

ST2600 ICE & EVB Hardware Manual

Revision 1.4
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Sitronix

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1. GENERAL DESCRIPTION

ST26xx ICE system consists of a ICE controller board and an ST2600 evaluation board (EVB). The EVB can be used as a stand-alone demo board when it is not connected to the ICE controller board. This document describes the connections and configurations of the 2 boards.

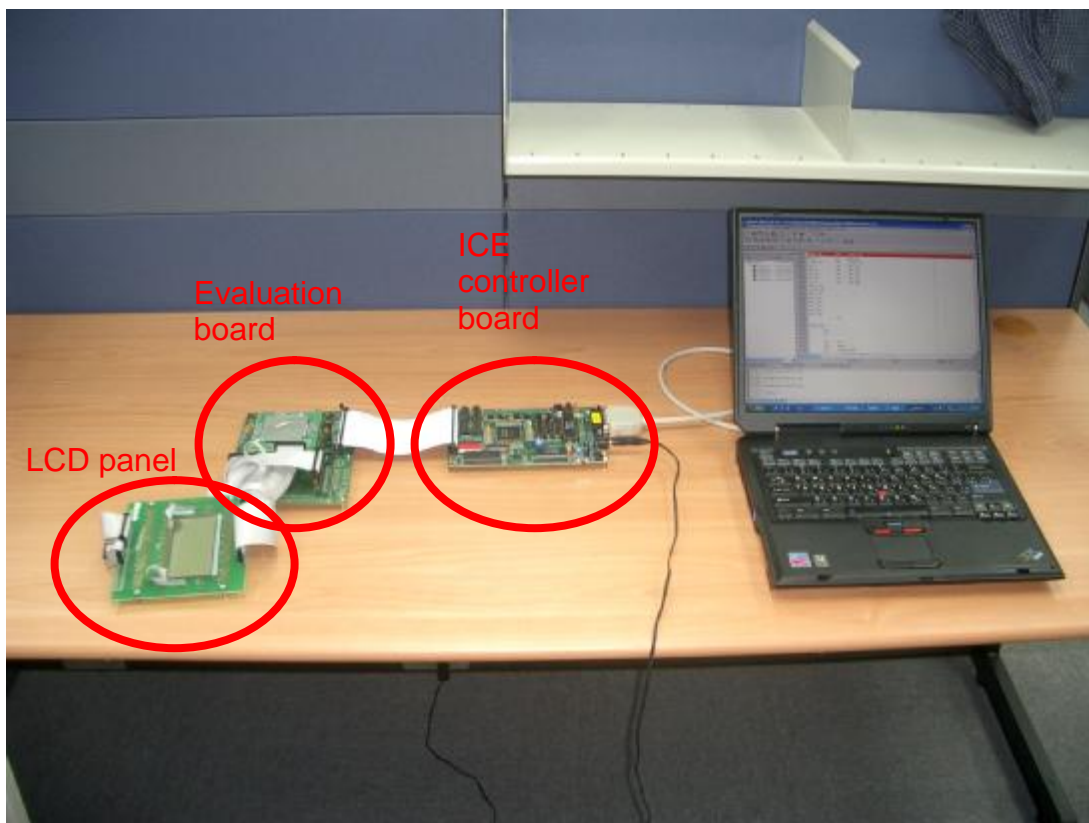
2. ICE MODE

When the ICE controller board and the ST2600 evaluation board are connected through a 60-pin cable, the system is in ICE mode. Users can download program into the ICE controller through PC parallel port, execute the program and debug the program. The hardware installation is described below. For the instruction of PC debugger software, please reference the user's manual of Sitronix Smart ICE.

The connection of ICE mode is shown in the following photos.

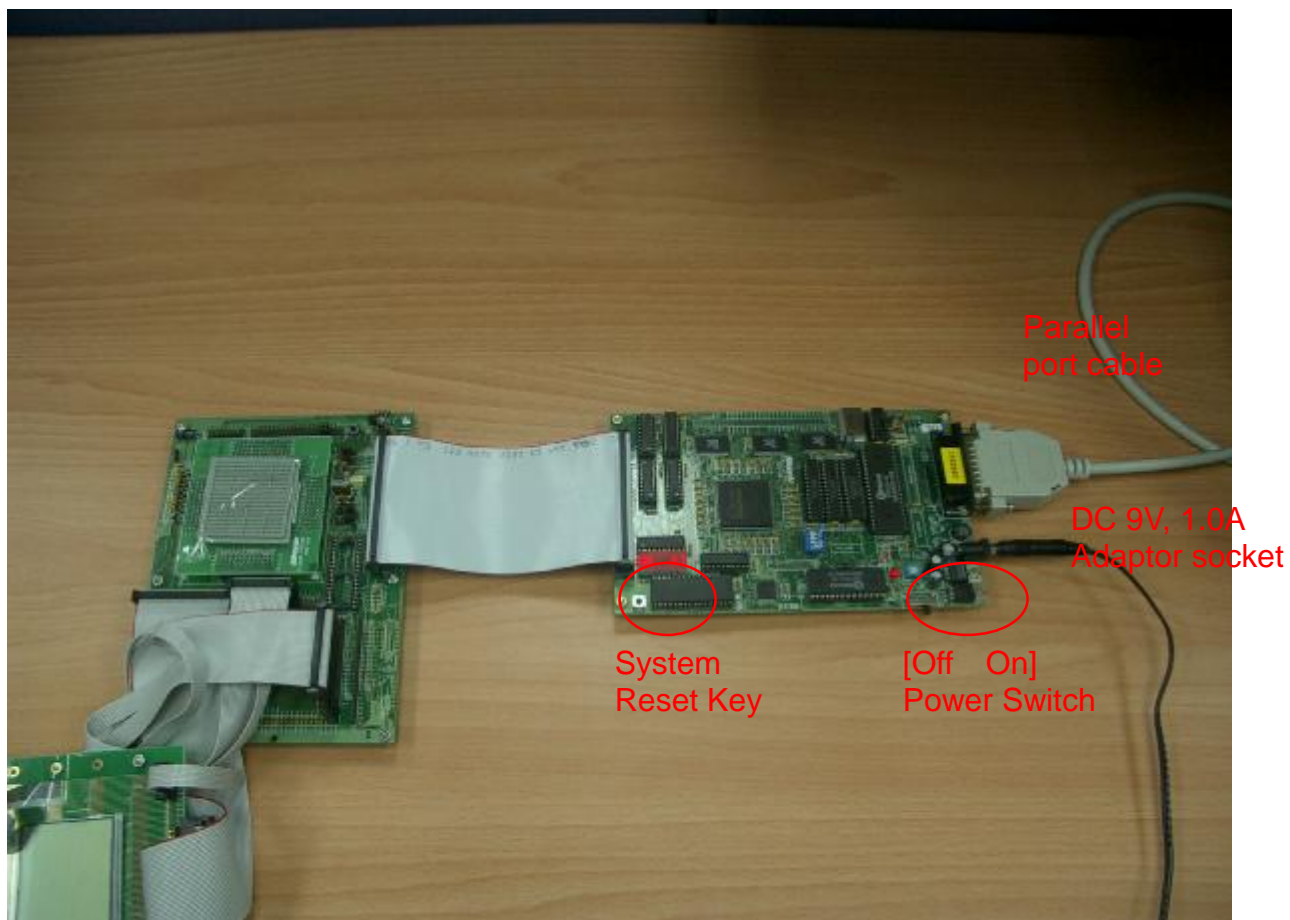
1. Whole system with PC/Notebook.

A complete ST2600 ICE system includes a PC, an ICE controller board and a ST2600 EVB. Users can connect their own LCD panel on the EVB. The LCD panel is not provided in ICE hardware package.



2. Near view of ICE system – ICE controller board

The ICE controller board is connected to PC via a parallel port cable. It is connected to EVB via a 60-line cable. The power switch and system reset key are also highlighted in the photo below.

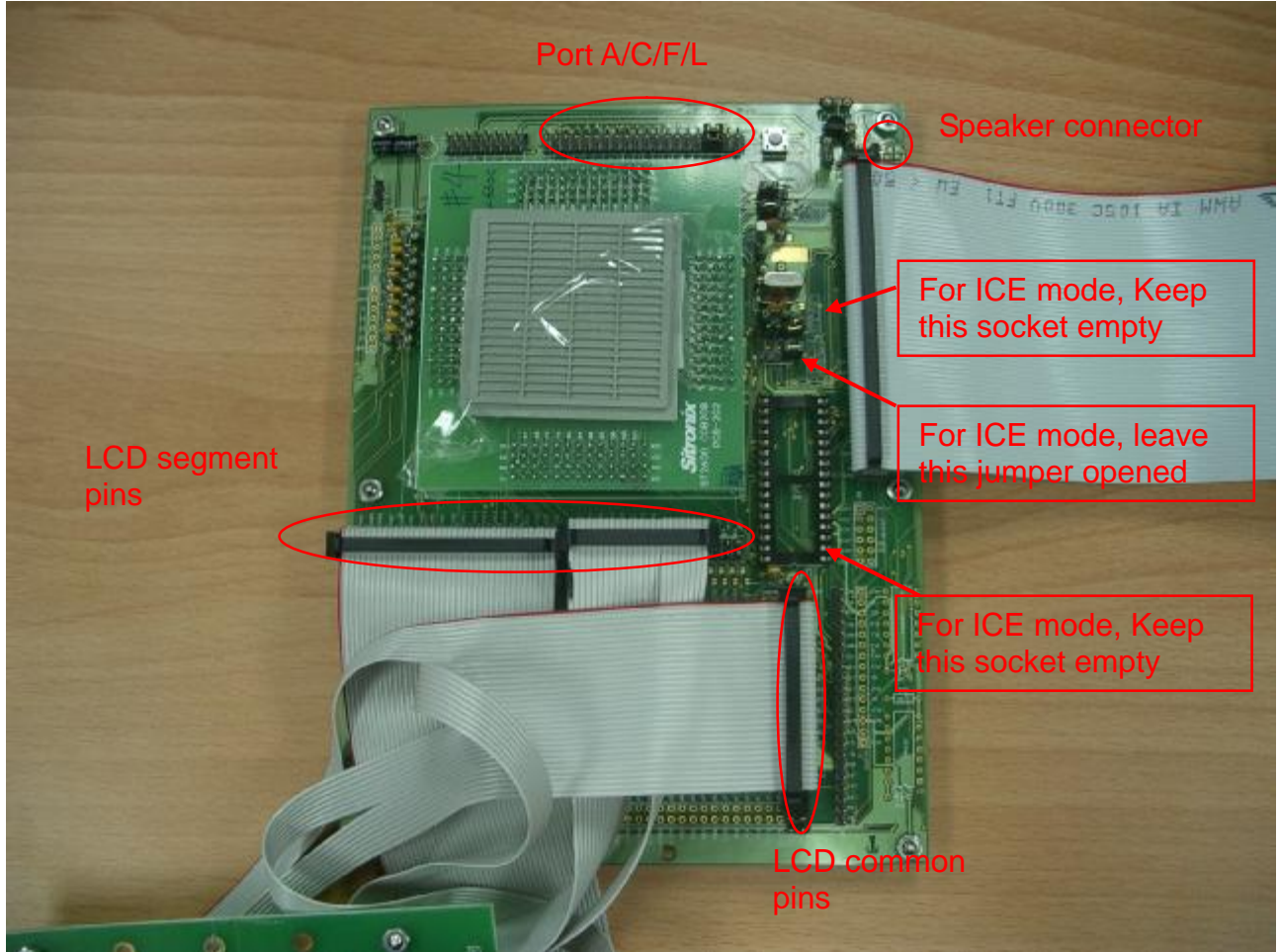


3. Near view of ICE system -- Evaluation Board

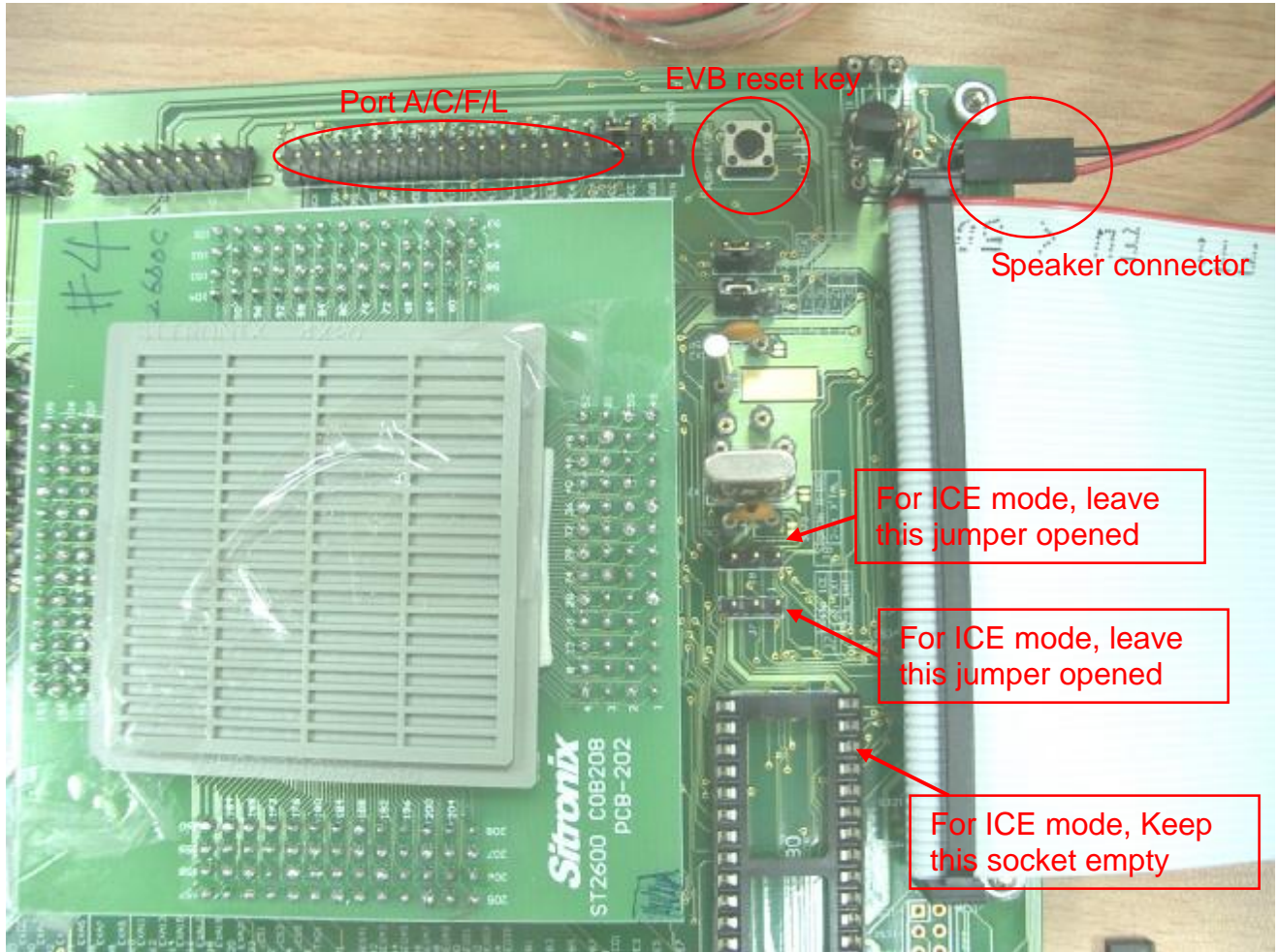
In ICE mode, 3 important things should be noted. Or else the ICE system may not function correctly. The 3 guide lines are:

- a. Jumper 7 and Jumper 8 must be opened (as shown in the following photo),
- b. Remove crystal oscillator, and
- c. EEPROM Socket should be empty.

LCD segment and common pins, Port A/C/F/L and speaker connector are high-lighted in the photo.

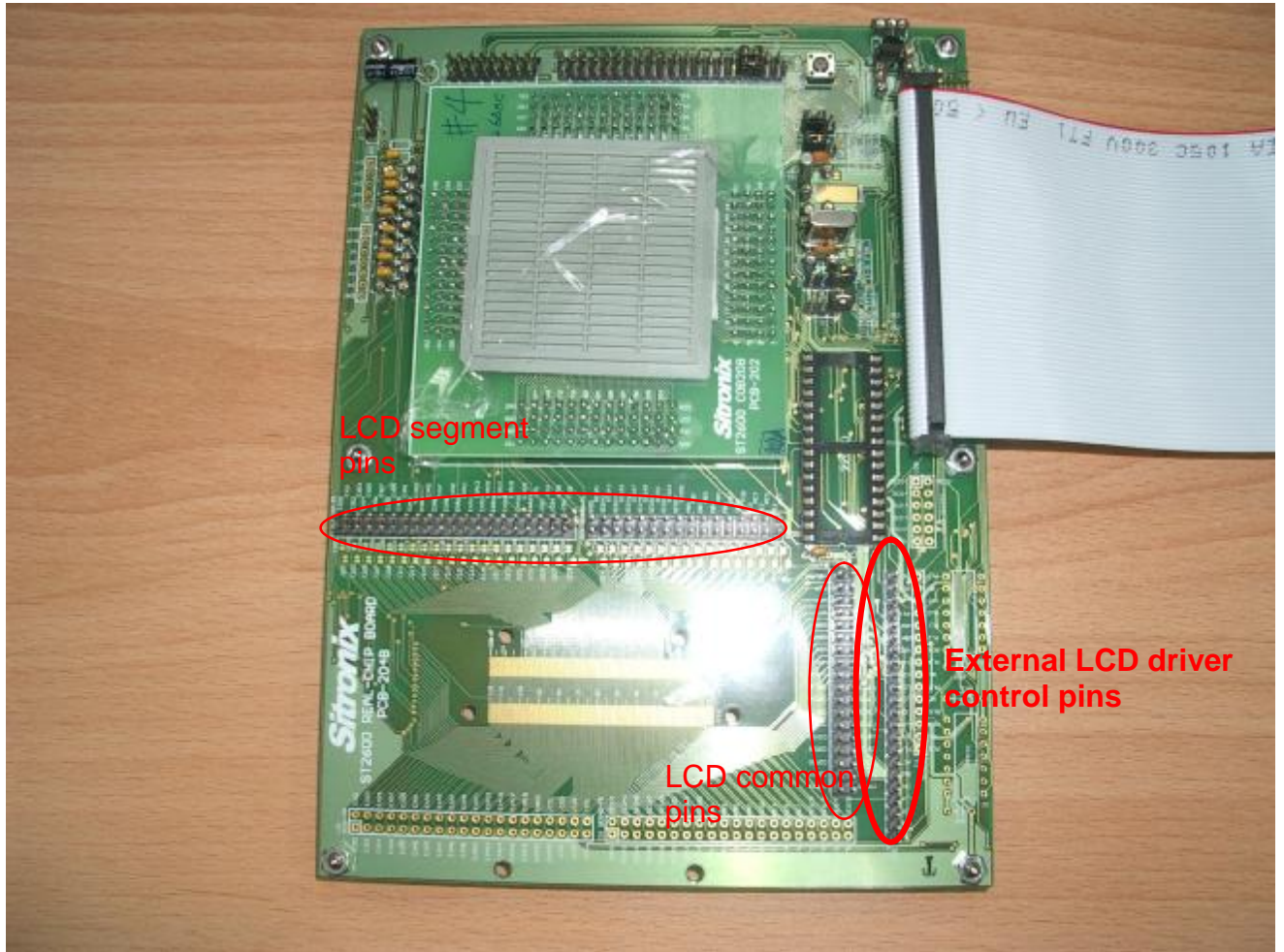


- 4. Near view of ICE system -- Evaluation Board 2
This is a closer view of the EVB.



5. Near view of ICE system -- Evaluation Board 3

This photo highlights the locations of LCD pins including external LCD driver controlling ones.



3. EVALUATION MODE

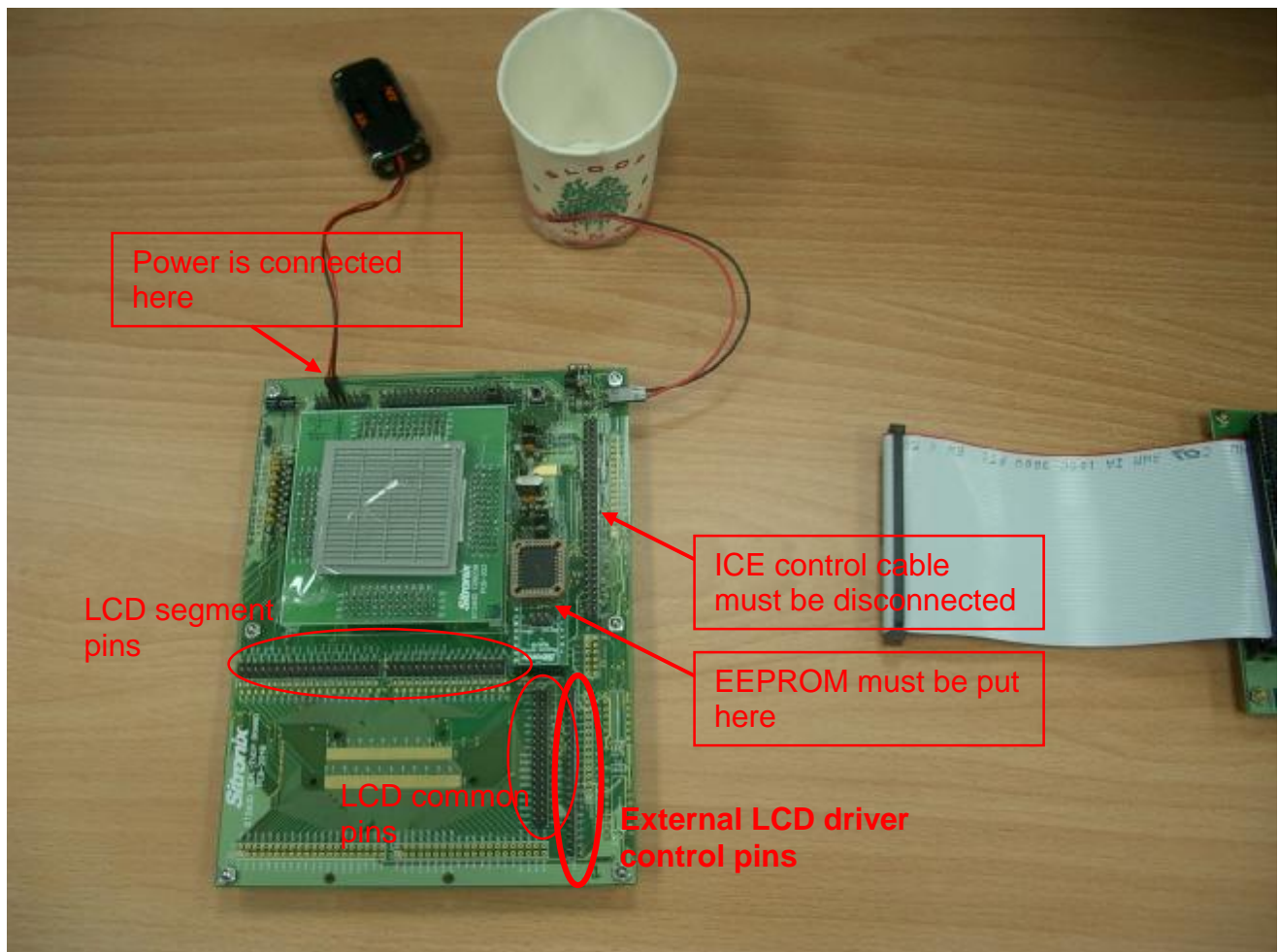
The EVB can execute program in stand-alone for demo purpose. To configure the EVB as a stand-alone set, the following guide lines must be done.

- a. The 60-line cable should be removed from the EVB.
- b. The program should be programmed into a EEPROM. The EEPROM should be put on the EEPROM socket of the EVB.
- c. The pin 2 and 3 of Jumper 7 must be shorted.
- d. For crystal mode of main oscillator, the pin 2 and 3 of Jumper 8 must be shorted. For RC mode of main oscillator, the Jumper 8 must be opened.

e. Power must be connected.

The listed items above are all highlighted in the following photos.

1. Stand-alone EVB – whole system view

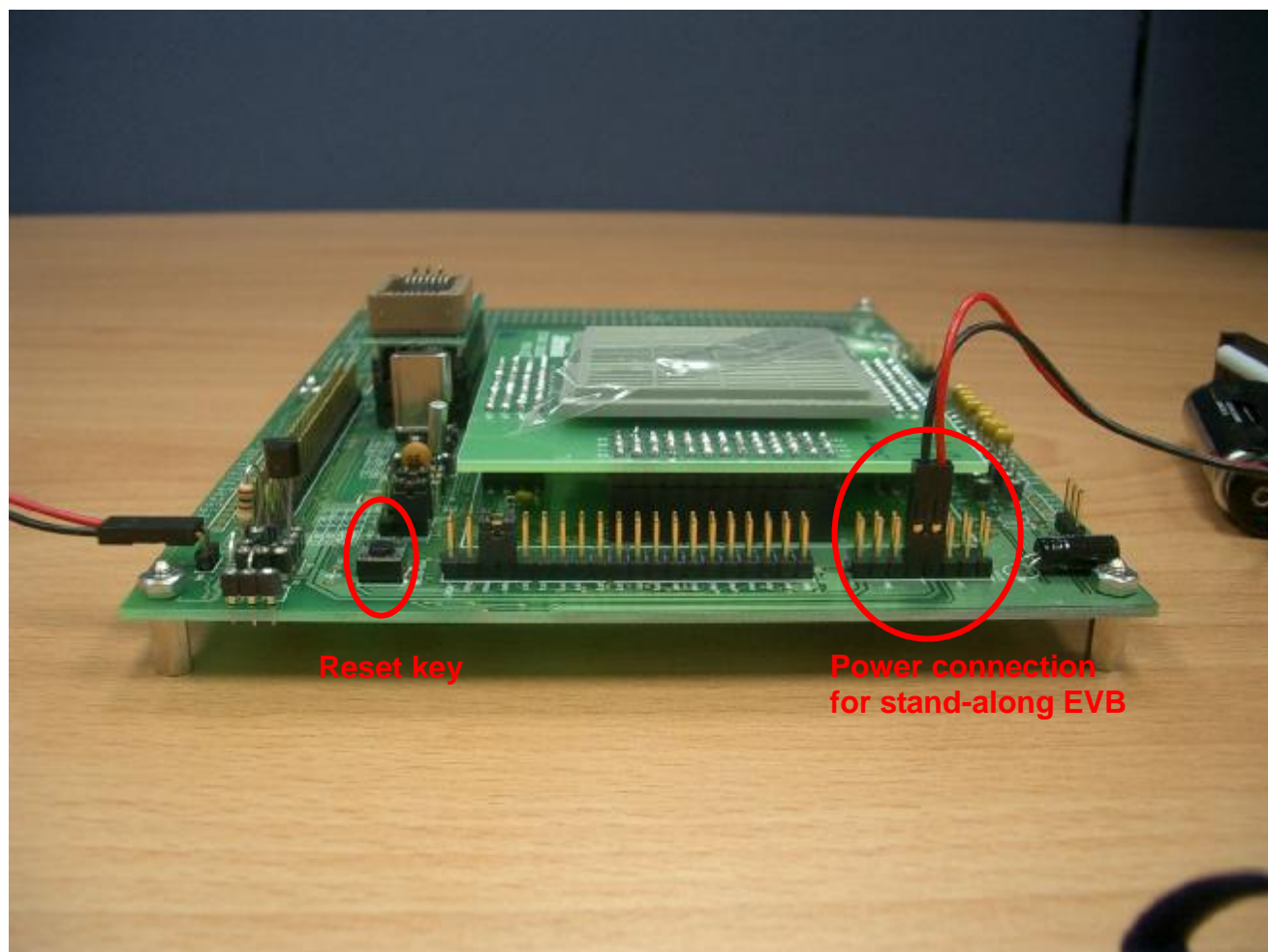


2. Stand-alone EVB -- jumper settings



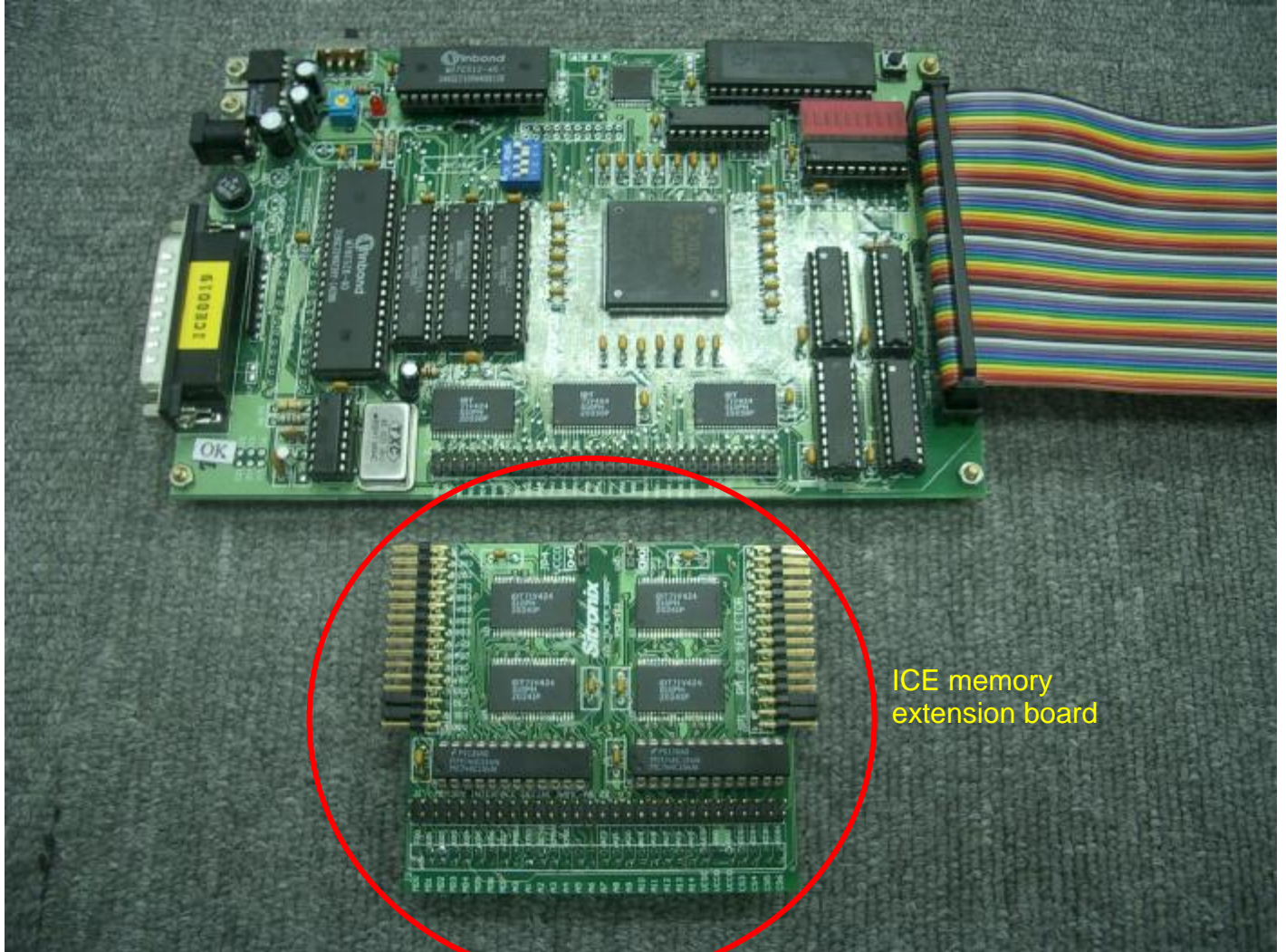
3. Stand-alone EVB -- power connection

This photo highlights the power connection. Please note the location and polarity of the power connector.

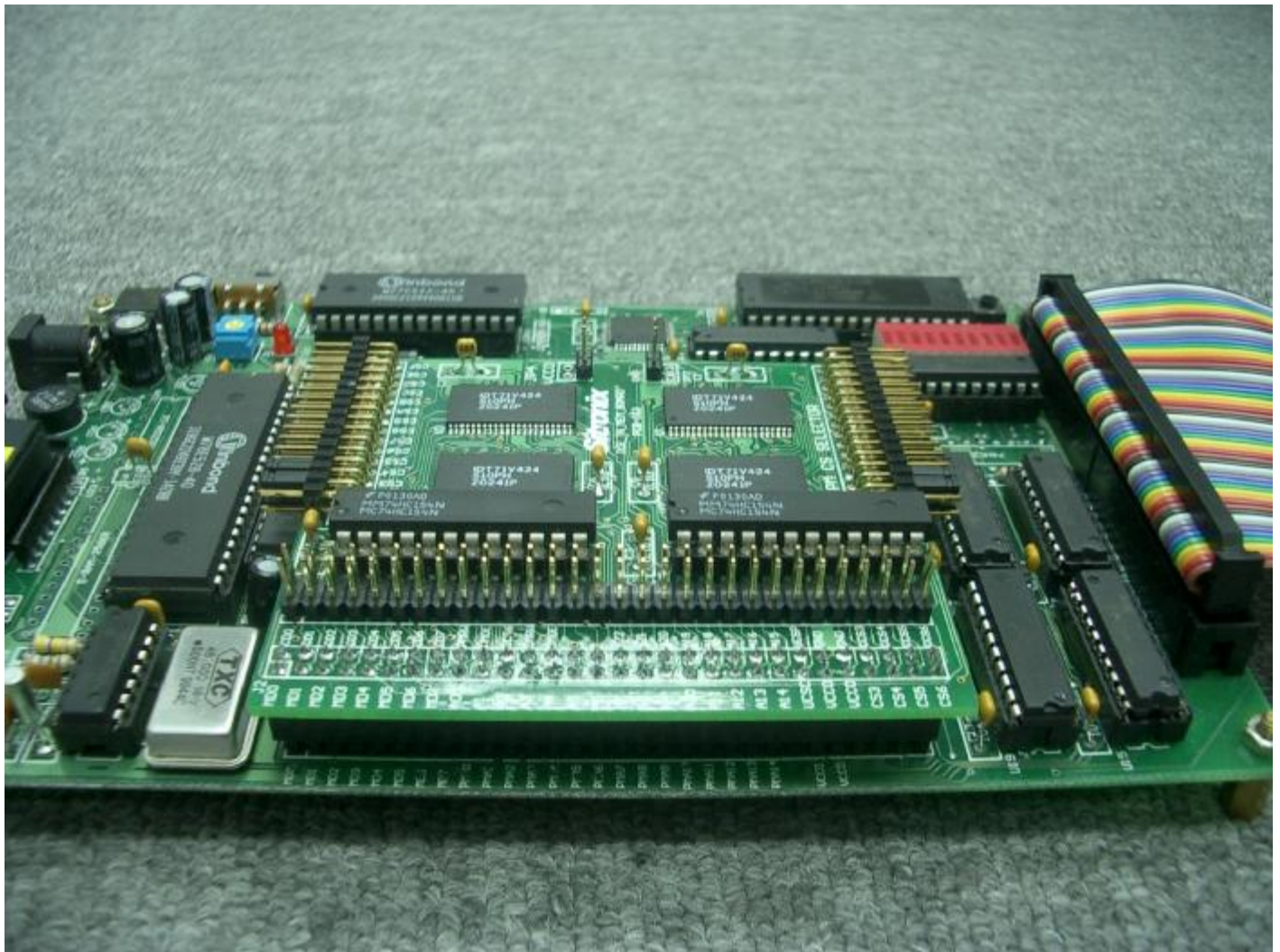


4. ICE MEMORY EXTENSION BOARD

There are only 4 Mbit memory on ICE controller board. For ST2608 emulation, the memory must be extended to 8 Mbit. To extend the memory size, a memory extension board should be attached. The photo of the extension board is shown below.



The connection of the 2 boards are shown in the following photo.



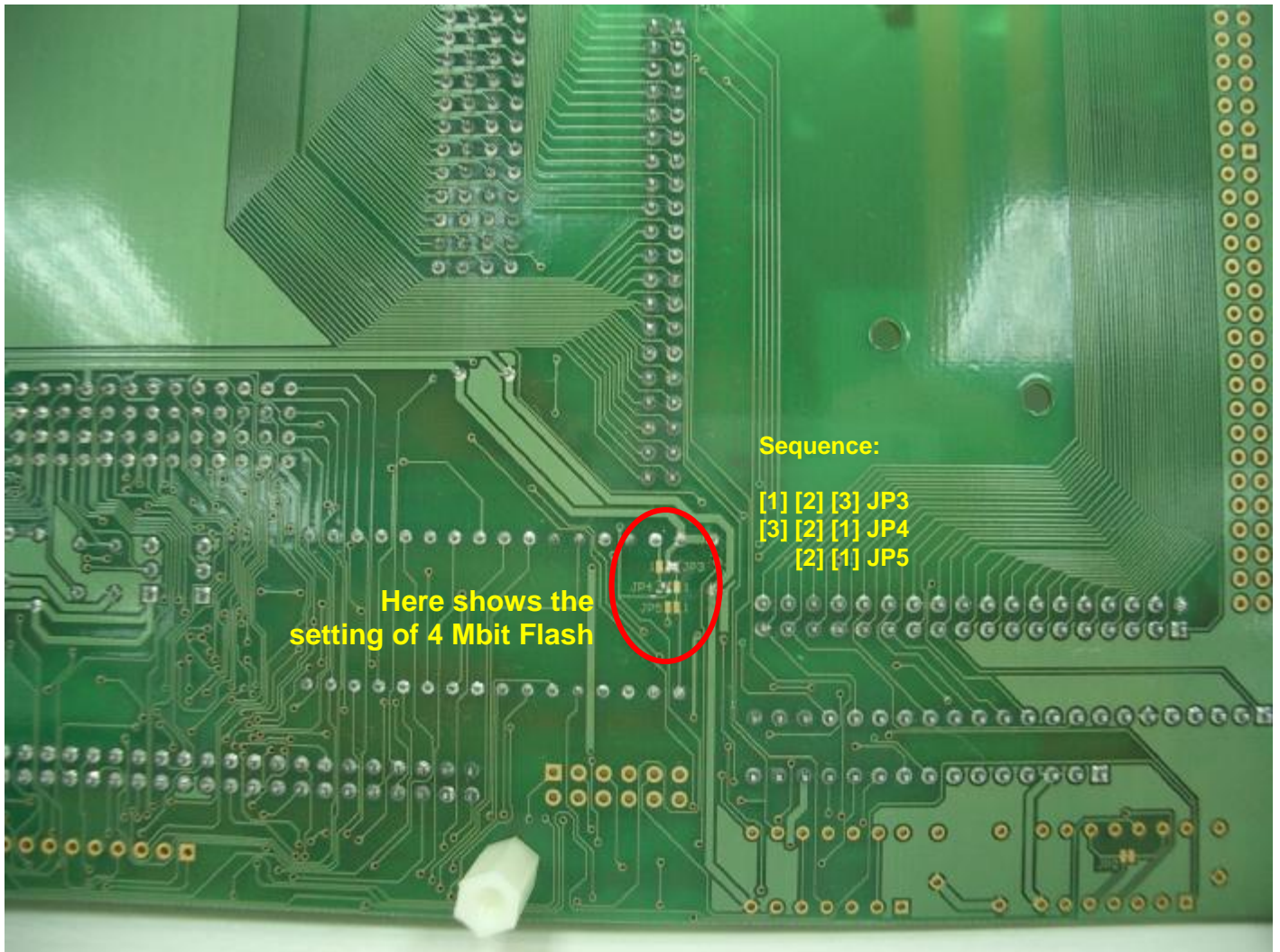


5. MEMORY TYPE/SIZE SETTING OF EV-BOARD

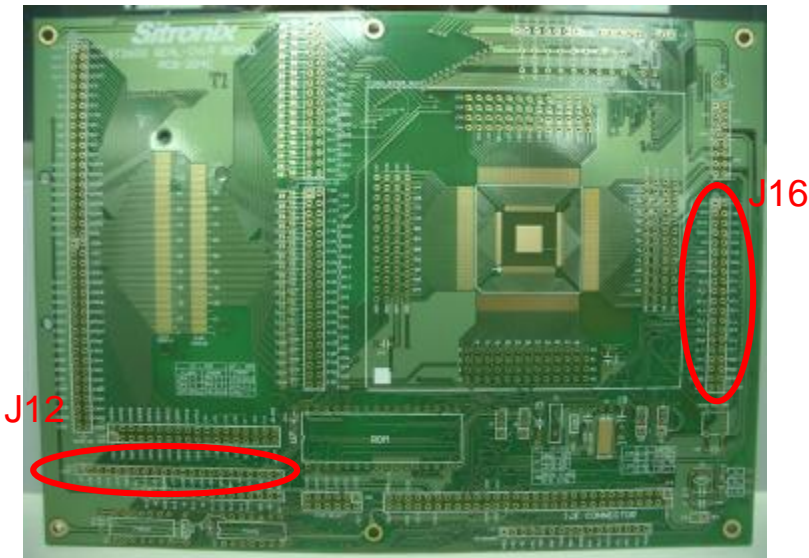
When the EVB is in stand-alone mode, the memory device can be 4-Mbit EEPROM, 8-Mbit EEPROM or 4-Mbit Flash. Users can set 3 jumpers, JP3, JP4 and JP5, to configure the memory setting. The setting of the 3 jumpers listed in the following table.

	4-Mbit EEPROM	8-Mbit EEPROM	4-Mbit Flash
JP3	2-3 short	Open	1-2 short
JP4	2-3 short	2-3 short	1-2 short
JP5	open	short	open

The location of the 3 jumpers are shown in the following photo.



6. HEADER PIN INFORMATION



J12: LCD Control

1	LD7
2	LD6
3	LD5
4	LD4
5	LP2
6	GND
7	AC
8	FLM
9	LP1
10	BLANK
11	CP
12	LD3
13	LD2
14	LD1
15	LD0
16	VCC
17	VBAT
18	/POFF
19	PE4
20	PE5
21	PE6
22	PE7

J16: I/O pins

PC0 / INTX	1	2	PA0
PC1 / SCK	3	4	PA1
PC2 / MISO	5	6	PA2
PC3 / MOSI	7	8	PA3
PC4 / SS	9	10	PA4
PC5 / DRYB	11	12	PA5
PC6 / TXD0	13	14	PA6
PC7 / RXD0	15	16	PA7
PL0	17	18	PF0
PL1	19	20	PF1
PL2	21	22	PF2
PL3	23	24	PF3
PL4	25	26	PF4
PL5	27	28	PF5
PL6	29	30	PF6
PL7	31	32	PF7
VCC	33	34	GND
PVCC	35	36	PGND
PSGOB	37	38	PSGO
VIN	39	40	/RESET

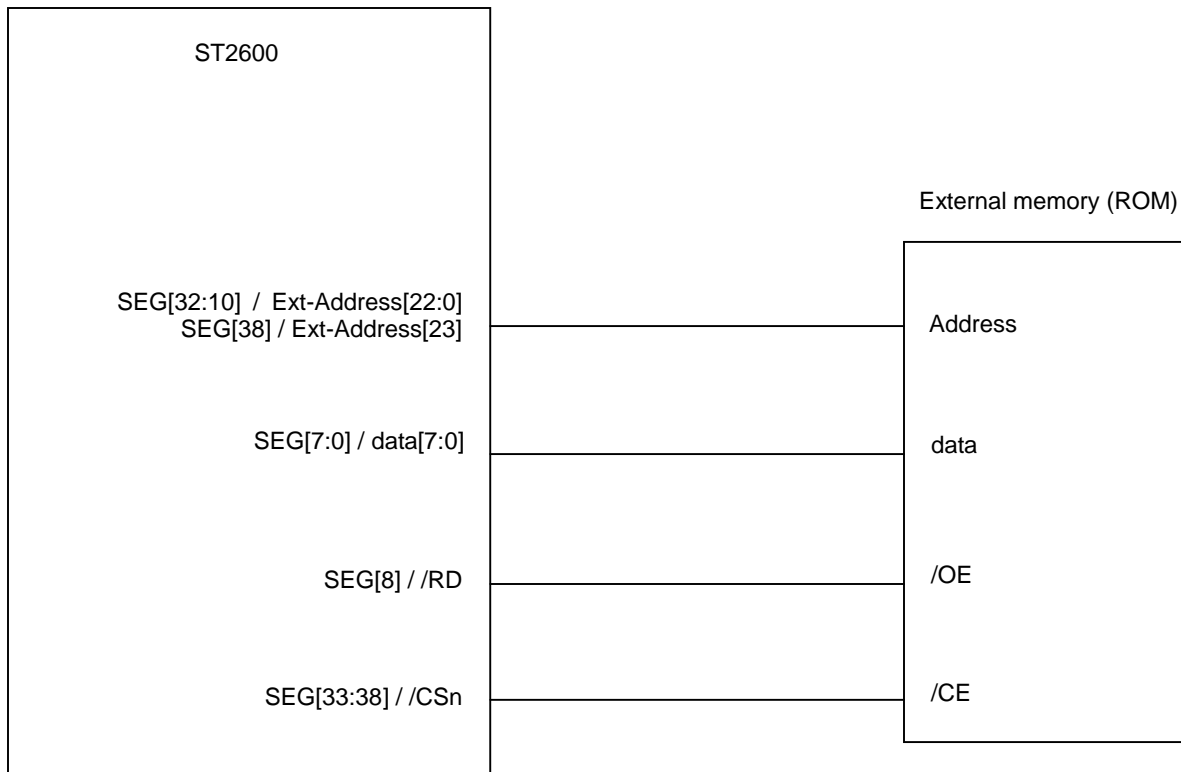
7. CONNECTING EXTERNAL MEMORY

ST2600 can connect external memory devices via its LCD segment pins. To connect external memory devices, the following firmware procedures need to be completed in advance.

1. Users should set an LCFG register to x6h or x7h to enable external memory bus, and
2. Set a PFD register to enable the CS function of Port D.
3. Connect external devices according to EV mode or ICE mode.

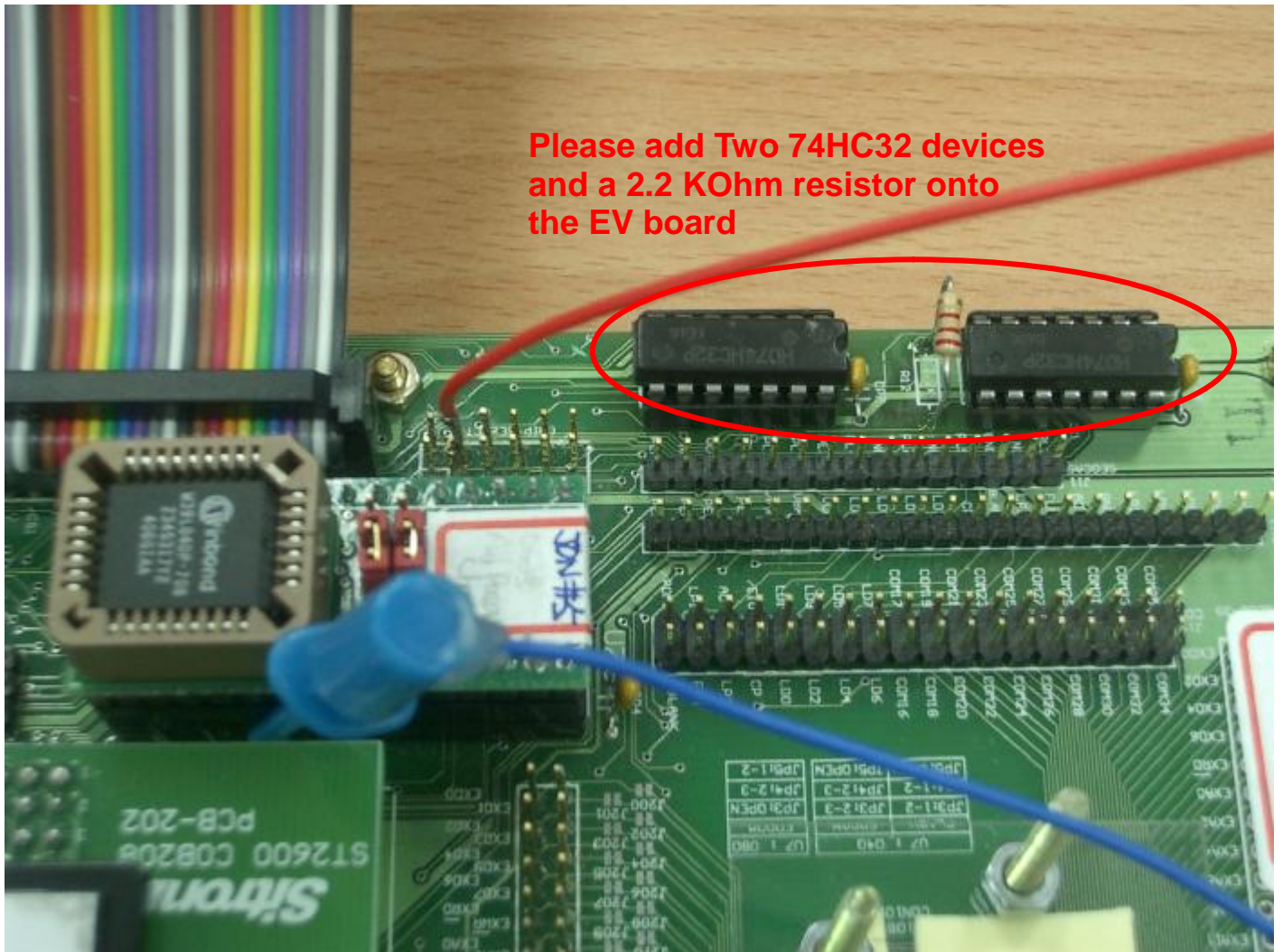
7.1 EV mode (stand-alone mode)

Connect external memory devices via ST2600 external address/data buses and external /RD, /WR signals. The external address/data buses and the /RD, /WR pins share LCD segment [0:32] pins. The /CE pin of the external memory device is connected to /CSn pins of the ST2600. The /CSn pins share LCD segment [33:39 pins].

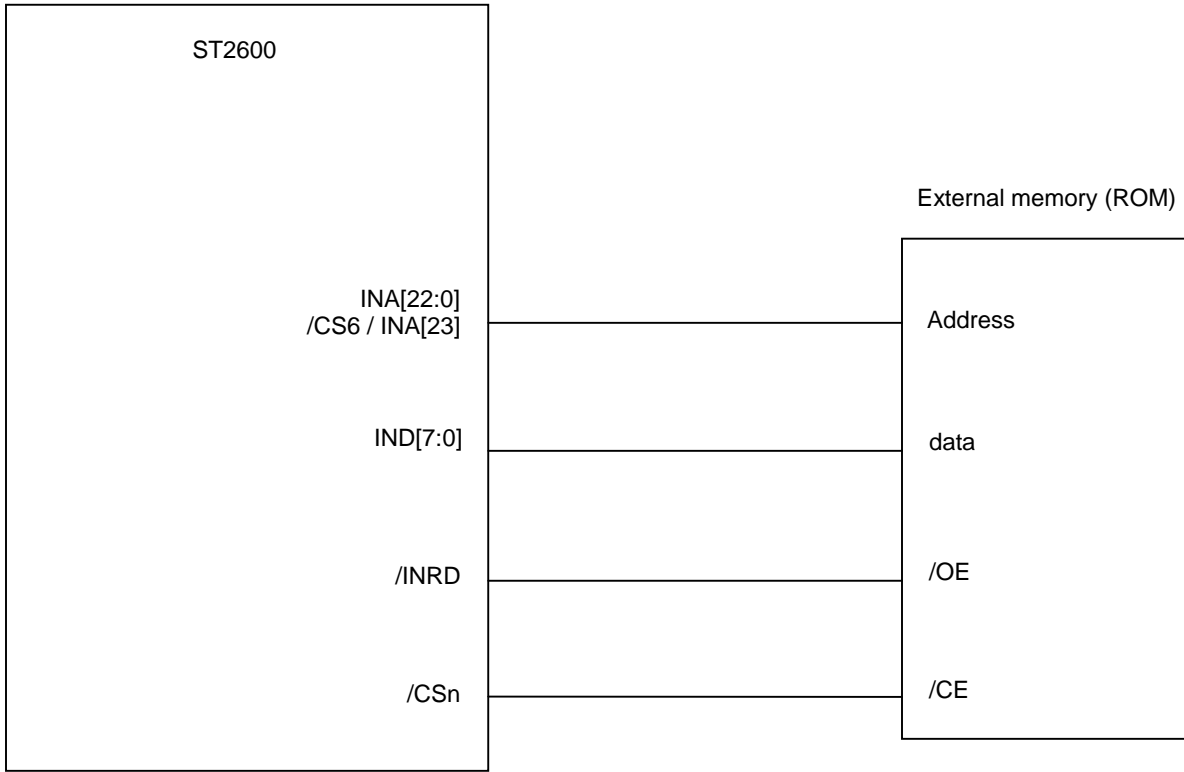


7.2 ICE mode

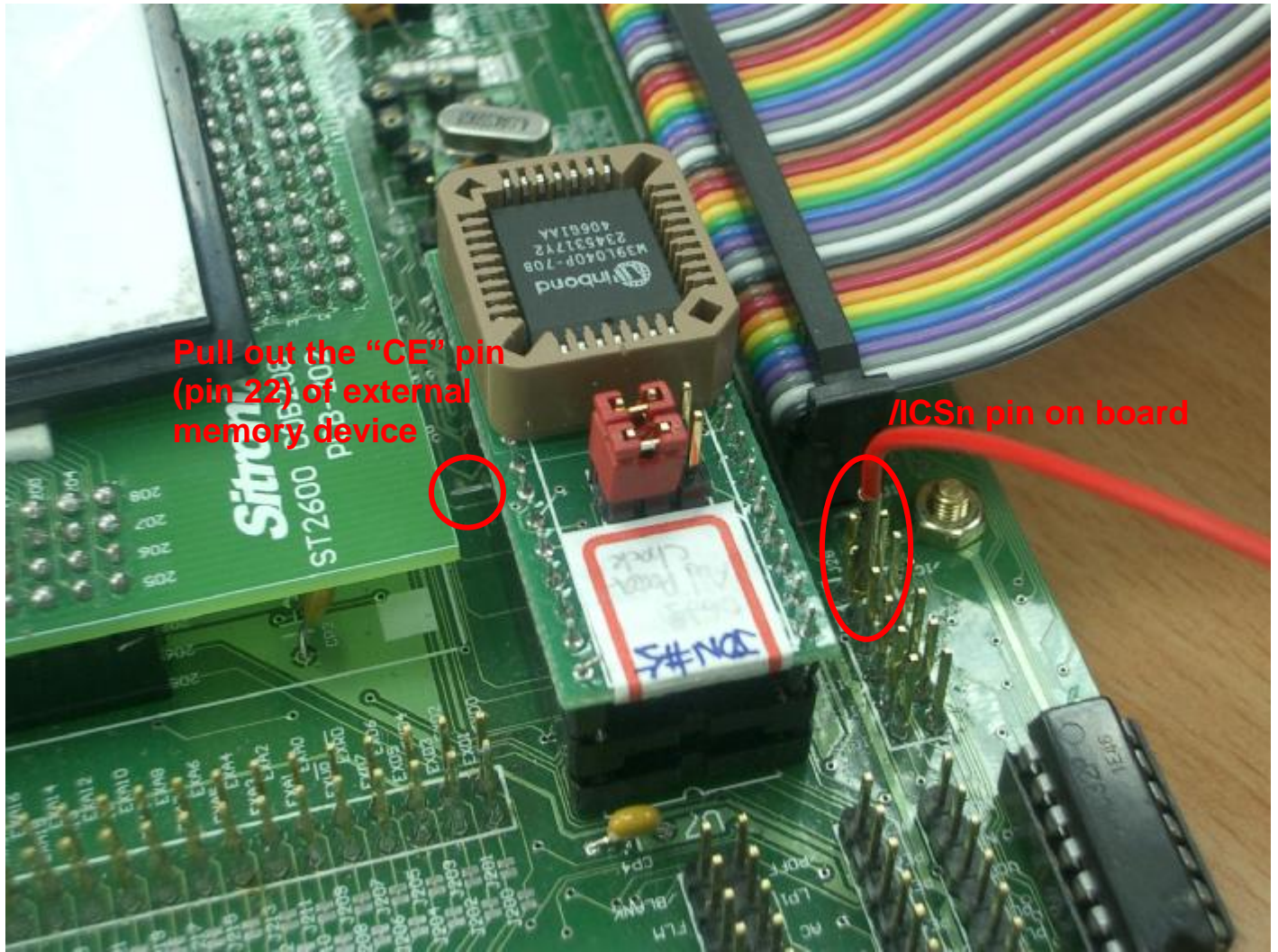
Before connecting external memory devices in ICE mode, please make sure there are two 74HC32 devices on U11 and U12 and a 2.2 KOhm resistor on R12 socket.



Connect external memory devices via ST2600 internal address/data buses and external /RD, /WR signals. The /CE pin of the external memory device is connected to /ICS_n pins of the EV board. The /ICS_n pins is on jumper 28.



(a) For the memory devices with the size smaller than 1MB, users can pull out its /CE pin (pin 22) and put it on the U7 socket. Connect the /CE pin to /ICS_n pin. Refer to following photo for details.



view of whole system



(b) For the memory devices with the size larger than 1MB, please connect the address bus, data bus, CE and OE of the memory device to the INA[23:0], IND[7:0], /CSn and /INRD of ICE control bus. Since the front side of connector has been utilized by ICE cable (the colorful cable), the 2nd cable can be connected through the rear side of the PCB. The connector information of the ICE connector is shown below.



ICE connector J15

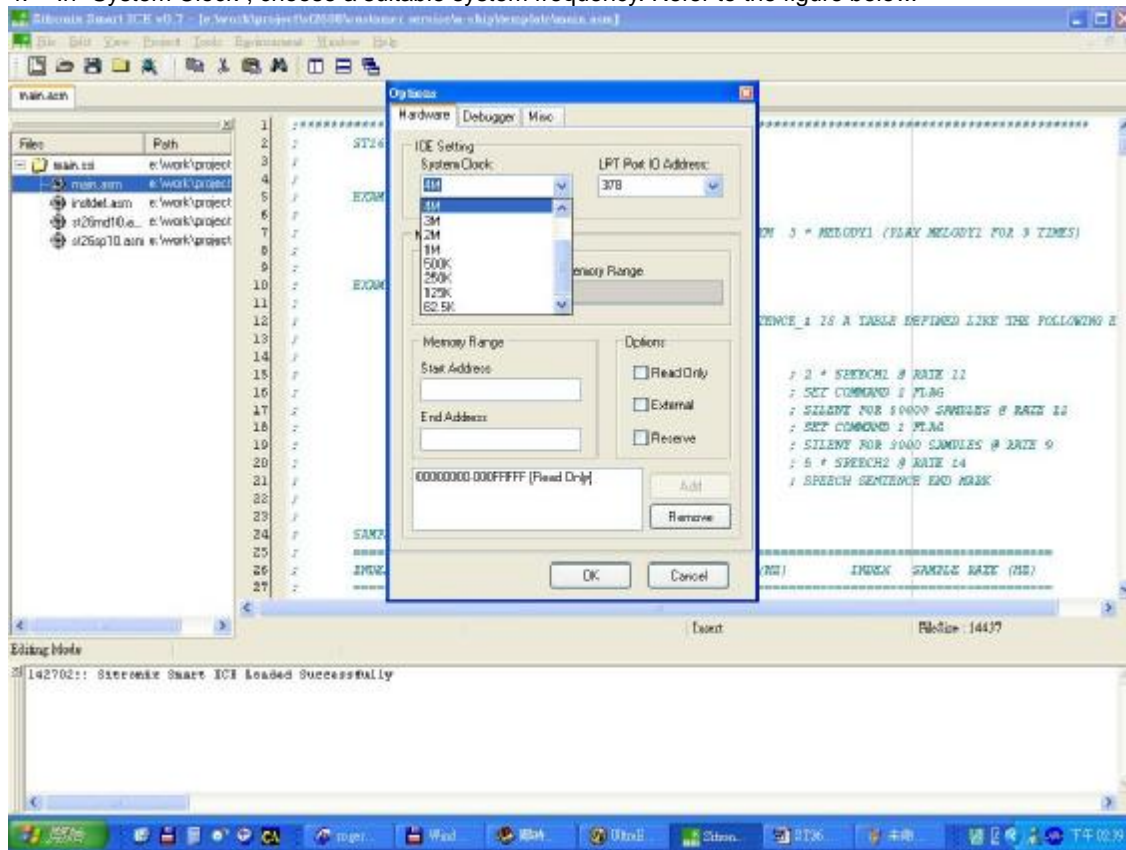
INA0	1	2	VCC
INA1	3	4	INA18
INA2	5	6	INA19
INA3	7	8	INA20
INA4	9	10	INA21
INA5	11	12	INA22
INA6	13	14	/CS6/A23
INA7	15	16	IND0
INA8	17	18	IND1
INA9	19	20	IND2
INA10	21	22	IND3
INA11	23	24	IND4
INA12	25	26	IND5
INA13	27	28	IND6
INA14	29	30	IND7
INA15	31	32	/INWR
INA16	33	34	/INRD
INA17	35	36	GND
/CS1	37	38	/CS2
/CS3	39	40	/CS4
/CS5	41	42	MMD/CS0
OSCXI	43	44	OSCI
EVBMEM	45	46	RESET
XMD	47	48	XIO
VBAT	49	50	ICE2
VCC	51	52	TEST
/INWR	53	54	ICE4
ICE5	55	56	ICE1
	57	58	
MMD/CS0	59	60	ICE3

8. ICE DEBUGGER SETTING

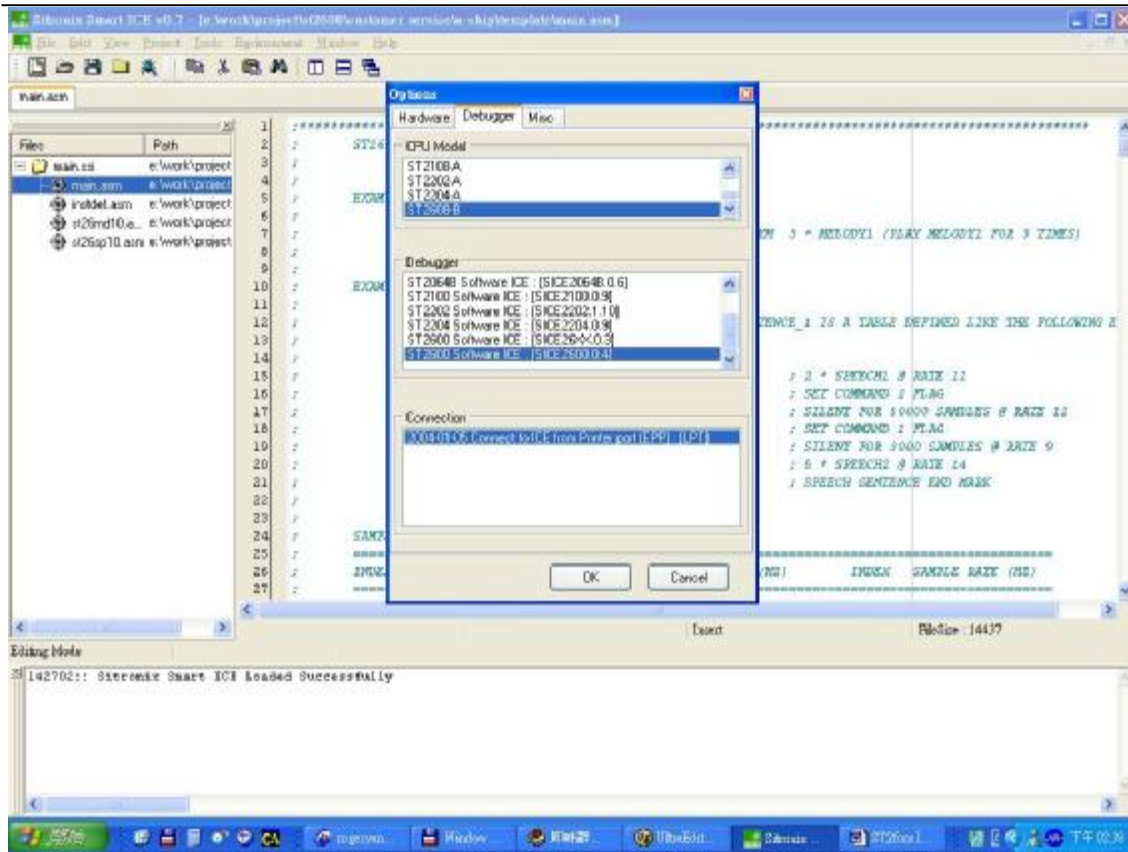
Sitronix ICE debugger software supports 2 debugging mode. They are software-simulator mode and hardware-emulator mode. Only in the software-simulator mode, a control panel of software keyboard and LCD window will be popped up. To choose the debugger mode, please follow the steps below.

Software simulator mode:

1. Execute Sitronix Smart ICE software.
2. On top menu, click “Environment” -> “Debugger Options”. A pop-up window will be shown.
3. In the pop-up window, click on “Hardware” label.
4. In “System Clock”, choose a suitable system frequency. Refer to the figure below.



5. Click on “Debugger” label. In “CPU model” box, select “ST2608”. In “Debugger” box, select “ST2600 software ICE”. Refer to the following figure.

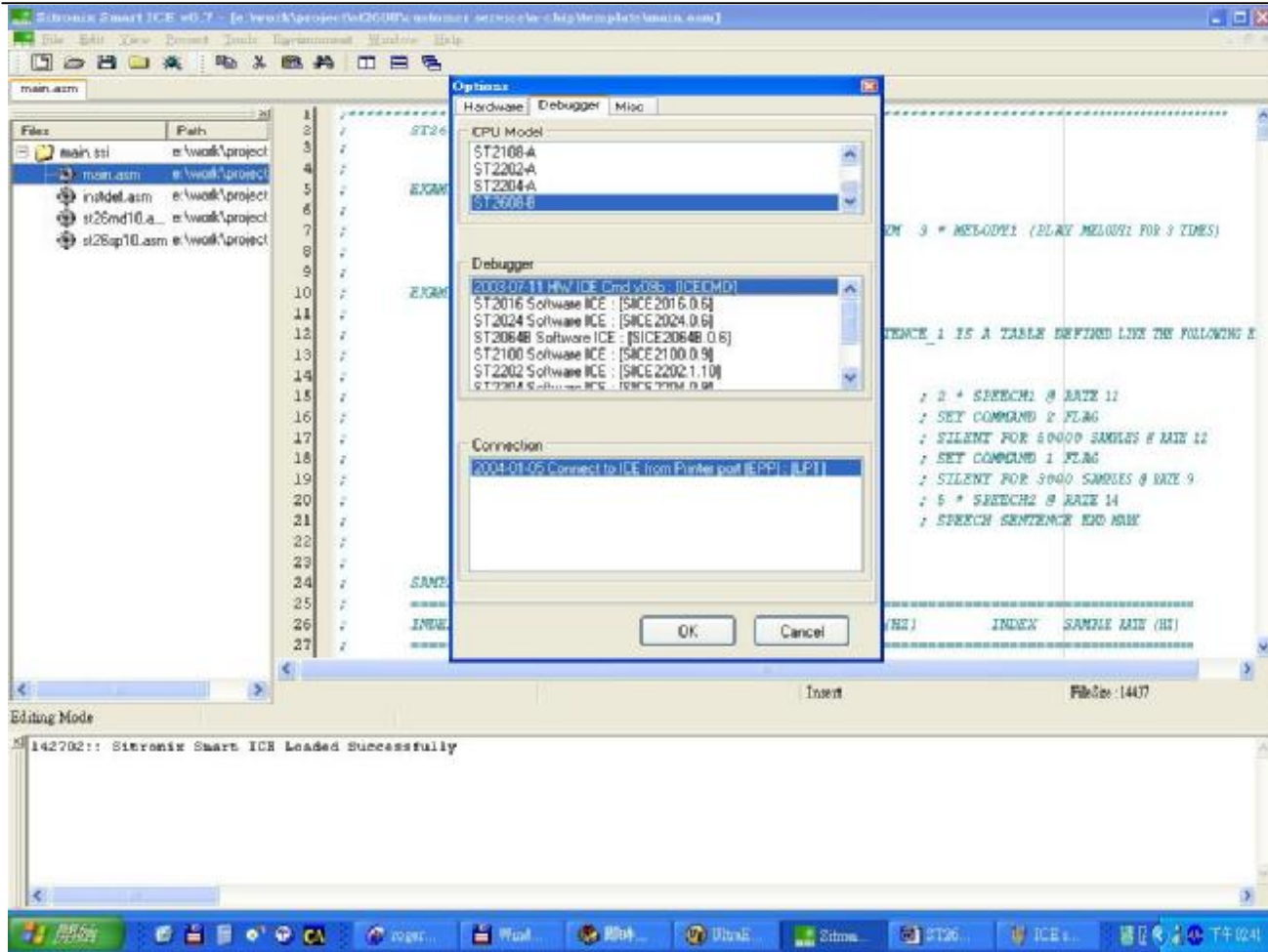


6. Press “OK”.

Hardware emulator mode:

Step 1. ~ Step 4. are same as above.

5. Click on “Debugger” label. In “CPU model” box, select “ST2608”. In “Debugger” box, select “Hard ICE Cmd (the 1st line)”. Refer to the following figure.



6. Press OK.