

## R-IN32M3 Module (RY9012A0)

R18AN0064EJ0103

Rev.1.03

### Sample Package (uGOAL Edition)

May 31, 2023

## Introduction

This document is an application note of the industrial network sample program package (uGOAL Edition) for R-IN32M3 Module. This application note describes the overview and structures of this package.

## Target Device

R-IN32M3 Module

## Related Documents

R19UH0122ED****	R-IN32M3 Module User's Manual Hardware
R17US0002ED****	R-IN32M3 Module User's Manual Software
R19DS0109ED****	R-IN32M3 Module Datasheet
R30AN0398EJ****	R-IN32M3 Module Application Note for RA6M3 / RA6M4 (uGOAL Edition)
R30AN0399EJ****	R-IN32M3 Module Application Note for Evaluation Board with RX66T (uGOAL Edition)
R30AN0400EJ****	R-IN32M3 Module Application Note for RL78/G14 (uGOAL Edition)
R30AN0402EJ****	R-IN32M3 Module User's Implementation Guide (uGOAL Edition)
R30AN0390EJ****	R-IN32M3 Module Management Tool Instruction Guide
R30AN0401EJ****	R-IN32M3 Module Firmware Update Guide
R30AN0406EJ****	R-IN32M3 Module Modbus TCP Start-Up Manual

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**1. Overview****1.1 Scope**

This application note applies to the sample program package (uGOAL Edition) of the industrial network for R-IN32M3 Module.

## 2. About sample program package

The sample program package is a software package (uGOAL Edition) of the industrial network sample software for R-IN32M3 Module. Major industrial Ethernet protocols, EtherNet/IP, PROFINET RT, EtherCAT and Modbus TCP for industrial Ethernet is supported in this package.

In this version, a sample program of host MCU for RX66T and RL78/G14 are provided in addition to the one for RA6M3/RA6M4.

The folder structure of this sample program package is below.

```

r18an0064xx0103
| r18an0064ej0103-r-in32m3-module-sample-package.pdf // This file(English)
| r18an0064jj0103-r-in32m3-module-sample-package.pdf // This file(Japanese)
|
| SolutionKit // Industrial Network sample program folder
| | RA6 // For RA6M3, RA6M4 board
| | | r30an0398ej0103-r-in32m3-module.pdf // Application note for RA6M3/RA6M4 (English)
| | | r30an0398jj0103-r-in32m3-module.pdf // Application note for RA6M3/RA6M4 (Japanese)
| | | Software
| | | | RA6_uCCM_V103.zip // Project for RA6M3, RA6M4
| | |
| | | RL78 // For RL78/G14 board
| | | | r30an0400ej0103-r-in32m3-module.pdf // Application note for RL78/G14 (English)
| | | | r30an0400jj0103-r-in32m3-module.pdf // Application note for RL78/G14 (Japanese)
| | | | Software
| | | | | RL78_uCCM_V103.zip // Project for RL78/G14
| | |
| | | RX66T // For Evaluation Board with RX66T (SEMB1320 from Shimafuji Elec.)
| | | | r30an0399ej0103-r-in32m3-module.pdf // Application note for RX66T (English)
| | | | r30an0399jj0103-r-in32m3-module.pdf // Application note for RX66T (Japanese)
| | | | Software
| | | | | RX66T_uCCM_V103.zip // Project for RX66T
| |
| Firmware // R-IN32M3 Module firmware folder
| | ReleaseNote.txt // Firmware history file
| | irj45_2.1.4.0_ci178.pfw // Firmware Ver2.1.4.0
|
| Documents // Document folder
| | r19uh0122ed0204-r-in32m3-module.pdf // User's Manual Hardware (English)
| | r19uh0122cj0204-r-in32m3-module.pdf // User's Manual Hardware (Chinese)
| | r19uh0122jj0204-r-in32m3-module.pdf // User's Manual Hardware (Japanese)
| | r17us0002ed0205-r-in32m3-module.pdf // User's Manual Software (English)
| | r17us0002cj0205-r-in32m3-module.pdf // User's Manual Software (Chinese)
| | r17us0002jj0205-r-in32m3-module.pdf // User's Manual Software (Japanese)
| | r19ds0109ed0204-r-in32m3-module.pdf // Datasheet (English)
| | r19ds0109cj0204-r-in32m3-module.pdf // Datasheet (Chinese)
| | r19ds0109jj0204-r-in32m3-module.pdf // Datasheet (Japanese)
| | r30an0402ej0102-r-in32m3-module.pdf // User's Implementation Guide (uGOAL Edition) (English)
| | r30an0402jj0102-r-in32m3-module.pdf // User's Implementation Guide (uGOAL Edition) (Japanese)
| | r30an0390ej0101-r-in32m3-module.pdf // Management Tool Instruction Guide (English)
| | r30an0390jj0101-r-in32m3-module.pdf // Management Tool Instruction Guide (Japanese)
| | r30an0401ej0101-r-in32m3-module.pdf // Firmware Update Guide (English)
| | r30an0401jj0101-r-in32m3-module.pdf // Firmware Update Guide (Japanese)
| | r30an0406ej0200-r-in32m3-module.pdf // Modbus TCP Start-Up Manual (English)
| | r30an0406jj0200-r-in32m3-module.pdf // Modbus TCP Start-Up Manual (Japanese)
|
| Tool // Tool folder
| | iCommExplorer-win32-ci193-v1.4.0.zip // Management Tool Ver1.4.0
| | ModbusDemoApplication.zip // Modbus TCP Evaluation Tool
| | Renesas Image Generator.zip // Firmware Image Generator

```

### 3. Usage

For usage of each sample program, refer to each document.

In addition, Platform-specific software packages are incorporated in each sample program. The key components that configure this software package can reduce the required time for basic software development around the hardware.

The names of the software packages used in each sample program and the supported versions are shown below.

Sample programs	Software packages (Smart Configurator)	Supported versions
RA6_uCCM_V103	Flexible Software Package (FSP)	V4.4.0
RX66T_uCCM_V103	Firmware Integration Technology (FIT)	v1.37
RL78_uCCM_V103	-	-

## Revision History

		Page	Summary
1.00	Oct. 15, 2021	-	First edition issued
1.01	Jan 11, 2022	-	<ul style="list-style-type: none"> <li>- Update Application Note for RA6M3/RA6M4</li> <li>- Update Application Note for RL78/G14</li> <li>- Update Application Note for Evaluation Board with RX66T</li> <li>- Update sample project for RA6M3/RA6M4</li> <li>- Update sample project for RL78/G14</li> <li>- Update sample project for Evaluation Board with RX66T</li> <li>- Add Modbus TCP Start-Up Manual</li> <li>- Add Modbus TCP Evaluation Tool</li> </ul>
1.02	Aug 5, 2022	-	<ul style="list-style-type: none"> <li>- Update Application Note for RA6M3/RA6M4</li> <li>- Update Application Note for RL78/G14</li> <li>- Update Application Note for Evaluation Board with RX66T</li> <li>- Update sample project for RA6M3/RA6M4</li> <li>- Update sample project for RL78/G14</li> <li>- Update sample project for Evaluation Board with RX66T</li> <li>- Update R-IN32M3 Module firmware</li> <li>- Update User's Manual Hardware</li> <li>- Update User's Manual Software</li> <li>- Update Datasheet</li> <li>- Update User's Implementation Guide (uGOAL Edition)</li> <li>- Update Management Tool Instruction Guide</li> <li>- Update Modbus TCP Start-Up Manual</li> </ul>
1.03	May 31, 2023	-	<ul style="list-style-type: none"> <li>- Update Application Note for RA6M3/RA6M4</li> <li>- Update Application Note for RL78/G14</li> <li>- Update Application Note for Evaluation Board with RX66T</li> <li>- Update sample project for RA6M3/RA6M4</li> <li>- Update sample project for RL78/G14</li> <li>- Update sample project for Evaluation Board with RX66T</li> <li>- Update User's Manual Hardware</li> <li>- Update User's Manual Software</li> <li>- Update Datasheet</li> <li>- Update User's Implementation Guide (uGOAL Edition)</li> <li>- Add Firmware Image Generator</li> </ul>

## 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.

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## Corporate Headquarters

TOYOSU FORESIA, 3-2-24 Toyosu,  
Koto-ku, Tokyo 135-0061, Japan  
[www.renesas.com](http://www.renesas.com)

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