrupt caused by wires, the uncertain package loss may found when under 100M working mode.

Make the connector comply with EIA/TIA568B standard. According to the figure, the wire sequence is collocated in a certain color sequence. (1. white orange, 2.orange, 3. white green,4.blue, 5. white blue, 6.green, 7. white brown, 8. brown). Please pay attention that the green wire must span the blue one. Never put white green wire with green to avoid of crosstalking and lower the transmission efficiency. Trim the wire after putting the right order, cut down the bareness twisted-pair by special clamp, leaving about 15mm length. Uniform the tail and put into RJ45 pin according to the sequence. Put the white orange wire to the first pin, remaining analogy.

Using RJ45 press line pliers to press the RJ45 connector after ensuring each wire in the right place. As the network card and HUB connects directly, the RJ45 connector making way should be the same on the other end. The RJ45 connectors on the two ends must exactly the same when complete.

Please note: Both direct and across cable is workable for this device.

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