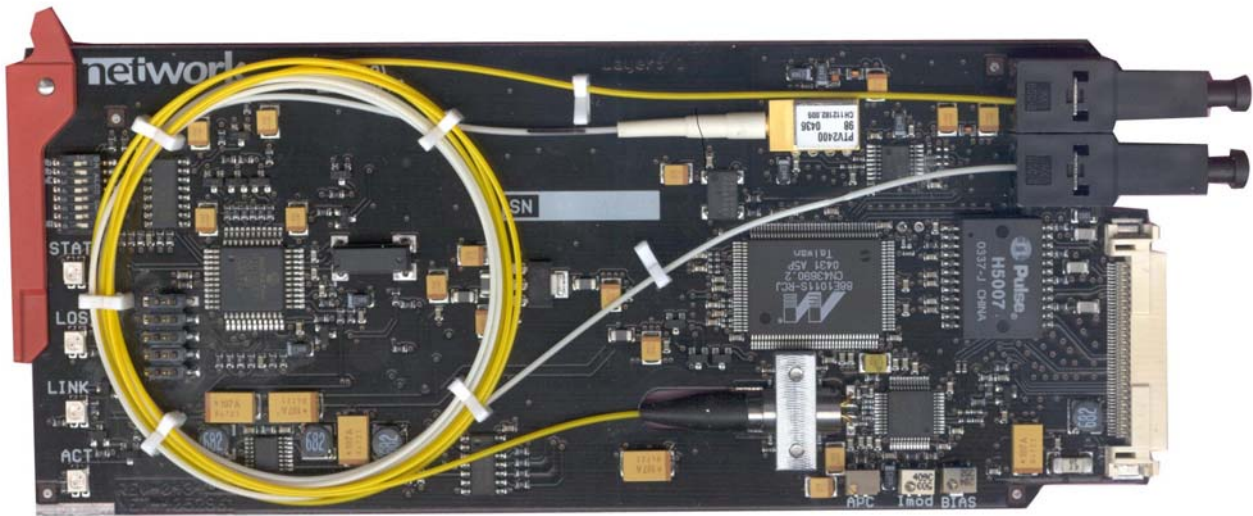


Flashlink®



USER MANUAL

ETH1000MC

Gigabit Ethernet Media Converter

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1 Revision history

The latest version is always available in pdf-format on our web-site:

<http://www.network-electronics.com/>

Revision	Date	Description
2	2005-02-21	Completed list of laser options
1	2004-08-10	<i>First version</i>
0	2004-01-30	<i>Initial version</i>

2 Index

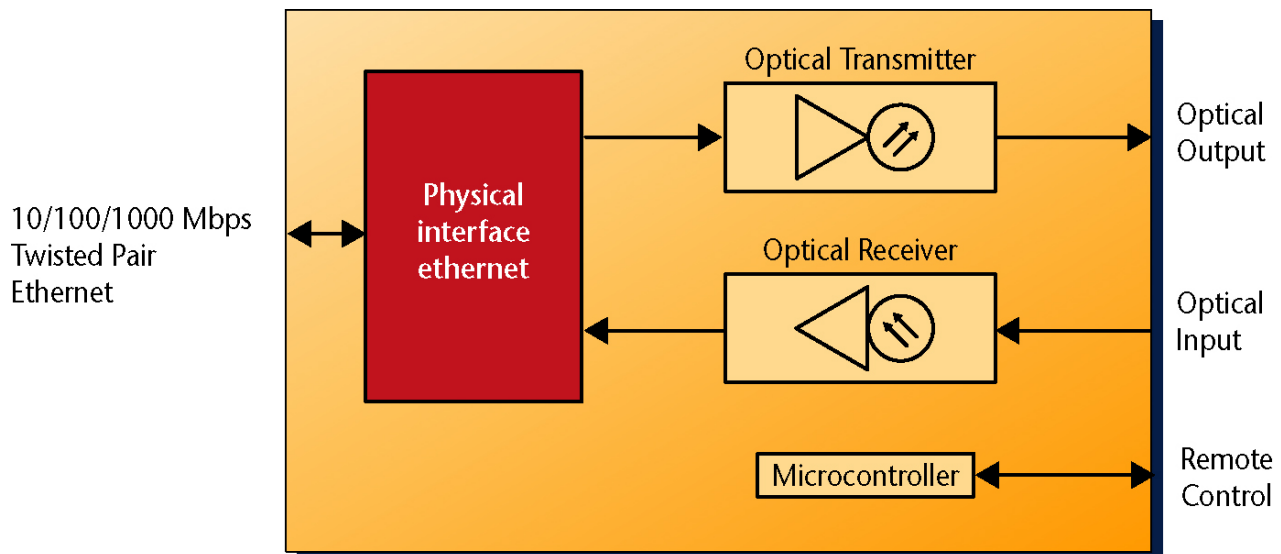
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3 Versions

There is only one version of the ETH-1000MC.

4 Overview

The **flashlink**® ETH1000MC is a 1000Base-T to fibre converter module in the Network flashlink family. The module converts a standard 1000 Mbit/s Ethernet signal on copper to fibre suitable for long haul applications. The module has one electrical Ethernet port, and one fiber transceiver port (receiver fibre connector and transmit fibre connector). The speed on the electrical connector is dependent of the DIP switch setting. Speed will upon link connection automatically be set the highest possible. User can independently enable or disable 10Mbit, 100Mbit or 1000Mbit. The fibre link can be used in one or two fibre installations, or occupy two wavelengths in a WDM, CWDM or DWDM installation.



5 Specifications

Optical input:

Sensitivity:	Better than -25dBm
Optical wavelength:	1200nm – 1610nm
Transmission circuit fibre:	Single mode 9/125um compatible
Return loss:	>40dB with single mode fibre
Detector damage threshold:	>+1dBm
Max input power:	0 dBm
Connector:	SC/UPC

Optical output:

Transmission circuit fibre:	Single Mode
Light source:	F-P/DFB Laser
Optical wavelength :	See <i>Laser Options</i> below

Ethernet:

10BaseT/100BaseTx/1000BaseT on RJ-45 connectors, compliant with IEEE 802.3 and IEEE 802.3u, speed auto sensing, auto MDI/MDI-X

Electrical

Power:	+5V DC/2W
Control:	Control system for access to setup and module status with BITE (Built-In Test Equipment)

6 Laser options

The ETH1000MC card is available in these versions:

Part number	Wavelength	Laser type	Output power	Receiver sensitivity
ETH1000MC-13T, -7.5dBm	1310 $\pm$ 40 nm	Fabry-Perot	-7.5 dBm	Better than -25 dBm
ETH1000MC-C1270, 0dBm	1270 $\pm$ 6 nm	DFB	0 dBm	Better than -25 dBm
ETH1000MC-C1290, 0dBm	1290 $\pm$ 6 nm	DFB	0 dBm	Better than -25 dBm
ETH1000MC-C1310, 0dBm	1310 $\pm$ 6 nm	DFB	0 dBm	Better than -25 dBm
ETH1000MC-C1330, 0dBm	1330 $\pm$ 6 nm	DFB	0 dBm	Better than -25 dBm
ETH1000MC-C1350, 0dBm	1350 $\pm$ 6 nm	DFB	0 dBm	Better than -25 dBm
ETH1000MC-C1370, 0dBm	1370 $\pm$ 6 nm	DFB	0 dBm	Better than -25 dBm
ETH1000MC-C1390, 0dBm	1390 $\pm$ 6 nm	DFB	0 dBm	Better than -25 dBm
ETH1000MC-C1470, 0dBm	1470 $\pm$ 6 nm	DFB	0 dBm	Better than -25 dBm
ETH1000MC-C1490, 0dBm	1490 $\pm$ 6 nm	DFB	0 dBm	Better than -25 dBm
ETH1000MC-C1510, 0dBm	1510 $\pm$ 6 nm	DFB	0 dBm	Better than -25 dBm
ETH1000MC-C1530, 0dBm	1530 $\pm$ 6 nm	DFB	0 dBm	Better than -25 dBm
ETH1000MC-C1550, 0dBm	1550 $\pm$ 6 nm	DFB	0 dBm	Better than -25 dBm
ETH1000MC-C1570, 0dBm	1570 $\pm$ 6 nm	DFB	0 dBm	Better than -25 dBm
ETH1000MC-C1590, 0dBm	1590 $\pm$ 6 nm	DFB	0 dBm	Better than -25 dBm
ETH1000MC-C1610, 0dBm	1610 $\pm$ 6 nm	DFB	0 dBm	Better than -25 dBm

7 Connector module

The ETH1000MC has a dedicated connector module: ETH1000MC-C1. This module is mounted at the rear of the sub-rack

7.1 Mounting the connector module

The details of how the connector module is mounted, is found in the user manual for the sub-rack frame FR-2RU-10-2.

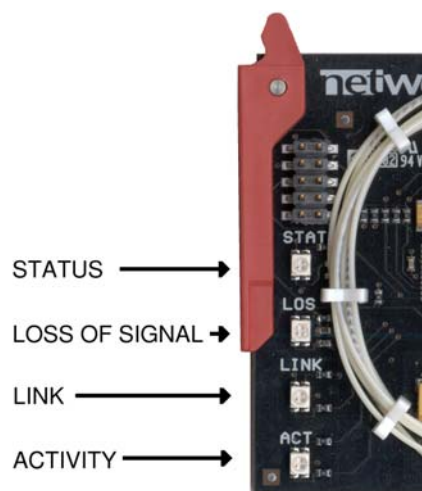
This manual is also available from our web site:
<http://www.network-electronics.com/>



8 Status indicators

8.1 Front Panel LEDs

The status of the module can be easily monitored visually by the LED's at the front of the module

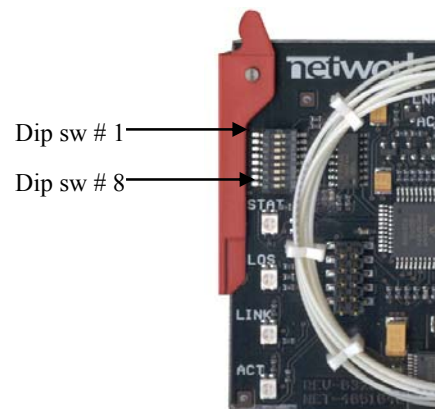


LED	Description	Green light	Yellow light	Red light	No light
STAT	Module status	Module self-test is OK and power is present.		- Module initialising (takes approx. 2 sec). - The laser is turned off. - Module is faulty (fuse blown, laser failure, laser APC out of lock, etc). The card needs factory repairment.	Module has no power.
LOS	Loss of optical signal	Optical input signal present. Note: This is an optical measurement, a green light does not imply that there exists a valid Ethernet signal on the optical input.		- No optical input signal. - Check fibre connection. - Check card in opposite end.	
LINK	Ethernet link	Ethernet link to opposite end established at 1000Mbit	Ethernet link to opposite end established at 10 or 100Mbit		Ethernet link to opposite end not established.
ACT	Ethernet activity	Flashes when Ethernet packets are sent over the fibre link. When the Ethernet activity is high, this will be on continuously.			The fibre link is idle, no packets are sent on the link.

8.3 Dip switches

The tables below explains the functionality of the dipswitches shown in the below figure.

Dip switch #	Description
1	Enable 10Mbit
2	Enable 100Mbit
3	Enable 1000Mbit (GbE)
4	Reserved
5	Reserved
6	Reserved
7	Reserved
8	Gyda override/DIP



When DIP switch 1,2 and 3 are all on or all off, highest speed possible will be used when link connection.

Switch 1 disables 10Mbit connection when DIP is closest to board edge. Switch 2 enables/disables 100Mbit and switch 3 enables/disables 1000Mbit.

Dip 4, 5, 6 and 7 are reserved.

Dip 8 sets if Gyda is able to configure or not. When Gyda override is set, the actual setting can be read by using the info command (se Gyda user manual for details).

9 Laser safety precautions

Guidelines to limit hazards from laser exposure:

Note: All the available EO (including ETH1000MC) units in the flashlink® range include a laser. Therefore this note on laser safety should be read thoroughly.

The lasers emit light at wavelengths around 1310 nm or 1550 nm. This means that the human eye cannot see the beam, and the blink reflex cannot protect the eye. (The human eye can see light between 400 nm to 700 nm).

A laser beam can be harmful to the human eye (depending on laser power and exposure time). Therefore:

!! BE CAREFUL WHEN CONNECTING / DISCONNECTING FIBRE PIGTAILS (ENDS).

NEVER LOOK DIRECTLY INTO THE PIGTAIL OF THE LASER/FIBRE.

NEVER USE MICROSCOPES, MAGNIFYING GLASSES OR EYE LOUPES TO LOOK INTO A FIBRE END.

USE LASER SAFETY GOGGLES BLOCKING LIGHT AT 1310 nm AND AT 1550 nm

Instruments exist to verify light output power: Power meters, IR-cards etc.

flashlink® features:

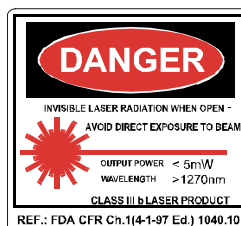
All the laser module cards in the flashlink® product range, are Class 1 laser products according to IEC 825-1 1993, and class I according to 21 CFR 1040.10 when used in normal operation.

More details can be found in the user manual for the FR-2RU-10-2 frame.

Maximum output power* : 5 mW.

Operating wavelengths: > 1270 nm.

**Max power is for safety analysis only and does not represent device performance.*



10 Declaration of conformity with CE

This apparatus meets the requirements of EN 55103-1 (November 1996) with regard to emissions, and EN 55103-2 (November 1996) with regard to immunity; it thereby complies with the Electromagnetic Compatibility Directive 89/336/EEC.

11 General environmental requirements for Network flashlink® equipment

1. The equipment will meet the guaranteed performance specification under the following environmental conditions:

- Operating room temperature range 0°C to 40°C
- Operating relative humidity range up to 90% (non-condensing)

2. The equipment will operate without damage under the following environmental conditions:

- Temperature range -10°C to 50°C
- Relative humidity range up to 95% (non-condensing)

3. Electromagnetic compatibility conditions:

- Emissions EN 55103-1 (Directive 89/336/EEC)
- Immunity EN 55103-2 (Directive 89/336/EEC)