R-IN, RZ/T1, EC-1 Groups

Software PLC Guide: EtherCAT

R01AN3547EJ0100
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Outline

This application note explains the procedure for running evaluation boards with on-chip microcontrollers of the R-IN, RZ/T1, and EC-1 groups in connection with the CODESYS software programmable logic controller (PLC). In particular, it covers how to add and configure the EtherCAT protocol stack supported by CODESYS.

The creation of new projects, the procedure for debugging, and the creation of user-interface displays are described in the following application note: "Software PLC Guide: Configuring Projects and Creating User Interfaces" (R01AN3544EJ0100).

By connecting a software PLC with an evaluation board, users can read commands transferred from the controller and responses from the evaluation board.

Target Devices

R-IN32M3-EC

R-IN32M3-CL

RZ/T1

EC-1

Related Documents

"Software PLC Guide: Configuring Projects and Creating User Interfaces" (R01AN3544EJ0100)

Contents

1. Configuring a New Device

This section describes how to add a new device to the CODESYS program, with an EtherCAT slave device taken, as an example.

*To execute an existing project, please refer to the chapter "2. Device network setting".

1.1 Adding the EtherCAT Slave Device

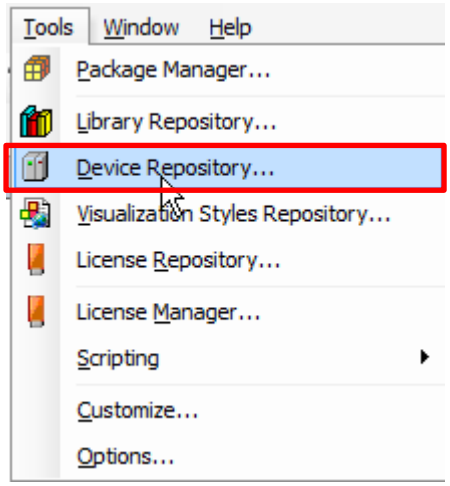
1.1.1 Creating a Project

Create the project to which you want to add the device. Refer to the "Software PLC Guide: Configuring Projects and Creating User Interfaces" (R01AN3544EJ0100) for how to create a new project.

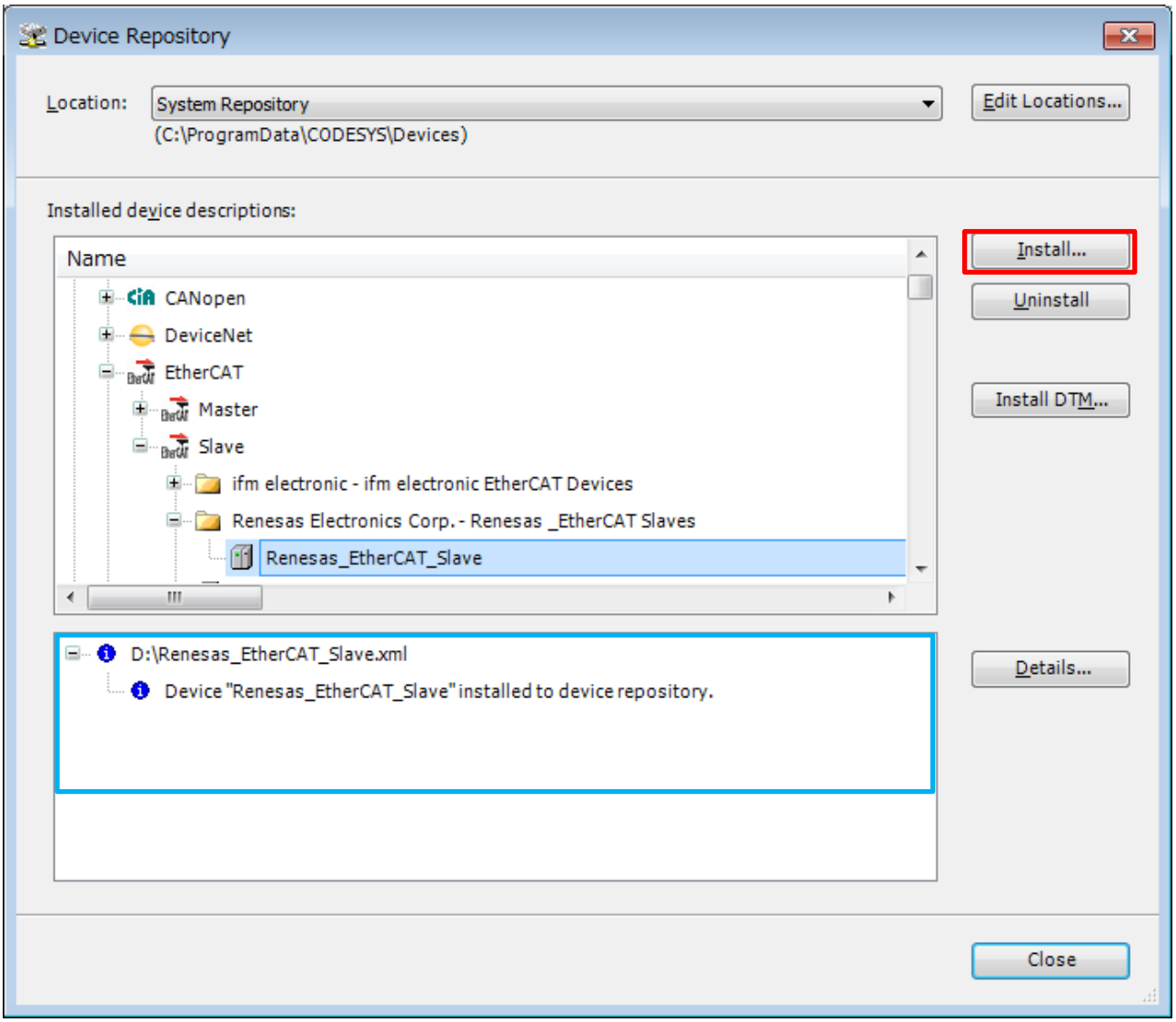
1.1.2 Installing the Device Information

Install an ESI (EtherCAT slave information) file which contains a description of the EtherCAT slave device. An XML file for use with EtherCAT is provided with the released stack.

Select "Device Repository…" from the "Tools" menu of the CODESYS program.



In the dialog box, click on the "Install" button to produce a dialog box where you are to enter the name of the provided ESI file. Specify "Renesas-EtherCAT-Slave.xml. The result of installation will be indicated under the file name. An icon " " appears in the case of normal installation, as is shown within the blue rectangle in the figure below.

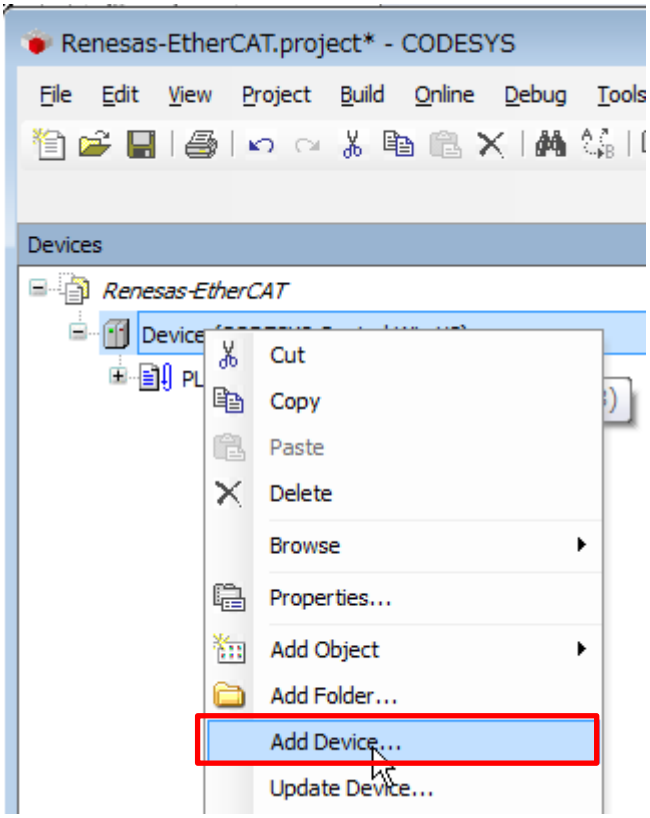


1.1.3 Adding a Device

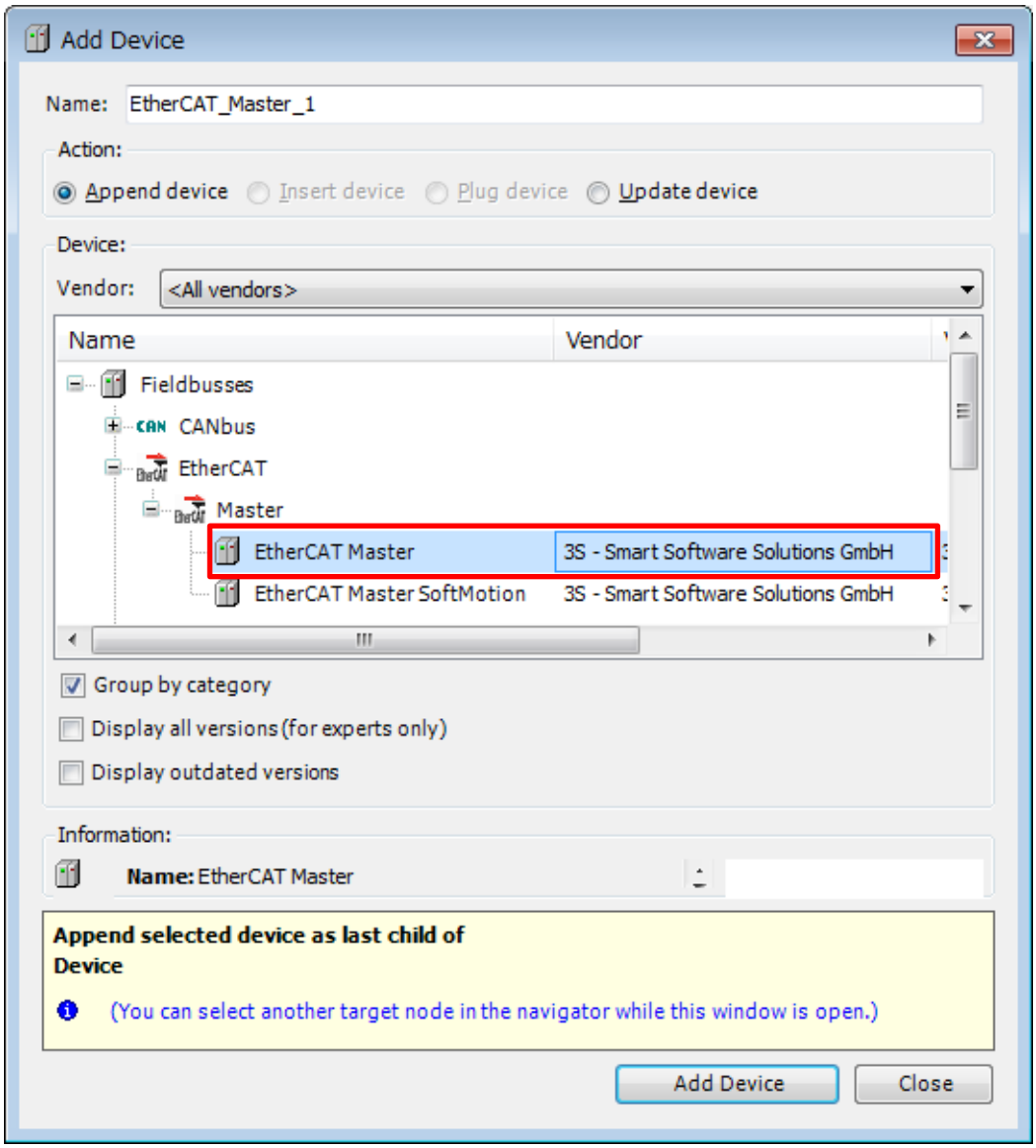
Add necessary devices to the "Device" tree.

(1) **EtherCAT Master**

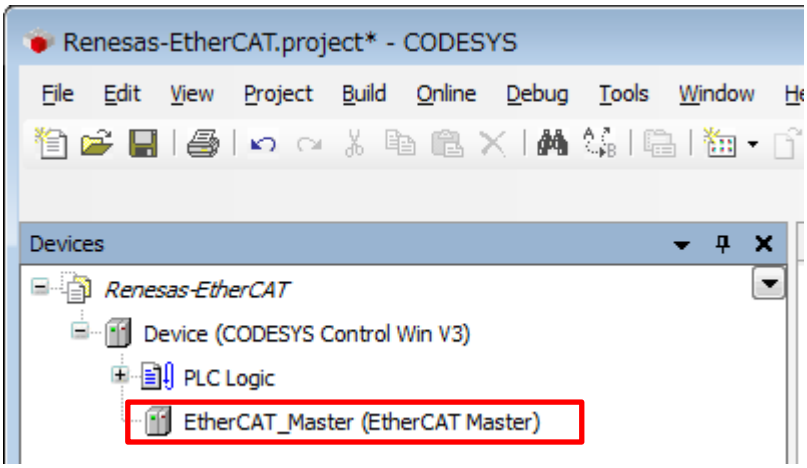
Right-click on "Device (CODESYS Control Win V3)" in the "Device" tree and select "Add Device".



The "Add Device" dialog box opens. Select "EtherCAT Master" under "Fieldbusses", "Ethercat", then "Master" and click on the "Add Device" button.

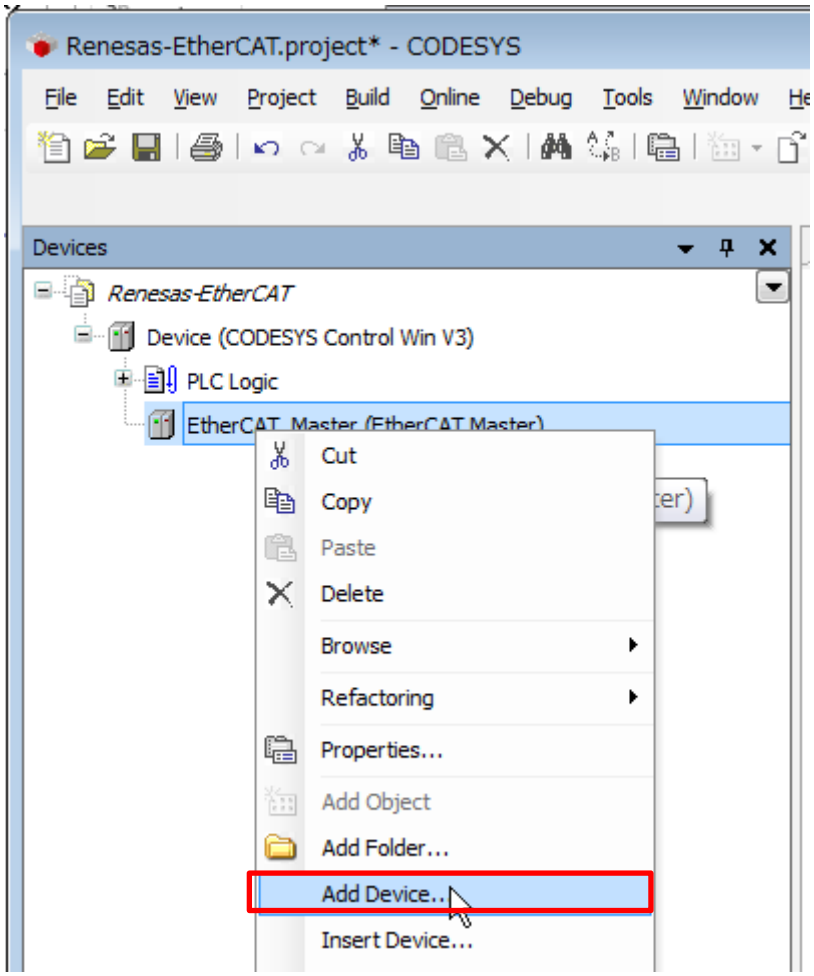


You can see that "EtherCAT Master" has been added under "Device (CODESYS Control Win V3)" in the "Device" tree.



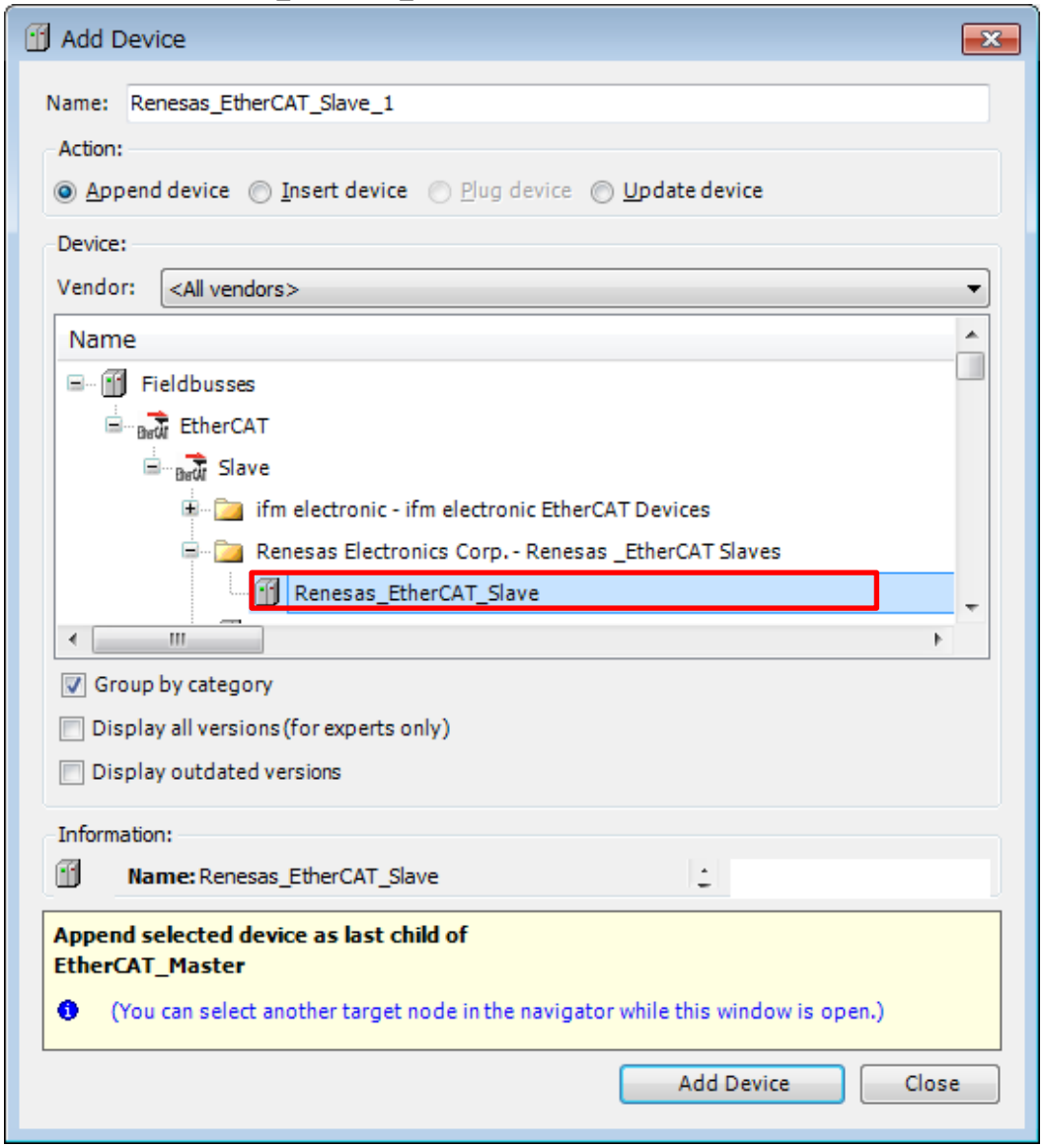
(2) **Renesas_EtherCAT_Slave**

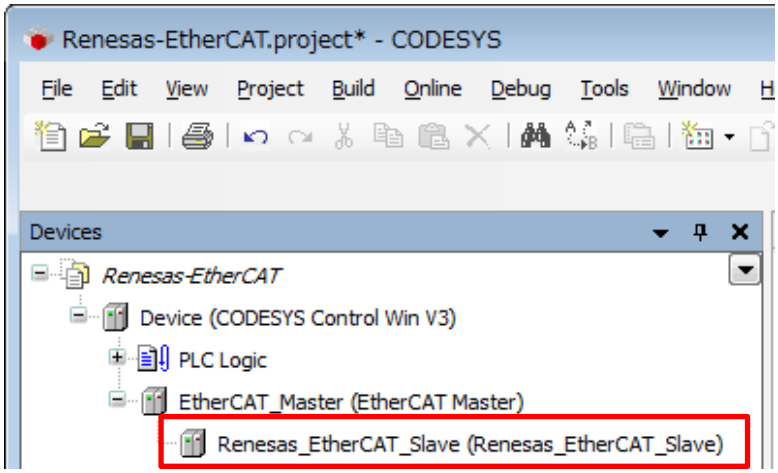
Right-click on "EtherCAT Master (EtherCAT Master)" in the "Device" tree and select "Add Device".



The "Add Device" dialog box opens. Select "Renesas_EtherCAT_Slave" under "Fieldbusses", "Ethercat", "Slave", then "Renesas Electronics Corp. - Renesas_EtherCAT_Slaves" and click on the "Add Device" button.

You can see that "Renesas_EtherCAT_Slave" has been added under "EtherCAT Master" in the "Device" tree.





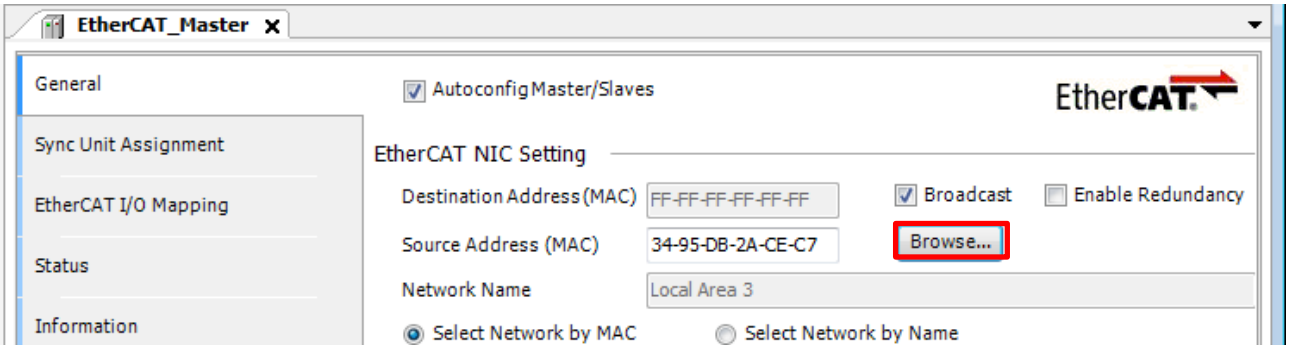
2. Configuring a Device Network

This section describes device configuration, including the setting of an IP address for use in a network of devices.

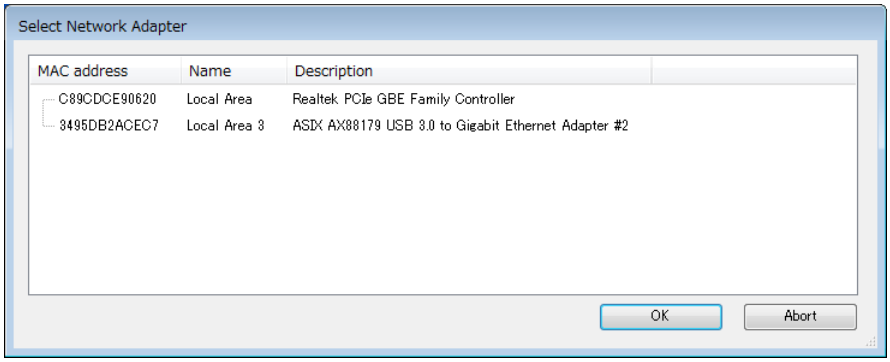
Note: Establish a connection with the software PLC service before configuring the network. Refer to the "Software PLC Guide: Configuring Projects and Creating User Interfaces" (R01AN3544EJ0100) for the procedure.

(1) Configuring the EtherCAT Master

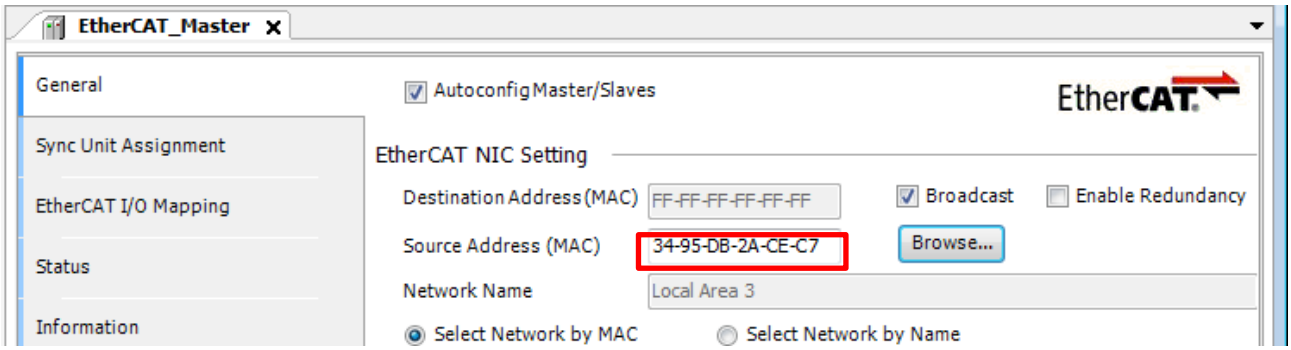
Double-click on "EtherCAT Master (EtherCAT Master)" in the "Device" tree to open the configuration window. In the "General" tabbed page, click on the icon next to the text box for "Interface" section as shown in the red rectangle below.



In the "Select Network Adapters" window, select the interface you wish to use from among the interfaces offered for connection.



Confirm that the correct MAC address is set for the interface you have selected.



(2) **Renesas_EtherCAT_Slave**

Users do not need to make settings for this device.

3. Website and Support

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http://www.renesas.com/

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Revision History

Rev.	Date	Description	
		Page	Summary
1.00	May 17, 2017	—	First edition issued

General Precautions in the Handling of Microprocessing Unit and Microcontroller Unit Products

The following usage notes are applicable to all Microprocessing unit and Microcontroller unit products from Renesas. For detailed usage notes on the products covered by this document, refer to the relevant sections of the document as well as any technical updates that have been issued for the products.

1. Handling of Unused Pins

   Handle unused pins in accordance with the directions given under Handling of Unused Pins in the manual.

   — The input pins of CMOS products are generally in the high-impedance state. In operation with an unused pin in the open-circuit state, extra electromagnetic noise is induced in the vicinity of LSI, an associated shoot-through current flows internally, and malfunctions occur due to the false recognition of the pin state as an input signal become possible. Unused pins should be handled as described under Handling of Unused Pins in the manual.

2. Processing at Power-on

   The state of the product is undefined at the moment when power is supplied.

   — The states of internal circuits in the LSI are indeterminate and the states of register settings and pins are undefined at the moment when power is supplied.
   In a finished product where the reset signal is applied to the external reset pin, the states of pins are not guaranteed from the moment when power is supplied until the reset process is completed.
   In a similar way, the states of pins in a product that is reset by an on-chip power-on reset function are not guaranteed from the moment when power is supplied until the power reaches the level at which resetting has been specified.

3. Prohibition of Access to Reserved Addresses

   Access to reserved addresses is prohibited.

   — The reserved addresses are provided for the possible future expansion of functions. Do not access these addresses; the correct operation of LSI is not guaranteed if they are accessed.

4. Clock Signals

   After applying a reset, only release the reset line after the operating clock signal has become stable. When switching the clock signal during program execution, wait until the target clock signal has stabilized.

   — When the clock signal is generated with an external resonator (or from an external oscillator) during a reset, ensure that the reset line is only released after full stabilization of the clock signal. Moreover, when switching to a clock signal produced with an external resonator (or by an external oscillator) while program execution is in progress, wait until the target clock signal is stable.

5. Differences between Products

   Before changing from one product to another, i.e. to a product with a different part number, confirm that the change will not lead to problems.

   — The characteristics of Microprocessing unit or Microcontroller unit products in the same group but having a different part number may differ in terms of the internal memory capacity, layout pattern, and other factors, which can affect the ranges of electrical characteristics, such as characteristic values, operating margins, immunity to noise, and amount of radiated noise. When changing to a product with a different part number, implement a system-evaluation test for the given product.

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