ETH1000-MKII

Gigabit Ethernet Media Converter

User manual

Rev. 1

Nevion Support

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Revision history

Current revision of this document is the uppermost in the table below.

Rev.	Repl.	Date	Sign	Change description
1	0	2011-11-29	AJM	Changed wording in chapter 3.1
0	-	2011-06-30	GMW/MS	First version

Contents

1 Product overview

The Flashlink ETH1000-MKII is a 10/100/1000Base-T to 1000Base-X media converter module. The module converts a 10/100/1000Mbps Ethernet signal on copper to 1000Mbps optical on fibre suitable for medium haul applications. The module has one electrical Ethernet port, and one optical fibre transceiver port (receiver fibre connector and transmit fibre connector). The speed on the electrical connector is dependent of the DIP switch setting or GYDA control. Speed will upon link connection automatically be set at the highest possible speed. User can independently enable or disable 10Mbps, 100Mbps or 1000Mbps. The fibre link can be used in one or two fibre installations, or occupy two wavelengths in a WDM or CWDM installation.
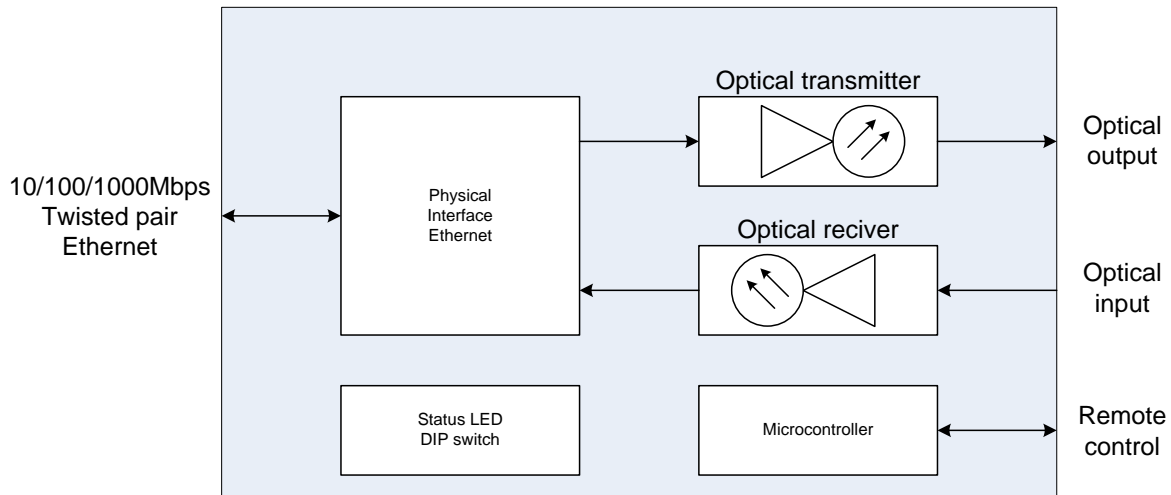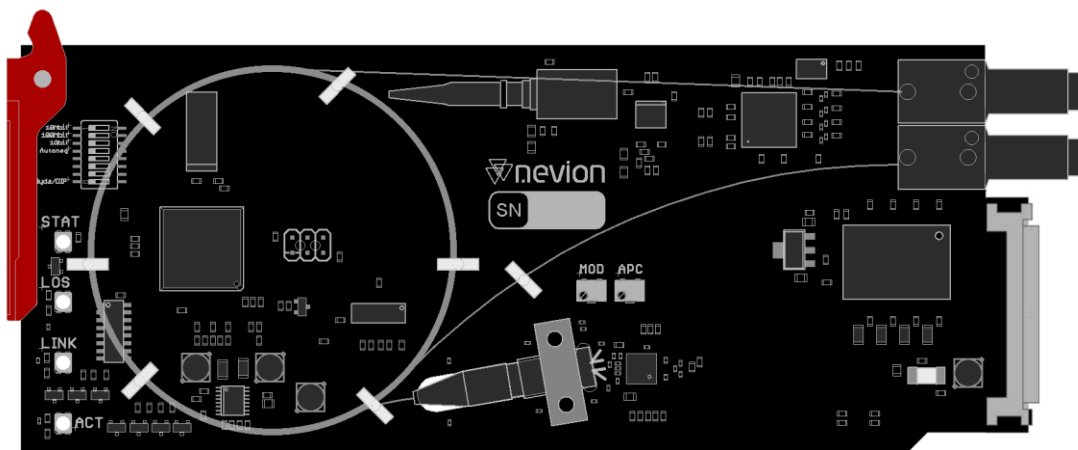

Figure 1

Figure 2

2 Specifications

2.1 Optical Characteristics

Optical input

Transmission circuit fibre:	9/125um Single Mode
Sensitivity	Better than –25dBm
Optical wavelength	1200nm – 1610nm
Detector damage threshold	> +1dBm
Max input power	0dBm
Connector	SC/UPC

Optical Output

Transmission circuit fiber	9/125um Single mode
Light source	F-P / DFB laser
Optical power	13T -5 dBm: -3 to -12dBm, typ -5dBm,
	CWDM: +0dBm +/- 1dBm
Optical centre wavelength	1310nm or CWDM

2.2 Ethernet

10BaseT/100BaseTx/1000BaseT on RJ-45 connectors. Compliant with IEEE 802.3, IEEE 802.3u, IEEE 802.3ab and IEEE 802.3z. Auto speed sensing and MDI/MDI-X.

2.3 General

Power	+5V DC/2.9W
Control	Control system for access to setup and module status with BITE (Built-In Test Equipment)

3 Configuration

ETH1000-MKII can be configured by DIP or from Flashlink Multicon GYDA.

3.1 DIP control

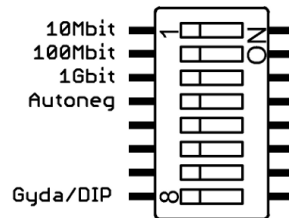The tables below explain the functionality of the dip switches.

Figure 3

#	Description
1.	Enable 10Base-T
2.	Enable 100Base-T
3.	Enable 1000Base-T
4.	Auto- negotiation on 1000Base-X
5.	Reserved
6.	Reserved
7.	Reserved
8.	GYDA override/DIP

When DIP switch 1, 2 and 3 are all on or off, speed is set to auto.

DIP switch 1 enables/disables 10Base-T electrical connection.

DIP switch 2 enables/disables 100Base-T electrical connection.

DIP switch 3 enables/disables 1000Base-T electrical connection.

DIP switch 4 enables/disables auto-negotiation on the optical connection, 1000Base-X. When connecting ETH1000-MKII to ETH1000MC, auto-negotiation must be disabled. Using two ETH1000-MKIIs or ETH1000-MKII together with ETH1000-D, these DIPs must be in the same position on both cards. Also this dip must be on to be able to communicate with other vendors Ethernet switches.

Dip 5, 6 and 7 are reserved.

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

3.2 Multicon Gyda control

Latest configuration from Multicon Gyda is stored locally on the card. This prevents configuration loss during power recycling.

The card supports Flashlink protocol v4.0.

3.2.1 Block descriptions
Supported block command.

3.2.1.1 Laser
<identifier> ::= 'lsr'

<status> ::= 'C' [<wavelength>'nm'] [<power>'dBm'] ['on'|'off'] ['ok|fail']

<block command> ::= <operation>

<operation> ::= 'on'|'off'

3.2.1.2 PIN
<identifier> ::= 'pin'

<status> ::= ['cd'|'ncd']

3.2.1.3 Voltage
<identifier> ::= 'pwr'

<status> ::= [<nominal voltage>'Vnom'] [<voltage>]

3.2.1.4 General output
<identifier> ::= 'gpi'

<status> ::= ['out'] ['act'|'inact'] ['thru'] ['id' '"'<GPI identifier>'"']

<block command> ::= <set state>

<set state> ::= 'act'|'inact'|'thru'

3.2.1.5 Ethernet port
<identifier> ::= 'ethp'

<status> ::= ['dis'|'en'] ['cd'|'ncd'] [('10'|'100'|'1000') ('man'|'auto')] [('full'|'half') ('auto')]

                [('mdi|mdix') ('auto')] [('mas'|'sla') ('auto')]

<block command> ::= 'dis'|'en'| <speed mode>

<speed mode> ::= 'speed' '10'|'100'|'1000'|'auto'

3.2.1.6 Misc
<identifier> ::= 'misc'

<status> ::= ['prog'|'fin'] ['ovr']

4 Connector module

The ETH1000-MKII has a dedicated connector module: ETH1000-C1. This module is mounted at the rear of the sub-rack. The module is shown in the figure below.
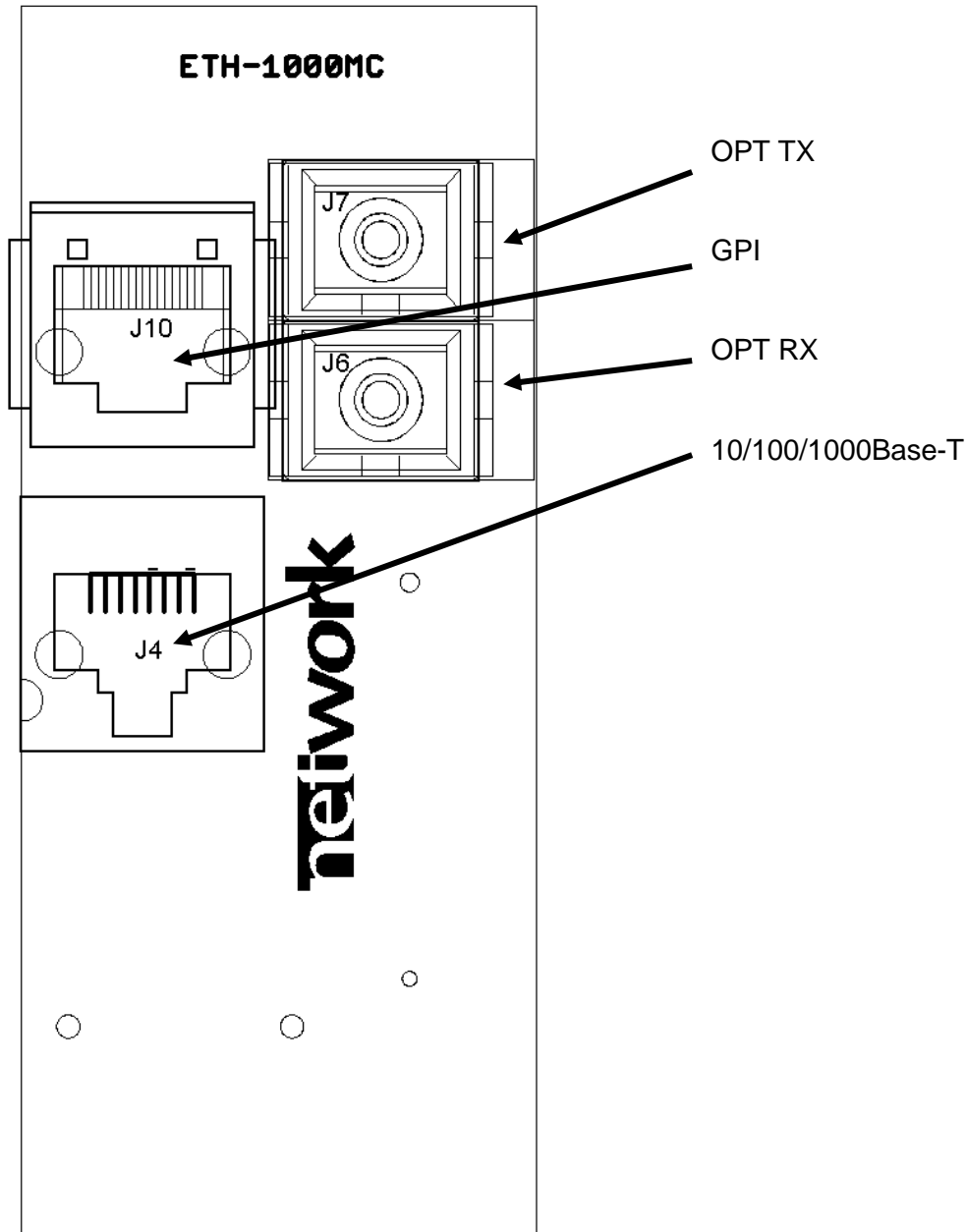
Figure 4

4.1 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.nevion.com/.

4.2 Terminal format support

The different input and output ports on ETH1000-MKII can support a number of formats. The table below shows the input and output signals on the back plane.

Terminal format support:

Terminal	Function	Supported Format	Mode
OPT RX	Optical input	1000Base-X	Input
OPT TX	Optical output	1000Base-X	Output
1000Base-T	Electrical input	10/100/1000Base-T	In/output
GPI ALARM	Open Collector Alarms	Wired alarms	OC Output

5 Module status

The status of the module can be monitored in three ways.

1. GYDA-SC System Controller (optional).
2. GPI at the rear of the sub-rack.
3. LED's at the front of the sub-rack.

Of these three, the GPI and the LEDs are mounted on the module itself, whereas the GYDA System Controller is a separate module giving detailed information on the card status. The functions of the GPI and the LEDs are described in sections 5.2 and 5.1. GYDA-SC is described in a separate user manual

5.1 Front panel – Status monitoring

The status of the module can be easily monitored visually by the LEDs at the front of the module. The LEDs are visible through the front panel as shown in the figure below.
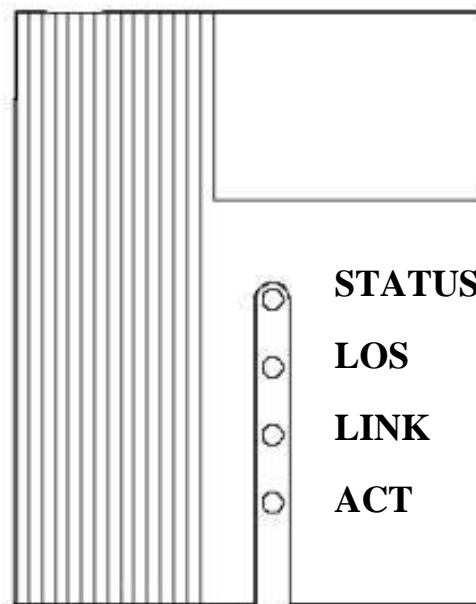

Figure 5 - Front panel indicators for the ETH1000-MKII

ETH1000-MKII has 4 LEDs each showing a status corresponding to the GPI pinning.

Diode \ State	Red LED	Green LED	Orange LED	No light
Status	Module is faulty, or module is initializing.	Module is OK Module power is OK	Laser off	Module has no power
LOS	No optical signal	Optical signal		Module has no power
LINK	No 10/100/1000Base-T link	10/100/1000Base-T link		No link
ACT		Ethernet traffic		No Ethernet traffic

5.2 GPI Alarm – Module status outputs

These outputs can be used for wiring up alarms for third party control systems. The GPI outputs are open collector outputs, sinking to ground when an alarm is triggered. The GPI connector is shown in figure below.

GPI pinning

Signal	Name	Pin #	Mode
Status	General error status for the module.	Pin 1	Open Collector
LOS	Loss of optical signal	Pin 2	Open Collector
LINK	Ethernet electrical link	Pin 3	Open Collector
LASER	Laser fail	Pin 4	Open Collector
Ground	0 volt pin	Pin 8	0V.

Electrical Maximums for GPI outputs

Max current: 100mA
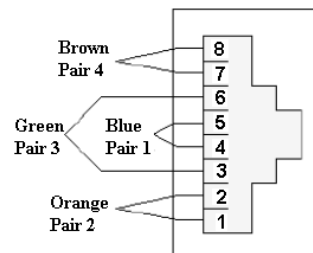
Max voltage: 30V

Figure 6

6 Laser safety precautions

Guidelines to limit hazards from laser exposure.

All the available EO units in the Flashlink range include a laser.

Therefore this note on laser safety should be read thoroughly.

The lasers emit light at 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[1]: 5 mW.

Operating wavelengths: > 1270 nm.

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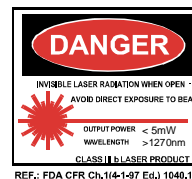
[1] Max power is for safety analysis only and does not represent device performance.

General environmental requirements for Nevion 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: <90% (non-condensing)

2. The equipment will operate without damage under the following environmental conditions:
    - Temperature range: -10°C to 55°C
    - Relative humidity range: <95% (non-condensing)

Product Warranty

The warranty terms and conditions for the product(s) covered by this manual follow the General Sales Conditions by Nevion, which are available on the company web site:

www.nevion.com

Appendix A Materials declaration and recycling information

A.1 Materials declaration

For product sold into China after 1st March 2007, we comply with the "Administrative Measure on the Control of Pollution by Electronic Information Products". In the first stage of this legislation, content of six hazardous materials has to be declared. The table below shows the required information.

組成名稱 Part Name	Toxic or hazardous substances and elements					
	鉛 Lead (Pb)	汞 Mercury (Hg)	镉 Cadmium (Cd)	六价铬 Hexavalent Chromium (Cr(VI))	多溴联苯 Polybrominated biphenyls (PBB)	多溴二苯醚 Polybrominated diphenyl ethers (PBDE)
ETH1000-MKII	O	O	O	O	O	O

O: Indicates that this toxic or hazardous substance contained in all of the homogeneous materials for this part is below the limit requirement in SJ/T11363-2006.

X: Indicates that this toxic or hazardous substance contained in at least one of the homogeneous materials used for this part is above the limit requirement in SJ/T11363-2006.

This is indicated by the product marking:

A.2 Recycling information

Nevion provides assistance to customers and recyclers through our web site http://www.nevion.com. Please contact Nevion's Customer Support for assistance with recycling if this site does not show the information you require.

Where it is not possible to return the product to Nevion or its agents for recycling, the following general information may be of assistance:

– Before attempting disassembly, ensure the product is completely disconnected from power and signal connections.
– All major parts are marked or labelled to show their material content.
– Depending on the date of manufacture, this product may contain lead in solder.
– Some circuit boards may contain battery-backed memory devices

EC Declaration of Conformity

MANUFACTURER	Nevion Europe AS P.O. Box 1020, 3204 Sandefjord, Norway
AUTHORIZED REPRESENTATIVE (Established within the EEA)	Not applicable
MODEL NUMBER(S)	ETH1000-MKII
DESCRIPTION	Gigabit Ethernet Media Converter
DIRECTIVES this equipment complies with	Low voltage (EU Directive 2006/95/EC) EMC (EU Directive 2004/108/EC) RoHS (EU Directive 2002/95/EC) China RoHS[2] WEEE (EU Directive 2002/96/EC) REACH
HARMONISED STANDARDS applied in order to verify compliance with Directive(s)	EN 55103-1:1996 EN 55103-2:1996

TEST REPORTS ISSUED BY	**Notified/Competent Body**	**Report no:**
	-	-
TECHNICAL CONSTRUCTION FILE NO	Not applicable	
YEAR WHICH THE CE-MARK WAS AFFIXED	2011	
TEST AUTHORIZED SIGNATORY		

MANUFACTURER	**AUTHORIZED REPRESENTATIVE (Established within EEA)**	**Date of Issue**
		2011-06-30
		Place of Issue
	Not applicable	Sandefjord, Norway

NEVION EUROPE AS
O.nr. 976 584 201 MVA

Name	Thomas Øhrbom
Position	VP of Quality, Nevion Europe (authorized signature)

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[2] Administration on the Control of Pollution Caused by Electronic Information Products