

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		



SONiX 8-Bit MCU ICE User Menu

USER MANUAL REVISION HISTORY	2
HARDWARE REVISION HISTORY	2

1		
L	INTRODUCTION	4

L	Sonix in-circuit emulator	5

2.1 CONNECTING SONIX ICE	5
2.2 INSTALLING SONIX ICE	6

3

3.1 SETUP SONIX EMULATOR	. 14
3.2 STARTING A NEW PROJECT	. 17

4 5

T
ROUBLE SHOOTING 28

5.1 EV BOARD	
5.1 ICE BOARD	35
5.3 WORKING UNDER DOS MODE:	



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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+ tot, - + - C Offerst	Poiders	Gtistary 2	≌ °S X ⊨	n 🖆 -		
Address Gill Control Parwl						· 2%
Control Panel	Accessibility Options	Add/Remove Hardware	Additioner	Administrative Tools	UNIX/Tave	
Use the settings in Control Panel to perionalize your computer. Select an item to view its	Deska	Faider Options	A4	Gane Controlers	Diternet Options	
decoption. Mindanis Landete Mindanis 2000 Support	England	2	5 Neuer	Network and Dial-up Co	Dere al	
	Power Cittors	Printers	Solution and Contract	Scamers and Compres	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	ove Hardware Wizard	
Choos W	e a Hardware Task hich hardware task do you want to	perform?
Se	lect the hardware task you want to	perform, and then click Next.
(*	Add/Troubleshoot a device Dhoose this option if you are add problems getting a device working	ng a new device to your computer or are having 9.
C	Uninstall/Unplug a device Choose this option to uninstall a c device.	levice or to prepare the computer to unplug a
		<back next=""> Cancel</back>



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

Which hardware dev	ice do you want to troubles	hool?	2
The following hardwa with one of these dev	re is already installed on yo rices, select the device, an	ur computer. If you are d then click. Next.	having problems
If you are attempting device, and then clic	to add a device and it is no k.Next.	t shown below, select i	4dd a new
Devices			
Add a new devic		******	
ACPI Fixed Feat	ure Button		100
Programmable in	Aerrupt controller		
🖳 System timer			
E Direct memory a	ccess controller		
Standard 101/10	32-Key or Microsoft Natural Post ICOM11	PS/2 Keyboard	-

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

and instal	s the correct driv	er, en an ovvalete, it to er,	necks the currer	a seargs for th	e device
Do you w	ant Windows to s	earch for your ne	w hardware?		
C Ye	, search for new	hardware			
(* No	I want to select	the hardware hor	0.4.85		



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

Handware Type What type of hardware do you want to install?	E.
Select the type of hardware you want to install.	
Hardware types:	
30 Multi-port serial adapters	<u> </u>
IN Network adapters	
P Differ devices	
PCMCIA adapters	
(IP Ports (COM & LPT)	
SCSI and RAID controllets	-
< <u>H</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?
Select the manufacturer an have a disk that contains the	d model of your hardware device and then click Next. If you he driver you want to install, click Have Disk.
Manufacturers:	Mogels:
Standard IDE ATA/ATAPI cor Standard Infrared Port) (Standard Modern Types) (Standard port types) (Standard system devices)	Standard Dual Channel PCI IDE Controller Standard IDE/ESDI Hard Disk Controller
	Have Disk



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)

Add/Ren	move 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	ur hardware dervic want to install, clict	e and then click. N k Have Disk.	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)



3 FA DA	- 1.96 (Froj : Demol JV : Yaw Jook Fill (Mil	[1] [Drein].com] by Window Ida				_		5.7
	1000 9 8	19 19 19 19 19	91010	*	1			
Chip //((SB	Deno pr semp1708 HEI_CODE_OPTION .Code_Option .Code_Option .Code_Option	035 High_CLX High_CLX High_CLX/2 Security	Esable RC Esable Enable			PCHL C DC H L X V R BA	vstem Regist ecces c z p mm. na 55 z 60 m vz 55 m 11111	ler 1111 1109 0 0 FF FF FF
	.Code_Option	Match_Dog	Enable			510	P 01111	1111
//))58	.Code_Option .Code_Option HI3_CODE_OPTION	Match_Dag	Enable			STR	P 81111 DH 18686	1111
//))58	.Code_Option .Code_Option HIX_CODE_OPTION	LV0 Watch_Dog	Enable		2	STRA INTE	P 01111 DH 10000 NO Part 11111	000
//))58 [*****	.Code_Option .Code_Option HEI2_CODE_OPTION	LVO Watch_Dog	Enable	88	3 Cyc: 7084	Pil Pil	P 01111 CM 10000 VO Post 11111 11000	1111
	.Code_Option .Code_Option HIX_CODE_OPTION	Luo Match_Dog	Enable Enable X	02 02	a Cyc: 7EB4 RS:	5110 1HTT PI PI P2	P 01111 CH 10000 VO Part 111111 11000 00000	1111
//))58 [.Code_tption .Code_Eption HII2_COBE_OPTION	Luo Match_Dog	Enable Enable X V Z	82 82 F7	2 Cyc: 7034 n3: Cyc/Sec: 20021 Trace: 1023/1	5110 1HTT 91 92 92 93	P 01111 CM 10000 VO Post 11111 11000 00000 00000	1000
(//))58	.Code_Dption .Code_Dption HIII_COBE_OFTION	Luo Match_Dog	Enable Enable V V FC	82 82 F7 2) Cpc: 7034 n3: Cpc/Jac: 20027 Trace: 1023/ 1	5110 1HTT 91 92 93 94 94	P 01111 LM 10000 VO Port 111111 11000 R00000 R00000 R00000	
	,Code_Uplion Code Dytion HIII_CODE_OPTION	Luo Match_Dog	X Y Z FC	82 82 F7 2	3 Cpc: 7034 R5: Cpc/Sec: 20021 Trace: 1023/ 1	5110 1HTT P1 P2 P3 P3 P5	P 01111 CM 10000 VO Puit 11111 11000 00000 00000 00000 00000 00000	1000 1000 1000 1000
//))58 [.Code_Uplion Code Dytion HIS_CODE_OPTION	Luo Match_Dog	Esable Esable V Z FC	82 82 F7 2	2 Cyc: 7034 #6: Cyc/Jec: 24821 Trace: 1823/ 1	5110 1HTT 91 P1 P2 P3 P3 P5	P 01111 CH 10000 10 Puit 11111 11000 00000 00000 00000 00000 00000 00000 0000	1000
	.Code_Uplion .Code Dytion HIS_CODE_OPTION	Luo Match_Dog	Esable Esable X Y FG	82 83 F7 2	2 Cyc: 7034 #6: Cyc/Jac: 20021 Trace: 1023/ 1	5110 1HTT P1 P2 P3 P3 P3 P3 P3 P3 P3 P3 P3 P3 P3 P3 P3	P 01111 CH 10000 10 Punt 11111 11000 000000	1000 1000 1000 1000 1000

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.



Carl 1 and 2	0 10 10 8 8 M %		- # 1
Chip unkp1700 Chip unkp1700 //((SUNIX_CODE_OPTION 	Enable 80 Enable Enable Enable Enable Enable	System ACC PCHL C DG Z H L GHL X Y Z R GYZ R GY	Register 00000111 00000 0
Anto Weth Men Pane Men Wal + +	Epe: mi: Epe:Sec: Trace: N/	P8 P1 P2 P3 P3 P4 P5 S1K76 S1K76	11111880 11200200 80200200 80200200 80200200 80200200 80200200 80200200 80200200 80200200 80200200 80200000 802000000

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		_				
Els Yiew Help						
New	Cui+N	 1 contract over 	886900	8 8 M		
Qpen	CFHO					
New Project						
Open Project						
Close Project						
Recent Projecto						
1 SNSReadous TXT						
Egit						
				Ln	1, Col 1	



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.

IceDriver	3.000	 + (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.

🐨 SNBASM - 1.96 (Proj : Demo1.P	RJ} - (Denot.sm)					.ox
DEFEN Yew Josh Fil Lai	ty <u>Mindow H</u> elp () 111 (115) (?) (?)	FIDIO 00	25			- 8 ×
Chip sn8p1708 //{{SONIX_CODE_OPTION .Code_Option .Code .Cod	OSG High_Clk High_Clk/2 Security LUD Watch_Dog	Enable RC Enable Enable Enable Enable Enable	****		System ACC PCHL C DC Z H L GHL X Y Z R GYZ RBANK STKP INTEN	Register 00000 0000 0000 0000 000000 000000
		******			V0 P0	Port 00000000
			Cyc: MS: Cyc/Sec: Trace: Ø/		P1 P2 P3 P4 P5	
Auto Wetch Merco Name Merco	Mnd a (»	<u>.</u>	La L-Call	•	STK76 STK54	ACK 0000 0000 0000 0000



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".

D Bie Blit Yirv 1	toolo Fill Unity	Mintow 1	elp.				_ 8 :
	Assembly Described	F7 FR	P (7 10 10 10 10 10 10 10 10 10 10 10 10 10	4			
*********	Beset Rgo	Cut+P5 P5		**************	**	System ACC	a Register
; Chip sn® //{{SONIX_C .Co	Single Step Qvec Step Ogt Rate to Qarsor	F11 F10 Shaft=F11 Cbd+F10	Enable			PCHL CDCZ HLGHL XYZ	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
. Co . Co	PC to Curror Search Loble	F12	- RC Enable Enable			R QVZ RBANK	00 00 0000000
.co .co //}}SONIX_C	Breskpoint Breskpointe	F9 Alt+F9	Enable			STRP	89099099
	RAM Break. Datecrupt	Cule P9	************	*******	2	PØ	0000000
	Animete Single Animete StepOve	4		Cyc: #S: Cyc/Sec: Trace: @/		P1 P2 P3 P4	00000000
						P5	eeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeee
					Ē	STK76 STK54	0000 0000

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
C	ж



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

mpile de Option is 02FF, EPROM Check Sum is 6293. ip SN0P1708 has maximum program ROM size : 4095 e program has used size : 306 [0x132] e program remain free size : 3789 for use			System ACC PCHL	Register
			C DC 2 H L GHL X Y 2 R GYZ RBANK STKP INTEN	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
		1	PØ	69869869
Cy rs Cy Tr	yc: S: yc/Sec: race:	e/	P1 P2 P3 P4 P5 STK76 STK76	00000000 00000000 00000000 00000000 0000
ta Wetch Mem Name Man Wind 4 > 4			51854	0000 0000

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

🗇 Bie Bit Yow	Ioola Fill Unity	Mintov 1	delp				- 8 >
	Assembly Download	F7 F6	0-0-0-0 <u>-0</u> -00	5			
*****	Beat Rya	Ctab PS PS	******	********	- 8	ACC PCHL	Register Rensense Rensense
Chip sn8 //{{SONIX_C .Co	gauge Step Qvec Step Ogt Rven to Quesor	F10 SheftsF11 Chd+F10	Enable			CDCZ HLGHL XYZ	6 0 0 69 69 69 69 69 69
.Co .Co	PC to Curnte Search Loble	F12	Enable Enable			R QYZ RBANK	60 60 60060060
.Co .Co ///}}SONIX_C	Breakpoint Breakpoints	F9 Alt+F9	Enable			STKP INTEN	00000000 00000000
¢	jaterrupt	Ctd+F9		1	×	PØ	00000000
	Animete Single Animete StepOver	1		Cyc: MS: Cyc/Sec: Trace: Ø/		P1 P2 P3 P4 P5	00000000 00000000 00000000 00000000 0000
Auto Wetch Me	m Name Man W	nd a [s]	4		•	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 (Proj	: Demo1.PRJ} - (D	enoi.am)					. DX
D En Bit	Yire Ico	lo Fill Unity Moo	tow Help					_ 8 ×
	8 m C	8 8 96 94 9	000000	0 8 H	1			
: A = 6 	jnp nov jnp p98: add	test_jmp90 a,#0 test_jmp90 a,#1				[K [].	System ACC PCHL C DC Z H L GHL X Y Z R GYZ RBANK STKP INTEN VC P0	A Register 00000111 0111 0 8 8 AA 55 FF 00 00 F7 55 FF 1111110 0111111 10000000 0 Port 1111000
		1		X 80	Cyc: 6288	+	P1	11088088
				Y 08	MS: Cuc/Sec: 10999		P2	69069069
				Z F7	Trace: 1023/ 1		P3	00000000
			ŀ	u 0			Ph	00000000
				_			P5	88888881
				-			S	TACK
						_	STR76	FFFF FFFF
Mark Mark						-	STR54	FFFF FFFF
Ready Web	A Mem H	NER MIN 4		Ln	599, Col 1 JCE	Sto	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".

	30- 10-	840 20		Birw K 1	Ioolo Fill Unity Amenalty Download	<u>M</u> intow) F7 F8	0+10 €+0	P[10]10	-0 4	6 M				- 8
	a0:		ľ,	jnp	Beset Rgo	Cute P5 P5						-	ACC	Register
	; A ; a1;	-	1	jnp	Single Step Qver Step Ogs Ran to Qansor	F11 F10 ShansF11 ChdsF10							C DC Z H L GHL X Y Z	0 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 QYZ RBANK	55 FF
	az:			jnp	Breakpoint Breakpointe	F0 Alt+F9						-	STRP	01111111
<	1		3		RAN Breek	Ctab P9	-				3	*	PØ	11111804
				-	Animate Single			P	CI.	81	Cyc: 158C4	-	P1	11000000
					Axinste StepOve				x	60	mS:		P2	89099099
				_			_		۷	66	Cyc/Sec: 20064		P3	00000000
									Z	F7	Trace: 1023/ 1		PA	0000000
			_			_			FC	8			P5	88888881
							_		+	-			STR76	ACK



13. Red dot represents successful breakpoint setting.

🐺 SNBASH - 1 96 (Pmj : Demo1.	PRJ} - (Demoi.azm)				
💬 Ein Stit Yew Ioolo Fill D	ility <u>M</u> infow Help				_ 8 X
	6 (CO CO C	0 4			
<pre>i A = 0 a0: jnp test_ i A = 1 i</pre>	jmp90			System ACC PCHL C DC Z H L GHL X Y Z R GYZ RBANK STKP INTEN	n Register 00000100 0101 0 8 8 AA 55 FF 00 00 F7 55 FF 11111110 01111111 10000000 D Port
¢			2	10	11111000
	PCL	91	Cyc: 158C4	. 11	11088088
	X	69	nS:	P2	69069069
	۷	66	CUC/Sec: 20064	P3	00000000
	Z	F7	11 ace. 1023/ 1	P4	00000000
	FC	8		P5	88888881
				S	TACK
		-		STW74	FFFF FFFF
	L				FITT FITT
Auto Wetch Mem Name Mar	a. Wind. a [a]			\$1854	FFFF FFFF
Really		Ln	575, Col 1 JCE 3	100	

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.

郡 SNBASM - 1.96 (Proj : Demod.PRJ) - (Demod.ann) 第 File Edit Yiew Jooks Fill Yulity Hindow Help					- = ×
□ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □	*		~	System ACC PCHL C DC Z H L GHL X Y Z R GYZ RBANK	Register 00000010 0 0 0 0 0 0 0 0 7 0 0 0 55 FF 1111110
O jnp test_jnp90 ;A = 3		,	×		Port 111111008
X V Z FC	80 00 F7 0	Cyc: 158C4 mS: Cyc/Sec: Trace: 1023/ 1		P1 P2 P3 P4	11088088 88088088 88088088 88088088 880880
Anin Weich, Menn Nume Menn, Weid e > •				P5 STK76 STK54	00000011 FACK FFFF FFFF FFFF FFFF



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!!!

B SNBASM - 1.96 (P. File Bit Yew Icols Disc I (S. 1996)	roj : Drmol ann) - Drr Fil Dilly Window	nalena Bol III 70 70 70 70 70 70 70 70 70 70		-	
<pre>BF Denol.am a1: jmp : A = 2 ; a2: jmp : A = 3 ; a3: jmp ; A = 4 a4:</pre>	test_jnp90 rnuck Symbol @HL @YZ ADB ADM ADR DAM DAM DP0X DP1X H INTEN	OK Cancel F EQU access BIT access	228/	System ACC PCHL C DC 2 H L BHL X Y 2 R BYZ RBANK STKP INTEN VO P0 P1 P2 P3 P4	Register 0 0000010 0 100 0 100 0
Auto Watch Mer	n Nome Mens Wad 4 >		• • 1 ICE 30	STK76 STK54	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	rl.asm} - Demol.asm		
Pie Bet Yew Iools Fil Dal	8 10 10 15 70 70 70 10		
<pre> # Demol.ssm a1: jnp tes i</pre>	t_jnp90 t_jnp90 t_jnp90		System Register ACC 00000010 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 1000000 VD Port VD Port P0 11111000 VD
Auto	20 20 20 20 20 20 20 20 20 20 20 20 20 2	Eyc: MS: Eyc/Sec: Trace: 228/	P1 11000000 P2 00000000 P3 00000000 P4 1111111 P5 00000000 STACK STK76 FFFF FFFF STK54 FFFF FFFF FFFF
Realy		Ln 574, Col 1 ICE St	09



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 : Demot.	ama) - Den	nol.nem						
30x	Bat Yev Ball	Tools Fill Unity Assembly Download	<u>W</u> indow F7 F8	14-10 1-10 1-10 1-10	600	<u>+</u>	M SA			
8	Demol.um a1:	Reset Ryn Single	CadeP5 P5 F11						ACC PCHL	Register 00000010 0100
0	: A = 2 ; a2:	Step Qver Step Ogt Ran to <u>C</u> arsor	F10 ShafterF11 Chd+F10	1p98 ->	000113				H L GHL X Y Z R GVZ	0 0 0 AA 55 FF 80 80 F7
	; A = 3 ; a3:	PC to Currer Search Loble Breakpoint Breakpoint	F12 F9 Allt+F9	_					RBANK STKP INTEN	95 FF 11111110 01111111 10080080
L	; A - A a4:	RAM Breek	Cute F9						PO	Port 11111008
		Animets Single Animets StepOver					Cyc: mS: Cyc/Sec: Trace: 228/		P2 P3 P4 P5	11000000 00000000 11111111 00000000
Aut	to Watch	Mem Name Men	ı. Wind ∢ ⊨	I	•	T.	STA Col1 N.T.	•	STK76 STK54	ACK 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
<pre> # Demol.som ; a6: ; a6: ; a7: a7: p test_jnp9 <>> a </pre>	mp te ov a, mp te 0: dd a,	st_jmp91 H0 st_jmp91 #1	8				System ACC PCHL C DC Z H L GHL X Y Z R GYZ RBANK STKP INTEN VO	Register accacci [0113 [0] 0 [0]
	no te	st inoti					PØ	1111188
	PCL	13	-		Cyc: mS: Cyc/Sec: Trace: 229/	•	P1 P2 P3 P4 P5	1100000 0000000 0000000 1111111 0000000
Ánto Watch	Mem Name	Man Mod	and af				STK76 STK54	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 7 PE 2 C DE 2 DE 200 3	8 M 9	
Image: second	20 100 100 100	System Register ACC 00000101 PCHL 0000 C DC Z 0 0 H L GHL AA 55 FF X Y Z 00 00 F7 R BVZ 55 FF RBANK 11111110 STKP 01111111
: A - 1 : a1: imp test PCL Stop Run	Cyc: 138 ▲ nS: Cyc/Sec: Trace: 1023/ 1	P0 11111000 P1 11000000 P2 00000000 P3 00000000 P4 1111111 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 Yiew Icols Fill Util	ity <u>M</u> indow	Help				
	8 10 10	1 8 8 8 8 9 8 9	6 8 A 9			
2 Demol.com					System	Register
inp int	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
			Eyc/Sec: 39 Trace: 1823/	32	PB	0000000
			Tracer race,	1	P4	1111111
					P5	8999998
					P5	eeeeee ACK
					P5 S1 S1K76	0000000 ACK FFFF FFF
Artho Watch Mem Name ()	fen Wind a Lu				P5 STK76 STK54	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	i (Proj : Demo1.	ann} - Dem	ol.nam			
	<u>COUD</u> Fill Unity Assembly Download	Mundow 1 F7 F8	00000			
🖉 Denol.am	Reat	Cate P5			System	Register
0	Run	P5	; 0		ACC	8000011
;******	Single Step Qver Step Ogt Run to Qursor	F11 F10 ShafesF11 Cwi+F10			PCHL CDCZ HLGHL XYZ	0 0
int_main - main_tes ;*******	PC to Curror Search Lable	F12				55 F
	Breakpoint Breakpoints	F9 Alt+F9				0111111 1000000
	KADI DUPEK			100	- Pure	
:	Duternipt	Ctri#F9			10	1111100
	Animate Single			Cyc: 526C *	P1	1100000
	Animate StepOver	¢		MS: CWC/SPC: 3932	P2	10000000
		-		Trace: 1823/ 1	P3	0000000
					P4	1111111
					P5	8999996
					-S1	ACK
					STR76	FFFF FFF
Auto Watch	Mem Name Max	Wind wi wi		1.	STK54	FFFF FFF
starts the non-room				Lo. 45 Col.1 1CR 20	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	- 1	h	COM1	
COM2	5		6	COM3	
COM4	1	- 7	<u> </u>	COMS	
COM6	1	:	<u> </u>	COM7	
SEGD	14		<u> </u>	SEG1	
SEG2	, y	10	<u> </u>	SEG3	
SEG4	11	12	<u> </u>	SEGS	
SBG6	15	14	<u> </u>	SBG7	
SEG8	15	11	<u>v</u> —-	SEG9	
SEG 10	17	18	<u>v</u> —-	SEG11	
SBG12	19	20	<u>v</u> —-	SEG 13	
SBG14	21	22	<u>v</u> —-	SBG 15	
SBG 16	25	24	<u> </u>	SEG 17	
SBG 18	25	24	<u> </u>	SEG 19	
SEGZI	27	28	<u> </u>	SEG21	
SEG22	29	30	<u> </u>	SEG23	
SEG24	31	32	<u> </u>	SEG25	
SEG26	33	34	<u> </u>	SEG27	
SEG28	35	36	<u> </u>	SEG29	
SEG30	37	38	<u> </u>	SEG31	
SEG32	39	40	<u> </u>	SEG33	
SBG34	41	+2	<u>e</u> —-	SEG35	
SBG36	43	++	<u>e—-</u>	SEG37	
SBG36	45	+ 4	<u>v </u>	SEG39	
0	47	48	p		
HEATIER 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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