



**RC112-GE (A) series
10/100/1000M auto negotiation
Copper-to-Fiber
Media Converter**

User Manual

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Chapter 1. Overview

1. Model Description

RC112-GE(A) series copper to fiber media converters are 10/100/1000M auto-negotiation and bandwidth configurable, including: RC112-GE(A)-M, RC112-GE(A)-S1, RC112-GE(A)-S2, RC112-GE(A)-S3, RC112-GE(A)-SS13, RC112-GE(A)-SS15, RC112-GE(A)-SS23, and RC112-GE(A)-SS25.

Model	Description
RC112-GE(A)-M	Local module, 10/100/1000Mbps auto negotiation, multi mode, 0-2KM, RJ45/DSC
RC112-GE(A)-S1	Local module, 10/100/1000Mbps auto negotiation, single mode, 0-25KM, RJ45/DSC
RC112-GE(A)-S2	Local module, 10/100/1000Mbps auto negotiation, single mode, 10-60KM, RJ45/DSC
RC112-GE(A)-S3	Local module, 10/100/1000Mbps auto negotiation, single mode, 15-120KM, RJ45/DSC
RC112-GE(A)-SS13	CP module, 10/100/1000Mbps auto negotiation, single mode single strand, dual-wavelength, 0-25KM, RJ45/SC-PC
RC112-GE(A)-SS15	Local module, 10/100/1000Mbps auto negotiation, single mode single strand, dual-wavelength, 0-25KM, RJ45/SC-PC
RC112-GE(A)-SS23	CP module, 10/100/1000Mbps auto negotiation, single mode single strand, dual-wavelength 10-50KM, RJ45/SC-PC
RC112-GE(A)-SS25	Local module, 10/100/1000Mbps auto negotiation, single mode single strand, dual-wavelength 10-50KM, RJ45/SC-PC

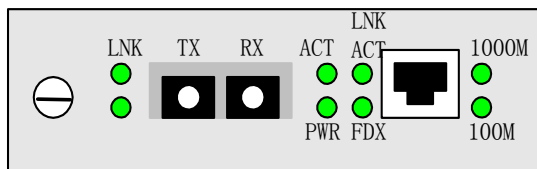
2. Product Parameters

Model	Interface	Wavelength nm	Tx Power dB	RX Sensitivity dB	Optical saturation dB	Typical range/ Km	Attenuation dB/Km
RC112-GE(A)-M	DSC-RJ45	850	-11.5~+4	-18	-3	0 - 2	3
RC112-GE(A)-S1	DSC-RJ45	1310	-9.5 - -3	-23	-3	0 - 25	0.5
RC112-GE(A)-S2	DSC-RJ45	1310	-3 - +2	-24	-3	10 - 60	0.5
RC112-GE(A)-S3	DSC-RJ45	1550/DFB	-2 - +3	-25	-3	15 - 120	0.25
RC112-GE(A)-SS13	SC/PC-RJ45	1310	-11 - -5	-31	-5	0 - 25	0.5
RC112-GE(A)-SS15	SC/PC-RJ45	1550	-11 - -5	-31	-5	0 - 25	0.5

RC112-GE(A)-SS2 3	SC/PC-RJ4 5	1310	-5 - -0	-35	-3	10 - 50	0.5
RC112-GE(A)-SS2 5	SC/PC-RJ4 5	1550	-5 - -0	-35	-3	10 - 50	0.5

3. Front view and indicators

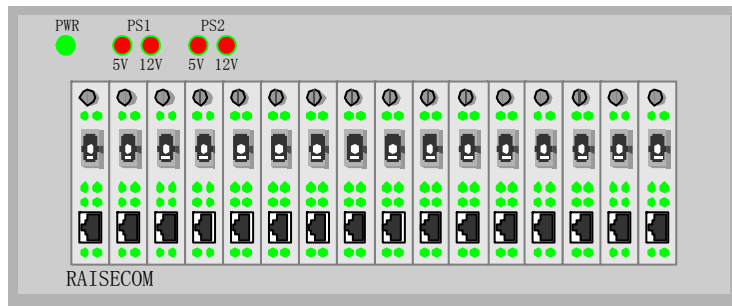
1. Front view of RC112-GE(A):



Explanation of RC112-GE(A) Indicators:

Interface	Indicator Name	Indicator	Explanation of Indicator
Optical interface	Optical RX Indicator	LNK	ON, optical RX link works properly; OFF, optical RX link is abnormal
	Optical TX Indicator	ACT	Flickering, optical port is transmitting data
Electrical interface	Electrical link/data TX & RX indicator	LNK/ACT	ON, electrical port works properly; OFF, electrical port is abnormal
	Duplex indicator of electrical port	FDX	ON, electrical port works in full-duplex mode; OFF, electrical port works in half-duplex mode
	Rate indicator of electrical port	1000M 100M	1000M ON, 100M OFF, the data rate of electrical port is 1000M; 1000M OFF, 100M ON, the data rate of electrical port is 100M; 1000M OFF, 100M OFF, the data rate of electrical port is 10M
Power supply	Power supply indicator	PWR	ON, power supply works properly; OFF, power supply is abnormal

2. Front view of 16-slot chassis



Explanations of the indicators on 16-slot chassis are as follows:

PWR indicator: ON, chassis power supply works normal.

PS1-5V indicator: OFF, power supply PS1 for modules works normal, otherwise abnormal.

PS1-12V indicator: OFF, power supply PS1 for fans works normal, otherwise abnormal.

PS2-5V indicator: OFF, power supply PS2 for modules works normal, otherwise abnormal.

PS2-12V indicator: OFF, power supply PS2 for fans works normal, otherwise abnormal.

Chapter 2. Connection Configuration

1. Interconnecting Devices

Please follow the connecting rules in the following table when interconnecting RC112-GE(A) media converters; otherwise they may not work properly.

Local Site	Customer Premise
RC112-GE(A)-M	RC112-GE(A)-M
RC112-GE(A)-S1	RC112-GE(A)-S1
RC112-GE(A)-S2	RC112-GE(A)-S2
RC112-GE(A)-S3	RC112-GE(A)-S3
RC112-GE(A)-SS15	RC112-GE(A)-SS13
RC112-GE(A)-SS25	RC112-GE(A)-SS23

2. Connecting MC with Other Devices (at Electrical Port)

1. You can use straight-through cable or crossover cable to connect RC112-GE(A) series media converters with other devices when enabling the electrical interface's auto-negotiation and auto-MDI/MDIX (straight-through and crossover cable auto-negotiation).

Media converter	Other device	Connection type of RJ45 port
Media converter	Switch	Straight-through, crossover
Media converter	HUB	Straight-through, crossover
Media converter	Router	Crossover, straight-through
Media converter	NIC	Crossover, straight-through

2. When the electrical port of RC112-GE(A) is set to manual configuration, auto-MDI/MDIX function is disabled. Then the following connection types must be followed.

Media converter	Other device	Connection type of RJ45 port
Media converter	Switch	Straight-through
Media converter	HUB	Straight-through
Media converter	Router	Crossover
Media converter	NIC	Crossover

3. Working Mode Configuration (at Electrical Port)

- A. When RC112-GE(A) series media converter is configured to auto-negotiation, the electrical port can operate at: 10M half duplex, 10M full duplex, 100M half duplex, 100M full duplex, and 1000M full duplex, but not 1000M half duplex. The electrical port of other network equipment shall be configured to auto-negotiation to ensure normal data transmission.
- B. RC112-GE (A) series media converter cannot operate at 1000Mbps when the electrical port is configured to manual configuration. In this case the working mode of other devices must follow that of the below table to ensure normal data transmission.

Working mode of MC electrical port	Working mode of other device electrical port
100M/Full duplex	100M/ Full duplex
100M/Half duplex	100M/ Half duplex
10M/Full duplex	10M/ Full duplex
10M/Half duplex	10M/ Half duplex

4. Connecting MC with Other Devices (at Optical Port)

The following conditions must be satisfied:

1. The same wavelength (single strand dual wavelength MC is not included)
2. The same data rate
3. Matched optical power
4. Gigabit Ethernet protocol (IEEE 802.3z Gigabit Ethernet)

Chapter 3. Installation & Preparation

1. Make sure that fiber optical media matches the media converter.

RC112-GE(A)-M must use multi mode optical fiber and the connector should be DSC.

RC112-GE(A)-S1/2/3 must use single mode optical fiber and the connector should be DSC.

Single mode optical interface of RC112-GE(A)-SS13/5, RC112(A)-GE-SS23/5 must use single mode optical fiber medium and the connector should be SC/PC.

2. Fiber type

Fiber for multi mode optical interface:

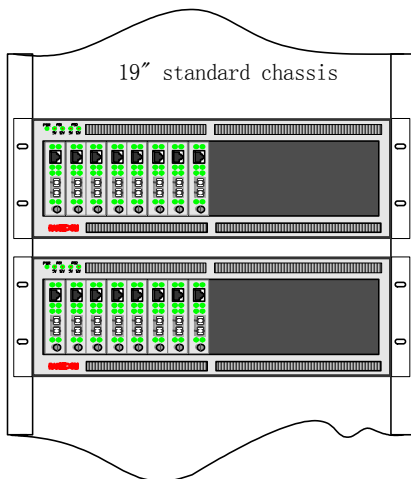
62.5/125um multi mode optical fiber or 50/125um multi mode optical fiber

Fiber for single mode optical interface:

9/125um single mode optical fiber

3. Electrical interface: Connecting media converter with Cat.5 twisted-pair which should not be longer than 100m. Refer to 2. *Connecting MC with Other Devices (at Electrical Port)* in Chapter 2 for details.

4. Installation of chassis (refer to the following figure)

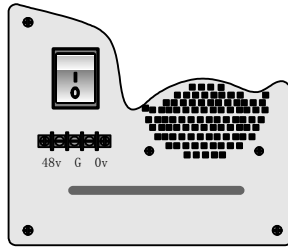


Note: Brackets used to fix the chassis are in the accessory box. If you use the bracket's rear holes to attach brackets to the chassis, there will be 3cm space between chassis front panel and cabinet front panel; and if you use the bracket's front holes, the front panel and the rack will be at the same level vertically.

5. Install the DC power supply:

There are three connectors of DC power supply: -48V, Ground, 0V, which must be connected to

-48 power supply cable, protection ground and 0V power supply cable respectively.



6. Ambience

Operating temperature: -20-60°C

Humidity: 5%~90% (non-condensing)

7. Power supply requirement:

Single slot chassis: 90-265V AC or -36- -72V DC

16-slot chassis: 90-265V AC or -36- -72V DC

8. Dimensions

Single slot chassis: 155(W)x 39(H)x 120mm(D)

16-slot chassis: 440(W)x 131(H)x 410mm(D)

Chapter 4. Dip-Switch Configuration

Functions of RC112-GE(A) series copper-to-fiber media converter can be configured by the function configuration DIP-switches. The modular media converter has two function configuration DIP-switches, SW2 and SW3. The standalone media converter has one function configuration DIP-switch, SW2 and the rear panel. Besides, modular media converter also has a type configuration switch SW1.

1. Introduction of function configuration DIP-switches

- SW2 is an 8-bit DIP-switch, the first 6 bits are respectively used for: electrical port auto-negotiation/manual configuration, data rate 100M/10M, full/half duplex, optical port auto-negotiation enable/disable, optical port RX-to-TX fault-pass-through enable/disable, maximum frame length 9728Byte/1536Byte, optical-to-electrical fault-pass-through enable/disable, and electrical-to-optical fault-pass-through enable/disable. Please refer to the following table for details:

Switch	Function	Status	Explanation
SW2-1	Electrical port auto-negotiation/manual configuration	OFF	Electrical port auto-negotiation
		ON	Electrical port manual configuration
SW2-2	Data rate at 100M/10M	OFF	Electrical port manually configured at 100M
		ON	Electrical port manually configured at 10M
SW2-3	Electrical port works at full/half duplex	OFF	When electrical port manual configured, MC at full duplex mode; When auto-negotiated and auto-negotiation fails, MC at half duplex mode.
		ON	When electrical port manual configured, MC at half duplex mode; When auto-negotiated and auto-negotiation fails, MC at half duplex mode.
SW2-4	Optical port auto-negotiation enable/disable	OFF	Optical port auto-negotiation disabled
		ON	Optical port auto-negotiation enabled
SW2-5	optical port RX-to-TX fault-pass-through enable/disable	OFF	Optical port RX-to-TX fault-pass-through disabled
		ON	Optical port RX-to-TX fault-pass-through enabled
SW2-6	Maximum frame	OFF	9728 Byte

	length 9728byte/1536byte	ON	1536 Byte
SW2-7	Optical-to-electrical fault-pass-through enable/disable	OFF	Optical-to-electrical fault-pass-through disabled
		ON	Optical-to-electrical fault-pass-through enabled
SW2-8	Electrical-to-optical fault-pass-through enable/disable	OFF	Electrical-to-optical fault-pass-through disabled
		ON	Electrical-to-optical fault-pass-through enabled

Note: If SW2-5 bit is switched to ON and optical RX cannot receive any signal, optical TX will be shut down; If SW2-5 is OFF, this function is disabled. When RC112-GE works in pairs, it is forbidden to enable this function at both sides.

SW2-6 bit is for setting up the maximum frame length. When electrical port works at 1000M, the max frame length is 9728 Byte. When electrical port works at 10M/100M, the max frame length is 1536 Byte.

Factory default setup for SW2:

	1	2	3	4	5	6	7	8
ON								
OFF	■	■	■	■	■	■	■	■

- SW3 is a 4-bit DIP-switch. The bits respectively stand for: Symmetric PAUSE frame enable/disable when electrical port at 1000M, non-symmetric PAUSE frame enable/disable when electrical port at 1000M, reserved, and reserved.

Please refer to the following table for details:

Switch	Function	Status	Explanation
SW3-1	Symmetric PAUSE frame enable/disable when electrical port at 1000M	OFF	Symmetric PAUSE frame enabled
		ON	Symmetric PAUSE frame disabled
SW3-2	Non-symmetric PAUSE frame enable/disable when electrical port at 1000M	OFF	Non-symmetric PAUSE frame enabled
		ON	Non-symmetric PAUSE frame disabled
SW3-3	Reserved	N/A	N/A
SW3-4	Reserved	N/A	N/A

Note: SW3-1 and SW3-2 only take effect when electrical port is operating at 1000Mbps.

Factory default setup for SW3:

	1	2	3	4
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ON				
OFF	■	■	■	■

2. Introduction of type configuration DIP-switch

SW1 is used for setting up the type of device. Please refer to the following table for details:

SW1-1	SW1-2	SW1-3	SW1-4	Module type
ON	ON	ON	ON	RC112-GE(A)-M
ON	ON	ON	OFF	RC112-GE(A)-S1
ON	ON	OFF	ON	RC112-GE(A)-S2
ON	ON	OFF	OFF	RC112-GE(A)-S3
ON	OFF	ON	ON	RC112-GE(A)-SS13
ON	OFF	ON	OFF	RC112-GE(A)-SS15
ON	OFF	OFF	ON	RC112-GE(A)-SS23
ON	OFF	OFF	OFF	RC112-GE(B)-SS25

Note: Customers are not permitted change the state of type configuration DIP-switch SW1.

Chapter 5. Network Management

1. View the module status

The RC112-GE(A) status information can be viewed, controlled, and configured through network management software.

Available status information of RC112-GE(A) through “show module” command is:

Number	Status name, control and configuration items	Value	Control and configuration operation
1	Module type	M, S1, S2, S3, SS15, SS25	Non-controllable, non-configurable
2	Optical-to-electrical port fault pass through	Enable, disable	Configurable
3	Electrical-to-optical fault pass through	Enable, disable	Configurable
4	RX rate of electrical port	N * Step★	N is configurable
5	TX rate of electrical port	N * 8Mbps★	N is configurable
6	Electrical port: Link status	Up, Down	Non-controllable, non-configurable
7	Electrical interface: control	On, off	Configurable
8	Electrical interface: auto-negotiation	Enable, manual	Configurable
9	Electrical interface: duplex mode	Full, half duplex	Configurable
10	Electrical interface: data rate	10M, 100M	Configurable
11	Optical interface: Link status	Up, Down	Non-controllable, non-configurable
12	Optical interface: auto-negotiation	Enable, manual	Configurable
13	Optical interface: RX-to-TX fault pass through	Enable, disable	Configurable
14	Error frame number of electrical port RX (optical interface TX)	Traffic stat. figure	Non-controllable, non-configurable
15	Error frame number of electrical port TX (optical interface RX)	Traffic stat. figure	Non-controllable, non-configurable

Note★: The data rate of electrical port RX and TX shall be configured separately. The TX step of electrical port is fixed 8Mbps (cannot be changed). The RX step adapts to the electrical interface rate: 8Mbps at 1000Mbps, 0.8Mbps at 100Mbps, 0.08Mbps at 10Mbps.

2. Configure the module

In the above table, the configurable items can be configured through “config module” command. These items includes: RX rate of electrical port, TX rate of electrical port, working mode of electrical port, auto-negotiation of optical port, RX-to-TX fault pass through, optical-to-electrical port fault pass through, electrical-to-optical port fault pass through, etc.

3. Reset the module

Host-site module can be reset through “Reset module” command. After reboot, the working mode and status will remain the same as that before reboot.

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