



# HIMax<sup>®</sup>

Release Notes

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## 1 HiMax operating system V9

This main chapter describes the improvements and new functions of the following HiMax operating system V9 compared to the previous ones:

OS version	File name	Description
V9.20	HIMAXCPU_HA1_OS_V9.20.ldb	Safety-related operating system for X-CPU 01 processor modules
V9.20	HIMAXCPU31_HA1_OS_V9.20.ldb	Safety-related operating system for X-CPU 31 processor modules
V9.24	HIMAXCOM_HA2_OS_V9.24.ldb	Operating system for X-COM 01 communication modules

Table 1: Modified Operating System Versions

The operating system versions not mentioned in Table 1 are listed in the previous release notes.

### 1.1 Compatibilities

#### 1.1.1 Compatibilities with the previous versions

The functions of V9 processor module are only compatible with the functions of the previous versions V6.30...V8.x and can be operated redundantly with those versions. Operating system versions prior to V6.30 must be subject to an intermediate upgrade to V6.30, V7 or V8, before upgrading them to V9.

Systems with X-CPU 01 allow I/O modules, system bus modules and communication modules to use differing operating system versions (V2.x...V8.x, and V9.x) when operated within a single system. For systems with X-CPU 31, operating system versions V6.x...V9.x can be used within a single system.

HIMA recommends upgrading all modules to the current operating system version.

### 1.2 New functions

The new functions described in this chapter require the use of SILworX V9 and higher.

#### 1.2.1 Modbus slave V2 (MOS)

The Modbus slave V2 protocol with extended functions is an alternative to the existing Modbus slave protocol. This variant improves the internal protocol data processing on the HIMA controller without changing the supported standard Modbus function codes.

The Modbus slave V2 protocol features the following functions:

- Reload possible without cold reload of the communication module.
- Write requests from several Modbus sources and user programs to a single global variable possible.
- Definition of the Modbus masters authorized for access with corresponding data view assignment. Unauthorized Modbus masters are rejected!
- Compatibility with HIQuad Modbus slave.

## 1.3 Improvements

### 1.3.1 Mode switch position DEFECT

So far, no warning was issued if a defined value could not be read in for the mode switch position of the processor module (hardware fault). In such cases, the last valid switch position was displayed in the Control Panel. The new switch position DEFECT is now displayed.

DEFECT triggers the following warning in the online view of the processor module: *The mode switch position could not be detected. Please check that the switched is correctly engaged.*

When powering up with DEFECT, the processor module behaves in the same manner as when the mode switch position is STOP [HE21363].

### 1.3.2 Communication warning

A communication warning (*A reload is to be performed...*) is issued if the connection between two safe**ethernet** partners exists, but the transport path in one safe**ethernet** partner is configured as redundant whereas one of the two channels in the transport path of the other partner is set to non-redundant.

In particular, the communication warning is issued during a reload change as long as the redundant partner has not yet been reloaded.

### 1.3.3 System variables Master Connection State and Redundancy State

The Modbus slave system variables *Master Connection State* and *Redundancy State* are neither affected by the online command *Reset Statistics* nor by the system variable function *Reset All Counters* [HE28947].

### 1.3.4 Licensed protocol still valid after reload

The licensed protocol is still valid if the protocol is moved to another communication module (X-COM 01) during the reload and the source communication module is deleted from the configuration [HE29037].

### 1.3.5 New mode Optimized Use of Com. Time Slice

Using the new mode *Optimized Use of Com. Time Slice*, shorter response times can be achieved for safe**ethernet**/HIPRO-S V2/PADT communication provided that communication is predominantly routed via the processor module. In such cases, safe**ethernet** also includes communication with OPC/OTS/safeEDR/remote I/Os partners.

**Caution:** This mode can affect the temporal utilization of *Max.Com. Time Slice ASYNC [ms]* and the system parameter *Max. Duration of Configuration Connections [ms]* such that these two times can be subject to more demands. In turn, this may result in a higher overall cycle time; for this reason, the times derived therefrom must be taken into account.

In case of safe**ethernet**/OPC/OTS/safeEDR/HIPRO-S V2, the effect applies to the use of *Max.Com. Time Slice [ms]* whereas, in case of PADT communication, it is related to the use of *Max. Duration of Configuration Connections [ms]*. In case of communication with the remote I/Os, both the use of *Max.Com. Time Slice [ms]* and of *Max. Duration of Configuration Connections [ms]* may increase [HE27939].

### 1.3.6 No synchronization abort

SOE configurations with synchronization data that was fragmented in the last message, no longer cause synchronization to abort [HE28782].

- 1.3.7      No COM operating system reboot during temporarily blocked TCP connection  
A temporarily blocked TCP connection of a TCP server in the ComUserTask no longer causes the communication module operating system to reboot [HE29233].
- 1.3.8      LLDP messages with Ethernet interface MAC address  
The LLDP messages are issued with the MAC address of the Ethernet interface as chassis ID TLV instead of with the MAC address of the port [HE26152].

## 1.4 Restrictions

### 1.4.1 Unintentional stop of the communication module

In very seldom cases, if one or more communication protocols such as Modbus or ComUserTask are used under load control and the controller or communication module changes from RUN to STOP, the communication module may reboot [HE25065].

### 1.4.2 Licenses and reload

If a system's DEMO license is complemented with a suitable license (e.g., for a communication protocol) by performing a reload, the DEMO license remains active on the affected module. The message displayed in the license management of the processor module notes that a regular license is available, but a DEMO license is in use.

The new license is only activated and properly reported after a restart, reload or cold reload of the affected module [HE29163].

### 1.4.3 Modbus slave V2 reload

In seldom cases, communication problems may occur after the reload of a redundant Modbus slave V2 protocol, if a redundant Modbus slave V2 protocol or protocol instance was moved to another communication module. In such cases, a configuration download must be performed instead of a reload [HE29480].

### 1.4.4 Reload of I/O modules with operating system version < V6

If a HIMax system contains I/O modules with operating system version < V6, HIMA recommends upgrading all the I/O modules to the current operating system version.

If, prior to upgrading, changes should be made to I/O modules with operating system version < V6, the following points must be observed:

- Changes to the configuration must be performed in a separate reload process.
- Removing one or more I/O modules from the HIMax system must also be performed in a separate reload process.



## 1.5 Upgrading from a previous version

### 1.5.1 Upgrade from V2.x...V8 to V9

If possible, HIMA recommends upgrading the operating systems of HiMax modules when the system is stopped.

The compatibilities with the previous versions must be observed, see Chapter 1.1.1.

An upgrade during operation must be performed with particular care following the instructions provided in Chapter 1.5.1.1 and Chapter 1.5.1.2. Upgrading the OS loader can be dispensed with if a long redundancy loss should be avoided. The OS loader should be upgraded the next time the system is stopped.



It must be ensured that no additional system changes may be performed during the upgrade. Prior to upgrading the operating systems, the HiMax system must be in a fault-free state!

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#### 1.5.1.1 Upgrading a single module

The following section 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 starts automatically.
  - If a fault occurs while loading the operating system, the OS loader is started. If the OS loader was not yet upgraded, 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 with the configured IP address.
4. Additional upgrades may only be performed when the module is fully running in system operation. In particular, the process data communication should be completely established for processor and communication modules.

### 1.5.1.2 Upgrading the overall 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 2. The upgrading procedure described in Chapter 1.5.1.1 must be observed for each module. Observe the restrictions applying to the operating system versions to be loaded!

Step	Modules	Operating system	OS version	OS loader version
1.	All I/O modules	HIMaxIO_HA1_BS HIMaxIO_HA2_BS HIMaxIO_HA3_BS	V7.34	V6.0
2.	All processor modules	HIMaxCPU0X_HA1_BS HIMaxCPU3X_HA1_BS	V9.20	V6.0
	The simultaneous use of processor modules with differing operating system versions is only allowed for the duration of the upgrade! All the processor modules must be upgraded to the same version. As long as this is not done, a warning is displayed.			
3.	All system bus modules	HIMaxSB_HA2_BS	V7.32	V6.0
	If the operating system version of the X-SB 01 is prior to V7.24. First upgrade the system bus modules in slots 1 of all racks, and then the modules in slots 2. The downgrade of system bus modules back to a version up to V4.20 is not allowed and may cause the system bus module to permanently lose its functionality.			
4.	All communication module	HIMaxCOM_HA1_BS	V9.24	V6.0

Table 2: Operating System Upgrade Order for the Overall System

### 1.5.1.3 Upgrade from V1.x to V9

When upgrading from operating system V1.x to V9, SILworX must be upgraded as well.

The upgrade from V1.x to V9 may only be performed if the system is stopped!

HiMax modules with operating system V1.x cannot be used together with HiMax modules with operating system V2.x and higher!

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

## 1.6 References

- HiMax system manual, HI 801 001 E
- HiMax safety manual, HI 801 003 E
- Communication manual, HI 801 101 E
- HIPRO-S V2 manual, HI 800 723 E

## 2 HiMax operating system V8

This main chapter describes the improvements and new functions of the following HiMax operating system V8 compared to the previous ones:

OS version	File name	Description
V8.8	HIMAXCPU_HA1_OS_V8.8.ldb	Safety-related operating system for X-CPU 01 processor modules
V8.8	HIMAXCPU31_HA1_OS_V8.8.ldb	Safety-related operating system for X-CPU 31 processor modules
V8.6	HIMAXCOM_HA2_OS_V8.6.ldb	Operating system for X-COM 01 communication modules

Table 3: Modified Operating System Versions

The operating system versions not mentioned in Table 3 are listed in the previous release notes.

### 2.1 Compatibilities

#### 2.1.1 Compatibilities with the previous versions

The functions of V8 processor modules are compatible with the functions of V2...V7.

Systems with X-CPU 01 allow I/O modules, system bus modules and communication modules to use differing operating system versions (V2.x...V7.x, and V8.x) when operated within a single system. For systems with X-CPU 31, operating system versions V6.x...V8.x can be used within a single system.

HIMA recommends upgrading all modules to the current operating system version.

## 2.2 New functions

### 2.2.1 Support for the safe communication protocol HIPRO-S V2

The safety-related communication protocol HIPRO-S V2, is used for communicating with the HIQuad PES.



The HIQuad PES needs an operating system version that supports HIPRO-S V2; refer to the HIQuad documentation for details.

---

### 2.2.2 Reset commands executable with operator permission

Users with at least *Read and Operator* permission may perform the commands **Reset Cycle Time Statistics** and **Reset Total Number of Errors, Faults or Warnings**. In the previous versions, the *Read and Write* permission was necessary.

### 2.2.3 No reload possible with differing major versions of the operating system

HIMax rejects a reload, if all the following conditions are met:

- Processor modules redundant to one another are equipped with operating systems with differing major versions, e.g., V5.10 and V7.10.
- At least one of the processor modules is equipped with operating system V8 or higher.

During the reload, it is thus no longer necessary to observe the various compatibility restrictions due to differing major versions previously [HE24860, HE25725].

## 2.3 Improvements

### 2.3.1 Successful license reload

A valid license and the enabled functions may be added and removed in one reload process. In the previous version, two reload processes were necessary [HE27502].

### 2.3.2 System operation maintained during X-CPU 31 synchronization

In the previous version, on rare occasions during synchronization of an X-CPU 31 processor module, system operation could be lost, or it was adopted by the synchronized module with restrictions [HE27463].

### 2.3.3 MAC address of the Ethernet switch port

The MAC address of the Ethernet switch ports is the MAC address of the LLDP sender.

LLDP uses the MAC addresses of the Ethernet switch ports as MAC addresses of the sender. This procedure can prevent potential network problems from occurring if the Ethernet switch is split into separate networks through port-based VLAN [HE26152].

To ensure that the changes take effect, the following hardware and production revisions are required:

	Hardware revision	Production revision
X-CPU 01	01	06
X-COM 01	02	01

Table 4: Hardware and Production Revisions for the Ethernet Switch Ports

### 2.3.4 MAC addresses of Ethernet ports used for X-CPU 01

The new operating system version uses the MAC addresses of the Ethernet ports for the X-CPU 01 processor module. These MAC addresses are required for LLDP messages [HE26603].

To ensure that the changes take effect, the following hardware and production revisions are required:

	Hardware revision	Production revision
X-CPU 01	01	06

Table 5: Hardware and Production Revisions for the X-CPU Ethernet Ports

### 2.3.5 Communication module protocols

The protocols of a communication module can still function if an unmatching message appears.

In the previous version, a safe**ethernet** message that did not match the loaded project could block the process data communication of a communication module. This occurred when the protocols only used that communication module to communicate [HE26525].

### 2.3.6 ComUserTask can use the maximum process data volume

The previous version created an error message when the maximum process data volume was used [HE25101].

## 2.4 Restrictions

### 2.4.1 Autostart

Autostart triggered by removing and reinserting two system bus modules or by switching the supply voltage off and on again.

If both system bus modules set to Responsible are removed and reinserted, an autostart previously configured in the project is triggered even if the system has been stopped beforehand using the PADT.

This behavior can also be triggered by switching the operating voltage off and on again.

This applies to processor modules up to V4.x [HE20023].

### 2.4.2 Lost connections

Lost connections and timing inaccuracies within communication protocols

In communication protocols with time-critical, cyclic transmissions, e.g., PROFINET, the transmissions may reveal timing inaccuracies with very large process data volumes (e.g., 10 000 Modbus register variables). The cause is the load on the communication module. Depending on the setting of the send interval and connection monitoring watchdog, the connection to the protocol and thus to the superordinate protocols (e.g., PROFIsafe) could be aborted.

**Workaround:** HIMA recommends using multiple communication modules and separating time-critical protocols from protocols exchanging very large process data volumes.

### 2.4.3 Increase of the cycle time due to the upgrade to the current version

When upgrading the operating system version of the PES, the cycle time of the user program may increase, but no more than 6 ms, if the following conditions are met [HE25684]:

- The operating system is upgraded to the current version, e.g., from V2.14 to V6.30 or higher.
- The system parameter *Max. Duration of Configuration Connections [ms]* is set to a value greater than 6 ms.

## 2.5 Upgrading from a previous version

### 2.5.1 Upgrade from V2.x...V7 to V8

If possible, HIMA recommends upgrading the operating systems of HiMax modules when the system is stopped.

The compatibilities with the previous versions must be observed, see Chapter 2.1.1.

An upgrade during operation must be performed with particular care following the instructions provided in Chapter 2.5.1.1 and Chapter 2.5.1.2. Upgrading the OS loader can be dispensed with if a long redundancy loss should be avoided. The OS loader should be upgraded the next time the system is stopped.



It must be ensured that no additional system changes may be performed during the upgrade. Prior to upgrading the operating systems, the HiMax system must be in a fault-free state!

---

#### 2.5.1.1 Upgrading a single module

The following section 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 starts automatically.
  - If a fault occurs while loading the operating system, the OS loader is started. If the OS loader was not yet upgraded, 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 with the configured IP address.
4. Additional upgrades may only be performed when the module is fully running in system operation. In particular, the process data communication should be completely established for processor and communication modules.

### 2.5.1.2 Upgrading the overall 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 6. The upgrading procedure described in Chapter 2.5.1.1 must be observed for each module. Observe the restrictions applying to the operating system versions to be loaded!

Step	Modules	Operating system	OS version	OS loader version
1.	All I/O modules	HiMaxIO_HA1_BS HiMaxIO_HA2_BS HiMaxIO_HA3_BS	V7.34	V6.0
2.	All processor modules	HiMaxCPU0X_HA1_BS HiMaxCPU3X_HA1_BS	V8.8	V6.0
	The simultaneous use of processor modules with differing operating system versions is only allowed for the duration of the upgrade! All the processor modules must be upgraded to the same version. As long as this is not done, a warning is displayed.			
3.	All system bus modules	HiMaxSB_HA2_BS	V7.32	V6.0
	If the operating system version of the X-SB 01 is prior to V7.24. First upgrade the system bus modules in slots 1 of all racks, and then the modules in slots 2. The downgrade of system bus modules back to a version up to V4.20 is not allowed and may cause the system bus module to permanently lose its functionality.			
4.	All communication module	HiMaxCOM_HA1_BS	V8.6	V6.0

Table 6: Operating System Upgrade Order for the Overall System

### 2.5.1.3 Upgrade from V1.x to V8

When upgrading from operating system V1.x to V8, SILworX must be upgraded as well.

The upgrade from V1.x to V8 may only be performed if the system is stopped!

HiMax modules with operating system V1.x cannot be used together with HiMax modules with operating system V2.x and higher!

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



## 2.6 References

- HIMax system manual, HI 801 001 E
- HIMax safety manual, HI 801 003 E
- Communication manual, HI 801 101 E
- HIPRO-S V2 manual, HI 800 723 E

## Appendix

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