

S5U1C17000Y2 GangWriter

Software Manual

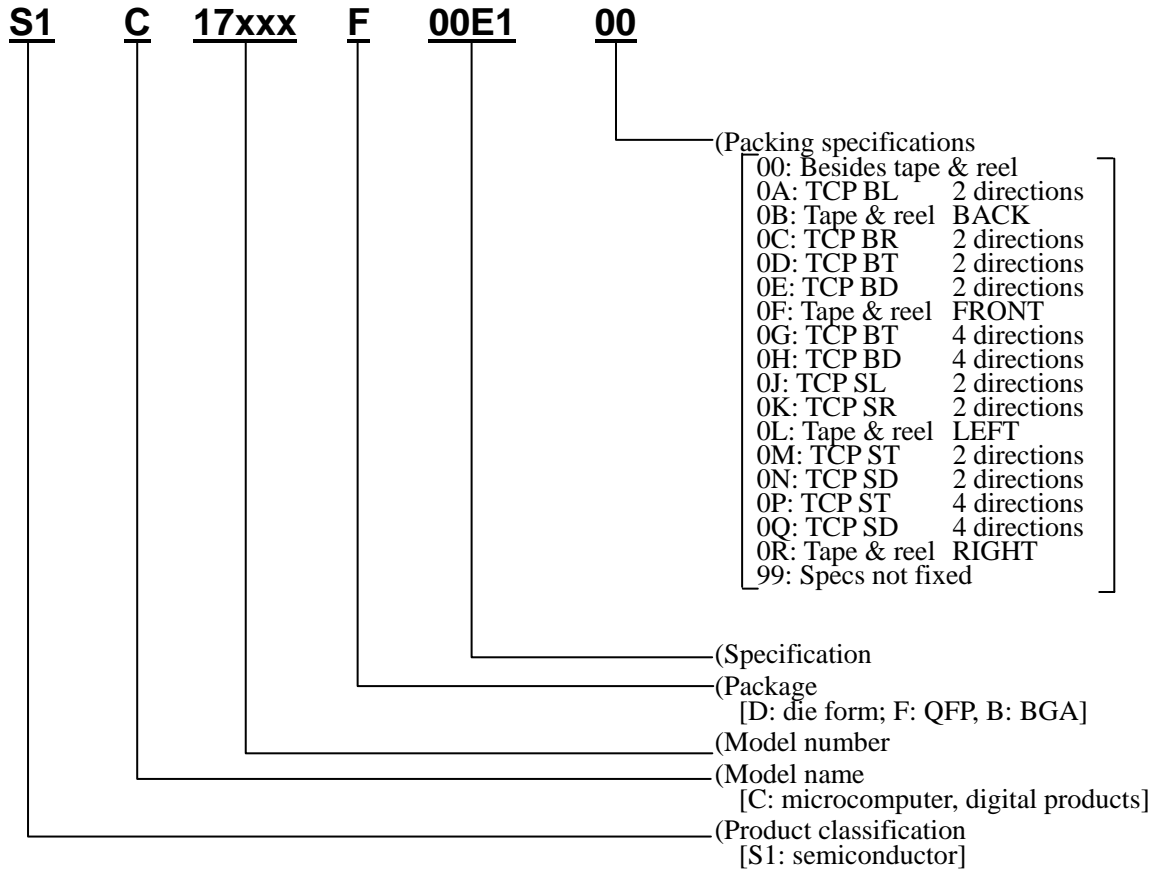
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Configuration of product number

●Devices



●Development tools

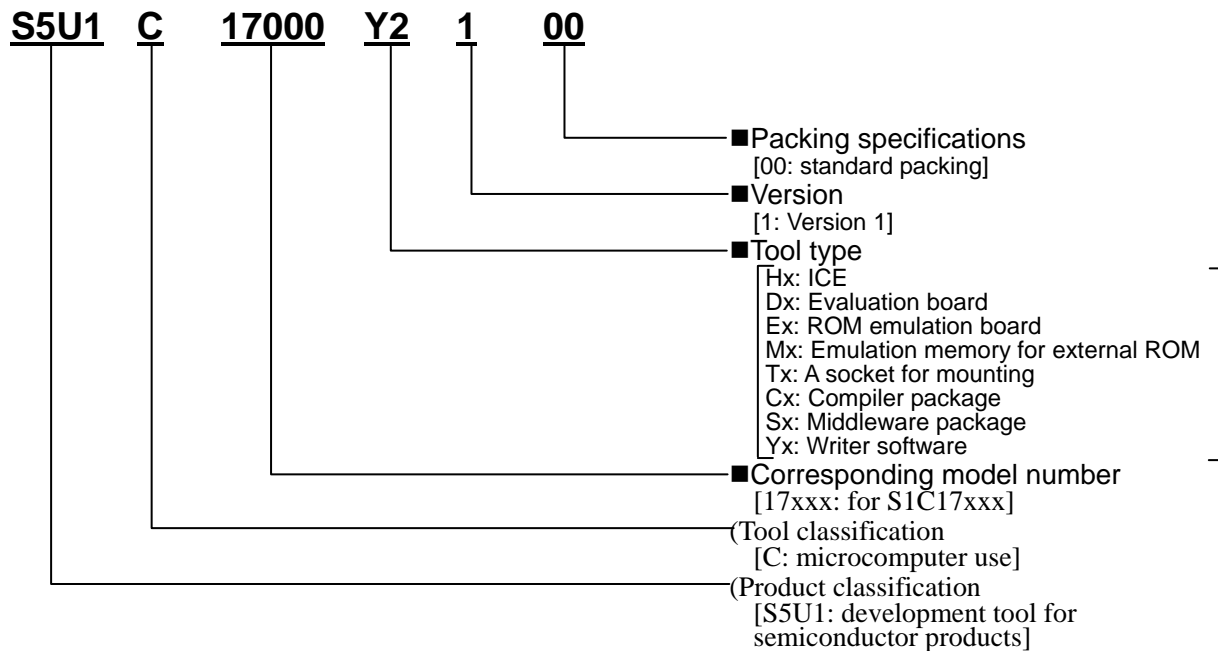


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1. Description

This software is a Windows application for implementing the GangWriter function using S5U1C17001H (hereafter, ICDmini).

Using a maximum of 10 ICDmini units, the software allows you simultaneously to erase the Flash memory of target systems and to download data (a user program).

This product is compatible with USB 1.1.

The software is compatible with Windows 2000, Windows XP and Windows Vista (Japanese and English versions)

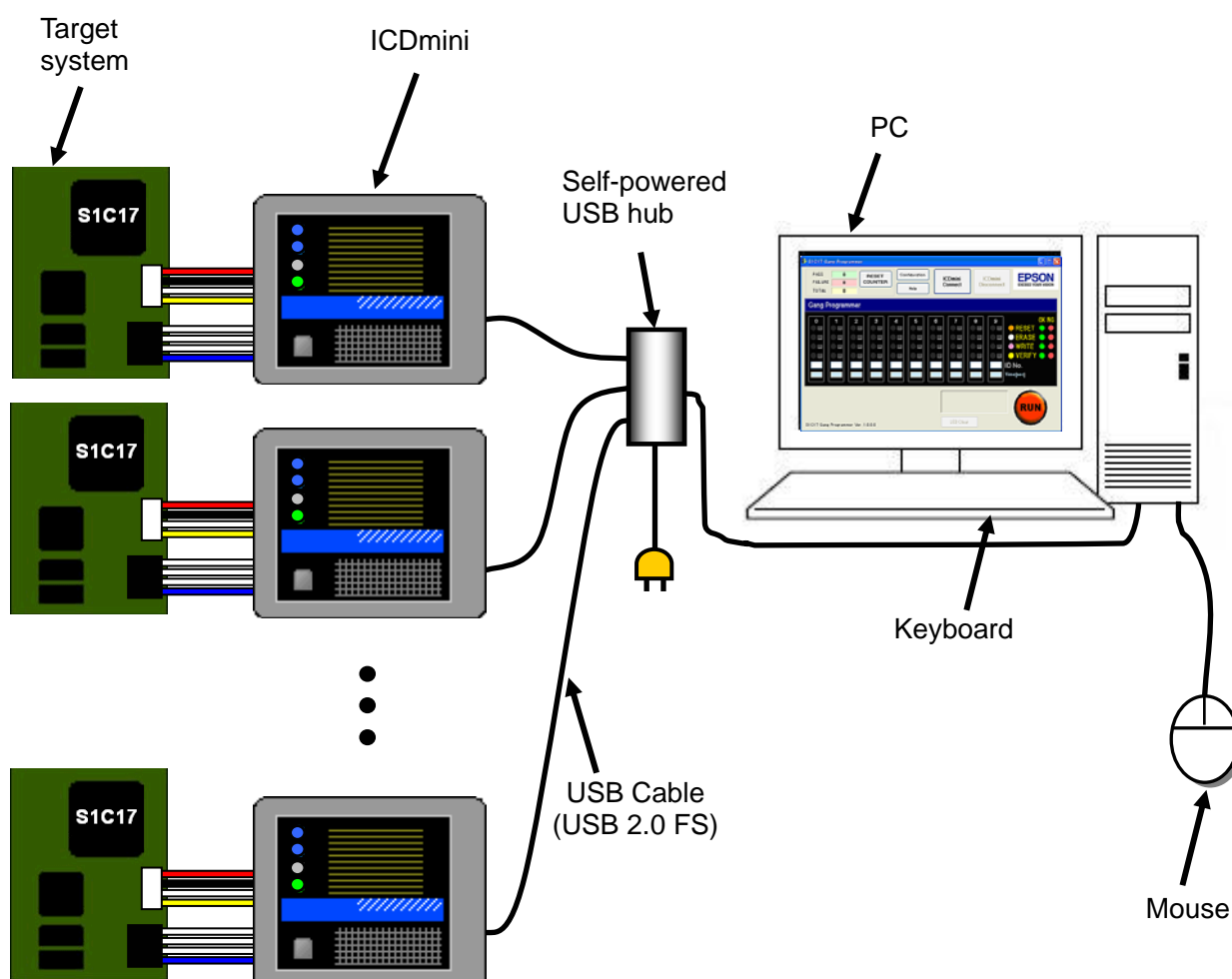


Figure 1.1 GangWriter hardware configuration

2. Hardware Required

2. Hardware Required

The hardware required can be obtained from the following sources.

Table 2.1 Required items

Item	Source
S5U1C17000Y2 GangWriter package	Epson Web site http://www.epson.jp/device/semicon_e/product/mcu/
S5U1C17001C (S1C17 Family C compiler package)	
S5U1C17001H User Manual (ICDmini)	
S5U1C17001H (ICDmini) firmware Version 2.2 or higher	
The required quantity of S5U1C17001H (ICDmini) units	Please contact the Seiko Epson Sales Representative.
USB hub (A self-powered hub that can supply a maximum of 500 mA for each ICDmini 1 unit is required.)	Supplied by the user.
PC Required specification: CPU-Pentium 4 1.5 GHz or more, RAM-512 MB or more	Supplied by the user.

3. Preparing the S5U1C17001H (ICDmini)

To implement GangWriter, the following 2 steps are required.

- A) Setup of the PC used for setting the ICDmini
- B) Setup of the GangWriter host PC

A) is explained in Chapter 3, while B) is explained in Chapter 4.

In these explanations, a different PC is used for A) and B), but the same PC can be used for both steps.

3.1 Installing S5U1C17001C (S1C17 Family C compiler package)

Install the S1C17 Family C compiler package in the PC used for setting the ICDmini.

Refer to “Installation” in the S5U1C17001H Manual.

3.2 Installing the USB Driver

Connect the ICDmini to the PC with a USB cable. A message prompting you to install the USB driver appears. Specify the folder below and install the USB driver.

Here, the driver is installed in the default location of the S1C17 Family C compiler package.

```
C:\¥EPSON¥GNU17¥utility¥drv_usb
```

Refer to “Connecting to the Host Computer” in the S5U1C17001H User Manual for more details.

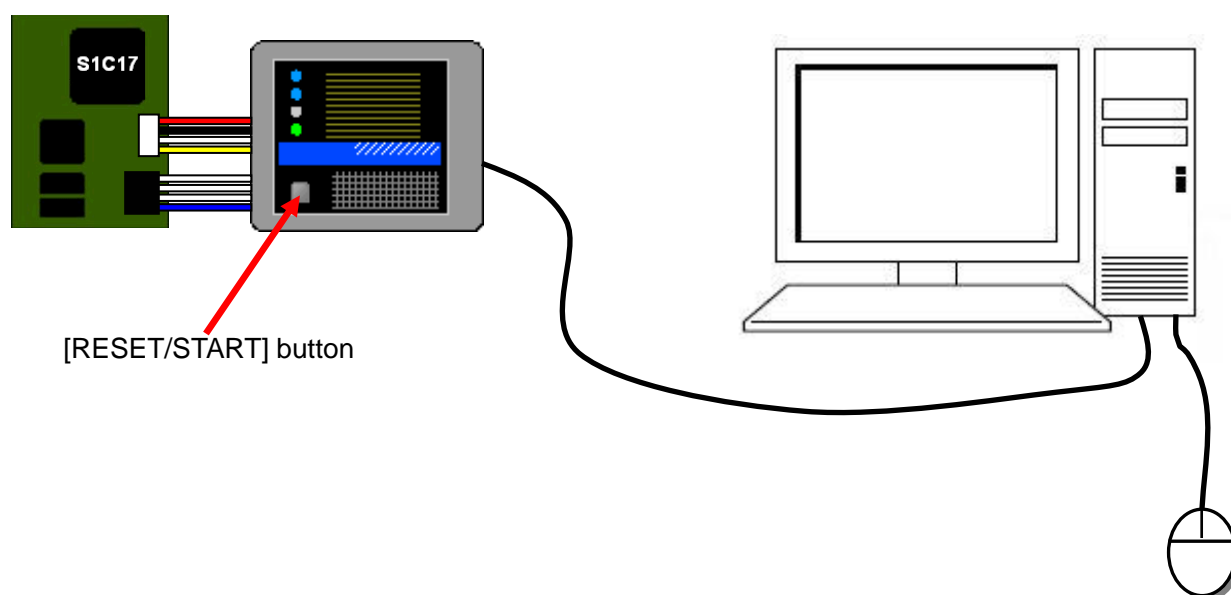


Figure 3.1 Connection when setting the ICDmini

3. Preparing the S5U1C17001H (ICDmini)

3.3 Checking the ICDmini Firmware Version

To implement GangWriter, the firmware version of the ICDmini must be 2.2 or higher. Check the firmware version using the steps below.

Connect the ICDmini to the PC with a USB cable as shown in Figure 3.1.

Set DIP switch 7 on the ICDmini to ON, or connect to a target system equipped with S1C17 using a 4-pin target connection cable.

After connecting to the PC, press the [RESET/START] button on the top of the ICDmini.

Next run `C:\Epson\GNU17\gdb.exe` to start the debugger.

When `(gdb)` is displayed in the [Console] window, enter “`target icd usb`”, and press the Enter key. The firmware version is displayed.

```
(gdb) target icd usb
```

```
Connection with target (ID_OK) ..... done
ICD Initializing (ID_INITIALIZE) ..... done
Read ICD Version (ID_VER_READ) ..... done
ICDmini hardware version .....1.0
ICDmini software version .....2.2 ← Firmware version
Debug base address (ID_DATA_READ) .. 0x000000
Boot address (ID_DATA_READ) ..... 0x000000
Hardware break MAX ..... 1
```

If the firmware version is 2.2 or higher,
firmware update is not required. → To Section 3.5
(However, use the latest firmware if possible)

If the firmware version is 2.1 or lower,
firmware update is required. → To Section 3.4

3.4 Updating the ICDmini Firmware

Refer to “Firmware Update” in the S5U1C17001H User Manual and update the ICDmini firmware.

3.5 Downloading the Required Data

The Flash erase/download program (FLS) and the data (user program) must first be downloaded in each ICDmini using the debugger. The capacity limit of the data (user program) is 4 MB.

The Flash erase/download program (FLS), the data (user program) and the ID number for identifying the ICDmini must first be downloaded in each ICDmini using the debugger. The debugger is included in S5U1C17001C.

Table 3.1 Types of data

Data	Content
Erase/download program (FLS)	The program for each model can be found in C:\¥EPSON¥GNU17¥mcu_model. Read the relevant readme_e.txt / readme_j.txt file before using the program. To download data to an external Flash memory, modify the sample program as required with reference to the application notes of the FLS program on the Epson Web site, or contact your Seiko Epson Sales Representative.
Data (User program)	A program created by the user. The program must be created in the .saf format. Refer to "Stand-Alone Flash Writer" in the S5U1C17001H User Manual for more details.
ID number	Each ICDmini must be set with a different number between 0 and 999. (If multiple units are set with the same ID, only one unit is recognized.)

Download the data by connecting a single ICDmini to the PC.

In the example below, the following settings are used.

Program (FLS): fls17701.saf

Data (user program): userprog.saf

ID number: 3

(A.1) Connect the PC and ICDmini

Set DIP switch 7 on the ICDmini to ON, and connect the PC and ICDmini with a USB cable.

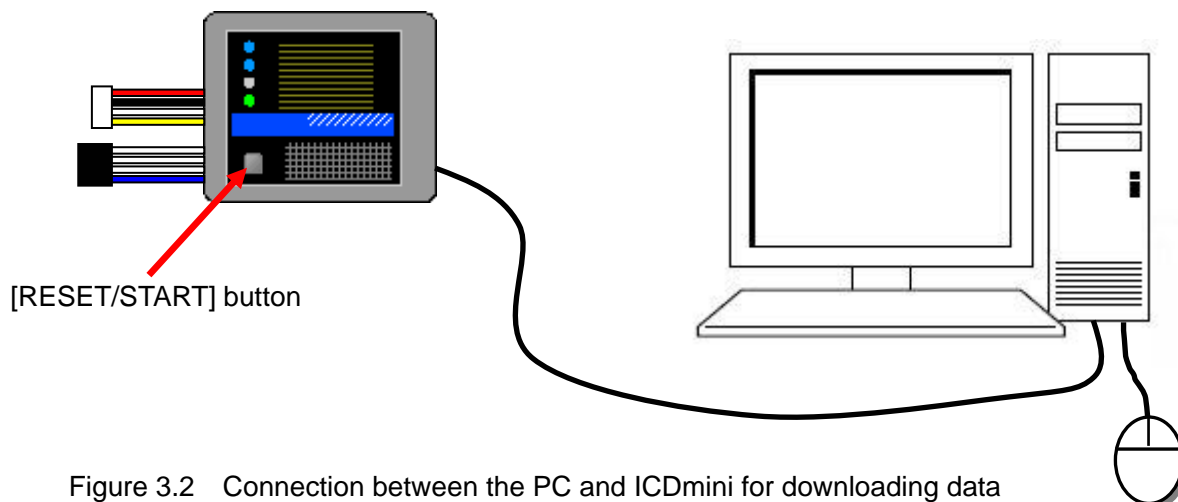


Figure 3.2 Connection between the PC and ICDmini for downloading data

3. Preparing the S5U1C17001H (ICDmini)

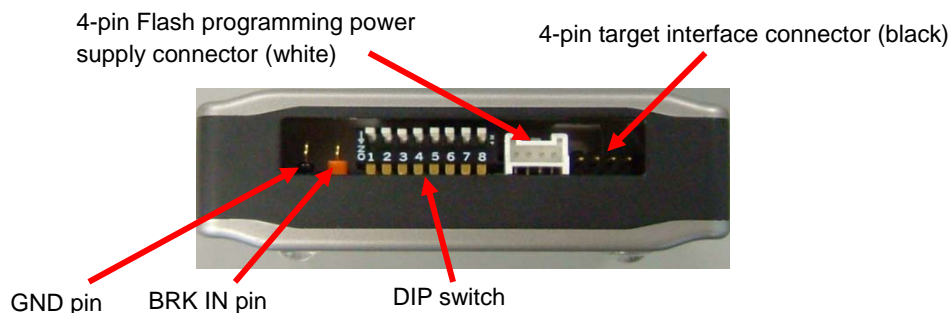


Figure 3.3 Left side panel of the ICDmini

(A.2) Reset the ICDmini

Press the [RESET/START] button on the top of the ICDmini.

(A.3) Start the debugger

Run `C:\¥EPSON¥GNU17¥gdb.exe` to start the debugger.

(A.4) Connect the ICDmini

When (gdb) is displayed in the [Console] window, enter the following after (gdb).

```
(gdb) target icd usb
```

(A.5) Download the program (FLS) and ID

```
(gdb) c17 fwlp fls17701.saf 0x48 0x80 3
```

0x48: Enter the erase routine end address and the value shown in the FLS readme_e.txt / readme_j.txt.

0x80: Enter the download routine end address and the value shown in the FLS readme_e.txt / readme_j.txt.

3: ID number (only decimal numbers are accepted)

(A.6) Download the data (user program)

```
(gdb) c17 fwld userprog.saf 0 0 0x8000
```

0: Erase start block (sector)

0: Erase end block (sector) *1

0x8000: Flash memory start address

*1 When erase start block = erase end block = 0, all Flash memory areas are set to be erased.

3. Preparing the S5U1C17001H (ICDmini)

(A.7) Quit the debugger

```
(gdb) quit
```

(A.8) Disconnect the ICDmini

Disconnect the ICDmini from the USB cable and connect the next ICDmini.

(A.9) Repeat the procedure

Repeat the procedure for each ICDmini.

These commands can be written in a "filename.cmd" text file, and can be executed continuously like
C:\¥EPSON¥GNU17¥gdb.exe -x filename.cmd.

The content of *filename.cmd*

```
target icd usb
c17 fwlp fls17701.saf 0x48 0x80 3
c17 fwld userprog.saf 0 0 0x8000
quit
```

4. Preparing the PC for GangWriter

4. Preparing the PC for GangWriter

4.1 Installing the Software

Install the S5U1C17000Y2 application.

4.2 Installing the USB Driver

Connect the ICDmini to the PC with a USB cable. If a message prompting you to install the USB driver appears, specify the folder below and install the USB driver.

```
C:\¥EPSON¥GANGWRITER¥utility¥drv_usb
```

Refer to “Connecting to the Host Computer” in the S5U1C17001H User Manual for more details.

4.3 Connecting the ICDmini and Target System

Connect the GangWriter PC to the ICDmini units and the target system via a USB hub as shown in Figure 4.1.

(Check that DIP switch 7 of the ICDmini units is set to OPEN)

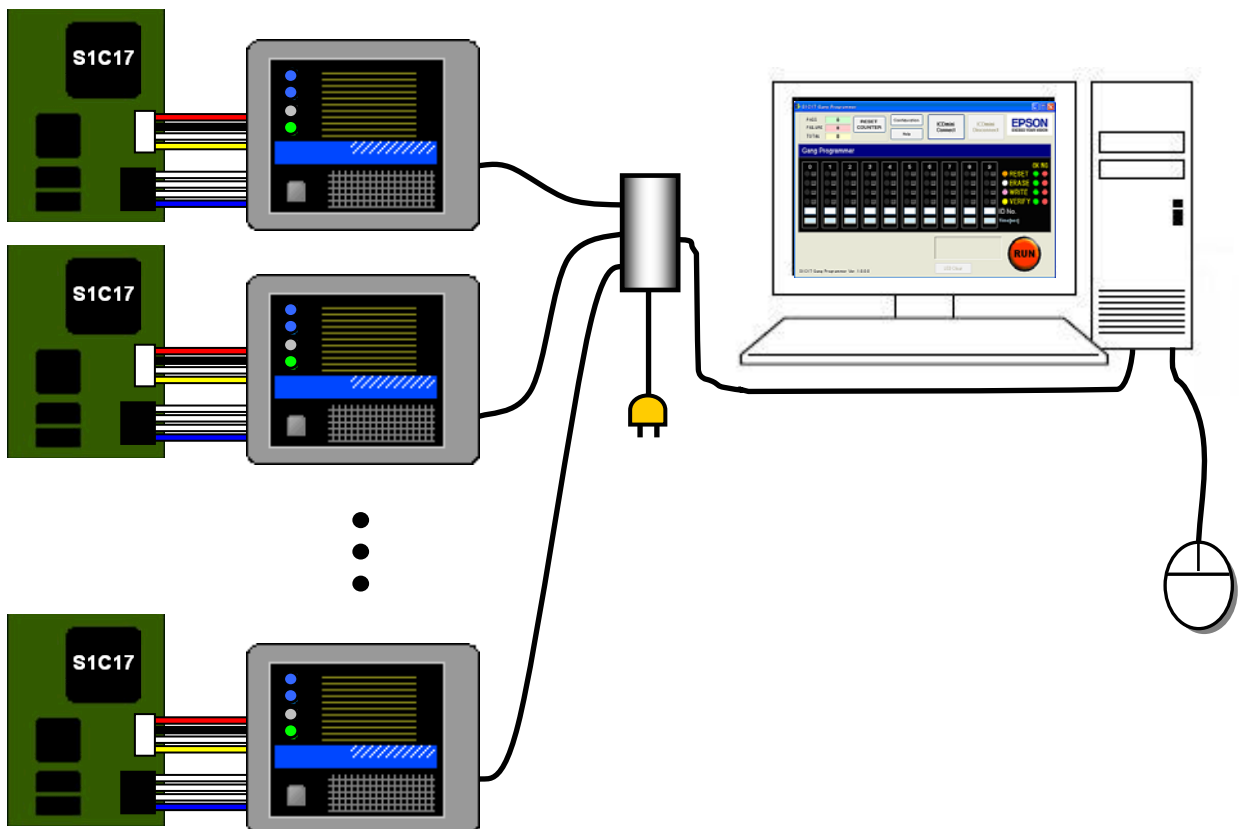


Figure 4.1 The connection between the PC, ICDmini units and target systems

5. How to Use GangWriter

5.1 Names and Functions of Screen Items

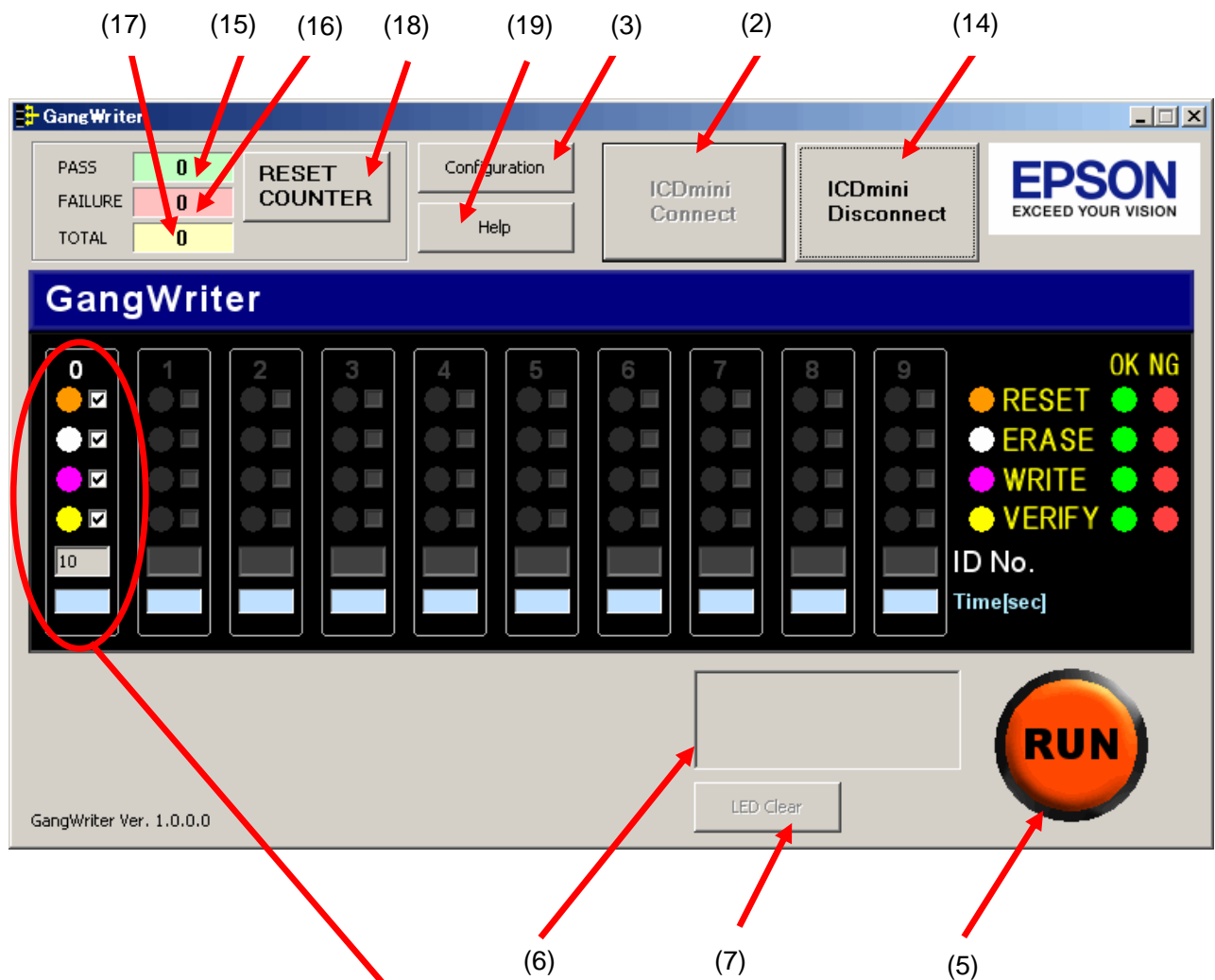


Figure 5.1 Start screen

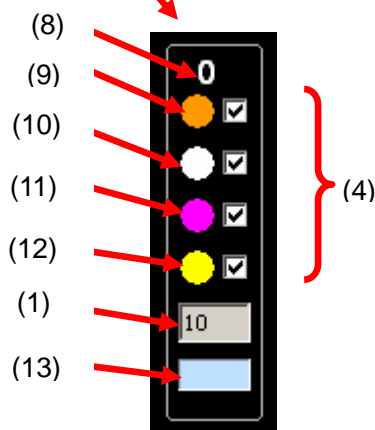


Figure 5.2 ICDmini image

5. How to Use GangWriter

- (1) ID number input field Set the ID number of the connected ICDmini.

- (2) [ICDmini Connect] button Establishes a connection between the ICDmini and PC.

- (3) [Configuration] button Displays the [Configuration] window.

- (4) Check box Checked functions are selected.

- (5) [RUN] button Runs all connected ICDmini units.

- (6) Results If all connected ICDmini units are modified successfully, ALL PASS is displayed in green.
 If a single ICDmini unit fails, FAILURE is displayed in red.

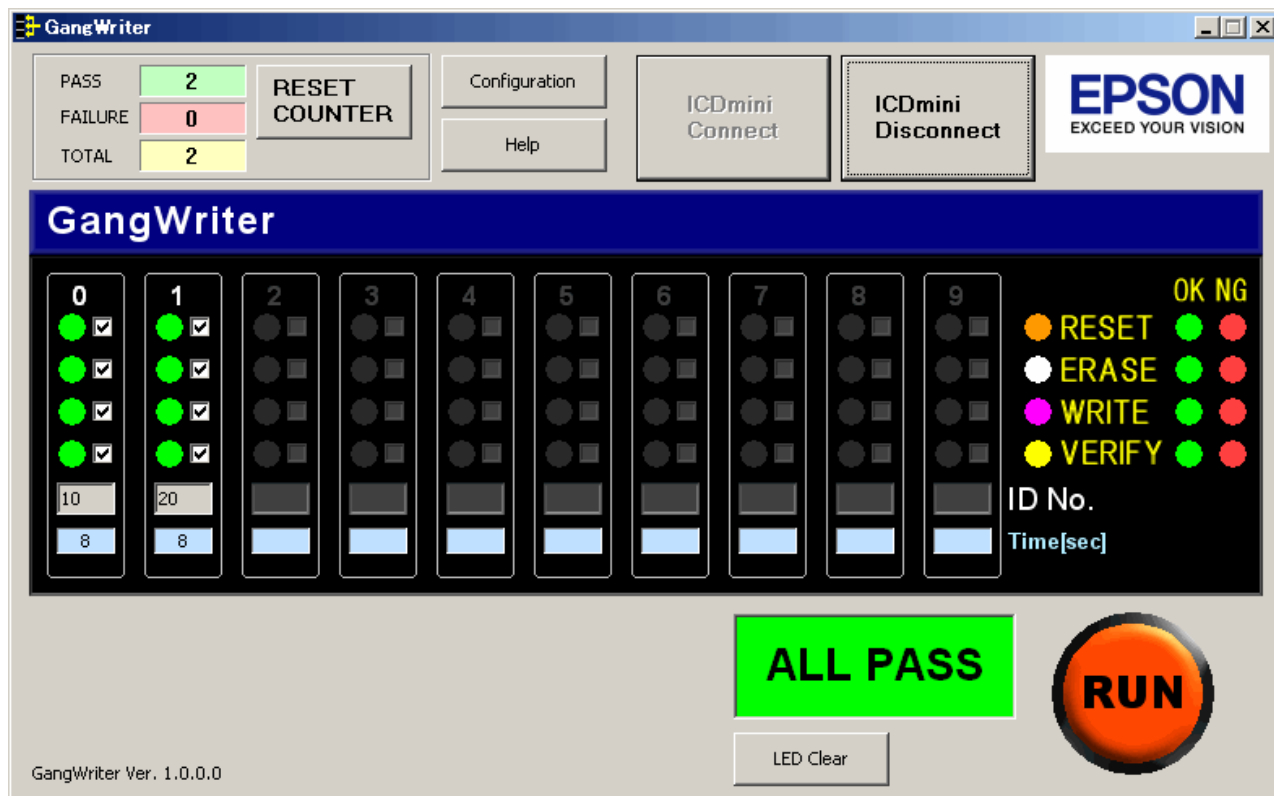


Figure 5.3 ALL PASS displayed

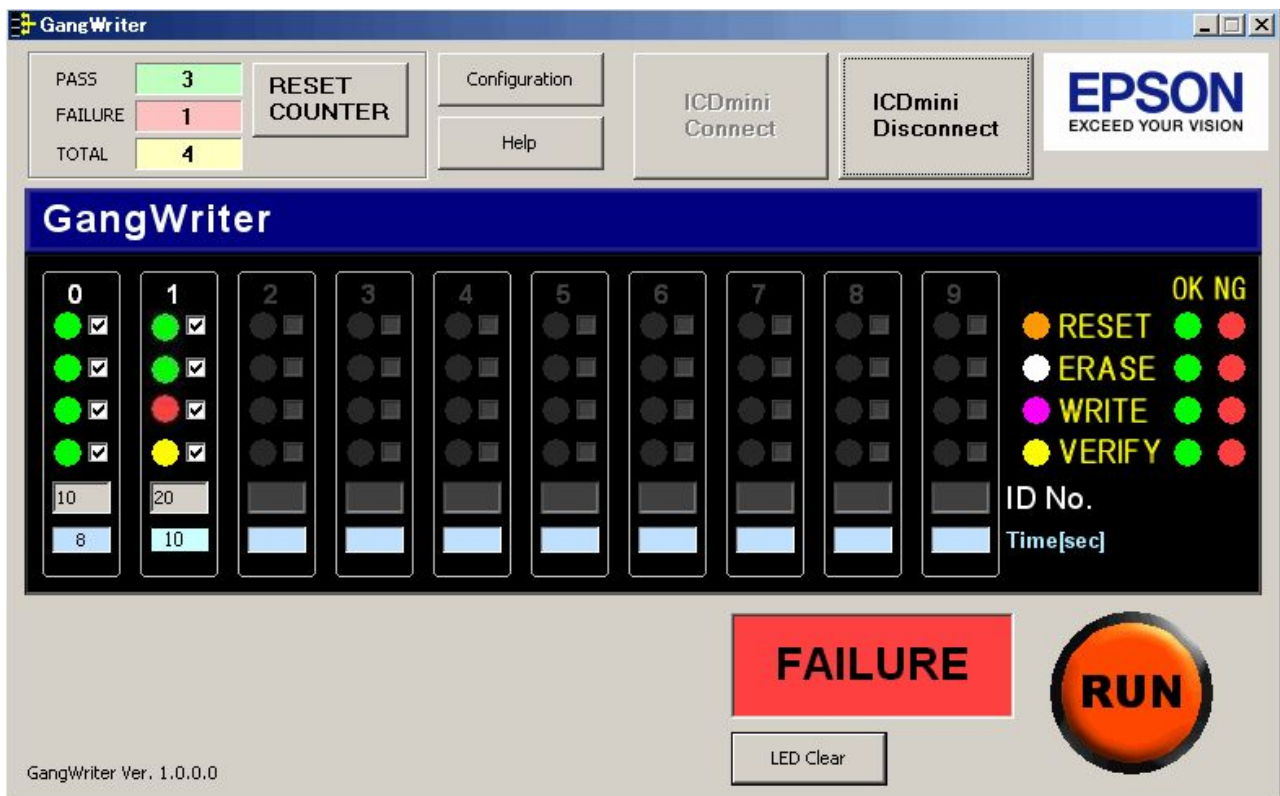


Figure 5.4 FAILURE displayed

- | | |
|------------------------|---|
| (7) [LED CLEAR] button | Resets LEDs 1 to 4 to their defaults. |
| (8) Index number | Displays the position number of the ICDmini from 0 to 9. |
| (9) LED 1 | Lights up orange when RESET is enabled. After upload, it turns to green for a PASS or red for a FAIL. |
| (10) LED 2 | Lights up white when the ERASE function is enabled. After upload, it turns to green for a PASS or red for a FAIL. |
| (11) LED 3 | Lights up purple when the WRITE function is enabled. After upload, it turns to green for a PASS or red for a FAIL. |
| (12) LED 4 | Lights up yellow when the VERIFY function is enabled. After upload, it turns to green for a PASS or red for a FAIL. |
| (13) Runtime | Displays the runtime in seconds. |

5. How to Use GangWriter

- | | |
|----------------------------------|--|
| (14) [ICDmini Disconnect] button | Closes the connection between the ICDmini and PC. |
| (15) PASS counter | Counts the number of operations that succeed. |
| (16) FAILURE counter | Counts the number of operations that fail. |
| (17) TOTAL counter | Displays the total number. |
| (18) [RESET COUNTER] button | Sets the PASS, FAILURE and TOTAL counters to zero. |
| (19) [Help] button | Displays the Help screen. |

5.2 Tutorial (Basic Operation)

This section explains how to achieve the GangWriter functions using two ICDmini units set with ID numbers 10 and 20 respectively. These ID numbers are the numbers set in 3.5 Downloading the Required Data above.

This section consists of steps (B.1) to (B.10).

(B.1) Connect the ICDmini units

Connect all ICDmini units to the PC using USB cables and a self-powered USB hub.

* At this stage, the target systems are not connected.

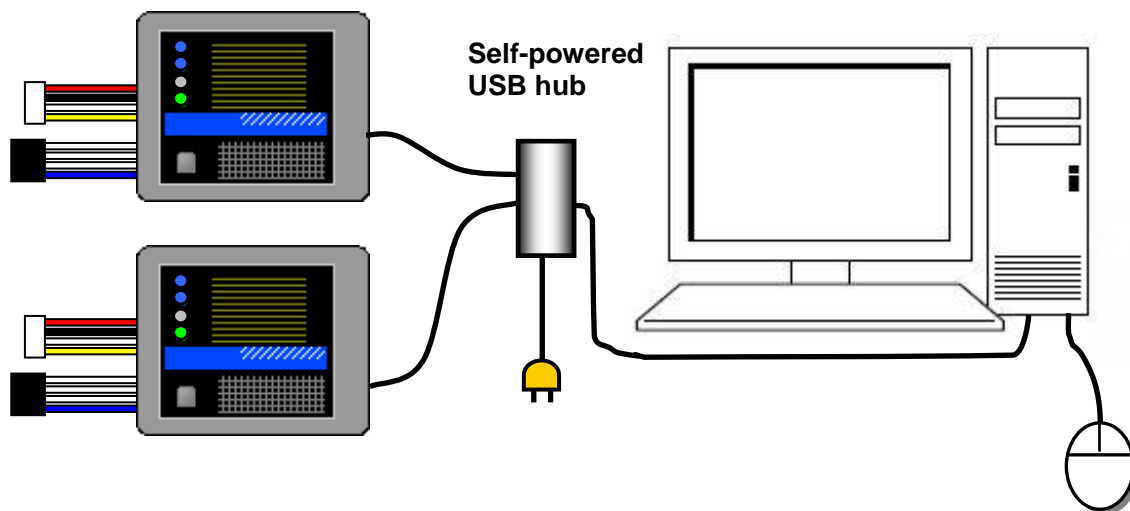


Figure 5.5 Basic configuration

5. How to Use GangWriter

(B.2) Start up the GangWriter software

Start up the GangWriter software.

In the Windows Start menu, select [Start]→[All Programs]→[EPSON MCU]→[GangWriter].

The following screen is displayed.

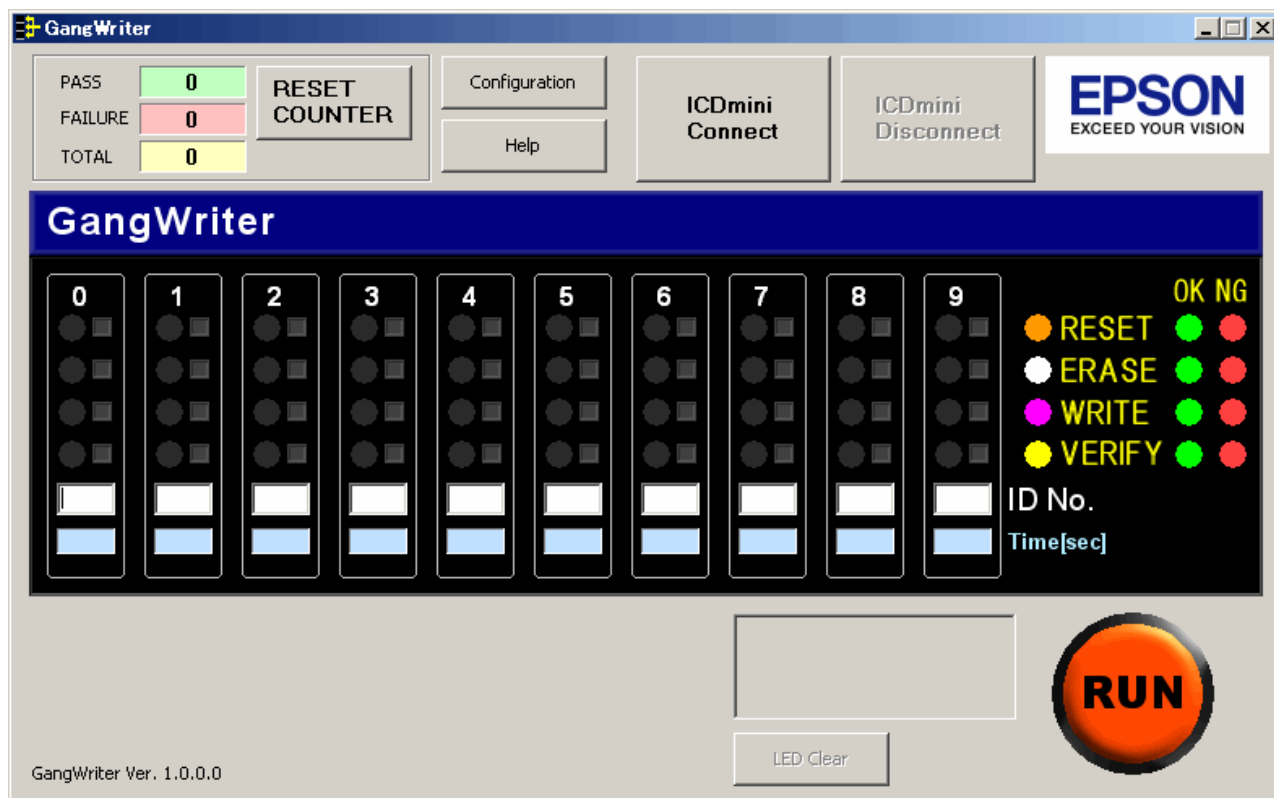


Figure 5.6 Start screen

(B.3) Enter an ID number

Below, the ID number 10 is entered in index number 0, and 20 is entered in index number 1.

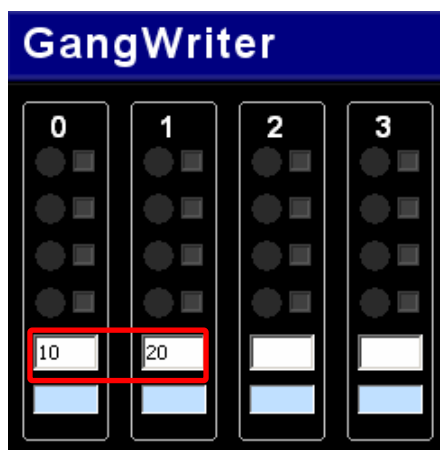


Figure 5.7 ID number input screen

(B.4) Connect the ICDmini

Click the [ICDmini Connect] button.

When the connection is established, LEDs 1 to 4 of index numbers 0 and 1 light up as shown below.

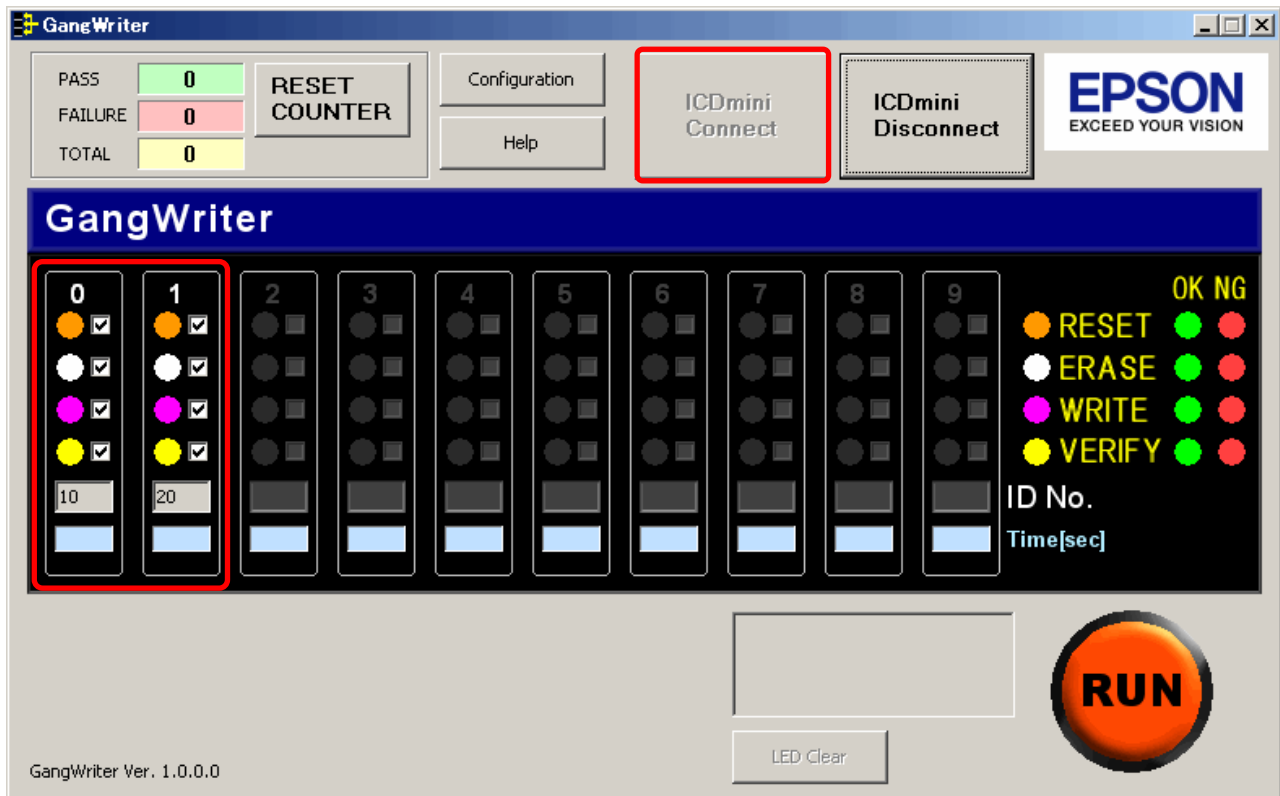


Figure 5.8 Connection established

5. How to Use GangWriter

(B.5) Connect the target systems

Connect the target systems.

3.3 V or 1.8 V can be used for the level of the interface with the target system, or the voltage input from the target system can be used. To use this function, set DIP switch 4 of the ICDmini to ON, and input the voltage from the target system to the TARGET VCC IN pin.

To control resetting of the target system from the GangWriter application, it is necessary to connect the target reset signal output of the ICDmini (TARGET RST OUT) to the reset of the target system. Refer to “Flash Programming Power Supply Connector” in the S5U1C17001H User Manual (ICDmini) for more details.

Note:

- In order to prevent communication errors between the ICDmini and target system, connect the target reset signal output (TARGET RST OUT) to the target system reset.
- When using cables other than those provided with the ICDmini, make the distance between the ICDmini and microcomputer, including the wiring in the target system, as short as possible. Longer distances increase the likelihood of communication errors.

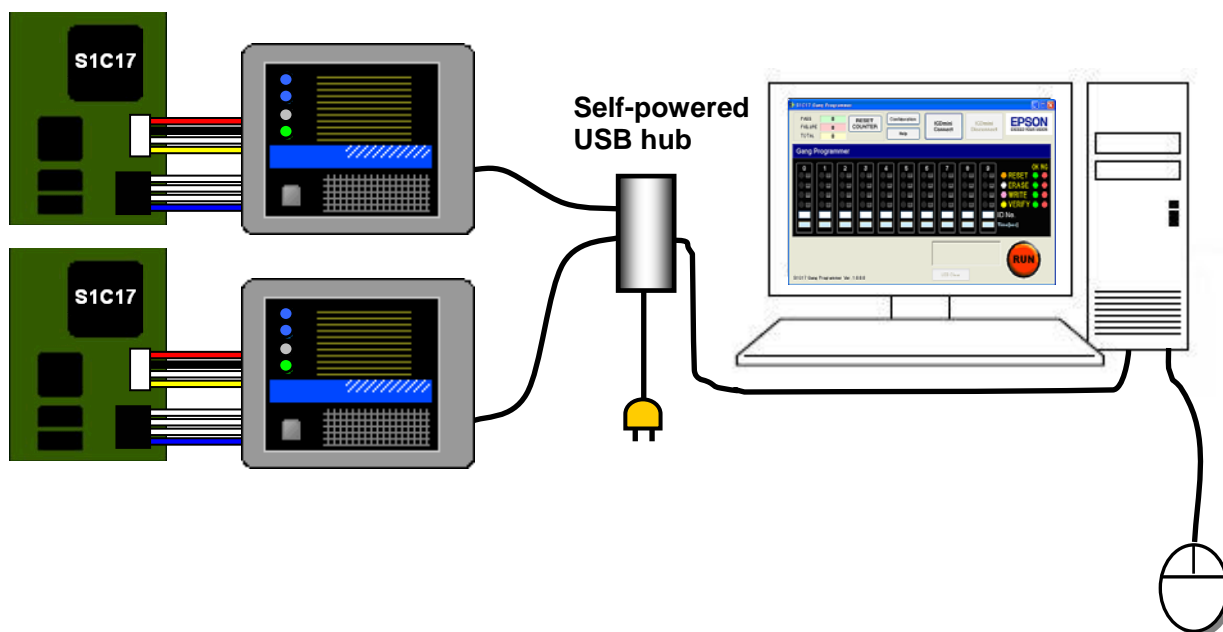


Figure 5.9 The configuration when the target systems are connected

(B.6) Run

Click the [RUN] button (or press [Enter] on the keyboard).

The operation proceeds in the order RESET, ERASE, WRITE, and VERIFY. The LEDs flash when the operation is in progress.

The LED turns green (●) if the operation finishes normally.

When all operations are completed normally, “ALL PASS” is displayed at bottom right.

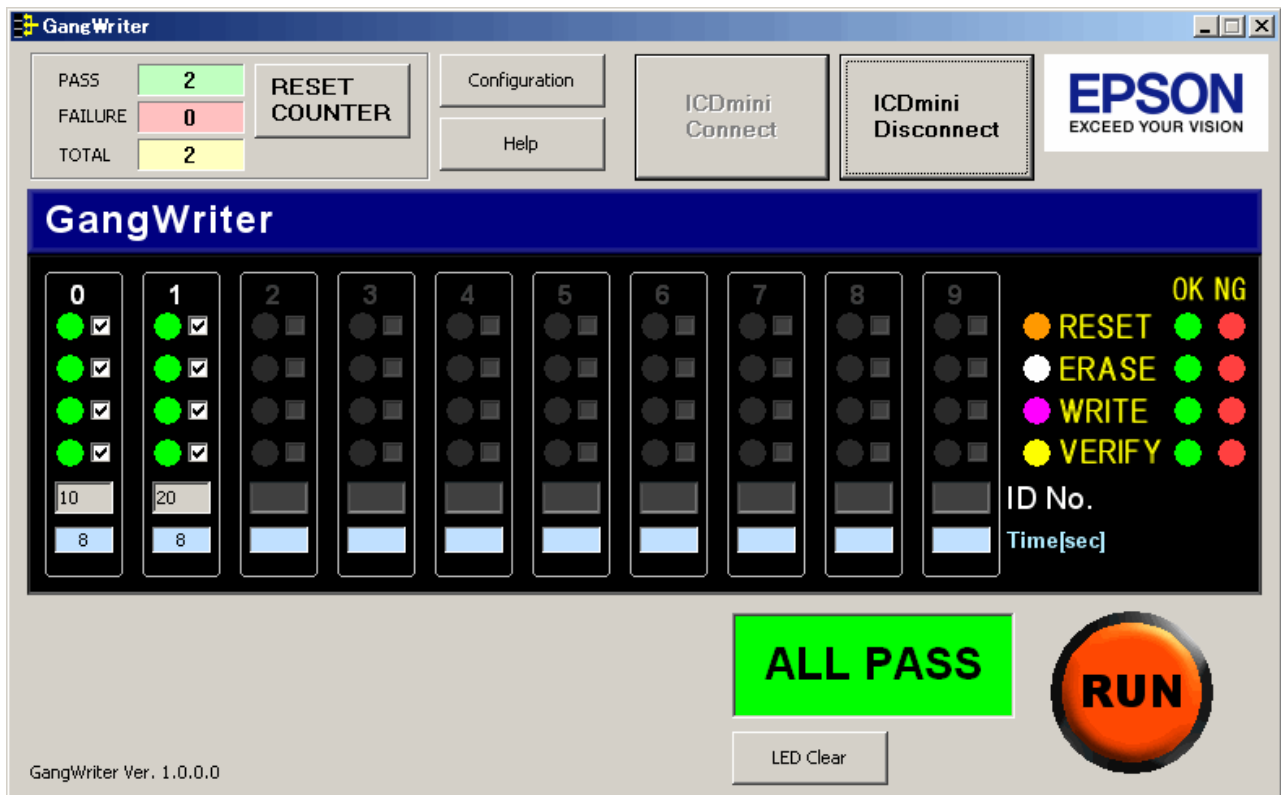


Figure 5.10 Screen displayed when RUN is successful

5. How to Use GangWriter

If an error occurs, the LED for the operation that fails lights up red (●), and processing of the ICDmini stops. If errors occur with one or more ICDmini, “FAILURE” is displayed in the results.

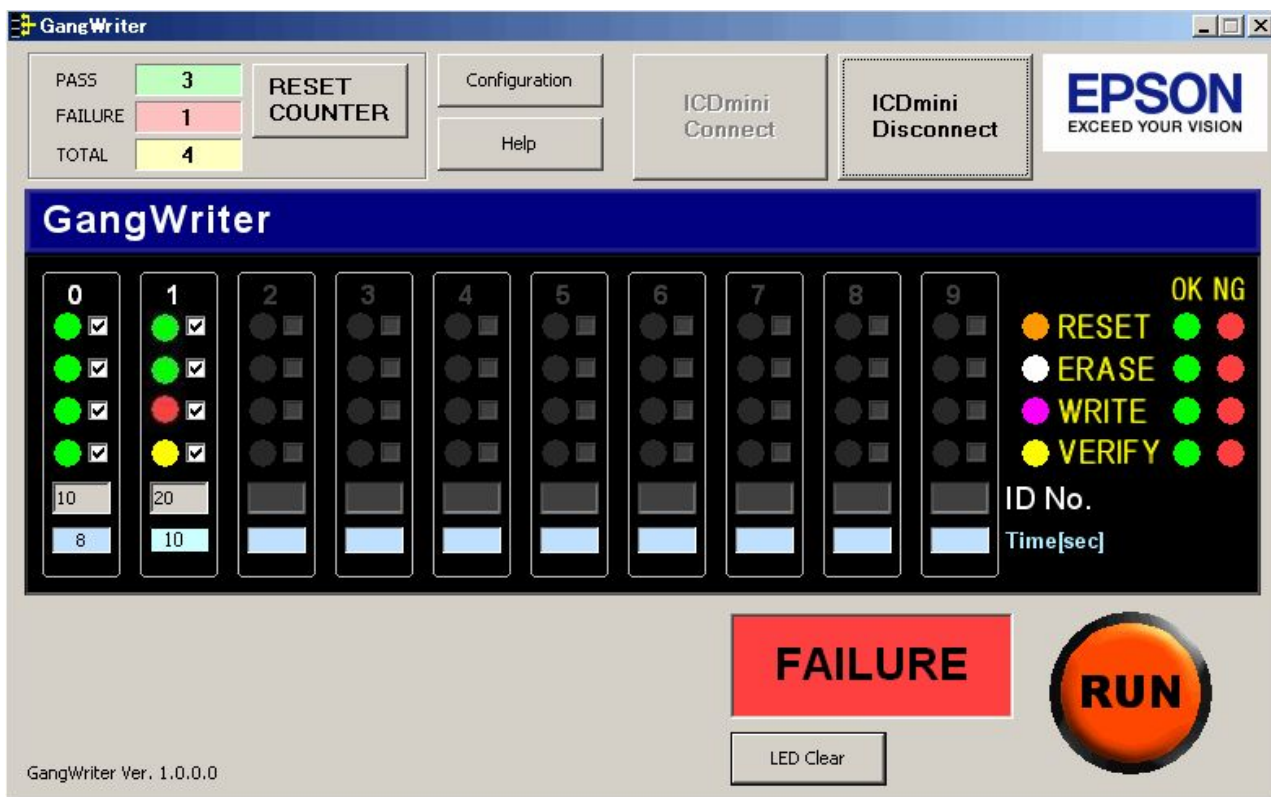


Figure 5.11 Screen displayed when an error occurs

You can run the operation again for an ICDmini where an error occurred by pressing the number key corresponding to the index number of the ICDmini on the keyboard.

For example, to run index number 1 again, press “1” on the keyboard.

(B.7) Remove the target systems

Turn off the power of the target systems before removing them.

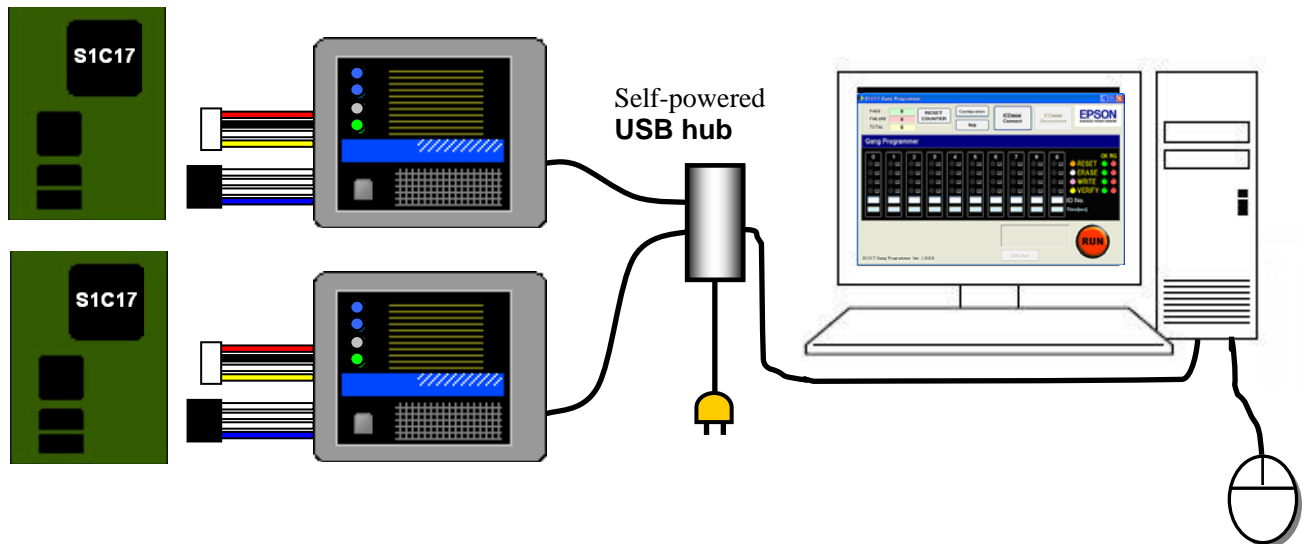


Figure 5.12 Removing the target systems

(B.8) Clear the LED display

Click the [LED Clear] button to return the LEDs to their defaults.

*If you click the [RUN] button without clicking the [LED Clear] button, when the LEDs return to their defaults, the relevant operation is performed at the same time. Therefore it is not always necessary to click the [LED Clear] button.

(B.9) Repeat the procedure

Connect the next batch of target systems and to download data again, repeat steps (B.5) to (B.8).

(B.10) Finish the task

To finish the task, click the [ICDmini Disconnect] button and quit the application.

5. How to Use GangWriter

5.3 Other Functions

5.3.1 Select an Operation

You can select which operations to run by selecting and clearing the check boxes.

The check boxes correspond to RESET, ERASE, WRITE, and VERIFY from the top.

Example: The setting for resetting and verifying only the target system at index number 0.

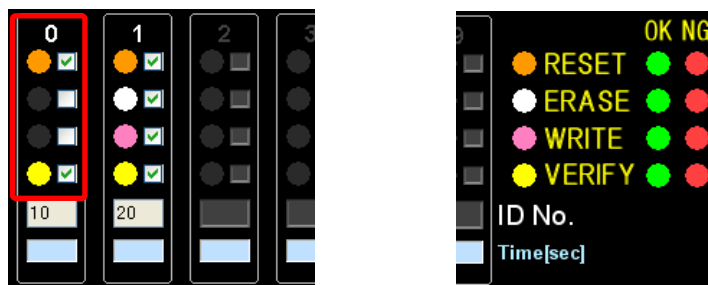


Figure 5.13 Selecting functions with check boxes

The check box settings are saved and enabled the next time the application is started.

5.3.2 Counter Function

The number of times (TOTAL) that operations succeed (PASS) and fail (FAILURE) after the software is started up is displayed at the top of the [GangWriter] window. Click the [RESET COUNTER] button to return each number to 0.

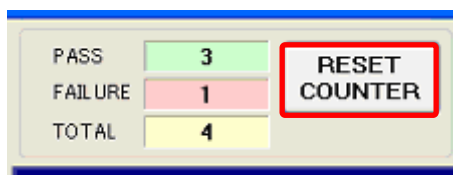


Figure 5.14 Counter

5.3.3 Help Function

Click the [Help] button to display simple explanations of the screens.



Figure 5.15 Help button

The screenshot shows the GangWriter software interface with the following callouts:

- (1) Points to the ID number input field for target 0.
- (2) Points to the 'ICDmini Connect' button.
- (3) Points to the 'ICDmini Connect' button.
- (4) Points to the 'RUN' button.
- (5) Points to the 'ALL PASS' indicator.
- (6) Points to the 'LED Clear' button.
- (7) Points to the 'ICDmini Disconnect' button.

Usage

- (1) Write ID number.
- (2) Push 'ICDmini Connect' button.
- (3) (Connect all targets to ICDmini.)
- (4) Push 'RUN' button.
- (5) Push 'LED Clear' button.
- (6) (Remove all targets from ICDmini.)
- (7) Return to (3) if continue, or Push 'ICDmini Disconnect' button if end.

ICDmini Connect ↓ ↑ ICDmini Disconnect ← LED Clear

→ RUN

Figure 5.16 Help window

5. How to Use GangWriter

5.3.4 Configuration Function

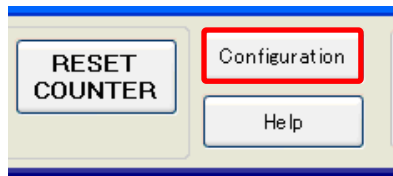


Figure 5.17 Configuration button

Clicking the [Configuration] button displays the following [Configuration] window.

Here you can set the location for saving log files, the names of files, and the length of time out.

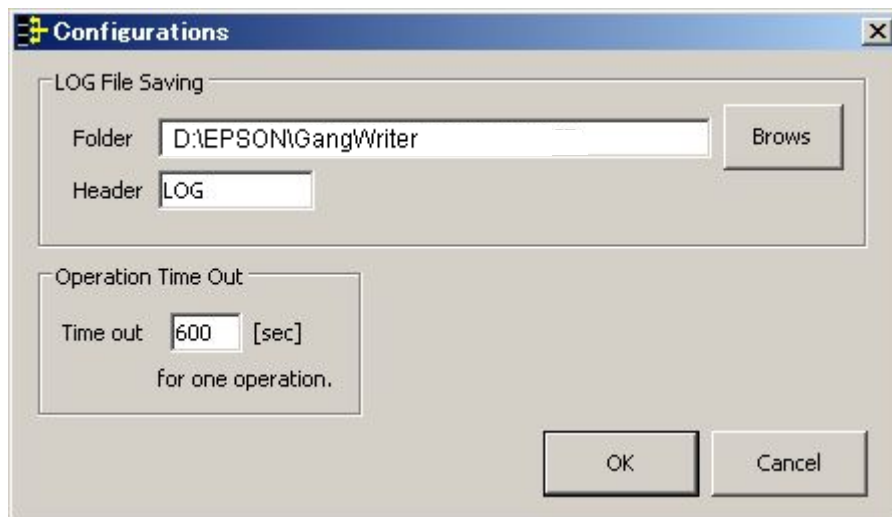


Figure 5.18 Configuration window

Folder

In [Folder], enter the name of a folder for saving log files.

Enter a path from the drive name.

Click the [Brows] button to select a folder directly.

Header

In [Header], enter text to add to the front of the names of log files.

This field can be left blank.

With the header added, the log file appears as follows.

[Header]YYYYMMDD.txt

If the header is “LOG” and the date is June 30, 2009, the file name is as follows.

LOG20090630.txt

The Folder and Header settings are enabled from the next time you start up.

Time Out

In [Time Out], enter a time out for all operations from erase through write to verification.

(The default value is 600 seconds.)

If the data for upload is large, a long time out must be set.

Enter a value that allows a sufficient margin. (Setting a value of 3 seconds or less will always cause an error.)

Appendix A GangWriter Dynamic Link Library Manual

A.1 Overview

This Appendix explains how to use the ICD_GANG.DLL function used for communicating with the ICDmini. Refer to this Appendix when using the Dynamic Link Library directly.

A.1.1 Preparation

Use the GDB command for

- setting the ID number (the individual identification number of the ICDmini)
- downloading the FLS program
- downloading the user program

to the ICDmini.

When configuration is complete, the FLS program and user program are saved in the Flash memory built into the ICDmini.

Write the ID number in the comment section of the “fwlp” command of the debugger.

ID number conditions

- A value from 0 to 999
- Invalid from the 4th digit
- If data other than a numeric value is found, the value is valid up to that point

Example: Set 3 as the ID number

```
(gdb) c17 fwlp fls17701.saf 0x48 0x80 3
```

A.1.2 Function Calling Example

Example:

```
OpenIcdConnection      // Establishes a connection with the ICDmini
                        (Execute separately for each unit)

* Repeated parts
(Replace the target systems)

ResetTarget            // Issues target reset
GetStatus              // Monitors the end of target reset
CheckTargetConnection // Issues confirmation of connection with the target IC
GetStatus              // Monitors the end of confirmation of connection with the target IC
StartOperation        // Executes the specified operation
Example:              // Monitors the end of all specified operations
CloseIcdConnection    // Closes the connection with the ICDmini
                        (Execute separately for each unit)
```

A.2 Function Details

A.2.1 OpenIcdConnection

• Function

Opens the USB communication port and establishes communication with the ICDmini.

Control is not returned until this function either succeeds or fails.

• Format

```
long OpenIcdConnection (long IcdDeviceNumber);
```

• Parameter

IcdDeviceNumber: ICDmini ID number (0 to 999)

• Return value

OK

ERROR_PARAMETER

ERROR_ICD_OPEN_CONNECTION

A.2.2 CloseIcdConnection

- **Function**

Corresponds to OpenIcdConnection, and closes communication with the ICDmini.

Control is not returned until this function either succeeds or fails.

- **Format**

long CloseIcdConnection (long IcdDeviceNumber);

- **Parameter**

IcdDeviceNumber: ICDmini ID number (0 to 999)

- **Return value**

OK

ERROR_PARAMETER

ERROR_ICD_CLOSE_CONNECTION

A.2.3 ResetTarget

- **Function**

Issues target reset to the target system.

Time out is 1 second.

Control is returned immediately after this function is called.

Monitor the end of the operation with the GetStatus function.

- **Format**

long ResetTarget (long IcdDeviceNumber);

- **Parameter**

IcdDeviceNumber: ICDmini ID number (0 to 999)

- **Return value**

OK

NG

ERROR_PARAMETER

ERROR_ICD_CONNECTION

A.2.4 CheckTargetConnection

- **Function**

Confirms connection with the target system.

Time out is 1 second.

Control is returned immediately after this function is called.

Monitor the end of the operation with the GetStatus function.

- **Format**

long CheckTargetConnection (long IcdDeviceNumber);

- **Parameter**

IcdDeviceNumber: ICDmini ID number (0 to 999)

- **Return value**

OK

NG

ERROR_PARAMETER

ERROR_ICD_CONNECTION

A.2.5 StartOperation

• Function

Executes the specified operation (target reset, erasure, writing or verification).

Confirms connection with the target system within this function.

Control is returned immediately after this function is called.

Monitor the end of the operation with the GetStatus function.

When performing multiple operations, the GetStatus function returns OK when all operations are finished.

• Format

long StartOperation (long IcdDeviceNumber, long IcdOperation, long TimeOut);

• Parameter

IcdDeviceNumber: ICDmini ID number (0 to 999)

IcdOperation: Sets the operation to execute.

bit0: Target Reset (1: Yes 0: No)

bit1: Erasing Flash memory (1: Yes 0: No)

bit 2: Writing to Flash memory (1: Yes 0: No)

bit 3: Verifying Flash memory (1: Yes 0: No)

TimeOut: Time out (1 = 0.1 seconds)

The range is 0 to 72000 (maximum 120 minutes).

If 0 is specified, there is no time out.

This is used for all Flash memory operations (erase, write, verify).

• Return value

OK

NG

ERROR_PARAMETER

ERROR_ICD_CONNECTION

A.2.6 GetStatus

- **Function**

Returns the status of the current operation.

- **Format**

long GetStatus (long IcdDeviceNumber, long* ErrorAddress);

- **Parameter**

IcdDeviceNumber:	ICDmini ID number (0 to 999)
ErrorAddress:	Returns the address of the error.
ResetTarget:	Fixed at 0
CheckTargetConnection:	Fixed at 0
StartErase:	Erase start address
StartWrite:	Address of the error
StartVerify:	Address of the error

- **Return value**

OK

OPERATION_TARGET_CONNECTION

OPERATION_TARGET_RESET

OPERATION_ERASE

OPERATION_WRITE

OPERATION_VERIFY

ERROR_PARAMETER

ERROR_TIMEOUT_TARGET_CONNECTION

ERROR_TIMEOUT_TARGET_RESET

ERROR_TIMEOUT_ERASE

ERROR_TIMEOUT_WRITE

ERROR_TIMEOUT_VERIFY

ERROR_ICD_CONNECTION

ERROR_TARGET_CONNECTION

ERROR_TARGET_RESET

ERROR_ERASE
ERROR_WRITE
ERROR_VERIFY

A.2.7 GetString

- **Function**

Converts the return code to a character string.

- **Format**

long GetString (long ReturnedCode, char* ReturnedString);

- **Parameter**

ReturnedCode	Return code.
ReturnedString	Returns a character string for the return code. Allow 256 bytes for the invoker.

With an invalid return code,
“Invalid returned code” is returned.

- **Return value**

OK
NG

A.3 Return Code

OK	0x00	Normaly ended.
NG	0x01	Error occured.
ERROR_TIMEOUT_TARGET_CONNECTION	0x12	Time out occured while connecting with the target system.
ERROR_TIMEOUT_TARGET_RESET	0x13	Time out occured while executing target-reset.
ERROR_TIMEOUT_ERASE	0x14	Time out occured while erasing the FLASH memory.
ERROR_TIMEOUT_WRITE	0x15	Time out occured while writing to the FLASH memory.
ERROR_TIMEOUT_VERIFY	0x16	Time out occured while verifying the FLASH memory.
ERROR_ICD_OPEN_CONNECTION	0x21	Can not connect with the ICDmini.
ERROR_ICD_CONNECTION	0x22	Already disconnected with the ICDmini.
ERROR_ICD_CLOSE_CONNECTION	0x29	Can not disconnect with the ICDmini.
ERROR_TARGET_CONNECTION	0x32	Disconnected with the target system.
ERROR_TARGET_RESET	0x33	No response from the target for target-reset.
ERROR_ERASE	0x44	Error occured while erasing the FLASH memory.
ERROR_WRITE	0x45	Error occured while writing to the FLASH memory.
ERROR_VERIFY	0x46	Error occured while verifying the FLASH memory.
ERROR_PARAMETER	0x50	Parameter is invalid.
OPERATION_TARGET_CONNECTION	0x82	Connecting with the target system.
OPERATION_TARGET_RESET	0x83	Executing target-reset.
OPERATION_ERASE	0x84	Erasing the FLASH memory.
OPERATION_WRITE	0x85	Writing to the FLASH memory.
OPERATION_VERIFY	0x86	Verifying the FLASH memory.

A.4 Restrictions

Do not connect multiple ICDmini units with the same ID number at the same time.

If you connect multiple ICDmini units with the same ID number at the same time, only the first ICDmini connected is recognized.

Revision History

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Code No.	Page	Contents
411755900	All	First edition

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