



Welcome

JUMO mTRON T

First steps with soft PLC CODESYS V3



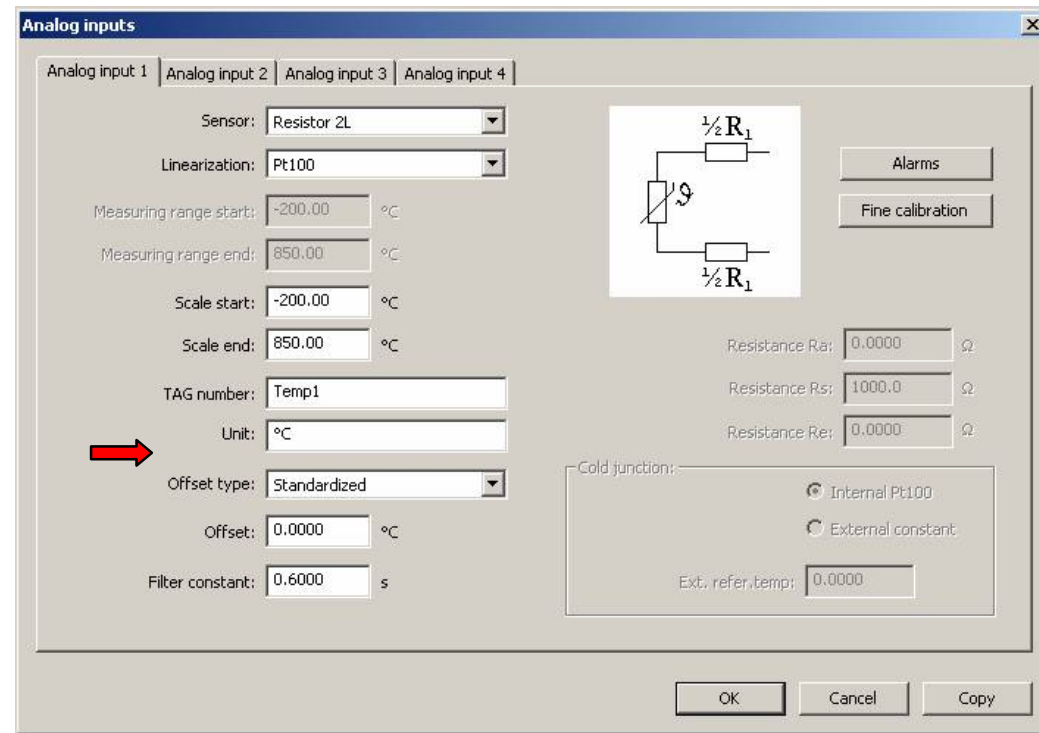
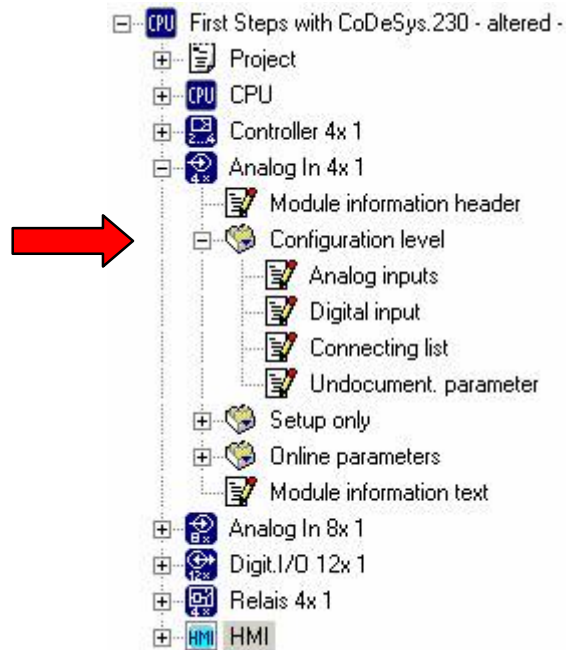
More than **sensors + automation**

Average calculation

Measuring of temperature values 1 to 4 by an analog input module and indicating together with the average value on the multifunction panel

Configuration of 4-channel analog input module

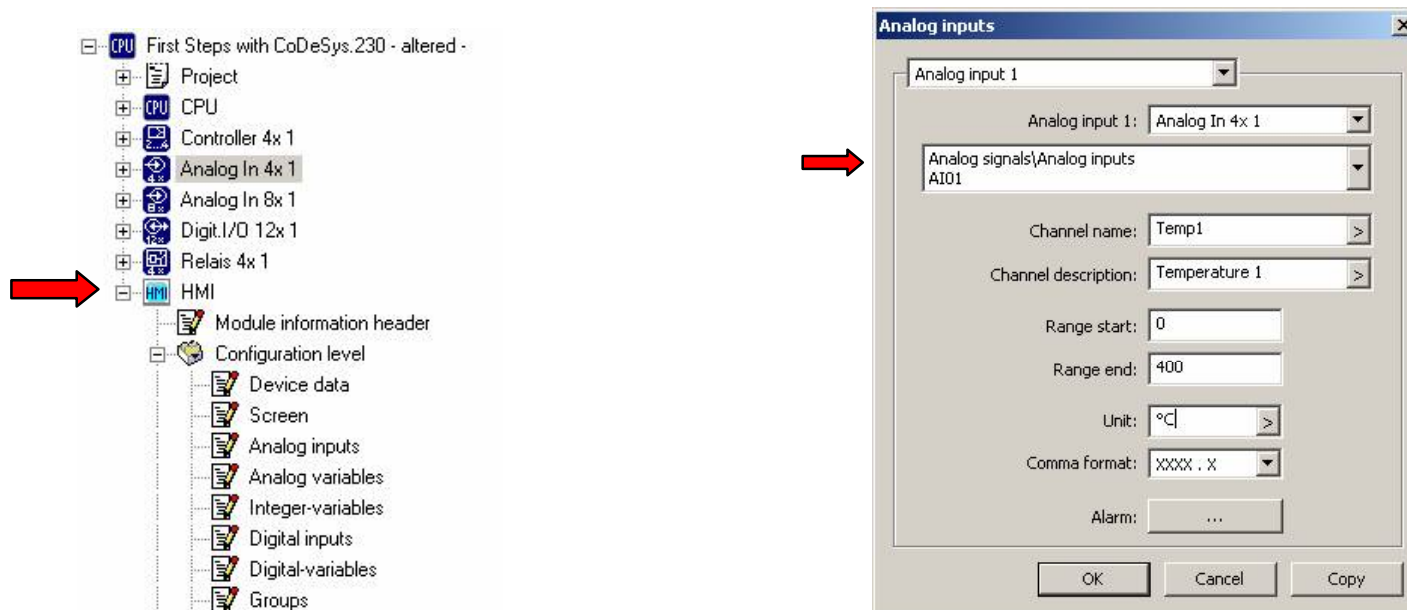
Give Tag-number for analog input 1-4 – will be displayed as a comment in the soft-SPS CODESYS



Configuration of multifunction panel (HMI)

Allocation of the analog inputs by a selector in the setup program

- The HMI has got „54 analog inputs“: software inputs , to this input Process variables can be assigned (e.g. analog input to 4):



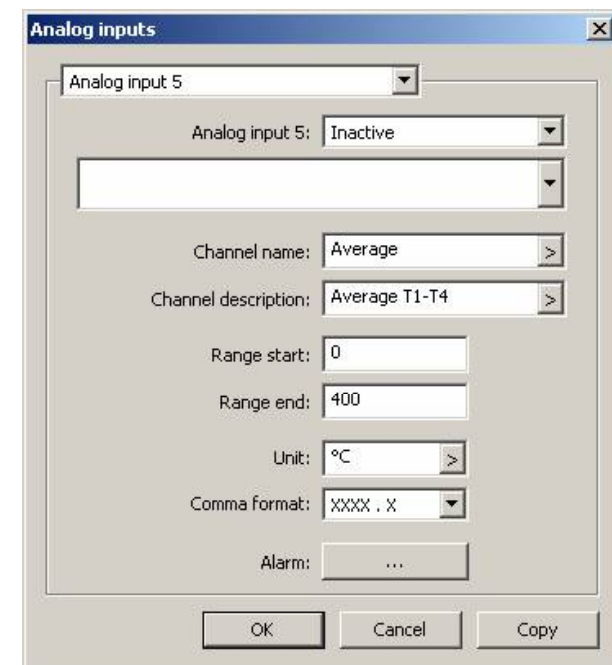
Configuration of multifunction panel (HMI)

Assignment of the analog inputs by soft PLC CODESYS

- The HMI has got „54 analog inputs“: software inputs , to this input Process variables can be assigned (e.g. average value):

The software inputs of the HMI can directly be written by the soft PLC

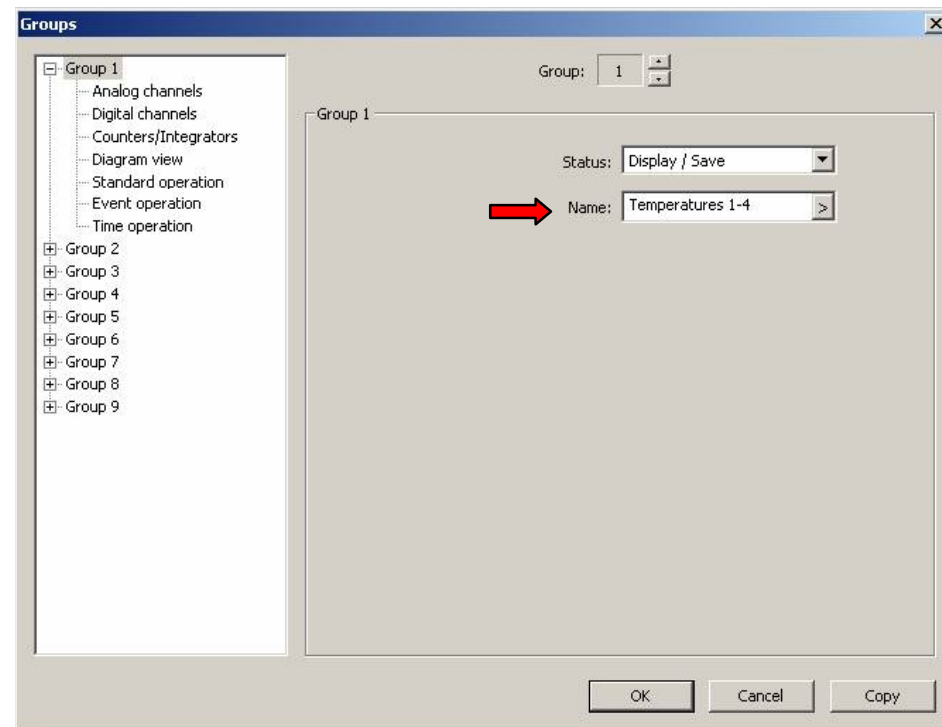
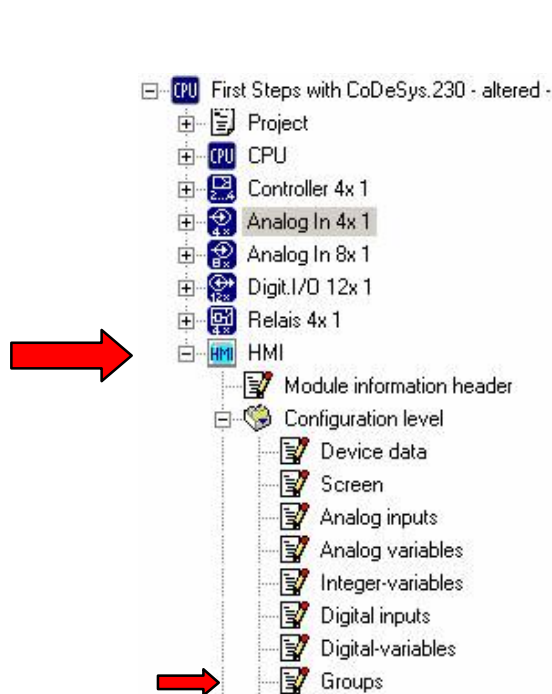
The allocation by the selector of the setup program is not necessary

Configuration multifunction panel (HMI)

Configuration of groups

- The HMI has got 9 groups , the groups can be named



Configuration multifunction panel (HMI)

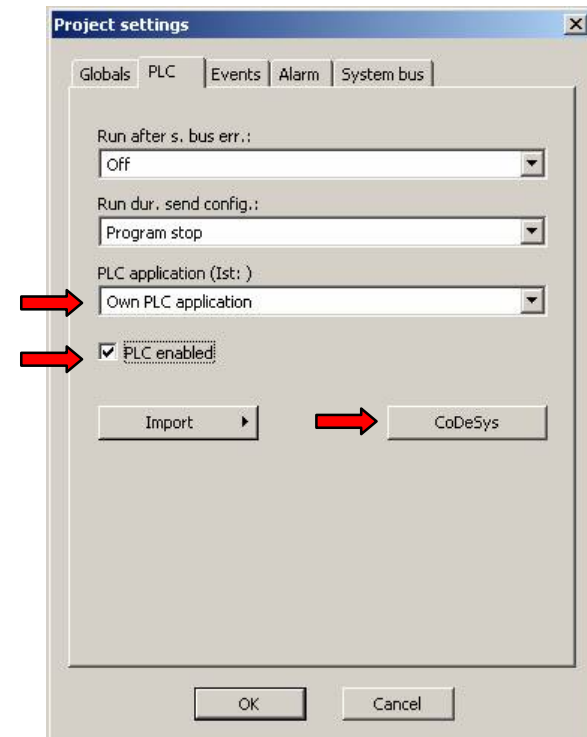
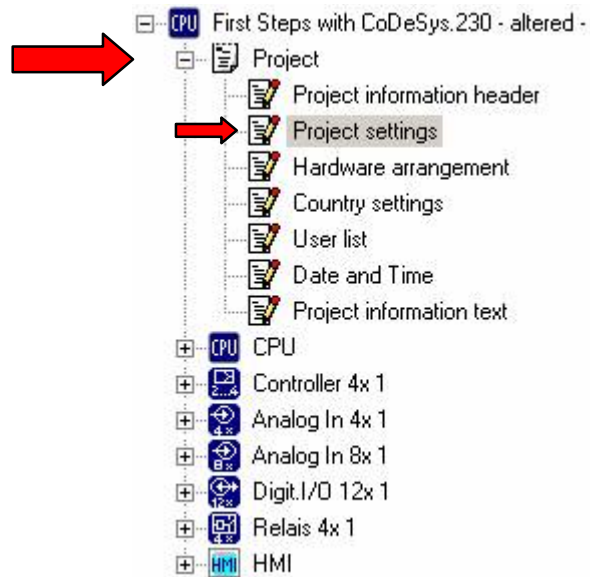
Configuration of groups

- The analog inputs of the HMI will be assigned to its groups

The image shows the configuration of HMI groups in CODESYS. On the left, the project tree is visible, with 'HMI' expanded to show 'Konfigurationsebene'. Under 'Konfigurationsebene', 'Analogeingänge' and 'Gruppen' are highlighted with red arrows. On the right, the 'Groups' dialog box is open, showing the configuration for 'Group 1'. The dialog has a 'Group' dropdown set to '1'. Under 'Group 1 \ Analog channels', there are tabs for 'Channel 1' through 'Channel 6'. The 'Input signal' dropdown is set to 'Analog signals\Analog inputs' and 'Analog input 1'. The 'Line width' is set to 'Thin'. There is a checkbox for 'Tol; band active'. Below, there are input fields for 'Positive tolerance: 10.000', 'Negative tolerance: -10.000', 'Positive hysteresis: 2.0000', and 'Negative hysteresis: 2.0000'. At the bottom, there are dropdowns for 'Ref. alarm text (+): Tolerance exceeded: 1' and 'Ref. alarm text (-): Tolerance underrun: 1'. Buttons for 'OK', 'Cancel', and 'Copy' are at the bottom right.

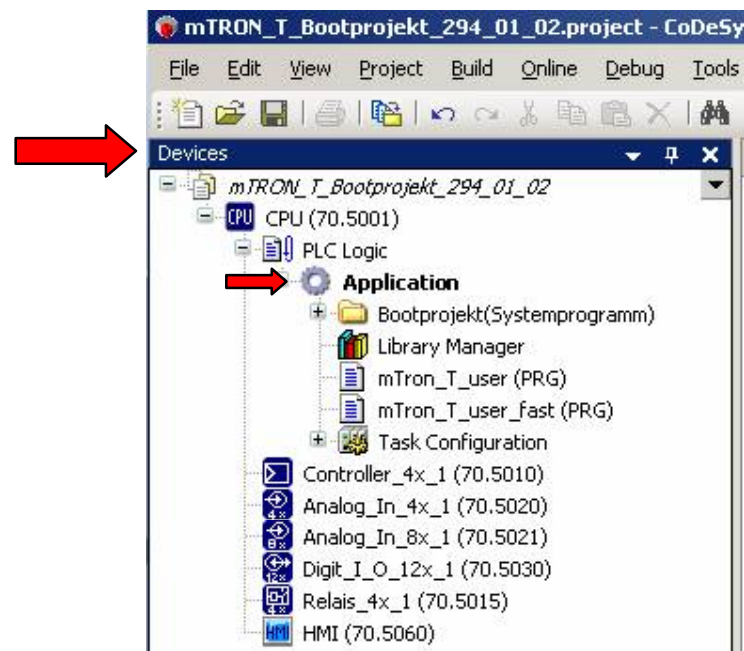
Project settings for own PLC application

- Switching of PLC application from „Standard“ to „Own PLC application“, then activation of the „PLC enabled“ function and then starting CODESYS by the button



Own PLC application

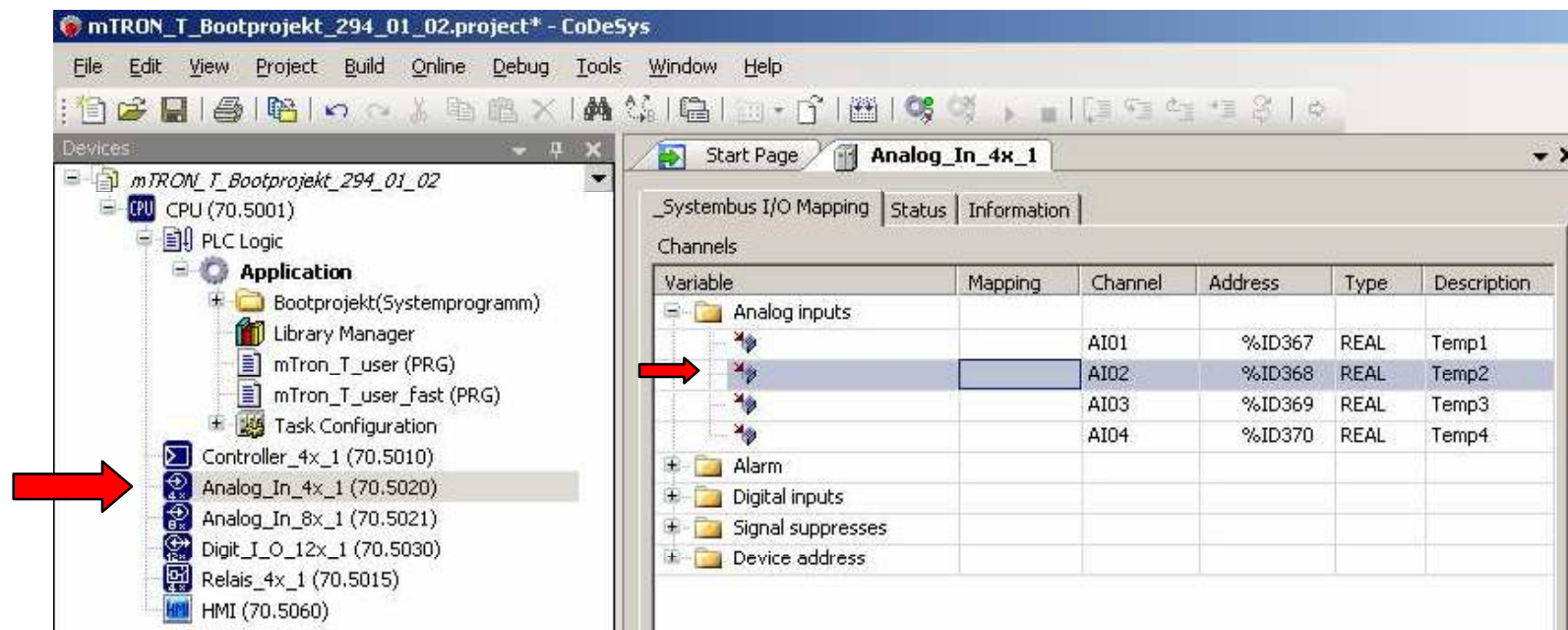
- By starting CODESYS from the setup program the project settings will be given to CODESYS. JUMO mTRON T with application and hardware configuration is shown in the devices window.



Own PLC application

I/O Mapping of the modules

- Display of the I/O mapping by a double click on the concerning module icon



Own PLC application

Generation of the global variable „Temp1 to Temp4“ of the type REAL

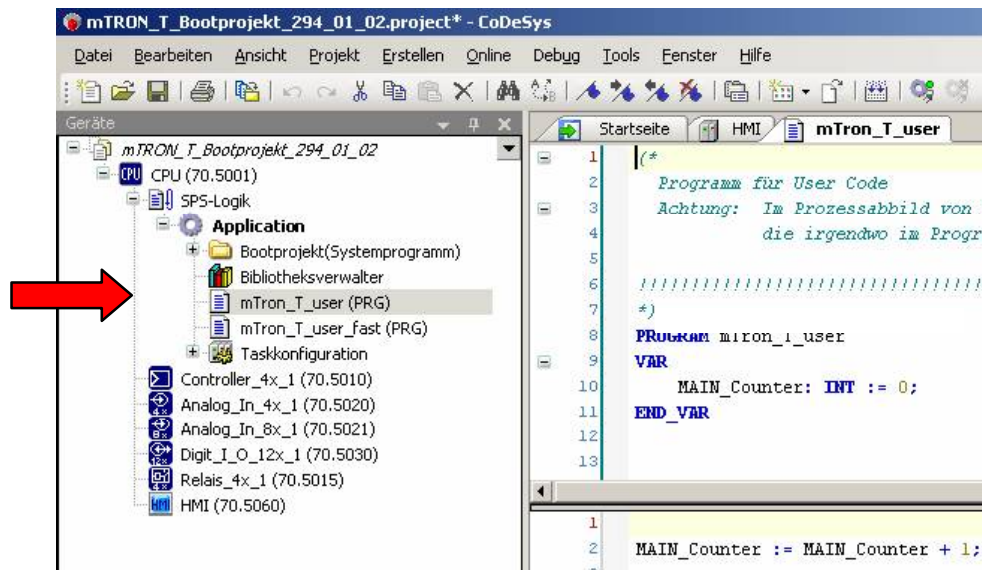
- By a double click in the I/O mapping a global variable can be generated and assigned to the hardware

Variable	Mapping	Channel	Address	Type	Description
Temp1		AI01	%ID367	REAL	Temp1
Temp2		AI02	%ID368	REAL	Temp2
Temp3	...	AI03	%ID369	REAL	Temp3
Temp4		AI04	%ID370	REAL	Temp4

Own PLC application

Generation of the program code

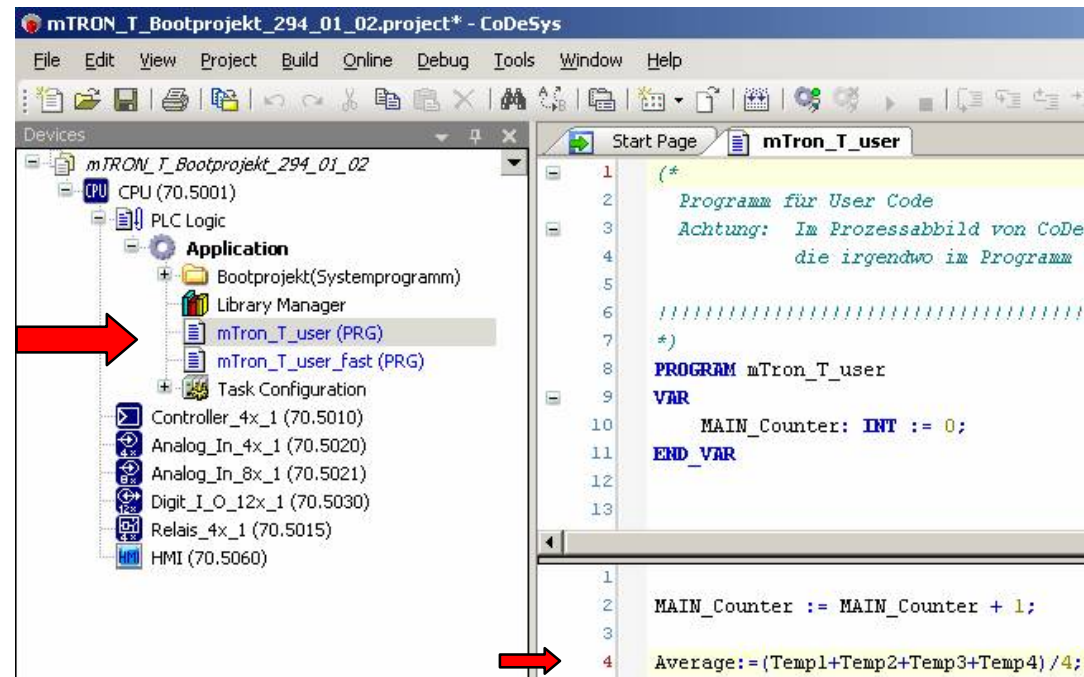
- For the first steps with soft PLC the program mTron_T_user has been provided with the programming language structured text ST



Own PLC application

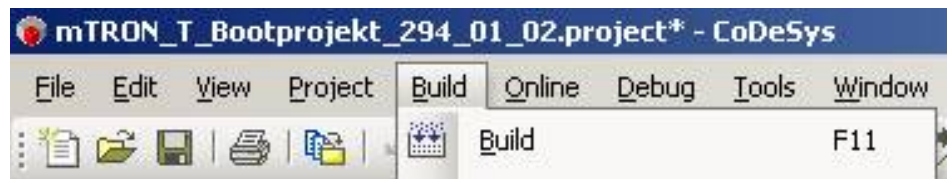
Generation of the program code

- Afterwards customized calculations can be programmed under mTron_T_user



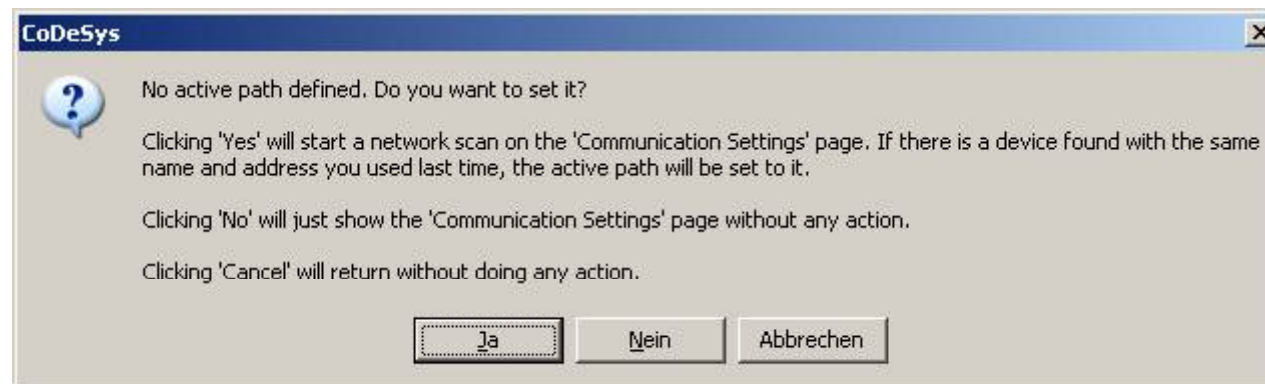
Own PLC application

Compiling of program code (F11)



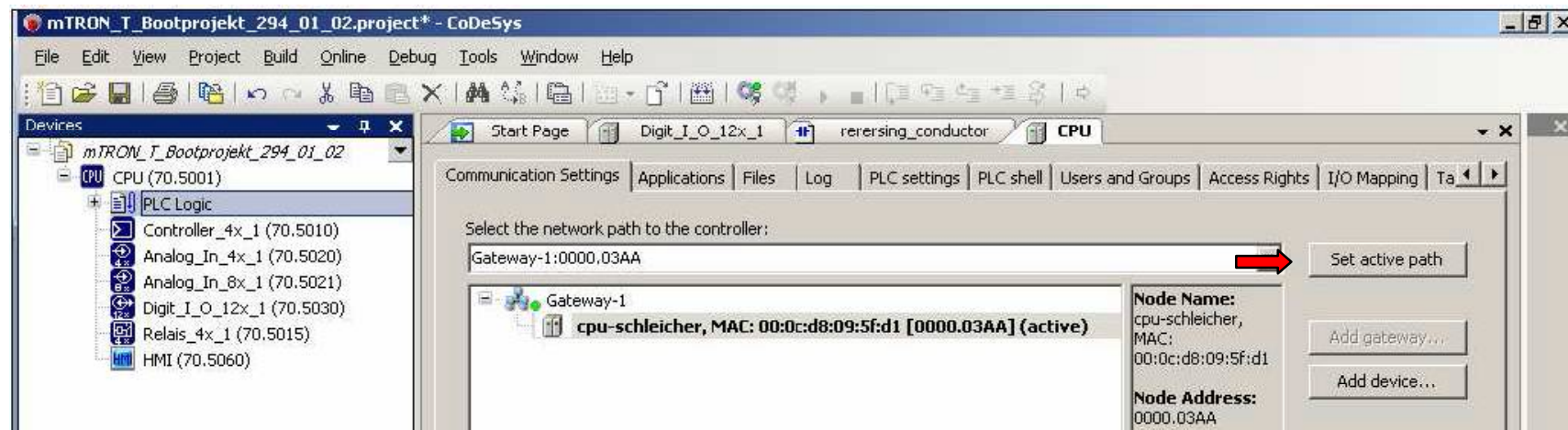
Own PLC application

Online, login on control, starting a network scan



Own PLC application

Online, login on control, setting of active path



Own PLC application

Online, login on control, then debug Start (F5)

Expression	Type	Value	Prepared value
MAIN_Counter	INT	566	

Note: Program is only in the RAM of the control and can be tested

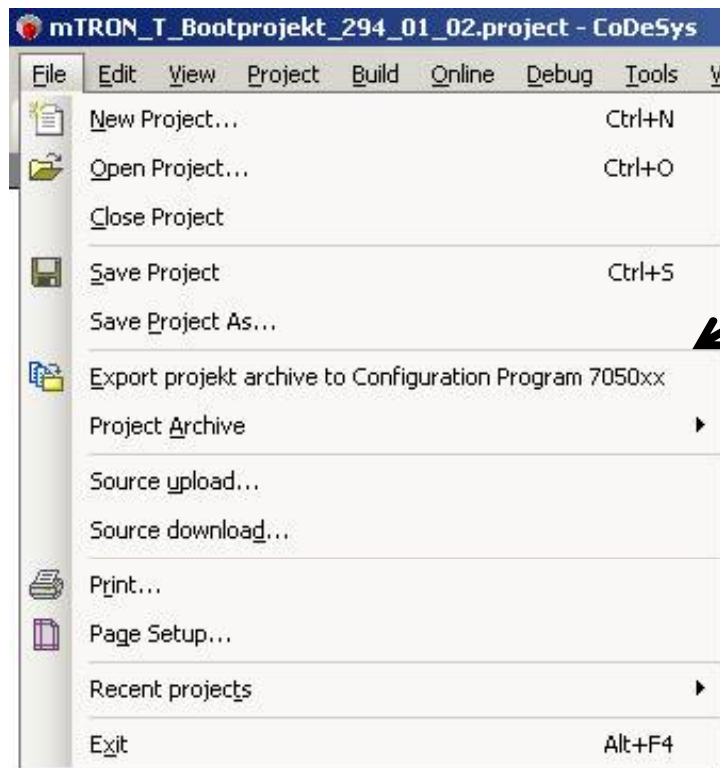
```

1
2 MAIN_Counter := MAIN_Counter + 1;
3
4 Average := (Temp1 + Temp2 + Temp3 + Temp4) / 4;

```

Own PLC application

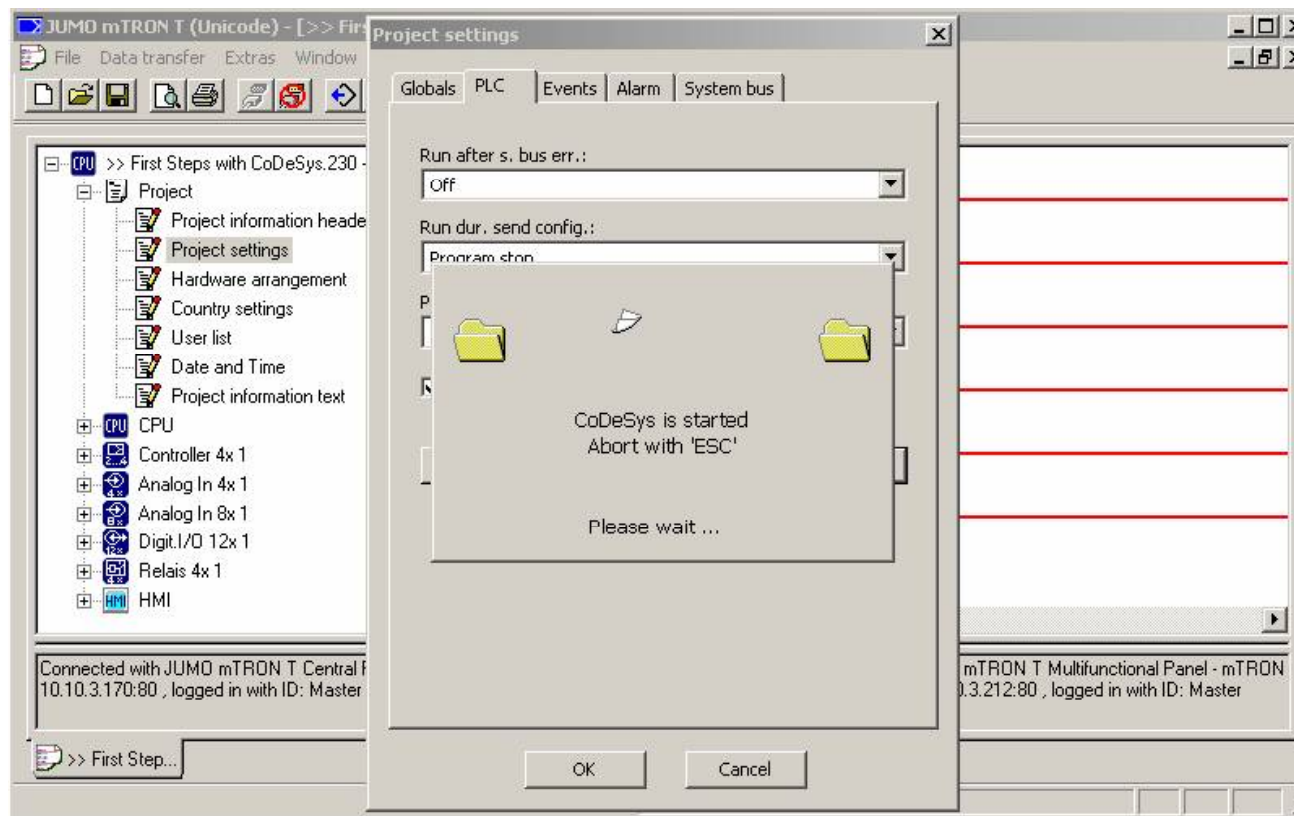
Online, logout; file, Export project archive to JUMO setup



The extension of the project will be given to the setup-program, then finishing CODESYS

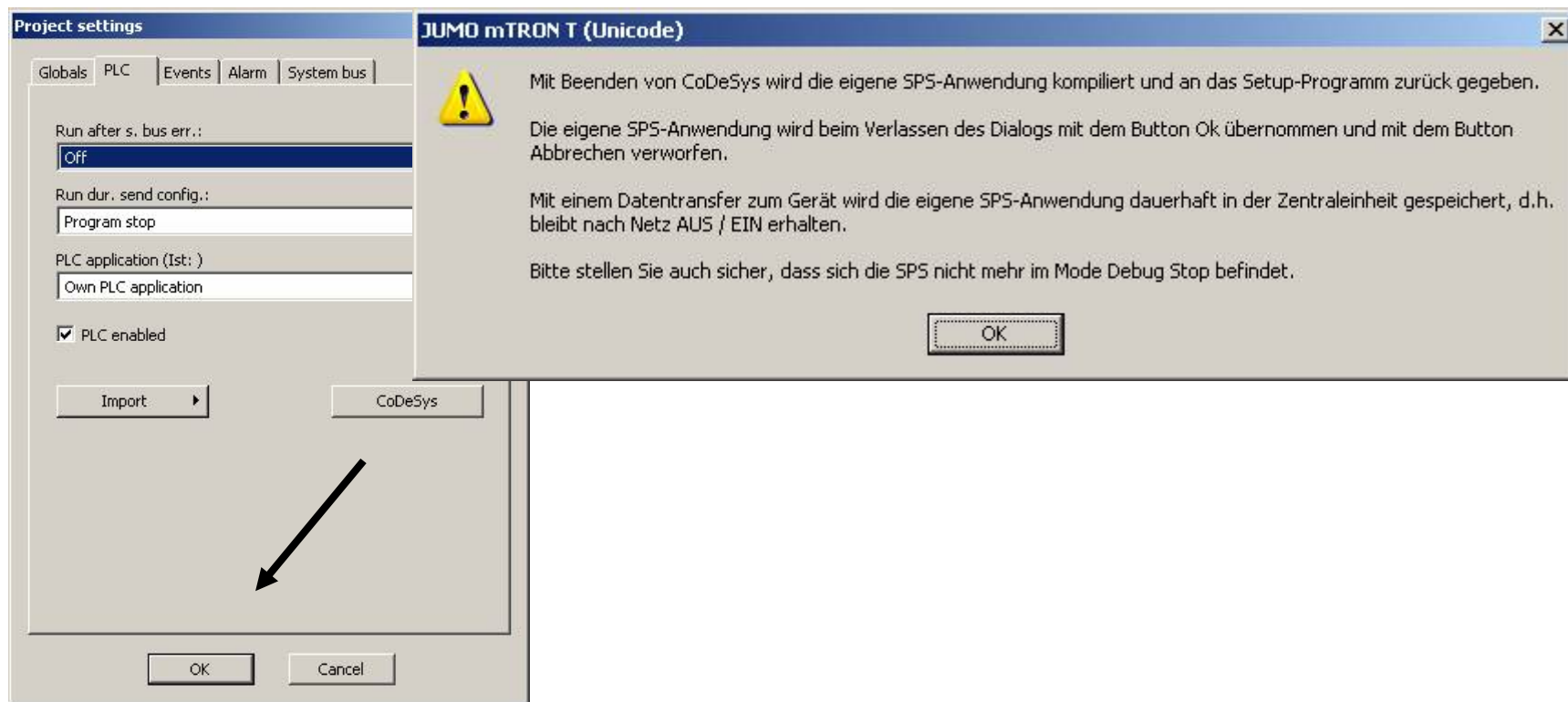
Own PLC application

Setup modifications are not possible during CodeSys is active



Own PLC application

Assigning of project extensions into the setup by pressing OK and saving it permanently in the device with data transfer to the device



Own PLC application

Checking of averaging calculation on the HMI

