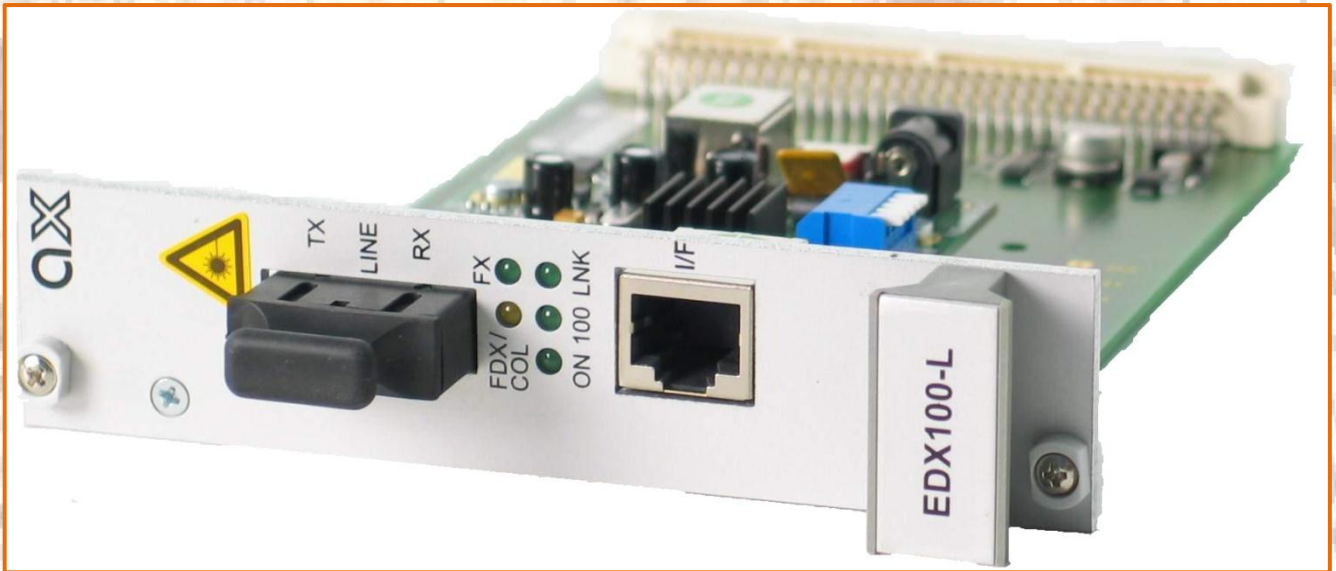# User's Guide

arcutronix

Fast Ethernet Converter

EDX100

Short Description

The Ethernet converter EDX100 is an unmanaged Fast Ethernet media converter, which offers an economical copper to fiber optic signal conversion.

As Ethernet has evolved into the most widely implemented physical and link layer protocol today, more and more services are delivered on Ethernet infra-structure. As bandwidth demand is growing, Fast Ethernet to the customer satisfies today needs for broadband access. Fiber optic connections allow long-haul Ethernet-links to spread Metro Ethernet services into a wide area.

EDX100 is an easy to install and easy to operate device, which saves costs and energy.

In case of signal loss of fiber optic port, an alarm-output is triggered for external use, so failures can easily be detected and problem-location is quickly done.

As part of arcutronix Multi Service Platform (axMSP) the EDX100 can be housed in small footprint single-slot housing or 19" rack to achieve high density on small footprint.

Covered Products

The EDX100 product family offers 2 interfaces to the customer. One copper Fast Ethernet interface (10/100BaseT) and a fiber-optic Ethernet interface (100BaseFX). While the copper interface is always the same (RJ45), the fiber-optic port can vary to fit the unit in different application scenarios.

A SFP-based EDX100 is available to give maximum choice of wavelength and distances. This device (EDX100-SFP) can be host and operate all available 155Mbit-SFPs, which are according the SFP Multi-supplier-Agreement (MSA).

In addition to the EDX100-SFP some preconfigured converter are available, offering different wavelength, distances and connector options.

Please see table below for details.

| Ethernet Demarcation				
EDX100	0715-2001	GS1	EDX100-S	Ethernet Converter. 1x 100BaseFX (1310nm SM standard FO, ST conn.); 1x 10/100BaseT (RJ45 conn.); Alarm Relay Control; LPT; 3RU rack mount card.
	0715-2002	GS1	EDX100-M	Ethernet Converter. 1x 100BaseFX (1310nm MM standard FO, ST conn.); 1x 10/100BaseT (RJ45 conn.); Alarm Relay Control; LPT; 3RU rack mount card.
	0715-2003	GS1	EDX100-A	Ethernet Converter. 1x 100BaseFX (WDM option: 1310Tx, 1550 Rx SM standard FO, 40km, ST conn.); 1x 10/100BaseT (RJ45 conn.); Alarm Relay Control; LPT; 3RU rack mount card.
	0715-2004	GS1	EDX100-B	Ethernet Converter. 1x 100BaseFX (WDM option: 1550Tx, 1310 Rx SM standard FO, 40km, ST conn.); 1x 10/100BaseT (RJ45 conn.); Alarm Relay Control; LPT; 3RU rack mount card.
	0715-2101	GS1	EDX100-L	Ethernet Converter. 1x 100BaseFX (1550nm SM long haul FO, SC conn.); 1x 10/100BaseT (RJ45 conn.); Alarm Relay Control; LPT; 3RU rack mount card.
	0715-2200	GS1	EDX100-SFP	Ethernet Converter. 1x 100BaseFX, pluggable SFP module (no module included); 1x 10/100BaseT (RJ45 conn.); Alarm Relay Control; LPT; 3RU rack mount card.

Table 1: Overview

This User's Guide does cover all above mentioned members of the EDX100 product family.

User's Guide

Application Example

The EDX100 can be used to bridge long distances, thus enhancing copper Ethernet networks by using a fiber optic line between branch offices or to achieve FE-rollout for customers.

Each EDX model is a 3U card that can be either plugged into a 19" rack system chassis for POP application, or a stand-alone chassis as customer premises equipment.
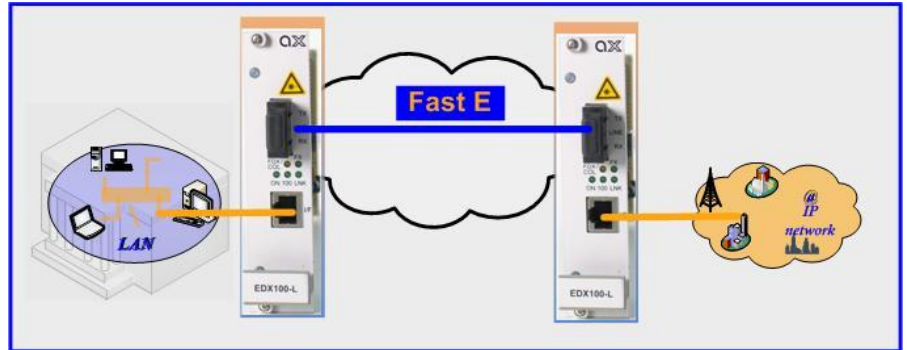
Connectors, Indicators and Controls

Front Panel

The front panel of the EDX100 does give access to the copper Fast Ethernet port as well as the fiber-optic interface. Three slightly different variants are available, but the ports and LED indicators are always the same. As an example, the EDX100-SFP is shown.

1) **Line port: Fiber Optic Transmitter (SFP), RX**
2) **Line port: Fiber Optic Receiver (SFP), TX**
3) **FDX/COL: On = Full duplex mode; Blink = Collision**
4) **FX: On = 100BaseFX ok; Blink = Data on FO port**
5) **ON: On = Power On**
6) **100:   On = I/F link with 100BaseTX**
7) **LNK: On = 10/100BaseT ok; Blink = Data on I/F**
8) **I/F port: 10/100BaseT**

CAUTION
LASER Class 1

User's Guide
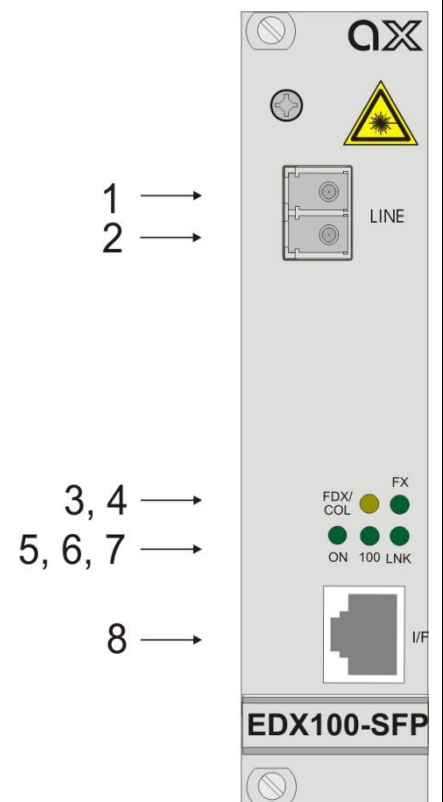
Unit Setup

The Ethernet converter EDX100 is a "plug'n'play" unit, which needs no special setup or knowledge. Installation in single-slot housing (SHX) or system rack (SRX) must be done according the specification of these devices. After installation of the EDX100 in the housing, attach fiber optic cable and CAT5 (better 5e) cable to interfaces.

A DIP-switch is placed on the PCB to configure basic behavior, as
- Auto-Negotiation of Copper port
- Speed on Fiber port
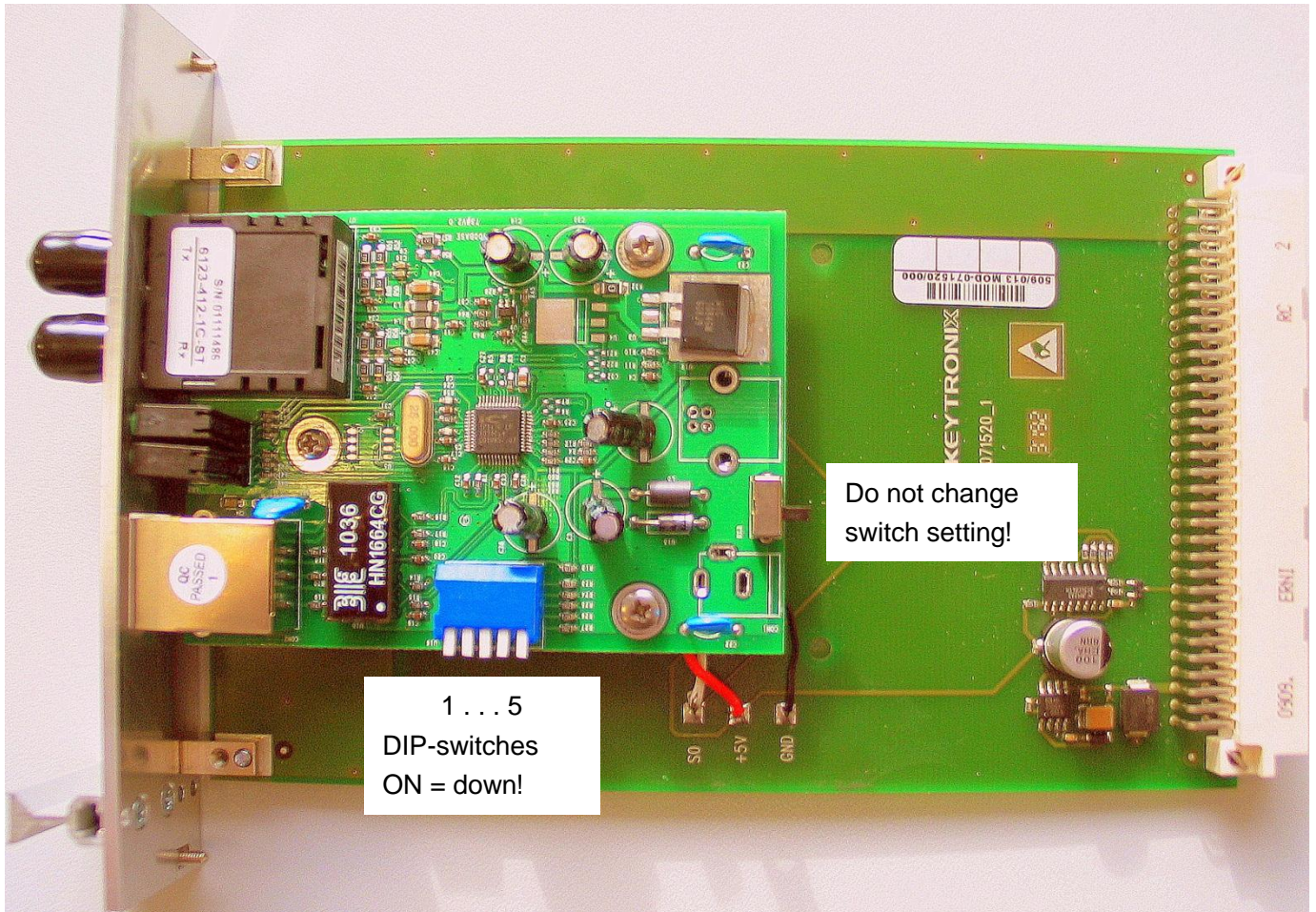- Link Pass Through (LPT)

Do not change switch setting!

1 . . . 5
DIP-switches
ON = down!

Figure 1: EDX100 PCBA

Configuration with DIP-Switch:

No.	Name	Setting
1	**Local TP Port Forced**	**OFF (up):** TP port supports auto-negotiation with 10M/100M, full/half capability.
		ON (down): TP port supports auto-negotiation with limited capability defined in SPEED_MODE and DUPLEX_MODE.
2	**Local TP Port Low-Speed** It is valid only if **Local TP Port Forced** is enabled.	**OFF (up):** TP port has the 100Mb speed ability **ON (down):** TP port has the 10Mb speed ability only
3	**Local TP Port Half-Duplex** It is valid only if **Local TP Port Forced** is enabled.	**OFF (up):** TP port has the Full duplex ability **ON (down):** TP port has the Half duplex ability only
4	**Disable Link fault pass through (LFP)**	**OFF (up):** LPT is enabled Link status of one port is forwarded to the other port. **ON (down):** LPT is disabled
5	**Force Fiber Port to Half-Duplex**	**OFF (up):** Fiber port has the Full duplex ability (100FDX) **ON (down):** Fiber port has the Half duplex ability only (100HDX)

Rem.: The DIP-switches 2 and 3 are to be used in Forced Mode (DIP 1 = ON), only.

The Default-Configuration for the different variants is given below:

| No	Name	EDX100-S	…-L	…-M	…-A/B	…-SFP
1	**Local TP Port Forced**	**ON (down)** Forced Mode	**OFF** Autoneg-Mode	**OFF** Autoneg-Mode	**OFF** Autoneg-Mode	**OFF** Autoneg-Mode
2	**Local TP Port Low-Speed**	**ON (down)** 10Mbps, only	**OFF** 10/100Mbps	**OFF** 10/100Mbps	**OFF** 10/100Mbps	**OFF** 10/100Mbps
3	**Local TP Port Half-Duplex**	**OFF (up)** Full Duplex	**OFF (up)** Full Duplex	**OFF (up)** Full Duplex	**OFF (up)** Full Duplex	**OFF (up)** Full Duplex
4	**Disable Link fault pass through (LFP)**	**OFF (up)** LFP enabled	**OFF (up)** LFP enabled	**OFF (up)** LFP enabled	**OFF (up)** LFP enabled	**OFF (up)** LFP enabled
5	**Force Fiber Port to Half-Duplex**	**OFF (up)** FO FD	**OFF (up)** FO FD	**OFF (up)** FO FD	**OFF (up)** FO FD	**OFF (up)** FO FD

TP Port Force Mode

The TP port of EX100 can work at auto mode or force mode. The following table shows all of the combination of its TP port.

{ Local TP Port Forced, Local TP Port Low-Speed, Local TP Port Half-Duplex}	EDX100's link result / EDX100's capability	Link partner's capability							
		AN on				AN off			
		100F	100H	10F	10H	100F	100H	10F	10H
OFF, OFF, OFF	100/10M, Full/Half, AN on	100F	100H	10F	10H	100H	100H	10H	10H
OFF, OFF, ON	100/10M, Half, AN on	X	100H	X	10H	100H	100H	10H	10H
OFF, ON, OFF	10M, Full/Half, AN on	X	X	10F	10H	100H	100H	10H	10H
OFF, ON, ON	10M, Half, AN on	X	X	X	10H	100H	100H	10H	10H
ON, OFF, OFF	100M, Full, AN on	100F	X	X	X	100F	100F	X	X
ON, OFF, ON	100M, Half, AN on	X	100H	X	X	100H	100H	X	X
ON, ON, OFF	10M, Full, AN on	X	X	10F	X	X	X	10F	10F
ON, ON, ON	10M, Half, AN on	X	X	10H	X	X	X	10H	10H

Notes:

AN on: with auto-negotiation capability
AN off: without auto-negotiation capability
100F: 100M full duplex
100H: 100M half duplex
10F: 10M full duplex
10H: 10M half duplex

RJ45 Pinout (Female)
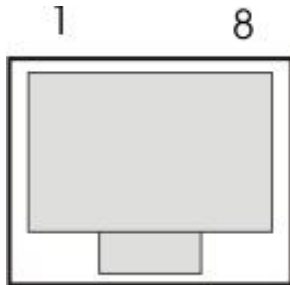
10/1000BaseTX port

acc.
EIA/TIA T568B

Supporting Auto-MDIX

Pin	Signal
1	RD+
2	RD-
3	TD+
4	-
5	-
6	TD-
7	-
8	-

Technical Data

Network I/F (WAN)

- 1x 100BaseFX, for all variants
  - IEEE 802.3
- VLAN support
- Different optical characters available:
- EDX100-L:
  - 1550nm SM, long haul, 29dB Budget, 80km
  - Connector: SC
- EDX100-S:
  - 1310nm SM, standard, 16dB Budget, 20km
  - Connector: ST
- EDX100-M:
  - 1310nm MM, standard, 2km
  - Connector: ST
- EDX100-A:
  - TX: 1310nm SM, RX: 1550nm
  - standard, 40km
  - Connector: ST
- EDX100-B:
  - TX: 1550nm SM, RX: 1310nm
  - standard, 40km
  - Connector: ST
- EDX100-SFP:
  - Pluggable SFP modules
  - Connector: SFP

Service I/F (LAN)

- 1x 10/100BaseT
  - IEEE 802.3
  - Auto-Negotiation
  - Auto MDIX
  - Connector: RJ-45

Features

- Link Pass Through Capability
- Easy Configuration via DIP-switches
- Plug-n-Play installation
- Low power consumption
- Support of Jumbo Frames
- Support of VLAN-tagged traffic
- LEDs on front to indicate status
- MTU: 1600 Bytes

Environmental

- Operating: +5 to +40°C (ETS300019-1-3; class3.1)
- Transport: -25 to +70°C (ETS300019-1-2; class2.2)
- Storage: -25 to +55°C (ETS300019-1-1; class1.2)
- Humidity: 10 to 90%, non-condensing
- Safety-Norm: acc. to EN60950
- EMC
- Emission: EN55022 class B
- Immunity: EN61000-4-3   10V/m

Power

- Supply Voltage: +5VDC (4,8 to 5,2 V) from BP
- Power Consumption: < 4VA, over current protected
- Voltage/Lightning Protection: ITU-T K20/K21
- Power supply via system rack SRX or housing SHX

Physical

- Weight: < 200g
- Dimensions:
  - 130mm H x 30mm W x 190mm D
  - 45mm H x 145mm W x 260mm D (in SHX3)
- 19" rack: 10 slots available in 3U rack

General Safety Precautions

Transport, Installation and Operation

- Avoid excessive vibration and shocks.
- Avoid contact with water, dust, and dirt.
- Avoid excessive direct sunlight.
- Ensure sufficient cooling.
- Prevent loose items from falling into the device.

Fiber Optics

- Looking into the fiber optic output can cause injury to the eye. When observation is necessary, precaution must be taken to avoid exceeding the limits recommended in ANSI Z136.1-1981.
- Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous laser light exposure.

Impressum

arcutronix GmbH

Garbsener Landstr. 10	Phone:	+49 (511) 277 2700	Sales-Contact:	sales@arcutronix.com
30419 Hannover	Fax:	+49 (511) 277 2709	Technical-Support:	service@arcutronix.com
Germany	Web:	www.arcutronix.com		