



# 1 New Version of the Operating System

Version 2.14 for HIMax Controllers

## 2 Notes

Version 2.14 solves numerous problems which, in certain situations, limit the availability.

### 2.1 Improvements of Reload

- Considerably faster reload
- Stopping the user program is also possible during reload.  
Stopping the user program also aborts the reload.
- If a period is set, reload observes the defined period and uses the time remaining to the period set and not to the watchdog time. This could cause the controller to reject a reload due to too short remaining time, even if the reload would be possible in HIMax V. 1.22.
- The period and watchdog time can be changed online to ensure that the controller does not reject the reload.
- The period and the watchdog time can also be changed in the state RUN RELOAD CLEAN to correct a too short period and watchdog time that was set and activated by the reload, thus enabling RELOAD CLEAN (after RELOAD CLEAN, the time parameters can be set lower again).

### 2.2 Further Improvements

- Sequence of events recording (SER), event read-out through the OPC server.
- LEDs of different modules blinking synchronously
- Warnings signaled by blinking Error LED
- ComUserTask for communication modules  
Communication modules can run user-specific programs to process special communication protocols or other tasks.
- Enhancements for Modbus:
  - New function codes allow transmission of up to 1100 bytes.
  - The Modbus slave can simultaneously support several fieldbus interfaces.

### 2.3 Restrictions

- If an error occurs, the state variables are set to the initial value instead of the safe value.  
If a channel error occurs in the analog input modules X-AI 32 01 and X-AI 32 02, the global variables assigned with the channel state variables

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-> *State LL*, -> *State L*, -> *State N*, -> *State H*, -> *State HH*, are set to their initial value instead of the safe value FALSE.

Workaround: Set the initial value of the corresponding global value to FALSE. [HE16041]

- If the system bus connection is disturbed, the initial values are adopted too late. If the fault tolerance time (FTT) for a HiMax system is set to  $> 2 * \text{watchdog time (WDT)}$ , the noise blanking for the connection between I/O module and processor module is active. Only if the noise blanking is configured for the I/O module, the blanking of connection noises also operates properly for channels. If no noise blanking was configured for the affected I/O module and given permanent connection noises or a connection loss, it is possible that the initial or safe values are adopted with a delay of up to a CPU cycle. The connection noise blanking for module-specific or submodule-specific data also leads to delayed values if the connection is disturbed. Workaround: Configure the noise blanking for the I/O module. In doing so, the problem does no longer occur with noises of channel-specific data. [HE16113]
- Delay when processor modules are synchronized  
This problem only occurs if the following applies:  $\text{FTT} - 2 * \text{WDT} > \frac{1}{3} * \text{FTT}_{\text{Max}}$  with  $\text{FTT}_{\text{Max}} = 22\,500\text{ ms}$ .  
When a processor module is synchronized to another processor module in the RUN state, a mistake can occur under the following conditions:
  - Noise blanking is active for at least one I/O module.
  - When the noise blanking ceases, the noise still exists.In such a case, one of the processor modules no longer takes part in redundancy and tries a new synchronization. Further, this could cause the module to adopt the initial or safe values with a certain delay. This effect depends on the safety time (FTT) and the watchdog time (WDT) that have been configured for the resource. If  $\text{FTT} - 2 * \text{WDT} > \frac{1}{3} * \text{FTT}_{\text{Max}}$ , it is possible that the initial or safe values are not adopted until the noise blanking ceases the next time. [HE16133]

The preceding restrictions also apply to the previous versions V.1.10 and V.1.22.

- The operating system version 2.14 must be installed on both controllers to ensure that a **safeethernet** connection between two HiMax controllers can start operation.
- A project configuration with too much retain data causes the controller to reboot. A project configuration exceeding the maximum storage capacity for retain data (32 KB for HiMax), is not considered as faulty and thus not rejected when it is loaded into the controller. Such a configuration causes the controller to reboot. [HE14908, HE14942, HE14973]
- Changes to local retain variables cause system malfunction after the reload. If the retain attributes for local variables are changed *without* simultaneously modifying the program logic, a warm start performed after reloading the changes into the controller results in errors associated with the variables. For instance, these retain variables may receive incorrect values.

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Workaround: Always modify the program logic when the retain attributes for local variables are changed. Compare the CRCs of the program binary file to verify the changes. If the CRCs before and after the changes are different, no malfunction will occur. [HE15030]

- Modifying the configuration of **safeethernet** connections together with the synchronization of a processor module can lead to a safety-critical failure. In exceptional cases, the processor modules can provide differing values to a **safeethernet** connection if the following sequence of actions occurs:
  - RUN operation of a system with **safeethernet** connections.
  - Stopping and downloading a new configuration with less **safeethernet** connections than the previous one.
  - Synchronizing additional processor modules (e.g., after plug in).
  - Downloading a new configuration having more **safeethernet** connections than the previous one.
  - Transition to RUN operation.

In this case, the data of some **safeethernet** connections in the synchronized processor module could adopt the valid process values, while the data of the **safeethernet** connections in the remaining processor modules could assume the initial values.

Workaround: After downloading the configuration of the **safeethernet** connections and before entering RUN operation, remove all processor modules, reinsert them in the system, and then start the system's RUN operation.

### 3 Migration from V.1.10/V.1.22 to V.2.14

SILworX version must be changed when migrating to HiMax firmware version 2.14, since SILworX V.1.12/1.20 can only co-operate with HiMax V.1.10/1.22 and SILworX V.2.36 can co-operate with HiMax V.2.14 and higher.

All modules of the HiMax system must be migrated to V. 2.x:

- Processor modules, system bus modules, and I/O modules to V.2.14
- Communication modules to V.2.16

The migration procedure is described in the [Release Notes for SILworX V.2.36 and V.2.46](#) and has to be adhered to.