

RX72M Group

Communications Board EtherNet/IP Startup Manual

Application Note

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Introduction

This application note is a quick start guide for EtherNet/IP communication with the RX72M communication board for industrial network evaluation.

This stack runs on E-Force's real-time OS "µC3 (micro-C-cube)" and TCP/IP protocol stack "µNet 3 (micro-net-cube)".

Target Device

RX72M Group

Sample program

This sample program uses the evaluation version of EtherNet/IP stack of our partner: JSL Technology Co., Ltd.

Please contact JSL Technology Corporation for the purchase of the official version and the specifications of the sample program.

JSL Technology Co., Ltd .: <u>https://jslt.co.jp/</u>

[Restrictions]

The evaluation version of the EtherNet/IPIP stack is a library file built with the following functional restrictions, and can only be used for evaluation. It cannot used for integration into the product. In that case, please consider purchasing the official version.



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1. Operating Environment

The sample program in this manual assumes the following environment.

Table 1.1	Operating Environment
-----------	------------------------------

Item Description		
Board	RX72M communications board	
	TS-TCS07298 from Tessera Technology	
CPU	RX CPU (RXv3)	
	R5F572MNDxBD	
Operating frequency	CPU clock (CPUCLK): 240 MHz	
Operating voltage	3.3 V	
Operating modes	Single chip mode	
Device requirements	R5F572MNDDBD	
	Code flash memory	
	Capacity: 4 Mbytes	
	ROM cache: 8 Kbytes	
	Data flash memory	
	Capacity: 32 Kbytes	
	RAM / extended RAM	
	Capacity: 512 Kbytes / 512 Kbytes	
Communications protocol	EtherNet/IP (Version 3.5.7.0, Tested with ODVA CT18.1)	
Available port	CN2, CN3	
Integrated development environment	e2Studio V7.5.0 or later	
Tool chain	C/C ++ compiler package V3.01.00 or later for RX family	
Emulator (ICE)	Renesas E2 Lite	

1.1 Stack compatible specifications

The supported stack specifications are as follows.

- CIP Networks Library, CIP, Volume 1 (Edition 3.15, November 2013)
- CIP Networks Library, EtherNet/IP, Volume 2 (Edition 1.16, November 2013)



1.2 Supported CIP Object

The following CIP objects are supported.

CIP Objects 0x01 : Identity 0x02 : Message Router 0x04 : Assembly 0x06 : Connection Manager 0xF5 : TCP/IP Interface 0xF6 : Ethernet Link

1.2.1 Identity Object, Class 0x01

The support status of "Identity Object, Class 0x01" is described below.

Class Attributes

ld	Description	Get	Data Type		Value
01h	Revision	0	-	1	
02h	Max Instance	\bigcirc	-	1	
03h	Number of instances	0	-	1	

Class Services

	ld	Service
01h		Get_Attributes_All
0Eh		Get_Attribute_Single

■Instance Attributes

ld	Description	Get	Data Type	Value
01h	Vendor Id	0	UINT	0x451(1105) "Renesas Electronics"
02h	Device Type	0	UINT	0x2b (43) "Generic Device"
03h	Product Code	0	UINT	0x65 (101)
04h	Revision	0	UINT	3
		0	UINT	5
05h	Status	0	WORD	Bit 0: Owned Bit 1: Reserved, set to 0 Bit 2: Configured Bit 3: Reserved, set to 0 Bit 4-7: See Extended Device Status Bit 8: Minor Recoverable fault Bit 9: Minor Unrecoverable fault Bit 10: Major Recoverable fault Bit 11: Major Unrecoverable fault



				Bit 12-15: Reserved, set to 0 Extended device status (Bit 4-7) 0000 = Self-Testing or Unknown 0001 = Firmware Update in Progress 0010 = At least one faulted I/O connection 0011 = No I/O connections established 0100 = Non-Volatile Configuration bad 0101 = Major Fault 0110 = At least one I/O connection in run mode 0111 = At least one I/O connection established, all in idle mode
06h	Serial Number	0	UDINT	0x0000001 (1)
07h	Product Name	0	SHORT_ STRING	0F 45 49 50 53 2d 44 45 4d 4f 2d 52 58 37 32 4d Size: 15Byte "EIPS-DEMO-RX72M"

Common Services

ld	Implemented		Service
	Class	Instance	
01h	0	0	Get_Attributes_All
05h	-	0	Reset
0Eh	0	0	Get_Attribute_Single

Reset Services

Parameter	Service
0 (Power Cycle)	Save the current value in non-volatile memory and reset the power supply
1 (Return to Factory Defaults)	Save the default value to non-volatile memory and reset the power supply

1.2.2 Message Router Object, Class 0x02

The support status of "Message Router Object, Class 0x02" is described below.

- * Access to Class Attributes and Instance Attributes for this object is not supported.
- * Message Router Object is used only to route Explicit messages to other objects.



1.2.3 Assembly Object, Class 0x04

The support status of "Assembly Object, Class 0x04" is described below.

Class Attributes

ld	Description	Get	Data Type	Value
01h	Revision	0	UINT	2
02h	Max Instance	0	UINT	199
03h	Number of instances	0	UINT	8

■Instance Attributes

ld	Access Rule	Name	Data Type	Value
03h	Set by instance	Data	ARRAY of BYTE	Set by instance

■Instance 101, 103, 104, 106

ld	Access Rule	Name	Data Type	Size	Value
03h	Get	Data	ARRAY of BYTE	8	00 00 00 00 00 00 00 00 00

■Instance 102, 105

ld	Access Rule	Name	Data Type	Size	Value
03h	Get / Set	Data	ARRAY of BYTE	8	00 00 00 00 00 00 00 00

■Instance 198, 199

ld	Access Rule	Name	Data Type	Size	Value
03h	Get / Set	Data	ARRAY of BYTE	0	

■Common Services

ld	Impler	nented	Service
	Class Instance		
0Eh	0	0	Get_Attributes_Single
10h	-	0	Set_Attribute_Single



1.2.4 Connection Manager Object, Class 0x06

The support status of "Connection Manager Object, Class 0x06" is described below.

Class Attributes

ld	Description	Get	Data Type	Value
01h	Revision	0	UINT	1
02h	Max Instance	0	UINT	1
03h	Number of instances	0	UINT	1

■Instance Attributes

ld	Description	Get	Data Type	Value
01h	Open Requests	0	UINT	0
02h	Open Format Rejects	0	UINT	0
03h	Open Resource Rejects	0	UINT	0
04h	Open Other Rejects	0	UINT	0
05h	Close Requests	0	UINT	0
06h	Close Format Requests	0	UINT	0
07h	Close Other Requests	0	UINT	0
08h	Connection Timeouts	0	UINT	0

■Common Services

ld	Impler	nented	Service
	Class Instance		-
01h	0	0	Get_Attributes_All
0Eh	0	0	Get_Attribute_Single

■ Object-Specific Services

ld	Implen	nented	Service
	Class	Instance	
4Eh	-	0	Forward_Close
54h	-	0	Forward_Open
5Bh	-	0	Large_Forward_Open



1.2.5 TCP/IP Interface Object, Class 0xF5

The support status of "TCP/IP Interface Object, Class 0xF5" is described below.

Class Attributes

ld	Description	Get	Data Type	Value
01h	Revision	0	UINT	4
02h	Max Instance	0	UINT	1
03h	Number of instances	0	UINT	1

■Instance Attributes

ld	Description	Get	Data Type	Value
01h	Status	0	UINT	2
02h	Configuration Capability	0	UINT	32
03h	Configuration Control	0	UINT	0
04h	Physical Link	0	STRUCT of:	-
	Path size		UINT	2
	Path		Padded EPATH	20 F6 24 01
05h	Interface Configuration	0	STRUCT of:	0
	IP Address		UDINT	0A 01 A8 C0 "192.168.1.10"
	Network Mask		UDINT	00 FF FF FF "255.255.255.0"
	Gateway Address		UDINT	00 00 00 00 "0.0.0.0"
	Name Server		UDINT	00 00 00 00 "0.0.0.0"
	Name Server2		UDINT	00 00 00 00 "0.0.0.0"
	Domain Name		STRING	00 00
06h	Host Name	0	STRING	0
08h	TTL Value	0	USINT	1
09h	MCast Config	0	STRUCT of:	-
	Alloc Control		USINT	0
	Reserved		USINT	0
	Mun Mcast	-	UINT	32
	Mcast Start Addr	-	UDINT	20 02 C0 EF "239.192.2.32"
0Ah	SelectAcd	Get/Set	BOOL	1



0Bh	LastConflictDetected	Get/Set	STRUCT of:	
	AcdActivity		USINT	
	RemoteMAC		Array of 6 USINT	00 00 00 00 00 00 Mac address "00:00:00:00:00"
	ArpPdu		ARRAY of 28 USINT	00 00 00 00 00 00 00 00 00 00 00 00 00 0
0Dh		Get/Set		

Common Services

ld	Implen	nented	Service
	Class	Instance	
01h	0	0	Get_Attributes_All
0Eh	0	0	Get_Attribute_Single
10h	-	0	Set_Attribute_Single



1.2.6 EtherNet Link Object, Class 0xF6

The support status of "EtherNet Link Object, Class 0xF6"" is described below.

Class Attributes

ld	Description	Get	Data Type	Value
01h	Revision	0	UINT	4
02h	Max Instance	0	UINT	3
03h	Number of instances	0	UINT	3

■Instance Attributes

ld	Description	Get	Data Type	Value
01h	Interface Speed	0	UDINT	Set by instance
02h	Interface Flags	0	DWORD	Set by instance
03h	Physical Address	0	Array of 6 USINT	Set by instance
04h	Interface Counters	0	STRUCT of:	-
	In Octets		UDINT	Set by instance
	In Ucast Packets		UDINT	Set by instance
	In NUcast Packets		UDINT	Set by instance
	In Discards		UDINT	Set by instance
	In Errors		UDINT	Set by instance
	In Unknown Protos		UDINT	Set by instance
	Out Octets		UDINT	Set by instance
	Out Ucast Packets		UDINT	Set by instance
	Out NUcast Packets		UDINT	Set by instance
	Out Discards		UDINT	Set by instance
	Out Errors		UDINT	Set by instance
05h	Media Counters	0	STRUCT of:	-
	Alignment Errors		UDINT	Set by instance
	FCS Errors		UDINT	Set by instance
	Single Collisions		UDINT	Set by instance
	Multiple Collisions		UDINT	Set by instance
	SQE Test Errors		UDINT	Set by instance
	Deferred Transmissions		UDINT	Set by instance
	Late Collisions		UDINT	Set by instance
	Excessive Collisions		UDINT	Set by instance
	MAC Transmit Errors	ĺ	UDINT	Set by instance
	Carrier Sense Errors		UDINT	Set by instance



[Frame Too Long	Γ	UDINT	Set by instance
	l	-	_	
	MAC Receive Errors		UDINT	Set by instance
07h	Interface Type	0	USINT	Set by instance
08h	Interface State	0	USINT	Set by instance
0Ah	Interface Label	0	SHORT_STRING	Set by instance
0Bh	Interface Capability	0	STRUCT of:	-
	Capability Bits		DWORD	Set by instance
	Speed/Duplex Options		STRUCT of:	-
	Speed/Duplex Array Count		USINT	Set by instance
	Speed/Duplex Array		ARRAY of:	-
	Speed/Duplex Pair		STRUCT of:	-
	Interface Speed		UINT	Set by instance
	Interface Duplex Mode		USINT	Set by instance
	Interface Speed		UINT	Set by instance
	Interface Duplex Mode		USINT	Set by instance
	Interface Speed		UINT	Set by instance
	Interface Duplex Mode		USINT	Set by instance
	Interface Speed		UINT	Set by instance
	Interface Duplex		USINT	Set by instance

■Instance 1 (Port 1)

ld	Description	Get	Data Type	Value
01h	Interface Speed	0	UDINT	0x00000064 (100) 100Mbps
02h	Interface Flags	0	DWORD	0x000000F (15) "Successfully negotiated speed and duplex"
03h	Physical Address	0	Array of 6 USINT	12 34 56 78 36 15 Mac address "12:34:56:78:36:15"
04h	Interface Counters	0	STRUCT of:	-
	In Octets		UDINT	0
	In Ucast Packets		UDINT	0
	In NUcast Packets		UDINT	0
	In Discards		UDINT	0
	In Errors		UDINT	0
	In Unknown Protos		UDINT	0
	Out Octets		UDINT	0
	Out Ucast Packets		UDINT	0
	Out NUcast Packets		UDINT	0



	Out Discards	1	UDINT	0
	Out Errors		UDINT	0
05h	Media Counters	\odot	STRUCT of:	-
	Alignment Errors		UDINT	0
	FCS Errors		UDINT	0
	Single Collisions		UDINT	0
	Multiple Collisions		UDINT	0
	SQE Test Errors		UDINT	0
	Deferred Transmissions		UDINT	0
	Late Collisions		UDINT	0
	Excessive Collisions		UDINT	0
	MAC Transmit Errors		UDINT	0
	Carrier Sense Errors		UDINT	0
	Frame Too Long		UDINT	0
	MAC Receive Errors		UDINT	0
07h	Interface Type	0	USINT	0x02 (2) "Twisted-pair"
08h	Interface State	0	USINT	0x01 (1) "The interface is enabled"
0Ah	Interface Label	0	SHORT_STRING	06 50 6f 72 74 20 31 Size: 6Byte "Port 1"
0Bh	Interface Capability	\bigcirc	STRUCT of:	-
	Capability Bits	-	DWORD	0x00000006 Auto-negotiate, Auto-MDIX
	Speed/Duplex Options		STRUCT of:	-
	Speed/Duplex Array Count		USINT	4
	Speed/Duplex Array		ARRAY of:	-
	Speed/Duplex Pair		STRUCT of:	-
	Interface Speed		UINT	10
	Interface Duplex Mode		USINT	0
	Interface Speed		UINT	10
	Interface Duplex Mode		USINT	1
	Interface Speed		UINT	100
	Interface Duplex Mode		USINT	0
	Interface Speed		UINT	100
	Interface Duplex		USINT	1



■Instance 2 (Port 2)

ld	Description	Get	Data Type	Value
01h	Interface Speed	0	UDINT	0x00000064 (100) 100Mbps
02h	Interface Flags	0	DWORD	0x0000000F (15) "Successfully negotiated speed and duplex"
03h	Physical Address	0	Array of 6 USINT	12 34 56 78 36 15 Mac address "12:34:56:78:36:15"
04h	Interface Counters	0	STRUCT of:	-
	In Octets		UDINT	0
	In Ucast Packets		UDINT	0
	In NUcast Packets		UDINT	0
	In Discards		UDINT	0
	In Errors		UDINT	0
	In Unknown Protos		UDINT	0
	Out Octets		UDINT	0
	Out Ucast Packets		UDINT	0
	Out NUcast Packets		UDINT	0
	Out Discards		UDINT	0
	Out Errors		UDINT	0
05h	Media Counters	0	STRUCT of:	-
	Alignment Errors		UDINT	0
	FCS Errors		UDINT	0
	Single Collisions		UDINT	0
	Multiple Collisions		UDINT	0
	SQE Test Errors		UDINT	0
	Deferred Transmissions		UDINT	0
	Late Collisions		UDINT	0
	Excessive Collisions		UDINT	0
	MAC Transmit Errors		UDINT	0
	Carrier Sense Errors		UDINT	0
	Frame Too Long		UDINT	0
	MAC Receive Errors		UDINT	0
07h	Interface Type	0	USINT	0x02 (2) "Twisted-pair"
08h	Interface State	0	USINT	0x01 (1) "The interface is enabled"
0Ah	Interface Label	0	SHORT_STRING	06 50 6f 72 74 20 32 Size: 6Byte "Port 2"
0Bh	Interface Capability		STRUCT of:	-



Capability Bits	0	DWORD	0x00000006 Auto-negotiate, Auto-MDIX
Speed/Duplex Options		STRUCT of:	-
Speed/Duplex Array Count		USINT	4
Speed/Duplex Array		ARRAY of:	-
Speed/Duplex Pair		STRUCT of:	-
Interface Speed		UINT	10
Interface Duplex Mode		USINT	0
Interface Speed		UINT	10
Interface Duplex Mode		USINT	1
Interface Speed		UINT	100
Interface Duplex Mode		USINT	0
Interface Speed		UINT	100
Interface Duplex		USINT	1

■Instance 3 (internal)

ld	Description	Get	Data Type	Value
01h	Interface Speed	0	UDINT	0x00000000 (0) 0Mbps
02h	Interface Flags	0	DWORD	0x00000010 (16) "Successfully negotiated speed and duplex"
03h	Physical Address	0	Array of 6 USINT	12 34 56 78 36 15 Mac address "12:34:56:78:36:15"
04h	Interface Counters	0	STRUCT of:	-
	In Octets		UDINT	0
	In Ucast Packets		UDINT	0
	In NUcast Packets		UDINT	0
	In Discards		UDINT	0
	In Errors		UDINT	0
	In Unknown Protos		UDINT	0
	Out Octets		UDINT	0
	Out Ucast Packets		UDINT	0
	Out NUcast Packets		UDINT	0
	Out Discards		UDINT	0
	Out Errors		UDINT	0
05h	Media Counters	0	STRUCT of:	-
	Alignment Errors		UDINT	0
	FCS Errors		UDINT	0
	Single Collisions		UDINT	0



	Multiple Collisions		UDINT	0
	SQE Test Errors		UDINT	0
	Deferred Transmissions		UDINT	0
	Late Collisions		UDINT	0
	Excessive Collisions		UDINT	0
	MAC Transmit Errors		UDINT	0
	Carrier Sense Errors		UDINT	0
	Frame Too Long		UDINT	0
	MAC Receive Errors		UDINT	0
07h	Interface Type	0	USINT	0x01 (1) "The interface is internal to the device"
08h	Interface State	0	USINT	0x01 (1)
		Ŭ		"The interface is enabled"
0Ah	Interface Label	0	SHORT_STRING	08 69 6e 74 65 72 6e 61 6c
				Size: 8Byte "internal"
0Bh	Interface Capability	0	STRUCT of:	-
	Capability Bits		DWORD	0x0000006
				Auto-negotiate, Auto-MDIX
	Speed/Duplex Options		STRUCT of:	-
	Speed/Duplex Array Count		USINT	4
	Speed/Duplex Array		ARRAY of:	-
	Speed/Duplex Pair		STRUCT of:	-
	Interface Speed		UINT	10
	Interface Duplex Mode		USINT	0
	Interface Speed		UINT	10
	Interface Duplex Mode		USINT	1
	Interface Speed		UINT	100
	Interface Duplex Mode		USINT	0
	Interface Speed		UINT	100
	Interface Duplex		USINT	1

■Common Services

ld	Impler	nented	Service
	Class	Instance	
01h	0	0	Get_Attributes_All
0Eh	0	0	Get_Attribute_Single
10h	-	0	Set_Attribute_Single



■Object-Specific Services

ld	Implen	nented	Service
	Class	Instance	
4Ch	-	0	Get_and_Clear

Get_and_Clear corresponds to the following Instance Attribute.

- 0x04: Interface Counters
- 0x05: Media Counters

The value of each attribute is reset to 0 after the service is executed.



1.3 Sample program folder structure

The release folder structure is described below.

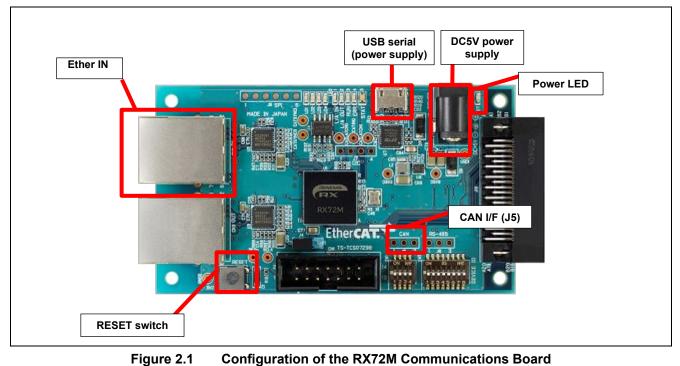
```
[eip_adpt]
```

```
|
|-[lib] : library
|
|-[prj_rx72m_e] : e<sup>2</sup> studio folder
|
|-[src] : Source folder
|-[app]
| |-[rx72m]
| |-[rx72m]
| |-[uC3] : uC3 main, driver
| |-[odva] : EDS/STC file
| | |-[eds] : EDS file "Renesas RX72M EIP Adapter Sample.eds"
| | |-[stc] : Structure file for CT18.1 test "Renesas EIP RX72M Sample.stc"
```



2. Setting up and Connecting the Evaluation Board

For detailed information on the board, refer to the RX72M Group Communications Board Hardware Manual.



2.1 Setting up the Board

Before supplying power to the board, set up jumpers and connect the cables. In addition, make settings for the JTAG configuration mode. This mode is normally used with a short circuit between jumper pins 2 and 3.

For the detailed locations of the related parts, refer to the RX72M Communications Board Hardware Manual.

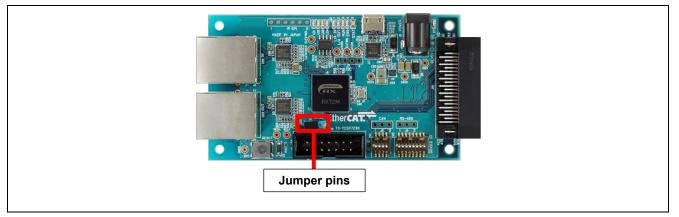


Figure 2.2 Setting up Jumper Pins

2.2 Selecting the Power Source

Power to the RX72M can be supplied from a 5-V DC power source or through the USB port. Use whichever is suitable for the configuration of your operating environment.



3. Installing the e² studio

Download RX72M compatible e2studio (V7.5.0 or later) from the following website.

https://www.renesas.com/e2studio_download

3.1 Installing the CC-RX Compiler V3.01.00

The compiler selection screen appears while installing e2studio. By selecting [Renesas CCRX v3.0 1.00] and selecting [Next], CC-RX V3.0 1.00 compiler compatible with RX72M will be installed together.

🙀 Renesas CC-RX Compilers	* ^
□ Renesas CCRX v3.00.00 v3.00.00 Renesas C/C++ Compiler Package for RX Family v3.00.00 ダウンロード・サイズ: 22.5 MB Requires: • Renesas Tool License Manager - 2.2.1 ■ Renesas C/C++ Compiler Package for RX Family v3.01.00 ダウンロード・サイズ: 21.4 MB Requires: • Renesas Tool License Manager - 2.2.1	
🙀 GCC for Renesas RX (Registration Required)	*
GCC for Renesas RX 4.8.4.201803 4.8.4.201803 GCC for Renesas RX 4.8.4.201803 ダウソロード・サイズ: 72.8 MB	
GCC for Renesas RX 4.8.4.201801 4.8.4.201801	~

To start e2studio, please run "e2studio.exe" located in the installed folder below.

e2_studio_rx72m\eclipse



3.2 Registering the Tool Chain

Register the CC-RX compiler v3.01.00 so that it can be used with the e² studio for RX72M.

(1) Start the e^2 studio for RX72M.

(2) Select [File] \rightarrow [New] \rightarrow [C/C++Project] \rightarrow [Next].

e ² New Project Select a wizard Create a new C or C++ project	
Wizards: type filter text C/C++ C/C++ Project Makefile Project with Existing Code Java SVN	

(3) In the [Templates for New C/C++ Project] dialog box, select [Renesas RX] → [Renesas CC-RX C/C++ Executable Project] → [Next].

All GCC for Renesas RX C/C++ Library Project ^ Make A C/C++ Library Project for Renesas RX using the GCC for Renesas RX Toolchain. ^ Renesas RX Makefile Project (Kperimental) Create a new project that builds with the 'make' build tool using CDT's new Core Build Syste Renesas CC-RX C/C++ Executable Project A C/C++ Diplect for Renesas RX using the Renesas CCRX toolchain. Renesas CC-RX C/C++ Library Project A C/C++ Diplect for Renesas RX using the Renesas CCRX toolchain.
Make Renesas Debug Renesas RX Renesas RX Makefile Project (Experimental) Create a new project that builds with the 'make' build tool using CDT's new Core Build Syste Renesas CC-RX C/C++ Executable Project A C/C++ Project for Renesas RX using the Renesas CCRX colchain. Renesas CC-RX C/C++ Executable Project A C/C++ Droject for Renesas RX using the Renesas CCRX toolchain. Renesas CC-RX C/C++ Library Project A C/C++ Library Project for Renesas RX using the
Renesas CCRX toolchain,

- (4) In the [New Renesas CC-RX C/C++ Executable Project] dialog box, enter a desired project name and select [Next].
- (5) In the [Select toolchain, device & debug settings] dialog box, select [Toolchain Management] under [Toolchain Settings].



(6) In the [Renesas Toolchain Management] dialog box, select [Add] → [Browse...] to refer to the installation folder "C:¥Renesas¥RX¥3_0_1".

The registration was successful if "v3.01.00 has been added under "Renesas CCRX".

Scan for installed toolchains on	startup	
Disable warning if no toolchains	are installed	
Toolchain Type	Installation Path	
✓ ■ Renesas CCRX		
√ v3.01.00	C:¥Renesas¥RX¥3_1_0¥	
v2.08.00	C:¥Program Files (x86)¥Renesas¥RX¥2_8_0¥	
GCC for Renesas RX		
KPIT GNURX-ELF Toolchain		



4. Evaluation environment construction method

The following describes method to build a development environment.

4.1 Preparing the evaluation environment

- (1) Preparing the environment folder
 - Release environment (unzid download folder) in an optional folder.
 - ex : C:\proj\eip_adp

(2) EDS File

Use the EDS file in the following folder for the EDS file.eip_adpt\src\app\rx72m\uc3\odva\eds

• Renesas RX72M EIP Adapter Sample.eds

4.2 Execution procedure

Describes the procedure to execute communication in the sample application.

- (1) After starting e2studio, click "File"-> "Import".
- (2) In the "Select" dialog, select "General" \rightarrow "To an existing project to workspace" and click "Next".

Select an import wizard: type filter text	e Impor Select Create no	t ew projects from an archive file or directory.	 2	×
	type filt	er text General Archive File File System W HEW Projects into Workspace Projects from Folder or Archive Projects from Folder or Archive Projects from Folder or Archive Renesas CCRX project conversion to Renesas GCC RX Renesas CS+ Project for CA78K0R/CA78K0 Presesas CS+ Project for CC-RX and CC-RL (/C++ Code Generator Git	e	



(3) Select the "Select root directory" check box in the "Import project" dialog and click "Browse". Select "prj_rx72m_e" and click "Open". Click Finish to complete the project import.

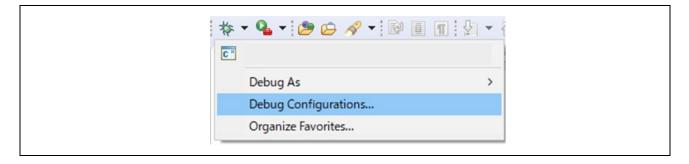
e ² Import		
Import Projects Select a directory to sear	ch for existing Eclipse projects.	
• Select root directory:	C:¥Users¥a5000352¥Desktop¥Renesas_RX72N ∨	Browse
○ Select archive file:	✓	Browse
Projects:		
main (C:¥Users¥a	5000352¥Desktop¥Renesas_RX72M_EIP_Adapter_v	Select All
		Deselect All
		Refresh

(4) Select the "main" project in the [Project Explorer] field, select the arrow next to the [Build] button (hammer icon), and select [HardwareDebug] from the drop-down menu.

File Edit Source Refactor Navigate Search	h Project Renesas Views Run Window Help	
🐔 🐐 🔳 🔯 Debug 🗸	main HardwareDebug 🗸 🌞 🗄 🖛 📓 🔞	• 🔦 • 🔜 🗽 🛛 👦 • 🎭 💷 😭 🐑
i	<mark>중</mark> ▼!ඖ	 1 HardwareDebug (Debug on hardware)
🎦 Project Explorer 🐹 📄 🤹 🍸 🗖 🗖		🖳 🗖 🔚 Outline 🔀 💿 Build T 📍
 > S ecat_demo_comrx72m > ecat_demo_rskrx72m > main 		An outline is not available.



(5) e2studio builds the project. Once the build is complete, you can start debugging by selecting the arrow next to the Debug button (bug icon) and selecting "Debug Configuration".

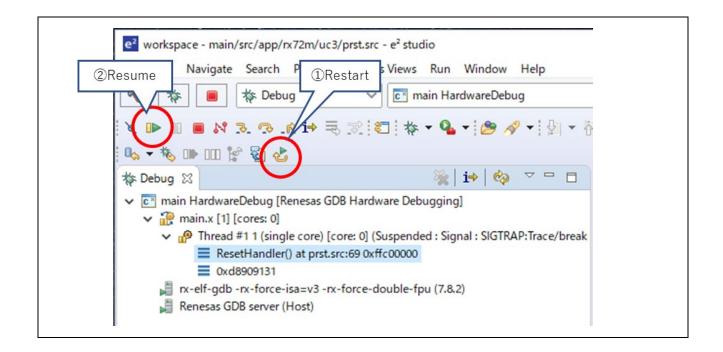


(6) Select "main HardwareDebug" and select [Debug] to download the program to the target.

			20
	Name: main HardwareDebug		
type filter text	📄 Main 🚿 Debugger 🕨 Startup 🧤	Source Common	
C/C++ Application	Project:		
C/C++ Remote Application	main		Browse.
GDB Hardware Debugging	C/C++ Application:		
GDB OpenOCD Debugging	HardwareDebug/main.x		
CP GDB Simulator Debugging (RH850) Java Applet		Variables Search Project	Browse.
Java Application	Build (if required) before launching		
🚭 Launch Group խ Launch Group (Deprecated)	Build Configuration: Select Automatical	L.	
Remote Java Application			
✓ C [™] Renesas GDB Hardware Debugging	O Enable auto build	O Disable auto build	
▶ ecat_demo_comrx72m HardwareDebug ▶ ecat_demo_rskrx72m HardwareDebug	Use workspace settings	Configure Workspace Settings	
c* main HardwareDebug			
Renesas Simulator Debugging (RX, RL78)			
		Revert	Apply



- (7) If a firewall warning is displayed for "e2-server-gdb.exe", check the checkbox for [Private networks, such as my home or work network] and select [Allow access].
- (8) The User Account Control (UAC) dialog box may appear. Enter the administrator's password and select [Yes].
- (9) If the Confirm Perspective Switch dialog box appears prompting you to switch the perspective, check the checkbox for [Remember my decision] and select [Yes].
- (10) The green "ACT" LED on the E2 Lite debugger will be continuously lit.
- (11) After downloading the code, select the [Resume] button to run the code. The code will break at the address where the main function starts. Select the [Resume] button again to continue to run the code.





5. Confirmation of sample project operation

This chapter describes the sample project operation check using the CODESYS software PLC.

Connect the communication board and PC according to "5.1 Connection Configuration". Connecting the PC and USB Serial of the communication board turns on the power to the communication board.

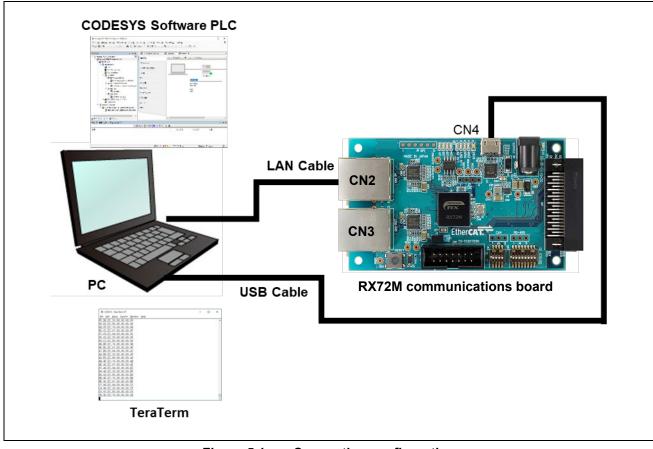


Figure 5.1 Connection configuration



5.1 Starting the CODESYS and Creating a New Project

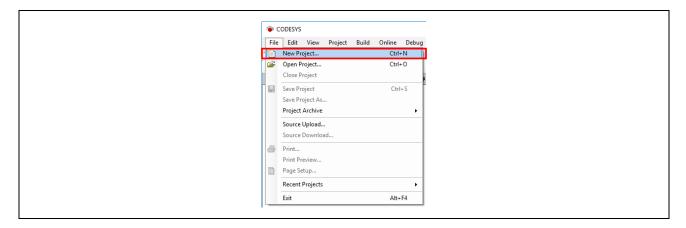
5.1.1 Starting the CODESYS

Select "All Programs" > 3S CODESYS > CODESYS > CODESYS Vx.x (x.x represents the version number) from the Windows start menu.

You can also startup the program by double-clicking on the "CODESYS" icon, which will be created on the desktop after the installation of the program.

5.1.2 Creating a New Project

Select "New Project" from the "File" menu to create a new project.



In the "New Project" window, select "Projects" from the "Categories" section and "Standard project" from the "Templates" section.

Then, specify the name of the project and its location and click on "OK".

1 New Pro	ject			×	
	raries ojects	Templates Empty project	HMI project	Standard project	
A project c	ontaining one device, one app	lication, and an empty i	mplementation for	PLC_PRG	
Name Location	Renesas-EtherNetIp C:¥Proj			~ ·	
			OK	Cancel .:	



In the "Standard Project" window, select the controller and programming language you wish to use from the drop-down lists for "Device" and "PLC_PRG in". For this example, select "CODESYS Control Win V3" and "Structured Text (ST)", respectively. (If the 64-bit version is installed on the PC, select "CODESYS Control Win V3 x64") After that, click on "OK" to open the new project

Standard Pro	ject		×
	objects withir - One progran - A program P - A cyclic task	t to create a new standard project. This wizard will create the following a this project: mable device as specified below LC_PRG in the language specified below which calls PLC_PRG to the newest version of the Standard library currently installed.	
ſ	Device	CODESYS Control Win V3 (3S - Smart Software Solutions GmbH)	\sim
F	PLC_PRG in	Structured Text (ST)	\sim
		OK Cancel	

The "Device" tree for the newly created project will be displayed as shown below.

The components that belong to "Device (CODESYS Control Win V3)" are managed in a tree structure.



5.1.3 Starting the Gateway Server

Check the state of the gateway server on the system tray. If the server is down, click on the " 🖤 " icon and select "Start Gateway" to start the server up. Usually, the server will automatically be started as a standard service on booting of Windows and its status are indicated in the system tray in the lower-right corner of the desktop.



5.1.4 Starting the Software PLC

Check the state of the software PLC on the system tray. If the program is stopped, click on the " III " icon and select "Start PLC" to start the program up. Usually, the program will automatically be started as a standard service on booting of Windows and its status is indicated in the system tray in the lower-right corner of the desktop

Start PLC Stop PLC Exit PLC Control About
イズ 14: 14: 14:



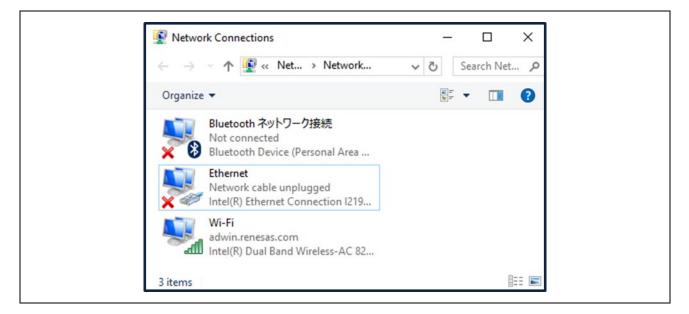
5.1.5 Configuring a Device Network

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

Setting the Host IP Address

Set the IP address before configuring the device.

Open "Network Connection".



In the "Local Area Connection Status" window, select "Properties".

	tivity: No network acc Enab REL-W 1 day 03:24 300.0 M y:
--	---



In the "Local Area Connection Properties" window, highlight "Internet Protocol Version 4 (TCP/IPv4)" then click on the "Properties" button.

	t Properties	2	×
Networking	Sharing		_
Connect u	sing:		
👮 Inte	I(R) Ethernet Connection 1219–LM	_	
This conne	ection uses the following items:	Configure	
🗆 🐙м	ficrosoft ネットワーク用ファイルとプリンター	共有 ^	1
🗆 👰 Q	loS パケット スケジューラ		
	(ンターネット プロトコル パージョン 6 (TOP)	/IPv6)	
	(ンターネット プロトコル パージョン 4 (TOP)	(IPv4)	
🗆 💶 Li	ink–Layer Topology Discovery Mapper	I/O Driver	
П.М	licrosoft Network Adapter Multiplexor	Protocol Y	
<		>	
Inst	tall Uninstall	Properties	
Descripti	ion		
	御プロトコル/インターネット プロトコル。相〕 トワーク間の通信を提供する、既定のワイ】	互接続されたさまざ ド エリア ネットワーク	
			·
	OK	Cancel	

Select the radio button "Use the following IP Address" and set IP and subnet mask. However, the network IP address should match with Device IP.

eneral	
	automatically if your network supports eed to ask your network administrator
Obtain an IP address autom	atically
• Use the following IP address	s:
IP address:	
Subnet mask:	
Default gateway:	
Obtain DNS server address	automatically
• Use the following DNS serve	er addresses:
Preferred DNS server:	
Alternate DNS server:	
Validate settings upon exit	Advanced
	OK Cancel

This is the end of the configuration.



5.2 Connection setting with CODESYS

5.2.1 Select device

Make connection settings for connecting the software PLC service from your development environment. Double-click on the "Device (CODESYS Control Win V3) in the "Device" tree. On the "Device" tabbed page, select "Connection settings" and click on the "Scan network..." button.

 Renesas-EtherNetlp.project - CODESYS File Edit View Project Build Online Debug T 	ools Window Help
管 📽 🖬 🕌 🗠 여 🐰 🖿 🛍 🗙 🕌 🌿 [📕 🐄 🦄 🦄 🛱 🏷 🖝 🔓 🛛 Application [Device:
Devices - 4 ×	EIPS_DEMO_RX72M
Renesas-EtherNetIp CODESYS Control Win V3) PLC Logic Application Library Manager PLC_PRG (PRG)	Communication Settings Scan Network Applications Backup and Restore
Task Configuration	Files

The "Select Device" window opens and a search for available devices that can use the local network automatically starts. Finding a software PLC service constitutes success and the name of the corresponding PC will be indicated. Double-click on the PC name to make a connection.

If the service will not be found, check the settings described in previous sections, 5.1.3Starting the Gateway Server and 5.1.4Starting the Software PLC.

Gateway-1	Scan network
PC name [numeric value] will be displayed.	



5.2.2 Installing the Device Information

Install an EDS (electronic data sheet) file which contains a description of the EtherNet/IP slave device. A file for use with EtherNet/IP is provided with the released stack.

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

Tool	s <u>W</u> indow <u>H</u> elp
Ø	Package Manager
1	Library Repository
1	Device Repository
8	Visualization Styles Repository
	License Repository
	License Manager
	Scripting
	Customize
	Options



In the dialog box, click on the "Install" button to produce the dialog box where you are to enter the name of the provided EDS file. Specify " Renesas_RX72M_EtherNetIP_Adapter.eds ". The result of installation will be indicated under the file name. An

icon "¹ appears in the case of normal installation, as is shown within the blue rectangle in the figure below

Location	System Repository				\sim	Edit Locations
	(C:\ProgramData\CODESYS\Device	s)				
Installed d	levice descriptions					
String for	a fulltext search	/endor:	<all vendors=""></all>		\sim	Install
Name		Ven	dor	Version	^	Uninstall
□ (🗕 EtherNet/IP					Export
	🗉 🖷 🦉 Ethernet Adapter					
	🗉 😔 EtherNet/IP Local Adapter					
6	🛎 👄 EtherNet/IP Module					
6	EtherNet/IP Remote Adapter					
	EIPS-DEMO-RX72M	Ren	esas Electronics	Major Revision=16#3, Minor Revi	s	
	🛄 Generic EtherNet/IP device	3S -	Smart Software Solutions GmbH	3.5.15.0		
	🗄 - ⊖ EtherNet/IP Scanner				¥	
<				>		
	: :¥proj¥eip_adpt¥src¥app¥rx72m¥uc3¥	- J V - J.	VD DV ZOM EID A db C	ula ada		
	Device "EIPS-DEMO-RX72M" installer			ple.eus		Details
	Device EIPS-DEMO-RX72M Installe	a to devic	e repository.			



5.2.3 Adding EtherNet/IP Device

Add necessary devices to the "Device" tree.

(1) Adding Ethernet

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

<u>F</u> ile <u>E</u> dit <u>V</u> iew	Project	<u>B</u> uild <u>O</u> nline	<u>D</u> ebug	<u>T</u> ools	Wind
1) n c	, he ita :	× 1.444 (*	\$ I @	1
Devices				→ ₽	×
B Prenesas-El	therNetIP				•
🖻 💮 Device	(CODESYS	Control Win V3)			
	C Log 🐰	Cut			
		Сору			
	œ.	Paste			
	\times	Delete			
		Browse		•	
	æ	Properties			
	***	Add Object		•	
		Add Folder			
		Add Device			
		Update Device			



The "Add Device" dialog box opens. Select "Ethernet" under "Fieldbusses", "Profinet IO", then "Ethernet Adapter" and click on the "Add Device" button.

Action: Action:	Insert device	Plug device O Update devic	e
Device:			
Vendor: <all th="" vendor<=""><th>s></th><th></th><th></th></all>	s>		
Name		Vendor	Version
🖃 👔 Fieldbusses			
🖃 👄 EtherNet/	IP		l
🖃 🕮 Ether	net Adapter		
- 🗃 Et	hernet	3S - Smart Software Solutions Gr	mbH 3.5.9.0
🗷 👄 Etheri	Net/IP Scanner		
•		III	4
Group by category			
Display all version	s (for experts o	nly)	
Display outdated v	ersions		
Information:			
Name: Etherne	t		
Vendor: 3S - Sr		-	
	hernet Adapter	r, Ethernet Adapter, Ethernet	
Adapter Version: 3.5.9	0		3
~ ! !		•	
Append selected dev	vice as last ch	ild of	
Device			
			dow is open.)



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

Eile	<u>E</u> dit	View	NetIP.pr Project	Build	<u>O</u> nline	<u>D</u> ebug		
Device	25			<u></u>	3 63 3	× 1 #4	2.58 E	
		evice ((erNetIP CODESYS (Logic rnet (Ethe		Win V3)			

(2) Adding EtherNet/IP Scanner

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

<u>File E</u> dit <u>V</u> ie	w <u>Projec</u>	t <u>B</u> uild <u>O</u> nline	<u>D</u> ebug <u>T</u> ools	Windo
12 🚔 🔚 1	5 M	- X 🖻 🖻 🗡	< 🚜 🕼 🛱) %
Devices			▼ 4	×
Renesas	EtherNetIP			
🗏 💮 Devic	e (CODESY	S Control Win V3)		
æ-∎¶ P	LC Logic			
L. 🕤 E	thernet (Et			
		Cut		
		Сору		
		Paste		
	×			
		Browse	•	
		Refactoring	•	
	G	Properties		
	223	Add Object		
	0	Add Folder		
		Add Device		
		Insert Device		



The "Add Device" dialog box opens. Select "EtherNet/IP Scanner" under "Fieldbusses", "EtherNet/IP", then "EtherNet/IP Scanner" and click on the "Add Device" button.

Device: Vendor:	<all vendors=""></all>		-
Name		Vendor	Versic ^
B	dbusses EtherNet/IP G EtherNet/IP Local Adapter C EtherNet/IP Scanner		Б
	EtherNet/IP Scanner	3S - Smart Software Solutions GmbH	3.5.9.1
•			•
Veno Cate Vers Orde	e: EtherNet/IP Scanner for: 3S - Smart Software Solutions gories: EtherNet/IP Scanner ion: 3.5.9.10 er Number: 1 cription: EtherNet/IP Scanner	GmbH	
Cate Vers Orde	gories: EtherNet/IP Scanner ion: 3.5.9.10 er Number: 1		



You can see that "EtherNet/IP Scanner" has been added under "Ethernet" in the "Device" tree.

 Renesas-EtherNetIP.project* - CODESYS <u>File</u> <u>Edit</u> <u>View</u> <u>Project</u> <u>Build</u> <u>Online</u> <u>Debui</u> 	g <u>T</u> ools <u>W</u> i
19 🖻 🖶 🥔 🗠 🛪 🖿 🛍 🗙 🖊	s si a P
Devices	→ ₽ X
	• • •
 ∃∰ Renesas-EtherNetIP	
Internet in the second s	
Renesas-EtherNetIP	
Renesas-EtherNetIP Device (CODESYS Control Win V3)	

(3) Adding Renesas_EIP_Adapter

Right-click on "EtherNet_IP_Scanner" in the "Device" tree and select "Add Device".

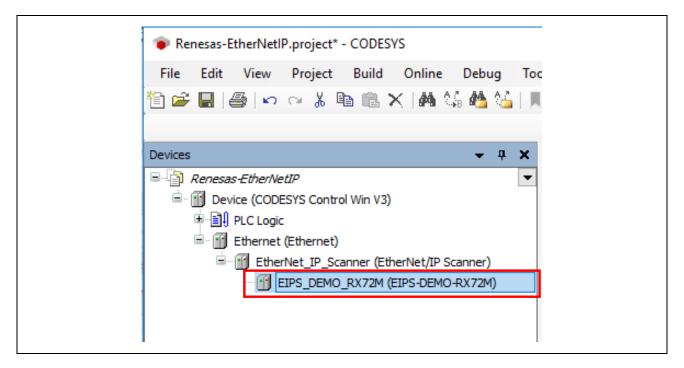
1			ug <u>T</u> ools	VVII
	~ *	₽ R × I	Ma 🕼 🛱	31
Devices			→ ₽	×
Renesas-EtherNet	P			-
Device (CODES	YS Cont	rol Win V3)		
🗷 🗐 PLC Logic				
🖻 🚮 Ethernet (B	Ethernet)		
🕤 EtherN	let 📆	0-1 x 1 k	~ `	
		Cut		
		Сору		
	E.	Paste		
	\times	Delete		
		Browse		۲
		Refactoring		•
	Ē	Properties		
	222	Add Object		
		Add Folder		
		Add Device		
		InservDevice		



In the Add Device dialog, select "EIPS-DEMO-RX72M" under "Fieldbusses – EtherNet / IP – EtherNet / IP Remote Adapter" and click the "Add Device" button.

Name EIPS_DEMO_RX72M_1 Action Append device Insert device	O Plug device O L	pdate device	
String for a fulltext search	Vendor	<all vendors=""></all>	~
Name Fieldbuses Comparison of the second s	Vendor		Version
EIPS-DEMO-RX72 Generic EtherNet,	M Renesas	Electronics t Software Solutions GmbH	Major Revision=16#3, N 3.5.15.0
Group by category Display al Name: EIPS-DEMO-RX72M Vendor: Renesas Electronics Categories: EtherNet/IP Rem Version: Major Revision = 16# Order Number: EIPS-DEMO-f Description: EtherNet/IP Tar Adapter Sample eds Device: F	note Adapter 3, Minor Revision = 16# RX72M get imported from EDS F	5	versions
Append selected device as last ch EtherNet_IP_Scanner (You can select another target			Device Close

"EIPS-DEMO-RX72M" is added as a device under "EtherNet_IP_Scanner" in the device window.





(4) Configuring the Ethernet

Double-click on "Ethernet (Ethernet)" 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 a red rectangle below

General	Interface:	
Status	Use Operating	System Settings
Information	🔘 Change Operati	ng System Settings
	IP address	192 . 168 . 0 . 1
	Subnet mask	255 . 255 . 255 . 0
	Default Gateway	0.0.0.0

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

Name Description IP Address Local Area Realtek PCIs GBE Family Controller 10.166.21.70 Local Area 3 ASDX AX88179 USB 3.0 to Gigabit Ethernet Adapter #2 0.0.0 IP Address 101662170 Subnet Mask 2552552520 Default Gateway 10166201 MAC Address C8.9C.DC:E3.06:20	Interfaces:			
Local Area 3 ASDX AX88179 USB 3.0 to Gigabit Ethernet Adapter #2 0.0.0 IP Address 10 166 21 .70 Subnet Mask 255 .252 .0 Default Gateway 10 .166 .20 .1	Name De	scription	IP Address	
IP Address 10 . 166 . 21 . 70 Subnet Mask 255 . 255 . 252 . 0 Default Gateway 10 . 166 . 20 . 1	Local Area Rea	altek PCIe GBE Family Controller	10.166.21.70	
Subnet Mask 255.255.252.0 Default Gateway 10.166.20.1	Local Area 3 AS	X AX88179 USB 3.0 to Gigabit Ethernet Ad	apter #2 0.0.0.0	
Subnet Mask 255.255.252.0 Default Gateway 10.166.20.1				
Subnet Mask 255.255.252.0 Default Gateway 10.166.20.1				
Subnet Mask 255.255.252.0 Default Gateway 10.166.20.1				
Subnet Mask 255.255.252.0 Default Gateway 10.166.20.1	ID Address	10 100 01 70		
Default Gateway 10 . 166 . 20 . 1				
	Subnet Mask	255 . 255 . 252 . 0		
MAC Address C89C:DC:E9:06:20		10 . 166 . 20 . 1		
	Default Gateway			
				OK Cancel

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

Interface:		
 Use Operating S Change Operation 		
IP address Subnet mask	192 . 168 . 0 . 1 255 . 255 . 255 . 0	
	0.0.0.0	



(5) Setting of EtherNet/IP_Scanner

Users do not need to make settings for this device.

(6) Setting of EtherNet/IP_Adapter

Double-click on "EtherNet_IP_Scanner (EtherNet_IP_Scanner)" in the "Device" tree to open the configuration window. Then, select the "General" tab.

The EtherNet/IP system recognizes slave devices by the IP address. Enter the address set within the slave device (For setting method please refer to 6.6 IP address setting method).

General	Address Settings	
Connections	IP Address: 192 . 168 . 0 . 2	EtherNet/IP
Assemblies		
User Parameter	Electronic Keying	
EtherNet/IP I/O Mapping	Compatibility Check	
	 Strict Identity Check 	



5.3 Connection confirmation with CODESYS

This section describes how to run a program on the CODESYS development environment and how to ensure connection of the device.

Select "Build" from the "Build" menu.

Renesas-EtherNetIP.projec	t - COE	DESYS			
File Edit View Projec	t Bu	ild Online	Debug	Tools	Winde
နီ မက မနံနာ 🔚 🚔 🖆		Build		F1	1
		Rebuild			
Devices		Generate co	de		
Renesas-EtherNetIP		Generate ru	ntime syst	em files	
🚊 📆 Device (CODESYS Cor	itro	Clean			
🖹 🗐 PLC Logic		Clean all			
🖹 👘 Application					

Select "Login" from the "Online" menu

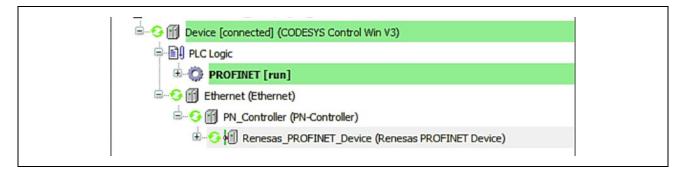
Renesas-EtherNetIP.project - CODESYS						
File Edit View Project Build	Online Debug Tools	Window Help				
🎦 🚅 📕 🚭 🗠 여 🐰 🖻 🛍 1	🕵 Login	Alt+F8				
	💜 Logout	Ctrl+F8				
Devices	Create Boot Application					
Renesas-EtherNetIP	Download					
🖃 🔟 Device (CODESYS Control Win V3)	Online Change					

Select "Start" from the "Debug" menu. The project will automatically start on Windows

Renesas-EtherNetIP.project - CODESYS			
<u>File E</u> dit <u>V</u> iew <u>Project B</u> uild <u>O</u> nline	Deb	ug <u>T</u> ools <u>W</u> indow	<u>H</u> elp
🎁 🚅 📕 🕌 しゅう 🏦 🏝 🤇	•	Start	F5
	10	stop Sh	ift+F8
Devices		Single Cycle C	trl+F5
Renesas-EtherNetIP	ton.	New Breakpoint	
B-G M Device [connected] (CODESYS Co	5	Edit Breakpoint	
		Toggle Preskpoint	FO



The states of connection will be indicated next to each device name. Successful connection is indicated by the "¹ icon as shown in the tree view below



The icons indicating status of each device is listed below.

- . The application is connected to the PLC and is running.
- S : The application is connected to the PLC but is not running.
- **A** : Error. Check the error contents and the settings of the device.
- There is no device information in the device repository. Review the device information file and reinstall it.



6. Debug function

The debug function is described below.

6.1 Terminal software settings

Debug logs can be output via USB Serial (CN4).

(1) Start the "Tera Term", press the "new connection" in the "File", and then select the COM port.

File Edit Setup Control Window Help New connection Alt+N DupWrate session Alt+D Cygwin connection Alt+G Log Communication	M	Itera Term - [disconnected] VT				
Dup Scate session Alt+D Cygwin connection Alt+G	File	Edit Setup	Control	Window	Help	
Cygwin connection Alt+G		New connection	on	Alt+N		
		Duplicate sessi		Alt+D		
Log		Cygwin conne	ction	Alt+G		
		Log				
		o				

(2) Select the USB serial port for log output.

Tera Term: New conr	nection		×
O TCP/ĮP	Hos <u>t</u> History Service: ○ Telnet SSH ○ Other	TCP <u>p</u> ort#. 22 SSH <u>v</u> ersion: SSH2 Proto <u>c</u> ol: UNSPE	~ ~ C ~
⊚ S <u>e</u> rial	Po <u>r</u> t: COM8: US OK Cancel	SB Serial Port (COM8)	Y

noto	It is different from the port for
note	communication.



(3) Set serial communication parameters from "Serial Port" in "Settings".

. 🔟 Tera T	🧧 Tera Term - [disconnected] VT			
. File Edit	File Edit Setup Control Window Help			
	Т	erminal		
	v	Vindow		
	F	ont		
		eyboard		
	(s	erial port)	
	-	rovy W		

(4) Configure the serial port settings as shown in Figure 5.14.

Tera Terr	rm: Serial port setup				×	
Sp Da P <u>a</u> St	cort: p <u>e</u> ed: gata: g <u>a</u> rity: top bits: low control:	COM1 115200 8 bit none 1 bit none		OK Cancel <u>H</u> elp		
	Transmit delay		mse	c/ <u>l</u> ine		



6.2 Version confirmation method

The version confirmation method is described below.

The following command

"Ver"

Version can be confirmed by typing from the console.

■Version displayed terminal.

ver JSL EIP PORTING KIT Ver = 1.07 eForce Operating System Sample Program V2.0 TMG TE, - EtherNet/IP Stack Adapter

Adapter Stack v3.5.7.0 Application v3.5 Revision CIP v3.5

PRODUCT NAME = EIPS-DEMO-RX72M

6.3 MAC address confirmation method

The MAC address confirmation method is described below.

The following command

"mac r"

MAC address can be confirmed by typing from the console.

■ Mac address displayed terminal.

Mac r

MAC : 12:34:56:78:36:15



6.4 IP address confirmation method

The IP address confirmation method is described below.

The following command

"ip r"

IP address can be confirmed by typing from the console.

■ IP displayed terminal.

ip r

IP Address : 192.168.000.10

6.5 MAC address setting method

The MAC address setting method is described below.

6.5.1 Method of change MAC address from code definition change

The following describes how to change the MAC address by changing the definition on the source code.

MAC address setting

"12.34.56.78.36.15"

It is set to.



6.5.2 Method of change MAC address from the Console.

The following describes how to change the MAC address from the console.

After the power is turned on, the MAC address and IP address can be changed for 5 seconds (definition: INIT_SET_WAIT).

(Other than this 5 seconds, MAC address rewriting from the console is not accepted.)

The following is a countdown terminal.

countdown terminal

JSL EIP PORTING KIT Ver = 1.07 eForce Operating System Sample Program V2.0 TMG TE, - EtherNet/IP Stack Adapter

Adapter Stack v3.5.7.0 Application v3.5 Revision CIP v3.5

PRODUCT NAME = EIPS-DEMO-RX72M

Console Enable.

The following string from the console at the above time

"Mac w"

By entering, you will enter the MAC address rewrite mode.

■MAC rewrite mode terminal

JSL EIP PORTING KIT Ver = 1.07 eForce Operating System Sample Program V2.0 TMG TE, - EtherNet/IP Stack Adapter

Adapter Stack v3.5.7.0 Application v3.5 Revision CIP v3.5

PRODUCT NAME = EIPS-DEMO-RX72M

Console Enable. > >mac w3 MAC write Sequence Start !! If you want to cancel sequence, Please push Enter Key !!

MAC :>12:34:56:78:36:15

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Move the cursor to the position and set the desired value from the console.

(Enter the values for all the parts that do not change. If you fail, please start from the beginning.)

Setting completion terminal

JSL EIP PORTING KIT Ver = 1.07 eForce Operating System Sample Program V2.0 TMG TE, - EtherNet/IP Stack Adapter

Adapter Stack v3.5.7.0 Application v3.5 Revision CIP v3.5

PRODUCT NAME = EIPS-DEMO-RX72M

Console Enable.

>mac w3 MAC write Sequence Start !! If you want to cancel sequence, Please push Enter Key !!

MAC :>12:34:56:78:90:12

MAC: 12:34:56:78:90:12

Write OK ? : Yes->[y]Key / No-> Other Key MAC write OK !! MAC : 12:34:56:78:90:12 init_set_wait_time END

TMG TE, - EtherNet/IP Stack Adapter

Adapter Stack v3.5.7.0 Application v3.5 Revision CIP v3.5

After setting the MAC address value from the cursor, click "Write OK?"

If there is no problem, type "y" from the console.

(After the setting is completed, the settable time is reset to 5 seconds again.)

This completes the setting.



6.6 IP address setting method

The IP address setting method is described below.

6.6.1 Method of change IP address from code definition change

The following describes how to change the IP address by changing the definition on the source code.

IP address setting

"192.168.0.10"

It is set to.

When changing the IP address,

The following file

eip_adpt***\src\app\rx72m\uc3\user_main.c

Edit the following definitions.

```
unsigned long uaser_app_ipaddr = 0xC0A8000A; /* IP address (192.168. 0.10) */
unsigned long uaser_app_gateway = 0xC0A80001; /* Gateway (192.168. 0 1 */
unsigned long uaser_app_mask = 0xFFFFF00; /* Subnet mask (255.255.255. 0) */}
```

The above will be updated by the initialization process "user_net_init".

6.6.2 Method of change IP address from the Console.

The following describes how to change the IP address from the console.

After the power is turned on, the MAC address and IP address can be changed for 5 seconds (definition: INIT_SET_WAIT).

(Other than this 5 seconds, MAC address rewriting from the console is not accepted.)

The following is a countdown terminal.

countdown terminal

Adapter Stack v3.5.7.0 Application v3.5 Revision CIP v3.5

PRODUCT NAME = EIPS-DEMO-RX72M

Console Enable.



RX72M Group

The following string from the console at the above time

"ip w"

By entering, you will enter the MAC address rewrite mode.

■ IP rewrite mode terminal

JSL EIP PORTING KIT Ver = 1.07 eForce Operating System Sample Program V2.0 TMG TE, - EtherNet/IP Stack Adapter

Adapter Stack v3.5.7.0 Application v3.5 Revision CIP v3.5

PRODUCT NAME = EIPS-DEMO-RX72M

Console Enable.

> ip w
 IP Address write Sequence Start !!
 If you want to cancel sequence, Please push Enter Key !!

IP Address : 192.168.000.010

Move the cursor to the position and set the desired value from the console.

(Enter the values for all the parts that do not change. If you fail, please start from the beginning.)

Setting completion terminal

JSL EIP PORTING KIT Ver = 1.07 eForce Operating System Sample Program V2.0 TMG TE, - EtherNet/IP Stack Adapter

Adapter Stack v3.5.7.0 Application v3.5 Revision CIP v3.5

PRODUCT NAME = EIPS-DEMO-RX72M

Console Enable.

>

>ip w IP Address write Sequence Start !! If you want to cancel sequence, Please push Enter Key !!

IP Address : 192.168.001.123

IP Address : 192.168.001.123

Write OK ? : Yes->[y]Key / No-> Other Key IP Address write OK !! IP Address : 192.168.001.123 init_set_wait_time END



TMG TE, - EtherNet/IP Stack Adapter

Adapter Stack v3.5.7.0 Application v3.5 Revision CIP v3.5

After setting the MAC address value from the cursor, click "Write OK?"

If there is no problem, type "y" from the console.

(After the setting is completed, the settable time is reset to 5 seconds again.)

This completes the setting.



Revision History

		Descriptio	n
Rev.	Date	Page	Summary
1.00	July. 31, 2019	-	First edition issued
1.01	Dec. 5, 2019	18	Fix misstatements of uC3 folder names
1.02	May 22, 2020	20,32	Added information
		29.40	Fixed the command
1.03	Aug. 31, 2020	4	Operating environment changed due to stack support for 2 ports
		13	Folder structure changed due to stack bundling
		18	Change the sample build due to stack bundling
1.04	Aug. 31, 2021	5-17	Change of supported CIP Object
		-	Support Quick Connect
1.05	Jan. 31, 2022	-	Supports CT18.1 test
		-	Supports DHCP client function
		-	Supports I / O Connection function
		-	Supports ACD function
		-	Change TCP / UDP sockets to maximum
1.06	Jan. 31, 2023	-	Supports CT19 test
		-	Supports 2port

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. Precaution against Electrostatic Discharge (ESD)

A strong electrical field, when exposed to a CMOS device, can cause destruction of the gate oxide and ultimately degrade the device operation. Steps must be taken to stop the generation of static electricity as much as possible, and quickly dissipate it when it occurs. Environmental control must be adequate. When it is dry, a humidifier should be used. This is recommended to avoid using insulators that can easily build up static electricity. Semiconductor devices must be stored and transported in an anti-static container, static shielding bag or conductive material. All test and measurement tools including work benches and floors must be grounded. The operator must also be grounded using a wrist strap. Semiconductor devices must not be touched with bare hands. Similar precautions must be taken for printed circuit boards with mounted semiconductor devices.

2. Processing at power-on

The state of the product is undefined at the time 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 time 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 time 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 time when power is supplied until the power is supplied until the power is supplied until the power reaches the level at which resetting is specified.

3. Input of signal during power-off state

Do not input signals or an I/O pull-up power supply while the device is powered off. The current injection that results from input of such a signal or I/O pull-up power supply may cause malfunction and the abnormal current that passes in the device at this time may cause degradation of internal elements. Follow the guideline for input signal during power-off state as described in your product documentation.

4. 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 the 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.

5. Clock signals

After applying a reset, only release the reset line after the operating clock signal becomes stable. When switching the clock signal during program execution, wait until the target clock signal is 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. Additionally, 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.

- 6. Voltage application waveform at input pin Waveform distortion due to input noise or a reflected wave may cause malfunction. If the input of the CMOS device stays in the area between V_{IL} (Max.) and V_{IH} (Min.) due to noise, for example, the device may malfunction. Take care to prevent chattering noise from entering the device when the input level is fixed, and also in the transition period when the input level passes through the area between V_{IL} (Max.) and V_{IH} (Min.).
- 7. Prohibition of access to reserved addresses

Access to reserved addresses is prohibited. The reserved addresses are provided for possible future expansion of functions. Do not access these addresses as the correct operation of the LSI is not guaranteed.

8. Differences between products

Before changing from one product to another, for example to a product with a different part number, confirm that the change will not lead to problems. The characteristics of a microprocessing unit or microcontroller unit products in the same group but having a different part number might differ in terms of 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 systemevaluation test for the given product.

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