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RC9 Firmware Install Manual

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●Prerequisites

- Prohibited matter

Do not install WINCAPS3 • VRC9 on the same IPC as the RC9 firmware.

- System requirement

If the IPC does not meet the following specifications, the installation will be aborted.

- BECKHOFF IPC
- Windows 10 IoT Enterprise LTSC(2019)
- TwinCAT XAE 3.1.4024.10
- CPU : Intel(R) 1.91GHz, 4Core
- Memory : 4GB
- Disk : 20GB
- Ethernet : 4 ports (2 of them can be USB to LAN)

●Preparation

- Installation of TwinCAT

Run installer.

If you don't have TwinCAT XAE 3.1.4024.10, tell DNWA.

- Activation of TwinCAT license

See below.

<https://infosys.beckhoff.com/>

TwinCAT3 > Licensing > Ordering and activation of TwinCAT3 standard licenses >

Activating standard licenses manually

※A TC1300 C ++ license is required to boot the RC9 firmware.

- TwinCAT core allocation change setting

Execute the following file to make the core allocation changeable.

"C:\TwinCAT\3.1\System\win8settick.bat" (in default setting)

Reboot IPC.

- Network settings

Overview of each port

(1) EtherCAT 1

"EtherCAT 1" is a port for controlling the servo.

(2) EtherCAT 2

"EtherCAT 2" is a port that connects to the EK1100 and mainly controls FiedelNet devices.

(3) TP Connection

"TP Connection" is a port for communication with the Teaching Pendant.

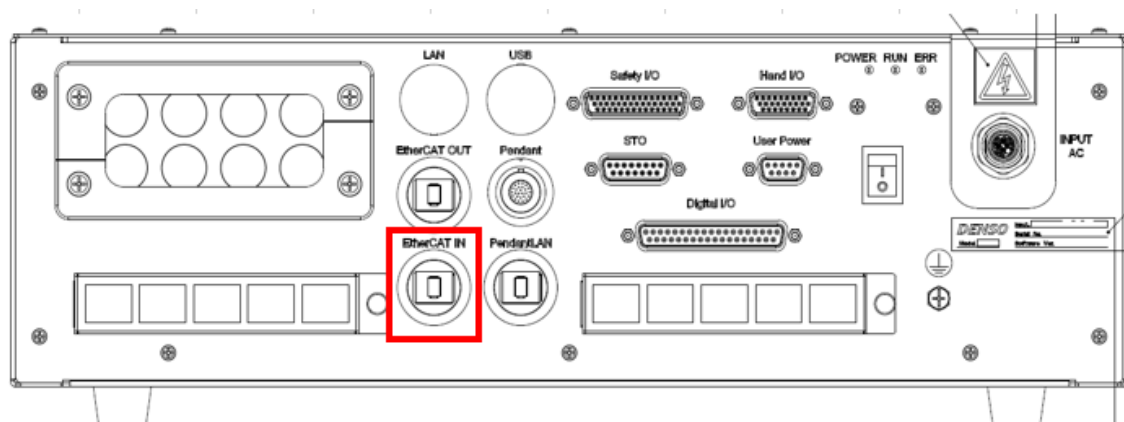
(4) Local Area Connection

"Local Area Connection" is a port for connecting to a local PC and communicating with WINCAP3.

● Manual settings1

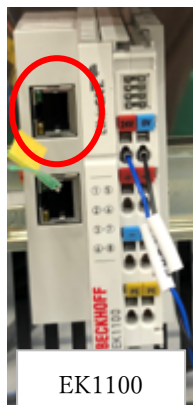
Settings of each port

(1) EtherCAT 1



Connect any LAN port of IPC to the Ethernet port of the controller panel in the above figure.
Set the LAN port name of the IPC connected at this time to "EtherCAT 1".

(2) EtherCAT 2

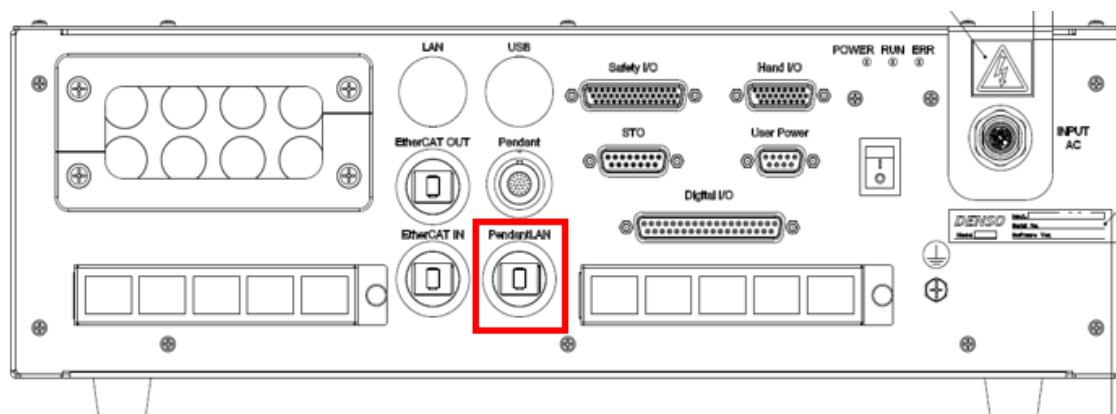


Connect any LAN port of IPC to the Ethernet port of EK1100 in the above figure.

Set the LAN port name of the IPC connected at this time to "EtherCAT 2".

If you do not use the EK1100 and FieldNet devices, set the unused LAN port of IPC as the reserved area and set the port name to "EtherCAT 2".

(3) TP Connection



Connect any LAN port of IPC to the Ethernet port of the controller panel in the above figure.

Set the LAN port name of the IPC connected at this time to "TP Connection".

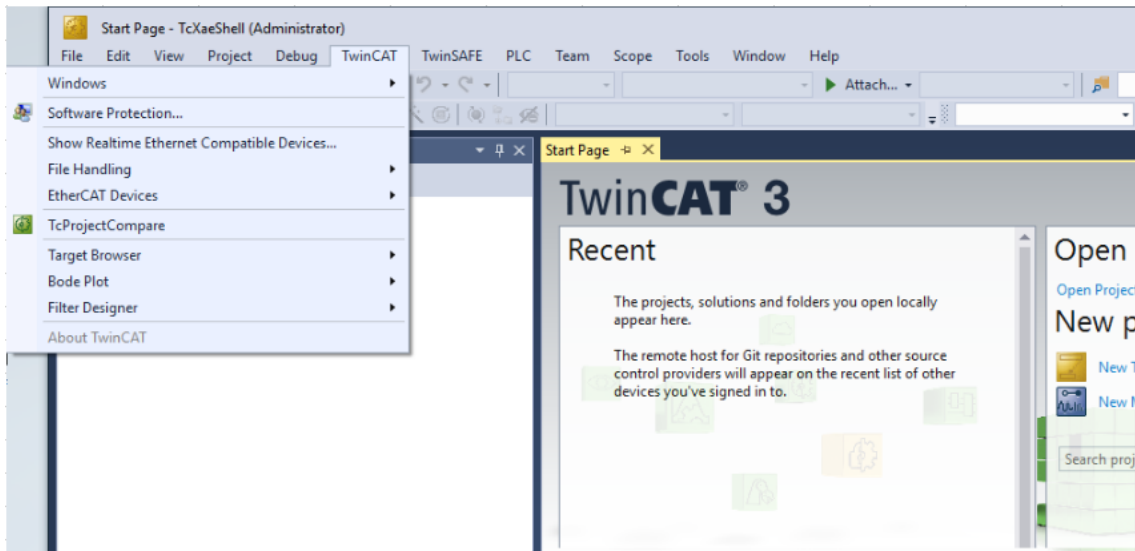
(4) Local Area Connection

Set the LAN port name of the IPC you want to connect to the local PC as "Local Area Connection".

• TwinCAT network driver settings

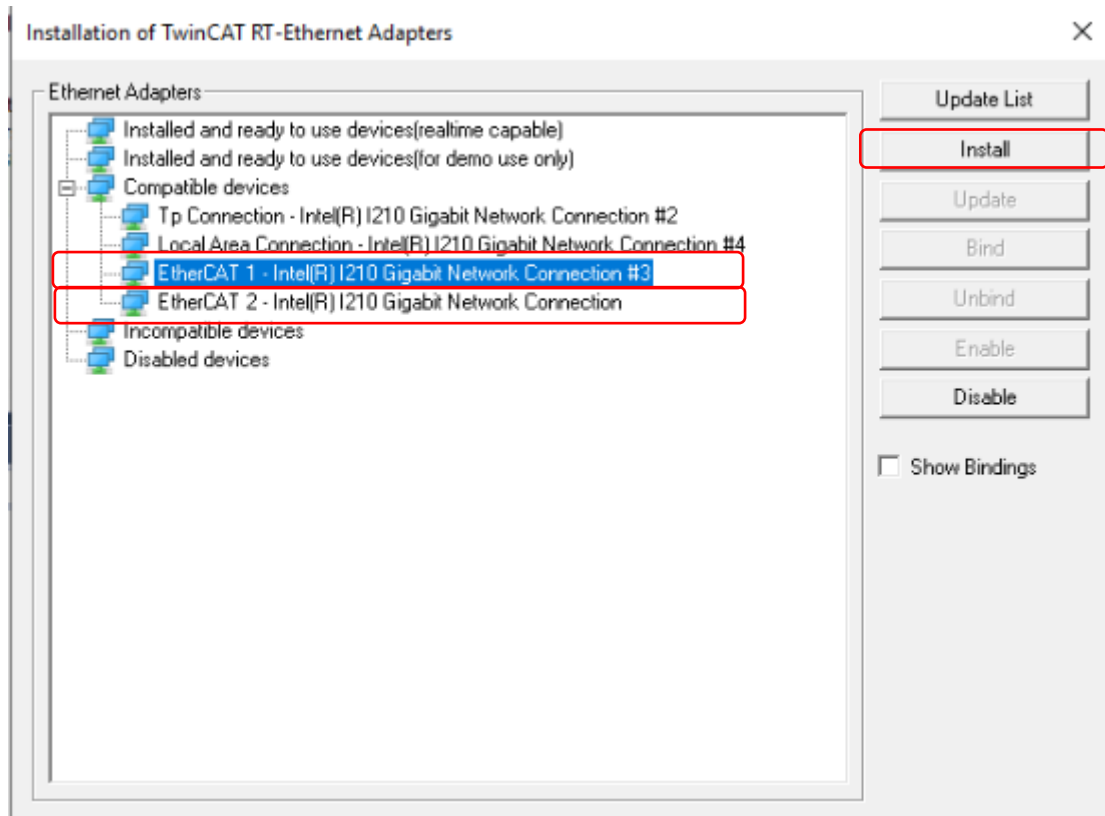
Summary: Set the TwinCAT network driver on the "EtherCAT 1" and "EtherCAT 2" ports.

Start TcXAEShell and select "Show Realtime Ethernet Compatible Devices" from TwinCAT in the menu.

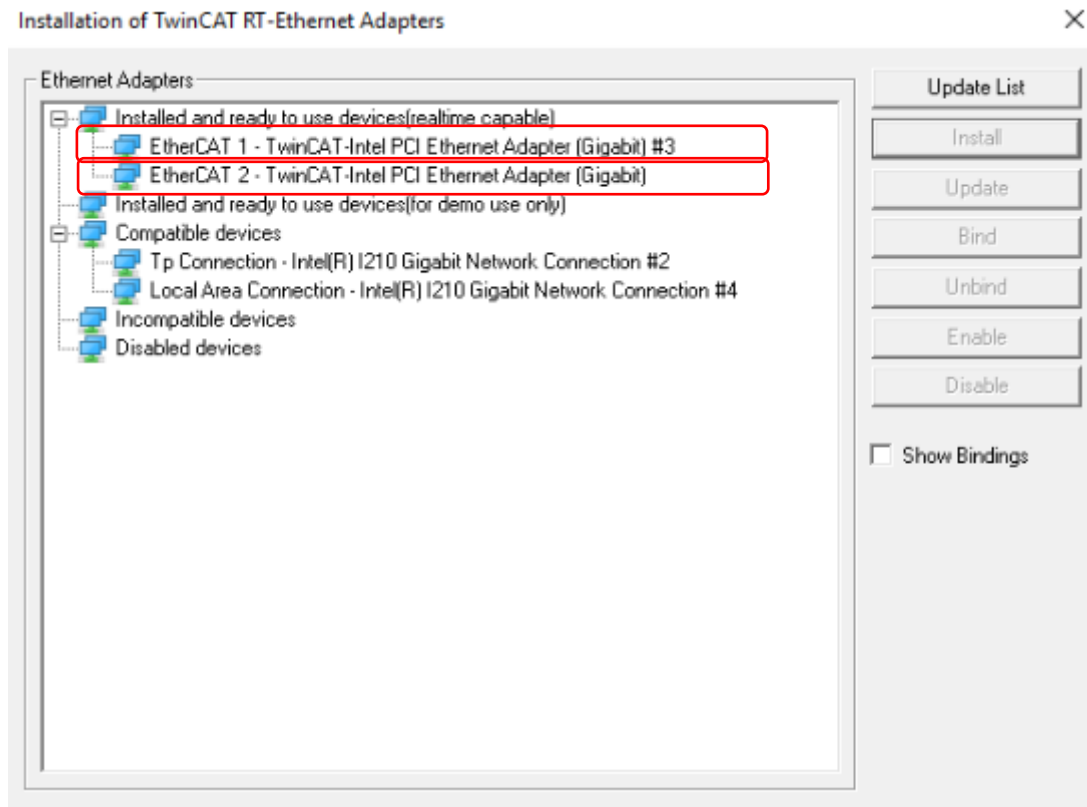


Select "EtherCAT 1" and press "Install".

Select "EtherCAT 2" and press "Install".



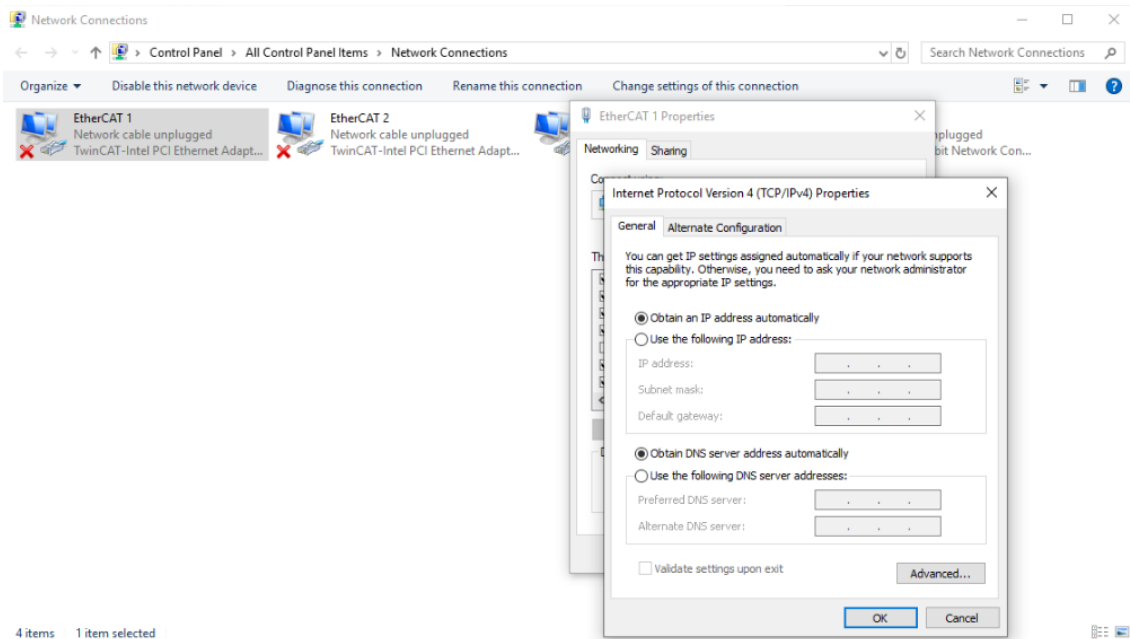
After the installation is complete, the TwinCAT network driver will be set as shown below.
Press "x" to finish.



- "EtherCAT 1" and "EtherCAT 2" settings

Select the Internet Protocol Version 4 (TCP / IPv4) property from the properties of the network adapter names "EtherCAT 1" and "EtherCAT 2" in the "Network Connections", set as shown in the figure below, and press OK.

Check "Obtain an IP address automatically".

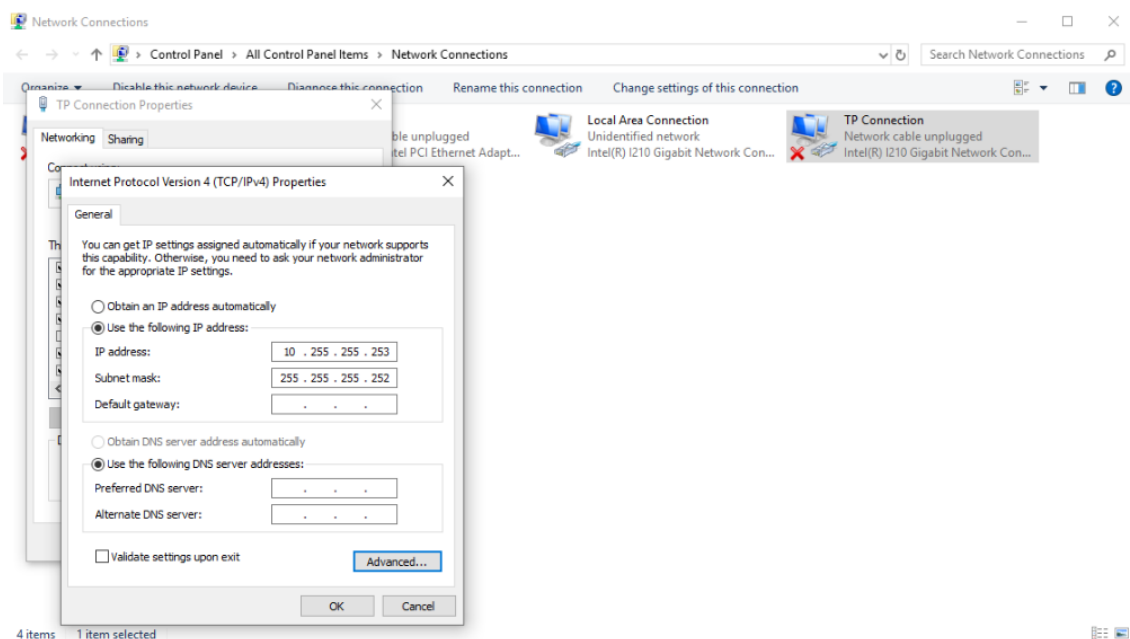


- "TP Connection" settings

Select the property of Internet Protocol Version4 (TCP / IPv4) from the property of the network adapter name "TP Connection" in the "Network Connections", set it as shown in the figure below, and press OK.

IP address: 10.255.255.253

Subnet mask: 255.255.255.252



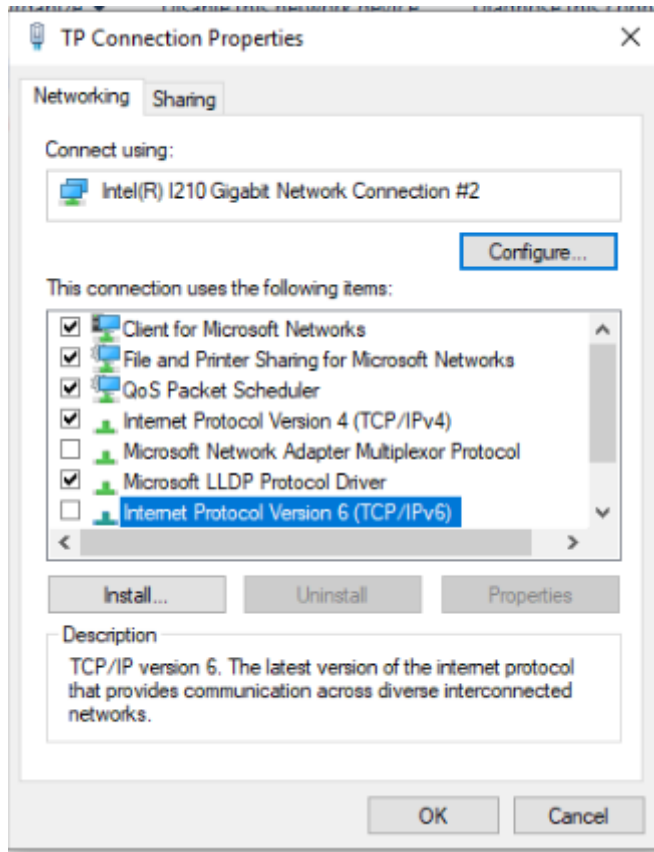
Make the following settings.

Enable "Client for Microsoft Networks"

Enable "File and Printer Sharing for Microsoft Networks"

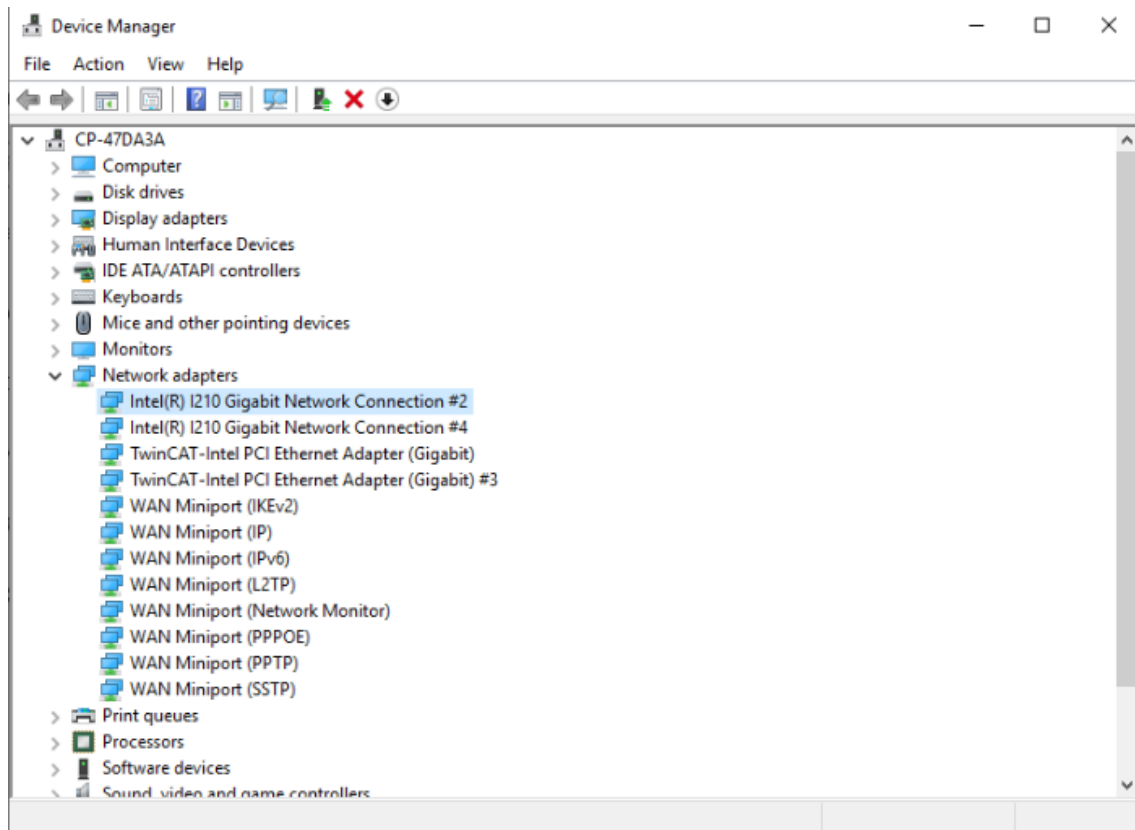
Enable "Internet Protocol Version 4 (TCP/IPv4)"

Disable "Internet Protocol Version 6 (TCP/IPv6)"

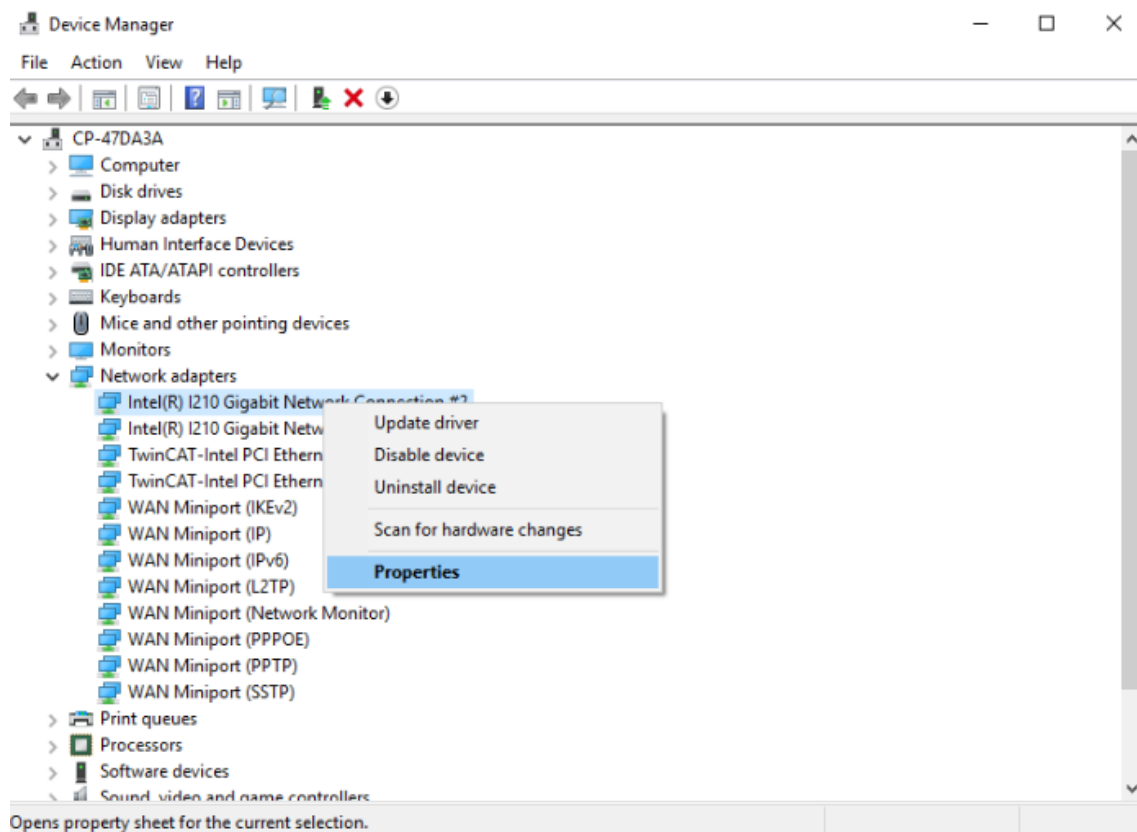


Open Device Manager.

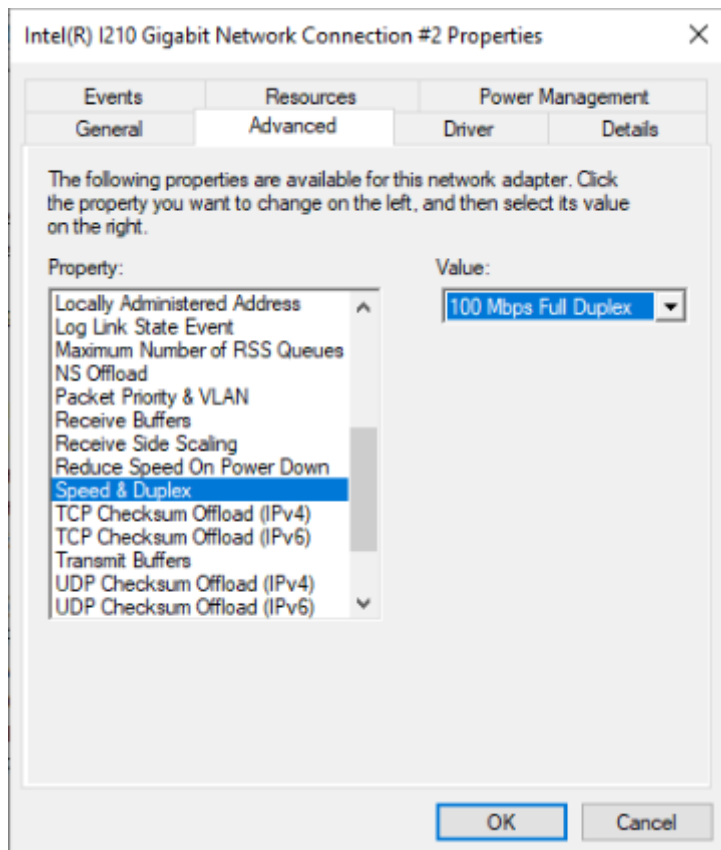
Select the item corresponding to "TP Connection" from Network adapters.



Right click and select Properties.



Select the Advanced tab, select "Speed & Duplex", set "100 Mbps Full Duplex" and press OK.
Exit Device Manager.



●Installer

Download

<https://www.denso-wave.com/ja/robot/download/application/>

Run Installer(Setup.exe).

After the installation is completed, copy the following folder of the installer data and save it in the IPC.

[source folder]

- Installer¥Tools¥Rc9FirmwareSettingTool
- Installer¥Tools¥XAERemoteAccessTool

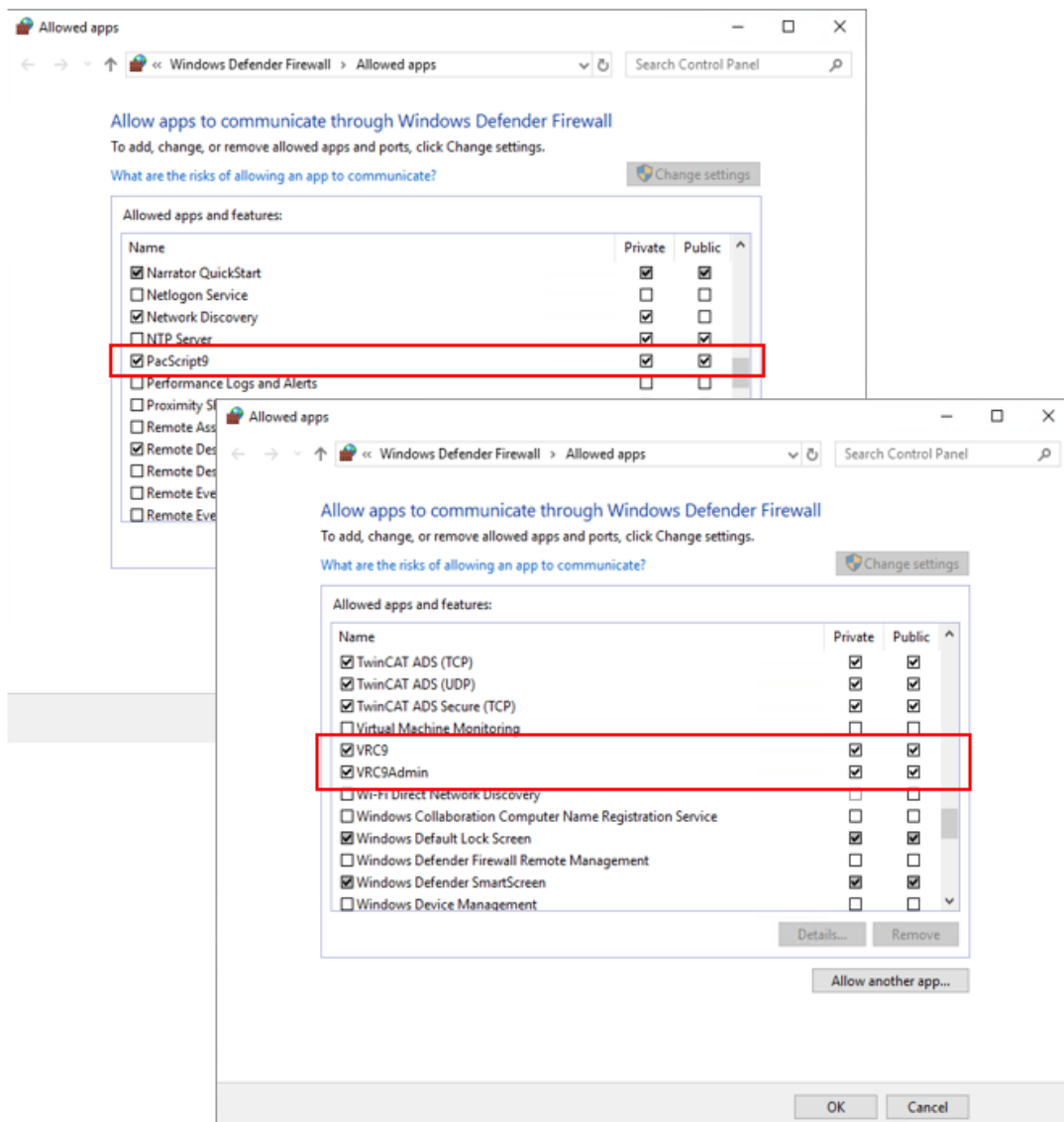
[destination folder]

- C:¥Program Files (x86)¥DENSO ROBOTICS¥VRC9¥Tools

●Manual settings2

- Firewall settings

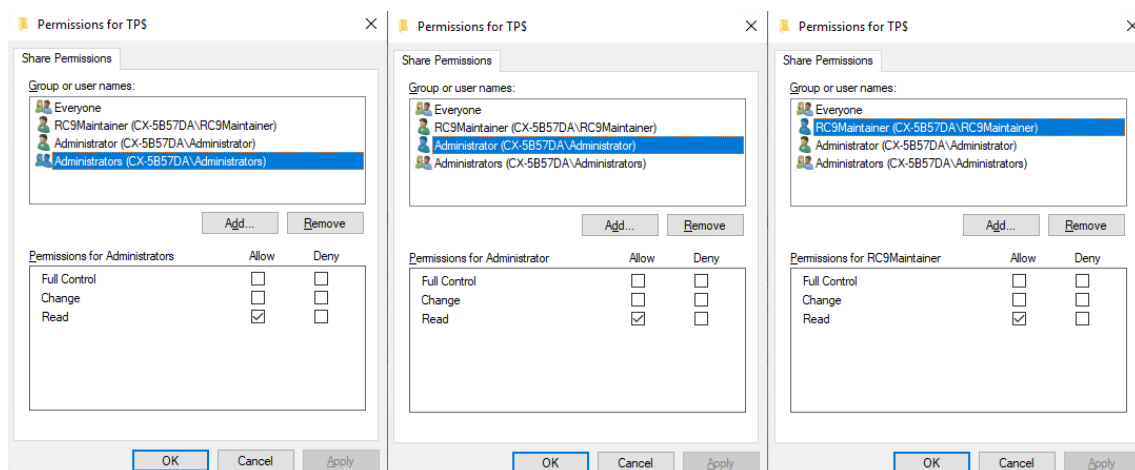
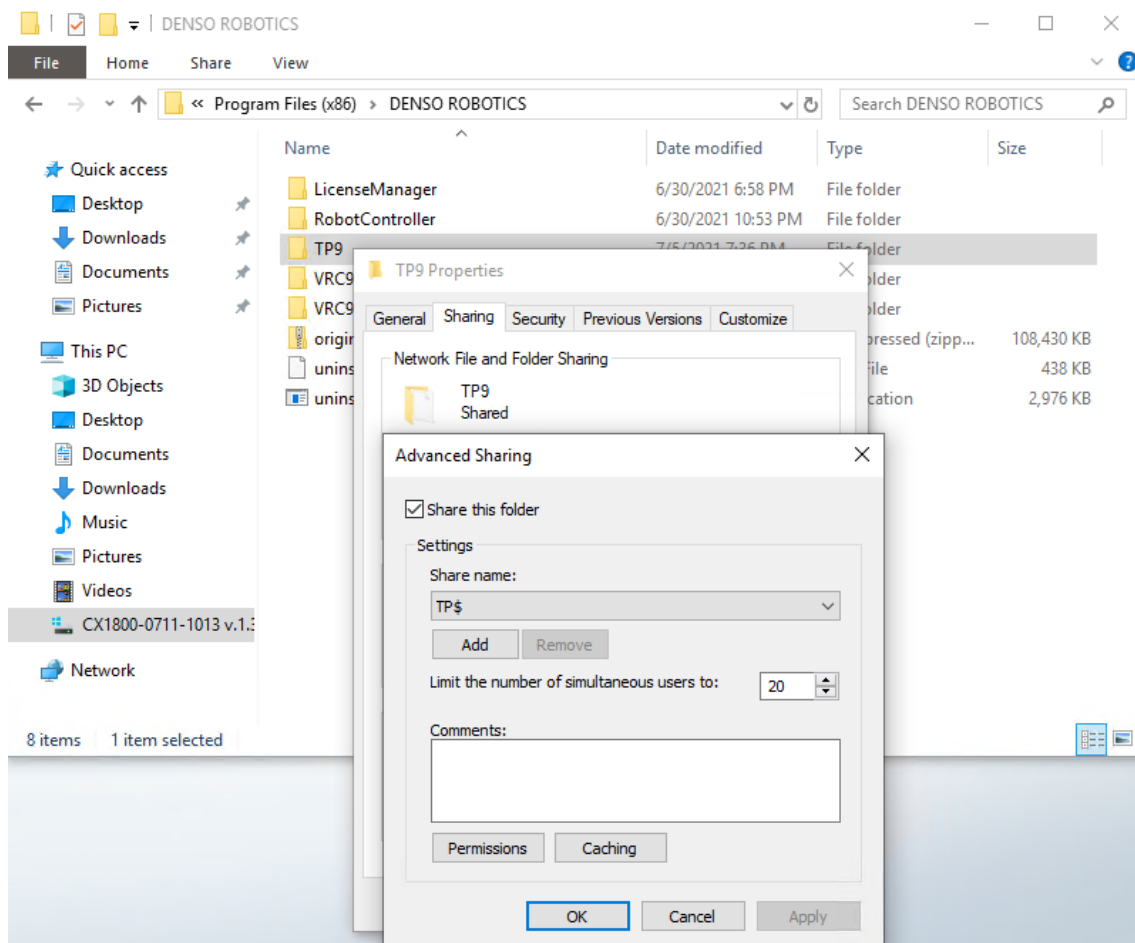
Allow “PacScript9”, “VRC9”, and “VRC9Admin”.



- Share folder settings

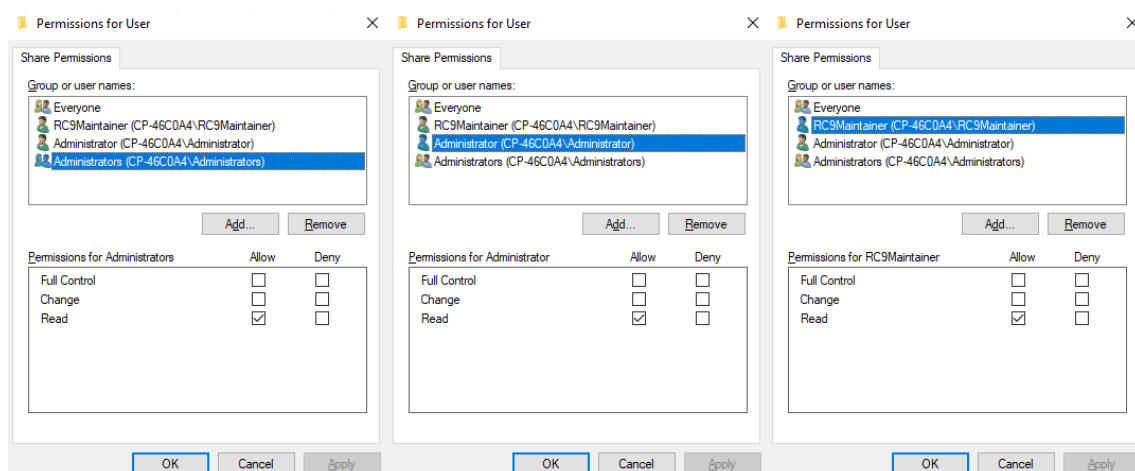
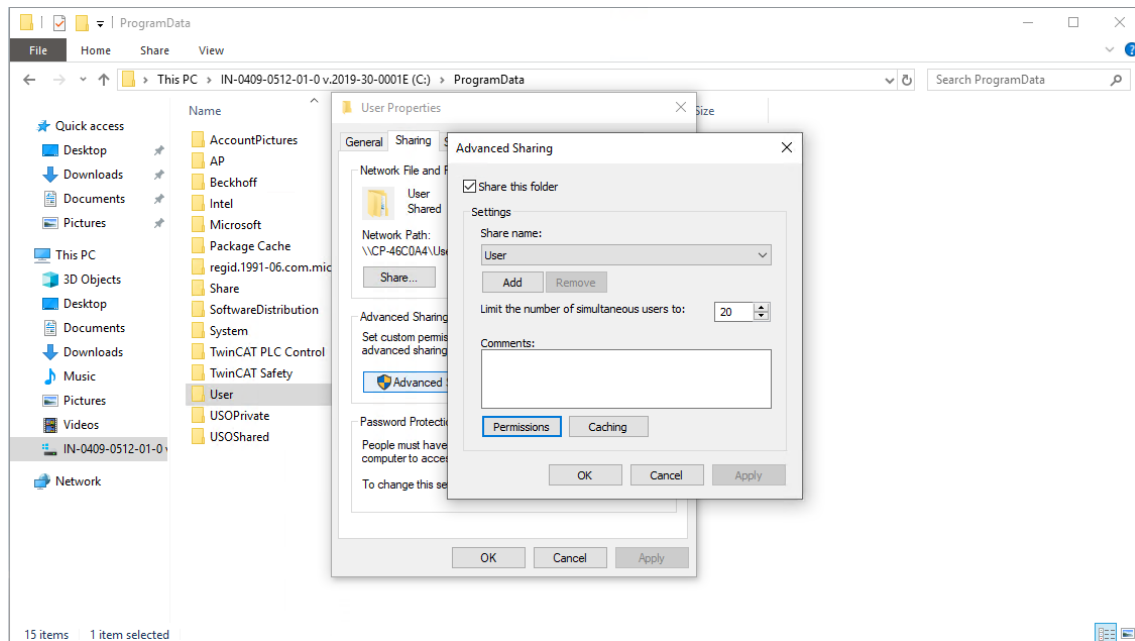
[TP9 folder]

Set "TP9"[(in default setting)C:\Program Files (x86)\DENSO ROBOTICS\TP9] as a shared folder and give read permission to Administrators, Administrator and RC9Maintainer. Set the shared folder name "TP\$".



[User Folder]

Set "User"[(in default setting) C:\ProgramData\User] as a shared folder and give read permission to Administrators, Administrator and RC9Maintainer.

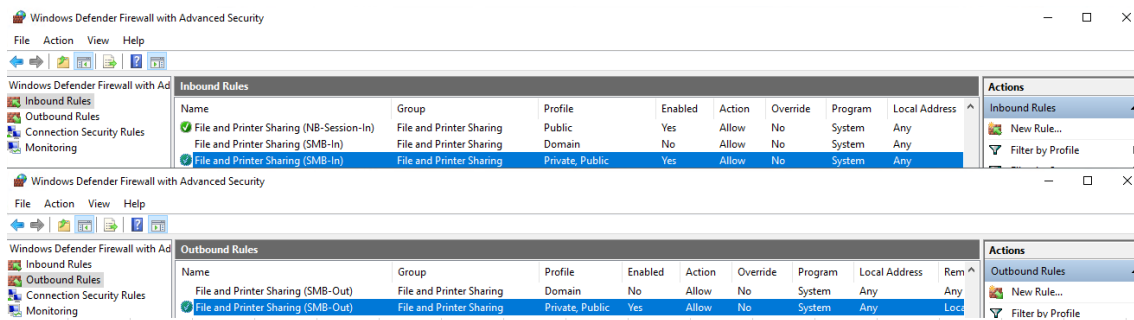


- Firewall settings

Allow the following items in "Windows Defender Firewall with Advanced Security".

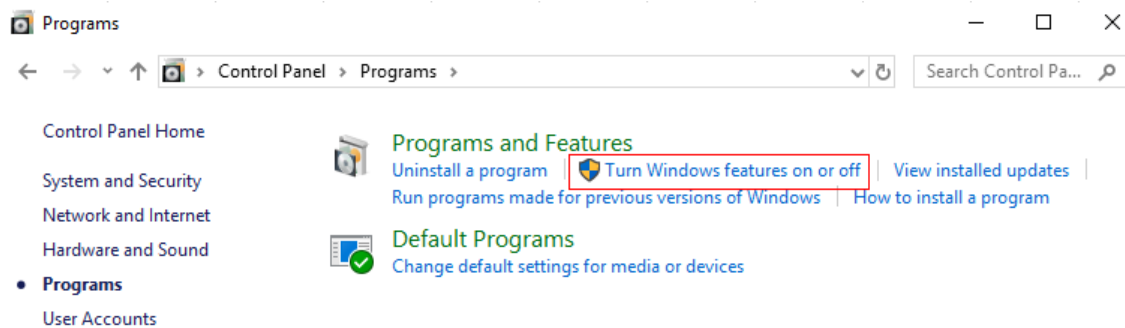
Inbound Rules "File and Printer Sharing (SMB-In)

Outbound Rules "File and Printer Sharing (SMB-Out)



• IIS Server setting

Install IIS Server



Turn Windows features on or off



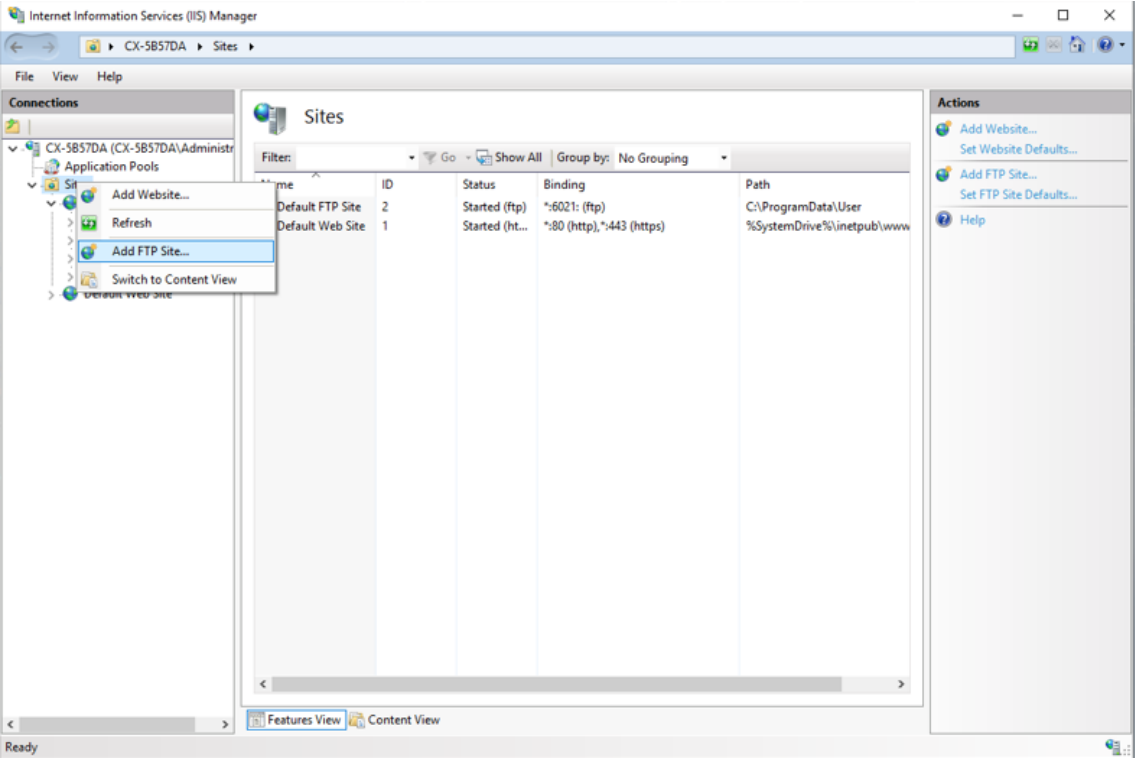
To turn a feature on, select its check box. To turn a feature off, clear its check box. A filled box means that only part of the feature is turned on.

- ☒ Internet Information Services
 - ☒ FTP Server
 - ☐ FTP Extensibility
 - ☒ FTP Service
 - ☒ Web Management Tools
 - ☐ IIS 6 Management Compatibility
 - ☒ IIS Management Console
 - ☐ IIS Management Scripts and Tools
 - ☐ IIS Management Service
 - ☒ World Wide Web Services
 - ☒ Application Development Features
 - ☐ .NET Extensibility 3.5
 - ☐ .NET Extensibility 4.7
 - ☐ Application Initialization
 - ☐ ASP
 - ☐ ASP.NET 3.5
 - ☐ ASP.NET 4.7
 - ☐ CGI
 - ☒ ISAPI Extensions
 - ☒ ISAPI Filters
 - ☐ Server-Side Includes
 - ☐ WebSocket Protocol
 - ☒ Common HTTP Features
 - ☒ Default Document
 - ☒ Directory Browsing
 - ☒ HTTP Errors
 - ☐ HTTP Redirection
 - ☒ Static Content
 - ☐ WebDAV Publishing
 - ☒ Health and Diagnostics
 - ☐ Custom Logging
 - ☒ HTTP Logging
 - ☐ Logging Tools
 - ☐ ODBC Logging
 - ☐ Request Monitor
 - ☐ Tracing
 - ☒ Performance Features
 - ☐ Dynamic Content Compression
 - ☒ Static Content Compression
 - ☒ Security
 - ☐ Basic Authentication
 - ☐ Centralized SSL Certificate Support
 - ☐ Client Certificate Mapping Authentication
 - ☐ Digest Authentication
 - ☐ IIS Client Certificate Mapping Authentication
 - ☐ IP Security
 - ☒ Request Filtering
 - ☒ URL Authorization
 - ☒ Windows Authentication

OK

Cancel

Set FTP site to IIS Server



**Site Information**

FTP site name:

Default FTP Site

Content Directory

Physical path:

C:\ProgramData\User



User Folder

Previous

Next

Finish

Cancel

**Binding and SSL Settings****Binding**

IP Address:

*

Port:

6021

☐ Enable Virtual Host Names:

Virtual Host (example: ftp.contoso.com):

☒ Start FTP site automatically**SSL**☐ No SSL☐ Allow SSL☒ Require SSL

SSL Certificate:

CX-5B57DA

Default:
IPC's Hostname

Select...

View...

Previous

Next

Finish

Cancel

Add FTP Site

? X



Authentication and Authorization Information

Authentication

- ☐ Anonymous
☒ Basic

Authorization

Allow access to:

Specified users

RC9FTP

Permissions

- ☒ Read
☒ Write

Previous

Next

Finish

Cancel

Firewall setting

Allow the following items.

Inbound Rules "IIS-WebServerRole-FTP-In-TCP-21"

Inbound Rules "IIS-WebServerRole-FTP-Passive-In-TCP"

Windows Defender Firewall with Advanced Security

File Action View Help

Windows Defender Firewall

- Inbound Rules
- Outbound Rules
- Connection Security Rules
- Monitoring

Name	Group	Profile	Enabled	Action	Override	Program
File and Printer Sharing (Spooler Service - ...	File and Print...	Public	No	Allow	No	C:\Wind...
File and Printer Sharing (Spooler Service - ...	File and Print...	Domain	No	Allow	No	C:\Wind...
File and Printer Sharing (Spooler Service - ...	File and Print...	Private	No	Allow	No	C:\Wind...
File and Printer Sharing (Spooler Service - ...	File and Print...	Public	No	Allow	No	C:\Wind...
File and Printer Sharing (Spooler Service - ...	File and Print...	Domain	No	Allow	No	C:\Wind...
File and Printer Sharing over SMBDirect (i...	File and Print...	All	No	Allow	No	System
FTP Server (FTP Traffic-In)	FTP Server	All	Yes	Allow	No	%windir...
FTP Server Passive (FTP Passive Traffic-In)	FTP Server	All	Yes	Allow	No	C:\Wind...
FTP Server Secure (FTP SSL Traffic-In)	FTP Server	All	No	Allow	No	%windir...
HomeGroup In	HomeGroup	Private	No	Allow	No	C:\Wind...

- Permission

Set “Projects” [(in default setting) C:¥ProgramData¥User¥Projects] to the following account permissions, object inheritance and container inheritance

Set “Settings” [(in default setting) C:¥ProgramData¥User¥Settings] to the following account permissions, object inheritance and container inheritance

Set “Temp” [(in default setting) C:¥ProgramData¥User¥Temp] to the following account permissions, object inheritance and container inheritance

Set “Update” [(in default setting) C:¥ProgramData¥User¥Update] to the following account permissions, object inheritance and container inheritance

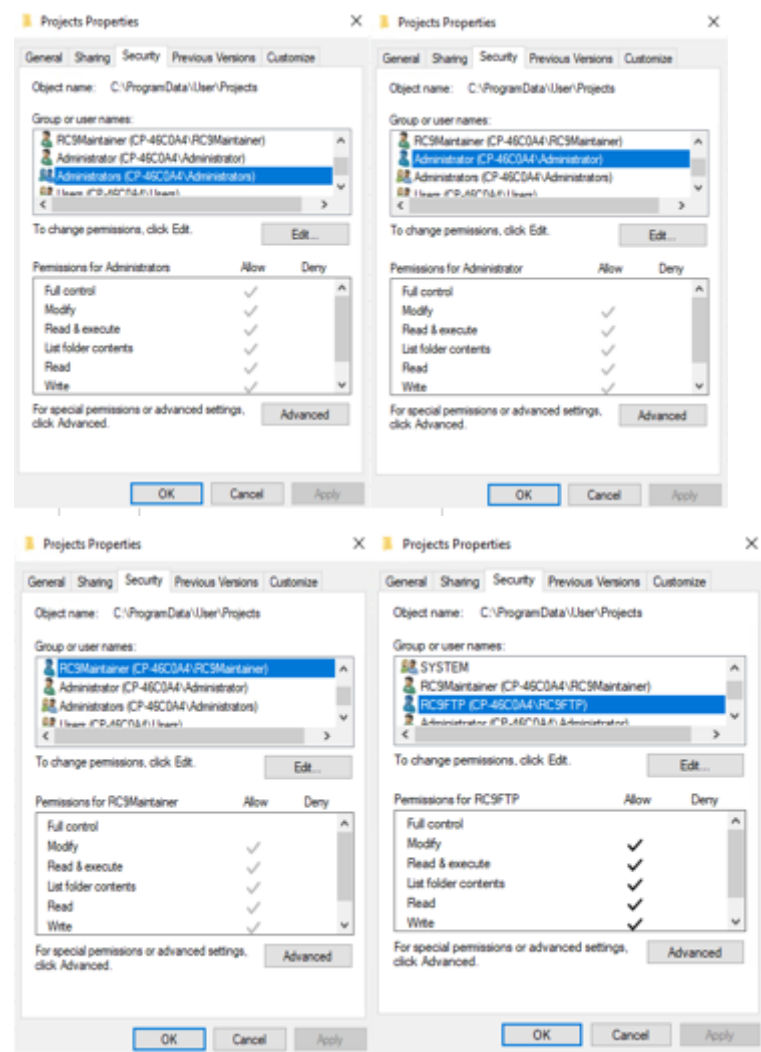
[Administrators]

[Administrator]

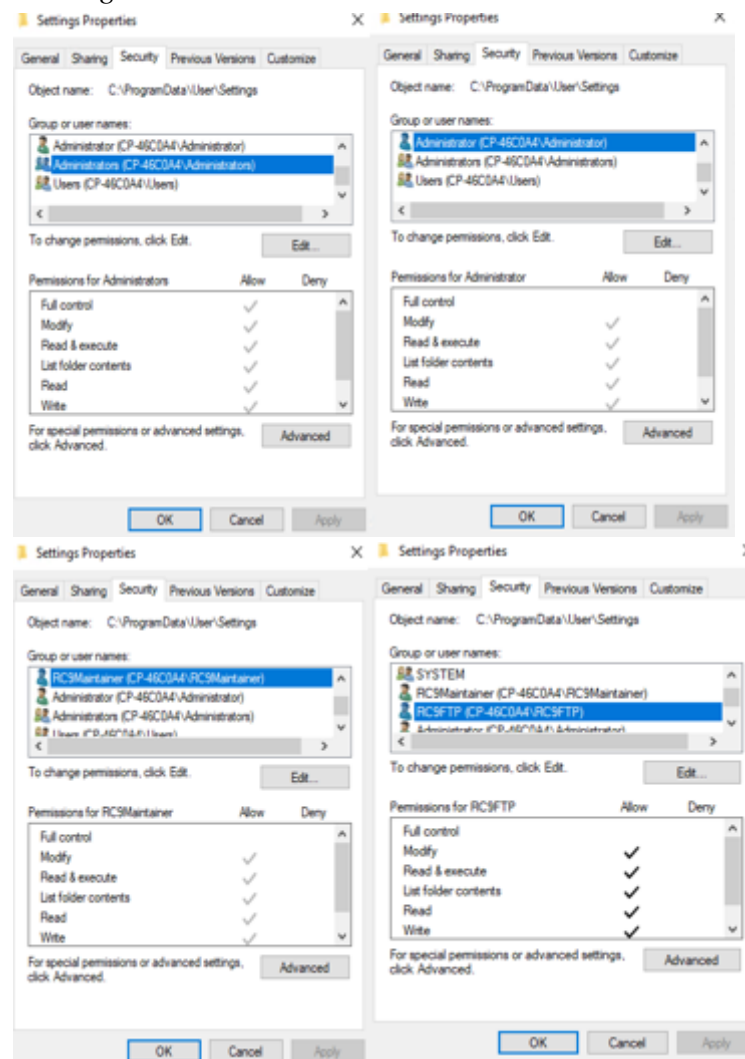
[RC9Maintainer]

[RC9FTP]

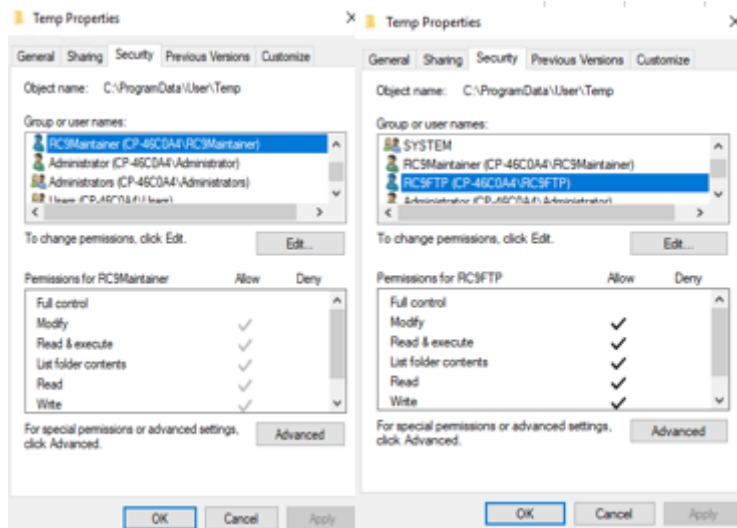
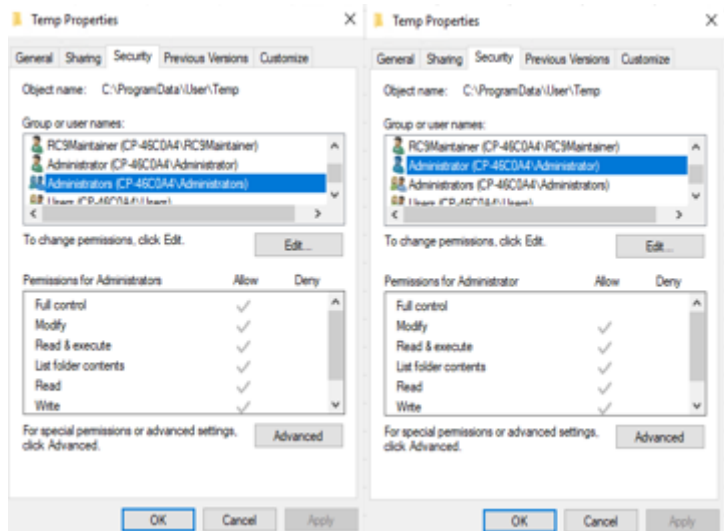
“Projects”



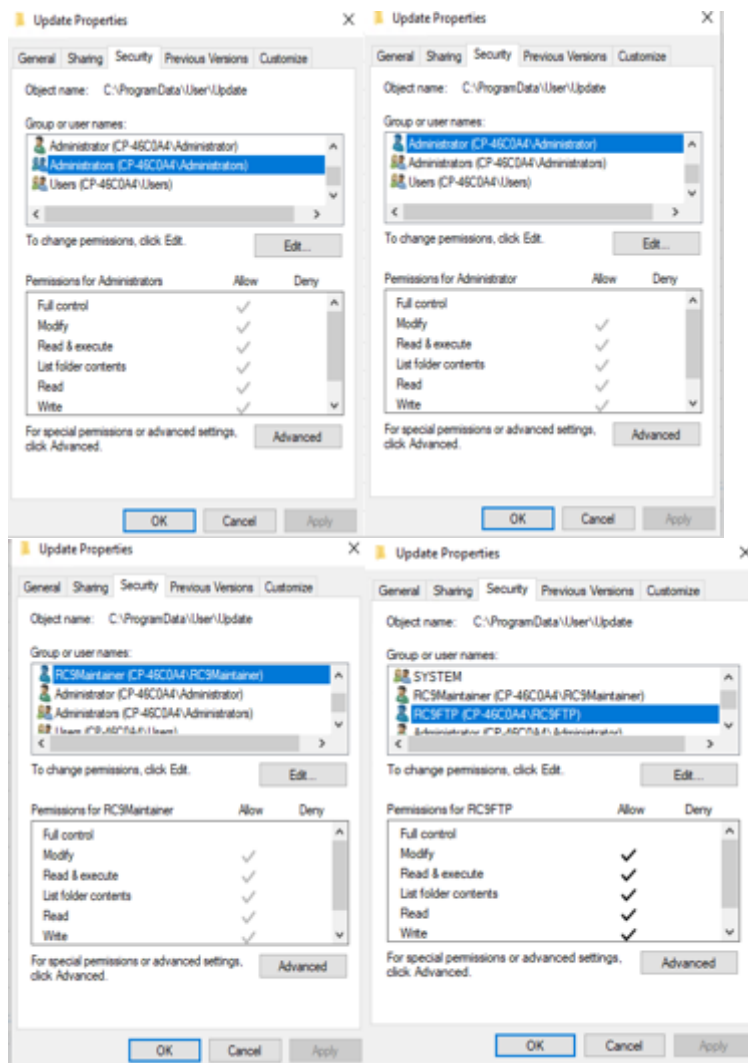
“Settings”



“Temp”

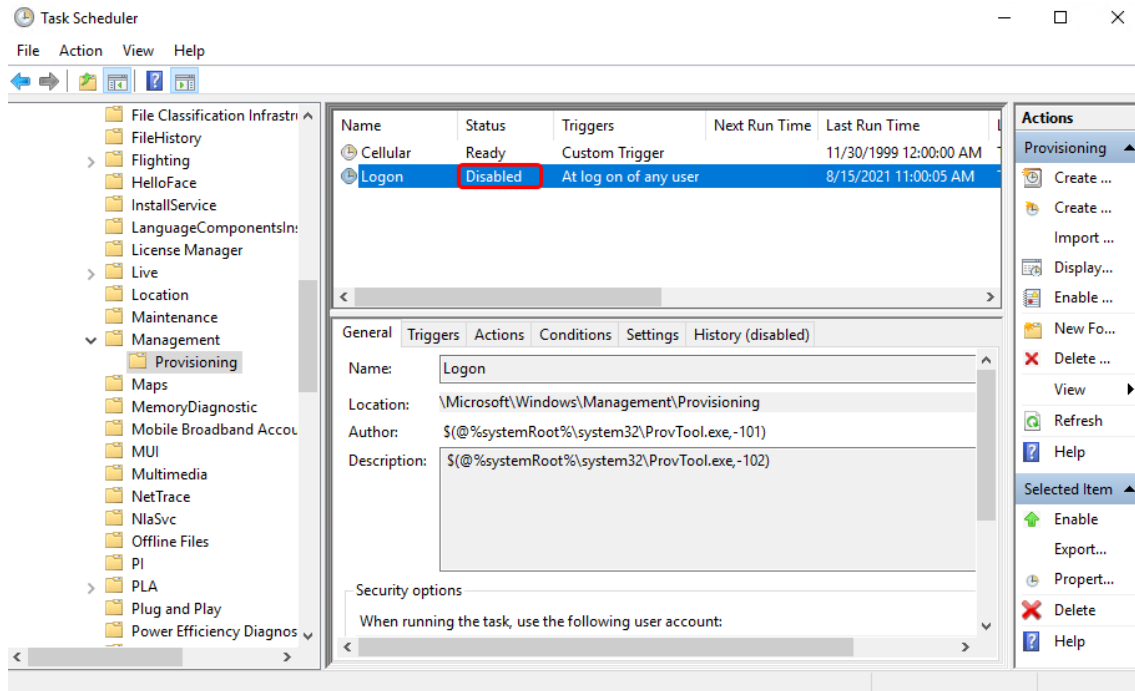


“Update”



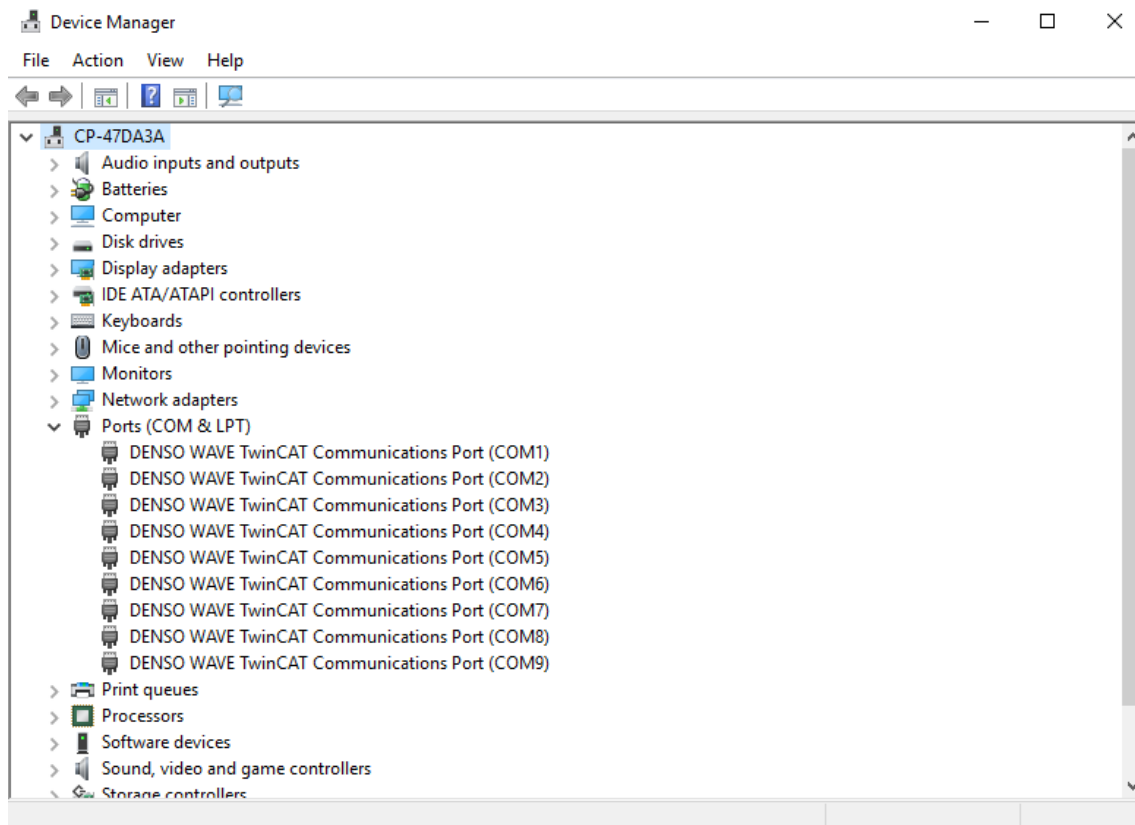
● Task Scheduler setting

Set the status of "¥Microsoft¥Windows¥Management¥Provisioning¥Logon" to "Disabled".



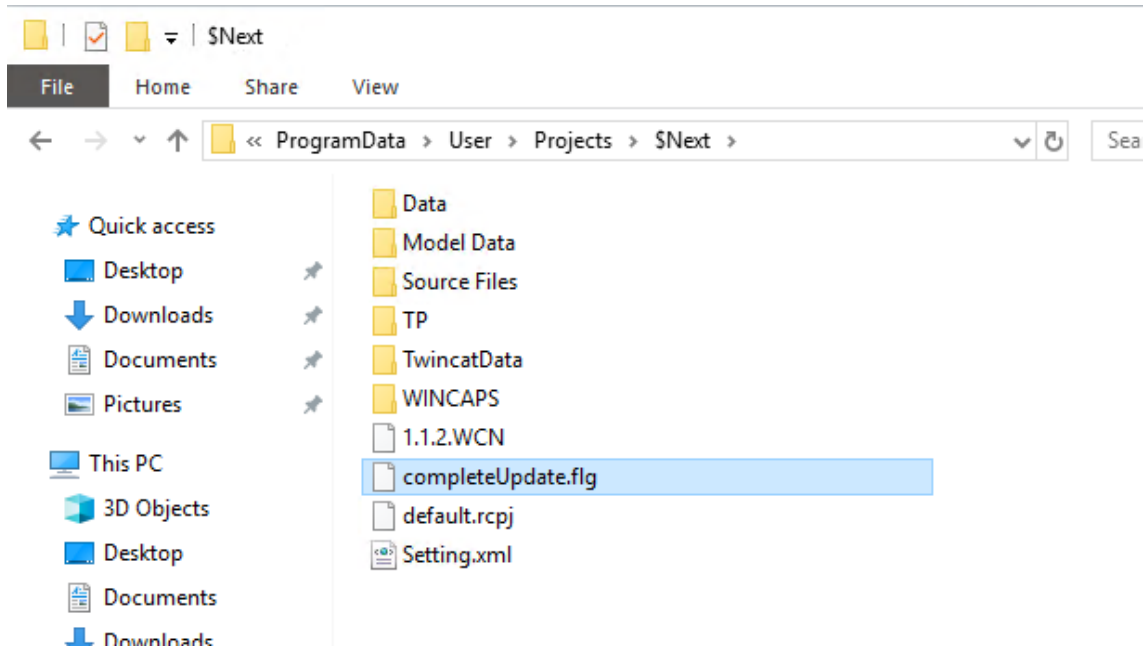
● Port settings

Check Ports(COM & LPT) in Device Manager. If the same port is used, change settings.

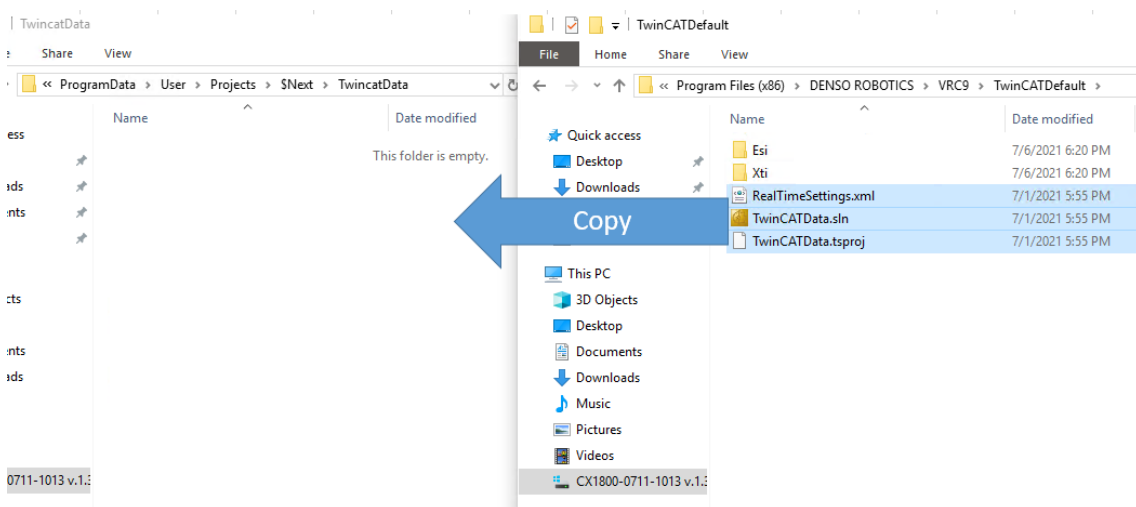


●Project setting

- Create New project by WINCAPS3.
- Copy the project to the IPC(C:\ProgramData\User\Projects), and rename folder name to “\$Next”. The folder structure should be as shown in the figure below. Create “completeUpdate.flg” (empty file).



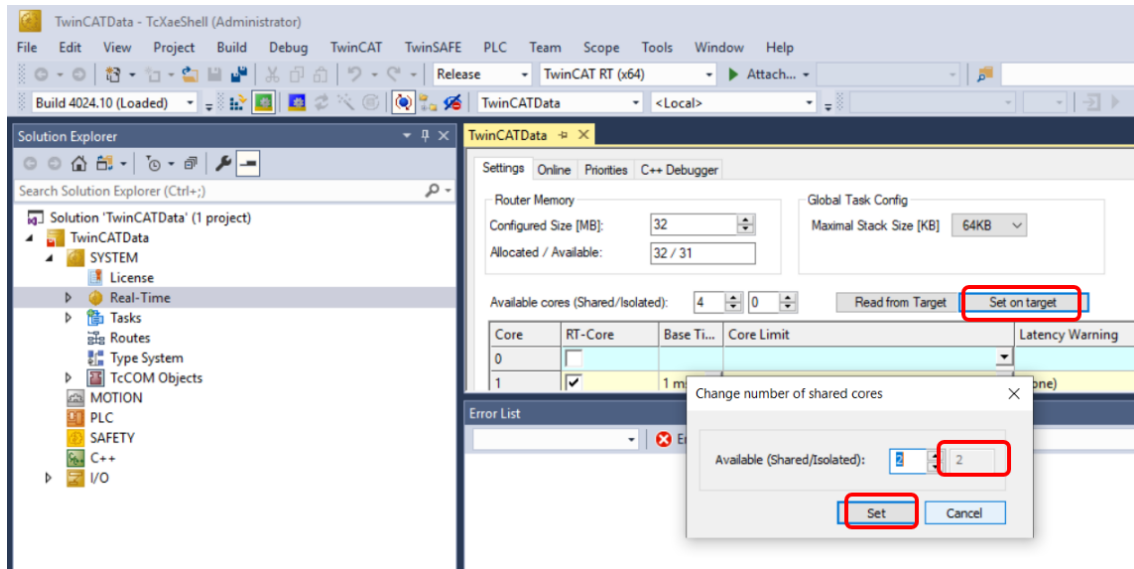
- Copy “TwinCATData.sln”, “TwinCATData.tsproj”, and “RealTimeSettings.xml” from “C:\Program Files (x86)\DENSO ROBOTICS\VRC9\TwinCATDefault” to “C:\ProgramData\User\Projects\\$Next\TwincatData”.



- TwinCAT core allocation setting

Open TwincatData.sln (in “C:\ProgramData\USER\Projects\Next\TwincatData”) in TcXAEShell.

Select TwinCATData → SYSTEM → Real-Time, select “Set on target”, set Isolated to 2 or more, and press Set. Restart IPC.



After restarting IPC

- Delete TwinCATData folder (“C:\ProgramData\USER\Projects\Next\TwincatData”).

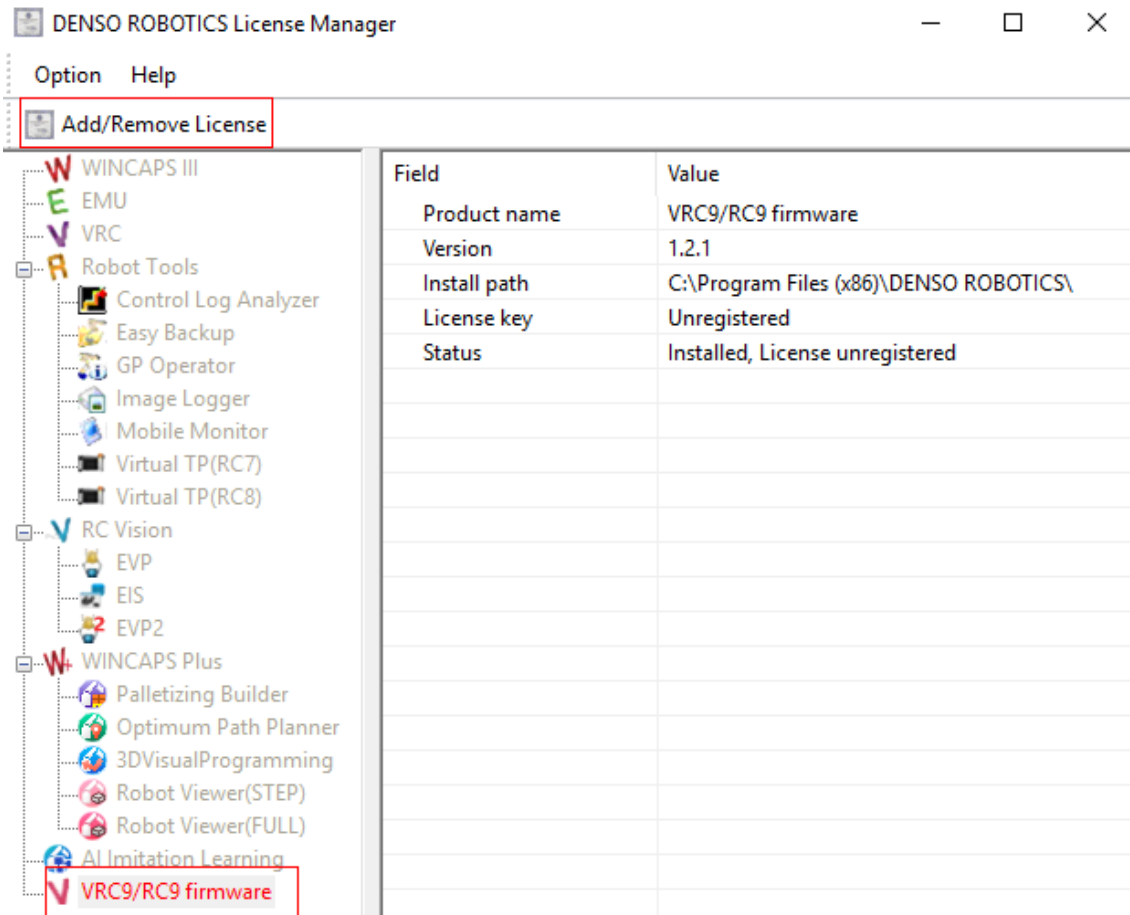
●RC9FirmwareSettingTool

Run Rc9FirmwareSettingTool.exe to initialize.

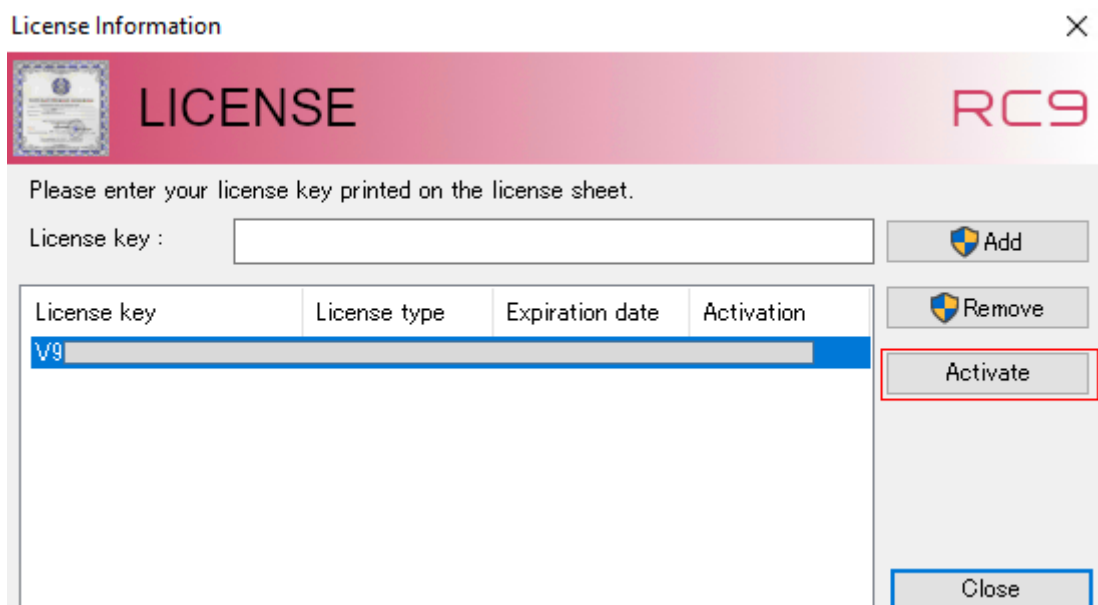
●RC9 firmware Activation

Run LicenseManager.

Select “VRC9/RC9 firmware”, and press the [Add/Remove License] button.



Press [Activation] button.



Check "License key" and "Unique key".

Activation ×

ACTIVATION

RC9

Please enter an issued activation key.

Activation key:

Register

To issue an activation key, the following license key and unique key are necessary.

Product name	VRC9/RC9 firmware
License key	V9
Unique key	

Close

Issue an "Activation key" on the "DENSO ROBOTICS MEMBER"(<https://www.denso-wave.com/ja/robot/login/>).

Enter the "Activation key" on the License Manager and press the [Register] button. The message "Successful" is displayed.

Activation ×

ACTIVATION

RC9

Please enter an issued activation key.

Activation key:

Register

To issue an activation key, the following license key and unique key are necessary.

Product name	VRC9/RC9 firmware
License key	V9
Unique key	

Close

● Starting RC9 firmware

Run "StartRC9FW.bat"

"C:¥Program Files (x86)¥DENSO ROBOTICS¥VRC9¥VRC9Admin"(in default setting)

● Exiting RC9 firmware

Right-click on the RC9 icon on the taskbar, and click "Exit".

After a few seconds the RC9 icon disappears.

