



The Synchronization Experts.

Release Notes

LANTIME OS Firmware v7.08.002

and

LANTIME OS Firmware v7.08.002-light

English



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1. Foreword

This document describes the changes & features of the new **“LANTIME OS” (LTOS) Firmware v7.08.002**. Please read these Release Notes carefully before installing LTOS v7.08.002.

All Meinberg LANTIME time servers shipped as of July 26, 2023 (M Series, SyncFire, IMS) will include the new v7.08.002 firmware pre-installed. This firmware revision provides many new features and improvements for the LANTIME range of systems and their management tools. These include a variety of security-related improvements.

2. Software Versions

LTOS v7.08.002 comprises several software components, some of which are provided by third parties. The most important third-party software packages included are listed below alongside their version numbers.

Linux	Linux kernel 4.14.307
SSL/TLS	OpenSSL 1.1.1u
SSH	OpenSSH 9.3p2
LDAP	OpenLDAP 2.6.3
NTP	NTP 4.2.8p17
NTS client	Chrony 4.2
NTS TLS libraries	GnuTLS 3.8.0, Nettle 3.8.1, GMP 6.2.1

Table 1

3. Requirements

System Requirements — Standard Version

The following requirements must be met in order to be able to operate LTOS v7.08.002.

Name of Firmware Revision	LANTIME OS v7.08.002
Release Date	July 26, 2023
System Compatibility	
LANTIME Systems	M100
	M150
	M200
	M250
	M300
	M320
	M400
	M450
	M600
	M900
	SyncFire 1000
	SyncFire 1100
	SyncFire 1200
	SyncFire 1500
LANTIME IMS Systems	M500
	M1000
	M1000S
	M2000S
	M3000
	M3000S
	M4000
Modules	CPU-C05F1 ¹
	CPU-C15G2
	IMS Modules ²
Installation Requirements	
CPU Module RAM:	Min. 256 MB
CPU Module Storage	Min. 512 MB

Table 2

¹ Devices with a CPU-C05F1 module with 128 MB of RAM only support LTOS v7.08.002-light.

² Systems with LTOS v7.08.002 installed support all current IMS clocks and I/O modules.

System Requirements — Light Version

The following requirements must be met in order to be able to operate LTOS v7.08.002-light. Refer to the chapter “v7-light” for further information on the differences in the feature set of the “light” version.

Name of Firmware Revision	LANTIME OS v7.08.002-light
Release Date	July 26, 2023
System Compatibility	
LANTIME Systems	M100
	M150
	M200
	M250
	M300
	M320
	M400
	M450
	M600
	M900
LANTIME IMS Systems	M500
	M1000
	M1000S
	M2000S
	M3000
	M3000S
	M4000
Modules	CPU-C05F1
	CPU-C15G2
	IMS Modules ¹
Installation Requirements	
CPU Module RAM	Min. 128 MB
CPU Module Storage	Min. 512 MB

Table 3

¹Systems with LTOS v7.08.002-light installed support all current IMS clocks and I/O modules.

Connection Requirements

Cipher Suites

To be able to establish an **SSL/TLS connection** once your device is updated, your browser must support at least one of the listed cipher suites.

Web Server	
TLS Cipher Suites:	ECDHE-ECDSA-AES128-GCM-SHA256
	ECDHE-RSA-AES128-GCM-SHA256
	ECDHE-ECDSA-AES256-GCM-SHA384
	ECDHE-RSA-AES256-GCM-SHA384
	ECDHE-ECDSA-CHACHA20-POLY1305
	ECDHE-RSA-CHACHA20-POLY1305
	DHE-RSA-AES128-GCM-SHA256
	DHE-RSA-AES256-GCM-SHA384

Table 4

To be able to establish an **SSH connection** once your device is updated, your SSH client must support at least one of the cryptographic algorithms listed below (i.e., SSH ciphers, key exchange algorithms, message authentication codes).

SSH	
Ciphers:	chacha20-poly1305@openssh.com
	aes256-gcm@openssh.com
	aes128-gcm@openssh.com
	aes256-ctr
	aes192-ctr
	aes128-ctr
Key Exchange Algorithms:	curve25519-sha256@libssh.org
	ecdh-sha2-nistp521
	ecdh-sha2-nistp384
	ecdh-sha2-nistp256
	diffie-hellman-group-exchange-sha256
Host Key Algorithms:	rsa-sha2-512
	rsa-sha2-256
	ecdsa-sha2-nistp521
	ssh-ed25519
MACs:	hmac-sha2-512-etm@openssh.com
	hmac-sha2-256-etm@openssh.com
	umac-128-etm@openssh.com
	hmac-sha2-512
	hmac-sha2-256
	umac-128@openssh.com

Table 5

4. New Features

Support for New IMS Modules and Systems

Support has been added for the following IMS modules and systems in LTOS v7.08.002:

Modules:

- GPS183
- GNS183
- GNS183-UC
- PSX210
- REL1002

Systems:

- SyncFire 1500
- LANTIME M350

REST API: io-ports structure for TSU GbE [mbgID 13346]

The “TSU GbE” PTP module has a new io-ports structure.

The query

```
https://<IP address>/api/configuration/chassis0/slots/io2/module/io-ports
```

will return the following information:

system-information	
API Version	“LANTIME REST API V16.01.015”
version	“fw_7.08.002”
serial-number	“124325436543”
hostname	“hostname”
time-stamp	“2023-07-11T07:10:23”
model	“M3000”
data	
0	
object-id	“port1”
port-type	“configurable”
direction	“output”
signal-type	“pps”
signal-source	“ref”
1	
object-id	“port2”
port-type	“configurable”
direction	“output”
signal-type	“pps”
signal-source	“ref”
changes	
pending changes	0
links	
self	“https://<IP address>/api/configuration/chassis0/slots/io2/module/io-ports”

Table 6

VSI: “Daily Jam Time” Option [mbgID 13288]

The VSI module now also supports NTSC. This requires a “daily jam time” to be configured to function correctly. A corresponding configuration option has been added to the Web Interface.

Interface for Authorized REST-API Use [mbgID 13075]

As of LTOS v7.08.002, the REST API supports authentication via a dedicated resource for delivery of a bearer token. This token can then be used for the duration of its validity to query the REST API without having to perform Basic Auth again. The established method of using Basic Auth for authentication when accessing any resource is still supported.

A token can be requested by calling “/api/get-token” with a valid Basic Auth header. If the resource is accessed while a valid bearer token is already in place, the REST API will return a new token and overwrite the old one. The bearer token is written to the authorization header.

It is structured as follows:

```
Authorization: Bearer abcdefghABCDEFGH123456789...
```

REST API: Path Parameters Added for changes, commit and rollback commands [mbgID 12289]

To allow individual changes to be committed permanently or rolled back, the two commands “commit” and “rollback” have been expanded to support a “start node” as a parameter.

Performing permanent commits with a parameter, for example with “commit /configuration/chassis0/slots/io4”, will only apply uncommitted configuration changes for objects under the specified path (in this case the IO4 slot configuration). The rollback command works in the same way, i.e., only changes made under the specified path are rolled back. No uncommitted changes in other parts of the tree structure will be committed.

If no parameter is specified, the commands will behave in the original fashion, i.e., all changes will be committed or rolled back.

The command “changes” has been expanded to also support a path as a parameter, which will enable only the uncommitted changes under the specified path to be displayed/returned.

REST API: Support for CPE Modules [mbgID 12110]

IMS CPE modules can now also be configured via the REST API or using the `lt_cli` tool; it was previously only possible to configure these via the Web Interface.

Multiple SANs in the CSR and Certificate Generation Form [mbgID 12074]

The CSR and certificate generation form now also features a button to add multiple additional SANs. Autocomplete for IP addresses or DNS names is also supported.

Support for NTS Server Mode [mbgID 11429]

LTOS v7.08.002 now supports Server Mode operation for Network Time Security (NTS). NTS is a modern mechanism for cryptographically securing the NTP time protocol. NTS enables easy key distribution based on a PKI (Public Key Infrastructure) to provide a high level of security and scalability with minimal loss of accuracy.



LANTIME devices with Type C05F1 CPU modules do not support NTS Server Mode. NTS Client mode is only available on LANTIME devices with MRS support.

IPv6 Support for Parallel NTP Server Operation on Multicore Processors [mbgID 11599]

SyncFire products now also support parallel NTP server operation over IPv6.

Additional Slot Information for LNE Modules [mbgID 11465]

In addition to the slot information displayed in the “Physical Network Configuration” section of the Web Interface for LNE modules, the letter of the port printed on the module itself is now also displayed alongside the slot name to enable the physical interface to be located more easily.

Improved curl Examples in REST API Reference Guide [mbgID 10395]

The REST API Reference Guide now includes additional curl examples for all available methods of each resource.

Leap Second File Download via Proxy [mbgID 9862]

From Version 7.08.002, the leap second file can now also be downloaded via a proxy. This enables the public web links to be used, even if the LANTIME has no direct access to the internet.

Support for IEC 61850 [mbgID 6226]

The standard IEC 61850 is employed within the power generation & transmission industry to standardize communication protocols in modern automated substations. IEC 61850 integration has been introduced with LTOS v7.08.002, encompassing:

- support for the Manufacturing Message Specification standard (MMS), which is used for communication with other devices within the IEC 61850 network architecture,
- generation and export of ICD files intended for use with a Substation Configuration Tool,
- import of CID files generated by the Substation Configuration Tool to allow integration of the LANTIME device into the IEC 61850 network architecture.

Certificates Validated upon Execution of curl Commands [mbgID 9784]

curl commands triggered manually by a user interaction or automatically by LTOS are executed with curl certificate validation by default as of Version 7.08.002 This applies to all external data requests over HTTPS. For a query to work, the Root CA certificate for the Root CA responsible for the target system must be stored on the device from which the query originates.



A missing Root CA certificate may cause automated data queries performed by SyncMon to microSync systems to fail after the update is performed. Please verify that it is functioning correctly.

ESI Configuration: Plausibility [mbgID 1776]

The validity of parameter inputs in the Web Interface under “IO Config -> Input Configuration” is now verified. Invalid entries will be rejected with an error message as of LTOS v7.08.002.

Revised Session Handling of Web Interface [mbgID 1391]

The session handling of the Web Interface supports form-based authentication as of LTOS v7.08.002. This replaces the previous “basic auth” type authentication method used for the web-based UI in earlier versions of LTOS. The session key is now stored in a cookie, which is transmitted to prove that the user is authorized to access the Web Interface upon successful login. Most browsers support this authentication method automatically, provided that cookies are enabled; users should not notice any other fundamental changes to the Web Interface user experience. However, if custom tools are in use that query a LAN-TIME’s web pages automatically, it may be necessary to adapt these to the new form-based authentication. Meinberg’s Technical Support team will be happy to assist with any issues that arise in adapting custom tools to form-based authentication.

The REST API can still be queried using “basic auth” authentication. In addition to the “basic auth” method, the “bearer token” method is now also supported. A bearer token is acquired by submitting the command “PUT https://<IP address>/api/get-token” to the REST API. If the client is not yet authenticated, it will first be prompted to authenticate using “basic auth”. The token returned in the body can then be passed as part of a query to the REST API in the authorization header with the value “Bearer: <token>”. The token is valid for the configured period of time. A new token can be requested at any time with a valid token using the same “PUT https://<IP address>/api/get-token” command. See also [“Interface for Authorized REST-API Use \[mbgID 13075\]”](#)

Clock Class-Definition [mbgID 1358]

The PTP Clock Class status now shows a brief descriptive text, depending on the PTP profile.

Statistics Page Removed [mbgID 1339]

The statistics page has been removed from the Web Interface. PTPv2 statistics can already be acquired from the SyncMon page. NTP statistics are provided under the NTP tab as of LTOS v7.08.002.

REST API: io-ports structure for FDM [mbgID 13313]

The REST API has had an io-ports structure added to allow additional information regarding FDM modules to be acquired. Querying

`https://<IP address>/api/configuration/chassis0/slots/io6/module/io-ports`

will return:

system-information	
API Version	"LANTIME REST API V16.01.015"
version	"fw_7.08.002"
serial-number	"061011003580"
hostname	"su-rims1-2.test.mbg_support.de"
time-stamp	"2023-07-11T08:33:49"
model	"M3000"
data	
0	
object-id	"port1"
port-type	"fixed"
direction	"output"
signal-type	"fdm-string"
signal-source	"local"
fdm-string	
baudrate	"19200"
framing	"8n1"
mode	"per-minute"
string-type	"none"
1	
object-id	"port2"
port-type	"fixed"
direction	"output"
signal-type	"fdm-string"
signal-source	"local"
fdm-string	

baudrate	"19200"
framing	"8n1"
mode	"per-minute"
string-type	"none"
2	
object-id	"port3"
port-type	"fixed"
direction	"output"
signal-type	"fdm-analogue"
signal-source	"local"
fdm-analogue	
analogue-output-mode	"frequency-deviation"
3	
object-id	"port4"
port-type	"fixed"
direction	"output"
signal-type	"fdm-analogue"
signal-source	"local"
fdm-analogue	
analogue-output-mode	"frequency-deviation"
changes	
pending-changes	0
links	
self	"https://<IP address>/api/configuration/chassis0/slots/io2/module/io-ports"

Table 7

REST API: CPU Temperature [mbgID 12514]

The REST API resource “api/status/chassis0/slots.*/module/info/sensors” can be used to query the current temperatures of the installed modules, provided that these have a temperature sensor. The temperature of the CPU module is also included.

REST API: File System/Partition Information [mbgID 12322]

lt_cli and the REST API provide detailed information about the storage partitions and file system via the resource “/status/system/storage”. It is possible to query the total size, used/free space, and mount point of each file system.

REST API: Support for BPE Modules [mbgID 12108]

Where it was previously only possible to configure a BPE module (BPE 8000/BPE 8700) via the Web Interface, this can now also be done via the REST API or lt_cli tool.

Customizable Banner on Web Interface Login Page [mbgID 11021 and 9243]

A custom banner can be displayed on the Web Interface login page. A super user can place a login banner in “/www/htdocs/public/login_banner/” to be displayed on the login page. This banner can also be configured on the System page of the Web Interface, where images and basic HTML tags can be used.

Information on “Factory Reset” Function [mbgID 10913]

The Web Interface now makes it clearer that the network configuration will not be modified when a “Factory Reset” is performed via the Web Interface.

Information on Power Consumption [mbgID 1346]

The information on power consumption and redundant power supplies have been separated into two different sections of the System tab of the Web Interface.

Programs Removed

No programs have been removed in this version of LTOS.

v7-light

Since the release of LTOS v7.06, a separate **“light” version** has also been made available to download. This version is intended for use with any older system with 128 MB RAM. The increasing demands placed by the software on the hardware mean that it is no longer possible to implement all functions and all security fixes for these devices. This is why v7-light is provided for the older 128 MB devices; while the feature set is reduced compared to the full version, it provides most of the security features of the standard v7 release and shares a common development basis with the full v7 OS.

The following functions are not present in v7-light:

- SyncMon
- NTS
- Bird

LTOS v6 Operating System

All users of LTOS v6 are urged to update either to LTOS v7 or to LTOS v7-light, ideally the latest version v7.08.002.

The official End-of-Life Announcement for the LTOS v6 Operating System, dated July 26, 2022, is provided at the following link: http://www.mbg.link/eol-ltos6_en

5. Known Bugs & Issues

There are no known bugs in this version. Please report any bugs you may find to Meinberg Technical Support (techsupport@meinberg.de).

Compatibility with Meinberg Network Management System (mbgNMS)

mbgNMS uses the LTOS REST API as a communication interface. Please note when updating your LAN-TIME systems to LTOS v7.08.002 that versions of mbgNMS prior to v1.2.0 are not compatible with it due to an incompatibility with the revised LTOS REST API. Updating mbgNMS to the latest version v1.2.1 will eliminate this bug and ensures compatibility with LTOS v7.08.002 and the associated v16.x REST API.

Further information is available under the following links:

<https://community.dataminer.services/partner/meinberg/>

<https://community.dataminer.services/meinberg-nms-v1-2-0-is-out-now/?hilite=meinberg>

6. Download LTOS v7.08.002

Our download page is located at the following address:

<https://www.meinbergglobal.com/english/sw/firmware.htm>

You can access the download section by entering your system's serial number and your email address and accepting the Privacy Policy. The download section provides information about the most recent LTOS Firmware as well as a link to download it.

Meinberg Technical Support Page

Our support page is located at the following address:

<https://www.meinbergglobal.com/english/support/tech-support.htm>

7. Acknowledgments

Our thanks go to all those who have contributed to helping us improve the functionality and security of our LTOS Firmware. Each and every security issue that is reported and fixed is a benefit for everyone. So, thank you!