SAFETY NONSTOP

Release Notes

Content

1 New SILworX V8.34

This document describes the improvements and new functions of V8.34 compared to the previous versions:

- Chapter 2 describes the new functions and improvements.
- Chapter 3 presents the resolved problems.
- Chapter 4 specifies the current restrictions of V8.34.
- Chapter 5 describes the migration procedure from the previous version.
- Chapter 6 provides references.

1.1 Compatibility with the PES Operating System

SILworX V8.34 can be used for the following HIMA system families:

- HIMax
- HIMatrix F systems
- HIMatrix M45

1.2 Compatibility with Existing Projects

SILworX V8.34 can convert and edit projects that were created with a previous version. When generating code for the unchanged project, the CRC is maintained except for cases in which code is generated for several resources, see Chapter 3.5, Point 9.

1.3 Compatibility with the PC in Use

The minimum requirements for the computer used to run SILworX are specified on the corresponding **HIMA DVD**.

In particular with very large projects, old PCs may require long processing times and thus be inappropriate for this task. Therefore, state-of-the-art computers should be used whenever possible. Enhanced hardware features such as computing power and memory space result in improved performance.

2 Improvements of V8.34

This chapter describes the improvements of V8.34 compared to versions prior to V8.

1 Support for HIPRO-S V2

For HIMax and HIMatrix, SILworX V8.34 supports the new and safe protocol HIPRO-S V2 for Ethernet connections with HIQuad PES.

2 Messages from previous SILworX sessions saved in the log files are adopted in the project history

Using the **Project History** menu option, the user can see messages that occurred in previous SILworX sessions.

3 Changed standard values for short-circuit threshold

The default value for the short-circuit threshold *SC Limit* changed from 21.3 mA to 21.0 mA in the analog HIMax input modules X-AI 32 01, X-AI 32 02 and X-AI 32 51.

4 Online view for safe**ethernet**

In the SILworX safe**ethernet** online view, the values for connection control and for the channel quality of the first and of the redundant connection are displayed as hexadecimal values. A tooltip explains the meaning of the bits.

5 Up to 255 safe**ethernet** connections can be configured for HIMatrix F10 PCI 03, F30 03, F31 03, F35 03, F60 CPU 03

The HIMatrix device requires a suitable CPU operating system V12 to be able to establish more than 128 safe**ethernet** connections.

6 In the FBD Editor, empty pages can be deleted from the logic

Exceptions: the empty pages that form a frame around the program logic.

7 Error messages for pins that are very close to one another

During code generation and validation, SILworX issues a warning if two pins in the FBD Editor are located next to one another without distance so that it is not possible to recognize whether they are connected or not.

8 The Standard Library contains two new function blocks:

- BITPACK: Packs 8 inputs of type BOOL in an output of type BYTE.
- BITUNPACK: Outputs the individual bits of the BYTE input to 8 outputs of type BOOL.

3 Problems Resolved in V8.34

This chapter describes problems in versions prior to V8 that have been resolved in V8.34.

3.1 Hardware Editor

1 For F10 PCI 03 only: VLAN connections to ports 1…4 can be activated online

In the previous version, the VLAN connections from the PC port to ports 1…4 could not be activated online, but only when a configuration was loaded. The VLAN connections could be deactivated online. [HE26160]

2 SRS is specified in the title bar of the A&E Editor [HE26068]

3 Error message in connection with a global variable having the source and the drain within the same remote I/O

If a global variable had the source and the drain in the same remote I/O, the previous version issued an error message informing that the variable had more than one source. [HE26061]

4 Proper SILworX reaction when the 64th M45 module is added

The maximum number of modules permitted for the HIMatrix M45 system is 63, including the processor module. Trying to add an illicit 64th module could cause the previous version to terminate. [HE24522]

5 Deletable generic module in HIMax proxy resource

In the previous version, a generic module previously inserted into a rack could no longer be deleted in a SILworX proxy resource of HIMax type. [HE26020]

6 Unnecessary system variable for redundant HIMax counter modules renamed

In the previous version, the detail view of a redundancy group composed of HIMax counter modules, X-CI 24 01 or X-CI 24 51, contained the system variable *-> Count.Read. (Revolv.) [UDINT].* A global variable could be assigned to the system variable. The system variable, however, always returned the value 0 and was therefore needless.

The needless system variable was renamed in *-> Reserved[UDINT]*. [HE26041]

7 Rack and remote I/O previously selected can be cut and pasted

In the previous version, the following sequence of actions caused SILworX to terminate:

- A rack and a remote I/O were selected.
- The selection was cut and copied to the clipboard.
- The object was pasted from the clipboard.

[HE26230]

8 Setting the mirroring online

The mirroring settings can be changed online for the Ethernet connections of processor modules, X-CPU 31 and M-CPU 01. [HE26467]

9 IP address of proxy resources specified in the documentation

The IP address entered for a proxy resource in specified in the project documentation. [HE26006]

10 The *IP Forwarding* checkbox no longer in the IP settings

The *IP Forwarding* checkbox is no longer included in the IP settings of modules with Ethernet connections. This feature is not supported by the controller's operating system. [HE23595]

11 **Set SB to Responsible** now only available in module login dialog boxes

The **Set SB to Responsible** check box is no longer available in the system login dialog boxes of HIMax system bus modules. The corresponding function can only be performed during the module login. [HE25131]

12 Error message when the X-CPU 01 with X-CPU 31 is replaced through a reload

The attempt to replace the X-CPU 01 processor modules and the X-SB 01 system bus modules with the X-CPU 31 and to load this change through a reload causes the system to issue an error message rejecting the action. In such a case, the previous version terminated. [HE26646]

13 Messages during code generation include the text Cold Reload whenever a cold reload is necessary [HE24446]

14 Ethernet switch parameters of several resources can be displayed simultaneously

In the previous version, if the Ethernet switch parameters of several resources were displayed in the online detail views, it could happen that the values for a resource were not displayed. [HE27163]

15 The detail view of the counters for HIMatrix F60 CIO 2/4 01 corresponds to that of the F35 03 [HE18857]

3.2 Editors

1 Faulty function blocks can be copied and pasted

In the previous version, the following procedure caused SILworX to terminate when a function block or function was copied and pasted:

a A variable of type VAR_INPUT or VAR_OUTPUT was created in the function block or function and a user-defined data type was assigned to the variable.

b The variable was used in the function block or function.

c The user-defined data-type was changed, e.g., by adding a dimension to an array.

d The affected VAR_INPUT or VAR_OUTPUT was **not** updated in the function block or function.

e The function block or function was copied to a structure tree position from which the modified data type was accessible.

[HE25573]

2 SILworX no longer terminates if standard function block instances are copied to the logic and a user-defined data type with the same name already exists

If a user-defined data type (array or struct) was used and had the same name as the standard function block, e.g., `AND`, SILworX terminated when attempting to copy an instance of a standard function block to the logic. [HE26419]

3 SILworX no longer terminates if function blocks from restored archives have no unique name

When opening a function block or program in the previous version, SILworX terminated if all the following conditions were met:

- A structure or array data type contained elements named the same as POUs.
- Instances of such POU types were used.

[HE26652]

4 **Cross-Reference in Column** properly shows the arrays and structures in use

In the previous version, when filtering by "unused", the **Cross-Reference in Column** function still showed the correspondent main element of array and structure variables as "unused". [HE26029]

5 Elements of a structure variable can be updated even after simultaneous change

In the previous version, the following sequence could prevent the elements of a global structure variable from being updated:

a The data type of a structure variable was changed. As a result, the variable had to be updated in the Global Variable Editor. This was signalized through a red exclamation point.

b In another editor, e.g., the PROFIBUS DP Slave Editor, this variable was simultaneously assigned to a system variable. This editor reserved the global variable.

c Attempting to update these variables in the Global Variable Editor resulted in an error message.

d Closing the other editor (in this example: the PROFIBUS DP Slave Editor) allowed the variables to be updated, but not their elements.

e Saving the variables prevented the variables to be updated again.

6 No lock through **Cross-Reference in Column** during running code generation

In the previous version, the following sequence resulted in an infinitive loop and SILworX had to be terminated through the task manager:

a The Global Variable Editor was opened and left open.

b The multi code generation was started for safe**ethernet**.

c The **Cross-Reference in Column** function in the Global Variable Editor was used [HE25122].

7 Dialog box for selecting files retains the path of the ComUserTask file

In the previous version, when loading the ComUserTask, the dialog box for selecting files set the name of the ComUserTask file opened last to a default name. [HE27058]

8 The dialog box for selecting files can be opened even if the file name is invalid

The dialog box for exporting a table as CSV file contains a field for entering the file name. If an invalid file name is typed into this field and **OK** is clicked, SILworX attempts to start the export. If **…** is clicked in the CSV export window, SILworX opens the dialog box for selecting files. In the previous versions, there was no reaction. [HE26057]

9 Value fields with assigned comment fields or OLT fields can be docked to lines

The previous version rejected to dock a value field to a line if the following conditions were met:

- The value field was connected to an assigned comment field or an assigned online test field.
- The connection line between value field and assigned field crossed the connection pin of the value field

[HE27082]

10 Automatic connection of function block or function with open line segments on both sides

The previous version terminated if the new inputs were automatically connected to existing line segments by enlarging a function or a function block. The line segments were open on both sides. [HE27586]

11 SILworX can edit faulty projects

In the previous version, a warning about an open connection that appeared during code generation could indicate a defective project. If an attempt to use **Go to** on this warning to access the POU caused an internal error message to be issued in the logbook. Additionally, various user actions such as the deletion of a variable or the offline simulation could cause SILworX to terminate.

An error message containing the text "internal line chain error" appears instead of the warning. [HE26126]

12 The Structured Text Editor displays cross-references to structure variables properly like in the FBD Editor

For structure variables, the previous version displayed the cross-references to the main element or sub-elements of structure variables if the following conditions were met:

- Structure variables were used in the Structured Text Editor
- Only the sub-elements of the structure variables were referenced, not the main element.

[HE26025]

3.3 Online Test and Offline Simulation

1 Online test or the offline simulation can be started

In the previous version, the following procedure caused SILworX to terminate when the online test or offline simulation was started:

a A variable was assigned to an online test field.

b The name of the variable was changed to a fixed value.

c Code was generated and loaded to the PES.

[HE26212]

2 OLT fields inserted by the user take inverted outputs into account

In the previous version, an OLT field inserted by the user did not display the proper value under all the following conditions:

- The OLT field was connected to an inverted output of a function, function block or value field.
- The data type of the output was not BOOL.

[HE25675]

3 Copied independent online test fields can display nested variable elements

In the previous version, the copy of an independent online test field did not contain the reference to the variable element to be displayed. [HE26203]

3.4 Protocols

1 Grayed-out **Reset Statistics** function in context menus during online connection

If a PES online view was available (Control Panel or Hardware Editor), the **Reset Statistics** function was grayed out in many context menus. This affected all context menus in the structure tree and many more. The **Reset Statistics** function had a reference to the clicked object in very few cases and was therefore superfluous. [HE26031]

2 Reload code generation checks code generation details of other resources

The reload code generation for safe**ethernet** also checks the code generation details of communication partners. The code generation reports if these resources contain obsolete signatures. [HE25897]

3 In the safe**ethernet** Connection Editor, context menu options are also available in the main menu

In the safe**ethernet** Connection Editor, options that had only been available in the context menu are now also accessible from the main menu. The corresponding shortcuts can also be used. [HE25926]

4 New dialog box for behavior on connection loss in the safe**ethernet** Editor

The handling of faulty user inputs was improved. [HE24978]

5 Improvements of safe**ethernet** Editor

Like other editors, the safe**ethernet** Editor offers operating options:

- Menu functions for resolving existing conflicts.
- Replacement of variables using drag&drop.

[HE26194]

6 Verification in SILworX adjusted to the HIMatrix standard PES features

HIMatrix PES F3* 01x and F60 CPU 01 are able to establish 55 simultaneous safe**ethernet** connections. The verification in SILworX was adjusted to this value. [HE26233]

7 The User Data Editor for the PROFIBUS DP master properly reads the GSD file

The User Data Editor for the PROFIBUS DP master properly reads the GSD file, even if it contains the following peculiarities:

- The indexes for ExtUserPrmData are not sorted in ascending order.
- ExtUserPrmData contain no parameter texts.

[HE27286]

8 SILworX checks whether the size of the user data buffer for the PROFIBUS DP slave is valid

SILworX checks if the configured send and receive data exceeds the maximum buffer sizes and, if required, it aborts the code generation with an error message. [HE27488]

9 New dialog box for recalculating the Modbus slave offsets

The dialog box allows the user to specify the initial and final values as well as the calculation method. [HE25560]

3.5 Others

1 The **Connect References** option in the **Extras** menu is only available when a project is open

[HE27077]

2 Reload basis CRC is available in the version comparator documentation

The reload basis CRC, which has only been displayed during the version comparison, is now printed in the documentation as well. [HE25987]

3 Extended selection results in up-to-date force values and force switches

In the previous version, the following conditions could cause SILworX to use obsolete force values and force switches for local or global variables:

- In the Force Editor, more local or global variables were selected than they could be displayed.
- The selected variables were already forced.
- One or several variables were added to the selection by clicking and simultaneously pressing the CTRL key.
- The *Edit Local Force Data* or *Edit Global Force Data* dialog box was displayed.

When browsing the dialog box *Edit Local Force Data* or *Edit Global Force Data*, the hidden variables were then likely to have obsolete force values and force switch settings. [HE26501]

4 Enhanced cyber security for SILworX installation

The access to the bash used during program generation was restricted to enhance cyber security. [HE26170]

5 Force Editor may be opened when the online view is open

The previous version terminated under the following conditions:

- A global variable was assigned an input or output system variable and was used in the user program.
- The user program's online view was open.
- The Force Editor was started from the **Force** menu. [HE26138]

6 Global variables with invalid data type assigned to system variables

In a redundancy group of the previous version, a global variable with invalid data type could be assigned a system variable. This could cause an unsuitable and therefore incomprehensible error message to appear. [HE26593]

7 Version comparison with loaded project

Updating the PES values may take very long. During this time, SILworX displays NA for the values that are still not available. Instead, the previous version displayed default values that could have been misleading. [HE26115]

8 Code generation may be started in immediate succession for any number of resources

The processing is synchronized by SILworX itself. [HE26532]

9 Code generation of several resources is performed in a predefined order

The code generation and CRCs are thus stable.

Notice: Generating code for several resources that are connected via safe**ethernet** and belong to a project converted from a previous version, may cause the CRC to change. Generating code for a single resource does not cause the CRC to change: [HE25330]

10 Deletion of variable assignments in protocol editors affects the selected variables

The **Delete Variable Assignments** option on the context menu of some protocol editors affects the selected variables (lines). In the previous version, the topmost line was deleted. [HE25821]

11 Local force variables are always updated

When updating all the force variables, the previous version could miss to update the local force variables.

12 Watchpage contents still displayed after clicking a column title

If a watchpage is sorted by clicking a column title, the displayed position is retained. [HE26425]

13 Improved error message if the sum of the maximum user program durations is too large

The sum of the *Max. Duration for Each Cycle [µs]* parameters in all user programs must not exceed the resource watchdog time. The content of the error message issued by the code generator if this condition was not met was improved. [HE24866]

14 Error message when attempting to start download during code generation

Attempting to start a download during the code generation results in an error message. In such a case, the previous version could terminate. [HE24758]

15 Fields that can display both numerals and texts have a more consistent design

4 Restrictions

When using SILworX versions V8.x, observe the following restrictions.

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 Restrictions when Converting from Previous Versions

Observe the following restrictions when converting projects from previous SILworX versions.

1 All versions: CRC change in OPC configuration

Generating a new code for X-OPC or X-OTS in a project converted from a previous version causes the CRC of the `opc.conf` file to change.

2 All versions: code generation of several resources connected via safe**ethernet**

Generating code for several resources that are connected via safe**ethernet** and belong to a project converted from a previous version may cause the CRC to change. Generating code for a single resource does not cause the CRC to change: [HE25330]

3 SILworX V5: Licenses are sorted by names, which may cause the CRC to change

During code generation, SILworX V6.34 and higher no longer stores the licenses sorted by entry order, but by name. This may result in a changed CRC when converting projects from previous versions.

Workaround: Use suitable names, ask for HIMA technical support.

4 SILworX V4 project integrity

In SILworX V4, deletion actions could cause objects to remain in the database, but be no longer editable. These objects did not affect the rest of the project, but they were reported during the project integrity check.

Projects that were created in SILworX V4 and V5 and contain such "residual" objects are very unlikely convertible to SILworX V6 and V7. The likelihood is particularly high if the projects contain user-defined data types.

Workaround: Remove the objects found during the integrity check prior to converting the project. The following steps represent the simplest procedure and must be performed in the previous SILworX version:

a Archive all the child nodes of the project that are positioned in the structure tree under the project, except for **Programming and Debugging Tool**.

b Create a new project in the previous SILworX version.

c Delete the **Configuration** node in the new project.

d In the new project, restore the configuration archived in step a) and, if existing, additional child nodes of the project.

The project just created should be convertible to the current SILworX version.

[HE25994, Restriction]

5 Invalid date if the project history is imported from an English V2 project

When an English project created with SILworX V2 is imported, SILworX does not properly interpret the date in the project history. Example: 1/11/2013 is interpreted as 1st November 2013 instead of the 11th January 2013. 1/13/2013 is interpreted as invalid date and resulted in the default value 1st January 2000. [HE28418, Restriction]

4.2 Restrictions of V8.x

4.2.1 General

1 Sequential function chart: No indication of deadlocks

Combined use of selection and simultaneous nodes causes deadlocks, i.e., undefined states in which either all steps or no steps are active. SILworX does not warn the users. [HE17716]

2 User program size in the Control Panel and version comparator

The user program size displayed in the Control Panel may differ from that displayed in the version comparator. The Control Panel displays the size of the memory actually used. This value is usually higher than the value indicated in the version comparator. The values may also be identical.

This deviation is due to technical reasons and does not mean that a fault or a safety problem has occurred.

3 SILworX may not always be started under Windows 8

Under unspecified circumstances, it may happen that SILworX will not start under Windows 8.

Workaround: Reboot the computer. In this case, an error message also recommends rebooting the PC.

4 Force messages with no reference to target objects

Force messages in the logbook provide no details on the objects they refer to.

Example: The user cannot discern from which user program forcing was started. [HE25923]

5 Deleting and re-inserting many objects during a load procedure

The number of objects that can simultaneously be added to a resource during a load procedure (download or reload) is limited to the maximum number of objects within the resource. During a load procedure, it is only possible to add as many objects as previously allowed. Deleting objects in the same load procedure does not increase the number of insertable objects.

Insertable objects are, e.g., programs, safe**ethernet** connections, hardware modules, remote I/Os or protocols.

Moving objects, e.g., modules, to another rack is the same as deleting them and inserting the new ones.

Workaround: Delete and insert the new objects in separate load procedures. [HE25955, Restriction]

6 2700 consecutive comment lines are not possible in the Structured Text Editor

SILworX terminates when commenting out 2700 consecutive lines in the Structured Text Editor.

Workaround: Partition long comments, e.g., by grouping 1000 lines to one comment. [HE27464]

7 Table titles for alarms and events

Some event table titles for alarms and events are in English in the German SILworX user interface and contain unsuitable terminology in the English user interface. [HE27292]

8 SILworX terminates if large array variables are used in protocols

Attempting to adopt an array variable with more than 32 768 elements into a communication protocol causes SILworX to terminate.

Workaround: Partition large array variables into several smaller parts. [HE24258]

9 Path names with more than 32 767 characters cause SILworX to terminate

SILworX terminates if objects with names containing more than 32 767 characters are processed. For example, the path name is composed of the following elements:

Project name + configuration name + resource name + library name + … + function block name

Very long names can result from nested libraries if the individual libraries have long names.

Workaround:

a When possible, avoid long path names.

b If required, shorten the names of objects located at the beginning of the path.

c If necessary, delete the lowest library. In doing so, SILworX terminates again, but the library is deleted once the project has been restored.

[HE26815, Restriction]

10 SILworX terminates when creating new hardware, if the clipboard contains hardware objects

The following sequence for HIMax hardware provides an example:

a Open the Hardware Editor in the HIMax resource.

b Copy a HIMax rack.

c Close the Hardware Editor.

d Create the new resource.

e Open the Hardware Editor for the resource.

f Select **HIMax** in the *New* dialog box and confirm the action.

This causes SILworX to terminate!

Workaround:

Prior to creating new hardware, replace the elements on the clipboard with objects other than hardware objects. To this end, copy a text or an object from the structure tree. [HE27975]

11 The use of functions in structured text function blocks is not displayed as cross-reference

[HE26451]

12 Inconsistent state due to links set to objects that have already been deleted

If two editors are used simultaneously, the following sequence may lead to an inconsistent project state:

a In the first editor, a linkable object is deleted, but the action is not saved.

b In the second editor, a link to the deleted, but still visible object is created.

c The changes are saved in the second editor.

d The changes are saved in the first editor.

This causes the second editor to have a link to an object that no longer exists! The project state is not consistent and can cause the editors to terminate when they are opened.

Workaround:

If the editor can be opened, the link can be set to a valid object. Otherwise, the entire parent object must be deleted and created again. The parent object can be a POU or a hardware part. [HE27882]

13 No message when the name of a redundancy group is assigned twice in the Hardware Editor

SILworX does not issue any error message if the name assigned to a redundancy group in the Hardware Editor already exists. Only a logbook entry is created. The redundancy group receives the default name. [HE27149]

4.2.2 FBD Editor

1 Information on global variables used as VAR_EXTERNAL is not displayed

If global variables with Struct or Array data type are used as VAR_EXTERNAL, the FBD Editor does not display for sub-elements the information entered in the column *Initial Value, Description, Additional Comment and Technical Unit* [HE19688]

2 Conflict resulting from changing the constant attribute for global variables after their use

A conflict occurs during code generation, if a global variable is used as VAR_EXTERNAL and is set from Constant to Changeable or vice versa, when a value is assigned to this VAR_EXTERNAL and the global variable is constant.

Workaround: Delete the global variable at all positions in which it is used so that VAR_EXTERNAL disappears. Then, insert it again at all positions. [HE24487]

3 Conflict icon remains visible, in spite of removed conflict

In the following cases, the conflict icon remains visible although the invalid action was canceled and the valid value displayed:

- Invalid name is entered for a variable.
- An existing sequence number is assigned to an interface variable.

Workaround: Start verification or update process. [HE24339]

4 Empty pages cannot always be deleted

The **Delete Empty Page** context menu option is not active under the following conditions:

- A line extends over two or more adjacent sides of the empty page.
- The line does not cross the empty page.

Therefore, the empty page cannot be deleted.

4.2.3 Online

1 Many messages in the online view of the Hardware Editors

When a module is clicked in the online view of the Hardware Editors, SILworX checks which system family the module belongs to. Modules with previous operating systems are not able to provide this information. For such modules, SILworX issues an error message stating that the hardware type of the module is unknown. Clicking several modules results therefore in many error messages. Previous operating systems are:

- HIMax operating systems up to V7.
- HIMatrix F processor operating systems up to V11.
- HIMatrix M45 processor operating systems up to V11.

[HE27060]

4.3 Special features

When using SILworX, the described special features must be observed.

4.3.1 General

1 In the Hardware Editor, the scaling settings for an analog value are read as REAL

SILworX reads the values specified for the vertices of an analog value as REAL (at 4 mA and 20 mA). 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 vertex values. [HE16388, Restriction]

2 Logic operations of BOOL variables having values that originate from external systems can provide results that differ from those expected

The cause is that the coding of BOOL values used in the third-party system deviates from the coding used in the HIMA system.

Two **workarounds** are possible:

- The external system only provides 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]

3 Impossible to save certain changes in a SILworX editor

After specific changes are made in an editor, the message 'Impossible to save changes' appears while attempting to save. After confirming the message, however, the changes are saved.

If the SILworX editor is then closed and re-opened, the message 'The required data is being processed' appears.

An example of changes in which this problem occurs is the cyclic renaming of variables (A => B, B => C, C => A).

Workaround: Avoid exchanging names.

If required, restart SILworX. [HE11613, Restriction]

4 Variations of the cycle time during LREAL calculations

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

[HE12115, Restriction]

5 Different handling for inputs of SFC transitions and SFC actions

- A POU is processed in accordance with the following sequence: first the step sequences, afterwards the SFC actions and then the FBD logic. As a result, the input values of SFC transitions and SFC actions that are calculated in the FBD logic always originate from the previous cycle. The evaluation of the input values, however, reveals small differences. These differences and the connected impact are explained in the following table:

SFC Element	Evaluation of the inputs	Impact	**Workaround**
SFC Transition	During the FBD processing, the input value of an SFC transition is stored in the SFC transition memory. Thus, a step sequence does not move before the second cycle, even if the SFC transition contains the value TRUE.	If a field with the value TRUE is used as the SFC transition input after the initial state, the SFC transition is only switched in the second cycle.	When programming step sequences, take into account that an SFC transition is performed in the second cycle at the earliest.
SFC Action	The input value of an SFC action is read from the source during the processing of the SFC action. The value FALSE is read whenever the source is a function since functions are initialized at the beginning of the POU processing and are only processed after the SFC actions.	If a function output is used as input of an SFC action, the SFC action input is always FALSE, even if the function output has the value TRUE.	To use a function result as input value for an SFC action, a variable must be connected between function output and SFC action input.

Table 1: Behavior of SFC Transitions and SFC Actions Resulting from the Processing Sequence

[HE28370]

6 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]

7 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 Windows to display the online help content and print out the individual topics. [HE14244, Feature]

8 Value of user program's system variables during the online test and offline simulation

The value of user program's 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 variable and connect this variable to an OLT field. Forcing is possible because the system variable in the program is connected with a variable. This variable can be forced. [HE15396, Restriction]

9 Import of export files from a previous version

It cannot be ensured that key terms in the export or import files (.CSV, .XML) do not change between SILworX versions. If this occurs, SILworX imports the corresponding data as default values and issues an error message.

Example: The data type for the **English** language setting was denoted Data Type in versions up to V5.xx, and Data type in V5.xx and higher. When an export file is imported from a version up to V5.xx, SILworX creates all the variables with the default data type BOOL.

Workaround: Adjust the corresponding key words in the file to be imported. [HE21691]

10 Converting a safe**ethernet** connection from *Prior to V6* to *V6 and Higher*

When converting from a version prior to V6 to V6 and higher, observe that the timing master and its behavior may be changed. Refer to the SILworX communication manual (HI 801 101 E) V6.01 and higher for more information on the timing master.

Workaround: Set the timing master explicitly. [HE25666, Restriction]

11 Misleading indication of the force status for local forcing in connection with HIMatrix F*01x devices

For HIMatrix F*01x devices (such as F20 01, F30 01, F31 02, F35 01, F35 012 or F60 CPU 01), the parameters indicating the status of local forcing (located above the force table) are set to regular values as if the information was actually available. In particular, these parameters are *Force State*, *Forced Variables*, *Remaining Force Duration* and *Force Time Reaction*.[HE23021]

12 Copying obsolete online values

In the Force Editor and other force tables, online values can be copied to the clipboard. If values that were not located in the visible window are copied, they may be obsolete.

Workaround: Sorting the table after the process value provides the current values. Then, data may be sorted in accordance with the desired criteria, and may be copied once sorting has finished (indicated by cursor shape). [HE23314, Feature]

4.3.2 Arrays and Structures

1 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 variable.

Workaround: Use different structure variables for the elements written to by the user program and for the elements written to by the hardware or communication. [HE15700, Feature]

2 Elements of struct variables used as index

Elements of variables with struct data type cannot be used as array index. [HE16159, Feature]

3 Invalid array index addresses a random array element

If the array index value is outside the defined range, accessing the array with this index returns the value of a random array element. [HE25075, Feature]

4.3.3 PC Environment

1 Use of hardlocks

The following points must be taken into account if SILworX under Window 7, 8, 8.1 is licensed using hardlocks (USB sticks).

- Administrator rights are required to perform the installation.
- User privileges are sufficient for operation.

2 Windows synchronization deletes the project file from the network drive

The following sequence could cause a project file to be unintentionally deleted:

- The project file is located in a directory on a network drive.
- The Windows synchronization is running on the client PC.
- The project file is being edited with SILworX on the client PC.
- A synchronization process is started.
- The user stops editing the project file and exits SILworX.

Cause: When a project is being edited, SILworX saves the project to a temporary file. When the project is closed, SILworX deletes the previous project file and renames the temporary file. In the process, the Windows synchronization on the server may delete the previous project file, but not rename the temporary file.

Workaround: Only perform synchronization after closing the project in SILworX. [HE25231, Restriction]

4.3.4 Function Blocks and Functions

1 The number of instances of function blocks restricts the program's reloadability

If the user program has a very nested structure, the maximum number of operations necessary to perform a reload may be exceeded.

Only resources with 21845 or less instances can be reloaded. Depending on its structure, a user program may not be capable of reload in connection with a significant lower number.

Possible **workaround**:

- Avoid using POUs and data types that are excessively structured.
- In POUs with many instances, the problem can be worked around by changing the type of the variables from VAR to VAR_OUTPUT. [HE26889, Feature]

2 Value changes for VAR_INPUT variables in user-defined function blocks

In user-defined function blocks, SILworX handles VAR_INPUT variables differently, depending on how the inputs are connected:

- If the inputs are wired with variables of a default data type, the value of the variable is transferred to a copy within the function block (call by value).
- If the inputs are connected to variables of a user-defined data type, a reference to the variable is transferred to the function block (call by reference).

This behavior may result in errors if all the following conditions are met:

- The VAR_INPUT variable is a global variable.
- The VAR_INPUT variable is additionally used in the called function block as VAR_EXTERNAL.

If the value of the VAR_EXTERNAL variable is changed in the function block, the subsequent reading of the corresponding VAR_INPUT variable in the function block results in the following actions:

- For a user-defined data type, the current values are read.
- For an elementary data type, the previous values are read, which were valid at the beginning of the function block instance processing.

Workaround: Do not simultaneously use VAR_INPUT and VAR_EXTERNAL for transferring the value of identical global variables. [HE17740, Restriction]

3 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 output 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]

4 The MUL function block provides erroneous values if the following conditions are met:

- HIMatrix standard resource.
- Data type LREAL.
- One input has the value +/-∞, the other input the value *nan* (not a number).

In this case the result is -∞, and not *nan* as specified. [HE21924, Restriction]

5 EXPT function for large negative exponents

During the offline simulation and OTS, the EXPT function provides the result *nan* («not a number») instead of 1, if 1.0 is used for the basis (IN1) and a large negative number or –∞ is entered for the exponent (IN2).

Workaround: If this particular case is relevant for the application, the function must be handled in the user program. [HE14526, Restriction]

5 Upgrading from a Previous Version to V8.34

Project data from previous versions can still be used in V8.34.

No CRC changes occur as long as the **minimum configuration version** setting remains unchanged for a resource and none of the cases described in Chapter 1.2 has occurred. SILworX retains the CRCs compatible provided that no changes occur or no new features are used.

Observe the following procedure to upgrade from V2.36 and higher to V8.34:

- Generate code for all resources prior to conversion. This allows potential deviations after the conversion to be detected during generation.
- Prior to converting the project, save it, e.g., on a removable medium.
- Open the project in V8.34 and convert it.
- Since the conversion is extensive, check the project integrity after completing the conversion.
- Generate the code in V8.34 to detect potential errors and check if CRCs have changed.
- Remove detected errors and re-generate the code to detect CRC changes.
- If no CRC changes are detected, the migration was completed successfully.
- If CRC changes are detected, verify if they can be accepted.
- If the changes can be accepted, the migration is successfully completed.
- If they cannot be accepted, continue to work with corresponding previous version.

Conversion Notes:

- The procedure to convert versions up to V2.36 is described in the release notes to V2.36.
- For very large projects, the conversion can take several hours.

6 References

- SILworX first steps manual, HI 801 103 E
- Communication manual, HI 801 101 E