

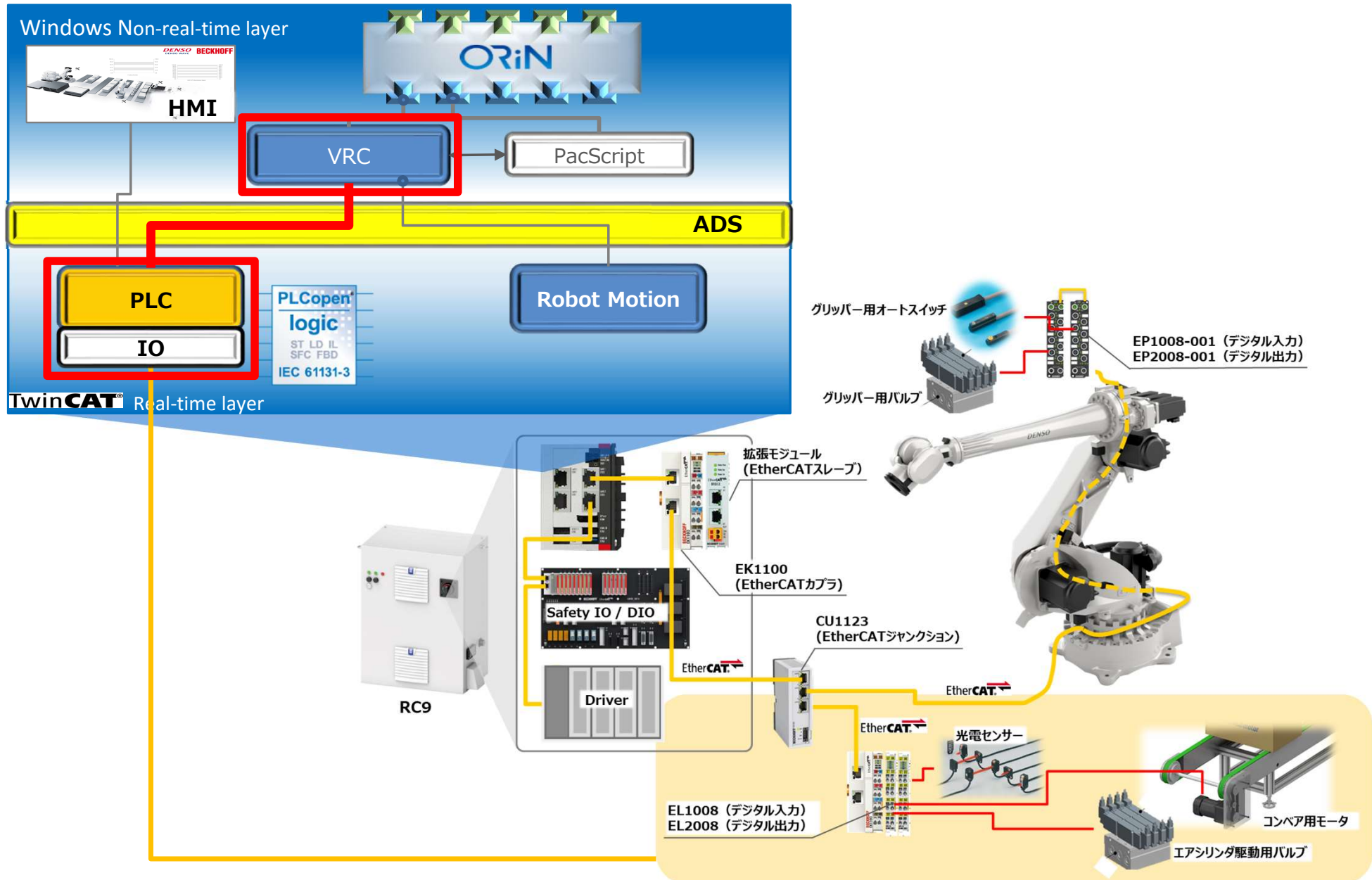
TwinCAT PLC and VRC connection setting

DENSO

www.densorobotics.com

RC9 software configuration

Enable the I/O communication between TwinCAT PLC and VRC.



TwinCAT3 installation

Install TwinCAT3 from the page below.

<https://www.denso-wave.com/en/robot/download/application/twincat3.html>



Industrial Robots
Robotics

Home | About us | GLOBAL

SELECT LANGUAGE  Login Membership Reg.

Products | Applications | Technical Info | **Downloads** | Support | Events | Contact us

Downloads | Catalogs | Manuals | CAD | Application software | Part List

Robotics TOP > Downloads > Application software > TwinCAT3

TwinCAT3

TwinCAT 3 is a software required to perform the following operations.

1. Settings of the device connected to RC9.
(Master, IO-Link and Beckhoff expansion device settings)
2. Software PLC settings and programming
3. HMI (Visualization) design
4. Processing of USB license dongle file
5. Addition of PLC task & priority change

Please download this software on the Beckhoff Automation website according to the procedure manual.
Beckhoff Automation | [TwinCAT 3 Download](#)

■ Procedure manual

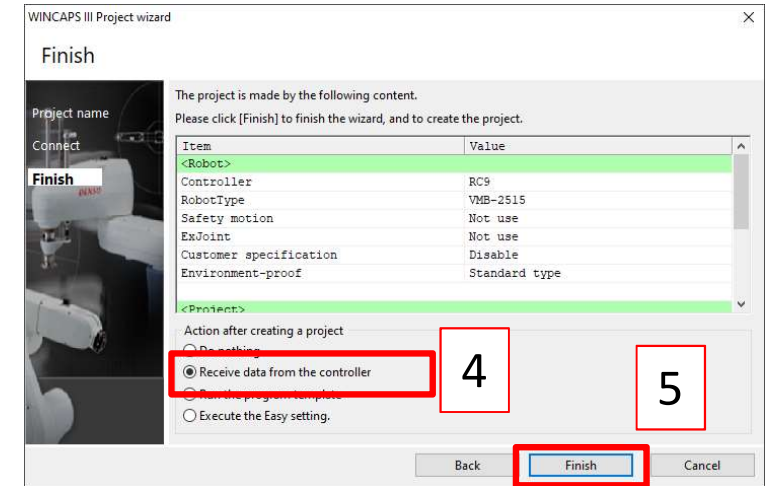
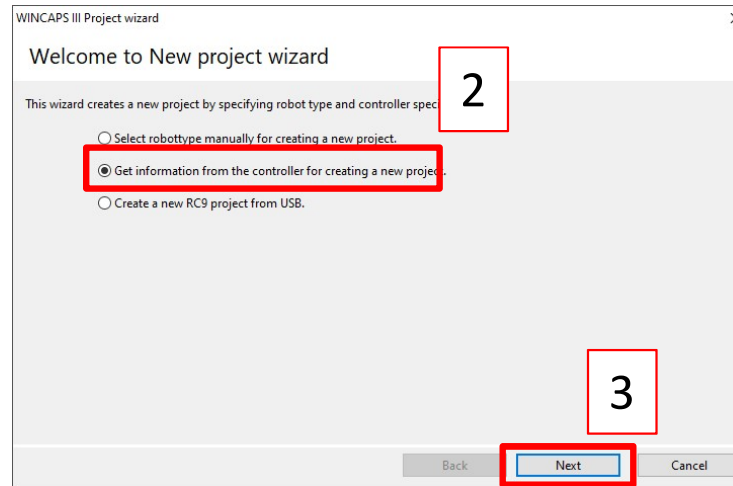
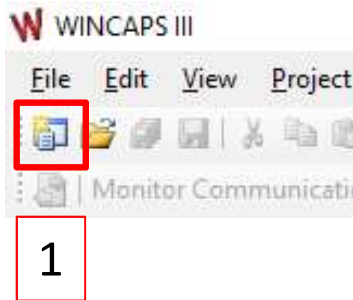
 English
 中文
 한국

Update

Version	Update contents	Updated date
-	Released the download link for TwinCAT 3.	Oct. 20th, 2020

Get TwinCATData

Get TwinCATData using WINCAPSIII.

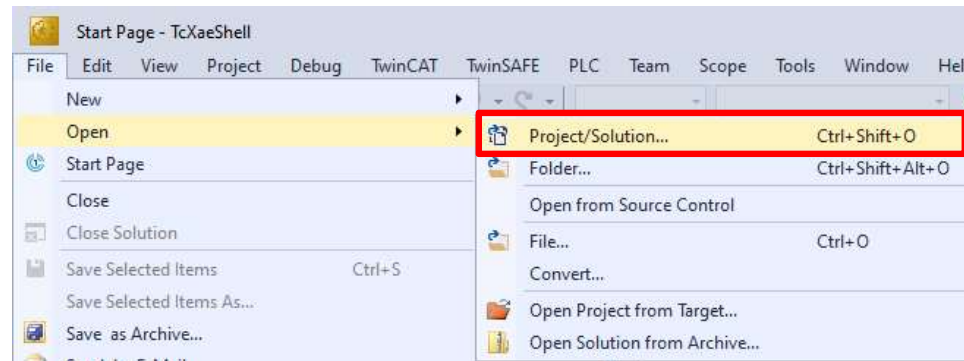


Read TwinCATData

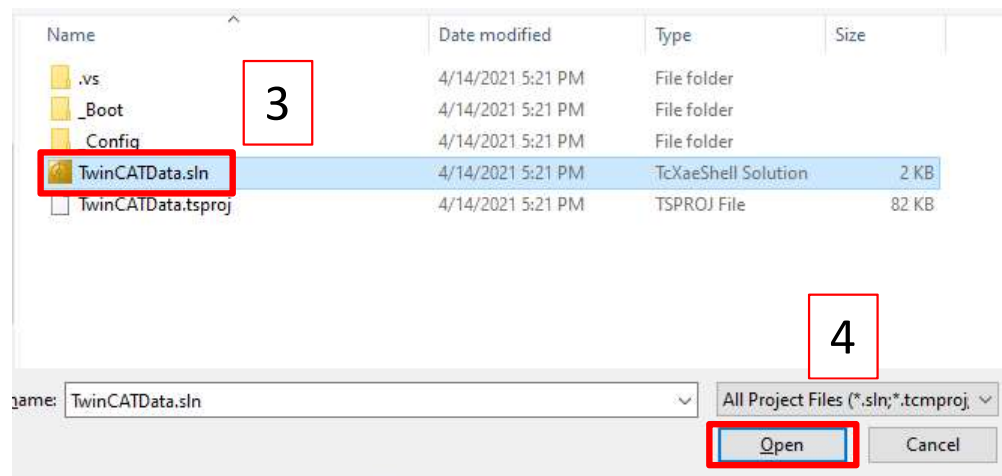
Read the acquired TwinCATData with XAE.



1



2

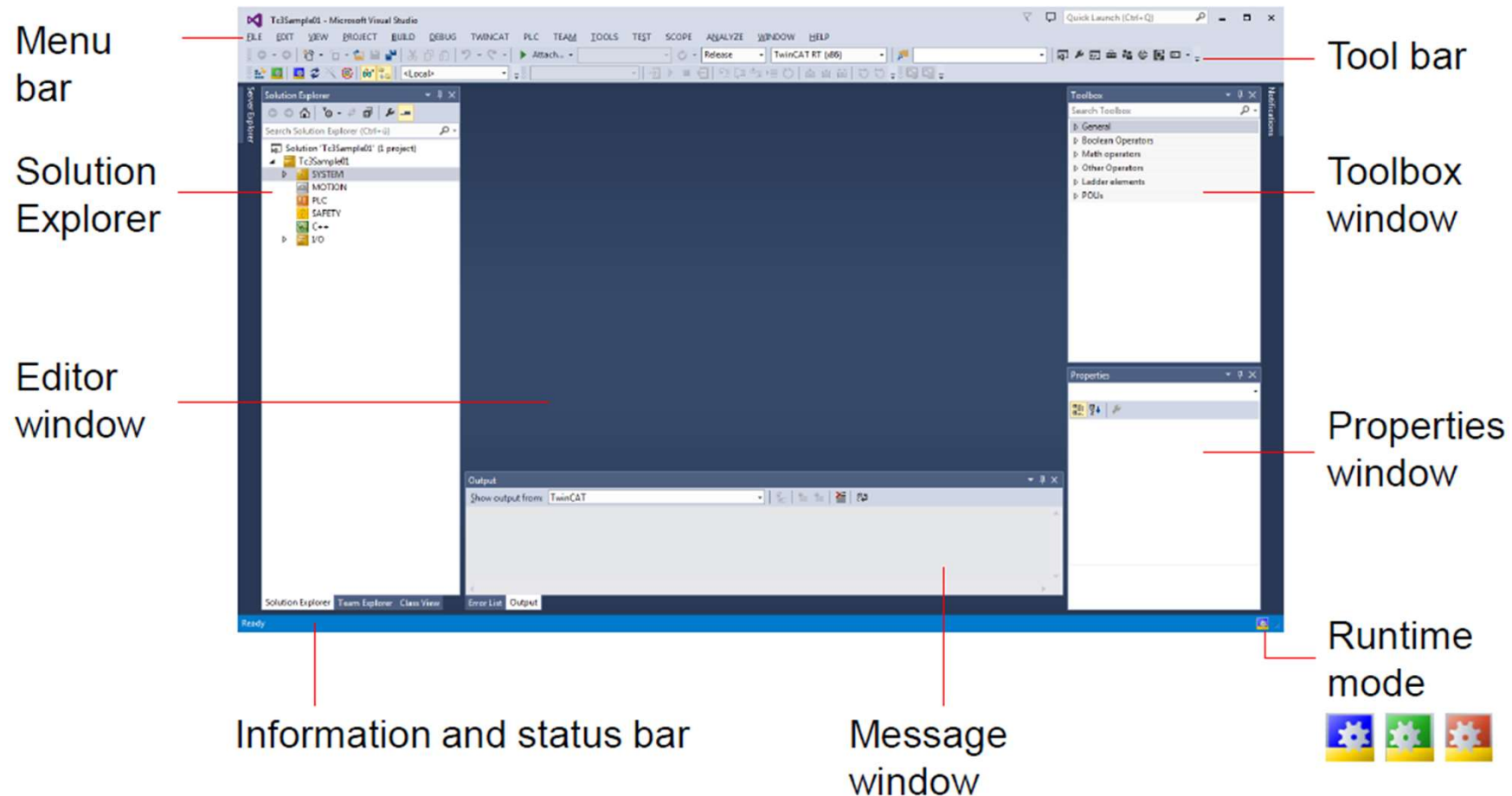


3

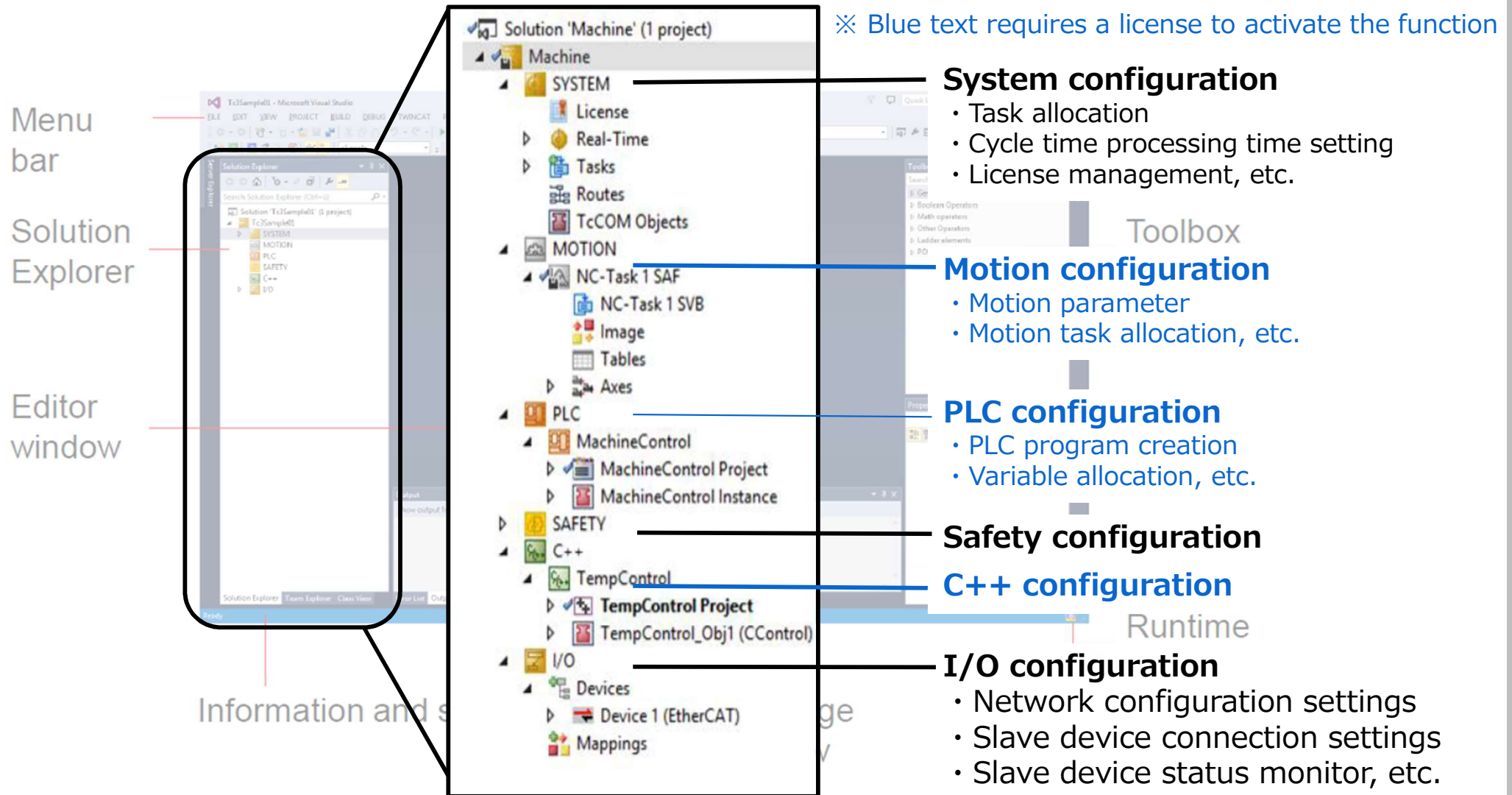
4

Select [Project name]¥[Project name]¥TwincatData¥TwinCATData.sln.

XAE screen layout

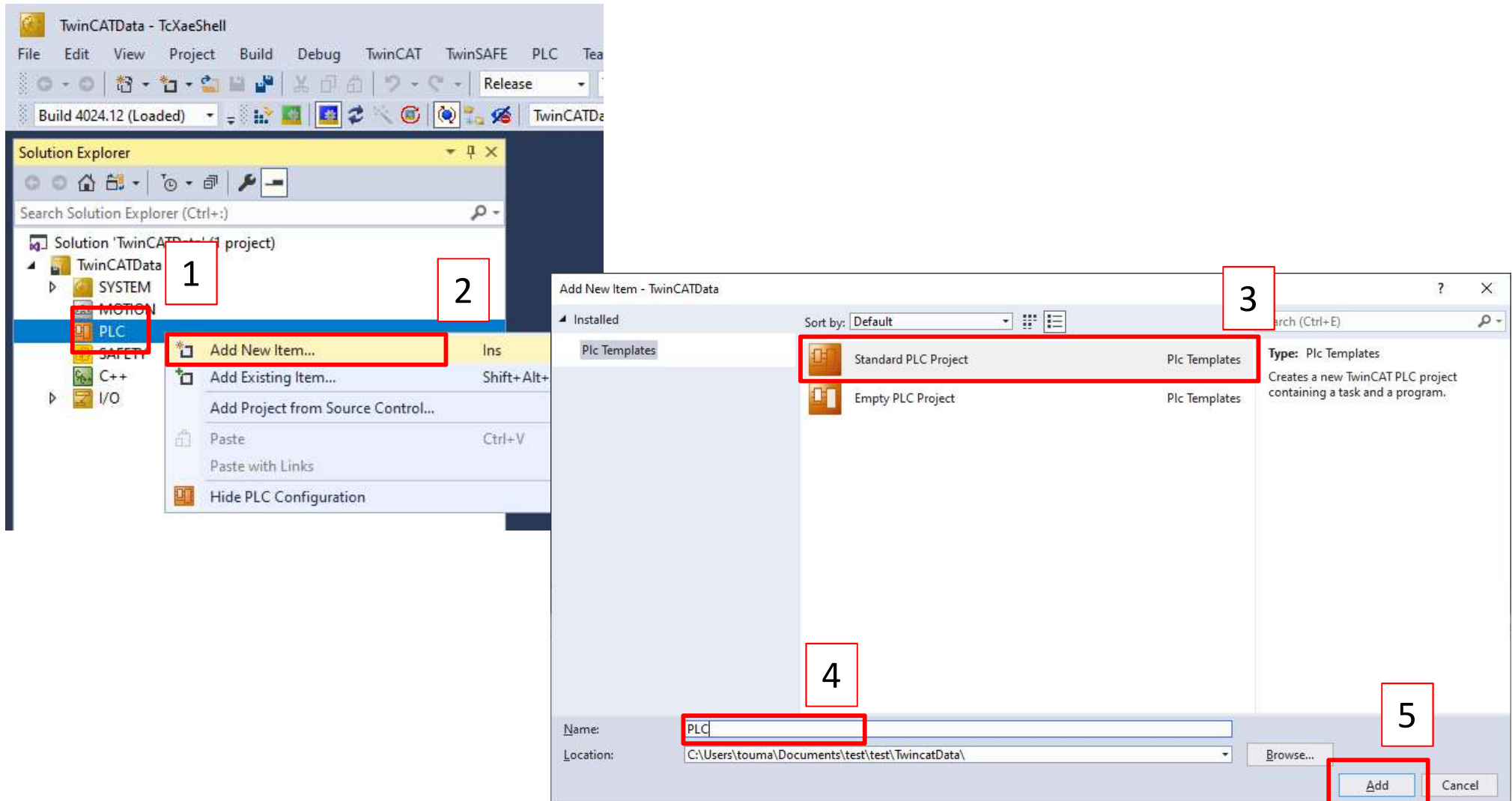


XAE Solution Explorer



Setup steps TwinCAT setting

Open the loaded project, 1) right-click on the [PLC] and 2) select [Add New Item].
Select the 3) [Standard PLC Project], enter the 4) [Name] and click the 5) [Add] button.



Setup steps TwinCAT setting

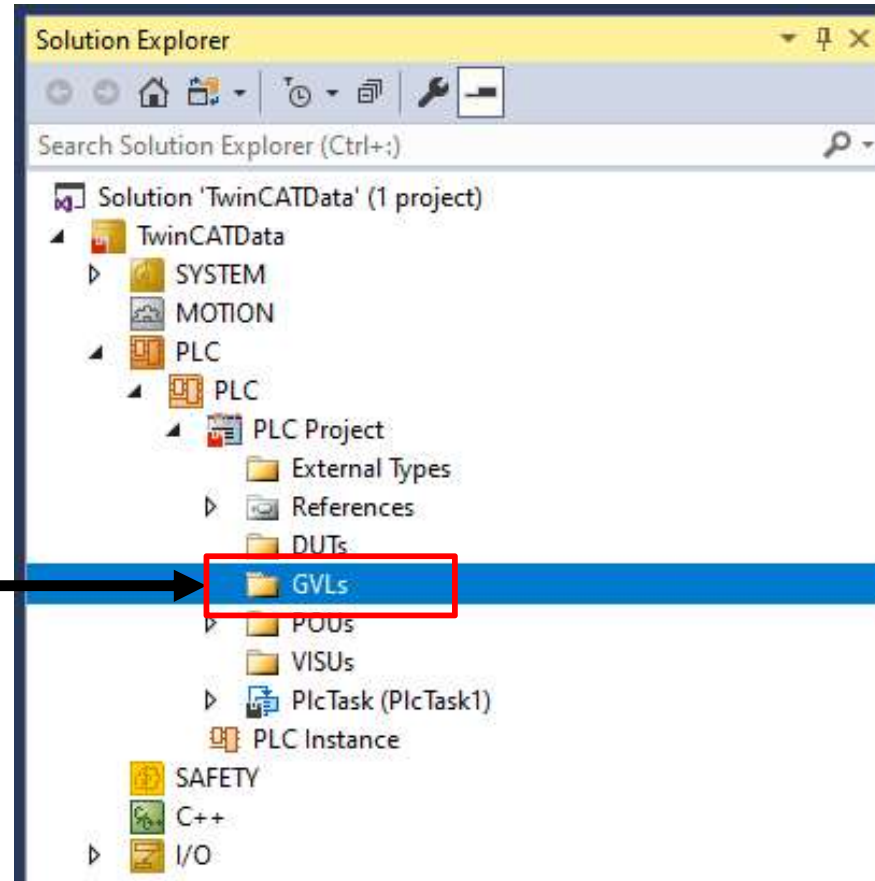
Import the communication variables (XML file) prepared by DENSO WAVE into the GVL folder of TwinCAT.

DNRobot communication variables
IN/Out **32 Byte**

DNRobot communication variables
IN/Out **504 Byte**

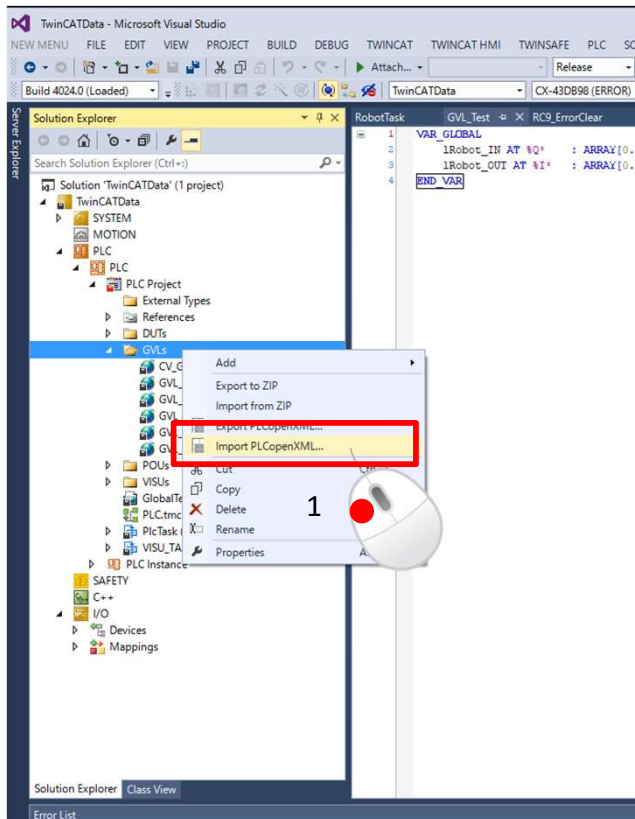
DNRobot communication variables
IN/Out **1024 Byte**

XML



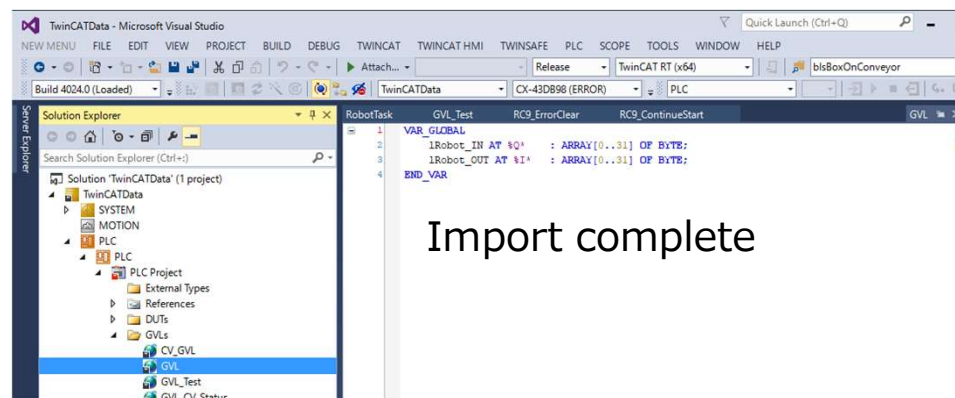
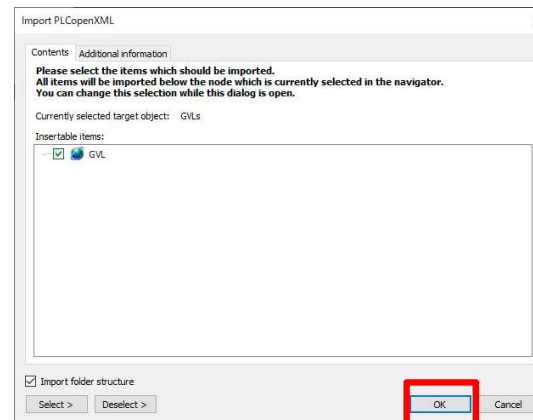
Setup steps

How to import variables



Select the variable to use.

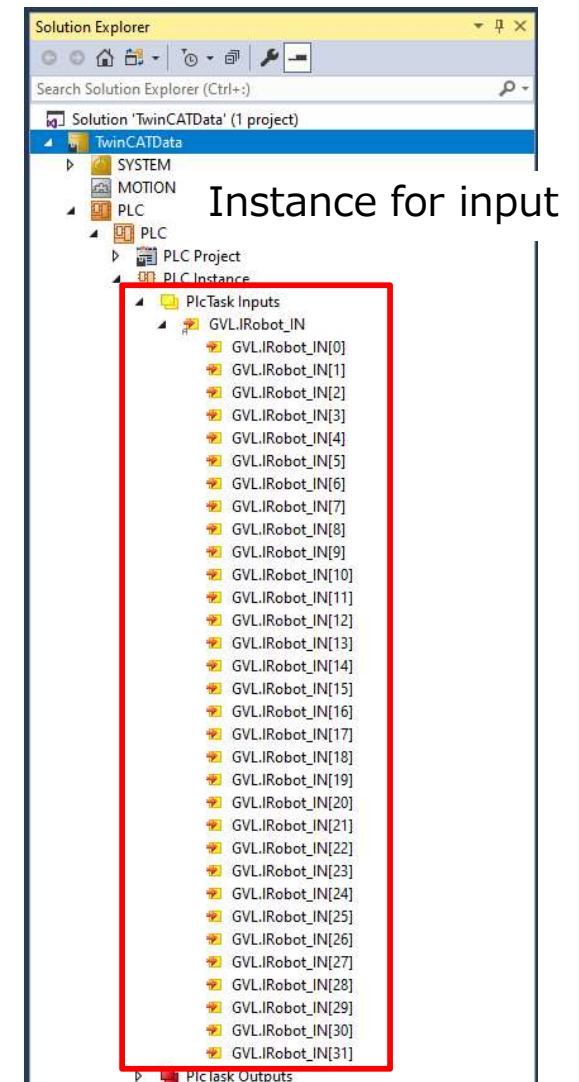
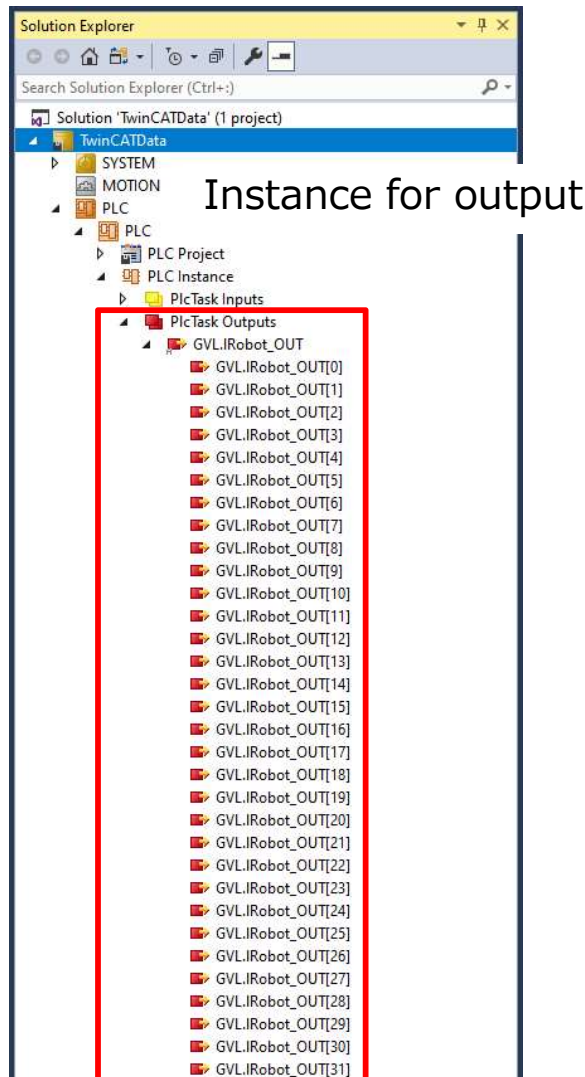
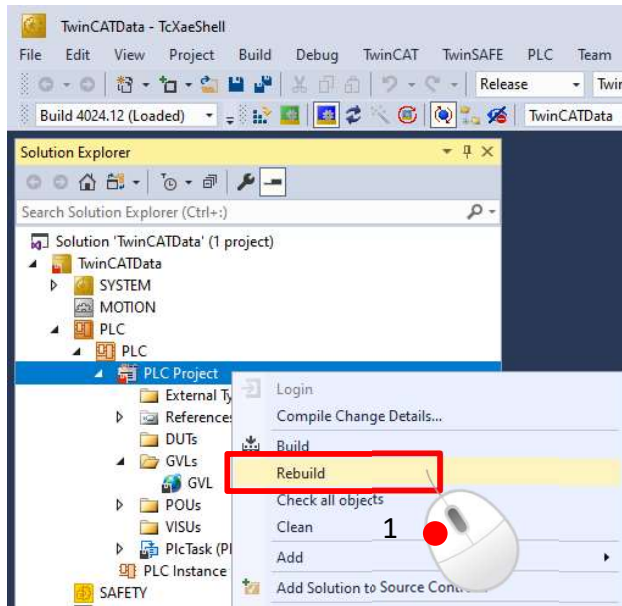
[Project name]¥[Project name]¥Data¥Controller¥IO¥SoftPLC



Import complete

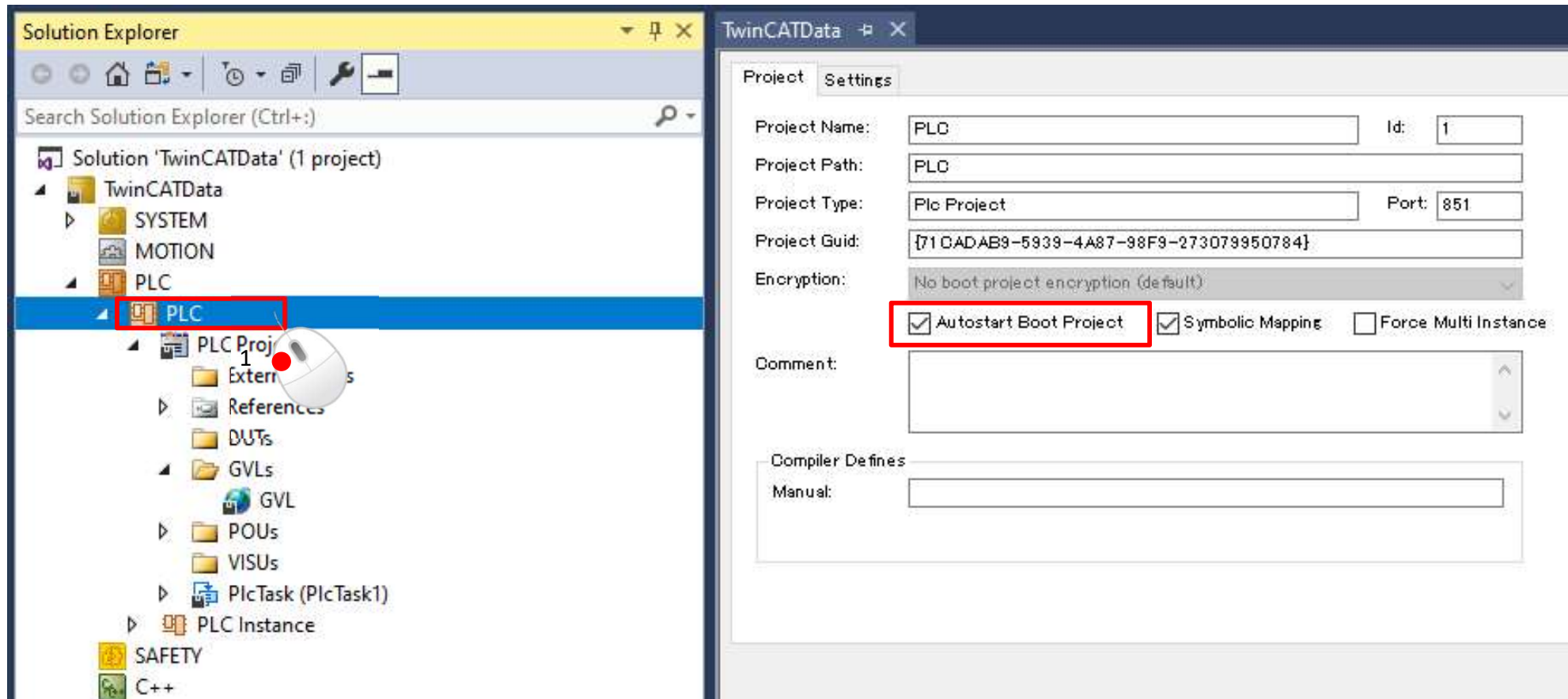
Setup steps TwinCAT setting

After the variable import, rebuild the PLC Project.
Instances for PLC communication will be generated.



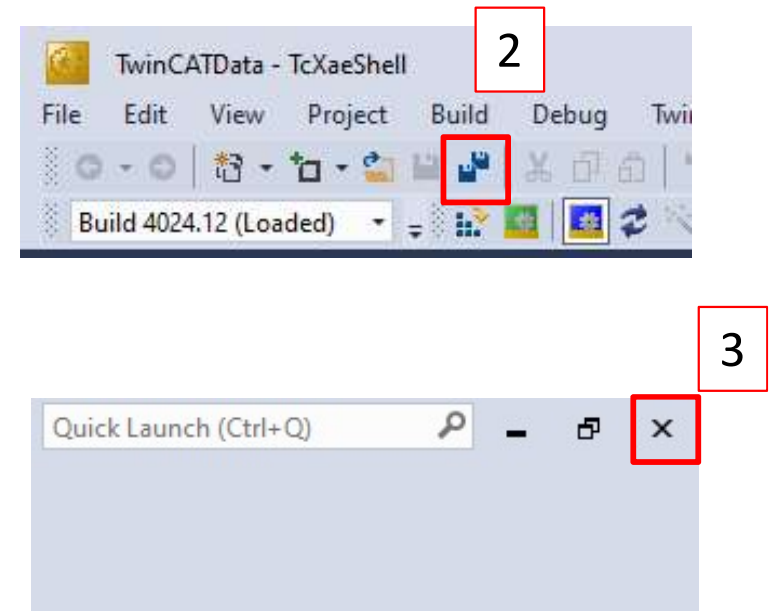
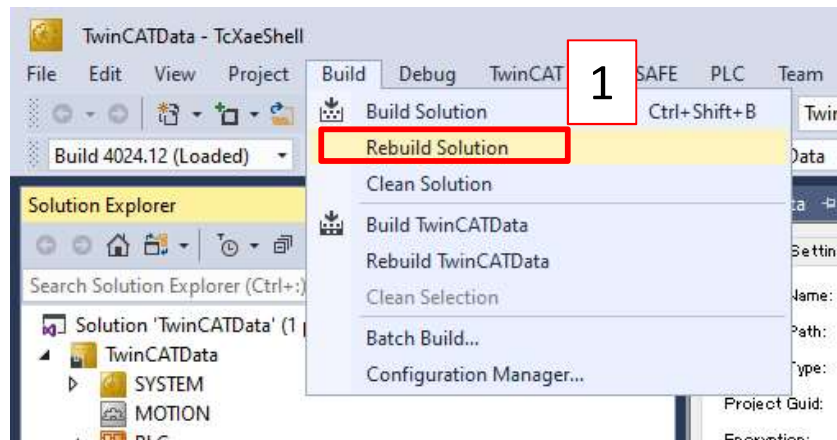
Setup steps TwinCAT setting

Check the [Autostart Boot Project].



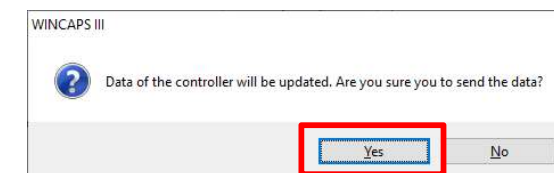
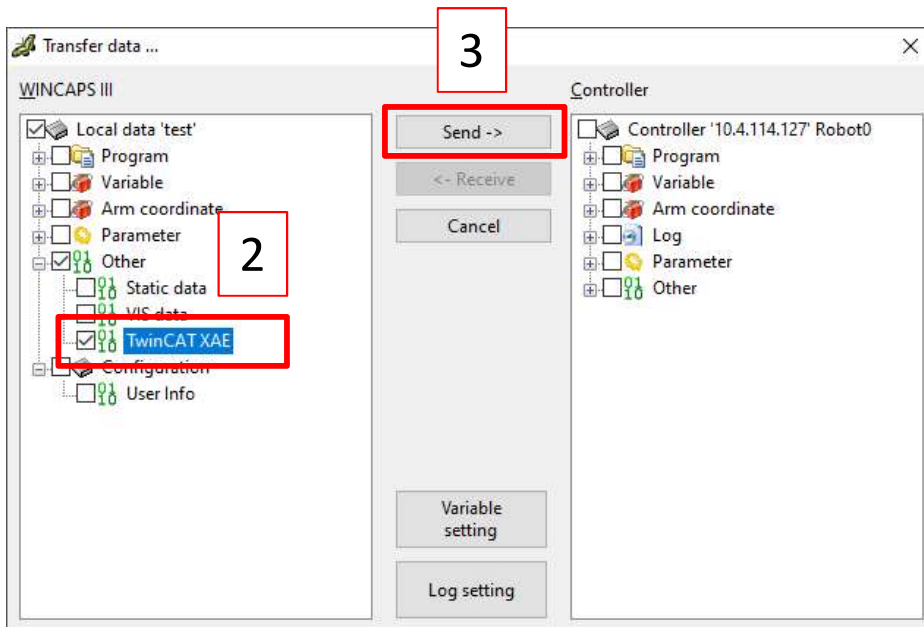
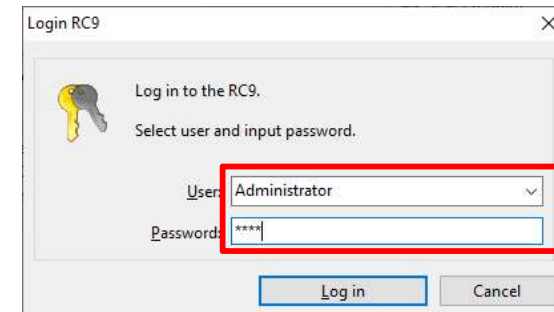
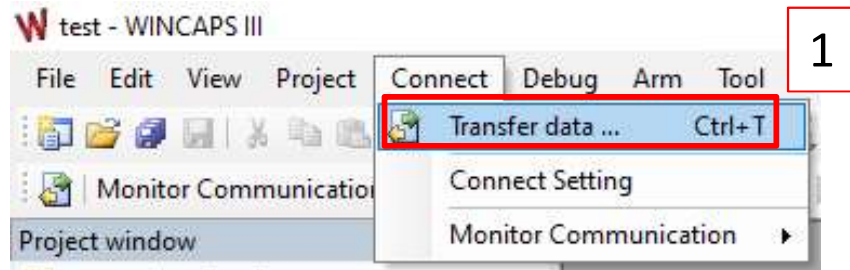
Setup steps TwinCAT setting

Rebuild the solution.



Setup steps TwinCATData transfer

Transfer TwinCATData(TwinCAT XAE) from WINCAPS.



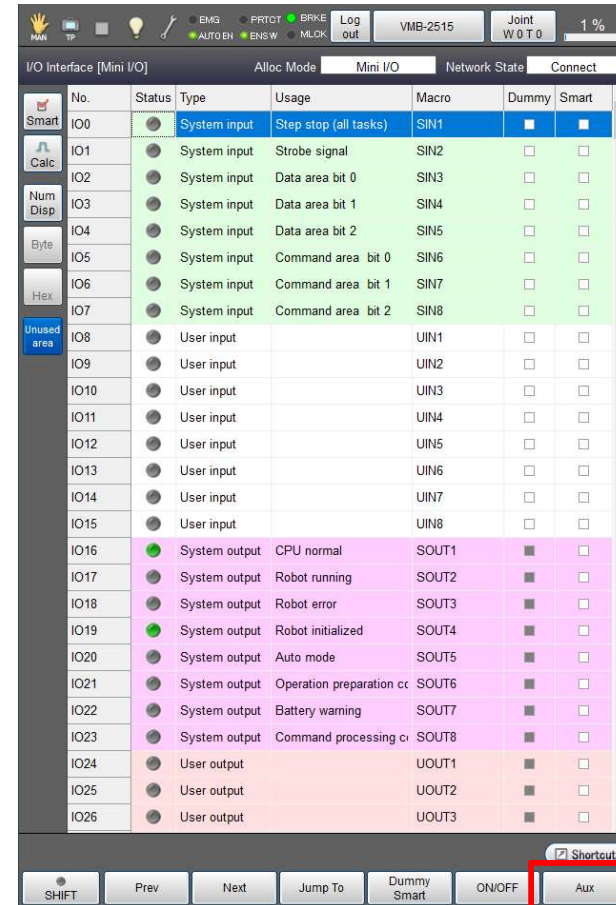
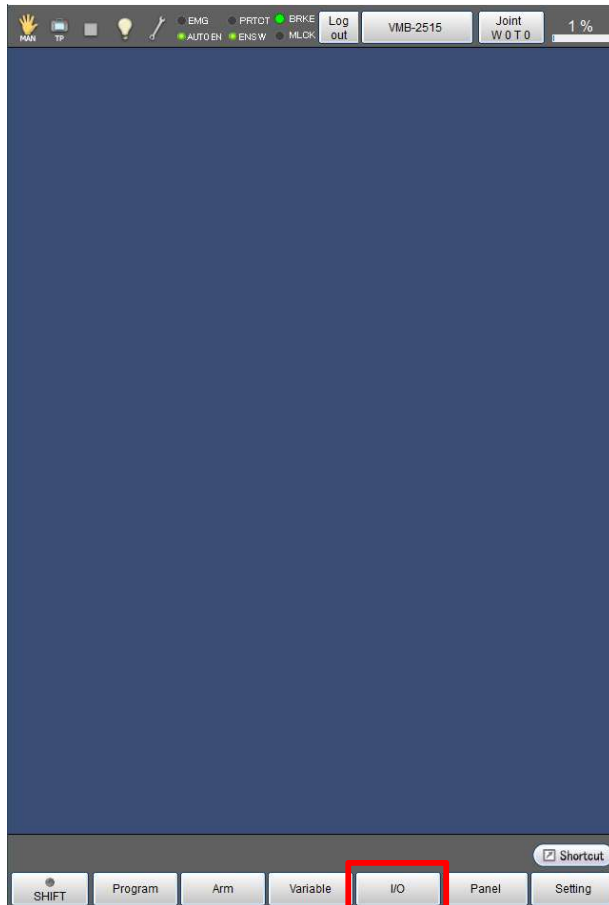
6

Restart the RC9.

Startup will take longer than usual.

Setup steps Controller setting

Select the [I/O] from Smart TP and select the [Aux] in the I/O screen.

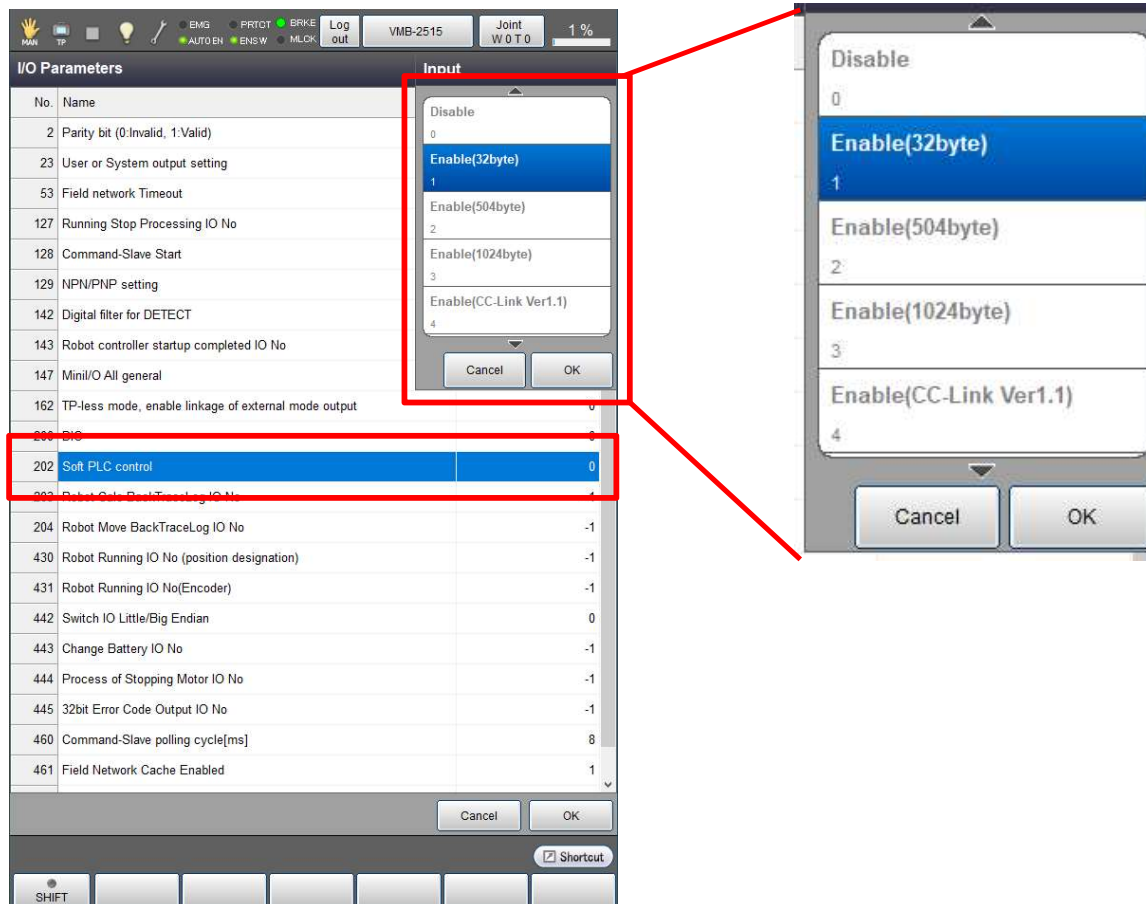


Setup steps Controller setting

From the [I/O Parameters], select the data size same as the XML data that you imported from the [Soft PLC control] parameters into TwinCAT.

Please restart after setting.

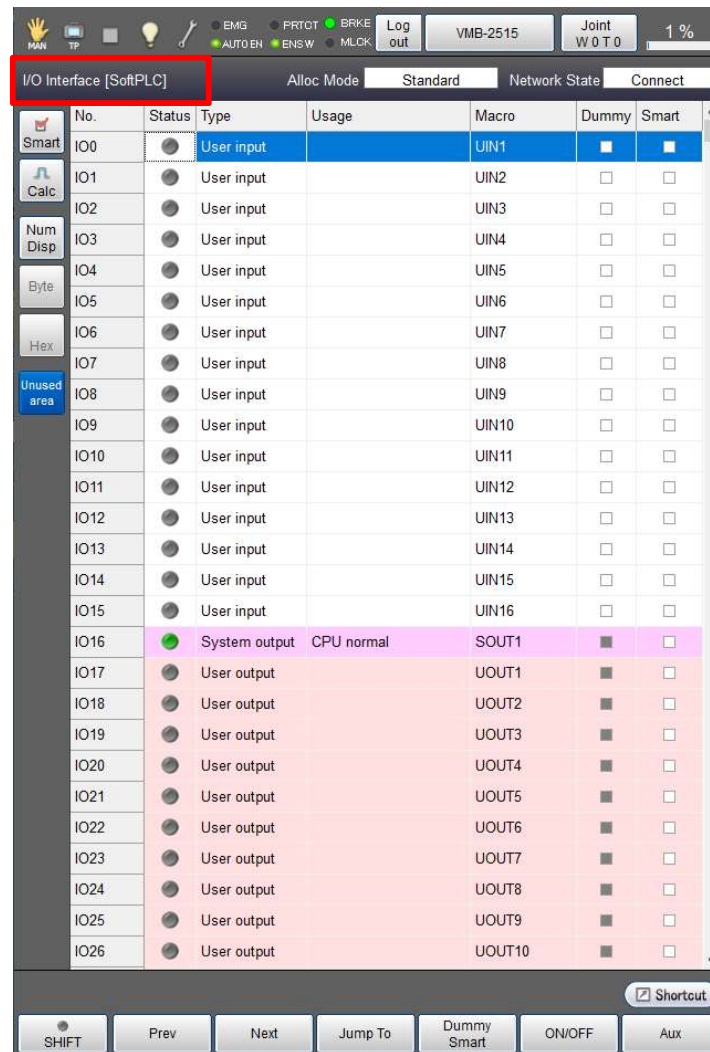
Startup will take longer than usual.



- 0 : Disable (Default)
- 1 : Enable (32Byte)
- 2 : Enable (504Byte)
- 3 : Enable (1024Byte)

Setup steps Controller setting

After reboot, make sure that the [I/O Interface] at the top left of the screen is [SoftPLC].



Operation check

The controller input is assigned to the output variable on the PLC side every 1byte from [IO512].

The image shows two screenshots from the TwinCAT software. The left screenshot displays the 'I/O Interface [SoftPLC]' window with the 'Alloc Mode' set to 'Standard'. It lists various I/O addresses and their assignments. The right screenshot shows the 'TwinCATData.PLC.GVL' variable declaration table.

I/O Interface [SoftPLC] - Alloc Mode: Standard

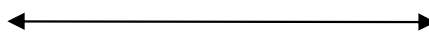
No.	Byte	Status	Type	Usage
IO512		☒	System input	Step stop (all tasks)
IO513		☒	System input	--<Reserved>
IO514		☒	System input	Instantaneous stop (;
IO515	0	☒	System input	Strobe signal
IO516		☒	System input	Interruption skip
IO517		☒	--	
IO518		☒	--	
IO519		☒	System input	Command data are:
IO520		☒	System input	Data area 1 bit 0 (8)
IO521		☒	System input	Data area 1 bit 1 (8)
IO522		☒	System input	Data area 1 bit 2 (8)
IO523	0	☒	System input	Data area 1 bit 3 (8)
IO524		☒	System input	Data area 1 bit 4 (8)
IO525		☒	System input	Data area 1 bit 5 (8)
IO526		☒	System input	Data area 1 bit 6 (8)
IO527		☒	System input	Data area 1 bit 7 (8)

TwinCATData.PLC.GVL

式	タイプ	値
IRobot_IN	ARRAY [0..31] OF B...	
IRobot_OUT	ARRAY [0..31] OF B...	
IRobot_OUT[0]	BYTE	2#00000101
IRobot_OUT[1]	BYTE	2#00000000
IRobot_OUT[2]	BYTE	2#00000000
IRobot_OUT[3]	BYTE	2#00000000
IRobot_OUT[4]	BYTE	2#00000000
IRobot_OUT[5]	BYTE	2#00000000
IRobot_OUT[6]	BYTE	2#00000000
IRobot_OUT[7]	BYTE	2#00000000
IRobot_OUT[8]	BYTE	2#00000000
IRobot_OUT[9]	BYTE	2#00000000
IRobot_OUT[10]	BYTE	2#00000000
IRobot_OUT[11]	BYTE	2#00000000
IRobot_OUT[12]	BYTE	2#00000000
IRobot_OUT[13]	BYTE	2#00000000
IRobot_OUT[14]	BYTE	2#00000000
IRobot_OUT[15]	BYTE	2#00000000
IRobot_OUT[16]	BYTE	2#00000000
IRobot_OUT[17]	BYTE	2#00000000
IRobot_OUT[18]	BYTE	2#00000000
IRobot_OUT[19]	BYTE	2#00000000
IRobot_OUT[20]	BYTE	2#00000000

Red boxes highlight the 'System input' rows in the I/O interface and the corresponding 'IRobot_OUT' array elements in the variable declaration table. Red arrows connect the two, showing the mapping from controller input to PLC output.

System/User input of controller



PLC output
(IRobot_OUT)

Operation check

The controller output is assigned to the input variable on the PLC side every 1byte from [IO768].

The screenshot displays the TwinCAT I/O interface. On the left, the 'I/O Interface [SoftPLC]' window shows a table of I/O points. On the right, the 'TwinCATData.PLC.GVL' window shows the PLC input variables. Red boxes and arrows highlight the mapping from controller outputs to PLC inputs.

No.	Byte	Status	Type	Usage
IO824	0	☒	User output	
IO825		☐	User output	
IO826		☐	User output	
IO827		☐	User output	
IO828		☐	User output	
IO829		☐	User output	
IO830		☐	User output	
IO831		☐	User output	
IO832	0	☐	User output	
IO833		☐	User output	
IO834		☐	User output	
IO835		☐	User output	
IO836		☐	User output	
IO837		☐	User output	
IO838		☐	User output	
IO839		☐	User output	

式	タイプ	値
IRobot_IN	ARRAY [0..31] OF B...	
IRobot_IN[0]	BYTE	2#01110000
IRobot_IN[1]	BYTE	2#00000000
IRobot_IN[2]	BYTE	2#00000000
IRobot_IN[3]	BYTE	2#00000000
IRobot_IN[4]	BYTE	2#00000000
IRobot_IN[5]	BYTE	2#00000000
IRobot_IN[6]	BYTE	2#00000000
IRobot_IN[7]	BYTE	2#00000000
IRobot_IN[8]	BYTE	2#01001011
IRobot_IN[9]	BYTE	2#00000000
IRobot_IN[10]	BYTE	2#00000000
IRobot_IN[11]	BYTE	2#00000000
IRobot_IN[12]	BYTE	2#00000000
IRobot_IN[13]	BYTE	2#00000000
IRobot_IN[14]	BYTE	2#00000000
IRobot_IN[15]	BYTE	2#00000000
IRobot_IN[16]	BYTE	2#00000000
IRobot_IN[17]	BYTE	2#00000000
IRobot_IN[18]	BYTE	2#00000000
IRobot_IN[19]	BYTE	2#00000000
IRobot_IN[20]	BYTE	2#00000000
IRobot_IN[21]	BYTE	2#00000000
IRobot_IN[22]	BYTE	2#00000000

System/User output of
controller

PLC input
(IRobot_IN)