RENESAS

Contributing to More Efficient Embedded System Development
E2 emulator
RTE0T00020KCE00000R

https://www.renesas.com/e2

Overview

The E2 emulator is an advanced on-chip debugging emulator and flash programmer developed with the concept of greater efficiency in development. In addition to the basic debugging functions of the E2 emulator Lite, the combination of its high-speed downloading and various software and hardware solutions will contribute to reducing development times.
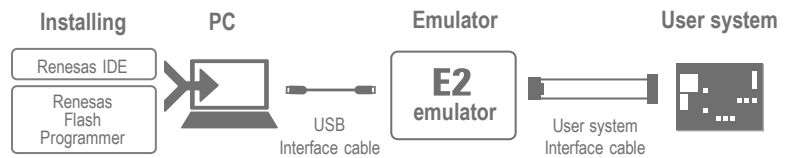
Package components

- E2 emulator main unit
- Conversion adapter
- User system interface cable
- USB interface cable
- Test lead

System configuration

Installing	PC		Emulator		User system
Renesas IDE			**E2 emulator**		
Renesas Flash Programmer		USB Interface cable		User system Interface cable	

Debugging

Debugging is possible in combination with the e² studio or CS+ of integrated development environment (IDE) from Renesas.

e² studio   www.renesas.com/e2studio

CS+   www.renesas.com/cs+

Programming

Programming is also possible in combination with the Renesas Flash Programmer programming software from Renesas.

Renesas Flash Programmer   www.renesas.com/rfp

For the RL78 and RX Families

Current Consumption Tuning Solution

✔ Measuring current with the E2 emulator alone

✔ Stopping a program when an excessive current is detected

✔ Visualizing the relationship between program operations and current

☑ https://www.renesas.com/qe-current-consumption

The tool for measuring current drawn, "QE for Current Consumption", reduces the time taken in operations for the tuning of current.

No need for an ammeter
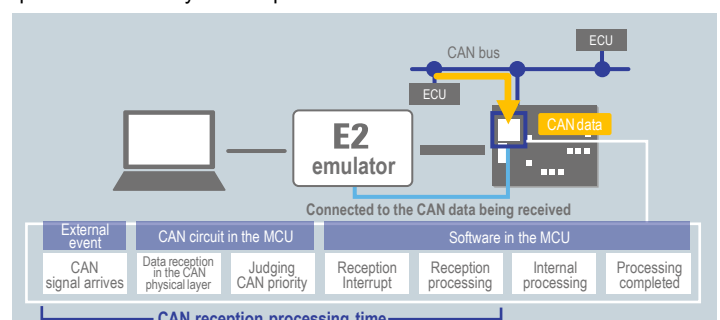
No need to remodel a board
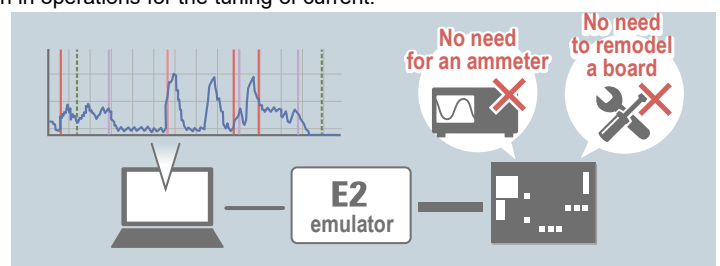
For the RH850 Family

CAN Communications Time Measurement Solution

✔ Measuring the reception processing time in CAN communications with the E2 emulator alone

✔ Stopping a program when the reception processing time exceeds the design value

✔ Visualizing the history of CAN communications

☑ https://www.renesas.com/e2-solution-can

The solution makes it easy to verify whether the CAN communications speed meets the system requirements.

CAN bus

ECU

ECU

CAN data

E2 emulator

Connected to the CAN data being received

External event	CAN circuit in the MCU		Software in the MCU			
CAN signal arrives	Data reception in the CAN physical layer	Judging CAN priority	Reception Interrupt	Reception processing	Internal processing	Processing completed

CAN reception processing time

Target Devices

✔ RA Family   ✔ RL78 Family   ✔ RX Family

✔ RISC-V MCU   ✔ RH850 Family   ✔ R-Car Family

Since the supported devices differ with the software you are using, confirm [Release Information] on the web page of the E2 emulator.
www.renesas.com/e2

Product Specifications

Item	Description
Method of connection Break function Tracing Reference to and changing memory contents while a program runs Performance measurement Hot plug-in	Since the method of connection and the functions may differ with the device you are using, refer to ⧉ On-chip Debuggers Performance Property Search keyword : R20UT0616
On-board programming	Supported
User interfaces	14pin 2.54mm pitch connector (7614-6002: from 3M Japan, 2514-6002: from 3M Limited) 20pin 1.27mm pitch connector (FTSH-110-01-L-DV-K: from Samtec) 10pin 1.27mm pitch connector (FTSH-105-01-L-DV-K: from Samtec, FTSH-105-01-L-DV: from Samtec without a marking for matching the position of the connector; keying shroud)
PC interface	USB 2.0, full speed and high speed
Connection to the system	Connection to the system is via the user system interface cable which comes with the product (signals for connection vary with the type of the target MCU). *To connect the E2 emulator to the 10pin 1.27mm pitch connector when using a device of the RA Family or a RISC-V MCU, purchase the separately available 20-10pin cable (RTE0T00020KCAC1000J).
Power-supply voltage	The range of operating voltage for the target MCU (1.8 V to 5.5 V)
Facility to supply power to the user system from the E2 emulator	200 mA max. (1.8 V to 5.0 V)
External dimensions (except for the protruding parts)	105.9 mm × 64.0 mm × 19.5 mm
Compliance with overseas standards	European Standards: EN 55022 Class A, EN 55024 US FCC Standard: FCC part 15 Class A

The supported facilities differ with the integrated development environment you are using.

Optional Products

The following optional products are provided to facilitate the use of the E2 emulator in various ways.

Supported MCUs vary depending on the products.

Please refer to "Optional Products for E2, E2 emulator Lite, E1, E20, and E8a emulators" www.renesas.com/ocd-options.

Conversion adapter	Converts the number and pitch of pins of the connector for connecting the emulator.
Isolator	Enables debugging in environments where the grounds of the user system and the host PC are not the same.
Low-voltage OCD board	Enables debugging of an MCU with a power-supply voltage such that the on-chip flash ROM cannot be reprogrammed.
Debugging MCU board Emulation adapter	Enables the use of enhanced debugging functions.

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