NE&COM

NEXCOM International Co., Ltd.

Network and Communication Solutions
Network Security Appliance
DNA 120
User Manual

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Preface

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Acknowledgements

DNA 120 is a trademark of NEXCOM International Co., Ltd. All other product names mentioned herein are registered trademarks of their respective owners.

Regulatory Compliance Statements

This section provides the FCC compliance statement for Class B devices and describes how to keep the system CE compliant.

Declaration of Conformity

FCC

This equipment has been tested and verified to comply with the limits for a Class B digital device, pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. Operation of this equipment in a residential area (domestic environment) is likely to cause harmful interference, in which case the user will be required to correct the interference (take adequate measures) at their own expense.

CE

The product(s) described in this manual complies with all applicable European Union (CE) directives if it has a CE marking. For computer systems to remain CE compliant, only CE-compliant parts may be used. Maintaining CE compliance also requires proper cable and cabling techniques.

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RoHS Compliance

NEXCOM RoHS Environmental Policy and Status Update

NEXCOM is a global citizen for building the digital infrastructure. We are committed to providing green products and services, which are compliant with European Union RoHS (Restriction on Use of Hazardous Substance in Electronic Equipment) directive 2011/65/EU, to be your trusted green partner and to protect our environment.

RoHS restricts the use of Lead (Pb) < 0.1% or 1,000ppm, Mercury (Hg) < 0.1% or 1,000ppm, Cadmium (Cd) < 0.01% or 100ppm, Hexavalent Chromium (Cr6+) < 0.1% or 1,000ppm, Polybrominated biphenyls (PBB) < 0.1% or 1,000ppm, and Polybrominated diphenyl Ethers (PBDE) < 0.1% or 1,000ppm.

In order to meet the RoHS compliant directives, NEXCOM has established an engineering and manufacturing task force in to implement the introduction of green products. The task force will ensure that we follow the standard NEXCOM development procedure and that all the new RoHS components and new manufacturing processes maintain the highest industry quality levels for which NEXCOM are renowned.

The model selection criteria will be based on market demand. Vendors and suppliers will ensure that all designed components will be RoHS compliant.

How to recognize NEXCOM RoHS Products?

For existing products where there are non-RoHS and RoHS versions, the suffix "(LF)" will be added to the compliant product name.

All new product models launched after January 2013 will be RoHS compliant. They will use the usual NEXCOM naming convention.

Warranty and RMA

NEXCOM Warranty Period

NEXCOM manufactures products that are new or equivalent to new in accordance with industry standard. NEXCOM warrants that products will be free from defect in material and workmanship for 2 years, beginning on the date of invoice by NEXCOM. HCP series products (Blade Server) which are manufactured by NEXCOM are covered by a three year warranty period.

NEXCOM Return Merchandise Authorization (RMA)

- Customers shall enclose the "NEXCOM RMA Service Form" with the returned packages.

- Customers must collect all the information about the problems encountered and note anything abnormal or, print out any on-screen messages, and describe the problems on the "NEXCOM RMA Service Form" for the RMA number apply process.

- Customers can send back the faulty products with or without accessories (manuals, cable, etc.) and any components from the card, such as CPU and RAM. If the components were suspected as part of the problems, please note clearly which components are included. Otherwise, NEXCOM is not responsible for the devices/parts.

- Customers are responsible for the safe packaging of defective products, making sure it is durable enough to be resistant against further damage and deterioration during transportation. In case of damages occurred during transportation, the repair is treated as "Out of Warranty."

- Any products returned by NEXCOM to other locations besides the customers' site will bear an extra charge and will be billed to the customer.

Repair Service Charges for Out-of-Warranty Products

NEXCOM will charge for out-of-warranty products in two categories, one is basic diagnostic fee and another is component (product) fee.

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System Level

- Component fee: NEXCOM will only charge for main components such as SMD chip, BGA chip, etc. Passive components will be repaired for free, ex: resistor, capacitor.

- Items will be replaced with NEXCOM products if the original one cannot be repaired. Ex: motherboard, power supply, etc.

- Replace with 3rd party products if needed.

- If RMA goods can not be repaired, NEXCOM will return it to the customer without any charge.

Board Level

- Component fee: NEXCOM will only charge for main components, such as SMD chip, BGA chip, etc. Passive components will be repaired for free, ex: resistors, capacitors.

- If RMA goods can not be repaired, NEXCOM will return it to the customer without any charge.

Warnings

Read and adhere to all warnings, cautions, and notices in this guide and the documentation supplied with the chassis, power supply, and accessory modules. If the instructions for the chassis and power supply are inconsistent with these instructions or the instructions for accessory modules, contact the supplier to find out how you can ensure that your computer meets safety and regulatory requirements.

Cautions

Electrostatic discharge (ESD) can damage system components. Do the described procedures only at an ESD workstation. If no such station is available, you can provide some ESD protection by wearing an antistatic wrist strap and attaching it to a metal part of the computer chassis.

Safety Information

Before installing and using the device, note the following precautions:

- Read all instructions carefully.

- Do not place the unit on an unstable surface, cart, or stand.

- Follow all warnings and cautions in this manual.

- When replacing parts, ensure that your service technician uses parts specified by the manufacturer.

- Avoid using the system near water, in direct sunlight, or near a heating device.

- The load of the system unit does not solely rely for support from the rackmounts located on the sides. Firm support from the bottom is highly necessary in order to provide balance stability.

- The computer is provided with a battery-powered real-time clock circuit. There is a danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.

Installation Recommendations

Ensure you have a stable, clean working environment. Dust and dirt can get into components and cause a malfunction. Use containers to keep small components separated.

Adequate lighting and proper tools can prevent you from accidentally damaging the internal components. Most of the procedures that follow require only a few simple tools, including the following:

- A Philips screwdriver

- A flat-tipped screwdriver

- A grounding strap

- An anti-static pad

Using your fingers can disconnect most of the connections. It is recommended that you do not use needle-nose pliers to disconnect connections as these can damage the soft metal or plastic parts of the connectors.

Safety Precautions

1. Read these safety instructions carefully.

2. Keep this User Manual for later reference.

3. Disconnect this equipment from any AC outlet before cleaning. Use a damp cloth. Do not use liquid or spray detergents for cleaning.

4. For plug-in equipment, the power outlet socket must be located near the equipment and must be easily accessible.

5. Keep this equipment away from humidity.

6. Put this equipment on a stable surface during installation. Dropping it or letting it fall may cause damage.

7. The openings on the enclosure are for air convection to protect the equipment from overheating. DO NOT COVER THE OPENINGS.

8. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.

9. Place the power cord in a way so that people will not step on it. Do not place anything on top of the power cord. Use a power cord that has been approved for use with the product and that it matches the voltage and current marked on the product's electrical range label. The voltage and current rating of the cord must be greater than the voltage and current rating marked on the product.

10. All cautions and warnings on the equipment should be noted.

11. If the equipment is not used for a long time, disconnect it from the power source to avoid damage by transient overvoltage.

12. Never pour any liquid into an opening. This may cause fire or electrical shock.

13. Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel.

14. If one of the following situations arises, get the equipment checked by service personnel:
    a. The power cord or plug is damaged.
    b. Liquid has penetrated into the equipment.
    c. The equipment has been exposed to moisture.
    d. The equipment does not work well, or you cannot get it to work according to the user's manual.
    e. The equipment has been dropped and damaged.
    f. The equipment has obvious signs of breakage.

15. Do not place heavy objects on the equipment.

16. The unit uses a three-wire ground cable which is equipped with a third pin to ground the unit and prevent electric shock. Do not defeat the purpose of this pin. If your outlet does not support this kind of plug, contact your electrician to replace your obsolete outlet.

17. CAUTION: DANGER OF EXPLOSION IF BATTERY IS INCORRECTLY REPLACED. REPLACE ONLY WITH THE SAME OR EQUIVALENT TYPE RECOMMENDED BY THE MANUFACTURER. DISCARD USED BATTERIES ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS.

Technical Support and Assistance

1. For the most updated information of NEXCOM products, visit NEXCOM's website at www.nexcom.com.

2. For technical issues that require contacting our technical support team or sales representative, please have the following information ready before calling:
   – Product name and serial number
   – Detailed information of the peripheral devices
   – Detailed information of the installed software (operating system, version, application software, etc.)
   – A complete description of the problem
   – The exact wordings of the error messages

Warning!
1. Handling the unit: carry the unit with both hands and handle it with care.

2. Maintenance: to keep the unit clean, use only approved cleaning products or clean with a dry cloth.

3. CompactFlash: Turn off the unit's power before inserting or removing a CompactFlash storage card.

Conventions Used in this Manual

Warning:
Information about certain situations, which if not observed, can cause personal injury. This will prevent injury to yourself when performing a task.

Caution:
Information to avoid damaging components or losing data.

Note:
Provides additional information to complete a task easily.

Global Service Contact Information

Headquarters
NEXCOM International Co., Ltd.
15F, No. 920, Chung-Cheng Rd.,
ZhongHe District, New Taipei City, 23586,
Taiwan, R.O.C.
Tel: +886-2-8226-7786
Fax: +886-2-8226-7782
www.nexcom.com

America
USA
NEXCOM USA
2883 Bayview Drive,
Fremont CA 94538, USA
Tel: +1-510-656-2248
Fax: +1-510-656-2158
Email: sales@nexcom.com
www.nexcom.com

Asia
Taiwan
NEXCOM Intelligent Systems
Taipei Office
13F, No.920, Chung-Cheng Rd.,
ZhongHe District,
New Taipei City, 23586, Taiwan, R.O.C.
Tel: +886-2-8226-7796
Fax: +886-2-8226-7792
Email: sales@nexcom.com.tw
www.nexcom.com.tw

NEXCOM Intelligent Systems
Taichung Office
16F, No.250, Sec. 2, Chongde Rd.,
Beitun Dist.,
Taichung City 406, R.O.C.
Tel: +886-4-2249-1179
Fax: +886-4-2249-1172
Email: sales@nexcom.com.tw
www.nexcom.com.tw

Japan
NEXCOM Japan
9F, Tamachi Hara Bldg.,
4-11-5, Shiba Minato-ku,
Tokyo, 108-0014, Japan
Tel: +81-3-5419-7830
Fax: +81-3-5419-7832
Email: sales@nexcom-jp.com
www.nexcom-jp.com

China
NEXCOM China
1F & 2F, Block A, No. 16 Yonyou Software Park,
No. 68 Beiqing Road, Haidian District,
Beijing, 100094, China
Tel: +86-010-5704-2680
Fax: +86-010-5704-2681
Email: sales@nexcom.cn
www.nexcom.cn

Chengdu Office

9F, Shuxiangxie, Xuefu Garden,
No.12 Section 1, South Yihuan Rd.,
Chengdu, 610061, China
Tel: +86-28-8523-0186
Fax: +86-28-8523-0186
Email: sales@nexcom.cn
www.nexcom.cn

Shanghai Office

Room 603/604, Huiyinmingzun Plaza Bldg., 1,
No.609, Yunlin East Rd.,
Shanghai, 200333, China
Tel: +86-21-5278-5868
Fax: +86-21-3251-6358
Email: sales@nexcom.cn
www.nexcom.cn

Shenzhen Office

Room1707, North Block, Pines Bldg.,
No.7 Tairan Rd., Futian Area,
Shenzhen, 518040, China
Tel: +86-755-8332-7203
Fax: +86-755-8332-7213
Email: sales@nexcom.cn
www.nexcom.cn

Wuhan Office

1-C1804/1805, Mingze Liwan, No. 519
South Luoshi Rd., Hongshan District,
Wuhan, 430070, China
Tel: +86-27-8722-7400
Fax: +86-27-8722-7400
Email: sales@nexcom.cn
www.nexcom.cn

Europe
United Kingdom
NEXCOM EUROPE

10 Vincent Avenue,
Crownhill Business Centre,
Milton Keynes, Buckinghamshire
MK8 0AB, United Kingdom
Tel: +44-1908-267121
Fax: +44-1908-262042
Email: sales.uk@nexcom.eu
www.nexcom.eu

Italy
NEXCOM ITALIA S.r.l

Via Gaudenzio Ferrari 29,
21047 Saronno (VA), Italia
Tel: +39 02 9628 0333
Fax: +39 02 9625570
Email: nexcomitalia@nexcom.eu
www.nexcomitalia.it

Package Contents

Before continuing, verify that the DNA 120 package that you received is complete. Your package should have all the items listed in the following table.

Item	Part Number	Name	Description	Qty
1	19L00012000X0	DNA 120 ASSY		1
2	6013300339X00	DNA 113 EPE Sentenel	210 x 106 x 65.6mm	2
3	7400040002X00	Power Adapter FSP:FSP040-DGAA1(N09001)	40W 12V/ 3.33A for NXG50	1
4	6012200049X00	ASG110 PE Bag 24x38cm	240 x 380 x 0.08mm	1
5	6023309084X00	Console Cable HO-BASE:MD-0908-180B	COM Port. DB9 Female to RJ45 8P8C L:1800mm	1
6	6012200053X00	PE Zipper Bag #3	100x70mm, w/China RoHS Symbol	1
7	50311F0100X00	(H)Round Head Screw w/Spring+Flat Washer Long FEI:P3x6L	P3x6 iso/SW6x0.5 NI	1
8	60233PW154X00	SATA DOM Power Cable EDI:355202020071-RS	JST 2.5 2-pin Pitch 2.5mm to MOX1.25 2-pin Pitch 1.0mm L=70mm	1
9	601111A146X00	Inner Carton DNA 110 YI GIA	229 x 197 x 125mm A Flute	1
10	601111A147X00	Outer Carton DNA 110 YI GIA	636 x 488 x 304mm A Flute	1
11	602DCD0759X00	(E)DNA 120 CD Driver VER:1.0	JCL	1

Ordering Information

The following below provides ordering information for DNA 120.

Barebone

DNA 120 (P/N: 10L00012000X0)

4th generation Intel® Atom™ processor E3815 single core, BGA type, 1 DDR3 SO-DIMM slots, 4 Copper LAN ports, SATA DOM socket, USB ports, VGA port, mini-PCIe slot (optional)

Chapter 1: Product Introduction

Overview

DNA 120

Key Features

- Intel® Atom™ processor E3815, BGA type

- DDR3- SO-DIMM memory, max. 8GB

- Support 4 PCIe GbE LAN ports

- Support one mini-PCIe x1 slot (optional)

Hardware Specifications

Main Board

- DNB120
- Intel® Atom™ processor E3815, BGA type

Main Memory

- DDR3 1066 SO-DIMM memory, max. 8GB

LAN Features

- 4x LAN Chip: Intel® i211-AT
- Support 10/100/1000 link speed
- 4x copper ports

Expansion

- 1x mini-PCIe slot (optional)

I/O Interface-Front

- Power status/HDD status/Power button

I/O Interface-Rear

- 2x USB 2.0 ports
- 1x RJ45 type console port
- 4x Copper ports
- 1x VGA port
- 1x DC power input
- 1x Reset button

Devices

- 1x Internal SATA DOM

Power Input

- 40W power adapter

Chassis Dimensions

- Chassis Dimension: 202.4 x 110.1 x 44mm
- Carton Dimension: 229 x 197 x 125mm

Weight

- Without Packing: 2Kg
- With Packing: 4Kg

Certifications

- CE approval
- FCC Class B
- UL

Knowing Your DNA 120

Front Panel

Power LED

Power Button   **HDD LED**

Rear Panel

RJ45 Console   **VGA**

Reset Button

12VDC Input

USB 3.0/2.0 Ports   **LAN 1 to LAN 4 Ports**
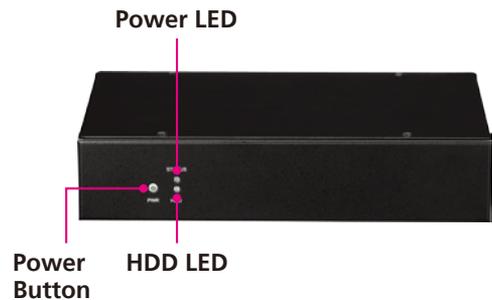
Power Button
Press to power-on or power-off the system.

Power LED
Indicates the power status of the system.

HDD LED
Indicates the hard drive activity.

Reset Button
Press this button to restart the system.

USB 3.0/2.0 Ports
Used to connect USB 3.0/2.0 devices.
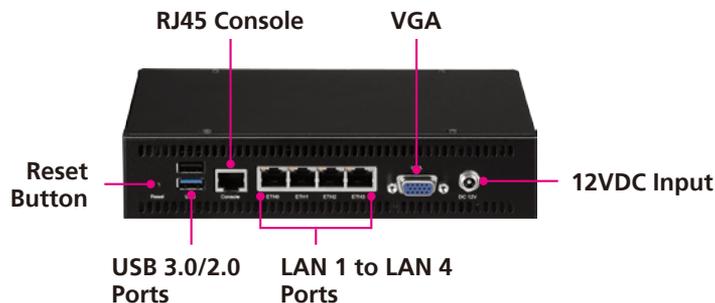
RJ45 Console Port
Used to connect RJ45 type console port.

LAN1 to LAN 4 Ports
Used to connect network devices.

VGA
Used to connect an analog VGA monitor.

12VDC Input
Used to plug a DC power cord.

Chapter 2: Jumpers and Connectors

This chapter describes how to set the jumpers and connectors on the DNA 120 motherboard.

Before You Begin

▪ Ensure you have a stable, clean working environment. Dust and dirt can get into components and cause a malfunction. Use containers to keep small components separated.

▪ Adequate lighting and proper tools can prevent you from accidentally damaging the internal components. Most of the procedures that follow require only a few simple tools, including the following:
  – A Philips screwdriver
  – A flat-tipped screwdriver
  – A set of jewelers screwdrivers
  – A grounding strap
  – An anti-static pad

▪ Using your fingers can disconnect most of the connections. It is recommended that you do not use needle-nosed pliers to disconnect connections as these can damage the soft metal or plastic parts of the connectors.

▪ Before working on internal components, make sure that the power is off. Ground yourself before touching any internal components, by touching a metal object. Static electricity can damage many of the electronic components. Humid environments tend to have less static electricity than dry environments. A grounding strap is warranted whenever danger of static electricity exists.

Precautions

Computer components and electronic circuit boards can be damaged by discharges of static electricity. Working on computers that are still connected to a power supply can be extremely dangerous.

Follow the guidelines below to avoid damage to your computer or yourself:
▪ Always disconnect the unit from the power outlet whenever you are working inside the case.

▪ If possible, wear a grounded wrist strap when you are working inside the computer case. Alternatively, discharge any static electricity by touching the bare metal chassis of the unit case, or the bare metal body of any other grounded appliance.

▪ Hold electronic circuit boards by the edges only. Do not touch the components on the board unless it is necessary to do so. Don't flex or stress the circuit board.

▪ Leave all components inside the static-proof packaging that they shipped with until they are ready for installation.

▪ Use correct screws and do not over tighten screws.

Jumper Settings

A jumper is the simplest kind of electric switch. It consists of two metal pins and a cap. When setting the jumpers, ensure that the jumper caps are placed on the correct pins. When the jumper cap is placed on both pins, the jumper is short. If you remove the jumper cap, or place the jumper cap on just one pin, the jumper is open.

Refer to the illustrations below for examples of what the 2-pin and 3-pin jumpers look like when they are short (on) and open (off).

Two-Pin Jumpers: Open (Left) and Short (Right)
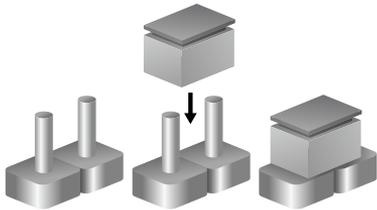
Three-Pin Jumpers: Pins 1 and 2 are Short
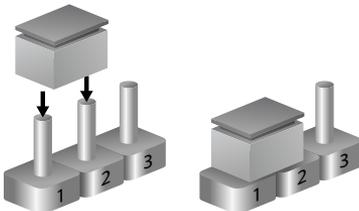
Locations of the Jumpers and Connectors

The figure below shows the location of the jumpers and connectors.
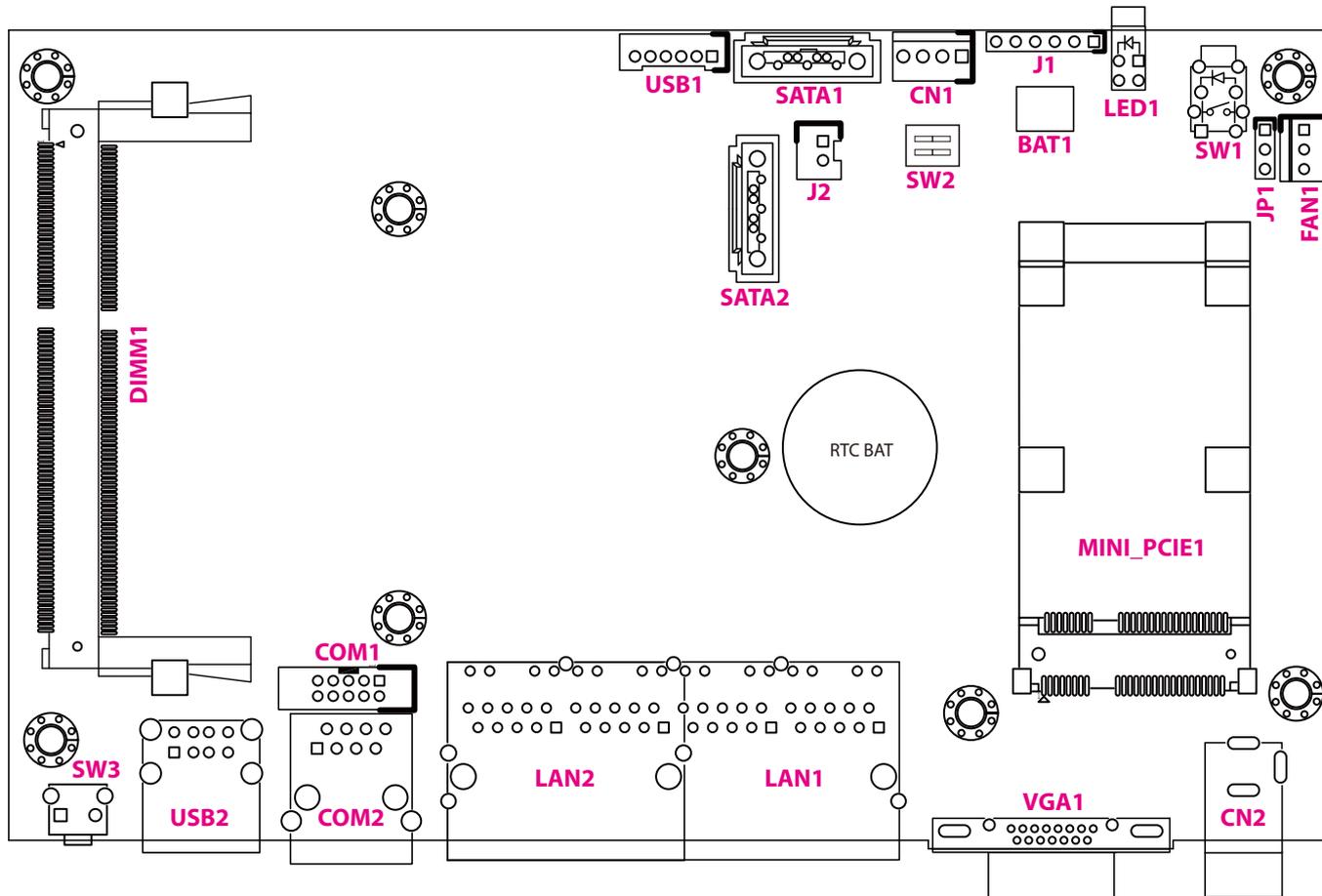
Jumpers and DIP Switch Settings

ATX/AT Select

Connector type: 1x3 3-pin header, 2.54mm pitch
Connector location: JP1

1 □ ○ ○ 3

Pin	Definition
1	SWITCH_PWRBTN#
2	MCU_PWRBTN#
3	N16910676

Clear CMOS

Connector type: 1x2 2-pin DIP switch
Connector location: SW2

Pin	Definition
1	RTC_TEST#
2	SRTC_RST#
3	GND
4	GND

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Connector Pin Definitions

External Connectors

Hardware Reset Button

Connector location: SW3
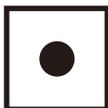
Pin	Definition
1	GND
2	RST_BTN#

USB 3.0 and USB 2.0 Ports

Connector type: USB 3.0 and USB 2.0 ports, Type A
Connector location: USB2
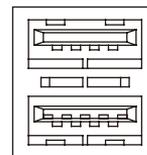
Pin	Definition	Pin	Definition
1	USB2_5V	2	USB_0N_C
3	USB_0P_C	4	GND
5	USB2_5V	6	USB_1N_L
7	USB_1P_L	8	GND
MH1	USBCH_GND	MH2	USBCH_GND
MH3	USBCH_GND	MH4	USBCH_GND

Console Port

Connector type: RJ45 port
Connector location: COM2
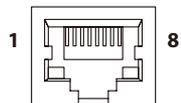
Pin	Definition	Pin	Definition
1	SIO_RTS_0	2	N/A
3	SIO_TXD_0	4	GND
5	N/A	6	SIO_RXD_0
7	N/A	8	SIO_RXD_0
MH1	COM1_GND	MH2	COM1_GND

LAN2 Port

Connector type: RJ45 port with LEDs
Connector location: LAN2
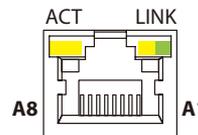
Act	Status
Flashing Yellow	Data activity
Off	No activity

Link	Status
Steady Green	1G network link
Steady Yellow	100Mbps network link
Off	No link

Pin	Definition	Pin	Definition
A1	LAN2_DMI0P	A2	LAN2_DMI0N
A3	LAN2_DMI1P	A4	LAN2_DMI1N
A5	LAN2_DMI2P	A6	LAN2_DMI2N
A7	LAN2_DMI3P	A8	LAN2_DMI3N
A9	N/A	A10	GND
A11	LAN2_ACT	A12	GND
A13	LAN2_100M	A14	LAN2_1G
MH1	CGND	MH2	CGND
MH3	CGND		

LAN1 Port

Connector type: RJ45 port with LEDs
Connector location: LAN1
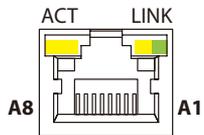
Act	Status
Flashing Yellow	Data activity
Off	No activity

Link	Status
Steady Green	1G network link
Steady Yellow	100Mbps network link
Off	No link

Pin	Definition	Pin	Definition
A1	LAN1_DMI0P	A2	LAN1_DMI0N
A3	LAN1_DMI1P	A4	LAN1_DMI1N
A5	LAN1_DMI2P	A6	LAN1_DMI2N
A7	LAN1_DMI3P	A8	LAN1_DMI3N
A9	N/A	A10	GND
A11	LAN1_ACT	A12	GND
A13	LAN1_100M	A14	LAN1_1G
MH1	CGND	MH2	CGND
MH3	CGND		

VGA

Connector type: DB-15 port, 15-pin D-Sub
Connector location: VGA1
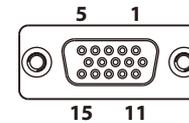
Pin	Definition	Pin	Definition
1	VGA_RED	2	VGA_GREEN
3	VGA_BLUE	4	NC
5	VGA_GND	6	VGA_GND
7	VGA_GND	8	VGA_GND
9	VGA_+5V	10	VGA_GND
11	NC	12	VGA_DATA
13	VGA_HS	14	VGA_VS
15	VGA_CLK	MH1	VGA_GND
MH2	VGA_GND		

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DC Power Input

Connector location: CN2

Pin	Definition
1	GND
2	GND
3	P12V

Power Button

Connector location: SW1

Pin	Definition	Pin	Definition
1	GND	2	PBT_PU
3	PBT_PU	4	GND
A1	PWRLED_N	C1	PWRLED_P
MH1	GND	MH2	GND

Connector Pin Definitions

Internal Connectors

COM Port (RS-232)

Connector type: 2x5 10-pin header, 2.0mm pitch
Connector location: COM1
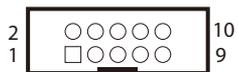
Pin	Definition	Pin	Definition
1	N/A	2	SIO_RXD_1
3	SIO_TXD_1	4	N/A
5	GND	6	N/A
7	SIO_RTS_1	8	SIO_CTS_1
9	N/A	10	GND

SATA Connectors

Connector type: Standard Serial ATA 7P (1.27mm, SATA-M-180)
Connector location: SATA1 and SATA2
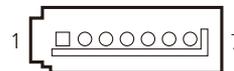
Pin	Definition	Pin	Definition
1	GND	2	SATA_TX0P_C
3	SATA_TX0N_C	4	GND
5	SATA_RX0N_C	6	SATA_RX0P_C
7	GND		

SATA Power Connector

Connector type: 1x4 4-pin Wafer
Connector location: CN1

Pin	Definition
1	+12V
2	GND
3	GND
4	VCC5

Battery Connector

Connector type: 1x2 2-pin header
Connector location: J2

Pin	Definition
1	GND
2	RTC_BAT
3	GND
4	GND

USB JST Port

Connector type: 1x6 6-pin header, 2.0mm pitch
Connector location: USB1

CPLD Port

Connector type: 1x6 6-pin header, 2.54mm pitch
Connector location: J1
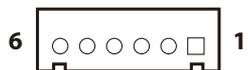
Pin	Definition	Pin	Definition
1	P5V_USB_P23	2	USB_3N_C
3	USB_3P_C	4	N/A
5	N/A	6	GND

Pin	Definition	Pin	Definition
1	P3V_SB	2	GND
3	GAL_TCK	4	GAL_TDO
5	GAL_TDI	6	GAL_TMS

3-Pin Fan Connector

Connector type: 1x3 3-pin Wafer, 2.54mm pitch
Connector location: FAN1

Pin	Definition
1	GND
2	V12S
3	FAN1_R

SATA DOM Power

Connector type: 1x2 2-pin header
Connector location: J2

Pin	Definition
1	VCC5
2	GND

System LED

Connector location: LED1

STATUS

PWR   **HDD**
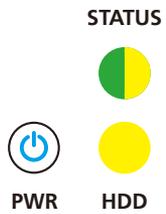
Pin	Definition
A1	HD_LED
A2	STATUS_LED_G
C1	SATA_LED_V3P3#
C2	STATUS_LED_Y

Mini-PCIe Slot

Connector location: MINI_PCIE1
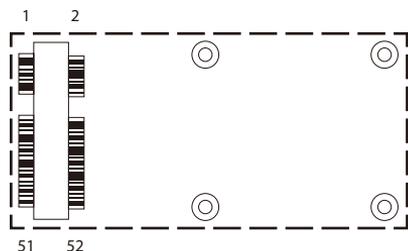
Pin	Definition	Pin	Definition
1	MPCIE_WAKE#	2	3VSB
3	N/A	4	GND
5	N/A	6	P1V5_STBY
7	CLKREQ#	8	N/A
9	GND	10	N/A
11	PCIE_MINI_CLK_N	12	N/A
13	PCIE_MINI_CLK_P	14	N/A
15	GND	16	N/A
17	N/A	18	GND
19	N/A	20	MPCIE_DIS#
21	GND	22	MPCIE_RST_R
23	PCIE_RXN2_MINI	24	3VSB
25	PCIE_RXP2_MINI	26	GND

Pin	Definition	Pin	Definition
27	GND	28	P1V5_STBY
29	GND	30	EXP_CLK
31	PCIE_TXN2_MINI	32	EXP_DATA
33	PCIE_TXP2_MINI	34	GND
35	GND	36	USB_2N
37	GND	38	USB_2P
39	3VSB	40	GND
41	3VSB	42	N/A
43	GND	44	N/A
45	N/A	46	N/A
47	N/A	48	P1V5_STBY
49	N/A	50	GND
51	N/A	52	3VSB

Chapter 3: System Setup

Removing the Chassis Cover

CAUTION! Prior to removing the chassis cover, make sure the unit's power is off and disconnected from the power sources to prevent electric shock or system damage.

1. The screws around the cover are used to secure the cover to the chassis. Remove these screws and put them in a safe place for later use.

Screws on the sides

Installing a SO-DIMM Memory Module

1. Push the ejector tabs which are at the ends of the socket outward. This indicates that the socket is unlocked.

SO-DIMM socket

2. Note how the module is keyed to the socket. Grasping the module by its edges, align the module with the socket so that the "notch" on the module is aligned with the "key" on the socket. The key ensures the module can be plugged into the socket in only one direction.

Notch on the module   **Key on the socket**
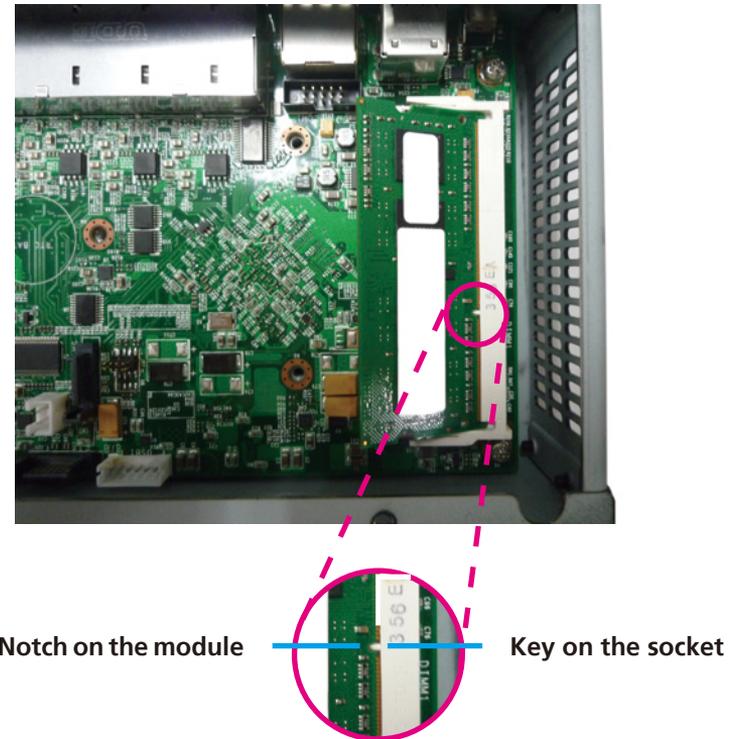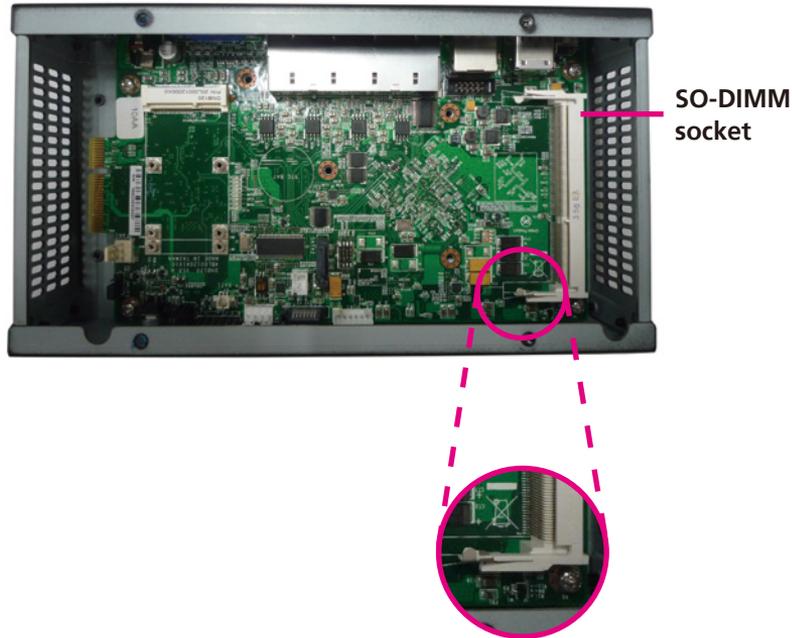
3. Insert the module into the socket at an approximately 30 degrees angle. Apply firm even pressure to each end of the module until it slips down into the socket. The contact fingers on the edge of the module will almost completely disappear inside the socket.

   The ejector tabs at the ends of the socket will automatically snap into the locked position to hold the module in place.

Installing a SATA DOM

1. Locate the SATA connector on the board.
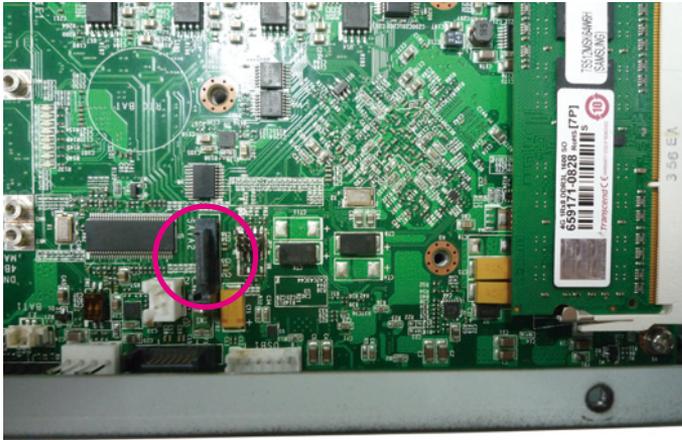
2. Fasten a copper post on the mounting hole.
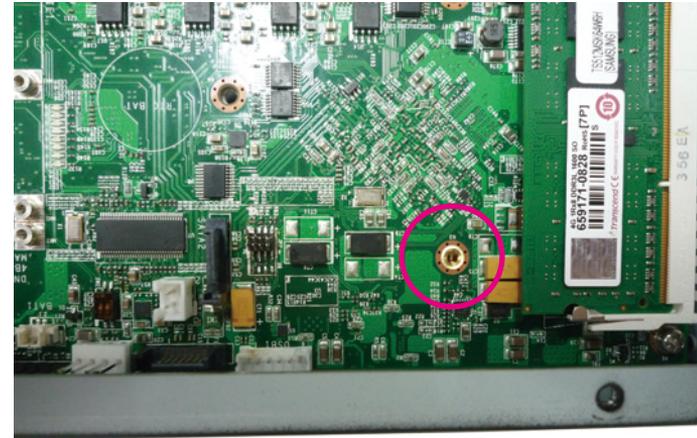
3. Install the SATA DOM to the connector with the mounting hole aligned to the copper post.

4. Fasten a screw on top of the copper post.

5. Connect one end of the power cable to the connector on the module and then connect the other end of the cable to the connector on the board.
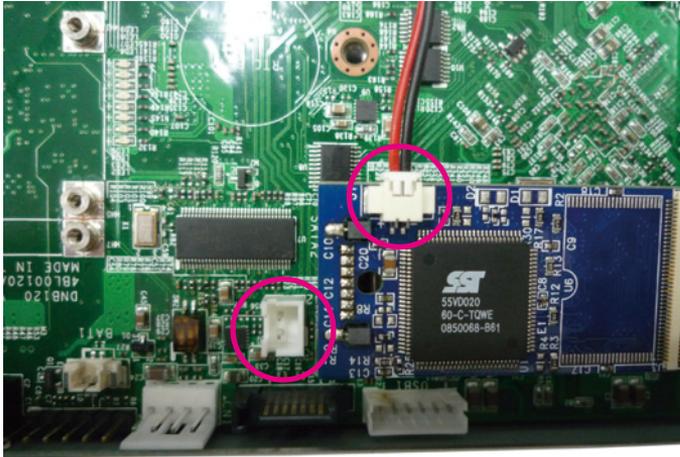
Chapter 4: BIOS Setup

This chapter describes how to use the BIOS setup program for the DNA 120. The BIOS screens provided in this chapter are for reference only and may change if the BIOS is updated in the future.

To check for the latest updates and revisions, visit the NEXCOM Web site at www.nexcom.com.tw.

About BIOS Setup

The BIOS (Basic Input and Output System) Setup program is a menu driven utility that enables you to make changes to the system configuration and tailor your system to suit your individual work needs. It is a ROM-based configuration utility that displays the system's configuration status and provides you with a tool to set system parameters.

These parameters are stored in non-volatile battery-backed-up CMOS RAM that saves this information even when the power is turned off. When the system is turned back on, the system is configured with the values found in CMOS.

With easy-to-use pull down menus, you can configure such items as:
- Hard drives, diskette drives, and peripherals
- Video display type and display options
- Password protection from unauthorized use
- Power management features

The settings made in the setup program affect how the computer performs. It is important, therefore, first to try to understand all the setup options, and second, to make settings appropriate for the way you use the computer.

When to Configure the BIOS

- This program should be executed under the following conditions:
- When changing the system configuration
- When a configuration error is detected by the system and you are prompted to make changes to the setup program
- When resetting the system clock
- When redefining the communication ports to prevent any conflicts
- When making changes to the Power Management configuration
- When changing the password or making other changes to the security setup

Normally, CMOS setup is needed when the system hardware is not consistent with the information contained in the CMOS RAM, whenever the CMOS RAM has lost power, or the system features need to be changed.

Default Configuration

Most of the configuration settings are either predefined according to the Load Optimal Defaults settings which are stored in the BIOS or are automatically detected and configured without requiring any actions. There are a few settings that you may need to change depending on your system configuration.

Entering Setup

When the system is powered on, the BIOS will enter the Power-On Self Test (POST) routines. These routines perform various diagnostic checks; if an error is encountered, the error will be reported in one of two different ways:

- If the error occurs before the display device is initialized, a series of beeps will be transmitted.

- If the error occurs after the display device is initialized, the screen will display the error message.

Powering on the computer and immediately pressing <kbd>Del</kbd> allows you to enter Setup.

Legends

Key	Function
← →	Moves the highlight left or right to select a menu.
↑ ↓	Moves the highlight up or down between sub-menu or fields.
Esc	Exits the BIOS Setup Utility.
+	Scrolls forward through the values or options of the highlighted field.
−	Scrolls backward through the values or options of the highlighted field.
Tab	Selects a field.
F1	Displays General Help.
F2	Load previous values.
F3	Load optimized default values.
F4	Saves and exits the Setup program.
Enter	Press <Enter> to enter the highlighted sub-menu

Scroll Bar

When a scroll bar appears to the right of the setup screen, it indicates that there are more available fields not shown on the screen. Use the up and down arrow keys to scroll through all the available fields.

Submenu

When "▶" appears on the left of a particular field, it indicates that a submenu which contains additional options are available for that field. To display the submenu, move the highlight to that field and press Enter.

BIOS Setup Utility

Once you enter the AMI BIOS Setup Utility, the Main Menu will appear on the screen. The main menu allows you to select from several setup functions and one exit. Use arrow keys to select among the items and press Enter, to accept or enter the submenu.

Main

The Main menu is the first screen that you will see when you enter the BIOS Setup Utility.

Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.					
Main	Advanced	Chipset	Security	Boot	Save & Exit

```
BIOS Information
BIOS Vendor                American Megatrends          Set the Date. Use Tab to switch
Core Version               5.009                        between Date elements.
Compliancy                 UEFI 2.3; PI 1.2
Project Version            G121- 0.05
Build Date and Time        03/24/2014 13:03:25

CPU Configuration
Microcode Patch            31e
BayTrail SoC               B3 Stepping

System Date                [Sun 01/22/2012]
System Time                [15:57:56]
                                                        →←: Select Screen
Access Level               Administrator                ↑↓: Select Item
                                                        Enter: Select
                                                        +/-: Change Opt.
                                                        F1: General Help
                                                        F2: Previous Values
                                                        F3: Optimized Defaults
                                                        F4: Save & Exit
                                                        ESC: Exit
```

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System Date
The date format is <day>, <month>, <date>, <year>. Day displays a day, from Monday to Sunday. Month displays the month, from January to December. Date displays the date, from 1 to 31. Year displays the year, from 1999 to 2099.

System Time
The time format is <hour>, <minute>, <second>. The time is based on the 24-hour military-time clock. For example, 1 p.m. is 13:00:00. Hour displays hours from 00 to 23. Minute displays minutes from 00 to 59. Second displays seconds from 00 to 59.

Access Level
Displays the access level of the current user in the BIOS.

Advanced

The Advanced menu allows you to configure your system for basic operation. Some entries are defaults required by the system board, while others, if enabled, will improve the performance of your system or let you set some features according to your preference.

⚠️ Setting incorrect field values may cause the system to malfunction.

```
              Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.
     Main       Advanced     Chipset     Security      Boot      Save & Exit

  ▶ ACPI Settings                                       System ACPI Parameters.
  ▶ NCT7802Y HW Monitor
  ▶ Serial Port Console Redirection
  ▶ CPU Configuration
  ▶ IDE Configuration
  ▶ Network Stack Configuration
  ▶ CSM Configuration
  ▶ USB Configuration




                                                        →←: Select Screen
                                                        ↑↓: Select Item
                                                        Enter: Select
                                                        +/-: Change Opt.
                                                        F1: General Help
                                                        F2: Previous Values
                                                        F3: Optimized Defaults
                                                        F4: Save & Exit
                                                        ESC: Exit

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```

ACPI Settings

This section is used to configure ACPI Settings.

```
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                  Advanced

  ACPI Settings                                         Enables or Disables BIOS ACPI
                                                        Auto Configuration.
  Enable ACPI Auto Configuration      [Disabled]

  Lock Legacy Resources               [Disabled]




                                                        →←: Select Screen
                                                        ↑↓: Select Item
                                                        Enter: Select
                                                        +/-: Change Opt.
                                                        F1: General Help
                                                        F2: Previous Values
                                                        F3: Optimized Defaults
                                                        F4: Save & Exit
                                                        ESC: Exit

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```

Enable ACPI Auto Configuration
Enables or disables BIOS ACPI auto configuration.

Lock Legacy Resources
Enables or disables lock of legacy resources.

NCT7802Y HW Monitor

This section is used to monitor hardware status such as temperature, fan speed and voltages.

```
          Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.
            Advanced

   Pc Health Status

   cpu temperature              : +41 C
   System temperature           : +27.9 C
   VCC                          : +3.356 V
   VCORE                        : +0.792 V
   VCC5                         : +5.226 V
   VCC3                         : +3.336 V

                                                  →←: Select Screen
                                                  ↑↓: Select Item
                                                  Enter: Select
                                                  +/-: Change Opt.
                                                  F1: General Help
                                                  F2: Previous Values
                                                  F3: Optimized Defaults
                                                  F4: Save & Exit
                                                  ESC: Exit

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```

CPU Temperature
Detects and displays the current CPU temperature.

System Temperature
Detects and displays the current system temperature.

VCC to VCC3
Detects and displays the output voltages.

Serial Port Console Redirection

This section is used to configure the serial port that will be used for console redirection.

```
          Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.
            Advanced

                                                  Console Redirection Enable
                                                  or Disable
   COM0
   Console Redirection              [Enabled]
 ► Console Redirection Settings

   Serial Port for Out-of-Band Management /
   Windows Emergency Management Services (EMS)
   Console Redirection              [Disabled]
 ► Console Redirection Settings

                                                  →←: Select Screen
                                                  ↑↓: Select Item
                                                  Enter: Select
                                                  +/-: Change Opt.
                                                  F1: General Help
                                                  F2: Previous Values
                                                  F3: Optimized Defaults
                                                  F4: Save & Exit
                                                  ESC: Exit

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```

Console Redirection
Enables or disables the console redirection.

Console Redirection Settings

Specifies how the host computer and the remote computer (which the user is using) will exchange data. Both computers should have the same or compatible settings.

```
        Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.
              Advanced
┌─────────────────────────────────────────────────────┬──────────────────────┐
│                                                        │                      │
│  COM0                                                  │ Emulation: ANSI: Extended │
│  Console Redirection Settings                          │ ASCII char set. VT100: ASCII │
│                                                        │ char set. VT100+: Extends │
│                                                        │ VT100 to support color, function │
│  Terminal Type                 [ANSI]                  │ keys, etc. │
│  Bits per second               [115200]               │ VT-UTF8: Uses UTF8 encoding │
│  Data Bits                     [8]                     │ to map Unicode chars onto 1 │
│  Parity                        [None]                  │ or more │
│  Stop Bits                     [1]                     │                      │
│  Flow Control                  [None]                  │                      │
│  VT-UTF8 Combo Key Sup         [Enabled]               │                      │
│  Recorder Mode                 [Disabled]              │                      │
│  Resolution 100x31             [Disabled]              │ →←: Select Screen    │
│  Legacy OS Redirection         [80x24]                 │ ↑↓: Select Item      │
│  Putty KeyPad                  [VT100]                  │ Enter: Select        │
│  Redirection After BIO         [Always Enable]         │ +/-: Change Opt.     │
│                                                        │ F1: General Help     │
│                                                        │ F2: Previous Values  │
│                                                        │ F3: Optimized Defaults │
│                                                        │ F4: Save & Exit      │
│                                                        │ ESC: Exit            │
│                                                        │                      │
└─────────────────────────────────────────────────────┴──────────────────────┘
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```

Terminal Type
ANSI — Extended ASCII character set.
VT100 — ASCII character set.
VT100+ — Extends VT100 to support color, function keys, etc.
VT-UTF8 — Uses UTF8 encoding to map Unicode characters onto 1 or more bytes.

Bits Per Second
Selects the serial port transmission speed. The speed must match the other side. Long or noisy lines may require a lower speed.

Data Bits
The options are 7 and 8.

Parity
A parity bit can be sent with the data bits to detect some transmission errors.

Even — Parity bit is 0 if the number of 1's in the data bits is even.
Odd — Parity bit is 0 if number of 1's in the data bits is odd.

Stop Bits
Stop bits indicate the end of a serial data packet. (A start bit indicates the beginning). The standard setting is 1 stop bit. Communication with slow devices may require more than 1 stop bit.

Flow Control
Flow control can prevent data loss from buffer overflow. When sending data and the receiving buffers are full, a "stop" signal can be sent to stop the data flow.

VT-UTF8 Combo Key Support
Enables or disables VT-UTF8 combo key support.

Recorder Mode
When this field is enabled, only text will be sent. This is to capture the terminal data.

Resolution 100x31
Enables or disables extended terminal resolution.

Legacy OS Redirection
Selects the number of rows and columns that support redirection.

Putty Keypad
Selects the Putty keyboard emulation type.

Redirection After BIOS POST
Enables or disables redirection after BIOS POST.

CPU Configuration

This section is used to configure the CPU.

```
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    Advanced

   CPU Configuration                              Socket specific CPU Information

 ▶ Socket 0 CPU Information

   CPU Speed                      1467 MHz
   64-bit                         Supported

   Limit CPUID Maximum            [Disabled]
   Execute Disable Bit            [Enabled]
   Hardware Prefetcher            [Enabled]
   Adjacent Cache Line P          [Enabled]
   Intel Virtualization           [Enabled]
   Power Technology               [Disable]
                                                →←: Select Screen
                                                ↑↓: Select Item
                                                Enter: Select
                                                +/-: Change Opt.
                                                F1: General Help
                                                F2: Previous Values
                                                F3: Optimized Defaults
                                                F4: Save & Exit
                                                ESC: Exit

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```

Limit CPUID Maximum

The CPUID instruction of some newer CPUs will return a value greater than 3. The default is Disabled because this problem does not exist in the Windows series operating systems. If you are using an operating system other than Windows, this problem may occur. To avoid this problem, enable this field to limit the return value to 3 or lesser than 3.

Execute Disable Bit

When this field is set to Disabled, it will force the XD feature flag to always return to 0.

Hardware Prefetcher

The options are Enabled and Disabled.

Adjacent Cache Line Prefetch

The options are Enabled and Disabled.

Intel® Virtualization Technology

When this field is set to Enabled, the VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.

Power Technology

Configures the power management features.

IDE Configuration

This section is used to configure the SATA drives.

```
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    Advanced

  IDE Configuration                                      Enable/Disable SATA Device

  Serial-ATA (SATA)                  [Enabled]
  SATA Test Mode                     [Disabled]

  SATA Speed Support                 [Gen2]
  SATA Mode                          [AHCI Mode]

  Serial-ATA Port 0                  [Enabled]

  Serial-ATA Port 1                  [Enabled]

  SATA Port0
  Not Present                                            →←: Select Screen
                                                         ↑↓: Select Item
  SATA Port1                                             Enter: Select
  Not Present                                            +/-: Change Opt.
                                                         F1: General Help
                                                         F2: Previous Values
                                                         F3: Optimized Defaults
                                                         F4: Save & Exit
                                                         ESC: Exit



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```

Serial-ATA (SATA)
Enables or disables SATA device.

SATA Test Mode
Enables or disables SATA test mode.

SATA Speed Support
Configures the SATA controller to Gen1 or Gen2 speed.

SATA Mode
Configures the SATA as IDE, AHCI or RAID mode.

IDE   This option configures the Serial ATA drives as Parallel ATA physical storage device.

AHCI   This option configures the Serial ATA drives to use AHCI (Advanced Host Controller Interface). AHCI allows the storage driver to enable the advanced Serial ATA features which will increase storage performance.

Serial-ATA Port 0 and Serial-ATA Port 1
Enables or disables SATA port 0 and SATA port 1.

Network Stack

This section is used to configure the network stack.

```
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  Advanced

  Network stack              [Disabled]              Enable/Disable UEFI network
                                                     stack












                                                     →←: Select Screen
                                                     ↑↓: Select Item
                                                     Enter: Select
                                                     +/-: Change Opt.
                                                     F1: General Help
                                                     F2: Previous Values
                                                     F3: Optimized Defaults
                                                     F4: Save & Exit
                                                     ESC: Exit



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```

Network Stack
Enables or disables UEFI network stack.

CSM Configuration

This section is used to configure the compatibility support module features.

```
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  Advanced

  Compatibility Support Module Configuration          Enable/Disable CSM Support.

  CSM Support                [Enabled]

  CSM16 Module Version       07.71

  GateA20 Active             [Upon Request]
  Option ROM Messages        [Force BIOS]
  INT19 Trap Response        [Immediate]

  Boot option filter         [UEFI and Legacy]

  Option ROM execution order                          →←: Select Screen
                                                      ↑↓: Select Item
  Network                    [Do not launch]          Enter: Select
  Storage                    [UEFI only]              +/-: Change Opt.
  Video                      [Legacy only]            F1: General Help
  Other PCI devices          [UEFI only]              F2: Previous Values
                                                      F3: Optimized Defaults
                                                      F4: Save & Exit
                                                      ESC: Exit



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```

CSM Support
This field is used to enable or disable CSM support, if Auto option is selected, based on OS, CSM will be enabled or disabled automatically.

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
This field is used to set display mode for Option ROM. The options are Force BIOS and Keep Current.

INT19 Trap Response
Allows Option ROMs to trap Interrupt 19 when enabled.

Immediate   Execute the trap right away.
Postponed   Execute the trap during legacy boot.

Boot Option Filter
Configures which drives the system can boot from.

Network
Enables or disables the boot option for legacy network devices.

Storage
Enables or disables the boot option for legacy storage devices.

Video
Enables or disables the boot option for legacy video devices.

Other PCI Devices
Enables or disables the boot option for legacy PCI devices.

USB Configuration

This section is used to configure the USB.

```
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           Advanced

      USB Configuration                                Enables Legacy USB support.
                                                       AUTO option disables legacy
      USB Module Version          8.11.01              Support if no USB devices are
                                                       connected. DISABLE option will
      USB Devices:                                     keep USB devices available
            1 Keyboard, 1 Hub                          only for EFI applications.

      Legacy USB Support          [Enabled]
      XHCI Hand-off               [Enabled]
      EHCI Hand-off               [Disabled]
      USB Mass Storage Driv       [Enabled]

      USB hardware delays a
      USB transfer time-out       [20 sec]             →←: Select Screen
      Device reset time-out       [20 sec]             ↑↓: Select Item
      Device power-up delay       [Auto]               Enter: Select
                                                       +/-: Change Opt.
                                                       F1: General Help
                                                       F2: Previous Values
                                                       F3: Optimized Defaults
                                                       F4: Save & Exit
                                                       ESC: Exit


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```

Legacy USB Support
Enable   Enables Legacy USB.
Auto   Disables support for Legacy when no USB devices are connected.
Disable   Keeps USB devices available only for EFI applications.

XHCI Hand-Off
This is a workaround for OSs that does not support XHCI hand-off. The XHCI ownership change should be claimed by the XHCI driver.

EHCI Hand-Off
This is a workaround for OSs that does not support EHCI hand-off. The EHCI ownership change should be claimed by the EHCI driver.

USB Mass Storage Driver
Enables or disables USB mass storage driver support.

USB Transfer Time-out
The time-out value for control, bulk, and Interrupt transfers.

Device Reset Time-out
Selects the USB mass storage device's start unit command timeout.

Device Power-up Delay
Maximum time the value will take before it properly reports it self to the Host Controller. "Auto" uses default value: for a Root port it is 100 ms, for a Hub port the delay is taken from Hub descriptor.

Chipset

This section gives you functions to configure the system based on the specific features of the chipset. The chipset manages bus speeds and access to system memory resources.

```
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     Main      Advanced    Chipset    Security    Boot    Save & Exit

  ▶ North Bridge                                      North Bridge Parameters
  ▶ South Bridge




                                                    →←: Select Screen
                                                    ↑↓: Select Item
                                                    Enter: Select
                                                    +/-: Change Opt.
                                                    F1: General Help
                                                    F2: Previous Values
                                                    F3: Optimized Defaults
                                                    F4: Save & Exit
                                                    ESC: Exit


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```

North Bridge
This field is used to configure North Bridge Parameters.

South Bridge
This field is used to configure South Bridge Parameters.

North Bridge

```
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                              Chipset

  Memory Information                                  Maximum Value of TOLUD.

  Total Memory                 4096 MB (LPDDR3)

  Max TOLUD                    [Dynamic]




                                                    →←: Select Screen
                                                    ↑↓: Select Item
                                                    Enter: Select
                                                    +/-: Change Opt.
                                                    F1: General Help
                                                    F2: Previous Values
                                                    F3: Optimized Defaults
                                                    F4: Save & Exit
                                                    ESC: Exit


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```

Max TOLUD
Configures the maximum value of TOLUD.

South Bridge

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Chipset	
▶ PCI Express Configuration	Enable or disable SMBus Controller.
High Precision Timer [Enabled]	
Restore AC Power Loss [Power On]	
	→←: Select Screen
	↑↓: Select Item
	Enter: Select
	+/-: Change Opt.
	F1: General Help
	F2: Previous Values
	F3: Optimized Defaults
	F4: Save & Exit
	ESC: Exit
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High Precision Timer
Enables or disables the high precision event timer.

Restore AC Power Loss
Select AC power state when power is re-applied after a power failure.

PCI Express Ports Configuration

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Chipset	
PCI Express Configuration	Enable or disable the PCI Express Port 0 in the Chipset.
PCI Express Port 0 [Enabled]	
Speed [Gen 1]	
PCI Express Port 1 [Enabled]	
Speed [Gen 1]	
PCI Express Port 2 [Enabled]	
Speed [Gen 1]	
PCI Express Port 3 [Enabled]	
Speed [Gen 1]	→←: Select Screen
	↑↓: Select Item
	Enter: Select
	+/-: Change Opt.
	F1: General Help
	F2: Previous Values
	F3: Optimized Defaults
	F4: Save & Exit
	ESC: Exit
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PCI Express Port 1 to PCI Express Port 4
Enables or disables the PCI Express port.

Speed
Configures the speed of the PCI Express ports.

Security

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Main	Advanced	Chipset	Security	Boot	Save & Exit

Password Description **The password length must be** **in the following range:** Minimum length 3 Maximum length 20 Administrator Password	Set Administrator Password →←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit

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Administrator Password
Select this to reconfigure the administrator's password.

Boot

This section is used to configure the boot features.

```
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    Main      Advanced    Chipset    Security      Boot     Save & Exit

   Boot Configuration                                         Number of seconds to wait for
   Setup Prompt Timeout              1                        setup activation key. 65535
   Bootup NumLock State              [On]                     (0xFFFF) means indefinite
                                                              waiting.

   Quiet Boot                        [Disabled]

   Boot mode select                  [LEGACY]

   FIXED BOOT ORDER Priorities
   Boot Option #1                    [USB CD/DVD]
   Boot Option #2                    [USB Key]
   Boot Option #3                    [Hard Disk]
   Boot Option #4                    [USB Hard Disk]
   Boot Option #5                    [CD/DVD]                 →←: Select Screen
   Boot Option #6                    [USB Floppy]             ↑↓: Select Item
   Boot Option #7                    [Network]                Enter: Select
                                                              +/-: Change Opt.
                                                              F1: General Help
                                                              F2: Previous Values
                                                              F3: Optimized Defaults
                                                              F4: Save & Exit
                                                              ESC: Exit

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```
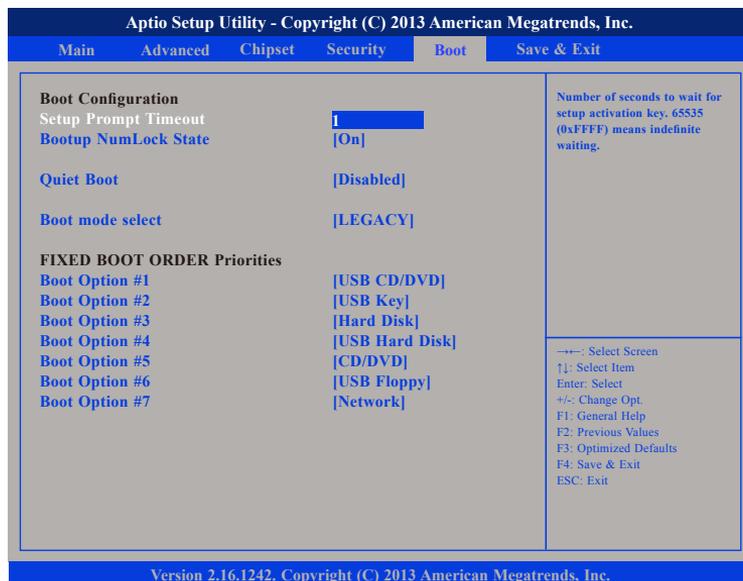
Setup Prompt Timeout
Selects the number of seconds to wait for the setup activation key. 65535(0xFFFF) denotes indefinite waiting.

Bootup NumLock State
This allows you to determine the default state of the numeric keypad. By default, the system boots up with NumLock on wherein the function of the numeric keypad is the number keys. When set to Off, the function of the numeric keypad is the arrow keys.

Quiet Boot

Enabled	Displays OEM logo instead of the POST messages.
Disabled	Displays normal POST messages.

Boot Mode Select
Configures the boot mode option.

Boot Option #1 to Boot Option #7
Adjust the boot sequence of the system. Boot Option #1 is the first boot device that the system will boot from, next will be Boot Option #2 and so forth.

Save & Exit

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Main	Advanced	Chipset	Security	Boot	**Save & Exit**

```
Save Changes and Reset                              Reset the system after saving
Discard Changes and Reset                           the changes.

Restore Defaults

Boot Override

Launch EFI Shell from filesystem device




                                                   →←: Select Screen
                                                   ↑↓: Select Item
                                                   Enter: Select
                                                   +/-: Change Opt.
                                                   F1: General Help
                                                   F2: Previous Values
                                                   F3: Optimized Defaults
                                                   F4: Save & Exit
                                                   ESC: Exit
```

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Save Changes and Reset

To save the changes and exit the Setup utility, select this field then press <Enter>. A dialog box will appear. Confirm by selecting Yes. You can also press <F4> to save and exit Setup.

Discard Changes and Reset

To exit the Setup utility without saving the changes, select this field then press <Enter>. You may be prompted to confirm again before exiting. You can also press <ESC> to exit without saving the changes.

Restore User Defaults

To restore the BIOS to user default settings, select this field then press <Enter>. A dialog box will appear. Confirm by selecing Yes.

Boot Override

To bypass the boot sequence from the Boot Option List and boot from a particular device, select the desired device and press <Enter>.

Launch EFI Shell From Filesystem Device

Launches the EFI shell.