MBN500

4-port (AMD G-Series SoC)

USER'S MANUAL

Version: 1.1

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Introduction

Product Description

The MBN500 networking motherboard is based on the latest AMD G-Series SoC. It is ideally suited for rugged and compact design as entry level networking appliance.

The motherboard is configured with the AMD GX-412HC or GX-412TC SoC. It supports one DDR3L SO-DIMM, tour GbE ports with one bypass segment, one mini PCIe half-size socket, one Cfast socket, one STAT 3.0 and two USB 3.0 connectors. Moreover, it has more extensions I/O through pin-deader such as two USB 2.0 and COM2 (LCM).

MBN500-4CG Features

- AMD GX-412HC Quad Care 1.2GHz SoC
- Four Intel® i211-AT Gigabit LAN ports
- One DDR3L SO-DIMM, up to 8GB
- Mini Display Port
- Mini PCI-E half size slot x1
- Cfast socket
- One Bypass Segment on Eth3/4 and configurable by BIOS

MBN500-4C Features

- AMD GX-412TC Quad Care 1.0GHz SoC
- Four Intel® i211-AT Gigabit LAN ports
- One DDR3L SO-DIMM, up to 8GB
- Mini PCI-E half size slot x1
- Cfast socket
- One Bypass Segment on Eth3/4 and configurable by BIOS

Checklist

Your MBN500 package should include the items listed below.

- The MBN500-4CG or MBN500-4C embedded board
- Windows Drivers are able to download from iBase, please contact your sales representative.
- Cables are optional.

MBN500 Specifications

Product Name	MBN500-4CG or MBN500-4C		
Form Factor	Proprietary Size		
CPU Type Operating Frequency	AMD G-Series Crowned Eagle SoC, 28nm process technology MBN500-4CG: AMD GX-412HC Quad Core 1.2GHz [TPD = 7W] MBN500-4C: AMD GX-412TC Quad Core 1.0GHz [TPD = 6W]		
BIOS	AMI BIOS 64Mb		
Memory	One DDR3L SO-DIMM socket, Non-ECC, unbuffered		
Display	N/A		
Ethernet controller	Intel I211-AT PCI Express Gigabit ethernet controller x4		
LAN	Eth1, 2, 3 & 4: Intel I211-AT @ RJ45 with LED		
Network Bypass	One Bypass segment (Eth3/4) Control by GPIO / Watchdog		
Front Edge	 System LED: Power (Green) / Bypass (Green/Red) / Status (Yellow/Red) LAN LED: Link/Active (Green) x 4; LAN Speed (Yellow/Green) x 4 1 x Mini DP (MBN500-4CG only) Factory Mode Restore Reset Switch (GPIO control) 1 x USB 2.0 receptacle 		
Rear Edge	 1 x RJ45 Console 2 x USB 3.0 receptacle RJ45 GbE port x 4 with status LED 1 x Power on/off switch 2 x USB 2.0 Cylindrical (Tip) Connector DC +12V inlet with screw lock 		
Internal I/O Headers	 1 x DC Fan 3-pin Connector 1 x DC-in 2-pin header (12V) 2 USB 2.0 DF11 8-pin connector 1 x COM2 DF11 8-pin connector 1 x SATA 3.0 data 7-pin connector 1 x SATA 3.0 data 7-pin connector 1 x SATA power (5V) 4-pin JST connector 1 x Cfast socket 1 x Mini PCIe half-size socket 4 x GPIO header 6-pin pitch 2.0mm 		
LPC I/O	Nuvoton NCT5523D: • 1 x RJ45 Console • 1 x COM2 DF11 8-pin connector; RS232 4-pin		
Watchdog Timer	Yes (256 segments, 0, 1, 2255 sec/min)		
Expansion Slot	Mini PCIe half-size socket x 1		
Power Requirement	 Full range 40W Adapter / 12V (Optional) Minimum 12V @ 2A without Cfast & mini PCIe module 		
Dimensions	162 (W) x 110 (D) mm		
Operation Temperature	0 ~ 60 °C (32 ~ 140 °F)		
Storage Temperature	-20 ~ 80 °C (-4 ~ 176 °F)		

Board Dimensions



unit: mm

Installations

This section provides information on how to use the jumpers and connectors on the MBN500 in order to set up a workable system. The topics covered are:

Installing the Memory	. 6
Setting the Jumpers and Connectors	.7

Installing the Memory

The MBN500 board supports one DDR3 memory socket that can support up to 8GB memory, DDR3L (w/o ECC function).

Installing and Removing Memory Modules

To install the DDR3L module, locate the memory slot on the board and perform the following steps:

- 1. Hold the DDR3L module so that the key of the DDR3L module aligns with that on the memory slot. Insert the module into the socket at a slight angle (approximately 30 degrees). Note that the socket and module are both keyed, which means that the module can be installed only in one direction.
- 2. To seat the memory module into the socket, apply firm and even pressure to each end of the module until you feel it slip down into the socket.
- 3. With the module properly seated in the socket, rotate the module downward. Continue pressing downward until the clips at each end lock into position.
- 4. To remove the DDR3L module, press the clips with both hands.



Setting the Jumpers and Connectors

Jumpers are used on MBN500 to select various settings and features according to your needs and applications. Contact your supplier if you have doubts about the best configuration for your needs.

Jumper & Connector Location on MBN500-4CG / MBN500-4C



J1:SPEKER (Reserved)

Pin #	Signal Name
1	VCC5
2	SPKR#

JBAT1: Clear CMOS Setting

JP2	Setting
123	Normal
123	Clear CMOS

JP5: LCM COM2

	Signal Name	Pin #	Pin #	Signal Name
JP5	VCC5	1	2	VCC5
8 0 0 0 2	SOUT2	3	4	RTS#2
	SIN2	5	6	CTS#2
	GND	7	8	GND

JP4: LPC Debug Port

	Signal Name	Pin #	Pin #	Signal Name
	LPC_AD0	1	2	SIO_PLTRST#
	LPC_AD1	3	4	LPC_FRAME#
	LPC_AD2	5	6	+3.3V
S JP4	LPC_AD3	7	8	Ground
	LPC_CLK	9		

J4 : USB2.0 Ports

8	Signal Name	Pin #	Pin #	Signal Name
	+5V	1	2	GND
	P4-	3	4	P5+
	P4+	5	6	P5-
	GND	7	8	+5V

JP1: SPI Debug Port

6	Signal Name	Pin #	Pin #	Signal Name
	NC	1	2	NC
	SPI_CS#0	3	4	3VDUAL
	SPI_SO	5	6	SPI0_HOLD#
1	SPI0_WP#	7	8	SPI_CLK
	GND	9	10	SPI_SI

J2: External SATA Power Connector (only for 2.5" SATA)

Pin #	Signal Name
1	+5V
2	Ground
3	Ground
4	NA

SW1:ATX On/Off



Installations

JP7: System Function Connector

JP7 provides connectors for system indicators that provide light indication of the computer activities and switches to change the computer status. JP7 is a 8-pin header that provides interfaces for the following functions



Power LED: Pins 1,2

The power LED indicates the status of the main power switch.

Pin #	Signal Name
1	+5V
2	GND

ATX Power ON Switch: Pins 3, 4

This 2-pin connector is an "ATX Power Supply On/Off Switch" on the system that connects to the power switch on the case. When pressed, the power switch will force the system to power on. When pressed again, it will force the system to power off.

Pin #	Signal Name
3	Power_ON
4	GND

Hard Disk Drive LED Connector: Pins 5, 6

This connector connects to the hard drive activity LED on control panel. This LED will flash when the HDD is being accessed.

Pin #	Signal Name		
5	+3.3V		
6	-HDD_LED		

Reset Switch: Pins 7, 8

The reset switch allows the user to reset the system without turning the main power switch off and then on again. Orientation is not required when making a connection to this header.

Pin #	Signal Name
7	PM_SYSRST#
8	GND

CPU_FAN1: System Fan Power Connector

FAN1 is a 3-pin header for system fans. (Max. 1A).



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

LED6: Status LED

A1 & C1 : Status LED A2 & C2 : Bypass LED A3 & C3 : Power LED

 C3 🔘 🤇	Ct
A3	A 1

Signal Name	Pin #	Pin #	Signal Name
SIO_GP27	A1	C1	SIO_GP26
ALARM_R	A2	C2	SIO_GP25
PWR_R	A3	C3	GND

Remark: It is controlled by Logical Device 7, Index port is 0x2E, Data port is 0x2F, GPIO24-27 Data Register: 0xE9 BIT4-7

CN11 : DC Power Jack (+12V only)

Remarks: CN11 and J6 cannot be connected at the same time.

J6: AT_12V Connector

J6 is a DC-in internal connector supporting +12V. *Remarks*: CN11 and J6 cannot be connected at the same time.

J6	Pin #	Signal Name
	1	+12V
	2	Ground

SW2: Software reset button

Signal Name	Pin #	Pin #	Signal Name
GND	1	2	GPIO_S5_7

JP6:SODIMM Power select

	Pin #	Signal Name
	1	MEM_1V5
	2	GND
	3	MEM_1V35

JP2 & JP3: Watchdog (WDT) Bypass Control

JP2,JP3		Setting	Function	Power OFF	Power ON,OS run software
		JP2 Pin 2-3 Closed	System LAN bypass function is controlled by Super I/O GP23		GP23 Active: Low: Bypass High: Normal
۲	1	& 3-4 Closed < Default >	System will reboot upon the time out of watchdog timer.		WDT Reboot System
رم ع	JP2	JP2 Pin 1-2 Closed JP3 Pin 1-2 & 3-4 Open	System will Normal LAN upon the time out of watchdog timer.	LAN	Relay Mode Change
۹ ۹	• •	JP2 Pin 2-3 Closed JP3 Pin 1-2 & 3-4 Open	System LAN bypass function is controlled by Super I/O GP23.	Bypass	GP23 Active: Low: Bypass High: Normal
		JP2 Pin 1-2 Closed	System LAN is at normal		LAN Always Normal
		Closed	System will reboot upon the time out of watchdog timer.		WDT Reboot System

- **CN10:Console Port**
- CN1: SATA3.0 Port
- CN3:USB3.0 Port(x2)
- CN4: USB2.0 Port(x1)
- **CN2: CFAST Connector**
- J5: Mini PCI- E(x1) W/USB Connector
- CN6,CN7,CN8,CN9: Intel I211 LAN
- **J3:SODIMM Socket**
- CN5: MINI DP (only MBN500-4CG)

LED1, LED2, LED3, LED4: LAN Port Link, Active LED

BIOS Setup

This chapter describes the different settings available in the BIOS that comes with the board.

BIOS Introduction

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

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 or <F2> 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.

Main Settings Aptio Setup Utility – Copyright © 2015 American Megatrends, Inc.						
Main	Advanced	Chipset	Boot	Security	y Save & Exit	
	In 6 6				Choose the system default language	
Total me	emory		4080 MB (DDR3)			
System	Language		[English]		\rightarrow ←Select Screen	
System	Date	[Mon 08/10/2015] ↑ ↓ Select It		↑↓ Select Item		
System	Time		[15:27:20]		+- Change Field	
Access I	Level		Administrator		F1: General Help F2: Previous Values F3: Optimized Default F4: Save ESC: Exit	

System Date

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

System Time Set the Time. Use Tab to switch between Time 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.

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Main	Advanced	Chipset	Boot	Security	y Save & Exit
 LAN ACP CPU IDE Shut USB NCT NCT Serial 	Configuration state 1 Settings 1 Configuration Configuration down Temperature 2 Configuration 5523D Super IO C 5523D H/W Monite al Port Console Re	e Configuration onfiguration or direction		[Normal]	 → ←Select Screen ↑ ↓ Select Item Enter: Select +- Change Field F1: General Help F2: Previous Values F3: Optimized Default F4: Save ESC: Exit

LAN Configuration state

LAN Bypass Function Setting [Bypass] or [Normal]

ACPI Settings

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Main	Advanced	Chipset	Boot	Security	/ Save & Exit
ACPI S	Settings				→ ←Select Screen
Enable ACPI S	Hibernation Sleep State	[Ena [S3 c	bled] only(Suspend to]	Enter: Select +- Change Field F1: General Help
					F2: Previous Values F3: Optimized Default F4: Save ESC: Exit

Enable Hibernation

Enables or Disables System ability to Hibernate (OS/S4 Sleep State). This option may be not effective with some OS.

ACPI Sleep State

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

CPU Configuration

This section shows the CPU configuration parameters.

Main Advanced	Chipset	Boot	Security	/ Save & Exit
CPU Configuration				
Module Version: 4.6.5.4 AGESA Version: 1.0.0.6	AullinsPI 022			→ ←Select Screen
PSS Support PSTATE Adjustment PPC Adjustment NX Mode SVM Mode CPB Mode Core Leveling Mode ► Node 0 Information		[Enable] [Pstate 0] [Pstate 0] [Enable] [Enable] [Auto] [automatic Mode]		<pre>↑↓ Select Item Enter: Select +- Change Field F1: General Help F2: Previous Values F3: Optimized Default F4: Save ESC: Exit</pre>

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PSS Support

Enable/disable the generation of ACPI _PPC, _PPC, _PSS, and _PCT objects.

PSTATE Adjustment

Provide to adjust startup P-state level.

PPC Adjustment

Provide to adjust _PPC object.

NX Mode

Enable/disable No-execute page protection function.

SVM Mode

Enable/disable CPU Virtualization.

CPB Mode

Enable/disable CPB.

Core Leveling Mode

Change the number of cores in the system.

Node 0 Information

View memory information related to Node 0.

IDE Configuration

Main	Advanced	Chipset	Boot	Security	Save & Exit
IDE C	onfiguration				
SATA SATA	Port0 Port1	N	ot Present ot Present		→ ←Select Screen ↑↓ Select Item Enter: Select +- Change Field F1: General Help F2: Previous Values F3: Optimized Default F4: Save ESC: Exit

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Shutdown Temperature Configuration Aptio Setup Utility – Copyright © 2015 American Megatrends, Inc.

Main	Advanced	Chipset	Boot	Security	Save & Exit
ACPI	Shutdown Temperat	ture	[Disabled]		→ ← Select Screen ↑ ↓ Select Item Enter: Select +- Change Field F1: General Help F2: Previous Values F3: Optimized Default F4: Save ESC: Exit

USB Configuration

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Main Advanced	Chipset	Boot	Security	/ Save & Exit
USB Configuration				
USB module Version		8.10.33		
USB Devices:				
1 Keyboard, 2Hubs				\rightarrow \leftarrow Select Screen
Logoov LISP Support		[Enchlod]		↑↓ Select Item
		[Enabled]		Enter: Select
		[Enabled]		Fi Conorol Holm
EHCI Hand-off	_	[Enabled]		FI: General Help
USB Mass Storage Drive	r Support	[Enabled]		F2: Previous values
				F3: Optimized Default
USB hardware delays and	d time-outs:			F4: Save
USB transfer time-out		[20 sec]		ESC: Exit
Device reset tine-out		[20 sec]		
Device power-up delay		Auto		
,				

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.

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

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.

USB Transfer time-out

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

Device reset time-out

USB mass storage device start unit command time-out.

Device power-up delays

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 100 ms, For a Hub port the delay is taken form Hub descriptor.

NCT5523D Super IO Configuration

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Main	Advanced	Chipset	Boot	Security	/ Save & Exit
NCT5	523D Super IO Conf	iguration			
NCT5523D Super IO Chip Serial Port 0 Configuration Serial Port 1 Configuration Bayes on other payor foilure		NCT5523D → ←Select Scre ↑ ↓ Select Item Enter: Select +- Change Fiel		→ ←Select Screen ↑↓ Select Item Enter: Select +- Change Field	
FOWE			[power on]		F1: General Help F2: Previous Values F3: Optimized Default F4: Save ESC: Exit

Serial Port 0 Configuration

Set parameters of Serial Port 0 (COMA)

Serial Port 1 Configuration

Set parameters of Serial Port 1 (COMB)

NCT5523D H/W Monitor

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Main	Advanced	Chipset	Boot	Security	Save & Exit
PC He	ealth Status				
Smart	Fan Mode Configur	ation	[Dischlod]		
SMart SYS 1 CPU ⁻ Fan S VCOF Memo	Fan Function Femp peed EE ry Voltage		[Disabled] :+40.5 C :+44.0 C :0 RPM :+0.856 V :+1.504 V		<pre>→ ←Select Screen</pre>

Temperatures/Voltages

These fields are the parameters of the hardware monitoring function feature of the board. The values are read-only values as monitored by the system and show the PC health status.

Smart Fan Function

This field enables or disables the smart fan feature. At a certain temperature, the fan starts turning. Once the temperature drops to a certain level, it stops turning again.

Serial Port Console Redirection

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Main	Advanced	Chipset	Boot	Security	/ Save & Exit
COM0 Conso ► Cons	le Redirection ole Redirection Sett	ings		[Disabled]	
Serial Windo Conso ► Cons	Port for out-of-Band ws Emergency Man le Redirection ole Redirection Sett	Management/ agement Services	(EMS)	[Disabled]	→ ←Select Screen ↑↓ Select Item Enter: Select +- Change Field F1: General Help F2: Previous Values F3: Optimized Default F4: Save ESC: Exit

Console Redirection

Console Redirection Enable or Disable

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.

Main	Advanced	Chipset	Boot	Security	Save & Exit
► So	uth Bridge			→ ↑ E1 ++ F2 F2 F2 F2 F4 E5	←Select Screen ↓ Select Item nter: Select - Change Field 1: General Help 2: Previous Values 3: Optimized Default 4: Save SC: Exit

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Main	Advanced	Chipset	Boot	Security	y Save & Exit
AMD	Reference Code	Version:	Mullins PI 1.0	.0.6	Options for SATA Configuration
► SB	USB Configuration	on			
					$\rightarrow \leftarrow$ Select Screen
					↑↓ Select Item
					Enter: Select
					+- Change Field
					F1: General Help
					F2: Previous Values
					F3: Optimized Default
					F4: Save
					ESC: Exit

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Main	Advanced	Chipset	Boot	Security	Save & Exit
OnChi OnChi SATA	p SATA Channel p SATA Type p IDE mode IDE Combined N	lode	[Enabled] [AHCI] [Legacy mode] [Enabled]		 → ← Select Screen ↑ ↓ Select Item Enter: Select +- Change Field F1: General Help F2: Previous Values F3: Optimized Default F4: Save ESC: Exit

BIOS Setup

OnChip SATA Channel

Enabled / Disabled Serial ATA.

OnChip SATA Type

Select OnChip SATA Type.

OnChip IDE mode

Sata IDE Controller Mode.

SATA IDE Combined Mode

SATA IDE Controller Combined Mode

Boot Settings

This section allows you to configure the boot settings.

Main	Advanced	Chipset	Boot	Security	/ Save & Exit
Boot Co Setup F Bootup	onfiguration Prompt Timeout NumLock State		1 [off]		
Quiet B Fast Bo	oot ot		[Disabled] [Disabled]		
Boot mo	ode select		[LEGACY]		→ ←Select Screen †↓ Select Item
FIXED	BOOT ORDER Pric	orities			Enter: Select
Boot op	tion #1		[Hard Disk]		+- Change Field
Boot op	tion #2		[CD/DVD]		F1: General Help
Boot op	tion #3		[USB Hard Disk]		F2: Previous Values
Boot op	tion #4		[USB CD/DVD]		F3: Optimized Default
Boot op	tion #5		[USB KEY]		F4: Save
Boot op	tion #6		[USB Floppy]		ESC: Exit
Boot op	tion #7		[Network]		
► CSM16	parameters				
CSM pa	arameters				

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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.

Boot mode select

Select boot mode LEGACY/UEFI

Boot Option Priorities

Sets the system boot order.

CSM16 parameters

CSM16 configuration Enable/Disable, Option ROM execution settings,etc.

		Aprilo Setup Otinity – Copyright @ 2015 American Megatienus, inc.								
Г										
	Main	Advanced	Chipset	Boot	Security	Save & Exit				

Main	Advanced	Chipset	Boot	Security	/ Save & Exit
CSM1	6 configuration				
CSM1	6 Module Version		07.76		→ ←Select Screen
GateA Option	20 Active ROM Messages		[Upon Red [Force BIC	quest] DS]	<pre>File Select Free Field File General Help F2: Previous Values F3: Optimized Default F4: Save</pre>
					ESC: Exit

GateA20 Active

UPON REQUEST - GA20 can be disabled using BIOS services. ALWAYS – do not allow disabling GA20; this option is useful when any RT code is executed above 1MB

Option ROM Messages

Set display mode for Option ROM

CSM parameters

OpROM execution, boot options filter, etc.

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Main	Advanced	Chipset	Boot	Security	Save & Exit
Launch CSM Boot option filter		[Enabled] [UEFI and Legacy] [Do not launch]		Select Serees	
Launch Storage OpROM policy Launch Video OpROM policy		[Legacy o	only] only]	→ ← Select Screen ↑↓ Select Item Enter: Select +- Change Field F1: Concert Holp	
Other PCI device ROM priority		iredaca c	νριτοινί]	F1: General help F2: Previous Values F3: Optimized Default F4: Save ESC: Exit	

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.

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Main	Advanced	Chipset	Boot	Security	Save & Exit
Passw	ord Description				
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			set, then asked this is a to boot e		
The pa	assword length mus	st be			
in the	following range:				
Minim	um length		3		\rightarrow \leftarrow Select Screen
Maxim	num length		20		↑↓ Select Item
Admin User F	istrator Password Password				Enter: Select +- Change Field F1: General Help F2: Previous Values F3: Optimized Default F4: Save ESC: Exit

Administrator Password

Set Setup Administrator Password.

User Password

Set User Password.

Save & Exit Settings

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Main	Advanced	Chipset	Boot	Security	/ Save & Exit
Save	Changes and Exit				
Disca	rd Changes and Exit				
Save	Changes and Reset				
Disca	rd Changes and Rese	et			
Save	Options				
Save	Changes				$\rightarrow \leftarrow \texttt{Select Screen}$
Discard Changes					↑↓ Select Item
					Enter: Select
Restore Defaults					+- Change Field
Save as User Defaults					F1: General Help
Restore User Defaults					F2: Previous Values
					F3: Optimized Default
Boot Override				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.

Drivers Installation

This section describes the installation procedures for software and drivers. The software and drivers are included with the board. If you find the items missing, please contact the vendor where you made the purchase. The contents of this section include the following:

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LAN Drivers Installation	46

IMPORTANT NOTE:

After installing your Windows operating system, you must install first the Intel Chipset Software Installation Utility before proceeding with the drivers installation.

Chipset Software Installation Utility

1. In the Drvier folder, execute the CDGulde file. Click *AMD*, then *AMD Steppe Eagle Drivers*.

👪 AMD
퉬 Lan
🐌 SCSI
퉬 TOOLS
autorun
🛍 CD
(CDGuide
🚱 guidepost
🧼 Icon1
🧼 Icon2
💑 icon3
for inner 1

	side T	his CD Version : A-2_Gen_G-1.0 @1
-	AMD	AMD Steppe Eagle Drivers
Good	LAN Card	
말의	Tools	
	8	Support AMD Steppe Eagle Drivers

2. Click AMD Steppe Eagle Graphics Drivers.

Installation



3. Select the language you would like to be displayed and click *Next*.

AMD - Catalyst [™] Install Ma	nager - Version: 08.00.0916
Welcome	
Welcome	Welcome Catalyst '^ Install Manager is used to install and update the software for your graphics products
AMD CATALYST SOFTWARE	Lanquage Support Which language would you ike Catalyst™ Install Manager to display? English
	http://www.amd.com

Installation

4. Select **Express** and the **installation location** and click *Next*.



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5. Click Accept to accept the End User License Agreement.

End User License Agreement

End User License Agreement

PLEASE READ THIS LICENSE CAREFULLY BEFORE USING THE SOFTWARE. BY USING THE SOFTWARE, YOU ARE AGREEING TO BE BOUND BY THE TERMS OF THIS LICENSE.

WARNING: The Materials may disable or alter: (1) software including features and functions in the operating system, drivers and applications, and other system settings; and (2) system services. WHEN THE MATERIALS ARE USED TO DISABLE OR ALTER THESE ITEMS IN WHOLE OR PART, YOU MAY EXPERIENCE (A) INCREASED RISKS THAT CERTAIN SECURITY FUNCTIONS DO NOT FUNCTION THEREBY EXPOSING YOUR COMPUTER SYSTEM TO POTENTIAL SECURITY THREATS INCLUDING, WITHOUT LIMITATION, HARM FROM VIRUSES, WORMS AND OTHER HARMFUL SOFTWARE; (B) PERFORMANCE AND INTEROPERABILITY OPTENTIAL SECURITY ADVERSELY AFFECT YOUR EXPERIENCE AND THE STABILITY OF YOUR COMPUTING SYSTEM; AND (C) OTHER EXPERIENCES RESULTING IN ADVERSE EFFECTS, INCLUDING, BUT NOT LIMITED, TO DATA CORRUPTION OR LOSS.

The best of the solution of th



Decline

6. To reboot the system, click Yes.



LAN Drivers Installation

- 1. In the Drvier folder, execute the CDGulde file.
- 2. Click LAN Card and then Intel LAN Controller Drivers.



3. Click Intel(R) 121x Gigabit Network Drivers

Inside T	Version : A-2_Gen_G-1.0 @1
AMD	Intel(R) Gigabit Ethernet Drivers Intel(R) I21x Gigabit Network Drivers
LAN Card	
8	Support Intel(R) 121x Gigabit Network Drivers

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

5. When the Ready to Install the Program screen appears, click *Install* to continue.

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

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-03AFh	PCI bus
0000h-000Fh	Direct memory access controller
0010h-001Fh	Motherboard resources
0020h-0021h	Programmable interrupt controller
0040h-0043h	System timer
0061h-0061h	System speaker
0070h-0071h	System CMOS/real time clock
0072h-007Fh	Motherboard resources
0081h-0083h	Direct memory access controller
0084h-0086h	Motherboard resources
0087h-0087h	Direct memory access controller
00A0h-00A1h	Programmable interrupt controller
00A2h-00BFh	Motherboard resources
00C0h-000Dh	Direct memory access controller
00F0h-00FFh	Numeric data processor
02F8h-02FFh	Communications Port (COM2)
03B0h-03BBh	PCI Express standard Root Port
03B8h-03DFh	PCI bus
03F8h-03FFh	Communications Port (COM1)
0CD8h-0CDFh	Motherboard resources
F000h-F00Fh	AMD SATA Controller

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
IRQ 0	System timer
IRQ 3	Communications Port (COM2)
IRQ 4	Communications Port (COM1)
IRQ 8	High precision event timer
IRQ 13	Numeric data processor
IRQ 18	Standard Enhanced PCI to USB Host Controller
IRQ 18	Standard Enhanced PCI to USB Host Controller
IRQ 19	AMD SATA Controller
IRQ81	Microsoft ACPI-Compliant System
IRQ82	Microsoft ACPI-Compliant System
IRQ83	Microsoft ACPI-Compliant System
IRQ84	Microsoft ACPI-Compliant System

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:

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

APPENDIX

```
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>
#include <conio.h>
#include <stdio.h>
#include <stdlib.h>
#include "NCT5523D.H"
int main (void);
void WDTInitial(void);
void WDTEnable(unsigned char);
void WDTDisable(void);
//-----
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 \&= (\sim 0x01);
Set_NCT5523D_Reg(0x30, bBuf); //Enable WDTO
}
```

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); $bBuf \&= (\sim 0x08);$ Set NCT5523D Reg(0xF0, bBuf); //count mode is second 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 } //-----