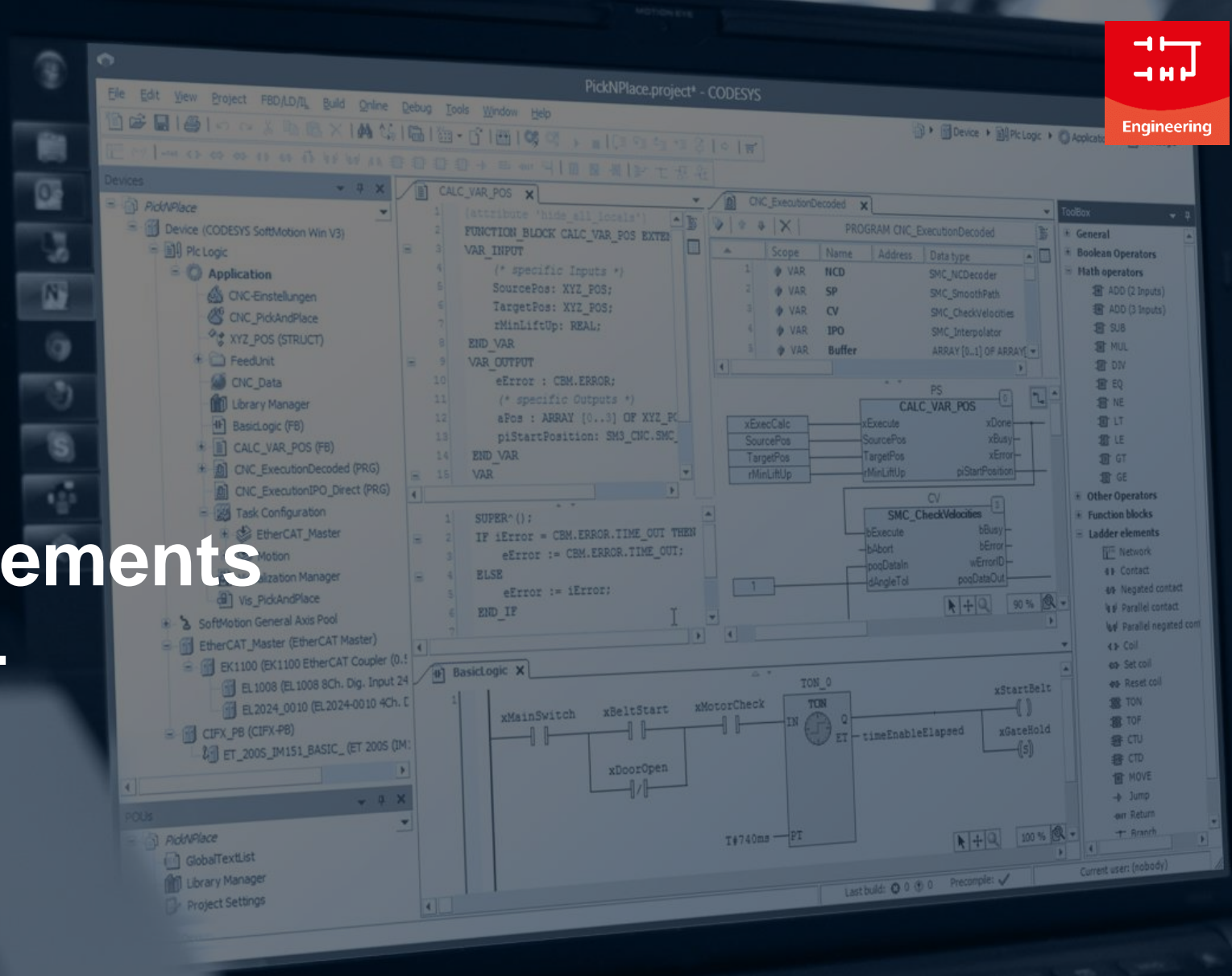


CODESYS

Features and Improvements

CODESYS V3.5 SP14



1

Engineering

2

Runtime

3

Visualization

4

Motion + CNC

5

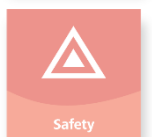
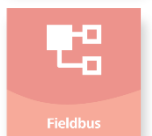
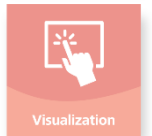
Fieldbus

6

Safety

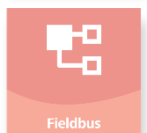
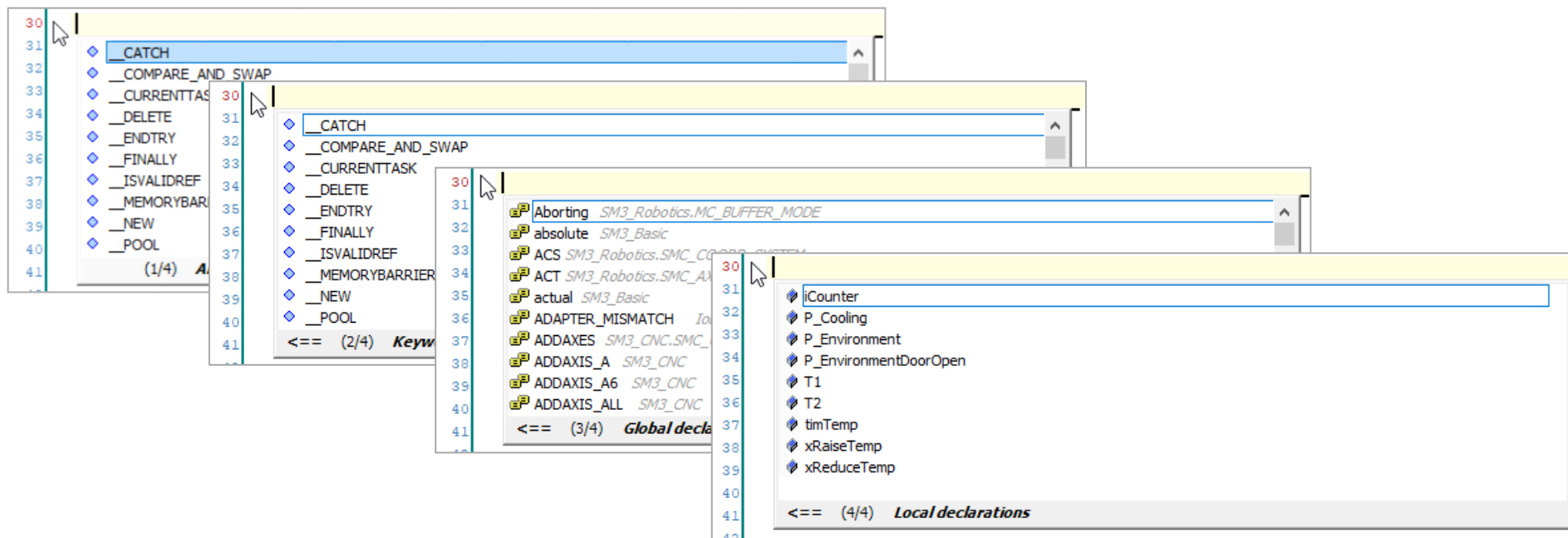
Overview

- Improvements of the intelligent input assistance
- Watchlist
- New data type
- Multicore devices
- Extensive improvements of the ST editor
- CFC
- General improvements



Improvements of the intelligent input assistance

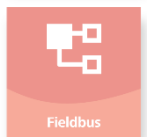
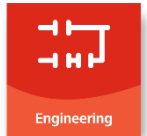
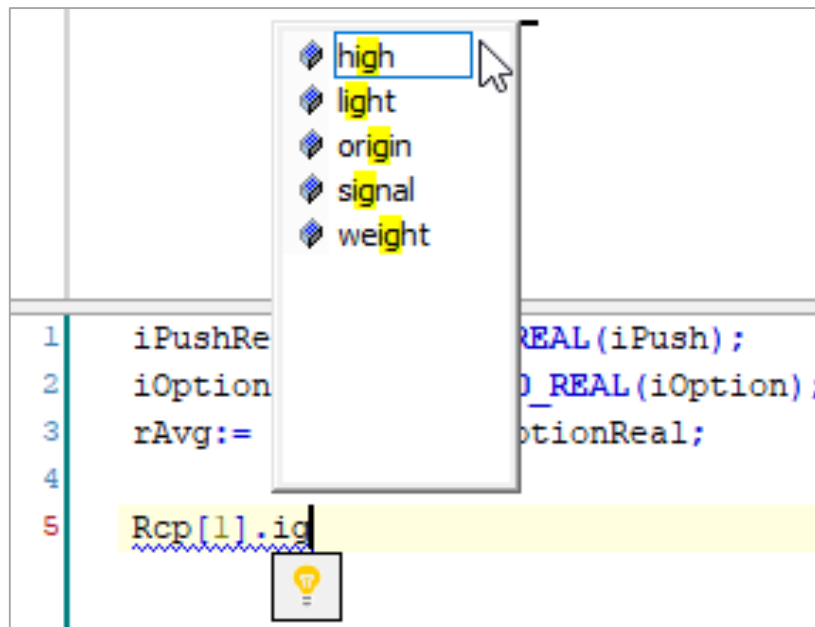
- Preselection for component access
- Categories
 - Open with Ctrl+Space
 - Switch pages with arrow left / right



Improvements of the intelligent input assistance

▪ Filters

- Independent of character position in the search item
- Character highlighting



Watchlist

- Type cast for pointers in the watchlist
- Monitoring of instance via interface, also in case of dynamically created objects
- Monitoring of the instance when reference is made via pointer

| Expression | Type | Value |
|----------------------------------|-----------|-------------|
| Inst1 | POU | |
| a | BOOL | FALSE |
| b | BOOL | FALSE |
| c | BOOL | FALSE |
| Inst2 | POU_1 | |
| d | BOOL | FALSE |
| e | BOOL | FALSE |
| pPointer | ITF_Drive | 16#04E47570 |
| Device.Application.PLC_PRG.Inst1 | POU | |
| a | BOOL | FALSE |
| b | BOOL | FALSE |
| c | BOOL | FALSE |
| xTrigger | BOOL | FALSE |

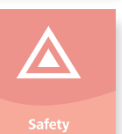
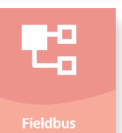
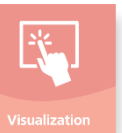
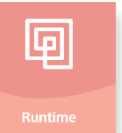
```

1 IF NOT xtriggerFALSE THEN
2   pPointer:=Inst1;
3 ELSE
4   pPointer:=Inst2;
5 end_if
6 RETURN
  
```

| Expression | Type | Value |
|----------------------------------|-----------|-------------|
| Inst1 | POU | |
| a | BOOL | FALSE |
| b | BOOL | FALSE |
| c | BOOL | FALSE |
| Inst2 | POU_1 | |
| d | BOOL | FALSE |
| e | BOOL | FALSE |
| pPointer | ITF_Drive | 16#04E47570 |
| Device.Application.PLC_PRG.Inst2 | POU_1 | |
| d | BOOL | FALSE |
| e | BOOL | FALSE |
| xTrigger | BOOL | TRUE |

```

1 IF NOT xtriggerTRUE THEN
2   pPointer:=Inst1;
3 ELSE
4   pPointer:=Inst2;
5 end_if
6 RETURN
  
```



New data type

- **New data type: `__VECTOR[3]` of `LREAL` or `REAL`**

Syntax:

`<variable name> : __ VECTOR[<vector size>] OF <element type> (:=initialization)? ;`

`<vector size> : 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8`

`<element type>: REAL | LREAL`

`\\ (...)? : Optional`

```

PLC_PRG x
1 PROGRAM PLC_PRG
2 VAR
3     vcA : __VECTOR[3] OF REAL;
4 END_VAR
5
6 vcA[0] := 1.1;
7 vcA[1] := 2.2;
8 vcA[2] := 3.3;
  
```

| Expression | Type | Value |
|------------|---------------------|-----------------|
| vcA | __VECTOR[3] OF REAL | [1.1, 2.2, 3.3] |
| vcB | __VECTOR[3] OF REAL | [1.5, 2.3, 3.8] |
| vcResult | __VECTOR[3] OF REAL | [2.6, 4.5, 7.1] |

```

PLC_PRG x
1 (* vcA : __VECTOR[3] OF REAL;
2   vcB : __VECTOR[3] OF REAL;
3   vcResult : __VECTOR[3] OF REAL; *)
4 vcA[0] 1.1 := 1.1;
5 vcA[1] 2.2 := 2.2;
6 vcA[2] 3.3 := 3.3;
7 vcB[0] 1.5 := 1.5;
8 vcB[1] 2.3 := 2.3;
9 vcB[2] 3.8 := 3.8;
10 vcResult := vcA __VCADD vcB; RETURN
  
```

- **Support of operators for parallel processing, e.g. `__VCADD`, `__VCMUL`, `__VCDOT`**



Engineering



Runtime



Visualization



Motion + CNC



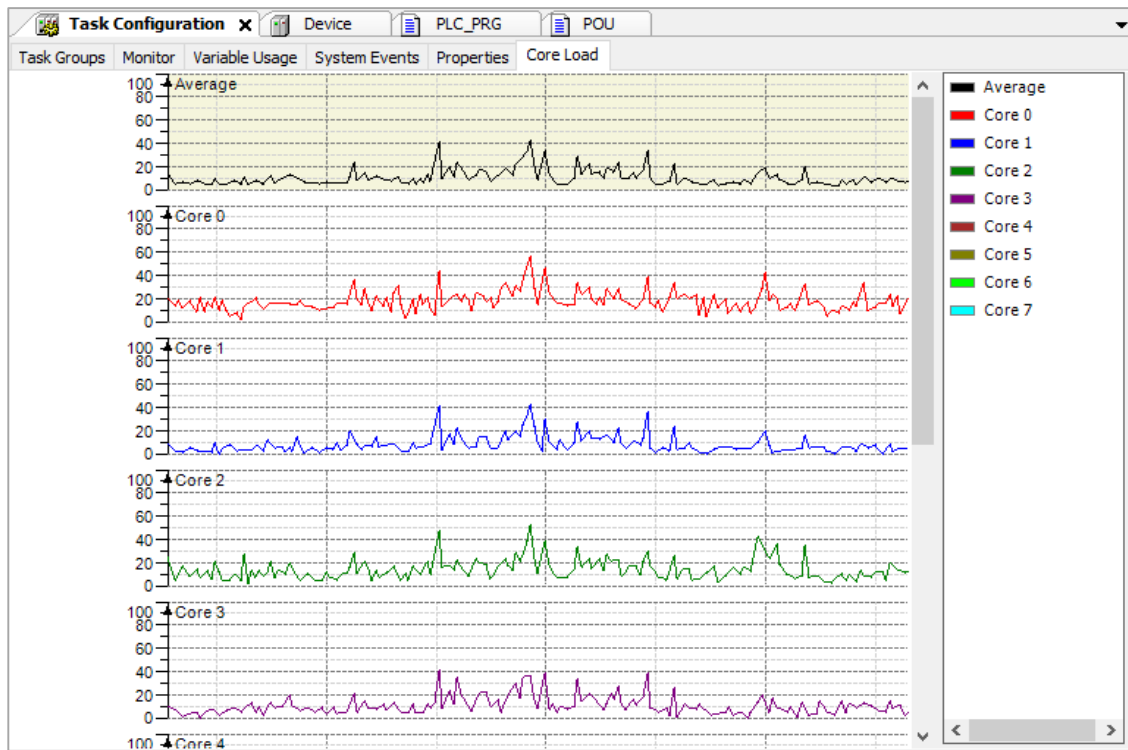
Fieldbus



Safety

Multicore devices

- Atomic operators for task synchronization
- Online view for core deployment



Engineering



Runtime



Visualization



Motion + CNC



Fieldbus



Safety

Extensive improvements of the ST editor

- **Highlighting of identical symbols**
 - When the cursor is on a symbol name, all occurrence locations of the symbol within the editor are highlighted.

```
10  Timer(IN:= TRUE, PT:= TextTimer);
11  str_Text:=StrArray[index];
12  BildIndex:=BildArray[index];
13  IndustriesTitle:=IndustriesArray[index,0];
14  IndustriesSubText:=IndustriesArray[index,1];
15  IndustriesSubText2:=IndustriesArray[index,2];
16  IF Timer.Q THEN
17      index:=index+1;
18      IF index=iMaxIndex+1 THEN
19          index:=0;
20      END_IF
21      Timer(IN:= FALSE);
22  END_IF
```



Engineering



Runtime



Visualization



Motion + CNC



Fieldbus



Safety

Extensive improvements of the ST editor

- **Incremental search for strings**
 - Open input field at bottom edge by Ctrl+Shift+i
 - Set cursor at search location by pressing the arrow buttons or Alt+Page Up / Down

```
40: //Standard mode: running leds on outs
41: IF Timer2.Q AND NOT Direction THEN
42:   dOut1:=ROL(dOut1,1);
43:   Timer2(IN:= FALSE);
44: ELSIF Timer2.Q AND Direction THEN
45:   dOut1:=ROR(dOut1,1);
46:   Timer2(IN:= FALSE);
47: END_IF
48: //Toggle direction
49: IF dOut1 >= 16#C000 THEN
50:   Direction:=TRUE;
51: ELSIF dOut1 <= 16#0003 THEN
52:   Direction:=FALSE;
53: END_IF
54:
55: 20: //React on emergency stop: Non Safe outs are blinking
56: SafetyRisingEdge:=TRUE;
57: BLINK1(ENABLE:= TRUE, TIMELOW:= T#200MS, TIMEHIGH:= T#200MS, OUT=>Blinker);
58: IF Blinker THEN
59:   dOut1:=16#FFFF;
60: ELSE
61:   dOut1:=16#0;
62: END_IF
63: 25: //Emergency stop release: Non Safe outs are prepared for standard mode
64: dOut1:=16#3;
```

direction ^ v 2 of 5 matches x



Engineering



Runtime



Visualization



Motion + CNC



Fieldbus



Safety

Extensive improvements of the ST editor

- **Comment multiple selected lines at once**
 - Via context menu
 - Via shortcut: Ctrl+O / Ctrl+I

```

16 IF Timer.Q THEN
17     index:=index+1;
18     IF index=iMaxIndex+1 THEN
19         index:=0;
20     END_IF
21     Timer(IN:= FALSE);
22 END_IF
23
24
25 IF SOut1_logic THEN
26     Mode:=20;
27 ELSIF NOT SOut1_logic AN
28     Mode:=25;
29 ELSIF NOT Run THEN
30     Mode:=30;
31 ELSIF Run AND Run_Previous THEN
32     Mode:=35;
33 ELSE
34     Mode:=10;

```

The screenshot shows a context menu with options: Cut, Copy, Paste, Delete, Select All, Browse, Advanced, and Input Assistant... The 'Advanced' submenu is expanded, showing: Expand All Folds, Collapse All Folds, Enable inline monitoring, **Comment out selected lines** (highlighted), and Uncomment selected lines.

```

16 // IF Timer.Q THEN
17 //     index:=index+1;
18 //     IF index=iMaxIndex+1 THEN
19 //         index:=0;
20 //     END_IF
21 //     Timer(IN:= FALSE);
22 // END_IF
23
24
25 IF SOut1_logic THEN
26     Mode:=20;
27 ELSIF NOT SOut1_logic AN
28     Mode:=25;
29 ELSIF NOT Run THEN
30     Mode:=30;
31 ELSIF Run AND Run_Previous THEN
32     Mode:=35;
33 ELSE
34     Mode:=10;

```

The screenshot shows the same code as the previous image, but the selected lines are now commented out with // at the beginning. The context menu is still open, and the 'Uncomment selected lines' option is highlighted.



Engineering



Runtime



Visualization



Motion + CNC



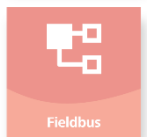
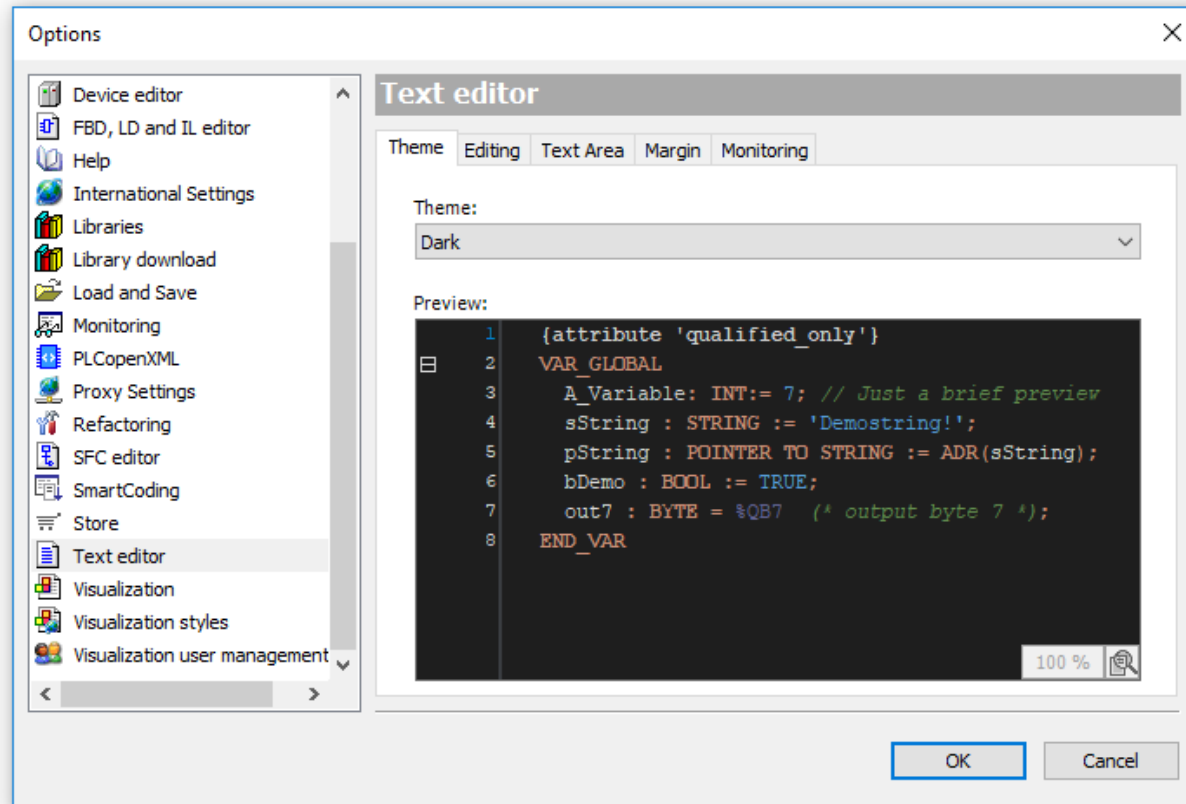
Fieldbus



Safety

Extensive improvements of the ST editor

- **Themes for optical display**
 - Stored at C:\Program Files (x86)\CODESYS 3.5.14.0\CODESYS\Themes



Extensive improvements of the ST editor

▪ Editing columns via keyboard operation

- Shift+Alt+ → : The selected area is extended one position to the right
- Shift+Alt+ ← : The selected area is extended one position to the left
- Shift+Alt+ ↑ : The selected area is extended one position up
- Shift+Alt+ ↓ : The selected area is extended one position down

```
20 iLocal_1 := aiCardGame[1, 3, 5]; // Assignment of 10
21 iLocal_2 := aiCardGame[2, 3, 5]; // Assignment of 20
22 iLocal_3 := aiCardGame[1, 4, 5]; // Assignment of 30
23 iLocal_4 := aiCardGame[2, 4, 5]; // Assignment of 40
24 iLocal_5 := aiCardGame[1, 3, 6]; // Assignment of 50
25 iLocal_6 := aiCardGame[2, 3, 6]; // Assignment of 60
26 iLocal_7 := aiCardGame[1, 4, 6]; // Assignment of 70
27 iLocal_8 := aiCardGame[2, 4, 6]; // Assignment of 80
```



Engineering



Runtime



Visualization



Motion + CNC



Fieldbus

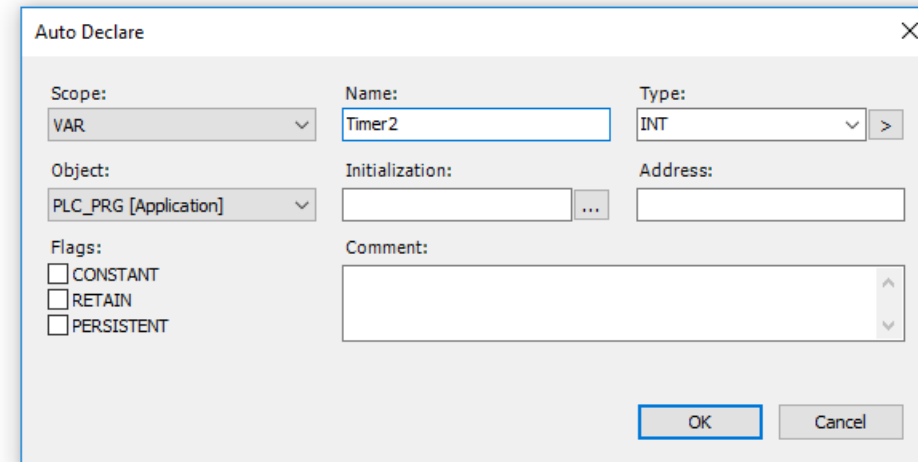
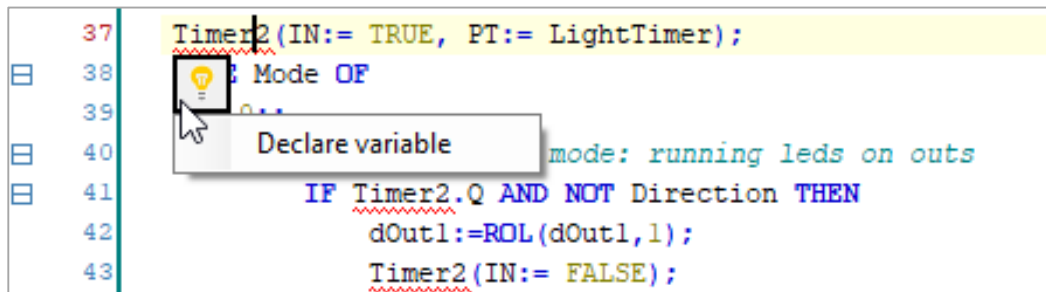


Safety

Extensive improvements of the ST editor

- Auto declare via “Smart Tags”: Suggestion of appropriate commands directly at the programming element
 - To open the auto declare dialog:
 - Ctrl+.
 - ↓
 - Enter

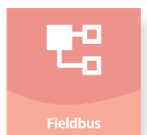
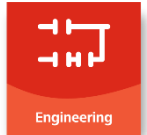
```
37 Timer2(IN:= TRUE, PT:= LightTimer);
38 Mode OP
39 ...
40 mode: running leds on outs
41 IF Timer2.Q AND NOT Direction THEN
42   dOut1:=ROL(dOut1,1);
43   Timer2(IN:= FALSE);
```



Auto Declare

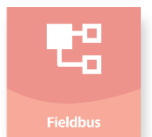
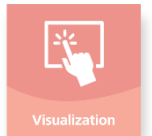
| | | |
|-------------------------------------|-----------------|----------|
| Scope: | Name: | Type: |
| VAR | Timer2 | INT |
| Object: | Initialization: | Address: |
| PLC_PRG [Application] | | |
| Flags: | Comment: | |
| <input type="checkbox"/> CONSTANT | | |
| <input type="checkbox"/> RETAIN | | |
| <input type="checkbox"/> PERSISTENT | | |

OK Cancel



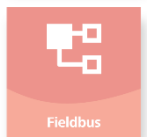
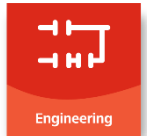
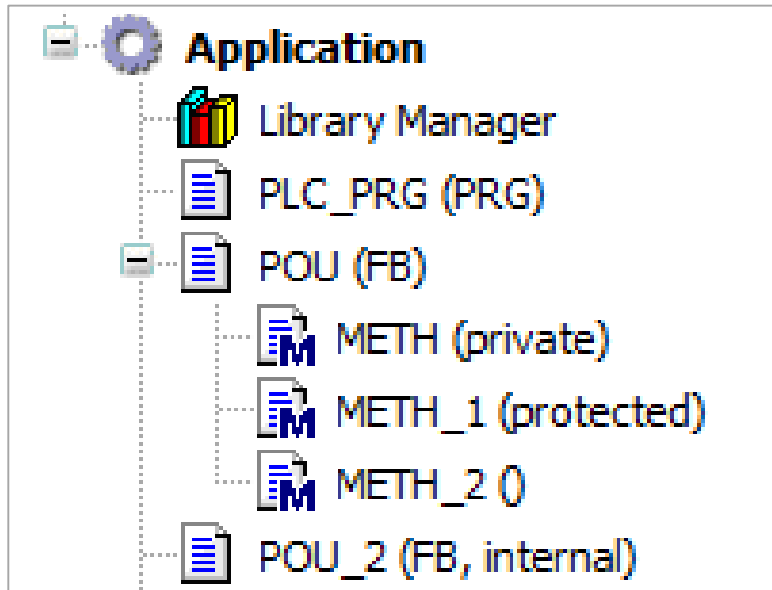
CFC

- **Accelerated multiple insertion of an element from the ToolBox in the CFC editor**
 - Select the element in the ToolBox view
 - Press the Ctrl key and left-click in the editor
 - An element is inserted on each click



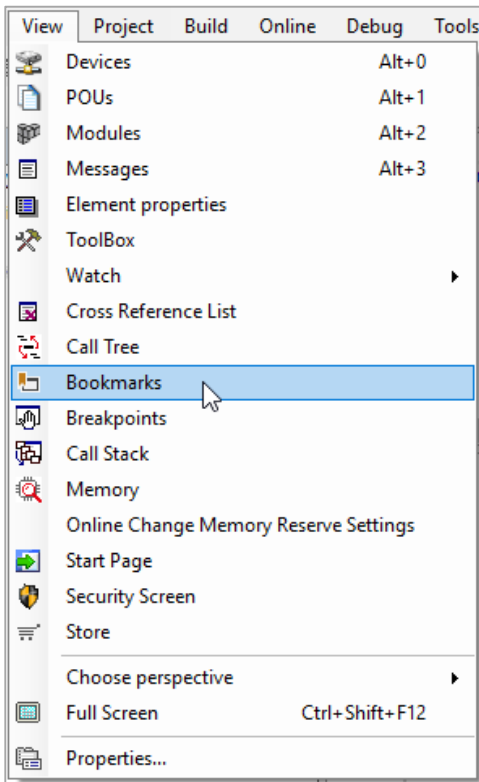
General improvements

- Display of access modifiers („PROTECTED“, „PRIVATE“, „INTERNAL“) in the device tree



General improvements

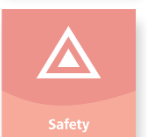
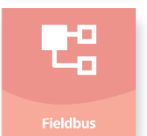
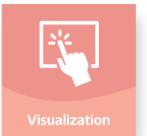
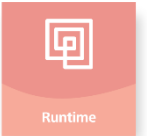
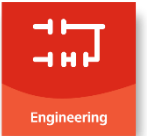
- Global and persistent bookmarks in the source code



A screenshot of the 'Bookmarks' window. It features a toolbar with 'Previous Bookmark' and 'Next Bookmark' buttons. Below is a table listing several bookmarks. The 'Bookmark_2' row is selected, and a tooltip is visible over it.

| Bookmark | Object | Position |
|-------------------|---|-------------------------|
| Bookmark_0 | Motion_PRG [Device: PLC Logic: Application] | Line 9 (Ded) |
| Bookmark_1 | PLC_PRG [Device: PLC Logic: Application] | Element 4 (Impl) |
| Bookmark_2 | Signals [Device: PLC Logic: Application] | Network 2 / (Impl) |
| Bookmark_3 | Signals [Device: PLC Logic: Application] | Network 3 / (Impl) |
| Bookmark_4 | Motion_PRG [Device: PLC Logic: Application] | Element 6 (Impl) |
| Bookmark_5 | Simulation [Device: PLC Logic: Application] | Line 6, Column 1 (Impl) |
| Bookmark_6 | Simulation [Device: PLC Logic: Application] | Line 7 (Ded) |

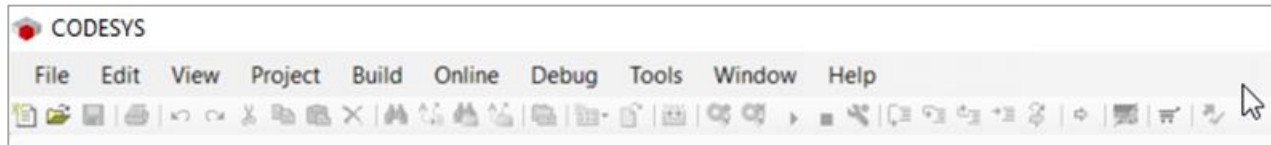
At Signals [Device: PLC Logic: Application], Network 2 / (Impl)



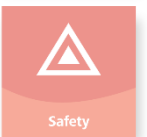
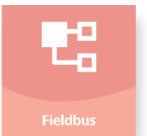
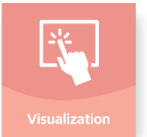
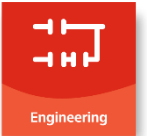
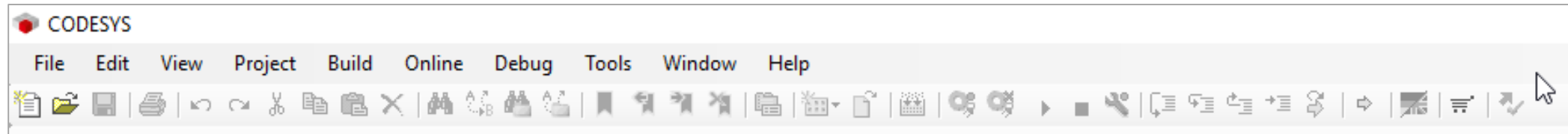
General improvements

- Improved scaling with high DPI monitors (as of Windows 10)
→ No blurring

CODESYS V3.5 SP13 Patch 2 and descending



CODESYS V3.5 SP14



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Engineering

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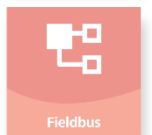
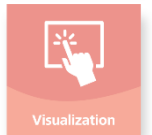
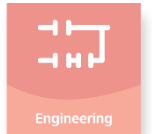
Fieldbus

6

Safety

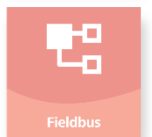
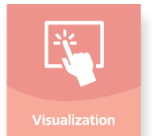
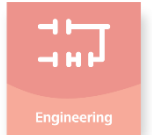
Overview

- **PLC Handler**
- **OPC UA**
- **Security**
- **MemPoolManager**
- **ARM devices**
- **Raspberry Pi**



PLC Handler

- 64-bit version for Windows and Linux
- Encrypted communication
- Standard monitoring for embedded controllers



OPC UA

- Access to complex data types via single query

| Expression | Type | Value |
|-------------|----------------------------------|----------------|
| iOption | INT | 0 |
| iPush | INT | 0 |
| xCheck | BOOL | FALSE |
| sName | STRING | " |
| rAvg | REAL | NaN |
| aArray2 | ARRAY [1..4, 1..2, 1..5] OF REAL | |
| Rec1 | Box | |
| Rcp | ARRAY [1..3] OF Box | |
| Rcp[1] | Box | |
| weight | USINT | 228 |
| volume | UINT | 5 |
| color | WORD | 4 |
| origin | STRING(20) | 'BKFS' |
| prsr | REAL | 80.5 |
| dst | INT | 7 |
| stp | TIME | T#1d12h8m5s2ms |
| Rcp[2] | Box | |
| Rcp[3] | Box | |
| iOptionReal | REAL | 0 |
| iPushReal | REAL | 0 |

Unified Automation UaExpert - The OPC Unified Architecture Client - Complex_Data

File View Server Document Settings Help

Project Data Access View

| # | Server | Node Id | Display Name | Value | Datatype |
|---|-----------------|------------------|--------------|-------------------------------|-----------------|
| 1 | OPCUAServer@... | NS4 String lv... | iOption | 0 | Int16 |
| 2 | OPCUAServer@... | NS4 String lv... | iPush | 0 | Int16 |
| 3 | OPCUAServer@... | NS4 String lv... | rAvg | 0 | Float |
| 4 | OPCUAServer@... | NS4 String lv... | sName | | String |
| 5 | OPCUAServer@... | NS4 String lv... | xCheck | false | Boolean |
| 6 | OPCUAServer@... | NS4 String lv... | aArray2 | Double click to display value | Float |
| 7 | OPCUAServer@... | NS4 String lv... | Rec1 | Double click to display value | ExtensionObject |
| 8 | OPCUAServer@... | NS4 String lv... | Rcp | Double click to display value | ExtensionObject |

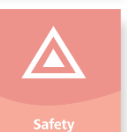
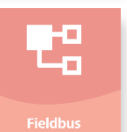
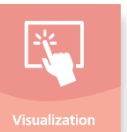
Address Space

- No Highlight
- Root
 - Objects
 - Types
 - Views

Edit Value

| Name | Value |
|--------------------------|-----------|
| Application.Box Array[3] | |
| [0] Application.Box | |
| weight | 228 |
| volume | 5 |
| color | 4 |
| origin | BKFS |
| prsr | 80.5 |
| dst | 7 |
| stp | 130085002 |
| [1] Application.Box | |
| [2] Application.Box | |

Write Cancel



Security

- Encrypted communication configurable as user option
- User administration configurable as optional or obligatory

Change communication policy

Communication

Current policy: Optional encryption

New policy: **No encryption**

Device User Management

Current policy: Optional user management

New policy: **Enforced user management**

The user management on the device is active and cannot be disabled by the user.

OK Cancel

Change communication policy

Communication

Current policy: Optional encryption

New policy: **Optional encryption**

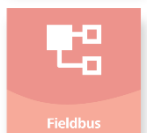
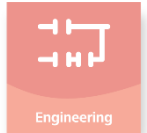
The device supports both encrypted and unencrypted communication. This can be decided by the user.

Device User Management

Current policy: Optional user management

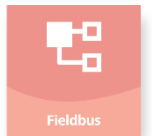
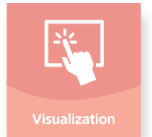
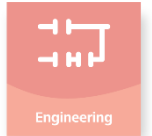
New policy: **Optional user management**

OK Cancel



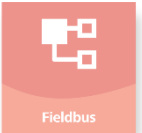
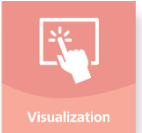
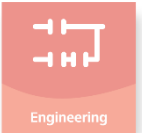
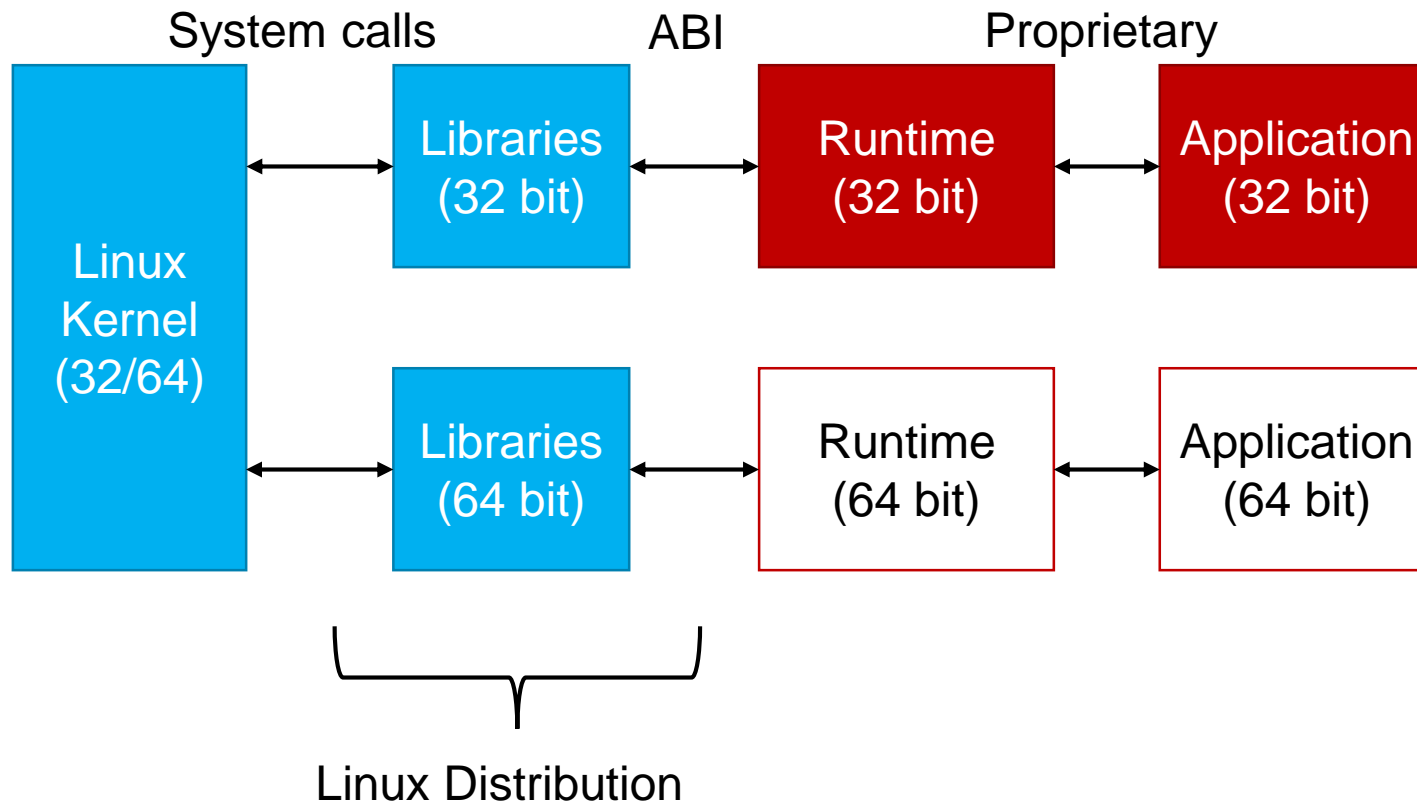
MemPoolManager

- **Reduced locking:**
Reduced interference from tasks running in parallel
→ Reduced jitter



ARM devices

- 64-bit runtime system for ARM devices



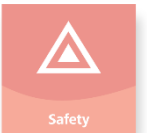
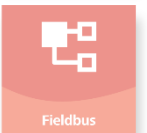
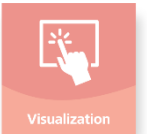
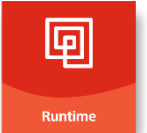
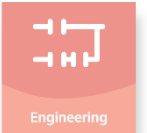
Raspberry Pi

- Option:
Multicore for Raspberry Pi (starting with Pi2 model B)

| | Pi Zero | Pi Zero W / WH | Pi 1 Mod. A | Pi 1 Mod. A+ | Pi 1 Mod. B | Pi 1 Mod. B+ | Pi 2 Mod. B | Pi 2 Mod. B v1.2 | Pi 3 Mod. B | Pi 3 Mod. B+ |
|----------|---------|----------------|-------------|--------------|-------------|--------------|-------------|------------------|-------------|--------------|
| CPU | ARM1176 | | | | | | Cortex A7 | Cortex A53 | | |
| ARM Core | ARMv6 | | | | | | ARMv7 | ARMv8 | | |
| Cores | 1 | | | | | | 4 | | | |

Pi 0/1 = Singlecore

Pi 2/3 = Multicore




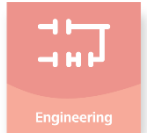
Raspberry Pi

- Option:
Multicore for Raspberry Pi (starting with Pi2 model B)

| Name | Vendor | Version | Description |
|--|------------------------------------|-----------|--|
| PLCs | | | |
| SoftMotion PLCs | | | |
| CODESYS Control for BeagleboneBlack SL | 3S - Smart Software Solutions GmbH | 3.5.13.20 | CODESYS Control from 3S |
| CODESYS Control for emPC-A-iMX6 SL | 3S - Smart Software Solutions GmbH | 3.5.13.20 | CODESYS Control from 3S |
| CODESYS Control for Linux SL | 3S - Smart Software Solutions GmbH | 3.5.14.0 | CODESYS Control from 3S |
| CODESYS Control for Raspberry Pi MC SL | 3S - Smart Software Solutions GmbH | 3.5.14.0 | CODESYS Control for Raspberry Pi MC. Supports Raspberry Pi 2 and above and MultiCore capabilities. |
| CODESYS Control for Raspberry Pi SL | 3S - Smart Software Solutions GmbH | 3.5.14.0 | CODESYS Control for Raspberry Pi. Supports all available Raspberry Pi variants. |
| CODESYS SoftMotion RTE V3 | 3S - Smart Software Solutions GmbH | 3.5.14.0 | A CODESYS 3.x SoftMotion Soft PLC with hard realtime for Win32 |
| CODESYS Softmotion RTE V3 x64 | 3S - Smart Software Solutions GmbH | 3.5.14.0 | A CODESYS 3.x Soft PLC for Win64 |

Group by category
 Display all versions (for experts only)
 Display outdated versions

 **Name:** CODESYS Control for Raspberry Pi MC SL
Vendor: 3S - Smart Software Solutions GmbH
Categories:
Version: 3.5.14.0
Order Number: 2302000032
Description: CODESYS Control for Raspberry Pi MC. Supports Raspberry Pi 2 and above and MultiCore capabilities.



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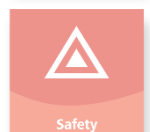
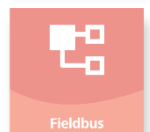
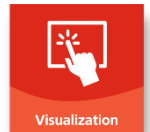
Fieldbus

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Safety

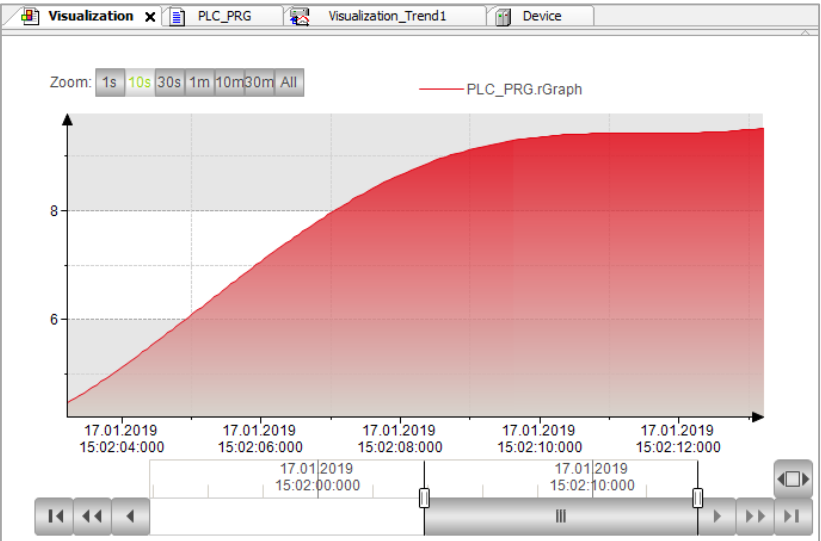
Overview

- Improvements in trend and standard elements
- General improvements
- CODESYS HMI SL



Improvements in trend and standard elements

- Trends:
Graphs with filling colors



Variable Settings

Variable: PLC_PRG.rGraph

Attached y axis: Default Y axis

Display variable name:

Description: Description of variable to display in tooltip

Curve type: Area

Graph color: Blue

Filling type: Plain color

Filling color: Red

Transparency: 255

Line width: 1

Line style: Solid

Point type: None

Activate minimum warning:

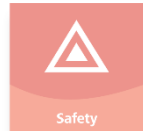
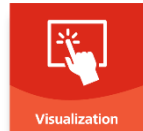
Critical lower limit: 0

Warning minimum color: Black

Activate maximum warning:

Critical upper limit: 0

Warning maximum color: Red



Improvements in trend and standard elements

- Configurable radii for rectangles:
From style, relative to the element size, explicit

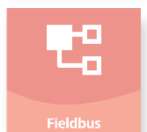
| Property | Value |
|-----------------|-----------------|
| Element name | GenElemInst_2 |
| Type of element | Round rectangle |
| Position | |
| Radius setting | |
| Radius | From style |

| Property | Value |
|-----------------|------------------------------|
| Element name | GenElemInst_2 |
| Type of element | Round rectangle |
| Position | |
| Radius setting | |
| Radius | Relative to the element size |

| Property | Value |
|-----------------|-----------------|
| Element name | GenElemInst_2 |
| Type of element | Round rectangle |
| Position | |
| Radius setting | |
| Radius | Explicit |
| Value | 5 |

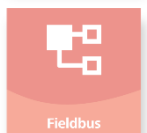
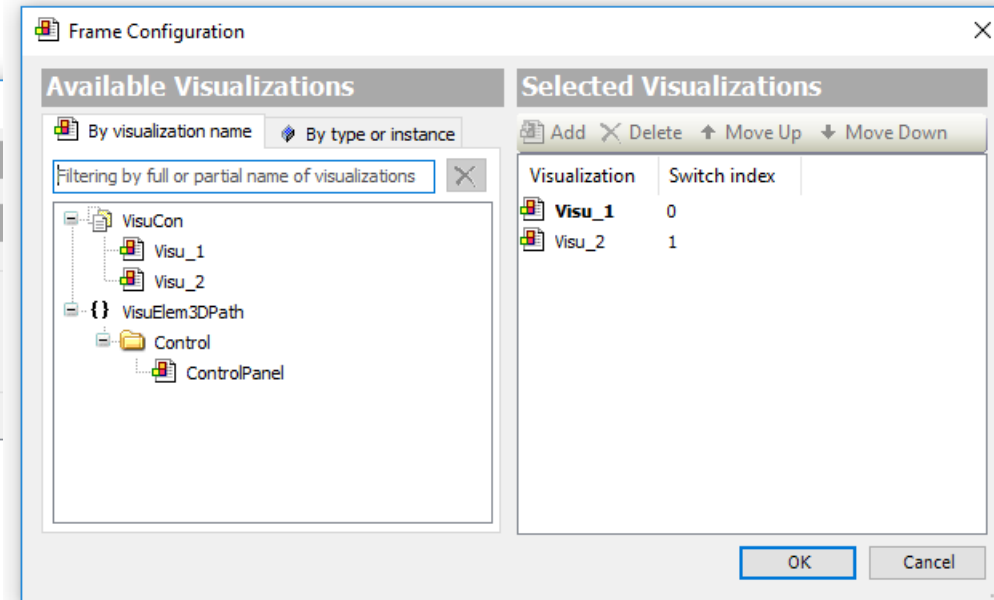
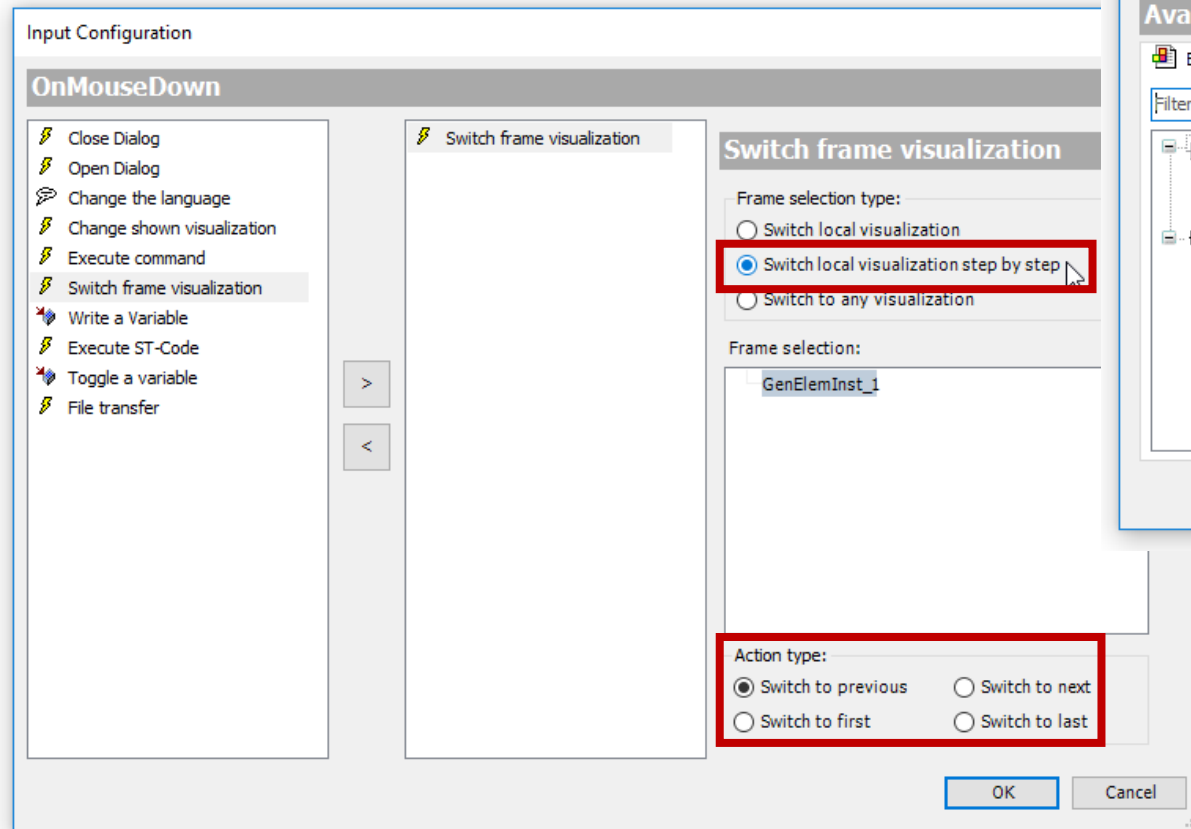
- Combo boxes:
Dynamically adaptable value ranges

| Value range | |
|---------------|----------------------------------|
| Minimum value | PLC_PRG.iVolume ... |
| Maximum value | 50 |



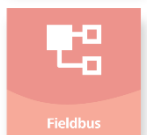
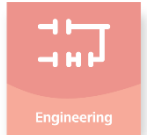
Improvements in trend and standard elements

- Frame shifting (previous / next)



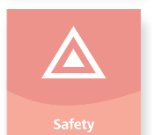
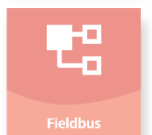
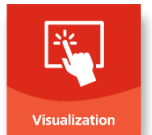
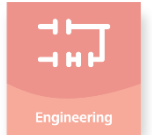
General improvements

- **Alarms:**
Alarm storage includes time zone information
→ **Stored times remain stable when changing between summer and winter time.**



CODESYS HMI SL

- **CODESYS HMI SL:**
Dynamic communication settings in data sources
→ IP addresses can be set via variable, e.g. visualization or configuration dialog



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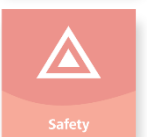
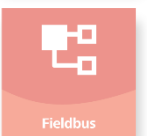
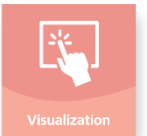
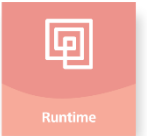
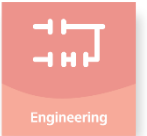
Fieldbus

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Safety

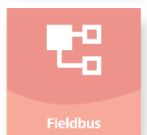
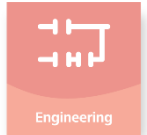
Overview

- **Robotics**



Robotics

- **Improvements in quality:**
Smoother movements, improved blending and many bug fixes
- **Improvements in reproducibility:**
Identical speed profile when moving along the same trajectory multiple times
- **Improvements in performance:**
Increased performance on ARM PLCs



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Safety

Overview

- Device descriptions
- CAN
- EtherCAT
- EtherNet/IP
- KNX
- PROFINET



Engineering



Runtime



Visualization



Motion + CNC



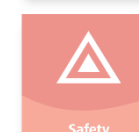
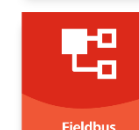
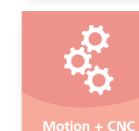
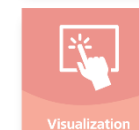
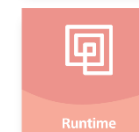
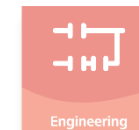
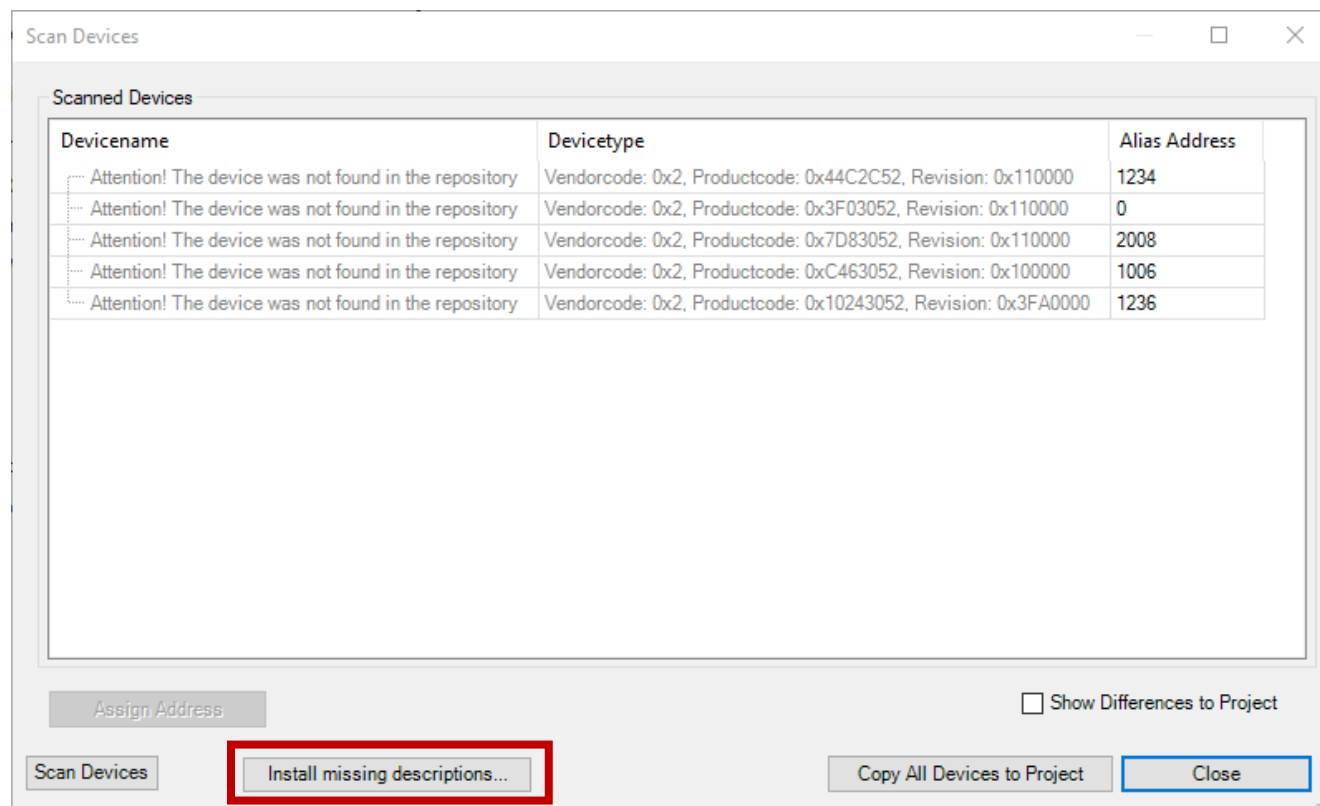
Fieldbus



Safety

Device descriptions

- Device descriptions can be post-installed in the scan dialog
 → No need to close the scan dialog



CAN

- **IXXAT CAN minidriver implemented:**
Support of the USB adapter from IXXAT (Gateway and CODESYS Control Win V3)
- **EL6751:**
Support 29 bit CAN frames
→ J1939 possible with the EtherCAT CAN Gateway



Engineering



Runtime



Visualization



Motion + CNC



Fieldbus



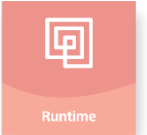
Safety

EtherCAT

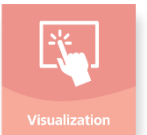
- **Support of redundant networks in CODESYS:**
Joint PLC redundancy and cable redundancy
- **Support of new devices for Fast Hot Connect:**
Physicstype H supported in ESI files
- **Option to split EtherCAT frames:**
Separation of process data and asynchronous data into two separate frames
→ reduced jitter



Engineering



Runtime



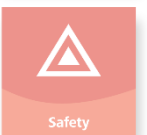
Visualization



Motion + CNC



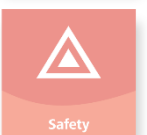
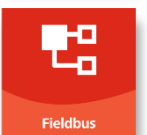
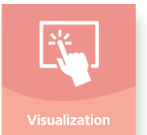
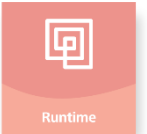
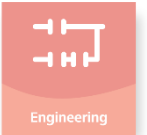
Fieldbus



Safety

EtherNet/IP

- **Improved EDS Interpretation:**
 - Support for connection path parameters
 - Support for enumeration bit strings
 - Support for parameters with scaling
 - Improved EDS validation
- **Support of “Change of State Connections” for scanner and adapter**




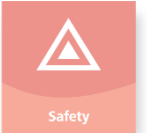
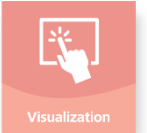
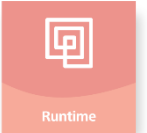
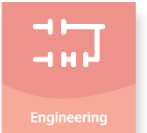
KNX

- KNX package as add-on:**
Configurator for I/O channels, KNXnet/IP protocol stack, data exchange function with ETS5, plug-in for ETS5
→ Updates independent of the overall system

The screenshot shows the CODESYS STORE website. At the top, there is a navigation bar with 'My Account', 'Login', 'My Wishlist', a 'Service' dropdown, and a shopping cart icon showing '0 Products' for '€0.00'. Below the navigation bar is a main menu with categories: 'All Products', 'Engineering', 'Application', 'Communication', 'Systems', 'Accessories', and 'Trainings & Events'. The main content area features the 'CODESYS KNX SL' product. It includes a product image, a description: 'CODESYS KNX consists of a configurator for I/O channels, a KNXnet/IP protocol stack in the form of a runtime system component, and a data exchange function with the ETS5 configuration system. This allows any CODESYS-compatible device to be expanded to function as a KNX subscriber and to communicate with KNX I/Os.', a price of '€100.00 plus VAT', and a 'Download >' button. Below the price, there are bulk purchase options: 'Buy 4 for €95.00 each and save 5%', 'Buy 10 for €91.00 each and save 9%', 'Buy 25 for €85.00 each and save 15%', and 'Buy 50 for €81.00 each and save 19%'. There is also a 'Qty: 0' field and an 'Add to Cart >' button. At the bottom of the product page, there are tabs for 'Product Description', 'System Requirements', 'Support', and 'More products from this supplier'. The 'Product Description' tab is active, showing detailed text about the product's integration with ETS5 and other bus protocols.

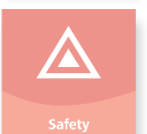
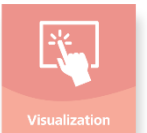
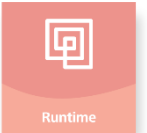
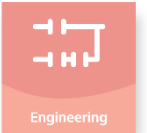
The screenshot shows the 'Package Manager' interface. It has a title bar with a package icon and the text 'Package Manager'. Below the title bar, there is a section for 'Currently installed packages:' with a 'Refresh' button. A table lists the installed packages:

| Name | Version |
|---|---------|
|  CODESYS KNX | 4.0.0.0 |



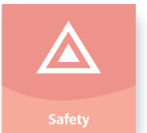
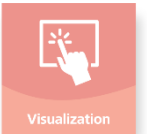
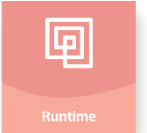
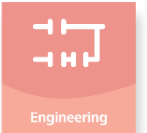
KNX

- **KNX Editor:**
Possibility of direct editing within the table
- **Additional output channel for control of status byte**
- **Trigger output action:**
Separation into two bits for sending or disabling of cyclic transmission
- **Download of the CODESYS plug-in for ETS5 directly at KNX**



PROFINET

- Pass the latest PNO conformance test (automated)
- PROFINET device:
Function blocks for adding / removing module diagnosis
- Support of reconfiguration for controller (CIFX) and device (IEC)



1

Engineering

2

Runtime

3

Visualization

4

Motion + CNC

5

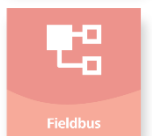
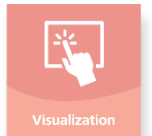
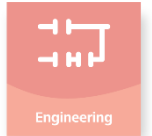
Fieldbus

6

Safety

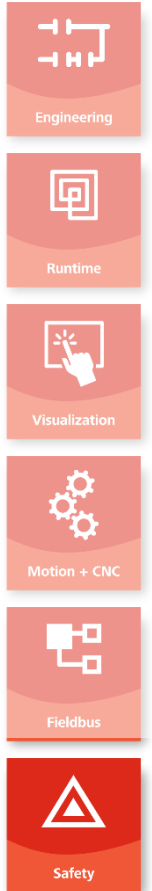
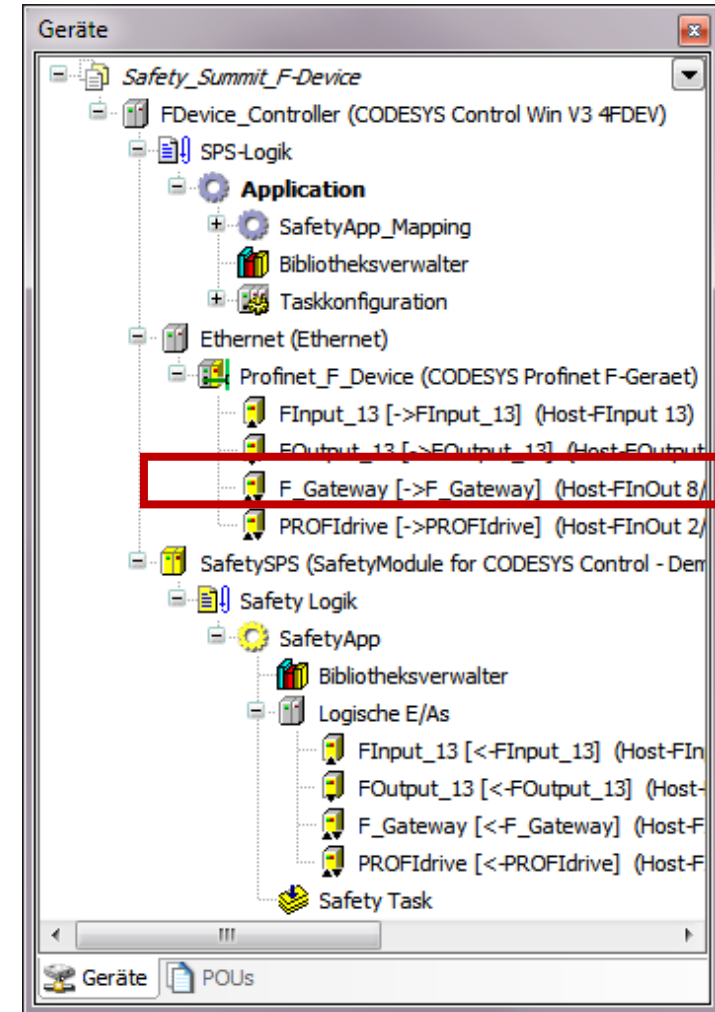
Overview

- **CODESYS PROFIsafe F-Device**



CODESYS PROFIsafe F-Device

- **New add-on product:**
CODESYS PROFIsafe F-Device V2.6
 - Slave part of the PROFIsafe protocol
 - Product for manufacturers of Safety devices
 - Completely integrated extension in the runtime system and programming system
 - Ready-to-use adaptation for CODESYS PROFINET Device, further PN Device solutions possible



CODESYS PROFIsafe F-Device

The image displays three overlapping windows from the CODESYS PROFIsafe F-Device configuration software:

- Host_FInput_13 (Top):** Shows configuration parameters for a host input module.

| Name | Wert | Symbolischer Wert | Beschreibung | Einheit |
|-----------------------|-----------|-------------------|--|---------|
| Source Address | 1 | | Configures the source/destination relationship (Codename): F_Source_Add must match to it | |
| Destination Address | 1 | | Configures the source/destination relationship (Codename): F_Dest_Add must match to it | |
| F_ParamDescCRC | 58350 | | identifies the correct description of the module's F-parameters | |
| F_IO_StructureDescCRC | 433100162 | | identifies the correct description of the module's I/O structure | |
- F_Gateway PRG (Bottom Left):** Shows a ladder logic program for the F_Gateway module.

| Zeile | Gültigkeitsbereich | Name | Datentyp | Initialwert | Kommentar |
|-------|--------------------|-----------|----------------|-------------|-----------|
| 1 | VAR_EXTERNAL | F_Gateway | PSDeviceModule | | |







The program includes a call to the `F_Gateway` module, which is a `PSDeviceModule`. The module's parameters are:

 - `S_ModuleOK_DS` (Digital Signal)
 - `S_ActivateModule_DC` (Digital Control)
 - `S_ValuesToHostOK_DS` (Digital Signal)
 - `S_ValuesToHost_tick_DC` (Digital Control)
 - `OA_Req_DC` (Digital Control)
 - `S_F_SIL` (Safety Integrity Level)
 - `S_ConfigOK` (Digital Signal)
- I/O Configuration (Bottom Right):** Shows the physical I/O configuration for the module.

| Variable | Kanal | Datentyp | E. | Kommentar | Beschreibung |
|-----------------|-------|----------|----|-----------|-----------------|
| bit0_from_Host | bit0 | SAFEBOOL | | | bit0 from Host |
| bit1_from_Host | bit1 | SAFEBOOL | | | bit1 from Host |
| bit2_from_Host | bit2 | SAFEBOOL | | | bit2 from Host |
| bit3_from_Host | bit3 | SAFEBOOL | | | bit3 from Host |
| bit4_from_Host | bit4 | SAFEBOOL | | | bit4 from Host |
| bit5_from_Host | bit5 | SAFEBOOL | | | bit5 from Host |
| bit6_from_Host | bit6 | SAFEBOOL | | | bit6 from Host |
| bit7_from_Host | bit7 | SAFEBOOL | | | bit7 from Host |
| bit_A_0_to_Host | bit0 | SAFEBOOL | | | bit A-0 to Host |
| bit_A_1_to_Host | bit1 | SAFEBOOL | | | bit A-1 to Host |
| bit_A_2_to_Host | bit2 | SAFEBOOL | | | bit A-2 to Host |

The physical I/O is set to `Host_FInOut_8_1`. An instance table below shows:

| Variable | Datentyp |
|-----------------|----------------|
| Host_FInOut_8_1 | PSDeviceModule |

-  Engineering
-  Runtime
-  Visualization
-  Motion + CNC
-  Fieldbus
-  Safety



Thank you for your attention.

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