RX Family

Debug Console Function Using E1

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Introduction

E1 has a new feature “Debug Console” which can print the strings to High-performance Embedded Workshop though the emulator E1. User doesn’t need use other cable to communicate with PC. This document introduce how to use the function

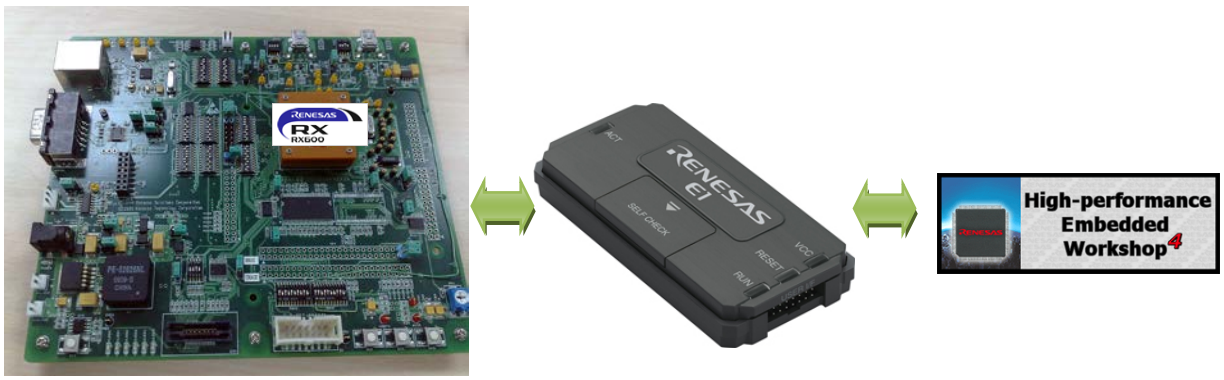
Target Device

RX Family

Contents

1. Configuration

You will need a RX CPU board, an E1 emulator and E1/E20 emulator debugger. Then, we can use the debug console function.



RX CPU Board

E1 Emulator

E1/E20 emulator debugger
V.1.00.00 or later

Figure 1 Configuration of the System Used in the Document

2. Create a New Workspace

Use project generator to create a new project and select the option “Use I/O Library”. See the figure 2 and there will be a SRC file being generated. The total files are shown in the figure 3. Lowlvl.src and lowsrc.c will be used for the debug console function.

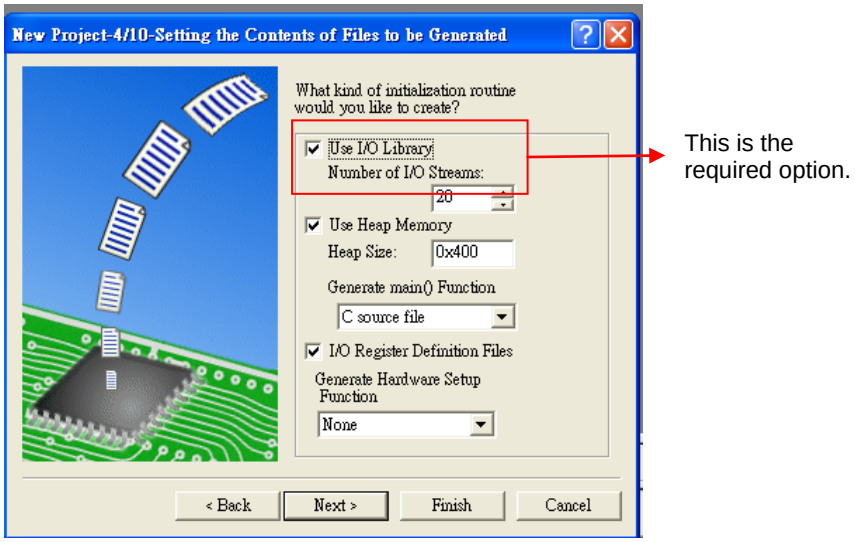


Figure 2 Required Option in the Project Generator

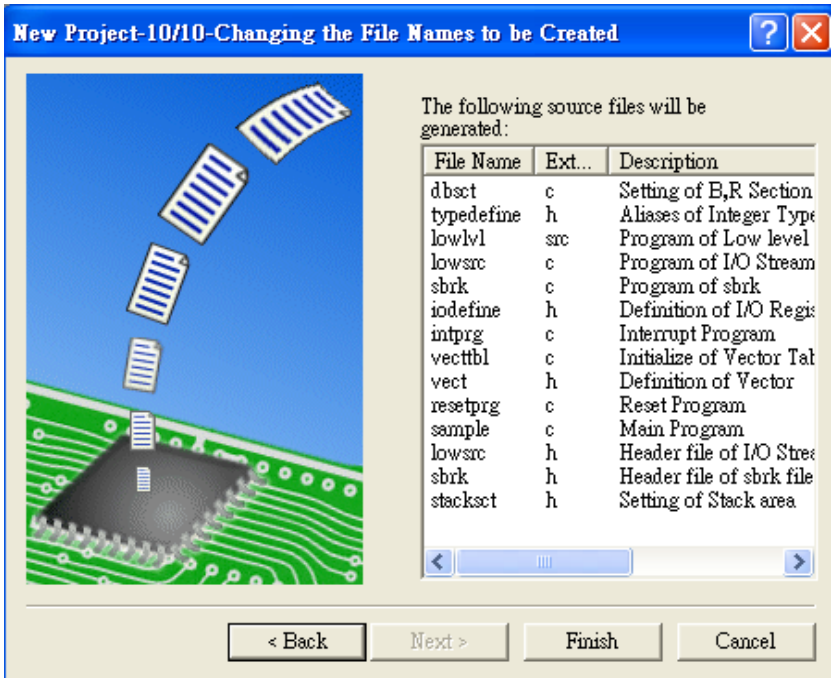


Figure 3 The File List

3. Modify the SRC File

In order to use the debug console function by E1, we need do modify the lowlvl.src file. According to the E1/E20 Emulator Additional Document for User’s Manual (High-performance Embedded Workshop RX Debug) (R20UT2081EJ0100), we need to copy the code in next page and replace the original in lowlvl.src. The stdio.h should be included in the project in order to use printf( ) and scanf ( )function.

```
;---------------------------------------------------------------------
;
; FILE :lowlvl.src
; DATE :Wed, Jul 01, 2009
; DESCRIPTION :Program of Low level
; CPU TYPE :RX
;
;---------------------------------------------------------------------
   .GLB  _charput
   .GLB  _charget
;---------------------------------------------------------------------
;register define
;---------------------------------------------------------------------
FC2E0 .EQU 00084080h
FE2C0 .EQU 00084090h
DBGSTAT .EQU 000840C0h
RXFL0EN .EQU 00001000h
TXFL0EN .EQU 00000100h

  .SECTION P,CODE
;---------------------------------------------------------------------
; charput:
;---------------------------------------------------------------------

_charput:
   .STACK _charput = 00000000h
_C2ESTART:
   MOV.L #TXFL0EN,R3
   MOV.L #DBGSTAT,R4
__TXLOOP:
   MOV.L [R4],R5
   AND R3,R5
   BNZ __TXLOOP
__WRITEFC2E0:
   MOV.L #FC2E0,R2
   MOV.L R1,[R2]
__CHARPUTEXIT:
   RTS
;---------------------------------------------------------------------
; charget:
;---------------------------------------------------------------------

_charget:
   .STACK _charget = 00000000h
__E2CSTART:
   MOV.L #RXFL0EN,R3
   MOV.L #DBGSTAT,R4
__RXLOOP:
   MOV.L [R4],R5
   AND R3,R5
   BZ __RXLOOP
__READFE2C0:
   MOV.L #FE2C0,R2
   MOV.L [R2],R1
__CHARGETEXIT:
   RTS
;---------------------------------------------------------------------
   .END
```

4. Use Debug Console Function of E1 Emulator

Click the symbol of the debug console as figure 4 after connecting the target board by E1.

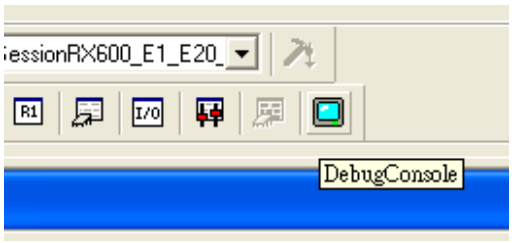


Figure 4 Open the Debug Console

Use the printf( ) and scanf ( ) as the following code and then the message will be shown in Debug console window.

The result is shown as figure 5. The information can be transferred directly between user and MCU with this function

```
printf("Hello the world!! \n");
printf("Renesas Eletronics Taiwan Co,. Ltd. \n");
printf(" HEW DEBUG CONSOLE TESTING. \n");
printf(" please enter your name: \n");


scanf("%s",s);
printf("%s!!",s);
printf("welcome to use the HEW CONSLE \n");
```

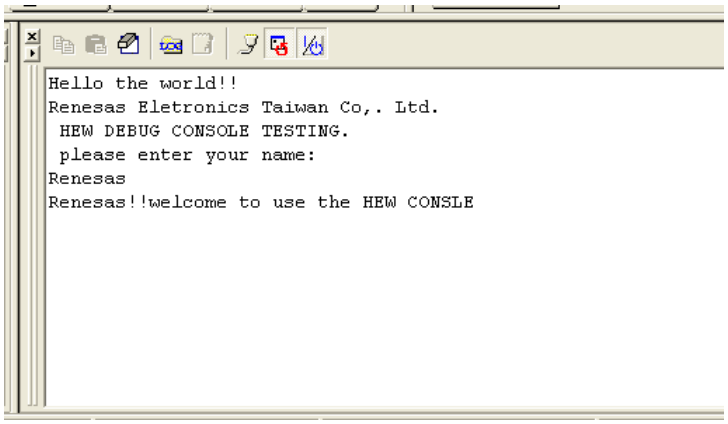


Figure 5 The Console Output

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REVISION HISTORY	RX Family Application Note RX/62N Using E1 Debug Console Function

Rev.	Date	Description	
		Page	Summary
1.00	Jan. 29, 2011	—	First edition issued
1.01	Mar. 18, 2013	2, 3	Changed the reference product.

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The following usage notes are applicable to all MPU/MCU 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. Handling of Unused Pins

   Handle unused pins in accord 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 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. Unused pins should be handled as described under Handling of Unused Pins in the manual.

2. Processing at Power-on

   The state of the product is undefined at the moment 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 moment 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 moment 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 moment when power is supplied until the power reaches the level at which resetting has been specified.

3. Prohibition of Access to Reserved Addresses

   Access to reserved addresses is prohibited.

   — The reserved addresses are provided for the possible future expansion of functions. Do not access these addresses; the correct operation of LSI is not guaranteed if they are accessed.

4. Clock Signals

   After applying a reset, only release the reset line after the operating clock signal has become stable. When switching the clock signal during program execution, wait until the target clock signal has 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. Moreover, 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.

5. Differences between Products

   Before changing from one product to another, i.e. to a product with a different part number, confirm that the change will not lead to problems.

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