The Synchronization Experts.

MANUAL

IMS-LNE-GBE-SFP Setup Guide

Hot-Plug Module

November 30, 2023

Meinberg Funkuhren GmbH & Co. KG

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1 Imprint

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2 Copyright and Liability Exclusion

3 Important Safety Information

Please ensure that IMS modules designed for "hot-plugging" (modules that are removable and insertable while a system is in operation) are always handled with the utmost care.

Before performing any maintenance work on the system:

- We recommend making a backup of any stored configurations (e.g. using a USB flash drive or from the Web UI)
- Take note of the chapter "Prevention of ESD Damage".
- Take note of the chapter "Power Supply".

3.1 Product Documentation

Detailed product documentation is provided on a USB flash drive delivered with the Meinberg system. The manuals can also be downloaded from the Meinberg website at https://www.meinbergglobal.com, where you can enter your system name into the search box at the top of the page to find the relevant manual. Alternatively, contact Meinberg Support for further assistance.

The "Docs & Support" menu on the Web Interface also provides user manuals for time server administrators.

This manual contains important safety instructions for the installation and operation of the device. Please read this manual thoroughly before using the device.

This device may only be used for the purpose described in this manual. In particular, the specified operating limits of the device must be heeded. The person setting up the device is responsible for safety matters in relation to any larger system in which the device is installed!

Failure to observe these instructions may have an adverse impact on device safety!

Please keep this manual in a safe place.

Target Readership

This manual is only intended to be used by qualified electricians, or by persons who have been appropriately instructed by a qualified electrician and who are familiar with applicable national standards and with safety rules & regulations. This device may only be installed, set up, and operated by qualified personnel.

3.2 Prevention of ESD Damage

ATTENTION!

An ESDS device (electrostatic discharge-sensitive device) is any device at risk of damage or malfunction due to electrostatic discharges (ESD) and thus requires special measures to prevent such damage or malfunction. Systems and modules with ESDS devices usually bear the following symbol:

Symbol Indicating Devices with ESDS Components

The following measures will help to protect ESDS components from damage and malfunction.

When preparing to dismantle or install devices:
Ground your body (for example, by touching a grounded object) before touching sensitive devices.

Ensure that you wear a grounding strap on your wrist when handling such devices. These straps must in turn be attached to an uncoated, non-conductive metal part of the system.

Use only tools and devices that are free of static electricity.

When transporting devices:
Devices must only be touched or held by the edges. Never touch any pins or conductors on the device.

When dismantling or installing devices:
Avoid coming into contact with persons who are not grounded. Such contact may compromise your connection with the earth conductor and thus also compromise the device's protection from any static charges you may be carrying.

When storing devices:
Always store devices in ESD-proof ("antistatic") bags. These bags must not be damaged in any way. ESD-proof bags that are crumpled or have holes cannot provide effective protection against electrostatic discharges.

ESD-proof bags must have a sufficient electrical resistance and must not be made of conductive metals if the device has a lithium battery fitted on it.

3.3 Power Supply

WARNING!

The IMS system in which the module is used is operated at a dangerous voltage. Please refer to your IMS Manual for more information about safety.

When removing a hot-pluggable power supply unit, always disconnect its power cable before removing it from the IMS system.

Never open a power supply unit—there may still be hazardous residual voltages present even after disconnection from the mains supply. In the event that a power supply unit is no longer working (e.g. defective), please return it to Meinberg for repair.

Failure to observe these safety instructions may result in serious injury and/or property damage. The IMS system must only be installed, set up, and operated by qualified personnel.

3.4 Cabling

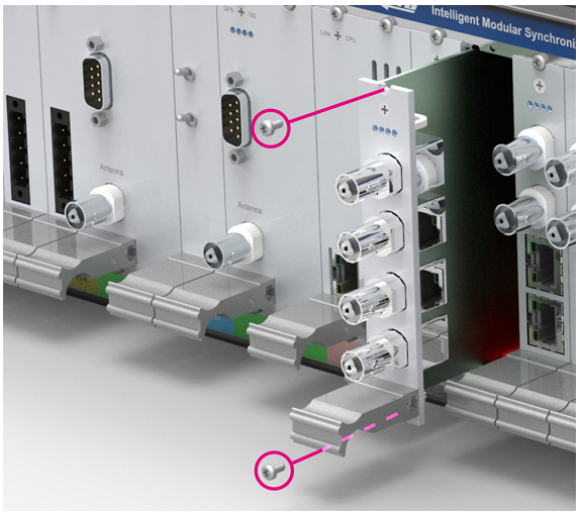
WARNING!

Danger of death from electric shock! Never work on cables while the power is live! Always disconnect the cables from the devices at **both** ends before working on the plugs and terminals of connected cables!

4 Replacement or Installation of a Hot-pluggable IMS Module

If the system is supplied with an antenna and antenna cable, it is advisable to first mount the antenna in a suitable location (see chapter Antenna Mounting) and lay the antenna cable.

Please use a Torx screwdriver (T8 x 60) for removal and installation of the module.



1. Follow the safety instructions at the beginning of this manual!

2. Remove the two marked Torx screws from the module holder plate or the cover plate of the empty slot.

3. **Note when removing!**
   Pull the module carefully out of the guide rail. Note that the module is firmly anchored in the connector block of the housing. You need a certain amount of force to release the module from this link. Once the connection to the connector block of the system's backplane is loosened, the module can be easily pulled out.

4. **Note during installation!**
   Please ensure that the module is correctly inserted into the two guide rails of the system housing as otherwise damage to the module and the housing could be caused. Make sure that the module is securely locked into the connector block before you fasten the two screws.

5. Now you can put the installed module into operation.

Attachment points of an 1U IMS system

4.1 Important Information Regarding Hot-Pluggable IMS Modules

The following information should be strictly observed when replacing IMS modules during operation. Not all IMS modules are fully hot-pluggable. For example, it is naturally not possible to replace a power supply unit in a system without PSU redundancy without first having installed a second power supply unit while the system is in operation.

The following rules apply for the individual IMS slots:

PWR Slot:	"Hot-Swappable"	If you operate your system with only one power supply unit, a second power supply unit must be installed before removing or replacing it in order to keep your system operational.
I/O, ESI, and MRI Slots:	"Hot-Pluggable"	
CLK1, CLK2 Slots:	"Hot-Pluggable"	When a clock module is replaced or installed, it is important to rescan the reference clocks ("Rescan Refclocks") in the "System" menu of the Web Interface.
RSC/SPT Slots:	"Hot-Pluggable"	It will not be possible for your IMS system to switch between signal generators while the RSC/SPT is not installed.
CPU Slot:	"Not Hot-Pluggable"	Before the CPU is removed, the IMS system must be powered down. Please note that after powering on and rebooting the LANTIME Operating System, the configuration of some IMS modules may be reset to factory defaults!

Information:

The NTP service and access to the web interface will be unavailable while the CPU is not installed. Management and monitoring functions will also be disabled.

5 LNE-GbE-SFP: Network Expansion with Gigabit Support for IMS Systems

Key Features
- Four additional Network Ports
- Status LEDs
- Connector Type: SFP
- For longer distances: Singlemode Fiber: e.g. LX - 1310 nm (for distances up to 10 km)

Additional Network Interfaces Card with Gigabit Support and Fiber Optical Connectors
The module LNE-GbE-SFP extends a LANTIME NTP time server (IMS Systems) with four additional network connections. The additional ports can be used to provide time synchronization to additional separate networks or - by using a feature called "bonding" - to configure redundant network connections.

Characteristics

Interface:	SFP	
Duplex Modes:	Half/Full/Autonegotiaton	
Link speed:	Electrical:	1000 Base-T
	Fiber Optic	1000-FX
Cable:	Copper Twisted Pair:	e.g. CAT 5.0
	Multimode Fiber:	GI 50/125 μm or GI 62,5/125 μm gradient fiber
	Singlemode Fiber:	E9/125 μm monomode fiber
Electrical Connectors:	96-pin VG-rail DIN 41612 (IEC 60603-2)	
Board type:	Eurocard	
Ambient Temperature:	0 ... 50° C / 32 ... 122° F	
Humidity:	Max. 85%	

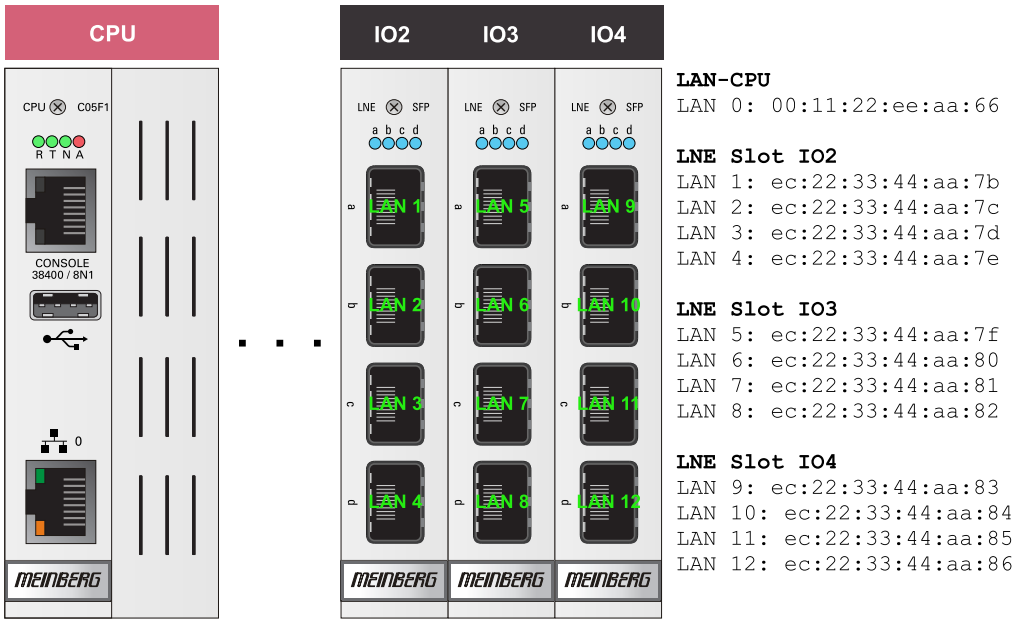
LED Indicators

LED St:	Init	lights blue during initialisation
LED In - LED B:	Shows the state of the four LAN ports after initialisation	
	green	normal operation
	red	defective LAN port

Recommended and tested Transceivers from other Vendors

MULTI MODE:	AVAGO AFBR-5710PZ FINISAR FTLF8524P3BNL CISCO GLC-SX-MMD
SINGLE MODE:	AVAGO AFCT-5710PZ FINISAR FTLF1318P3BTL SMARTOPTICS SO-SFP-L120D-C63
RJ-45:	AVAGO ABCU-5740RZ FINISAR FCLF8521P2BTL

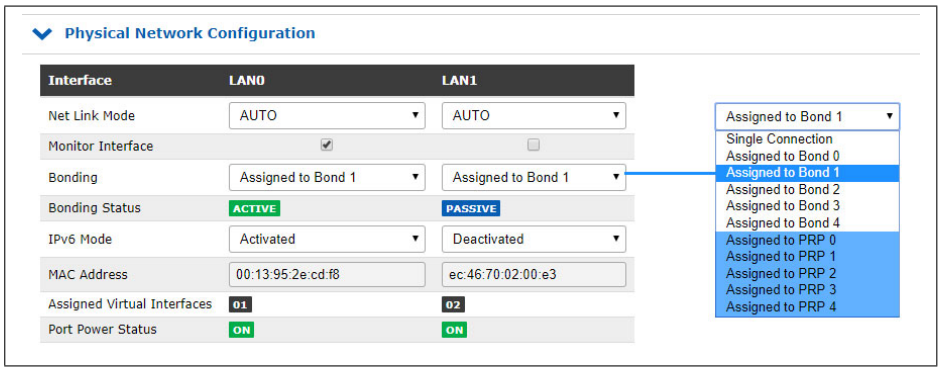
LAN interface alignment with several LNE modules in operation:
Basically, the physical network ports are assigned according to the MAC address order. Thus, the uppermost interface on a LNE module has the lowest and the bottommost interface has the highest MAC address, respectively. Let's take an example where three LNE modules are inserted in a device. Then the logical order of network interfaces assigned in a webinterface follows the MAC address order of LNE modules, disregarding the I/O slot order by which the modules are inserted.



In a factory assembling, LNE modules are sorted in an ascending order starting from left to right (see the corresponding figure above). LAN 0 is therefore always the first network interface of the LAN-CPU.

5.1 LNE-GBE Configuration via the Web Interface

If the LNE-GBE operates in an LANTIME system, all network settings can be configured via the web interface then.



Physical Network Configuration

Net Link Mode: The network interfaces LAN1 - LAN4 (LNE-GBE) can be used in 1000 MBIT HALF / FULL duplex mode.

Indicate Link: LED indication for the selected physical interface, only if a front display with function keys is available.

Bonding: to optimize the reliability and the use of a of higher bandwith.

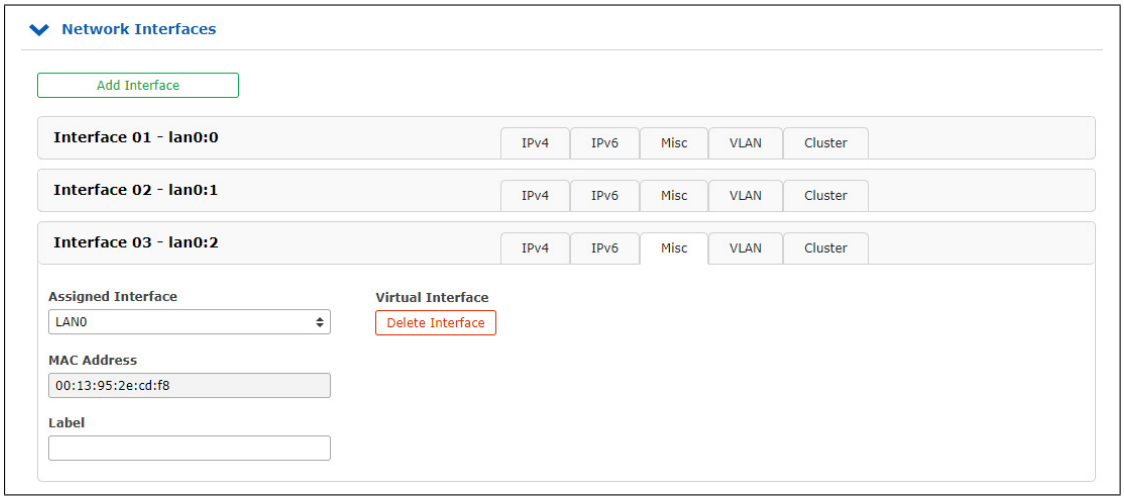
PRP: As of LANTIME firmware version 7.0, PRP can also be conveniently set via the web interface menu "Network → Physical Network Configuration". Select the same PRP group for at least two interfaces in the drop-down menu "Bonding".

IPv6 Mode: This mode must be activated here.

MAC-Address: Displays the unique MAC address of the physical interface.

Assigned Virtual Interfaces: In the Ethernet Interfaces menu (see below) virtual network interfaces can be added.

Menu Interfaces



IPv4: Manually adjustment of all important parameters such as TCP / IP address, subnet mask and gateway. The DHCP client can also be activated here for automatic network configurations.

Misc: With the tab Misc the virtual interface can be assigned to a physical interface.

VLAN: With VLAN, this function can be enabled and configured.

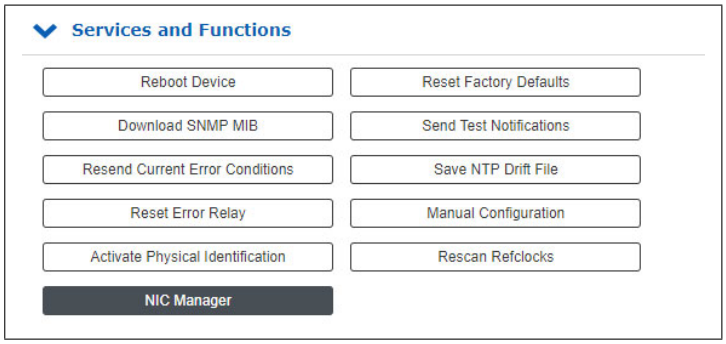
Cluster: The cluster function can be activated with this submenu and additional Parameters such as multicast or unicast mode, TCP / IP address and subnet mask can be set up here.

5.2 Adding / Removing an LANTIME Network Extension LNE

An LNE module can be installed in each MRI/ESI or IO Slot of a LANTIME IMS device.

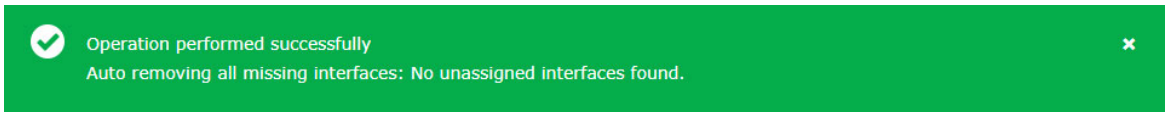
Adding a LANTIME Network Extension

After installing the LNE module, please start the web interface. In the menu "System → Services and Functions" press the button **NIC Manager** then . With this function you add all new physical network interfaces to the system's network configuration. Now it is ensured that the IMS module is correctly installed and recognized by the system.



Remove a LANTIME Network Extension LNE

To remove a LNE network extension from the LANTIME system, the card must first be removed. However, the removed LNE interfaces are still listed in the network configuration. The "NIC Manager" can be used to update the network configuration in this case as well.



After successfully running the "NIC Manager", only the actually existing interfaces are displayed in the web interface. A system restart is not necessary.

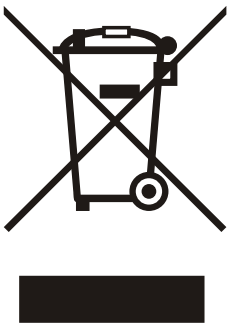
6 RoHS and WEEE

Compliance with EU Directive 2011/65/EU (RoHS)

We hereby declare that this product is compliant with the European Union Directive 2011/65/EU and its delegated directive 2015/863/EU "Restrictions of Hazardous Substances in Electrical and Electronic Equipment" and that no impermissible substances are present in our products pursuant to these Directives. We warrant that our electrical and electronic products sold in the EU do not contain lead, cadmium, mercury, hexavalent chromium, polybrominated biphenyls (PBBs), polybrominated diphenyl ethers (PBDEs), bis(2-ethylhexyl)phthalat (DEHP), benzyl butyl phthalate (BBP), dibutyl phthalate (DBP), or diisobutyl phthalate (DIBP) above the legal limits.

WEEE Status of the Product

This product is handled as a B2B (Business to Business) category product. To ensure that the product is disposed of in a WEEE-compliant fashion, it may be returned to the manufacturer. In this case, the shipping costs are to be borne by the customer, while Meinberg will cover the costs for disposal.



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