

## APPLICATION NOTE

# RIN32M3 Module (RY9012A0)

R30AN0379ED0101 Rev.1.01 2021.6.25

Software PLC Guide: CODESYS for EtherCAT

### Introduction

This application note explains the procedure for running evaluation the R-IN32M3 Industrial Ethernet Module Solution Kit in connection with the CODESYS software programmable logic controller (PLC). In particular, this covers how to add and configure the protocol stack EtherCAT supported by CODESYS.

## **Target Device**

R-IN32M3 module

#### **Related document**

Document Type	Document Title	Document No.
Data Sheet	R-IN32M3 Module Datasheet	R19DS0109ED****
User's Manual	R-IN32M3 Module User's Manual: Hardware	R19UH0122ED****
User's Manual	R-IN32M3 Module User's Manual: Software	R17US0002ED****
Quick Start Guide	R-IN32M3 Module Application Note: Quick Start Guide	R12QS0042ED****
Application Note	R-IN32M3 Module (RY9012A0) User's Implementation Guide	R30AN0386EJ****
User's Manual	Adaptor Board with R-IN32M3 module YCONNECT-IT-I-RJ4501	R12UZ0094EJ****
Quick Start Guide	Evaluation Kit for RA6M3 Microcontroller Group EK-RA6M3 Quick	R20QS0011EU***
	Start Guide	
Application Note	R-IN32M3 Module (RY9012A0) Application Note RA6M3/RA6M4	R30AN0388EJ****
Application Note	R-IN32M3 Module (RY9012A0) Application Note RX66T	R12AN0111EJ****
Application Note	Software PLC Connection Guide CODESYS for PROFINET	R30AN0377ED****
Application Note	Software PLC Connection Guide CODESYS for EtherNet/IP	R30AN0378ED****
Application Note	Software PLC Connection Guide TwinCAT	R30AN0380ED****

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## 1. Overview

## 1.1 Abstract

This document describes how to setup R-IN32M3 module with CODESYS for EtherCAT.

## **1.2 Operating environment**

For details on the software environment and hardware environment, refer to the application note included in the sample package (r18an0052xx0 \*\*\*).

#### **Table 1-1 Application Note**

資料名	資料番号
R-IN32M3 Module Application Note RA6M3 / RA6M4	R30AN0388EJ****
R-IN32M3 Module Application Note RX66T	R12AN0111EJ****

The connection procedure described in this manual assumes that the following conditions are met. For the setup method of each evaluation board, refer to the application note corresponding to each sample software included in the sample package.

#### 1.2.1 Software environment

**Table 1-2** shows the software operating environment.

 Sample software and various documents are included in the sample package.

#### Table 1-2 Software environment

Name	Link
R-IN32M3module sample package	r18an0052xx0***
CODESYS	https://www.codesys.com/
CODESYS Group	
Npcap	https://nmap.org/npcap/
NMAP.ORG	



## R-IN32M3 Module (RY9012A0)

### 1.2.2 Hardware environment

This document applies only to the following configurations:

- 1) R-IN32M3 module Adapter board with EK-RA6M3 / EK-RA6M4 2) R-IN32M3 module Adapter board with SK-S7G2
- 3) R-IN32M3 module CPU card



Fig. 1.1 Evaluation environment

#### **Table 1-3 Evaluation environment**

Name	Туре
R-IN32M3 Module Adapter board	YCONNECT-IT-I-RJ450
R-IN32M3 Module CPU card	SEMB1320
RA6M3 MCU Group Evaluation Board	EK-RA6M3
RA6M4 MCU Group Evaluation Board	EK-RA6M4
SK-S7G2 starter kit.	SK-S7G2



#### 2. Configuring the Device

#### 2.1 Setup EtherCAT project

#### 2.1.1 Creating a project

Select "All Programs > CODESYS > CODESYS V\*\* SP\*\* Patch\*\*" from the Windows start menu.

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

i C File	ODESYS <u>Edit View Project Build</u> <u>New Project Ctrl+N</u> <u>Open Project Ctrl+O</u> <u>Close Project</u>	Categories Iempla	stes project HMI project Findard project w
	Save Project Ctrl+S Save Project As Project Archive ▶		
	Source upload Source downloa <u>d</u>	A project containing one device, one application,	, and an empty implementation for PLC_PRG
8	Print	Name R-IN32M3_Module_ECAT	×
	Figure	2.1. now project	OK Cancel

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.

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 x64**" and "Structured Text (ST)", respectively. After that, click on "OK" to open the new project.

Standard P	roject		Х		
<b>6</b> 7	You are about to create a new standard project. This wizard will create the following objects within this project: - One programmable device as specified below - A program PLC_PRG in the language specified below - A cyclic task which calls PLC_PRG - A reference to the newest version of the Standard library currently installed.				
	<u>D</u> evice	CODESYS Control Win V3 x64 (3S - Smart Software Solutions GmbH)	$\sim$		
	PLC_PRG in	Structured Text (ST)	$\sim$		
		OK Cancel			
<b>C</b> :	aura 22	Salaat the Davias and DLC programming	~		

Figure 2.2 Select the Device and PLC programming

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

The components that belong to "Device (CODESYS Control Win V3 x64)" are managed in a tree structure.



Figure 2.3 Project View

#### 2.1.2 Install Slave Information (ESI)

Install an ESI (EtherCAT Slave Information) file which contains a description of the EtherCAT slave device. Select "Device Repository..." from the "Tools" menu of the CODESYS program.



Figure 2.4 Open Device Repository

n the dialog box, click on the "Install" button to produce the dialog box where you are to enter the name of the provided ESI file. R-IN32M3 module sample package has ESI file for each application (Table 2-1 ESI file).

When the installation is complete, [R-IN32M3\_Module] will be registered in "Slave" tree.

Location	Custom Depository		Edit Locations
	(C:\ProgramData\CODESYS\Devices)	Ŷ	
Installed d	le <u>v</u> ice descriptions		
String for	a fulltext search Vendor: <all td="" vendor<=""><td>ors&gt; ~</td><td><u>I</u>nstall</td></all>	ors> ~	<u>I</u> nstall
Name		^	<u>U</u> ninstall
	≜ <sub>Bed</sub> Slave		Export
	💷 📴 Beckhoff Automation GmbH & Co. KG - Drive and	Axis Terminals (EL7xxx)	
	🐵 🚞 Delta Electronics, Inc Servo Drives		
	🖲 🗀 Festo AG & Co. KG		
	ifm electronic - ifm electronic EtherCAT Devices		Renew Device
	Panasonic Corporation, Appliances Company - AC	C Servo Driver	Repusitory
	Parker Hannitin - Parker Servo Drive 1M		
	Parker harming - Parker Servo Drive 15		
	RIN32M3 Module		
	RIN32M3 Module		Details
	Hul - Ponossa Electronica Corn - Denossa EC 1 Sisua	v	Decanom
🖃 😗 🛛	++++++++++++++++++++++++++++++++++++++	utionKit¥Synergy¥Softwar	
L	Device "RIN32M3 Module" installed to device repository.		

Figure 2.5 Install the ESI File

#### Table 2-1 ESI file

Sample project	application	directory	
	Mirror	RA6_CCM_V***\appl\mirror_sample\ac\03_ecat_slave_renesas\esi	
RA sample	Remote-IO	RA6_CCM_V***\appl\remote_io_sample\ac\03_ecat_slave_renesas\esi	
	Sensor	RA6_CCM_V***\appl\sensor_sample\ac\03_ecat_slave_renesas\esi	
Synergy sample	Mirror	r Synergy_CCM_V***\appl\2015013_irj45\ac\09_ecat_slave\esi	
	Mirror	RX66T_CCM_V***\appl\mirror_io_sample\03_ecat\esi	
RX66T sample	Remote-IO	RX66T_CCM_V***\appl\remote_io_sample\03_ecat\esi	
	Motor	RX66T_CCM_V***\appl\motor_sample\03_ecat\esi	



## R-IN32M3 Module (RY9012A0)

#### 2.1.3 Adding Master and Slave Device

Add necessary devices to the "R-IN32M3 Module" to the project tree.

#### 1.) Add the EtherCAT Master

Right-click on "Device (CODESYS Control Win V3 x64)" in the "Device" tree and select "Add Device...".

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

You can see that "EtherCAT Mater" has been added in the Project tree.

				Add Device	×
Devices		- 1 X		Name     EtherCAT_Master_1       Action	
		-		String for a fulltext search Vendor <all vendors=""></all>	~
Device (CODESYS Control Win V3	en)		_	News Meridae Description	_
PLC Logic	¥	Cut	- 1	Vendor Vendor Vesion Description	
🖹 💮 Application		Сору	- 8	Gen Cablus	
Library Manager	ß	Paste	- 8	⊟ not EtherCAT	
PLC_PRG (PRG)	×	Delete	- 8	B 🔂 Macher	
😑 🧱 Task Configuration		Pefectorian		EtherCAT Master 3S - Smart Software Solutions GmbH 3.5.15.30 EtherCAT Master	
🖻 💖 MainTask (IEC-Ta		Relactoring	<u> </u>		5c
PLC_PRG	i)	Properties	- 1	the set of the s	~
	*::	Add Object	•		>
	$\bigcirc$	Add Folder	- 8	Group by category Display all versions (for experts only) Display outdated versions	
		Add Device		Mame: EtherCAT Master	
		Hadata Davies		Vendor: 35 - Smart Software Solutions GmbH	
	ъ?	Edit Object	- 8	Categories: Master	
		Edit Object with	- 8	Order Number:	
		Edit Object with	-1	Numerical Control of Marian	
				Append selected device as last child of         Device	
				Add Device Cit	ose

Figure 2.6 Add an EtherCAT Master



#### 2.) Add R-IN32 Module Slave

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



Figure 2.7 Add R-IN32M3 Module

The "Add Device" dialog box opens. Select "RIN32M3 Module(\*\*\*\*)" under "Fieldbuses > EtherCAT > Slave", then " Renesas Electronics Corp. > R-IN32M3 Module" and click on the "Add Device" button.

You can see that "Renesas\_Module (\*\*\*\*\*)" has been added under "EtherCAT\_Master (EtherCAT Master)" in the Project tree.

(\*\*\*\*\*\*) is different for each application (Table 2-1 ESI file)...



Figure 2.8 R-IN32M3 Module in Project

## 3. Configuring CODESYS Network

### 3.1 Connecting to the Software PLC

This section gives the procedure for connection to the target software PLC from the CODESYS development environment via a gateway.

#### 3.1.1 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 is indicated in the system tray<sup>Note</sup> in the lower-right corner of the desktop.

Note: If you cannot find the icon in the system tray, start the server up by the following procedure: Click on "All Programs" > CODESYS > CODESYS Gateway V3.



Figure 3.1 Start of Gateway Server

#### 3.1.2 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.



Figure 3.2 Start PLC Controller

Usually, the program will automatically be started as a standard service on booting of Windows and its status is indicated in the system tray<sup>Note</sup> in the lower-right corner of the desktop.

Note: If you cannot find the icon in the system tray, start the server up by the following procedure: Click on "All Programs" > CODESYS > CODESYS Control Win V3 x64 SysTray.



Figure 3.3 Run PLC Controller

### 3.2 Configuring Network

#### 3.2.1 Device registration

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.

Devices 👻 🕈 🗙	M Device X		
Renesas-ECAT     CODESYS Control Win V3 x64)	Communication Settings	Scan Network Gateway 👻   Device 👻	
	Applications		_
EtherCAT_Master (EtherCAT Master)	Backup and Restore		
	Files		
			ateway

Figure 3.4 Start of PLC

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, **3.1 Connecting to the Software PLC.** 

Select Device	
Select the network path to the controller:	
= Ato Cateway-1	Scan network
- 8	
PC name	
1	
	(
	Concerning Cancerning

Figure 3.5 Select the PLC

When the available device is registered, the device is activated, and the green circle mark lights up.

Scan Network Gate	way - Device -			
		Gateway	••••	•
	Gateway-1		~	~
	IP-Address:		Press ENTER to set activ	e path

Figure 3.6 registered device



#### 3.2.2 Configuring the EtherCAT Master

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

Devices 👻 🖣 🗙	Device EtherCAT_I	Master X	
■	Coursel.		
Device (CODESYS Control Win V3 x64)	General	Autoconfig Master/Slaves	Ether <b>CAT</b>
E D Application	Sync Unit Assignment	EtherCAT NIC Setting	
EtherCAT_Master (EtherCAT Master)	100	Destination address (MAC) FF-FF-FF-FF-FF-FF	Broadcast Enable redundancy
Renesas_Module (RIN32M3 Module)	Log		
_	EtherCAT I/O Mapping	Source address (MAC) 84-AF-EC-73-D6-43	Browse
		Network Name イーサネット 7	
	EtherCAT IEC Objects	Select network by MAC     Select network by networ	ame

Figure 3.7 Configure the EtherCAT Master

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

terfaces			
Name	Description	IP address	-
(. #++L.0	I - KD) E4 Toto 114 #0	0.000	
- ゴーノリル エソア 1960元*	a	0.0.0	
( – サネット 7	ASIX AX88179 USB 3.0 to Gigabit Ethernet Adapter #2	192.168.0.1	
6 U#51 1	Finite Contract Street Allerty (UDID CON)	1000	
(-ympro	For their COL MPN Marked Ethernol Meland	10.07.08	
<sup>o</sup> address ubnet mask lefault gateway 1AC address	192       .168       .0       .1         255       .255       .255       .0         0       .0       .0       .0         84 AF:EC-78 D6:43       .0		

Figure 3.8 Select the Networking Card

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

Devices 👻 👎 🗙	Device EtherCAT_	Master X	
Renesas-ECAT     Provide (CODESYS Control Win V3 x64)	General	Autoconfig Master/Slaves	Ether CAT
=- ■ PLC Logic ■ <b>Opplication</b>	Sync Unit Assignment	EtherCAT NIC Setting	
EtherCAT_Master (EtherCAT Master)	Log	Destination address (MAC) FF-FF-FF-FF-FF-FF	Broadcast Enable redundancy
🗐 Renesas_Module (RIN32M3 Module)	EtherCAT I/O Mapping	Source address (MAC) 84-AF-EC-73-D6-43	Browse
	EtherCAT IEC Objects	Network Name イーザネット 7	iy name

Figure 3.9 MAC address configured

### 4. CODESYS Network Connection

### 4.1 Download the Project

Now we have finished the offline configuration and can start the online mode.

Click on the button 🤹 to build and download the configuration.

📦 Renesas-ECAT.project - CODESYS							
Ele Edit View Project Build Online Debug Tools Window Help 會 當 圖 圖 心 べ 法 軸 職 ×   執 為 過 賞 貫 刻 刻 漬 職 酒 酒 (語) 部・ 自   證   Application [Device: PLC Logic] - 愛 이 → 田 弐 (耳 空 空 空 空 空 空 空 空 空 空 空 空 空 空 空 空 空 空							
Devices - 4 ×	Device     EtherCAT_N	Aaster 🔐 Renesas_Module 🗙					
Renesas-ECAT     Povice (CODESVS Control Win V3 v64)	General	Address	Additional				
	Process Data	AutoInc address 0 🗘	Enable expert settings	Ether <b>CAT</b>			
Application     Sthere (AT Master)		EtherCAT address 1001	Optional				
Renesas_Module (RIN32M3 Module)	Startup Parameters	Distributed Clock					
	EtherCAT I/O Mapping						

Figure 4.1 Login the project

When you have change something in the project then you will be asked to download it. Acknowledge it with "OK"



Figure 4.2 Download project

When the download is finished click "Start" to run the project.

Renesas-ECAT.project - CODESYS					
<u>File Edit View Project Build Online Debug Too</u>	ols <u>W</u> indow <u>H</u> elp		_	_	
🎦 🛩 🖬   🚑   🗠 🗠 🐇 🗈 🛍 🗙   🛤 😘 🐴 🚰   📕	에 케 챔   🖷   🏪 💣   🛗	Application [Device: PLC L	ogic] 🔹 👒 😋 😱	📲 🕊 🗊 🖅 📲 🖇	4   🎫   💱 👘
Devices 👻 🗸 🗶	Device EtherCAT_Ma	ister 🖉 👘 Renesas_M	1odule 🗙		
Renesas-ECAT	General	Address		Additional	
ODESYS Control Win V3 x64)		AutoInc address	0	Enable expert settings	Ether CAT.
Application [stop]	Process Data	EtherCAT address	1001	Optional	
EtherCAT_Master (EtherCAT Master)	Startup Parameters				
☐ Arenesas_Module (RIN32M3 Module)		Distributed Clock –			
	EtherCAT I/O Mapping	Diagnostics			
	EtherCAT IEC Objects	Current State			
	Status				

Figure 4.3 Start project

## 4.2 Run Project

Now, if all the icons in front of the device turn green, the EtherCAT connection is successful.

Devices 👻 🔻 🛪	Device 🖬 EtherCA	_Master 🔐 Renesas_Module 🗙		
Renesas-ECAT	Ganaral	Address	Additional	· · · · · ·
= 😳 🔟 Device [connected] (CODESYS Control Win V3 x64)	General			EtherCATT
PLC Logic	Process Data	AutoInc address 0	Enable expert settings	Luici CAI.
🗄 🔘 Application [run]	Process Data	EtherCAT address 1001	↓ Optional	
🖹 🧐 EtherCAT_Master (EtherCAT Master)	Startup Parameters			
😔 📺 Renesas_Module (RIN32M3 Module)		Distributed Clock		
	EtherCAT I/O Mapping	Diagnostics		
		Current State Operational		
	EtherCAT IEC Objects	operatoria		

Figure 4.4 successful running project

The icons indicating status of each device is listed below.

- The application is connected to the PLC and is running.
- Sec. 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.



## 4.3 Creating and Simulating a User Interface

#### 4.3.1 General

This section includes the following procedures:

- Displaying the development environment screen
- Implementation example
- Relating variables to components and to the I/O ports of devices

The CODESYS development environment allows the creation of user interfaces. You can access all internal variables used in the PLC program on the screen as well as monitoring and changing the parameters.

The PLC example it this case uses the "mirror" feature (Mirror sample application) of the R-IN32M3 module application. The INPUT value of the device (Module) will be increase by one and send back to the OUTPUT value of the PLC. The speed of this increase can be controlled by the value MAXI.

#### 4.3.1.1 Adding Components

Components to be placed on a user-interface display need to be added to the "Device" tree before creating one. Right-click on "Application" in the tree and select "Add Object", then "Visualization...".

🖻 👔 Device (CODESYS Cont	rol Win V3 x64)	General		Data Sources Manager	- I -
PLC Logic		Connection	<b>*</b> *	DUT	10
🖹 💮 Application		Connection	,	External File	- F
🗂 Library 💑	Cut			Global Variable List	
PLC_P	Сору		2		
🖃 🔛 Task 🤇 💼	Paste			Global Variable List (tasklocal)	
- <sup>-</sup> <sup>-</sup> <sup>©</sup> <sup>™</sup> ×	Delete			Image Pool	
			⊶	Interface	ch
	Refactoring	•	2	Network Variable List (Receiver)	ch
	Properties		3	Network Variable List (Sender)	ty
	Add Object	•	T	Persistent Variables	r I
🚊 🚮 Ethernet (Ethe 🚞	Add Folder		≞	POU	L.
🖮 🕤 EtherNet 🗋 🖻	Edit Object		≞	POU for implicit checks	
R_IN3	Edit Object with		А,	Recipe Manager	re
0	Login		ø	Redundancy Configuration	re
~	Login		∎t <mark>s</mark>	Symbol Configuration	
	Delete application from	m device		Text List	Vi
			<b>⊡</b> ∮	Trace	
			2	Trend Recording Manager	
			3	Unit Conversion	
		<	•	Visualization	
		Messages - Tot		Visualization Manager	

Figure 4.5 Add of Visualization object in Project tree

#### 4.3.1.2 Development Pane

Double-clicking on "Visualization" in the tree displays the development pane.

#### Development pane

The main pane for structuring user-interface displays. Place the components you will be using here.

#### <u>Toolbox</u>

The toolbox provides basic components for placements in the development pane. As well as such as graphs, tables, and labels, meters, switches, progress bars, and other items are available.

Users can select the desired components from this box and place them in the development pane.

#### **Properties**

Parameters for the components placed on the development pane are monitored and changed from here. The internal variables of the PLC program are also handled within this pane.

[함학]교민원종]탈탈탈별월,왕왕	Visualization Toolbox
lization X	
RENESAS R-IN32M3 Module Application	Basic Common Contr
g	Alarm Manager Measurement C
D MessureOnt Value D	Toolbox
10.0 20.0 40.0 60.0 00.0 100.0	Special (
	Symbols ImagePoolDia
Control of speed	Kettangle Rounded Ellipse
	Rectangle
· · · · · · · · · · · · · ·	
	Properties
	¥ Filter • Sort by • 2+ Sort order • □ Ad
Development pane	Property Value
	Use gradient color
	Gradient setting 🗾 linear, Black, Whit
	Element look
	= Texts
	Text Measurement Value
	Tooltip
	* Text properties
	ADSOLUCE MOVEMAN
	* Kelative mover
	Properties
	* Text variables Properties
	Text variables     Toperties     Color variables
	Text variables     Toperfiles     State variables

#### Figure 4.6 Development of visualisation example

To design an example just drag and drop the display and control item out of the "Toolbox" in the "Development pane"



## 4.3.1.3 Development of PLC program

For our PLC example we have to establish a small application program.



Figure 4.7 Development of visualisation example

Therefore, please double click of "PLC\_PRG" in the project tree.

Input the necessary variables like "INPUT", "OUTPUT", "COUNTER" and "MAXI".

The variables "INPUT" and "OUTPUT" are assigned to dedicated device address. These addresses can be found in the device configuration. Make a double click on the Input or/and Output module of the device and open the tab "PNIO Module I/O Mapping".

Devices – 4 X	Device Renesas_Mo	odule 🗙						
Arrow And Anton And Anton And Anton A	General	Find		Filter Show all			•	🖶 Add FB for IO Channel
PLC Logic	Process Data	Variable ⊪*∿	Mapping	Channel digital Outputs 1-8	Address %QB0	Type USINT	Unit	Description digital Outputs 1-8
- 🦢 GVL - 🎁 Library Manager	Startup Parameters	±		digital Inputs 1-8	%IB0	USINT		digital Inputs 1-8
PLC_PRG (PRG)	Log							
EtherCAT_Task (IEC-Tasks)	EtherCAT I/O Mapping							
	EtherCAT IEC Objects							
VISUEIASK (IEC-TASKS)	Status							
🖻 🍓 Visualization Manager – 🎁 TargetVisu	Information							
WebVisu     Usualization								
EtherCAT_Master (EtherCAT Master)		1						
Carl Renesas_Module (RIN32M3 Module)								
				Reset Mappi	ng Alway	s up date var	iables	Use parent device setting

Figure 4.8 Parameter addresses

Here are the addresses of the module parameters. In our case the address %IB0 will be used for the INPUT variable and %QB0 for OUTPUT.

On the "PLC\_PRG" tabbed page, write the source code in the code-writing section with defined variables.

1	// Test Program
2	
з	COUNTER := COUNTER + 1;
4	IF COUNTER > MAXI THEN
5	OUTPUT := INPUT + 1;
6	IF OUTPUT = 100 THEN
7	OUTPUT := 0;
8	END_IF
9	COUNTER := 0;
10	END_IF
11	

Figure 4.9 PLC program

## 4.3.1.4 Result of Running the Program

By starting the PLC, the following screen will come up:



The measurement value (green bar) will move from "0" to "100" and back to "0".

The speed of the increase of the measurement value can be controlled by the slider. The default value is 25. The highest speed is a "0" and the slowest is a "50".

## **Revision History**

		Description		
Rev.	Date	Page	Summary	
Rev.1.0	2020.12.15	-	First Edition	
Rev.1.01	2020.6.25	3	Add Evaluation Environment part	



## APPLICATION NOTE

#### Notice

**KENESAS** 

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