Content

1   New SILworX Version 4.116

This document describes the new functions of version 4.116, its restrictions and improvements compared to previous versions:

- Chapters 2 and 3 describe the new functions and improvements.
- Chapter 4 specifies the current restrictions of version 4.116.
- Chapter 5 describes the upgrade procedure from a previous version.

1.1   Compatibility

Version 4.116 can be used for the following PES with the specified operating system versions:

- HIMax controllers, firmware version 2.0 and beyond.
- HIMatrix controllers standard, CPU operating system version 7.0 and beyond and COM operating system version 12.0 and beyond.
- HIMatrix controllers F10 PCI 03, F30 03, F31 03, F35 03, and F60 CPU 03, CPU operating system version 8.0 and beyond and COM operating system version 13.0 and beyond.

The minimum requirements for the computer used to operate SILworX are specified on the individual installation DVD. Especially with very large projects, older computers may need long processing times and thus be not suitable. The computer hardware should therefore comply with the state of the art. Better hardware features such as CPU capacities and RAM result in enhanced performance.

2 Improvements of Version 4.116 Compared to Version 4.64

This chapter describes the enhancements and extensions of version 4.116 compared to version 4.64.

- Support for *X-OTS - HIMax Safety Simulator*
  SILworX supports X-OTS allowing one to configure OTS resources (Operator Training System) within a project. An OTS resource is the simulation of a controller (without I/O modules) on a PC operating under Windows.
  A license is required to use this option.

- Loop Enable for user-defined function blocks
  User-defined function blocks can be set up such that the contained logic is run multiple times within a user program cycle until the stop criterion is met.

- Optimized behavior of the setting 'Short Tag Names for A&E' with respect to control system integration
  Some control systems (in particular ABB and Emerson) use the event source as filter and sort criterion. To ensure seamless integration of the HIMA events into these systems, the resource context for the event source is not specified for this setting.
  Example:
    - Previous behavior:
      Event source name in the client: *ResourceName_GlobalVariable*
    - Behavior with version 4.116 and beyond:
      Event source name in the client: *GlobalVariable*

  This change only concerns the X-OPC server configuration file and does not affect the controller's configuration (CRC)!
  The following effects result:
    - When code is generated with version 4.116, the X-OPC server configuration file changes.
    - If multiple resources are connected in the X-OPC server and have the same name in the event definitions, the tag names for alarms and events are no longer unique.

  If the tag names contain the resource names, the setting 'Short Tag Names for A&E' must be reset.

2.1 Improvements Compared to Previous Versions

Refer to the release notes for version 4.64 for more information on the extensions and improvements of version 4.64 compared to the previous versions.

3   Corrected Problems of Version 4.116

This chapter lists problems within previous versions that have been resolved in this version 4.116.

- The name of POU help file could always be changed.
  In the previous version, the help file name could also be changed for POUs, even though this should not be possible:
    - Read-only POUs
    - POUs with know-how protection. [HE20154]

- Error message after deletion: Code generation is no longer possible.
  In the previous version, after a program logic containing connectors was deleted, an error message could appear saying that there were objects without graphical representation. As a result, code could no longer be generated for the project.
  This problem does no longer occur in the current version. [HE20725]

- Error message: 'Inconsistent network numbers'.
  In the previous version, after a program logic containing connectors was verified, the error message 'Inconsistent network numbers' could appear with the request for establishing new connections.
  This problem does no longer occur in the current version. [HE20566]

- SILworX V4 is permitted as minimum configuration version for resources of type HIMatrix standard.

4   Restrictions of the Version 4.116

When using SILworX version 4.116, take the following restrictions into account.
If the following instructions are observed, the restrictions have no influence on safety and on the availability of the code generated for a controller.

4.1 Known Restrictions

- SILworX terminates if output structure variables are used
  SILworX allows one to reference the output parameter A of a function block instance X in the format X.A. Attempting to reference all output parameters as structure X, causes SILworX to terminate. [HE20256]

- System variables mixed up when converting HIMatrix projects from version 4.64
  The global variables of projects with HIMatrix resources F10 PCI 03, F30 03, F31 03, F35 03 or F60 CPU 03, which were created with SILworX V.4.64 and converted to V.4.116, are assigned to system variables according to the following scheme:
    - The variable previously assigned to *Spare 2* is now assigned to *User LED2*.
    - The variable previously assigned to *User LED1* is now assigned to *Spare 2.*

- The variable previously assigned to *User LED2* is now assigned to *User LED1.*

  This change does not result in a signature change. [HE21038]

- No test of successive use of selection and simultaneous nodes
  Using selection and simultaneous nodes within the same hierarchy causes deadlocks. SILworX does not report this problem. Workaround: Do not use selection and simultaneous nodes within the same hierarchy. [HE17716]

- No global variable warning symbols in the online cross-references
  If the initial value of a global variable is changed, SILworX 4.116 does not display any exclamation point in the online cross-references. [HE20311]

- Value of global variables used as VAR_EXTERNAL is not displayed
  If global variable with non-elementary data type (Struct, Array) are used as VAR_EXTERNAL, the FBD Editor for sub-elements **does not** display the values entered in the column: *Initial Value*, *Description*, *Additional Comment* and *Technical Unit* [HE19688].

- SILworX terminates when action blocks are copied after changing the language
  The following sequence of actions causes SILworX to terminate:
    - An action block is created in a function block.
    - The language of SILworX is changed. To this end, SILworX is restarted.
    - The action block is copied in the FBD Editor.
    - The FBD Editor is closed and re-opened.

  SILworX terminates and the project is corrupted!
  Workaround: If action blocks are to be used, set the language when starting to work on a project and leave it unchanged.
  If the project has been corrupted, contact the HIMA support. [HE21163]

- Force icon at the transition input cannot be immediately seen
  If the transition input is forced in the graphical online test, the force icon is not displayed since the graphical representation of the transition input is not refreshed during forcing. The force icon only appears when the transition input is visualized in the Force Editor. The same applies to the force icon, which remains visible when forcing is stopped. [HE21345]

4.2 Basic Restrictions

The restrictions described in this chapter are fundamental in their nature. They relate to properties of the resources that SILworX requires to run, e.g., the PC operating system. For this reason, it is unlikely that these restrictions will be lifted in the foreseeable future.

- Base points of analog values are read as REAL
  SILworX reads the values specified for base points of an analog value (at 4 mA and 20 mA) as REAL. They are, however, further processed as LREAL. LREAL can also be used in the user program. This restriction is only relevant with very large or very small base point values. [HE16388, Restriction]

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- Logic operations of BOOL variables having values that do not originate from safety-related communication, can provide results that differ from those expected.
  The cause is that the coding of BOOL values used in the external system deviates from the coding used in the HIMax.
  Two workarounds are possible:
  - The external system only transmits 0 for FALSE and 1 for TRUE
  - A correction circuit is implemented in the user program for all relevant BOOL variables to normalize the value to 0 or 1:
    non-normalized variable -> AtoByte function block -> AtoBOOL function block -> *normalized variable* [HE13042, Restriction].

- Is it impossible to save changes in an Editor?
  After specific changes are made within an editor, the message 'Impossible to save changes' appears while attempting to save. After confirming the message, however, the changes are saved.
  If the editor is then closed and re-opened, the message 'The required data is being processed' appears.
  Examples of changes in which this problem occurs are the cyclic renaming of variables (A => B, B => C, C => A).
  Workaround: Avoid exchanging names.
  If required, restart SILworX. [HE11613, Restriction]

- Variations of the cycle time during LREAL calculations.
  The cycle times can vary strongly during calculations with variables of type LREAL. To measure the watchdog time, the cycle time must be determined under realistic conditions.
  [HE12115, Restriction]

- Sequential function chart: Step-internal TON starts a cycle later than normal TON
  A reload is performed and leads to the following changes:
  - A new step is added and must be active immediately after the reload.
  - A TON function block with the input set to TRUE is added.

  The step-internal TON then starts one cycle later than the TON function block in the program logic. [HE16288, Restriction]

- Use of hardlocks
  Licensing SILworX using hardlocks (U3 USB sticks, standard USB sticks) is managed differently among the various operating systems:
  - With Windows XP, administrator rights are required in the following cases:
    1. To perform the installation
    2. For operation, if SIlworX was licensed using U3 USB sticks
    The rights of a standard user are sufficient for operation, if SILworX was licensed using standard USB sticks.
  - With Windows 7, administrator rights are required to perform the installation.
    For operation, hardlocks can be used to license SILworX to all types users.

Workaround for Windows XP: Use softlock licenses or standard USB sticks. [HE17056, Restriction]

- DIV_TIME with REAL typecast reports an error on ENO for divisor := +/-INF
  The DIV_TIME function from the standard library improperly sets the ENO error output ENO to FALSE and reports therefore an error under the following conditions:
  - The IN2 input (divisor) is of type REAL.
  - The value of IN2 is +/-INF. [HE15199, Restriction]

- Handling of VAR_INPUT variables in connection with user-defined function blocks
  With user-defined function blocks, SILworX handles VAR_INPUT variables differently, depending on how the inputs are wired:
  - If the inputs are wired with variables of a default data type, SILworX transfers the value of the variable to a copy within the function block (call by value). Changes to the original variables do not affect this copy.
  - If the inputs are wired with variables of a user-defined data type, SILworX transfers a reference to the variable (call by reference).
    If the variable is a global variable, take into account that it can be modified in the function block. Additionally, a global variable can be used in a function block as VAR_EXTERNAL. Changes to such variables are effective immediately when the corresponding VAR_INPUT variable is read in the function block. As such, the value can change while executing the function block. [HE17740, Restriction]

- Reconnecting the diagnostic view causes a module login, instead of a system login.
  If the diagnostic view is opened during a system login and the connection is closed, SILworX offers the module login when attempting to re-establish the connection. [HE11926, Restriction]

- Online help associated with a POU not printable
  The document management cannot print the content of the online help associated with a user-defined POU.
  Workaround: Use the display panel to display the online help content and print out the individual topics. [HE14244]

- Various elements of a structure variable cannot be written simultaneously from different sources
  The user program and the hardware or communication cannot simultaneously write to two different elements of the same structure variables.
  Workaround: Use different structure variables for those elements written to by the user program and for those elements written to by the hardware or communication. [HE15700]

- ENO output in connection with user-defined function blocks may be overwritten during reload.
  With user-defined function blocks, in which the ENO output is only dependent on the EN input, ENO may be set to FALSE during a reload. Such function blocks do not themselves write to ENO. [HE19129]

- Elements of structure variables used as index
  It is not possible to use elements of variables with structure data type as array index. [HE16159]

- Retain attribute of timer function blocks is not safe
  Timer function blocks cannot be correctly used with the retain attribute. If a timer function block is used with the retain attribute, the time counter may adopt any potential value after a warm start.
  Workaround: Do not use timer function blocks with the retain attribute. [HE17252]

- Value of system variables during the online test and offline simulation
  The value of system variables is not displayed during the online test and offline simulation:
    - The OLT field is empty
    - The value of digital system variables is not represented by the color of the corresponding line
    - The *Process Value* column in the **System Variables** tab of the Object Panel is empty
    - The Force Editor contains no system variables

  Workaround: Most of the information is displayed elsewhere, e.g., in the Control Panel. To display it in the OLT, connect the system variable to a global variable (VAR_TEMP) and connect this to an OLT field. Forcing can only be performed in HIMax, if the program is connected to the system variable via a global variable. The global variable can be forced. [HE15396, Restriction]

5 Upgrading from one Previous Version to Version 4.116

Observe the following procedure to upgrade from version 2.36 and beyond to version 4.116:

- Generate all resources prior to conversion. This allows potential deviations after the conversion to be detected during generation.

- Prior to converting, save the project, e.g., on a removable medium.

- Open the project in version 4.116 and convert it.

- Since the conversion is extensive, check the project integrity after completing the conversion.

- Generate the code in version 4.116 to detect potential errors and check if CRCs changed.

- Remove detected errors and re-generate the code to detect changed CRCs.

- If no CRC changes are detected, the migration was completed successfully.

- If CRC changes are detected, verify whether they can be accepted.

- If this is the case, the migration was completed successfully.

- If they cannot be accepted, continue to work with corresponding previous version.

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Notes on Conversion:

- The procedure to convert versions prior to V.2.36 is described in the release notes to V.2.36.

- For very large projects, the conversion can take several hours.