SI-83

User Manual



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Safety Information

Your SI-83 is designed and tested to meet the latest standards of safety for information technology equipment. However, to ensure your safety, it is important that you read the following safety instructions

Setting up your system

- Read and follow all instructions in the documentation before you operate your system.
- Do not use this product near water.
- Set up the system on a stable surface. Do not secure the system on any unstable plane.
- Do not place this product on an unstable cart, stand, or table. The product may fall, causing serious damage to the product.
- Slots and openings on the chassis are for ventilation. Do not block or cover these openings. Make sure you leave plenty of space around the system for ventilation.
 Never insert objects of any kind into the ventilation openings.
- This system should be operated from the type of power indicated on the marking label. If you are not sure of the type of power available, consult your dealer or local power company.
- Use this product in environments with ambient temperatures between 0°C and 45°C.
- If you use an extension cord, make sure that the total ampere rating of the devices plugged into the extension cord does not exceed its ampere rating.
- DO NOT LEAVE THIS EQUIPMENT IN AN ENVIRONMENT WHERE THE STORAGE TEMPERATURE MAY GO BELOW -20° C (-4° F) OR ABOVE 80° C (176° F). THIS COULD DAMAGE THE EQUIPMENT. THE EQUIPMENT SHOULD BE IN A CONTROLLED ENVIRONMENT.

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Care during use

- Do not walk on the power cord or allow anything to rest on it.
- Do not spill water or any other liquids on your system.
- When the system is turned off, a small amount of electrical current still flows. Always unplug all power, and network cables from the power outlets before cleaning the system.
- If you encounter the following technical problems with the product, unplug the power cord and contact a qualified service technician or your retailer.
 - > The power cord or plug is damaged.
 - Liquid has been spilled into the system.
 - The system does not function properly even if you follow the operating instructions.
 - The system was dropped or the cabinet is damaged.

Lithium-Ion Battery Warning

CAUTION: Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

NO DISASSEMBLY

The warranty does not apply to the products that have been disassembled by users

WARNING HAZARDOUS MOVING PARTS KEEP FINGERS AND OTHER BODY PARTS AWAY



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CHAPTER 1 INTRODUCTION

1.1 General Description

The "Signature BookTM" SI-83 is a professional digital signage system powered by 4th Gen. Intel® CoreTM i Processor with Intel[®] HD 4600 / 4400 Integrated Graphics. It comes with dual DP and one HDMI. The slim and segregated ventilation design player comes with a chassis that provides passive cooling for better system reliability and quiet operation.



SI-83 overview



1.2 System Specifications

1.2.1 Hardware Specifications

Model Name	SI-83
System Mainboard	IB983
CPU	4th Generation Intel® Core™ i7-4700EQ 2.4GHz
	4th Generation Intel® Core™ i5-4400E 2.7GHz
Memory	2x DDR3L-1600 MHz SO-DIMM, Max. 16GB (Non-ECC)
I/O Interface	1 x HDMI
	2 x DP
	2 x USB 3.0 ports, 2x USB 2.0 port
	2 x RJ45 for GbE LAN, 1x RJ45 for RS232
	1 x Microjack audio connectors for Audio/Mic
	1 x Power on/off button
	1 x Reset button
	1 x DC jack
Storage	1 x mSATA
Expansion Slots	1 x mPCIe(x1) for WiFi + Bluetooth, 3G, GPS and TV tuner options
	1 x UIM/SIM card slot (for 3G/LTE adapter in mPCIe slot)
Power Supply	+ 12V DC-in
Construction	Aluminum + SGCC
Mounting	Standard system bracket
Dimensions	175mm(W) x 116mm(D) x 32mm(H)
	6.9"(W) x 4.6"(D) x 1.18"(H)
Operating	0°C~ 45°C (32°E~113°E)
Temperature	
Storage	-20° - 80°C (-1°E 176°E)
Temperature	-20 ~ 80 C (-4 T ~ 170 T)
Relative Humidity	5~90% @ 45°C, (non-condensing)
Vibration	mSATA: 5 grms / 5~500Hz / random operation
RoHS	Available
Certification	CE, FCC, UL, CCC

·This specification is subject to change without prior notice.



1.2.2 Dimensions









1.2.3 I/O View





SI-83 rear side



1.3 Exploded View of the SI-83 Assembly





1.3.1 Parts Description

Part No.	Description	Part No.	Description
1	SI-83 heat sink	2	Fan
3 SI-83 fan bracket		4	IB983 motherboard
5	SI-83 body case	6	SI-83 base
7	SI-83 system base bracket	8	Antenna
9	SI-83 label	10	SI-83 board bracket
11	SI-83 top gasket	12/13	SI-83 I/O gasket-1/2



1.4 Packing List

Item No.	Description	Qty
1	Driver CD	1
2	Power adaptor	1
3	Power cord	1
4	Mounting kit	1

1.4.1 Optional Items

WiFi Solution	Description	
WiFi module	Wireless; PCI-E Mini Card 802.11B/G/N [AW-NE238H] (A008WLAWNE238H000P)	
External Antenna, 2pcs	WiFi Antenna (A055RFA02C2M20800P)	The summer of the summer
Internal cable	Internal Antenna 100mm[BTC130-1-70B-100] RoHS (A055RFA0000021000P)	
Internal cable	Internal Antenna 200mm [BTC130-1-70B-200-1] RoHS, (A055RFA0000020000P)	
Screw, 2pcs	Screw;A44-N NI 3.4 NYLOK M2*L3.8 P0.4mm [LHS]RoHS (H02203A0442200N00P)	
Bracket, -1set	Component BOM;MPCIE-EXT V-B2 Bracket (SC2MPCIEEXT0B2100P)	
3G Solution	Description	
3G	Wireless; 3.75G UMTS/HSPA [ZU202] RoHS (A008W IRELESS00520P)	0
3G+GPS	Wireless; 3.75G UMTS/HSPA & GPS Module [ZU200] RoHS (A008WIRELESS00510P)	
Cable	Cable; SMA IPX Cable For 3G 30CM [RF11030A] RoHS (A012INTENAL010000P)	
Antenna	3G [ANT0921Q2P] RoHS (A055ANT0921Q2P000P)	_
COM Port Cable	Description	
EXT-424	Cable;EXT-424 2-HD 8C 90CM; RJ45 Jack-8M=>DSU-9F RoHS (C501EXT4240902000P)	
EXT-481	Cable;EXT-481 2-HD 8C 90CM; RJ45 Jack-8M=>DSU-9M RoHS (C501EXT4810902000P)	

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1.5 HARDWARE INSTALLATION

1.5.1 Installing the Mounting Kit

1. Please install the mounting kit and make sure the direction. And then screw two screws as shown.







1.5.2 Installing the Optional Wireless Module

1. Remove the two screws on the back cover that are used to secure the cover to the chassis. Once all the screws are removed, from the side, dismount the cover forward to remove it.



2. Remove the two screws on the base and four screws on the bracket and draw out the chassis.



motherboard.

3. Remove the eight screws indicated on the picture below and remove the motherboard.

4. Install the internal cable on the "□" type bracket. Please pay attention to the length of two internal cables.



Internal Antenna [A055RFA0000021000P] 10cm



Internal Antenna [A055RFA0000020000P] 20cm



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5. Install the motherboard and bracket, and arrange the longer right cable as shown.

6. Screw the two screws and note to the orientation of the WIFI module and bracket.



7. Push the WIFI module into the slot and connect the two internal antenna as shown below.



1.5.3 Installing mSATA

1. Remove the 2 screws on the back cover that are used to secure the cover to the chassis. Once all the screws are removed, from the side, dismount the cover forward to remove it.





2. Push the mSATA module into the slot as shown in the picture below.





1.5.4 SI-83 Mounting Bracket Solution

SI-83 mounting bracket (IBASE) part number: SC2SIMK3---0A1100P

Please install SI-83 to the mounting bracket using 4 screws, as shown in the picture.





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CHAPTER 2 MOTHERBOARD INTRODUCTION

2.1 Introduction

The IB983 **CUSTOM SIGNAGE SBC** is based on the latest Intel® QM87 chipset. The platform supports onboard 4th generation Intel® Core processor family that features an integrated dual-channel DDR3 memory controller as well as a graphics core.

The latest Intel® processors provide advanced performance in both computing and graphics quality. This meets the requirement of customers in the gaming, POS, digital signage and server market segment.

The QM87 platform is made with 22-nanometer technology that supports Intel's first processor architecture to unite the CPU and the graphics core on the transistor level. The IB983 **CUSTOM SIGNAGE SBC** utilizes the dramatic increase in performance provided by this Intel's latest cutting-edge technology. It offers fast 6Gbps SATA support, USB3.0 and interfaces for HDMI and DP displays.

CPU			
Model	4th Generation Intel® Core™ i7-4700EQ 2.4GHz		
	4th Generation Intel® Core™ i5-4400E 2.7GHz		
Speed	2.4GHz and 2.7GHz		
Cache	6MB / 3MB		
Socket	FCBGA1364 package		
TDP	TDP=47 W / 37 W		
	Chipset		
Model	Intel® QM87 PCH		
BIOS			
Model	AMI BIOS, support ACPI Function		
Memory			
Configuration	4GB x 2		
Max. Support	2x DDR3 1600 MHz SO-DIMM, Max. 16GB (Non-ECC)		



Edge I/O		
Display	1x HDMI 1.4a	
	2x DP v1.3	
LAN / PHY	1x GbE with Intel® WGI217LM	
	1x GbE with Realtek RTL8111G-CG	
Audio	Intel® QM87 PCH built-in HD audio controller +	
	ALC892 w/ 7.1 channels	
	1x Audio Connector (Lin out)	
USB	2x USB 3.0; 2x USB 2.0	
LPC I / O	1x RS-232 (recessed-Mount RJ45)	
Button	1x Power Button	
DC Jack	1x Screw type) Power Jack (+12V DC)	
Other	1x LED for Power	
	1x Smart DC fan (12V DC)	
Internal I/O		
Super I/O	NCT 5523D Super I/O	
	CPU Temp + Temp monitor +Voltage Monitor	
Expansion Slot	1x mSATA, 1x mPCIe(x1) only	
	1x UIM/SIM card slot (for 3G/LTE adapter in mPCIe	
	slot)	
	Add-On Feature	
Watchdog	Yes (256 segments, 0, 1, 2255 sec/min)	
H/W Monitor	YES	
iSMART	YES	
Others	LAN Wakeup, iSmart, Vpro (9965), & TPM	
Dimensions		
PCB Dimensions	155mm(W) x 108mm(D)	
Power		
Power	Power Jack (+12V DC)	
	Environmental	
Temperature	Operating Temperature : 0°C~60°C (32°F~140°F)	
	Storage Temperature : -20°C~80°C (-4°F~176°F)	
Regulation	RoHS	
Certification	CE/FCC Class A (Target B) UL, CCC	

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IB983 Jumpers and Connectors





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2.2 Installations

2.2.1 Installing the Memory

The IB983 board supports two DDR3 memory sockets for a maximum total memory of 16GB DDR3 memory type.

Installing and Removing Memory Modules

To install the DDR3 modules, locate the memory slot on the board and perform the following steps:

- 1. Hold the DDR3 module so that the key of the DDR3 module aligned with that on the memory slot.
- 2. Gently push the DDR3 module in an upright position until the clips of the slot close to hold the DDR3 module in place when the DDR3 module touches the bottom of the slot.
- 3. To remove the DDR3 module, press the clips with both hands.





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2.3 Setting the Jumpers

Jumper Locations on IB983



JP1: Clear CMOS Contents



JP1	Setting	Function
<u> </u>	Pin 1-2 Short/Closed	Normal
123	Pin 2-3 Short/Closed	Clear CMOS

JP2: Clear ME Contents



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J18	Setting	Function
123	Pin 1-2 Short/Closed	Normal
123	Pin 2-3 Short/Closed	Clear CMOS



2.4 Connectors on IB983



CN1: Board Input Power(12V) Connector



CN2: Console Port (COM1)



The console port is an RJ45 RS-232 serial port.

Pin #	Signal Name
1	RTS
2	DTR
3	TXD
4	GND
5	GND
6	RXD
7	DSR
8	CTS

CN3, CN4: Display Port

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CN5, CN8: USB2.0 Connector



CN6, CN7: USB3.0 Connector



CN9: Gigabit LAN (RTL8111G) RJ45 Connector





CN10: Gigabit LAN (I217) RJ45 Connector



CN11: HDMI Port



CN12: HD Audio (Audio out) Connector



CN13: Micro SIM Card Connector



J1, J9: DDR3 SO-DIMM Socket



J4: Mini PCIE Connector



J5: mSATA Connector





J7: CPU Fan Power Connector



Pin #	Signal Name	
1	Ground	
2	+12V	
3	Rotation detection	

J8: SPI Flash Connector (Factory use only)



J10: LPC debug Connector (Factory use only)



SW1: Power Switch

CHAPTER 3 BIOS SETUP

This chapter describes the different settings available in the AMI BIOS that comes with the board. The topics covered in this chapter are as follows:

3.1 BIOS Introduction

The BIOS (Basic Input/Output System) installed in your computer system's ROM supports Intel processors. The BIOS provides critical low-level support for a standard device such as disk drives, serial ports and parallel ports. It also password protection as well as special support for detailed fine-tuning of the chipset controlling the entire system.

3.2 BIOS Setup

The BIOS provides a Setup utility program for specifying the system configurations and settings. The BIOS ROM of the system stores the Setup utility. When you turn on the computer, the BIOS is immediately activated. Pressing the key immediately allows you to enter the Setup utility. If you are a little bit late pressing the key, POST (Power On Self Test) will continue with its test routines, thus preventing you from invoking the Setup. If you still wish to enter Setup, restart the system by pressing the "Reset" button or simultaneously pressing the <Ctrl>, <Alt> and <Delete> keys. You can also restart by turning the system Off and back On again. The following message will appear on the screen:

```
Press <DEL> to Enter Setup
```

In general, you press the arrow keys to highlight items, <Enter> to select, the <PgUp> and <PgDn> keys to change entries, <F1> for help and <Esc> to quit.

When you enter the Setup utility, the Main Menu screen will appear on the screen. The Main Menu allows you to select from various setup functions and exit choices.



Warning: It is strongly recommended that you avoid making any changes to the chipset defaults. These defaults have been carefully chosen by both AMI and your system manufacturer to provide the absolute maximum performance and reliability. Changing the defaults could cause the system to become unstable and crash in some cases.

Main Settings

Main Adva	nced Chipset	Boot	Security	Save & Exit
BIOS Information			Ch	oose the system default
			lang	uage
Total Memory	4096	4096 MB (DDR3)		
Memory Frequenc	y 1333	1333 Mhz		
System Date	[Tue	01/20/2009]		
System Time	[21:5	[21:52:06]		Select Screen
			Ent	er: Select
	۸dmi	niatrator	+- F1:	Change Field General Help
Access Level	Admi	riistratof	F2: F3: F4:	Optimized Default Save ESC: Exit

Aptio Setup Utility - Copyright © 2013 American Megatrends, Inc.

System Date

Set the Date. Use Tab to switch between Data elements.

System Time

Set the Time. Use Tab to switch between Data elements.

Advanced Settings

This section allows you to configure and improve your system and allows you to set up some system features according to your preference.

Aptio Setup Utility					
Main	Advanced	Chipset	Boot	Security	Save & Exit
 ACP Trus Wak CPL SAT Shut iSmat AMT USB NCT 	'I Settings .ted Computing seup Event Configuration J Configuration 'A Configuration tdown Temperature C art Controller Configuration S Configuration 3 Configuration 5523D H/W Monitor	tion Configuration		$\rightarrow \leftarrow Se$ $\uparrow \downarrow Se$ Enter +- Cl F1: G F2: P F3: O F4: S	elect Screen elect Item : Select hange Field General Help Previous Values optimized Default ave ESC: Exit

ACPI Settings

Aptio Setup Utility

Main Advanced	Chipset Boot	Security Save & Exit
ACPI Settings		→ ← Select Screen
ACPI Sleep State Lock Legacy Resources S3 Video Repost	S3 (Suspend to R) Disabled Disabled	<pre>↑ ↓ Select Item Enter: Select +- Change Field F1: General Help F2: Previous Values F3: Optimized Default F4: Save ESC: Exit</pre>

ACPI Sleep State

Select ACPI sleep state the system will enter, when the SUSPEND button is pressed.

Lock Legacy Resources

Enabled or Disabled Lock of Legacy Resources.

S3 Video Repost

Enable or disable S3 Video Repost.


Trusted Computing

	Aptio Setup Utility							
Main	Advanced	Chipset	Boot	Security	Save & Exit			
Configura	ation							
Securit	y Device Support	Di	sabled	$\rightarrow \leftarrow 2$ $\uparrow \downarrow 2$ Ente	Select Screen Select Item r: Select			
Current S	Status Information			+- (F1:	Change Field General Help			
SUPP	ORT TURNED OFF			F2: F3: F4:	Previous Values Optimized Default Save ESC: Exit			

Security Device Support

Enables or Disables BIOS support for security device. O.S. will not show Security Device. TCG EFI protocol and INT1A interface will not be available.

Wake up event settings

Aptio Setup Utility Advanced Main Chipset Security Save & Exit Boot Wake Event Configuration $\rightarrow \leftarrow$ Select Screen Wake on PCIE Wake Event Disabled $\uparrow \downarrow$ Select Item Enter: Select +- Change Field F1: General Help F2: Previous Values F3: Optimized Default F4: Save ESC: Exit

Wake on PCIE Wake Event

The options are Disabled and Enabled.

CPU Configuration

This section shows the CPU configuration parameters.

Main	Advanced	Chipset	Boot	Security	Save & Exit
CPU Cor	figuration				
Intel(R) C	CPU Core(TM)i7-4700	EQE @ 2.40	OGHz		
CPU Sig	nature		306c3		
Processo	or Family		6		
Microcod	e Patch		17		
FSB Spe	ed		100MHz		
Max CPL	J Speed		2400 MHz		
Min CPU	Speed		800 MHz		
CPU Spe	ed		2400 MHz		
Processo	or Cores		4		
Intel HT	Fechnology		Supported		
Intel VT-:	k Technology		Supported		
Intel SM>	K Technology		Supported		
64-bit			Supported		
EIST			Supported		
Hyper-th	reading		Enable	$\rightarrow \leftarrow \text{Sele}$	ect Screen
Active Pr	ocessor Cores		All	↑ ↓ Sele	ect Item
Limit CP	UID Maximum		Disabled	+- Chan	ge Field
Execute	Disable Bit		Enabled	F1: Gene	eral Help vious Values
Intel Virtu	alization Technology		Enabled	F3: Opt	imized Default
EIST			Enabled	F4: Save	e ESC: Exit
				1	

Aptio Setup Utility

Hyper-threading

Enabled for Windows XP and Linux (OS optimized for Hyper-Threading Technology) and Disabled for other OS (OS not optimized for Hyper-Threading Technology). When Disabled only one thread per enabled core is enabled.

Active Processor Cores

Number of cores to enable in each processor package.

Limit CPUID Maximum

Disabled for Windows XP.



Execute Disable Bit

XD can prevent certain classes of malicious buffer overflow attacks when combined with a supporting OS

Intel Virtualization Technology

When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.

EIST

Enabled/Disabled Intel Speedstep.

SATA Configuration

SATA Devices Configuration.

Aptio Setup Utility

Main	Advanced	Chipset	Boot	Se	curity	Save & Exit
SATA CA SATA M SATA CA	ontroller(s) ode Selection ontroller Speed		Enabled AHCI Default		→ ← Se	lect Screen
Serial A ⁻ Soft Hot	TA Port 0 ware Preserve Plug		Empty Unknown Disabled		↑↓ Se Enter: +- Ch F1: Ge F2: Pr F3: Op F4: Sa	lect Item Select ange Field eneral Help revious Values timized Default we ESC: Exit

SATA Controller(s)

Enable or disable SATA Device.

SATA Mode Selection

- (1) IDE Mode.
- (2) AHCI Mode.

SATA Controller Speed

Indicates the maximum speed the SATA controller can support.

Hot Plug

Designates this port as Hot Pluggable.

Shutdown Temperature Configuration

Aptio Setup Utility

Main	Advanced	Chipset	Boot	Secu	rity	Save & Exit
APCI Sr	utdown Temperature		Disabled		→ ← ↑ ↓ Ente +- F1: F2: F3: F4:	Select Screen Select Item er: Select Change Field General Help Previous Values Optimized Default Save ESC: Exit

ACPI Shutdown Temperature

The default setting is Disabled.

iSmart Controller

Aptio Setup Utility

Main	Advanced	Chipset	Boot Secur	rity Save & Exit
iSmart C	Controller			
Power-O	n after Power failure		Disable	→ ← Select Screen ↑ ↓ Select Item Enter: Select +- Change Field
Schedule	∋ Slot 1		None	F1: General Help F2: Previous Values
Schedule	e Slot 2		None	F3: Optimized Default F4: Save ESC: Exit

iSmart Controller

Setup the power on time for the system.

Schedule Slot 1 / 2

Setup the hour/minute for system power on.



AMT Configuration

Main	Advanced	Chipset	Boot	Security	Save & Exit
Main Intel AM BIOS H MEBx S Hide Ur Un-Con Amt Wa Activate USB Co PET Pro	Advanced	Chipset mation Process	Boot	Security Enabled Disabled Disabled Disabled Disabled 0 Disabled Enabled Enabled 0	Save & Exit
Watchd	og			Disabled	+- Change Field F1: General Help
OS T	imer			0	F1: General Help F2: Previous Values
BIOS	Timer			0	F3: Optimized Default F4: Save ESC: Exit

Aptio Setup Utility

Intel AMT

Enabled / Disabled Intel(R) Active Management Technology BIOS Extension. Note: iAMT H/W is always enabled. This option just controls the BIOS extension execution. If enabled, this requires additional firmware in the SPI device.

BIOS Hotkey Pressed

OEMFLag Bit 1: Enable/Disable BIOS hotkey press.

MEBx Selection Screen

OEMFLag Bit 2: Enable/Disable MEBx selection screen.

Hide Un-Configure ME Confirmation

OEMFLag Bit 6: Hide Un-Configure ME without password Confirmation Prompt

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Hide Un-Configure ME Confirmation OEMFLag Bit 15: Un-Configure ME without password

Amt Wait Timer Set timer to wait before sending ASF_GET_BOOT_OPTIONS.

Disable ME Set ME to Soft Temporary Disabled.

Activate Remote Assistance Process

Trigger CIRA boot.

USB Configure

Enable/Disable USB Configure function.

PET Progress

User can Enable/Disable PET Events progress to receive PET events or not.

Watchdog Timer

Enable/Disable Watchdog Timer.



USB Configuration

Aptio Setup Utility

Main Advanced	Chipset	Boot	Security	Save & Exit
USB Configuration				
USB Module Version USB Devices:			8.10.28	
Legacy USB Support			Enabled	
USB3.0 Support			Enabled	
XHCI Hand-off			Enabled	
EHCI Hand-off			Enabled	
USB Mass Storage Drive	er Support		Enabled	
Port 60/64 Emulation			Enabled	
USB hardware delays ar USB Transfer time-out Device reset tine-out Device power-up delay	nd time-outs:		20 sec 20 sec Auto	<pre>→ ← Select Screen ↑ ↓ Select Item Enter: Select +- Change Field F1: General Help F2: Previous Values F3: Optimized Default F4: Save ESC: Exit</pre>

Legacy USB Support

Enables Legacy USB support.

AUTO option disables legacy support if no USB devices are connected. DISABLE option will keep USB devices available only for EFI applications.

USB3.0 Support

Enable/Disable USB3.0 (XHCI) Controller support.

XHCI Hand-off

This is a workaround for OSes without XHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver.

EHCI Hand-off

Enabled/Disabled. This is a workaround for OSes without EHCI hand-off support. The EHCI ownership change should be claimed by EHCI driver.

USB Mass Storage Driver Support

Enable/Disable USB Mass Storage Driver Support.

Port 60/64 Emulation

Enables I/O port 60h/64h emulation support. This should be enabled for the complete USB keyboard legacy support for non-USB aware OSes.

USB Transfer time-out

The time-out value for Control, Bulk, and Interrupt transfers.

Device reset tine-out

USB mass Storage device start Unit command time-out.

Device power-up delay

Maximum time the device will take before it properly reports itself to the Host Controller. 'Auto' uses default value: for a Root port it is 100ms, for a Hub port the delay is taken from Hub descriptor.

NCT5523D HW Monitor

Aptio Setup Utility

Main	Advanced	Chipset	Boot	Security	Save & Exit
PC Hea	Ith Status				
Smart C	CPU_FAN1 function		Disa	Ibled	
SYS Th	ermistor Temp		+37.	.0 C	. Select Screen
CPU Di	ode Temp		+42.	.5 C	<pre>→ ← Select Screen ↑ ↓ Select Item Enter: Select</pre>
CPU_F	AN Speed		444(RPM	+- Change Field
VCORE			+1.7	68 V	F1: General help F2: Previous Values
VDDQ			+1.5	20	F4: Save ESC: Exit

Smart CPU_FAN1 Function

Smart Fan Mode select



Chipset Settings

This section allows you to configure and improve your system and allows you to set up some system features according to your preference.

Aptio Setup Utility								
Main	Advanced	Chipset	Boot	Security	Save & Exit			
▶ PCH-▶ Syste	IO Configuration m Agent (SA) Config	uration		→ ← Select ↑ ↓ Select Enter: Se. +- Change F1: Gener F2: Previo F3: Optim F4: Save	: Screen : Item lect e Field al Help ous Values ized Default ESC: Exit			

PCH-IO Configuration

This section allows you to configure the North Bridge Chipset.

Main Advanced	Chipset Boot	Security Save & Exit
Intel PCH RC Version	1.7.0.0	
Intel PCH SKU Name	QM87	
Intel PCH Rev ID	05/C2	
 USB Configuration PCH Azalia Configuration 	n	→ ← Select Screen ↑ ↓ Select Item Enter: Select +- Change Field F1: General Help F2: Previous Values
PCH LAN Controller	Enabled	F3: Optimized Default
Wake on LAN	Disabled	F4: Save ESC: Exit

Aptio Setup Utility

PCH LAN Controller

Enable or disable onboard NIC.

Wake on LAN

Enable or disable integrated LAN to wake the system. (The Wake On LAN cannot be disabled if ME is on at Sx state.)

USB Configuration

Main	Advanced	Chipset	Boot	Security	Save & Exit
USB Cor	figuration				
USB Pre	condition		Disab	led	
xHCI Mode			Smart Auto		
BTCG			Enab	ed	→ ← Select Screen ↑ ↓ Select Item Enter: Select
USB Por	ts Per-Port Disable (Control	Disab	led	<pre>+- Change Field F1: General Help F2: Previous Values F3: Optimized Default F4: Save ESC: Exit</pre>

USB Precondition

Precondition work on USB host controller and root ports for faster enumeration.

xHCI Mode

Mode of operation of xHCI controller.

BTCG

Enabling/disabling trunk clock gating

USB Ports Per-Port Disable Control

Control each of the USB ports (0~13) disabling.



PCH Azalia Configuration

Main	Advanced	Chipset	Boot	Secu	ity Save & Exit
PCH Az	alia Configuration				→ ← Select Screen
Azalia			Auto		<pre>For the second sec</pre>

Azalia

Control Detection of the Azalia device.

Disabled = Azalia will be unconditionally be disabled.

Enabled = Azalia will be unconditionally be enabled.

Auto = Azalia will be enabled if present, disabled otherwise.

System Agent (SA) Configuration

Aptio Setup Utility

Main	Advanced	Chipset	Boot	Securi	ty Save & Exit
System A	Agent Bridge Name		Ha	aswell	
System A	Agent RC Version		1.5.0.0	0	
VT-d Ca	pability		Suppo	orted	
VT-d			Enable	ed	→ ← Select Screen ↑ ↓ Select Item Enter: Select +- Change Field
► Graph	nics Configuration				F1: General Help F2: Previous Values F3: Optimized Default F4: Save ESC: Exit

VT-d

Check to enable VT-d function on MCH.

Graphics Configuration

		A	vptio Setu	ip Utility		
Main	Advanced	Chipset	Boot	Security	Sav	ve & Exit
Main Graphic: IGFX VE IGfx Fre Graphic: Primary Primar	Advanced s Configuration 3IOS Version quency s Turbo IMON Curro Display y PEG y PCIE	Chipset	Boot	Security 2167 800 MHz 31 Auto Auto Auto	Sa	ve & Exit
Internal Aperture DVMT F DVMT T Gfx Low Panel Pe	Graphics Pre-Allocated Cotal Gfx Mem Power Mode ower Enable			Auto 256MB 32M 256MB Enabled Disabled		<pre>→ ← Select Screen ↑ ↓ Select Item Enter: Select +- Change Field F1: General Help F2: Previous Values F3: Optimized Default F4: Save ESC: Exit</pre>

Graphics Turbo IMON Current

Graphics turbo Imon current values supported (14-31)

Primary Display

Select which of IGFX/PEG/PCI graphics device should be primary display or select SG for switchable Gfx.

Primary PEG

Select PEGO/PEG1/PEG2/PEG3 Graphics device should be Primary PEG.

Primary PCIE

Select PCIE0/PCIE1/PCIE2/PCIE3/PCIE4/PCIE5/PCIE6PCIE7 Graphics device should be primary PCIE.

Internal Graphics

Keep IGD enabled based on the setup options.



Aperture Size

Select the Aperture Size

DVMT Pre-Allocated

Select DVMT 5.0 Pre-Allocated (Fixed) Graphics memory size used by the internal graphics device.

DVMT Total Gfx Mem

Select DVMT 5.0 total graphics memory size used by the internal graphics device.

Gfx Low Power Mode

This option is applicable for SFF only.

Panel Power Enable This applicable for SFF only

Boot Settings

Aptio Setup Utility

Main	Advanced	Chipset	Boot	Security	Save & Exit
Boot Config	guration				
Setup Prompt Timeout			1		
Bootup Nur	mLock State		On		
Quiet Boot			Disab	led	
Fast Boot			Disab	led	
Set Boot P	riority				
1st Boot			CD/D	VD	
2nd Boot			Hard I	Disk	
3rd Boot			USb F	Горру	
4th Boot			USB (CD/DVD	
5th Boot			USB I	Hard Disk	
6th Boot			USB ł	KEY	
7th Boot			Netwo	ork	
8th Boot			UEFI		
	D				→ ← Select Screen ↑↓Select Item
Boot Option	n Priorities				Enter: Select
Boot Option	n #1				+- Change Field F1: General Help
► CSM16	Parameters				F2: Previous Values
CSM Parar	neters				F3: Optimized Default F4: Save ESC: Exit
Hard Dis	sk Drive BBS Prid	orities			

Setup Prompt Timeout

Number of seconds to wait for setup activation key. 65535(0xFFFF) means indefinite waiting.

Bootup NumLock State

Select the keyboard NumLock state.

Quiet Boot

Enables or disables Quiet Boot option.

Fast Boot

Enables or disables boot with initialization of a minimal set of devices required to launch active boot option. Has no effect for BBS boot options.



Set Boot Priority

Set Boot Priority

Boot Option Priorities

Sets the system boot order.

CSM parameters

This section allows you to configure the boot settings.

		-	-	•	
Main	Advanced	Chipset	Boot	Security	Save & Exit
Launch CS Boot optio Launch P) Launch St Launch Vi Other PCI	SM n filter KE OpROM policy orage OpROM policy deo OpROM policy device ROM priority		Enabled JEFI and Leg Do not launch Legacy only Legacy only JEFI OpROM	acy	 → ← Select Screen ↑ ↓ Select Item Enter: Select +- Change Field F1: General Help F2: Previous Values F3: Optimized Default F4: Save ESC: Exit

Antio Setup Litility

Launch CSM

This option controls if CSM will be launched.

Boot Option Filter

This option controls what devices system can boot to.

Launch PXE OpROM Policy

Controls the execution of UEFI and Legacy PXE OpROM.

Launch Storatge OpROM Policy

Controls the execution of UEFI and Legacy Storage OpROM.

Launch Video OpROM Policy

Controls the execution of UEFI and Legacy Video OpROM.

Other PCI Device ROM Priority

For PCI devices other than Network, Mass storage or Video defines which OpROM to launch.

Security Settings

This section allows you to configure and improve your system and allows you to set up some system features according to your preference.

	Aptio Setup Utility									
Main	Advanced	Chipset	Boot	Security	s	ave & Exit				
Password	Password Description									
If ONLY th access to If ONLY th password the User v	If ONLY the Administrator's password is set, then this only limit access to Setup and is only asked for when entering Setup. If ONLY the User's password is set, then this is a power on password and must be entered to boot or enter Setup. In Setup the User will have Administrator rights									
The passv	vord length must be									
in the follo	wing range:									
Minimum	length			3		→ ← Select Screen ↑↓ Select Item				
Maximum	length			20		Enter: Select +- Change Field F1: General Help				
Administra	ator Password					F2: Previous Values F3: Optimized Default				
User Pass	sword					F4: Save ESC: Exit				

Administrator Password

Set Setup Administrator Password.

User Password

Set User Password.



Save & Exit Settings

Aptio Setup Utility

Main Advanced	Chipset	Boot	Security	Save & Exit
Save Changes and Exit Discard Changes and Exit Save Changes and Reset Discard Changes and Reset				
Save Options Save Changes Discard Changes Restore Defaults Save as User Defaults Restore User Defaults				 → ← Select Screen ↑ ↓ Select Item Enter: Select +- Change Field F1: General Help F2: Previous Values F3: Optimized Default F4: Save ESC: Exit

Save Changes and Exit

Exit system setup after saving the changes.

Discard Changes and Exit

Exit system setup without saving any changes.

Save Changes and Reset

Reset the system after saving the changes.

Discard Changes and Reset

Reset system setup without saving any changes.

Save Changes

Save Changes done so far to any of the setup options.

Discard Changes

Discard Changes done so far to any of the setup options.

Restore Defaults

Restore/Load Defaults values for all the setup options.

Save as User Defaults

Save the changes done so far as User Defaults.

Restore User Defaults

Restore the User Defaults to all the setup options.

CHAPTER 4 DRIVERS INSTALLATION

The Intel Chipset Drivers should be installed first before the software drivers to enable Plug & Play INF support for Intel chipset components. Follow the instructions below to complete the installation.

4.1 Intel Chipset Software Installation Utility

1. Insert the DVD that comes with the board. Click Intel and then Intel(R) 8 Series Chipset Drivers.



2. Click Intel(R) Chipset Software Installation Utility.





3. When the Welcome screen to the Intel® Chipset Device Software appears, click *Next* to continue.

4. Click **Yes** to accept the software license agreement and proceed with the installation process.

5. On the Readme File Information screen, click *Next* to continue the installation.

States allow		A TELEVISION		Licensel and the	-
ntel®	Chipse	t Device Se	oftware	-	/intel
Peadm	e File In	formation			
Gerterin		Carline Contract	Same and the	the second	
- ABAYNES				Contraction in the	CARLES HAR LOOK
efer to the	Readme file	below to view the s	vstem requirements a	and installation in	oformation.
ress the P	age Down key	to view the rest of	the file.	arre and concretor in	normationa
******	********			*********	********
* Proc	uct: Int	er(K) Cuiba	et Device Sof	tware	
* Kelt	ease: Bet	a			
- ver	310n: 9.4	1.0.1010 Naimenti Vari		- /7	
	jet PDA/C	hipset: has	weil/LynxPoin	C/LYNXPOI	NC-LP
· Idi(: Septem	QEI 11 2012			
* Date					
* Dat(
* Date					-
* Date	m				

6. The Setup process is now complete. Click *Finish* to restart the computer and for changes to take effect.

4.2 VGA Drivers Installation

1. Insert the DVD that comes with the board. Click Intel and then Intel(R) 8 Series

Chipset Drivers.

Inside T	Version : 9.0.3i
Intel Intel LAN Gard Tools	Intel(R) Cedarview Chipset Drivers Intel(R) 6 Series Chipset Drivers Intel(R) 7 Series Chipset Drivers Intel(R) 8 Series Chipset Drivers

2. Click Intel(R) Core(TM) i3/i5/i7 Graphics Driver.

Inside T	Version : 9.0.3i
Intel<	Intel(R) Chipset Software Installation Utility Intel(R) HD Graphics Driver Realtek High Definition Audio Driver Intel(R) PRO LAN Network Drivers Intel(R) ME 9.0 Drivers Intel(R) USB 3.0 Drivers
8	Intel(R) Core(TM) i3/15/17 Graphics Driver

- 3. When the Welcome screen appears, click *Next* to continue.
- 4. Click Yes to to agree with the license agreement and continue the installation.



5. On the screen shown below, click *Install* to continue.



6. Setup complete. Click *Finish* to restart the computer and for changes to take effect.



4.3 Realtek HD Audio Driver Installation

1. Insert the DVD that comes with the board. Click *Intel* and then *Intel(R)* 8 Series Chipset Drivers.

Inside	This CD Version : 9.0.3i
intel	Intel(R) Cedarview Chipset Drivers
LAN Gard	Intel(R) 6 Series Chipset Drivers Intel(R) 7 Series Chipset Drivers
Tools	Intel(R) 8 Series Chipset Drivers

2. Click Realtek High Definition Audio Driver.

	side 1	Version : 9.0.3i
↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓<	Intel LAN Card Tools	Intel(R) Chipset Software Installation Utility Intel(R) HD Graphics Driver Realtek High Definition Audio Driver Intel(R) PRO LAN Network Drivers Intel(R) ME 9.0 Drivers Intel(R) USB 3.0 Drivers
	8	Realvek High Definition Audio Driver



3. On the Welcome to the InstallShield Wizard screen, click **Yes** to proceed with and complete the installation process.

Realtek High Definition Audio Driver Setup (3.50) R2,70	
ealtek High Definition Audio Driver R2.70	Particularity and account and the
Provide the Party of the Party	
Reator High Denetion Audio Univer - and atomical Gazard	28.1
Welcome to the InstallShield Wizard	
The InstallShield Wizard will install Realter High Definition Audio Driver	
Do you want to continue the installation of new driver?	
be you wan to concrue the inclusion of the area and i	
	-
Yts (V0	
	- 58
	8-33 PM

4. The InstallShield Wizard Complete. Click *Finish* to restart the computer and for changes to take ffect.



4.4 LAN Drivers Installation

1. Insert the DVD that comes with the board. Click *Intel* and then *Intel(R)* 8 Series Chipset Drivers.



2. Click Intel(R) PRO LAN Network Driver.

Insid	e This CD Version : 9.0.3i
Intel	rd Intel(R) Chipset Software Installation Utility Intel(R) HD Graphics Driver Realtek High Definition Audio Driver Intel(R) PRO LAN Network Drivers Intel(R) ME 9.0 Drivers Intel(R) USB 3.0 Drivers
	hatel (R) PRO LAN Nerwood: Drivers



3. Click Install Drivers and Software.



- 4. When the Welcome screen appears, click Next.
- 5. Click *Next* to to agree with the license agreement.

6. Click the checkbox for **Drivers** in the Setup Options screen to select it and click **Next** to continue.

7. The wizard is ready to begin installation. Click *Install* to begin the installation.



8. When InstallShield Wizard is complete, click *Finish*.

的 Intel(R) Network Connections Install Wizard	X
Install wizard Completed	(intel)
To access new features, open Device Manager, and view the properties of the network adapters.	
< Back Finish	Cancel



4.5 Realtek LAN Controller Drivers Installation

Follow the steps below to install the Realtek LAN Drivers.

1. Insert the CD that comes with the board. Click *LAN Card,* and then *Realtek Lan Controller Drivers*.



2. Click Realtek RTL8111E LAN Drivers.



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3. When the welcome screen to InstallShield Wizard appears, click *Next* to start the installation.



4. When the InstallShieldWizard has finished installing the Realtek LAN drivers, click *Finish*.





4.6 Intel[®] Management Engine Interface



The following application requires Microsoft .NET Framework 3.5 or later: Intel® Management Engine Components. Please install the latest version of Microsoft .NET Framework from Microsoft Download Center to run this application correctly.

Follow the steps below to install the Intel Management Engine.

1. Insert the DVD that comes with the board. Click *Intel* and then *Intel(R)* 8 Series Chipset *Drivers* and then *Intel(R)* AMT 9.0 Drivers.



2. When the Welcome screen to the InstallShield Wizard for Intel® Management Engine Components, click the checkbox for **Install Intel® Control Center** & click *Next*.



3. Click Yes to to agree with the license agreement.



4. When the Setup Progress screen appears, click **Next**. Then, click **Finish** when the setup progress has been successfully installed.



4.7 Intel[®] USB 3.0 Drivers

1. Insert the DVD that comes with the board. Click *Intel* and then *Intel(R)* 8 Series Chipset Drivers.

Inside T	Version : 9.0.3i
LAN Card	Intel(R) Cedarview Chipset Drivers Intel(R) 6 Series Chipset Drivers Intel(R) 7 Series Chipset Drivers Intel(R) 8 Series Chipset Drivers

2. Click Intel(R) USB 3.0 Drivers.

side T	his CD
Intel LAN Card Tools	Intel(R) Chipset Software Installation Utility Intel(R) HD Graphics Driver Realtek High Definition Audio Driver Intel(R) PRO LAN Network Drivers Intel(R) ME 9.0 Drivers Intel(R) USB 3.0 Drivers
8	Intel(R) USB 3.0 Drivers



3. When the Welcome screen to the InstallShield Wizard for Intel® USB 3.0 eXtensible Host Controller Driver, click *Next*.

ntel® Installation Framework		- 0 🐼
Intel® USB 3.0 eXtensible Hos Welcome to the Setup Program	t Controller Drive	(intel)
This setup program will install the following compor • Intel® USB 3.0 extensible Host Controller Driver • Intel® USB 3.0 Hub Driver • Intel® USB 3.0 Host Controller Switch Driver • Intel® USB 3.0 Monitor Click Next to continue.	ients:	
	< Back Next >	Cancel

4. Click **Yes** to to agree with the license agreement and continue the installation.

cense Agreement		(intel
You must accept all of the terms of the program. Do you accept the terms?	license agreement in order t	o continue the	setup
INTEL SOFTWARE LICENSE AGREEMEN	iT (Alpha / Beta, Organizatio	nal Use)	1
IMPORTANT - READ BEFORE COPYING	, INSTALLING OR USING.		18
Do not use or load this software and a until you have carefully read the follow Software, you agree to the terms of t install or use the Software.	ny associated materials (colie ing terms and conditions. By iis Agreement. If you do not	ectively, the "Si loading or usin wish to so agri	oftware") ig the ee, do not
The Software contains pre-release "alp and which Intel Corporation ("Intel") m of the Software. Intel can provide no	ha" or "beta" code, which m ey substantielly modify in pri assurance that it will ever pr	ay not be fully oducing any "fir oduce or make	functional nal" version generally
	1	1.550.5	

5. On the Readme File Information screen, click *Next* to continue the installation of the Intel® USB 3.0 eXtensible Host Controller Driver.

6. Setup complete. Click *Finish* to restart the computer and for changes to take effect.





Appendix

A. I/O Port Address Map

Each peripheral device in the system is assigned a set of I/O port addresses which also becomes the identity of the device. The following table lists the I/O port addresses used.

Address	Device Description
0000h-001Fh	Direct memory access controller
0000h-0001h	PCI bus
0040h-0043h	System timer
0050h-0053h	System timer
0070h-0077h	System CMOS/real time clock
0081h-0091h	Direct memory access controller
0093h-009Fh	Direct memory access controller
00C0h-00DFh	Direct memory access controller
00F0h-00F0h	Numeric data processor
03B0h-03BBh	Intel(R) HD Graphics 4600
03C0h-03DFh	Intel(R) HD Graphics 4600
03F8h-03FFh	Communications Port (COM1)
0D00h-FFFFh	PCI bus
E000h-EFFFh	Intel(R) 8 Series/C220 Series PCI Express Root Port #7 - 8C1C
F000h-F03Fh	Intel(R) HD Graphics 4600
F040h-F05Fh	Intel(R) 8 Series/C220 Series SMBus Controller - 8C22
F0E0h-F0E7h	Intel(R) Active Management Technology - SOL (COM3)

B. Interrupt Request Lines (IRQ)

Peripheral devices use interrupt request lines to notify CPU for the service required. The following table shows the IRQ used by the devices on board.

Level	Function
IRQ0	System timer
IRQ4	Serial Port #1
IRQ8	System CMOS / real time clock
IRQ11	Intel(R) 8 Series/C220 Series SMBus Controller
	-8C22
IRQ13	Numeric data processor
IRQ16	Intel(R) 8 Series/C220 Series USB EHCI#2 -8C2D
IRQ19	Intel(R) 8 Series 4 port Serial ATA Storage Controller
	-8C01
IRQ22	High Definition Audio Controller
IRQ23	Intel(R) 8 Series/C220 Series USB EHCI#1-8C26


C. Watchdog Timer Configuration

The WDT is used to generate a variety of output signals after a user programmable count. The WDT is suitable for use in the prevention of system lock-up, such as when software becomes trapped in a deadlock. Under these sorts of circumstances, the timer will count to zero and the selected outputs will be driven. Under normal circumstance, the user will restart the WDT at regular intervals before the timer counts to zero.

SAMPLE CODE: File of the NCT5523D.H //-----// // THIS CODE AND INFORMATION IS PROVIDED "AS IS" WITHOUT WARRANTY OF ANY // KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE // IMPLIED WARRANTIES OF MERCHANTABILITY AND/OR FITNESS FOR A PARTICULAR // PURPOSE. // //-----#ifndef __NCT5523D_H #define __NCT5523D_H 1 //-----#define NCT5523D_INDEX_PORT (NCT5523D_BASE) #define NCT5523D_DATA_PORT (NCT5523D_BASE+1) //-----#define NCT5523D_REG_LD 0x07 //-----#define NCT5523D_UNLOCK 0x87 #define NCT5523D_LOCK 0xAA //----unsigned int Init_NCT5523D(void); void Set_NCT5523D_LD(unsigned char); void Set_NCT5523D_Reg(unsigned char, unsigned char); unsigned char Get_NCT5523D_Reg(unsigned char); //-----

#endif //__NCT5523D_H

File of the MAIN.CPP.
//
//
// THIS CODE AND INFORMATION IS PROVIDED "AS IS" WITHOUT WARRANTY OF ANY
// KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE
// IMPLIED WARRANTIES OF MERCHANTABILITY AND/OR FITNESS FOR A PARTICULAR
// PURPOSE.
//
//
#include <dos.h></dos.h>
#include <conio.h></conio.h>
#include <stdio.h></stdio.h>
#include <stdlib.h></stdlib.h>
#include "NCT5523D.H"
//
int main (void);
void WDTInitial(void);
void WDTEnable(unsigned char);

void WDTDisable(void);

iBASE

```
//-----
int main (void)
{
 char SIO;
 SIO = Init_NCT5523D();
 if (SIO == 0)
 {
    printf("Can not detect Nuvoton NCT5523D, program abort.\n");
    return(1);
  }
   WDTInitial();
   WDTEnable(10);
   WDTDisable();
   return 0;
}
//-----
void WDTInitial(void)
{
 unsigned char bBuf;
 Set_NCT5523D_LD(0x08);
                                                             //switch to logic device 8
 bBuf = Get_NCT5523D_Reg(0x30);
 bBuf &= (~0x01);
                                                             //Enable WDTO
 Set_NCT5523D_Reg(0x30, bBuf);
}
//-----
void WDTEnable(unsigned char NewInterval)
{
 unsigned char bBuf;
 Set_NCT5523D_LD(0x08);
                                                             //switch to logic device 8
 Set_NCT5523D_Reg(0x30, 0x01);
                                                             //enable timer
 bBuf = Get_NCT5523D_Reg(0xF0);
 bBuf &= (~0x08);
 Set_NCT5523D_Reg(0xF0, bBuf);
                                                             //count mode is second
```

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Set_NCT5523D_Reg(0xF1, NewInterval);	//set timer
}	
//	
void WDTDisable(void)	
{	
Set_NCT5523D_LD(0x08);	//switch to logic device 8
Set_NCT5523D_Reg(0xF1, 0x00);	//clear watchdog timer
Set_NCT5523D_Reg(0x30, 0x00);	//watchdog disabled
}	
//	
File of the NCT5523D.CPP	
//	

//

// THIS CODE AND INFORMATION IS PROVIDED "AS IS" WITHOUT WARRANTY OF ANY

// KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE

// IMPLIED WARRANTIES OF MERCHANTABILITY AND/OR FITNESS FOR A PARTICULAR

// PURPOSE.

//

//-----

#include "NCT5523D.H"

#include <dos.h>

//-----

unsigned int NCT5523D_BASE;



```
void Unlock_NCT5523D (void);
void Lock_NCT5523D (void);
//-----
unsigned int Init_NCT5523D(void)
{
 unsigned int result;
 unsigned char ucDid;
 NCT5523D_BASE = 0x4E;
 result = NCT5523D_BASE;
 ucDid = Get_NCT5523D_Reg(0x20);
 if (ucDid == 0xC4)
                                                           //NCT5523D??
{ goto Init_Finish; }
 NCT5523D_BASE = 0x2E;
 result = NCT5523D_BASE;
 ucDid = Get_NCT5523D_Reg(0x20);
 if (ucDid == 0xC4)
                                                           //NCT5523D??
{    goto Init_Finish;    }
 NCT5523D_BASE = 0x00;
 result = NCT5523D_BASE;
Init_Finish:
return (result);
}
//-----
void Unlock_NCT5523D (void)
{
 outportb(NCT5523D_INDEX_PORT, NCT5523D_UNLOCK);
 outportb(NCT5523D_INDEX_PORT, NCT5523D_UNLOCK);
}
//-----
void Lock_NCT5523D (void)
{
 outportb(NCT5523D_INDEX_PORT, NCT5523D_LOCK);
```

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```
//-----
void Set_NCT5523D_LD( unsigned char LD)
{
 Unlock_NCT5523D();
 outportb(NCT5523D_INDEX_PORT, NCT5523D_REG_LD);
 outportb(NCT5523D_DATA_PORT, LD);
 Lock_NCT5523D();
}
//-----
void Set_NCT5523D_Reg( unsigned char REG, unsigned char DATA)
{
 Unlock_NCT5523D();
 outportb(NCT5523D_INDEX_PORT, REG);
 outportb(NCT5523D_DATA_PORT, DATA);
 Lock_NCT5523D();
}
//-----
unsigned char Get_NCT5523D_Reg(unsigned char REG)
{
 unsigned char Result;
 Unlock_NCT5523D();
 outportb(NCT5523D_INDEX_PORT, REG);
 Result = inportb(NCT5523D_DATA_PORT);
 Lock_NCT5523D();
 return Result;
}
```

//-----

