

Adaptor Board with R-IN32M3 module

YCONNECT-IT-I-RJ4501

User's Manual
(Reference Material)

R-IN32M3 Module (RY9012A0)

All information contained in these materials, including products and product specifications, represents information on the product at the time of publication and is subject to change by Renesas Electronics Corp. without notice. Please review the latest information published by Renesas Electronics Corp. through various means, including the Renesas Electronics Corp. website (<http://www.renesas.com>).

Notice

1. Descriptions of circuits, software and other related information in this document are provided only to illustrate the operation of semiconductor products and application examples. You are fully responsible for the incorporation or any other use of the circuits, software, and information in the design of your product or system. Renesas Electronics disclaims any and all liability for any losses and damages incurred by you or third parties arising from the use of these circuits, software, or information.
2. Renesas Electronics hereby expressly disclaims any warranties against and liability for infringement or any other claims involving patents, copyrights, or other intellectual property rights of third parties, by or arising from the use of Renesas Electronics products or technical information described in this document, including but not limited to, the product data, drawings, charts, programs, algorithms, and application examples.
3. No license, express, implied or otherwise, is granted hereby under any patents, copyrights or other intellectual property rights of Renesas Electronics or others.
4. You shall be responsible for determining what licenses are required from any third parties, and obtaining such licenses for the lawful import, export, manufacture, sales, utilization, distribution or other disposal of any products incorporating Renesas Electronics products, if required.
5. You shall not alter, modify, copy, or reverse engineer any Renesas Electronics product, whether in whole or in part. Renesas Electronics disclaims any and all liability for any losses or damages incurred by you or third parties arising from such alteration, modification, copying or reverse engineering.
6. Renesas Electronics products are classified according to the following two quality grades: "Standard" and "High Quality". The intended applications for each Renesas Electronics product depends on the product's quality grade, as indicated below.

"Standard": Computers; office equipment; communications equipment; test and measurement equipment; audio and visual equipment; home electronic appliances; machine tools; personal electronic equipment; industrial robots; etc.

"High Quality": Transportation equipment (automobiles, trains, ships, etc.); traffic control (traffic lights); large-scale communication equipment; key financial terminal systems; safety control equipment; etc.

Unless expressly designated as a high reliability product or a product for harsh environments in a Renesas Electronics data sheet or other Renesas Electronics document, Renesas Electronics products are not intended or authorized for use in products or systems that may pose a direct threat to human life or bodily injury (artificial life support devices or systems; surgical implantations; etc.), or may cause serious property damage (space system; undersea repeaters; nuclear power control systems; aircraft control systems; key plant systems; military equipment; etc.). Renesas Electronics disclaims any and all liability for any damages or losses incurred by you or any third parties arising from the use of any Renesas Electronics product that is inconsistent with any Renesas Electronics data sheet, user's manual or other Renesas Electronics document.

7. No semiconductor product is absolutely secure. Notwithstanding any security measures or features that may be implemented in Renesas Electronics hardware or software products, Renesas Electronics shall have absolutely no liability arising out of any vulnerability or security breach, including but not limited to any unauthorized access to or use of a Renesas Electronics product or a system that uses a Renesas Electronics product. RENESAS ELECTRONICS DOES NOT WARRANT OR GUARANTEE THAT RENESAS ELECTRONICS PRODUCTS, OR ANY SYSTEMS CREATED USING RENESAS ELECTRONICS PRODUCTS WILL BE INVULNERABLE OR FREE FROM CORRUPTION, ATTACK, VIRUSES, INTERFERENCE, HACKING, DATA LOSS OR THEFT, OR OTHER SECURITY INTRUSION ("Vulnerability Issues"). RENESAS ELECTRONICS DISCLAIMS ANY AND ALL RESPONSIBILITY OR LIABILITY ARISING FROM OR RELATED TO ANY VULNERABILITY ISSUES. FURTHERMORE, TO THE EXTENT PERMITTED BY APPLICABLE LAW, RENESAS ELECTRONICS DISCLAIMS ANY AND ALL WARRANTIES, EXPRESS OR IMPLIED, WITH RESPECT TO THIS DOCUMENT AND ANY RELATED OR ACCOMPANYING SOFTWARE OR HARDWARE, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY, OR FITNESS FOR A PARTICULAR PURPOSE.
8. When using Renesas Electronics products, refer to the latest product information (data sheets, user's manuals, application notes, "General Notes for Handling and Using Semiconductor Devices" in the reliability handbook, etc.), and ensure that usage conditions are within the ranges specified by Renesas Electronics with respect to maximum ratings, operating power supply voltage range, heat dissipation characteristics, installation, etc. Renesas Electronics disclaims any and all liability for any malfunctions, failure or accident arising out of the use of Renesas Electronics products outside of such specified ranges.
9. Although Renesas Electronics endeavors to improve the quality and reliability of Renesas Electronics products, semiconductor products have specific characteristics, such as the occurrence of failure at a certain rate and malfunctions under certain use conditions. Unless designated as a high reliability product or a product for harsh environments in a Renesas Electronics data sheet or other Renesas Electronics document, Renesas Electronics products are not subject to radiation resistance design. You are responsible for implementing safety measures to guard against the possibility of bodily injury, injury or damage caused by fire, and/or danger to the public in the event of a failure or malfunction of Renesas Electronics products, such as safety design for hardware and software, including but not limited to redundancy, fire control and malfunction prevention, appropriate treatment for aging degradation or any other appropriate measures. Because the evaluation of microcomputer software alone is very difficult and impractical, you are responsible for evaluating the safety of the final products or systems manufactured by you.
10. Please contact a Renesas Electronics sales office for details as to environmental matters such as the environmental compatibility of each Renesas Electronics product. You are responsible for carefully and sufficiently investigating applicable laws and regulations that regulate the inclusion or use of controlled substances, including without limitation, the EU RoHS Directive, and using Renesas Electronics products in compliance with all these applicable laws and regulations. Renesas Electronics disclaims any and all liability for damages or losses occurring as a result of your noncompliance with applicable laws and regulations.
11. Renesas Electronics products and technologies shall not be used for or incorporated into any products or systems whose manufacture, use, or sale is prohibited under any applicable domestic or foreign laws or regulations. You shall comply with any applicable export control laws and regulations promulgated and administered by the governments of any countries asserting jurisdiction over the parties or transactions.
12. It is the responsibility of the buyer or distributor of Renesas Electronics products, or any other party who distributes, disposes of, or otherwise sells or transfers the product to a third party, to notify such third party in advance of the contents and conditions set forth in this document.
13. This document shall not be reprinted, reproduced or duplicated in any form, in whole or in part, without prior written consent of Renesas Electronics.
14. Please contact a Renesas Electronics sales office if you have any questions regarding the information contained in this document or Renesas Electronics products.

(Note1) "Renesas Electronics" as used in this document means Renesas Electronics Corporation and also includes its directly or indirectly controlled subsidiaries.

(Note2) "Renesas Electronics product(s)" means any product developed or manufactured by or for Renesas Electronics.

(Rev.5.0-1 October 2020)

Corporate Headquarters

TOYOSU FORESIA, 3-2-24 Toyosu,
Koto-ku, Tokyo 135-0061, Japan
www.renesas.com

Trademarks

Renesas and the Renesas logo are trademarks of Renesas Electronics Corporation. All trademarks and registered trademarks are the property of their respective owners.

Contact information

For further information on a product, technology, the most up-to-date version of a document, or your nearest sales office, please visit:
www.renesas.com/contact/

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 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 system-evaluation test for the given product.

- Ethernet is a registered trademark of Fuji Xerox Limited.
- IEEE is a registered trademark of the Institute of Electrical and Electronics Engineers, Inc.
- EtherCAT® is registered trademark and patented technology, licensed by Beckhoff Automation GmbH, Germany.
- PROFINET is a registered trademark of PROFIBUS and PROFINET International (PI).
- EtherNet/IP is a trademark of ODVA, Inc
- Additionally all product names and service names in this document are a trademark or a registered trademark which belongs to the respective owners.

How to Use This Manual

1. Purpose and Target Readers

This manual is designed to provide the user with an understanding of the hardware functions and electrical characteristics of the R-IN32M3 Module. It is intended for users designing application systems incorporating the MCU. A basic knowledge of electric circuits, logical circuits, and MCUs is necessary in order to use this manual.

Particular attention should be paid to the precautionary notes when using the manual. These notes occur within the body of the text, at the end of each section, and in the Usage Notes section.

The revision history summarizes the locations of revisions and additions. It does not list all revisions. Refer to the text of the manual for details.

The following documents apply to the R-IN32M3 Module. Make sure to refer to the latest versions of these documents. Last four digits of document number (described as ****) indicate version information of each document. The newest versions of the documents listed may be obtained from the Renesas Electronics Web site.

Document Type	Description	Document Title	Document No.
Data Sheet	Hardware overview and electrical characteristics	R-IN32M3 Module Datasheet	R19DS0109ED****
User's manual for Hardware	Hardware specifications (pin assignments, peripheral function specifications, electrical characteristics, timing charts) and operation description	R-IN32M3 Module User's Manual: Hardware	R19UH0122ED****
User's manual for Software	Description of API	R-IN32M3 Module User's Manual: Software	R17US0002ED****
Quick Start Guide	Information on application examples Sample program for Host MCU.	R-IN32M3 Module Application Note: Quick Start Guide	R12QS0042ED****
Sample Package	Package of sample software, documents and tool.	R-IN32M3 Module Sample Package	r18an0052xx**** r18an0064xx****
Renesas Technical Update	Product specifications, updates on documents, etc.	Available from Renesas Electronics Web site.	

2. Notation for Numbers and Symbols

Note:

Explanation of a point marked “Note” in the text.

Caution:

Item deserving extra attention.

Remark:

Supplementary explanation to the text

3. List of Abbreviations and Acronyms

Abbreviation	Full Form
Hi-Z	High Impedance
SPI	Serial Peripheral Interface
SW	Switch
DC	Distributed Clock
MCU	Micro Controller Unit

Table of Contents

Table of Contents	6
1. Overview	7
1.1 Introduction	7
1.2 Package Contents	8
1.3 Operating Environment.....	8
2. Hardware Configuration	9
2.1 Board Specification.....	9
2.2 Board Appearance.....	9
2.3 External Interface.....	10
2.3.1 RJ-45 (R-IN32M3 Module)	10
2.3.2 Arduino™	10
2.3.3 PMOD™	13
2.3.4 LED	14
2.3.5 Jamper Pin Settings.....	15
2.3.6 USB.....	16
2.3.7 RST	16
2.3.8 DIPSW	16
2.4 R-IN32M3 Module.....	16
2.5 EtherCAT Support	17
3. Board Connection.....	18
4. Appendix	19
Revision History	21

1. Overview

This document describes the hardware specifications, circuit configuration, and easy connection of an adaptor board with R-IN32M3 Module (YCONNECT-IT-I-RJ4501).

Subsequently, this document describes YCONNECT-IT-I-RJ4501 as this board.

1.1 Introduction

The adaptor board with R-IN32M3 Module (YCONNECT-IT-I-RJ4501) is an evaluation board equipped with an R-IN32M3 module. By connecting to a variety of MCU evaluation boards with Arduino™ or Pmod™ interfaces, you can evaluate communications and develop applications for industrial Ethernet PROFINET, EtherNet/IP™, and EtherCAT®.

Figure 1-1 shows a connection diagram between the adaptor board and various MCU evaluation boards. Sample software of each host MCU for quick evaluation of industrial Ethernet is ready.

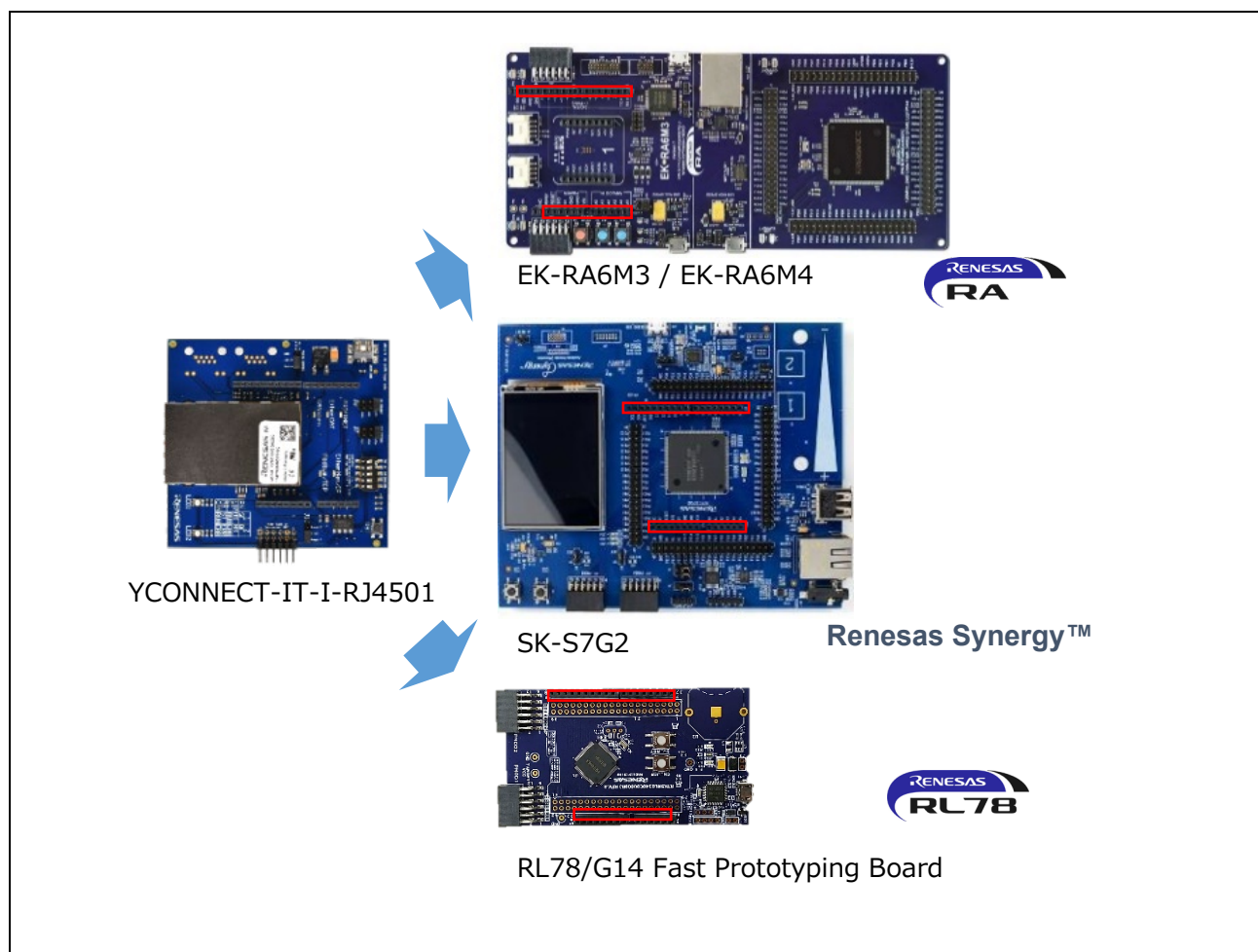


Figure 1-1 Connection to MCU Evaluation Board

1.2 Package Contents

The package consists of the following items.

Table 1-1 The package contents

Item	Qty.
Adapter board with R-IN32M3 Module (YCONNECT-IT-I-RJ4501)	1
USB Cable Type A to mini B	1
Bridge wire	red 1, yellow 1
Connection extenders	4
CE Compliance document	1
China RoHS compliance document	1
Product content list	1

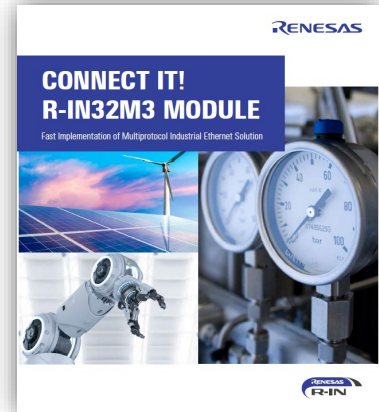


Figure 1-2 YCONNECT-IT-I-RJ4501

1.3 Operating Environment

A MCU evaluation board equipped with Arduino or Pmod interface for connecting to this board is required to evaluate R-IN32M3 module with this board.

This document is confirmed in the following environment.

- Synergy SK-S7G2 Starter Kit [rev.3.3 or later]
- PC
 - OS : Windows® 10
 - RAM : 8GB or more
 - LAN port
 - USB 2.0 interface

2. Hardware Configuration

2.1 Board Specification

Table 2-1 Board Spec

Item	Description
Input supply voltage	3.3V (supply from Arduino or Pmod interface) or 5V (supply from USB Mini-B)
Operating temperature	0 ~ 45 °C
Board dimensions	85mm x 85mm

2.2 Board Appearance

The appearance diagram of this board is shown in Figure 2-1, and the main components and external interfaces are shown in Table 2-2.

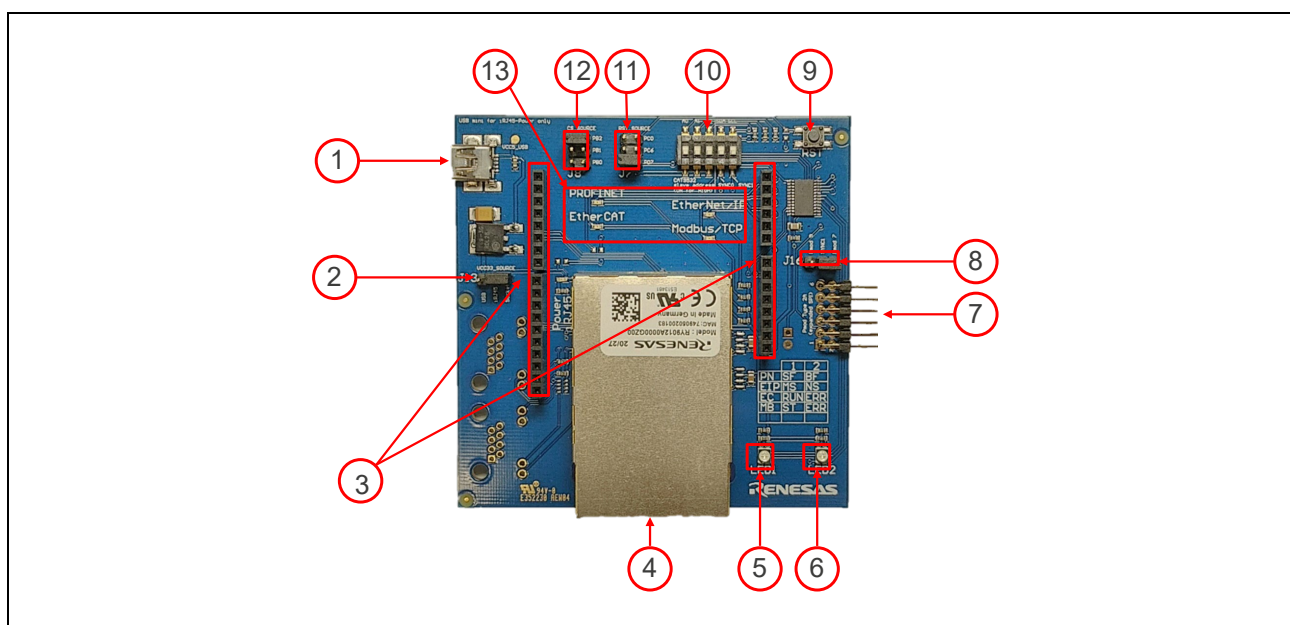


Figure 2-1 Appearance diagram

Table 2-2 External interface

No.	Component Description	No.	Component Description
1	mini-USB	8	J16 : Sync1 select jumper (not used)
2	J13 : Power input select jumper	9	RST: Reset switch (SW1)
3	Arduino Interface	10	S1 : DIPSW (all off : fixed)
4	RJ-45 Port (R-IN32M3 Module)	11	J7 : Reset select jumper
5	LED1 : Protocol status LED (G/R)	12	J8 : CS select jumper
6	LED2 : Protocol status LED (G/R)	13	Protocol LED
7	Pmod interface		

2.3 External Interface

This chapter describes the main external interfaces.

2.3.1 RJ-45 (R-IN32M3 Module)

The R-IN32M3 Module on this board has two RJ-45 Ethernet ports and two LEDs per port. (Figure2-2)

For more information about the R-IN32M3 Module, see R-IN32M3 Module User's Manual Hardware (R19UH0122ED****).

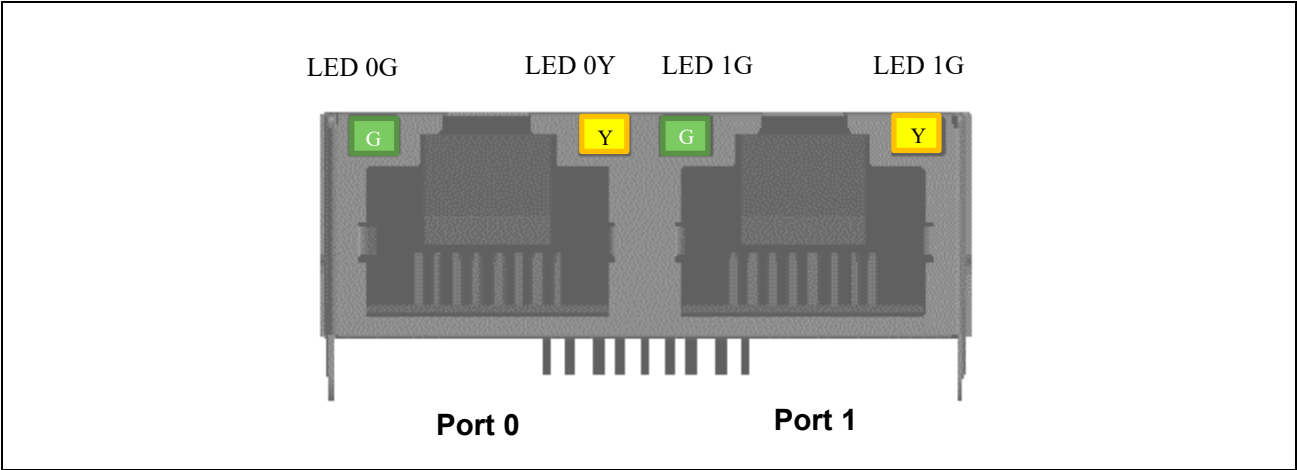


Figure2-2 RJ-45 ports

Table2-3 LED Feature

Port	LED	Signal	Description
0	0G	Network Link	Green LED for connected link on port 0
	0Y	Network Activity	Yellow LED for communication activity on port 0
1	1G	Network Link	Green LED for connected link on port 1
	1Y	Network Activity	Yellow LED for communication activity on port 1

2.3.2 Arduino™

This board can be connected with host MCU via Arduino UNO R3 compatible interface. J13 setting defines whether the power source from Arduino interface (VCC33_socket) is supplied to this board.

Note) When Synergy SK-S7G2 board is connected via Arduino interface, connect two jumper wirings externally to Arduino interface to use DC(distribute clock) sync mode in EtherCAT. See Table2-4 and Chapter 2.5 for details.

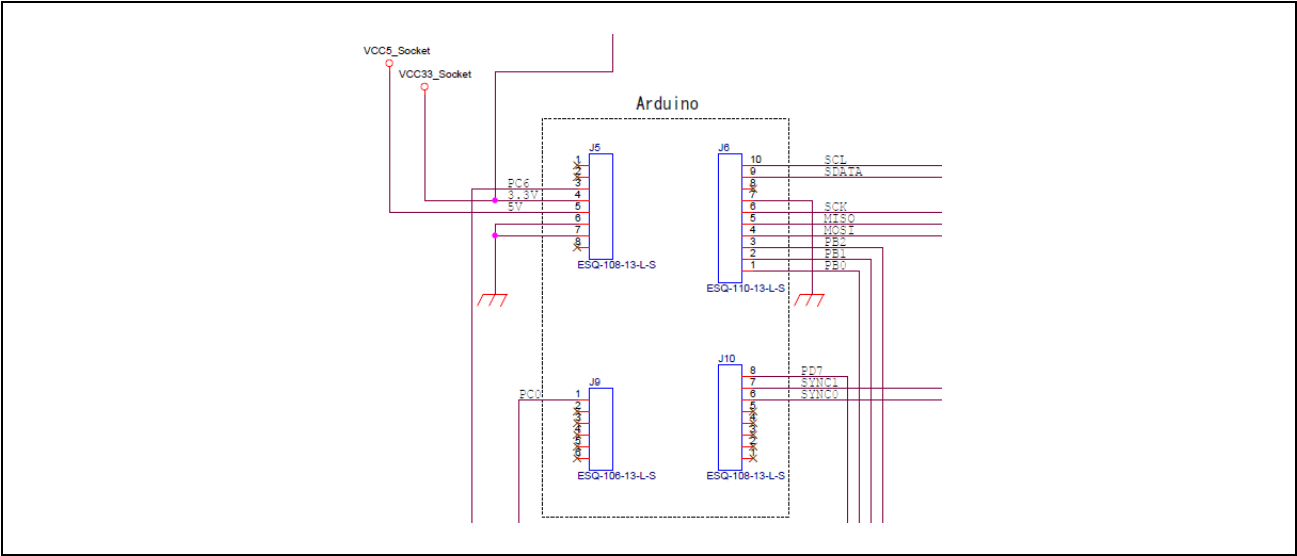


Figure 2-3 Arduino



Figure 2-4 Appearance of Arduino interface

Table2-4 Arduino Connector

Connector		Arduino Compatible	YCONNECT-IT-I-RJ4501	Note
J5	1	NC	NC	
	2	IOREF	NC	
	3	RESET	PC6 (J7-3)	no use (*1)
	4	3.3V	3.3V	
	5	5V	5V	no use
	6	GND	GND	
	7	GND	GND	
	8	VIN	NC	
J9	1	A0	PC0 (J7-1)	no use (*1)
	2	A1	NC	
	3	A2	NC	
	4	A3	NC	
	5	A4	NC	
	6	A5	NC	
J10	1	D0 RXD	NC	(*2)
	2	D1 XD	NC	(*2)
	3	D2 INT0	NC	CATSYNC0
	4	D3 INIT1	NC	CATSYNC1
	5	D4	NC	
	6	D5	SYNC0	Connect with J10-3pin externally
	7	D6	SYNC1	Connect with J10-4pin externally
	8	D7	PD7 (J7-5)	RESET (*1)
J6	1	D8	PB0 (J8-2)	no use (*1)
	2	D9	PB1 (J8-4)	no use (*1)
	3	D10 SPI_SS	PB2 (J8-6)	SPI_CS (*1)
	4	D11 SPI_MOSI	MOSI	SPI
	5	D12 SPI_MISO	MISO	SPI
	6	D13 SPI_SCK	SCK	SPI
	7	GND	GND	
	8	AREF	NC	no use
	9	I2C_SDA	SDATA	I2C for LED driver
	10	I2C_SCL	SCL	I2C for LED driver

(*1) in case of default jumper configuration

(*2) depending on the board. (SK-S7G2 : no use, EK-RA6M4:UART log, EK-RA6M3:UART log)

2.3.3 PMOD™

This board also enables for R-IN32M3 Module to connect host MCU via Pmod™ interface. In this case, 3.3V is supplied to this board from Pmod interface.

Note) The sample software of host MCU for Synergy SK-S7G2, EK-RA6M4 and EK-RA6M3 does not support the Pmod connection.

Also, when Synergy SK-S7G2 board is connected via Pmod interface, there are some hardware restrictions. (DC sync mode of EtherCAT cannot be used because the SYNC signal cannot be connected. LED cannot be controlled because I2C interface cannot be connected.)

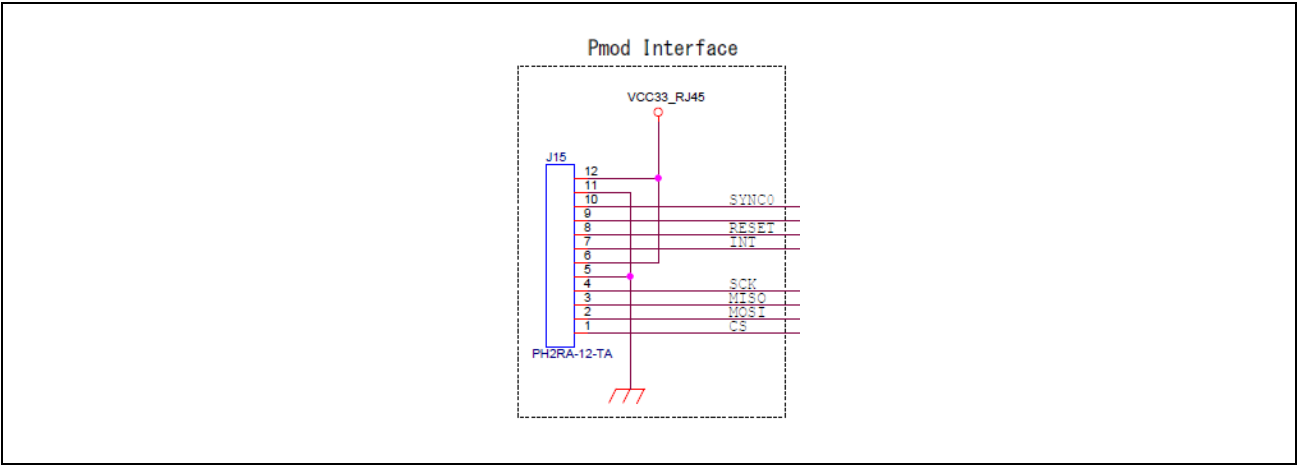


Figure 2-5 Pmod

Table2-5 Pmod Connector

Connector		Pmod Type 2A	YCONNECT-IT-I-RJ4501
J15	1	CS	/SS
	2	MOSI	MOSI
	3	MISO	MISO
	4	SCK	SCK
	5	GND	GND
	6	VCC	VCC33_RJ45
	7	GPIO	(J16-1) INT
	8	GPIO	/RESET
	9	GPIO	(J16-3)
	10	GPIO	/SYNC0
	11	GND	GND
	12	VCC	VCC33_RJ45

2.3.4 LED

LED1 (green/red) and LED2 (green/red) on this board are status LEDs defined by each industrial protocol standard. LED3 to 6 also indicate which industrial protocol is running (LED6 is not supported). They are controlled with LED driver IC.

For more information about the required specification of status LEDs for the R-IN32M3 Module, see the R-IN32M3 Module User's Manual Hardware (R19UH0122ED****).

Note) The sample software for SK-S7G2 controls the LED driver on this board with the I2C bus via Arduino interface. It does not support LED control via Pmod interface.

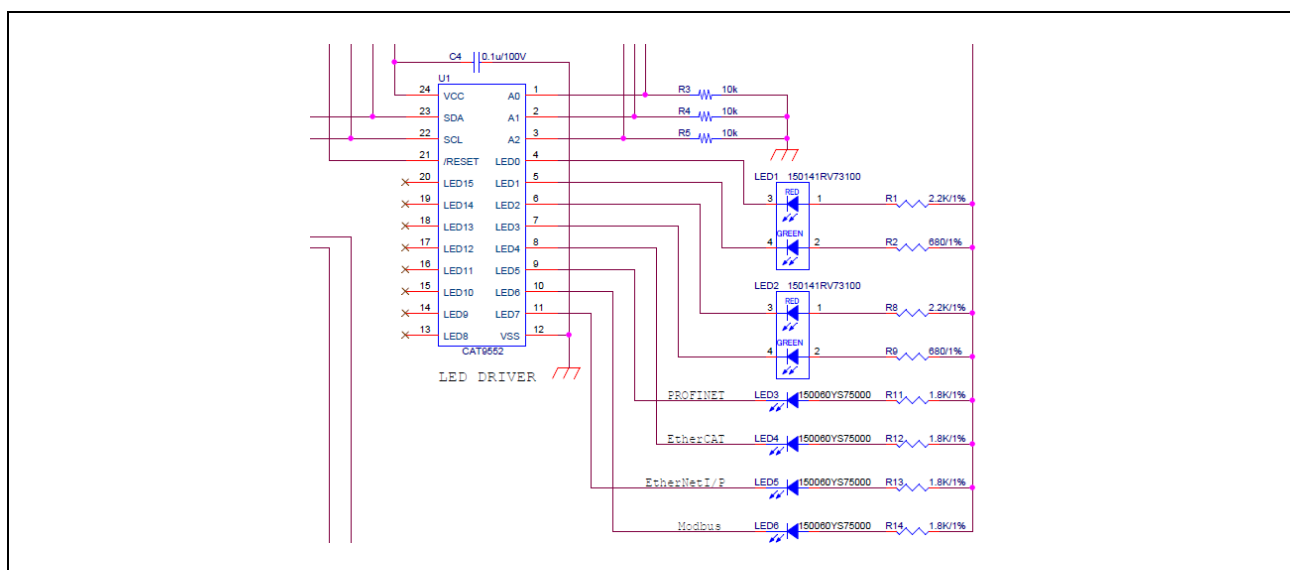


Figure 2-6 LED

Table 2-6 Protocol Status LED

Mode		LED2		LED1	
		Description	Color	Description	Color
1	PROFINET	SF	Red	BF	Red
		Connection	Green	DCP Indicator	Green (Blink)
2	EtherNet/IP	MS	Green/ Red	NS	Green/ Red
3	EtherCAT	RUN	Green	ERR	Red

SF: system failure, BF: bus failure, MS: module status indicator, NS: network status indicator,

DCP: Discovery and Configuration Protocol

2.3.5 Jamper Pin Settings

The jumper pin settings of this board are explained.

The sample software for SK-S7G2 is provided with the recommended settings below.

2.3.5.1 J13

Select the 3.3V power source to supply to the R-IN32M3 Module.

Table 2-7 J13

J13 setting	Description	Recommended settings
1-2 (Silk description "USB")	The USB connector (J18) supplies 3.3V power to the R-IN32M3 Module. <i>Caution) Do not select this when connecting to Pmod.</i>	
2-3 (Silk description "Socket")	The Arduino connector (J5_4pin) supplies 3.3V power to the R-IN32M3 Module	✓

2.3.5.2 J7

Select the reset signal terminal when connecting the Arduino connector.

Table 2-8 J7

J7 setting	Description	Recommended settings
PC0	PC0 (J9_1pin) as reset terminal	
PC6	PC6 (J5_3pin) as reset terminal	
PD7	PC7 (J10_8pin) as reset terminal	✓

2.3.5.3 J8

Select the CS signal terminal when connecting the Arduino connector.

Table 2-9 J8

J8 setting	Description	Recommended settings
PB2	PB2 (J6_3pin) as CS terminal	✓
PB1	PB1 (J6_2pin) as CS terminal	
PB0	PB0 (J6_1pin) as CS terminal	

2.3.5.4 J16

Select SYNC1 signal connection. (no use)

Table 2-10 J16

J16 setting	Description	Initial settings
1-2 (Silk description "Pmod 7")	Connect SYNC1 with J15-7pin	✓
2-3 (Silk description "Pmod 9")	Connect SYNC1 with J15-9pin	

2.3.6 USB

Mini-USB terminal for supplying power to this board.

This is enabled when shorting the 1-2 pin in J13. Do not be used when connecting to Pmod.

2.3.7 RST

RST (SW1) is a reset switch of the R-IN32M3 Module. The reset terminal (/RESET) is pulled up in the R-IN32M3 Module. See R-IN32M3 Module User's Manual Hardware (R19UH0122ED****) Chapter 5.2.3 for recommended reset circuit for R-IN32M3 Module.

Note) Since the reset switch SW1 is connected with /RESET signal directly on this board, /RESET signal is controlled by Hi-Z or Low with the sample software for the host MCU.

2.3.8 DIPSW

DIPSW (S1) is unused.

Set it as a fixed all SW OFF.

2.4 R-IN32M3 Module

The R-IN32M3 Module has a 9-pin interface for application, and it has functions as a power supply, SPI slave interface, reset signal, and EtherCAT DC synchronous signal.

They are connected to the Arduino and Pmod connectors on this board, respectively.

Table 2-11 R-IN32M3 Module pin

pin	Signal	I/O	Description
1	V _{CC}	—	3.3V ±0.15V DC power supply
2	GND	—	Ground
3	/SS	I	Slave select: Active low to enable the slave device
4	RESET#	I	Reset of the whole R-IN32M3 Module: Active low
5	MISO	O	Master in slave out. Data from slave to master
6	MOSI	I	Master out slave in. Data from master to slave
7	SCLK	I	Serial clock: The master provides the clock to shift the data.
8	SYNC0	O	EtherCAT sync signal for distributed clocks
9	SYNC1	O	EtherCAT sync signal for distributed clocks

Note) Pin 8 and pin 9 are EtherCAT sync signals for distributed clocks are only used for EtherCAT protocol.

2.5 EtherCAT Support

Limitations and supplementary matters for EtherCAT support of this board are shown below.

- **For DC mode**

To use DC sync mode in EtherCAT, SYNC0 and SYNC1 signals need to be assigned to the interrupt port of the host MCU.

In combination with Synergy SK-S7G2, short 3pin and 6pin, also 4pin and 7pin of J10, respectively. (Figure 2-7)

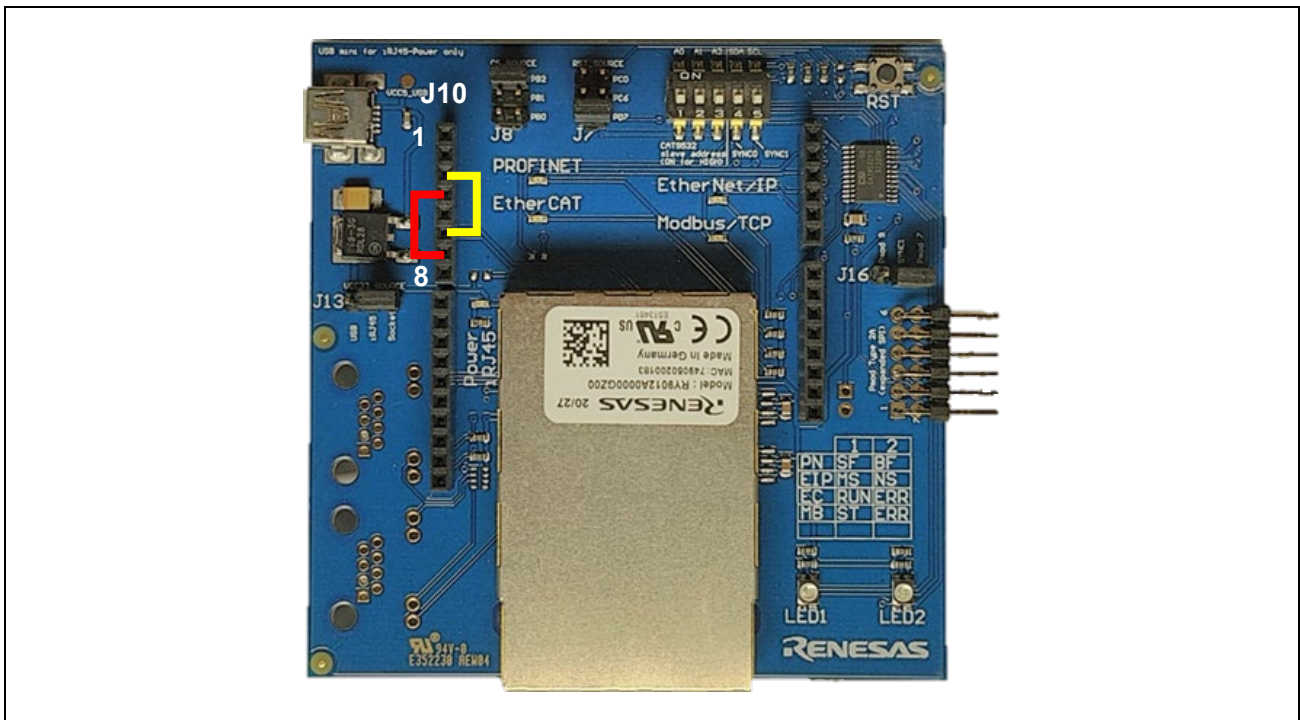


Figure 2-7 Jumper connection for EtherCAT

- **For the conformance test**

In order to comply with the standards of EtherCAT slave equipment with this board, the following changes are required. This board have passed it with the following additional works.

- Add device ID configuration switch.
- Add indication as "IN" and "OUT" around EtherCAT port, respectively.

3. Board Connection

Figure 3-1 shows Arduino interface connection with SK-S7G2, as an example of host MCU connection.

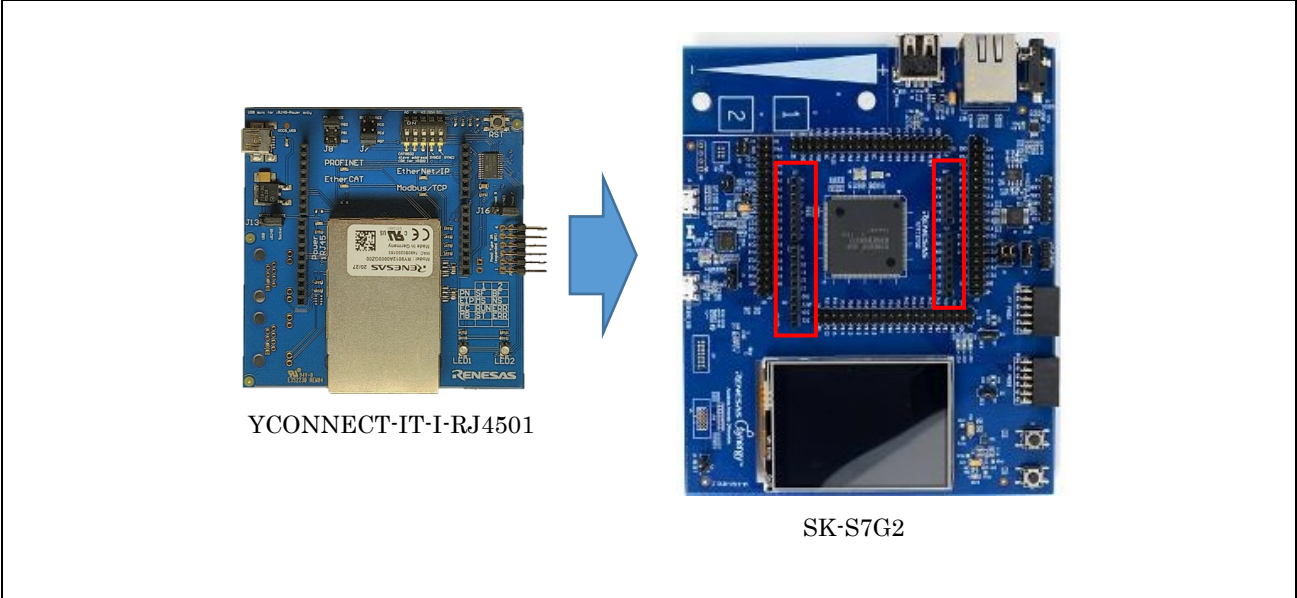


Figure 3-1 Arduino Connection

The power is also supplied from the USB connector of the SK-S7G2 board to this board.

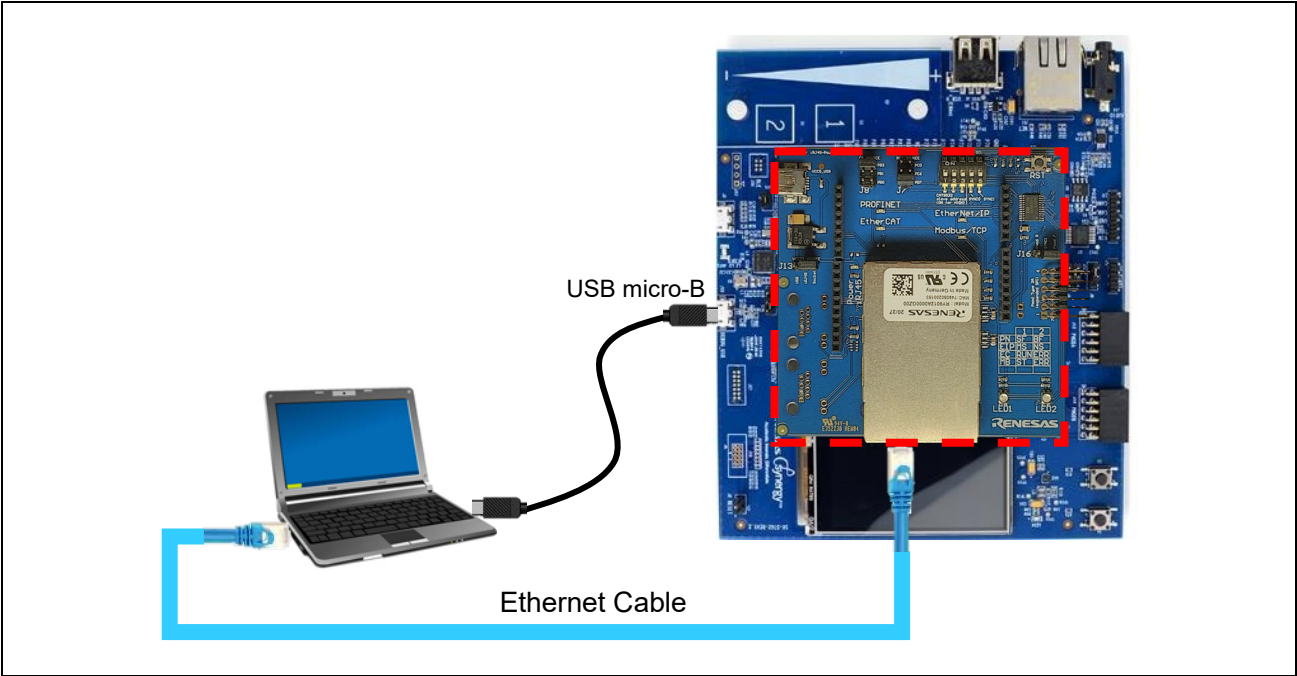


Figure 3-2 Evaluation environment

4. Appendix

A reference schematic of YCONNECT-IT-I-RJ4501 is posted.

Revision History	Adaptor Board with R-IN32M3 module User's Manual
------------------	--

Rev.	Date	Page	Description
1.00	Feb 5, 2021		First edition issued
1.01	May 31, 2021	12	Added Table2-4 and Figure 2-4
		13	Updated section 2.3.3
		14	Modified Table 2-6
		15	Added section 2.3.5.4
1.02	Oct 15, 2021	7	Added Figure 1-1

Adaptor Board with R-IN32M3 module User's Manual

Publication Date: Rev.1.02 Oct 15, 2021

Published by: Renesas Electronics Corporation

Adaptor Board with R-IN32M3 module