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RC581-FE Installation User Manual

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Comments and questions about how the NView iEMS system software works are welcomed. Please review the FAQ in the related manual, and if your question is not covered, send email by using the following web page:

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If you have comments on the NView iEMS specification, instead of the web page above, please send comments to:

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We hope to hear from you!

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Preface

About This Manual

This manual indicates how to physically install and configure RC581-FE media converter, also introducing its features and components. This manual introduces the standard installation procedures and connecting cable specifications to the customer.

This manual is regarding to the hardware installation and configuration of RC581-FE media converter. For software configuration, please refer to *RC581 Configuration User Manual.*

Who Should Read This Manual

Sales and marketing engineers, after service staff and telecommunication network design engineers could use this manual as a valuable reference. If you want to get an overview on features, applications, architectures and specifications of Raisecom RC series integrated access devices, you could find useful information in this manual as well.

Compliance

The RC series products developed by Raisecom are strictly complied with the following standards as well as ITU-T, IEEE, IETF and related standards from other international telecommunication standard organizations:

YD/T900-1997 SDH Equipment Technical Requirements - Clock

YD/T973-1998 SDH 155Mb/s and 622Mb/s Technical conditions of optical transmitter module and receiver module

YD/T1017-1999 Network node interface for the Synchronous Digital Hierarchy (SDH)

YD/T1022-1999 Requirement of synchronous digital hierarchy (SDH) equipment function

YD/T1078-2000 SDH Transmission Network Technique Requirements-Interworking of Network Protection Architectures

YD/T1111.1-2001 Technical Requirements of SDH Optical Transmitter/Optical Receiver Modules——2.488320 Gb/s Optical Receiver Modules

YD/T1111.2- 2001 Technical Requirements of SHD Optical Transmitter/Optical Receiver Modules——2.488320 Gb/s Optical Transmitter Modules

YD/T1179- 2002 Technical Specification of Ethernet over SDH

G.703 Physical/electrical characteristics of hierarchical digital interfaces

G.704 Synchronous frame structures used at 1544, 6312, 2048, 8448 and 44 736 kbit/s hierarchical levels

G.707 Network node interface for the synchronous digital hierarchy (SDH)

G.774 Synchronous digital hierarchy (SDH) - Management information model for the network element view

G.781 Synchronization layer functions

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G.803 Architecture of transport networks based on the synchronous digital hierarchy (SDH)

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G.825 The control of jitter and wander within digital networks which are based on the synchronous digital hierarchy (SDH)

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G.828 Error performance parameters and objectives for international, constant bit-rate synchronous digital paths

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G.831 Management capabilities of transport networks based on the synchronous digital hierarchy (SDH)

G.841 Types and characteristics of SDH network protection architectures

G.842 Interworking of SDH network protection architectures

G.957 Optical interfaces for equipments and systems relating to the synchronous digital hierarchy

G.691 Optical interfaces for single channel STM-64 and other SDH systems with optical amplifiers

G.664 Optical safety procedures and requirements for optical transport systems

I.731 ATM Types and general characteristics of ATM equipment

I.732 ATM Functional characteristics of ATM equipment

IEEE 802.1Q Virtual Local Area Networks (LANs)

IEEE 802.1p Traffic Class Expediting and Dynamic Multicast Filtering

IEEE 802.3 CSMA/CD Access Method and Physical Layer Instruction

Chapter 1 System Overview

Audience

This guide is compiled only for those professionals who need to configure the RC581 series demarcations. It mainly introduces the functional modules' theories and features as well as the configuration guide for the modules.

Structure

This guide includes the following parts:

Chapter 2: Summarization

Systematically introduce the functional features of RC581 series demarcations.

Chapter 3: Command-line of system

Introduce how to use the command line to configure the RC581 series demarcations.

Chapter 4: Command-line configuration.

Introduce the function and configuration methods of RC581 series Ethernet demarcations.

Chapter 5: Bandwidth management function configuration

Introduce the bandwidth management function and configuration methods for the RC581 series demarcations.

Chapter 6: Physical layer interface configuration

Introduce the configuration of physical layer interface for the RC581 series demarcations.

Chapter 7: Layer 3 interface configuration

Introduce the configuration of Layer 3 interface for the RC581 series demarcations.

Chapter 8: RMON configuration

Introduce the basic RMON conceptions and configurations for the RC581 series demarcations.

Chapter 9: ARP management configuration

Introduce the basic ARP conceptions and configurations for the RC581 series demarcations.

Chapter 10: SNMP configuration

Introduce the basic SNMP conceptions and configurations for the RC581 series demarcations.

Chapter 11: System log configuration

Introduce the basic conceptions and configuration methods of system log configuration for the RC581 series demarcations.

Chapter 12: System clock

Introduce the system clock configuration methods for the RC581 series demarcations.

Chapter 13: Malfunction location command

Introduce the using of malfunction location command for the RC581 series demarcations.

Chapter 14: VLAN configuration

Introduce the basic VLAN principles and the configuration methods for the RC581 series demarcations.

Chapter 15: ACL and network security configuration

Introduce the using and configuration methods for the RC581 series demarcations.

Chapter 16: QoS configuration

Introduce basic QoS principles and configurations for the RC581 series demarcations.

Chapter 17: Customer network

Introduce the basic theories and configuration of user network for the RC581 series demarcations.

Chapter 18: OAM

Introduce the basic OAM principles and configuration methods for the RC581 series demarcations.

ABBREVIATION

10Base-T: Manchester-coded 10Mbps Ethernet over Cat.3 twisted pair or better

100Base-TX: 4B/5B-coded 100Mbps Fast Ethernet over two pairs of Cat. 5 twisted pair

Auto-negotiation: Auto negotiated port will adjust its data rate to the feasible highest data rate according to the other device port rate and duplex mode.

Full duplex: The device will be able to send and receive data simultaneously under this mode.

Half duplex: The device will only be able to send or receive data at a certain time.

RJ45: An eight-pin connector that used as the connector of twisted pair cable

MDI: Medium Dependent Interface

MDIX: Medium Dependent Interface Crossover

Reference

RC581 Command Guide, Raisecom

RC581 Configuration User Manual, Raisecom

Chapter 2 Specification

RC581-FE is a 10/100Mbps Ethernet media converter that implements SNMP and OAM management functions. Its basic configuration includes 1 10/100Mbps Ethernet electrical interface, 1 100Mbps optical interface, and 1 console port. The system power consumption is less than 10W.

The dimensions of RC581-FE media converter are 38mm (height)*260mm (length)*130mm (width). It weighs 2.5kg and can be placed on the table.

The specification of RC581-FE optical interface is as follows.

Type of optical port	Laser	Optical-electric diode	Wavelength (nm)	Launch power (dBm)	Receiving sensitivity (dB)	Distance (Km)
-M	LED	PIN	1310	-18 ~ -14	<-29	0 ~ 2
-S1	FP	PIN	1310	-15 ~ -8	<-34	0 ~ 25
-S2	FP	PIN	1310	-5 ~ 0	<-34	10 ~ 60
-S3	DFB	PIN	1550	-3 ~ +2	<-36	15 ~ 120
-SS15	DFB	PIN	1550	-12 ~ -3	<-30	0 ~ 25
-SS13	FP	PIN	1310	-12 ~ -3	<-30	0 ~ 25
-SS25	DFB	PIN	1550	-5 ~ 0	<-32	10 ~ 50
-SS23	FP	PIN	1310	-5 ~ 0	<-32	10 ~ 50

The working environment of RC581-FE media converter:

Working temperature: 0 ~ 45℃

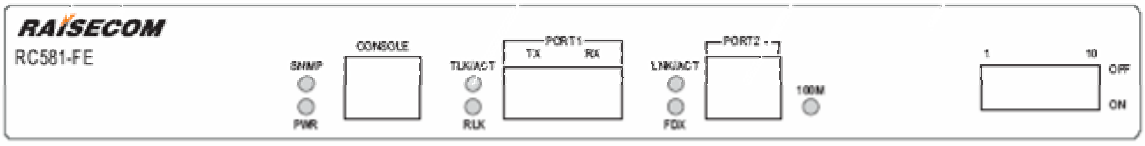
Storage temperature: -25 ~ 60℃

Relative humidity: 5% ~ 90%

Chapter 3 Construction & Indicators

Front Panel

The front panel of RC581-FE media converter includes 1 10/100Mbps Ethernet electrical interface, 1 100Mbps optical interface, 1 console port, 1 10-digits dip-switch, and status indicators.



Introduction to the front panel:

(1) The part number and logo: RC581-FE

(2) Two status indicators: SNMP and PWR

Indicator	Color	Status	Indication
SNMP	Green	Flashing	Transceiving SNMP management data
		Off	No SNMP management data
PWR	Green	On	The system power is on
		Off	The system power is down

(3) Console port

(4) 1 100Mbps optical port *Port 1*, two indicators *TLK/ACT* and *RLK*

Indicator	Color	Status	Indication
TLK/ACT	Green	On	The optical port is up
		Flashing	The optical port is transceving data
		Off	The optical port is down
RLK	Green	On	The optical port receives signal
		Off	The optical port does not receive signal

(5) 1 10/100Mbps Ethernet electrical port *Port 2*, three indicators *LNK/ACT, 100M,* and *FDX*

Indicator	Data rate	Color	Status	Indication
LNK/ACT	10M/100M	Green	On	The electrical port is up
			Flashing	The electrical port is transceving data
			Off	The electrical port is down
100M	100M	Green	On	The electrical port is at 100M data rate
			Off	The electrical port is at 10M rate, or abnormal, or down

FDX	10M/100M	Green	On	The electrical port is at full duplex mode
			Off	The electrical port is at half duplex mode or down

(6) 10-digits dip-switch is used to configure the device port working mode. The configuration of dip-switch is less prioritized than software configuration of the same function. The configuration functions are: electrical port auto-negotiation enable/disable, electrical port data rate, electrical port duplex mode, optical port ALS, reserved, reserved, remote management enable/disable, reserved, optical port to electrical port fault propagation, and electrical port to optical port fault propagation.

Bit	Definition	Status	Configuration explanation
1	Electrical port auto-negotiation	ON	The electrical port is manually configured
		OFF	The electrical port is auto negotiation
2	Electrical port data rate	ON	When manually configuring electrical port, the speed is 10Mbps
		OFF	When manually configuring electrical port, the speed is 100Mbps
3	Electrical port duplex mode	ON	When manually configuring electrical port, the mode is half duplex; when auto-negotiation fails, the mode is half duplex
		OFF	When manually configuring electrical port, the mode is full duplex; when auto-negotiation fails, the mode is half duplex
4	Optical port ALS	ON	Enable the optical port ALS
		OFF	Disable the optical port ALS
5	Reserved		
6	Reserved		
7	Remote management	ON	Disable remote management
		OFF	Enable remote management
8	Reserved		
9	Optical port to electrical port fault propagation	ON	If there is no receiving signal at local optical port or remote optical port, shut down local electrical port; if electrical port to optical port fault propagation is enable at remote side and remote electrical port is down, shut down local electrical port
		OFF	Disable fault propagation function, the electrical port is always working
10	Electrical port to optical port fault propagation	ON	If local electrical port is disconnected, shut down local optical port
		OFF	Disable fault propagation function, the optical port is always working

Note: the default configuration is all OFF.

Rear Panel

Only 220V AC power supply is provided at the rear panel of RC581-FE media converter.

Introduction to the rear panel:

(1) 220V AC power supply socket.

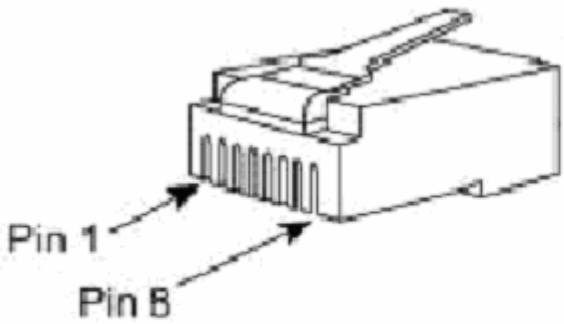
How to Connect RC581-FE Media Converter

(a) Connect the console port of RC581

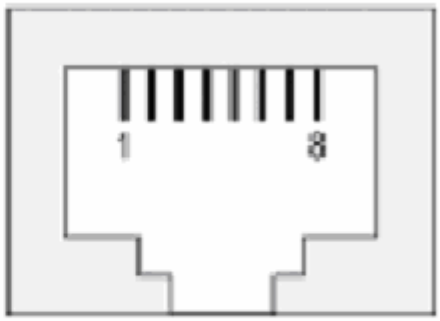
RC581-FE media converter uses RJ45 connector to provide RC232C protocol based console port. The console port can be connected to PC serial port using the console cable provided with RC581 device. RC581 can be configured and managed by PC console.

- The console cable pin definition

RC581-FE media converter adopts RJ45 connector for the console port. The pin definition of RJ45 plug and socket is as follows.



RJ45 Plug



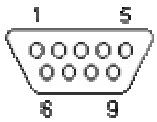
RJ45 Socket

The following table describes the function of Console pin of the RC581-FE media converter

Pin No.	Function	Type
3	RxD	Input
6	TxD	Output
4, 5	GND	
1, 2, 7, 8	N.C	

- The definition of PC Serial Port Signal

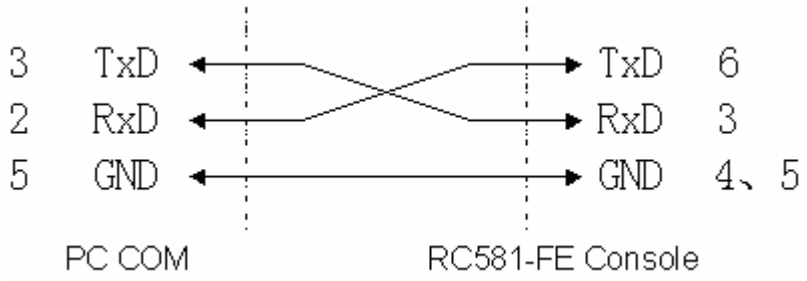
The following figures show the number of the PC 9-pin serial plug and the functions.



Pin No	Function	Type	Pin No.	Function	Type
1	CD		6	DSR	
2	RxD	Input	7	RTS	
3	TxD	Output	8	CTS	
4	DTR		9	RI	
5	GND				

- CONSOLE Port connection and configurations

The following figure shows the connection between the Console port and PC Serial port.



The connection settings of the PC Terminal are as below:

(1) baud– 9600

(2) data bit– 8

(3) stop bit– 1

(4) Parity– None

(5) Flow Ctrl– None

(b) Connect to Ethernet

Ethernet Electrical Port: RC581-FE media converter provides one 10/100M auto-negotiation Ethernet Electrical Port, and the default setting is enabling the auto-negotiation.

When enabling the auto-negotiation function, RC581-FE media converter has Auto-MDI/MDIX function, and is able to automatically switch between the MDI signal and MDIX signal. Whatever the device connecting to RC581 has MDI port or MDIX port, and whatever straight –through cable

or Crossover cable is deployed, it can work well.

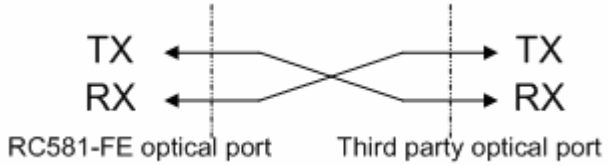
Please refer to the chapter “The console cable pin definition” for the RJ45 Plug and RJ45 Pin Number.

The following table describes the MDI and MDIX signal

Pin No.	MDI-X Signal	MDI Signal
1	RD+	TD+
2	RD-	TD-
3	TD+	RD+
6	TD-	RD-
4, 5, 7, 8	N.C	N.C

When disabling the Ethernet auto-negotiation function, RC581-FE Ethernet Electrical port is MDI-X, and it can connect the MDI port PC via the straight-through cable.

Ethernet Optical Port: RC581-FE media converter provides one 100M Ethernet optical port, and it always works as 100M full Duplex.



(c) Applying the Power Supply

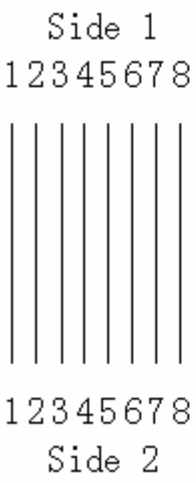
RC581-FE media converter adopts the 115V/220V AC power, and connects the power connector in the back panel and the 115V/220V AC power via the attached power cord.

Note: RC581-FE media converter does NOT have the power switch. When connecting the RC581-FE media converter to the power with the power cord, RC581 is accordingly power-on. Therefore, make sure the RC581-FE connect correctly before connecting the power.

RJ45 Cable Making Example

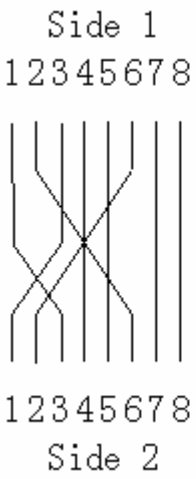
Please refer to the chapter “The console cable pin definition” for the RJ45 Plug and RJ45 Pin Number.

- Straight-through RJ45 cable



Side 1	Side 2
1 = Or Str	1 = Or Str
2 = Orange	2 = Orange
3 = Gr Str	3 = Gr Str
4 = Blue	4 = Blue
5 = Bl Str	5 = Bl Str
6 = Green	6 = Green
7 = Br Str	7 = Br Str
8 = Brown	8 = Brown

- 100M Crossover RJ45 cable



Side 1	Side 2
1 = Or Str	1 = Gr Str
2 = Orange	2 = Green
3 = Gr Str	3 = Or Str
4 = Blue	4 = Blue
5 = Bl Str	5 = Bl Str
6 = Green	6 = Orange
7 = Br Str	7 = Br Str
8 = Brown	8 = Brown

Applying Power Supply to RC581

- After following the above steps to install the RC581, connect the media converter with the 115V/220V AC power via the power cord, the media converter will be power-on.
- After the power on, if the LED PWR is always on, it shows the system has the power.
- When all the LEDs in the front panel are flashing, it shows the media converter is self-detecting and initializing.
- After the self-detection and initialization, the device is on the working status, Ethernet electrical and optical LEDs shows relevant port status (It depends on the port settings and connection status)
- Before the power on, if the media converter console port connects PC and sets the Terminal software correctly, the PC will show the GUI to control (refer to software configuration user manual)

Chapter 4 Notice

When installing, maintaining and plugging the RC581, it must be by the qualified technical support personnel. The device should be installed in a temperature and humidity controllable room, and pay attention to the conductivity of the place. If the humidity is too high, it is possible to cause short circuit. While if the room is too dry, it is possible to cause a fire. Therefore the environment is very important.

- There must be grounding protection to discharge the static
- Keep away from other electrical device when installing the media converter.
- It is strongly recommended that cross a hot wire when deploying outside cabling, and avoid running parallel near a hot wire for a long distance.
- Strictly follow the instructions in this user manual
- Do NOT operate the media converter with wet hands
- Do NOT disassembly or reconstruct the media converter