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USER MANUAL



DuraMAR 5915

Rugged Cisco 5915 Mobile IP Router Subsystem

MAR-5915-0x and MAR-5915-1x

MNL-0596-01 Rev A6 ECO-5813 Effective: 25 Apr 19

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Chapter 1 Introduction

The DuraMAR® 5915 is a rugged Commercial-Off the Shelf (COTS) Cisco IOS-managed mobile router integrated with Cisco's 5915 Embedded Services Router (ESR) card in an ultra-rugged chassis optimized for harsh military and civil vehicle/aircraft installations. The DuraMAR 5915 has configurations as a standalone 5-port network router (-0x) or with the Parvus Dual Gigabit Ethernet Switches (COM-1268s) expansion module integrated into a common chassis (-1x). For details, contact the Parvus Sales department.

About This Document

This manual provides a functional description of the DuraMAR 5915, both as a standalone Cisco 5915 router and with integrated switch modules.



Note: This manual is not a comprehensive guide to the Cisco 5915 or IOS. That information is available directly from Cisco Systems at www.cisco.com.

Manual Organization

Chapters 1 through 6, the ***base manual***, cover the MAR-5915-0x base router, which includes the Cisco 5915, chassis, and Parvus power supply.

- Chapter 1 provides a functional description of the DuraMAR 5915, and explains how expansion modules are integrated with the Cisco 5915 in a common chassis.
- Chapter 2 explains how to operate the base router. It describes the cables, connectors, and LEDs, and includes procedures for starting the Cisco console, performing zeroization, and loading Cisco files.
- Chapter 3 contains connector pinouts for the base module.
- Chapter 4 provides chassis specifications, dimensions, and mounting instructions for all DuraMAR 5915 modules. In addition, it provides the specifications for the Cisco 5915 router.
- Chapters 5 and 6 provide troubleshooting and Parvus contact information, and apply to all DuraMAR 5915 modules.

Each expansion module (EM) is described in a separate ***addendum*** that follows the same general organization as the base manual. Chapters in the addendum are identified by the addendum letter; for example, "A3 Connector Descriptions."

- Addendum A describes MAR-5915-1x, the Parvus Dual Gigabit Ethernet Switches (COM-1268s) expansion module, referred to as the COM-1268 EM.

Description of Safety Symbols

The following safety symbols are used in this manual and indicate potentially dangerous situations.



Warning! Danger, electrical shock hazard!

Personal injury or death could occur. Also damage to the system, connected peripheral devices, or software could occur if the warnings are not followed carefully.



Caution! Hazard to individuals, environment, devices, or data!

If you do not adhere to the safety advice next to this symbol, there is obvious hazard to individuals, to environment, to materials, or to data.



Note: This symbol highlights important information or instructions that should be observed.

Overview

The DuraMAR® 5915 is a rugged Commercial-Off-the-Shelf (COTS) Cisco IOS-managed mobile router integrated with Cisco's 5915 Embedded Services Router (ESR) card in an ultra-rugged chassis optimized for harsh military and civil vehicle/aircraft installations. The DuraMAR 5915 is an ideal solution for IP networking technology refresh and situational awareness applications, including those seeking a migration path for legacy Cisco 3200 (3230/3250/3270)-based router subsystems.

Optimized for Size, Weight and Power (SWaP) sensitivity as well as mechanical robustness under extreme environmental conditions per MIL-STD-810G (thermal, shock, vibration, humidity, exposure to dust, water), the DuraMAR 5915 enables prime contractors and civilian agencies to deploy Cisco Mobile Ready Net capabilities, including data, video, and voice services virtually anywhere LAN or WAN connectivity may be required, especially in mobile, airborne, ground, manned or unmanned vehicle applications.

Leveraging stackable PC/104 subassemblies and a modular enclosure design, the unit is completely sealed, requires no active cooling, provides interfaces over MIL-C-38999 style connectors, and features a military-grade power supply supporting aircraft (MIL-STD-704F) and ground/marine (MIL-STD-1275D) vehicle voltage inputs, spikes, and transient levels, as well as MIL-STD-461F EMI/EMC filtering.

The DuraMAR 5915 features dual WAN uplinks and is available as either:

- A standalone 5-port network router (Figure 1)
- The base router with one or more expansion modules (EM) factory-installed, such as the integrated Parvus Dual Gigabit Ethernet Switches (COM-1268s EM) (Figure 2)



Figure 1. Standalone Router (MAR-5915-0x)



Figure 2. Router with Expansion Module (MAR-5915-1x)

With software built upon the Cisco 3270 IOS architecture, the DuraMAR 5915 delivers the performance, security, advanced Quality of Service (QoS), high availability, and manageability that customers expect from Enterprise IOS-based routing technology. The unit supports extensive IPv4 and IPv6 routing protocols, IP multicasting, Radio Aware Routing (RAR), Dynamic Link Exchange Protocol (DLEP) and Mobile IP routing for transparent connectivity to a roaming vehicle network in Comms-on-the-Move (COTM) applications. An onboard AES hardware encryption engine offloads encryption processing from the router to provide highly secure yet scalable data, video, and voice services.

Features

Cisco Technology

- Ruggedized Cisco 5915 Router with Enterprise IOS Software for robust security, management, QoS, VLAN, IPv4/IPv6 routing, IP mobility, interoperability
- Integrated Services Router (ISR) features support concurrent data, video, and voice services, as well as firewall and hardware AES encryption acceleration

Scalability

- Modular, open-architecture rugged COTS PC/104 hardware design
- Standalone Router provides 5 Ethernet ports (3x 10/100 switched, 2x 10/100 routed)
- Router plus COM-1268 EM provides integrated Parvus Dual Gigabit Ethernet Switches (two COM-1268s).
  - Scales port density to 19 Ethernet ports for higher-port-density application requirements
  - Provides 19 Ethernet ports total (15 GigE switched, 2x 10/100 switched, 2x 10/100 routed)
- Additional expansion modules upon request

Ruggedization

- Qualified to MIL-STD-810G Shock, Vibration, Thermal, Altitude, Humidity
- -40 to +71C fanless extended temperature operation with no moving parts
- Corrosion-resistant, aluminum chassis sealed against water, dust, EMI
- Circular MIL-DTL-38999 connectors for reliable network connections
- Filtered, transient-protected power supply for aircraft and vehicle use
- Qualified to MIL-STD-461F Conducted/Radiated Emissions and Conducted/Radiated Susceptibility
- Data Zeroization support to erase sensitive information
- Conformal coating for humidity/tin-whisker mitigation
- Flexible, robust mounting – base flange mount or side boss mount

Functional Description

Configurations

Product	Product Number	Base Enterprise IOS	Advanced Enterprise IOS	Breakout Cableset	Description
Standalone Router	MAR-5915-0x	-00	-01, -02*, -03**,-04***	CBL-5915-00	DuraMAR 5915 Mobile Router • 2x FE routed ports • 3x FE switched ports
Base Router with Dual Gigabit Ethernet Switches (COM-1268s)	MAR-5915-1x	-10	-11, -12*, -13**,-14***	CBL-5915-01	DuraMAR 5915 Mobile Router with COM-1268 EM • 2x FE routed ports • 2x FE switched ports • 15x GigE switched ports

* CME-5 Users
** CME-25 Users
*** CME-50 Users

Base Module

The base module of the DuraMAR 5915 contains the Cisco 5915 Router and the Parvus Power Supply (Figure 3). It is available as a standalone router (MAR-5915-0x) or as the bottom module with expansion modules, such as the MAR-5915-1x (Figure 4).

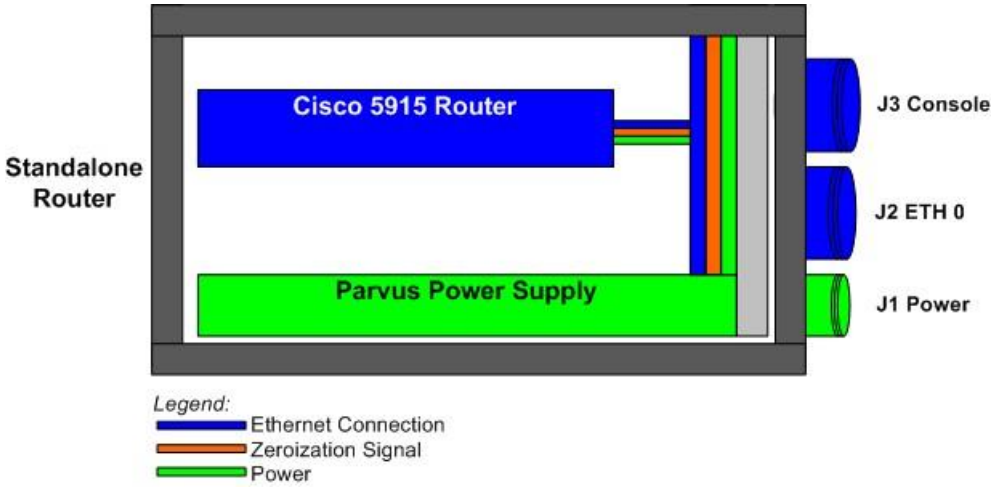


Figure 3. Standalone Router Block Diagram

- The Parvus Power Supply provides **power** for the Cisco 5915 and for boards in the expansion modules (if any).
- The internal **Ethernet connection** connects the Cisco 5915 to Ethernet boards in the expansion module. When expansion modules are connected to the Cisco 5915, Cisco port 0/4 is used for communication between modules.
- The **Zeroization signal** is externally generated at the J3 Console connector and transmitted to the Cisco 5915 and to boards in the expansion modules. See "Zeroization" on page 17 for more details.

Expansion Modules

In expansion module configurations, additional boards are added to the stack, the chassis height is increased, and the EM front panel is customized with unique connectors and LEDs appropriate for the functionality of the boards in that module. Figure 4 shows a typical expansion module configuration (MAR-5915-1x): the Base Router Module with the Dual Gigabit Ethernet Switch (COM-1268) Expansion Module, which contains two Parvus COM-1268 boards. Refer to the EM addenda at the end of this manual for detailed expansion module information.

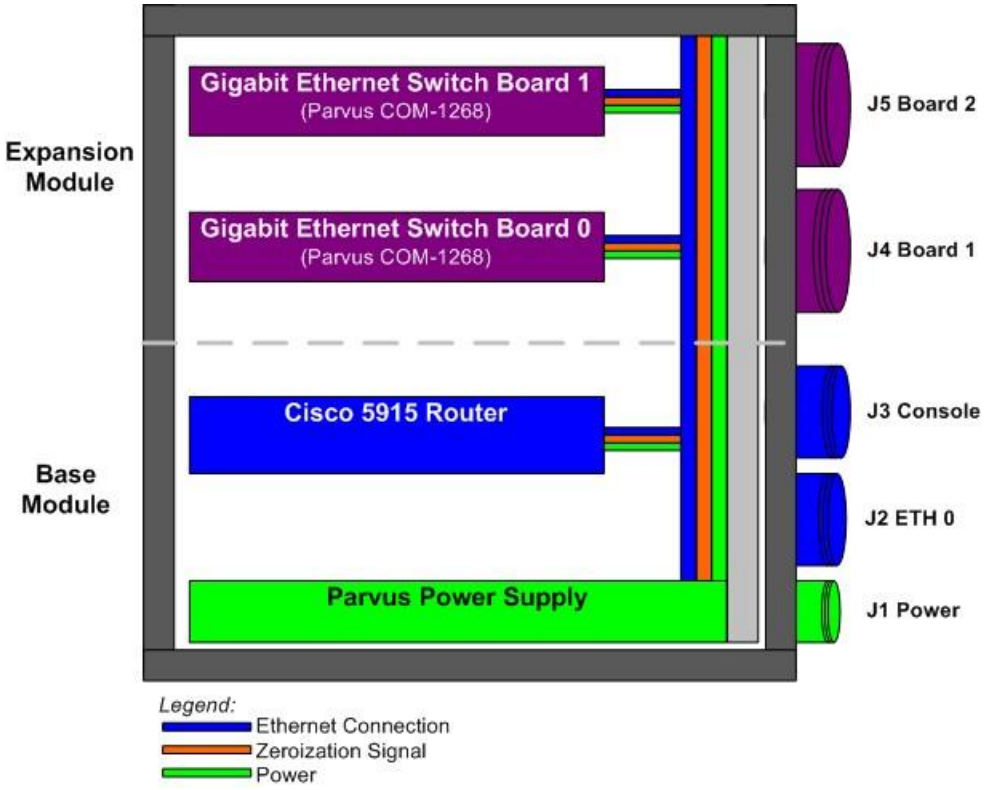


Figure 4. Router with Expansion Module Block Diagram (example)

Cisco 5915 Router

Refer to Cisco documentation at www.cisco.com for a functional description of the router.

Parvus Power Supply

The bottom board in the base module is a Parvus power supply. The rugged, isolated power supply is capable of supplying power output over extended temperature ranges (-40 to +85C per MIL-STD-810G). Featuring a rugged mechanical design, this small form-factor power supply is designed to operate without any active cooling and provide resistance to high levels of shock and vibration.

Features

- Uses 28V nominal power input voltage (18-33VDC range continuous).
- DuraMAR 5915-0x power consumption: designed for <15 watts.
- DuraMAR 5915-1x power consumption: designed for <50 watts.
- Over-voltage protection
- Reverse polarity protection
- Galvanic isolation: 1500V
- MIL-STD-704E and MIL-STD-1275D compliance:
  - 250V spike protection
  - 100V surge-protection

Chapter 2 Operating Description

This chapter describes the operation of the DuraMAR 5915 base module. This information applies both to the standalone router and to the base module with expansion modules.

Cable and Connector Identification

Starter Cableset for Base Module

You should test the DuraMAR 5915 and cabling or interfaces prior to installation in the target system to ensure full operational capability. Full bench-top testing can be performed by using the Parvus starter cableset available for this unit or by using a custom set of cables made specifically for the intended target system, vehicle, or craft. Refer to Chapter 3 for pinouts and descriptions.

The Parvus starter cableset (CBL-5915-00) for the base module is available for purchase through the Parvus Sales department and is meant for lab or bench testing purposes only. The cables provide access to connectors J1-J3.

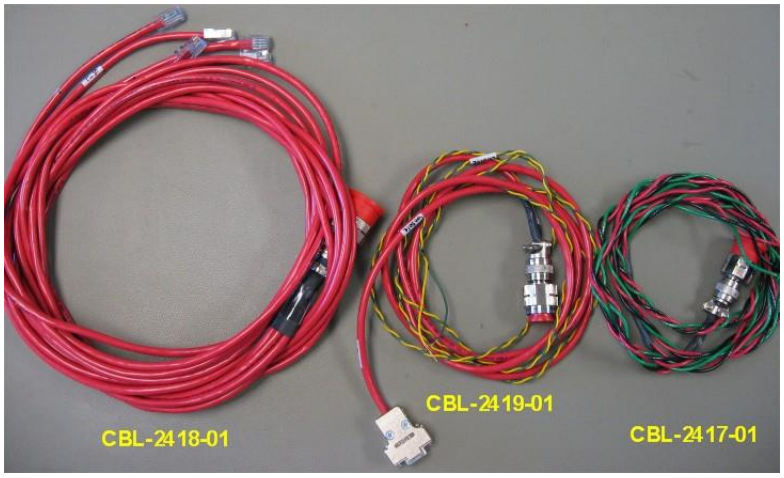


Figure 5. Base Module Starter Cableset (CBL-5915-00)

The starter cableset for the base module has the following MIL-C-38999 connectors.

Part #	Type	Quantity	Description
CBL-2417-01	Banana Plugs	3 each	J1 Power
CBL-2418-01	RJ-45 Connectors	5 each	J2 Ports 0-4
CBL-2419-01			J3 Console. Cable with two tails (flying leads and DB9) for attachment to the host PC.
	DB9	1 each	Serial connection to J3 Management Port
	Yellow Wire	1 each	J3 Pin 2, Zeroize
	Green Wire	1 each	J3 Pin 1, ground reference for the +12VDC signal

Base Module Connectors and LEDs

Figure 6 shows the connectors and LEDs on the base module front panel.



Figure 6. Base Module Connectors and LEDs

The table describes the LEDs on the front panel of the base module.

LED	Component	Description
PWR	System power supply	Blue light indicates power is on.
SYS	Cisco 5915 Router	• Blinking green light indicates the boot-up phase or ROMMON monitor mode of the Cisco router. • Steady green light indicates steady state, IOS load completed and running.
R0, R1	Routed Ethernet ports 0/0 and 0/1 on connector J2	Steady green light indicates link status.
S0, S1, S2	Switched Ethernet ports 0/2, 0/3, and 0/4 on connector J2	Steady green light indicates link status.

Figure 7 shows the mapping of Cisco port names to J2 signal names and to the LED labels on the front panel.

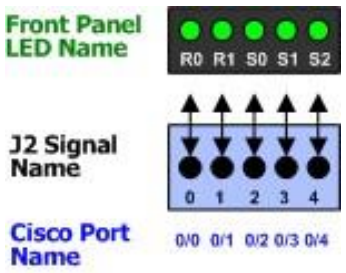


Figure 7. J2 LED Mapping to J2 Signal Name and Cisco Port Name

Note: In expansion module configurations (e.g., MAR-5915-1x), port 0/4 is used internally for Ethernet connection to boards in the EM(s), and LED S2 is green when there is a valid Ethernet connection to the EM(s).

Mounting the System

After testing is complete, you can mount the DuraMAR 5915 on the system. Refer to the instructions and dimensions in Chapter 4.

Basic Operating Procedures

This section describes basic operating procedures, including starting the system console, zeroizing the system, and reloading files after zeroization.

Starting the Cisco Console

1. Connect the console cable (CBL-2419-01) or a customer-designed cable to a host PC serial port and to connector J3 on the DuraMAR 5915.
2. Connect the power cable (CBL-2417-01) or a customer-designed power cable to connector J1 on the DuraMAR 5915 and to a 18-33VDC power source.
3. Open a terminal emulator on the host PC. For example, if you are running Windows XP, click:

   Start > All Programs > Accessories > Communications > HyperTerminal
4. Select the host COM port that is connected to the DuraMAR 5915.
5. Create a new terminal connection that has the following settings:

Bits per second	**9600**
Data bits	**8**
Parity	**None**
Stop bits	**1**
Flow control	**None**

6. Apply power (18-33 VDC) to the DuraMAR 5915.
7. The Cisco Router bootup information is displayed on the console screen.
8. After bootup, press Enter to get to the Router> prompt.
   - To configure the Cisco 5915 Router, refer to Cisco documentation.

Zeroization

For data security, the DuraMAR 5915 provides zeroization capability to erase the application code and configuration data stored in the system. Refer to the Cisco documentation on how to configure the 5915 for zeroization. Once the code is erased, the only method of recovery is to reload code to the system.

Enabling Zeroization in Cisco 5915 IOS

Prior to applying the zeroization signal, the Cisco IOS must be configured to enable the zeroization.

- From an IOS prompt, enter the following commands:

```
Router>    enable
Router#    conf t
Router(config)#      service declassify erase-all
Router(config)#      exit
```

- The "***erase-all***" argument will erase all files on the router (flash and NVRAM) when declassification (zeroization) is invoked
- "***erase-flash***" or "***erase-nvram***" may be substituted for "erase-all" if only the files in flash memory or NVRAM, respectively, are to be deleted.

Initiating Zeroization

The hardware setup must generate the off-board Zeroization trigger.

- If you have CBL-2419-01, use the yellow wire and apply a +12VDC signal pulse to J3 pin 2. The green wire is the ground reference for the +12VDC signal.
- If you do not have the starter cable, apply a +12VDC signal pulse to J3 pin 2.



Caution!

Do not apply +12VDC to any other pin. +12VDC must be relative to signal ground (J3 pin 1), not input power ground.

Zeroization Recovery

After zeroization has been completed (about 5 minutes), perform the following steps to reload the system.

1. Start the Cisco console. Reload the Cisco 5915 IOS (refer to the instructions in the next section).
2. Reload the Cisco 5915 configuration. Refer to the instructions in the next section.
3. If your system contains an expansion module that supports zeroization (such as the COM-1268 EM), you'll need to perform recovery for those boards. Refer to the addendum for your expansion module for instructions on zeroization recovery.

Loading Cisco Files

This section explains how to load Cisco application and configuration files to the Cisco 5915. It covers two cases: reloading after zeroization and upgrading to a new version.

This manual is not intended as a comprehensive guide to the Cisco 5915 or IOS. That information is available directly from Cisco Systems at www.cisco.com. The Cisco website is also your source for Cisco files.

Command Conventions

- Commands and arguments you must type are shown in bold.
- After you type the command, press the Enter key.
- If several command lines are presented in one step, press Enter after each line.

Loading the IOS Image After Zeroization

Host PC Setup

1. Start the Cisco console.
2. Identify the target folder used by the tftp server and place the Cisco IOS software image there. The DuraMAR 5915 ships with a factory default Cisco IOS version of:

   c5915-entbase-mz.SPA.152-1.GC1.bin
3. Place the configuration file to be reloaded (c5915-entbase-mz.SPA.152-1.GC1.bin or other) in the tftp target folder.
4. Attach the host PC to port 0/0 on J2. (This can be the same PC as that running the terminal emulator.)
5. Set the IP address of the host PC to use the fixed address **192.168.100.11**.
6. Open the tftp server on the host PC.

   A note on this: The Solarwinds TFTP server has a file transfer size limit of 32 MB. This is not a problem for the base IOS identified here. But if the c5915-adventerprisek9-mz.SPA.152-1.GC1.bin or another file in excess of 32 MB is transferred, the file is too large for Solarwinds. The TFTPD32 TFTP server handles the larger file size without a problem.

Load Procedure

There should be a rommon prompt in the terminal emulator window. If the rommon prompt is not displayed, reboot the DuraMAR 5915 and wait for the rommon prompt.

1. At the rommon command prompt, type the following CASE-SENSITIVE commands (press Enter after each command, the filename itself is NOT case-sensitive):

   ```
   IP_ADDRESS=192.168.100.10
   IP_SUBNET_MASK=255.255.255.0
   DEFAULT_GATEWAY=192.168.100.11
   TFTP_SERVER=192.168.100.11
   TFTP_FILE=c5915-entbase-mz.SPA.152-1.GC1.bin
   ```
2. At the rommon command prompt, type “set” and Enter. Verify the variables in step 1 have been set correctly.
3. At the rommon command prompt, type the following CASE-SENSITIVE command and Enter:

   ```
   tftpdnld
   ```

4. At the prompt: “Do you wish to continue y/n: [n],” type **y**.
5. The IOS will begin transferring to the Cisco 5915. If the transfer does not begin, a message will be displayed explaining the problem. Fix the problem and repeat the **tftpdnld** command.
6. When the file transfer is completed, issue a **reset** command at the rommon prompt.
7. The Cisco 5915 will then reboot and load. After the Cisco 5915 has finished the startup sequence, press Enter to display the Router> prompt. The Cisco IOS has been successfully reloaded.
8. Now follow the instructions in the next section to reload the IOS configuration.

Loading the IOS Configuration After Zeroization

After zeroization, you have to reload the IOS configuration file that enables communication between the Cisco boards and the COM-1268s. In these instructions, *filename* is the name of the IOS configuration file saved on the host PC, such as 5915config.bin. If you are using a different file, use that filename in the steps below.

1. Set the router port IP address:

```
Router>     enable
Router#     conf t
Router(config)#       Interf fast 0/0
Router(config-if)#    ip address 192.168.100.10 255.255.255.0
Router(config-if)#    no shut
Router(config-if)#    exit
Router(config)#       exit
Router#    copy tftp://192.168.100.11/filename startup-config
Destination filename [startup-config] ?
```

2. Make sure that the [ok- xxxx bytes] message is displayed. If not, fix the error and repeat the **copy tftp** command.
3. Power off the system.
4. Power on the system.
5. After the reload completes, press Enter to display a Router> prompt. The Cisco 5915 IOS configuration has been successfully reloaded.
6. If your DuraMAR 5915 includes expansion modules, you may need to perform additional recovery steps. Refer to "Zeroization Recovery" instructions in each addendum.

Upgrading to a New IOS Image

Use these instructions if you are upgrading the IOS to a new version. Go to the Cisco website www.cisco.com to download the new IOS file.

Host PC Setup

1. Identify the target folder used by the tftp server and place the new Cisco IOS software image there.
2. Attach the host PC to port 0/0 on J2. (This can be the same PC as that running the terminal emulator.)
3. Set the IP address of the host PC to use the fixed address **192.168.100.11**.
4. Open the tftp server on the host PC.

Upgrade Procedure

1. In the terminal emulator window, press Enter to get a Router> prompt.
2. Enter these commands:

```
Router>     enable
Router#     show flash:
```

(Note the old IOS version, such as c5915-entbase-mz.SPA.152-1.GC1.bin)

```
Router#     conf t
Router(config)#       Interf fast 0/0
Router(config-if)#    ip address 192.168.100.10 255.255.255.0
Router(config-if)#    no shut
Router(config-if)#    exit
Router(config)# exit
```

(Note: you should verify that there is a valid link from your PC to 0/0 prior to the following command)

```
Router# delete flash:<oldIOSversion>.bin
```

where *oldIOSversion* is the version noted earlier

```
Delete filename[oldIOSversion.bin ]?
Delete flash:oldIOSversion.bin ? [confirm]

Router# copy tftp://192.168.100.11/ <new IOS image>.bin flash:
Destination filename [<new IOS image>.bin] ?
X bytes copied in Y secs (Z bytes/sec)
```

Chapter 3 Connector Descriptions

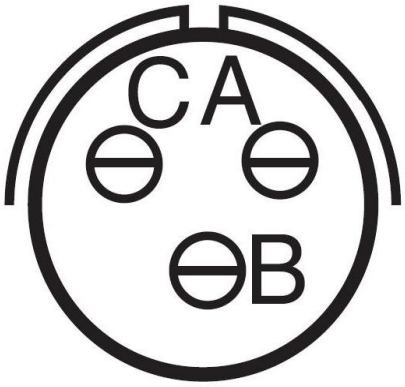
This section identifies the pinouts and signal descriptions for the base module. It also provides connector part numbers along with suggested mating connector details.

Connector Identification

Connector	Label	Description	Part Number	Mating Connector
J1	PWR	18-33 VDC Power Input	D38999/20FA98PN	D38999/26FA98SN
J2	ETH 0	3X 10/100 Switched, 2X 10/100 Routed for -0x 2X 10/100 Switched, 2X 10/100 Routed for -1x	D38999/20FC35SN	D38999/26FC35PN
J3	CONSOLE	RS-232 Console & Zeroize	D38999/20FB35SN	D38999/26FB35PN

J1 Power Connector Pinouts

J1 provides power input signals for +28V power to the Parvus Power Supply.



P/N: D38999/20FA98PN
(Shell Size 9)

Figure 8. Connector J1 Power

J1 Signal Name	Description	38999 Pin #
V+	28 VDC	A
V-	28 RTN	C
Chassis	Chassis	B

J2 Ethernet 0 Connector Pinouts

J2 provides the signals for the Ethernet ports in the base module. The standalone router has five Ethernet ports on J2. If the configuration includes any expansion modules, only four ports are available. Pinouts are provided for each configuration.



Connector Alignment: facing the insert side of the connector (pin side). The connector on the DuraMAR 5915 front panel (socket side) is an exact mirror of the picture on the left.

P/N: D38999/20FC35SN
(Shell Size 13)

Figure 9. Connector J2 Ethernet 0

5915-0x Ethernet Connector Pinout

The standalone router (5915-0x) provides three switched and two routed ports. Ports 0 and 1 are the routed ports; ports 2, 3, and 4 are the switched ports.

J2 Signal Name	Description	38999 Pin #
ETH 0_PORT0_TX+	10/100 TX 0 +	1
ETH 0_PORT0_TX-	10/100 TX 0 -	2
ETH 0_PORT0_RX+	10/100 RX 0 +	3
ETH 0_PORT0_RX-	10/100 RX 0 -	4
ETH 0_PORT1_TX-	10/100 TX 1 -	5
ETH 0_PORT1_TX+	10/100 TX 1 +	17
ETH 0_PORT1_RX+	10/100 RX 1 +	6
ETH 0_PORT1_RX-	10/100 RX 1 -	7
ETH 0_PORT2_TX-	10/100 TX 2 -	8
ETH 0_PORT2_TX+	10/100 TX 2 +	9
ETH 0_PORT2_RX+	10/100 RX 2 +	10
ETH 0_PORT2_RX-	10/100 RX 2 -	19
ETH 0_PORT3_TX-	10/100 TX 3 -	11
ETH 0_PORT3_TX+	10/100 TX 3 +	12
ETH 0_PORT3_RX+	10/100 RX 3 +	13
ETH 0_PORT3_RX-	10/100 RX 3 -	14
ETH 0_PORT4_TX-	10/100 TX 4 -	15
ETH 0_PORT4_TX+	10/100 TX 4 +	16

J2 Signal Name	Description	38999 Pin #
ETH 0_PORT4_RX+	10/100 RX 4 +	20
ETH 0_PORT4_RX-	10/100 RX 4 -	21
SPARE_11	Populated spare	18
SPARE_12	Populated spare	22



Note: Port 0 TX polarity is opposite of ports 1-4.

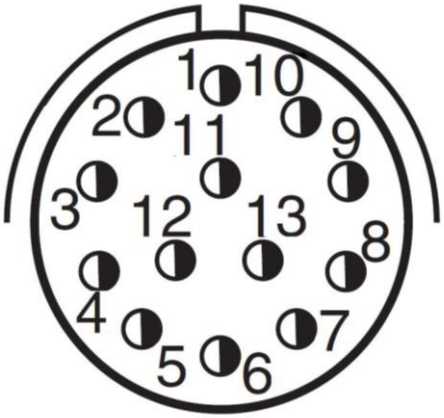
5915-1x Connector Pinout

With one or more expansion modules, port 4 is used internally for Ethernet connection to the expansion module boards, and four Ethernet ports are available on J2. Ports 0 and 1 are the routed ports; ports 2 and 3 are the switched ports.

J2 Signal Name	Description	38999 Pin #
ETH 0_PORT0_TX+	10/100 TX 0 +	1
ETH 0_PORT0_TX-	10/100 TX 0 -	2
ETH 0_PORT0_RX+	10/100 RX 0 +	3
ETH 0_PORT0_RX-	10/100 RX 0 -	4
ETH 0_PORT1_TX-	10/100 TX 1 -	5
ETH 0_PORT1_TX+	10/100 TX 1 +	17
ETH 0_PORT1_RX+	10/100 RX 1 +	6
ETH 0_PORT1_RX-	10/100 RX 1 -	7
ETH 0_PORT2_TX-	10/100 TX 2 -	8
ETH 0_PORT2_TX+	10/100 TX 2 +	9
ETH 0_PORT2_RX+	10/100 RX 2 +	10
ETH 0_PORT2_RX-	10/100 RX 2 -	19
ETH 0_PORT3_TX-	10/100 TX 3 -	11
ETH 0_PORT3_TX+	10/100 TX 3 +	12
ETH 0_PORT3_RX+	10/100 RX 3 +	13
ETH 0_PORT3_RX-	10/100 RX 3 -	14
SPARE_1	Populated spare	15
SPARE_2	Populated spare	16
SPARE_3	Populated spare	20
SPARE_4	Populated spare	21
SPARE_5	Populated spare	18
SPARE_6	Populated spare	22

J3 Console Connector Pinouts

J3 is the console connector for the Cisco 5915.



Connector Alignment: facing the insert side of the connector (pin side). The connector on the DuraMAR 5915 front panel (socket side) is an exact mirror of the picture on the left.

P/N: D38999/20FB35SN
(Shell Size 11)

Figure 10. Connector J3 Console

J3 Signal Name	Description	38999 Pin #
Zeroize	Zeroization of System	2
B-1 GND	Signal Ground. Used for zeroization.	1
CONS_TXD_RS232	Console Transmit Data	10
CONS_DTR_RS232	Console Data Terminal Ready	8
CONS_RTS_RS232	Console Ready to Send	9
CONS_RXD_RS232	Console Receive Data	12
CONS_DSR_RS232	Console Data Set Ready	7
CONS_CTS_RS232	Console Clear to Send	13
CON_GND_RS232	Console Ground	11
SPARE_1	Populated spare	3
SPARE_2	Populated spare	4
SPARE_3	Populated spare	5
SPARE_4	Populated spare	6

Chapter 4 Specifications

This chapter provides specifications for the DuraMAR 5915 chassis and Cisco 5915 Router.

Chassis

Physical Specifications

- Weight: 4.0 lbs. (1.81 kg) Standalone Router. (For the weight of expansion modules, refer to the expansion module addendums.)
- Installation: Base Flange Mount or Side Boss Mount (90° Rotated Orientation)
- Connectors: MIL-DTL-38999 Series III
- Cooling: Passive Conductive. No Moving Parts
- Enclosure/Finish: Corrosion Resistant, Aluminum Alloy with Black Anodize Finish per MIL-A-8625, Type II, Class 2

Dimensions

The table summarizes the physical dimensions of the DuraMAR 5915, excluding connectors and mounts. The drawings following the table illustrate the dimensions in different views.

Unit	Height	Depth	Width
Standalone Router	2.66” (~6.76 cm)	6.75" (~17.15 cm)	6.25” (~15.88 cm)
Base Router with 1 expansion module	4.66” (~11.84 cm)	Same	Same
Base Router with 2 expansion modules	2" higher: 6.66" (~16.92 cm)	Same	Same

Standalone Router Dimensions

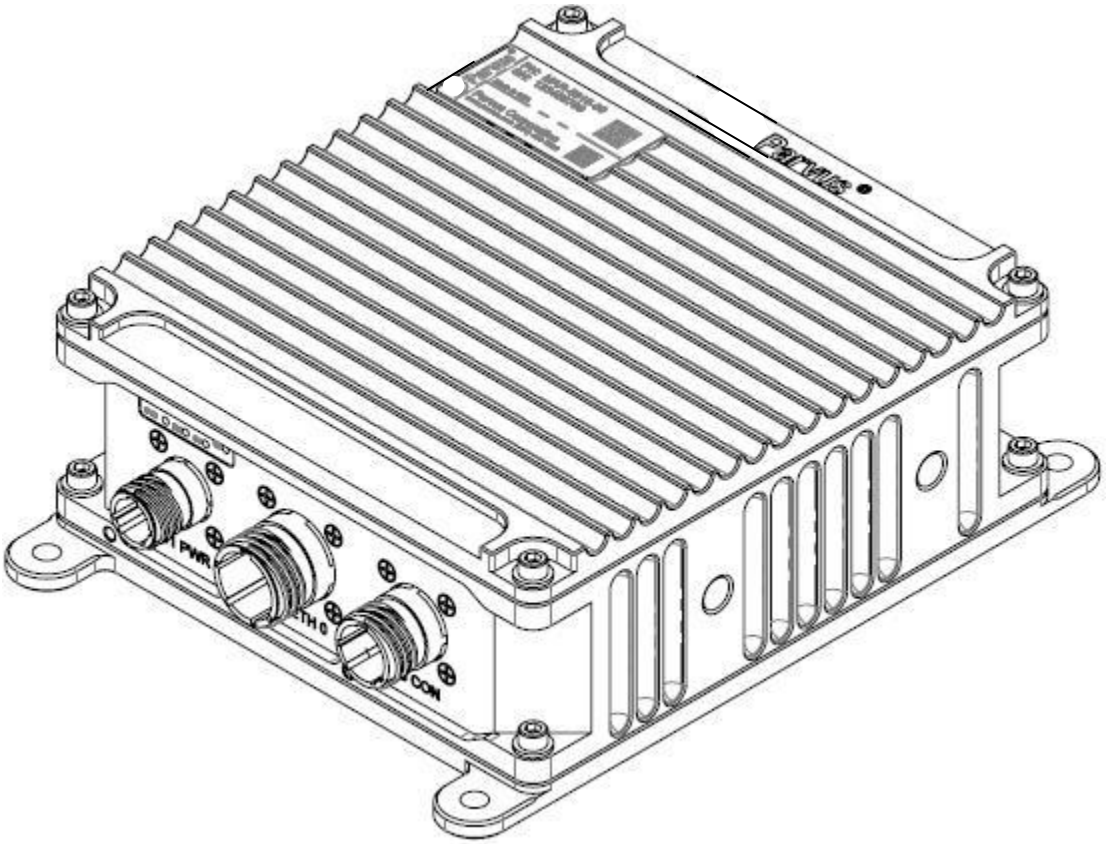


Figure 11. Standalone Router Angle View

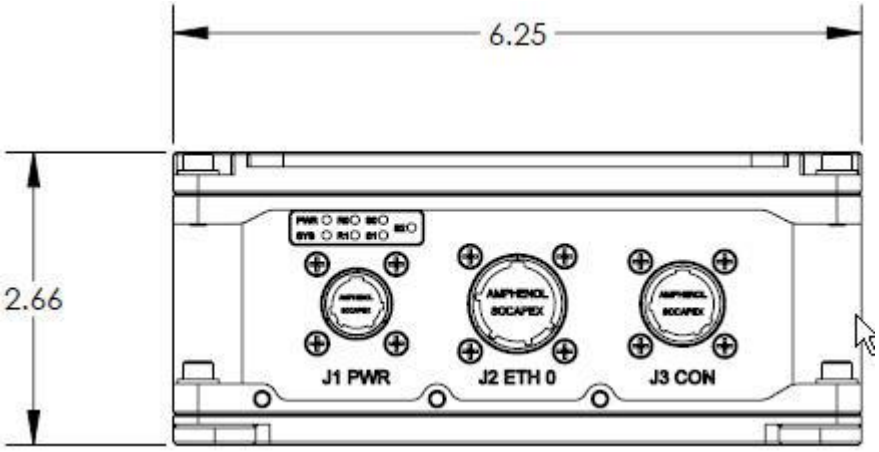


Figure 12. Standalone Router Front View

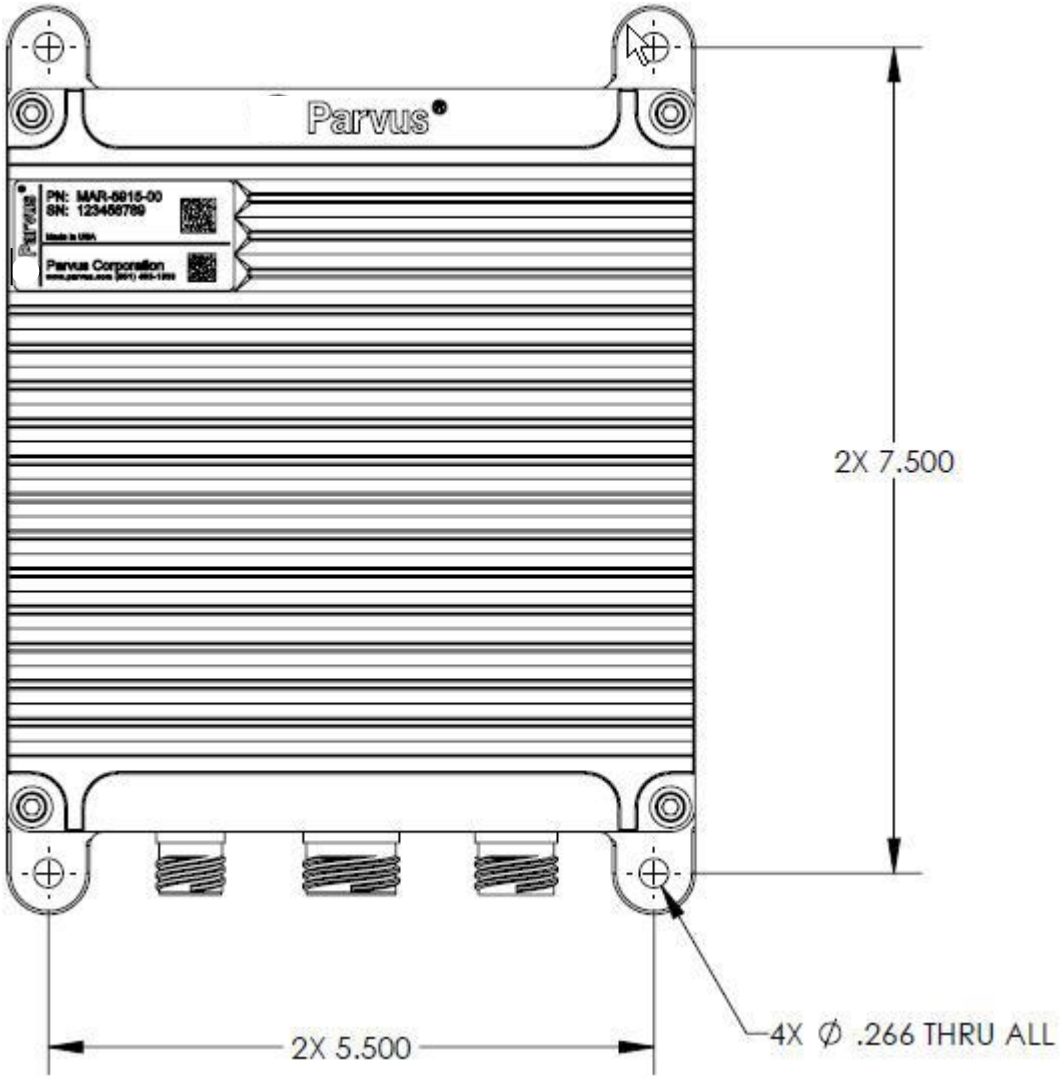


Figure 13. Standalone Router Top View

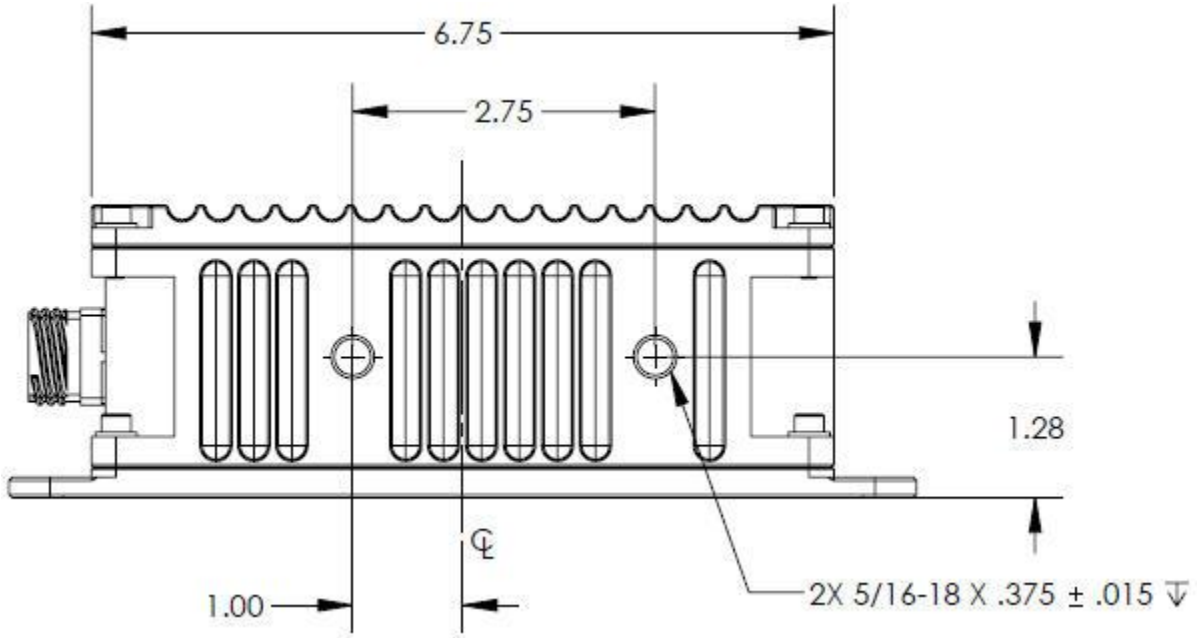


Figure 14. Standalone Router Side View

Router with Expansion Module Dimensions

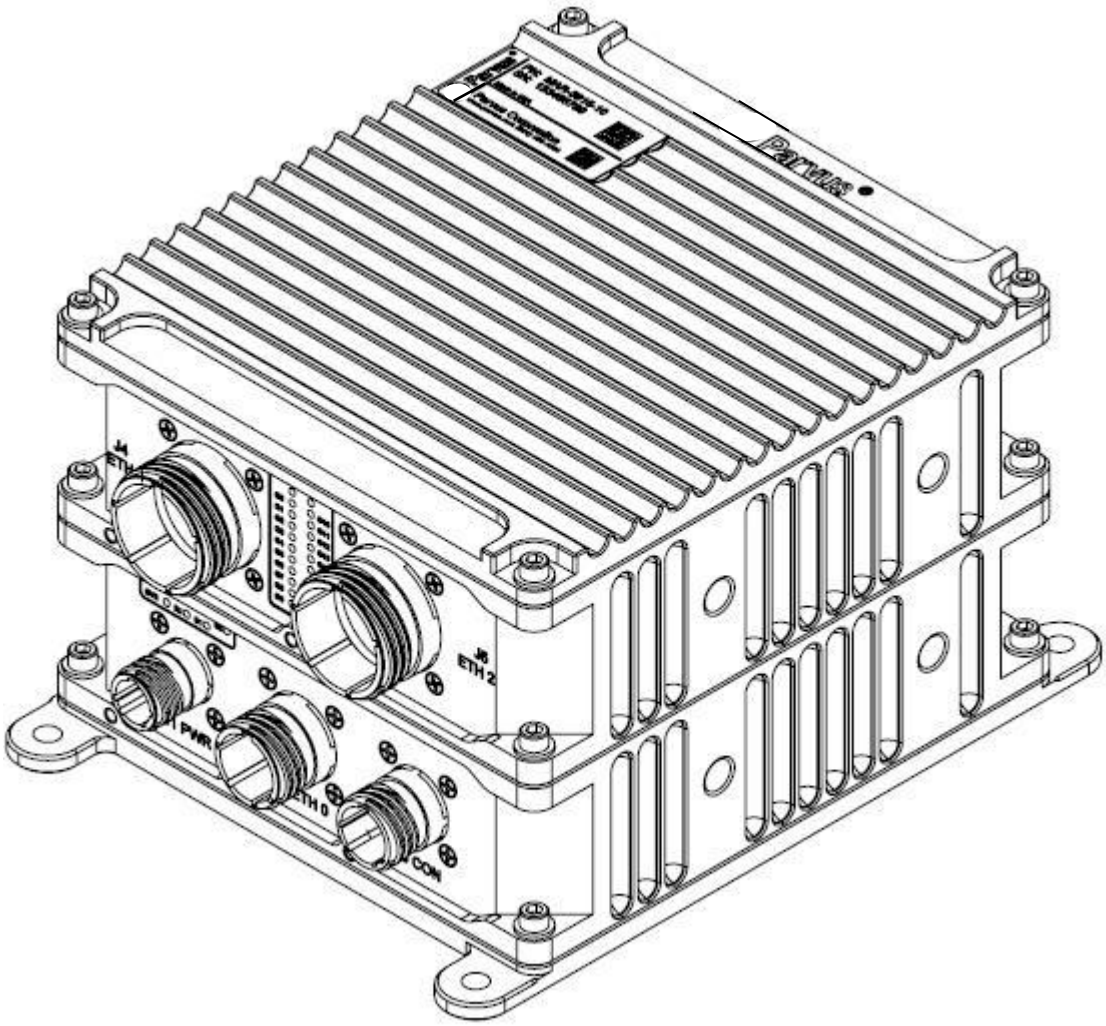


Figure 15. Router with EM Angle View

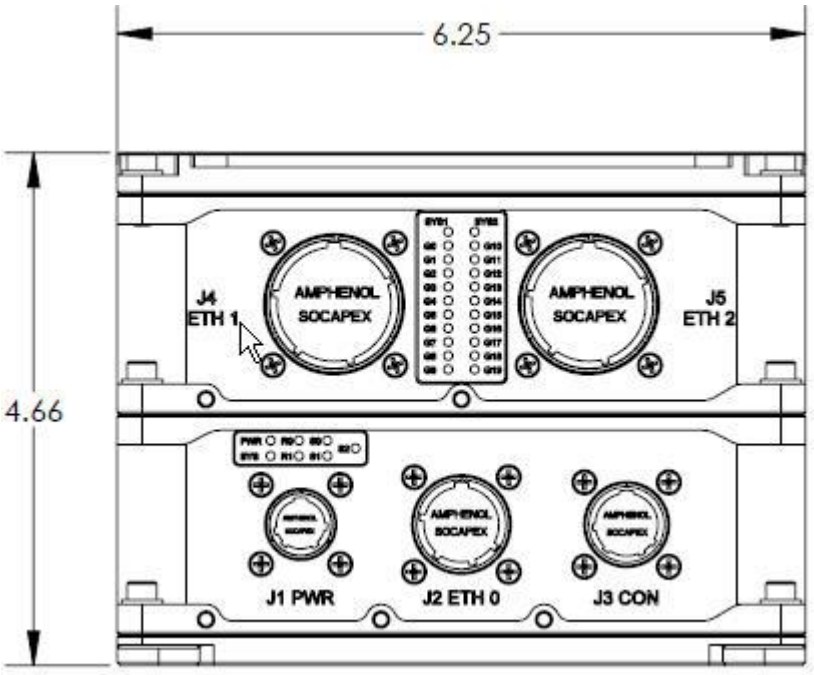


Figure 16. Router with EM Front View

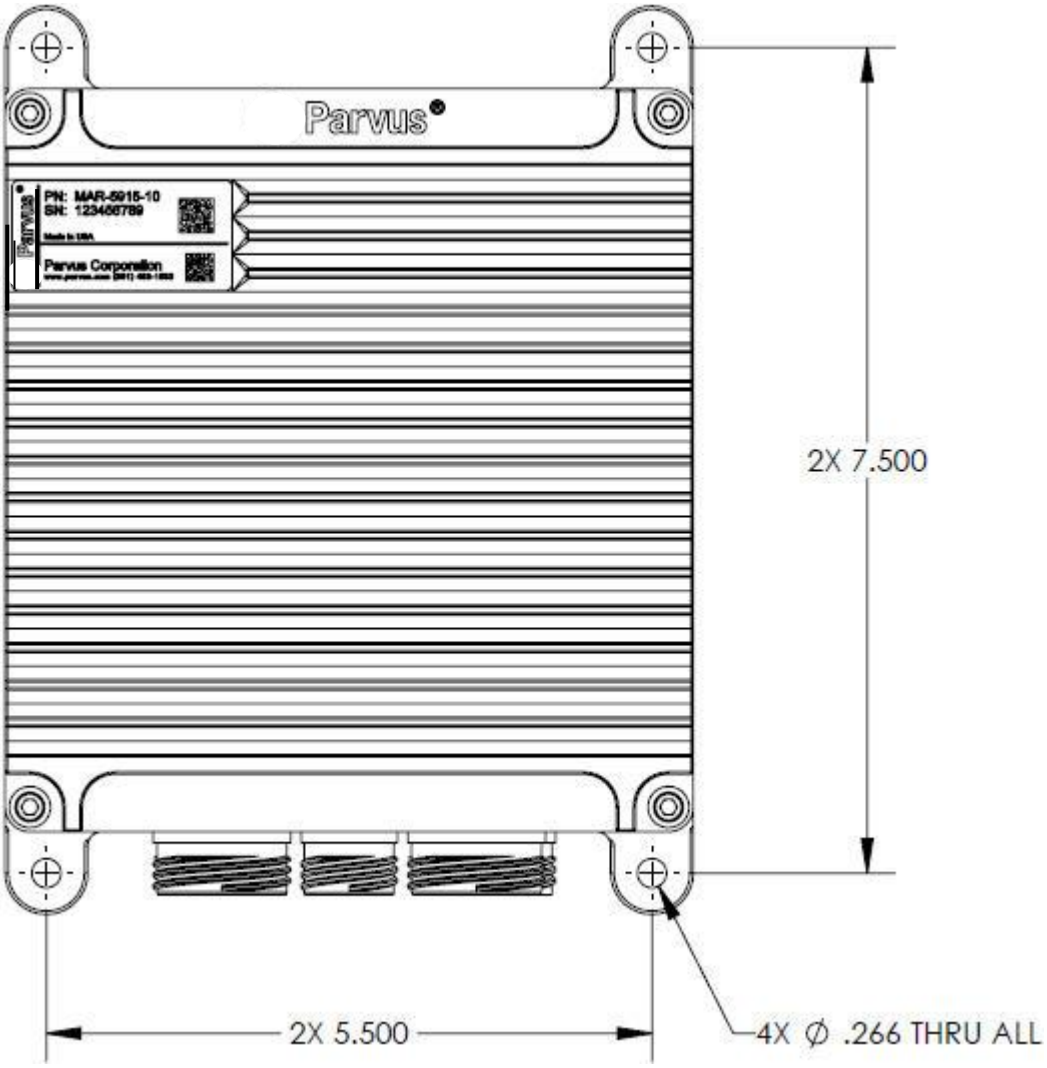


Figure 17. Router with EM Top View

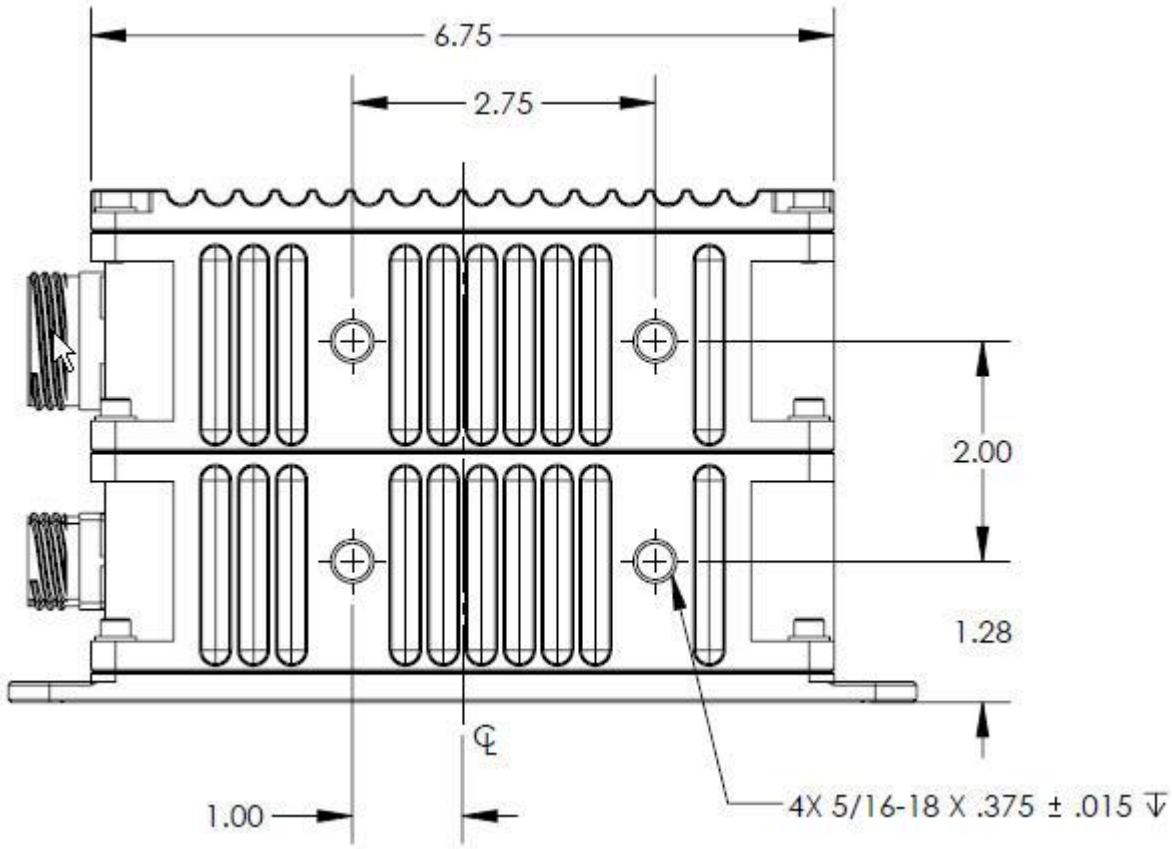


Figure 18. Router with EM Side View

Mounting Instructions

You can attach the DuraMAR 5915 to a mounting surface by using the mounting holes on the baseplate or the side. Figure 19 and Figure 20 show the side view of the DuraMAR 5915.



Figure 19. Standalone Router Side Boss Mounting



Figure 20. Router with Expansion Module Side Boss Mounting

- To attach the DuraMAR 5915 on its base (any configuration), use the four mounting holes in the baseplate flanges (Figure 13 or Figure 17). These mounting holes are clearance holes for 1/4" hardware.
- To attach the standalone DuraMAR 5915 on its side, use the two side mounting holes shown in Figure 14. The side mounting holes are blind and tapped for 5/16-18 x .375 ± 0.15" deep.
- To attach the router with one expansion module on its side, use the four side mounting holes shown in Figure 18. The side mounting holes are blind and tapped for 5/16-18 x .375 ± 0.15" deep.
- For grounding, you can attach grounding straps to either the baseplate flanges (Figure 13 or Figure 17) or the optional grounding boss on the back of the module (Figure 21).

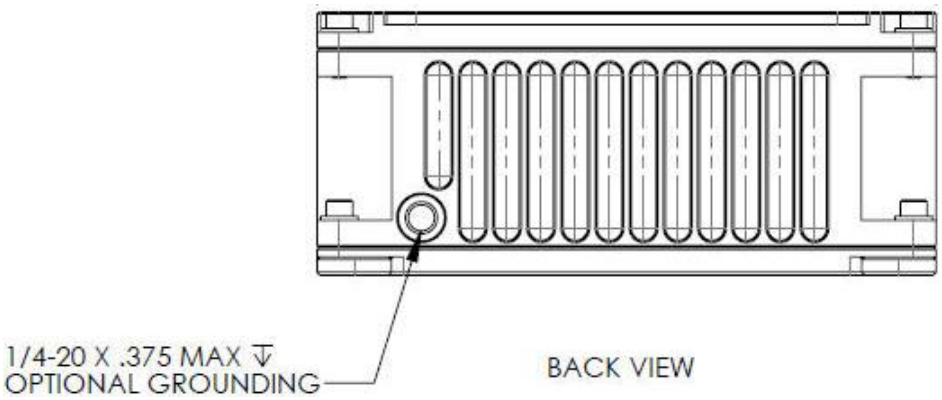


Figure 21. Router Back View Showing Optional Grounding Boss Location

5915 Router Specifications

For a complete IOS feature set comparison, refer to the Cisco Feature Navigator at www.cisco.com.

Cisco Technology

- Integrated Cisco 5915 Embedded Services Router (ESR) PCI-104 Card
- Cisco Enterprise IOS - Base Image or Advanced Services Image
- Support for IPv6 Routing, VoIP/CME, VPN/Firewall/IPS, Mobile IP, IPSec (Advanced IOS only)

Ports

- Standalone Router:
  - 2x 10/100Mbps Fast Ethernet WAN Router Ports, IEEE 802.3 Compliant
  - 3x 10/100Mbps Fast Ethernet Switched LAN Ports, IEEE 802.3U Compliant
  - 1x Console Port, RS-232

Management and Monitoring

- Base/Advanced Enterprise Cisco IOS Software with Command Line Interface (CLI)
- Configuration Management via Serial Console or Ethernet Port Through Terminal Emulation Application
- SNMPv2/v3, Telnet, RADIUS, TACACS+, Cisco Service Assurance Agent, Syslog, Response Time Reporter, NTP Client, TFTP Client and Server, DHCP Client and Server, DHCP Relay, HSRP
- Network Address Translation; Address Conservation; DHCP Client Address Negotiation, Easy IP Phase I

Voice Support

- Cisco Unified Comms Manager Express for Remote IP Telephony/Command & Control Comms, 5/25-User License Support (Advanced IOS add-on option)

Routing/Bridging

- IPv4 and IPv6 Routing (IPv6 features available in Advanced Enterprise IOS Image only)
- Routing Protocol Support: RIPv1v2; OSPF; EIGRP-IP; Cisco Discovery Protocol, Cisco GMP; IP Multicast PIM v1, PIMv2; Protocol Independent Multicast -Sparse Mode (PIM-SM); IGMPv1v2; IP Policy Routing, IP Multicast Load Splitting; Point-To-Point Protocol (PPP), Frame Relay, X.25, XOT, High-Level Data Link Control (HDLC), Telnet, Dial-On-Demand Routing (DDR), PPP Over Frame Relay, UDP Telnet
- VLAN: Virtual Local Area Network Logical Segmentation of Network for Optimal Use of Bandwidth
- Radio Aware Routing (RAR) RFC 5578 – OSPFv3/EIGRP w/ Mobile Ad-Hoc Networks (MANET) Extensions (PPPoE)
- Mobile IP Routing and Cisco Mobile Network Support (Advanced Enterprise IOS Only)

Security

- Authentication: Route, PAP, CHAP, MS-CHAP Local Password, IP Access Lists, Time-Based Access Control Lists
- Generic Routing Encapsulation (GRE); Fast Switching, Cisco Express Forwarding, Process Switching, STAC Compression, RTP Header Compression
- Advanced Enterprise IOS Only: Stateful Inspection Firewall; Intrusion Detection System; Easy VPN for Client/Server/Remote; MPLS VPN; Hardware Accelerated Crypto: IPSec, 3DES, AES, IKE Protocols; Port-To-Application Mapping; Tunnel Endpoint Discovery; Secure Shell (SSH) Protocol Client and Server

Information Assurance

- Data Zeroization Support to Erase Sensitive Information (Initiated by Offboard Signal Trigger) – Advanced IOS only
- Common Criteria Evaluation and Validation Scheme (CCEVS) EAL and Federal Information Processing Standard (FIPS) 140-2 Certification Pending on Cisco 5915 Router Card (building on Legacy Cisco 3200 EAL3 Certification)

QoS

Quality of Service (QoS) Classification/Prioritization of Data, guaranteeing determinism for mission-critical data:

- Generic Traffic Shaping, Class-Based Ethernet Matching, Mobile Access Routing (802.1p Class of Service), Committed Access Rate, Flow-Based WRED, Low-Latency/Priority/Weighted Fair Queuing, Dial Backup, Dialer Profiles, Dialer Idle Timeout, Dial on Demand, Class-Based Weighted Fair Queuing, Traffic Policing RSVP
- 802.1Q Virtual Local-Area Network (VLAN) Trunking and Encapsulation support

Status Indication

- LED Indicators for power (PWR) and link status (LNK)

Power

- 24/28 VDC nominal voltage input; range: 18-33 VDC
- Power Consumption: 12W Max (Standalone Router)
- Qualified to MIL-STD-704F and MIL-STD-1275D Steady State Voltage, Ripple, Surges, and Spikes
- Galvanic Isolation: 1500 VDC

Environmental

Qualified to MIL-STD-810G:

- Operating Temperature: -40° to +71°C (-40° to +160°F) (MIL-STD-810G, Methods 501,502)
- Storage Temperature: -40° to +85°C (-40° to 185°F) (MIL-STD-810G, Methods 501,502)
- Operating Shock: 40g, 11ms, 3 pos/neg per axis, 18 terminal peak sawtooth pulses (MIL-STD-810G, Method 516)
- Crash Hazard Shock: 75g, 11ms, 2 pos/neg per axis, 12 terminal peak sawtooth pulses (MIL-STD-810G, Method 516)
- Random Vibration: 10Hz to 2000Hz, 3 Axes, 1 Hour/Axis Parvus combined Jet-Helo (MIL-STD-810G, Method 514)
- Humidity: Up to 95% RH @ 40C, Non-Condensing
- Water Immersion: 1 Meter, 30 Minutes (MIL-STD-810G, Method 512)
- Blowing Sand and Dust per MIL-STD-810G, Method 501.5 (qual by analysis)
- Operational Altitude: Up to 15,000 feet (4,572 meters) - MIL-STD-810G, Method 500
- Storage Altitude: Up to 40,000 feet (12,192 meters) - MIL-STD-810G, Method 500

EMI/EMC

- Qualified to MIL-STD-461F
- Conducted Emissions, CE102, Power Leads, 10 KHz to 10MHz, basic curve
- Conducted Susceptibility, CS101, Power Leads, 30 Hz to 150 KHz, Curve 2 (28V and below)
- Radiated Emissions, RE102, Electric Field, 10 KHz to 18 GHz, Figure RE102-3
- Radiated Susceptibility, RS103, Electric Field, 2MHz to 18 GHz, Aircraft External, 200 Volts per Meter

Reliability

- MTBF per MIL-HDBK-217F
  - Ground Benign, +25°C 966,053 hours (110 years)
  - Ground Mobile, +25°C 109,379 hours (12.5 years)
  - Airborne Inhabit, +25°C 28,907 hours (3.3 years)
  - Airborne Rotary, +25°C 23,278 hours (2.7 years)
- Industrial-Grade Components; No Moving Parts; Passive Cooling; Conformal Coated Boards

Chapter 5 Troubleshooting

Product Identification

The product is labeled with the Parvus P/N and serial number. Please refer to this information when communicating with Parvus.

Technical Assistance

If you have a technical question or if you cannot isolate a problem with your product, please call or e-mail the Parvus Technical Support team:

Email	slp_tsupport@curtisswright.com
Phone	1 (801) 433-6322
Fax	1 (801) 483-1523

Returning for Service

Before returning any Parvus product, please fill out a Return Material Authorization (RMA) request form available for download from the following website under the support section:

www.curtisswrightds.com/parvus

Email this form to the Technical Support email address (slp_tsupport@curtisswright.com) to receive authorization for shipment. An RMA number will be emailed back to you as soon as possible.



Note: You must have the RMA number in order to return any product for any reason.



Warning!
Any product returned to Parvus improperly packed will immediately void the warranty for that particular product.

Chapter 6 Contact Info

Company contact info:

Defense Solutions Division
Curtiss-Wright
3222 S. Washington St.
Salt Lake City, Utah, USA 84115

(801) 483-1533
FAX (801) 483-1523

Website: www.curtisswrightds.com/parvus

Sales:

+1(800) 483-3152 or (801) 483-1533
slp_sales@curtisswright.com

Product Technical Support:

+1 (801) 433-6322
slp_tsupport@curtisswright.com

Customer Feedback:

slp_feedback@curtisswright.com

Expansion Module

Addendum A: Gigabit Ethernet Switches

MAR-5915-1x



A1 Introduction

The Dual Gigabit Ethernet expansion module for the DuraMAR 5915 contains two Parvus COM-1268 PC/104+ Gigabit Ethernet Switch boards, and is referred to as the COM-1268 EM in this addendum. The COM-1268 EM consolidates switch and router functions into a single hardened subsystem qualified to MIL-STD-810G and MIL-STD-461F environmental conditions, and expands the LAN port count for the DuraMAR 5915 to 19 ports.

About This Document

This addendum describes the Parvus Dual Gigabit Ethernet Expansion Module (MAR-5915-1x).

COM-1268 Manuals

The documentation for the MAR-5915-1x consists of two Parvus user manuals: this hardware manual and a COM-1268 firmware manual (MNL-0599) that describes port configuration and switch management for the COM-1268 boards.

- This addendum is specific to the COM-1268 EM, while the firmware manual is generic and used with other Parvus 1268 products. That means this addendum is the authority on what features your product has.
- Parvus offers different firmware versions to support different COM-1268 configurations. If you do not have a firmware manual, you can download it from the Parvus website www.parvus.com.
  - Navigate to the Products > Rugged Routers and Switches page, select your product, and click the Documents and Downloads tab. All Parvus user manuals for the DuraMAR 5915 are listed on this page.
  - Select the manual for the firmware version you are running, i.e., 5.0.x.
- A third Parvus document, *1268 Firmware Revision History and Compatibility Matrix*, is helpful in determining the correct versions of firmware and manuals for this product.

Addendum Organization

This addendum follows the same general organization as the base manual Chapters 1 through 4.

- Chapter A1 provides a functional description of the switches.
- Chapter A2 contains basic operating information.
- Chapter A3 contains connector pinouts for the COM-1268 switches.
- Chapter A4 contains the specifications that are unique to MAR-5915-1x. For chassis dimensions and mounting instructions, refer to Chapter 4 in the base manual.

For troubleshooting and Parvus contact information, refer to Chapters 5 and 6 in the base manual.

Overview

The DuraMAR® 5915 is a rugged Commercial-Off the Shelf (COTS) Cisco IOS-managed mobile router integrated with Cisco's 5915 Embedded Services Router (ESR) card in an ultra-rugged chassis optimized for harsh military and civil vehicle/aircraft installations. The MAR-5915-1x expansion module features two integrated Gigabit Ethernet switches (COM-1268s) for a total of 19 Ethernet ports, supporting higher port-density application requirements.



Figure 22. MAR-5915-1x with Integrated COM-1268 EM

Features

Scalability

- Router plus two COM-1268s: 19 Ethernet Ports (15 GigE Switched, 2x 10/100 Switched, 2x 10/100 Routed)

Ruggedization

- Qualified to MIL-STD-810G Shock, Vibration, Thermal, Altitude, Humidity
- -40 to +71C Fanless Extended Temp Operation with No Moving Parts
- Corrosion-Resistant, Aluminum Chassis Sealed Against Water, Dust, EMI
- Circular MIL-DTL-38999 Connectors for Reliable Network Connections
- Qualified to MIL-STD-461F Conducted/Radiated Emissions & Susceptibility
- Data Zeroization Support to Erase Sensitive Information
- Conformal Coating for Humidity/Tin-Whisker Mitigation
- Flexible/Robust Mounting – Base Flange Mount or Side Boss Mount

Functional Description

The two Parvus COM-1268 PC/104+ Gigabit Ethernet switch cards expand the LAN port count for the base DuraMAR 5915 and consolidate switch and router functions into a single hardened subsystem qualified to MIL-STD-810G and MIL-STD-461F environmental conditions.

Configurations

This addendum applies to the following DuraMAR 5915 configurations.

Product	Parvus Product Number	Base Enterprise IOS	Advanced Enterprise IOS	Breakout Cableset	Description
Router with Dual Gigabit Ethernet Switches	MAR-5915-1x	-10	-11, -12*, -13**,-14***	CBL-5915-01	DuraMAR 5915 Mobile Router with two COM-1268s (Gigabit Ethernet switches) • 2x FE routed ports • 2x FE switched ports • 15x GigE switched ports

* CME-5 Users
** CME-25 Users
*** CME-50 Users

Block Diagram

Figure 2 shows the base module with the COM-1268 EM.

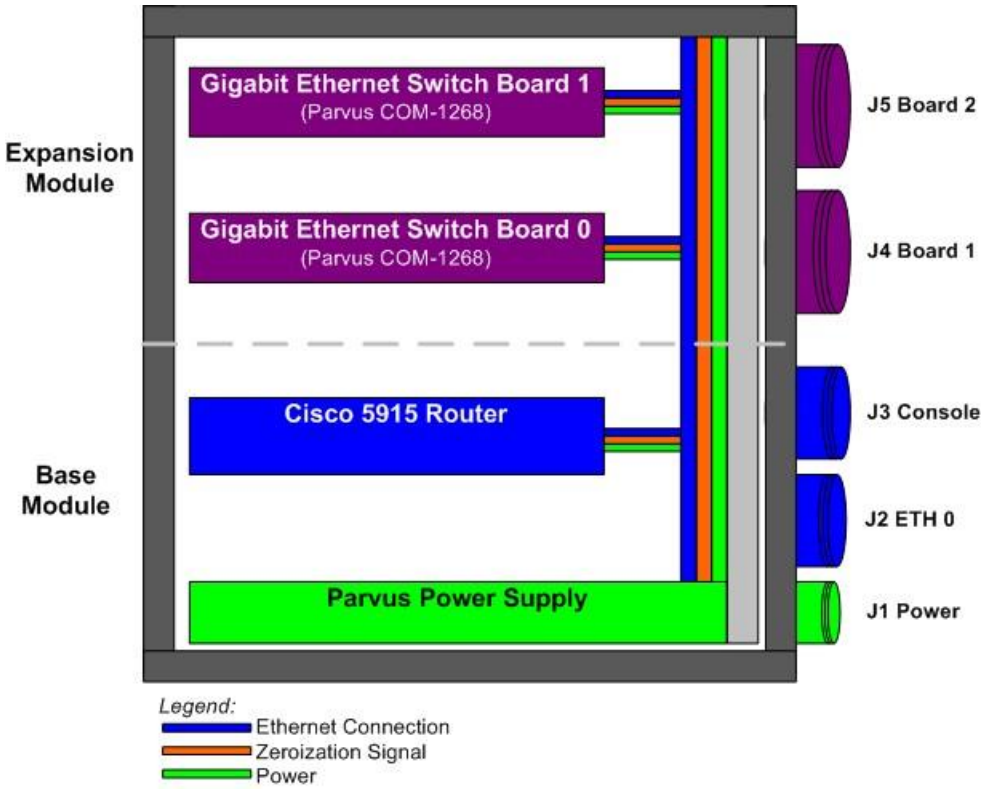


Figure 23. Router with COM-1268 EM Block Diagram

- The Parvus Power Supply provides power for the Cisco 5915 and the expansion module boards.
- The internal Ethernet connection connects the Cisco 5915 to the COM-1268 boards in the expansion module.
- The Zeroization signal is externally generated at the J3 Console connector and transmitted to the Cisco 5915 and expansion module boards. Zeroization erases the COM-1268 application code and configuration data on both COM-1268s. For additional information, refer to "Zeroization" on page 46.
- From the DuraMAR 5915 perspective (front panel, pinouts, cables), the two COM-1268 boards are J4 ETH 1 and J5 ETH2. To the COM-1268 management interface, the two boards are boards 0 and 1 with ports 0/0-1/9.

Internal Ethernet Connections

Each COM-1268 has ten ports but some ports are internally connected to provide connection between COM-1268 board 0 and board 1 and between COM-1268 board 0 and the Cisco 5915 (Figure 24).

COM-1268 management is performed via the serial management port on board 0.

- Commands for board 1 are sent from board 0 via IrDA (infrared). The IrDA link supports board 1 port configuration, transfer of board 1 configuration files to and from a host PC, and initiating upgrading of board 1 application code.

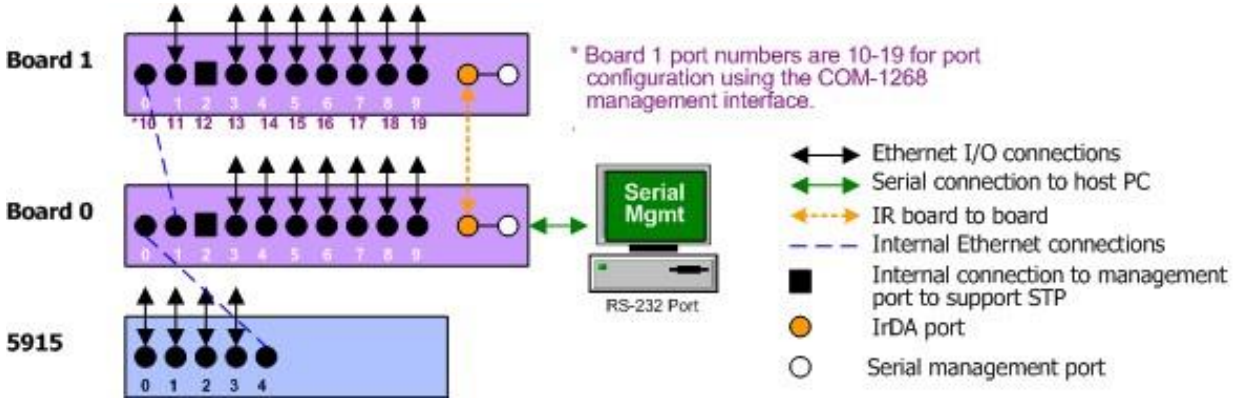


Figure 24. 1268 EM Internal Connections

A2 Operational Description

Cables and Connectors

You should test the COM-1268s prior to installation in the target system to ensure full operational capability. Full bench-top testing can be performed by using the Parvus starter cableset available for this unit or by using a custom set of cables made specifically for the intended target system, vehicle, or craft. Refer to Chapter A3 for pinouts and descriptions.

1268 EM Starter Cableset

The Parvus starter cableset for the 1268 EM (CBL-5915-01) is available for purchase through the Parvus Sales department and is meant for lab or bench testing purposes only. The cableset includes cables for both the expansion module and the base module, and provides access to connectors J1 through J5.

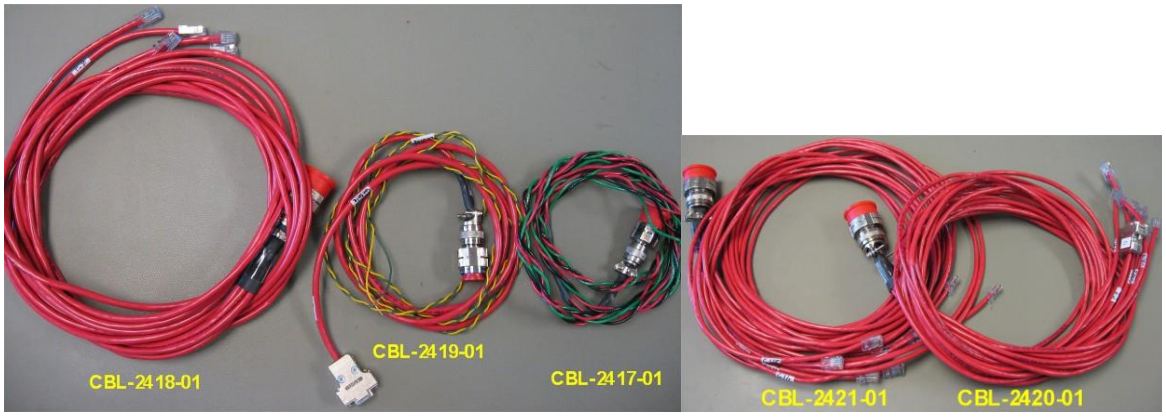


Figure 25. 1268 EM Starter Cableset (CBL-5915-01)

The starter cableset for the 1268 EM has the following MIL-C-38999 connectors.

Part #	Type	Quantity	Description
CBL-2417-01	Banana Plugs	3 each	J1 Power
CBL-2418-01	RJ-45 Connectors	5 each	J2 Ports 0-4
CBL-2419-01			J3 Console. Cable with two tails (flying leads and DB9) for attachment to the host PC.
	DB9	1 each	Serial connection to J3 Management Port
	Yellow Wire	1 each	J3 Pin 2, Zeroize
	Green Wire	1 each	J3 Pin 1, ground reference for the +12VDC signal
CBL-2420-01			J4 Management Port. Cable with two tails (RJ45 and DB9) for attachment to the host PC.
	RJ45 Connectors	7 each	J4 (Board 0) Ethernet Ports 3-9
	DB9	1 each	Serial connection to J4 (Board 0) Management Port
CBL-2421-01	RJ-45 Connectors	8 each	J5 (Board 1) Ethernet Ports 1 and 3-9

COM-1268 EM Connectors and LEDs



Figure 26. COM-1268 EM Connectors and LEDs

LED		Description
SYS1	COM-1268 board 0	Blue light indicates power is on.
SYS2	COM-1268 board 1	Blue light indicates power is on.
G0-G9	Ethernet ports on board 0 (connector J4)	Green light indicates a link is established to that port.
G10-G19	Ethernet ports on board 1 (connector J5)	Green light indicates a link is established to that port.

Basic Operating Procedures

Console Session Setup

The two COM-1268 boards are managed through a single serial management console on Board 0. The management interface requires hardware setup to connect the Management Port (J4) to a host PC which acts as the console. Refer to Chapter A3 for pin assignments, or order the Parvus starter cableset (CBL-5915-01).

1. Connect the console cable (CBL-2420-01 or a customer-designed cable) to J4.
2. Connect the serial DB9 tail to the host PC, and set up a terminal emulator with settings 115200-8-N-1 and no flow control.
3. If the DuraMAR 5915 is not powered on, connect the power cable (CBL-2417-01) or a customer-designed power cable to connector J1 and to a 18-33VDC power source.
4. Apply power.

MNL-0599-03, *COM-1268 Firmware v3.9x User Manual*, describes how to use the management interface to configure and manage the COM-1268s.

Zeroization

For data security, the COM-1268s support zeroization to erase the application code and configuration data stored in the system. Once the code is erased, the only method of recovery is to reload code to the boards.

In normal operation, zeroization is used only if the user loses or forgets the COM-1268 password. The COM-1268 has no way to recover the password. The only way to resolve the issue and regain access to the COM-1268 management interface is to zeroize the system firmware and reload.

Initiating Zeroization

To initiate zeroization, refer to the "Zeroization" section in Chapter 2 of the base manual.

Zeroization Recovery

Zeroization erases COM-1268 configuration data and application code on both boards, and the COM-1268 switches revert to a basic Layer 2-only switch. To recover after zeroization, use the serial management interface to reload the application code to the COM-1268s. See the Zeroization Recovery procedure in the *COM-1268 Firmware User Manual*.

A3 Connector Descriptions

This chapter provides the pinouts necessary for creating cables to connect to the COM-1268 EM.

All EMI and EMC considerations must be handled by the customer.

Connector Identification

The table shows the connector part numbers along with suggested mating connector details.

Connector	Label	Description	Part Number	Mating Connector
J4	ETH 1	7X Gigabit Switched Ports & Console	D38999/20FF35SN	D38999/26FF35PN
J5	ETH 2	8X 10/100/100 Switched Ports	D38999/20FF35SN	D38999/26FF35PN

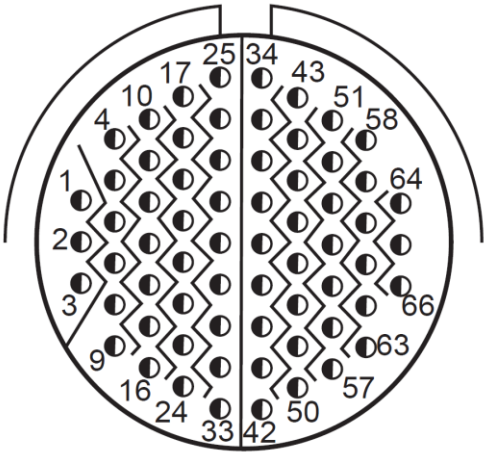
COM-1268 Port Numbers

The DuraMAR 5915 and the COM-1268 management interface use different port numbers for the COM-1268 ports. The table below maps the DuraMAR 5915 signal name to the corresponding COM-1268 board port number, DuraMAR 5915 LED identifier, and COM-1268 configuration port number. For additional information, refer to Figure 24 on page 43.

DuraMAR 5915 Signal Name	COM-1268 Port	DuraMAR 5915 LED	COM-1268 Configuration Port
J4 Ethernet 1	**COM-1268 Board 0 (Master)**		
CONS_RXD_RS232	Board 0 Serial Management Port		
ETH 1_P3	Board 0 Port 3	G3	0/3
ETH 1_P4	Board 0 Port 4	G4	0/4
ETH 1_P5	Board 0 Port 5	G5	0/5
ETH 1_P6	Board 0 Port 6	G6	0/6
ETH 1_P7	Board 0 Port 7	G7	0/7
ETH 1_P8	Board 0 Port 8	G8	0/8
ETH 1_P9	Board 0 Port 9	G9	0/9
J5 Ethernet 2	**COM-1268 Board 1 (Slave)**		
	Board 1 Serial Management Port		
ETH 2_P1	Board 1 Port 1	G11	1/1
ETH 2_P3	Board 1 Port 3	G13	1/3
ETH 2_P4	Board 1 Port 4	G14	1/4
ETH 2_P5	Board 1 Port 5	G15	1/5
ETH 2_P6	Board 1 Port 6	G16	1/6
ETH 2_P7	Board 1 Port 7	G17	1/7
ETH 2_P8	Board 1 Port 8	G18	1/8
ETH 2_P9	Board 1 Port 9	G19	1/9

J4 Ethernet 1 Connector Pinouts

J4 provides signals to Parvus COM-1268 Board 0 (Ethernet 1) Serial Management Port (CONS_RXD_RS232) and Ethernet ports ETH-1 0/3-0/9.



Connector Alignment: facing the insert side of the connector (pin side). The connector on the front panel (socket side) is an exact mirror of the picture on the left.

P/N: D38999/20FF35SN
(Shell Size 19)

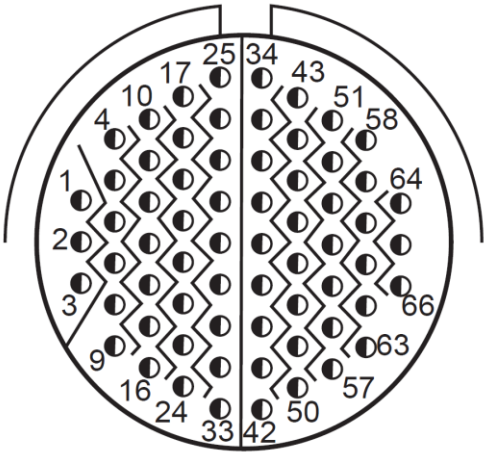
Figure 27. Connector J4 Ethernet 1

J4 Signal Name	Description	38999 Pin #
ETH 1_P3_A+	10/100/1000 Port 3 A+	4
ETH 1_P3_A-	10/100/1000 Port 3 A-	10
ETH 1_P3_B+	10/100/1000 Port 3 B+	1
ETH 1_P3_B-	10/100/1000 Port 3 B-	5
ETH 1_P3_C+	10/100/1000 Port 3 C+	2
ETH 1_P3_C-	10/100/1000 Port 3 C-	6
ETH 1_P3_D+	10/100/1000 Port 3 D+	3
ETH 1_P3_D-	10/100/1000 Port 3 D-	7
ETH 1_P4_A+	10/100/1000 Port 4 A+	17
ETH 1_P4_A-	10/100/1000 Port 4 A-	18
ETH 1_P4_B+	10/100/1000 Port 4 B+	26
ETH 1_P4_B-	10/100/1000 Port 4 B-	27
ETH 1_P4_C+	10/100/1000 Port 4 C+	35
ETH 1_P4_C-	10/100/1000 Port 4 C-	36
ETH 1_P4_D+	10/100/1000 Port 4 D+	43
ETH 1_P4_D-	10/100/1000 Port 4 D-	44
ETH 1_P5_A+	10/100/1000 Port 5 A+	11
ETH 1_P5_A-	10/100/1000 Port 5 A-	12
ETH 1_P5_B+	10/100/1000 Port 5 B+	19
ETH 1_P5_B-	10/100/1000 Port 5 B-	20
ETH 1_P5_C+	10/100/1000 Port 5 C+	13
ETH 1_P5_C-	10/100/1000 Port 5 C-	14
ETH 1_P5_D+	10/100/1000 Port 5 D+	21
ETH 1_P5_D-	10/100/1000 Port 5 D-	22

J4 Signal Name	Description	38999 Pin #
ETH 1_P6_A+	10/100/1000 Port 6 A+	28
ETH 1_P6_A-	10/100/1000 Port 6 A-	29
ETH 1_P6_B+	10/100/1000 Port 6 B+	37
ETH 1_P6_B-	10/100/1000 Port 6 B-	38
ETH 1_P6_C+	10/100/1000 Port 6 C+	30
ETH 1_P6_C-	10/100/1000 Port 6 C-	31
ETH 1_P6_D+	10/100/1000 Port 6 D+	39
ETH 1_P6_D-	10/100/1000 Port 6 D-	40
ETH 1_P7_A+	10/100/1000 Port 7 A+	52
ETH 1_P7_A-	10/100/1000 Port 7 A-	53
ETH 1_P7_B+	10/100/1000 Port 7 B+	45
ETH 1_P7_B-	10/100/1000 Port 7 B-	46
ETH 1_P7_C+	10/100/1000 Port 7 C+	54
ETH 1_P7_C-	10/100/1000 Port 7 C-	55
ETH 1_P7_D+	10/100/1000 Port 7 D+	47
ETH 1_P7_D-	10/100/1000 Port 7 D-	48
ETH 1_P8_A+	10/100/1000 Port 8 A+	8
ETH 1_P8_A-	10/100/1000 Port 8 A-	9
ETH 1_P8_B+	10/100/1000 Port 8 B+	15
ETH 1_P8_B-	10/100/1000 Port 8 B-	16
ETH 1_P8_C+	10/100/1000 Port 8 C+	23
ETH 1_P8_C-	10/100/1000 Port 8 C-	24
ETH 1_P8_D+	10/100/1000 Port 8 D+	32
ETH 1_P8_D-	10/100/1000 Port 8 D-	33
ETH 1_P9_A+	10/100/1000 Port 9 A+	62
ETH 1_P9_A-	10/100/1000 Port 9 A-	63
ETH 1_P9_B+	10/100/1000 Port 9 B+	56
ETH 1_P9_B-	10/100/1000 Port 9 B-	57
ETH 1_P9_C+	10/100/1000 Port 9 C+	49
ETH 1_P9_C-	10/100/1000 Port 9 C-	50
ETH 1_P9_D+	10/100/1000 Port 9 D+	41
ETH 1_P9_D-	10/100/1000 Port 9 D-	42
SPARE_1	Populated SPARE	58
SPARE_2	Populated SPARE	51
CONS_RXD_RS232	CONS_RXD_RS232	64
SPARE_3	Populated SPARE	59
CONS_TXD_RS232	CONS_TXD_RS232	65
SPARE_4	Populated SPARE	60
CONS_GND_RS232	CONS_GND_RS232	66
SPARE_5	Populated SPARE	61
SPARE 6	Populated SPARE	25
SPARE 7	Populated SPARE	34

J5 Ethernet 2 Connector Pinouts

J5 provides the signals for COM-1268 Board 1 ports ETH2 1/1, 1/3-1/9.



Connector Alignment: facing the insert side of the connector (pin side). The connector on the front panel (socket side) is an exact mirror of the picture on the left.

P/N: D38999/20FF35SN
(Shell Size 19)

Figure 28. Connector J5 Ethernet 2

J5 Signal Name	Description	38999 Pin #
ETH 2_P1_A+	10/100/1000 Port 1 A+	4
ETH 2_P1_A-	10/100/1000 Port 1 A-	10
ETH 2_P1_B+	10/100/1000 Port 1 B+	1
ETH 2_P1_B-	10/100/1000 Port 1 B-	5
ETH 2_P1_C+	10/100/1000 Port 1 C+	2
ETH 2_P1_C-	10/100/1000 Port 1 C-	6
ETH 2_P1_D+	10/100/1000 Port 1 D+	3
ETH 2_P1_D-	10/100/1000 Port 1 D-	7
ETH 2_P3_A+	10/100/1000 Port 3 A+	17
ETH 2_P3_A-	10/100/1000 Port 3 A-	18
ETH 2_P3_B+	10/100/1000 Port 3 B+	26
ETH 2_P3_B-	10/100/1000 Port 3 B-	27
ETH 2_P3_C+	10/100/1000 Port 3 C+	35
ETH 2_P3_C-	10/100/1000 Port 3 C-	36
ETH 2_P3_D+	10/100/1000 Port 3 D+	43
ETH 2_P3_D-	10/100/1000 Port 3 D-	44
ETH 2_P4_A+	10/100/1000 Port 4 A+	11
ETH 2_P4_A-	10/100/1000 Port 4 A-	12
ETH 2_P4_B+	10/100/1000 Port 4 B+	19
ETH 2_P4_B-	10/100/1000 Port 4 B-	20
ETH 2_P4_C+	10/100/1000 Port 4 C+	13
ETH 2_P4_C-	10/100/1000 Port 4 C-	14
ETH 2_P4_D+	10/100/1000 Port 4 D+	21
ETH 2_P4_D-	10/100/1000 Port 4 D-	22
ETH 2_P5_A+	10/100/1000 Port 5 A+	28

J5 Signal Name	Description	38999 Pin #
ETH 2_P5_A-	10/100/1000 Port 5 A-	29
ETH 2_P5_B+	10/100/1000 Port 5 B+	37
ETH 2_P5_B-	10/100/1000 Port 5 B-	38
ETH 2_P5_C+	10/100/1000 Port 5 C+	30
ETH 2_P5_C-	10/100/1000 Port 5 C-	31
ETH 2_P5_D+	10/100/1000 Port 5 D+	39
ETH 2_P5_D-	10/100/1000 Port 5 D-	40
ETH 2_P6_A+	10/100/1000 Port 6 A+	52
ETH 2_P6_A-	10/100/1000 Port 6 A-	53
ETH 2_P6_B+	10/100/1000 Port 6 B+	45
ETH 2_P6_B-	10/100/1000 Port 6 B-	46
ETH 2_P6_C+	10/100/1000 Port 6 C+	54
ETH 2_P6_C-	10/100/1000 Port 6 C-	55
ETH 2_P6_D+	10/100/1000 Port 6 D+	47
ETH 2_P6_D-	10/100/1000 Port 6 D-	48
ETH 2_P7_A+	10/100/1000 Port 7 A+	8
ETH 2_P7_A-	10/100/1000 Port 7 A-	9
ETH 2_P7_B+	10/100/1000 Port 7 B+	15
ETH 2_P7_B-	10/100/1000 Port 7 B-	16
ETH 2_P7_C+	10/100/1000 Port 7 C+	23
ETH 2_P7_C-	10/100/1000 Port 7 C-	24
ETH 2_P7_D+	10/100/1000 Port 7 D+	32
ETH 2_P7_D-	10/100/1000 Port 7 D-	33
ETH 2_P8_A+	10/100/1000 Port 8 A+	62
ETH 2_P8_A-	10/100/1000 Port 8 A-	63
ETH 2_P8_B+	10/100/1000 Port 8 B+	56
ETH 2_P8_B-	10/100/1000 Port 8 B-	57
ETH 2_P8_C+	10/100/1000 Port 8 C+	49
ETH 2_P8_C-	10/100/1000 Port 8 C-	50
ETH 2_P8_D+	10/100/1000 Port 8 D+	41
ETH 2_P8_D-	10/100/1000 Port 8 D-	42
ETH 2_P9_A+	10/100/1000 Port 9 A+	58
ETH 2_P9_A-	10/100/1000 Port 9 A-	51
ETH 2_P9_B+	10/100/1000 Port 9 B+	64
ETH 2_P9_B-	10/100/1000 Port 9 B-	59
ETH 2_P9_C+	10/100/1000 Port 9 C+	65
ETH 2_P9_C-	10/100/1000 Port 9 C-	60
ETH 2_P9_D+	10/100/1000 Port 9 D+	66
ETH 2_P9_D-	10/100/1000 Port 9 D-	61
SPARE 1	Populated SPARE	25
SPARE 2	Populated SPARE	34

Note 1: DuraMAR module expansion may require J5 ETH 2_P1/1 to be connected internally to the next expansion module for inter-module connectivity.
Note 2: All spares are populated.

A4 Specifications

This chapter defines the specifications for the COM-1268 boards used in the MAR-5915-1x.

Physical Specifications

This section summarizes the physical specifications that are unique to the MAR-5915-1x. For additional information on the MAR-5915-1x chassis, including dimension drawings and mounting instructions, refer to Chapter 4 in the base manual.

Size

- Weight: 7.39 lbs (3.36 kg) Router with two integrated COM-1268s
- Dimensions: The COM-1268 EM adds 2" to the height of the base module. Dimensions of MAR-5915-1x, excluding connectors and mounts:

  4.66” H x 6.75" D x 6.25” W (~11.84 cm H x ~17.15 cm D x ~15.88 cm W)
- Form factor: PC/104-Plus

Power

- Power Consumption: 36 W max (two COM-1268s)

Status Indication

- LED Indicators for PWR and LNK

Ports

- Two MIL-DTL-38999 Connectors, providing access to 15x 10/100/1000Mbps Gigabit Ethernet Switched LAN Ports, IEEE 802.3AB Compliant (2x PC104+ COM-1268 cards)
- 1x Console Port, RS-232, for the two Gigabit Ethernet Switches

Technical Specifications

Switching Architecture

- Chipset: Marvel 88E6185
- Non-Blocking OSI Data Layer 2, Low-Latency
- Ten (10) Fully Independent 802.3 Media Access Controllers (MACs)
- High-Speed Four Traffic Class QoS Switch Fabric
- 8K MAC Address Look-Up Engine with Integrated 1MB Frame Buffer Memory
- Back-Pressure and Pause Frame-Based Flow Control

Port Features

- Expansion:
  - Any port can serve as a link port for cascading multiple switches, resulting in a blocking architecture.
  - The onboard IrDA (Infrared Data Association) interface supports recognition and management of two stacked COM-1268 boards for management under a common console interface. (Not supported by COM-1268 firmware version 4.1x.)
- Data Transfer: 10Mbps, 100Mbps, or 1000Mbps
- Duplex: Each port works at 10Mbps or 100Mbps, full or half-duplex mode; or 1000Mbps full-duplex mode
- Auto-MDI/MDIX, Auto-Negotiation, Auto-Detect; Speed Auto-Sensing, Auto-Crossover; Port Mirroring, Port Monitoring

Management and Monitoring

- Configuration Management via Serial Console Port Through Terminal Emulation Application

Declassification

- Data Zeroization Support for Secure Data. Initiated by off-board signal trigger; returns board to basic layer 2 unmanaged state.
- Recoverable Declassification

Protocol Standards

- IEEE 802.3 10Mbps 10BASE-T (Ethernet)
- IEEE 802.3U 100BASE-TX 100Mbps (Fast Ethernet)
- IEEE 802.3AB 1000BASE-T 1000Mbps (Gigabit Ethernet)
- IEEE 802.1D Spanning Tree Protocol (Bridging)
- IEEE 802.1P LAN Layer 2 QoS/CoS Protocol for Traffic Prioritization
- IEEE 802.1Q Virtual LANs (VLAN) and Trunking
- RFC 2460 IP Protocol Support for IPv4 and IPv6 Addressing

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