

ARTISAN®
TECHNOLOGY GROUP

Your **definitive** source for quality pre-owned equipment.

Artisan Technology Group
(217) 352-9330 | sales@artisantg.com | artisantg.com

Full-service, independent repair center
with experienced engineers and technicians on staff.

We buy your excess, underutilized, and idle equipment
along with credit for buybacks and trade-ins.

Custom engineering
so your equipment works exactly as you specify.

- Critical and expedited services
- In stock / Ready-to-ship
- Leasing / Rentals / Demos
- ITAR-certified secure asset solutions

Expert team | Trust guarantee | 100% satisfaction

All trademarks, brand names, and brands appearing herein are the property of their respective owners.

Visit our website - *Click HERE*

Hardware Reference Manual

NETernity* RM921N / RM921ND

VME Managed Ethernet Switch, IPv6-Capable, Layer 2/3+, 12/24 Port Gigabit, OpenWare* Switch Management

Publication No. 597-0000000013-000 Rev. F



abaco SYSTEMS

Document History

Revision	Date	Description
D	November 2010	N/A
D.1	March 2016	Rebranded to Abaco format
E	September 2019	Added CoV in Appendix C
F	November 2019	Added updated CoV and added reference to RM921ND

Waste Electrical and Electronic Equipment (WEEE) Returns



Abaco Systems is registered with an approved Producer Compliance Scheme (PCS) and, subject to suitable contractual arrangements being in place, will ensure WEEE is processed in accordance with the requirements of the WEEE Directive.

Abaco Systems will evaluate requests to take back products purchased by our customers before August 13, 2005 on a case by case basis. A WEEE management fee may apply.

About This Manual

Conventions

Notices

This manual may use the following types of notice:



WARNING

Warnings alert you to the risk of severe personal injury.



CAUTION

Cautions alert you to system danger or loss of data.



NOTE

Notes call attention to important features or instructions.



TIP

Tips give guidance on procedures that may be tackled in a number of ways.



LINK

Links take you to other documents or websites.

Numbers

All numbers are expressed in decimal, except addresses and memory or register data, which are expressed in hexadecimal. Where confusion may occur, decimal numbers have a “D” subscript and binary numbers have a “b” subscript. The prefix “0x” shows a hexadecimal number, following the ‘C’ programming language convention. Thus:

One dozen = 12_D = 0x0C = 1100_b

The multipliers “k”, “M” and “G” have their conventional scientific and engineering meanings of $x10^3$, $x10^6$ and $x10^9$, respectively, and can be used to define a transfer rate. The only exception to this is in the description of the size of memory areas, when “K”, “M” and “G” mean $x2^{10}$, $x2^{20}$ and $x2^{30}$ respectively.

In PowerPC terminology, multiple bit fields are numbered from 0 to n where 0 is the MSB and n is the LSB. PCI terminology follows the more familiar convention that bit 0 is the LSB and n is the MSB.

Text

Signal names ending with “#” denote active low signals; all other signals are active high. “-” and “+” denote the low and high components of a differential signal respectively.

Further Information

Abaco Website

You can find information regarding Abaco products on the following website:



LINK
https://www.abaco.com

Abaco Documents

This document is distributed via the Abaco website. You may register for access to manuals via the website.



LINK
https://www.abaco.com/products/neternity-rm921n/p1222



NOTE
Technical literature describing components used on the RM921N is available from the manufacturers' websites.

Technical Support Contact Information

You can find technical assistance contact details on the website Support page.



LINK
https://www.abaco.com/support

Abaco will log your query in the Technical Support database and allocate it a unique Case number for use in any future correspondence.

Alternatively, you may also contact Abaco's Technical Support via:



LINK
support@abaco.com

Returns

If you need to return a product, there is a Return Materials Authorization (RMA) form available via the website Support page.



LINK
https://www.abaco.com/support

Do not return products without first contacting the Abaco Repairs facility.

Contents

About This Manual 3
1 • Overview 8
1.1 Features 9
1.1.1 Product Features 9
1.1.2 Switch Fabric Features 9
1.2 System Management Support 9
1.3 Safety Summary 10
1.3.1 Do Not Operate in an Explosive Atmosphere 10
1.3.2 Keep Away from Live Circuits 10
1.3.3 Do Not Service or Adjust Alone 10
1.3.4 Do Not Substitute Parts or Modify System 10
1.3.5 Handling 10
2 • Unpacking and Installation 11
2.1 Unpacking Procedures 11
2.2 Identifying Your Board 11
2.3 Equipment Grounding 11
2.4 Installation 11
2.5 Front Panel Connectors and Indicators 12
2.5.1 Network Connections 12
2.5.2 Port LEDs 12
2.5.3 Serial Console Port 14
2.5.4 Baseboard-to-VME Backplane Connector 15
3 • Theory of Operation 16
3.1 Operation 16
3.2 Switch Software Environment 19
3.3 Switching Fabric 19
3.3.1 IPv6 Support 19
3.3.2 Layer 2/3 19
3.3.3 Virtual LAN (VLAN) 20
3.3.4 Routing Domains 20
3.3.5 Port Mirror 21
A • Compliance 22
A.1 Emission Compliance Notice 22
A.2 Optical/Laser Device Notice 23
B • Specifications 24
C • Statement of Volatility 25
C.1 Volatile Memory 25
C.2 Non-Volatile Memory 25
C.3 Media Storage 26

List of Figures

Figure 2-1 RM921N Front Panels 13
Figure 2-2 Serial Console Port 14
Figure 2-3 Serial Console Port LEDs' Location 14
Figure 3-1 Baseboard Block Diagram 17
Figure 3-2 DA921 with Removable Secure Memory 18

List of Tables

Table 2-1 Front Panel LEDs 12
Table 2-2 Serial Console Port (P13) Pin Descriptions 14
Table 2-3 Serial Console Port (P13) LEDs 14
Table 2-4 Board-to-VME Backplane Connector (P1) Pin Description 15
Table 2-5 Board-to-VME Backplane Connector (P2) Pin Description 15
Table B-1 Specifications for RM921N 24
Table C-1 Volatile Memory 25
Table C-2 Non-Volatile Memory 25
Table C-3 Media Storage 26

1 • Overview

The NETernity* RM921N is a full wire speed, Managed Layer 2/3 switch with Abaco's exclusive OpenWare* switch management environment. The RM921N provides an all-Gigabit Ethernet solution for high availability VME systems with an option to support 100Base-FX Ethernet connections. The boards feature 12 or 24 ports of GbE (Gigabit Ethernet) or 100Base-FX. Port configuration can be ordered with a combination of different types of Gigabit (copper and fiber) and 100Base-FX interfaces. The 100Base-FX interface uses an LC-type fiber transceiver. In addition, the RM921N offers Layer 3 support for routing and Layer 4-7 for packet classification and filtering. All ports are switched ports.

The RM921N occupies either a single slot (12) or dual slot (24) in a VME chassis, depending upon the number of ports configured. The minimum configuration is the baseboard with 12 ports. The expansion board (second slot) provides an additional 12 ports through a board-to-board connection which then enables the RM921N to support a total of 24 ports.

The GbE ports can be ordered as either fiber or copper interfaces. The fiber interfaces support either 1000Base-SX or 1000Base-LX GbE transceivers. RJ45 connectors are used for the copper media; LC for fiber.

The new management processor board, DA921, has an optional secure memory function that allows easy removal of the flash memory from the board. This is available on the RM921ND only. The flash memory on the RM921N is not removable.

1.1 Features

1.1.1 Product Features

- 6U VME form factor
- Layer 2/3 Switching
- 12 Port Gigabit /100Base-FX Switch [single slot]
- 24 Port Gigabit /100Base-FX Switch [dual slot]
- Fully managed solution
- Full IPv6 Compatibility
- Combination of copper or fiber ports
- Full wire speed
- 1000Base-SX fiber transceivers
- 1000Base-LX fiber transceivers
- Automatic MDI crossover on each copper port

1.1.2 Switch Fabric Features

- Optional secure memory
- QoS prioritization
- Packet filtering
- Link aggregation
- 802.1Q VLAN standard
- Multiple Spanning Tree
- Broadcast and multicast storm control
- Port mirroring
- Congestion control

1.2 System Management Support

- Linux® based management software executing on PPC (PowerPC®) processor
- 802.1Q Multiple Spanning Tree Protocol
- Frame statistics collection and reporting
- Simple Network Management Protocol (SNMP)
- Operators Command Line Interface (CLI) accessed via network (Telnet or SSH) and local RS232 Serial port

1.3 Safety Summary

The following general safety precautions represent warnings of certain dangers of which Abaco Systems is aware. Failure to comply with these or with specific Warnings and/or Cautions elsewhere in this manual violates safety standards of design, manufacture and intended use of the equipment. Abaco Systems assumes no liability for the user's failure to comply with these requirements. Also follow all warning instructions contained in associated system equipment manuals.



WARNING

Use extreme caution when handling, testing, and adjusting this equipment. This device may operate in an environment containing potentially dangerous voltages.

Ensure that all power to the system is removed before installing any device.

To minimize shock hazard, the chassis and system cabinet must be connected to an electrical ground. A three-conductor AC power cable should be used. The power cable must either be plugged into an approved three-contact electrical outlet or used with a three-contact to two-contact adapter with the grounding wire (green) firmly connected to an electrical ground (safety ground) at the power outlet.

1.3.1 Do Not Operate in an Explosive Atmosphere

Do not operate the system in the presence of flammable gases or fumes. Operation of any electrical system in such an environment constitutes a definite safety hazard.

1.3.2 Keep Away from Live Circuits

Operating personnel must not remove product covers. Component replacement and internal adjustments must be made by qualified maintenance personnel. Do not replace components with power cable connected. Under certain conditions, dangerous voltages may exist even with the power cable removed. To avoid injuries, always disconnect power and discharge circuits before touching them.

1.3.3 Do Not Service or Adjust Alone

Do not attempt internal service or adjustment unless another person capable of rendering first aid and resuscitation is present.

1.3.4 Do Not Substitute Parts or Modify System

Because of the danger of introducing additional hazards, do not install substitute parts or perform any unauthorized modification to the product. Return the product to Abaco for service and repair to ensure that safety features are maintained

1.3.5 Handling

Only handle the RM921N by the edges, ejector handles or front panel.

2 • Unpacking and Installation

This chapter describes the handling, installation, front panel and baseboard-to-backplane connectors of the RM921N board.

2.1 Unpacking Procedures

On receipt of the shipping container, check for any evidence of physical damage. All claims arising from shipping damage should be filed with the carrier and a complete report sent to Abaco Technical Support, see Technical Support Contact Information.

Electronic assemblies use devices that are sensitive to static discharge. Observe antistatic procedures when handling these boards. All products should be in an antistatic plastic bag or conductive foam for storage or shipment. Work at an approved antistatic workstation when unpacking boards.

2.2 Identifying Your Board

The board is identified by labels at strategic positions. These can be cross-checked against the Advice Note provided with your delivery.

Identification labels attached to the shipping box and the antistatic bag give identical information: product code, product description and equipment number. On the board within the antistatic bag, there is an identifying label attached to the PCB.

2.3 Equipment Grounding

To minimize electric shock hazard, connect the equipment chassis and rack/enclosure to an electrical ground. If AC power is supplied to the rack/enclosure, the power jack and mating plug of the power cable must meet International Electrotechnical Commission (IEC) safety standards.

2.4 Installation

1. Locate the slot in the chassis into which the switch will be installed.
2. Switch off power to the chassis.
3. Observing proper anti-static procedures, insert the RM921N into the chassis.
4. Use the ejector handles to ensure the card is fully seated into the backplane.
5. The chassis may now be powered up



NOTE

To utilize the VME system reset, the JP1 jumper must be installed on the board.

2.5 Front Panel Connectors and Indicators

2.5.1 Network Connections

There are three types of network connections used in the product family:

- RJ45 connectors for 10/100/1000 MByte/s TX (copper) ports
- LC connections for Fiber ports
- RJ45 Connector for console port

All RJ45 connectors are wired per industry specification; any standard network cable may be used to connect them to a NIC card. Each copper port can perform an automatic Media Dependent Interface (MDI) crossover, eliminating the need for crossover cables or cross-wired (MDIX) ports.

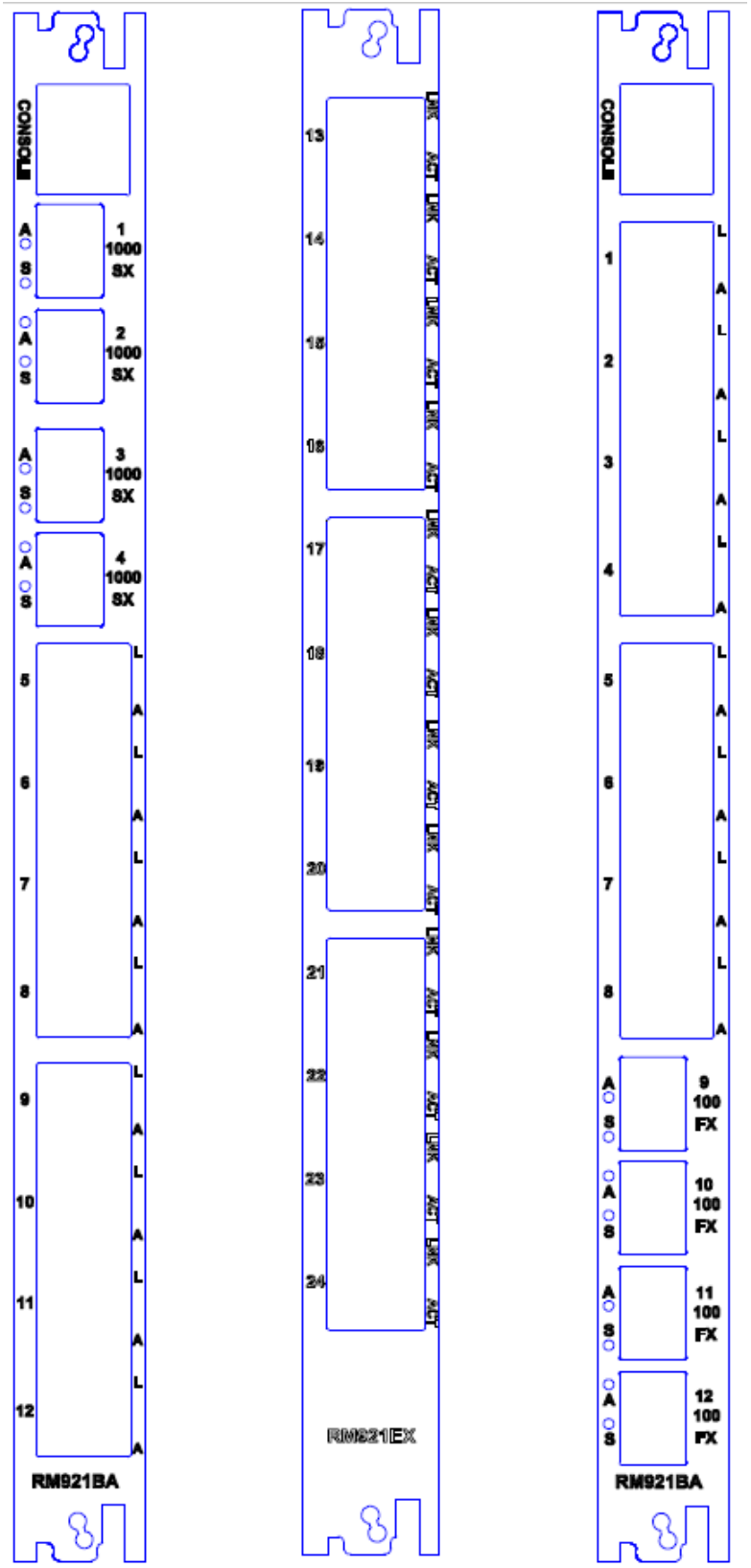
2.5.2 Port LEDs

RM921N uses two LEDs per port. One LED is used to indicate a valid link and the other one displays port activity. The LED colors for fiber and copper interfaces are defined in Table 2-1.

Table 2-1 Front Panel LEDs

Copper Interface LEDs			
LED	Color	Description	Indication
ACT	Yellow	Port activity	Blinking: Port in TX/ RX mode
LNK	Green	Link status	ON: Valid link OFF: No link
Fiber Interface LEDs			
LED	Color	Description	Indication
A	Orange	Port activity	Blinking: Port in TX/ RX mode
S	Green	Signal detect (SD)	ON: Valid fiber link OFF: No fiber link

Figure 2-1 RM921N Front Panels



NOTE

The front panels from left to right are: The first front panel with 8 Gigabit Copper ports and 4 Gigabit Fiber ports; the second front panel is the Expansion Panel with 12 Gigabit Copper ports, and the third front panel is 8 Gigabit Copper ports and 4 100FX Fiber.

2.5.3 Serial Console Port

The baseboard provides a serial port through an RJ45 with integrated LEDs in the front panel (P13). This port is used for serial communication with the management board.

Figure 2-2 Serial Console Port

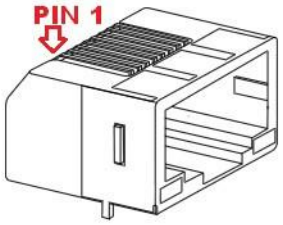


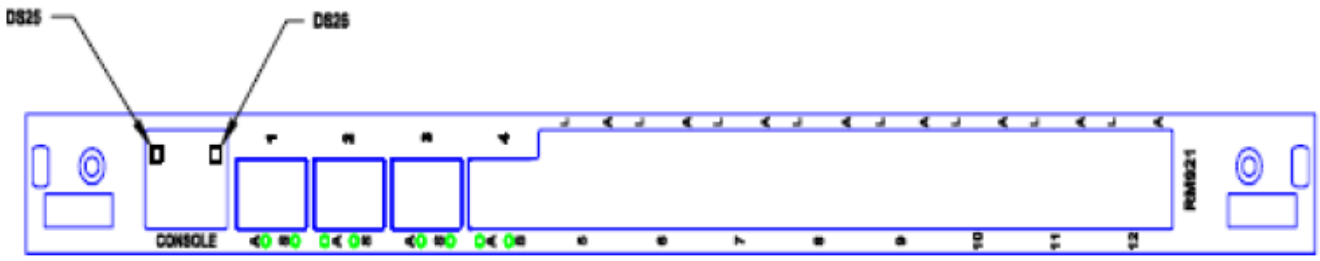
Table 2-2 Serial Console Port (P13) Pin Descriptions

Pin No.	Name	Description
1, 2	N/C	No Connection
3	GND	Circuit Ground
4	RXD0	Receive Data
5	TXD0	Transmit Data
6	GND	Circuit Ground
7, 8	N/C	No Connection
9, 10	CGND	Chassis Ground

Table 2-3 Serial Console Port (P13) LEDs

LEDs	Indication
DS25[GRN]	ON: Power Good: Board not in reset OFF: Board in reset
DS26[GRN]	Not Used

Figure 2-3 Serial Console Port LEDs' Location



2.5.4 Baseboard-to-VME Backplane Connector

The RM921N base module interconnects with the VME backplane through the P1 and P2 connectors. P1 and P2 are standard DIN triple-row, 96-pin male connectors.

Table 2-4 Board-to-VME Backplane Connector (P1) Pin Description

Pin No.	Name	Description	Comments
A9, A11, A15, A17, A19	GND	Circuit ground	Connected to RM921N ground plane
A21-A22	IACKIN#, IACKOUT#	Interrupt Acknowledge IN & OUT	Signals are bypassed on RM921N
A32	+5V	+5V supply	Connected to RM921N +5V power plane
B4-B5	BG0IN#, BG0OUT#	Bus grant IN & OUT (level 0)	Signals are bypassed on RM921N
B6-B7	BG1IN#, BG1OUT#	Bus grant IN & OUT (level 1)	Signals are bypassed on RM921N
B8-B9	BG2IN#, BG2OUT#	Bus grant IN & OUT (level 2)	Signals are bypassed on RM921N
B10-B11	BG3IN#, BG3OUT#	Bus grant IN & OUT (level 3)	Signals are bypassed on RM921N
B20 and B23	GND	Circuit ground	
B32	+5V	+5V supply	Connected to RM921N +5V power plane
C9	GND	Circuit ground	
C32	+5V	+5V supply	Connected to RM921N +5V power plane



NOTE

The RM921N uses only +5V voltage from rows A, B and C. Pins not listed in the table are left open.

Table 2-5 Board-to-VME Backplane Connector (P2) Pin Description

Pin No.	Name	Description	Comment
B1, B13, B32	+5V	+5V supply	Connected to RM921N +5V power plane
B2, B12, B22, B31	GND	Circuit ground	Connected to RM921N ground plane



NOTE

The RM921N uses only +5V voltage from rows B. Pins not listed in the table are left open.

3 • Theory of Operation

The RM921N is a VME-based managed Ethernet switch with 12/24 port Gigabit, Layer 2/3, supporting IPv6. Moreover, the RM921N supports 100Base-FX interfaces through different hardware configurations. The management entity executes on an embedded processor. With a single slot solution, the baseboard supports 12 ports for GbE or 100Base-FX or a combination of both. With a dual slot solution, the combined baseboard and expansion board will support a total of 24 ports for GbE, 100Base-FX or a combination of both.

3.1 Operation

The RM921N block diagram is shown in Figure 3-1. The design incorporates a highly integrated 24-port GbE multi-layer switch fabric. The switch fabric supports IPv6 routing functions.

The Management processor configures and manages both the switch and port controllers.

The DA921 management board with secure memory option provides a Mini Edge Card socket. This connector enables user to plug/remove the flash memory module into/from the management board.

The RM921N board supports a combination of fiber and copper media interfaces. For copper media, the BCM56302 interfaces with an external PHY to provide link layer support (e.g., auto negotiation). The copper physical interface uses dual RJ45 connectors with integrated LEDs. The fiber optic interface is connected directly to the switch fabric.

Figure 3-1 Baseboard Block Diagram

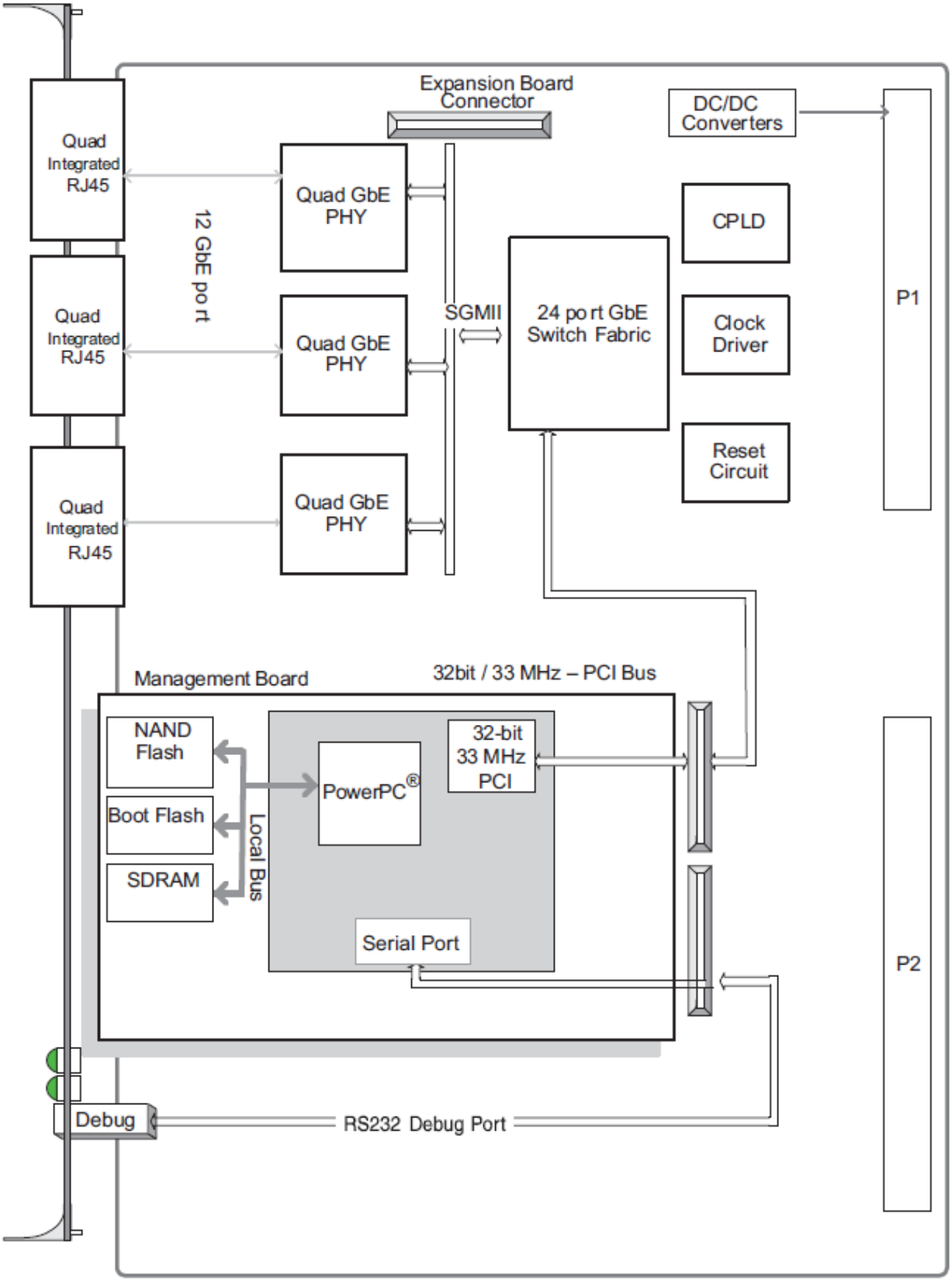
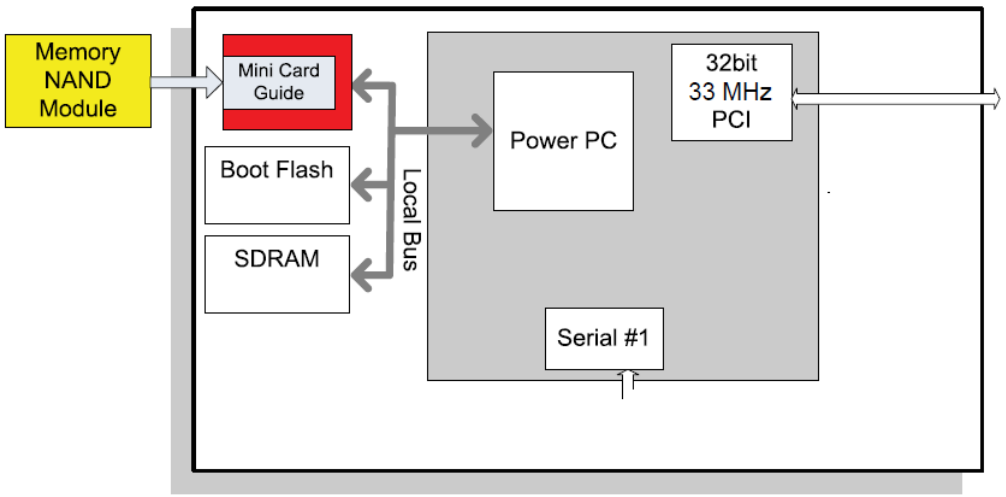


Figure 3-2 DA921 with Removable Secure Memory



NOTE

The removable memory module is only available on the RM921ND.

3.2 Switch Software Environment

The Switch Control services execute within the context of a standard Linux kernel. Using Linux as the basis for services has a number of advantages.

On powerup, the Linux kernel goes through the basic initialization steps. Local configuration information is loaded from files saved on the switch.

The operator interface for switch control and monitoring is the console program that provides a Command Line Interface (CLI) for configuration and control of the switching fabric.

The console may be accessed from either the RS232 port or via a network session (Telnet or SSH).

3.3 Switching Fabric

The fundamental feature of the RM921N is a state-of-the-art IPv6-capable Switch Fabric. Switch Fabrics are distinguished from hubs or repeaters by allowing multiple ports to be active simultaneously. The fabric is capable of full wire speed switching, allowing a maximum aggregate throughput that is the sum of all the ports. Use of a Switch Fabric increases both overall capacity and reduces typical latency because multiple ports can forward packets at the same time. A packet will only be delayed if there is already activity on the destination port. Packet switching is at Layer 2/3 and packet routing at Layer 3 (IP routing).

3.3.1 IPv6 Support

The RM921N provides support for IPv6 routing. Management interface can be on both IPv6 and IPv4 networks (i.e., assigned both types of addresses).

3.3.2 Layer 2/3

Address information (i.e., packet source and destination) is in headers at the beginning of each packet. The headers are sequential: Layer 2 followed by Layer 3 and Layer 4 information. During initialization (or dynamically by operator control), information is entered into the fabric that controls packet processing. As each packet arrives at the switch fabric, header information is examined and compared with the stored information to determine the port(s) to which the packet should be forwarded. Once sufficient header information has been processed, the packet will be sent to the resolved port(s).

Layer 2 switching uses only the MAC address of each network interface (i.e., network connected host system) to guide packets through the fabric. As each packet arrives at the switch, its source (L2 or MAC) address is examined, and the information stored. For Layer 2 switching, no outside information (e.g., IP addresses) is necessary. No configuration or setup is required, making installation of the switch simple.

Layer 3 and above, use information from the IP header. This can be an IP address, optionally qualified by port number. When a packet arrives, where the destination is not in the switch fabric database, it is “flooded” to applicable ports (i.e., VLAN setup may restrict the ports to which the packet will be forwarded). Once a specific port for the destination is known, the packet is forwarded only to that specific port with all processing done by the Switch Fabric.

3.3.3 Virtual LAN (VLAN)

VLAN is a mechanism useful for both security and improved performance. It allows a network to be partitioned into several virtual networks so that packets from one are not forwarded to another. Restricting forwarding reduces traffic (improves performance) and can be a component of a security control. VLAN support is available at both Layer 2 (port based) and Layer 3. Packets received at the switch either contain a VLAN ID (per 802.1q) or are assigned based on a per port default.

3.3.4 Routing Domains

The switch has the ability to create up to 32 Routing Domains. These are based upon the previous definition of a VLAN, and therefore, contains the same port membership as the VLAN. The Routing Domain adds the concept of a subnet to the VLAN. This creates an exception to the isolation of a VLAN.

The switch can forward packets between routing domains, performing the duties of a standard IP router. When the destination of a packet is to a Routing Domain directly connected to the switch (e.g., across VLANs), the fabric can forward the packet at wire speed without any additional information.

In larger configurations, the destination may be one (or more) hops away. Thus, the switch must forward the packet to an IP address that is directly connected, which is known to be responsible for the next step of the route. To locate the appropriate next hop, a route table is required. The purpose of the table is to associate the final destination IP subnet with a specific IP address on one of the connected routing domains. For this purpose, the route table of the host Linux system is used. When a forwarding decision is required, the switch control application queries the Linux route table to find the next hop. Using the Linux table provides the advantage of a well-defined interface to read and change. Also, it allows the use of standard routing daemons for automatic update of routes.

These daemons will receive routing protocol messages (e.g., RIP, OPSF, etc.) and use them to automatically update the routing table. This provides for dynamic configuration and maintenance of the routes. In addition (or as an alternative), routes can be added as part of the switch initialization process. These routes will be permanent and always present for the switch. The two techniques (dynamic update with standard routing protocols or static routes) can be used together or independently.

3.3.5 Port Mirror

A Port Mirror is a mechanism which provides a method to observe traffic that is flowing on one port from another port. This can be very useful in a debug situation. If there is no access to a connection, a mirror-to port can be created that can be attached to an external analyzer. Any port, except the mirror-to port itself, can be designated as the mirror-from port for traffic occurring on the port to be observed. The switch supports one mirror-to port at a time. The mirror-from ports can be a list of ports with ingress and egress as configurable options.

A • Compliance

A.1 Emission Compliance Notice

This equipment complies with the following international and North American emission requirements:

- **Australia and New Zealand — AS/NZS 3548/CISPR 22 Class A ITE**



WARNING

This is a Class A product. In a dramatic environment, this product may cause radio interference in which case the user may be required to take adequate measures.

- **Canada — ICES-003**

This Class A digital apparatus complies with Canadian ICES-003.

(Cet appareil numerique de la class A est conforme a la norme NMB-003 du Canade.)

- **Europe — EN55022**



WARNING

This is a Class A product. In a domestic environment, these boards may cause radio interference in which case the user may be required to take adequate measures.

- **Japan — VCCI Class A ITE**

This is a Class A product based on the standard of the Voluntary Control Council for Interference from Information Technology Equipment (VCCI). If this is used near a radio or television receiver in a domestic environment, it may cause radio interference. Install and use the equipment according to the instruction manual.

- **USA — FCC Part 15**



NOTES

The hardware 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 in this documentation, may cause harmful interference to radio communications. Operation of the 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.

Changes or modifications not expressly approved by the manufacturer, could void the user's FCC granted authority to operate the equipment.

A.2 Optical/Laser Device Notice

For optical/laser devices read the following note, caution, and warnings:



WARNING

For this product, use only the Class 1 laser devices that have the following approval:

– FDA21 CFR 1040.10
– IEC 60825-1



NOTE

Protect optical devices by inserting clean dust plugs into the device after the cables are extracted from them. Be sure to clean the optic surfaces of the fiber cables before plugging the dust plugs back into the optical bores of another optical device. Avoid getting dust and other contaminants into the optical bores of your device. The optics will not work correctly when obstructed with dust.



CAUTION

It is important to disconnect or remove all cables before removing or installing an optical transceiver. Failure to do so may result in damage to the cable or device.



WARNING

An optical transmitter is a Class 1 device. Invisible laser radiation may be emitted from disconnected fibers or connectors. Do not stare into beams or view directly with optical instruments as this may permanently damage your eyes.

Do not leave an optical transceiver uncovered except when inserting or removing a cable. The safety/dust plugs keep the port clean and prevent accidental exposure to laser light.

B • Specifications

Table B-1 Specifications for RM921N

Power	
	31 Watts (12 copper ports) / 46 Watts (24 copper ports)
@ 5V	9.2 Amp (Max)
	26 Watts (12 fiber ports) / 37 Watts (24 fiber ports)
@ 5V	7.2 Amp (Max)
Form Factor	
VME	6U Single Slot
MTBF	
Telcordia Issue 1, Method 1 Case 3 at 40 °C for 24-port version	260,829 hours
Temperature	
Operating	0 to +65 °C
Storage	-40 to +125 °C
Industrial Temperature	
Operating	-40 to +85 °C
Storage	-40 to +125 °C
Humidity	
Operating	5% to 95% Non-condensing
Storage	5% to 95% Non-condensing
Gigabit Ethernet Characteristics	
For Copper Media Ports	
10Base-T, 100Base-TX, 1000Base-T	Quad RJ45 connectors with integrated LEDs
For Fiber Media Ports	
1000Base-LX or 1000Base-SX	LC connectors
100Base-FX	LC connectors
Porting Route	Front

C • Statement of Volatility

C.1 Volatile Memory

This product contains volatile memory, i.e., memory in which the contents are lost when power is removed.

Volatile memory devices listed below are physically located on the DA921 daughter card.

Table C-1 Volatile Memory

Type of Memory	Size	User Modifiable	Function	Process to Clear
2x SDRAM (U14, U15)	512 MBytes	No	Processors SDRAM	Power Off

C.2 Non-Volatile Memory

This product contains non-volatile memory, i.e., memory in which the contents are retained when power is removed.

Non-volatile memory devices listed below are physically located on the DA921 daughter card.

Table C-2 Non-Volatile Memory

Type of Memory	Size	User-Modifiable	Function	Process to Clear
EEPROM (U4)	2 Kbits	No	ETH0 Mac/Setup Parameters	None/factory re-program
NAND Flash (U16) ***RM921N ONLY**	512 MBytes	Yes	Holds Operating System Holds Switch Configuration (user-modifiable)	Login to switch as: admin -config reset -reboot -delete any modified daemon configuration files -change switch IP address back to default
NOR Flash (U17)	64 MBytes	Yes	Boot Loader	None/factory re-program (User modification not recommended or advised)
CPLD (U11)	128-macrocell	No	Fiber LED control	None/JTAG header, CPLD programming cable and SW required

C.3 Media Storage

This product contains media storage capability, e.g., removable or nonremovable disk drives, memory cards, etc.

Media storage device listed below is physically located on the DA921 daughter card.

Table C-3 Media Storage

Type of Memory	Size	User-Modifiable	Function	Process to Clear
Mini Edge Card (Removable) ***RM921ND ONLY**	64 MBytes	Yes	Holds Operating System Holds Switch Config (user-modifiable)	Login to switch as: admin - config reset - reboot - delete any modified daemon configuration files - change switch IP address back to default

© 2019 Abaco Systems, Inc.
All rights reserved.

* indicates a trademark of Abaco Systems, Inc. and/or its affiliates. All other trademarks are the property of their respective owners.

This document contains Proprietary Information of Abaco Systems, Inc. and/or its suppliers or vendors. Distribution or reproduction prohibited without permission.

THIS DOCUMENT AND ITS CONTENTS ARE PROVIDED "AS IS", WITH NO REPRESENTATIONS OR WARRANTIES OF ANY KIND, WHETHER EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO WARRANTIES OF DESIGN, MERCHANTABILITY, OR FITNESS FOR A PARTICULAR PURPOSE. ALL OTHER LIABILITY ARISING FROM RELIANCE ON ANY INFORMATION CONTAINED HEREIN IS EXPRESSLY DISCLAIMED.

Abaco Systems Information Centers

Americas:
1-866-652-2226 (866-OK-ABACO)
or 1-256-880-0444 (International)

Europe, Middle East and Africa:
+44 (0)1327 359444

Additional Resources

For more information, please visit the Abaco Systems web site at:

www.abaco.com

Publication No. 597-0000000013-000 Rev. F

Artisan Technology Group is an independent supplier of quality pre-owned equipment

Gold-standard solutions

Extend the life of your critical industrial, commercial, and military systems with our superior service and support.

We buy equipment

Planning to upgrade your current equipment? Have surplus equipment taking up shelf space? We'll give it a new home.

Learn more!

Visit us at **artisantg.com** for more info on price quotes, drivers, technical specifications, manuals, and documentation.

Artisan Scientific Corporation dba Artisan Technology Group is not an affiliate, representative, or authorized distributor for any manufacturer listed herein.

We're here to make your life easier. How can we help you today?

(217) 352-9330 | sales@artisantg.com | artisantg.com

ARTISAN® TECHNOLOGY GROUP