

## **Gigabit Ethernet Fiber-to-Fiber Converters**



*Illustrated: Standard and single fiber, bi-directional Gigabit Ethernet Converters*

Canary's Gigabit Ethernet Fiber-to-Fiber converters deliver economical long-range Gigabit data capacity as they link low-cost multi-mode ports with single-mode fiber optic segments. They are ideal for data intensive backbones in the enterprise or across the campus, and can be used to take advantage of low-cost Gigabit capable switches. Canary's Gigabit Fiber-to-Fiber converters are used to economically distribute Gigabit Ethernet capacity to remote user desktops across the network as bandwidth demand increases.

**GFC-55XX &  
GFC-31XX**

**Standard Multi-mode  
and Single-mode  
1000BASE-  
SX/LX/ZX series**

**GFC-5555E**

**Multi-mode to  
Extended Reach  
Multi-Mode over  
standard fiber**

**GFC-5537A/B**

**Multi-mode to  
Single-Fiber,  
Bi-Directional  
Single-Mode**

**GFC-55W-XX**

**Multi-mode to  
Single-mode with ITU  
specified CWDM  
wavelengths**

**Economic  
long-range Gigabit  
data capacity**

***When connections matter ... advancing the state of the art.***



## Product Specifications

### Power Supply:

- External switching
- 100/240 VAC, 1.2/0.6 Amp
- 50/60 Hz

### Environment:

- Operating Temp.: 0 to 49°C
- Storage Temp.: -10 to 66°C
- Relative Humidity: 5% to 95% non-condensing

### Mechanical:

- Height: 1.00" (2.54 cm)
- Length: 5.75" (14.61 cm)
- Width: 2.85" (7.24 cm)
- Ship Weight: 2.0 lb (0.9 Kg)
- Single Unit: 0.4 lb (0.2 Kg)

### Regulatory:

- Designed in compliance with CE, UL, CSA & TUV standards, ANSI X3T1 FC-AL
- IEEE 802.3z, A/B; 1000BASE-SX/LX/ZX
- Class 1 lasers conform to US 21CFR(J), EN 60825-1, UL 1950 and IEC-825

### Warranty:

- Five (5) Years, parts and labor

### Specifications for GFC-5555E

#### Environment:

- Operating Temp.: 0 to 49°C
- Storage Temp.: -10 to 66°C
- Relative Humidity: 5% to 95% non-condensing

#### Mechanical:

- Height: 1.00" (2.54 cm)
- Length: 7.88" (20.0 cm)
- Width: 8.14" (20.7 cm)
- Ship Weight: 3.0 lb (1.4 Kg)
- Single Unit: 2.5 lb (1.1 Kg)

## Gigabit Ethernet Fiber-to-Fiber Converters



Illustrated: Gigabit Ethernet Fiber-to-Fiber Converter

The pages that follow provide ordering information for Canary's Gigabit Ethernet Fiber-to-Fiber Converter products:

- **Standard Multi-mode and Single-mode 1000BASE-SX/LX/ZX series:**  
GFC-55XX & GFC-31XX
- **Multi-mode to Extended Reach Multi-Mode over standard fiber:**  
GFC-5555E
- **Multi-mode to Single-Fiber, Bi-directional Single-Mode:**  
GFC-5537A & GFC-5537B
- **Multi-mode to Single-mode with ITU specified CWDM wavelengths:**  
GFC-55W-XX

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# Gigabit Ethernet Fiber-to-Fiber Converters

**GFC-55XX** – Multi-mode to Single-mode series: 1000BASE-SX to 1000BASE-LX/ZX

**GFC-31XX** – Single-mode to single-mode series

**GFC-5555E** – Multi-mode to Extended Reach Multi-Mode over standard fiber



*Illustrated: Extended reach, multi-mode Gigabit converter.*

Standard GFC multi-mode ports provide minimum transmission distances of 220+ meters over 62.5/125  $\mu\text{m}$  fiber or 500+ meters over 50.0/125  $\mu\text{m}$  fiber.

Standard GFC models with single-mode ports provide transmission distances ranging from 10 to 70 kilometers over 9.0/125  $\mu\text{m}$  single-mode fiber.

Canary's Extended Reach Multi-Mode GFC-5555E versions can span up to two kilometers over multi-mode fiber. With Extended Reach versions, users on maximum length fiber segments can deploy and take full advantage of the raw speed and capacity of Gigabit Ethernet!

- Simple plug and go installation
- Transparent to Flow-Control commands such as PAUSE
- Dual power jacks for connecting optional, redundant power supply
- Optional: UK, Continental European power
- Auto-sensing, 100 / 240 VAC Power Supply
- Diagnostic LEDs
- Additional models include: Long-range single-mode, Single-Fiber Bi-Directional single-mode, Extended Reach multi-mode and versions launching ITU specified CWDM wavelengths

## Ordering Information

Gigabit Ethernet Model Numbers	Media Types	Optical Specifications								
		Min. Tx PWR	Max. Tx PWR	Rx Sensitivity	Min. PWR Budget	Max.PWR Budget	Max. Input PWR	Connector Type	Wavelengths (nm)	Transmit Distance
<i>GFC converters with standard multi-mode fiber port connectors are designated by (GFC-55XX) or (GFC-56XX) and have similar power and sensitivity specifications.</i>										
GFC-5555*	MM / MM	-9.5 dBm	-4.0 dBm	-17.0 dBm	7.5 dB	13.0 dB	0.0 dBm	SC/SC	850 nm	220/550 m ea.
GFC-5656*	MM / MM	-10.0 dBm	-4.0 dBm	-17.0 dBm	7.0 dB	13.0 dB	0.0 dBm	LC/LC	850 nm	220/550 m ea.
GFC-5555E	MM / MM	-10.5 dBm	-3.5 dBm	-19.5 dBm	9.0 dB	16.0 dB	-3.0 dBm	SC/SC	1310 nm	550m / 2 Km
<i>Specifications above in blue are for multi-mode, fiber connectors. Specifications below for single-mode, fiber connectors.</i>										
GFC-3131*	SM / SM	-10.0 dBm	-3.0 dBm	-20.0 dBm	10.0 dB	17.0 dB	-3.0 dBm	SC/SC	1310 nm	10Km each
GFC-5531	MM / SM	-10.0 dBm	-3.0 dBm	-20.0 dBm	10.0 dB	17.0 dB	-3.0 dBm	SC/SC	1310 nm	550m / 10 Km
GFC-5636	MM / SM	-10.0 dBm	-3.0 dBm	-20.0 dBm	10.0 dB	17.0 dB	-3.0 dBm	LC/LC	1310 nm	550m / 10 Km
GFC-5531L	MM / SM	-5.0 dBm	0.0 dBm	-24.0 dBm	19.0 dB	24.0 dB	-3.0 dBm	SC/SC	1310 nm	550m / 30 Km
GFC-5531XL**	MM / SM	-5.0 dBm	0.0 dBm	-24.0 dBm	19.0 dB	24.0 dB	-3.0 dBm	SC/SC	1550 nm	550m / 40 Km
GFC-5531E45**	MM / SM	-5.0 dBm	0.0 dBm	-24.0 dBm	19.0 dB	24.0 dB	-3.0 dBm	SC/SC	1550 nm	550m / 40 Km
GFC-5531E75	MM / SM	-2.0 dBm	3.0 dBm	-24.0 dBm	22.0 dB	27.0 dB	-3.0 dBm	SC/SC	1550 nm	550m / 70 Km

\* Reference optical specifications for standard multi-mode or single-mode fiber port connectors. Other table specifications are for alternate (second) fiber port connector.

\*\* Alternative part numbers

NOTE: Most versions of GFC-XXXX standalone converters are available as card modules for Canary's CCM-1600 and CCN-2000 / CCN-0400 Chassis models. Please refer to the CCM-1600 and CCN-2000 / CCN-0400 Data Sheets for more information.

More versions of the GFC-55XX series may be found on the Canary web site as they become available.



*Illustrated: Standard and single fiber, bi-directional Gigabit Ethernet Converters*

# Gigabit Ethernet Fiber-to-Fiber Converters

**GFC-5537A and GFC-5537B – Multi-mode to Single-Fiber, Bi-Directional Single-mode**

**GFC-3137A and GFC-3137B – Duplex Single-mode to Single-Fiber, Bi-Directional Single mode**

Canary's Gigabit GFC-5537A/B multi-mode to Single-Fiber, Bi-Directional single-mode converters deliver Gigabit data throughput the enterprise via a single strand of single-mode fiber



*Illustrated: Gigabit single-fiber Bi-Directional connectors*

cable. GFC-5537A/B converters are designed to free-up fiber capacity by using dual wavelengths transmitted bi-directionally over a single strand of a duplex fiber pair. They are ideal for data intensive backbones in the enterprise or across the campus where extra fiber capacity is lacking but additional access is needed for redundancy, to add user channels, or for alternate protocols.

Canary's Single-Fiber, Bi-Directional converters are functionally identical to standard units with the exception that units designated with an A (GFC-5537A & GFC-3137A) transmit at 1550 nm and receive on 1310 nm, while B units (GFC-5537B & GFC-3137B) transmit at 1310 nm and receive on 1550 nm. Single-Fiber converters must be connected as complementary A & B pairs. For proper

- Simple plug and go installation
- Transparent to Flow-Control commands such as PAUSE
- Dual power jacks for connecting optional, redundant power supply
- Optional: UK, Continental European power
- Auto-sensing, 100 / 240 VAC Power Supply
- Diagnostic LEDs

function, one A unit and one B unit must always be purchased, installed, and connected. Similarly, standalone A & B units can be connected to complementary A & B modules used in the CCN-2000/0400 or CCM-1600 Chassis families. Canary Single-Fiber converters are available with 20 kilometer or 40 kilometer transmission ranges.

Standard GFC multi-mode ports provide minimum transmission distances of 220+ meters over 62.5/125 μm fiber or 500+ meters over 50.0/125 μm fiber.

## Ordering Information

Gigabit Ethernet Model Numbers	Media Types	Optical Specifications								
		Min. Tx PWR	Max. Tx PWR	Rx Sensitivity	Min. PWR Budget	Max.PWR Budget	Max. Input PWR	Connector Type	Wavelengths (nm)	Transmit Distance
<i>GFC converters with standard multi-mode fiber port connectors are designated by (GFC-55XX) or (GFC-56XX) and have common power and sensitivity specifications.</i>										
<i>Standard single-mode fiber port connectors are designated by (-31-) e.g. (GFC-XX31) or (GFC-31XX) with Output PWR: ( -10, -3 dBm ) and Sensitivity: ( -20 dBm )</i>										
GFC-5555*	MM / MM	-9.5 dBm	-4.0 dBm	-17.0 dBm	7.5 dB	13.0 dB	0.0 dBm	SC/SC	850 nm	220/550 m ea.
<i>Specifications above in blue are for multi-mode, fiber connectors. Specifications below for single-mode, fiber connectors.</i>										
GFC-3131*	SM / SM	-10.0 dBm	-3.0 dBm	-20.0 dBm	10.0 dB	17.0 dB	-3.0 dBm	SC/SC	1310 nm	10Km each
GFC-5537A	MM / SM	-8.0 dBm	-3.0 dBm	-21.0 dBm	13.0 dB	18.0 dB	-3.0 dBm	SC/SC	1550/1310	550m / 20 Km
GFC-5537B	MM / SM	-8.0 dBm	-3.0 dBm	-21.0 dBm	13.0 dB	18.0 dB	-3.0 dBm	SC/SC	1310/1550	550m / 20 Km
GFC-5537E4A	MM / SM	-3.0 dBm	2.0 dBm	-23.0 dBm	20.0 dB	25.0 dB	-3.0 dBm	SC/SC	1550/1310	550m / 40 Km
GFC-5537E4B	MM / SM	-3.0 dBm	2.0 dBm	-23.0 dBm	20.0 dB	25.0 dB	-3.0 dBm	SC/SC	1310/1550	550m / 40 Km
GFC-3137A	SM / SM	-8.0 dBm	-3.0 dBm	-21.0 dBm	13.0 dB	18.0 dB	-3.0 dBm	SC/SC	1550/1310	10 Km / 20 Km
GFC-3137B	SM / SM	-8.0 dBm	-3.0 dBm	-21.0 dBm	13.0 dB	18.0 dB	-3.0 dBm	SC/SC	1310/1550	10 Km / 20 Km

\* Reference optical specifications for standard multi-mode or single-mode fiber port connectors. Other table specifications for alternate (second) fiber port connector.

NOTE: GFC-5537X / GFC-5537E4X standalone converters are available as card modules for Canary's CCM-1600 and CCN-2000 / CCN-0400 Chassis models. Please refer to the CCM-1600 and CCN-2000 / CCN-0400 Data Sheets for more information.

More versions of the GFC-5537A/B series may be found on the Canary web site as they become available.



# Gigabit Ethernet Fiber-to-Fiber Converters

## GFC-55W-XX – Multi-mode to Single-mode with ITU-specified CWDM wavelengths

Canary's Gigabit GFC-55W-XX series of Coarse Wavelength Division Multiplexing (CWDM) converters provide an economical way to access to high capacity CWDM based networks by converting standard multi-mode data output into CWDM wavelengths for launch and transport through CWDM Multiplexers.

Coarse Wavelength Division Multiplexing reduces network congestion with a minimum infrastructure investment. Using discrete wavelengths (one per channel), multiple data channels can be transported in parallel over a single-mode fiber cable.

GFC-55W-XX CWDM converters are designed to meet industry needs for an economical way to access CWDM point-to-point campus and metro-ring networks. They are used with Main Distribution Frame (central office) Multiplexer / De-multiplexers and with remote site, Optical Add/Drop Multiplexers (OADMs), to insert and/or drop optical traffic from single-mode fiber segments. Specific models provide transmission on one of eighteen discrete  $\lambda$ s, each an ITU specified, CWDM wavelength. Versions are available for either 40+ kilometer or 60+ Kilometer transmission distances. GFC-55W-XX multi-mode client ports provide minimum transmission distances of 220+ meters over 62.5/125  $\mu$ m fiber or 500+ meters over 50.0/125  $\mu$ m fiber.

- Simple plug and go installation
- Transparent to Flow-Control commands such as PAUSE
- Dual power jacks for connecting optional, redundant power supply
- Optional: UK, Continental European power
- Auto-sensing, 100 / 240 VAC Power Supply
- Diagnostic LEDs

CWDM converters are functionally identical to standard units with the exception that units at opposite ends of a fiber link must be models with identical wavelengths in order to maintain a common channel link e.g. if one device is operating at 1470 nm, the second must transmit and receive on the same wavelength. Similarly, a standalone 1470 nm unit can be connected to a CCM-1600 or CCN-2000 / CCN-0400 chassis module with the same wavelength.

### Ordering Information

Gigabit Ethernet Model Numbers	Media Types	Optical Specifications								
		Min. Tx PWR	Max. Tx PWR	Rx Sensitivity	Min. PWR Budget	Max.PWR Budget	Max. Input PWR	Connector Type	Wavelengths (nm)	Transmit Distance
<i>GFC converters with standard multi-mode fiber port connectors are designated by (GFC-55XX) or (GFC-56XX) and have common power and sensitivity specifications.</i>										
GFC-5555 **	MM / MM	-9.5 dBm	-4.0 dBm	-17.0 dBm	7.5 dB	13.0 dB	0.0 dBm	SC/SC	850 nm	220/550 m ea.
<i>Specifications above in blue are for multi-mode, fiber connectors. Specifications below for single-mode, fiber connectors.</i>										
GFC-55W-XX *	MM / SM	-5.0 dBm	0.0 dBm	-22.0 dBm	17.0 dB	22.0 dB	-3.0 dBm	SC/SC	CWDM	550m / 40+ Km
GFC-55W-XXE6	MM / SM	0.0 dBm	5.0 dBm	-24.0 dBm	24.0 dB	29.0 dB	-3.0 dBm	SC/SC	CWDM	550m / 60+ Km
GFC-55W-XXE8	MM / SM	dBm	dBm	dBm	dB	dB	dBm	SC/SC	CWDM	550m / 80 Km
<i>** Reference optical specifications for standard multi-mode or single-mode fiber port connectors. Other table specifications are for alternate (second) fiber port connector.</i>										
<i>NOTE 1: W-XX designates one of eighteen CWDM optical transmission wavelengths (λ) e.g. GFC-55W-47=1470nm or GFC-55W-61=1610nm transmission. Please refer to other CWDM (Coarse Wavelength Division Multiplexing Data Sheets for additional information.</i>										
<i>NOTE 2: GFC-55W-XX CWDM converters are available as card modules for the CCM-1600 and SNMP manageable CCN-2000 / CCN-0400 Chassis models. Please refer to the CCM-1600 and CCN-2000 / CCN-0400 Data Sheets for more information.</i>										
<i>Please refer to the Standalone / Rackable CWDM data pages for information on Passive Optical Multiplexer / De-Multiplexers and OADMs.</i>										
<i>There are eighteen CWDM wavelengths (λs) specified. Eight standard wavelengths plus four O-band λs are useable over most standard single-mode fiber. Canary offers products for the standard eight wavelengths plus four O-band λs: 1470, 1490, 1510, 1530, 1550, 1570, 1590, 1610 nm + 1290, 1310, 1330, 1350 nm</i>										
<i>More versions of the GFC-55W-XX series may be found on the Canary web site as they become available.</i>										

