Content

1   The New HIMax Operating System V7

1.1   Operating System Versions of the Module Types

The new V7 includes the following operating system versions of the module types:

OS version	Product designation in the revision list (Device-Type)	Description
V7.10	HIMAXCPU0X_HA1_BS	Safety-related operating system for X-CPU 01 processor modules
V7.10	HIMAXCPU3X_HA1_BS	Safety-related operating system for X-CPU 31 processor modules
V7.32	HIMAXSB_HA2_BS	Operating system for X-SB 01 system bus module
V7.34	HIMAXIO_HA1_BS	Safety-related operating system for SIL 3 I/O modules
V7.34	HIMAXIO_HA2_BS	Operating system for SIL 1 I/O modules and standard modules
V7.34	HIMAXIO_HA3_BS	Safety-related operating system for SIL 3 I/O modules: X-CI 24 01, X-DI 32 04, X-DI 32 05, X-AI 32 02, X-HART 32 01, X-MIO 7/6 01, X-AI 32 01 [1], X-DI 32 01 [1], X-DI 32 02 [1], X-DI 64 01 [1], X-DO 24 01 [1] and X-DO 32 01 [1]
[1] The operating system can be used for this module type as of the hardware revision specified in Chapter 2.		

Table 1:   Operating System Versions of the Module Types

The operating system versions not mentioned in Table 1 are referenced in the release notes for HIMax V6.x

HIMA Paul Hildebrandt GmbH   1/6
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1.2 Overview

These release notes describe the new functions and improvements of V7 compared to the previous version:

- Chapter 7 describes the new functions of V2.
- Chapter 3 presents the improvements and the resolved problems.
- Chapter 4 specifies the current restrictions.
- Chapters 5 and 6 describe the procedures to migrate from the previous versions.
- Chapter 7 provides references.

1.3 Compatibility

The functions of V7 are compatible with the functions of V2...V6.

Systems with X-CPU 01 allow I/O modules, system bus modules and communication modules to use differing operating system versions (V2.x...V6.x, and V7.x) when operated within a single system. For systems with X-CPU 31, operating system versions V6.x...V7.x can be used within a single system.

HIMA recommends upgrading all modules to the current version.

2 New Functions of V7

V7.x features the following new functions:

1 Support for new hardware revisions of I/O modules

For the specified hardware revision, operating system HIMAXIO_HA3_BS as of V7.28 must be used for the following I/O modules.

I/O module	Hardware revision
X-AI 32 01	AS 14
X-DI 32 01	AS 12
X-DI 32 02	AS 12
X-DI 64 01	AS 11
X-DO 24 01	AS 14
X-DO 32 01	AS 12

Table 2:   Modules and Hardware Revisions to be Used with HIMAXIO_HA3_BS as of V7.28

The I/O modules with previous hardware revisions require HIMAXIO_**HA1**_BS.

Note: The system only allows an operating system compatible with the module to be loaded.

3 Improvements of V7

V7 features the improvements describes in the following chapters.

3.1 System Functions

1 Different behavior of the **Set System ID** command

Changing the system ID causes safety times and safety switches that were previously set online to be reset to their default values.

A download must be performed whenever the system ID has changed.

Like a download, the **Load Configuration from Flash** function causes the parameters that are changeable online to be set to the values defined in the loaded configuration.

If the system ID has changed, the **Load Configuration from Flash** function can no longer be executed after a PES restart.

2 Optimized start behavior

The bootloader is loaded in the modules during the HIMA module manufacturing and cannot be replaced by the user.

Note: The bootloader is not the same as the OS loader (emergency loader).

If a bootloader as of HIMax CPU 01/31 V7.2 is used instead of a bootloader prior to HIMax CPU 01/31 V7.2, the CPU/COM operating system reboots much faster.

The resulting ComUserTask behavior may need to be adjusted.

HIMA recommends implementing handshaking in the user program. The user program is then able to react to delays or failures that occur while the ComUserTask is starting up. Refer to the communication manual (HI 801 101 E) for details.

3 CRC in diagnostic entries during the resource configuration load

In the following cases, when the configuration is being loaded, the operating system creates a diagnostic entry that includes the checksum (CRC):

- After connection of the supply voltage.
- After a resource configuration download.

4 Sporadic reboot of X-SB 01 module resolved [HE28087]

5 With HIMAXIO_HA3_BS versions ≥ V7.28, the X-HART modules no longer report channel faults during proper operation.

This error occurred in connection with certain HART devices, e.g., MSA PrimaX gas sensors. The reason were HART signals that swung too long, thus causing the module to receive faulty characters after a HART frame.
In versions ≥ V7.28, characters that are received after a HART frame are masked out and no longer result in error messages. [HE28655]

6 Increased availability for the X-AO 16 01 module at higher temperatures (≥ 65°C)

The X-AO 16 01 module switched off all outputs if the temperature remained at or above 65 °C for longer than 24 hours.
Fixed for X-AO 16 01 modules with HIMAXIO_HA1_BS versions ≥ V7.30. [HE28969]

7 Error LED goes out properly

If an error or warning is present for longer than 2^{31} ms (approx. 25 days), the error LED goes out (Field, System) as soon as the error or warning is removed [HE29193].

8 Open-circuit no longer displayed if a short-circuit is detected

If a short-circuit on a channel is detected, the hardware automatically opens the channel's output switches for 5 s. This is no longer displayed as an open-circuit in the diagnostics and system variables.

9 Potential WDT violations resolved

Potential violations of the watchdog time related to communication problems between redundant processor modules during a download in the STOP / INVALID CONFIGURATION state have been resolved. [HE25981]

3.2 safe**ethernet**

1 Deletion of safe**ethernet** connections through reload no longer hinders synchronization

In the previous version, the deletion of safe**ethernet** connections through a reload process could hinder the synchronization of additional processor modules.

To ensure that synchronization is no longer hindered, all the processor modules must be equipped with operating system as of V7. [HE25725]

2 safe**ethernet** connection via the communication module under unfavorable conditions

A safe**ethernet** connection via the communication module is possible, even under the following unfavorable conditions:

- The response timeout is too low.
- The network is disturbed.
- The operating system of the communication module is up to V6.26.

The problem no longer occurs in communication modules with an operating system as of V6.26. [HE25826]

4 Restrictions of V7

1 Reload during mixed operation of processor modules (with V6 and V7) is not allowed

Reload is not allowed if a group of processor modules is equipped with operating system V6 and another group with an operating system as of V7! [HE24860, HE25725]

2 Failure of communication protocols due to unmatching messages

A safe**ethernet** message that does not match the loaded project may block the process data communication of a communication module. This occurs when the protocols only use that communication module to communicate.

3 Read and write permission necessary for resetting the cycle time statistics

The commands **Reset Cycle Time Statistics** and **Reset Total Number of Errors, Faults or Warnings** may only be performed with access mode *Read and Write*, instead of *Read and Operator*. [HE27005]

4 Reload of a licensed function and associated license

Two steps are necessary to be able to load a licensed function (e.g., a protocol) and associated license by performing a reload:

a License reload
b Function reload (configuration)

The first reload activates the license on the PES. The second reload loads the function in the already activated license. [HE27502]

5 LLDP may cause errors in Ethernet ports if combined with VLAN configuration

If the LLDP protocol is used for the processor or communication modules and the Ethernet switch ports are configured via VLAN so that the internal module should not be reached from all the ports, errors may occur for the Ethernet ports. [HE26152, HE26603]

5 Migration from V2.x Through V6.x to V7.x

HIMA recommends, if possible, upgrading the operating systems of X-CPU 01, X-COM 01, and of the I/O modules when the system is stopped.

Particular care must be taken if the upgrade has to be performed while the system is operating as described in Chapters 5.1 and 5.2. The OS loader upgrade can be skipped to avoid reducing redundancy for an unnecessarily long period. The OS loader should be upgraded when the system is stopped at the next earliest opportunity.

No further actions may be performed on the system during the upgrade process!

Prior to upgrading the operating systems, the HIMax system must be in a fault-free state!

5.1 Upgrading a Module

The section below describes the upgrade procedure for a single module. Since I/O modules have no IP address, the remarks on IP address do not apply to them.

1. Upgrade the operating system of the module.
2. The module restarts.

   If a fault occurs while loading the operating system, the OS loader is started. If the OS loader was not upgraded at this point, the module is only accessible via the standard IP address.

   The HIMax operating system immediately uses the IP address that was previously configured.
3. Upgrade the OS loader. The OS loader operates again with the configured IP address.
4. Wait until the module is completely running again in system operation. In particular, the process data communication should be completely established for processor and communication modules.

This results in the upgrade of a single module.

5.2 Upgrading the Entire System

The upgrade of a module in the RUN state may only be started if the previous module has been completely upgraded and is fully running again in system operation!

The order described below must be absolutely observed!

The overall system is to be upgraded in the order of the modules described in Table 3. The upgrading procedure described in Chapter 5.1 must be observed for each module.

Step	Modules to be upgraded	Remarks
1.	All I/O modules	The current OS loader version of the I/O modules is V6.0.
2.	All processor modules	The current OS loader version of the processor module is V6.0. *Notes:* ▪ *The simultaneous use of processor modules with differing operating system versions is only allowed for the duration of the upgrade!* ▪ *If safeethernet is used, the processor modules must be upgraded one after the other, without performing any actions in between!*
3.	All system bus modules	To upgrade, if the operating system version of the X-SB 01 is not V7.32. First upgrade the modules in slots 1 of all racks, and then the modules in slots 2. The current OS loader version of the X-SB 01 is V6.0.
4.	All communication modules	The current OS loader version of the X-COM 01 is V6.0.

Table 3: Upgrading Order of the Modules

I/O modules, system bus modules and communication modules can be operated within a single system using differing operating system versions (V2.x, V3.x, V4.x, V5.x, V6.x and V7.x).

The downgrade of system bus modules back to a version prior to V4.20 is not allowed and may cause the system bus module to permanently lose its functionality.

This does **not** apply to processor modules! Processor modules must be upgraded to the same version. As long as this is not done, a corresponding warning is displayed.

Observe the restrictions applying to the operating system versions in use!

6 Migration from V1.x to V7.x

When upgrading from operating system V1.x to V7.x, the SILworX version must be changed as well.

HIMax modules with operating system V1.x cannot be used together with HIMax modules with operating system as of V2.x!

The procedure for migrating SILworX projects corresponds to that described in the release notes for SILworX V2.36 and V2.46 and has to be adhered to.

The upgrade from V1.x to V7.x may only be performed if the system is stopped!

7 References

- HIMax system manual, document number HI 801 001 E
- Communication manual, document number HI 801 101 E