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, 1000BASE-CWDM, or 1000BASE-DWDM 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 using a standard RJ-45 interface. The maximum Category 5 wiring distance is 328 feet (100 meters).

Cisco 1000BASE-SX GBIC

The Cisco 1000BASE-SX GBIC (WS-G5484) operates on legacy multimode fiber (MMF) optic link spans up to 1815 feet (550 m) and on laser-optimized multimode fiber (OM3) optic link spans up to 3281 feet (1 km).

Cisco 1000BASE-LX/LH GBIC

The Cisco 1000BASE-LX/LH GBIC (WS-G5486) fully complies with the IEEE 802.3z 1000BASE-LX10 standard. It allows for reaches up to 6.2 miles (10 km) over single-mode fiber (SMF) and up to 550 meters over multimode fiber (MMF). Note the requirements for mode conditioning patch (MCP) cords when coupled over legacy MMF: http://www.cisco.com/en/US/prod/collateral/modules/ps5455/product_bulletin_c25-530836.html.

Also note Cisco may support links up to 2 kilometers over legacy MMF in some deployment cases: http://www.cisco.com/en/US/prod/collateral/modules/ps5455/prod_bulletin0900aecd80425a37.html.

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 21 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)

Platform Support

Cisco GBICs are supported across a variety Cisco switches, routers, and optical transport devices. For more details, see the document Cisco Gigabit Ethernet Transceiver Modules Compatibility Matrix.

Connectors and Cabling

- Dual SC/PC connector (for optical GBIC modules)
- RJ-45 connector (for 1000BASE-T GBIC)

Note: For optical GBIC modules, only connections with patch cords with PC or UPC connectors are supported. Patch cords with APC connectors are not supported. All cables and cable assemblies used must be compliant with the standards specified in the standards section.

Note: Optical patch cables need to be compliant with GR-326 (single-mode) or GR-1435 (multimode).

Technical Specifications

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 (MMF and 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)
			50.0	2000	3281 ft (1000 m)
Cisco 1000BASE-LX/LH	1310	MMF*	62.5	500	1804 ft (550 m)
			50.0	400	1804 ft (550 m)
			50.0	500	1804 ft (550 m)
		SMF	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)**

* Mode-conditioning patch cord is required over legacy MMF and should not be used over OM3.
** 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.
*** Specified at transmission wavelength.

Standards

- Compatible with GBIC standard as specified in IEEE 802.3z
- Compliant with GBIC Specification Revision 5.4
- GR-20-CORE: Generic Requirements for Optical Fiber and Optical Fiber Cable
- GR-326-CORE: Generic Requirements for Single-Mode Optical Connectors and Jumper Assemblies

- GR-1435-CORE: Generic Requirements for Multifiber Optical Connectors

Table 2 shows fiber loss budgets for 1000BASE-SX, 1000BASE-LX, and 1000BASE-ZX.

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	-3	-9.5	0	-17
WS-G5486	1000BASE-LX/LH	-3	-9.5	-3	-19
WS-G5487	1000BASE-ZX	5	0	-3	-23*

* The WS-G5487 1000BASE-ZX GBIC provides a minimum optical power budget of 21 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): 1.90 x 3.91 x 8.89 cm. Cisco GBIC typically weigh less than 75 grams.

Environmental Conditions and Power Requirements

The operating temperature range is 32 to 122℉ (0 t o 50℃). Storage temperature range is -40 to 185℉ (-40 to 85℃).

Table 3 shows electrical power interface information.

Table 3. Electrical Power Interface

Parameter	Symbol	Minimum	Typical	Maximum	Units
Supply current	IS	-	200	300	mA
Supply voltage	Imax	-	-	6	-
Surge current	ISURGE	-	–	30	mA
Input voltage	VCC	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)

- Europe: 32 2 778 4242

- Australia: 612 9935 4107

- Other: 408 526-7209

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