Data Sheet

Cisco Gigabit Interface Converter

The industry-standard Cisco Gigabit Interface Converter (GBIC) is a hot-swappable input/output device that plugs into a Gigabit Ethernet port or slot, linking the port with the network. Cisco GBICs can be interchanged on a wide variety of Cisco products and can be intermixed in combinations of 1000BASE-T, 1000BASE-SX, 1000BASE-LX/LH, 1000BASE-ZX, or 1000BASE-CWDM interfaces on a port-by-port basis.

As additional capabilities are developed, these modules make it easy to upgrade to the latest interface technology, maximizing investment protection. Figure 1 shows three Cisco GBIC models.

Figure 1
Cisco Gigabit Interface Converters]

Cisco 1000BASE-T GBIC

The Cisco 1000BASE-T GBIC (product number WS-G5483) connects a GBIC port to Category 5 wiring via a standard RJ-45 interface. The maximum Category 5 wiring distance is 328 feet (100 meters). For details, see the *Cisco 1000BASE-T Gigabit Interface Converter Data Sheet*.

Cisco 1000BASE-SX GBIC

The Cisco 1000BASE-SX GBIC (WS-G5484) operates on ordinary multimode fiber (MMF) optic link spans up to 1815 feet (550 m) long.

Cisco 1000BASE-LX/LH GBIC

The Cisco 1000BASE-LX/LH GBIC (WS-G5486) fully complies with the IEEE 802.3z 1000BASE-LX standard. However, its higher optical quality allows it to reach 6.2 miles (10 kilometers) over single-mode fiber (SMF), compared with the 3.1 miles (5 km) specified in the standard.

Cisco 1000BASE-ZX GBIC

The Cisco 1000BASE-ZX GBIC (WS-G5487) operates on ordinary single-mode fiber optic link spans up to 43.4 miles (70 km) long. Link spans of up to 62 miles (100 km) are possible using premium single-mode fiber or dispersion shifted single-mode fiber. The GBIC provides an optical link budget of 23 dB—the precise link span length will depend on multiple factors such as fiber quality, number of splices, and connectors.

When shorter distances of single-mode fiber are used, it might be necessary to insert an in-line optical attenuator in the link to avoid overloading the receiver:

- A 5-dB or 10-dB inline optical attenuator should be inserted between the fiber-optic cable plant and the receiving port on the Cisco 1000BASE-ZX GBIC at each end of the link whenever the fiber-optic cable span is less than 15.5 miles (25 km).

Technical Specifications

This section covers the Cisco 1000BASE-SX GBIC, Cisco 1000BASE-LX/LH GBIC, and the Cisco 1000BASE-ZX GBIC, unless otherwise specified. Technical specifications for the Cisco 1000BASE-T GBIC can be found in a separate document, *Cisco 1000BASE-T Gigabit Interface Converter Data Sheet*.

Platform Support

Cisco GBICs are supported across a variety Cisco switches, routers, and optical transport devices. For more details, see the document *GBIC Compatibility Matrix*.

Connectors and Cabling

Connectors: Dual SC connector

Table 1 provides cabling specifications for the Cisco GBICs that you install in the Gigabit Ethernet port. Note that all Cisco GBICs have SC-type connectors, and the minimum cable distance for all GBICs listed (multimode fiber [MMF] and single-mode fiber [SMF]) is 6.5 feet (2 m).

Table 1 Cisco GBIC Port Cabling Specifications

GBIC	Wavelength (nm)	Fiber type	Core size (micron)	Modal bandwidth (MHz/km)	Cable distance
Cisco 1000BASE-SX	850	MMF	62.5	160	722 ft (220 m)
			62.5	200	902 ft (275 m)
			50.0	400	1640 ft (500 m)
			50.0	500	1804 ft (550 m)
Cisco 1000BASE-LX/LH	1300	MMF[1]	62.5	500	1804 ft (550 m)
			50.0	400	1804 ft (550 m)
		SMF	50.0	500	1804 ft (550 m)
			9/10	N/A	6.2 miles (10 km)
Cisco 1000BASE-ZX	1550	SMF	9/10	N/A	43.4 to 62 miles (70 to 100 km)[2]

1. Mode-conditioning patch cord (CAB-GELX-625 or equivalent) is required. Using an ordinary patch cord with MMF, 1000BASE-LX/LH GBICs, and a short link distance (10s of meters) can cause transceiver saturation resulting in an elevated bit error rate (BER). In addition, when using the Cisco 1000BASE-LX/LH GBIC with 62.5-micron diameter MMF, you must install a mode-conditioning patch cord between the GBIC and the MMF cable on both the transmit and receive ends of the link. The mode-conditioning patch cord is required for link distances greater than 984 feet (300 m).

2. Cisco 1000BASE-ZX GBIC can reach up to 62 miles (100 km) by using dispersion shifted SMF or low-attenuation SMF; the distance depends on fiber quality, number of splices, and connectors.

Note: A mode-conditioning patch cord (product number CAB-GELX-625 or equivalent) is required to comply with IEEE standards. The IEEE found that link distances could not be met with certain types of fiber-optic cable cores. The solution is to launch light from the laser at a precise offset from the center, which is accomplished by using the mode-conditioning patch cord. At the output of the patch cord, the Cisco 1000BASE-LX/LH GBIC is compliant with the IEEE 802.3z standard for 1000BASE-LX.

Standards

Compatible with GBIC standard as specified in IEEE 802.3z

Compliant with GBIC Specification Revision 5.4

Table 2 Fiber Loss Budgets for 1000BASE-SX, 1000BASE-LX, and 1000BASE-ZX

Device	Type	Transmit (dBm)		Receive (dBm)	
		Max	**Min**	**Max**	**Min**
WS-G5484	1000BASE-SX	–4	–9.5	0	–17
WS-G5486	1000BASE-LX/LH	–3	–9.5	–3	–20
WS-G5487	1000BASE-ZX	5	0	0	–23[1]

1. The WS-G5487 1000BASE-ZX GBIC provides a minimum optical power budget of 23 dB. To determine the supported link distance you should measure your cable plant with an optical loss test set to verify that the optical loss of the cable plant (including connectors and splices) is less than or equal to this figure. The optical loss measurement must be performed with a 1550-nanometer light source.

Dimensions

Dimensions (H x W x D): 8.5 mm x 13.4 mm x 56.5 mm

Environmental Conditions and Power Requirements

The operating temperature range is 32 to 122 F (0 to 50 C)

Storage temperature range is –40 to 185 F (–40 to 85 C).

Table 3 Electrical Power Interface

Parameter	Symbol	Minimum	Typical	Maximum	Units
Supply current	I_S	—	200	300	mA
Supply voltage	I_{max}	—	—	6	—
Surge current	I_{SURGE}	—	—	30	mA
Input voltage	V_{CC}	4.75	5	5.25	V

Warranty

- Standard warranty: 90 days
- Extended warranty (option): Available under a Cisco SMARTnet™ support contract for the Cisco switch or router chassis

Ordering Information

Table 4 lists product numbers to use when ordering Cisco GBICs.

Table 4 Cisco GBIC Product Numbers

GBIC	Product number
Copper (Cisco 1000BASE-T)	WS-G5483
Short wavelength (1000BASE-SX)	WS-G5484
Long wavelength/long haul (1000BASE-LX/LH)	WS-G5486
Extended distance (1000BASE-ZX)	WS-G5487

Regulatory and Standards Compliance

Safety—Laser Class I 21CFR1040

For More Information

For additional information about the Cisco Coarse Wavelength-Division Multiplexing (CWDM) GBIC Solution contact:

- United States and Canada: 800 553-NETS (6387)
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