



USB Interface+ User Manual

This documentation describes the Easyton USB Interface+
in the versions with
EIA-485 ((P.V10303) and with TF/FT (P.V10306) interface

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This manual ...

... provides you with all the information which you will require to use the Easylon[®] USB Interface⁺.

However, this manual will neither explain aspects of Echelon's[®] LONWORKS[®] technology, nor details of the ISO/IEC 14908 standard on which this product is based. Details concerning the interface network driver, which has been designed in accordance with the driver specifications of Echelon Corporation and above named standard, are not part of this documentation. For further information on the LONWORKS technology please refer to the extensive documentation provided by Echelon. Especially Echelon's "LONWORKS Host Application Programmer's Guide" will be required if applications are to be developed using Gesytec's Easy-lon Interfaces as a network interface.

After a general presentation of the Easylon USB Interface⁺ in Chapter 1, Chapter 2 describes the necessary steps to install the module.

Chapter 3 contains a general technical description.

Chapter 4 provides some information on the usage of the Interface⁺ as virtual network node (MIP).

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1

Product Information



Figure 1-1 Easylon USB Interface⁺ TP/FT and EIA-485

1.1 Variants

The following variants of the Easylon USB Interface+ are available.

Order code	LON interface	Hardware Type ID	
P.V10303	EIA-485	LVU2.DAA.n	
P,V10306	TP/FT with FT-X2	LVU2.FAAn.n	

1.2 Scope of Delivery

- PC plug-in card
- Mounting instruction
- USB cable
- Installation and documentation disk (CD-ROM) with
 - network drivers for 32 bit and 64 bit versions of Windows XP, Vista, 7, 8, 10, Server 2003, 2008, 2008 R2, 2012 sowie für Long-Term Linux Kernel ab 2.6.32, 3.2, 3.4, 3.10, in source code under GPL
 - Easylon RNI Software for remote LONWORKS access
 - EasyCheck utility for Easylon Interfaces
 - WLDV32.DLL
 - Documentation

1.3 Overview

The Easylyon USB Interface⁺ is a network interface link between a personal computer with USB and a control network following the ISO/IEC 14908 standard or the LONWORKS specifications. There are versions with TP/FT-10 or EIA-485 interface available to connect to the respective networks.

As an Easylyon Interface⁺ the network interface provides up to eight logical driver interfaces thus realizing the parallel access of several applications to the network either in MIP or LNS compatible mode.

1.3.1 Network Side

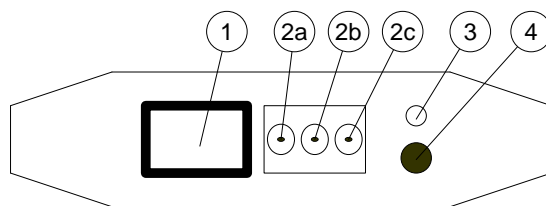


Figure 1-2 Network side connectors and LEDs

- (1) RJ-45 (pins 1 and 2: network, 7 shield)
- (2) screw-plug terminal
- (2a) shield, (2b) and (2c) network
- (3) status LED (yellow)
- (4) service button

The Easylyon USB Interface⁺ is provided with a service button and status LED. The module provides two connectors, either of which can be used:

- RJ-45 socket
- 3 pin screw-plug terminal

1.3.2 USB Side

Significant feature on the USB side is the USB socket. The red and green LED next to it indicate the following:

Green	blinking: in normal operation
Red	blinking: firmware is loaded
	ON: error, e.g. after reset

If both LEDs are off, the module is out of operation

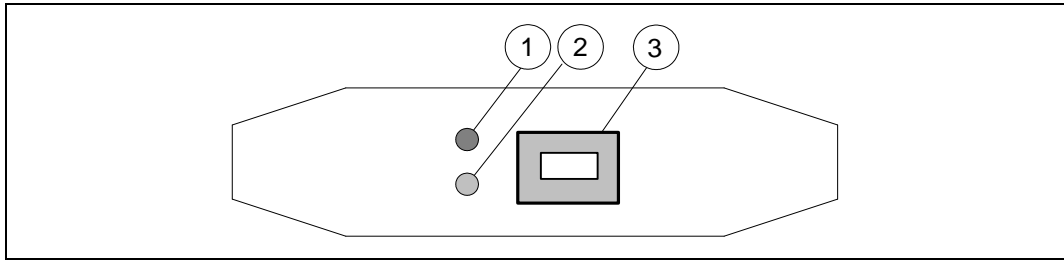


Figure 1-3 USB side connectors and LEDs

- (1) error LED (red)
- (2) status LED (green)
- (3) USB socket

1.3.3 VNI (Virtual Network Interface)

With VNI Echelon defined a transparent mode of operation for LonWorks interfaces. In this mode LonTalk packets are not preprocessed on the interface device, but the PC realizes the complete network access. Thus the applications running on the PC receives and sends the messages. VNI interfaces overcome several limitations of the conventional interfaces using MIP or NSI firmware. For instance they offer an increased performance. EasyLon Interfaces⁺ are compatible with the Echelon VNI interfaces and can be used with LNS based software such as LonMaker for Windows without problems.

1.3.4 MIP

The Neuron Chip used on the conventional network interface requires a firmware to realize the interface functionality. The de facto standard was the MIP firmware. Many applications still use the functionality of this firmware, which realizes layers 3–5 of the LonTalk protocol, namely network, transport and session. Using the drivers of the EasyLon VNI Interfaces (Interface⁺) up to 8 logical MIP interfaces can be used with one interface card, i.e. an EasyLon VNI Interface replaces 8 standard MIP interface cards.

2

Installation

Please check the delivered items. You must find the Easylon USB Interface⁺, an USB connector cable and an installation CD, also containing the documentation.

2.1 Hardware Installation

Connect the USB socket of the Interface module to an USB port of the PC using the cable delivered with the device (cf. Figure 1-3, (3)). Connectors can be identified by the sticker at the device bottom..



Figure 2-1 USB rear side, TP/FT version



Figure 2-2 USB rear side, EIA-485 version

After installing the drivers as described in the chapter below, connect the USB device to the LonWorks network using either the RJ45 jack or the 3 pin screw plug connector which can be used alternatively (cf. Figure 1-2, (1), (2)).

2.2 Driver Installation

Drivers for different Windows operating systems are available for the Easyton Interfaces⁺. Currently these are Windows 2000, XP, Vista, 7, 8 and 10, and the Windows Server OS 2003, 2008 und 2008 R2, 2012. The drivers support both, the 32 and the 64 bit version of these operating systems. Latest driver versions you can download from our web site: www.gesytec.com

A Linux driver is available from the “Drivers & Documentation” CD in source code.

Installation of the Windows drivers is described in the following sections:

Windows operating systems chapter 2.2.1.

16-bit driver under 32-bit Windows chapter 2.2.2

This section also describes in short the diagnosis utility “EasyCheck” which can be installed separately from CD.

The “Driver & Documentation” CD will lead you to the installation of drivers for different operating systems (OS). However, all setups can as well be started manually for each OS and the respective interface card directly from the CD.

2.2.1 Driver for Windows Operating System (WDM Drivers)

This section describes installation and setup of the Easyton Interface card drivers for the Windows operating system from Windows XP onwards.

The setup program is using the same WDM driver (Windows Driver Model) for all operating systems.

Note: For installation you can either use the Windows assistant or the program FastUpd.exe for manual installation. The latter is especially helpful if you are running Windows 7 and later or have to install several instances of the driver.

Finally de-installation of the driver is explained

2.2.1.1 Installation using the Windows Assistant

After the Easyton Interface has been mounted Windows will recognize the new device and start the hardware assistant.

If Windows should not find the driver on the “Drivers & Documentation” CD or the driver should be elsewhere, please select manually the appropriate drive and select the setup file “LvXLvu.inf” and the driver “Gesytec Lvuwdm Driver” from the “LvXLvu“ directory.

2.2.1.2 Manual Installation and Update

The easiest way to install the driver is to ignore the hardware assistant and run

FastUpd.exe or **FastUpd64.exe**¹

from the „LvxLvu“ folder of the CD-ROM.

The same program you will use to update an existing driver.

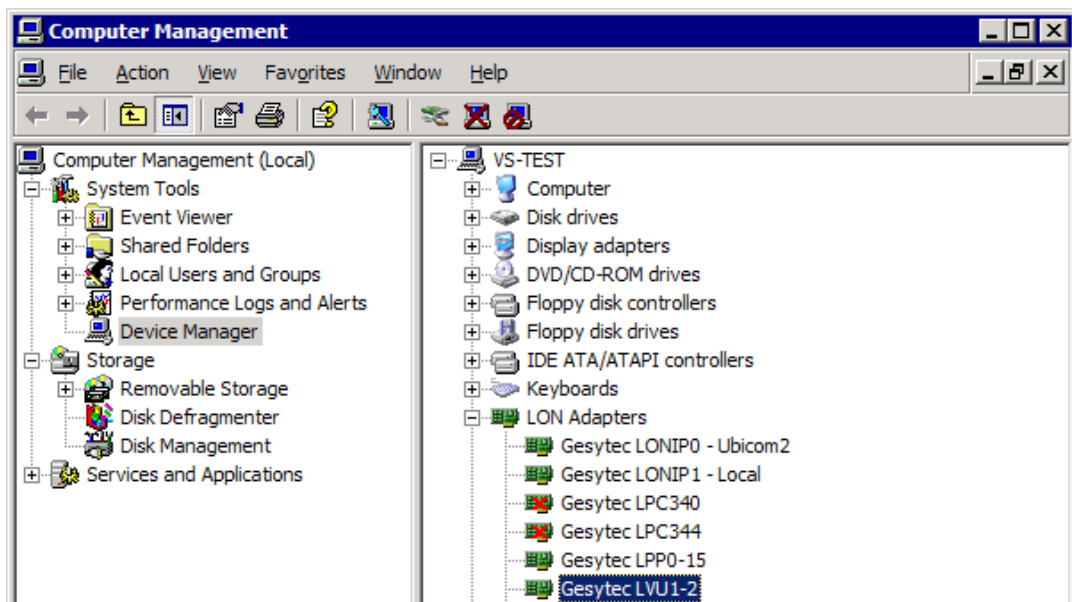
2.2.1.3 Driver Instances

The driver consists of a basic part for the interface hardware “LVU_{x-y}”² and of up to eight logical VNI drivers „LVU_{x-y-Vniz}“ and up to eight logical MIP drivers „LVU_{x-y-Mipz}“. These driver instances can be used like independent network interfaces.

For each logical driver instance an individual node-id (unique identification corresponding to the Neuron-ID) is used. VNI and MIP drivers with the last digit *z* will be assigned the same node-id. There is a maximum of 8 node-id available for each interface device.

2.2.1.4 Parameter Setting

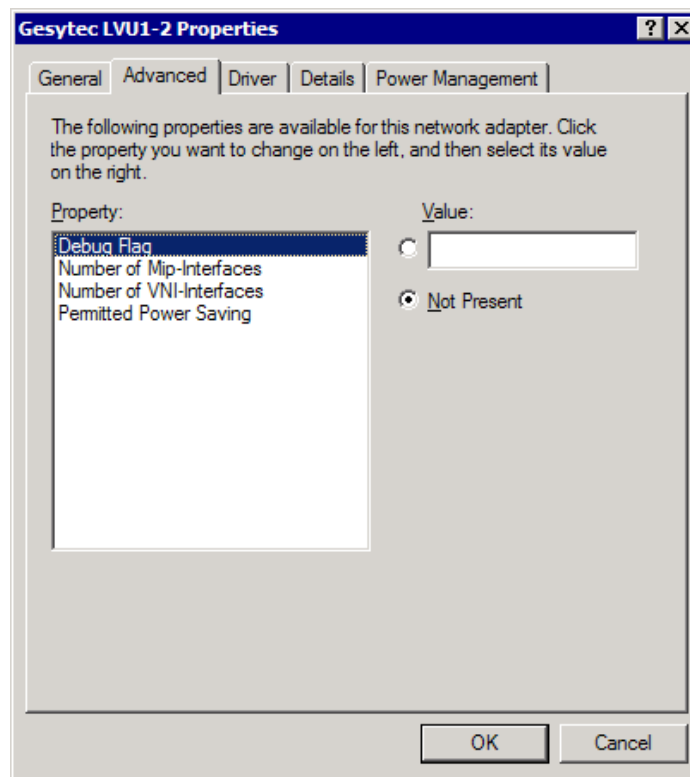
Settings for the Easylon VNI Interfaces can be parameterized in the Device Manager. Select the respective interface board under LON Adapters and modify the settings.



¹ For 64-bit systems

² x is designating the number of the USB host controller and y the port. If external hubs have been cascaded the respective port numbers are given as well.

The „Advanced“ TAB allows setting of individual properties. Parameters for interface device.



Debug Flag

This field contains a DWORD in hexadecimal notation of different flags for debug purposes. Usually it is set to 0 (= not existing). By setting the single bits certain debug features can be turned on. At the moment the bits 1 and 3 are used:

- Bit 1: Telegrams at the interface between PC and interface hardware are displayed in the debug output.
- Bit 3: CREATE and CLOSE of the driver are displayed in the debug output.

NOTE: The Debug Output can be displayed using, for example, the program DebugView, available at www.sysinternals.com.

Number of MIP -Interfaces

The number of virtual MIP-Interfaces can be set here (0 – 8, default = 2).

Number of VNI-Interfaces

The number of virtual VNI-Interfaces (Interfaces⁺) can be set here (0 – 8, default = 1).

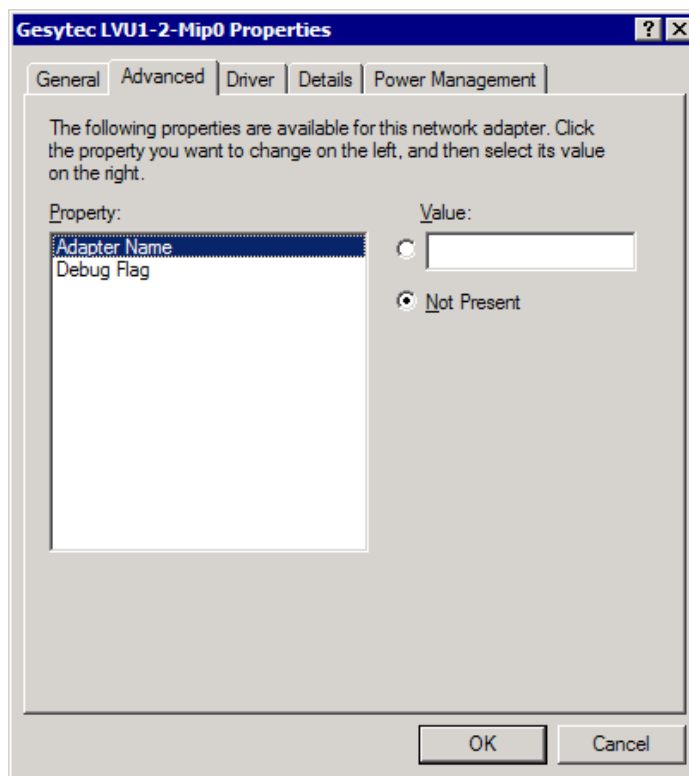
ATTENTION There are 8 node-IDs available for each interface device. These have to be assigned appropriately to the applications using the device either as VNI or as a MIP interface. If, for example, a VNI application is using the instance LVUx-y-Vni0 with its corresponding node-id, a MIP application must not use the instance LVUx-y-Mip0.

VNI applications (e.g. LNS) usually generate a node-id of their own, which will then be additional to the 8 standard node-id belonging to the interface device.

Permitted Power Saving

Usually the LON USB adapter allows a standby mode with applications running (Standby). At certain conditions however, (e.g. LON USB adapter using a hub under Windows 2000) the current supply to the USB adapter will be shortly interrupted during return from the standby mode by the hub. Under such conditions the standby mode must be turned off (None).

Parameters for logical instance



Adapter Name

An arbitrary name can be chosen freely (e.g. building 7).

NOTE This name must not be used by another instance. If the name is already in use, the device will not start (code 10).

Debug Flag

This field contains a DWORD in hexadecimal notation of different flags for debug purposes. Usually it is set to 0 (= not existing). By setting the single bits certain debug features can be turned on. At the moment the bits 0, 1 and 3 are used:

- Bit 0: LON telegrams at the interface from and to the application are displayed in the debug output.
- Bit 1: Telegrams at the interface between PC and interface hardware are displayed in the debug output.
- Bit 3: CREATE and CLOSE of the driver are displayed in the debug output.

2.2.1.5 De installation

WDM drivers are de installed using the “Device Manager”. Among “LON Adapters” select the “Gesyttec LVUx-yy” driver and click “de-install”.

2.2.2 Windows and 16 Bit Applications

The Windows driver for the 32 bit Windows versions also provides a 16 bit interface. (Unfortunately Microsoft does not support this in the 64 bit versions.) To use it, the following entry has to be made in the file „config.nt“, usually found in the windows\system32 directory:

```
Device=%SystemRoot%\system32\lpxdos.exe -Llvu1-2-Mip0
```

The 32 bit LON device used is specified by the optional -L or /L parameter:

```
//Lname
```

name =

```
lvu1-2-Mip0          for device LVU at USB host controller 1 and
                    with port number 2 at USB root hub
```

Note: Two subsequent “l” characters have to be entered, one indicating the parameter -L, the second as first character of the name: -Llxxxx

The 16 bit LON device used is specified by the following optional parameter:

```
/Dn
```

with n = 1...9 for LON1 to LON9

Without this parameter, the interface will be assigned the first unused name starting with “LON1”.

2.2.3 EasyCheck – Test Utility for Windows Drivers

In addition to the drivers, the test utility “EasyCheck” can be installed in the respective program directory (default: : \Easylon\Lpx). The program checks interface and software environment and displays information, from which can be concluded on the reasons for problems in connection with the interface.

EasyCheck runs an analysis of the system’s software. It will open the selected interface, check the driver version and display it. By sending a “query status” command the communication with the hardware is tested. Using the “read memory” command the utility will show if the device is running MIP or NSI firmware. Properly installed Easylon Interfaces will send a corresponding answer.

3 Technical Description

3.1 Network Interface

Easylon Interface+ cards are using an FPGA for accessing the control network. The programming is loaded at start up. 512 kbytes RAM are available to the FPGA as network buffer for transmit and receive. For use in protocol analysis each packet received is transmitted to the application with timestamp of 1 ms accuracy. The FPGA is connected to the computer bus.

The network interface of the Easylon Interface+ is compliant with ISO/IEC 14908. Eight node-ids are available on the interface for identification within the control network (cf. “ Driver Instances”). The interface status is signaled by a status LED. The Service push button is read by the driver software.

3.2 USB Interface

The Easylon USB Interface+ has been developed according to USB 2.0 standard, high speed. It can as well operate at USB 1.1 interfaces.

3.3 Connector Pin Assignment

For network connection the Easylon USB Interface+ provides a RJ45 jack and a 3 pin screw-plug terminal, which can be used alternatively. Pin assignment is shown in the below.

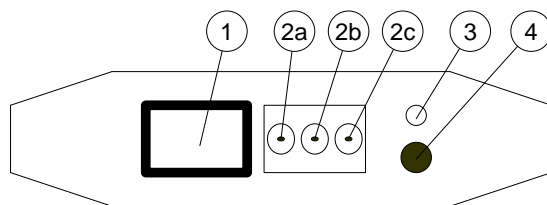


Figure 3-1 Connectors on network side

- (1) RJ-45 (pins 1 and 2: network, 7 shield)
- (2) screw-plug terminal
- (2a) shield, (2b) and (2c) network
- (3) status LED (yellow)
- (4) service button

3.4 Status LED

On its USB side the module shows a red error and a green status LED.

Green	blinking: in normal operation
Red	blinking: firmware is loaded ON: error, e.g. after reset

If both LEDs are off, the module is out of operation

The status LED at the network side (Figure 1-2, 3) signals network traffic.

3.5 Technical Specification

Network Interface

Type	ISO/IEC 14908 compliant control network interface
Node ID	in EEPROM
Transceiver	TP/FT-10 with TP-FX2, 78 kBit/s, for Free Topology and Link Power networks or EIA-485, 39,62 kBit/s to 1,25 Mbit/s, galvanically isolated from system ground
Connectors	- RJ 45 - 3 pin screw plug terminal, 0.5–2.5 mm ²

USB Interface

Connector	USB socket (type B)
Power Supply	5 V, from USB port
Power Consumption	100 mA typically

Temperature

operation	0 °C – 50 °C
storage	0 °C – 50 °C

Humidity	according to DIN 40040, class F
----------	---------------------------------

Dimensions

Dimensions	128 * 71 * 23 [mm]
------------	--------------------

Weight

Weight	135 g
--------	-------

EMC

Immunity	EN 55 024
Emission	EN 55 022 B

4 Programming Information

4.1 LONWORKS Network Node

Being an IEC14908 compatible interface device the Easylon Interface⁺ card can be used as a network node in a LONWORKS network. The Interface⁺ can realize one or more virtual MIP interfaces. As the external interface file (.xif) required for using the device as a network node can only be created for a specific application an example .xif file is provided. This must be adapted with the XIF editor prior to usage. The file can be found on the “Drivers & Documentation” CD.

Network Interface	Transmission Rate	XIF –File
TP/FT for virtual MIP interfaces	78 kbps	lolv075f.xif

Table 4-1 Network access and .xif files

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