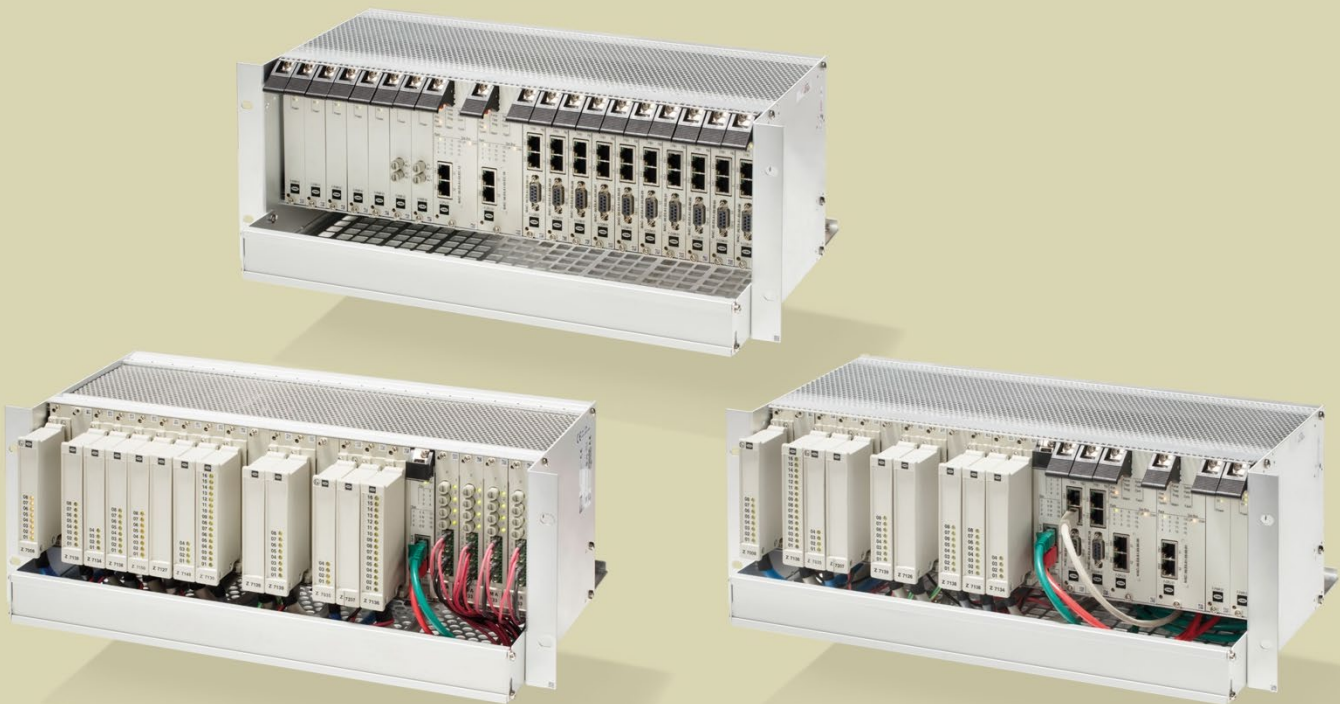

HIQuad[®]X

Release Notes 2023/02



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1.00	First edition of the Release Notes	---	---
1.01	Added: Notice in Chapter 1.1	---	X

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1 HIQuad X Operating System Versions

This manual describes the improvements, new functions, and restrictions of new HIQuad X operating system versions compared to the previous versions.

The following table lists the most current operating systems (OS) and associated loaders (OS loader, OSL) used in the HIQuad X system:

Module	OS version	Operating system	Designation
F-CPU 01	V14.6	Processor module	HQX_CPU5x_HA1_OS_V14.6.ldb
	V10.0	Loader for the processor module	HQX_CPU5x_HA1_OSL_V10.0.ldb
F-IOP 01	V11.0 (new)	I/O processing module	HQX_IOP0x_HA1_OS_V11.0.ldb
	V10.0	Loader for the I/O processing module	HQX_IOP0x_HA1_OSL_V10.0.ldb
F-COM 01	V14.12	Communication module	HQXCOM_HA1_OS_V14.12.ldb
	V10.0	Loader for the communication module	HQXCOM_HA1_OSL_V10.0.ldb

Table 1: HIQuad X Operating Systems and Associated Loader

Additionally, take the release notes for SILworX V14.0.0 into account.

i Irrespective of the used product versions, all the latest editions of the user documentation (e.g. Safety Manuals, Release Notes, etc.) must **always** be consulted, in particular those for SILworX.

Regularly assess these documents for their relevance in terms of:

- Functional Safety.
- OT Security.
- Availability.
- Restrictions.

This also applies if you are not planning to use new product versions.

1.1 Checksums of Operating System Versions

The following table specifies the checksums of the latest operating system versions:

Module	OS version	Safety CRC	SHA256
F-CPU 01	V14.6	0x640F_3B75	2F15.A03C.6DF2.8D57.DF7A.B2CE.2BA5.AF12.F57B.7ABF.EAF2.4746.639D.8681.3C9F.5786
F-IOP 01	V11.0 (new)	0x7BA8_CAF2	DAA2.CE0F.901D.94D8.7A28.2DEC.BE9D.AB50.07D1.363D.4730.E978.837A.1884.159A.2DB8
F-COM 01	V14.12	0xD9B2_8372	906C.85A7.C7CD.0130.AA83.6425.592E.63A9.F532.D105.5A8C.CBC6.071A.03EC.0B72.79DC

Table 2: Checksums

2 New Functions

None.

3 Improvements

The monitoring capability of the new V11.0 operating system for the F-IOP module has been extended to support viable communication between F-IOP and F-CPU modules.

4 Restrictions

- The CPU operating system version for the F-CPU 01 module (V13.8 and higher) optimizes the processors' memory access. Depending on the system structure, the application program and the associated workload, the cycle time can increase by up to 5%.
- If more than 6 F 3349 modules are used in the base rack (F-BASE RACK 02, H41X) or in an extension rack, the response time (phase timeout) specified in the F-CPU 01 processor module will be exceeded. This may cause the connection between F-CPU 01 and F-IOP 01 modules to be lost.

Use one of the following workarounds:

- Use a maximum of 6 F 3349 modules per F-BASE RACK 02 or per extension rack.
- If more than 6 F 3349 modules are used per rack, ensure that the watchdog time is greater than 2 x the maximum cycle time.
- Ensure that the watchdog time is a maximum of $\frac{1}{4}$ of the controller's (resource's) safety time.
- Users of the remote rack license can increase the system bus latency via the resource parameter *Maximum System Bus Latency* [μ s]. The maximum number of modules in a rack x 100 μ s must be added to the displayed value.

This restriction applies to all F-CPU 01 operating systems specified in the TÜV version list!

5 Updates to New Operating System Versions

HIMA recommends always using the latest operating system version of a module. To update an existing system, system downtimes can for instance be used to update the operating systems and operating system loaders (OSL) on all modules.

In the HIQuad X system, processor modules, I/O processing modules and communication modules can load the operating system version during operation. This applies provided a) the overall structure is redundant and uses I/O extension racks b) the modules within the system are in proper working order.

Refer to the maintenance manual for details on how to load operating systems.

Only operating system versions that are released for common operation may be loaded in HIQuad X modules! The compatibilities to the different operating system versions described in the release notes must be observed.

5.1 Loading New Operating System Versions and Loaders to Several Modules

When loading several modules, e.g., to update an entire system, HIMA recommends following the sequence as specified in Table 3. It is possible to deviate from this recommendation; however, when doing so, ensure that the redundant modules are promptly updated to the same operating system version. Additionally, ensure that processor modules are updated one after the other.

Observe the *restrictions* in the corresponding release notes.

Step	Modules	Connect the PADT to:
1.	I/O processing modules, UP loop	Communication module or processor module
2.	I/O processing modules, DOWN loop	Communication module or processor module
3.	All communication modules	Processor module
4.	All processor modules	Communication module, processor module
Notice: The simultaneous use of processor modules with differing operating system versions is only allowed for the duration of the update! If processor modules are operated with differing operating system versions, a warning appears. The processor modules must be updated one after the other, without performing any actions in between!		

Table 3: Recommended Order for Loading to Several Modules

6 References

- HIQuad X system manual, HI 803 211 E.
- HIQuad X safety manual, HI 803 209 E.
- HIQuad X maintenance manual, HI 803 213 E.
- Communication manual, HI 801 101 E.

6.1 Zstandard License Terms

The CPU operating systems contain a Zstandard decompression algorithm provided with the following license terms:

BSD License

For Zstandard software

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6.2 Apache License

The COM operating system includes an SSL/TLS library Mbed TLS licensed by ARM Limited <http://www.apache.org/licenses/LICENSE-2.0>.

6.2.1 Mbed TLS Adaptations

Index: include/mbedtls/config.h

```
=====
--- include/mbedtls/config.h (revision 28)
+++ include/mbedtls/config.h (revision 29)
@@ -1.3 +1.4 @@
+// Modifications copyright (C) 2018 HIMA Paul Hildebrandt GmbH
/**
 * \file config.h
 *
@@ -33.6 +34.13 @@
#define _CRT_SECURE_NO_DEPRECATED 1
#endif
+// Start of HIMA modification
+//error Wrong File - include platform specific configuration file from /mbedtls
(MBEDTLS_CONFIG_FILE is not set)
+// Falls dieser Fehler auftritt muss im entsprechenden Makefile (aus dem diese Datei gezogen
wird)
+// folgende Anpassung gemacht werden (siehe auch mbedtls.mke)
+// include <pfad_zu>p9tool/mbedtls/mbedtls_make.inc
+// End of HIMA modification
+
/**
 * \name SECTION: System support
 *
```

Index: library/timing.c

```
=====
--- library/timing.c (revision 28)
+++ library/timing.c (revision 29)
@@ -1.3 +1.4 @@
+// Modifications copyright (C) 2018 HIMA Paul Hildebrandt GmbH
/*
 * Portable interface to the CPU cycle counter
 *
@@ -372.7 +373.10 @@
#endif /* !MBEDTLS_TIMING_ALT */
#ifndef MBEDTLS_SELF_TEST
+// Start of HIMA modification
+//if defined(MBEDTLS_SELF_TEST) && defined(MBEDTLS_SSL_PROTO_DTLS)
+// HIMA: Test nur wenn DTLS aktiv - Ohne DTLS wird nur ein Teil von timing.c genutzt
(mbedtls_timing_hardclock)
+// End of HIMA modification
/*
 * Busy-waits for the given number of milliseconds.

```

Index: .

```
=====
--- . (revision 28)
+++ . (revision 29)
Property changes on: .
```

Added: svn:mergeinfo

-0.0 +0.2

Merged /mbedtls/mbedtls-2.5.1:r22-23

Merged /mbedtls/mbedtls-2.14.1:r26-27

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Release Notes

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