

How to Use Green Hills Software SuperTrace™ Probe in TRAVEO™ Family S6J3200 Series

About this document

Scope and purpose

AN217542 demonstrates how to configure and use the Green Hills Software SuperTrace™ Probe (GHS STP) in the Cypress TRAVEO™ family S6J3200 series MCUs with Embedded Trace Macrocell (ETM) tracing and step-back operation.

Associated Part Family

TRAVEO™ Family S6J3200 Series

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Introduction

1 Introduction

This application note is intended for users of the Cypress TRAVEO™ family S6J3200 series MCUs. It explains how to use the GHS STP in the S6J3200 series. It also describes 16-bit ETM tracing using GHS STP. GHS STP can capture up to 4 GB of trace at clock speeds up to 1.2 GHz (trace port speeds over 300 MHz). These capabilities combined with the TimeMachine Debugging Suite enable you to debug faster and test with confidence.

2 Hardware configuration for using GHS STP

When you use GHS STP, the following evaluation boards are necessary. See the documentation shown in [Table 1](#).

2.1 Using TRAVEO™ Family S6J3200 series evaluation board

Target systems using GHS STP are shown in [Table 1](#).

Table 1 S6J3200 series evaluation boards

MCU	Evaluation board	Product number	Guide document number
S6J3280 series 216-pin MCUs	TRAVEO™ family S6J3280 series 216-pin evaluation board	S6T3J200281A216A2	002-15058
	TRAVEO™ family S6J3280 series 256-pin evaluation board (216ADP)	S6T3J200282A256A2	002-16938
S6J3280 series 208-pin MCUs	TRAVEO™ family S6J3280 series 208-pin evaluation board	S6T3J200281A208A2	002-15079
	TRAVEO™ family S6J3280 series 256-pin evaluation board (208ADP)	S6T3J200281A256A2	002-16939
S6J32G0 series 216-pin MCUs	TRAVEO™ family S6J32G0 series 216-pin evaluation board	S6T3J2002G1A216A2	002-13002
	TRAVEO™ family S6J32G0 series 256-pin evaluation board (216ADP)	S6T3J2002G2A256A2	002-16940
S6J32G0 series 208-pin MCUs	TRAVEO™ family S6J32G0 series 208-pin evaluation board	S6T3J2002G1A208A2	002-13003
	TRAVEO™ family S6J32G0 series 256-pin evaluation board (208ADP)	S6T3J2002G1A256A2	002-16941

2.2 Using user target board

Mount the IC socket (NQPACK) described in [Table 2](#) by soldering it on the user target board.

Table 2 IC socket for user target board

MCU	IC socket	Vendor
S6J3280 series 216-pin MCUs	NQPACK216SE	Tokyo Eletech Corporation
S6J3280 series 208-pin MCUs	NQPACK208SD	Tokyo Eletech Corporation
S6J32G0 series 216-pin MCUs	NQPACK216SE	Tokyo Eletech Corporation
S6J32G0 series 208-pin MCUs	NQPACK208SD	Tokyo Eletech Corporation

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Hardware configuration for using GHS STP

Connect the user target board mounted with the NQPACK to the evaluation board. See the guides listed in [Table 3](#).

Table 3 S6J3200 series evaluation board

MCU	Evaluation board	Product number	Guide document number
S6J3280 series 216-pin MCUs	TRAVEO™ family S6J3280 series 256-pin evaluation board (216ADP)	S6T3J200282A256A2	002-16938
S6J3280 series 208-pin MCUs	TRAVEO™ family S6J3280 series 256-pin evaluation board (208ADP)	S6T3J200281A256A2	002-16939
S6J32G0 series 216-pin MCUs	TRAVEO™ family S6J32G0 series 256-pin evaluation board (216ADP)	S6T3J2002G2A256A2	002-16940
S6J32G0 series 208-pin MCUs	TRAVEO™ family S6J32G0 series 256-pin evaluation board (208ADP)	S6T3J2002G1A256A2	002-16941

Figure 1 shows the IC socket (NQPACK). Connect the user target board mounted with the NQPACK to the evaluation board. See the guides listed in [Table 3](#).

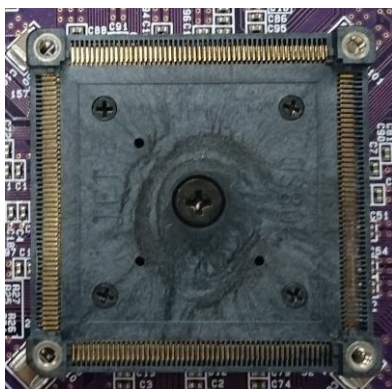


Figure 1 IC socket (NQPACK)

2.3 Target board connection

Figure 2 shows the connections for using the S6J3200 series 256-pin MCU.

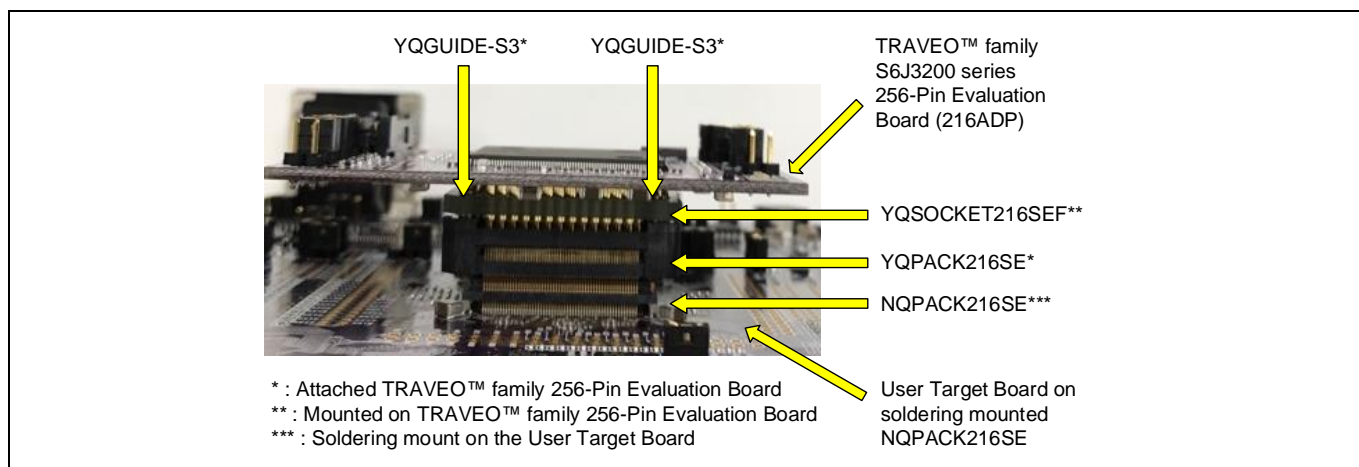


Figure 2 Connections for using S6J3200 series 256-pin MCU

3 GHS STP overview

The block diagram of the GHS STP is shown in [Figure 3](#).

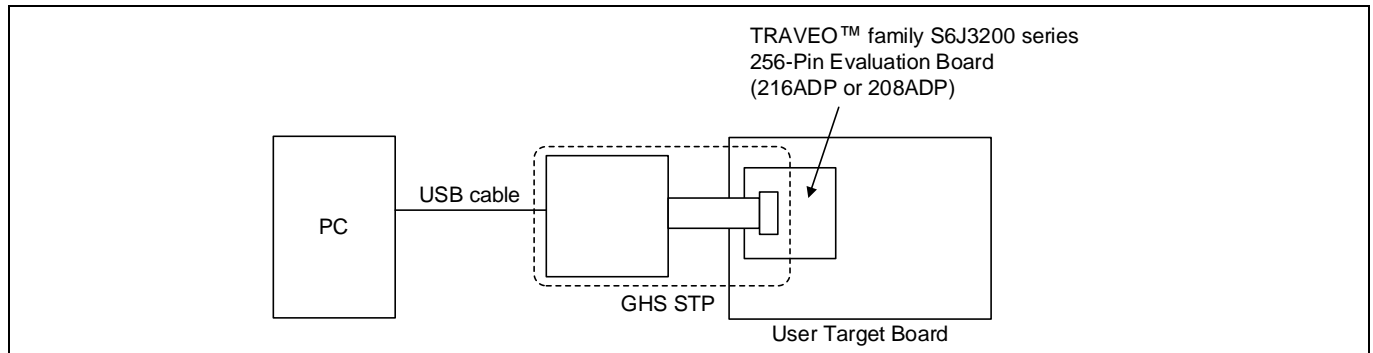


Figure 3 Block diagram

3.1 ETM

ETM is a real-time trace module that provides instruction and data tracing of MCUs.

3.2 TimeMachine™

TimeMachine is a trace analysis tool of the GHS MULTI integrated development environment (GHS MULTI) to analyze the trace data taken by GHS STP.

Port settings

4 Port settings

Port settings need to be configured in the user application. Set each port setting register to “0x0001” (PPC_PCFGR603–PPC_PCFGR620). See the [TRAVEO™ Family S6J3200 Series Hardware Manual](#) (Doc. No. 002-04852, section 3.2, “Port Output Function Configuration” *).

The 16-bit ETM trace ports are shown in [Table 4](#).

Note: * This section includes a table that shown in [Figure 4](#).

Table 4 16-bit ETM trace ports

Port No.	Port setting register	Trace signal
P6_03	PPC_PCFGR603	TRACE0
P6_04	PPC_PCFGR604	TRACE1
P6_05	PPC_PCFGR605	TRACE2
P6_06	PPC_PCFGR606	TRACE3
P6_07	PPC_PCFGR607	TRACE4
P6_08	PPC_PCFGR608	TRACE5
P6_09	PPC_PCFGR609	TRACE6
P6_10	PPC_PCFGR610	TRACE7
P6_11	PPC_PCFGR611	TRACE8
P6_12	PPC_PCFGR612	TRACE9
P6_13	PPC_PCFGR613	TRACE10
P6_14	PPC_PCFGR614	TRACE11
P6_15	PPC_PCFGR615	TRACE12
P6_16	PPC_PCFGR616	TRACE13
P6_17	PPC_PCFGR617	TRACE14
P6_18	PPC_PCFGR618	TRACE15
P6_19	PPC_PCFGR619	TRACE_CLK
P6_20	PPC_PCFGR620	TRACE_CTL

	(0x0184)	–	R6:POD[2]								
PPC_PCFGR603 (0x0186)	P6_03	GPIO_POD R6:POD[3]	TRACE0	-	-	-	-	-	-	-	-
PPC_PCFGR604 (0x0188)	P6_04	GPIO_POD R6:POD[4]	TRACE1	-	-	-	-	-	-	-	-
PPC_PCFGR605 (0x018A)	P6_05	GPIO_POD R6:POD[5]	TRACE2	-	-	-	-	-	-	-	-
PPC_PCFGR606 (0x018C)	P6_06	GPIO_POD R6:POD[6]	TRACE3	-	-	-	-	-	-	-	-
PPC_PCFGR607 (0x018E)	P6_07	GPIO_POD R6:POD[7]	TRACE4	-	-	-	-	-	-	-	-
PPC_PCFGR608 (0x0190)	P6_08	GPIO_POD R6:POD[8]	TRACE5	-	-	-	-	-	-	-	-
PPC_PCFGR609 (0x0192)	P6_09	GPIO_POD R6:POD[9]	TRACE6	-	-	-	-	-	-	-	-
PPC_PCFGR610 (0x0194)	P6_10	GPIO_POD R6:POD[10]	TRACE7	-	-	-	-	-	-	-	-
PPC_PCFGR611 (0x0196)	P6_11	GPIO_POD R6:POD[11]	TRACE8	-	-	-	-	-	-	-	-
PPC_PCFGR612 (0x0198)	P6_12	GPIO_POD R6:POD[12]	TRACE9	-	-	-	-	-	-	-	-
PPC_PCFGR613 (0x019A)	P6_13	GPIO_POD R6:POD[13]	TRACE10	-	-	-	-	-	-	-	-
PPC_PCFGR614 (0x019C)	P6_14	GPIO_POD R6:POD[14]	TRACE11	-	-	-	-	-	-	-	-
PPC_PCFGR615 (0x019E)	P6_15	GPIO_POD R6:POD[15]	TRACE12	-	-	-	-	-	-	-	-
PPC_PCFGR616 (0x01A0)	P6_16	GPIO_POD R6:POD[16]	TRACE13	-	-	-	-	-	-	-	-
PPC_PCFGR617 (0x01A2)	P6_17	GPIO_POD R6:POD[17]	TRACE14	-	-	-	-	-	-	-	-
PPC_PCFGR618 (0x01A4)	P6_18	GPIO_POD R6:POD[18]	TRACE15	-	-	-	-	-	-	-	-
PPC_PCFGR619 (0x01A6)	P6_19	GPIO_POD R6:POD[19]	TRACE_CLK	-	-	-	-	-	-	-	-
PPC_PCFGR620 (0x01A8)	P6_20	GPIO_POD R6:POD[20]	TRACE_CTL	-	-	-	-	-	-	-	-

Figure 4 Port output function configuration table of the TRAVEO™ Family S6J3200 series hardware manual

5 GHS STP global settings

5.1 Update GHS STP firmware

When the use of firmware is not supported by SuperTrace, you need to update the firmware.

1. Start the GHS MULTI, and open the **MULTI Launcher** window, as shown in [Figure 5](#).

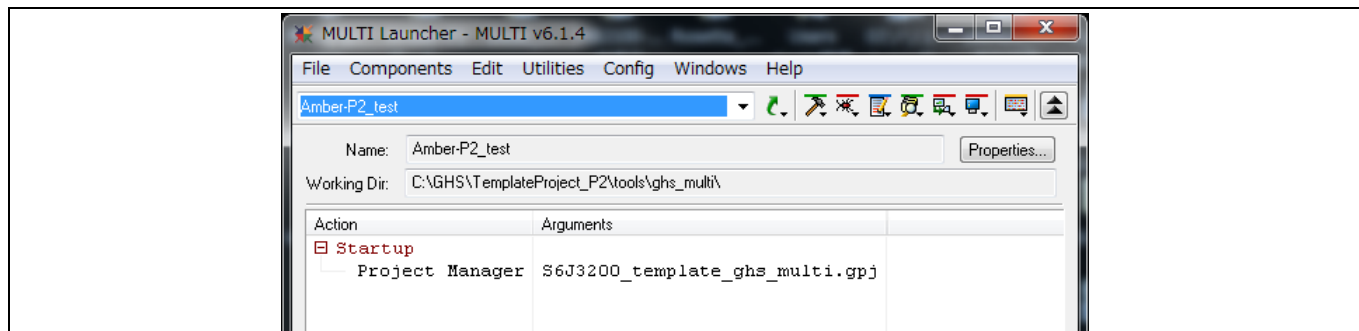


Figure 5 GHS MULTI - MULTI launcher window

2. Click the **Utilities** tab and choose **Probe Administrator**, as shown in [Figure 6](#).

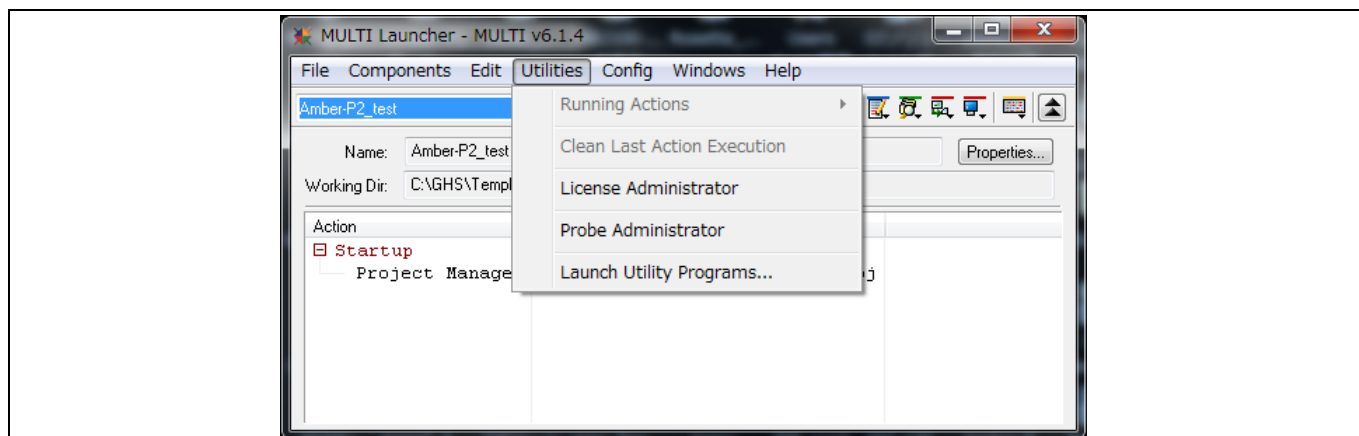


Figure 6 Probe administrator option

3. Click the **File** tab and choose **New Probe...**, as shown in [Figure 7](#).

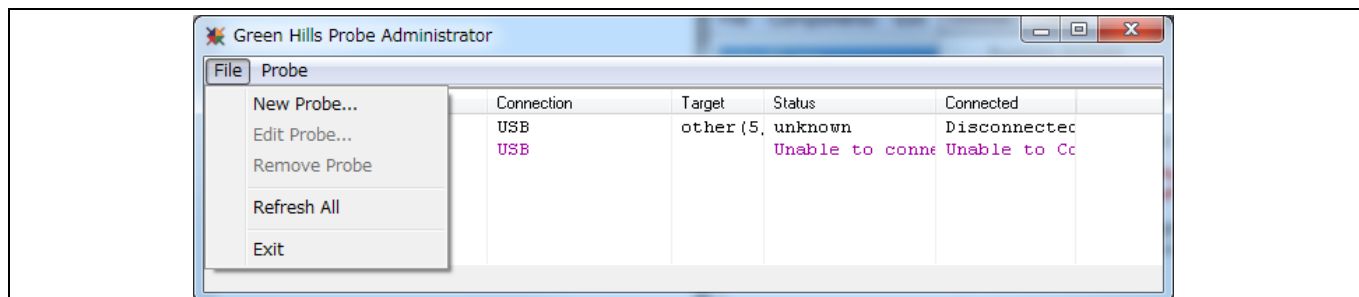


Figure 7 Probe administrator setup

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GHS STP global settings

4. Enter any name (such as stp_trace01) in the **Probe Name** field and select connection type **USB**. Then click **OK**, as shown in **Figure 8**.

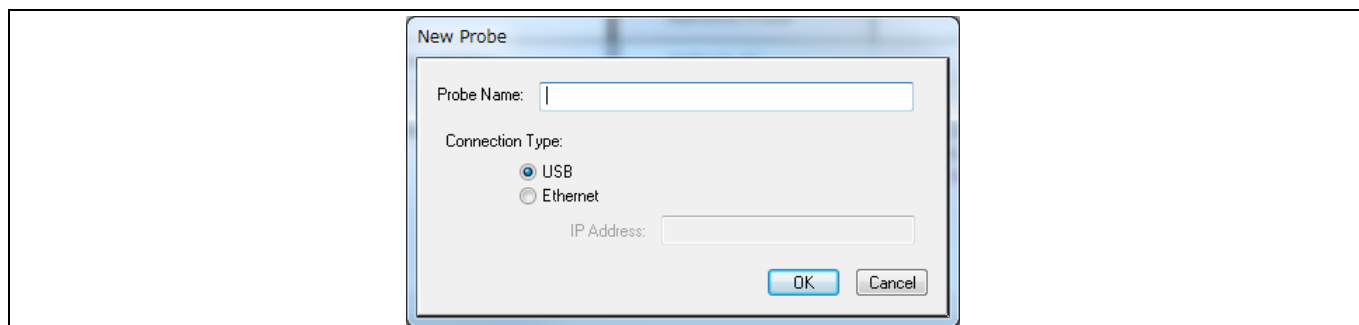


Figure 8 New probe setup

5. Right-click the entry name and select **Update Firmware...**, as shown in **Figure 9**. Then select an *.frm file, for example, *pbv3_firmware_5.0.8.frm*.

Note: Click **Yes** on the message “Are you sure you wish to update the firmware for the following probe? stp_trace01 connected by USB.”.

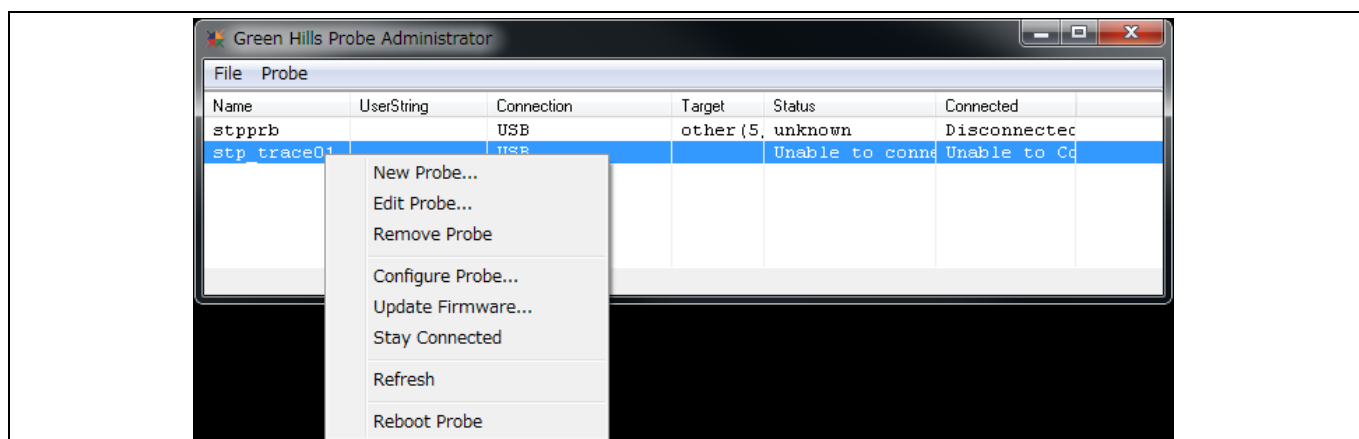


Figure 9 Update firmware startup

- Click **Flash Probe** and start updating the firmware, as shown in [Error! Reference source not found.](#)

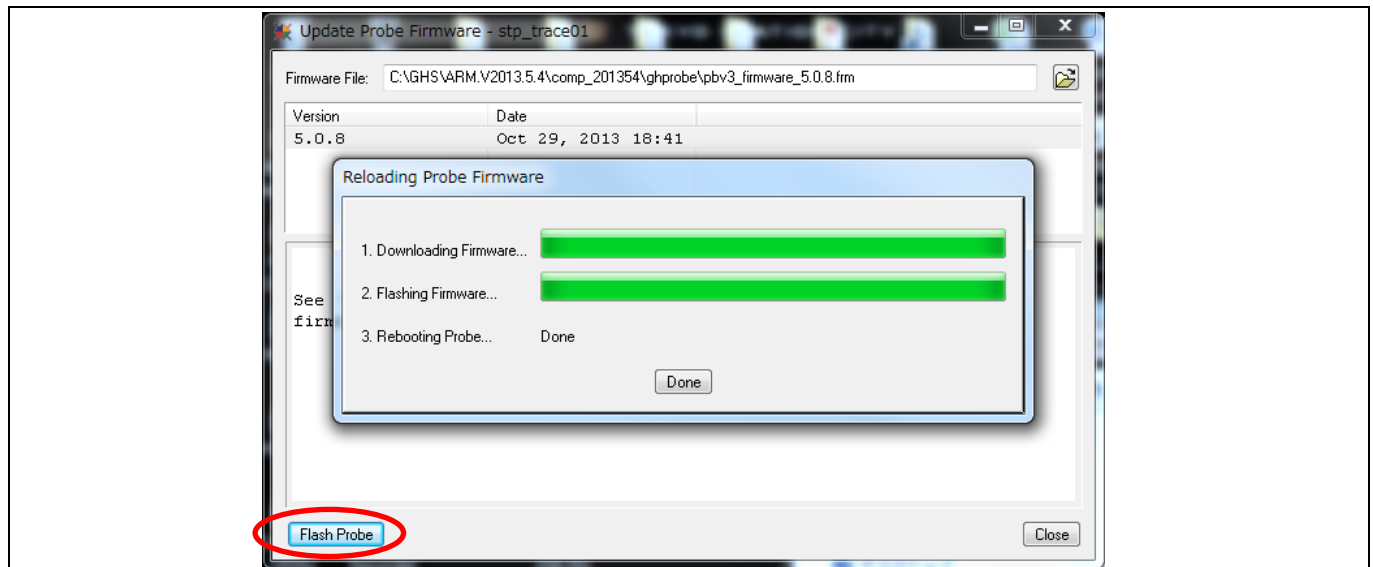


Figure 10 Update firmware

5.2 Enable ETM trace function

- Open the **Probe Administrator** of the GHS MULTI ([Figure 5](#)) and select **Configure Probe...**, as shown in [Figure 11](#).

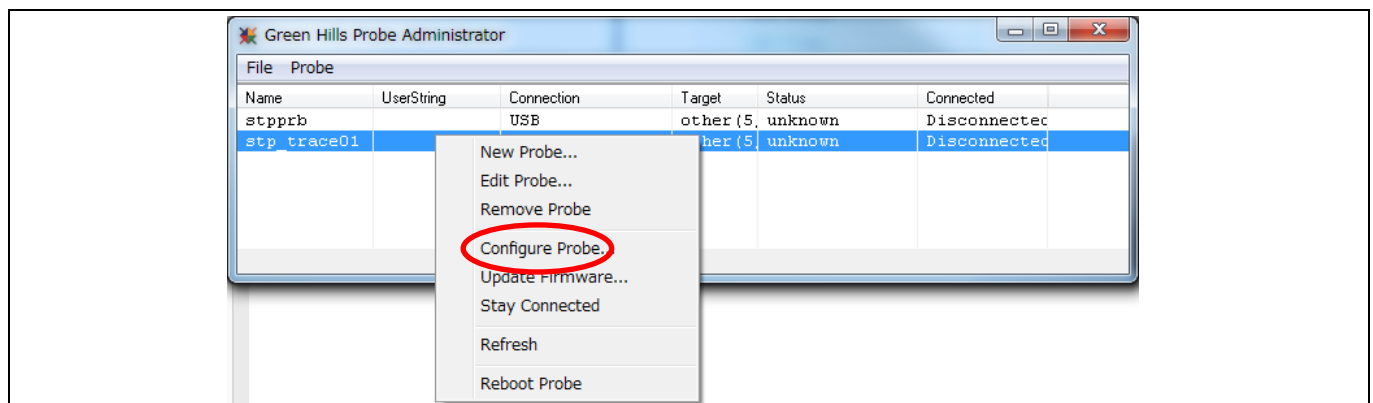


Figure 11 Configure probe startup

- Choose **File > Prompt**, and input the following command line, as shown in [Figure 12](#):
`xswitch>+tmpl_cortex.etb.` Then press Enter.

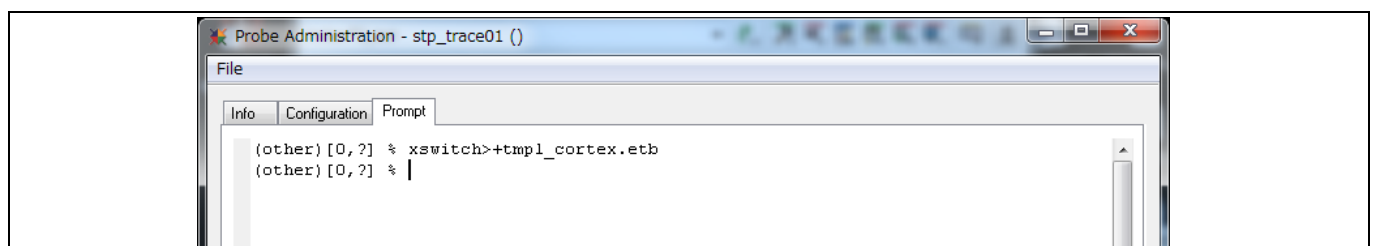


Figure 12 Enable ETM trace function

ETM trace operation

6 ETM trace operation

6.1 Input ETM trace command

1. Start the GHS MULTI to start debugging.
2. Input the following command in the command line of the GHS MULTI debugger, as shown in **Figure 13**:

```
target rw apb[0x80004000] 1
```

Note: *If this command line is described in debug script (connect_debugger.rc), then this command line is not needed.*

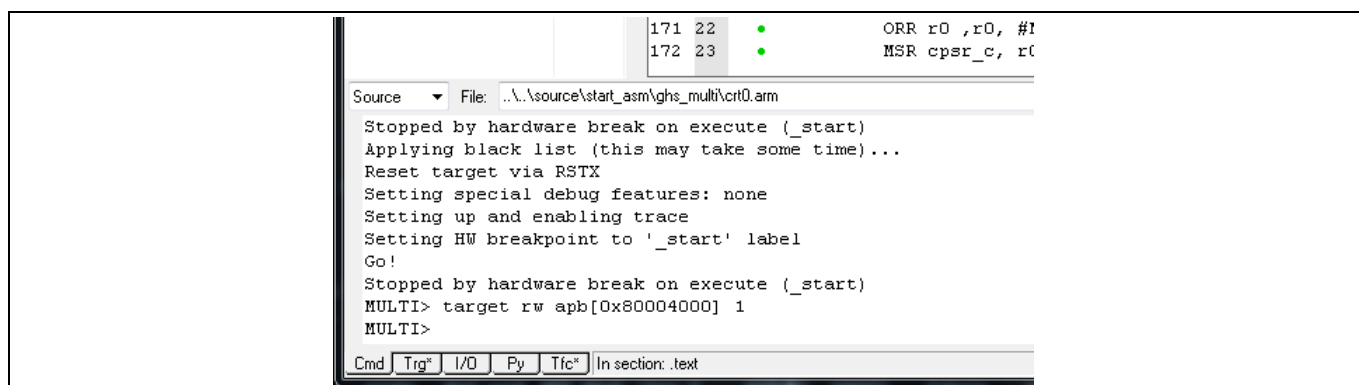


Figure 13 Input command line

6.2 Execute ETM trace

1. Start the GHS MULTI to start debugging, as shown in **Figure 14**.

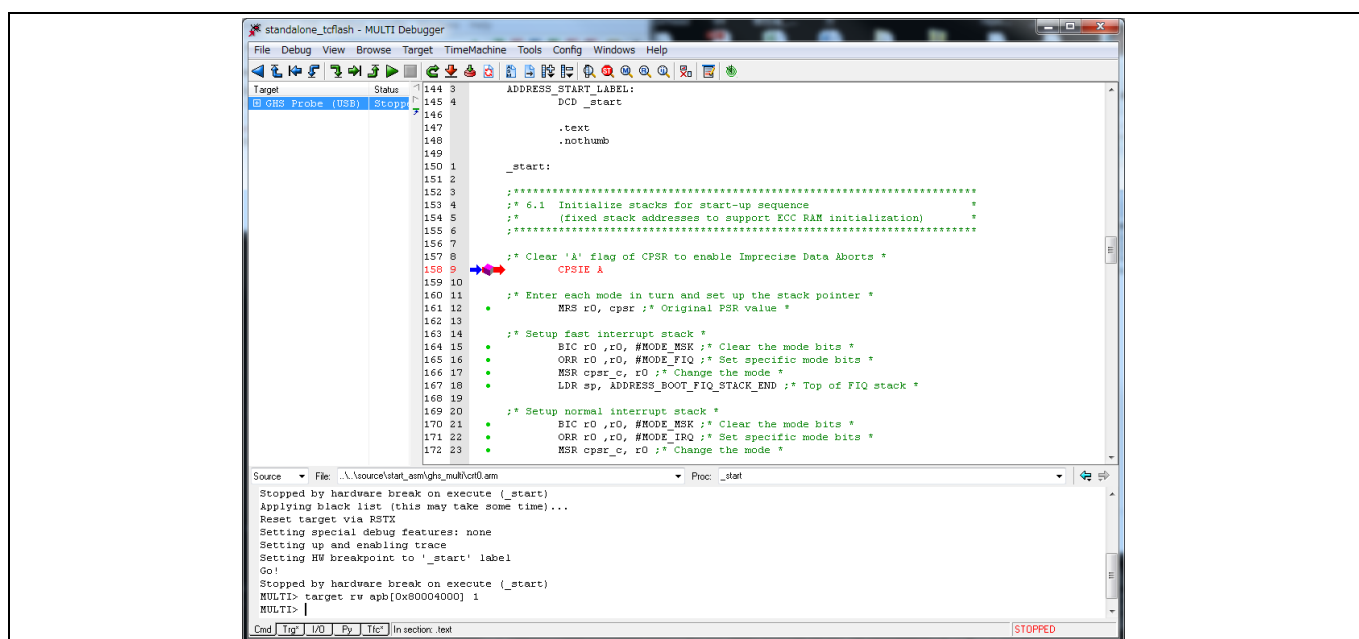


Figure 14 Program execution start

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ETM trace operation

2. Stop the GHS MULTI to stop debugging, as shown in **Figure 15**.

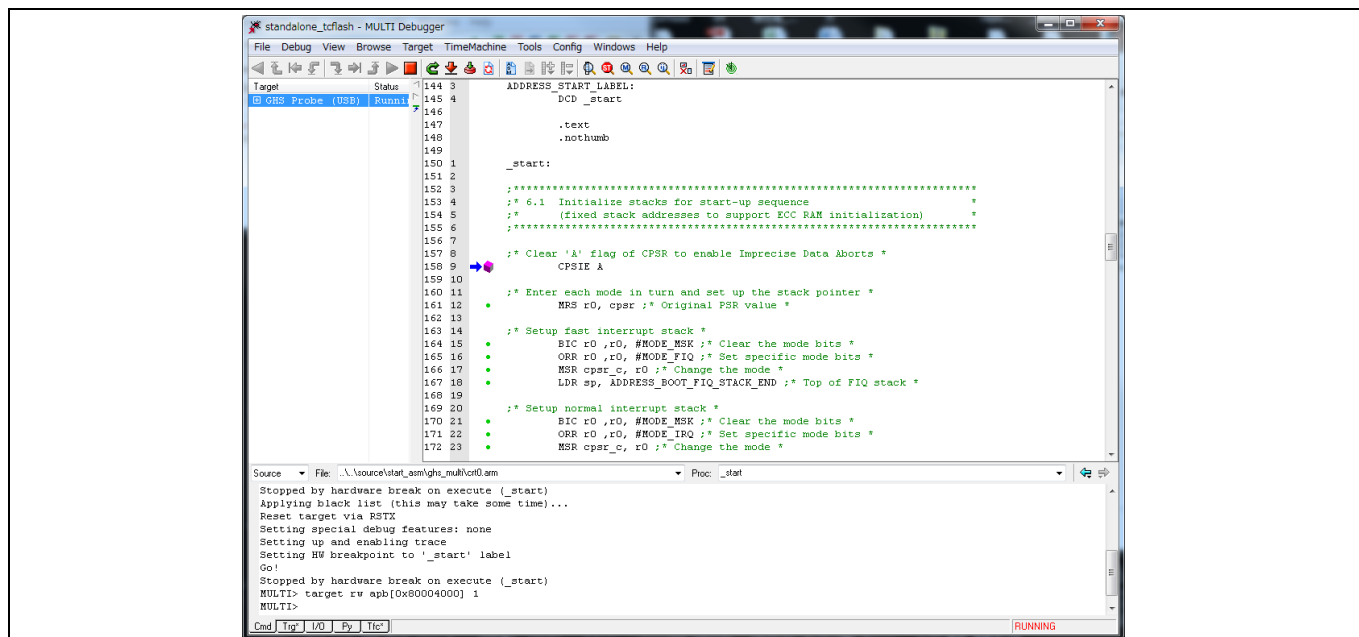


Figure 15 Program execution stopped

Note: When the **Port settings** are configured incorrectly, errors appear in the command window, as shown in **Figure 16**.

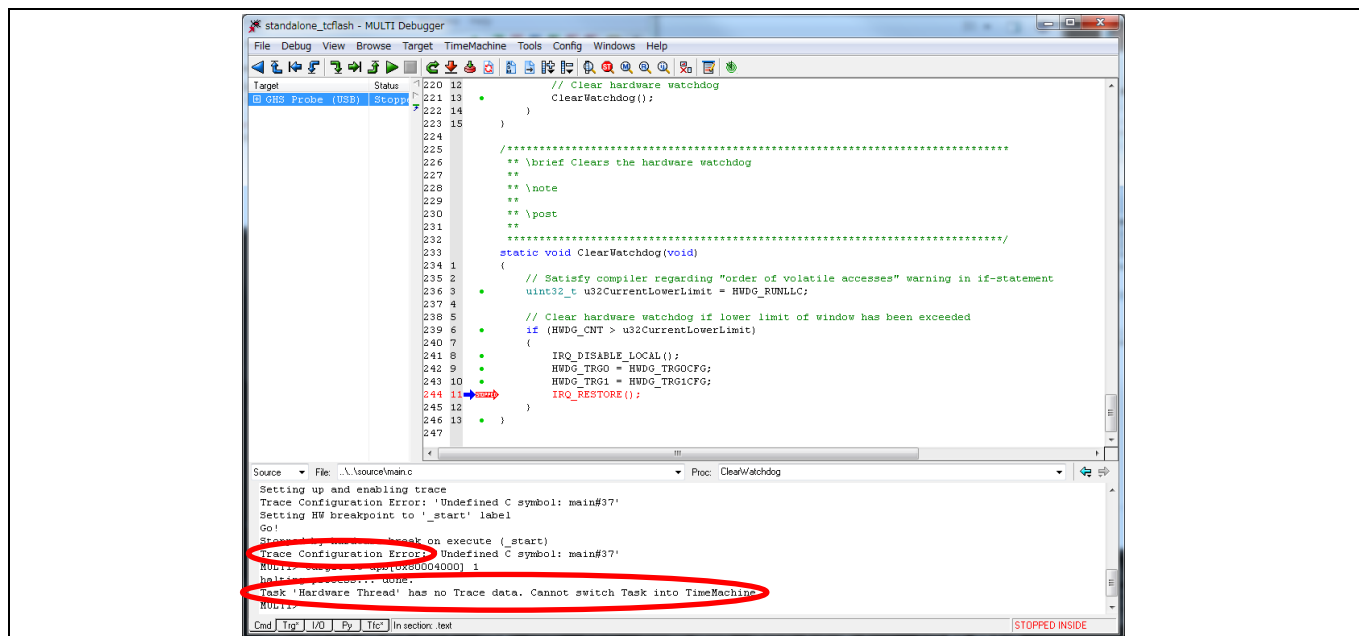


Figure 16 Error messages when port settings are incorrect

ETM trace operation

6.3 Execute TimeMachine

1. Click the TimeMachine button in the toolbar, as shown in [Figure 17](#).

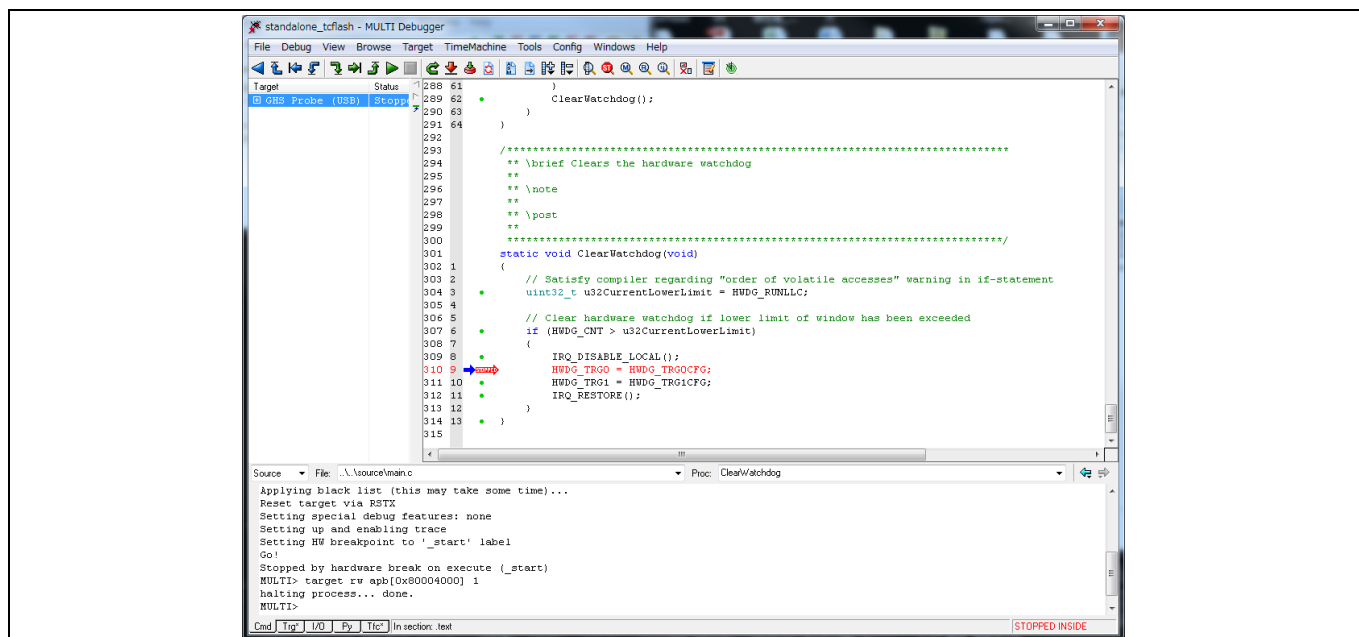


Figure 17 Start TimeMachine

2. Click the **TimeMachine** tab and select **Trace List...**, as shown in [Figure 18](#).

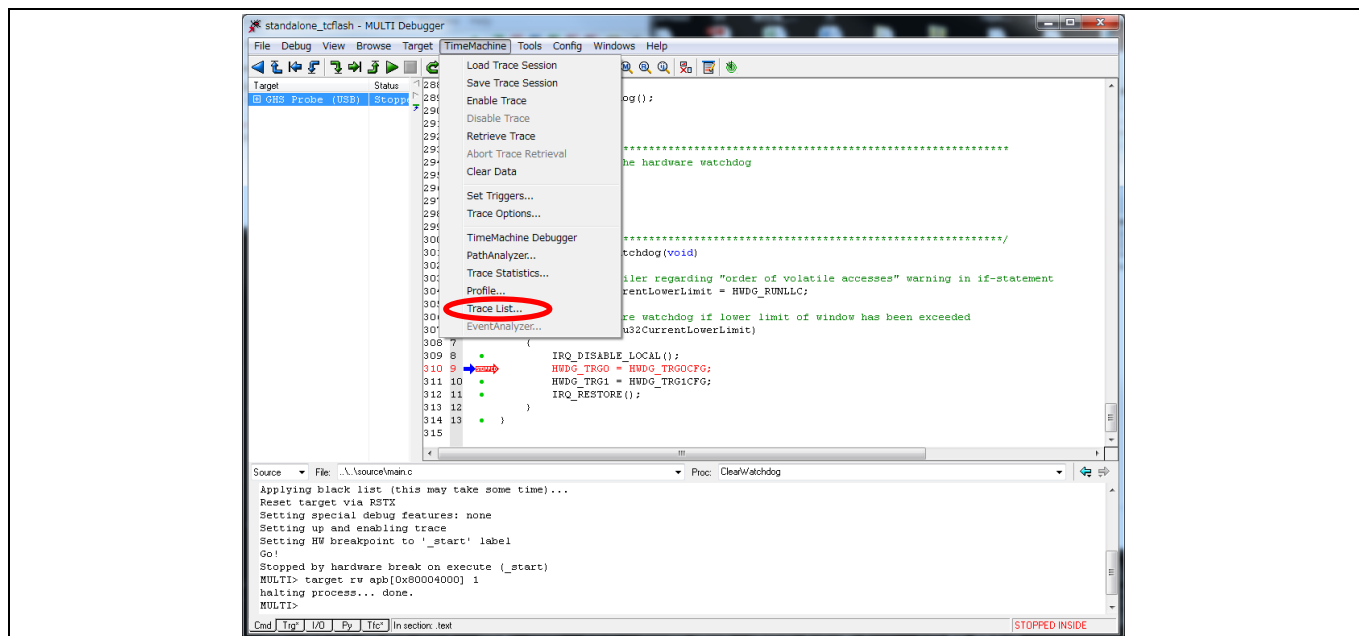


Figure 18 Open Trace List

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ETM trace operation

The trace result is displayed on the **Trace List**, as shown in **Figure 19**.

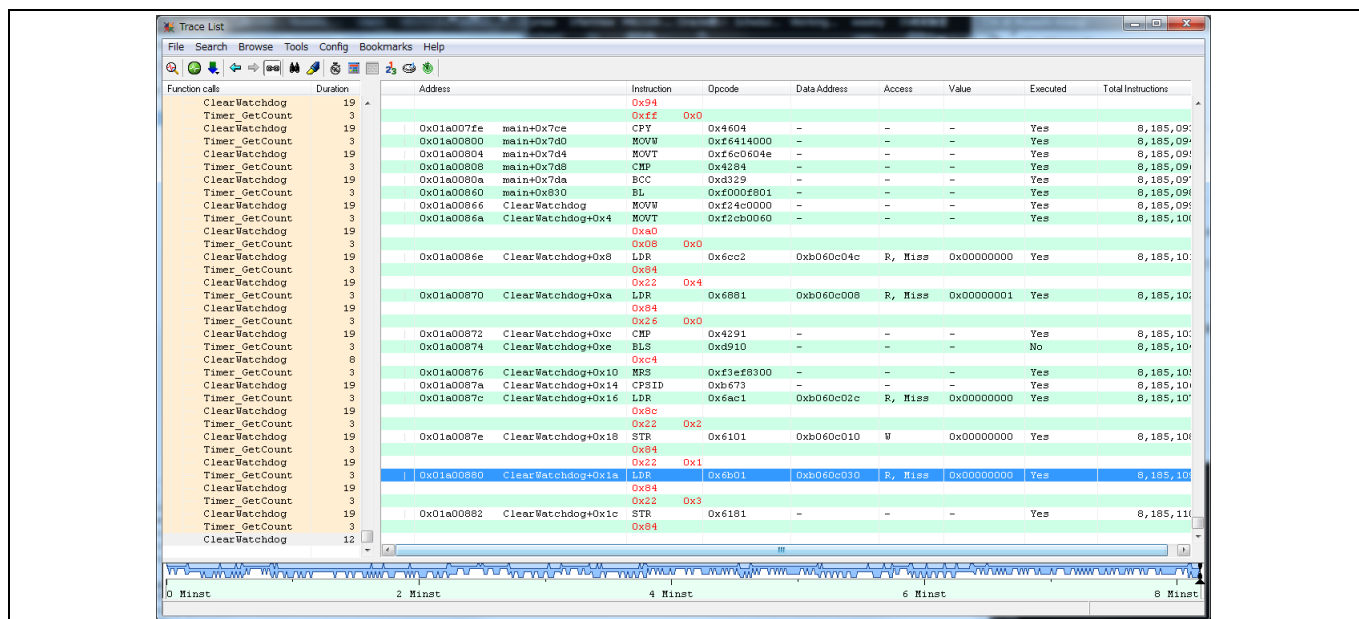


Figure 19 Trace result

Note: When the **Port settings** are configured incorrectly or operation mistake, the trace function is not executed, as shown in **Figure 20**.



Figure 20 Trace list when port settings are incorrect

ETM trace operation

6.4 Step-back operation

Execution of the program can be stepped back via the GHS MULTI step-back button (ALT + F11), as shown in [Figure 21](#).

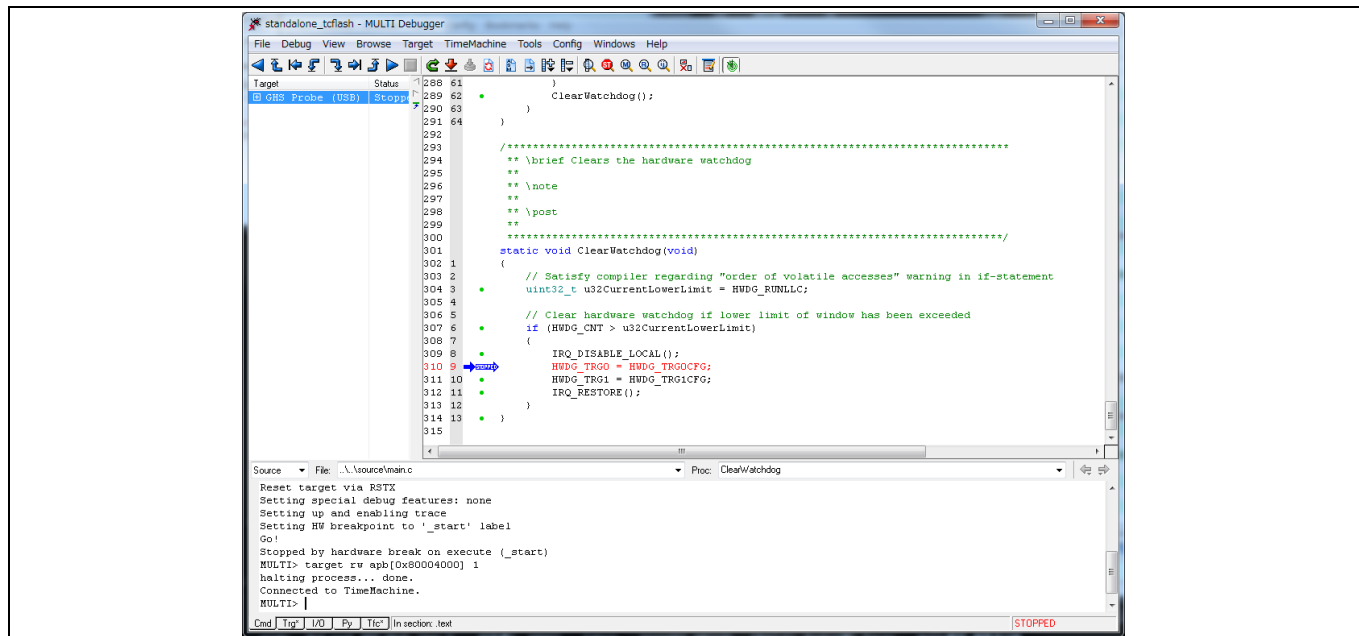


Figure 21 Step-back execution

Related documents

7 Related documents

- [S6J3200 Series Hardware Manual](#) (Doc. No. 002-04852)
- [S6J3200 Series Datasheet](#) (Doc. No. 002-05682)
- [AN209861 – Getting Started with the Traveo Family S6J3200 Series](#) (Doc. No. 002-09861)
- [TRAVEO™ Family Platform Part Hardware Manual](#) (Doc. No. 002-04854)
- [Green Hill Software MULTI Datasheet](#)

How to Use Green Hills Software SuperTrace™ Probe in TRAVEO™ Family S6J3200 Series



Revision history

Revision history

Document version	Date of release	Description of changes
**	2016-12-22	New application note.
*A	2017-07-27	Updated Cypress Logo and Copyright.
*B	2021-06-22	Updated to Infineon template.

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