

SmartSwitch 9000
9M426-02
User's Guide

9032531-01

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The Complete Networking Solution™

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Application of Council Directive(s): **89/336/EEC
73/23/EEC**

Manufacturer's Name: **Cabletron Systems, Inc.**

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Conformance to Directive(s)/Product Standards: **EC Directive 89/336/EEC
EC Directive 73/23/EEC
EN 55022
EN 50082-1
EN 60950**

Equipment Type/Environment: **Networking Equipment, for use in a
Commercial or Light
Industrial Environment.**

We the undersigned, hereby declare, under our sole responsibility, that the equipment packaged with this notice conforms to the above directives.

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Introduction

The 9M426-02 SmartSwitch Module shown in Figure 1-1, is a three port switch module with two front panel HSIM interfaces and one INB-2 backplane interface. With the proper HSIM, this module may be used as an ATM uplink for the SmartSwitch 9000 chassis.

Features

Processor

The 9M426-02 is equipped with an advanced Intel i960 microprocessor. This microprocessor provides a platform for all management functions within a scalable RISC-based architecture.

Packet Switch Engine

The 9M426-02 module incorporates the SmartSwitch ASIC, a collection of custom ASICs designed specifically for high speed switching. The SmartSwitch ASIC bus is 64 bits wide with a bandwidth of 320 Mbps. Since all frame translation, address lookups, and forwarding decisions are performed in hardware, the 9M426-02 can obtain a throughput performance of greater than 750K pps.

Management

The 9M426-02 module supports SNMP for local and remote management. Local management is provided through the RS-232 Com ports on the SmartSwitch 9000 Environmental Module using a standard VT-220 terminal or emulator. Remote management is possible through Cabletron's SPECTRUM or any SNMP compliant management tool as well as telnetting to the module. Management features including module MAC placement, front panel/FNB configuration, and SMT statistics. Switching statistics on both HSIM interfaces provide frames filtered, frames forwarded, and all Spanning Tree Protocol parameters. The 9M426-02 module supports the IETF MIB II (RFC-1213), IETF BRIDGE MIB (RFC-1493), and a host of Cabletron enterprise MIBs. In addition, the front panel provides LEDs for transmit and receive activity.

Connectivity

The 9M426-02 module has one interface to the INB-2 and two front panel HSIM interfaces.

Management Information Base (MIB) Support

For a complete list of supported MIBs, refer to the release notes provided in the 9M426-02 package.

LANVIEW LEDs

The 9M426-02 uses LANVIEW – the Cabletron Systems built-in visual diagnostic and status monitoring system. With LANVIEW LEDs, you can quickly identify the device, port, and physical layer status at a glance.

HSIM Modules

The 9M426-02 module uses standard Cabletron HSIMs. These are not shipped with this unit and may be purchased separately.

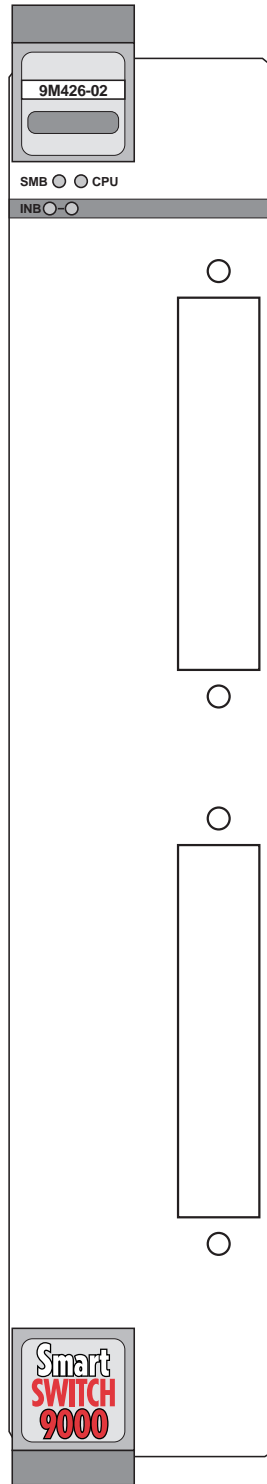


Figure 1-1. The 9M426-02 Module

Related Manuals

The manuals listed below should be used to supplement the procedures and technical data contained in this manual.

SmartSwitch 9000 Installation Guide

SmartSwitch 9000 9C300-1 Environmental Module User's Guide

SmartSwitch 9000 9C214-1 AC Power Supply User's Guide

INB Terminator Modules Installation Guide

SmartSwitch 9000 Module Local Management User's Guide

Getting Help

For additional support related to this device or document, contact the Cabletron Systems Global Call Center:

Phone	(603) 332-9400
Internet mail	support@ctron.com
FTP	ctron.com (134.141.197.25)
Login	<i>anonymous</i>
Password	<i>your email address</i>
BBS	(603) 335-3358
Modem setting	8N1: 8 data bits, No parity, 1 stop bit
For additional information about Cabletron Systems or its products, visit the World Wide Web site: http://www.cabletron.com/ For technical support, select Service and Support .	
To send comments or suggestions concerning this document, contact the Cabletron Systems Technical Writing Department via the following email address: TechWriting@ctron.com <i>Make sure to include the document Part Number in the email message.</i>	

Before calling the Cabletron Systems Global Call Center, have the following information ready:

- Your Cabletron Systems service contract number
- A description of the failure
- A description of any action(s) already taken to resolve the problem (e.g., changing mode switches, rebooting the unit, etc.)
- The serial and revision numbers of all involved Cabletron Systems products in the network
- A description of your network environment (layout, cable type, etc.)
- Network load and frame size at the time of trouble (if known)
- The device history (i.e., have you returned the device before, is this a recurring problem, etc.)
- Any previous Return Material Authorization (RMA) numbers

Installing the SmartSwitch 9000 Module

This module uses HSIMs for the front panel connections. They are not shipped with the module and must be purchased separately. For installation information, refer to the manual supplied with the HSIM.

Unpacking the Module

1. Carefully remove the module from the shipping box. (Save the box and packing materials in the event the module must be reshipped.)
2. Remove the module from the plastic bag. Observe all precautions to prevent damage from Electrostatic Discharge (ESD).
3. Carefully examine the module, checking for damage. If any damage exists, DO NOT install the module. Contact Cabletron Systems Technical Support immediately.

User Accessible Components

Figure 2-1 shows the various components that are accessible to the user. These consist of an eight position DIP switch, replaceable PROMs and sockets for RAM. These will be used for future upgrades. Instructions for installing the components will be supplied with the upgrade kit.

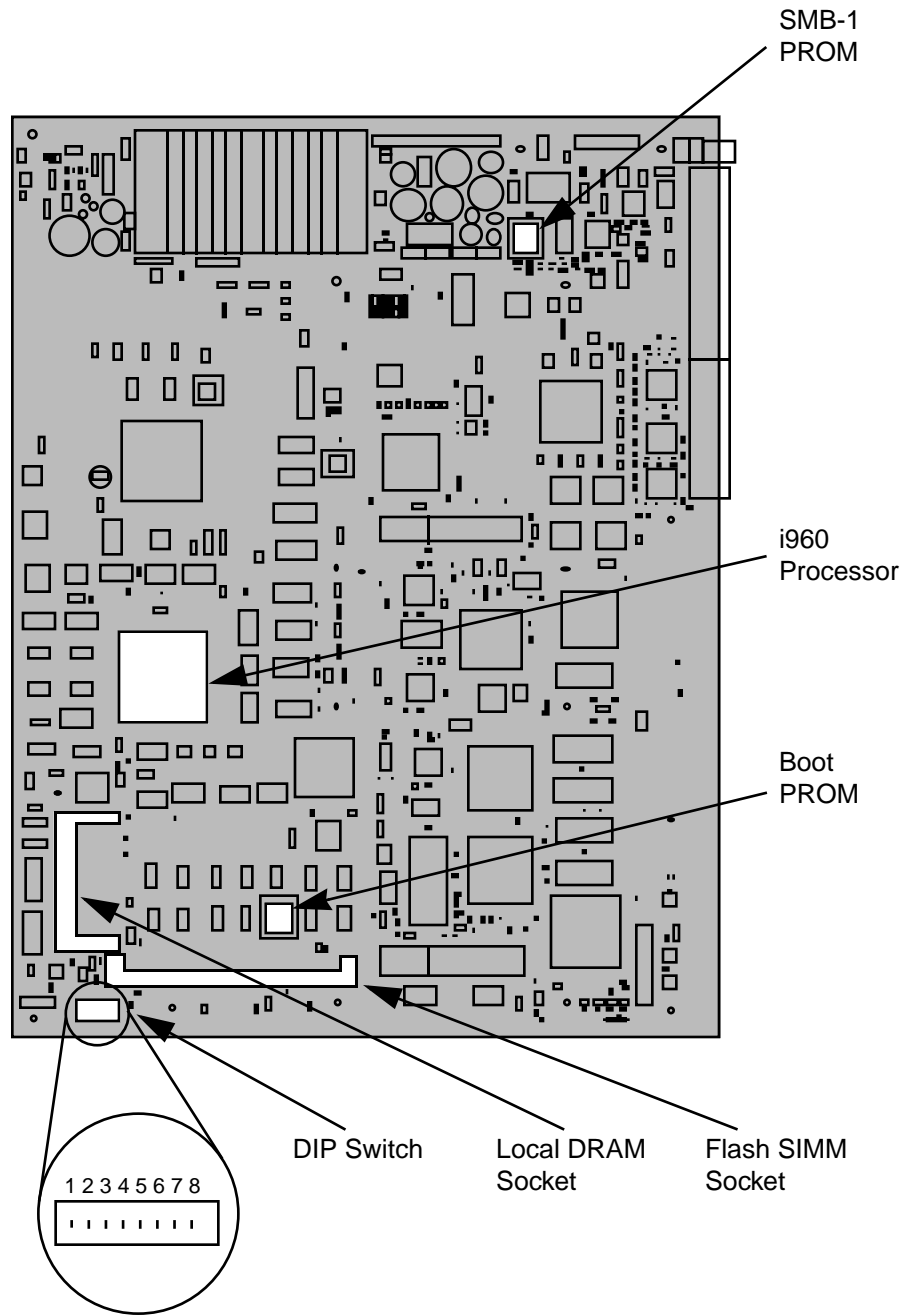


Figure 2-1. User Accessible Components

An eight position DIP switch is located on the module card as shown in Figure 2-1. The function of the switches are listed in Table 2-1.

See the **Cautions** at the end of this table.

Table 2-1. Function of DIP Switch

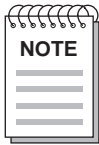
Switch	Function	Description
8	Clear Password ¹	When toggled, this switch clears user-entered passwords stored in NVRAM, and restores the default passwords. Once reset you can use the defaults or enter new passwords.
7	Clear NVRAM ²	The module uses NVRAM to store user entered parameters such as IP addresses, device name, etc. To reset these parameters to the factory defaults, toggle this switch. Once reset you can use the defaults or enter new parameters which are stored in NVRAM when the module is powered down, and remain there until the switch is toggled again.
6	Force BootP Download	Toggling this switch after pulling the board out of the SmartSwitch 9000, clears download information from NVRAM and forces image files to be downloaded from the station connected to the EPIM on the Environmental Module configured to act as that modules' BOOTP server.
5	Reserved	For Factory Use Only
4	Reserved	For Factory Use Only
3	Reserved	For Factory Use Only
2	Reserved	For Factory Use Only
1	Reserved	For Factory Use Only



- Caution:** Do not toggle Switch 8 unless you intend to reset the user configured passwords to their factory default settings.
- Caution:** Do not toggle Switch 7 unless you intend to reset the user parameters to the factory default settings.

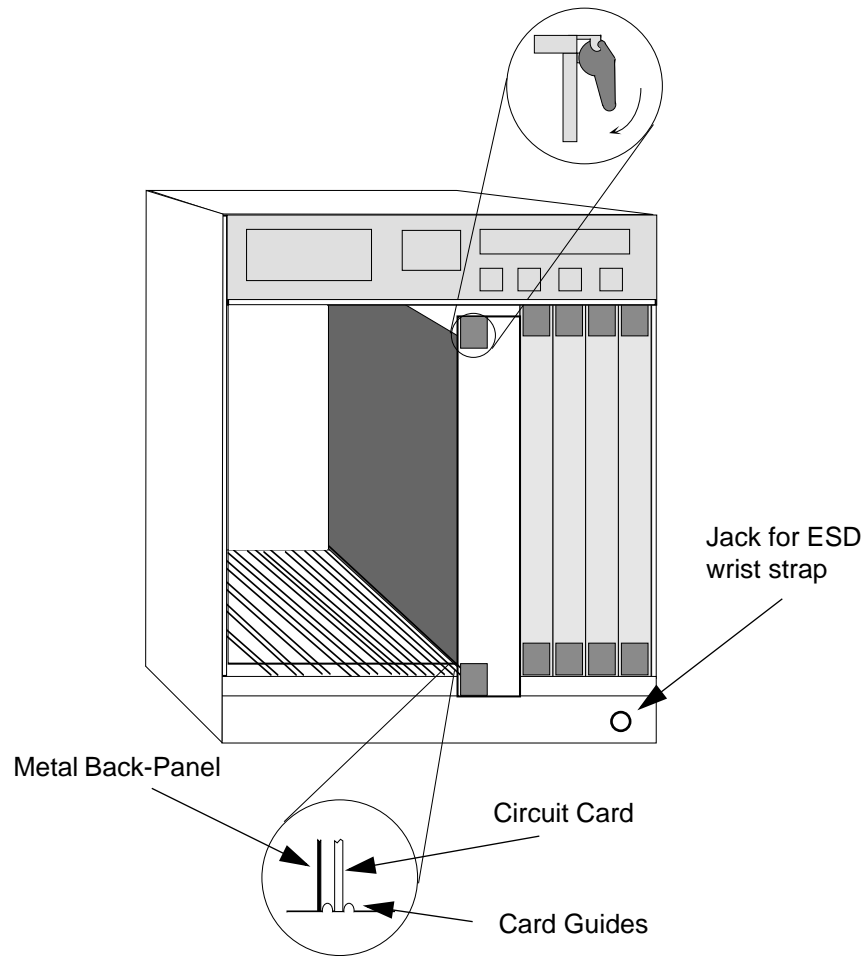
Installing the Module into the SmartSwitch 9000 Chassis

To install the SmartSwitch 9000 module, follow the steps below:



*The INB Terminator Modules must be installed on the rear of the chassis before powering up this module. Refer to the **INB Terminator Modules Installation Guide** for information and installation procedure.*

1. Remove the blank panel covering the two slots in which the module is being installed. All other slots must be covered, if other modules are not being installed, to ensure proper airflow and cooling.
2. Attach one end of the ESD wrist strap packaged with the SmartSwitch 9000 chassis to your wrist. Plug the other end into the ESD Wrist Strap Grounding receptacle in the lower right corner of the SmartSwitch 9000 Chassis shown in Figure 2-2.
3. Grasp the module and slide it into the slots. Make sure that the module's circuit card is between the card guides, as shown in Figure 2-2. Check both the upper and lower tracks the card. Take care that the module slides in straight and engages the backplane connectors properly.
4. Lock down the top and bottom plastic tabs, as shown in Figure 2-2.



Warning:
Ensure that the circuit card is between the card guides.
Lock down the top and bottom plastic tabs at the same time, applying even pressure.

Figure 2-2. Installing the 9M426-02 Module

The Reset Switch

The Reset switch is located under the top plastic tab as shown in Figure 2-3. Use the reset switch to reset the module's processor, shutdown (power down) the module, and/or restart the module.

- To reset the module's i960 processor, press the reset switch twice within three seconds.
- To shutdown the module, press and hold the reset switch for three or more seconds.
- To restart the module, press the reset switch momentarily.

SNMP management may be used to disable this switch to enhance module security.

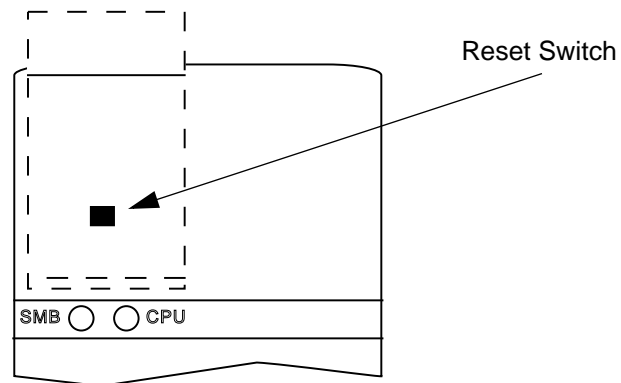


Figure 2-3. The Reset Switch

Operation

The 9M426-02 FDDI SmartSwitch Module is a three port switch module with two front panel HSIM interfaces and one INB-2 backplane interface. This module, with the proper HSIM, may be used for an FDDI, ATM, WAN and other high-speed connectivity for the SmartSwitch 9000 chassis.

System Management Buses

There are two management channels within the SmartSwitch 9000 system: the SMB-1 and the SMB-10. These buses provide out-of-band management and inter-module management communication.

SMB-1 Bus

The SMB-1 is a 1Mbs management bus located within the SmartSwitch 9000. This bus is utilized by all diagnostic controllers in the system including connectivity modules, power supply modules and the environmental module. The SMB-1 transports inter-chassis information between system components, such as power and environmental information, as well as diagnostic messages. Periodic loop-back tests are performed by all modules which share this bus to ensure the validity of SMB-1. In the event a failure is detected on SMB-1, the SMB-10 may be used as an alternate communication channel.

SMB-10 Bus

The SMB-10 is a 10Mbs management bus located within the SmartSwitch 9000 which is also used for inter-chassis communication of modules as well as serving as an out-of-band management channel into the SmartSwitch 9000. The SMB-10 is externalized from the chassis via an optional Ethernet Port Interface Module (EPIM) located on the front of the Environmental Module. Through an EPIM connection, full SNMP management of the SmartSwitch 9000 is available out-of-

band from user data. Modules which share the SMB-10 bus periodically send out loop-back packets to ensure the validity of SMB-10. In the event a fault is detected on the SMB-10, the SMB-1 can be used as an alternate communication channel by the modules.

System Diagnostic Controller

This diagnostic controller is composed of a Z-80 microprocessor and its supporting logic. The diagnostic controller is designed to control the power-up sequencing of modules, monitor the 9M426-02 input and output power parameters, keep watch over the main host processor, as well as monitor the temperature and control the SMB LANVIEW diagnostic LED. Although the diagnostic controller and the main host processor can operate independent of each other if needed, they exchange information about each other's status and overall module condition. The information gathered by the diagnostic controller is available to the network manager via local/remote management and the LCD located on the environment module. The 9M426-02 has been designed so that in the event of a diagnostic controller fault, the 9M426-02 will continue to function.

DC/DC Converter

The DC/DC converter converts the 48 VDC on the system power bus to the necessary operating voltages for its host network services module. The diagnostic controller monitors and controls the operation of the DC/DC converter.

INB Interface

Each module that attaches to the INB has an INB Network Interface Block (NIB). The INB NIB converts canonical frames to fixed length data blocks for transmission onto the INB. For data blocks received from the INB, the INB NIB reassembles the data blocks received from the INB back into canonical frames for transmission to the SmartSwitch ASIC then from the SmartSwitch ASIC to the front panel ports.

SecureFast Switch

The SmartSwitch ASIC is a hardware based switch design that is the key building block of the SmartSwitch 9000. All filtering/forwarding decisions are made in hardware as opposed to software as in traditional switches. This custom hardware allows the SmartSwitch ASIC to process over 150K frames per second. The SmartSwitch ASIC is designed to support up to 64 ports that are shared

between the host processor, the INB backplane, and LAN/WAN interfaces on the front panel of SmartSwitch 9000 modules. The SmartSwitch ASIC can operate in two modes: as a traditional switch, or as a SecureFast Switch (SFS). When operating in traditional switch mode, it makes filtering/forwarding decisions based on Destination Address (DA), with standard IEEE 802.1d learning. When operating in SecureFast Switch mode, all filtering/forwarding decisions are made based on a DA-SA pair and its receive port. These DA-SA pairs with the associated receive port are programmed into the switch using Cabletron's SecureFast Virtual Network Server (SecureFast VNS). This provides the network administrator with the ultimate network security without the performance degradation found when using routers or traditional switches with special filtering capabilities. The SmartSwitch 9000 enterprise switching system can support modules operating in traditional switch mode and SecureFast Switch mode simultaneously providing security when/where needed and ease of configuration where security is not required.

i960 Core

The i960 core provides the SNMP protocol stacks, to support industry standard MIBs. Additionally, Cabletron enterprise extension MIBs are supported for each media type. Advanced management services, such as the Distributed LAN Monitor, telnet and network address to MAC address mapping, are also provided by the i960 core.

The Host engine sends and receives packets via the CPU SmartSwitch ASIC Interface. This allows the traditional switch to perform spanning tree protocol and other traditional switching functions. The SMB Interfaces provide communication to the Host Engine for management functions and communication with other modules in the chassis.

LANVIEW LEDs

The front panel LANVIEW LEDs indicate the status of the module and may be used as an aid in troubleshooting. Shown in Figure 4-1 is the LANVIEW LEDs of the 9M426-02 module.

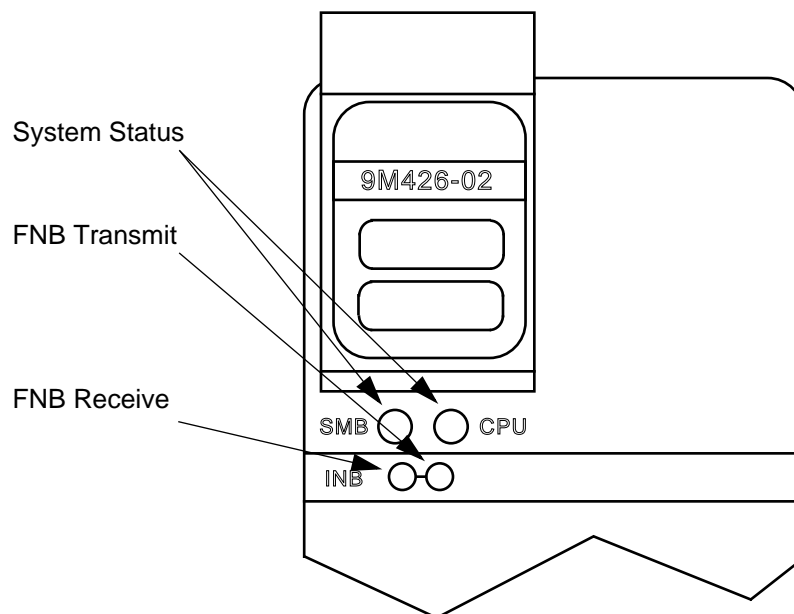


Figure 4-1. The LANVIEW LEDs

The functions of the two System Status LEDs, System Management Bus (SMB) and the CPU, are listed in Table 4-1.

Table 4-1. System Status (SMB and CPU) LEDs

LED Color	State	Description
Green	Functional	Fully operational.
Yellow	Testing	Power-up Testing
Yellow (flashing)	Crippled	Not fully operational (i.e., one bad port).
Yellow/Green	Booting	Blinks yellow and green while booting.
Red	Reset	Normal power-up reset.
Red (Flashing)	Failed	Fatal error has occurred.
Off	Power off	Module powered off.

The functions of the INB receive LED are listed in Table 4-2.

Table 4-2. INB Receive LED

LED Color	State
Green (Flashing)	Link, Port Disabled
Green	Link, Port Enabled, No activity
Yellow (Flashing)	Link, Port Enabled, Activity
Red	Fault
Off	No Link

The functions of the INB transmit LED are listed in Table 4-3.

Table 4-3. INB Transmit LED

LED Color	State
Green (Flashing)	Data Activity
Yellow (Flashing)	Port in Standby State
Red (Flashing)	Collision
Red	Fault
Off	No activity, Port Disabled

Specifications

Technical Specifications

CPU

Intel i960 RISC based microprocessor

Memory

4 Meg. Flash Memory (expandable to 8 Meg.)

16 Meg. DRAM (expandable to 32 Meg.)

Network Interface

Cabletron HSIMs

Safety



It is the responsibility of the person who sells the system to which the module will be a part to ensure that the total system meets allowed limits of conducted and radiated emissions.

This equipment meets the safety requirements of:

- UL 1950
- CSA C22.2 No. 950
- EN 60950
- IEC 950
- EMI Requirements of FCC Part 15 Class A
- EN 55022 Class A
- VCCI Class I

- EMC requirements of:
 - EN 50082-1
 - IEC 801-2 ESD
 - IEC 801-3 Radiated susceptibility
 - IEC 801-4 EFT

Service

MTBF (MHBK-217E)	>200,000 hrs.
MTTR	<0.5 hr.

Physical

Dimensions

35.0 D x 44.0 H x 6.0 W centimeters
(13.8 D x 17.4 H x 2.4 W inches)

Weight

Unit:	2.6 kg. (6lb)
Shipping:	3.6 kg. (8lb)

Environment

Operating Temperature	5 to 40° C
Storage Temperature	-30 to 90° C
Relative Humidity	5% to 95% non-condensing

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