

SONiX 8-Bit MCU

In-Circuit Emulator

USER'S MANUAL

General Release Specification

SONiX 8-Bit Micro-Controller Development Tools

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USER MANUAL REVISION HISTORY

Version	Date	Description
VER 1.9	Sep. 2002	V1.9 first issue
VER 1.93	Feb. 2003	1. Re-organize installation procedure
		2. Add appendix A

HARDWARE REVISION HISTORY

Part	Version	Date	Description
Kernel chip	S8KD-1	Sep. 2002	S8KD second issue.
	S8KD-2	Nov. 2002	Revision for S8KD-1.
EV board	1.9	0222	V1.9 first issue.
	2.0	0224	Modify the LED description on the board.
ICE board	1.0	Jun. 2002	



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1 INTRODUCTION

SONiX ICE is an In-Circuit Emulator designs to support all series of SONiX 8-bit Microcontroller. It provides a powerful and reliable emulating environment. To begin with, a complete developer tool includes SONiX emulator with 8-bit micro-controller kernel chip, assembler, simulator and Window based integrated development software. Users are allow to do program editting, source level debug and system simulation with SONiX assembler software. SONiX emulator board supports 5V/3.3V DC power supply or an external power supply from the target board.



2 SONIX IN-CIRCUIT EMULATOR

In this Chapter, you will learn how to connect and to install the SONiX ICE to your computer.

2.1 CONNECTING SONIX ICE

Accessories

Before you start, check the following items prior to the setup:

- SONiX ICE, and it contains
 - EV board with SONiX S8KD-2 kernal chip (See Appendex A for detailed information) -information regarding kernal chip version, please contact your local agent for availability
 - ICE board (See Appendex A for detailed information)
- DC power adaptor (+7.5VDC)
- Parallel cable –contact your local agent for availability
- Transition socket module *contact your local agent for availability*

Connection Procedure

Follow the steps in this section to connect your SONiX ICE:



The EV board should be in CORRECT setting. If you haven't set your EV board, please see Appendex A.



Both SONiX ICE and PC should not have the power be turned ON at this time.

- Step 1: Attach the DC adaptor to SONiX ICE
- Step 2: Turn on SONiX ICE
- Step 3: turn on PC
- Step 4: Locate an unused LPT port of PC
- Step 5: Connect SONiX ICE to the LPT port using a parallel cable
- Now, go to the next section to install your SONiX ICE.



2.2 INSTALLING SONIX ICE

About SONiX Assembler

SONiX 8-bit microcontroller developer environment software provides text editor, assembler, simulator and windows-based debug functions. It supports all series of SONiX 8-bit microcontroller.

System Requirment

- Windows NT/95/98/2000/ME/XP
- 2.0MB of available hard drive space
- 32MB RAM or greater

File Description

- SN8ASMxxx.zip: assembler software package, xxx represents the version. (ie. 1.97)
- S8ASMxxx.exe: main execution program, xxx represents the version. (ie. 1.97)
- MACRO1.h: reference macro 1
- MACRO2.h: reference macro 2
- MACRO3.h: reference macro 3



DO NOT delete or change any of the hidden directory from the unzipped files to avoid system errors.

System Interface

• Print port (EPP or ECP mode)

Intallation Procedure

Follow the steps in this section to install your SONiX ICE:

Step 1: Download the ZIP file from SONiX's website <u>http://www.sonix.com.tw</u>. Click "Entry" to enter the website, then go to the "Download/Tools" page to download the program you need.



Login ID: sonix Password: spec Both Login ID and Password are case sensitive.



Step 2: Creat a new folder, and then unzip the file to the destination folder that you wish. (ie. C:\sonix\s8asmxxx)



If you are using **Windows 95/98**, please go to Step 15. If you are using **Windows NT/2000/ME/XP**, please go to Step 3.

Step 3: Click [Start], go to Setting/Control Panel (See figure below)



Following is an example of Windows 2000. Any questions regarding Window NT/XP, please contact you local agent for details.

Di Control Panel		the second second		Sec. 1	ine in the second s	_101 ×1
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Control Panel	Accessibility Options	Add/Remove Hardware	Additionerse Programe	Administrative Tools	UNIX/Tave	
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	Power Cittors	Printers	Solution and Contract	Scamers and Commers	Tarka	
	Sounds and Materiada	System:	Liters and Passworth			
23 object(4)				le le	E Hy Compute	× /



Step 4: Click [Add/Remove Hardware] (See figure below)



Step 5: Select "Add/Troublesshoot a device", and click [Next>] (See figure below)

d/Rem	nove Hardware Wizard	
	se a Hardware Task Vhich hardware task do you want to perform?	E ST
Se	elect the hardware task you want to perform, and then click Next.	
(*	Add/Troubleshoot a device Choose this option if you are adding a new device to your computer or are having problems getting a device working.	
¢	Uninstall/Unplug a device Choose this option to uninstall a device or to prepare the computer to unplug a device.	
	< <u>B</u> ack <u>N</u> ext> Co	ancel



Step 6: Go to the top of the lists, Select "Add a new device", and click [Next>] (See figure below)

Which hardware dev	evice ice do you want to trout	leshoot?	2
	e is already installed on rices, select the device,	your computer. If you are and then click Nest.	having problems
If you are attempting device, and then clic		not shown below, select	Add a new
Devices			
Add a new devic			
ACPI Fixed Feat	ure Bulton		
Programmable in	kerrupt controller		
System timer			
Direct memory a	ccess controller		
	02-Key or Microsoft Natu Post ICOM11	ral PS/2 Keyboard	-
I I Communications			
1.V Communications			

Step 7: Select "No, I want to select the hardware from a list", and click [<u>N</u>ext>] (See figure below)

	en Windows detects new hardware, it checks the current settings for the device installs the correct drives.
Do,	you want Windows to search for your new hardware?
(Yes, search for new hardware
(No, I want to peleot the hardware from a list



Step 8: Select "Other devices" from the lists, and click [<u>N</u>ext>] (See figure below)

d/Remove Hardware Wizard Hardware Type What type of hardware do you want to install?	E.
Select the type of hardware you want to install.	
Hardware types:	
90 Multi-port serial adapters	<u> </u>
Network adapters	
P Differ devices	
PCMCIA adapters	
Ports (COM & LPT)	
SCSI and RAID controllets	-
< <u>B</u> ack	Next > Cancel

Step 9: Select "Standard IDE ATA/ATAPI controller" in the Manufacturers column, then select "Standard Dual Channel PCI IDE Controller" in the Models column. And click [<u>H</u>ave Disk...] (See figure below)

dd/Remove Hardware Wizard	
Select a Device Driver Which driver do you want to it	nstall for this device?
	d model of your hardware device and then click Next. If you he driver you want to install, click Have Disk.
Manufacturers:	Models:
(Standard IDE ATA/ATAPI cor Standard Infrared Port) (Standard Infrared Port) (Standard port types) (Standard system devices)	Standard Dual Channel PCI IDE Controller Standard IDE/ESDI Hard Disk Controller
	Have Disk
	<back next=""> Cancel</back>
	. Zan



Step 10: Click [Browse...], find the directory with destination folder that contains unzipped files. Then click [OK] (See figure below)



Step 11: Select "Sonix ICE System" in the Models column, and click [Next>] (See figure below)

Sele	encove Hardware Wizard ect a Device Driver Which driver do you want to install for this d	evice?		Ð
\diamond	Select the manufacturer and model of you have a disk that contains the driver you v			ent. If you
Mogels: Sonix	r. ICE System			
			E	eve Disk
		< <u>B</u> ack	Nest>	Cancel



Step 12: Click [Next>] and the system will begin installation automatically (See figure below)



Step 13: Click [Finish] to complete the installation (See figure below)





Step 14: To check if you've successfully installed the SONiX ICE, go to the System Properties/Device Manager. You should be able to find Sonix ICE among the lists. (See figure below)



Step 15: Before you starting using SONiX Assembler, you may want to create a Shortcut for the SONiX Assembler. To do so, click right button of the mouse over the top of desktop area. And browse to the S8ASMxxx.exe file.



You are now ready to use the SONiX ICE, please go to Chapter 3 for Quick Start.



3 QUICK START

In this Chapter, you will learn how to emulate the program using SONiX ICE. The demo code is also provided in this Chapter.

3.1 SETUP SONIX EMULATOR

Before you begin using the SONiX Assembler, be sure to check the following items:

Item 1: EV board and ICE board are well connected to each other

Item 2: JP2 on ICE board (Bottom board of ICE) is in correct setting which specify the voltage supply

(3.3V, 5V or target power) from EV board (See Appendix A)

Item 3: Select Oscillator type to provide correct setting on EV board (See Appendix A)

Item 4: Adjust DIP switch on EV board to configure the system (See Appendix A)



For items 2, 3 and 4, Please refer to Appendix A.

Item 5: Parellel cable are well connected between PC and SONiX ICE

Item 6: DC power adaptor is connected to the SONiX ICE and both PC and SONiX ICE have been turned ON

Item 7: Check the linkage between the SONiX Assembler and SONiX ICE. TO DO SO, you will need execute "S8ASMxxx.exe" then load the demo code and compile it.

- *Press "F7" to start complie the program code*
- Then press "F5" to start emulation. When emulator software has successfully linked to the SONiX ICE, it will enter ICE mode and begin hardware in circuit emulation. (See Figure 3.1)



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	Deno p					ACC	80000111
						PCHI.	0105
						C DC 2	
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	.Code_Uption	0/5/G	Enable			XYZ	80 80 FZ
	.Code_Eption	High_C1k	28			R BVZ	55 FF
	.Code_Option .Code Option	High_Clk/2 Security	Enable			REARK	11111111
	.Code_Option	LUD	Enable			STRP	8111111
		March Marca	Enable				
	.Code Eption	Match_Dog	LEADER			INTEN	1000000
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//))58		usten_bog	X Y		2 Cyc: 7688 NS:	P8 P1 P2	Part 11111000 11200000 00000000
//))58		unton pog	X V Z	88 F7) Cyc: 7E88 rds: Cyc/Sec: 28829	P8 P1 P2 P3	Part 11111000 11000000 00000000 00000000
//))58		arto_og	X V Z	88 F7) Cyc: 7E88 rds: Cyc/Sec: 28829	P1 P2 P2 P3 P5	Part 11111000 11880000 80000000 80000000
//))58		unton_pog	X V Z	88 F7) Cyc: 7E88 rds: Cyc/Sec: 28829	P1 P2 P2 P3 P5	Part 11111000 11800000 00000000 00000000 00000000

ICE Mode

Remainder



If the connection between your computer and the SONiX ICE is not stable, you may want to set PC BIOS from printer port mode to EPP/ECP mode.



We strongly suggest the users not to connect the SONiX ICE through Key Pro or Print Port Switch. Also, we do advice the users to use LPT1 in order to receive the best available connectivity.

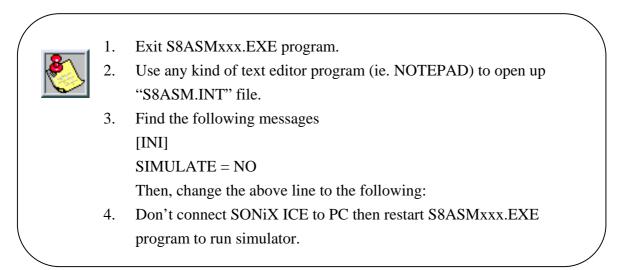


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	Deno p	iragran			ACC	80000111
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Chip	508p1708				HLEN	a 55 M
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Simulate Mode

Remainder

The default setting of software simulator is OFF. If users wish to change, please modify the "S8ASM.INI" file. On the other hand, if the software simulator has already been turned ON, "S8ASM.INI" and Assembler start up file "S8ASMxxx.EXE" are saves in the same directory. If can't find "S8ASM.INI" file, users will need to execute "S8ASMxxx.EXE" again in order for program to generate the "S8ASM.INI" file. To modify "S8ASM.INI" file, please see the details below:





3.2 STARTING A NEW PROJECT

1. The first time to start SONiX Assembler, the window displays as below:

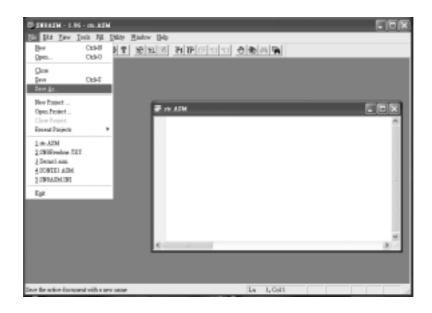


2. To create a new assembler file, click [File] from the menus and select "New".





3. When finished, click [File] again and type in the file name you wish you have.



4. After that, you will need to assign a new project. Click [File] from the menus and select "New Project...".

🗊 SNBASM - 1.96						
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New	Chi+N		西田田田の	3 th (th)		
Open	CFIHO					
New Pubject						
Open Project Close Project						
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1 2008Reading TXT	-	-				
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5. A file-open dialog appears to select an assembler file to be the project main file. The file should also include the chip declaration information.

Look jn: 🖸		 + (2)	₫.	
S8Asm19	5			
rtc.asm				
File <u>n</u> ame:	Itc		<u>Oper</u>	n

6. After assigning the project, the window should display the content information.

						aysicii	Register-
//{{SOM	snSp1708 HX_CODE_OPTION .Code_Option .Code_Option .Code_Option .Code_Option .Code_Option .Code_Option	OSG Righ_Clk High_Clk/2 Security LVD Vatch_Dog	Enable RC Enable Enable Enable Enable Enable		****	ACC PCHL C DC Z H L GHL X Y Z R GYZ RBANK STKP INTEN	
//}}506	IX_CODE_OPTION						Port
(2	P0	0000000
				Cyc: #S: Cyc/Sec: Trace:	8/	P2 P3 P4	0000000



7. Begin writing the program codes, when finishes, click [Tools] and select "Assembly" to start assemble the program.



Always save the file before you compile the program. To save a file, click [File] from the menu aboe then select "Save".

2800 Bit Yev Dissing <u>X</u> 11	Loois F/I Unity Assembly Download	<u>H</u> intov <u>1</u> Fi	•• •••••••••••••••••••••••••••••••••••	5			- 8
********	Beset Rgo	Cut+P5 P5		***************		- System ICC ICHL	Register
; Chip sn® //{{SONEX_C .Co	Single Step Qvec Step Ogt Riss to Quesor	F11 F10 SheftsF11 Chd+F10	Enable		C B	CHIL CDCZ LGHIL CYZ	9000 9 0 0 99 09 09 99 09 09
- 00. - 00. - 00.	PC to Curror Search Loble	F12	- RC Enable Enable		5	BANK	00 00 0000000
.Co .Co //}}SONIX_C	Breakpoint Breakpoints	F9 Alt+F9	Enable Enable		1.15	INTEN	89069068 99069068
	RAM Breek. Datecrupt	Ctab F9	*****	3			Port 00000000
	Animete Single Animete StepOve	¢		Cyc: mS: Cyc/Sec:	Ē	2 2 9	00000000
	_			Trace: 0/		эц 95	00000000
Auto Wetch Me	m Neme Mem W		۲ ۲			TK76	ACK 0000 000

8. In the start of assembly, the Code Option dialog allows you to specify appropriate code option for different chip. When done, click [OK] to begin compiling.



Be sure to read the datasheet for detailed configuration of code options.

SN8P1708	
Watch_Dog Enable •	High_Clk/2 Enable
	High_Clk RC •
LVD Enable	
Security Enable	OSG Enable
Update Co	de Option



9. The program will then start compiling, information such as ROM size, Check Sum will be listed in the output window.

Compile	<u>* EUS DDF</u>	1919 (1 18)			-	System	Register	-
	ROM Check Sum is 6293. Jimum program ROM size : 4 ce: 306 [0x132] size : 3789 for use	1095				ACC PCHL C DC Z H L GHL X Y 2 R GYZ RBANK STKP INTEN		04 94 94 94 94
						V0	Port	
¢				_	2	VO PØ	1000000	04
¢			Cyc: MS: Cyc/Sec: Trace:	8/				84 84 84
<[nS: Cyc/Sec:	8/	•	P0 P1 P2 P3 P4 P5 ST	000000 900000 900000 900000 900000	81 81 81 81

10. To begin using ICE emulation, click [Tools] from the menus and select "RUN".

🖓 Bie Bin Yer			del	-			- 8 X
	Assembly Download	F7 F6	0-0-0-0 <u>-0</u> -00	6	* 4	C	Deviator
*****	Beart Rga Sincle	Cale P5 P5 F11	******		10	ACC PCHL	Register Geneenee Genee
Chip sn8 //{{SDNIX_C .Co .Co	Step Qvec Step Ogt Rven to Qveror	F10 SheftsF11 ChdsF10	Enable RC			CDCZ HLGHL XYZ	6 0 0 69 69 69 69 69 69
- 03. 03. 03.	PC to Curror Search Loble	F12	Enable Enable Enable			R QVZ RBANK	60 60 60060060
.co .co //}}SONIX_C	Breakpoint Breakpoints RAM Break	F9 All+F9	Enable			STKP	easeasea easeasea Port
<	Jaterrupt	Ctd+F9			×	P0 P1	00000000
	Animete Single Animete StepOver	-		Cyc: MS: Cyc/Sec: Trace: Ø/		P2 P3 P4 P5	00000000 00000000 00000000 00000000 0000
Anto Wetch Me	m Name Man W	nd a [p]			•	STK76 STK54	ACK 0000 0000 0000 0000



11. The program halts at the reset vector if it's first time to run. A yellow arrow indicates where the program is.

🗊 SNBASH -	1.96 (Pm)	: Demo1.PRJ} - [De	no1.am)					
D En Bit	Yare Ico	lo Fjil Unity <u>M</u> indo	w Help					_ 8 ×
	古座國	8 8 10 11 18	000000	0 8 H	1			
; A = 0 a6: ; A = 7 a7: d7: test_jn	jnp nov jnp	test_jmp90 a,#0 test_jmp90 a,#1				K ()	ACC PCHL C DC Z H L GHL X Y Z R GYZ RBANK STKP INTEN VC P0	Register 00000111 010 000 000 000 000 00
				X 80	Cyc: 6288	+	P1	11888888
				Y 00	mS: Cyc/Sec: 19838		P2	69069069
			_	2 F7	Trace: 1023/ 1		рэ	00000000
			F	C 0	in all i heady i		P4	69069069
				-			P5	88888881
								TACK
				-			STR76	FFFF FFFF
						-		FFFF FFFF
Auto Web	a Mem I	Iane Man Wind 4 +	. <u>.</u>			×		
Really				Ln	599, Col 1 JCE	St	9	

12. To set a breakpoint, simply move the cursor to the line where you wish the program to be stopped. Then, click [Tools] from the menus and select "Breakpoint".

	20- 10-	-	1	Eirer 15 T	Icol: Fill Unity Assembly Downlost	<u>M</u> intow) F7 P8	-	00	<u> 1</u>	4				- 8
	a0:			jnp	Beset Rgo	Ctd#P5 P5						^	ACC	Register
	; A : a1:		1	jnp	Single Step Qver Step Ogs Ran to Quasor	F11 F10 Shaft=F11 Chd+F10							PCHL CDCZ HLGHL XYZ	010 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
	; A	-	2		PC to Curror Search Loble	F12							R @VZ RBANK	55 FI
	95:			jnp	Breakpoint Breakpointo	F9 Alt+F9						-	STRP	01111111
<	1		3		RAM Breek	Ctab F9	-				3	¥	PØ	Port 1111100
					Animate Single		_	PC	L 01	1	Cyc: 158C4		P1	1188888
					Axinate StepOve	r .			X 00	5	mŠ:		P2	8906906
						-			Y 88	8	Cyc/Sec: 20064		PB	0000000
									Z F7	1	Trace: 1023/ 1		Ph	0000000
						_		F	C 6	8			P5	8888888
År			stch	1 M	m Name Mam W			-					STK76	FFFF FFFF



13. Red dot represents successful breakpoint setting.

		a pi ya ya ya B <u>?</u> We hi	Hanton Hop I III 191 191 191 191 191 191 191 191 19	8 A	1	~	Conten	. Or alatas
; A - 1 ; A - 1 ; a1:	jnp jnp	test_jmp90 test_jmp90					ACC PCHL C DC Z H L GHL X Y Z R QYZ	Register 0000010 00 00 00 00 00 00 00 00 00 00 0
a2:	jnp	test_jmp90	1			0	RBANK STKP INTEN	1111111 0111111 1000000 Port
a2:		test_jmp9	1			[K] []	STKP INTEN	0111111
a2:		test_jmp91		91	3 Cuc: 158C		STKP INTEN	0111111 1000000 Port
a2:		test_jmp94	PCL X	01 00	3 Cyc: 158C nS:		STKP INTEN VC PØ	9111111 1009000 Port 1111100
a2:		test_jmp94	PCL		Cyc: 158C mS: Cyc/Sec: 2006	4 = 4	STKP INTEN VO PØ P1	0111111 1000000 Port 1111100 1100000
a2:		test_jmp9/	PCL X V Z	00	Cyc: 158C nS:	4 = 4	STKP INTEN VC PØ P1 P2	0111111 1000000 Port 1111100 0000000 0000000
a2:		test_jnp9/	PCL X V	60 68	Cyc: 158C mS: Cyc/Sec: 2006	4 = 4	STKP INTEN PØ P1 P2 P3 P4	0111111 1000000 11111100 1100000 0000000
a2:		test_jmp9	PCL X V Z	00 80 F7	Cyc: 158C mS: Cyc/Sec: 2006	4 = 4	STKP INTEN 90 P1 P2 P3 P4 P5	0111111 1000000 Port 1111100 1100000 0000000 0000000 0000000
a2:		test_jnp91	PCL X V Z	00 80 F7	Cyc: 158C mS: Cyc/Sec: 2006	4 = 4	STKP INTEN PØ P1 P2 P3 P4 P5 S1	0111111 1000000 11111100 1100000 0000000

14. To continue running the program, just repeat item number 9. The yellow arrow will stop at the breakpoint where you've set it initially.

節 SNSASM - 1.96 (Proj : Demol.PRJ) - (Demol.som) 第 Die Edit Yorw Jook Fil Lühty Muslow Help					- 8 1
□ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □	急 共	1	~	System ACC PCHL C DC Z H L GHL X Y Z R QYZ RBANK STKP	Register 00000010 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 7 55 FF 1111110 0111111
<pre>O jnp test_jnp90 ; n = 3 ;</pre>		2	*	INTEN VC PØ	10000000 Port 11111000
X	80	Cyc: 158C4	-	P1	11888888
Y	00	mS:		P2	89898989
2	F7	Cyc/Sec:		P3	asassas
FC	0	Trace: 1023/ 1		Ph	00000000
				P5	88888811
				S	TACK
Auto Wotch Menn Menne Menn Wind • [>] • [11	STK76 STK54	FFFF FFFF FFFF FFFF
Ready	Ln	575, Col 1 JCE	St		



15. Any time the program stops, "Watch" function could be set to monitor the variable. Click [Watch] button located at lower left hand corner of the program window. Then, select one of the empty edit box right above [Watch] button, a Search Symbol dialog box will automatically pop up. Check "EQU access" and pick one of the variable to monitor. (ie. PCL) NOTE!!!

	nj Drmolann) Drm Fil Dilly Mindow Fil (5) 7 (10) 101				
<pre>Browlarm a1: jmp : A = 2 ; a2: jmp ; A = 3 ; a3: jmp ; A = 4 a4:</pre>	test_jnp90 rnuck Symbol @HL @HL @YHL @YZ ADB ADM ADR DAM DAM DPDX DP1X H INTEN	OK Cancel F EQU access BIT access	228/	ACC PCHL C DC Z H L GHL X Y Z R GYZ RBANK STKP INTEN	Register 0 0000000 0 0 0 0 0 0 0 0 0 0 0
Auto Watch Men	a Nome Nem Wad 4 >		• • 1 JCE 280	STK76 STK54	00000000 ACK FFFF FFFF FFFF FFFF



To **REMOVE** the Watch variable, select the edit box again (ie. PCL). When the Search Symbol dialog box pop up, then remove all the contents from the top column.

16. "PCL" is selected and it will also appear in the edit box.

🕮 SNBASM - 1.96 (Proj : Demo			
Fir fift Yew Looks Fill (14)	y Window Heb T WM M POPPON		
: n = 2 ; a2: 0 jmp tes ; n = 3 ; a3:	t_jnp90 t_jnp90 t_jnp90		System Register ACC 04004010 PCHL 010C C DC Z 0 0 H L GHL AA 55 X Y Z 00 00 F7 R GYZ 55 FF RBAHK 1111111 STKP 01111111 14000000 GYD VD Port Port F0 11111000
Auto Watch Meen Name)	00 00 00 00 00 00 00 00 00 00 00 00 00	Cyc: n5: Cyc/Sec: Trace: 228/	P1 11000000 P2 00000000 P3 00000000 P4 1111111 P5 00000000 STACK STK76 FFFF FFFF STK54 FFFF FFFF FFFF
Realy		Ln 574, Coll JCE St	9



17. Click [Tools] from the menus and select "Step Over", you could trace Macro or Subroutine of the program in one step.

翻	SNBASM - 1.5	16 (Proj : Demo1.1	ams} - Den	nol.nom						
80e	Eda Yev B	Icols Fill Utility Assembly Download	<u>W</u> indow F7 F8		(F 1) 1)	<u>+</u>	M PA			
8	Demol.ssm a1:	Eeset Ryn Single	CadeF5 F5	-					ACC PCHL	Register Researce Researce Researce Researce Register
0	: A = 2 ; a2:	Step Qver Step Ogs Ren to <u>C</u> arsor	P10 Shafe+F11 Chd+F10	1p98 ->	000113				C DC Z H L GHL X Y Z	0 0 0 0 AA 55 FF
0	; A = 3 ; a3:	PC to Curror Search Loble Breakpoint Breakpoint	F12 F9 Alt+F9						R QYZ RBANK STKP INTEN	55 FF 11111118 01111111 10000000
	; A - A a4:	RAM Basek	Cule P9	_					P0 P1	Port 11111000 11000000
		Animote Single Animote StepOver					Cyc: mS: Cyc/Sec: Trace: 228/		P2 P3 P4 P5	00000000 11111111 00000000
Aut	b Waich	Mem Name Man	. Wnd 4 +	1	<u>.</u>	Ln	574, Col.1 JCE	• • 51	STK76 STK54	TACK FFFF FFFF FFFF FFFF

18. When finished "Step Over" function, the yellow arrow will move to the next line and stops. One of the macro PCL has been selected to be monitor in the above step, thus, you will see the content changes in the edit box. From "0C" to "13", and it is because of the macro.

	<u>b</u> 6	8 10	10000	10 0 0	A A	_	Cartan	Desister
; A - 7 a7: j test_jmp9	ova, mpte	st_jmp91 #0 st_jmp91 #1					ACC PCHL C DC Z H L GHL X Y Z R GYZ RBANK STKP INTEN	Register aanaaan 0111 0 0 AA 55 F1 aa aa F3 55 F1 1111111 0111111 1010000 Port
	no te	st inpl					PØ	1111188
	PCL	13	-		Cyc: mS: Cyc/Sec: Trace: 229/	•	P1 P2 P3 P4 P5	1100000 0000000 0000000 1111111 0000000
Auto Watch	Mem Name	Man Mod	cel T				STK76	ACK FFFF FFF FFFF FFF

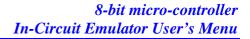


19. Click [Tools] from the menu and select "RUN" or press "F5" to continue program execution. The RUN dialogue will indicate the program status.

🐨 SNBASM - 1.96 (Proj : Demol.ann) - Demol.ann		
Ele Edit Yiew Iools Fill Unity Mindow Help		
DER 706 91 BER 9000 3	8 M 9	
jnp ah jnp a5 jnp a6 jnp a7 :	20 100 100 100 100 100 100 100 100 100 1	System Register ACC Q0000101 PCHL Q0000 Q0000 Q0000 H CHL Q0000 H CHL AA 55 FF X Y Q00 Q00 F7 R GYZ 55 FF RBAHK 11111110 STKP Q1111111 Tengengee Q1111111
; A - 1 ; a1: imp test PCL Stop Run	Cyc: 138 ▲ nS: Cyc/Sec: Trace: 1023/ 1	VO Port P0 11111000 P1 11000000 P2 00000000 P3 00000000 P4 11111111 P5 00000000
Auto Waith Mem Name Mem Wind 4 p 4		STACK STN76 FFFF FFFF STN54 FFFF FFFF

20. Click "Stop Run" or Press "F5" to terminate the program execution.

🗊 SNBASM - 1.96 (Proj : Demo	1.nm} - De	mol.sun				
Ele Edit Yew Icols Fill Util	ity <u>M</u> indow	Help				
	8 10 10	1 8 8 8 8 9 8 9	6 8 A 9			
P Demol.um					System	Register
	nain	; 0		_	ACC	00000111
	=				PCHL	000
;*************	*******	**************	******************	*****	C DC Z	0 0
org 18h					H L GHL	AA 55 F
					XYZ	88 88 F
int_main:					R BYZ	55 FI
main_test:					RBANK	1111111
					STRP	0111111
Sonix Instr	uction Ha	anual			INTEN	1000000
***********	*******	**************	*****************		ψo	Port
:					PØ	1111180
PCL	88		Cyc: 52	6C -	P1	1108808
			nS:		P2	8906906
			Cyc/Sec: 39 Trace: 1023/		PB	0000000
			Tracer race,	1	P4	1111111
					P5	8999998
						eeeeee ACK
					STK76	ACK
Auto Waich Mem Name J	fen Wind a Lu	N T			STK76	0000000 ACK FFFF FFF FFFF FFF



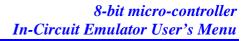


21. Click [Tools] from the menu and select "Reset" or press "Ctrl+F5" to reset the program. Then, you may emulate again starting from the program reset vector.

D SNBASH - 1.9						
	<u>tools</u> Fill Utility <u>A</u> recality Download	Mandow 1 F7 F8	00000			0.1.
🐺 DemoLaam	Reset	Catle P5				Register
Φ	Run	P5	; 0		ACC	8888811
;******	Single Step Qver Step Ogt Run to Qursor	F11 F10 ShaftsF11 Chi+F10			0000 0 0 0 AA 55 FF 80 80 F7	
int_main- main_tes	PC to Curror Search Lable	F12			R @VZ RBANK STKP	55 F
	Breakpoint Breakpoint RAM Break	F9 All+F9	,			9111111 1008008 Port
	KADI DUPEK		-	*******************	PØ	1111180
:	Duternipt	Cuis F9			P1	11008888
	Animate Single			Cyc: 5260 +	100	
	Animate StepOver	ť		MS: Cuc/Sec: 3932	P2 P3	8908906
		-		Trace: 1823/ 1	PA	000000
					1.0	1111111
					P5	8888888
						TACK
				-		FFFF FFF
Auto Watch	Mem Name Max	Wind wi wi			STK54	FFFF FFF
estarts the program.		111		Ln 46, Col 1 JCE St	00	



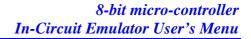
All the menu item function could work by using the hot keys, if there is a hot key description at the end of the select item.





4 Trouble shooting

- **Q** The ICE is reset spontaneously sometimes in ICE mode.
 - A It occurs when the user maps his network printer to the LPT1 that is connected to the ICE system. To solve it, just map the network printer to LPT2.
- **Q** ICE can't work under Windows 2000.
 - A When ICE works under Windows 2000/ Windows XP, ICE device driver needs to be installed. The document of ICE device driver describes the details of how to install the ICE under Windows 2000/Windows XP.
- **Q** Could ICE work emulate the 3.3 voltage supply?
 - A Yes. Just short the JP2 of the ICE board to the 3.3 voltage option.
- **Q** LCD can't work normally!
 - A Check the LCD connected port first. I/O port for LCD function is JP13 on the ICE board. If the connection is correct, then check the duty switch (c0, c1) at the SW1. Select the right duty mode that the LCD is.





5 Appendix A

5.1 EV BOARD

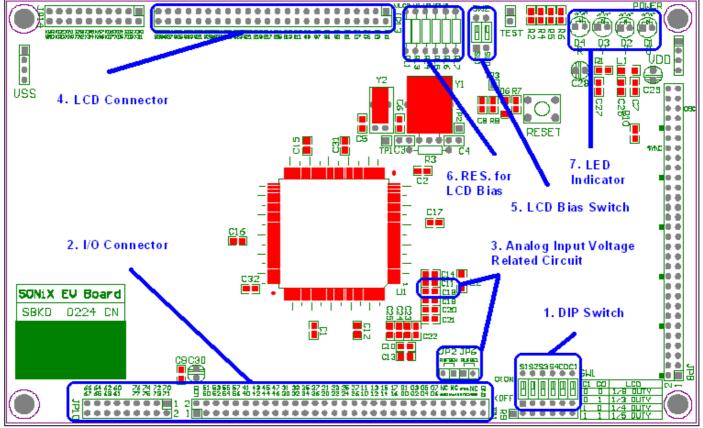


Fig. A-1



1. DIP Switch

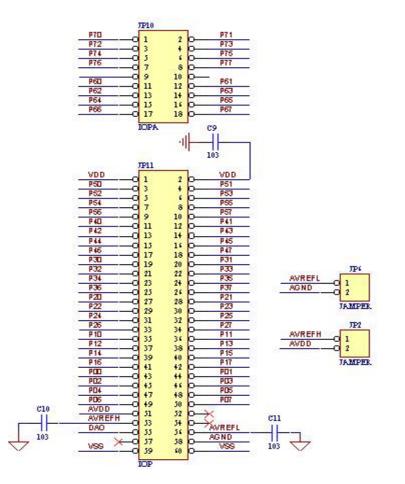
OPTION	S4	S 3	S2	S1	C1	C0
RC Mode	-	ON	ON	-	-	-
X'TAL 32K	-	ON	OFF	-	-	-
X'TAL 12M	-	OFF	ON	-	-	-
X'TAL 4M	-	OFF	OFF	-	-	-
X'TAL/2	-	-	-	ON	-	-
X'TAL	-	-	-	OFF	-	-
OSG Enabled	ON	-	-	-	-	-
OSG Disabled	OFF	-	-	-	-	-
LCD 1/8 DUTY	-	-	-	-	ON	ON
LCD 1/3 DUTY	-	-	-	-	ON	OFF
LCD 1/4 DUTY	-	-	-	-	OFF	ON
LCD 1/5 DUTY	-	-	-	-	OFF	OFF

- Press Reset button will reset the EV chip. The program will then be restarted from address 0.
- If system clock is lower than 1Mhz. "OSG enabled option is recommended no matter if the system is in RC or Crystal oscillator mode.
- When ICE works at RC mode, please refer to the table below to set your DIP switch for both "RC Mode" and "X'TAL/2". Do not place any components at C4 and Y1. Leave them open and then adjust appropriate R3 and C3 value to get proper RC oscillator clock frequency you wish you have. Following table provides a reference table of R3 and C3 VS. frequency when ICE works at 5V.

R3 (KOhm)	C3 (pF)	Frequency (KHz)
0.1	30	3380
1	30	1315
3	30	595
0.1	58	2660
1	58	785
3	58	320



- 2. I/O Connector (See below)
- 3. Analog Input Voltage Related Circuit



- JP10 and JP11 socket provide the connection interface between kernel chip and target board as well as all the I/O ports. But except LCD interface. It is very convinence for users to verify the actual circuit quickly and efficiently. Please see the above diagram for detailed description.
- JP2 and JP6 jumpers provide on-board power supply for the ADC reference voltage input. Short JP2 will connect AVREFH pin (ADC high reference voltage input) with AVDD (analog power supply) pin. Short JP6 will connect AVREFL pin (ADC low reference voltage input) with AGND (analog ground) pin. If JP2 and JP6 are leaved open, user's target board must provide appropriate reference voltage for AVREFH and AVREFL pin.

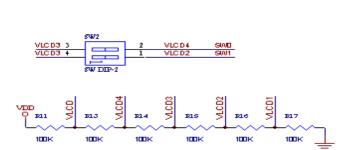


Be aware that the value of AVREFH minus AVREFL (AVREFH – AVREFL) must be greater than 1.2V.



- The bypass capacitor C10 and C11 is important for suppling a stable and clean power source for ADC reference voltage. Users can replace default value (0.1 uF) of C10 and C11 with larger capacitor to improve the performance of reference voltage.
- 4. LCD Connector (See below)
- 5. LCD Bias Switch (See below)
- 6. RES. for LCD Bias

JP13						
COMD	1	2	6	COMI		
CO III 2	3	4	6	COM3		
COM4	5	- 2	<u> </u>	COMS		
COME	7	8	<u> </u>	COM7		
SEGD	ý.	10		SEG1		
SBG2	, 11	12	6	SEG3		
SBG4	13	14	6	SEGS		
SBG6	15	16	6	SBG7		
SEG8	17	18	6	SEG9		
SEG 10	19	20	<u>с —</u>	SEG 11		
SBG12	21	20	<u>с —</u>	SEG 13		
SEG14	23	24	<u>р</u> —-	SEG 15		
SBG16	25	26	<u> </u>	SEG 17		
CEC 18 T			ц <u>—</u> .	SEG 19		
	27	28	ц <u>—</u> .	SEG21		
O	29	30	<u>с — </u>	SEG23		
O		32	<u>с</u> —.	SBG25		
SBG26	33	34	<u>с — </u>	SEG27		
SBG28	35	36	<u>с — </u>	SEG29		
SEG30	37	38	<u>с — </u>	SEG31		
O		40	<u>с — </u>	SEG33		
SBG34	41	42	о <u>—</u> .	SBG35		
SBG36	43	++	<u>с</u> —.	SEG37		
SBG38	45	46	<u>с</u> —.	SEG39		
0	+7	48	р <u>—</u> .			
HEADER 24 32						



LCD Connector

LCD Bias Voltage Network

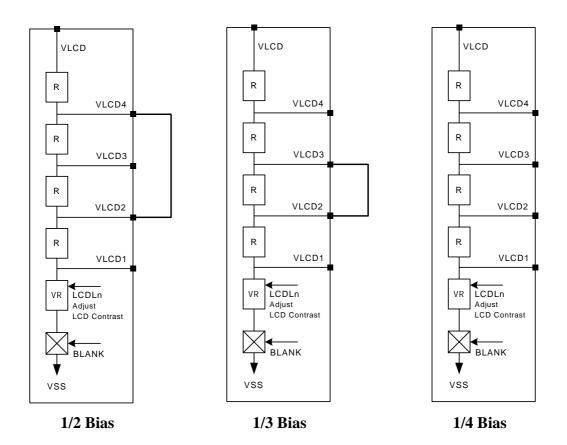
LCD BIAS	SW1	SW0
1/2 BIAS	ON	ON
1/3 BIAS	ON	OFF
1/4 BIAS	OFF	OFF

Bias Selection Table

- The pin assignment for LCD Connector and LCD Bias Voltage Network are descriped in the above diagram.
- To display data on the LCD, users will have to connect the desired pins to the LCD module.



Users may select three different types of LCD Bias simply by setting SW0 and SW1 of DIP SW2.
 When each combination of SW2 is selected, the bias voltage of the network output is listed in the above bias selection.





The internal LCD Bias circuit connection of the 8-bit MCU kernal chip on EV board is shown in the above diagram.



7. LED Indicator

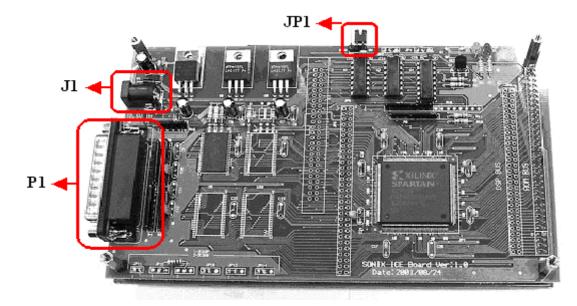
Status	D4	D3	D2	D1
Power Supply	-	-	-	ON
Green Mode	-	-	ON	-
High Clock Stop	-	ON	-	-
Stack Overflow /Underflow	ON	-	-	-



The four LED display indicates different status of the ICE operation mode. Users are able to monitor the program simply by looking at the LED.



5.1 ICE BOARD





Description:

- i. J1: 7.5V DC power supply input.
- ii. P1: Printer port socket. Connect to PC.
- iii. JP2: EV board's power source selection jumper. ICE board provide on board 3.3V and 5V power supply for EV board. If EV board's power is from external power supply, please release JP2.
- iv. D2: Power indicator.
- v. D3: ICE board initial indicator. ON = ICE initialize successfully. Off=ICE without initial.



5.3 WORKING UNDER DOS MODE:

Command: path\S8ASMxxx path2\xxx.asm [-A]

The path is the path of S8ASMxxx.EXE. The path2 is the path of file (.ASM). The "xxx.asm" is the source file name.

Description:

Compiler without [-A] parameter > If the compiler program compiles a file successfully, system will export a .SN8 & .HEX file and exits automatically. If compiling fail, system won't exit. The user can debug in the program and finish compiler.

Compiler with [-A] parameter >The [-A] parameter is to control the code option window and output some files. Including [-A], system will omit code option windows. System compiles a file successfully, system will export ".SN8", ".HEX", ".LST" and ".ERR" files, and then exits automatically. If compiling fail, system will only export ".ERR" file and exits automatically. The ".ERR" file is the debug file for some editors as "Code Wright".



*.SN8 for SONiX Writer. (works for both Mask and OTP devices) *.HEX for 3rd party writer. (eg. Hi-Lo)

Example:

C:>\TOOLS\SN8ASM DEMO\MOVE1.ASM -A



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