



The Synchronization Experts.



SETUP GUIDE

IMS-REL1000

Hot-Plug Module

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Meinberg Funkuhren GmbH & Co. KG

Table of Contents

1 Imprint	1
2 Introduction	2
3 Important Safety Hints	3
3.1 Additional Safety Hints	4
3.2 Prevention of ESD Damage	5
3.3 Supply Voltage	6
3.4 Cabling	6
4 Front Connectors IMS-REL1000	7
4.1 IMS-REL1000 - Status LEDs	8
4.2 Error Relay	9
5 Before you start	10
5.1 Scope of Delivery	10
5.2 Disposal of Packaging Materials	11
5.3 Pre-selection	11
6 System Installation	12
6.1 Important Hints for hot-pluggable IMS Modules	12
6.2 Installation of hot-pluggable IMS modules.	13
6.3 Connecting the System	14
7 Configuration of the IMS-REL1000	15
7.1 Events	15
7.2 Setting relays manually	16
8 RoHS and WEEE	17

1 Imprint

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2 Introduction

This Setup Guide is a systematically structured guideline which supports you during the set-up of your Meinberg product.

The IMS-REL1000 is used as an error relay module that can be used to switch a variety of operating states (e.g. Clock Not Sync, Antenna Faulty, etc.). If the internal hardware clock is running synchronously to the reference source, the relay will switch to NO (Normaly Open) mode. In the event of an error, the relay will switch to NC (Normaly Closed) mode.

Functionality.

Depending on the IMS system, is redundant with two reference clocks and IMS-RSC module (switching unit) or with one reference clock and SPT module, different relay states can be switched. There is also the possibility to set the relays A + C by different events.

The LANTIME firmware manual provides a complete description of all configurations and status monitoring options of your Meinberg product.

Download LTOS7 Firmware manual:
<http://www.mbg.link/doce-fw-ltos>

Compatibility

The IMS-REL1000 is an IMS module that is compatible with the following systems of the IMS family. Furthermore the module can be used in the following slots.

Compatibility - IMS REL1000

IMS-Systems	M500	M1000	M1000 S	M2000 S	M3000	M3000 S	M4000
Compatible		☑	☑	☑	☑	☑	☑
IMS-Slot	MRI	ESI	I/O				
Applicable	☑	☑	☑				

3 Important Safety Hints



Please make sure that IMS modules that can be exchanged during operation are always handled with utmost care.

Before any maintenance work on the system:

- Backup of stored configurations is recommended (e.g. via USB stick or Web UI)
- Please note the chapter "Prevention of ESD damage".
- Please note the chapter "Supply voltage".

3.1 Additional Safety Hints



This manual contains important information for the installation and operation of this device as well as for your safety. Make sure to read carefully before installing and commissioning the device.

Certain operating conditions may require the observance of additional safety regulations not covered by this manual. Nonobservance of this manual will lead to a significant abatement of the security provided by this device. Security of the facility where this product is integrated lies in the responsibility of the installer.

The device must be used only for purpose named in this manual, any other use especially operation above the limits specified in this document is considered as improper use.

Keep all documents provided with the device for later reference.

This manual is exclusively for qualified electricians or by a qualified electrician trained personnel who are familiar with the applicable national standards and specifications, in particular for the construction of high voltage devices.

3.2 Prevention of ESD Damage



ATTENTION!

The designation ESD (Electrostatic Sensitive Devices) refers to measures which are used to protect electrostatically endangered components from electrostatic discharge and thus to prevent destruction. Systems and assemblies with electrostatically endangered components usually have the following characteristics:



Indicator for assemblies with electrostatic endangered components

The following measures protect electrostatically endangered components from destruction:

Prepare removal and installation of assemblies

Unload yourself (for example, by touching a grounded object) before touching assemblies.

Ensure that you wear a grounding strap on the wrist when working with such assemblies, which you attach to an unpainted, non-conductive metal part of the system.

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

Transporting Assemblies

Assemblies may only be touched at the edge. Do not touch any pins or conductors on assemblies.

Installing and Removing Assemblies

Do not touch persons who are not grounded while removing or installing components. This could result in a loss of grounding protection from your electrostatic discharge.

Storing Assemblies

Always keep assemblies in ESD protective covers. These protective covers must be undamaged. ESD protective covers, which are extremely wrinkled or even have holes, no longer protect against electrostatic discharge.

ESD protective covers must not be low-resistance and metallically conductive if a lithium battery is installed on the assembly.

3.3 Supply Voltage



WARNING!

The IMS system in which the module is used operates at a dangerous voltage. The specific safety instructions can be found in the manual of the respective IMS System.

If the module is a hot-pluggable power supply unit, disconnect its power cable before removing it from the IMS System.

Never open a power supply unit cause dangerous voltages can even exist after it has been disconnected from the electrical supply. If a power supply is not working anymore, e.g. due to a defect, please send it back to Meinberg for necessary repairs.

Non-observance of these safety instructions can cause serious personal injury and material damage. Installation, initial start-up and operation of the IMS System may only be performed by qualified technical experts.

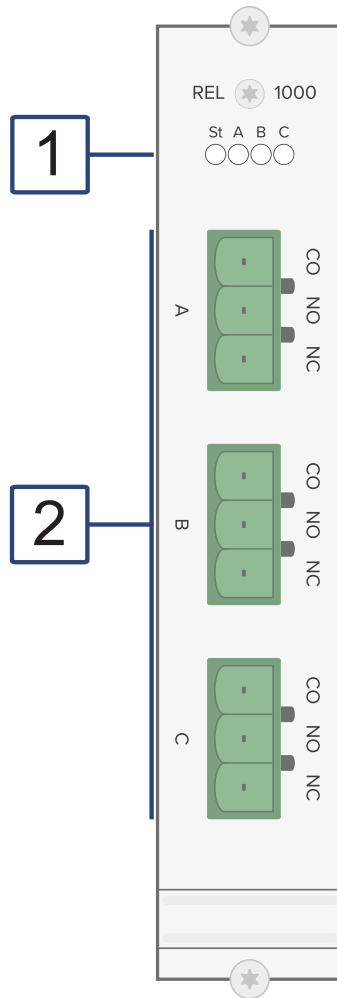
3.4 Cabling



WARNING!

Danger to life through electric shock! Never work with voltage applied! When working on the plugs and terminals of connected cables, always disconnect both sides of the cables from the respective devices!

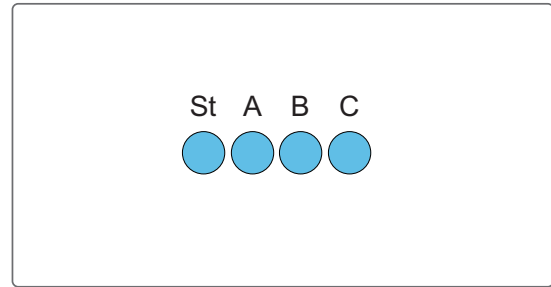
4 Front Connectors IMS-REL1000



4.1 IMS-REL1000 - Status LEDs

Status indicator

LED St: Status of the IMS-REL1000
 LED A: Status of Relais A
 LED B: Status of Relais B
 LED C: Status of Relais C



The status messages are as follows:

LED St:

Blue During initialization
 Green During operation

LED A - Status Relais A

Initialization: 1 Sek. red -> 1 Sek. yellow -> 1 Sek. green -> 1 Sek off

Green flashing *Normal Operation Mode*
 Red flashing *Error-Mode*

LED B - Status Relais B

Initialization: 1 Sek. red -> 1 Sek. yellow -> 1 Sek. green -> 1 Sek off

Green flashing *Normal Operation Mode*
 Red flashing *Error-Mode*

LED C - Status Relais C

Initialization: 1 Sek. red -> 1 Sek. yellow -> 1 Sek. green -> 1 Sek off

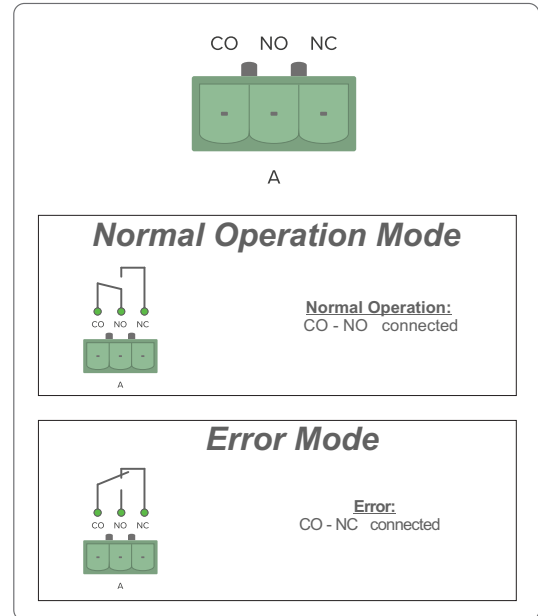
Green flashing *Normal Operation Mode*
 Red flashing *Error-Mode*

4.2 Error Relay

The illustration on the right shows the two switching states of an error relay.

Technical specification

Switching voltage max.:	220 V DC 250 V AC
Switching current max.:	2 A
Switching load max.:	60 W DC 62.5 VA AC
FCC surge breakdown voltage between contacts and coil	1,500 V
Max. operating speed (at rated load)	60 cpm
Switching current UL/CSA:	0.3 A 125 V AC 0.3 A 110 V DC 1 A 30 V DC
Response Time:	ca. 3 ms



WARNING!

This equipment is operated at a hazardous voltage.



Danger to life due to electrical shock!

- Never work with open terminals and plugs while the power is on!
- When working on the connectors of the error relay cable, always remove both sides of the cable from the respective devices!
- Dangerous voltages can occur at the terminal of the fault signal relay! Work on the terminal of the fault signal relay must never be carried out with the signal voltage present!

5 Before you start

5.1 Scope of Delivery

Unpack the IMS-REL1000 carefully and check the scope of 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: sales@meinberg.de

Check the system for shipping damage. If the system is damaged or cannot be put into operation, contact Meinberg immediately. Only the recipient (the person or company receiving the system) can assert a claim against freight forwarder for shipping damage.

Meinberg recommends that you keep the original packaging materials for possible future transport.

5.2 Disposal of Packaging Materials



The packaging materials we use are fully recyclable:

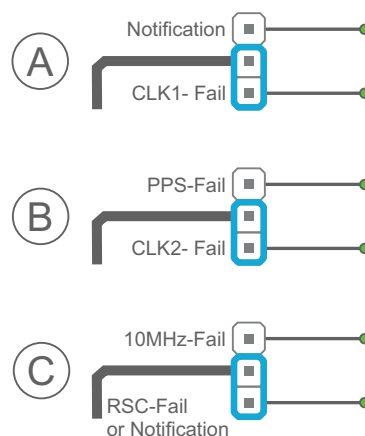
Material	Use for	Disposal
Cardboard	Shipping packaging, accessories packaging	Paper recycling
Foil	Shipping packaging, accessories packaging	Household waste or recycling depot

5.3 Pre-selection

Depending on whether the IMS system is redundantly equipped with RSC module and two reference clocks or with an SPT module with only one reference clock, different relay states can be selected. This must be selected by setting the jumper before installing the REL1000 module.

Jumper setting in redundant operation.

In redundant operation, the jumpers on the REL1000 are set as follows on delivery (see Fig. blue mark). Both clocks and the switchover unit are monitored.



Jumper setting in operation with one reference clock.

If only one reference clock is used, the jumpers of the REL1000 are set as follows on delivery: (Relay A: CLK1-Fail; Relay B: PPS-Fail; Relay C: 10 MHz-Fail). In addition, relays A + C can also be switched by notifications (events). This is explained in the chapter Events.

Possible configurations of the error output:

Relay A: Clock 1 / event notifications → Relay
 Relay B: Clock 2 / PPS
 Relay C: 10 MHz / RSC or event notifications → Relay

6 System Installation

6.1 Important Hints for hot-pluggable IMS Modules

The following points should be strictly observed when replacing IMS modules during operation. Not all IMS modules are fully hot-pluggable. Of course, it is not possible to replace a power supply unit of a non-redundant system without first having installed a second power source in operational mode.

The following applies to the individual IMS slots:

PWR:	"hot swappable"	If you operate your system with only one power supply, a second power supply must be installed before removing/replacing it to keep your system functioning.
I/O, ESI and MRI Slots:	"hot plugable".	
CLK1, CLK2:	"hot plugable"	Afer the exchange or the installation of a clock module a rescan of the reference clocks (Rescan Refclocks) must be executed in the web interface menu "System".
RSC/SPT:	"hot plugable"	The switching function or the distribution of generated signals is interrupted while the RSC/SPT is disconnected.

CPU: "hot plugable"



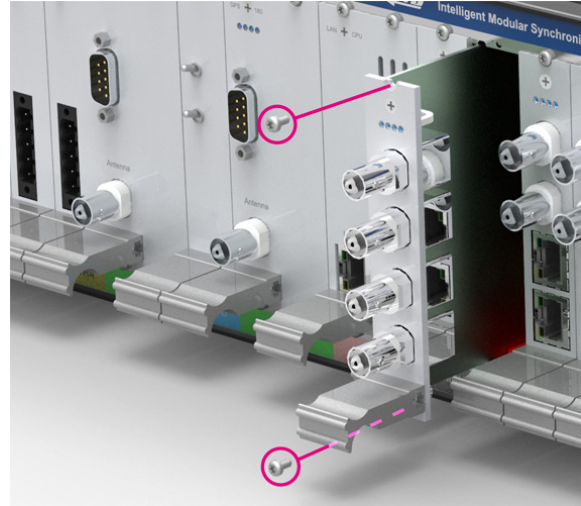
The NTP service and access to the web interface are interrupted while the CPU is disconnected. Also the management and monitoring functions are no longer available.

6.2 Installation of hot-pluggable IMS modules.

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

6.3 Connecting the System

The following schematic illustration shows an IMS-LANTIME M1000, which sends different error messages via the relays A and C of the IMS-REL1000 for example to a connected PLC/PLC.

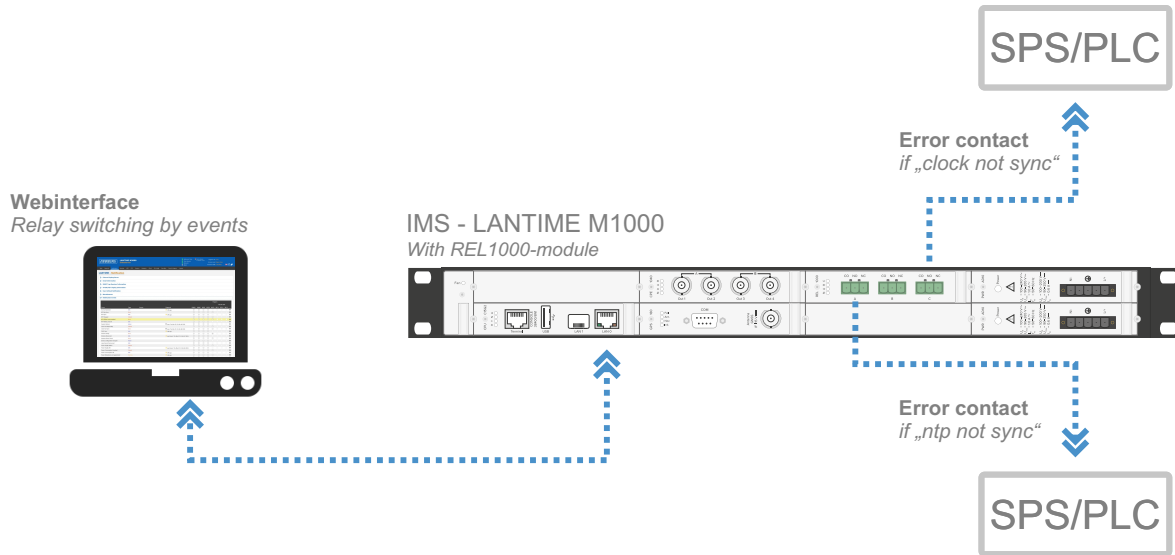


Figure: Reporting "clock not sync" and "ntp not sync" status via the REL1000 to a respective PLC/PLC.

7 Configuration of the IMS-REL1000

This chapter explains how to put a IMS-REL1000 into operation via the web interface.

7.1 Events

The relays A + C of the REL1000 module can be switched via notifications (events) when the jumpers are set and the hardware configuration is appropriate.

In the web interface menu "Notification → Notification" you have the possibility to activate the checkbox for the required event. The selected relay will be switched to error mode at this "event".

Selectable events are for example "NTP not Sync" or "Clock not Sync".

				Triggers								
				RELAY IO6								
Event	Type	Status	Triggered	EMAIL	SNMP	DISP	USER	ALED	REL1	REL2	REL3	
Normal Operation	Info		🚨 4d ago	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	+
NTP Not Sync	Error			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	+
NTP Sync	Info		🚨 4d ago	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	+
NTP Stopped	Critical			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	+

No selections are available in this figure - the relays are switched in redundant mode via the reference clocks and the RSC switching unit.

				Triggers								
				RELAY IO3								
Event	Type	Status	Triggered	EMAIL	SNMP	DISP	USER	ALED	REL1	REL2	REL3	
Normal Operation	Info		🚨 21d ago	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	+
NTP Not Sync	Error			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	+
NTP Sync	Info		🚨 21d ago	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	+
NTP Stopped	Critical			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	+

This figure shows the menu in a non-redundant system. Relay C can be triggered by the notifications.

7.2 Setting relays manually



This chapter contains information about how to set the relays of the IMS-REL1000 manually. This requires knowledge in handling the configuration in the LTOS command line interface (lt_cli).

Relays A and C of the IMS-REL1000 can be set manually via the command line starting with firmware version 3.14 of the REL1000 and LTOS V7.02.

Example:

The REL1000 is installed in IO-Slot 05 and the relay A is to be set. To do this, log in to the system via SSH and enter the following command.

```
lt_cmd relay 10 0 1
```

Structure of the command

lt_cmd relay < SlotId> < RelId> < State>:

Parameter

Each slot of an IMS system has a SlotId. Use the table below to identify the correct SlotId for the IMS-REL1000 module you are configuring.

Slot name	< SlotId >	< RelID >	< State >
MR11	2	0 = Relay A	0 = Relay off
MR12	3	1 = Relay B	1 = Relay on
ES11	4	2 = Relay C	
ES12	5		
IO1	6		
IO2	7		
IO3	8		
IO4	9		
IO5	10		
IO6	11		

8 RoHS and WEEE

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

We hereby declare that this product is conform to the European 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), and polybrominated diphenyl ethers (PBDEs), Bis (2-ethylhexyl)phthalat (DEHP), Benzylbutylphthalat (BBP), Dibutylphthalat (DBP), Diisobutylphthalat (DIBP), above the legal threshold.



WEEE status of the product

This product is handled as a B2B (Business to Business) category product. In order to secure a WEEE compliant waste disposal it has to be returned to the manufacturer. Any transportation expenses for returning this product (at its end of life) have to be incurred by the end user, whereas Meinberg will bear the costs for the waste disposal itself.

