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S1C17M03
Software Setup Guide

Contents

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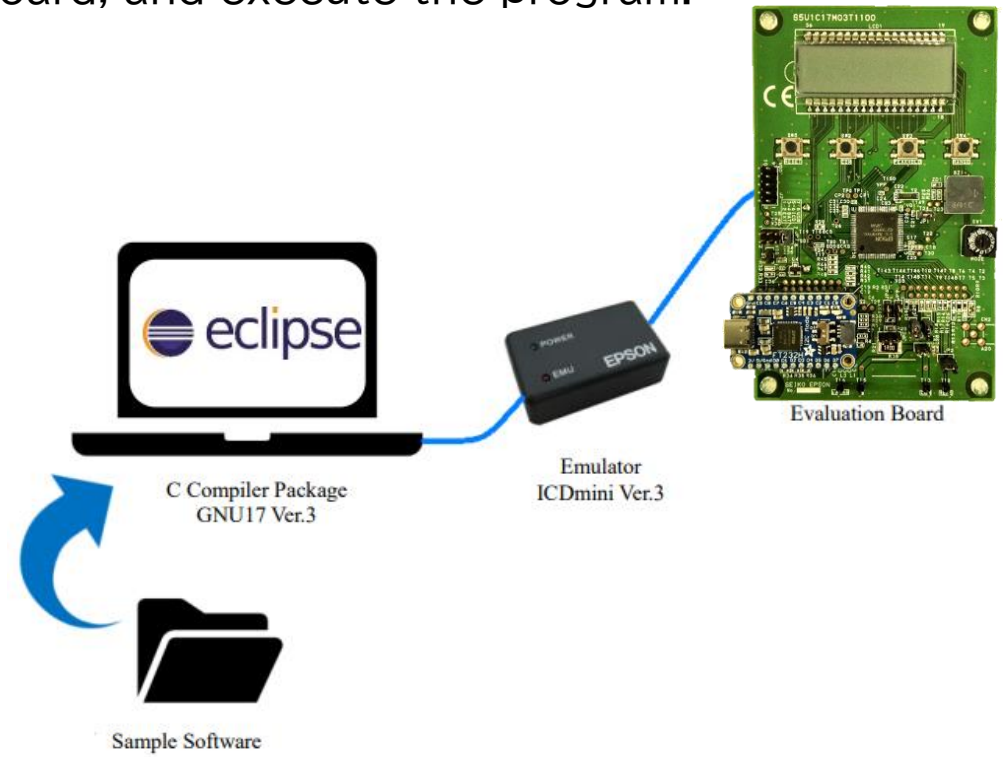
Introduction

This setup guide explains how to install the C compiler package, which is GNU17V3, import sample projects, build the projects, connect an emulator and an evaluation board, and execute the program.



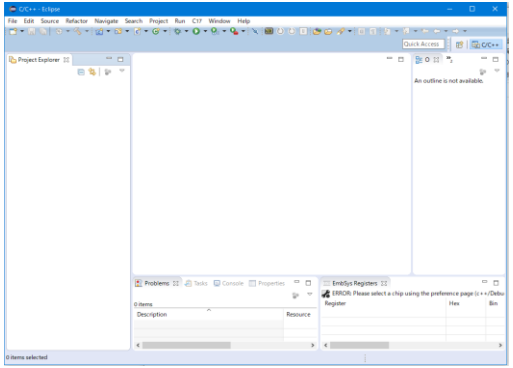
Working Environment

PC(OS:Windows10): - S1C17 Software Integrated Development Environment (GNU17V3) - Latest model-specific information file - Sample software and PC software	
emulator: - S5U1C17001H3(ICDminiV3) - USB cable - 10-pin connector	
Evaluation board for S1C17Family: - S5U1C17M03T	

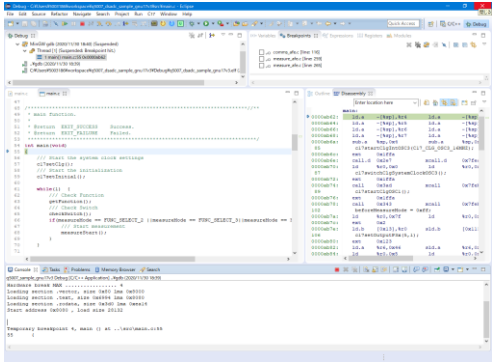
About GNU 17V3

GNU17V3 is a software integrated development environment for developing software on a PC. GNU17V3 includes a set of software tools and utilities that compile C source programs, assemble assembly source programs, debug them, and create executable and motorola files.

- Operating environment (OS): Windows10
- Development environment base: Eclipse
- Available languages: C and assembler
- Compiler: gcc compiler (gcc4 and gcc6)



IDE(Software development)



GDB(Software debug)

About ICDmini V3

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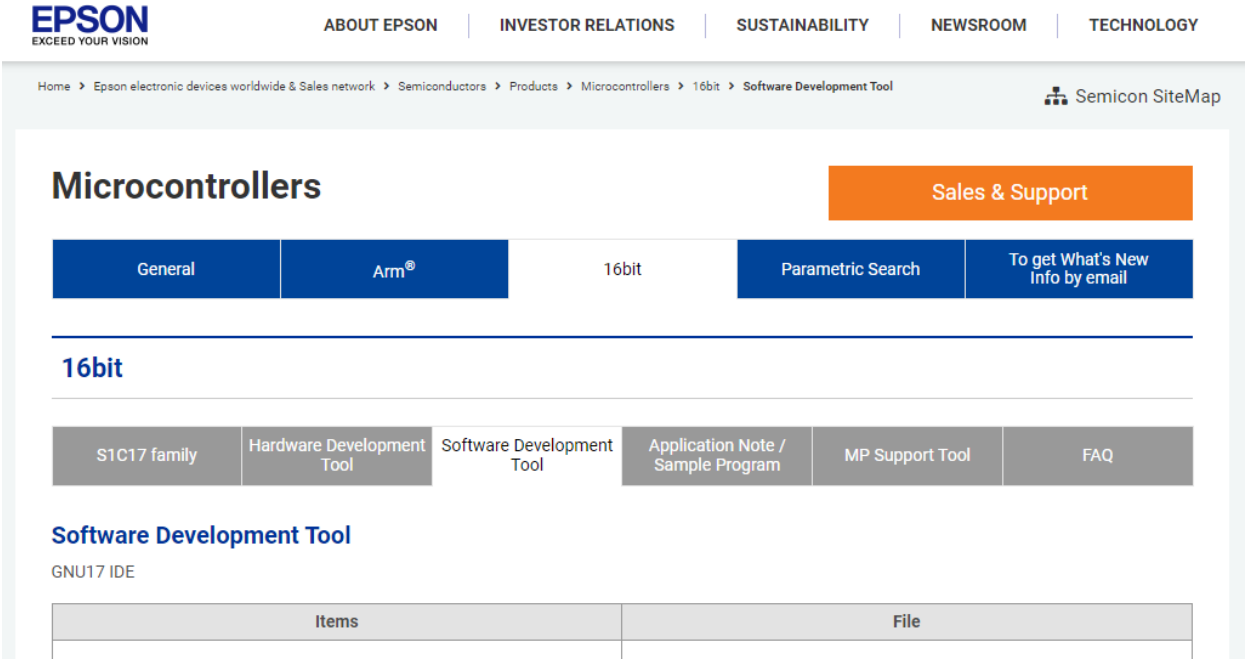
S5U1C17001H (ICDmini) connects the S1C17 microcomputer on the target system and GNU17V3, and provides an environment for debugging on the target system together with GNU17V3.

About user sites

We publish information related to the target MCU on the user site. Please download the latest GNU 17V3 and model-specific information files required for software development from the following.

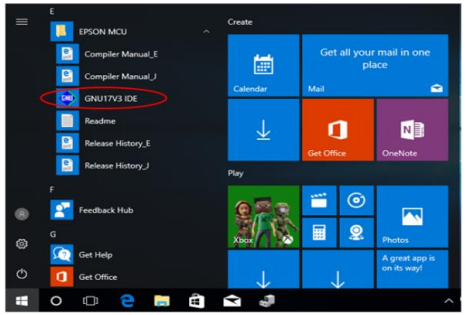
[16bit Microcontroller -Software Tool- Products - Semicon Top – Epson]



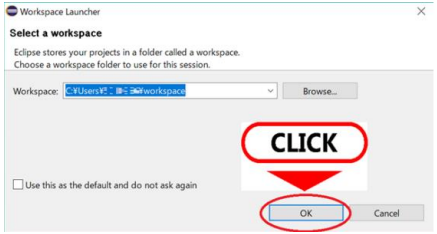
Program development

Booting GNU 17V3

1. To start GNU17, please start from Windows Startup Menu, and continue in order of [EPSON MCU] > [GNU17V3 IDE].



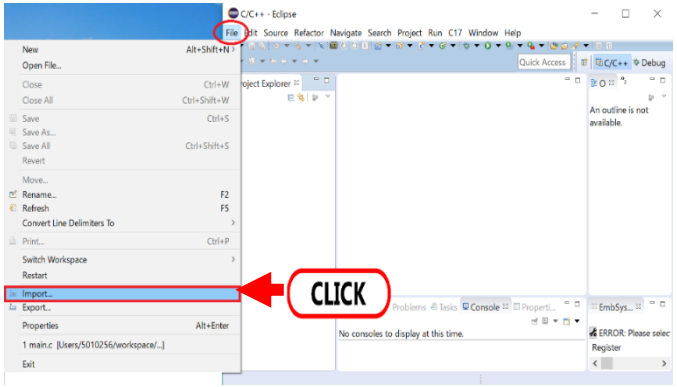
2. Please select a Workspace.



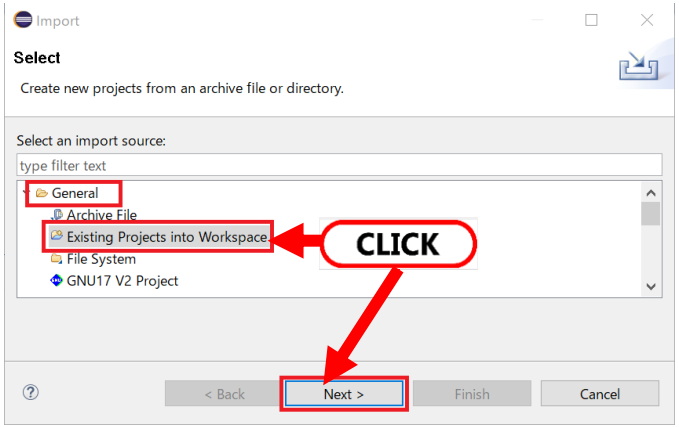
3. After a while, GNU17 is started. Please click on [Workbench] to close the Welcome window (the welcome window shows up only the initial startup.)

Importing sample projects(1)

1. Please click on [File] at the upper left corner, and select [Import].

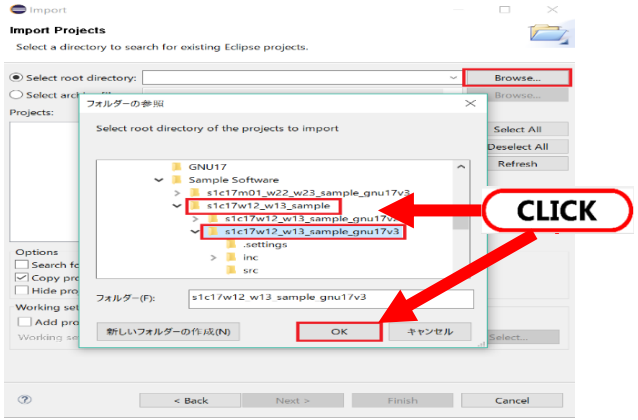


1. Please select [Existing Projects into Workspace] under [General], and click [Next>].

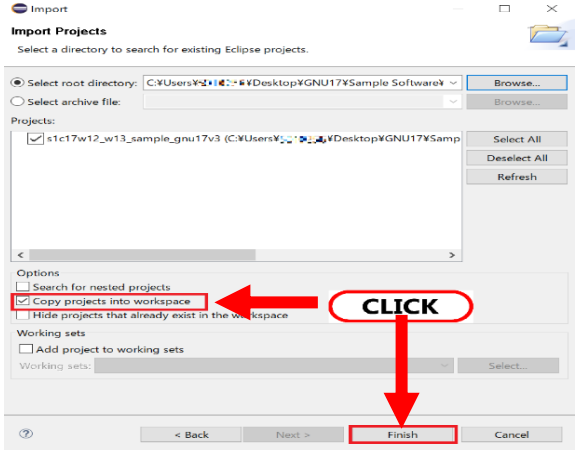


Importing sample projects(2)

3. To select root directory, please click on [Browse…], and select a sample project for GNU17V3.



4. Please check the [Copy projects into workspace] check box, and click on [Finish]. This is the end of importing sample projects.



Download model information file

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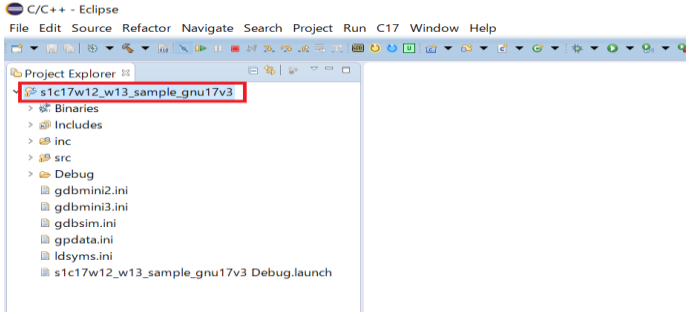
1. Please download the latest model-specific information file from the following URL.
   https://global.epson.com/products and drivers/semicon/products/micro controller/16bit/sw tool.html

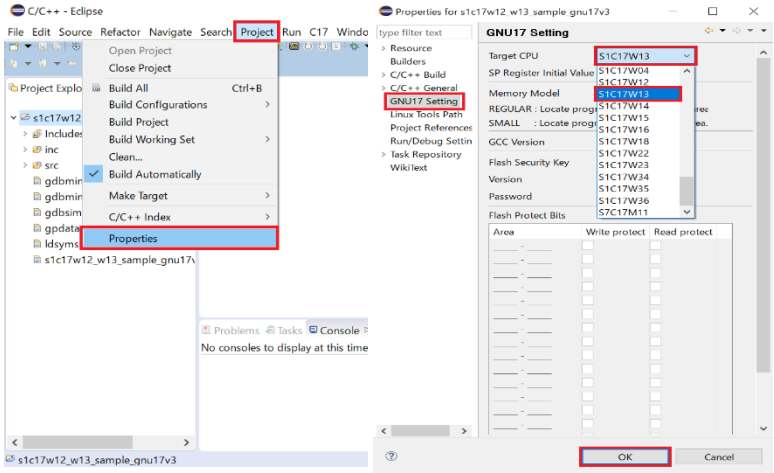
2. Please replace with the following folder.
   C:¥EPSON¥GNU17V3¥mcu_model

Project settings

1. Please check if there is the sample project file on a Project Explorer window, and open it with a Double-Click.



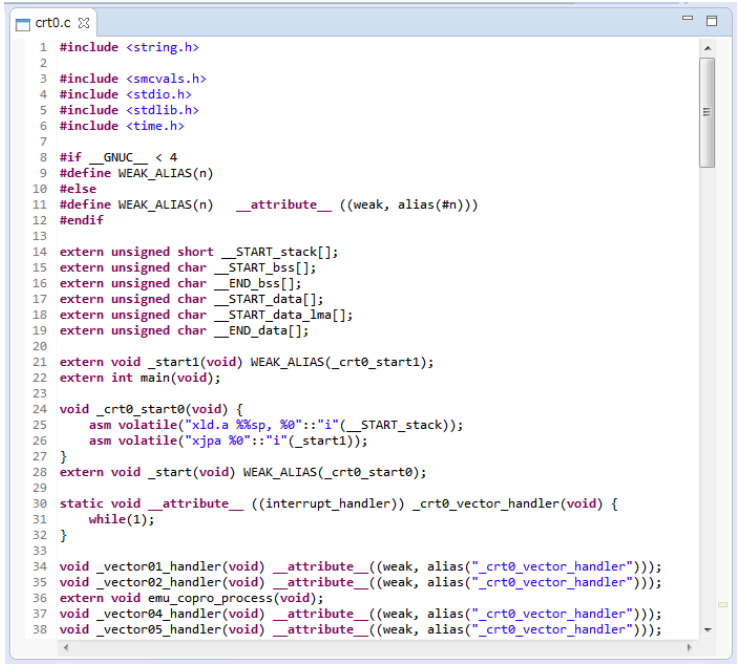
2. Please open in the order of [Project] > [Properties] > [GNU17 Setting], and check if Target CPU is selected correctly. (Target CPU is related to the evaluation board.)



Startup processing library (crt0.o)

GNU17V3 automatically incorporates the startup processing library “crt0.o” including the vector table, start and end functions when creating a project. Therefore, the program starts from crt0.o. The source code for crt0.o can be found below.

C¥EPSON¥GNU17V3¥utility¥lib src¥crt0.c

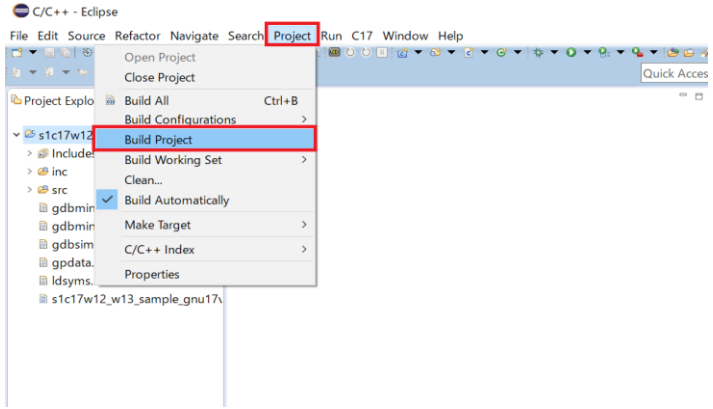


crt0.c

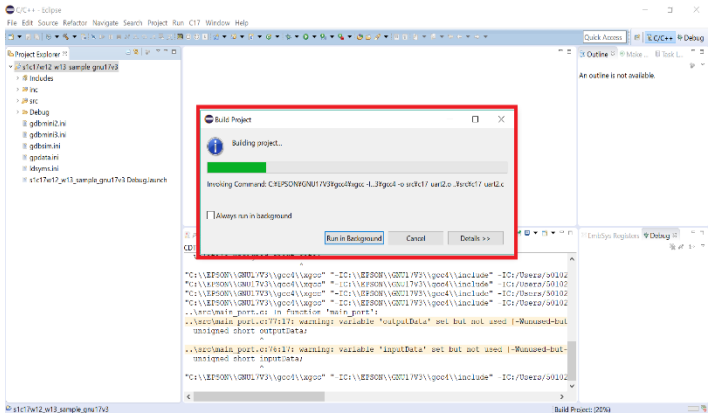
```
#include <string.h>

#include <smcvals.h>
#include <stdio.h>
#include <stdlib.h>
#include <time.h>

#if __GNUC__ < 4
#define WEAK_ALIAS(n)
#else
#define WEAK_ALIAS(n)   __attribute__ ((weak, alias(#n)))
#endif

extern unsigned short __START_stack[];
extern unsigned char __START_bss[];
extern unsigned char __END_bss[];
extern unsigned char __START_data[];
extern unsigned char __START_data_lma[];
extern unsigned char __END_data[];

extern void _start1(void) WEAK_ALIAS(_crt0_start1);
extern int main(void);

void _crt0_start0(void) {
    asm volatile("xld.a %%sp, %0"::"i"(__START_stack));
    asm volatile("xjpa %0"::"i"(_start1));
}
extern void _start(void) WEAK_ALIAS(_crt0_start0);

static void __attribute__ ((interrupt_handler)) _crt0_vector_handler(void) {
    while(1);
}

void _vector01_handler(void) __attribute__((weak, alias("_crt0_vector_handler")));
void _vector02_handler(void) __attribute__((weak, alias("_crt0_vector_handler")));
extern void emu_copro_process(void);
void _vector04_handler(void) __attribute__((weak, alias("_crt0_vector_handler")));
void _vector05_handler(void) __attribute__((weak, alias("_crt0_vector_handler")));
```

Building Projects(1)

1. Please click on [Build Project] under [Project].

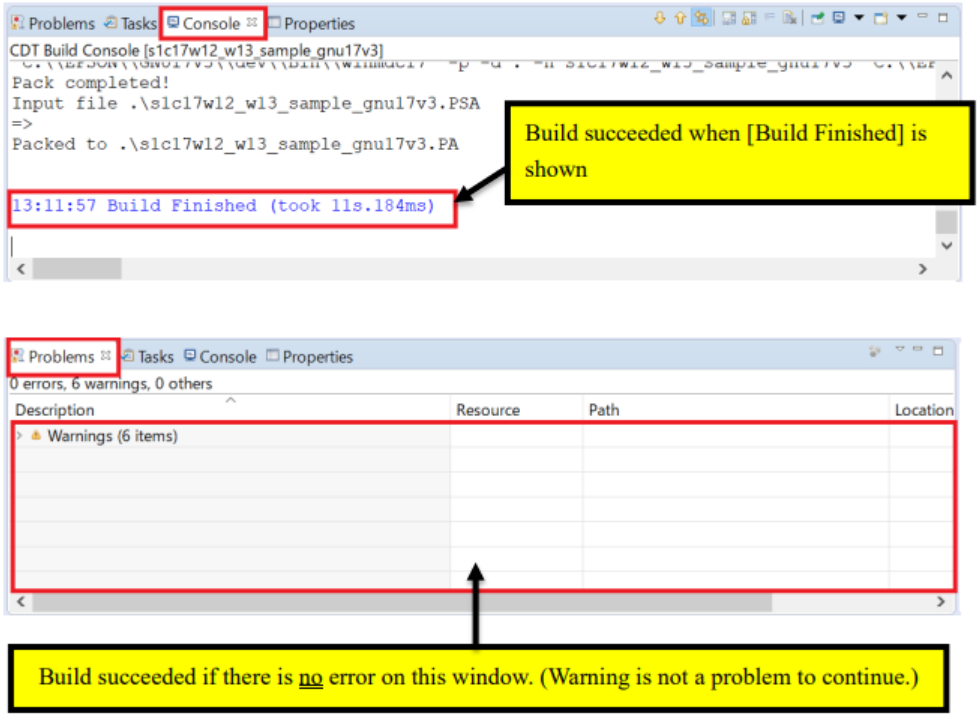


2. Building project is being started.



Building Projects(2)

3. Please open the [Console] tab which is located on under the middle window, and see [Build Finished] message. In addition, please open [Problems] tab and check if there is no error.

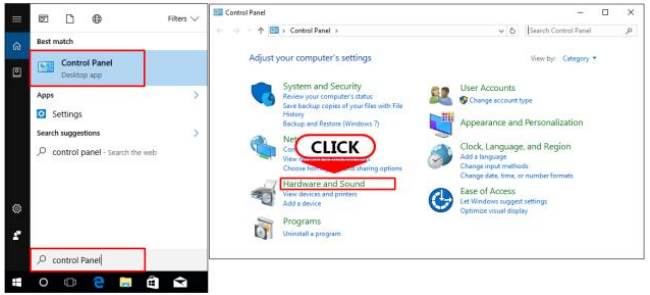


Evaluation board connection

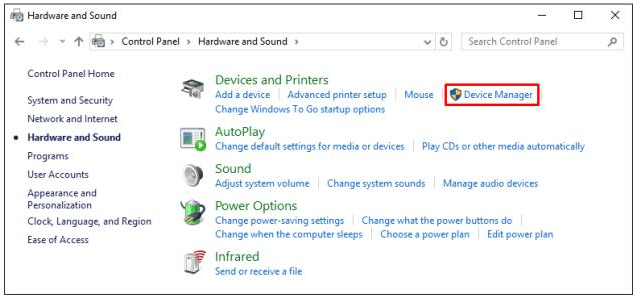
USB driver installation(1)

1. Moving on to install an USB driver for ICDminiV3 on the PC. Please connect only ICDminiV3 with PC, and check if green LED turns on. (It turns on after it blinks a couple of times.)

2. Please open [Control Panel] under Windows Menu, and click on [Hardware and Sound].

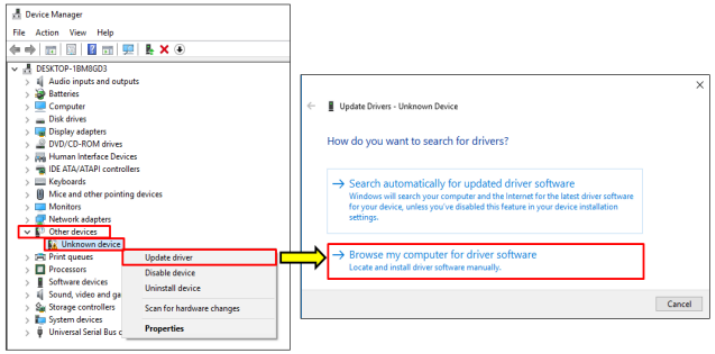


3. Please click on [Device Manager].

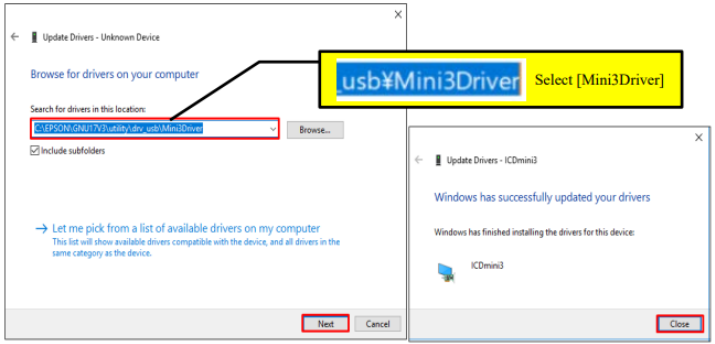


USB driver installation(2)

3. Please Right-Click on [Unknown devices], and renew the driver. “How do you want to search for drivers?” choose [Browse my computer for driver software]

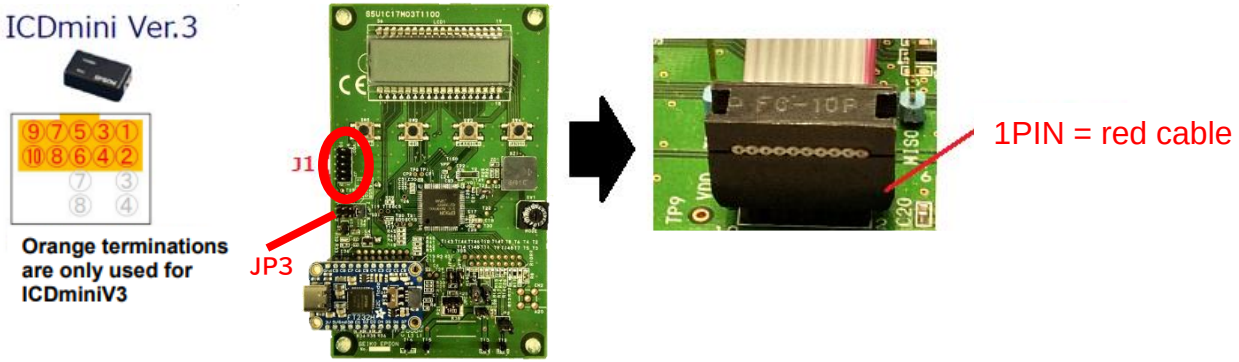


4. Please Right-Click on [Unknown devices], and renew the driver. “How do you want to search for drivers?” choose [Browse my computer for driver software]



ICDminiV3 connection

1. Connect the ICDminiV3 to the evaluation board.



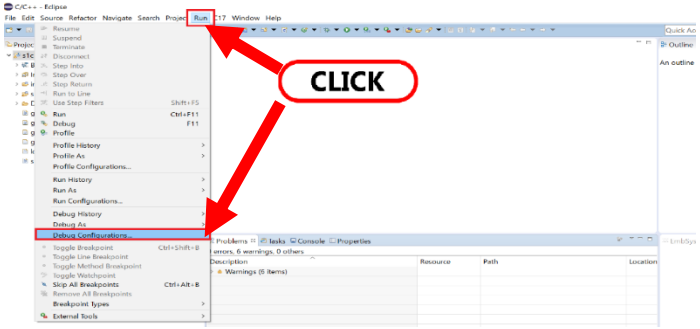
JP3 should short-circuit VDD_ICD.

2. Please connect the emulator and the evaluation board with the PC. Check if both green and red LEDs are on. If those do not turn on, please check the connection.

From program writing to debugging

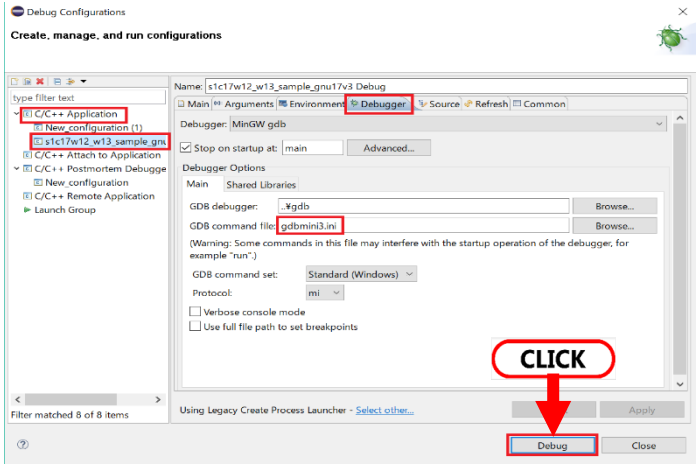
Launch the debugger(1)

1. Please select [Run] > [Debug Configurations]



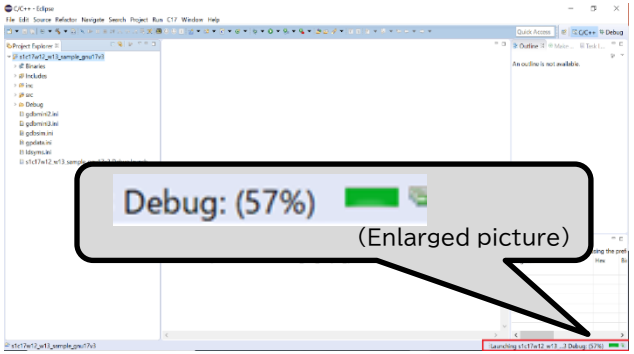
2. Under [C/C++ Application], please choose the sample project that is supposed to execute. Please click on [Debugger] tab, and edit the [GDB command file].

3. If ICDmini Ver.3 is used, enter [gdbmini3.ini].Please click on [Debug] then.

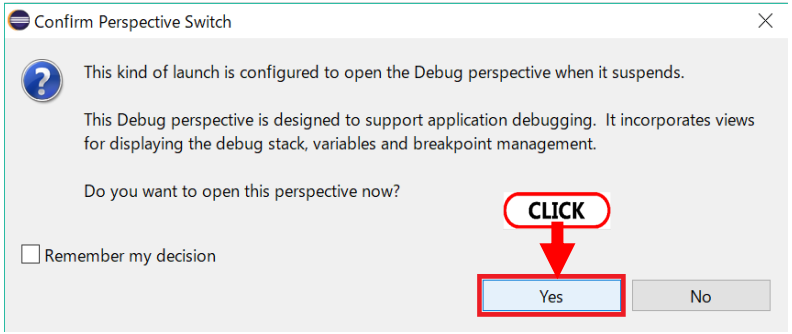


Launch the debugger(2)

3. Debugging is started, and progress bar is shown at the right bottom corner.

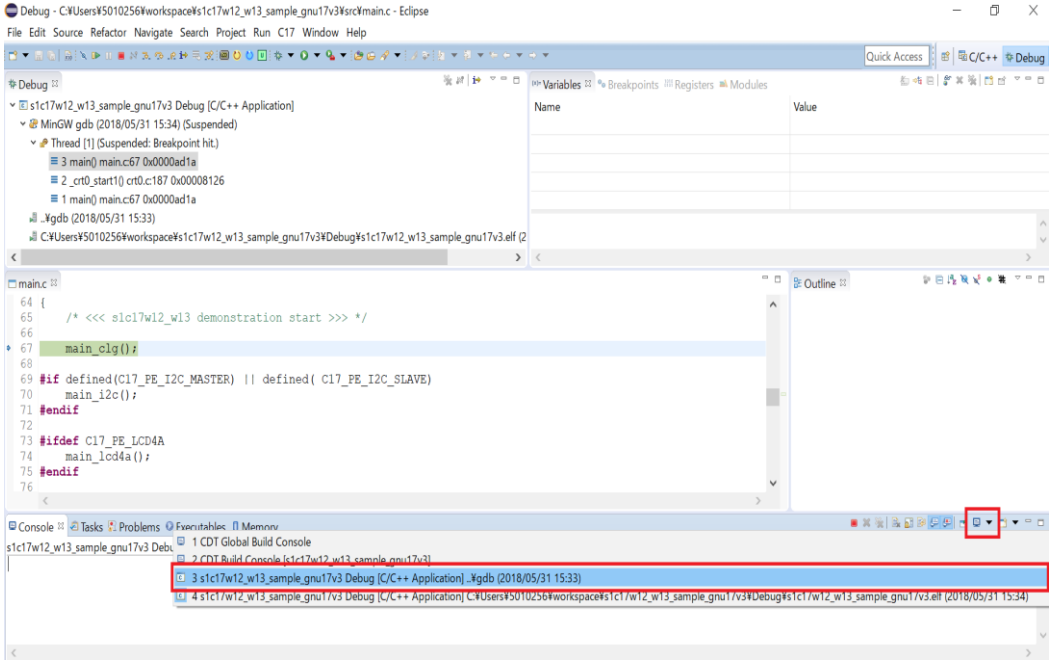


4. After a short time, [Confirm Perspective Switch] window appears. Please click on [Yes].



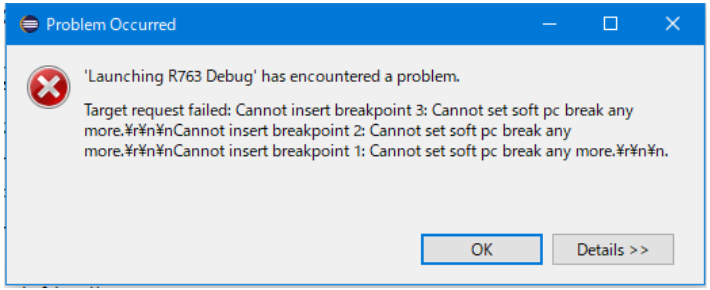
Launch the debugger(3)

5. Window is shifted Debug window. Please click on [Display Selected Console]pulldown, and select an option that end with […¥gdb]. Please check if any errors do not appear.

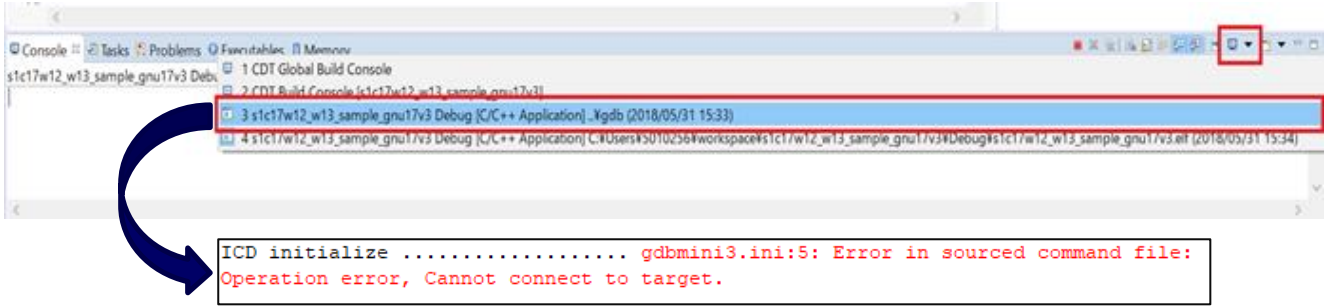


How to read error messages

When starting the debugger, the following message will be displayed if a problem occurs. (The text of this message has no meaning.)



If this message is displayed, follow ”Start Debugger (3)”, click the [Display Selected Console] pull-down menu at the bottom right, and then click the option ending with [… ¥ gdb]. The true error is displayed in red.

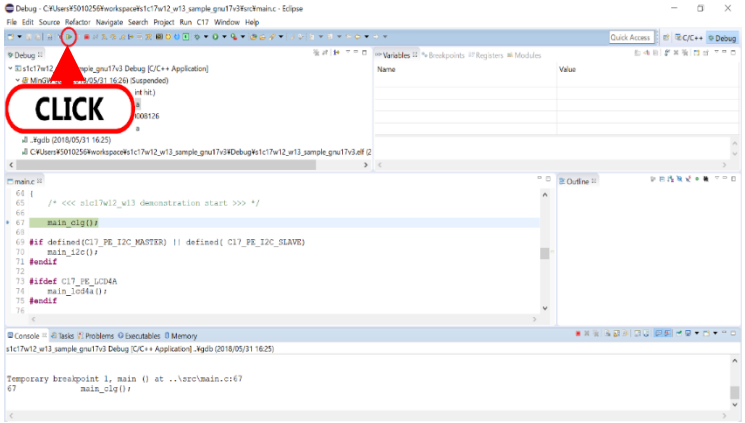


Time to write

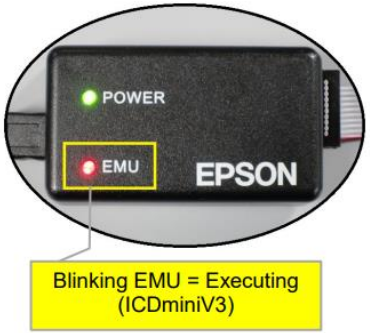
When the debugger is started, the program is written to the built-in Flash of the target IC. The time required for writing varies depending on the program size, but a guideline is given in the following file.
C:¥EPSON¥GNU17V3¥mcu model¥17M03¥fls¥fls17m03 readme e.txt

Executing the Program(1)

1. Please click on [Resume ].

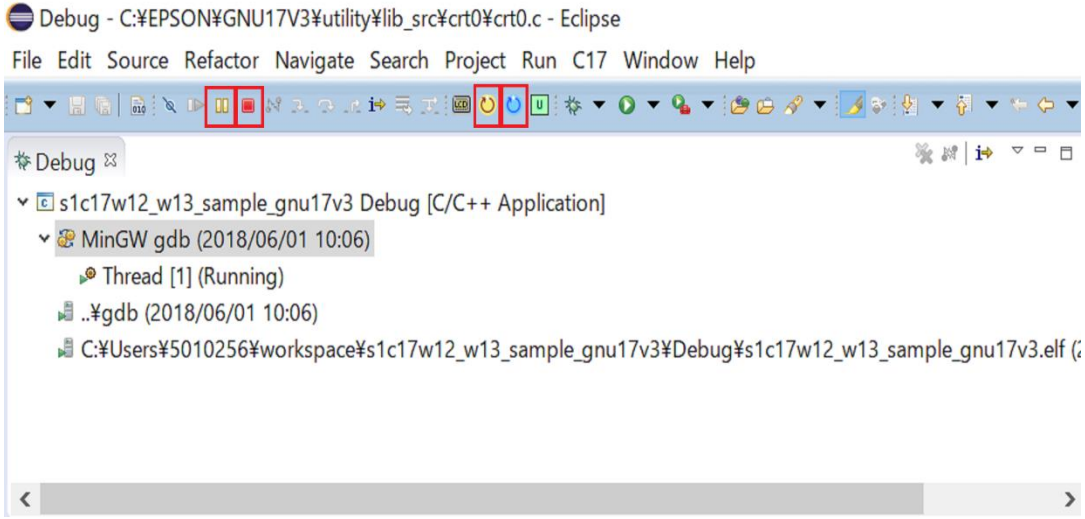


2. Sample project is executed.



Executing the Program(2)

3. Please click on [⏸] to suspend the program, and click on [■] to terminate the program. Please click on [↻] to reset the program, and click on [↻] to reset the program and the target.



Reference

I explained the basic operation of the software development environment. In the software development environment we provide, various other functions are available. If you have any problems, we recommend that you refer to the following tutorials and manuals.

■ **GNU17V3 Manual**

https://global.epson.com/products and drivers/semicon/pdf/id003054.pdf

■ **ICDminiV3 Manual**

https://global.epson.com/products and drivers/semicon/pdf/id002781.pdf

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