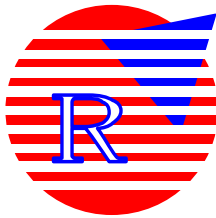


RCMS2404-240

Modular Optical Multiplexer Manual



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Chapter 1 Overview

RCMS2404-240B is an ideal transmission device of optical fiber for point to point networks, middle and small capacity networks, such as wireless communication base stations, private communication networks and switch networks. It can be applied to either public networks or various private networks. The RCMS2404-240B provides 8 E1 links and 4 Ethernet ports that share 100M full speed. RCMS2404-240 is modular product, which is installed in RC004-16 16-slot chassis. It can be managed, and can remote managed.

1.1 Features

- Adopts extra large ASIC chip with low power consumption and 4 layers PCB board to ensure high reliability.
- Provides 8 E1(2Mbps) data channels
- Provides 4 10/100Mbps auto-sensing Ethernet ports.
- Provides all alarms of optical multiplexer both for local and remote sites
- Supports local and remote loop-back capability for single E1 link or for all E1 links. It is convenient for maintenance and application.
- Supports switch and isolation between 4 Ethernet ports
- Supports 10/100Mbps, Full/ Half-duplex auto-negotiation, can be upgraded smoothly.
- Supports oversize frame transmission up to 1916 Bytes.
- Supports IEEE802.3x of full-duplex and flow control based on back press of half-duplex on Ethernet ports
- Supports IEEE 802.1q VLAN and IEEE 802.3d Spanning Tree
- Can be installed in RC004-16 chassis hot swap, realizing SNMP network management, and can manage remote equipment.

1.2 Interconnection

It must be complied with concrete connection type regulation that show under, otherwise will present abnormal phenomena of data link and data transmission.

RCMS2404-240 modular optical multiplexer of 1310nm single strand fiber must be worked in pairs with RCMS2504-240 standalone optical multiplexer of 1550nm single strand fiber.

Chapter 2 Technical characteristic

2.1 E1 interface

Bit rate:	2048Kbps \pm 50ppm
Line code:	HDB3
Impedance of interface:	75 Ω (unbalanced BNC interface) or 120 Ω (balanced RJ-45 interface)
Electrical characteristics:	complies with ITU-T G.703
Transfer characteristics:	complies with ITU-T G.823
Input jitter tolerance:	complies with ITU-T G.823

2.2 Fast Ethernet

Complied with IEEE 802.3、IEEE 802.3u
Supports IEEE 802.3d Spanning Tree、IEEE 802.1q VLAN
Supports oversize frame transmission up to 1916 Bytes (default packet size is 1536)
Rate: 10/100Mbps auto-sensing
Forced duplex manually
Supports full duplex IEEE802.3x and on half duplex mode flow control back pressure
Supports auto MDI/MDIX

2.3 Optical interface

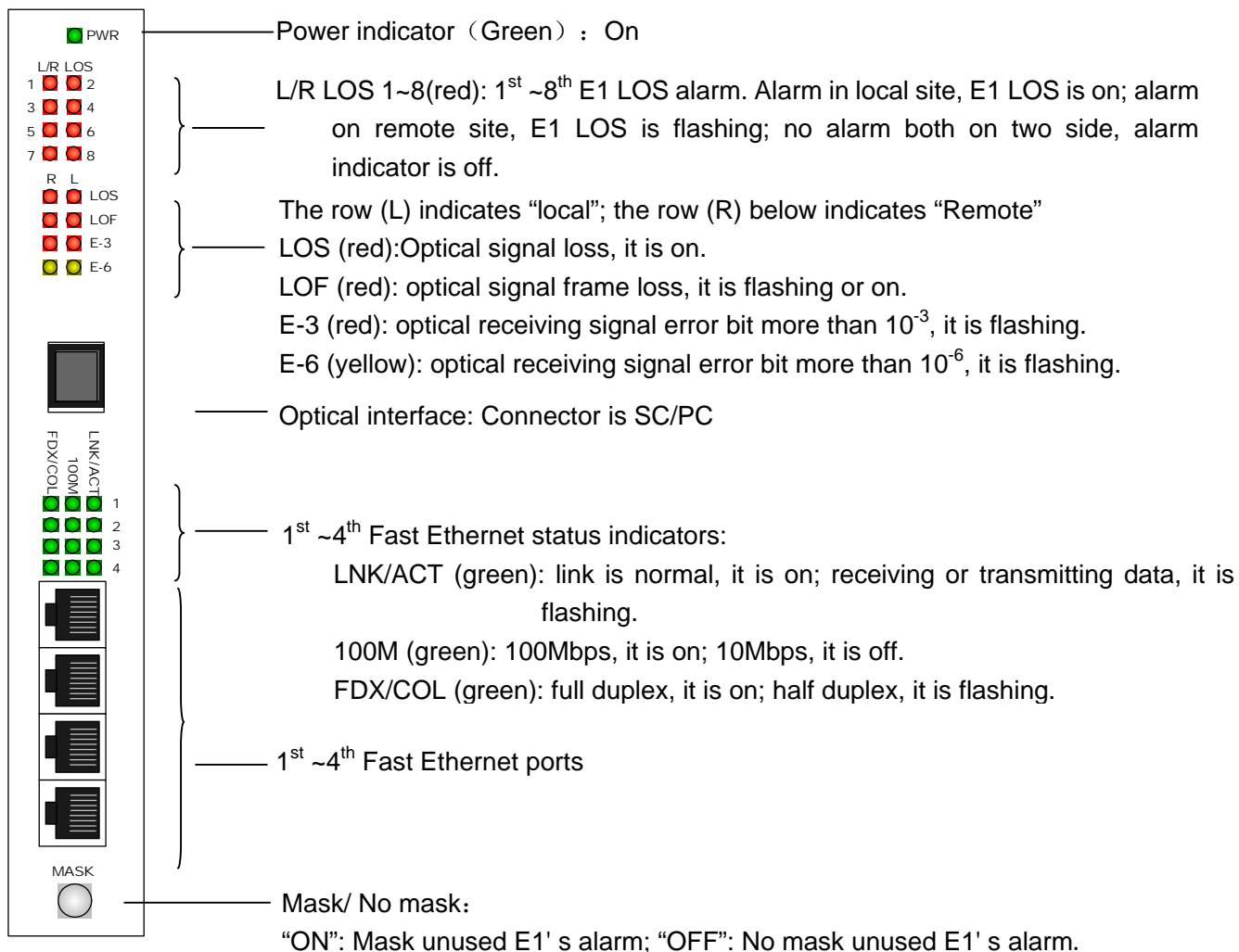
Bit rate:	155Mbps
Fiber connecter:	SC
Transmission parameter of single strand fiber interface	
Launch power: \geq -15 dBm	Receiving sensitivity: \leq -31 dBm
Transmitting wavelength: 1310nm	Transmission distance: >25km

2.4 Environment

Temp: 0 ~ 45°C
Humidity: \leq 90% (25°C)

Chapter 3 Instruction

3.1 Introduction of front panel

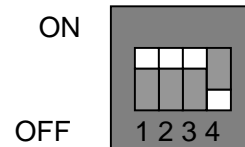


3.2 Internal DIP-Switch setting

3.2.1 Impedance setting of E1 interface S1~S8

There are 8 groups 4 bit DIP-Switch. These DIP-Switch can't be control by NMS. So they must be configured manually.

The definition is as following:



1 st	2 nd	3 rd	4 th
ON	ON	ON	OFF
75 Ω unbalanced signal effective			

Or

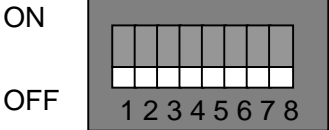
1 st	2 nd	3 rd	4 th
OFF	OFF	OFF	ON
120 Ω balanced signal effective			

As shown in figure above, the default status is set as “75 Ω unbalanced signal BNC interface effective”.

- 75ohm unbalanced: besides setting DIP-Switch, E1 interface should be installed CC4B-8G coax adapter on DB37 connector; this adapter converts DB37 interface to eight CC3 coax connector.
- 120ohm balanced: besides setting 8 groups DIP-Switch according to table above, E1 interface should be plug DB37 connector to fetch twisted pairs. About line order of DB37 for twisted pairs to see appendix A.

3.2.2 Fast Ethernet ports DIP-Switch: SW9 (default setting OFF)

SW9 is 8 bit DIP-Switch as shown right side



- 1st ~4th bit: forced setting for duplex

Status	1 st	2 nd	3 rd	4 th
ON	Forced half duplex on 1 st , auto-negotiation fail.	Forced half duplex on 2 nd , auto-negotiation fail	Forced half duplex on 3 rd , auto-negotiation fail	Forced half duplex on 4 th , auto-negotiation fail
OFF	Forced full duplex on 1 st , when auto-negotiation fail.	Forced full duplex on 2 nd , when auto-negotiation fail	Forced full duplex on 3 rd , when auto-negotiation fail	Forced full duplex on 4 th , when auto-negotiation fail

Note: always open auto-negotiation on default status. If negotiation is successful, rate of Ethernet port is 100Mbps full-duplex. When negotiation fails, please force the DIP-Switch manually according to shown table above.

- 5th bit: setting for oversize packet

5bit	Definition
ON	1916 byte
OFF	1536 byte

- 6th bit: reserved

- 7th、8th bit: Set isolation of Ethernet port

7 th	8 th	Definition
OFF	OFF	1~4 can switch data each other, default setting
OFF	ON	1~4 Ethernet port isolated on local site
ON	OFF	1~4 port isolated oppositely both on two sides (with TAG)
ON	ON	1~4 port isolated oppositely both on two sides (without TAG)

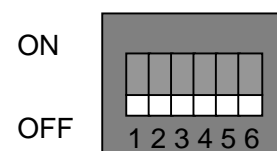
“switch” means all users of local site can switch data each other and with users of remote site.

“isolated on local site” means users of local site isolate each other; but can switch data with remote site.

“isolated oppositely on two sides” means 1st port local site can switch data with 1st port of remote site. So do others.

3.2.3 E1 interface DIP-Switch: SW10 (default setting is OFF)

SW10 is 6 bit DIP-Switch



- 1st~4th bit for E1 remote loop-back

1 st	2 nd	3 rd	4 th	Loop-back
OFF	Any	Any	Any	No loop-back
ON	OFF	OFF	OFF	1 st E1
ON	OFF	OFF	ON	2 nd E1
ON	OFF	ON	OFF	3 rd E1
ON	OFF	ON	ON	4 th E1
ON	ON	OFF	OFF	5 th E1
ON	ON	OFF	ON	6 th E1
ON	ON	ON	OFF	7 th E1
ON	ON	ON	ON	8 th E1

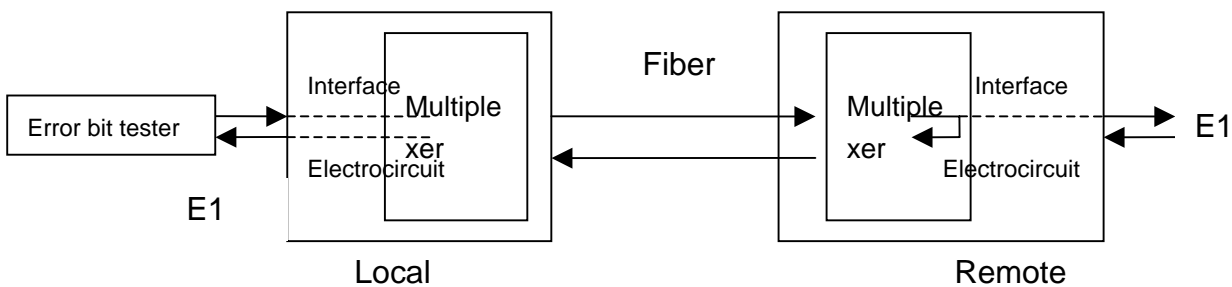


Figure2: sketch map of setting remote loop-back on local site

Note: When setting any loop-back on optical multiplexer of local site, the loop-back dip-switch of remote optical multiplexer must be default status.

- 5th bit: DIP-switch for FPT

When FPT is disable, it complies with AIS. When E1 signal on remote site is loss, the E1 output of local site is “1”; when optical signal is loss, all E1 output are “1” on local site.

FPT enable: there is alarm of LOS on any direction of optical interface, both sides E1 output are not HDB3. there is alarm of LOS on E1 terminal device, not AIS alarm.

5 th bit	FPT
OFF	Disable (complies with AIS)
ON	Enable

- 6th bit: reserved

Chapter 4 Installation and test

4.1 Inspect after Opening

Please first check if the models and part numbers are in consistence, and also check if the equipments are damaged.

4.2 Preparation before Installation

- Carefully read this manual
- Prepare all kinds of the cable. Ensure that they are not short-circuited. Refer to Appendix A for cable making.
- Ensure the pressure of power supply is in the tolerance range, the chassis is well connected with the ground.
- Prepare the BERT and optical power meter for test of line quality.
- Change the dip-switch setting on the bottom panel if 120 Ohm balanced signal interface is required.

Fix the equipment on to 19-inch rack or place the equipment at stable and secure environment. Pay attention to the requirements of the ambience.

4.3.1 connecting

- E1 interface
75ohm unbalanced: E1 interface should be installed CC4B-8G coax adapter on DB37 connector; this adapter converts DB37 interface to eight CC3 coax connector.
120ohm balanced: E1 interface should be plug DB37 connector to fetch twisted pairs
- Ethernet interface
Use CAT5 twisted pair, straight or cross over.
- Optical interface
Plug SC fiber patch cable into optical interface (push hard until to end). If not sure about transmission direction, we suggest first turn on the power of device and then plug the fiber.

4.3.2 configuration

- Test error bit
Use 2M Tester to test every E1 error bit level.
- Mask unused E1 alarm

If E1 links are already connected, but there is still are unused E1 tributaries. In this case the LOS alarm of unused E1 links called “unused E1 alarm”. Press MASK/NO MASK button “on” to clear all the unused E1 alarm and all the LOS alarm indicator of E1 tributaries are “off”.

In the case unused E1 tributary alarm being masked, if disconnection occurs at linked E1 tributary, the LOS indicator of this tributary still will be on.

If power supply is off and back to one again, then the mask function disabled. To enable mask function need press button to “off” and then pressed it to “on” again.

If after a period of operation, need new E1 tributaries to be connected, need first disable the mask function and then connect E1 link.

Chapter 5 Troubleshooting

If you have any problems during installation and using, try to solve them by the following proposals. If there is no solution, please contact with distributors for technical support.

These following explanations and solutions of alarm for optical port and LOS alarm for E1 tributaries are analyses of local alarm. Please handle it at remote site if there is remote alarm.

- Green PWR indicator not on

Answer: PS faults. Check if PS working properly and –48 PS connection is not reverse.

- LOS red indicator of optical port is on

Answer: Loss of receiving signal occurs at optical port. Check if the input fiber is connected well and if there is reverse in connection. Check the received optical power using optical power meter, it should be greater than receiving sensitivity.

- LOF red indicator of optical port is on

Answer: Loss of frame of receiving signal at optical port. In this case, optical signal has received, but the optical power may be about critical value of sensitivity. Check RX optical power to ensure if it connects well at remote optical TX port.

- E-3 red indicator is on at optical port

Answer: The bit error of optical RX signal is greater than 10^{-3} . Check if optical RX port connects well and RX optical power.

- E-6 yellow indicator of optical port is on

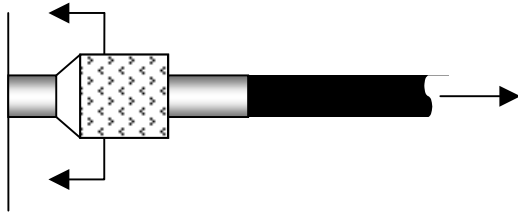
Answer: The bit error of optical RX signal is greater than 10^{-6} . It is normal that there is E-6 alarm just after turning on the power, after about 10 seconds, the E-6 indicator will be off. If there is E-6 alarm during operation, then check if optical RX port connects well and RX optical power.

- LOS red indicator of E1 channel is on

Answer: Loss alarm of RX signal at E1 channel, there is no HDB3 signal received. Check if it connects well at E1 port; if the connection of 75 Ω cable reverse and if the string of 75 Ω cable in right order. If there is LOS alarm of unused E1 tributary, can press “mask” button to “on” to make alarm after configuration of device.

- How to take cable off from connector

Answer: push the part that is the biggest diameter of connector; don't twist. Then pull off.



Appendix A Introduction of making cable

A.1 E1 interface

- 75ohm adopting DB37 coax adapter:
Suggest using SYV 75-2-2 coax cable, the distance less than 200 meter.

- 120ohm DB37 male connector is defined as following:

DB37 pin definition	1 st	2 nd	3 rd	4 th
OUT	3、 4	7、 8	11、 12	15、 16
IN	21、 22	25、 26	29、 30	33、 34

Others hang up. Twisted pairs can be jointing on DB37 female connector.

A.2 Cable of Ethernet

Straight or cross over both can work.

RJ45 line order as following:

Pin number	1	2	3	4	5	6	7	8
Definition	TX+	TX-	RX+	Not Used	Not Used	RX-	Not Used	Not Used