RENESAS

Development Tools Startup Manual

R-IN32M4-CL2

Industrial Ethernet Communication LSI

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1. IAR Tool Installation and License Setup

1.1 Download IAR Tool Installer <R>

Download the IAR tool installer from the IAR web page (https://www.iar.com/iar-embedded-workbench/).







Run the downloaded installer (EWARM-CD-****-****.exe: **** = version number). The below window will pop up and the necessary files will be unzipped automatically in the C¥Users directory. After extraction, the installer menu window will appear.

Extracting drivers¥S tellarisICDI¥winusbooinstaller2.dll Extracting drivers¥S tellarisICDI¥WUDFUpdate_01 009.dll Extracting drivers¥ti=xds¥ti_emupack_setup.exe Extracting ew¥setup.exe Destination folder C:¥Users¥a5033122¥AppData¥Local¥Temp¥RarSFX0 Browse Installation progress		xtracting drivers¥StellarisICDI¥WUDFUpdate_01 009 dll xtracting drivers¥ti-xds¥ti_emupack_setup.exe xtracting ew¥setup.exe estination folder :¥Users¥a5033122¥AppData¥Local¥Temp¥RarSFX0
--	--	--

1.2 Install and Setup Evaluation License

Click "Install IAR Embedded Workbench®" in the menu window.

IAR Embedded Workbench [®]	Japanese
for ARM	
Installation and licensing information	
Install IAR Embedded Workbench®	
Release notes	
Install drivers	
Explore the installation media	
Exit	
	SYSTEMS www.iar.com



The license wizard window will open. Make sure the computer has access to internet and select "Register with IAR Systems to get an evaluation license".

License Wizard	
Welcome	
This wizard will help you to activate your IA	AR Embedded Workbench for ARM license.
☐ If you have a license number, enter i	it here:
© <u>U</u> se a network license	
Register with IAR Systems to get an	evaluation license
Don't run the Wizard for this prod	Juct at startup.
	< Back Next > Cancel

Choose a product and click [Next] button.

Linense Wized	×
Choose a product Select the product you want to evaluate.	
TAR broaded Welsend for Arm	
0-0-0	SYSTEMS
	Deck Parts Circuit



Click [Register] button

When you register you will receive a license number for an evaluation license.	Berite	Register	
	O IAR	When you register you will receive a los	-
O IAR	••••••••••••••••••••••••••••••••••••••	Enter the loanse number you received a	ifter registering and click Next.
	SYSTEMS		©IAR

This will start the web browser and navigate to the user registration page for the evaluation license. Select either "Time limited" or "Code size limited", then enter the necessary user information.

IAR SYSTEMS		
Register for Evaluation		
Evaluation license type *		
 Time limited (30 days) IAR Embedded Workbench for ARM, v. 6.50, Evaluation 	on version	
Code size limited IAR Embedded Workbench for ARM, v. 6.50, 32K Kick	kstart Edition	
First name *]	
Last name *	1	
Title		
Email *		
Phone * Extension:		



Click [Submit Registration] button.

Will	you use an RTOS in your project? *	
۲	Yes	
0	No	
Whi	ch RTOS vendor would you be interested in?	
0	CMX	
0	Eforce	
0	Express Logic	
0	FreeRTOS	
0	Freescale MQX	
0	Micrium	
0	Micro Digital	
0	Quadros	
0	Sciopta	
0	SEGGER	
0	Wittenstein	
۲	Other, please specify:	
	uitron	
-	icates a required field. Jbmit Registration	
By r	egistering, you accept to receive information from IAR Systems in the future.	

An email with license number will be sent to your registered email address within a few minutes.

EIAR SYSTEMS
Please Confirm Registration Specified email address An email has now been sent to the address you specified, asking you to confirm the registration. Follow the instructions in that email to receive information on how to proceed.
IAR Systems website



Double click the registration address (<u>https://register.iar.com/confirm?key=XXXX</u>) in the e-mail.

From: IAR Systems + To:		ł
Dear Developer,		
We have received your web registrati	on for the product	
IAR Embedded Workbench for ARM, v.	6.50, 32K Kickstart Edition	
Please confirm this registration by	opening the web page	
https://register.iar.com/confirm?kev=		
You must confirm the registration wi	thin 14 days from when this email was	s sent.
If you have received this email in e registrations are erased from our sy	rror, you do not need to do anything. stem after 14 days.	Unconfirmed
You cannot reply to this email. Plea (<u>http://www.iar.com/contact/</u>) if you ha	se use the Contact page on our websit ave any comments or questions.	е
Best regards,		
IAR Systems		

A 14-digit license key will be displayed in "XXXX" below. This license key is bound to the registered PC, so when using several PC's, it is necessary to acquire and setup license for each PC.

EIAR SYSTEMS			
Registration Co	mplete		
Thank you for your registra	ion!		
You have been assigned t	e following license number:		
Enter the license number i) your License Wizard and click the Nex	t button.	
IAR Systems			



Go back to License Wizard window; input the received license number and click [Next] button to activate the IAR tool.

License Woard	8
Register When you register you will receive a loans	e number for an evaluation license.
R Enter the loanse number you received after	rester
XXXX	
0-0-0	SYSTEMS
	mass page prices

Registration is completed.

License Wrord
Confirm license details
Product IAR Embedded Workbench for ARM, 32K Kidistart Edition Version: 6.60 Locking orbeits: System UUID Dense modek Permanent loorse Features: IAR DC++ Compiler for ARM IAR Dc++ Compiler for ARM IAR Dabugger for ARM Dick. Nexto activate this license This may take more than a minute

It is possible to activate the software with both a "Time limited" license and a "Code size limited" license, and switch them with license manager. For details, refer to the license guide

(EW_LicensingGuide_LMS2.ENU.pdf) in installation directory "¥IAR Systems¥Embedded Workbench *.*¥common¥doc" folder. For release information of the IAR tool and related documents, refer to https://www.iar.com/iar-embedded-workbench/



2. Setup and Connect R-IN32M4-CL2 Board

There are two types of R-IN32M4-CL2 mounting board, a starter-kit board from IAR and an evaluation board from TSSR. Refer to the WEB site of each company for detailed information of each board.

IAR starter kit for R-IN32M4-CL2

https://www.iar.com/iar-embedded-workbench/partners/renesas/tools-for-renesas-r-in32/ <R>

TSSR evaluation board TS-R-IN32M4-CL2

http://www.tessera.co.jp/ts-r-in32m4.html <R>

2.1 Boot Mode Selection for R-IN32M4-CL2 Boards

Select the boot mode with on-board terminals (BOOT0, BOOT1). In the case of the IAR starter-kit board, DSW2 selects boot mode. While for the TSSR evaluation board, SW1 selects boot mode.

Table 2.1 Select Boot Mode (IAR Starter-Kit Board)

DSW2 (BOOT1)	Boot Mode Selection
ON (High)	Boot from instruction RAM (only for debug)
OFF (Low)	Boot from external serial flash ROM





SI	W1	Boot Mode Selection
1 (BOOT1)	2 (BOOT0)	
ON (High)	ON (High)	Boot from instruction RAM (for debug only)
ON (High)	OFF (Low)	Boot from external MCU
OFF (Low)	ON (High)	Boot from external serial flash ROM
OFF (Low)	OFF (Low)	Boot from external memory (not available for users)

Table 2.2 Select Boot Mode (TS-R-IN32M4-CL2)





2.2 IAR Starter-Kit Setup Procedure

Follow the steps below to connect and boot an IAR starter-kit board:



- (1) Set DIP-SW (DSW2) to select boot mode.
- (2) Use an Ethernet cable (category 5e or later recommended) to connect either port 0 or port 1 on the board (the picture above) with your PC's Ethernet port.
- Connect the 20-pin half-pitch connector to the ICE.
 Notice: No.1 terminal of the cable, which is Red one, must be on the left.
 Then connect the ICE to the PC by the USB cable that comes with ICE I-jet.
- (4) Use the kit-include mini-USB cable to connect the mini-USB port on the starter-kit board and a USB port on the PC.

This USB cable supplies power to the starter-kit board.





2.3 R-IN32M4-CL2 Evaluation Board Setup Procedure

Follow the steps below to setup the TSSR evaluation board. For more details, refer to the user manual published by TSSR on their web: <u>http://www.tessera.co.jp/eng/products/r-in32m4-cl2-e.html</u>



- (1) Use the mini-USB cable to connect the mini-USB port of the board to a USB port on the PC.
- (2) Use an Ethernet cable (category 5e or later recommended) to connect either Port 0 or Port 1 of the board to the PC's Ethernet port.
- Connect the 20-pin half-pitch connector to the ICE.
 Notice: No.1 terminal of the cable, which is Red one, must be on the left.
 Then connect the ICE to the PC by the USB cable that comes with ICE I-jet.
- (4) Set DIP-SW (SW1) switch to select the desired boot mode
- (5) Connect the 5V DC power adapter to the power jack on the evaluation board



R-IN32M4-CL2





3. Install USB Serial Conversion Driver on PC

3.1 Download the Driver

A driver for FT232R USB UART may be required when connecting the PC to the R-IN32M4-CL2 boards with the included USB cable. For Windows 7, the driver is already included in the OS and, therefore, does not require manual installation.

Found New Hardware Wizard		
	This wizard helps you install software for: pbLuaUSBSerial	
	If your hardware came with an installation CD or floppy disk, insert it now.	
	What do you want the wizard to do?	
	C Install the software automatically (Recommended)	
	Install from a list or specific location (Advanced)	
	Click Next to continue.	
	< <u>B</u> ack <u>Next</u> > Cancel	

In case the driver is necessary, download it from the website <u>http://www.ftdichip.com/Drivers/VCP.htm</u>, and follow the steps below to install the driver.



3.2 Install the FT232R USB UART Driver

Follow the steps below to install the FT232 USB UART driver.

Unzip the downloaded driver files to a directory of your choice. Locate the FT232R USB UART device in the "Device Manager". Right click and select update driver. Then select [Install from a list or a specific location], and click [Next].



ii Ur	date Driver Software - FT232R USB UART
	Browse for driver software on your computer
	Search for driver software in this location: Image: state of the subfolders
	Let me pick from a list of device drivers on my computer This list will show installed driver software compatible with the device, and all driver software in the same category as the device.
	Mext Cancel



Select the unzip directory (CDM *.**.** WHQL Certified) and then click [OK].

Browse For Folder Select the folder that contains drivers for your hardware.	×
	4
Eolder: CDM v2.08.30 WHQL Certified	Cancel

After the driver software update is completed, click [Close].

\frown	ate Driver Software - USB Serial Converter	×
9.	Update Driver Software - USB Serial Converter	
1	Nindows has successfully updated your driver software	
١	Nindows has finished installing the driver software for this device:	
	USB Serial Converter	
	*	



3.3 Install USB Serial Port Driver

Follow the steps below to install the USB Serial Port driver.

Locate USB Serial Port (COM*) in the device manager, right click and select driver update. Select [Install from a list or a specific location], click [Next] and then select [CDM 2.08.30 WHQL Certified] and click [OK].

Browse For Folder Select the folder that contains drivers for your hardware.	×
Local Disk (Q:) Network OM 2.08.30 WHQL Certified and64 i386 Static Eolder: CDM v2.08.30 WHQL Certified	4
OK	Cancel



After the driver update is completed, click [Close].

U U	odate Driver Software - USB Serial Port (COM9)	×
G	Update Driver Software - USB Serial Port (COM9)	
	The best driver software for your device is already installed	
	Windows has determined the driver software for your device is up to date.	
	USB Serial Port	



3.4 Configure UART Communication

Install serial terminal software such as Tera Term on the PC, start a new terminal connection and select the USB serial port where the R-IN32M4-CL2 board is connected.



Port name varies from PC to PC, not necessarily COM 14 as is shown in the figure.

File Edit Setup Control Win	dow Help		
Tera Term: New c	onnection		
© TCP/IP	Host: myhost.ex	ample.com	
	☑ History		
	Service: O Telnet	TCP port#: 23	
	SSH	SSH version: SSH2 👻	
	 Other 	Protocol: UNSPE -	
Serial	Port: COM3		
e centar	COM3	el(R) Active Management Technolog	IV - SOL (COM4)
	OK COM14: U	SB Serial Port (COM14)	, - 00E (00m)



Select [Setup] > [Serial port...].



Configure the serial port settings to set the baud rate to "115200".

Tera Term: Serial port setup Port: COM14 ▼ OK Baud rate: 115200 ▼ OK Data: 8 bit ▼ Cancel Parity: none ▼ Help Flow control: none ▼
Transmit delay 0 msec/char 0 msec/line



Select [Setup] > [Terminal...].



In terminal setup, select "CR+LF" as the Transmit New-Line symbol.

Tera Term: Terminal setup	Notes Tag	x
Terminal size 42 X 19 I Term size = win siz Auto window resiz	ORVER	
Terminal ID: VT100 Answerback:	Local echo Auto switch (VT<>TEK)	
UTF-8 -	Kanji (transmit) UTF-8 → Kanji-in: ^[\$B → □ 7bit katakana Kanji-out: ^[(B →	
locale:	CodePage: 932	



4. Use Sample Programs

4.1 Download the R-IN32M4 Sample Programs

The sample programs of R-IN32M4-CL2 are available for download from the web site below:

Sample software for IAR starter kit

https://www.renesas.com/us/en/software/D6002928.html <R>

Sample software for TSSR evaluation board

https://www.renesas.com/us/en/software/D6002926.html <R>

4.2 Run "cie_intelligent_device" Sample Program with EWARM Tool

The following steps describe how to run sample program of CC-Link IE Field intelligent device station from the previously installed Embedded Workbench IDE (EWARM).

To launch EWARM, double click the following executables depending on which board is used.

For IAR starter kit

¥r-in32m4_samplesoft¥Device¥Renesas¥RIN32M4¥Source¥Project¥IAR_StarterKit_CL2¥ cie_intelligent_device¥IAR¥main_en.eww

File Edit View Tools Help					
•	lude in libra	ary 🔻 Share with 👻 New folder		:== •	
📃 Recent Places	*	Name	Date modified	Туре	
Downloads		\mu cie_intelligent_device	04/02/2016 09:15	File folder	
🐔 OneDrive		퉬 interval_timer	04/02/2016 09:15	File folder	
P		📗 os_sample	04/02/2016 09:15	File folder	
iga Libraries Documents → Music ■ Pictures		퉬 osless_sample	04/02/2016 09:15	File folder	
		🌗 version_get_sample	04/02/2016 09:15	File folder	
	=	board_init.c	28/01/2016 17:36	C File	No preview
		📄 board_init.h	27/01/2016 16:38	H File	available.
Subversion					
📑 Videos					
🖳 Computer					
Local Disk (C:)					
Local Disk (D:)					
Local Disk (Q:)	_	•			•



For TSSR evaluation board

¥r-in32m4_samplesoft¥Device¥Renesas¥RIN32M4¥Source¥Project¥TS-R-IN32M4-CL2¥ cie_intelligent_device¥IAR¥main_en.eww

C V V V V V V V V V V V V V V V V V V V	32M4 ▶ Sou	rce Project TS-R-IN32M4-CL2	✓ Search T:	5-R-IN32M4-CL2	\$
File Edit View Tools Hel	р				
Organize 🔻 🔭 🍞 Open 🛛 Ir	nclude in librai	ry ▼ Share with ▼ New folder			
🖳 Recent Places	•	Name	Date modified	Туре	
〕 Downloads 🝊 OneDrive	_	ie_intelligent_device	04/02/2016 09:15	File folder	
		📗 interval_timer	04/02/2016 09:15	File folder	
P		鷆 os_sample	04/02/2016 09:15	File folder	
 Libraries Documents Music Pictures Subversion 		퉬 osless_sample	04/02/2016 09:15	File folder	
		퉬 version_get_sample	04/02/2016 09:15	File folder	
	=	📋 board_init.c	27/01/2016 16:38	C File	No previe
		📋 board_init.h	27/01/2016 16:38	H File	available
Videos					
Videos					
💻 Computer					
Local Disk (C:)					
Local Disk (D:)					
Local Disk (Q:)	-	•			
cie_intelligent_device					•



4.3 Select Build Setting

After EWARM is up, select build setting from the drop down list on the left panel (RAM Debug or Serial Flash Boot).

[To execute program in internal RAM (iRAM) of R-IN32M4-CL2 from ICE] In the case of booting the R-IN32M4-CL2 from internal RAM (iRAM), select "RAM Debug".

[To program external serial flash ROM of R-IN32M4-CL2 from ICE]

In the case of booting the R-IN32M4-CL2 from external serial flash ROM, select "Serial Flash Boot".



4.4 Build and Run "cie_intelligent_device" Program

Click [Project] > [Rebuild All].

	Project I-jet/JTAGjet Tools Wind				
🗅 🛩 🖬 🕼 🤅	Add Files		(I 🔄 🔍 🗢 🗢 📣 🕼 📴 😳 🕅 🦉	
Workspace	Add Group	Ļ	sample.c ker	nel_cfg.c R_IN32_Interface.c main.c	init_task(int) 🔻 🗴
RAM Debug	Import File List	[/ P77 Port Input	
8:: B	Add Project Connection				
	Edit Configurations		= 0xFF;	// RP10 Port Input	
	Remove		= 0x00;	// RP11 Port Input	
			= 0x00; = 0x00;	// RP12 Port Input // RP13 Port Input	
	Create New Project	ſ		// RP14 Port Input	
-⊕ 🖸	Add Existing Project			/ RP15 Port Input	
	Options	Alt+F7		// RP16 Port Input // RP17 Port Input	
	Version Control System		1	/ RF1/ FOFC INput	=
	Version Control System	•			-
	Make	F7	= 0xFF; = 0x00;	// RP20 Port Input // RP21 Port Input	
	Compile	Ctrl+F7	= 0x00;	// RP22 Port Input	
	Rebuild All	В	= 0x00;	// RP23 Port Input	
	Clean			// RP24 Port Input // RP25 Port Input	
	Batch build	F8		/ RP26 Port Input	
main	C-STAT Static Analysis			// RP27 Port Input	
Workspace Source B		· · · ·			+
× Log	Stop Build	Ctrl+Break			
Sun Jan 24, i	Download and Debug	Ctrl+D			
	Debug without Downloading				
5	Make & Restart Debugger	Ctrl+R			
€ Fund Log	Restart Debugger	Ctrl+Shift+R			•
Debug Log Build	Download				×
× Name	SFR Setup		Size	Access	
ACTLR	One Device Developing The		32	Read/Write	
ADCR0	Open Device Description File	۰ <u>۲</u>	32	Read only	
ADCR1	Save List of Registers UX4UUUUE38	Mamor	32	Read only Read only	
ADCR2 ADCR3	0x40000E38 0x40000E3C	Memory Memory		Read only	
ADCR2 ADCR3 K ADCR4	0x40000E40	Memory		Read only	-

After build succeeded, click button (1) to download program to the target, then click button (2) to start running.







5. CC-Link IE Field Communication

In order to test and validate the CC-Link IE field communication, the CC-Link Partner Association provides a simple master tool. Follow the instructions below to test CC-Link IE field communication on the R-IN32M4-CL2 boards.

5.1 Get the Sample Stack for CC-Link IE Field

Refer to section 4.

5.2 Download CC-Link IE Field Utility

Download the CC-Link IE Field Utility tool and manual from the CC-Link Partner Association website. There is no need to be a registered member of the association; the tool is downloadable after filling in the names of the user and company.

http://cc-link.org/eng/downloads/index.html

Downloads Events & Seninars Downloads Downloads Contact Specification Sheets Contact on the state Specification Sheets Contact on the state Specification Sheets Contact on the state Contact on the state Specification Sheets Contact on the state Contact on the state Contact on the state Specification Sheets Contact on the state Contact on the state Contact on the state Specification Sheets Contact on the state Cont		About CC-Link Products Development About CLPA Contact
Events & Seminars Downloads Image: Contact	HOME > Downloads	
Events & Seminars Image: Seminars Downloads Image: Seminars Contact Image: Seminars Contact Image: Seminars CC-Link Partner Image: Seminars Association Members Site Members Site Members Cnly Specification Sheets Members Cnly Specification Sheets Conformance Testing-related	Downloads	
Downloads Image: Contact Image: Con		Downloads
Contact Catalogs, White Papers Installation Manuals CSP+Files SLMP Material: CC-Link IE Field Utility CC-Link Partner Association Members Site Imstallation Imstallation Imstallation CSP+Files SLMP Material: CC-Link IE Field Utility CC-Link Partner Association Members Site Imstallation Imstallation CSP+Files SLMP Material: CC-Link IE Field Utility Specification Sheets Members Only Members Only CSP+ Specification and support tool	Downloads 🖡	Free Download
CC-Link Partner Association Members Only Members Only Members Only CSP+ Specification Sheets Conformance Testing-related Specification and support tool		White Papers Manuals Converties Schur Material Field Utility
Members Site Members Only Members Only Members Only Specification Sheets Conformance Testing-related CSP+		Members Only
		Conference Tester state state

5.3 Install WinPcap

CC-Link IE Field utility is using WinPcap, therefore it is necessary to install on your PC. Download and install WinPcap from the following web site: <u>http://www.winpcap.org/install/default.htm</u>



5.4 Confirm CC-Link IE Field Communication

5.4.1 Link CC-Link IE Field

Double click the executable file (cciutl.exe) of CC-Link IE Field utility to run the tool.

- (1) Select Ethernet port for 1000 Base-T as the I/F.
- (2) Set station number, RX/RY, and RWw/RWr.
- (3) Press "Start Cyclic Communication" button. The box in "Link" group will turn into green color if the link succeeds.

CC-Link IE Field utility I/F Intel(R) 82578LM Gigabit Network Connection Configuration (1) (2) Network No. 1 Total Stations 1 - Station RX/RY RWw/RWr Number Points Start End Link #1 #1 #1	
(3) Start Cyclic Communication Transient Communication CC-Link IE Field utility	
I/F Intel(R) 82578LM Gigabit Network Connection Configuration Network No. 1 Total Stations 1 Station RV/RY Number Points Start End #1 1 256 0100 01FF Image: 1	
Device RX RY RWw RWr Start Cyclic Communication Transient Communication Version Info Terminate Program	



5.4.2 Cyclic Communication – Data for Transmission

Data for transmission from the R-IN32M4-CL2 to the PC can be confirmed by pushing "RX..." button and setting the start address as is shown in the figure below. The transmission data sent by the sample program has the data bit shifting within range between bit-0 and bit-7.

The transmission data can be altered by modifying function UserSendCyclic() in source file

R_IN32M4_sample.c.

									RX
		0130	0120	0110	0100		Туре	-	
•	-	C	C	C	С		RX	-	
):0	-	0	0 (> 0	\circ	Е		_	
N (-	0	$^{\circ}$	Ο	Ο	-			
0:	-	\circ	$^{\circ}$	Ο	0	-	St		
OFF	-	Ο	$^{\circ}$	Ο	Ο	_	art.		
	-	0	Ο	0	0		Ac		
	-	0	Ο	0	0	-	ldre		
	-	0	0	0	0	-	ss(,	
	-	0	0	0	D		HEX		
	-	0	0	0	0	-)		
	-	0	0	0	Ο	5		_	
	-	0	Ο	0	Ο	4			
	-	0	$^{\circ}$	Ο	Ο	3	010		
	-	0	0	0	Ο	2	U	-	
	-	0	$^{\circ}$	0	Ο	1			
	-	0	0	0	۲	0			
Close		0000	0000	0000	2001	Value(HEX)			×



5.4.3 Cyclic Communication – Received Data

Data for transmission from R-IN to the PC can be confirmed by pushing "RY..." button and setting the start address as is shown in the figure below. The light of 8-bit LED array on the board shows received data. By double clicking the cycle symbols or entering values directly in the text fields on the utility tool, the status of LED will change.

The way to use the received data can be altered by modifying UserReceiveCyclic() in source file R_IN32M4_sample.c.







5.4.4 Transient Communication

Transient communication can be performed by pushing the transient communication button in the utility tool main window. It supports [Deliver Node Info], [Get Statistics] and [Acquire Detailed Node Info] commands. Commands can be sent by selecting the command from the drop down list and pressing "Transmit" button, and the reply from the R-IN boards is displayed in the "Response" field.

rx512e=256	offsetAddr=0 dataSize=168 dataSubType=2 opHeader.command=4 opHeader.subCommand=128 opHeader.rtn=0 opHeader.destNetNumber=1 opHeader.destNodeNumber=125 opHeader.srcNetNumber=1 opHeader.srcNodeNumber=1 rySize=256 rwwSize=256	alArHeader.nodeId=1 alArHeader.connectionInfo=2 alArHeader.srcNodeNumber=1 alArHeader.protocolVerType=1 seqNumber=128 dataId=1 wholeDataSize=168	Response alArHeader.arFType=34 alArHeader.dataType=7	Request Command Acquire Detailed Node Info 👻	
Close		E	<u>^</u>	Station No. 1 -	



REVISION HISTORY R-IN32M4-CL2 Development Tools Startup Manual

Rev.	Date		Description
		Page	Summary
1.00	Jan 29, 2016	-	1st version issued
2.00	Mar 16, 2016	31-38	6. KEIL MDK-ARM Setup, added
2.01	Jun 19, 2018	1, 2	1.1 Download IAR Tool Installer,
			screenshot added and description changed (Complement)
		7	1.2 Install and Setup Evaluation License,
			URL for reference changed (Error correction)
		8	2. Setup and Connect R-IN32M4-CL2 Board
			URL for reference changed (Error correction)
		22	4.1 Download the R-IN32M4 Sample Programs,
			URL for reference changed (Error correction)
2.02	Mar 29, 2019	32-39	6. KEIL MDK-ARM Setup, deleted

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 reaches the level at which reseting 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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