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# 1 New Release (09.12) for BS41q/51q V7.0-8, CRC 8A0E

This document describes the enhancements and new functions of revision (09.12) with respect to the previous revision.

- Chapter 2 describes the improvements.
- Chapter 3 specifies the restrictions applying to (09.12).
- Chapter 4 describes the migration procedure from the previous revision.

Note: In the following sections, HIMA software function blocks from the ELOP library (*Elop-Lib*) are referred to as HIMA function blocks.

## 1.1 Compatibility

Revision (09.12) may only be used with the central modules F 8650X and F 8652X, and the current version of ELOP II, see Table 1.

| Module / programming tool | Type | Version |
|---|---|---|
| Central module (CU) | F 8650X, F 8652X | BS41q/51q V7.0-8 (09.12) |
| Co-processor module (CM) | F 8621A | BS51-CM V6.0-6 (9808) |
| Ethernet module (EN-M) | F 8627X | BS V4.22 |
| PROFIBUS module (PB-M) | F 8628X | BS V4.22 |
| ELOP II | Software | ELOP II V5.8.Build 5003.7992IV2 |

Table 1: Versions Required for (09.12)

# 2 Improvements of Revision (09.12)

This chapter describes the improvements of revision (09.12) with respect to the previous revision (08.17).

## 2.1 New or Modified Diagnostics (Error Codes)

**1** Changed error code 101: Error stop with additional information.

As of this operating system version, additional information is provided with error code 101.
The meaning has not changed:
*Communication to other central module is not possible or the operating system and/or user program versions are different*. [HE27808]

**2** New error code 152: Error stop without additional information.

Meaning:
*The waiting time for communication between central modules has expired and the central modules cannot communicate with one another. One of the redundant central modules is not in RUN mode and initiates its own error stop.*

**3** New error code 153: Error stop with additional information.

Meaning:
*Error and abort in connection with redundant reload.*

**4** New error codes 45 and 155: Error stop without additional information.

Meaning:
*Error in central module.*

**5** New error code 46: For information only.

Meaning:
*Error in central module.*

## 2.2 Improvements Related to Availability and Redundancy Loss

**1** In the event of a redundancy loss due to a faulty central module, the redundant partner is not blocked.

If redundancy is lost due to a faulty central module, the other central module does not fail with error code 173, but continues to operate in MONO mode. [HE30166]

**2** Redundancy loss due to a memory error (error code 97) in a central module, the redundant partner does not fail.

If redundancy is lost due to a memory error in a central module, the other central module does not fail with error code 5, but continues to operate in MONO mode. [HE22744, HE27380, HE29219, HE29746]

**3** A redundancy loss can only be forced by a central module in RUN or MONO mode.

In certain modes of operation (e.g., when loading the user program through self-education), the non-operating central module could force an error stop of the central module operating in MONO mode (error code 102). This is no longer possible as of this operating system. The non-operating central module enters the error stop state and the operating central module remains in MONO mode.

## 2.3 Improvements Related to the User Program Loading Procedures

**1** No controller failure in connection with MONO reload of the user program and extensive changes.

A reload performed in a MONO controller via Ethernet no longer causes the controller to fail with error code 5. A MONO reload can also be successfully performed in connection with extensive changes.

**2** No controller failure in connection with redundant reload of the user program.

A reload performed in a redundant controller no longer causes the controller to fail with error code 16, 76, 102 or 101. A reload abort causes the central module that was loaded first to enter the error stop state with error code 101. The second central module remains in MONO mode. [HE26797, HE27808, HE30679]

**3** During start-up after the user program download, no error code 199 (event buffer initializing or initialized) is issued.

Since the event buffer is always initialized during the user program download, this error message is not required.

**4** Loading the user program from one central module to the other through self-education does not cause the central module being loaded to fail with error code 5. The faulty behavior was caused by an operating central module with a mean cycle time greater than 850 ms.

## 2.4 Improvements Related to the User Program Operation (OLT)

**1** The *IO.Acknowledgement* system variable can directly be forced during the online test, even in user programs with more than 64 K user data. [HE31174]

## 2.5 Improvements Related to Communication Protocols

**1** No loss of controller redundancy with error code 15 (i.e., redundancy lost after logical memory imbalance) during HIPRO-S communication via RS485 bus (serial).

The loss of the RS485 connection of a redundant HIPRO-S bus does not cause the redundant central module to stop. The controller remains in redundancy operation. [HE31161]

**2** No controller failure with error code 125 if HIPRO-S communication via Ethernet (TCP/IP on F8627X) is significantly disturbed.

Significant disturbances do not cause the controller to fail. The disturbed HIPRO-S transmission is discarded. Frequent multiple disturbances can interrupt the HIPRO-S communication. [HE28777]

## 2.6 Improvements Related to Start-Up (Power ON)

**1** No error code 25 during start-up following a RAM initialization.
After a RAM initialization due to a memory error, error code 25 (DIP switches S1…S8 were changed during operation since last power ON) is not entered in the error code history. The DIP switches are read in again and updated as done during power ON. [HE31242]

# 3 Restrictions of Revision (09.12)

## 3.1 Restrictions Related to Inputs and Outputs

**1** Output values from output modules of type F 3330…F 3335, F 3348 and F 3430 are retained despite the output modules having been deleted from the configuration.

User program changes, in which output modules of type F 3330, F 3331, F 3333, F 3334, F 3335, F 3348 or F 3430 are deleted from the configuration, do not alter the state of the physical modules. If the outputs of the specified types were activated before the program change, they remain activated after the change. This state is maintained as long as the 5 V power supply is on. The outputs adopt the previous state if only the 24 V power supply is switched off and on again.

**Workaround:** Prior to performing a change connected with an output module deletion, ensure that the outputs to be deleted are deactivated.

If possible, shortly switch off the 5 V power supply after the change. [Restriction]

**2** Set the safety time and the watchdog time in a relation of 3:1 to ensure faultless operation of the modules with their own processor system (*F 5220*, *F 6220* and *F 6221*).

Otherwise, brief interference interrupts the connection to the central modules and thereby causes the I/O module with their own processor system to fail.

**Workaround:** Check the safety settings. If the cycle time raises, increase the watchdog time as well. If needed and feasible, take the relation safety time/watchdog time ≥ 3 into account. [Restriction]

**3** Redundant wiring of F 3331 or F 3334 module causes faulty open-circuit detection in one of the two channels. This occurs because the 2 test pulses overlap.

**Workaround:** Use the HB-BLD-4 function block and only use the values after the evaluation of the outputs *Fault Channel 1…Fault Channel 8* in the user program is complete. [Restriction]

**4** Starting up again modules of type F 6213 and F 6214

If noise blanking is set to 0, the *ACK* key must be pressed twice.

If noise blanking is set to a value > 0, error code 197 is issued and logged in the error code history.

**Workaround:** Set noise blanking to a value > 0. If this is not possible, activate the *ACK* key twice.

**5** Starting up again modules of type F 6217.

If noise blanking is set to 0, the *ACK* key must be pressed twice.

If noise blanking is set to a value > 0, error code 197 is issued and logged in the error code history.

**Workaround:** Set noise blanking to a value > 0. If this is not possible, activate the *ACK* key twice.

**6** Starting up again modules of type F 6705.

If noise blanking is set to 0, the *ACK* key must be pressed twice.

If noise blanking is set to a value > 0, error code 197 is issued and logged in the error code history.

**Workaround:** Set noise blanking to a value > 0. If this is not possible, activate the *ACK* key twice.

## 3.2 Restrictions Related to Function Blocks

**1** In one case, the error code in the HF-AIX-3 function block is not correct

If an F 6221 module configured in ELOP II is removed from a subrack, the associated HF-AIX-3 function block issues 23 to the *Error Code* output instead of 2.

**Workaround:** When evaluating the error code in the user program, do not check for a specific value.

**2** In certain cases, the error code in the HB-RTE-3 function block is not correct.

If an external line fault occurs in a module of type F 3235, F 3237 or F 3238, the associated HB-RTE-3 function block may sometimes issue a wrong error code to the *Error Code Mod.* or *Error Code red.Mod.* output:

- n2 instead of n3
- n3 instead of n2

n *indicates the number of the channel in which the fault occurred.*

If the fault is still present after acknowledging the error, the correct error code is issued.

**Workaround:** When evaluating the error code in the user program, do not check for a specific value. [HE27505]

## 3.3 Restrictions Related to the User Program Handling

**1** Controller failure due to Upload→Code in connection with ELOP II V3.0, V3.5.

When executing the Upload→Code function in the Control Panel of ELOP II V3.5 and V3.0, the controller may fail with error code 5.

The use of the Upload→Code function for reading back the project data from within the controller must be avoided. This function is no longer available in ELOP II as of V4.1.

**Workaround:** Avoid using the Upload→Code function. Use ELOP II as of V4.1, if possible. [Restriction]

**2** Controller failure in connection with single-step mode and Modbus master (HK-MMT-3 function block in use).

If a controller is operated in single-step mode for testing, while a Modbus master is active, the controller may fail with error code 172.

**Workaround:** Prior to starting the single-step mode, deactivate the Modbus master operation by setting the *Enable* inputs to FALSE in all the function blocks of type HK-MMT-3.

**3** In certain cases, the online change of system parameters has no effect.

In the ELOP II Control Panel, the *Change System Parameters* dialog box can be opened. The **Safety** tab is used to change safety parameters during operation. If the *Parameter online change* setting is deactivated and is transferred to the controller, these parameters can no longer be changed online.

This, however, cannot be recognized from the tab content. For this reason, the functions for changing and transferring the parameters to the controller during operation can still be used. Nevertheless, the controller ignores further online changes, if the *Parameter online change* was deactivated.

Additional online changes can only be performed again if the *Parameter online change* setting located in the user program is reactivated and is transferred to the controller by performing a download.

**Workaround:** Note down the settings for the safety parameters prior to deactivating the *Parameter online change* setting. [HE19818 (ELOP II), Restriction]

**4** Force flag is transferred from the deleted to the added variable.

If a forced variable is deleted from the hardware assignment and a reload is performed to load this change, the physical input retains the force flag and the force value.

In ELOP II, this has the effect that the deleted variable is no longer visible in the Force Editor.

If a forced input is assigned a given variable at a later point in time and a reload is performed, this variable is forced immediately after the reload process is completed! This may impact the safety of the system.

**Workaround:** Stop forcing prior to loading the user program with the deleted variables!

[HE19938 (ELOP II), restriction, applies to all ELOP II versions, including V.5.1 730 IV3. With newer ELOP II versions, forcing of deleted variables can also be stopped from within the Force Editor upon completion of the loading process.]

**5** Large force images cannot be loaded into the controller.

The operating system rejects to load large force images with more than 60 modified forced variables.

**Workaround:** Perform major changes to the force image in smaller steps with a maximum of 60 changes each. [HE19490 (ELOP II)]

## 3.4 Restrictions Related to Communication Protocols

**1** Siemens communication protocol 3964R.

The Siemens communication protocol 3964R is based on a point-to-point connection via RS232. During active communication, sporadic interference may occur. Communication resumes automatically.

**Workaround:** None [Restriction]

**2** Interference related to Modbus function codes 5, 6 and 8.

When Modbus communication runs via the central module's serial interfaces, interference may occur in connection with the Modbus function codes 5, 6 and 8.

This only applies if the serial interfaces are redundantly connected. Function codes 5, 6 and 8 can be used without restrictions if the serial interfaces of the communication module are used or if the interfaces are not redundantly connected.

**Workaround:** Replace this function codes with other ones as follows.

- Instead of function code 5, use function code 15 and set the number of variables to 1.
- Instead of function code 6, use function code 16 and set the number of variables to 1.
- Instead of function code 8, use function code 15 or 16 and set the number of variables to 1. [Restriction]

**3** Duplicate responses for Modbus function code 1 (Read Coils).

Modbus function code 1 provides duplicate responses if all the following conditions are met:

- Modbus is redundantly connected via the interfaces of the F 8621A module.
- The response length is identical to the request length.

**Workaround:** Set the number of values read with a request, outside the range 17…24 to ensure that the response and request lengths differ.

Note: 8 digital values are packed in one byte. [HE25191, Restriction]

**4** Event loss related to Modbus function codes 65, 66, 67.

While reading events using Modbus function codes 65, 66 and 67 via redundant connections to the co-processor module F 8621A, events may be lost sporadically.

**Workaround:** Other connections:

- Mono connection via the interfaces of the F 8621A module.
- Redundant connections via the interfaces of the central modules F 8650X, F 8652X. [HE06595, Restriction]

**5** Controller failure in connection with slave response time set too low.

If the maximum slave response time is set too low in a Modbus master, the controller may fail with error code 125. The maximum slave response time can be configured on the *Max. Response Time Slave in ms* input of the HK-MMT-3 function block.

**Workaround:** Determine the response time properly. Take the safety margin into account.

The calculation rule is described in the online help of the HK-MMT-3 function block.

**6** Simultaneous use of serial HIPRO-S communication and HIPRO-S via Ethernet is not allowed for the same connection.

Serial HIPRO-S communication and simultaneous transmission of HIPRO-S data via Ethernet to the same partner is not allowed.

Interference may result and the HIPRO-S communication may be interrupted.

**Workaround**: Use the HK-COM-3 function block to prevent safety-related HIPRO-S communication via Ethernet for a connection with serial data transmission (triggered by the PES master). Refer to the HIPRO-S V2 manual (HI 800 723 E) for details.

# 4 Migrating from a Previous Revision

The migration is performed by loading the new operating system, either online or offline.

Prior to loading the new operating system into a central module, the following points must be observed:

- For central modules with an operating system up to BS41q/51q V7.0-8 (07.30), first import the stand-alone loader. Refer to the *Supplementary sheet of the HIMA standalone loader for HIQuad central modules* (HI 800 627 E) for details.
- For the online replacement of the operating system, refer to the description provided in the operating system manual (HI 800 105 E) and the rules for upgrading HIPRO-S to HIPRO-S V2 specified in the HIPRO-S V2 manual (HI 800 723 E).
- The restrictions as of Chapter 3, in particular Chapter 3.4, Point 6, must be observed. The described workaround must be applied prior to migration.
- Make sure that during migration with existing HIPRO-S communication using the HK-COM-3 function block, the inputs with new functions are not used during the migration process. This applies when migrating operating systems prior to BS41q/51q V7.0-8 (08.17) or operating systems as of BS41q/51q V7.0-8 (08.17) and no application of HIPRO-S V2.

# 5 References

- Operating System Manual BS41q/51q V7.0-8, Document Number HI 800 105 E
- Supplementary Sheet of the HIMA Standalone Loader for HIQuad Central Modules, Document Number HI 800 627 E
- ELOP II V5.8.Build 5003.7992IV2 Release Notes, Document Number HI 800 767 E.
- ELOP II V5.8.Build 5003.7992IV2 Online Help.
- HIPRO-S V2 Manual, Document Number HI 800 723 E