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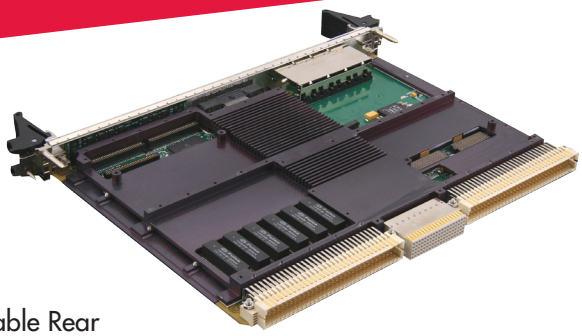




Data Sheet

SVME/DMV-682 FireBlade

VME Managed/Unmanaged Ethernet Switch/Router



Features

- Managed or unmanaged intelligent multi-layer (Layer 2/3) GbE switch, designed for highest port density in a 6U VME64x form factor
- Supports complete range of convection- and conduction-cooled formats (IEEE 1101.1, IEEE 1101.2)
- Data plane designed with Broadcom® StrataXGS® III switch chip with up to 24 wire-speed 10/100/1000 Mbps non-blocking, auto-negotiating ports
- Flexible fast Ethernet, Gigabit Ethernet (GbE) and fiber-optic port combinations
- Two 10 GbE XAUI Interfaces for high speed backbones or switch expansion
- Enhanced security with the PMC-110 CryptoNet™ to provide an ICSA certified statefull firewall that protects against evasive attacks (optional)
- Supports both in-band management through any of the 24 ports, and out-of-band management through a serial EIA-232 interface
- Field-upgradeable through a serial EIA-232 interface or a 10/100Base-TX debug Ethernet interface
- Fully integrated Layer 2 switching, Layer 3 routing, Quality of Service (QoS), IP multicast, security and network management
- Intuitive Command Line Interface (CLI), Web interface, SNMP and Telnet access for easy configuration and network management
- Fast boot architecture for quick power-up operation
- Available Rear Transition Module (RTM) with up to 24 RJ45 ports, one 10/100Base-TX Ethernet and EIA-232 debug port for easy network setup and lab development
- Front panel LED status indicator provides per port link speed (10, 100 or 1000 Mbps) and per-port link activity (receive or transmit)
- Pin compatible with the VME-680 Switchblade product

Overview

Enabling the vision of Network Centric operations and extending the reach of transformational networks, the VME-682 FireBlade is a rugged GbE multi-layer switch that is ideally suited for building Intra-Platform Networks (IPNs) for air, land, and sea vehicles. VME-682 FireBlade enables fast, reliable forwarding (switching and routing) of control and data packets with up to 24 wire-speed 10/100/1000 Mbps interfaces that can be used to connect multiple chassis, cards, or even processors within platform networks. Using star, dual star, mesh and hybrid network topologies, the VME-682 FireBlade provides a flexible cost effective solution that can be used to architect reliable backbone communications infrastructure for current and future networked platforms. Redundancy and fail-over can be implemented using dual star and mesh networks while investment dollars can be retained by implementing hybrid network topologies that co-exist with legacy and/or next generation interconnection strategies. Ready to deploy, the Curtiss-Wright VME-682 FireBlade allows system integrators to reduce development costs and Time-to-Integration (TTI) by simply plugging the VME-682 FireBlade into their 6U VME chassis, connecting the appropriate Ethernet ports, and focusing on the optimal partitioning and segmentation of their application's network.

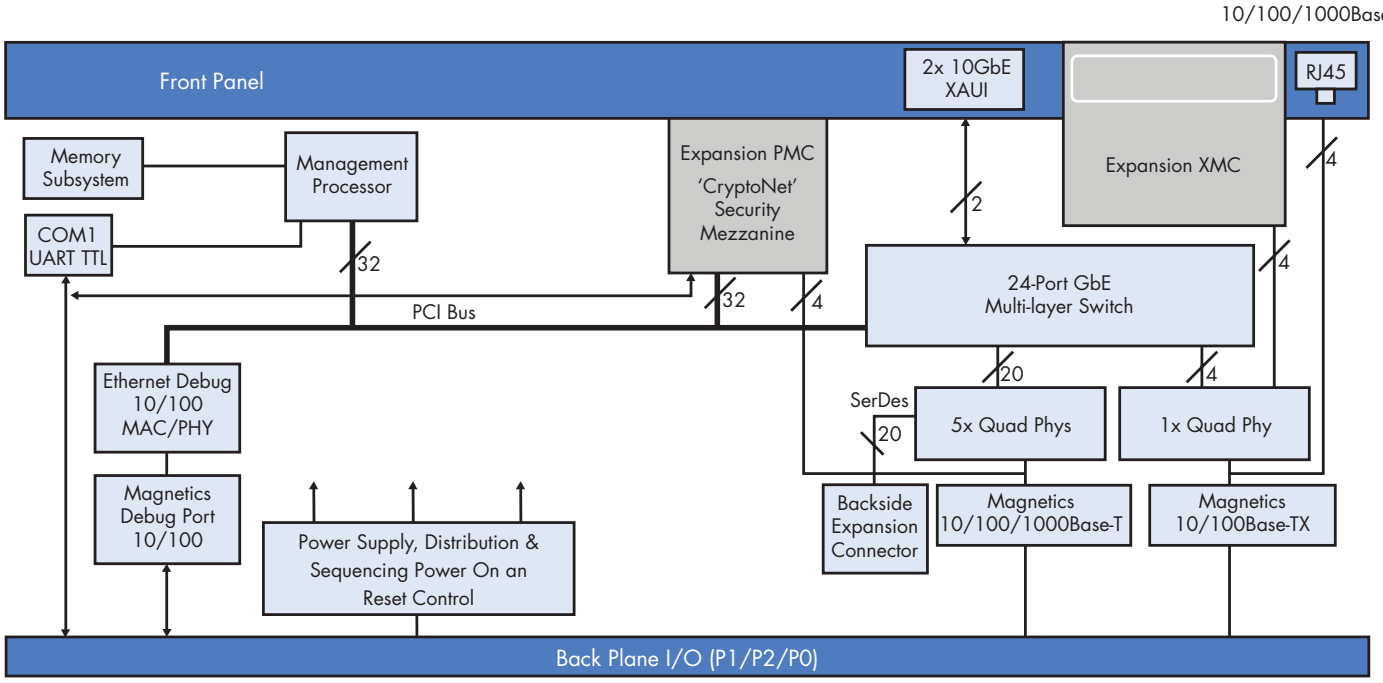
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Figure 1: SVME/DMV-682 Hardware Block Diagram



Wire-Speed Performance

Allowing system integrators to develop and deploy switch-fabric-based architectures today, the VME-682 FireBlade provides a completely integrated and unified management, control, and data plane solution for wire-speed performance of switched GbE traffic. Whether it is a small, medium or large network, the VME-682 provides unique port combinations that scale, with 20- and 24-port versions available. Two additional 10 GbE ports are provided on the front of the card, providing high-speed switch expansion or backbone connections.

The VME-682 FireBlade is comprised of a basecard (Figure 1) with 20x 10/100/1000Base-T GbE interfaces routed to the backplane. Four additional GbE ports are available in three different configurations to suit different system needs. These configurations include: a) 4x 10/100Base-TX routed to the backplane, b) 4x 1000Base-T GbE interfaces routed to the front panel, or c) four optical interfaces available on the front panel through use of optional RazorBlade III expansion modules. Other features of the VME-682 include: optional PMC-110 CryptoNet security module, rear transition module (RTM) for easy RJ45 connectivity in the lab, and front panel LED indicators for port status and activity. Based on the Broadcom StrataXGS III multi-layer switch, the VME-682 FireBlade data plane is capable of providing up to 24 10/100/1000 Mbps Ethernet ports with 64 million packets/second (line rate) of aggregate switching capacity. The key features at the core of each Broadcom StrataXGS III that facilitate low latency wire-speed performance include 1 MB of high speed fully integrated on-chip packet buffer memory, fast filter processors (FFP) per port, and advanced packet flow control capability per port. The 10 GbE XAUI ports can be used for higher port count solutions through switch to switch expansion, or can be used simply as 10 GbE uplink/backbone ports used to connect boxes or networks.



Basecards with Flexible Expansion Capability

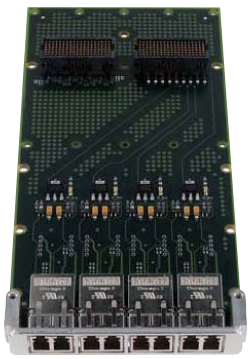
The VME-682 FireBlade was designed from the ground up to maximize the number of GbE channels within a single VME64x chassis while keeping port combination flexibility in mind. The base card will support various port combinations as listed in the table below.

Table 1: VME-682 FireBlade Port Combinations

Total Port Count	Basecard GbE (rear)	Additional Basecard GbE (front)	Additional Basecard Fast Ethernet (rear)	RIII Fiber-optic-SX (front)	XAUI 10 GbE (front)
20	20	-	-	-	-
22	20	-	-	-	2
24	20	4	-	-	-
24	20	-	4	-	-
24	20	-	-	4	-
26	20	-	-	4	2
Routing	P2 & P0	Front Panel	P1	Front Panel	Front Panel

All 20 primary GbE ports of the VME-682 are routed to the backplane (rear panel I/O) over P2 and P0 connectors. Each copper GbE interface is fed through integrated Quad BCM5464 PHY transceivers that are compliant to IEEE 802.3i (10Base-T) 802.3u (100Base-TX), and 802.3ab (1000Base-T) standards. The copper transceivers support MDI/MDX cross over which has the capability of ensuring correct interface operation in the chance that Rx and Tx wiring is crossed. Additionally, Semtech SLVU28-8 transient voltage suppressors are used on all GbE interfaces to protect against transients caused by electro static discharge (ESD), cable discharge events (CDE), lightning and other induced voltage surges.

Figure 2: RazorBlade III provides four 1 GbE Fiber-optic 1000Base-SX interfaces and extends the VME-682 FireBlade to a full 24 GbE ports within a single VME slot.



The 20-port version of the VME-682 FireBlade can be extended to 24-ports with either an optional fiber-optic RazorBlade III Port Expansion Module (which is illustrated in Tables 1 and 2), or additional 10/100/1000Base-T Ethernet interfaces integrated right onto the basecard.

RazorBlade III extends the VME-682 FireBlade with four optical fiber SX interfaces out the front (as seen in Figure 2). Using the Stratos Lightwave LTK-ST11H transceivers, the IEEE 802.3z 1000Base-SX standard is fully supported.

Table 2: RazorBlade III

Item	RazorBlade III
Card Format	XMC
Transceiver	LTK-ST11H*
Interface Type	1000Base-SX
Optical Wavelength	850nm
Optical Transmission	VCSEL
Optical Fiber Type	Multimode
Connection Interface	Duplex LC (front)
Distance	Up to 500 m

Advanced Security

The VME-682 FireBlade can also act as a Unified Threat Management (UTM) router that is capable of strong perimeter defense through an ICSA certified firewall. This is achieved with the PMC-110 CryptoNet. This optional security PMC module provides a statefull firewall that can protect against multiple evasive attacks. Other security features include:

- Stateful firewall (ICSA certified)
- Access control list (ACL) filtering
- Network Address Translation (NAT)
- Encryption/Decryption/Authentication
- Basic key generation/management
- Enables VPN with secure tunneling (IPSec/L2TP)

The PMC-110 CryptoNet connects to the StrataXGS III multilayer switch and can be managed through a serial EIA-232 port.



Managed vs. Unmanaged Switches

Both managed and unmanaged versions of the VME-682 FireBlade are available. The unmanaged version is a cost effective option that functions only as a L2 switch with minimal software and fast boot time. The managed version is a L2/L3 router with complete managed L2/L3 software, Quality of Service (QoS), IP multicasting, and basic security. Management interfaces include CLI, SNMP, and web for easy configuration and network management. (Please refer to Table 3 for Management Interfaces and Connection Strategies.)

Complete Integrated Software Solution

Managed versions of the VME-682 FireBlade provide extensive pre-integrated software that runs on its processor. Major software components include the full suite of Layer 2/3 software protocols required for intelligent switching and routing of IP packets (Figure 4 and Figure 5). Curtiss-Wright also provides extra software features such as declassification, and Built-in Tests (BIT). BIT tests include Power BIT (PBIT), Continuous BIT (CBIT), and Initiated BIT (IBIT). Declassification is a utility that erases the non-essential contents in the Flash File System. This process deletes the routing tables, filters and purges the switch of Ethernet packets and restores default configuration files from flash. This provides an extra layer of memory protection, and the ability to recover default information in the event of corruption.

Systems Integrators can plug the VME-682 into their VME64x chassis and focus on architecting their network through one of may intuitive management interfaces. (Please refer to Table 3.)

Table 3: Management Interfaces and Connection Strategies

Interface	Connection	Client
CLI	- EIA-232 - Any in-band Ethernet port	Terminal Program Telnet
Web	- Any in-band Ethernet port	Web Browser
Network Management Station (NMS)	- Any in-band Ethernet port	Standard off the shelf NMS Software

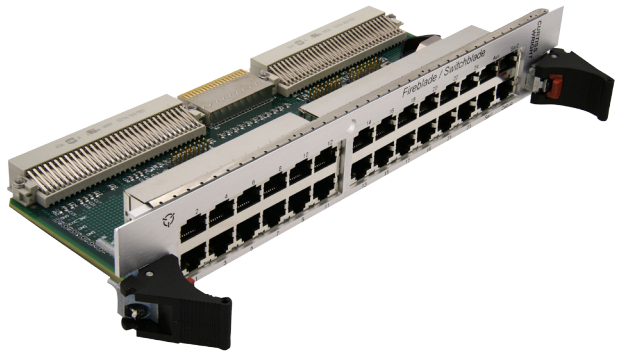
Accessories

For building networks in the lab environment, Curtiss-Wright provides a VME-682 FireBlade RTM that plugs into the backside of the VME64x backplane and provides up to 24-ports of RJ45 connectors (Figure 5). Two versions of the RTM are available, one with a P1 connector (supports full 24 in-band RJ45 ports) and one without a P1 connector (supports 20 in-band RJ45 ports). Both RTMs also provide 1x EIA-232 and 1x 10/100 RJ45 out-of-band debug port, and a reset switch. The EIA-232 port is multiplexed to communicate with either the MPC8245 processor on the basecard or the MPC8555E processor on the Security PMC.

An LED front panel indicator is included in all air-cooled versions of the VME-682 FireBlade cards. For conduction-cooled versions, the LED front panel mezzanine connects to the outside of the thermal frame and is sold separately.

A 10G expansion connector can be used to connect the 2x 10 GbE XAUI ports of one VME-682 to another.

Figure 3: VME-682 FireBlade Accessory (RTM)





Specifications Summary

Table 4: Summary of Hardware Specifications

Specification	Description
Switching Solution	Single Broadcom StrataXGS III
Management/Control Processor	MPC8245
Memory	256 MB SDRAM with ECC, 4 MB boot flash, 32 MB fast boot loader, 96 MB flash File System
Ethernet Ports	Up to 24-ports (see Table 1) 10/100/1000Base-T
Serial Port	1x serial EIA-232 for debug/comm with on-board MPC8245 processor or MPC8555E on security PMC
Debug Port	1x 10/100Base-TX Ethernet port, 1x JTAG connector
Physical Interfaces	Up to 6 BCM5464
Reset Switch	Switch resetable through backplane
LEDS	Status and activity for each port
Power	37W (20-ports) 45W (24-ports) 57W (24-ports + security) 61W (26-port + PMC-110 Security Processor
Form Factor	6U VME64x (160 mm x 233 mm)
Ruggedization	Conduction- or convection-cooled per IEEE 1101.1 and 1101.2

Figure 4: The VME-682 Fire Blade Software Block Diagram of Basecard Running on MPC8245 Processor

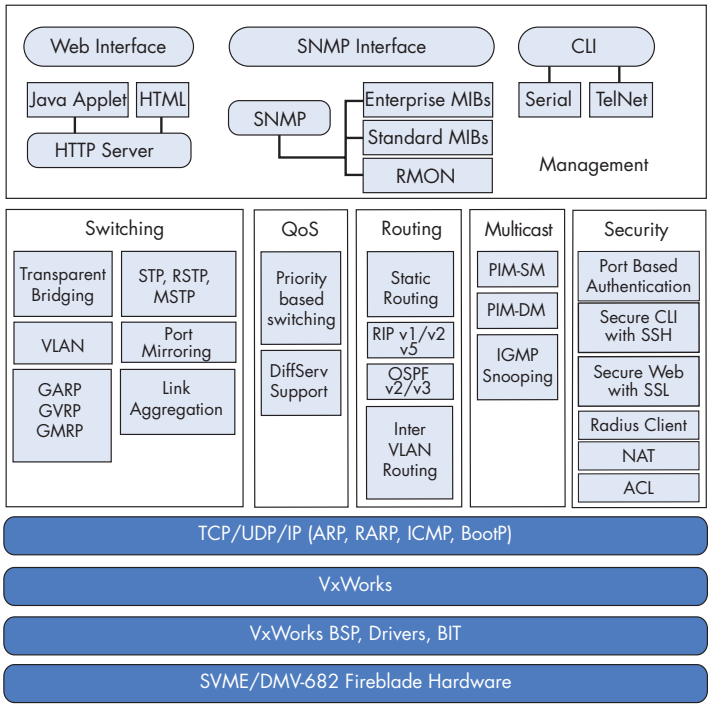


Figure 5: The Enhanced Security Software Block Diagram of PMC-110 CryptoNet Running on MPC8555E Processor

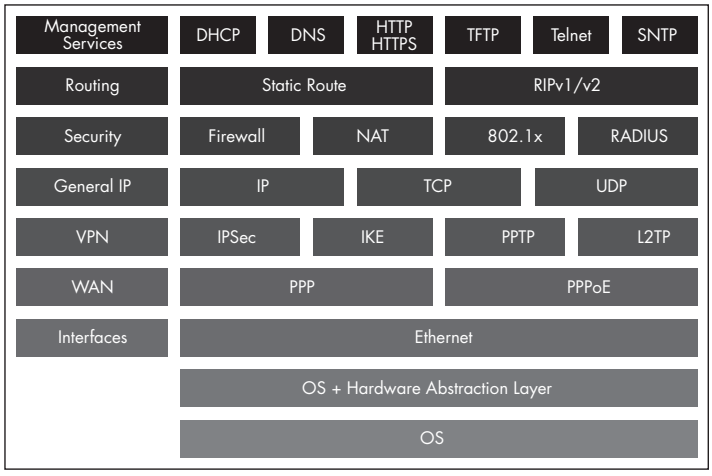






Table 5: Overall Feature Specifications

Feature	Specification
Number of Ports	Up to 24x 10/100/1000Base-T, 4x 10/100Base-TX, 2x 10 GbE XAUI, and optional 1000Base-SX Fiber
Out of Band Ports	• 10/100Base-TX Ethernet interface for software update • EIA-232 Serial Switch Management Interface • Redundant IPMB I2C System Management Interfaces • JTAG support
Form Factor	• Designed specifically for rugged convection and conduction-cooled applications compliant to IEEE 1101.1 and IEEE 1101.2 • 6U VME64x
Throughput	64 million packets/second aggregate switching capacity (24 port version)
Capacity	• Packet Buffer 0.75 MB pool • Support for Jumbo packets up to 9 KB • Up to 8K Layer 2 MAC addresses • Up to 1K Layer 3 IPv6 routes • 4K Virtual LANs supported • 1K Layer 2 Multicast groups • Content Aware Processor
Layer 2 Features	• Loop free, Transparent Bridging • Rapid Spanning Tree Protocol (RSTP) • Multiple Spanning Tree Protocol (MSTP) • VLAN Routing and Support • LAN information passing via GARP • VLAN registration passing via GVRP • Propagation of Multicast registration via GMRP • Forwarding Multicast traffic using IGMP Snooping • Increased Bandwidth and load sharing with Link Aggregation • Port Mirroring • Rate Limiting on each port

Feature	Specification
Layer 3 Features	• Unicast routing protocols like RIP, BGP & OSPF • Inter VLAN routing • Quality of Service QoS, in the form of Differential services • Supports both: – Differential Services Code Point DSCP mapping – Per Hop behavior • Multicast route computation using PIM and DVMRP – SM - sparse mode – DM - dense mode • Redundancy and Load Sharing through VRRP
General Features	• Support for DHCP Server / BOOTP server • Switch Configuration Save and Restore • Log file download via TFTP • Management of switch-through – SNMP – WebNM – CLI • Secure management interfaces through secure http (SSL) and secure shell (SSH) • RMON System probe for groups: 1 (Statistics), 2 (History), 3 (Alarm), and 9 (Events) • Power On Built-in Self Test





Table 6: Summary of Software Specifications*

Feature	Standard
MIB Support	
MIB II	RFC 1213
MIB II for SNMPv2c	RFC 1907, 3418
SNMP Community MIB	RFC 3548
SNMP Message Processing and Dispatching MIB	RFC 3412
SNMP Notification MIB	RFC 3413
SNMP Target MIB	RFC 3413
SNMP User-Based Security Model MIB	RFC 3414
SNMP View Based Access Control MIB	RFC 3415
Interface group MIB	RFC 2233
Bridge MIB	RFC 1493
MIB for Ethernet-like interfaces (requires support in hardware)	RFC 2665
VLAN MIB	RFC 2674
Spanning Tree Protocol MIB	RFC 1493
Rapid STP MIB	Draft/Prop MIB
Multiple STP MIB	Prop MIB
Link Aggregation MIB	IEEE 802.3ad, additional Prop MIB
Port-based Network Authentication Control MIB	IEEE 802.1X
IPv4 MIB	RFC 2011, 2013, 2096, Prop MIB
IGMP MIB	RFC 2933
DHCP	Prop MIB
RIP v1/v2 MIB	RFC 1723, 1724, 2453, Prop MIB
Radius Client MIB	RFC 2618
OSPFv2 MIB	RFC 1850, Prop MIB
PIM MIB	RFC 2934, Prop MIB
BGPv4 MIB	RFC 1657, Prop MIB
DVMRP MIB	Prop MIB
VRRP MIB	RFC 2787
Tunnel MIB	Prop MIB
IPv6 MIB	RFC 2465, Prop MIB
MLD MIB	RFC 3019, Prop MIB
RIPv6 MIB	Prop MIB
OSPFV3	Draft, Prop MIB

Feature	Standard
Management & Administration	
SNMP v1/v2c/v3 (Both IPv4 and IPv6 based)	RFC 1155, 1157, 1212, 1213, 1215, 1905, 2089, 2578, 3411, 3412, 3413, 3414, 3415, 3416, 3417 (partial), 3584
CLI (Telnet and console) (both IPv4 and IPv6 based)	-
CLI command completion (using Tab)	-
Context Sensitive Help in CLI	-
Multi-session telnet server	-
Web UI (embedded HTTP server) (both IPv4 and IPv6 based)	RFC 1945
Multiple levels of user privileges (CLI And WebUI)	-
TLS Protocol	RFC 2246
SSL Protocol Version 3.0	RFC 2246
SSH Protocol Architecture	Draft
SSH Transport Layer Protocol	Draft
SSH Authentication Protocol	Draft
SSH Connection Protocol	Draft
MIB save/restore using FLASH	-
MIB save/restore through TFTP	-
Trace route logging	-
Log file upload to remote system	-
IP authorized managers	-
Enterprise OID support	-
Chassis Management	-
Power over Ethernet support	IEEE 802.1af
Statistics	
RMON (1, 2, 3 & 9 groups)	IEEE 2819
Port Mirroring	-
Other	
Broadcast Storm Control	-
Stacking Support	-

*Note: Not all RFCs may be listed here. Please contact your local Sales Representative for complete RFC information.



Check with your local Curtiss-Wright representative for availability of specific part numbers.

SVME/DMV - 682 - ABCD - EFG (part numbering for the Switch)

EFG = Software Options
- U5: Unmanaged
- M5: Managed
- M5S: Managed + Security

CD = Number of Ports
- 20: 20 GbE ports
- 24: 20 GbE ports + 4 FE/GE/FO
- 26: 24 GbE ports + 2 10 Gbe ports

B = Type of Port Expansion
- 0: Less than 24-ports
- 1: 4 FE – Fast Ethernet (out back)
- 2: 4 GE – Gigabit Ethernet (out front)
- 3: 4 FO – SX Fiber-optic
- 5: 24 FO – SX Fiber-optic
- 6: 2 10G – XAUI Optic

A = Ruggedization Level
- 0: 0 to 50°C
- 1: -40 to 71°C
- 2: -40 to 85°C
- 4: Custom environment

Model number
- 682

Cooling method
- SVME: Air-cooled (AC)
- DMV: Conduction-cooled (CC)

RTM – 682 – 002X (part numbering for the RTM accessory)
X = Number of Ports
0: 20 RJ45 ports (no P1)
4: 24 RJ45 ports

LED – 682 – 0024 (part number for LED plate accessory – required only for conduction cooled versions)

CBL – 682 – 0000 (part number for 10G expansion connector)

Warranty

This product has a one year warranty.

Contact Information

To find your appropriate sales representative:

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Email: ds@curtisswright.com

Technical Support

For technical support:

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