



Getting started with COMBIVIS studio 6 FAQ No.0001

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Introduction

This manual is intended for doing first steps with COMBIVIS studio 6. It gives a short over-view about some basic features, assist you in creating a basic project and get your PLC running. Furthermore you get information about extended functions.

Versions

Tool for parameter adjustment: „KEB COMBIVIS 6“

Tool for programming and parameter adjustment: „KEB COMBIVIS studio 6“ (licence required)

Main features of COMBIVIS 6

- Parameter adjustment of KEB COMBIVERT F5/ B6/ G6/ H6 /R6/ S6 and COMBICONTROL C5/ C6
- Monitoring of device parameters via 16-channel scope
- KEB Device search (IP and serial scan)
- Down/ Upload of parameter lists
- Integrated startup assistants (wizards)

Main features of COMBIVIS studio 6

- All features of COMBIVIS 6
- PLC programming in **IEC 61131-3**
 - Function Block Diagram (**FBD**)
 - Ladder Logic Diagram (**LD**)
 - Instruction List (**IL**)
 - Sequential Function Chart (**SFC**)
 - Structured Text (**ST**)
 - Continuous Function Chart (**CFC**)
- Code Generation, Online Change, Monitoring, Debugging, Visualization
- Object orientated project organisation
 - Bus configuration (e.g. EtherCAT, CAN, Profibus, ...)
 - Configuration of Remote I/O s
 - Multiple applications in one project
 - Portability of projects/ applications/ IEC code to different platforms (C6-Embedded, IPC (Windows/ Linux), ...)
 - Re use of CoDeSys 2.3 IEC Code
 - Multitasking
 - KEB libraries with predefined functions for standard and enhanced applications

Basic COMBIVIS studio 6 knowledge

Project: Container for all elements of a project (objects and devices).

Project Navigator: Explorer for all elements of a project.

- Shows elements in logical alignment (tree structure)
- Adding, deleting, editing of elements

Device: General term for hardware component involved in an project

Adjustable Device/ KEB Device: Device for Monitoring and parameter adjustments (e.g. Inverter, control).

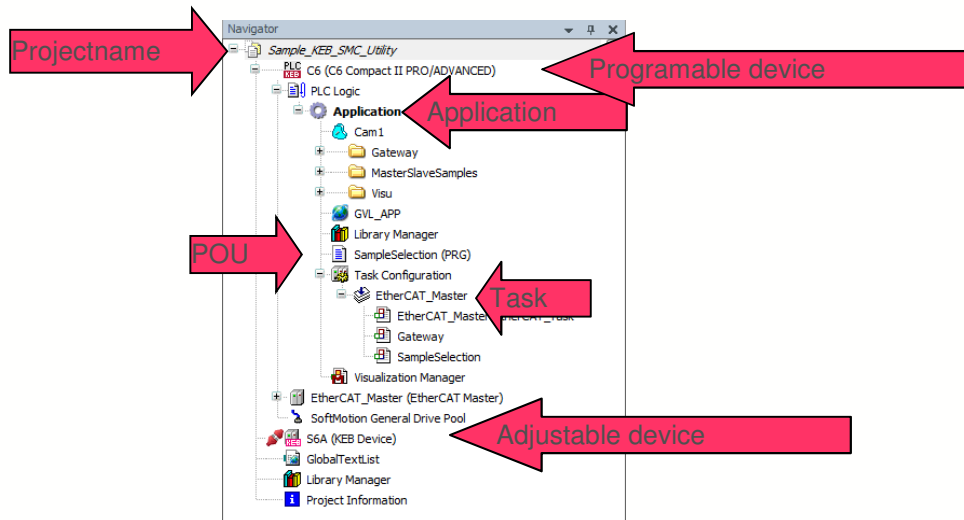
Programmable Device: Device to run an IEC application on. (embedded Controls, IPCs, ...).

Other: Other hardware components(real or virtual)

(e.g. EtherCAT Master/ slaves (Remote IO, Inverters)).

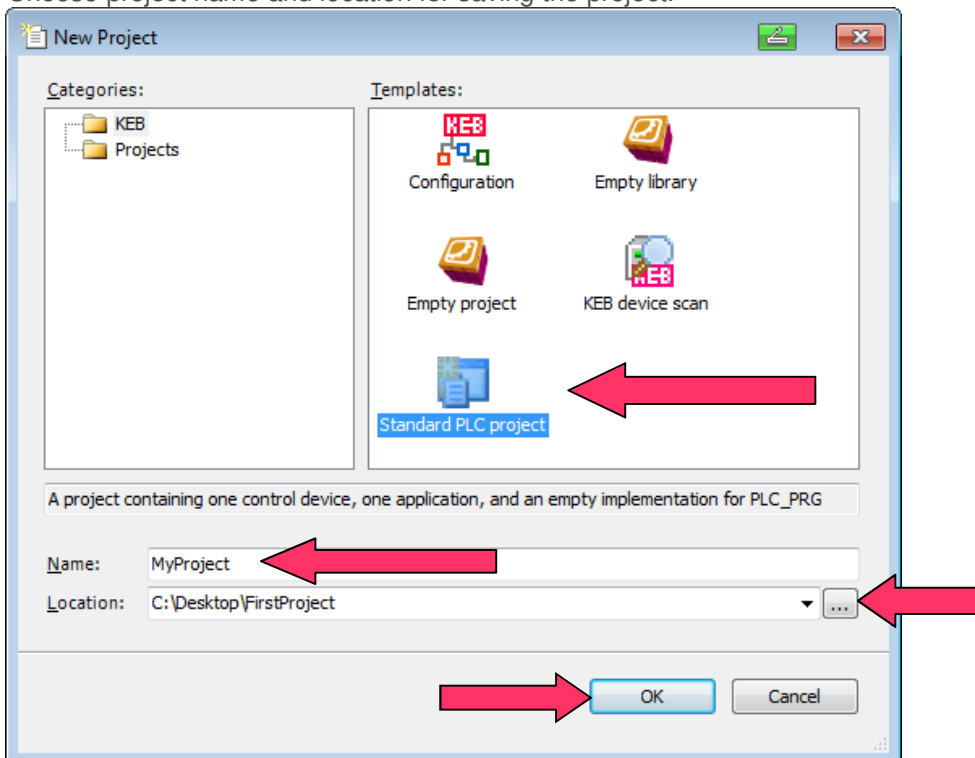
Object: Container for certain software functions.

- **Application:** Set of objects which build an IEC Application. An application can be linked and transferred to a certain programmable device.
- **POU:** Program Organization Unit (e.g. PLC_PRG). Container for IEC Code.
- **Library:** Collection of predefined software functions like function blocks, visualization templates and other modular IEC Code.
- **Library Manager:** For each application an individual set of libraries can be chosen.
- **Task:** Defines 1 to x programs, that are called in defined cycles by the PLC.
- **Task Configuration:** Definition and Monitoring of all Tasks that belong to an application.
- **Visualization:** Free programmable user interface to control and watch an application.

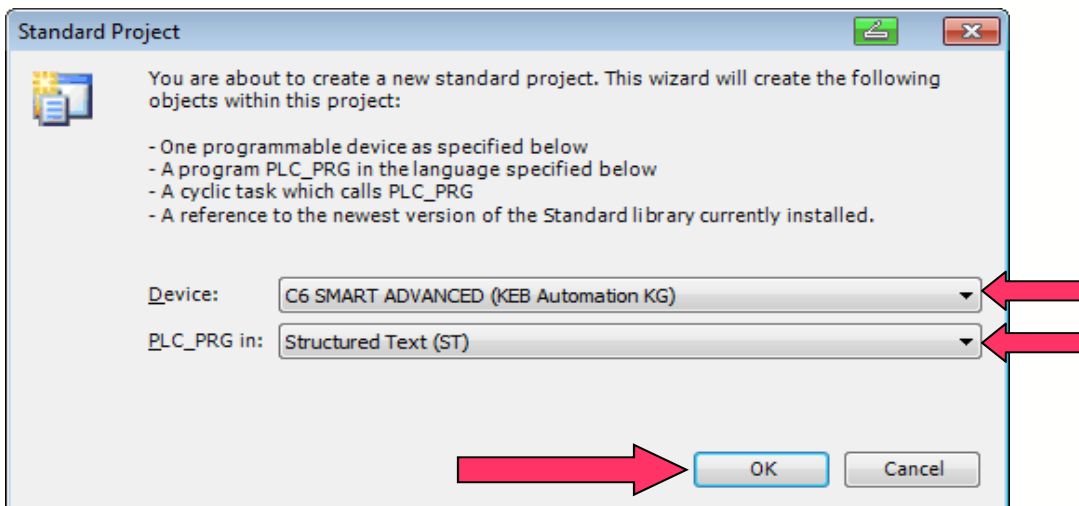


Create a new project

1. Start COMBIVIS studio 6.
2. Choose Standard PLC Project in the New Project dialog
3. Choose project name and location for saving the project.



4. Choose the type of control and IEC language for the first POU (PLC_PRG). With the “OK” button you create a standard project with the previous settings. You find in this manual the [different devices](#) and how you can change the device later in the project. (See the topic [change device](#)).



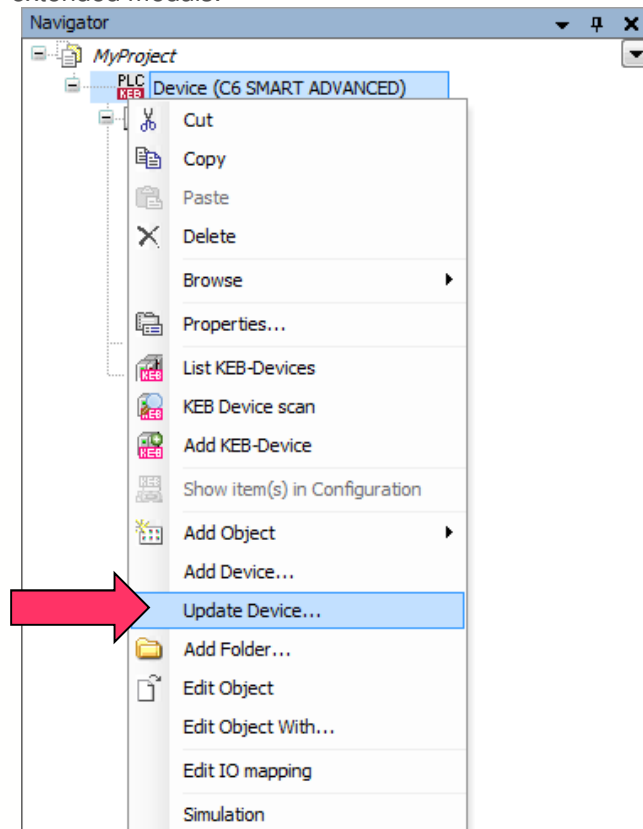
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Choose a device

You can change the device in different cases. If you create a new standard project it's necessary to choose the device for your project. About this device you can extend your project with frequency converter or/and I/O moduls (**add device**).

About the functionality **update device** you have the possibility to change/update the PLC or/and other extended moduls.



Following a short list with all available PLC's which you can choose in the beginning of a new project and for the update device functionality.

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Vendor	Name	Hardware	Class	Functionality
KEB	C6 Compact	C6 Compact	embedded	SoftPLC
KEB	C6 Compact für SoftMotion	C6 Compact	embedded	SoftPLC+ SoftMotion
KEB	H6 Control Unit	H6 Plattform	embedded	SoftPLC
KEB	H6 Control Unit SoftMotion	H6 Plattform	embedded	SoftPLC+ SoftMotion
KEB	P6 Control Unit	P6 Plattform	embedded	SoftPLC
KEB	C6 SMART	C6 SMART	embedded	SoftPLC
KEB	C6 SMART SoftMotion	C6 SMART	embedded	SoftPLC + SoftMotion
KEB	C6 HMI LC	C6 HMI LC	embedded	SoftPLC
KEB	C6 E22	C6 E22	embedded	SoftPLC
KEB	C6 E22 SoftMotion	C6 E22	embedded	SoftPLC + SoftMotion
3S	CoDeSys SP RTE	C6 ECON - PERFORM	Windows xp	SoftPLC + Target Visu
3S	CoDeSys SP SoftMotion RTE	C6 ECON - PERFORM	Windows xp	SoftPLC+ SoftMotion + Target Visu
3S	CoDeSys SP Win V3	Arbeitsplatz (Simulation)	Standard Windows	SoftPLC + Target Visu
3S	CoDeSys SP Win SoftMotion V3	Arbeitsplatz (Simulation)	Standard Windows	SoftPLC+ SoftMotion + Target Visu

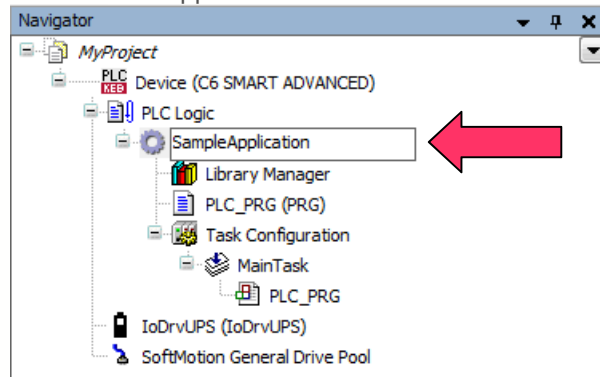
Hint: The blue one are hardware PLC's and the red one only software PLC's. The software PLC's are working only a limited time and are installed directly with COMBIVIS studio 6 on your PC

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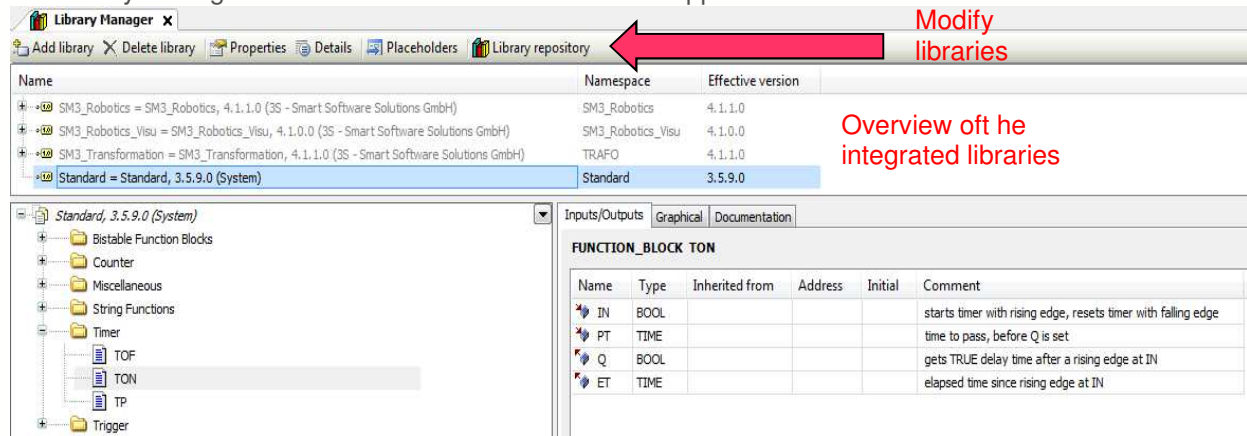
Application

An application contains all program parts, POU's, devices and configurations for the topology. The name of the application should be changed to a meaningful name because you have the possibility to create more than one application on the PLC. This name is also used for the bootapplication file.



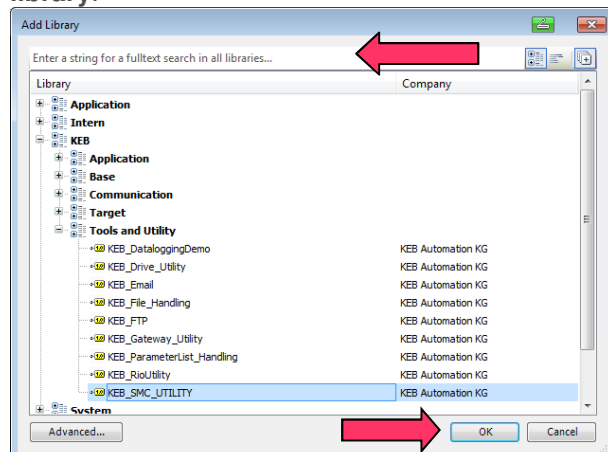
Library manager

The library manager defines the available libraries in this application.



If you like to add additional libraries press the **Add library** link.

You can search the libraries about the text search or the grouped categories and add it about **Add library**.



As next a short overview with different libraries which you can add to your project.

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3S → Softmotion

- **SM3_Basic:** Function blocks for motion control (PLC Open Standard)
- **SM3_CNC:** Basis CNC functions
- **SM3_Drive_ETC_KEB:** Softmotion driver for KEB drives via EtherCAT

...and more

System

- **Standard:** IEC help functions (e.g.: Timer, string handle, counter, trigger, ...)
- **Util:** More IEC help functions (e.g.: Math functions, Bit/Byte handle, signals, ...)
- **SysLibs:** (e.g. SysTime, SysSocket, Visu, ...)

...and more

KEB – KEB Automation KG

- **KEB_Base:** Basic functions (e.g.: Socket Handling)
- **PLC Hardware Library:** Hardware access functions (e.g.: PLC restart, error request, ...)
- **KEB_Communication_Utility:** Communication tools (e.g.: ModBus, TFTP, ...)
- **KEB_SMC_Utility:** Enhanced softmotion functions (e.g.: Caming, phasing, ...)
- **KEB_Drive_Utility:** Axis control without softmotion, different drive tools (PID, Ramp generator, ...)
- **KEB_Gateway_Utility:** Communication management of KEB devices.
 - Parameter adjustment of KEB devices about the field bus
 - Usage of parameter channel (SDO)
 - Master and slave handling (EtherCAT, HSP5, DIN66019, IEC, ...)
 - Bus diagnostic

KEB_Channelhandler: Gateway for all jobs (requests/ responses) of KEB devices. The basic library for the KEB communication model. Entire SDO communication is handled by the channelhandler function block.

...and more

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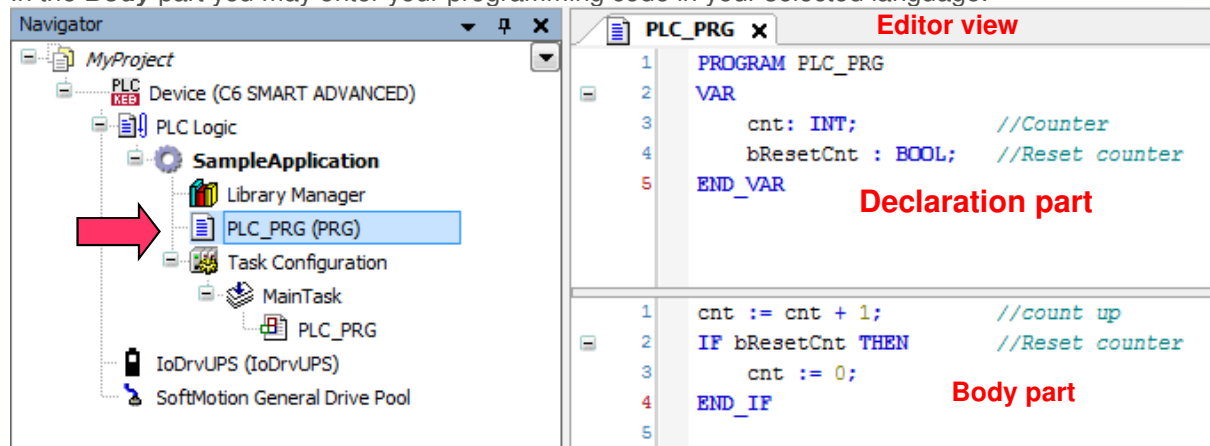
PLC_PRG

PLC_PRG is the standard POU that is called first of all by the PLC. (can be changed in the task configuration)

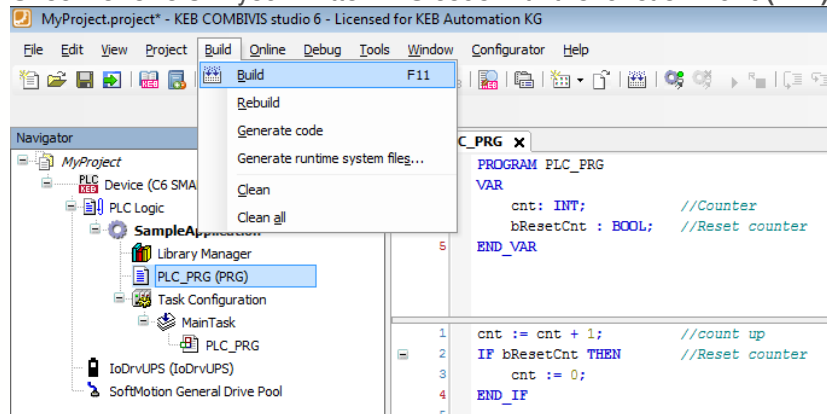
Double-Click on a POU (e.g. PLC_PRG) opens the editor view (ST Editor) which has two separated areas.

In the **Declaration** part you may declare the needed variables.

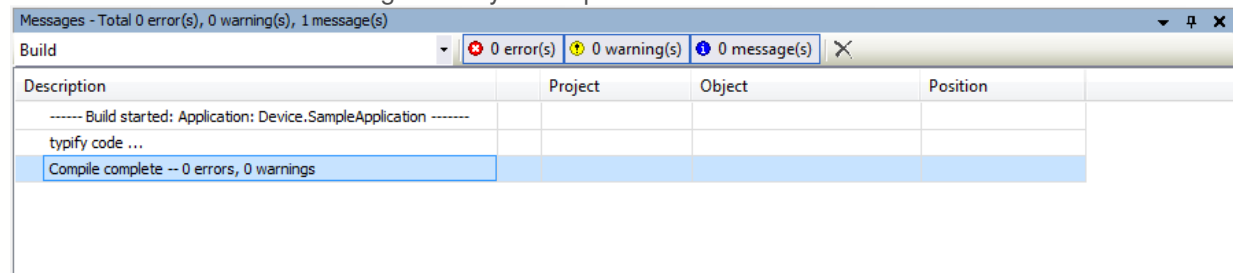
In the **Body** part you may enter your programming code in your selected language.



Check for errors in your written IEC code with the function **Built (F11)**.

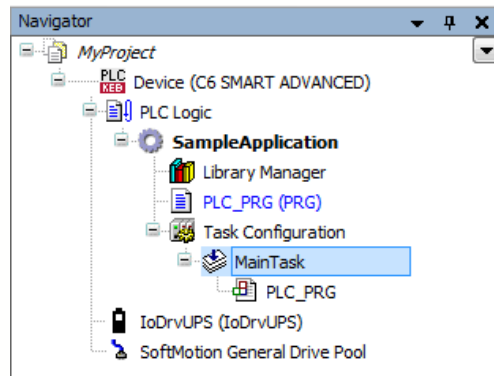


The window **Messages** shows the result of the build process. In an error case you can jump with a double click on the error message directly to the part in the IEC code.



Taskconfiguration

Double click on the MainTask object opens the task configuration view. Inside are different settings for the task



Priority: Tasks with higher priority may interrupt tasks with lower ones (0= highest priority).

Interval: Defines the task cycle time.

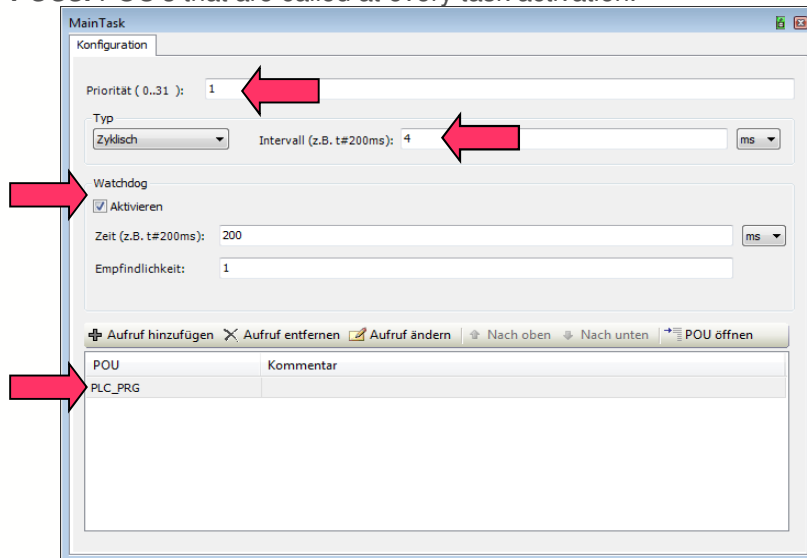
Recommendation: Factor 1.5...3 * max. cycletime, see Task Configuration -> Monitor
(Times can be reseted manually for a new measurement)

Attention: Too short cycletimes may result in high jitter and cycletime overflows.

Watchdog: (optional) If enabled, the program stops, if a program cycle is longer than the adjusted time.

Sensitivity: Number of critic cycles until cycle time error will be triggered.

POUs: POU's that are called at every task activation.



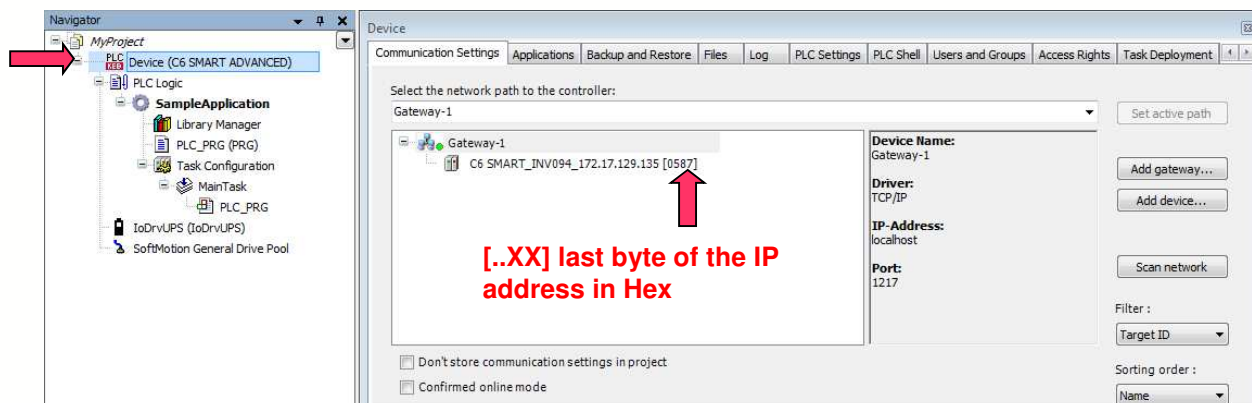
Hint: If the cycle time is too short you can get for example high jitter and / or cycle time overruns.
(Synchronicity isn't given)

Task Configuration						
Properties System Events Monitor						
Task	Status	IEC-Cycle Count	Cycle Count	Last Cycle Time (µs)	Average Cycle Time (µs)	Max. Cycle Time (µs)
MainTask	Valid	5803	5803	19	14	29

Hint: It's necessary that the type is set to external and the right task is selected if you use a C6 SMART.

Configure communication to PLC

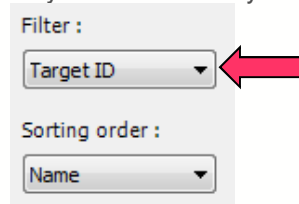
With a double click on the implemented device you open the device options. To connect your PC with a PLC it's necessary to search it in COMBIVIS studio 6 and set it to active path. Therefore open the tab **Communication Settings**, choose **Gateway-1** (standard gateway) and execute **Scan network**. For a successful device search it's mandatory to start the gateway on your PC. The gateway on your PC is activated, if the point of the Gateway-1 is green and one edge of the rectangle in the status bar is red.



Hint: The PLC should be enabled and connected to the same network as the PC. (Same IP network area and subnet mask). A description to adjust the IP network area is in the chapter [KEB device scan](#).

Hint: You can start the gateway in the status bar on your PC. Should be the program don't execute at the moment, you can trigger it manually: „Start -> All Programs -> KEB -> COMBIVIS studio 6 -> CODESYS Tools -> CODESYS Gateway SysTray“

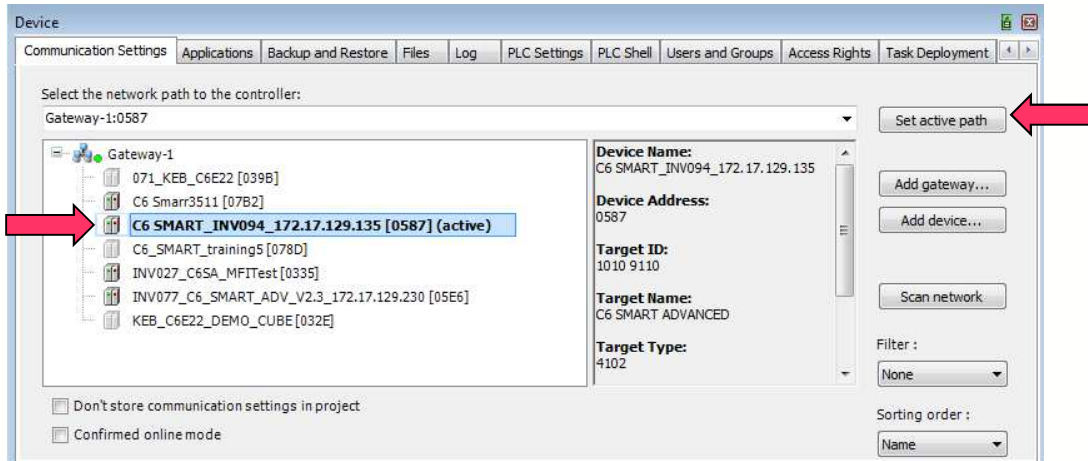
Hint: Deactivate all filter options to shown all PLC's in the network. With the filter "Target ID" you will get only the PLC which you choose in your project.



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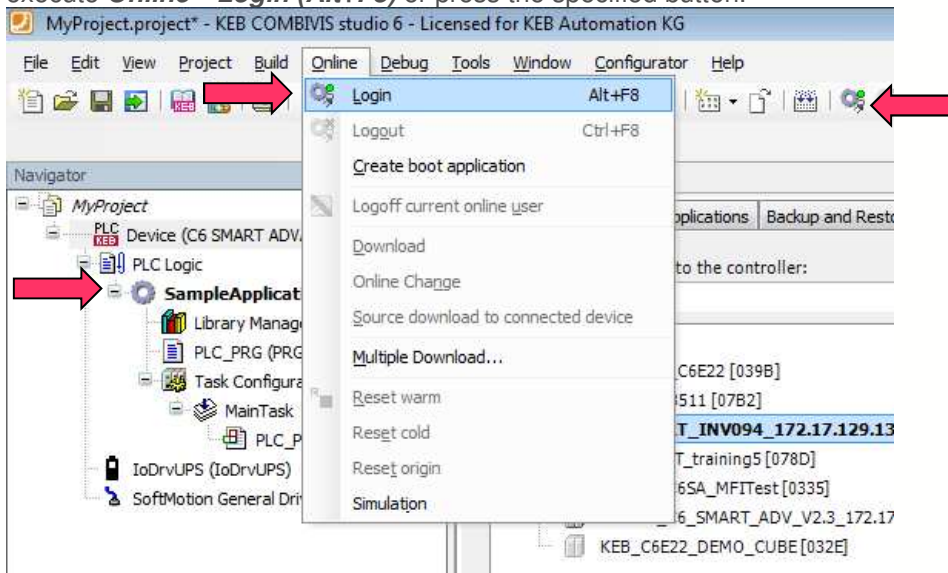


Choose your PLC and click on **set active path** to create the possibility for a download. The current active device will be shown in bold font.

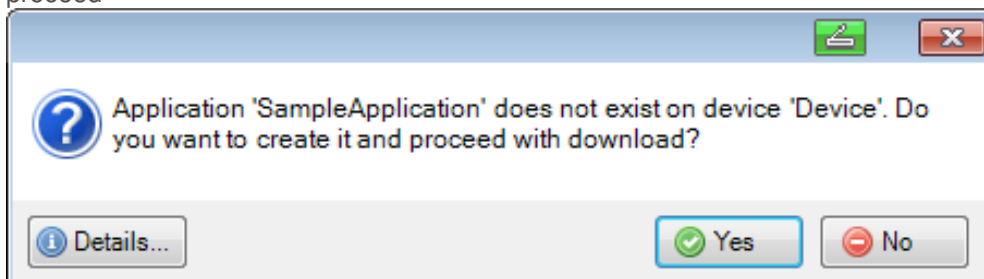


Download application and login

The currently active application in a project is displayed in bold font. To login with this application execute **Online** → **Login (Alt+F8)** or press the specified button.



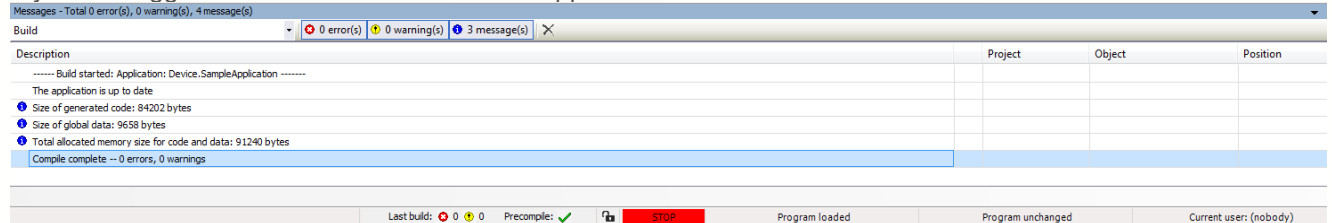
The current application status of the device is checked. The shown dialog has to be confirmed to proceed



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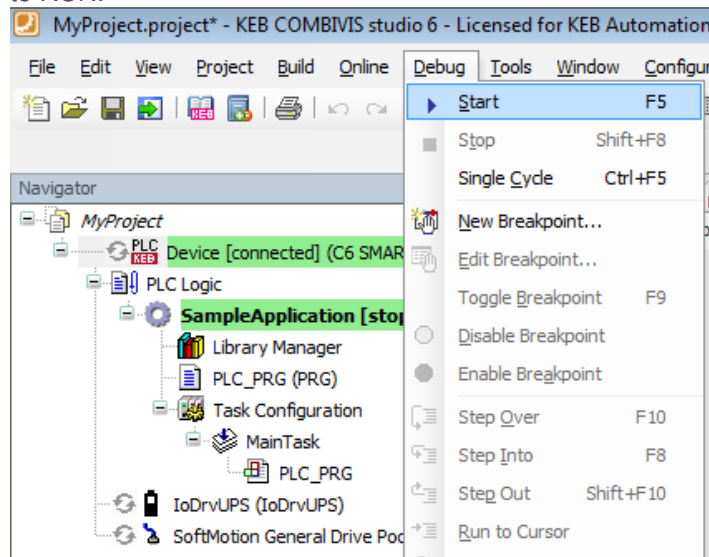


If you are logged in the status bar shows the application status.



→ STOP: Application is stopped

To start the application execute **Debug** → **Start (F5)** or press the specified button. The status changed to RUN.



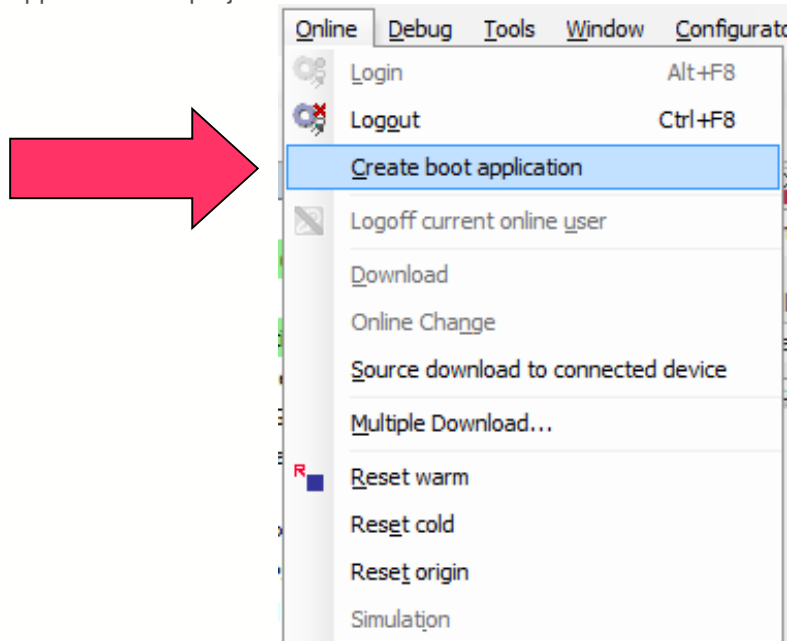
Reset online options

Following options are available if you are logged with the PC to the PLC. You find it in the tab “Online”

- Reset warm:** - Stopped the application
- Set normal variables / POU's to default
- Reset cold:** - Like „Reset warm“, extended you set the RETAIN variables to default
- Reset origin:** - Set all variables to default and delete the boot application on the device

Create boot application

To save an application persistent on the device a boot application has to be created. Without a boot application the project will be lost after a restart.



Hint: When you create a boot application on an IPC you have to reboot the IPC to save the boot project (start-->shut down). When you do a power off/on reset directly after the creating, the boot project will be lost!

Hint: On a C6 embedded control the creating of the boot project and automatic cleaning of the flash memory needs up to 30 sec. It is not allowed to turn the power off during this time!

Hint: Two files will be created with the boot application on the device.

- Applicationname. **APP**
- Applicationname. **CRC**

Check the files about the [file manager](#).

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Watch and write values

As you are logged in on an running application, the editor view switches into “online mode”
A field behind every variable shows the current value.

Device.SampleApplication.PLC_PRG				
Expression	Type	Value	Prepared value	Address
cnt	INT	10381		
bResetCnt	BOOL	FALSE		

```
1 cnt 10381 := cnt 10381 + 1; //count up
2 IF bResetCnt FALSE THEN //Reset counter
3 cnt 10381 := 0;
4 END_IF
5 RETURN
```

To change a parameter value online just click on the parameter field or in the column **Pre-pared Value** in the declaration part. In the body part you see the prepared value in angle brackets, too. Furthermore you have the possibility to prepare the value directly with a double click on the variable in the body part.

Device.SampleApplication.PLC_PRG				
Expression	Type	Value	Prepared value	Address
cnt	INT	-24800		
bResetCnt	BOOL	FALSE	TRUE	

```
1 cnt -24800 := cnt -24800 + 1; //count up
2 IF bResetCnt FALSE <TRUE> //Reset counter
3 cnt -24800 := 0;
4 END_IF
5 RETURN
```

To write the prepared value to the parameter execute **Debug** → **Write values (Ctrl+F7)**.
To force the prepared value to the parameter execute **Debug** → **Force values (F7)**.

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Expression	Type	Value	Prepared value	Add
cnt	INT	0		
bResetCnt	BOOL	F TRUE		

```
1 cnt 0 := cnt 0 + 1; //count up
2 IF bResetCnt F TRUE THEN //Reset counter
3 cnt 0 := 0;
4 END_IF
5 RETURN
```

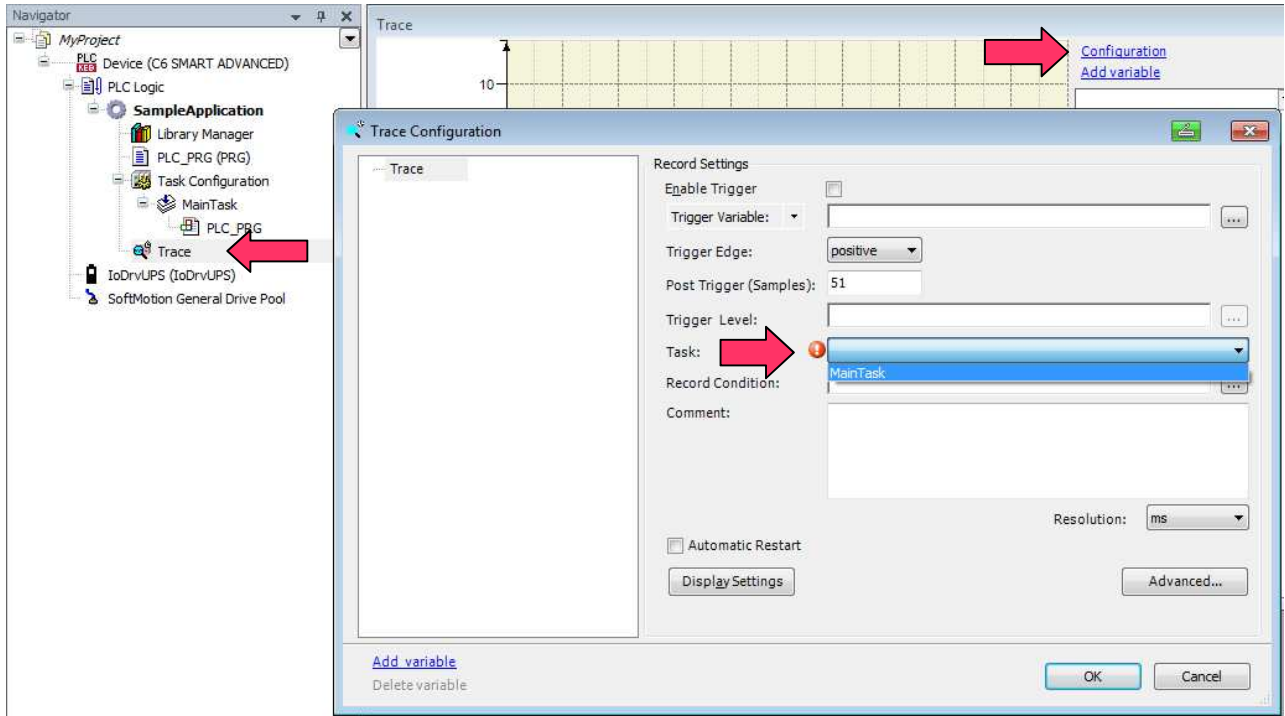
Another way to watch a value is the trace functionality. About **add object** you can implement this function to your project

The screenshot shows the 'Navigator' window with 'SampleApplication' selected. A context menu is open, and the 'Add Object' option is highlighted. A secondary menu is displayed, showing 'Trace...' as the selected option. Red arrows indicate the path from 'SampleApplication' to 'Add Object' and then to 'Trace...'.

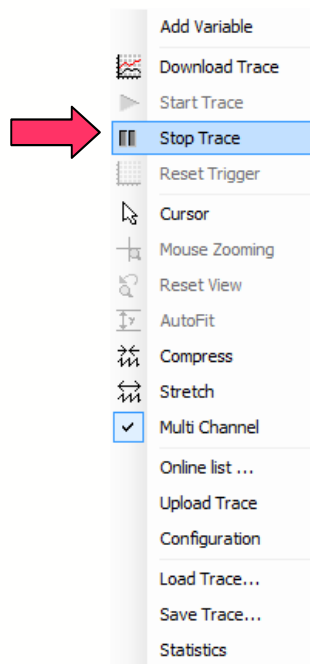
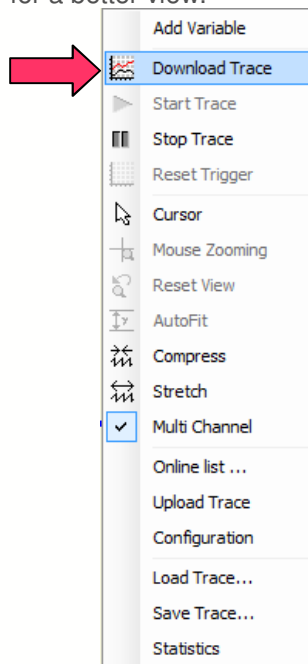
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Open the **configuration** and choose a task for the trace. Furthermore you can define there your variables.



If the project is running you can work with the trace and the implemented variables. A right click opens the options where you can start and stop the trace. Furthermore you have the possibility to zoom in/out for a better view.

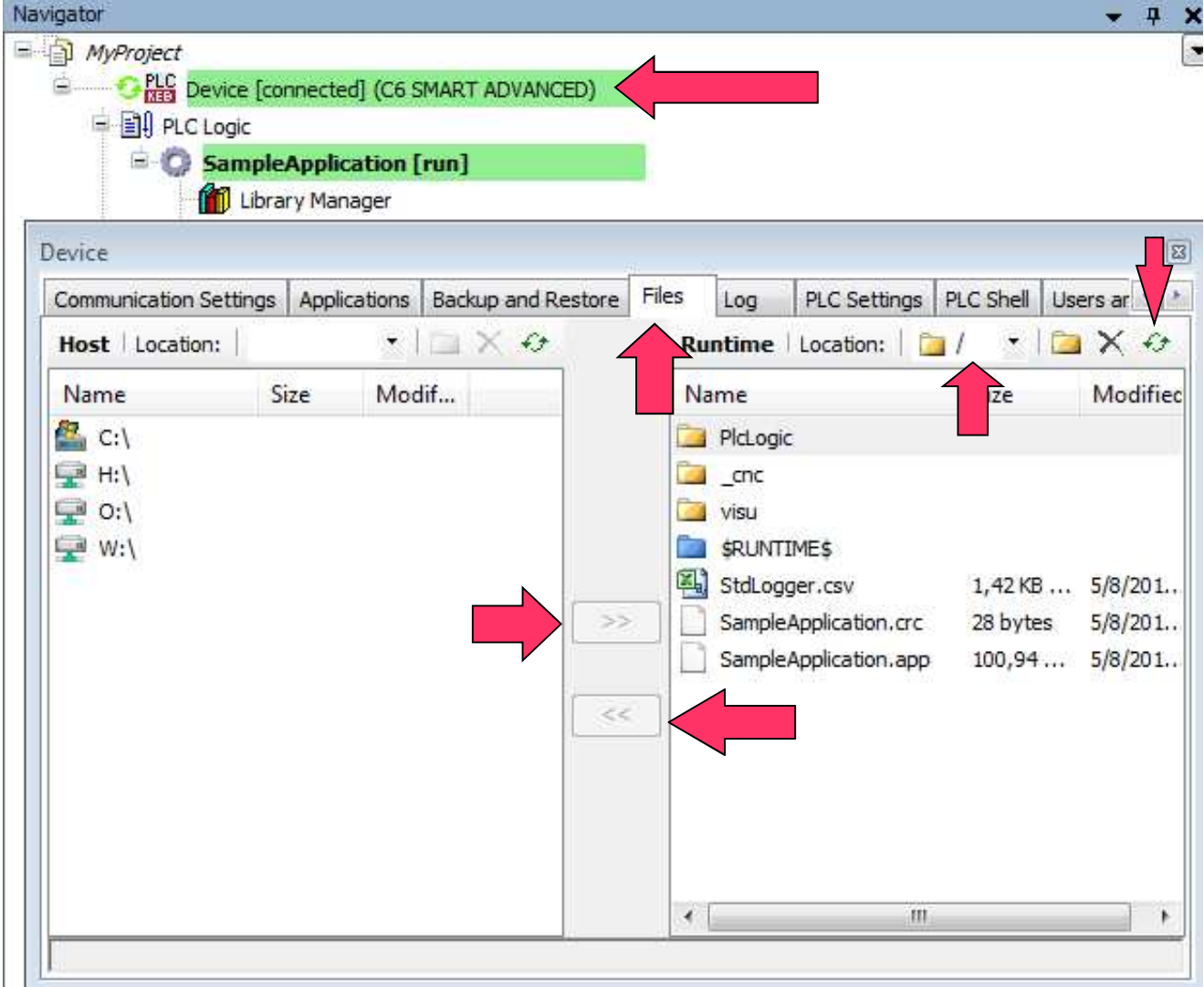


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Device file system access

The internal device file system can be easily managed by using the integrated file browser. With a double click on the device you can change to the tab **Files**. Click the refresh button to see the current files on the device. With the button << / >> you can transfer files between the PLC and the PC.



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Keywords for variables

Change the properties of the variables with different keywords.

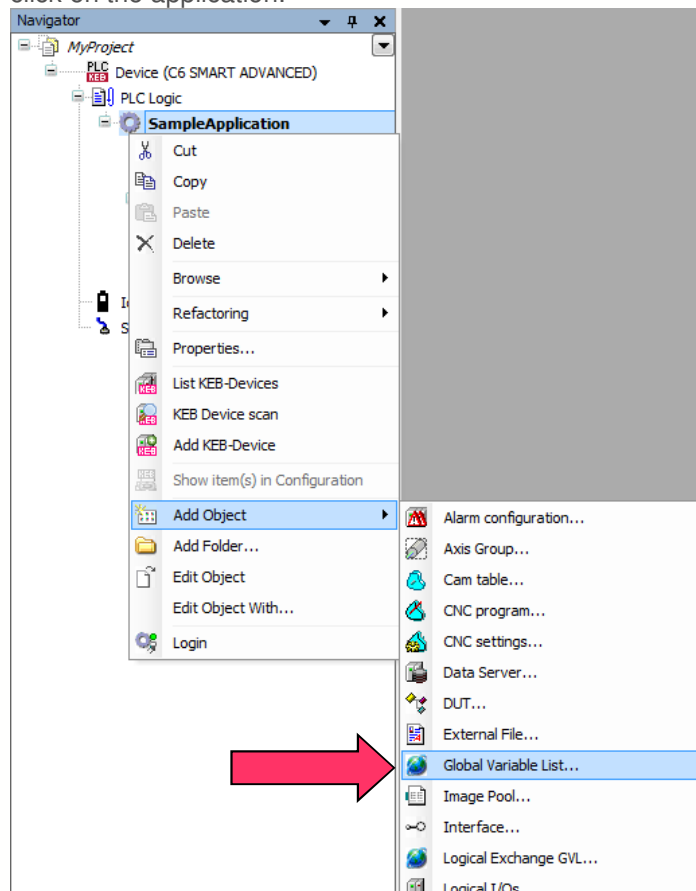
Var

With the keyword **VAR** the variables will be used only local in a POU

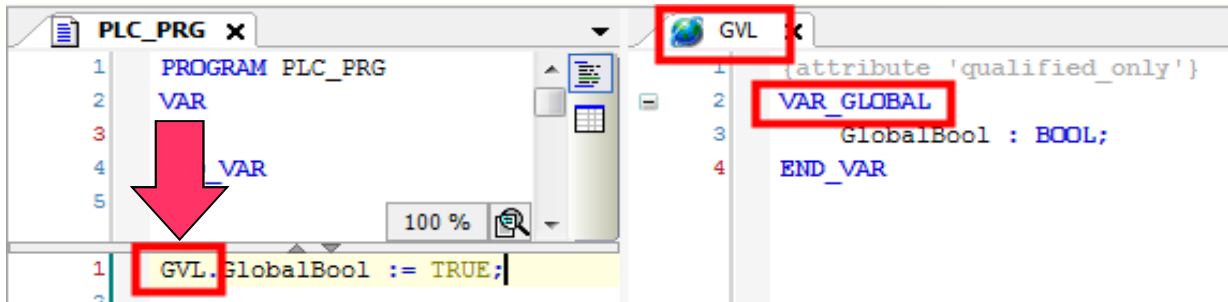
```
PLC_PRG x
1 PROGRAM PLC_PRG
2 VAR
3 variable1: BOOL;
4 END_VAR
5
```

Global

Variables with the keyword **VAR_GLOBAL** are declared as global. It's possible to use the variables in all POU's in your project. Therefore it's necessary to create a **Global Variable List (GVL)** with a right click on the application.



With the command **{attribute 'qualified_only'}** in the top of the GVL it's necessary that you write the complete path from a variable in a POU. In our sample the name GVL. at first. You get an error if you forget it.



```

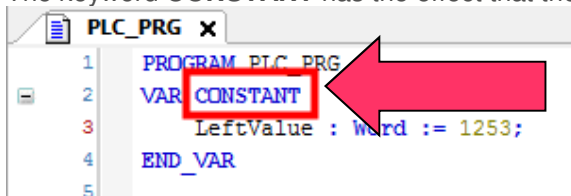
PLC_PRG x
1 PROGRAM PLC_PRG
2 VAR
3
4 VAR
5
1 GVL.GlobalBool := TRUE;

GVL
1 {attribute 'qualified_only'}
2 VAR_GLOBAL
3 GlobalBool : BOOL;
4 END_VAR
    
```

Hint: You can extend a GVL with other keyword. The property applies then for all variables inside the GVL

Constant

The keyword **CONSTANT** has the effect that the variable can't change from the program

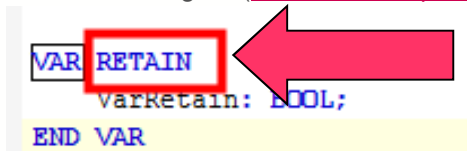


```

PLC_PRG x
1 PROGRAM PLC_PRG
2 VAR CONSTANT
3 LeftValue : Word := 1253;
4 END_VAR
5
    
```

Retain

Variables with the keyword **RETAIN** don't lost the value after a restart. You can set it to default with the reset cold or higher ([Reset online options](#))



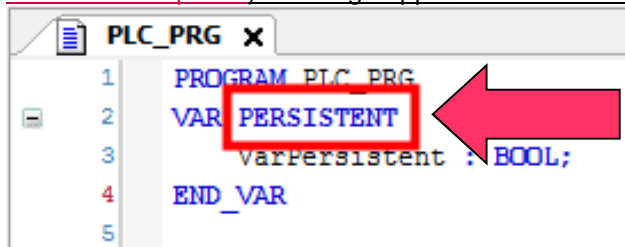
```

VAR RETAIN
varretain: BOOL;
END_VAR
    
```

Hint: This property works only with a created boot application on the device (Look chapter [create boot application](#))

Persistent

Variables with the keyword **PERSISTANT** lost the value only with ab „Reset Origin“ (Look to chapter [Reset online options](#)). Nothing happens with “reset warm” and “reset cold”!



```

PLC_PRG x
1 PROGRAM PLC_PRG
2 VAR PERSISTANT
3 varpersistent : BOOL;
4 END_VAR
5
    
```

Input

With the keyword **_INPUT** you define a variable which works as input on a POU

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```
PLC_PRG x
1 PROGRAM PLC_PRG
2 VAR_INPUT ←
3   varinput : BOOL;
4 END_VAR
5
```

Output

Variables with the keyword **_OUTPUT** are defined as output variables on a POU. This variables can be used in other program parts.

```
PLC_PRG x
1 PROGRAM PLC_PRG
2 VAR_OUTPUT ←
3   varoutput : BOOL;
4 END_VAR
5
```

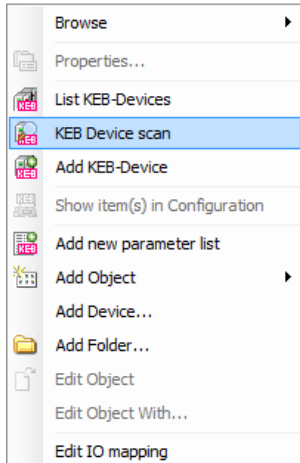
In_Out

VAR_IN_OUT variables are used as the input and output variables of POU's. The variables are passed on through the POU's (pass-by-reference variable). You can change the variables within the POU.

```
PLC_PRG x
1 PROGRAM PLC_PRG
2 VAR_IN_OUT ←
3   varinout : BOOL;
4 END_VAR
5
```

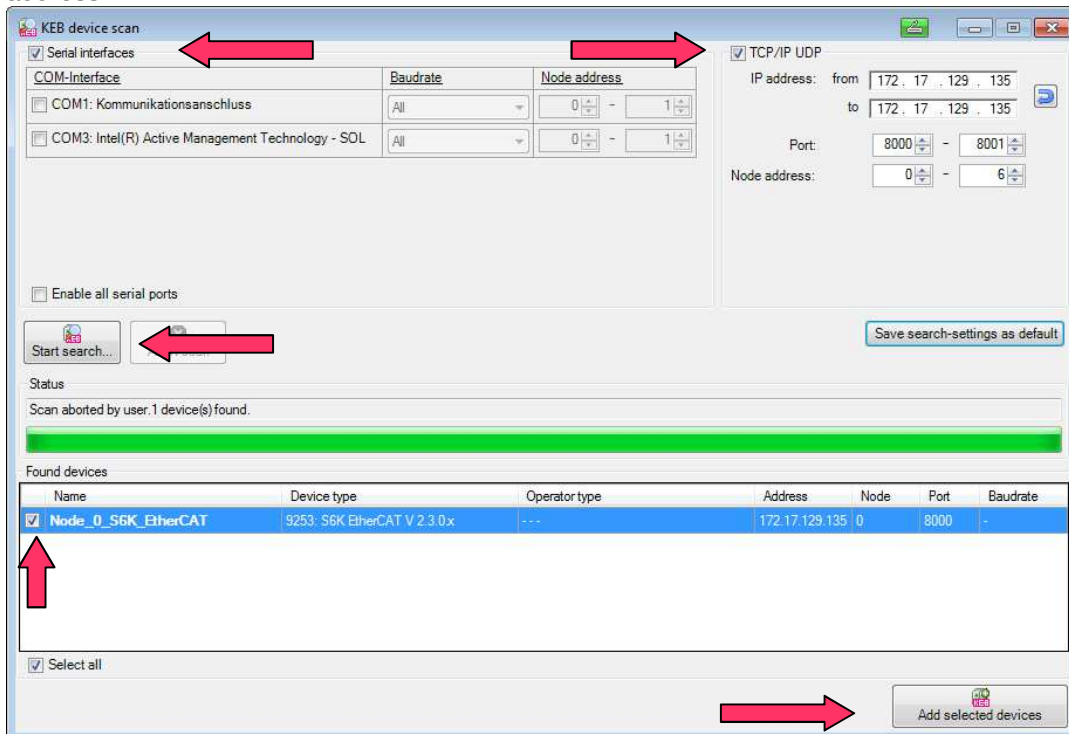
KEB device scan

To scan your COM ports/ your network for devices (controls/ inverters) just right-click any-where in environment and execute the **KEB device scan** or press the specified symbol.



5. Adjust the COM Ports or Ethernet range which you like to scan and activate this option
6. Press **Start search**.
7. Select the found devices you like to add to the project.
8. Press the **Add selected devices** button.

Hint: C6 embedded PLC's via TCP/IP can be found on Port **8001**, inverters on port 8000 + Node address

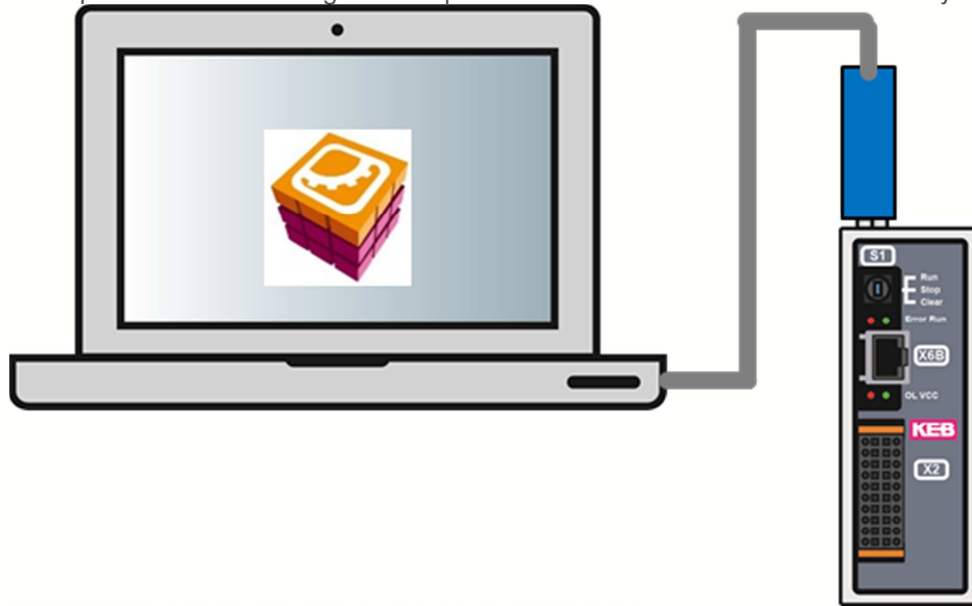


e.g.: S6 - K about the IP address 172.17.129.135 of the PLC.
The found devices are added to the project navigator.

USB Seriell Wandler

About the USB serial transmitter you can search and find devices about the COMBIVIS studio 6 option "device search".

It's important to connect e.g. C6 compact with the USB serial transmitter directly to the PC.

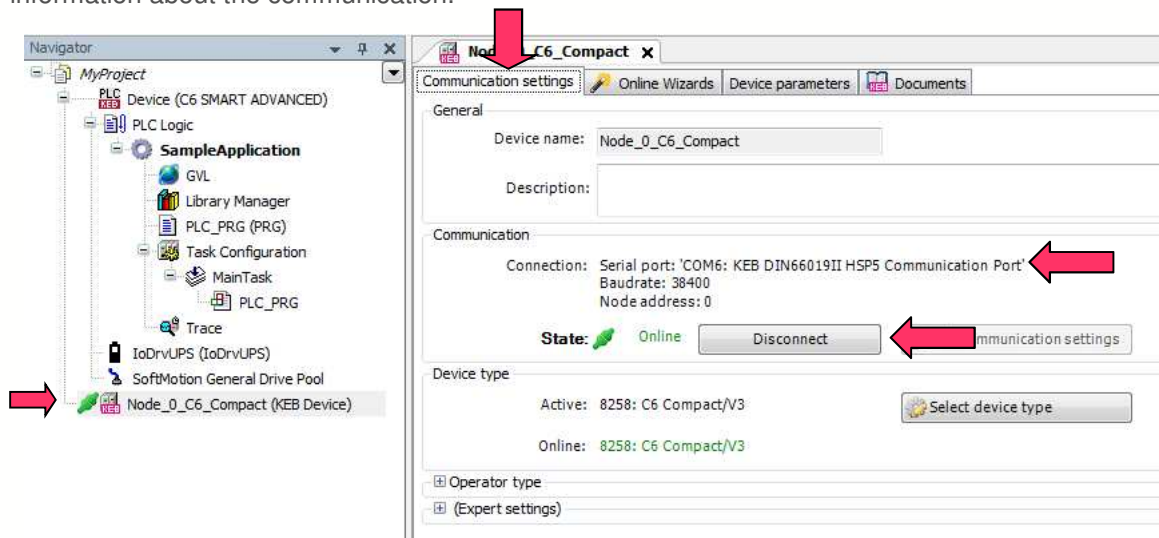


Activate in the **KEB device search** the option „serial interface” and then choose the COM port of the USB serial transmitter. **Start search** will be shown all devices from this connection and with **Add selected devices** you can transfer it directly to your project.

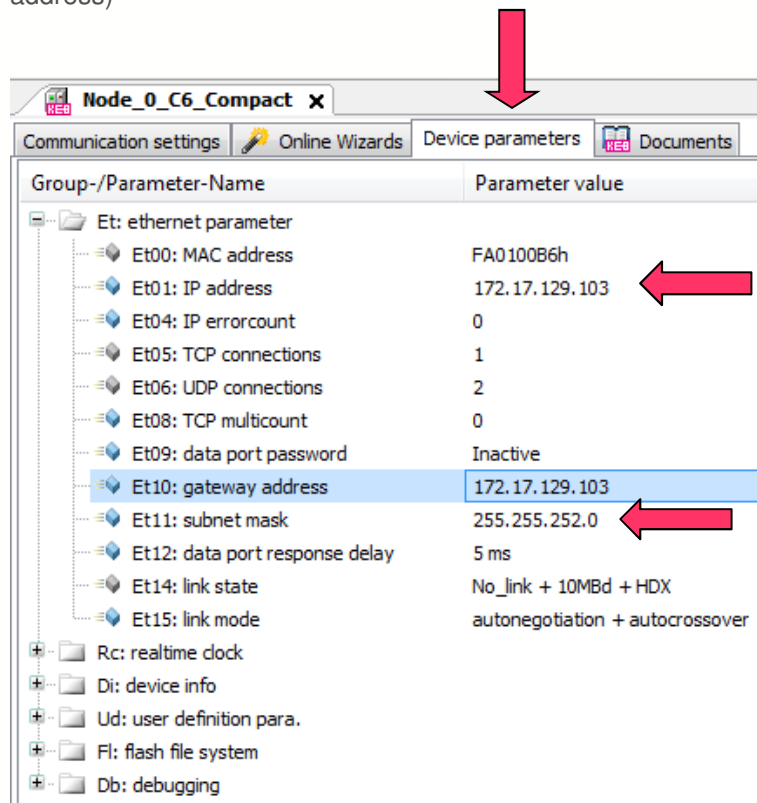
Now you have the possibility to see, edit or compare the parameters.

Assign IP address to KEB embedded control (C6 SMART / C6 HMI LC / C6 Compact / C6 S14)

Search and add the control via the KEB device search (e.g. control connected via serial COM). Double-Click on the device opens the device options view. In the tab **communication settings** are information about the communication.



Tab **device-parameters** shows the internal device parameters. (E.g. ethernet parameters and MAC address)



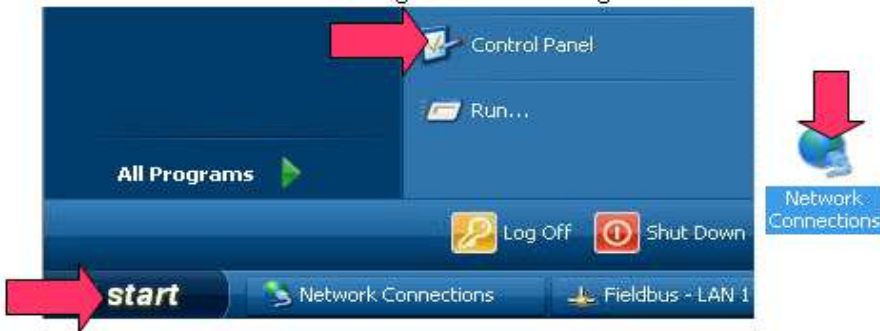
Hint: You can only login to devices that have a valid IP address (Et00) and are located in the same subnet (Et11) as your PC you want to login from!

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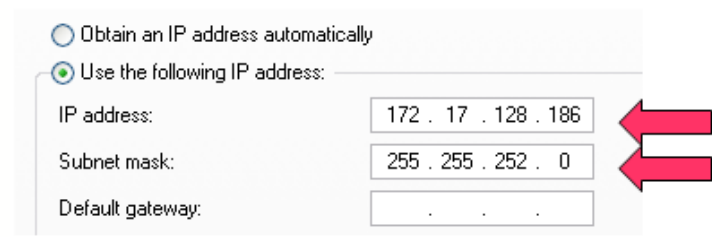
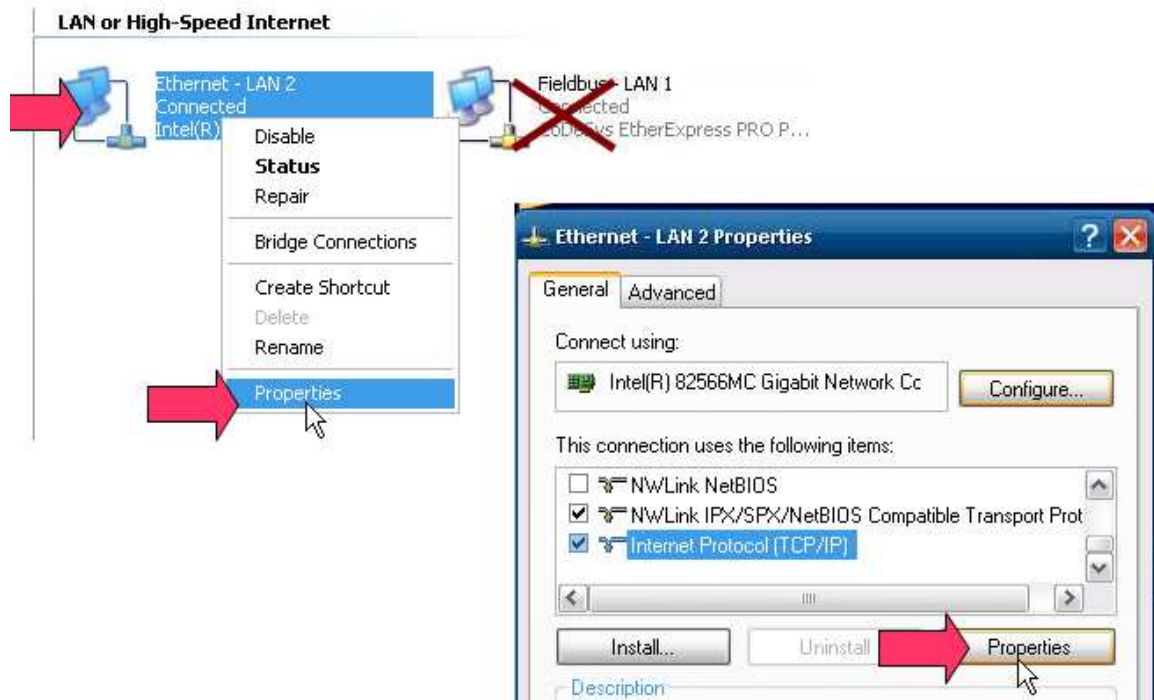


Assign IP address to KEB IPC (C6 ECON / C6 PERFORM / C6 E22 / C6 P34)

- Use the windows menu to assign the IP settings for the IPC



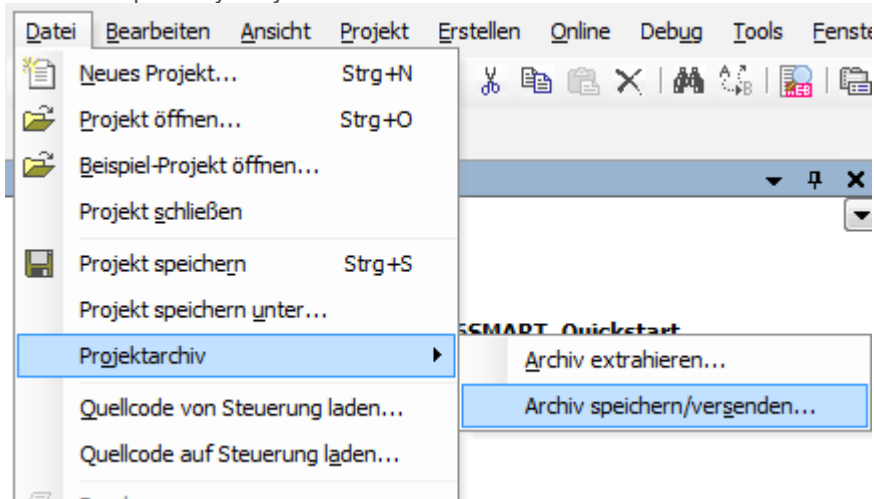
- Start → Control Panel → Network Connections
- Ethernet – LAN 2 → Properties
- Consult the responsible network administrator to choose an appropriate IP address AND Subnet mask for your Network



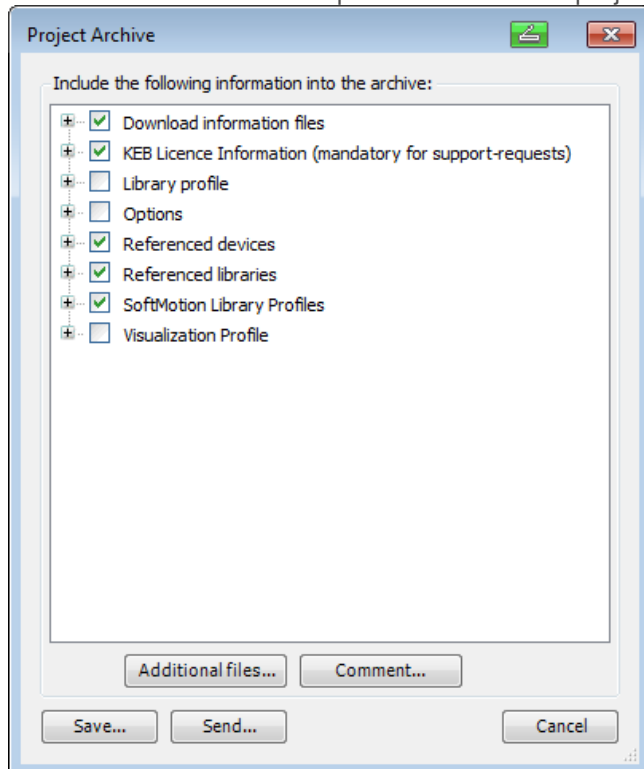
Hint: Do not change the Fieldbus LAN 1 settings!
(Fieldbus IP e.g.: 169.254.1.20; SubNetMask: 255.255.0.0)

Create a project archive

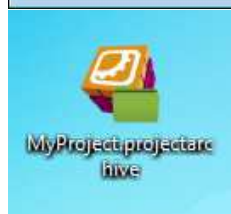
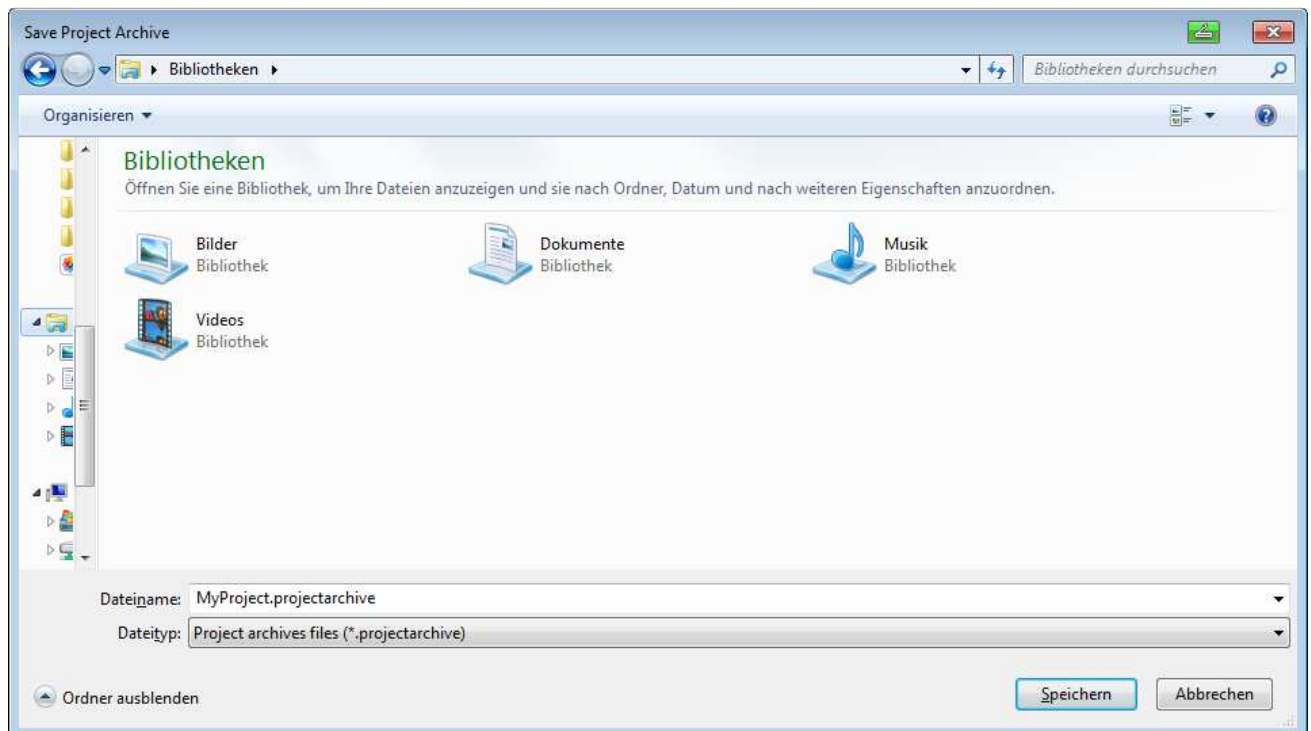
A project archive contains the IEC code, POU's, libraries, device version and many more. You can use this project archive to re-establish this project to a later point of time independent of the installed repository on your PC.



Choose in the following windows what you want to save in the project archive. Press save and choose the path for the created project archive file.



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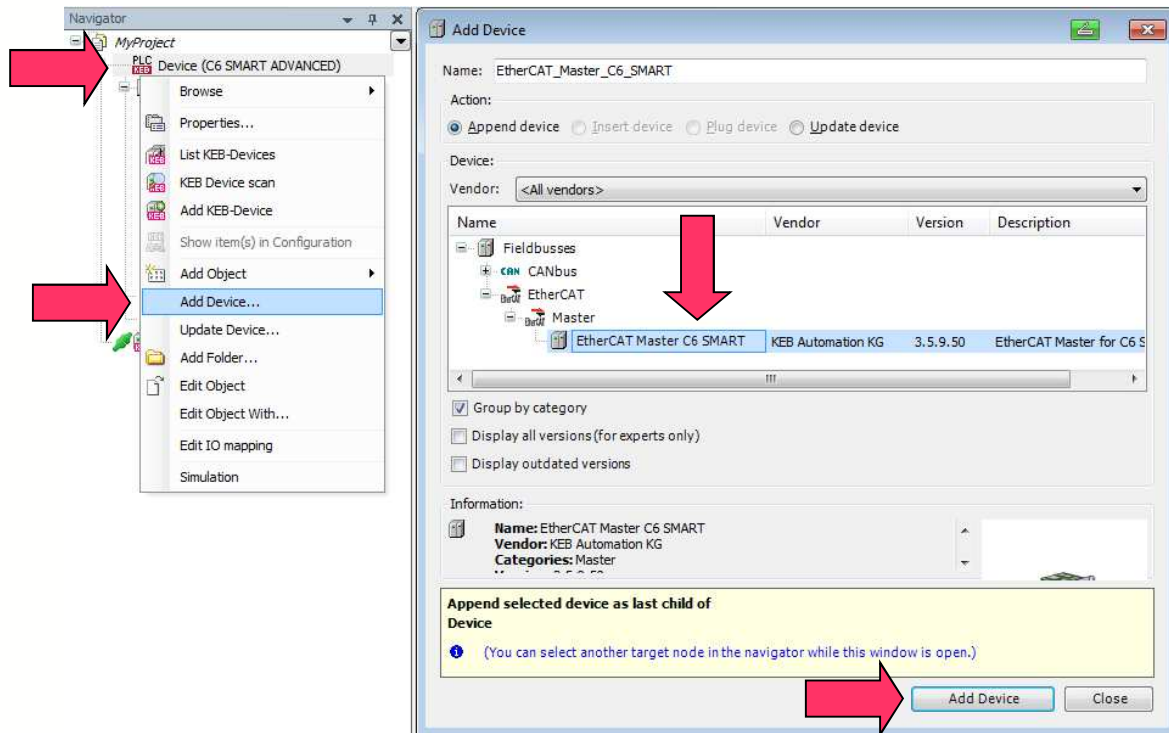
Hint: We recommend to create a project archive at the latest of your finished project and save it on an external, independent medium.

FAQ COMBIVIS studio 6



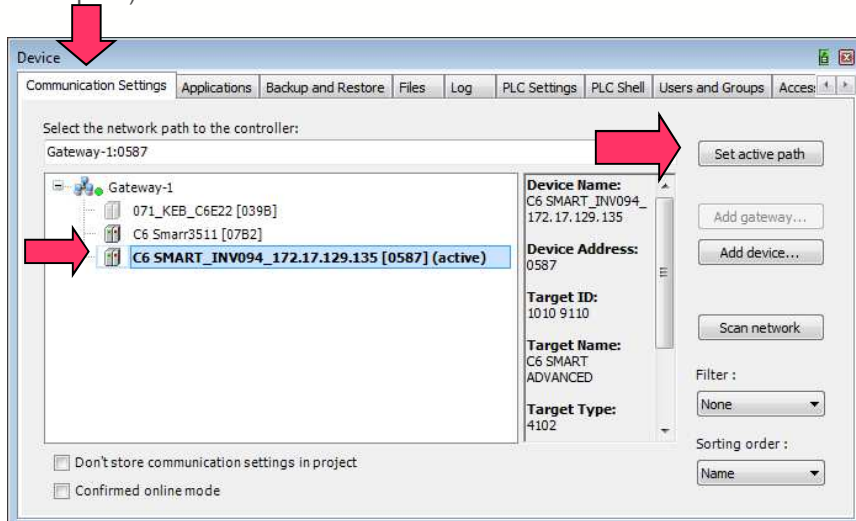
Configure Ethercat field bus

- Begin with a new standard project.
- Right click on the PLC → **Add Device**
- Select **Fieldbus** → **EtherCat** → **Master** → **EtherCAT Master**
- Select **add device**



Hint: Ethercat Master appears in the project navigator subordinated to selected device and is automatically implemented into the called task

Link the control device object to a hardware device in your network with Ethercat master ability. (Set active path)



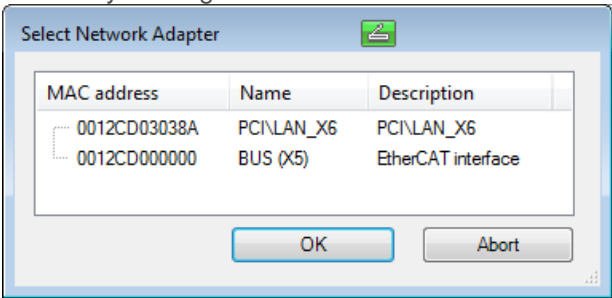


EtherCAT MAC options

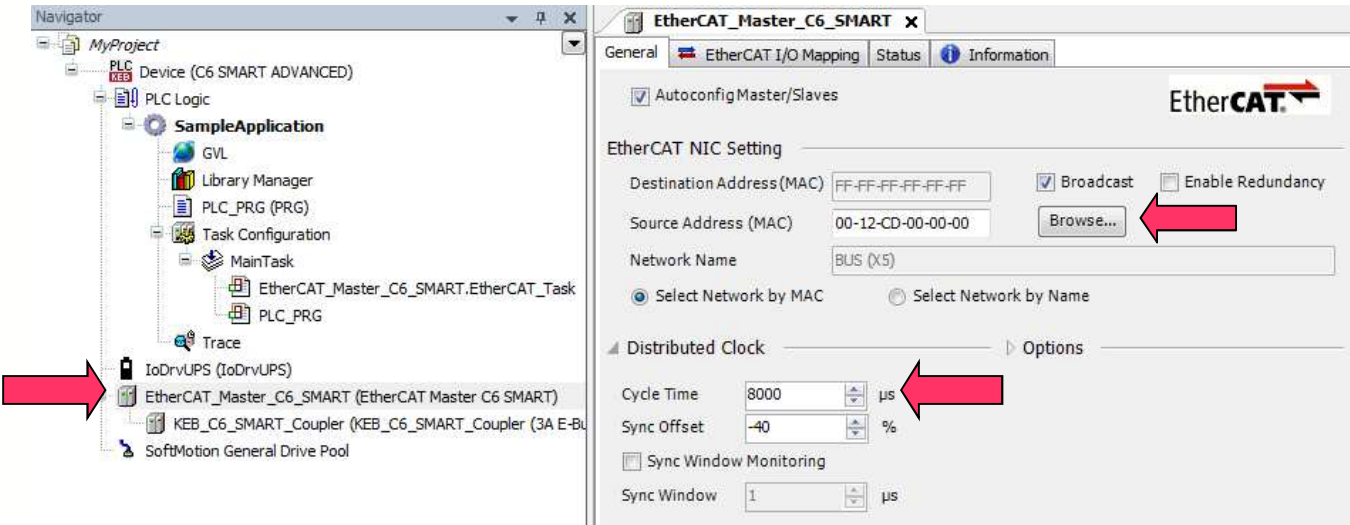
The EtherCAT Master need adjustment for the communication. There you can choose between two different options.

Option 1

- Double-Click on the e.g. EtherCAT_Master_C6_SMART object
- Choose the cycle time for the field bus communication
- Choose the hardware interface (RJ45 Ethernet slot) on the control device for the Ethercat Master by clicking on the **Browse..** button.



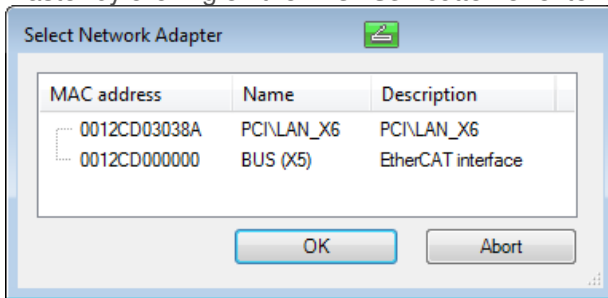
- Activate the option **Select Network by MAC**



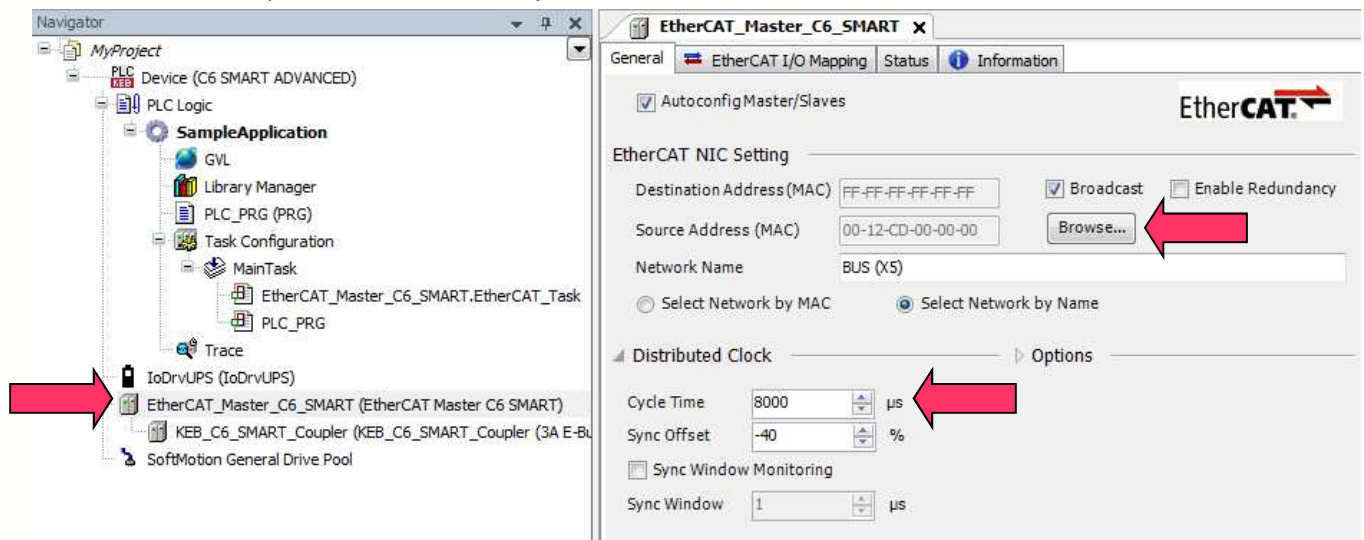
Option 2

Optional kann das Netzwerk über den Namen ausgewählt werden.

- Double-Click on the e.g. EtherCAT_Master_C6_SMART object
- Choose the cycle time for the field bus communication
- Choose the hardware interface (RJ45 Ethernet slot) on the control device for the Ethercat Master by clicking on the **Browse..** button or enter the name manually.



- Activate the option Select Network by Name



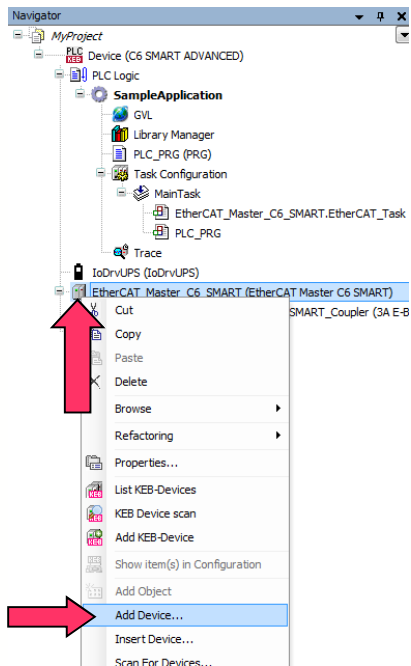
FAQ COMBIVIS studio 6



Append devices to the EtherCAT Master

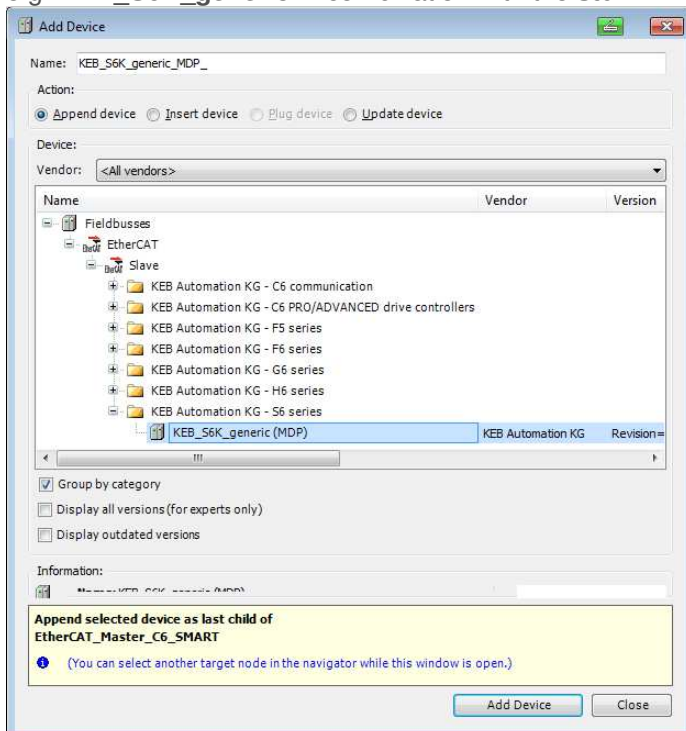
With this option you can append devices to the EtherCAT Master. It means the extension or rebuilding of the hardware structure in the project. (e.g. Frequency converter or I/O modules)

- Right-Click on the EtherCAT Master object → **Add Device...**



- Choose the device from the Ethercat Slave list → **Add Device**

e.g. **KEB_S6K_generic** in combination with the **std PD map**



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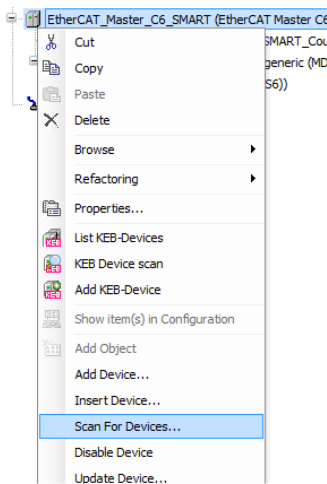


Append KEB I/O moduls

You have the possibility to append a KEB I/O modul about two different ways. The first is the option about [add device from the previous chapter](#).

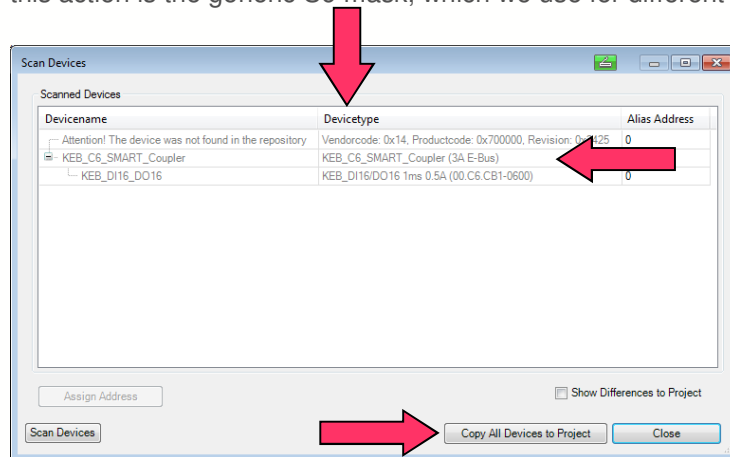
Another way is to scan your EtherCAT bus for all connected moduls. Therefor it's necessary to set your PLC to active path like chapter [configure communication to PLC](#).

- Right - click on EtherCAT Master and select Scan for Devices...

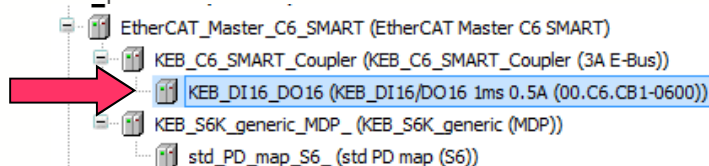


A new window with the scanned moduls are opened.

Hint: E.g. a S6 will be found about this option but it's necessary that you add it manually. The reason for this action is the generic S6 mask, which we use for different S6 config ID's.



The coupler and / or the KEB I/O moduls will be added to the EtherCAT Master.



To link inputs and outputs from the extended moduls follow the chapter link variables [link variables \(E/A Abbild\)](#)

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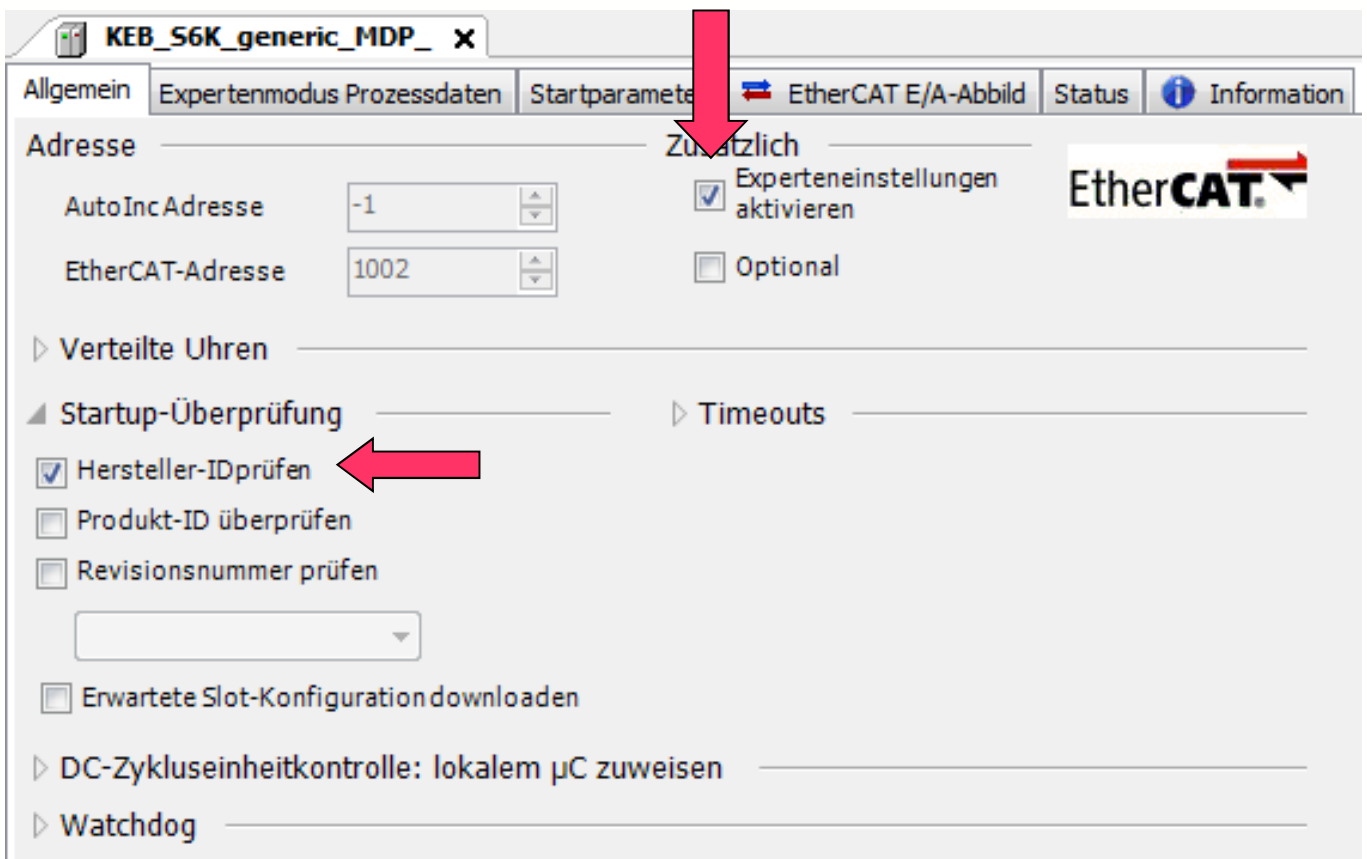


Configure device on the EtherCAT Master

To configure a device correctly you need the **Expert settings**, which you can activate in the adjustment of a device. Double click on the device opens the adjustment.

In the expert settings you will find checkboxes for the Vendor ID and Product ID. They will check if you use an unknown device.

Hint: Deactivate this option if you want to use a unknown device



Configure the EtherCAT Process Data

To control the devices on the EtherCAT bus you can define which parameters should be exchanged cyclically. Therefore you can use the standard mapping with preinstalled values.

Furthermore you can create your own mapping or edit anyone.

Following the standard mapping of the S6 inverter.

- Outputs:
 - std_PD_map_S6_controlword INT
 - std_PD_map_S6_target position DINT
 - std_PD_map_S6_target velocity DINT
 - std_PD_map_S6_modes of operation USINT
 - std_PD_map_S6_homing method USINT
 - std_PD_map_S6_vl target velocity INT
 - std_PD_map_S6_profile velocity DINT
 - std_PD_map_S6_end velocity DINT
- Inputs:
 - std_PD_map_S6_statusword INT
 - std_PD_map_S6_position actual value DINT
 - std_PD_map_S6_velocity actual value DINT
 - std_PD_map_S6_modes of operation USINT
 - std_PD_map_S6_vl velocity actual value INT

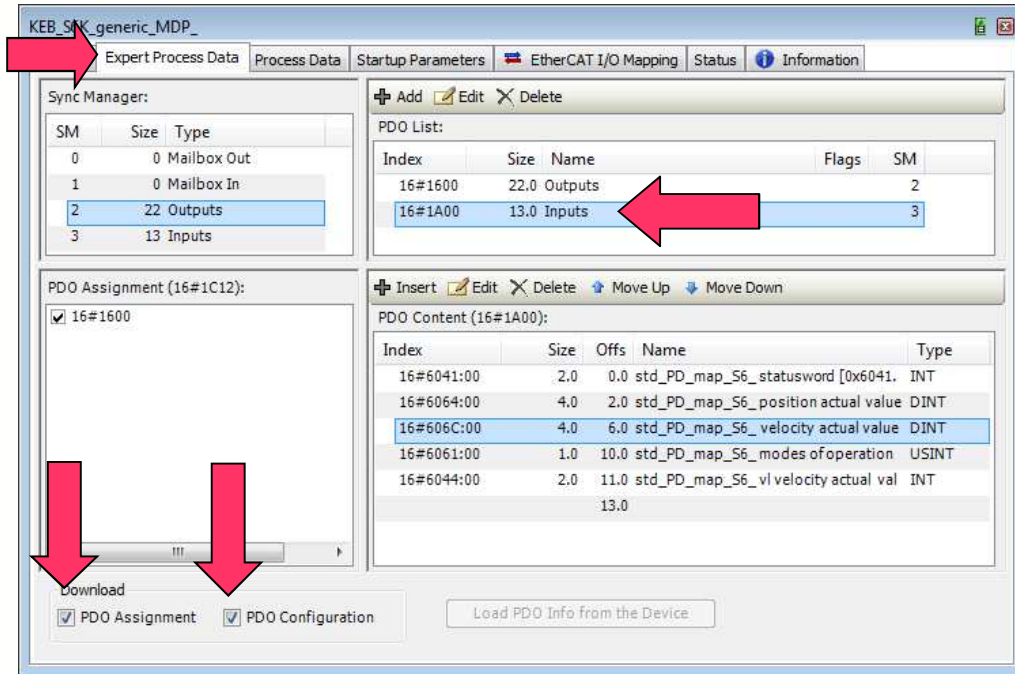
Hint: You have the possibility to control a motor only about the standard mapping

To edit the standard mapping it's necessary to change for example the name and the address of the new parameter. Do following steps

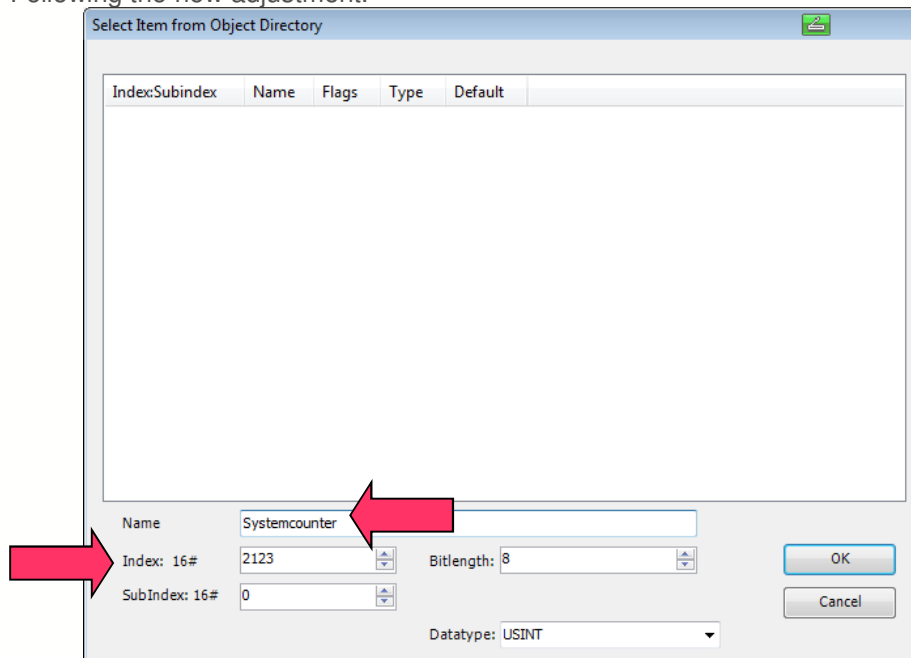
Enable the option „Enable Expert Settings” in the tab “General” of the converter (See the chapter [configure device](#))

- Choose tab “Expert Process Data”
- Set the ticks for “PDO Assignment” and “PDO Configuration”
- Click on Outputs or Inputs
- Double Click on the assignment you want to modify
- Then set the address to the desired parameters

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E.G.: Change the input „Velocity actual value“ to the “Systemcounter“ (st35) with the address 16#2123. Following the new adjustment.



Hint for F5: The first 16#2000 address are reserved by the EtherCAT Master! So in case of a F5 inverter you have to add this value as offset to your address (Address 16#0023 would be 16#2023)

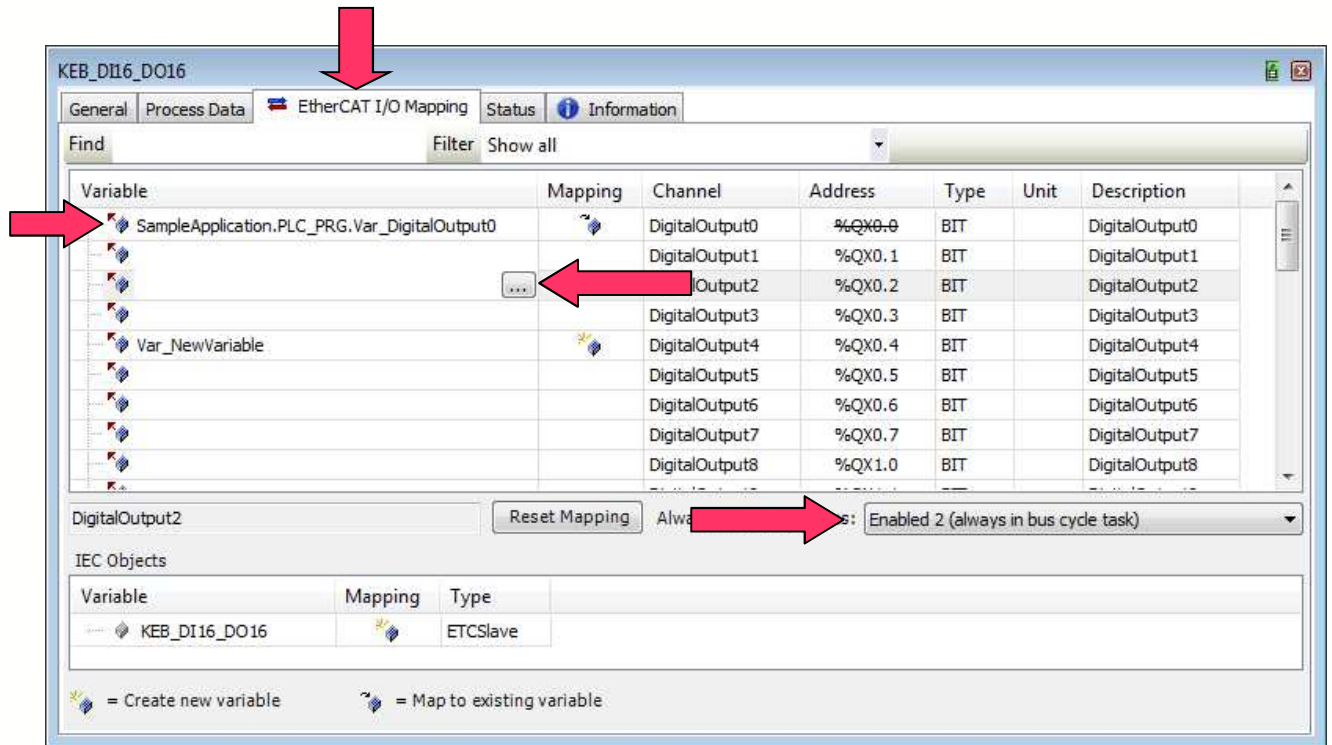
To link the standard mapping or the edited mapping to an internal programvariable use the chapter [Link variable \(I/O mapping\)](#).

Link variable (I/O mapping)

To use the internal programvariable on the I/O moduls it's important to link it in the EtherCAT I/O mapping of the extended modul.

Open with a double click the modul, change to the tab EtherCAT I/O mapping and and following settings.

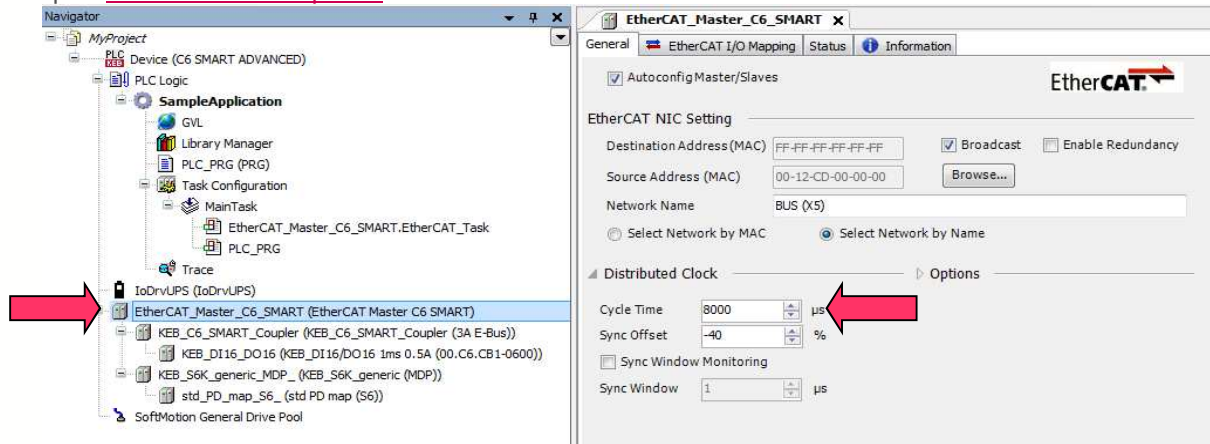
- To update the variable every cycle set Always update variable to Enable 2 (always in bus cycle task)
- Link variables from the IEC code with the input and output of the modul. Add this manually or about the help which you can open about the three points.
- You can see in the column "Mapping" if the linked variable consist before or generate new. A new generated variable will declare in an invisible global variable list (GVL)
- You can work with the address of the input / output, if you don't link a variable.



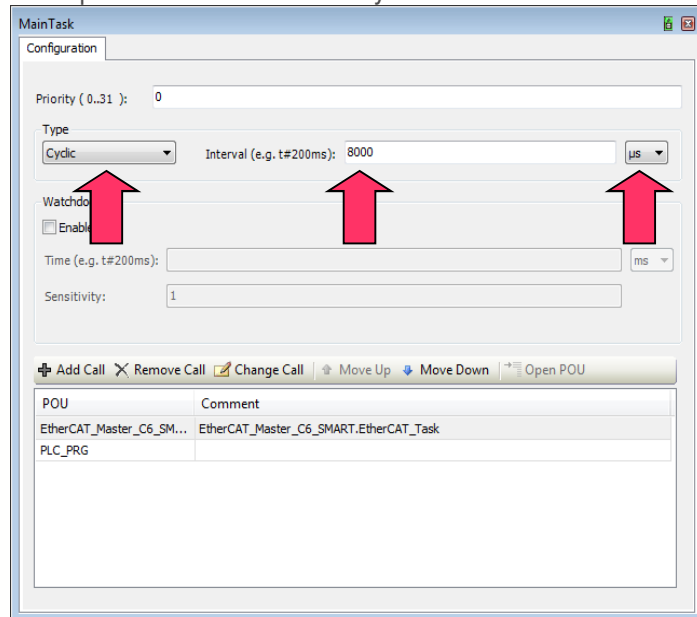
Adjust the cycletime

The adjustment of the cycletime was describe in the previous chapter, too.

To edit the EtherCAT Master it's important to set the cycle time. More information to this window is in chapter [EtherCAT MAC options](#).

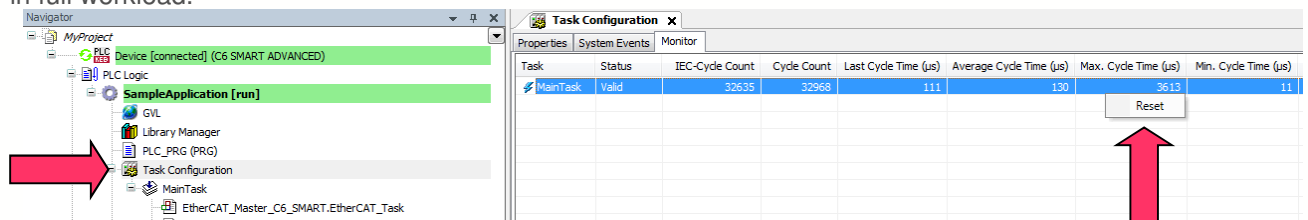


It's important to set the same cycle time for the task like as the EtherCAT Master.



Hint for the C6 SMART: It's necessary that you change the **Typ** in the “MainTask” to **External**. As external event will be choose directly **Event_ECM_DC**.

Hint: In the **Task configuration** in the tab **Monitor** you will see different information about the cycle time. A recommendation is to **reset** the values after start up the PLC. Now you can check the cycle time in full workload.



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Access via bus

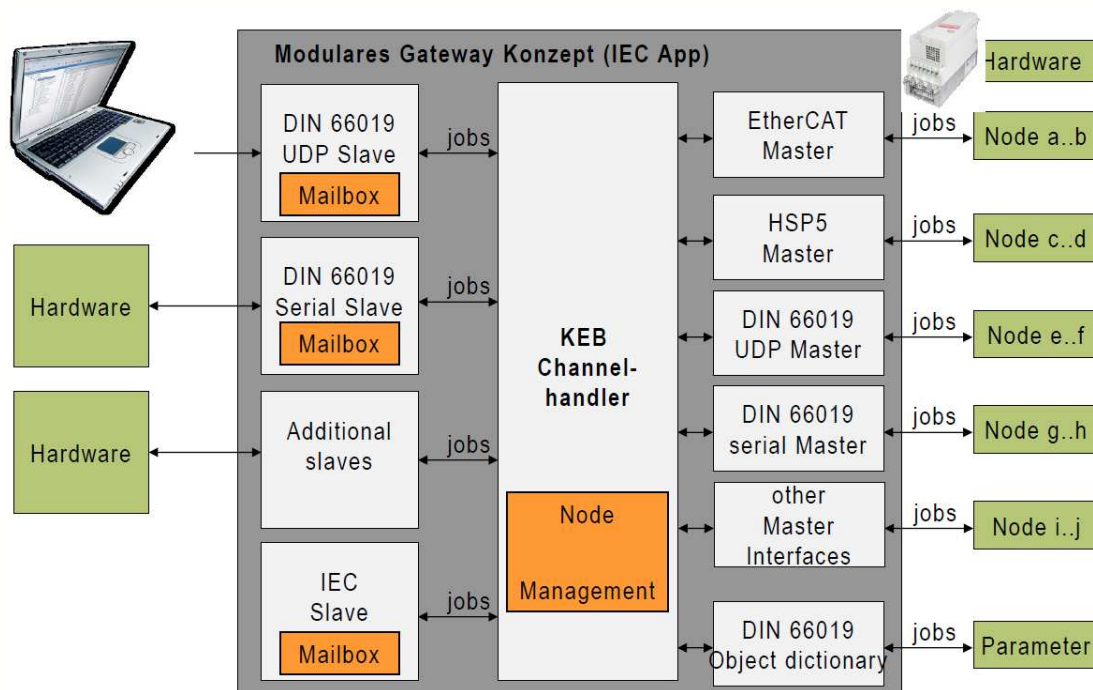
COMBIVIS studio 6 gives you the possibility to adjust and monitor all device parameters via the COMBIVIS 6 functions (e.g. Scope).

- Devices connected directly to your PC (serial/ Ethernet) with standard COMBIVIS functions.
- The devices which are connected via Bus to the PLC (Ethercat, HSP5, DIN66019II,...) need a gateway

To get access via bus to the devices the following conditions should be come true

- *KEB Channelhandler* function block is implemented in the application.
 - Has to be called every cycle by the PLC.
 - The used bus masters and slaves have to be registered to the Channel-handler.
- PLC is in RUN mode.

The KEB Channelhandler is a software function which runs on the PLC. It handles entire communication between the devices connected to the PLC. Receiving and Forwarding of all jobs (requests/ responses) of KEB devices.



Hint: See in the documentation of the KEB Gateway Utility library and / or the sample Projects in the gateway folder. There you see the needed function blocks, too.

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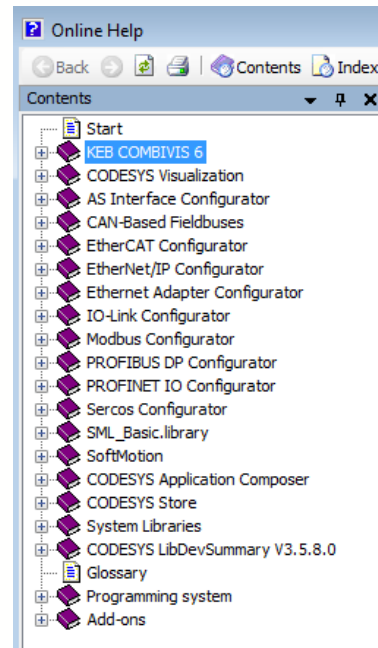
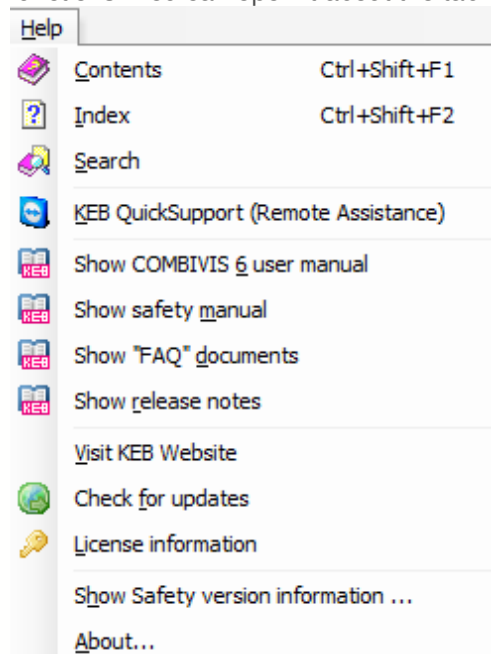


...more Information

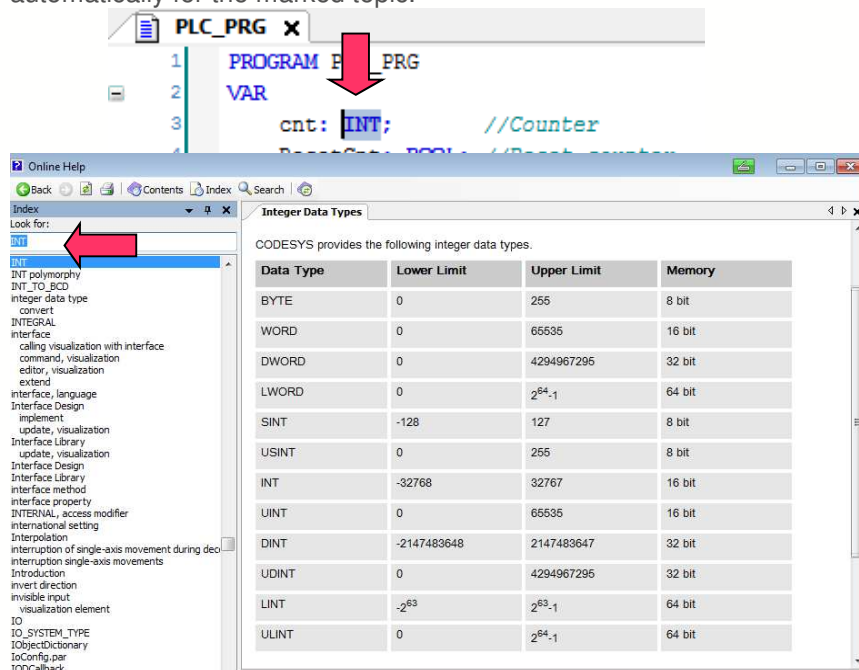
If the searched information is not a topic of this manual, please consult one of these data sources.

Online Help

Please consult the **Online Help** for more information about the development environment and these functions. You can open it about the tab **Help**.



The easiest way to find the information is to highlight the respective item (e.g. data type, function block, etc.) in the environment and press **F1** on your keyboard. The online help will be started and searches automatically for the marked topic.



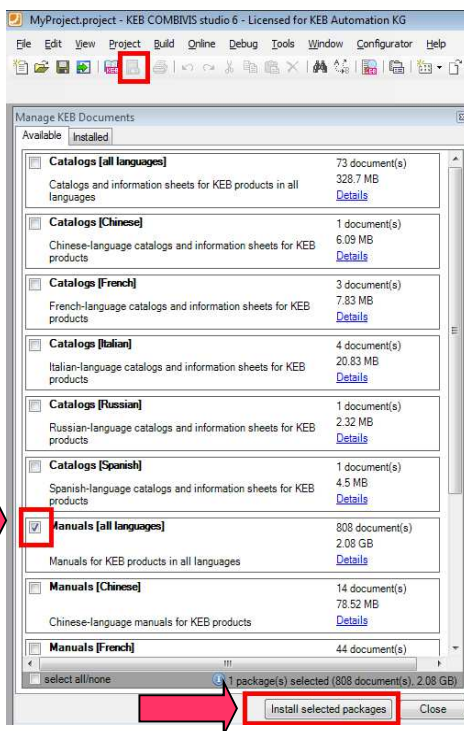
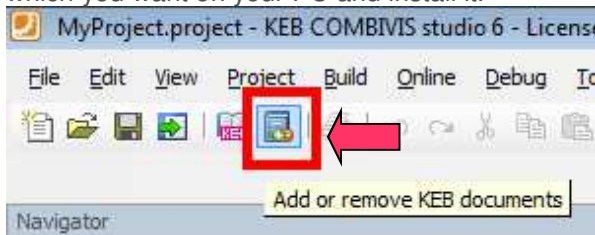
FAQ COMBIVIS studio 6



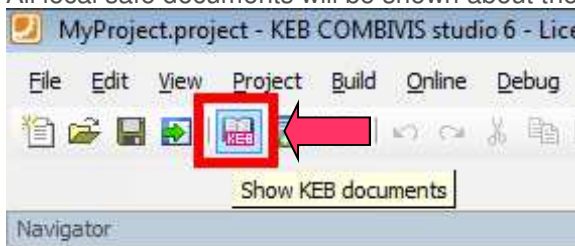
FAQ

You find in our environment COMBIVIS studio 6 and the internet site www.keb.de different FAQ's (Frequently Asked Questions). To open a FAQ about the environment it's important to download it one time local on your computer. They will be update automatically about the update function in COMBIVIS studio 6.

To download the documents click in the button **Add or remove KEB documents**, choose the topics which you want on your PC and install it.

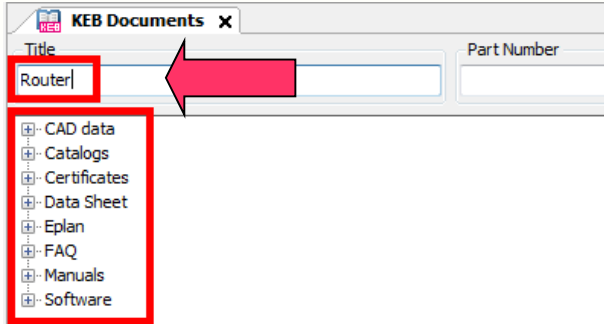


All local safe documents will be shown about the button **Show KEB documents**.

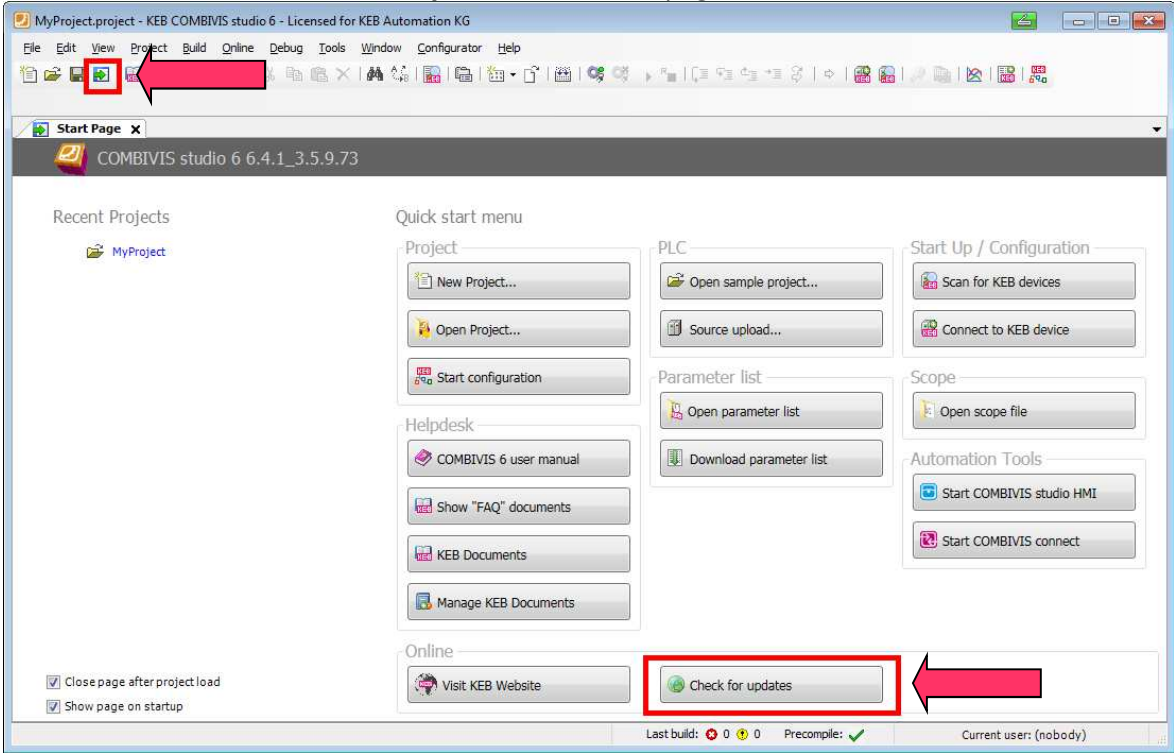


The FAQ can be filter via name or article number

FAQ COMBIVIS studio 6



These documents will be updated automatically in a specified interval, or you can start the update function with the button **Check for updates** on the start page.

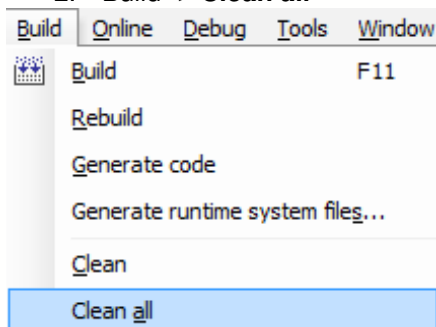


Unexpected behaviour

In some cases, certain online edits (work with pointers, constant definition changes, copy/ paste of objects, etc.) can result in unexpected behavior. In these cases we recommend the following step:

Clean all

1. Logout
2. Build -> **Clean all**



3. Rebuild
4. Login / download

Restart

Please restart the device. Disconnect the power supply and wait a short moment (Check that the under power supply (UPS) is empty. Read therefor the manual of the device)

Hint: The current variables, states, positions, etc. will be set to default during a restart. Execute a restart only in the case that you can't damage the machine.

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Notes

Disclaimer

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The information contained in the technical documentation, as well as any user-specific advice in verbal or in written form are made to the best of our knowledge and information about the application. However, they are considered for information only without responsibility. This also applies to any violation of industrial property rights of a third-party.

Inspection of our units in view of their suitability for the intended use must be done generally by the user. Inspections are particular necessary, if changes are executed, which serve for the further development or adaption of our products to the applications (hardware, software or download lists). Inspections must be repeated completely, even if only parts of hardware, software or download lists are modified.

Application and use of our units in the target products is outside of our control and therefore lies exclusively in the area of responsibility of the user.

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