



The Synchronization Experts.



MANUAL

IMS LSG180 Setup Guide

Hot-Plug Module

November 29, 2023

Meinberg Funkuhren GmbH & Co. KG

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1 Imprint

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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 Before You Start

4.1 Contents of Delivery

Unpack the IMS LSG180 and all accessories carefully and check the contents of the delivery against the enclosed packing list to ensure that no parts are missing. If any of the listed items are missing, please contact our Sales Department at sales@meinberg.de.

Check that the product has not been damaged in transit. If the product is damaged or fails to operate upon installation, please contact Meinberg immediately. Only the recipient (the person or company receiving the system) may file claims or complaints against the forwarder for damage caused in transit.

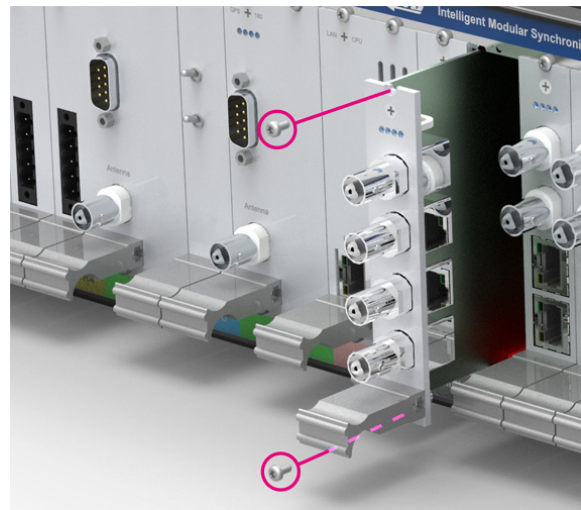
Meinberg recommends that you keep the original packaging materials in case the product needs to be shipped or transported again at a later date.

5 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

5.1 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:	" <u>Not</u> 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.

6 LSG180-2D (LSG180-4D)

Backplane Port Expander (Eurocard)

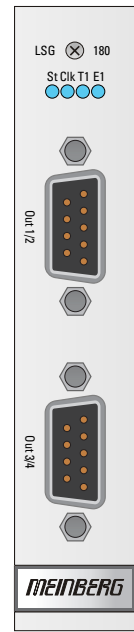
Output Signals: Fixed Output Signals: 4 x BITS
2,048 kBit/s (E1-mode) or
1,544 kBit/s (T1-mode),
120 Ω balanced
2 x 9pin D-SUB female connector

Current Consumption: 5 V \pm 5%, 750 mA

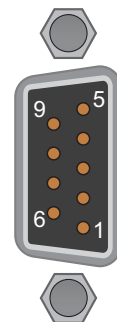
Status Indicators

St:	Status	blue during initialisation, green in normal operation mode
T1:	green	selected mode T1
	red:	output disabled
	yellow:	signal quality unknown
E1:	green	selected mode E1
	red:	output disabled
	yellow:	signal quality unknown

Figure right: LSG180-2D and LSG180-4D



Pin Assignment:	LSG-2D + 4D	LSG-4D
Connector A 1/2	Pin 1: TRing - 1 Pin 2: TTip - 1 Pin 8: TRing - 2 Pin 9: TTip - 2	Connector A 5/6 Pin 1: TRing - 5 Pin 2: TTip - 5 Pin 8: TRing - 6 Pin 9: TTip - 6
Connector B 3/4	Pin 1: TRing - 3 Pin 2: TTip - 3 Pin 8: TRing - 4 Pin 9: TTip - 4	Connector B 7/8 Pin 1: TRing - 7 Pin 2: TRing - 7 Pin 8: TRing - 8 Pin 9: TTip - 8



7 LSG180-A

Backplane Port Expander (Eurocard)

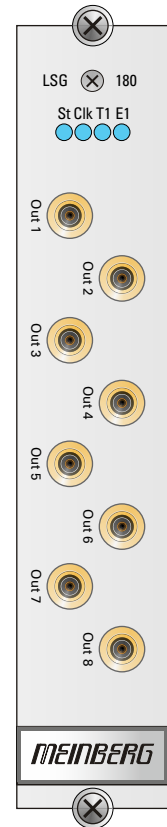
Output Signals: Fixed Output Signals: 8x BITS
 2,048 kBit/s (E1-mode) or
 1,544 kBit/s (T1-mode),
 75 Ω unbalanced
 6x DIN 1.0/2.3 coax connectors

Current Consumption: 5 V +-5%, 750 mA

Status Indicators

St:	Status	blue during initialisation, green in normal operation mode
T1:	green:	selected mode T1
	red:	output disabled
	yellow:	signal quality unknown
E1:	green:	selected mode E1
	red:	output disabled
	yellow:	signal quality unknown

Figure right: LSG180-A



8 LSG Configuration via the Web Interface

All settings for the LSG module can be made via the web interface in the menu "IO Config → Configuration of the outputs → LSG - Line Signal Generator".

Setting for Output 1:

The signal type is adjusted fixed on BITS, the format can be selected between E1 and T1. In addition, the Sa bit group can be adjusted.

The screenshot shows the configuration page for "LSG - Line Signal Generator 1 [Chassis 0, Slot ES12]" with the "Output 1" tab selected. The "Output Type" is set to "BITS Out". The "Format" dropdown is open, showing three options: "E1: 2048MBits/s / 2.048MHz" (selected), "E1: 2048MBits/s / 2.048MHz", and "T1: 1.544 MBits/s / 1.544MHz E1 timing". The "Sa Bits Group" dropdown is also open, showing options "Sa4" (selected), "Sa5", "Sa6", "Sa7", and "Sa8". The "Label" field contains "test_rcg".

SettingS for the follower outputs:

All settings for the other outputs on the LSG card are set via output 1.

T1 or E1?

T1 is a digital carrier signal that transmits the DS - 1 signal. It has a data rate of about 1.544 Mbit/second. It contains 24 digital channels and therefore requires a device that has a digital connection.

E1 is the european equivalent to T1. T1 is the North American term whereas E1 is a European term for digital transmission. The data rate of E1 is about 2 Mbit/second. It has 32 channels at the speed of 64 Kbit/second. 2 channels among 32 are already reserved. One channel is used for signaling while the other is used for controlling. The difference between T1 and E1 lies in the number of channels here.

Sa Bits

ITU-T Recommendations allow for bits Sa4 to Sa8 to be used in specific point-to-point applications (e.g. transcoder equipment) within national borders. When these bits are not used and on links crossing an international border they should be set to 1.

The Sa4 bit may be used as a message-based data link for operation, maintenance and performance monitoring. The SSM Bit (Synchronization Status Message) can be selected in the Web GUI for clock quality information. Sa4 is selected as per default.

9 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". We ensure that 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. Any transportation expenses for returning this product (at end-of-life) must be covered by the end user, while Meinberg will bear the costs for the waste disposal itself.





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