RAISECOM

RC513/514-FE (Rev. A)
10/100M Auto-negotiation
Copper-to-Fiber
Media Converter

User Manual

Raisecom Technology Co., Ltd.

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CONTENT

1. Safety Notice

Please read the following notice carefully before installing and using the device, Raisecom shall not be responsible for any loss that caused by violating safety notice.

RC513/514-FE (Rev. A) has high sensitivity optical interface, so the power of optical transceiver output interface must be checked before connecting. To avoid damaging, it is not allowed that the optical power of transceiver's output interface is higher than that of RC513/514-FE.

RC513/514-FE (Rev. A) is an integrated device which has precise elements, please avoid violent shake and impact, and do not disassemble or maintain the device yourself. If it is required, please do it under the guide of our technical staff following anti static steps. Please contact us if there is any need.

There must be grounding protection for the sake of safety; do not disassemble the device yourself, we regard this as you waiver your rights of repair guarantee.

2. Overview

2.1. Introduction

RC513/514 series remote-end managed, bandwidth adjustable Ethernet media converters are new generation media converters developed by Raisecom.

The remote-end management means that the network administrators can manage both the host-end and the remote-end equipments to conduct such operations as working status review, equipment control, loop-back test, and data flow statistics, etc.

The bandwidth adjustment means that the administrator can adjust the sending and receiving bandwidth of copper ports by N X 32kbps.

Operations to host-end equipment are as follows:

1. **Working status review of host-end equipment:**

    The working status that can be reviewed is:

    a. Copper port: upstream link, port ON/OFF, auto-sensing, full/half duplex;

    b. Fiber port: link receive (RLK), link transmit (TLK), port ON/OFF;

    c. Others: Fault-pass-through enable/disable, management status of remote-end equipment, loop-back test status, loop-back test success report, configuration application.

2. **Configuration of host-end equipment:**

    The configurable items include:

Copper port auto-negotiation, copper port duplex mode, copper port ON/OFF, Fault-pass-through enable/disable, remote-end management functions, reset of copper and fiber port, loop-back test enable and forbid, sending and receiving bit rate at N x 32kbps.

Operations to remote-end equipment are as follows:

1. **Working status review of remote-end equipment:**

    The working status that can be reviewed is:

    a. Copper port: link up, port ON/OFF, auto-sensing, full/half duplex;

    b. Fiber port: link receive (RLK), link transmit (TLK);

    c. Others: fault pass through enable, abnormal upper/lower limit of power voltage, feedback to configuration application, temperature of chassis ambience.

2. **Configuration of remote-end equipment:**

    The configurable items include:

    Copper port auto-negotiation, copper port duplex mode, copper port ON/OFF, Fault-pass-through enable/disable, reset of copper and fiber port, sending and receiving bit rate at N*32kbps.

2.2. Model Description

Part Number	Description
RC513-FE-S1	Standalone, remote managed, 10/100Mbps auto-sensing, single mode, single strand, dual wavelengths, 0-25Km, RJ45/SC
RC514-FE-S1	Module, remote managed, 10/100Mbps auto-sensing, single mode, single strand, dual wavelengths, 0-25Km, RJ45/SC

Note: RC514-FE and RC513-FE must be deployed in pairs.

3. Technical Specification

3.1. Optical Parameters

PART NUMBER	Interface	Wavelength (nm)	Launch Power (dBmW)	Receiving Sensitivity (dBmW)	Typical Range (Km)	Attenuation (dB/Km)
RC513-FE-S1	SC/PC-RJ45	1310	-12 ~ -3	< -30	0 ~ 25	0.5
RC513-FE-S2	SC/PC-RJ45	1310	-5 ~ 0	< -32	10 ~ 50	0.5
RC514-FE-S1	SC/PC-RJ45	1550	-12 ~ -3	< -30	0 ~ 25	0.5
RC514-FE-S2	SC/PC-RJ45	1550	-5 ~ 0	< -32	10 ~ 50	0.5

4. Construction & Indicator

4.1.   Front view and indicators

4.1.1. The Indicators on the Front Panel
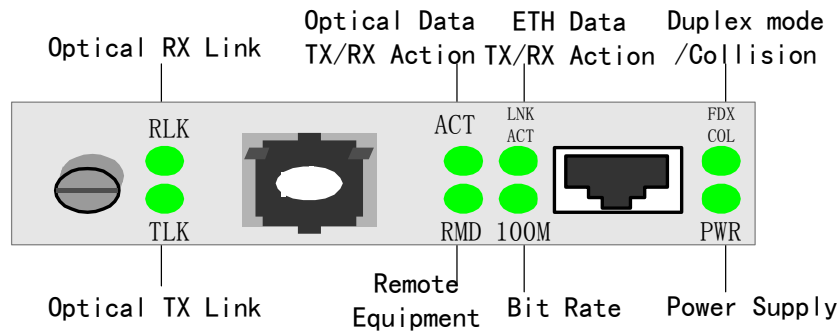
4.1.2. The Definition of Indicators

| Interface	Indicator Name	Indicator	The Status Explanation
Optical Interface	Optical Receive Link	RLK	ON: Optical receive link works in good condition; OFF: Optical receive link fails.
	Optical Transmit Link	TLK	ON: Optical transmit link works in good condition; OFF and RLK ON: Optical transmit link fails.
	Optical Data Active	ACT	Flashing: Transmitting data in Optical interface.
RJ45 Interface	Remote Management Device	RMD	ON: Remote media converter supports remote SNMP management; OFF: Remote media converter does not support remote SNMP management. Fast flashing: host and remote-end managed; Slow flashing: remote-end management prohibited by the remote-end device, or at the status of fault-pass-through
	Duplex Mode /Collision	FDX/COL	ON: RJ45 works at full duplex mode; OFF: RJ45 works at half duplex mode; Flashing: Half duplex and collision occurs.
	RJ45 Link Receive and Transmit	LNK/ACT	ON: RJ45 works in normal conditions; OFF: RJ45 link fails; Flashing: Transmitting data in RJ45 interface.
	Bit Rate	100M	ON: Rate is 100M; OFF: Rate is 10M.

Power Supply	Power	PWR	ON: Power supply works in good condition; OFF: Power supply disconnected.

4.1.3. 16-Slot Chassis (for RC514) Front Panel Sketch
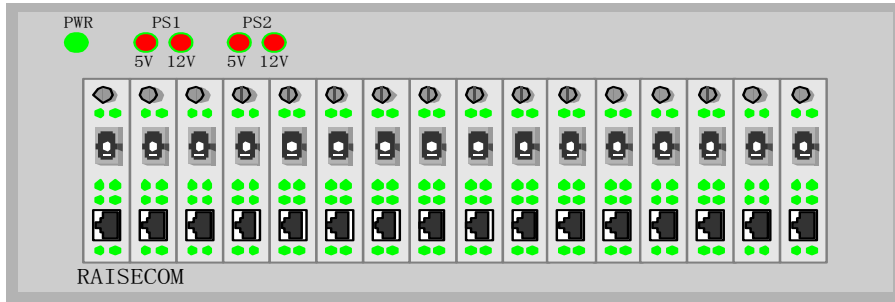
The working conditions indicated by each indicator are as follows:

PWR: steady ON, the power supply of chassis is working in good condition.

PS1-5V: steady OFF, the PS1 power supply to modules is in good condition.

PS1-12V: steady OFF, the PS1 power supply to the electric fans is in good condition.

PS2-5V: steady OFF, the PS2 power supply to modules is in good condition.

PS2-12V: steady OFF, the PS2 power supply to the electric fans is in good condition.

5. Function & Application

5.1.   Interconnecting Media Converters

When connecting with other media converters, it is required to comply with the specific connecting requirements according to the following table. Otherwise, link faults or abnormal data transmission will occur.

Host Site	Remote Site
RC514-FE-S1	RC513-FE-S1
RC514-FE-S2	RC514-FE-S2

5.2.   Connecting MC with Other Devices (at RJ45 Port)

1. When RC513/514 media converters are connected with other equipment, the copper port of the other equipment shall be configured to 10/100Mbps auto-sensing.

Media Converter	Other Equipment	RJ45 UTP Cable Type
Media Converter	Switch	Straight-through/Crossover
Media Converter	HUB	Straight-through/Crossover
Media Converter	Router	Crossover/Straight-through
Media Converter	Network Interface Card	Crossover/Straight-through

2. When RJ45 interface of RC513/514 series media converters works on the forced status, the "auto MDI/MDIX crossover" function may fail. So it is advised to adopt the following connection modes in the forced status.

Media Converter	Other Equipment	RJ45 UTP Cable Type
Media Converter	Switch	Straight-through
Media Converter	HUB	Straight-through
Media Converter	Router	Crossover
Media Converter	Network Interface Card	Crossover

5.3. Full Duplex Configuration (RJ45 Port)

5.3.1. RC513/514-FE Series RJ45 Interface Auto-negotiation

The copper port/RJ45 of other network equipment must be configured to "auto-negotiation" to ensure normal data transmission.

5.3.2. RC513/514-FE Series RJ45 in Forced Status

The RJ45 duplex mode of other network equipment must be configured as the following table to ensure normal data transmission.

Media Converter RJ45 Mode	Other Equipment RJ45 Mode
100M/Full Duplex	100M/Full Duplex
100M/Half Duplex	100M/Half Duplex
10M/Full Duplex	10M/Full Duplex
10M/Half Duplex	10M/Half Duplex

5.4. Connection with Other Equipment (at Optical Port)

Several mandatory conditions are required:
1. The same wavelength (single strand dual-wavelength media converters are not included)
2. The same bit rate
3. Matched optical power
4. Fast Ethernet protocol (IEEE 802.3u Fast Ethernet)

Note: when the fiber port of RC513/514 series media converters is connected with other equipment, the remote-end SNMP management does not work.

6. Installation & Inspection

6.1. Matching Fiber-Optic Cable with Media Converter

RC513/514-FE-S1 series shall adopt single strand single-mode fiber. The connector of fiber shall be SC/PC.

6.2. Types of Fiber-Optic Cable

Fiber-optic cable for multi-mode fiber port: 62.5/125um multi-mode fiber or 50/125um multi-mode fiber.
Fiber-optic cable for single mode fiber port: 9/125um single mode fiber.

6.3. RJ45 Interface

Cat.5 of twisted-pair shall be used. Please note that twisted-pair cables shall not be longer than 100 meters. For connection configuration, please see Chapter 2, Connection with Other Equipment (at RJ45 Port).

6.4. Installation of Chassis (for RC514)

The chassis can be fixed onto 19" rack. The fixing accessories of chassis are in the accessory box. If fixing the chassis with the rear hole, there'll be 3cm space between the front edge of chassis and the front edge of the rack; if fixing with the front hole, the front edges will be in the same vertical level.
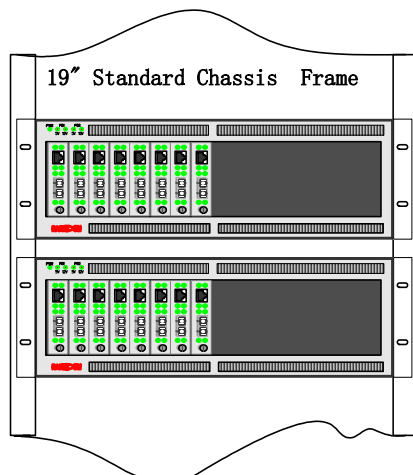
6.5. Installation of DC Power Supply (for RC514)

DC power supply provides three connectors: –48V, ground and 0V. These three connectors are connected respectively with –48V power cable, ground protection and 0V power cable.
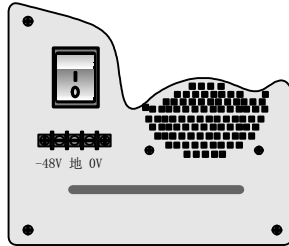
6.6. Ambience

Working temperature: -20-60℃
Humidity: 5%~90% non-condensing

6.7. Power Supply

Chassis: 115/230V AC or –48V DC

6.8. Dimensions

Modular: 91(width)*25(height)*155(depth) mm

7. DIP-switch Configuration

7.1. Explanation for SW20 Setup

SW20 switch has 8 bits and the functions for each bit are as follows in sequence: Auto-negotiation enable/disable, rate 100M/10M, full duplex/half duplex, reserved (vacant), frame length 1916 bytes/1536 bytes, remote network management enable/disable, reserved (vacant), Fault-pass-through disable/enable.

Switch	Contents	Status	Configuration Details
1	RJ45 auto-sensing or manual setup	ON	RJ45 is configured as manual setup
		OFF	RJ45 is configured as auto sensing
2	RJ45 manual 100M/10M setup	ON	RJ45 manual setup: bit rate is 10M
		OFF	RJ45 manual setup: bit rate is 100M
3	RJ45 manual setup: Full Duplex/Half Duplex	ON	RJ45 manual setting: Half duplex
		OFF	RJ45 manual setting: Full duplex
4	Vacant (Reserved)		
5	Over-sized frame configuration	ON	Over-sized frame up to 1536 bytes
		OFF	Over-sized frame up to 1916 bytes
6	Remote network management enable/disable	ON	Disable remote network management
		OFF	Enable remote network management
7	Vacant (Reserved)		
8	Fault-pass-through disable/enable	ON	Enabled: If the optical link is disconnected, the RJ45 interface will be disabled
		OFF	Disabled: host RJ45 will always work

Note: When SW20-1 is OFF (auto-sensing status)，SW20-2 will be disabled.

7.2. Explanation for SW21 Setup

SW21-1	SW21-2	Module Types
OFF	ON	RC513/514-FE-S1
ON	OFF	RC513/514-FE-S2

8. Network Management

8.1. Card/Module Information Review

With network management software, the status of RC513/RC514 series can be reviewed at the host site, and controlled/configured. The status information on "Show Module Info" is as follows:

No.	Status Name/Control & Configure Items	Options	Control & Configure Features
1	Module type	S1, S2	Uncontrollable, non-configurable
2	Fault-Pass-Through	Enable/disable	Configurable
3	Remote network management (Only used for RC514)	Enable/disable	Configurable
4	Loop back control (Only used for RC514)	Perform/No perform	Controllable
5	Loop back result (Only used for RC514)	Success/failure	Uncontrollable, non-configurable
6	Frame length	1916B, 1536B	Configurable
7	Receive rate (Only used for RC514)	N*32kb/s	N is Configurable
8	Transmit rate (Only used for RC514)	N*32kb/s	N is Configurable
9	Module voltage beyond upper limitation (Only used for RC513)	Normal/beyond upper limitation	Uncontrollable, non-configurable
10	Module voltage beyond lower limitation (Only used for RC513)	Normal/beyond lower limitation	Uncontrollable, non-configurable
11	Module temperature (Only used for RC513)	Actual temperature	Uncontrollable, non-configurable
12	RJ45: Link status	Up, Down	Uncontrollable, non-configurable
13	RJ45: auto-negotiation	Enable/manual	Configurable
14	RJ45: control	Turn on/off	Configurable
15	RJ45: duplex status	Full/half duplex	Configurable
16	RJ45: rate	10M, 100M	Configurable
17	Optical Interface: transmit Link	Up, Down	Uncontrollable, non-configurable
18	Optical Interface: receive Link	Up, Down	Uncontrollable, non-configurable
19	Optical Interface: control	Turn on/off	Uncontrollable, non-configurable
20	Optical Interface: signal	Normal/abnormal	Uncontrollable, non-configurable

8.2. Module Configuration

Options such as receiving rate, transmitting rate and RJ45 interface, etc. can be configured through "Configure Card".

8.3. Loop-back Test

Modules in the host site can perform the test of loop-back enable/disable through the

command "Show Module Info. Loop-back". The results of test can be shown through Show Module Info.

8.4. Show Module Info Reset

The host or remote-end modules can be reset through "Host Module Reset". The frame length after the reset is 1,916Bytes, and the working mode of port RJ45 is auto-negotiation.

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