

# AND-DNV3N3-4C

# Networking Micro Box

- Intel<sup>®</sup> Denverton<sup>®</sup> SoC
- 8 GbE Copper
- 2 SFP+



# User Manual

Acrosser Technology Co., Ltd. www.acrosser.com



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### Purpose

This document is intended to provide the information about the features and use of the product.

### Audience

The intended audiences are technical personnel, not for general audiences.

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# 1. System Introduction

The AND-DNV3N3-4C networking product is based on Intel's Atom C3000, powerful and scalable for vary application scenarios.

The AND-DNV3N3-4C provides a flexible system expansion versatility by supporting from Intel Atom C3558(4 core) with 8x GbE copper LANs and 2x 10G fiber networks (SFP+). Furthermore, in the system design, there are one 2.5-inch HDD/SSD and two Mini PCIe slots to support the latest WLAN function (IEEE 802.11 a/b/g/n/ac) and 4G LTE feature as well.

### 1.1. Specifications

(Specifications are subject to change without notice.)

#### General

Thermal Solution	•	Fanless, Passive h	eat dissipation			
CPU		Intel <sup>®</sup> Denverton <sup>®</sup> C3558 4 cores, 2.2GHz				
Memory	•	1x SO-DIMM DDR	4			
BIOS	•	Support Console R Support Bypass Se	Re-direction			
		Status	Normal	Bypass		
		SYS (ON)	V			
		SYS (OFF)		V		
		WDT (Timeout)		V		
		PWR (Lost)	Remained	prior status		
	•	Support PXE boot	from all RJ-45 Co	ppers		
Network Interfac	e					
Ethernet (on-board)	•	8x Copper, 2/4x SF	P+			
ζ ,	•	Intel i211, LAN [1:8	] Copper			
	•	SoC embedded SF	I, SFP+[1:2]			
Storage						
HDD Bay	•	1x 2.5" Internal HD	D Bay			
CFast	•	1x CFast socket				



<i>"</i> 0	
Front Panel	<ul> <li>Ethernet Link/Act LED x8 (LAN[1:8)</li> <li>Ethernet 1000M LED x8 (LAN[1:8])</li> <li>Ethernet 100/10M LED x8 (LAN[1:8])</li> <li>SFP+ Link LED x2</li> <li>SFP+ Act LED x2</li> <li>Sys Power LED x1 (12V)</li> <li>Storage LED x1</li> </ul>
Rear Panel	<ul> <li>Reset button</li> <li>2x USB 3.0</li> <li>1x RJ45 Console Port</li> <li>2x SFP+</li> <li>8x GbE LAN (Copper)</li> <li>4x Antenna holes for SMA connector (for WLAN &amp; WWAN module)</li> <li>1x DC-in connector for 12V input</li> </ul>
Internal I/O	<ul> <li>1x mini-PCle connector (for Wi-Fi IEEE 802.11 a/b/g/n/ ac 3T3R module)</li> <li>1x mini-PCle connector (w USB 2.0+3.0 signal only, for 4G module only, USB 3.0)</li> <li>1x SATA3+power connector</li> <li>GPIO pin header</li> </ul>

#### **Other Features**

Watchdog Timer	<ul> <li>Software programmable 0~255 Seconds, 0=disable timer.</li> </ul>
Battery	Lithium Battery, 3V 220mAH (CR2032), for RTC
Hardware Monitoring	<ul><li>CPU Voltage</li><li>CPU Temperature</li><li>System Temperature</li></ul>

### Power Requirement

Power Adapter	<ul> <li>12VDC, 40W Adapter</li> </ul>
---------------	--

#### Software

OS Support	<ul> <li>Linux Kernel 4.8 &amp; above, (64-bit)</li> </ul>
------------	--

#### Mechanical & Environment

Dimension	<ul> <li>300(L) x 201(W) x 44(H) mm</li> </ul>
-----------	--



<b>Operating Temperature</b>	•	0 ~ 40°C (32 ~ 104°F)
Storage Temperature	•	-20 ~ 80°C (-4 ~ 176°F)
Relative Humidity	•	0 to 90% @40°C, non-condensing

#### EMC & Safety

Certification	CE, FCC Class A, RoHS 2, cULus
Vibration Test	<ul> <li>IEC 60068-2-64, 5~500Hz, 3GRMS</li> </ul>
Drop Test	• ISTA-2A 2006

### 1.2. Package Contents

Check if the following items are included in the package.

Item	Q'ty
AND-DNV3N3-4C System	1
Console Cable	1
CD with Driver and Manual	1
Power Adapter (12V)	1
Power Cord	1
Screw Pack	1

### 1.3. Optional DDR4 List (6 SKUs)

Model Name	Description
	4GB DDR4-2666 memory (ECC)
	8GB DDR4-2666 memory (ECC)
	16GB DDR4-2666 memory (ECC)
AND-DNV3N3-4C	4GB DDR4-2666 memory (Non-ECC)
	8GB DDR4-2666 memory (Non-ECC)
	16GB DDR4-2666 memory (Non-ECC)



AND-DNV3N3-4C

# 1.4. System Dissection

### 1.4.1. Dimensions





#### 1.4.2. Front I/O Panel



• Sys Power

System Power LED

- Storage
   Storage Active LED
- LAN 1~8
  LAN 1~8 Link/Active LED
- SFP+ 1~2
  - SFP+ 1~2 Link/Active LED



#### 1.4.3. Rear I/O Panel



#### • ANT1 ~ ANT4

SMA Antenna Hole. Reserved for optional Wi-Fi / BT, 4G LTE antenna.

• DC 12V

DC12V Power Input

- LAN1 ~ LAN8
   RJ45 LAN Port
- USB 3.0 Port
- SFP1 ~ SFP2
   SFP LAN Port
- Console
   Console Port (RJ45)
- RST
   Reset Button



# 2. Components Assembly

Please follow the instruction to install the inner modules.

### 2.1. HDD/SSD Installation

Step 1: Plug the SATA cable (both the signal and power) in the socket on PCB.



Step 2: Connect the SATA cable with the HDD/SSD.





Step 3: Fasten the HDD/SSD with 4 screws onto the inner side of the chassis top cover.



Step 4: Before closing the top cover, pay attation to arrange the cable wire among the PCB components spaces.





Step 5: Fasten the cover with 4 screws.



### 2.2. PCB Parts Description

There are four modular sockets/slots reserved to install your modules: CFast, Mini-PCIe, DDR, and CFast.

Step 1: To install the CFast, you will have to remove the fixing screw first, and then have it fastened after inserting the module.





# 3. BIOS Settings

This chapter describes the BIOS menu displays and explains how to perform common tasks needed to get the system up and running. It also gives detailed explanation of the elements found in each of the BIOS menus. The following topics are covered:

- Main Setup
- Advanced Setup
- Chipset Setup
- Boot Setup
- Security Setup
- Save & Exit Setup

Once you enter the Award BIOS<sup>™</sup> CMOS Setup Utility, the Main Menu will appear on the screen. Use the arrow keys to highlight the item and then use the <Pg Up> <Pg Dn> keys to select the value you want in each item.

### 3.1. Main Setup

The BIOS setup main menu includes some options. Use the [Up/Down] arrow key to highlight the option, and then press the [Enter] key to select the item and configure the functions.

Aptio Setup Utility	- Copyright (C) 2012 American	n Megatrends, Inc.
Main Advanced Platform	Configuration Boot Security	y Save & Exit
BIOS Information BIOS Vendor Core Version Compliancy Project Name Release Version Build Date and Time Total Memory Memory Frequency	American Megatrends 4.6.5.3 UEFI 2.3; PI 1.2 DNV3N3 100-001 01/01/2019 11:22:33 4096 MB (DDR3) 1333 MHz	Set the Date. Use Tab to switch between Date elements.
ME FW Version System Date Ststem Time	8.0.10.1464 [Tue 01/01/2019] [11:22:33]	: Select Screen 1: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.15.1226.	Copyright (C) 2012 American	Megatrends, Inc.

Note:

: Listed at the bottom of the menu are the control keys. If you need any help with the item fields, you can press <**F1**> key, and it will display the relevant information.



- System Date Set the system date.
- System Time Set the system time.

### 3.2. Advanced Setup



- W83627DHG HW Monitor
   Dsiplay hardware monitor status.
- Serial Port Console Redirection Console port setting.
- Network Stack Configuration
   Network stack setting.
- CSM Configuration
   Compatibility Support Module Configuration. Enable/Disable Option ROM execution
   settings, etc.
- NVMe Configuration Set NVMe configuration.
- USB Configuration Set USB configuration parameters.



#### 3.2.1. W83627DHG Hardware Monitor

Aptio Setup Utility Advanced	- Copyright (C) 2012 Ameri	can Megatrends, Inc.	
Pc Health Status		Enable or Disable Smart Fan	
Smart Fan Function			
System temperature	: 32'C		
CPU temperature	: 37'C		
VCORE	: 0.992V		
RTC Battery Voltage	: +3.136V		
		: Select Screen	
		↑↓: Select Item	
		Enter: Select	
		+/-: Change Opt.	
		F1: General help	
		F2. Optimized Defaults	
		FA: Save f Frit	
		ESC: Exit	
Version 2.15.1226. Copyright (C) 2012 American Megatrends, Inc.			

### 3.2.2. Serial Port Console Redirection

Advanced COM 1 Console Redirection [Enable] Console Redirection Settings	The setting specify ho the host computer and the remote computer wil exchange data. Both computers should have the same or compatiable settings.
	: Select Screen +:: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit



#### 3.2.2.1. Serial Port Console Redirection Settings

Aptio Setup Utility - Co Advanced	pyright (C)	2012 American M	Megatrends, Inc.
COM 1 Console Redirection Settings Terminal Type Bits per second Date bits Parity Stop Bits Flow Control VT-UTF8 Combo Key Support Recorder Mode Resoultion 100*31 Putty KeyPad	[ANSI] [115200] [8] [None] [1] [None] [Disable] [Disable] [VT100]		The setting specify how the host computer and the remote computer will exchange data. Both computers should have the same or compatiable settings. : Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Same & Exit
Version 2 15 1226 Corr	reight (C) 2	012 Junopican Ma	ESC: Exit

### 3.2.3. Network Stack Configuration

Aptio Setup Util Advanced	ity - Copyright (C) 2012 Amer	ican Megatrends, Inc.
Network Stack	[Disable]	The setting specify how the host computer and the remote computer will exchange data. Both computers should have the same or compatiable settings.
		<pre>: Select Screen 1: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre>
Version 2.15.12	226. Copyright (C) 2012 Americ	can Megatrends, Inc.



# 3.2.4. CSM Configuration

Aptio Setup Uti Advanced	lity - Copyright (C) 2012 Am	erican Megatrends, Inc.
CSM Support	[Disable]	The setting specify how the host computer and the remote computer will exchange data. Both computers should have the same or compatiable settings.
		: Select Screen t: Select Item
		+/-: Change Opt.
		F1: General Help F2: Previous Values
		F3: Optimized Defaults F4: Save & Exit
		ESC: Exit
Version 2.15.1	.226. Copyright (C) 2012 Ame	rican Megatrends, Inc.

### 3.2.5. USB Configuration

Aptio Setup Utility Advanced	- Copyright (C) 20	12 American Megatrends, Inc.
USB Configuration		The setting specify how the bost computer and
USB Module Version	19	the remote computer will exchange data.
USB Controllers :		Both computers should have the same or
USB Devices:		compatiable settings.
Legacy USB Support	[Enable]	
	[20020]	
		: Select Screen
		Enter: Select
		+/-: Change Opt.
		F2: Previous Values
		F3: Optimized Defaults
		ESC: Exit
Version 2.15.1226.	. Copyright (C) 201	2 American Megatrends, Inc.



### 3.3. Platform Configuration

Aptio Setup Uti Main Advanced <mark>Plat</mark>	lity - Copyright (C) 2012 Amer form Configuration Boot Secu	ican Megatrends, Inc. rity Save & Exit
Platform RC Revision Processor Revision Microcode Revision Processor Configuration Memory Configuration South Bridge Chipset Co	Harcuvar 0.14934.64 506F1 24	Control the Lan Port Enable / Disable.
		<pre>: Select Screen 11: Select Item Enter: Select 4/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre>

### 3.3.1. Processor Configuration



EIST (GV3)

Enable/Disable EIST.



• Turbo Enable/Disable CPU Turbo capability.

### 3.3.2. Memory Configuration

Aptio Setup Utilit Platfor	y - Copyright (C) 2012 Ar m Configuration	merican Megatrends, Inc.
Memory Configuration Memory Information MRC Version Totla Frequency	Food 24001	The setting specify ho the host computer and the remote computer wi exchange data. Both computers should have the same or
		compatiable settings.
		: Select Screen
		<pre>fi: Select Item Enter: Select +/-: Change Opt. F1: General Help</pre>
		F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2 15 1220	6 Copyright (C) 2012 Ame	rican Megatrends Inc

Memory Frequency
 Memory speed



### 3.3.3. South Bridge Chipset Configuration

Aptio Setup Utility -	Copyright (C) 2012 Amer Configuration	rican Megatrends, Inc.
South Bridge Chipset Configura SATA Configuration State After G3	tion [Soft strap]	The setting specify how the host computer and the remote computer will exchange data. Both computers should have the same or compatiable settings.
		: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.15.1226. (	Copyright (C) 2012 Americ	can Megatrends, Inc.

• SATA Configuration Configuration of SATA controller.

#### • State After G3 Specify what state to go to when power is re-applied after a power failure (G3 state).



#### 3.3.3.1. South Bridge Chipset Configuration

1	Aptio Setup Utility Platform	- Copyright (C) Configuration	2012 American	Megatrends, Inc.
SATA O				The setting specify how the host computer and the remote computer will exchange data. Both computers should have the same or compatiable settings.
				: Select Screen ::: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
	Version 2.15.1226.	Copyright (C) 2	012 American Me	egatrends, Inc.

#### SATA 0

Configuration of sata controller



#### Enable controller

Enables/Disables SATA Controller if supported by current cpu SKU.



Aptio Setup Utility Platforn	7 - Copyright (C) 2012 American n Configuration	Megatrends, Inc.
Device Onformation Device Size Enable/Disable port Hot plug	[Enabled] [Disabled]	The setting specify how the host computer and the remote computer will exchange data. Both computers should have the same or compatiable settings.
		: Select Screen :: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.15.1226	. Copyright (C) 2012 American M	legatrends, Inc.

• Enable/Disable port

Enables/Disables SATA Controller port if supported by current cpu SKU.

 Hot plug Enables/Disables Hot plug

### 3.4. Boot Setup

Aptio Setup Utility - Copy Main Advanced Platform Config	right (C) 2012 Amer: guration Boot Secu	ican Megatrends, Inc. rity Save & Exit
Boot Logo Launch PXE OpROM policy	[Enabled] [Disabled]	Enables or disabled Quiet Boot option
Boot Option Priorities Network Device BBS Priorities		
		: Select Screen 1: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults
		F4: Save & Exit ESC: Exit



- Boot Logo
   Enables or disables Quiet Boot option.
- Launch PXE OpROM policy
   This option controls the execution of UEFI and Legacy PXE OpROM.
- **Boot Option Priorities** Set the system boot order.
- Network Device BBS Priorities Set the order of the legacy devices in this group.

### 3.5. Security Setup

Aptio Setup Utility - Copyright (C) 2012 American M Main Advanced Platform Configuration Boot <mark>Security</mark>	Megatrends, Inc. Save & Exit
Password Description If ONLY the Administrator's password is set, then this only limits access to Setup and is only asked for when entering Setup. The password length must be in the following range: Minimum length 3 Maximum length 20	Set Administrator Password
Administrator Password	: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit

• Administrator Password Set Administrator Password.



### 3.6. Save & Exit Setup

Aptio Setup Utility - Copyright (C) 2012 American : Main Advanced Platform Configuration Boot Security	Megatrends, Inc. Save & Exit
Save Changes and Exit Discard Changes and Exit Restore Defaults	Exit system setup after saving the changes.
	: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.15.1226. Copyright (C) 2012 American Me	egatrends, Inc.

- Save Changes and Exit Exit system setup after saving the changes.
- **Discard Changes and Reset** Exit system setup without saving any changes.
- Restore Defaults
   Restore/Load the default values for all the set up options.



# 4. Software Installation and Programming Guide

### 4.1. Introduction

#### 4.1.1. Environment

This test utility develop is based on kernel 4.8 above (Ubuntu 18.04.1 Server 64bit).

#### 4.1.2. GPIO

The AND-DNV3N3-4C provides GPIO interface. Users can use the GPIO APIs to control GPO Pin.

#### 4.1.3. Watchdog

The AND-DNV3N3-4C provides a Watchdog Timer. Users can use the Watchdog APIs to configure and to access the Watchdog timer. The Watchdog timer can be set to 1~255 seconds. Setting the timer to zero disables the timer. The remaining seconds of the timer to reboot can be read from the timer.

### 4.2. File Descriptions

### 4.2.1. GPIO/Watchdog/LAN Bypass Subsystem Module

#### 1. TestUtility.exe

The GPIO, Watchdog, Console user interface bin binary.

#### 2. Libw83627.h

This file includes the declarations of the APIs and macro definitions.

#### 3. Libw83627.a

The static library for linux.

#### 4. Libw83627.so

The dynamic library for linux.

#### 5. Install\_driver

This file is linux shell script file. Run this file can help you install environment and modprobe driver on linux.

#### 6. readme

Use this utility first. Please read the readme file first.



## 4.3. API List and Descriptions

#### 4.3.1. GPIO

Syntax:	Get_gpi_status(int pin)	
Description:	Get the status of GPIO input pins status.	
Parameters:	This function fills in an integer variable as the parameter.	
	The pin0 ~ pin1 is the status of the input pins.	
Return Value:	1: HIGH, 0: LOW.	
Syntax:	Get_gpo_status(int pin)	
Description:	Get the status of GPIO output pins status.	
Parameters:	This function fills in an integer variable as the parameter.	
	The pin0 ~ pin1 is the status of the output pins.	
Return Value:	1: HIGH, 0: LOW.	
Syntax:	Set_gpo(int pin, int value)	
Description:	Set the status of GPIO output value.	
Parameters:	Set value 0 is Low, 1 is High	
Return Value:	If the function sets the values successfully, it returns 0 or -1, any other returned value stands for error.	

\_\_\_\_\_

### 4.3.2. Watchdog

Syntax:	Void wdt_start(int _timevalue)
Description:	This function gets the watchdog timer register to the timevalue and starts to count down.
Parameters:	The parameter 'val' is the value to set to watchdog timer register. The range is 1 ~ 255.
Return Value:	This function returns the value of the time counter and returns it to the caller as an unsigned integer.

Syntax:	Void wdt_stop(void)	
Description:	This function sets the watchdog timer stop.	
Parameters:	None.	
Return Value:	None.	



### 4.3.3. Notes

Syntax:	int libw83627_init(void)	
Description:	Must call this function first before using the watchdog and gpio function.	
Parameters:	None.	
Return Value:	0: Successful, -1: Fail	

Syntax:	void lib_close(void)
Description:	If not using watchdog and gpio fuction on your program, please call this function.
Parameters:	None.
Return Value:	None.



# 5. FAQ

#### Q 1. Where is the serial number located on my system?

• The serial number (S/N) is an alpha-numeric character located on the bottom or side chassis.



(for reference only)



### **Technical Support Form**

We deeply appreciate your purchase of Acrosser products. Please find the "**tech\_form. doc**" file in our utility CD. If you have any questions or problems about Acrosser products, please fill in the following information. We will answer your questions in the shortest time possible.

#### **Describe Your Info and Acrosser System Info**

Your Company Name:	
Your Contact Info:	Phone Number:
Your E-Mail Address:	
Your Company Address:	
Acrosser Model Name:	
Acrosser Serial Number:	
Describe System Configuration	
CPU Type:	
Memory Size:	
<ul> <li>Storage Device (e.g. HDD, CF, or SSD):</li></ul>	
Additional Peripherals (e.g. Graphic Card):	
Operating System & Version (e.g. Window	s 7 Embedded):
Special API or Driver:	
	(If yes, please provide it for debug.)
Running Applications:	
Others:	
Describe Your Problems or Questions:	
Send the above information to one of the • Acrosser Local Sales Representative • Acrosser Authorized Sales Channels • Acrosser Inquiry http://www.acrosser.com	ne following Acrosser contacts:





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