

Network Security Appliance

Lanner

MR-328

User Manual

Rev 1.0

August 19, 2015

Network Security Appliance

Revision History

Rev	Date	Descriptions
0.1	July 22, 2015	Preliminary
1.0	August 19, 2015	Official release

This document contains proprietary information of Lanner Electronics Inc. –and is not to be disclosed or used except in accordance with applicable agreements.

Copyright © 2015. All Rights Reserved.

Copyright© 2015 Lanner Electronics Inc. All rights reserved. The information in this document is proprietary and confidential to Lanner Electronics Inc. No part of this document may be reproduced in any form or by any means or used to make any derivative work (such as translation, transformation, or adaptation) without the express written consent of Lanner Electronics Inc. Lanner Electronics Inc. reserves the right to revise this document and to make changes in content from time to time without obligation on the part of Lanner Electronics Inc. to provide notification of such revision or change.

The information in this document is furnished for informational use only, is subject to change without notice, and should not be construed as a commitment by Lanner Electronics Inc. Lanner Electronics Inc. assumes no responsibility or liability for any errors or inaccuracies that may appear in this document or any software that may be provided in association with this document.

Online Resources

The listed websites are links to the on-line product information and technical support.

Resource	Website
Lanner	www.lannerinc.com
Product Resources	www.lannerinc.com/support/download-center
RMA	http://eRMA.lannerinc.com

Acknowledgement

Intel, Pentium and Celeron are registered trademarks of Intel Corp.

Microsoft Windows and MS-DOS are registered trademarks of Microsoft Corp.

All other product names or trademarks are properties of their respective owners.

Compliances and Certification

CE Certification

This product has passed the CE test for environmental specifications. Test conditions for passing included the equipment being operated within an industrial enclosure. In order to protect the product from being damaged by ESD (Electrostatic Discharge) and EMI leakage, we strongly recommend the use of CE-compliant industrial enclosure products.

FCC Class A Certification

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the 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 instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

EMC Notice

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the 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 instruction manual, may cause harmful

Network Security Appliance

interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case users will be required to correct the interference at their own expense.

Safety Guidelines

- Follow these guidelines to ensure general safety:
- Keep the chassis area clear and dust-free before, during and after installation.
- Do not wear loose clothing or jewelry that could get caught in the chassis. Fasten your tie or scarf and roll up your sleeves.
- Wear safety glasses/goggles if you are working under any conditions that might be hazardous to your eyes.
- Do not perform any action that creates a potential hazard to people or makes the equipment unsafe.
- Disconnect all power by turning off the power and unplugging the power cord before installing or removing a chassis or working near power supplies
- Do not work alone if potentially hazardous conditions exist.
- Never assume that power is disconnected from a circuit; always check the circuit.

LITHIUM BATTERY CAUTION:

Risk of explosion could occur if battery is replaced by an incorrect type. Please dispose of used batteries according to the recycling instructions of your country.

- Installation only by a trained electrician or only by an electrically trained person who knows all the applied or related installation and device specifications..
- Do not carry the handle of power supplies when moving to other place.
- The machine can only be used in a fixed location such as labs or computer facilities.

Operating Safety

- Electrical equipment generates heat. Ambient air temperature may not be adequate to cool equipment to acceptable operating temperatures without adequate circulation. Be sure that the room in which you choose to operate your system has adequate air circulation.
- Ensure that the chassis cover is secure. The chassis design allows cooling air to circulate effectively. An open chassis permits air leaks, which may interrupt and redirect the flow of cooling air from internal components.

Electrostatic discharge (ESD) can damage equipment and impair electrical circuitry. ESD damage occurs when electronic components are improperly handled and can result in complete or intermittent failures. Be sure to follow ESD-prevention procedures when removing

Network Security Appliance

and replacing components to avoid these problems.

- Wear an ESD-preventive wrist strap, ensuring that it makes good skin contact. If no wrist strap is available, ground yourself by touching the metal part of the chassis.
- Periodically check the resistance value of the antistatic strap, which should be between 1 and 10 megohms (Mohms).

Mounting Installation Environment Precaution

1. Elevated Operating Ambient - If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum ambient temperature (T_{ma}) specified by the manufacturer.
2. Reduced Air Flow - Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.
3. Mechanical Loading - Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.
4. Circuit Overloading - Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on over-current protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.
5. Reliable Earthing - Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (e.g. use of power strips)."

Consignes de sécurité

Suivez ces consignes pour assurer la securite generale :

- Laissez la zone du chassis propre et sans poussiere pendant et apres l'installation.
- Ne portez pas de vetements amples ou de bijoux qui pourraient etre pris dans le chassis. Attachez votre cravate ou echarpe et remontez vos manches.
- Portez des lunettes de securite pour proteger vosmyeux.
- N'effectuez aucune action qui pourrait creer un dangermpour d'autres ou rendre l'equipement dangereux.
- Coupez completement l'alimentation en eteignant l'alimentation et en debranchant le cordon d'alimentation avant d'installer ou de retirer un chassis ou de travailler a proximite de sources d'alimentation.
- Ne travaillez pas seul si des conditions dangereuses sont presentes.
- Ne considerez jamais que l'alimentation est coupee d'un circuit, verifiez toujours le circuit.

Network Security Appliance

Cet appareil genere, utilise et emet une energie radiofrequence et, s'il n'est pas installe et utilise conformement aux instructions des fournisseurs de composants sans fil, il risque de provoquer des interferences dans les communications radio.

Avertissement concernant la pile au lithium

- Risque d'explosion si la pile est remplacee par une autre d'un mauvais type.
- Jetez les piles usagees conformement aux instructions.
- L'installation doit etre effectuee par un electricien forme ou une personne formee a l'electricite connaissant toutes les specifications d'installation et d'appareil du produit.
- Ne transportez pas l'unite en la tenant par le cable d'alimentation lorsque vous deplacez l'appareil.
- La machine ne peut etre utilisee qu'a un lieu fixe comme en laboratoire, salle d'ordinateurs ou salle de classe.

Sécurité de fonctionnement

- L'equipement electrique genere de la chaleur. La temperature ambiante peut ne pas etre adequate pour refroidir l'equipement a une temperature de fonctionnement acceptable sans circulation adaptee. Verifiez que votre site propose une circulation d'air adequate.
 - Verifiez que le couvercle du chassis est bien fixe. La conception du chassis permet a l'air de refroidissement de bien circuler. Un chassis ouvert laisse l'air s'echapper, ce qui peut interrompre et rediriger le flux d'air frais destine aux composants internes.
 - Les decharges electrostatiques (ESD) peuvent endommager l'equipement et generer les circuits electriques. Des degats d'ESD surviennent lorsque des composants electroniques sont mal manipules et peuvent causer des pannes totales ou intermittentes. Suivez les procedures de prevention d'ESD lors du retrait et du remplacement de composants.
- Portez un bracelet anti-ESD et veillez a ce qu'il soit bien au contact de la peau. Si aucun bracelet n'est disponible, reliez votre corps a la terre en touchant la partie metallique du chassis. Verifiez regulierement la valeur de resistance du bracelet antistatique, qui doit etre comprise entre 1 et 10 megohms (Mohms).

Consignes de sécurité électrique

- Avant d'allumer l'appareil, reliez le cable de mise a la terre de l'equipement a la terre.
- Une bonne mise a la terre (connexion a la terre) est tres importante pour proteger l'equipement contre les effets nefastes du bruit externe et reduire les risques d'electrocution en cas de foudre.
- Pour desinstaller l'equipement, debranchez le cable de mise a la terre apres avoir eteint l'appareil.
- Un cable de mise a la terre est requis et la zone reliant les sections du conducteur doit

Network Security Appliance

faire plus de 4 mm² ou 10 AWG.

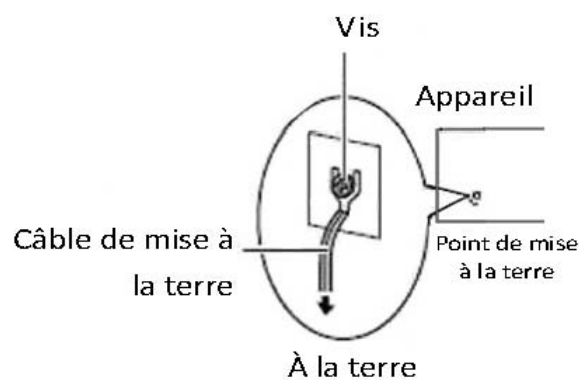
Procédure de mise à la terre pour source

d'alimentation CC Procédure de mise à la terre pour

source d'alimentation CC

- Desserrez la vis du terminal de mise a la terre.
- Branchez le cable de mise a la terre a la terre.
- L'appareil de protection pour la source d'alimentation

CC doit fournir 30 A de courant. Cet appareil de protection doit etre branche a la source d'alimentation avant l'alimentation CC.



Network Security Appliance

Table of Contents

Revision History	2
Chapter 1: Introduction	9
System Specification.....	9
Ordering Information	10
Package Contents	10
Chapter 2: System Overview	11
Mechanical Drawing.....	11
Block Diagram	12
Front I/Os	13
Rear I/Os	14
Chapter 3: Board Layout.....	15
Jumpers and Connectors on the Motherboard	15
Jumpers and Connectors List	16
Jumper Setting and Connector Pin-out	17
Chapter 4: Hardware Setup	23
Installing a SATA 2.5” HDD/SSD	24
Installing a Mini-PCIe Module	26
Appendix A: Terms and Conditions.....	27

Chapter 1: Introduction

Thank you for choosing MR-328. MR-328 is an entry level, Cavium-driven (Cavium Octeon III CN7010) desktop product which supports up to 6 GbE LAN ports and onboard 2GB memory. This Cavium Octeon integrated SoC processor delivers deep packet inspection, virtualization supports and low power consumption. MR-328 comes with multiple I/O connectivity including one RJ-45 console port, two USB 2.0 Type-A ports, six GbE RJ-45 LAN ports with 2 pairs of bypass and one SATA 2.5" HDD/SSD drive bay. With the RISC base and rich I/Os, MR-328 serves well as entry-level network security for enterprises and factory setting.

Here is the summary of the key features:

- Cavium Octeon III CN7010 800MHz Single Core CPU
- Onboard DDR3 memory at 2GB
- 6 x RJ-45 GbE LAN ports with level 3 surge protection
- 2 pairs of Lanner Gen1 bypass
- Marvell network switch 88E6172
- 2 x USB ports
- Storage: 1 x SATA 2.5" HDD/SSD drive bay and 1 x SD socket
- 1 x RJ-45 Console port

Please refer to the following chart for a detailed description of the system's specifications.

System Specification

Processor Options		Cavium Octeon III CN7010 800MHz single core CPU
System Memory		1x DDR3 onboard RAM at 2GB
USB		2 x USB 2.0 Type-A connectors
Storage		1x SATA 2.5" HDD/SSD drive bay 1 x SD card
Boot Loader		1 x NOR Flash MB
Networking	LAN	6 x RJ-45 GbE LAN ports
	Switch/Controller	1 x Marvell 88E6172 switch 1 x Intel I210
	Console	1 x RJ-45 console port
	Bypass	2 pairs of Lanner Gen1 bypass
Expansion		1x mini-PCIe socket with PCIe signal
LED Indicators		Power/Status/HDD indicators

Network Security Appliance

		2 x LAN LEDs on each LAN port
Form Factor		1U desktop
GPIO		2 x 5 (1 x PWR, 1 x GND, 4 x GPI, 4 x GPO)
Reset		1 x Reset switch
Cooling		1 x 3-pin Fan connector
Physical	Housing	Lanner 72 SPCG
Characteristics	Weight	2kg
	Dimensions	231 x 200 x 44, unit: mm
	Mounting	TBD
Environment	Operating Temperature	Standard: 0~40°C
	Ambient Humidity	5 to 95% (non-condensing)
Power	Input Voltage	+12V DC
	Power Input	1 x DC Jack with lock
	Adapter	FSP 36W Power Adaptor FSP036-RAC 9NA0361426 w/Lock
Certifications	EMC	CE, FCC
	Green product	RoHS

Ordering Information

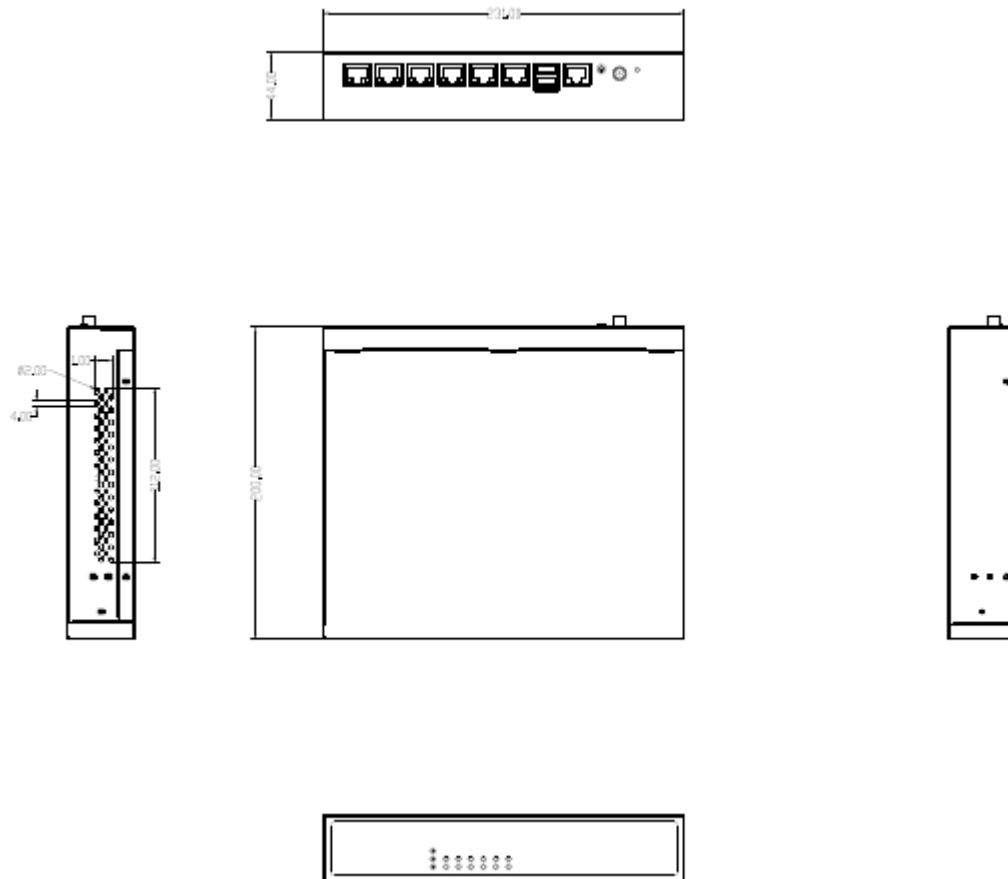
MR-328	MR-328 Cavium Octeon III CN7010-800MHz Single Core CPU Onboard DDR3 2G Memory, 1x RJ45 Console, 2x USB 2.0, 6x Gbe RJ45 with 2pairs bypass, optional 1x 2.5" HDD support
---------------	--

Package Contents

MR-328	1 x MR-328 Network Security Platform 1 x US power cable 1 x 36W power adaptor 1 x screws pack 1 x Console cable
---------------	---

Chapter 2: System Overview

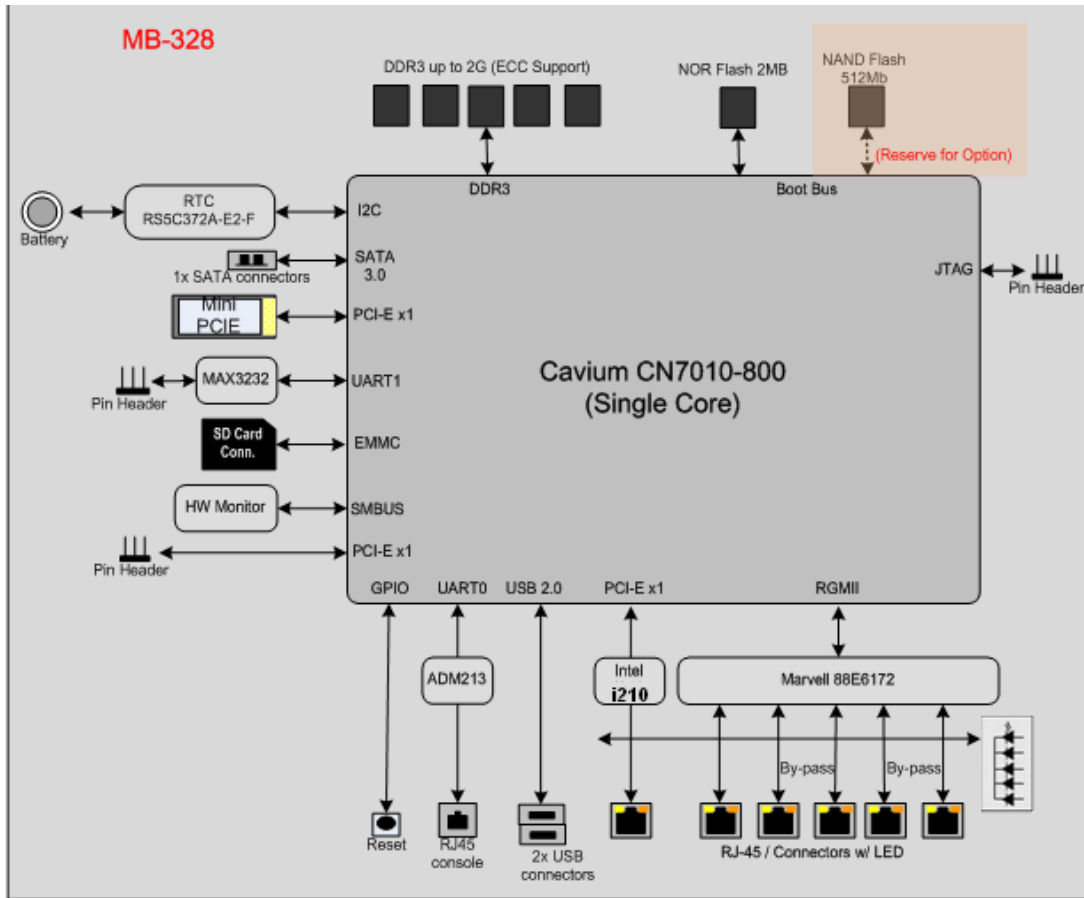
Mechanical Drawing



Unit: mm

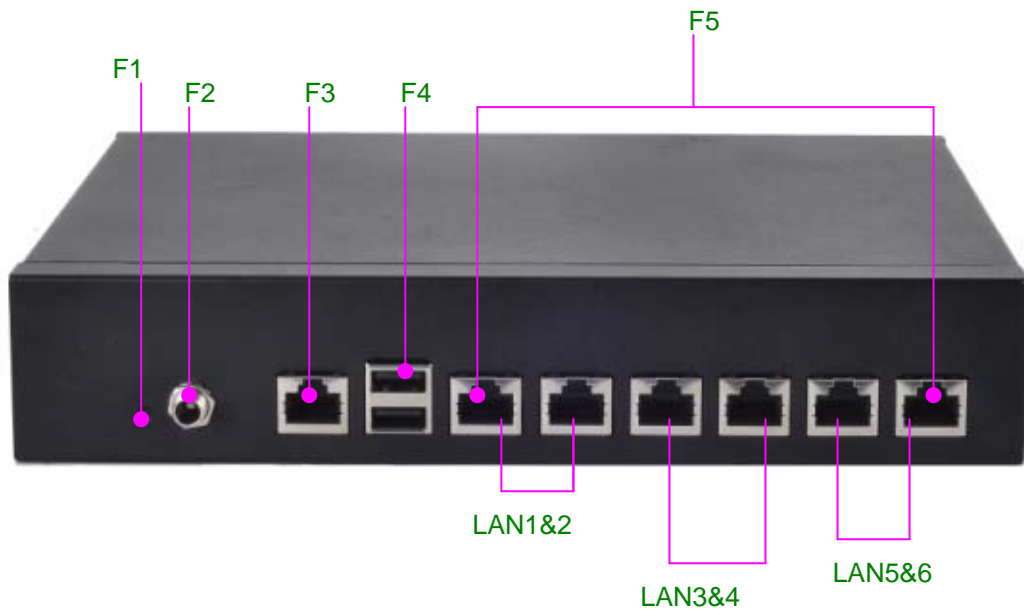
Network Security Appliance

Block Diagram



Network Security Appliance

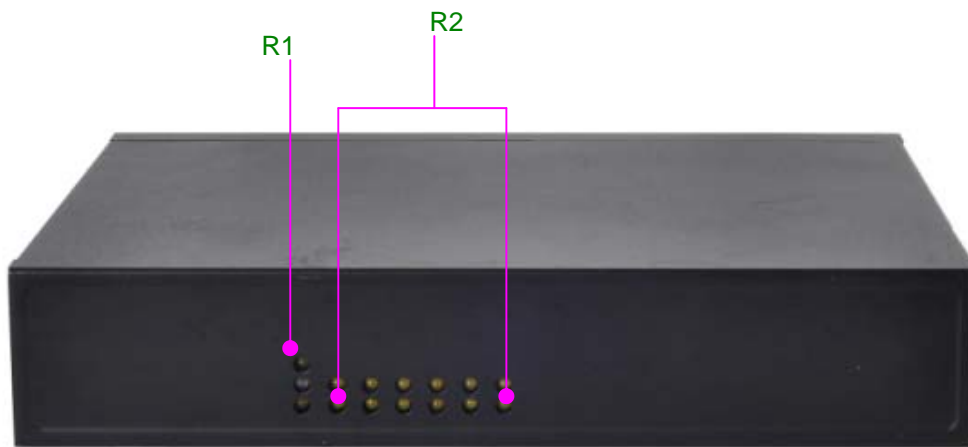
Front I/Os



F1 Reset switch	1 x reset switch, used to reboot the system without turning off the power.
F2 DC IN	DC Jack for power input. The required power supply is 12VDC.
F3 Console	1 x RJ-45 console port
F4 USB	2 x USB 2.0 Type-A connectors
F5 LAN	6 x RJ-45 GbE LAN ports, 2 pairs of LAN bypass (LAN3&4, LAN5&6)

Network Security Appliance

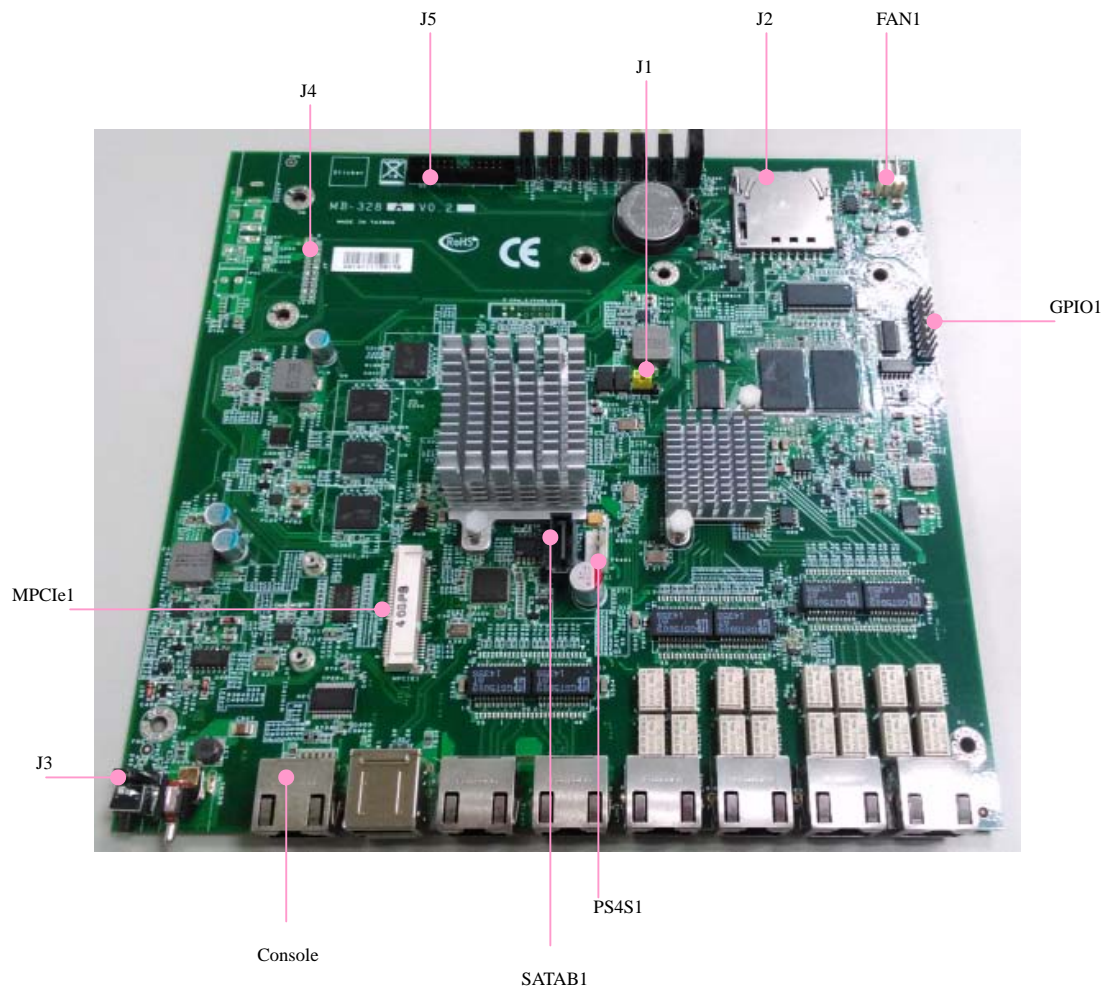
Rear I/Os



R1 LED (PWR/Status/HDD)	<p>LED indicators for power, device status and storage activities</p> <p>Power: If the LED is on it indicates that the system is powered on. If it is off, it indicates that the system is powered off.</p> <p>Status: This LED is programmable. You could program it to display the operating status with the following behavior:</p> <p>HDD: If the LED blinks, it indicates data access activities; otherwise, it remains off.</p>
R2 LED (LAN)	<p>LED indicators for LAN ports</p> <p>Speed LED (the upper LED): If the LED is amber, it indicates that the connection speed is 1000Mbps. If the LED is not flashing, it indicates that the connection speed is 10/100Mbps.</p> <p>Link/Active LED (the bottom LED): If the LED is on, it indicates that the port is active. If it blinks, it indicates that there is traffic.</p>

Chapter 3: Board Layout

Jumpers and Connectors on the Motherboard

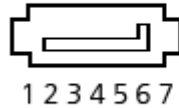


Jumpers and Connectors List

Labels	Descriptions	Remarks
BWP1	SPI ROM Write Protect	Reserved for factory use
CF1	CompactFlash socket	By option
CLR1	Clear CMOS	
COM1	Serial Port 1 connector	
CON1	SATA power connector	
KBMS1	Keyboard and mouse connector	
LAN1	RJ-45 LAN ports with bypass	
LAN1, 2, 3	RJ-45 LAN ports	
LPC1	Low-Pin-Count pin header	Reserved for factory use
PWR1	Power button connector	
SATA1	SATA signal connector	
SPI	Serial Peripheral Interface	
USB1/2	USB 2.0 Type-A connectors	
VGA1	VGA connector	
CN1	6-pin power input	
J3	Board-to-board connector	
J1	SO-DIMM socket	
RST1	Reset button	
RST2	HW/SW reset selection	
JP1	Board-to-board power connector	

Jumper Setting and Connector Pin-out

Serial-ATA Connector (SATAB1): It is for connecting a 2.5" SATA HDD/SSD to serve as your system's storage.



Pin No.	Function
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND

Serial-ATA Power Connector (CON1): It is a 4-pin connector for connecting the SATA power cable.



PIN	Signal
1	+12V
2	Ground
3	Ground
4	+5V

Network Security Appliance

Cooling fan connector (FAN1): it is a 3-pin DC fan for cooling purpose



PIN	Signal
1	Ground
2	+12V
3	FAN speed

PCIE Header (J4): reserved



PIN	Signal	PIN	Signal
1	+3.3V	2	+3.3V
3	Ground	4	Ground
5	+5V	6	TX_P
7	NC	8	TX_N
9	Ground	10	Ground
11	SCL	12	RX_P
13	SDA	14	RX_N
15	Ground	16	Ground
17	+2.5V	18	CLK_P
19	RESET	20	CLK_N

Network Security Appliance

Reset (J3): the jumper for hardware or software reset selection



PIN	Signal
Short 1-2	Hardware RESET
Short 2-3	Software RESET

LAN LEDs (J5): LED indicators for each LAN port



PIN	Signal	PIN	Signal
1	LAN1_100M link	2	LAN1_Gig link
3	+3.3V	4	LAN1_ACT-
5	LAN2_Gig link+	6	LAN2_Gig link-
7	LAN2_LINK_ACT+	8	LAN2_LINK_ACT-
9	LAN3_Gig link+	10	LAN3_Gig link-
11	LAN3_LINK_ACT+	12	LAN3_LINK_ACT-
13	LAN4_Gig link+	14	LAN4_Gig link-
15	LAN4_LINK_ACT+	16	LAN4_LINK_ACT-
17	LAN5_Gig link+	18	LAN5_Gig link-
19	LAN5_LINK_ACT+	20	LAN5_LINK_ACT-
21	LAN6_Gig link+	22	LAN6_Gig link-
23	LAN6_LINK_ACT+	24	LAN6_LINK_ACT-

Network Security Appliance

U-Boot Mode (J1)



PIN	Signal
Short 1-2	Normal mode
Short 2-3	Fail Safe mode

Digital GPIO Pin Header (GPIO1): 16-pin General Purpose Input/Output pin header



PIN	Signal	PIN	Signal
1	GPIO1	2	Ground
3	GPIO2	4	Ground
5	GPIO3	6	Ground
7	GPIO4	8	Ground
9	GPIO5	10	Ground
11	GPIO6	12	Ground
13	GPIO7	14	Ground
15	GPIO8	16	Ground

Network Security Appliance

RJ-45 Console Port (Console):



PIN	Signal	PIN	Signal
1	RTS	2	DTR
3	TXD	4	Ground
5	Ground	6	RXD
7	DSR	8	CTS

Mini-PCle socket (MPCIE1): 1 x mini PCIe socket with PCIe signal



PIN	Signal	PIN	Signal
1		2	3.3V
3	Reserved	4	GND
5	Reserved	6	1.5V
7	CLKREQ#	8	VCC

Network Security Appliance

9	GND	10	I/O
11	REFCLK-	12	CLK
13	REFCLK+	14	RST
15	N/C or GND	16	VPP
Mechanical key			
17	Reserved	18	GND
19	Reserved	20	Reserved
21	GND	22	PERST#
23	PERn0	24	+3.3Vaux
25	PERp0	26	GND
27	GND	28	+1.5V
29	GND	30	SMB_CLK
31	PETn0	32	SMB_DATA
33	PETp0	34	GND
35	GND	36	NC
37	Reserved	38	NC
39	Reserved	40	GND
41	Reserved	42	LED_WWAN#
43	Reserved	44	LED_WLAN#
45	Reserved	46	LED_WPAN#
47	Reserved	48	+1.5V
49	Reserved	50	GND
51	Reserved	52	+3.3V

Chapter 4: Hardware Setup

Preparing the Hardware Installation

To access some components and perform certain service procedures, you must perform the following procedures first.

WARNING:

- To reduce the risk of personal injury, electric shock, or damage to the equipment, please remove all power sources.
- Please wear ESD protected gloves before conducting the following steps.
- Do NOT pile items on top of the system to prevent damages due to this improper use. Lanner is not liable for damages caused by improper use of the product.

1. Power off MR-328 and remove the power cord.
2. The cover is designed an L-shape. Unscrew the threaded screw circled as shown in the picture below.



Network Security Appliance

3. Remove the cover.



Installing a SATA 2.5" HDD/SSD

The system can accommodate one 2.5" Serial-ATA disk.

Follow these steps to install a hard disk into the FW-7551:

1. Unscrew the 4 screws on the hard disk tray to take out the hard disk tray from the system.
2. Place hard disk on the hard disk tray and align the holes of the hard disk with the mounting holes on the tray.
3. Secure the hard disk with 4 mounting screws on the bottom of the hard disk tray.
4. Connect the Serial-ATA power and data disk cables to the hard disk's power and drive connector respectively.
5. Plug the Serial-ATA power and data disk cables to the Serial-ATA power and drive connectors on the main board.
6. Put the hard disk tray with the installed hard disk back to the system and secure it with the mounting screws.



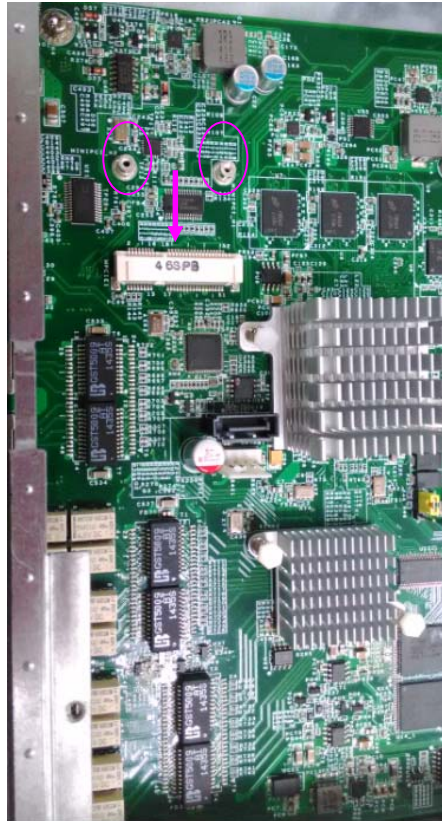
Network Security Appliance



Installing a Mini-PCle Module

Please follow the steps below for installing a half-sized mini-PCle module.

1. Align the Mini-PCIE module's keys with the Mini-PCle slot (MPCIE1) notch.
2. Insert the module into the connector.
3. Press the module down and install the module with screws.



Appendix A: Terms and Conditions

Warranty Policy

1. All products are under warranty against defects in materials and workmanship for a period of one year from the date of purchase.
2. The buyer will bear the return freight charges for goods returned for repair within the warranty period; whereas the manufacturer will bear the after service freight charges for goods returned to the user.
3. The buyer will pay for repair (for replaced components plus service time) and transportation charges (both ways) for items after the expiration of the warranty period.
4. If the RMA Service Request Form does not meet the stated requirement as listed on "RMA Service," RMA goods will be returned at customer's expense.
5. The following conditions are excluded from this warranty:
 - Improper or inadequate maintenance by the customer
 - Unauthorized modification, misuse, or reversed engineering of the product
 - Operation outside of the environmental specifications for the product.

Requesting a RMA#

1. To obtain a RMA number, simply fill out and fax the "RMA Request Form" to your supplier.
2. The customer is required to fill out the problem code as listed. If your problem is not among the codes listed, please write the symptom description in the remarks box.
3. Ship the defective unit(s) on freight prepaid terms. Use the original packing materials when possible.
4. Mark the RMA# clearly on the box.

Note: Customer is responsible for shipping damage(s) resulting from inadequate/loose packing of the defective unit(s). All RMA# are valid for 30 days only; RMA goods received after the effective RMA# period will be rejected.

Network Security Appliance

RMA Service Request Form

When requesting RMA service, please fill out the following form. Without this form enclosed, your RMA cannot be processed.

RMA No.:		Reasons to Return: <input type="checkbox"/> Repair(Please include failure details)	
		<input type="checkbox"/> Testing Purpose	
Company:		Contact Person:	
Phone No.:		Purchased Date:	
Fax No.:		Applied Date:	
Return Shipping Address: _____			
Shipping by: <input type="checkbox"/> Air Freight <input type="checkbox"/> Sea <input type="checkbox"/> Express _____			
<input type="checkbox"/> Others: _____			
Item	Model Name	Serial Number	Configuration

Item	Problem Code	Failure Status

- *Problem Code:
- | | | | |
|------------------------|------------------------------|--------------------|--------------------------|
| 01: D.O.A. | 07: BIOS Problem | 13: SCSI | 19: DIO |
| 02: Second Time R.M.A. | 08: Keyboard Controller Fail | 14: LPT Port | 20: Buzzer |
| 03: CMOS Data Lost | 09: Cache RMA Problem | 15: PS2 | 21: Shut Down |
| 04: FDC Fail | 10: Memory Socket Bad | 16: LAN | 22: Panel Fail |
| 05: HDC Fail | 11: Hang Up Software | 17: COM Port | 23: CRT Fail |
| 06: Bad Slot | 12: Out Look Damage | 18: Watchdog Timer | 24: Others (Pls specify) |

Request Party

Authorized Signature / Date

Confirmed By Supplier

Authorized Signature / Date