User Manual

GCR2000xx 10/100/1000Mbps to 1000Base-XX Fibre Optic Media Converter

Version 1.1
September 2010

Caution

Electronic Circuit devices are sensitive to static electricity. Dry weather conditions or walking across a carpeted floor may cause you to acquire a static electric charge.

To protect your switch, always:

- Touch the metal chassis of your computer to ground the static electrical charge before you handle the switch.

- Pick up the switch by holding it on the left and right edges only.

Electronic Emission Notices

Federal Communications Commission (FCC) Statement

This equipment has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment.

European Community (CE) Electromagnetic Compatibility Directive

This equipment has been tested and found to comply with the protection requirements of European Emission Standard EN55022/EN60555-2 and the Generic European Immunity Standard EN50082-1.

EMC:	EN55022(1988)/CISPR-22(1985)	class A
	EN60555-2(1995)	class A
	EN60555-3	
	IEC1000-4-2(1995)	4K V CD, 8KV, AD
	IEC1000-4-3(1995)	3V/m
	IEC1000-4-4(1995)	1KV – (power line), 0.5KV – (signal line)

Australian C-Tick Compliance.

This equipment is compliant with the required Australian C-Tick standards

1. Introduction

The GCR2000xx series of gigabit media converters is IEEE 802.3z/ab compliant and supports 10/100/1000Base-T Gigabit Copper to 1000Base-SX/LX Gigabit Fibre. A SFP based model is also available for use with Gigabit SFP Modules. SFP Modules can be interchanged to add Multimode, Single Mode, WDM and CWDM Connectivity to your media converter. The GCR2000xx can be used as a standalone unit or as a slide-in module for the DCR12xx 19" converter rack (up to 12 units) for use at a central wiring closet. The GCR2000 Series converters support two modes of LFP (Link Failure Propagation), the first by a feature called FEF (Far End Fault), this method can only be used in a paired configuration with another device that supports LFP via FEF. The second is a method called forced mode which allows the media converter to support LFP when connected to NON-FEF-AWARE devices such as Fibre Network Switches.

2. Model Description

Converter Chassis Model	Description
GCR2000SFP	10/100/1000Base-T to SFP Gigabit Media Converter
GCR2000SC	10/100/1000Base-T to 1000Base-SX (SC) Multimode Gigabit Media Converter. (220m, 500m)
GCR2000LC	10/100/1000Base-T to 1000Base-SX (LC) Multimode Gigabit Media Converter. (220m, 500m)
GCR2000SC.10	10/100/1000Base-T to 1000Base-LX (SC) Single Mode Gigabit Media Converter. (10Km)
GCR2000SC.S30	10/100/1000Base-T to 1000Base-LX (SC) Single Mode Gigabit Media Converter. (30Km)
GCR2000SC.S50	10/100/1000Base-T to 1000Base-SX (SC) Single Mode Gigabit Media Converter. (50Km)
GCR2000LC.10	10/100/1000Base-T to 1000Base-LX (LC) Single Mode Gigabit Media Converter. (10Km)
GCR2000LC.S30	10/100/1000Base-T to 1000Base-LX (LC) Single Mode Gigabit Media Converter. (30Km)
GCR2000LC.S50	10/100/1000Base-T to 1000Base-SX (LC) Single Mode Gigabit Media Converter. (50Km)
GCR2000S3.S20	10/100/1000Base-T to 1000Base-LX (SC) Single Mode WDM Gigabit Media Converter. (20Km) 1310nm TX, 1550nm RX
GCR2000S5.S20	10/100/1000Base-T to 1000Base-LX (SC) Single Mode WDM Gigabit Media Converter. (20Km) 1550nm TX, 1310nm RX

3. Checklist

Before you start installing your equipment, verify that the package contains the following:

- The GCR2000xx Gigabit Media Converter
- DC Power Supply
- USB Cable
- This Users Manual CD-ROM

Please notify your supplier immediately if any of the aforementioned items are missing or damaged.
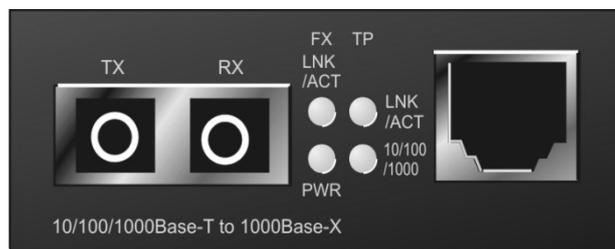

Fig. 1.1 Front Panel of GCR2000SC

Fig. 1.2 Front Panel of GCR2000SFP

Fig. 2 Rear Panel

4. Installation

Note: When used in the DCR12xx Chassis the Media Converter is hot-swappable.

Wear a grounding device for electrostatic discharge.

As a standalone unit:
⇒   Verify the AC-DC adapter conforms to your country AC power requirement and insert the power plug
⇒   If powering via USB cable plug USB cable into suitable USB device such as a Computer with available USB ports.

For use in the DCR12xx:
⇒   Slide the media converter into one of the spare slots on the DCR12xx chassis.

Fibre Port	Attach the fibre cable. The Tx, Rx fibre cable must be paired at both ends
TP Port	Attach TP Cat. 5 or above cable to TP port
	10/100Mbps Auto-Negotiation Auto-MDIX Flow Control for Full Duplex Backpressure for Half Duplex
	1000Base-T Auto-Negotiation Auto-MDIX Flow Control for Full Duplex Only

5. WDM Single Fibre Models

The GCR2000 Series have models available that support Wave Length Division Multiplexing. This allows the media converter to use a single fibre optic strand to transmit and receive data over the single fibre. This is achieved by transmitting and receiving data on different wavelengths.

Single Fibre Model	TX, RX Wavelength	
1310nm Single-Mode 20Km	TX (Transmit)	1310nm
	RX (Receive)	1550nm
1550nm Single-Mode 20Km	TX (Transmit)	1550nm
	RX (Receive)	1310nm

Note:
The 1310nm and 1550nm models must be installed in pairs. i.e. install 1310nm model at one end of the fibre run and 1550nm model at the other end.

6. Link Fault Pass Through

LFP is a function used to diagnose link fault issues between your copper and fibre devices. Two methods are supported, FEF (Far End Fault) and Forced Mode. FEF is used when both devices support this feature, such as two GCR2000's. If the copper port on one of the media converter loses link, a FEF packet is sent to the device at the other end of the fibre. This device then shuts down the link on the copper and fibre ports of the media converter. If the connecting fibre device does not support FEF it will not know what the FEF fault packet is and keep the link active.

Forced mode is used when the second fibre device being used doesn't support FEF, such as a fibre switch. If the copper port on the media converter loses link the media converter will automatically shut down the fibre port on the media converter, this in turn brings down the fibre link on the connecting switch.
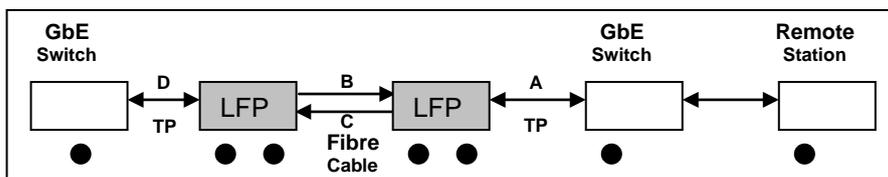
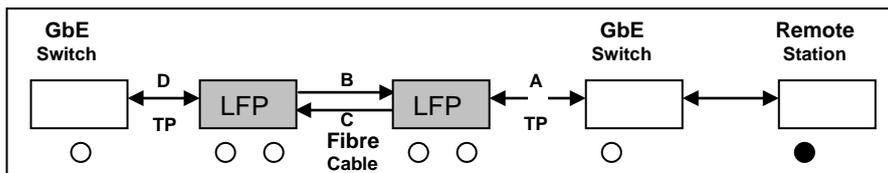Fig. 3 Normal status via LFP converter

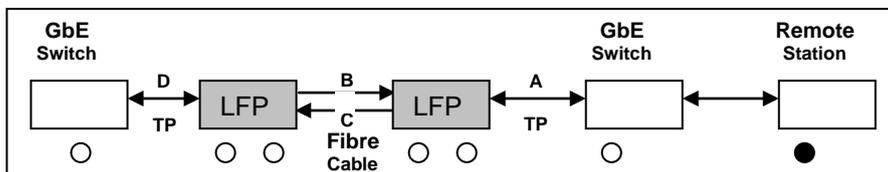Fig. 4 The status as TP Cable A or D is broken

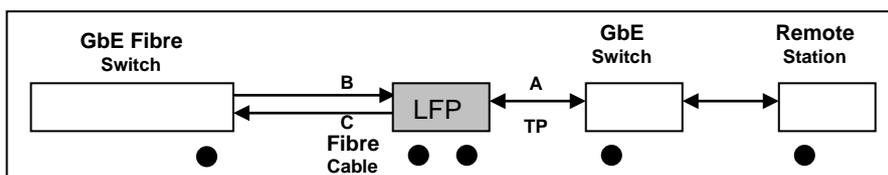Fig. 5 The status as Fibre Cable B or C is broken

Fig. 6 Normal status via LFP converter

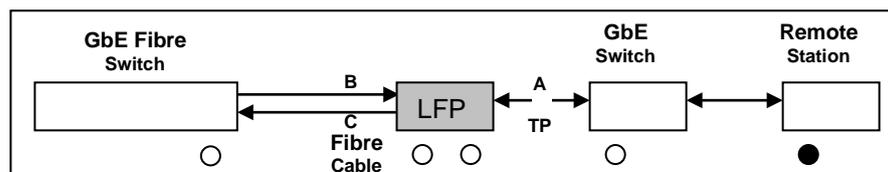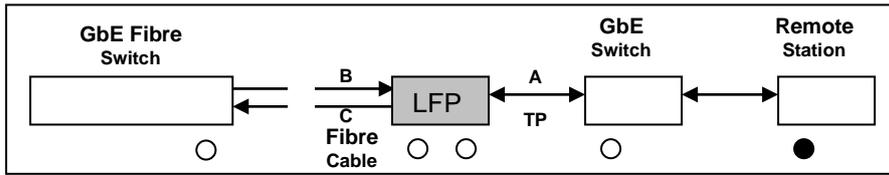Fig. 7 The status as TP Cable A is broken

Fig. 8 The status as Fibre Cable B or C is broken

Note : ●	Indicates LNK/ACT LED Lit
○	Indicates LNK/ACT LED Off

7. LED Description

LED	Colour	Function
FX LINK/ACT	Green	Lit when fibre connection is good Blinks when fibre traffic is present
TP LINK/ACT	Green	Lit when TP connection is good Blinks when TP traffic is present
TP SPD	Green Amber	Lit Green when the TP speed is 1000Mbps Lit Amber when TP speed is 100Mbps Off when TP speed is 10Mbps
PWR	Green	Lit when +5V power is active

8. DIP Switch

Fig. 9 DIP Switch Configuration and Settings

Switch 1 – 1 Bridge Mode　　　:　　Cut Through (Default) or Normal
Switch 1 – 2 LFP　　　　　　　:　　LFP Enabled (Default) or Disabled

Note:
When set to Cut Through Mode jumbo frame size supports up to 9216Bytes max. In Normal mode maximum frame size is 2048.

9. Cable Limitations

- **TP Cable Limitations:** Cat. 5 and above up to 100m
- **Fibre Cable Limitations:**

	Multi-Mode Fibre 62.5/125μm		Multi-Mode Fibre 50/125μm	
	Bandwidth MHz-Km	Distance	Bandwidth MHz-Km	Distance
1000SX 850nm	160	220m	400	500m
	200	275m	500	550m
1000LX 1310nm/ 1550nm	Single Mode Fibre 9/125μm Single Mode 1310nm: 10/30Km Single Mode 1550nm: 50Km			

Single Fibre Model	TX, RX Wavelength	
1310nm Single-Mode 20Km models	TX (Transmit)	1310nm
	RX (Receive)	1550nm
1550nm Single-Mode 20Km models	TX (Transmit)	1550nm
	RX (Receive)	1310nm

7. DC Jack and AC-DC Power Adapter

The DC jack's central post is 2.5mm wide, it conforms to the DC receptacle (2.5mm) on the 19-inch Converter Rack slot.
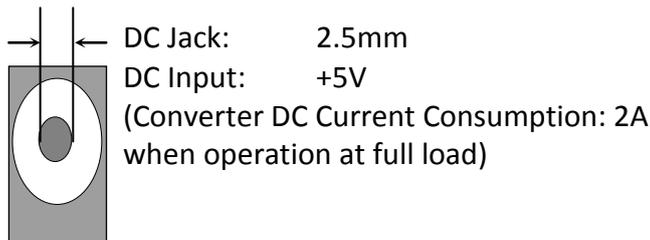
DC Jack: 2.5mm
DC Input: +5V
(Converter DC Current Consumption: 2A when operation at full load)

Fig. 3 DC+5V Input Jack and Dimension

Keep the AC-DC adapter as spare parts when Media Converter is installed in a 19-inch Media Converter Rack.

8. Technical Specifications

- **Standards:**   IEEE802.3z/AB 1000Base-T,
                           1000Base-SX/LX

- **UTP Cable:**   Cat. 5 cable and above, up to 100m

  Fibre Cable: SX: 50/125, 62.5/125, or 100/140μm multi-mode
                           LX: 9/125μm single-mode

- **LED Indicators:**   PWR
                           FX LINK/ACT, TP LINK/ACT, TP SPD

- **Data Transfer Rate:** 1000Mbps / 1,488,000 PPS
                           100Mbps / 148,800 PPS
                           10Mbps / 14,880 PPS

- **Power Requirement:**   1A@+5VDC

- **Ambient Temperature:**   0° to 50°C

- **Humidity:**   5% to 90%

- **Dimensions:**   26.2(H) × 70.3(W) × 94(D) mm