



ASTRO[®] 25 TWO-WAY RADIOS AT A GLANCE SAFETY REDEFINED





YOU ARE READY FOR THE NEXT CALL. WITH APX™, SO IS YOUR RADIO.

In an emergency, other first responders may be a few feet or several miles away. When every second counts, you need a radio you can rely on to get the job done. Since coordinating response and protecting lives is at the heart of every mission, every two-way radio transmission is crucial. Every radio has one job and one job only: to keep you safe.

ASTRO 25 is the leading Project (P25) standards-based system used by over 11,000 agencies around the world. With uncompromising real-world performance and legendary Motorola reliability, the ASTRO 25 solution continues to evolve, adding practical innovations and performance-driven capabilities that enable government agencies to protect the communities they work in and support neighboring communities through interoperability.

The APX P25 two-way radio series redefines safety in communication. APX puts the right device into the hands of the right user. Every feature and function is designed with its users in mind – from the rugged, easy to operate design to the loudest, clearest audio. The result is the ability to keep your people and community safer than ever before.



THE WORLD'S LEADING P25 PLATFORM

IMMEDIATE AND ASSURED VOICE IN AN EMERGENCY

When the emergency is critical, a call for help must get through. Motorola's ASTRO 25 system is a dedicated, communication system optimized to make sure the voice call gets through even during times of peak demand.

ACCESSIBILITY IN CHALLENGING ENVIRONMENTS

Tunnels, high rises and sub-basements create unique challenges for wireless communications, but ASTRO 25 is optimized to handle them. We offer unique solutions to minimize interference in specific environments.

RELIABLE VOICE AND DATA INTEGRATED AS ONE

Expanding your data usage while maintaining mission critical voice, ASTRO 25 provides reliable, always-available communications so multiple agencies can share voice and data communication simultaneously among their teams, deploy resources efficiently, maintain communication security and track personnel.

FUTURE READY PLATFORM

ASTRO 25 and APX radios are flexible and future- ready, adapting to your communications needs and evolving to support new technologies and applications, so you can be ready for the next call the moment it happens.

INTEROPERABILITY ON DEMAND








A variety of our APX radios work across P25 systems and digital and analog networks to achieve true interoperability. Some of these radios, such as the APX 8000/APX 8000XE, APX 7000/7500 offer not only this, but also the means to communicate seamlessly through any multiple frequency bands.



THE MOST COMPLETE LINEUP OF TWO-WAY RADIOS DESIGNED TO KEEP YOU SAFE

Agencies expect their investment to deliver maximum value and performance. From day one, every portable and mobile radio will meet your most demanding performance expectations.

ASTRO 25 PORTABLES

APX 8000		<p>Providing unlimited mobility and seamless WiFi connectivity, the APX 8000 multi-band radio places instant interoperability into the hands of mission-critical first responders.</p> <ul style="list-style-type: none"> • All-Band to enable communications across multiple agencies • WiFi for quicker wireless and codeplug updates • Adaptive Audio Engine to provide better audio experience in any environment
APX 8000XE		<p>The APX 8000XE is redefining mission critical communications by delivering an intrinsically safe radio that combines unlimited mobility, loud audio and secure WiFi connectivity for safety personnel in extreme environments.</p> <ul style="list-style-type: none"> • All-band to enable communications across multiple agencies • WiFi for quicker wireless and codeplug updates • Adaptive Audio Engine to provide better audio experience in any environment • 2m/4h submersion and intrinsically safe standard for extreme conditions
APX 7000L		<p>Delivering simultaneous LMR voice with LTE data, the APX 7000L is an ideal solution for federal government first responders that require the most up-to-date information faster and more efficiently.</p> <ul style="list-style-type: none"> • Provides simultaneous voice and data operation • Support for 4G LTE and FirstNet LTE Public Safety network providing access to nationwide wireless data coverage • Available in 800 MHz (3W) & VHF MHz only
APX 7000XE		<p>Taking safety to the extreme, the APX 7000XE is specifically designed for extreme environments with exaggerated controls and dual-band interoperability in a rugged design.</p> <ul style="list-style-type: none"> • Dual-Band to enable instant, interoperable communications • 2m/2h submersion and intrinsically safe standard for harsh conditions • Largest emergency button in the industry
APX 7000		<p>Efficiently manage mission critical voice and data in any environment across multiple agencies. The APX 7000 dual-band radio can operate in any of 2 bands (700/800, VHF, UHF R1, or UHF R2 MHz frequencies).</p> <ul style="list-style-type: none"> • Dual-Band to enable instant, interoperable communications • Largest Colored Front Display offered on the APX series • Dual 1 Watt Speakers to receive loud and clear audio
APX 6000XE		<p>Designed for gloved users working in extreme environments with exaggerated ergonomics and rugged specifications, the APX 6000XE is ideal for agencies requiring advanced features in a smaller, single-band form factor.</p> <ul style="list-style-type: none"> • Single band with extreme ergonomics and excellent audio • Extreme 1-sided noise reduction designed to locate the talker while canceling out ambient noise • Equipped with a unique speaker grill design that improves water runoff
APX 6000		<p>Delivering outstanding performance in a lightweight form factor, the APX 6000 is built for agencies requiring a single band solution with advanced features.</p> <ul style="list-style-type: none"> • Economical single band solution for federal, and state and local public safety users • Innovative T-grip design gives you a secure grip and better control • Available in 3 models (Top and Front display with full DTMF keypad, Top and Front display with limited keypad and Top Display Only)

ASTRO 25 PORTABLES

APX 4000



Durable and compact with key features in an easy to use design, the APX 4000 is ideal for agencies requiring a budget friendly P25 Phase 2 solution.

- Available in 2 models - Multi-function Single knob and Dedicated Dual Knob for volume and channel controls
- Offered in black housing only

APX 3000



Allowing your teams to operate discreetly without attracting interest or creating a distraction, the APX 3000 P25 TDMA capable covert radio can help you communicate securely while blending into the surroundings.

- Slim, compact radio that operates via accessories
- Optional flexible antenna attaches to the body under clothing
- Radio ships standard with a 3-wire surveillance kit (black or beige)

APX 1000



Engineered with a simplified control top to ensure ease of use, the APX 1000 is ideal for local government and public works users that require a budget friendly P25 Phase 2 solution.

- Meets IP54 Environmental Specifications
- Available in models 1.5, 2 and 3



ASTRO 25 MOBILES

APX 7500



Delivering interoperability on demand, the APX 7500 was designed for first responders who need best-in-class audio and intuitive technology.

- Multi-band capable for better coordination among agencies
- Complete portfolio of 5 control heads and 5 mounting options
- Supports Dual Radio operation and integrates vehicle controls

APX 6500



A complete solution for mission critical responders, the APX 6500 was built for first responders that need advanced features in a single band form factor.

- Single-band capable and supports dual radio operation with APX 7500
- Mid-power model fits into any existing XTL footprint, so you can reuse mounting holes and cables
- RFID label helps you track mobile radio information without uninstalling

ASTRO 25 MOBILES

APX 4500



Durable with basic features, the APX 4500 is ideal for public works, utilities and natural resources customers requiring a rugged P25 mobile solution.

- Compatible with rugged O2 Control Head, designed for extreme environments
- Durable IP56 certified form factor
- Leverage XTL accessories for O5 and O3 control heads to maximize your investment

APX 1500



Compact, easy-to-install dash mount design with basic features, the APX 1500 is ideal for local government and public works users needing a budget-friendly P25 mobile solution.

- Flexible, space-saving design for easier installation
- Compatible with O2 control head for intuitive operation
- Standard APX features (ie. intelligent lighting, dual-mic noise suppression, ADP privacy)



ASTRO 25 CONTROL HEADS

09



Compatible with APX 7500 and 6500 radios. Contains an extra large full color display with intelligent lighting, integrated full size DTMF keypad, large programmable one-touch buttons, dedicated siren controls, integrated response selector, and day/night mode capability.

07



Compatible with APX 7500 and 6500 radios. Contains large color display with intelligent lighting, multiple control head configurations with 02 and 07, motorcycle configuration available, multifunction volume/channel knob, day/night mode, and available with Lighting and Siren Controls or DTMF keypad.

05



Compatible with APX 7500 and 6500 radios. Provides tri-color display with intelligent lighting support, compatible with keypad microphone, can configure up to 4 05 control head configurations, and available in motorcycle configuration.

03



Compatible with APX 7500 and 6500 radios. Contains full integrated DTMF keypad, hand-held control head with intuitive user interface, and large color display with intelligent lighting. Compatible with Siren and Light Interface Module.

02



Compatible with APX 7500, 6500, 4500, and 1500 radios. Provides XE ergonomics controls, multiple control head configuration with 02 and 07, motorcycle availability, multifunction control knob, intelligent lighting, with a built in 7.5 watt speaker.

ASTRO TWO-WAY PORTABLES

SELECT THE RIGHT PRODUCT TO ENSURE SAFETY AND RELIABILITY

Features	APX 8000	APX 8000XE	APX 7000L	APX 7000	APX 7000XE	APX 6000	APX 6000XE	APX 4000	APX 3000	APX 1000
Supported Frequencies										
VHF (136 - 174) Power Level 6W	●	●	●	●	●	●	●	●	●	●
UHFR1 (380 - 470) Power Level 5W	●	●		●	●	●	●	●	●	●
UHFR2 (450 - 520) Power level 6W	●	●		●	●	●	●	●	●	●
700/800 MHz (764 - 870) Power Level 3W	●	●	●	●	●	●	●	●	●	●
900 MHz (896 - 901, 935 - 940) Power Level 2.5W								●		●
Protocols and Systems Supported										
Multi-Band Capable	●	●	●	●	●					
Dynamic Dual Mode (FDMA/TDMA)	●	●	●	●	●	●	●	●	●	●
Analog Conventional	●	●	●	●	●	●	●	●	●	●
P25 Phase I (FDMA) Conventional and Trunking	●	●	●	●	●	●	●	●	●	●
P25 Phase II (TDMA) Trunking	●	●	●	●	●	●	●	●	●	●
Smart Net/Smart Zone Analog and Digital Trunking	●	●	●	●	●	●	●	●	●	●
3600 and 9600	●	●	●	●	●	●	●	900 MHz Only	●	
MDC-1200 Analog Signaling	●	●	●	●	●	●	●	●	●	●
Standard Channels	3000	3000	3000	3000	3000	1000	1000	512	512	512
Encryption Capability										
Encryption Capability (Optional)	AES and DES	AES and DES	AES and DES	AES and DES	AES and DES	AES and DES	AES and DES	AES ONLY	AES and DES	
Multi-key	128	128	128	128	128	64	64	48	48	48
ADP	●	●	●	●	●	●	●	●	●	SW only
Radio Authentication	●	●	●	●	●	●	●	●	●	●
POP 25	●	●	●	●	●	●	●	●	●	●
P25 OTAR	●	●	●	●	●	●	●		●	
Applications										
Rugged	Std IP67, Delta T option	IS & Delta T Std	Std IP67, Delta T option	Std IP67, Delta T option	IS & Delta T Std	Std IP67, Delta T option	IS & Delta T Std	Std IP67, Delta T option	Standard IP67	Standard IP54
Models	1.5, 2.5, 3.5	1.5, 2.5, 3.5	1.5, 3.5	1.5, 3.5	1.5, 3.5	1.5, 2.5, 3.5	1.5, 2.5, 3.5	2 and 3	1	1.5, 2, and 3
Colors	Black, Yellow, Green	Black, Yellow, Green	Black	Black, Yellow, Green	Black, Yellow, Green	Black, Yellow, Green	Black, Yellow, Green	Black	Black	Black
Color Sleeves/Stickers				Sleeves Only Red, Orange, Blue		Sleeves Only Red, Orange, Blue		Metallic Display Stickers only		Metallic Display Stickers only
Mission Critical Wireless (Bluetooth)	●	●	●	●	●	●	●	●	●	
Option Board/Expanded Mem	●	●	●	●	●					
Mandown	●	●	●	●	●	●	●	●	●	
GPS	●	●	●	●	●	●	●	●	●	●
Integrated Voice and Data	●	●	●	●	●	●	●	●	●	●
Enhanced Data	●	●	●	●	●	●	●	●	●	
Voice Announcement	●	●	●	●	●	●	●	●	●	●

ASTRO TWO-WAY MOBILES

SELECT THE RIGHT PRODUCT TO ENSURE SAFETY AND RELIABILITY

Features	APX 7500	APX 6500	APX 4500	APX 1500
Control Heads				
Control Heads	02, 03, 05, 07, 09	02, 03, 05, 07, 09	02	02
Max. # of Control Heads	4	2	1	1
Rugged (IP Rating)	IP54	IP54	IP56	IP54
Protocols and Systems Supported				
Multi-Band Capable	●			
Dynamic Dual Mode Capable (FDMA/TDMA)	●	●	●	●
Analog Conventional	●	●	●	●
P25 Phase I (FDMA) Conventional and Trunking	●	●	●	●
P25 Phase II (TDMA) Trunking	●	●	●	●
SmartNet/SmartZone Analog and Digital Trunk	●	●	●	●
3600 and 9600	●	●	3600 or 9600	9600 Only
MDC-1200 Analog Signaling	●	●	●	●
Standard Channels	3000	1000	512	512
Mounting Options				
Dash Mount	●	●	●	●
Remote Mount	●	●	●	
Motorcycle	●			
Control Station	●	●	●	●
Console	●			
Encryption Capability				
Encryption Capability (Optional)	AES and DES	AES and DES	AES Only	ADP
Multi-key	128	64	48	
ADP	●	●	●	●
POP 25	●	●	●	●
P25 OTAR	●	●		
Applications				
Integrated Voice and Data	●	●	●	●
Enhanced Data	●	●	●	
Integrated GPS - Outdoor Location	●	●	●	●
Radio Authentication	●	●	●	●
Voice Announcement	●	●	●	●
Dual Radio Capability	●	●		

ADVANCED SOFTWARE FEATURES

DIGITAL TONE SIGNALING – Instantly alerts large groups of on-duty and off-duty responders over their APX radio to reduce response time.

LEX L10 COLLABORATION – Uses the LEX L10 Mission Critical LTE Handheld to remotely manage the zone, channel, volume and monitor signal strength and battery of the APX portable radio using Mission Critical Bluetooth.

WIFI – Quickly update codeplug, firmware and FLASHport features using the high-speed of WiFi 802.11n with WEP, WPA and WPA-2 security, while maintaining voice communications.

INTELLIGENT LIGHTING – Uses color alerts to notify you of the radio mode, potential emergencies or specific events.

RADIO PROFILES – Radios can be configured to adjust audio level, lighting and tones through user selected or automated options. Whether on surveillance or working in bright sunlight, you can customize settings as needed.

EXTREME AUDIO PROFILE – Intelligent 2-microphone noise reduction software and the latest AMBE vocoder dynamically adjusts for changing high noise environments.

TEXT MESSAGING – Offers a freeform or canned messaging solution so you can efficiently and discreetly send and receive messages to and from subscribers or dispatch operators.

UNIFIED CALL LIST – Consolidates all call lists underneath one unified list so you can easily access all information associated with a particular contact.

VOICE ANNOUNCEMENT – Allows you to navigate through channels/talk-groups and zones in the radio while an audible, pre-recorded voice file provides a description of the selected channel or zone.

P25 TDMA CAPABLE – Provides twice the voice capacity, so you can add more users to your system without the need for additional frequencies or infrastructure.

MULTIBAND OPERATION – Multiple frequency bands supported with best-in-class transceiver specifications and performance.

SEAMLESS SCAN – Seamless scanning of multiple protocols including FDMA and TDMA systems and multiple RF bands.

ENHANCED DATA – Utilizing TDMA technology, this feature offers greater capacity and reliability of the slotting mechanism where fewer collisions occur.

SITE SELECTABLE ALERT – Continuous tones sent to alert sites of mining detonation activity, evacuation of sites, or vehicle stops.

ADVANCED HARDWARE FEATURES

GPS LOCATION – Integrated GPS receiver can transmit the outdoor location of an individual or vehicle to map-based location software.

MISSION CRITICAL WIRELESS BLUETOOTH – A unique Bluetooth® solution that provides an encrypted link to high performance accessories and applications to support different mission critical environments. Supports commercial off the shelf (COTS) and personal area network (PAN) devices.

MAN DOWN – Unique accelerometer that senses the physical position of the user to communicate updated information to incident command/dispatch. Contains an audible beach with a unique critical emergency tone that will repeat itself until the emergency is manually deactivated.

RADIO AUTHENTICATION – Providing an extra, secure level of verification every time a radio registers onto a system.

FUTURE READY

MEMORY – Equipped with 64 MB of industrial grade internal memory and a removable memory MicroSD card slot. The removable memory card allows future expandability for growing technology needs.

PROGRAMMING OVER PROJECT 25 – Motorola's POP25 solution allows subscriber radios to be programmed over the air via the ASTRO 25 systems while remaining in the field without interruption.



ASTRO 25 TWO-WAY RADIO APPLICATIONS

Highlighting the most reliable and efficient application solution for ASTRO subscriber radio products to meet each customer's need.

APX™ P25 PERSONNEL ACCOUNTABILITY

Created and designed for fire safety personnel and battalion officers, APX P25 Personnel Accountability is an integrated solution that provides a cohesive report and improves responder safety. A NIMS compliant based solution, APX Accountability allows for better roll call integration, integrated graphical user interface (GUI) and Personnel Accountability Report (PAR) timers based on when agencies arrive on scene and when key events have occurred on scene.

USER-FRIENDLY GUI

Partnering with Systems Definition Inc., we developed a new, streamlined GUI that integrates multiple tasks on a single screen. Now, incident commanders can manage all of their tasks – conducting roll call, monitoring PAR checks and issuing evacuation notifications – from the convenience of one user-friendly screen.

ROLL CALL ALERT

With advanced features such as roll-call accountability, you no longer have to acknowledge your status with a voice-based response. Simply open the roll call window from the laptop at incident command to initiate an accountability roll call. Each responder acknowledges the Incident Commander's request for PAR from their APX series portable radios; they simply press the PTT button to acknowledge. Incident command receives confirmation of who has acknowledged the roll call and a count of those yet to respond. As a result, they not only have better accountability of personnel but the solution significantly reduces cycle time on PAR checks throughout the incident.

MAN DOWN ALERT

An optional, automatic Man Down alert on APX series P25 portable two-way radios adds another valuable level of safety. The on-board accelerometer in the radio monitors an individual's movement and orientation. If a responder is motionless or in a horizontal position for a predetermined amount of time, the APX portable radio will automatically transmit an emergency alert, notifying incident command that the responder is in distress.



APX™ RADIO MANAGEMENT

The APX CPS Management application can program up to 16 radios at one time and track which radios have been successfully programmed, providing a clear view of the entire radio fleet and a codeplug history for each radio.

ACCESS AND SHARE CODEPLUGS

When codeplug updates occur, the radio codeplug database can be stored on a network server allowing remote programmers to access and program radios and share a codeplug template across multiple radios. Changes to codeplug templates can be automatically applied to all affected radios while radio programming jobs can be scheduled ahead of time giving you more flexibility and operational efficiency.

MINIMIZE DOWNTIME

Save time and fuel by programming radios either via a USB port on a local or remote PC, or with Over-the-Air-Programming (OTAP) on a Project 25 system. With USB programming, a Device Programmer application resides on a PC and you can connect up to 16 radios via a USB hub to expedite the programming. To read/write multiple radios through a single computer or USB hub, the radios must be programmed with a unique IP address the first time they are read/written.

No application knowledge or application interaction is necessary by the user to program a radio with the Device Programmer application. The user simply plugs the radio into a USB port and the application automatically reads and writes the updates from the server to the radio.

Radio Management batch programming of APX radios via OTAP can only occur with a Motorola ASTRO® 25 Project 25 system, which has voice priority over data, so a user's call, emergency notifications or critical communications will not be interrupted with OTAP. Should an OTAP session be interrupted with communications, programming will resume after the call without the need to restart, expediting the process.

APX™ BATTERY MANAGEMENT

A radio is only as good as the battery that powers it. So when a battery fails and communication is lost, it impacts every aspect of your organization from serving customers to saving lives. But monitoring and maintaining the status of a large fleet of batteries can be time-consuming, inefficient and potentially overwhelming.

That's why we created our proprietary IMPRES™ Battery Management technology. It saves you the guesswork, complexity and costs of managing hundreds even thousands of radio batteries and chargers wherever they're located, and make it easier for your employees to do their work safely and successfully.

HOW DOES IT WORK?

Our IMPRES Battery Management software automatically collects critical data from IMPRES batteries when they are inserted into an IMPRES charger including battery age, capacity, charge and recondition history, the dates manufactured and put into service. This software analyzes battery data and tells you how "healthy" a battery is and when it needs to be changed, so you can quickly and efficiently determine when to remove a poor-performing battery, purchase a new one or redeploy it to less demanding, users, and even identify missing batteries.

VIEW CURRENT REPORTS OR CREATE CUSTOM ONES

Use existing reports or customize new ones to see the most relevant information for your organization. Data is stored in your database and can be exported to an Excel file or printed. IMPRES Battery Management software records and organizes a variety of data so you can:

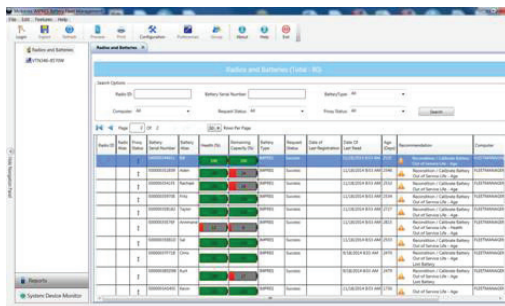
- See a status snapshot of your entire battery fleet
- Evaluate whether batteries are meeting your performance criteria
- Determine when batteries are nearing their end-of-life
- Decide exactly when to buy new batteries
- Get a lost battery report
- Optimize your charger utilization
- Monitor all devices in the system

IMPRES BATTERY MANAGEMENT DELIVERS BATTERY-CRITICAL INFORMATION

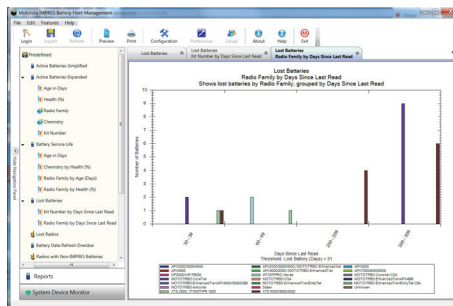
- Tells you when batteries are below an acceptable capacity
- Helps ensure users have enough capacity for a full work shift
- Alerts you to low capacity batteries so you can remove them
- Eliminates unexpected downtime and work interruptions
- Avoids the expense of throwing batteries away prematurely
- Confirms chargers are optimally distributed and used

EACH SOFTWARE LICENSE SUPPORTS:

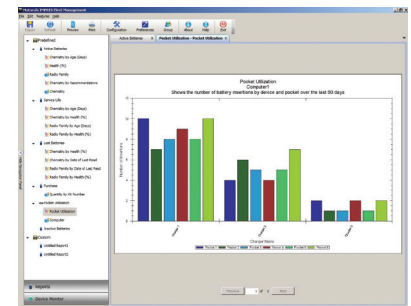
- 1 System Administrator Server
- 19 Remote Clients
- 25 IMPRES Chargers or IMPRES Battery Readers per client
- 25,000 IMPRES Batteries (the total number of batteries for the entire system cannot exceed 25,000)



Active battery report



Lost battery by location



Charger pocket utilization



DIGITAL VEHICULAR REPEATER SYSTEM (DVRS)

Digital Vehicular Repeater Systems (DVRS) from Futurecom is a radio system component that provides repeater capability between portable subscribers and RF base station infrastructure, extending radio coverage of your network.

Installed in the trunk of a car, fire truck, or other vehicles, the DVRS extends your ASTRO 25 network when portable users are outside of your vehicle, inside of a building or in any marginal coverage area. The DVRS also supports fixed mounting and is transportable.



FEATURES AND BENEFITS

- Flexible Coverage
- In-Band/Cross-Band
- Intelligent Activation
- End-to-End Encryption
- Portable ID Pass-Through
- Flash Upgradable
- Power Output 1-10W
- Compatible with XTL 5000, XLT 2500, APX 7500 and APX 6500 Remote Mount
- P25 Digital/Analog Operation
- Available in VHF, UHF, 700 MHz and 800 MHz

Vehicle Radio Extender (VRX) 1000 from Futurecom is an alternative radio system component to the Digital Vehicle Repeater Systems (DVRS) delivering extended ASTRO25 network to portable radios in areas where coverage isn't the most reliable. The compact and durable design allows for ease of installation in patrol cars and utility trucks.

The 3W simplex radio extender is available in 700/800 MHz, VHF and UHF frequencies and compatible with P25 APX 7500, APX6500 and APX 4500 mobile radios.



FEATURES AND BENEFITS

- Flexible Coverage
- IP54 Rated
- Power Output .5-3W
- Compatible with APX 7500, APX 6500, APX 4500 Remote Mount
- P25 Analog Operation
- Simplex Operation
- Available in VHF, UHF, 700/800 MHz
- In-Band/Cross-Band



All specifications subject to change without notice. Motorola Solutions, Inc. 1301 E. Algonquin Road, Schaumburg, Illinois 60196 U.S.A. motorolasolutions.com

MOTOROLA, MOTO, MOTOROLA SOLUTIONS and the Stylized M Logo are trademarks or registered trademarks of Motorola Trademark Holdings, LLC and are used under license. All other trademarks are the property of their respective owners. © 2016 Motorola Solutions, Inc. All rights reserved. 03-2016



POWERFUL AND FLEXIBLE VOIP COMMUNICATIONS

MCD 5000 DESKSET SYSTEM

Expand your communications with VoIP technology. Scalable from small operations to complex control centers and geographically disbursed operations, you can depend on the new modular MCD 5000 Deskset System with VoIP technology for your conventional and trunked communications. Whether used in dispatch environments, back-up sites, special events or call monitoring, you can easily expand communication capabilities throughout your organization using your IP network. This easy-to-deploy solution enables communications across your network

when and where you need it most, increasing safety, awareness and coordination.

MCD 5000 DESKSET

A flexible desktop console, the MCD 5000 Deskset provides digital control for a variety of Motorola two-way radios, and can connect directly to a radio or over an IP network using the MCD 5000 Radio Gateway Unit (RGU).

The MCD 5000 Deskset digital control link emulates the buttons and display of the connected radio and performs all the functions of the radio control head.

And with a large and easy-to-read color LCD screen, intuitive layout and an adjustable viewing angle, the MCD 5000 Deskset is ergonomically designed for both occasional and constant everyday use.

PRODUCT SPEC SHEET
MCD 5000 DESKSET SYSTEM

MCD 5000 RADIO GATEWAY UNIT

Connect the MCD 5000 Deskset to radios over your IP network using the MCD 5000 RGU. The MCD 5000 Deskset allows users to dynamically switch between MCD 5000 RGUs, giving access to additional radios across the network and expanding communications. Each MCD 5000 RGU can connect up to four radios, and each MCD 5000 Deskset can connect to one channel at a time.



The MCD 5000 RGU connects radios to the MCD 5000 Deskset over your IP network

DESKSET AUDIO ACCESSORIES

With flexible communication options, you can use the handset, Push-To-Talk (PTT) switch and built-in condenser microphone, or add the optional headset, footswitch and desk microphone accessories for user convenience.

IP NETWORK

Take full advantage of VoIP technology and deploy the MCD 5000 Deskset when and where you need it on your IP network.

CONFIGURATION AND REPORTING TOOLS

Our configuration tool offers the convenience of remote use from anywhere on the network or local use with an Ethernet connection. And you can provide timely support and save travel time when you remotely access your system to configure the MCD 5000 Deskset and MCD 5000 RGU. You can also remotely run reports and perform queries for information you need to make real-time decisions. Additional supervisor reporting tools allow monitoring of each MCD 5000 Deskset System devices (MCD 5000 Deskset/MCD 5000 RGU) to enhance training and operational efficiencies.

OPERATIONS MANAGEMENT CENTER (OMC) SERVER

An optional main management server for the MCD 5000 Deskset System, the Operations Management Center (OMC) enables system operation, maintenance, provisioning, and control for larger installations, as well as for customers with information assurance (IA) needs.

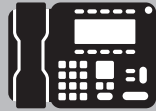
This central repository stores registration for all system users, MCD 5000 Desksets and radio resources, along with system-wide information including alarms, logs and audits. The OMC server runs on the Red Hat® LINUX® operating system.

Providing user-level interface to the OMC, the Administrator Control Panel Client (ACP) PC allows local and remote administration access for system management activities. The ACP runs on Microsoft Windows 7 (64-bit) and is required for systems with an OMC.

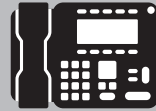
EXAMPLE MCD 5000 DESKSET SYSTEM SHOWING 3 OPERATOR POSITIONS CONTROLLING UP TO 8 RADIOS

The MCD 5000 Deskset system allows multiple desksets to dynamically switch to different MCD 5000 RGUs, giving you access to additional radios for expanded communications. Each MCD 5000 Deskset can connect to one radio at a time.

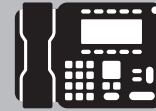
EACH DESKSET CAN SELECT ANY ONE OF THE 8 RADIOS BELOW



MCD 5000 DESKSET



MCD 5000 DESKSET



MCD 5000 DESKSET

IP NETWORK
WAN / LAN

MCD 5000 RGU



EACH MCD 5000 RGU
SUPPORTS UP TO 4 RADIOS

MCD 5000 RGU



TWO-WAY RADIO DEVICES



TWO-WAY RADIO DEVICES



CONVENTIONAL/TRUNKING/DIGITAL/ANALOG



TWO-WAY RADIO DEVICES

The MCD 5000 Deskset lets you control a wide variety of digital radios:

APX™ 7500 Multiband Console

ASTRO® Console (W9):

ASTRO® Spectra™
ASTRO® Spectra Plus™
ASTRO® XTL™ 5000

CDM Series Radios:

CDM 1550™
CDM 1550 LS™
CDM 1550 LS+™

Dimetra TETRA Mobile Radios:

MTM5400
MTM800E

MCS 2000™ Model III Control Station

TRC Radios/Base-Station/Adaptors

4-Wire E&M Radios

PRODUCT SPEC SHEET
MCD 5000 DESKSET

SPECIFICATIONS

MCD 5000 DESKSET

Dimensions	Height: 4.17 in (106 mm) Width: 10.35 in (263 mm) Depth: 8.27 in (210 mm) Weight: 3.97 lbs (1.8 kg)
Environmental	Operating temperature: 0 °C to 50 °C (32 °F to 122 °F) Storage temperature: -40 °C to 80 °C (-40 °F to 176 °F) Humidity: 5% to 95% @ +50° C (122° F), Non-Condensing
Power	Input power: +10.8 to +13.2VDC, (+12 V nominal) Dissipation: 12.5W Max. 37VDC to 57VDC. Powered via POE-PD; meeting 802.3af Standard for Powered Desksets class 0
Audio	The end-to-end distortion is no more than 3% THD The generated audio is no more than -50 dBm of Hum and Noise below the rate audio output The crosstalk between any audio signals is no more than -65 dBm at 0 dBm transmit audio power
Supported Radio Protocols	RS-232 TTL using RJ-45 connector, SB9600, IP, 4W-E&M, TRC
Regulatory-EMC	FCC part 15 class A
Safety	EN60950-1
Green Product	RoHS, WEEE Mark
Certified Standard Compliance Requirements	CE Mark, FCC part 15 A Mark, UL Mark (for P.S. only) US federal government Environmentally Preferable Specification (EPP) Program
Non-certified Standard Compliance Requirements	CSA, UL, MOTOROLA W18 certification, CMM
Vocoders	G.711 and G.729

MCD 5000 DESKSET SYSTEM CAPACITIES

Maximum Number of Radio Resources	512
Maximum Number of MCD 5000 Radio Gateway Units (RGUs)	128
Maximum Number of Radios per MCD 5000 Radio Gateway Unit (RGU)	4
Maximum Number of MCD 5000 Desksets	100
Maximum Number of Groups per MCD 5000 Deskset	20
Maximum Number of Users per MCD 5000 Deskset	8 (Non-OMC System) 1,000 (OMC System)

MCD 5000 RADIO GATEWAY UNIT

Dimensions	Height: 1.65 in (42 mm) Width: 8.58 in (218 mm) Depth: 10.39 in (264 mm) Weight: 5.73 lbs (2.6 kg)
Environmental	Operating temperature: -30 °C to 60 °C (-22 °F to 140 °F) Storage temperature: -40 °C to 80 °C (-40 °F to 176 °F) Humidity: 5% to 95% @ +50° C (122° F), Non-Condensing
Power	Input power:+10.8 to +14VDC, (+12 V nominal) Dissipation: 9W Max. 37VDC to 57VDC. Powered via POE-PD; meeting 802.3af Standard for Powered Desksets class 0
Audio	The end-to-end distortion is no more than 3% THD The generated audio is no more than -50 dBm of Hum and Noise below the rate audio output The crosstalk between any audio signals is no more than -65 dBm at 0 dBm transmit audio power
Supported Radio Protocols	RS-232 TTL, SB9600, IP, 4W-E&M, TRC
Regulatory-EMC	FCC part 15 class A
Safety	EN60950-1
Green Product	RoHS, WEEE Mark
Certified Standard Compliance Requirements	CE Mark, FCC part 15 A Mark, UL Mark (for P.S. only) US federal government Environmentally Preferable Specification (EPP) Program
Non-certified Standard Compliance Requirements	CSA, UL, MOTOROLA W18 certification, CMM
Vocoders	G.711 and G.729

To learn more about how the MCD 5000 Deskset System can help you implement powerful and flexible VoIP communications on your network, contact your Motorola representative or visit motorola.com/dispatch.

Motorola Solutions, Inc. 1301 E. Algonquin Road, Schaumburg, Illinois 60196 U.S.A. motorolasolutions.com

MOTOROLA, MOTO, MOTOROLA SOLUTIONS and the Stylized M Logo are trademarks or registered trademarks of Motorola Trademark Holdings, LLC and are used under license. Microsoft, Windows, Windows Me and Windows Vista are registered trademarks of Microsoft Corporation in the United States and other countries. All other trademarks are the property of their respective owners. © 2012 Motorola Solutions, Inc. All rights reserved. R3-13-2015A





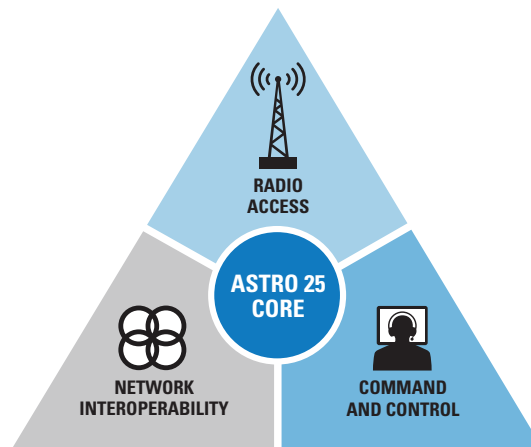
FLEXIBLE, SCALABLE CONFIGURATIONS

ASTRO 25 CORE

Small town or major city... single department or multi-agency... your radio system should fit your needs and your budget. Motorola's dynamic architecture gives you the freedom to deploy a right-sized system today, with the confidence that you can easily add coverage, capacity, and new capabilities as your agency's needs evolve in the future.

AN ADAPTABLE PLATFORM FOR MISSION CRITICAL COMMUNICATIONS

Designed to meet the demands of public safety, ASTRO® 25 systems are dependable under challenging conditions when lives are on the line. ASTRO 25 is the most widely used Project 25 (P25) compliant mission critical solution in the world, giving agencies complete control over their wireless voice and data on an integrated, interoperable and easy to manage network they will not outgrow.



The scalable and virtualized ASTRO 25 core provides an adaptable and affordable platform for mission critical wireless communications. Powerful servers combined with Motorola's proven software are leveraged to reliably and cost-effectively support a variety of critical voice and data services. This flexibility helps government agencies save money and be positioned to take full advantage of technologies that help first responders work with enhanced safety and impact in the field.

ASTRO 25 CORE – FLEXIBLE, SCALABLE, SIZED RIGHT

RADIO ACCESS

- ANALOG CONVENTIONAL
- P25 PHASE 1 DIGITAL CONVENTIONAL OR TRUNKING
- P25 PHASE 2 TDMA TRUNKING
- INTEGRATED DATA
- MUTUAL AID

INTEROPERABILITY

- P25 MULTI-NETWORK CONNECTIVITY VIA ISSI
- MULTI-BAND RADIOS
- MULTI-MODE RADIOS

COMMAND AND CONTROL

- MCC 7500 IP DISPATCH CONSOLE
- MCC 7100 IP DISPATCH CONSOLE

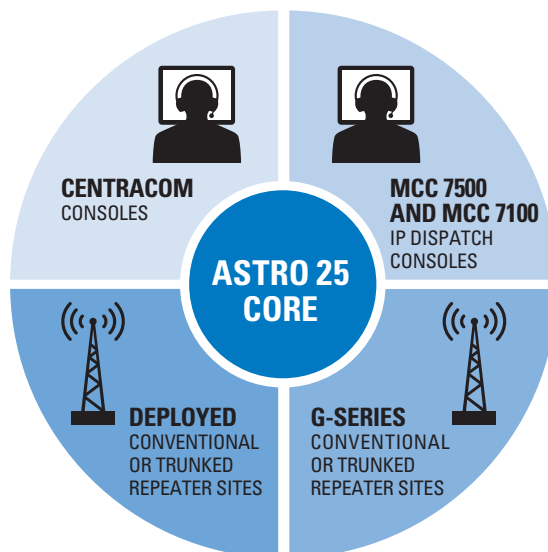
THE ASTRO 25 CORE

Designed for maximum availability and dependability, the core is the central source of network services and control. Depending on the system configuration, ASTRO 25 can support:

- Voice call processing designed for mission critical group communications
- Mobility management to allow users to roam seamlessly throughout the system
- Integrated Data and HPD call processing
- Radio System Management for centralized radio user and system configuration, fault monitoring and control
- Enterprise IT management for centralized management of user accounts to prevent unauthorized access and ensure prompt notification and resolution of events
- Ease of connectivity to other ASTRO® 25 cores for regional and statewide expanded coverage

A VIRTUALIZED CORE MAXIMIZES YOUR INVESTMENT

Motorola leverages the latest virtualization technology to achieve flexibility with core system design. Server consolidation, along with higher utilization, results in a scalable ASTRO 25 core that takes up less physical space and reduces energy consumption. Most importantly, agencies can meet their current functional requirements with the fewest IT resources and be confident their investment can evolve to meet future needs.



CONFIGURATIONS SIZED RIGHT FOR YOUR ORGANIZATION

To simplify system design for new installations, Motorola offers core configurations for conventional, trunked and converged conventional/trunked systems. ASTRO® 25 features scale across these configurations. K1 and K2 cores support single and multi-channel conventional systems. L1 and L2 cores support single zone trunked systems with up to 5 repeater sites or 10 simulcast sub-sites. M1 and M2 configurations are designed to support single zone systems with up to 24 sites. M3 configurations are designed for users with higher capacity needs or multi-zone requirements.

The following site types can be connected to the applicable scalable core configuration:

- Console sites
- Conventional sites
- HPD sites
- Multicast subsites
- Other P25 systems through an ISSI.1 Network Gateway Subsystem
- Repeater sites
- Simulcast subsites
- SmartZone™ sites through a SmartX converter
- System Management sites
- Voted repeater sites
- Voting subsites

Other design considerations in choosing the right solution are the number of channels, talkgroups, individual IDs, console operator positions, and network management application licenses as required.



SCALABLE IN SIZE AND FEATURES

Modular, scalable solution from voice only to full system capability, single site to multi site.

TOTAL COST OF OWNERSHIP

Virtualization means less hardware and improves energy efficiency at the core. A typical M3 core will consume 74% less power, 74% less heat and 67% less space. Additionally, less spares are required to maintain a Master Site.

LIFECYCLE MANAGEMENT

Operating system virtualization technology de-couples system software from hardware ensuring continual improvements in performance and minimizing hardware obsolescence risks.

ASTRO 25 CORE CONFIGURATIONS

ASTRO® 25 systems have multiple core configurations sized right for each user.

K1 CORE CONFIGURATION

P25 compliant single zone conventional configuration without high availability.

The K1 core supports conventional system configurations with up to 25 remote sites, 50 RF channels, and up to 75 IP devices. A K1 core provides a wireline interface to an MCC 7500 or MCC 7100 IP Dispatch Console with up to 20 operator positions. Product level fault management and configuration is available. The configuration utilizes a single GCP 8000 site controller and transport equipment to support call processing. With a K1 core, organizations have the option to add integrated data, expand system capacity or connect to a regional system. The configuration is available in either a single open rack or an enclosed cabinet.

K2 CORE CONFIGURATION

P25 compliant single zone conventional configuration with high availability.

The K2 core supports the same features and system capacities as a K1 Core. A redundant GCP 8000 site controller and additional network transport equipment is added to this configuration to support redundant call processing. Similar to the K1 core, organizations with a K2 core have the option to add integrated data, expand system capacity or connect to a regional system. The configuration is completely contained in either a single open rack or an enclosed cabinet.

L1 CORE CONFIGURATION

P25 compliant single zone trunked configuration without high availability.

The L1 core supports trunked system configurations with up to 5 repeater sites, 10 simulcast subsites, and up to 150 base repeaters. Up to 8 analog or digital conventional mutual aid channels can be used at each site. A single COTS server supports all call processing within the zone. The same server provides Active Directory functionality and can be used for the backup of databases at the core. Centralized system management applications also reside on this platform. The server and the necessary transport equipment are all contained within a single open rack or enclosed cabinet.

L2 CORE CONFIGURATION

P25 compliant single zone trunked configuration with high availability.

The L2 core supports the same features and system capacities as an L1 core. This core configuration adds one additional COTS server for redundant call processing capability and additional network transport equipment. The same server is used for high availability Active Directory functionality. This design is also completely contained within a single open rack or enclosed cabinet.

M1 CORE CONFIGURATION

P25 compliant single zone trunked and/or conventional configuration without high availability.

The M1 core supports trunked, conventional, or converged system configurations with up to 24 remote sites. A single COTS server supports all call processing, data controllers, authentication, security management, back up and restore and network management within the zone. Centralized system management applications also reside on this same platform. The server and necessary network transport equipment are all contained within a single open rack.

M2 CORE CONFIGURATION

P25 compliant single zone trunked and/or conventional configuration with high availability.

Based on the M1 design, this configuration adds one additional COTS server for redundant call processing capability and optional high availability data and redundant network transport equipment. This design is also contained within a single open rack.

M3 CORE CONFIGURATION

P25 compliant single or multi-zone trunked and/or conventional configuration with high capacity and availability.

The M3 core can be utilized in a trunked, conventional, or converged system configuration. Two COTS servers provide centralized system management and redundant call processing capability, redundant data controllers, security management, authentication and network management. All the servers are mounted in a high quality enclosed cabinet. High capacity, dual network transport equipment resides in a separate open rack. Systems with this configuration can initially be installed as single zone systems and later expand to multiple zone systems.



Motorola ASTRO 25 K1 Core with MCC 7500 IP Dispatch Console

SELECTING THE RIGHT CONFIGURATION

Motorola design engineers can assist you in identifying the configuration that best aligns with the goals of your organization. Consider your current and projected capacity requirements and the functions you want your system to support. Because of the inherent flexibility of the architecture and the ability to add new equipment to the core as needed, you can be confident that the configuration you select now will adapt and grow with your needs.

HIGH LEVEL COMPARISON	K1/K2	L1/L2	M1/M2	M3
CAPABILITY	Conventional voice or integrated data	Trunked voice or integrated voice and data	Conventional and trunked voice or integrated voice and data HPD	Conventional and trunked voice or integrated voice and data HPD
CAPACITY	50 channels 75 IP devices	150 channels system Wide 1-5 sites	300 channels per zone 1-24 sites	700 channels per zone 100 sites
FREQUENCY BANDS	700 MHz, 800 MHz, UHF (380 to 520 MHz), VHF (136 to 174 MHz), 900 MHz	700 MHz, 800 MHz, UHF (380 to 520 MHz), VHF (136 to 174 MHz), 900 MHz	700 MHz, 800 MHz, UHF (380 to 520 MHz), VHF (136 to 174 MHz), 900 MHz	700 MHz, 800 MHz, UHF (380 to 520 MHz), VHF (136 to 174 MHz), 900 MHz
TOPOLOGIES SUPPORTED	Repeater, simulcast, multicast, voting Analog 4-wire, mixed mode, v.24, IP digital	Repeater, IP simulcast Digital trunking Analog or digital conventional for Mutual Aid	Repeater, simulcast, multicast, voting Analog 4-wire, mixed mode, v.24, IP digital SmartX	Repeater, simulcast, multicast, voting Analog 4-wire, mixed mode, v.24, IP digital SmartX
DISPATCH SOLUTIONS	CENTRACOM™ Gold Elite MCC 7500 MCC 7100	MCC 7500 MCC 7100	CENTRACOM Gold Elite MCC 7500 MCC 7100	CENTRACOM Gold Elite MCC 7500 MCC 7100
STATIONS SUPPORTED	QUANTAR™, G-series, MTR series, other analog 4-wire conventional stations	G-Series Expandable Site Subsystem configuration	QUANTAR, G-series, MTR series, other analog 4-wire conventional stations	QUANTAR, G-series, MTR series, other analog 4-wire conventional stations
INTEROPERABILITY	N/A	ISSI.1 supported	ISSI 8000 supported on M2	ISSI 8000 supported

CORE COMPONENTS

ASTRO® 25 core configurations utilize powerful hardware combined with Motorola's proven software applications for high level mission critical communication reliability.

- COTS servers host radio call management and system management applications. They are designed to provide the highest possible throughput, capacity, and scalability.
- The GCP 8000 Site Controller utilized in conventional ASTRO 25 K1 and K2 cores, provide mission critical call processing and mobility throughout the system. GCP 8000 Site Controller interfaces via multiple Ethernet LAN switches, and provides access to the packet switched network via the core gateways. A full set of dispatch consoles, archiving interface servers, and conventional gateways are supported.

- Gateway appliances, utilized in all ASTRO 25 cores, control communications between the core and remote sites and perform the routing of audio, data, and system management traffic in the system.
- Optional service hardware provides an access point for the administration of system devices for maintenance purposes.
- A combination Virtual Private Network (VPN) router and firewall protects the system from unauthorized access and allows technicians with the appropriate security credentials and a corresponding VPN client to access the system through an internet connection for troubleshooting and optimization.

Other components can also be added to the core based on user needs for integrated data and HPD, plus additional functional and security services.



ASTRO 25 CORE SERVER HARDWARE SPECIFICATIONS

	HP PROLIANT DL380 SERVER	DOT HILL 3520 DAS	GCP 8000 SITE CONTROLLER
Height	3.44 in (8.73 cm)	3.5 in (8.9 cm)	5.25 in 3 RU (13.3 cm)
Width	17.54 in (44.55 cm)	17.6 in (44.7 cm)	19 in (48.3 cm)
Depth	27.50 in (69.85 cm)	21.3 in (54.0 cm)	18 in (45.7 cm)
Depth (including power supply handles)			
Weight	61.00 lbs	50.6 lbs (23kg)	40 lbs (18 kg)
Operating Temperature	50° to 95°F (10° to 35°C) at sea level with an altitude derating of 1.0°C per every 305 m (1.8°F per every 1000 ft) above sea level to a maximum of 10,000 ft (3050 m), no direct sustained sunlight. Maximum rate of change is 18° F/hr (10°C/hr). The upper limit may be limited by the type and number of options installed. System performance may be reduced if operating with a fan fault or above 86°F (30°C).	41°F to 104°F (5°C to 40°C)	-22° to 140°F (-30° to 60°C)
Non-operating Temperature	-22° to 140°F (-30° to 60°C). Maximum rate of change is 36°F/hr (20°C/hr).	-40°F to 158°F (-40°C to 70°C) Note: Derate 2°C for every km, up to 3000 meters	
Operating Relative Humidity	10 to 90% relative humidity (Rh), 28°C (82.4°F) maximum wet bulb temperature, noncondensing.	10% to 90% RH @ 104°F (40°C), non-condensing	122°F (50°C) 90% humidity
Operating Altitude	10,000 ft (3,050 m). This value may be limited by the type and number of options installed. Maximum allowable altitude change rate is 457 m/min (1500 ft/min).	To 10,000 ft (3,000 m)	Up to 16,400 ft (5,000 m)
Non-operating Altitude	30,000 ft (9144 m). Maximum allowable altitude change rate is 457 m/min (1,500 ft/min).	98,300 ft (30,000 m)	
Operating Input Voltage Range	100-240 V AC	100-240 V AC	90-264 V AC
AC Power	100-240 V AC, 50-60 Hz	100-240 V AC, 50-60 Hz	90-264 V AC, 47 to 63 Hz
Power Consumption	750W @ 120 V 750W @ 240 V	595W @ 120 V 595W @ 240 V	Single controller: 150W @ 100 V Dual controller: 180W @ 100 V
Input Current Drain	7A @ 120 V 3.7A @ 240 V	6.18 A @ 120VAC 3.23 A @ 230 VAC	

For more information about ASTRO® 25 solutions and the scalable core configurations, please contact your Motorola representative or visit motorola.com/ASTRO25.

Motorola Solutions, Inc. 1301 E. Algonquin Road, Schaumburg, Illinois 60196 U.S.A. motorola.com/ASTRO25

MOTOROLA, MOTO, MOTOROLA SOLUTIONS and the Stylized M Logo are trademarks or registered trademarks of Motorola Trademark Holdings, LLC and are used under license. All other trademarks are the property of their respective owners. © 2013 Motorola Solutions, Inc. All rights reserved. R3-26-2009B



SOLUTION BRIEF

P25 TDMA FOR ASTRO 25 TRUNKED SYSTEMS



ASTRO® 25 TRUNKED SYSTEMS

PROJECT 25 TDMA WITH DYNAMIC DUAL MODE

Improving spectrum efficiency is a critical issue facing government organizations. Agencies want to do more with the spectrum that they have assigned. And government spectrum bodies are mandating that equipment become more spectrum efficient. Project 25 has addressed this new requirement with the Phase 2 TDMA standard.

ASTRO 25 trunked systems are now available with Project 25 standards-based TDMA. This capability provides organizations with the flexibility required to maximize current frequency allocations with a standards-based solution while maintaining interoperability with other Project 25 systems.

PROJECT 25 TDMA STANDARD

The TIA-102 suite of standards defines Project 25 (P25) TDMA, adding spectrum-efficient TDMA voice service to the existing P25 FDMA trunked voice and packet data services.

P25 TDMA capable systems use the P25 FDMA control channel for all call requests, which allows systems to support FDMA calls as well as TDMA calls.

ENHANCED INTEROPERABILITY

At the cornerstone of all government communications is the need to interoperate with other users to support emergency response. As the new standard was created, interoperability with existing radios was one of the critical requirements. ASTRO 25 systems and APX subscribers support both P25 FDMA and P25 TDMA for interoperability.

In addition to a manual method for supporting interoperability, which requires the user to manually switch talkgroups on the radio, Motorola delivers seamless interoperability with a software feature called Dynamic Dual Mode that automatically selects what protocol is used based on the resources participating in the call.

SPECTRUM MANDATES

As part of the ongoing efforts to maximize spectrum, governing bodies are mandating that radio systems must move to 6.25e spectrum-efficient methods. For example, by 2017 the FCC will require 6.25 kHz equivalent operations for 700 MHz band plans.

SOLUTION BRIEF

P25 TDMA FOR ASTRO 25 TRUNKED SYSTEMS

INCREASED VOICE CAPACITY

With P25 TDMA, organizations can double their voice capacity within their fixed allocation of frequencies. For example, they can go from having 5 simultaneous voice calls using P25 FDMA trunked operation to the ability to have up to 10 simultaneous voice calls using P25 TDMA trunked operation. ASTRO 25 TDMA provides the additional advantage of increasing the potential voice path capacity of your system by offering up to 30 voice paths at a site.

P25 FDMA TRUNKED SYSTEM WITH 5 VOICE CHANNELS

FDMA CONTROL CHANNEL	P25 FDMA VOICE	P25 FDMA VOICE	P25 FDMA VOICE	P25 FDMA VOICE	P25 FDMA VOICE
12.5 kHz	12.5 kHz	12.5 kHz	12.5 kHz	12.5 kHz	12.5 kHz

EXPAND DATA APPLICATIONS WITH 6 VOICE CHANNELS

ADVANCED FDMA CONTROL CHANNEL	P25 TDMA VOICE	P25 TDMA VOICE	P25 TDMA VOICE	P25 TDMA VOICE	P25 DATA	P25 DATA
12.5 kHz	12.5 kHz	12.5 kHz	12.5 kHz	12.5 kHz	12.5 kHz	12.5 kHz

ASTRO 25 is a robust solution for government agencies. P25 TDMA functionality can be added to ASTRO 25 systems along with P25 FDMA trunking and conventional, 3600 trunking, analog conventional, and integrated data operation for total flexibility.

DYNAMIC DUAL MODE

Dynamic Dual Mode, an optional feature, allows users to interoperate between P25 FDMA and P25 TDMA services. It is part of the call processing application and uses an advanced control channel that dynamically switches call assignments between FDMA and TDMA.

Dynamic Dual Mode is seamless to users and requires no intervention from users or network operators. For example, if a user in an active P25 TDMA talkgroup call, roams onto a P25 FDMA-only site, the system automatically initiates P25 FDMA mode at the next push-to-talk (PTT). Or if an active P25 TDMA talkgroup call is underway at a site and a P25 FDMA-only member of the talkgroup joins (or "affiliates") with the call, the system automatically switches the call to P25 FDMA mode at the next PTT. The FDMA-only user is now included in the call, and the call switched without any user intervention or awareness.

As an added benefit in encrypted systems, the call set-up automatically switches between FDMA and TDMA while maintaining end-to-end encryption. This provides a high level of assurance that the system remains secure from dispatcher to radio user.

IMPROVED SYSTEM OPERATION

Dynamic Dual Mode improves ease of use in ASTRO 25 systems with a mixed fleet of P25 FDMA and P25 TDMA radios.

- Radio users have seamless interoperability regardless of the operations mode.
- Dispatch operators can automatically coordinate between P25 TDMA radio users and P25 FDMA radio users with no need to track or patch users together.
- System administrators do not need to preassign base stations as P25 TDMA or P25 FDMA; the system automatically assigns the appropriate station mode based on the needs of the user.

IMPLEMENTATION CONSIDERATIONS

Starting with ASTRO 25 System Release 7.11, P25 TDMA and Dynamic Dual Mode are available in trunked, simulcast and standalone repeater configurations operating in the VHF, UHF, 700 MHz and 800 MHz bands.

On fielded ASTRO 25 systems, key system components including G-series stations, controllers and comparators, the MCC 7500 IP Dispatch Console, and APX™ radios can be software upgraded to P25 TDMA.

ADDITIONAL CAPACITY FOR APPLICATIONS

Use additional channel capacity afforded by P25 TDMA trunked operation to provide data applications such as OTAR, location service, OTAP and text messaging.



The APX series of trunked radios is available with P25 FDMA and P25 TDMA in the same radio. Dynamic Dual Mode automatically switches between the capabilities.

Motorola Solutions, Inc. 1301 E. Algonquin Road, Schaumburg, Illinois 60196 U.S.A. motorola.com/ASTRO25

MOTOROLA, MOTO, MOTOROLA SOLUTIONS and the Stylized M Logo are trademarks or registered trademarks of Motorola Trademark Holdings, LLC and are used under license. All other trademarks are the property of their respective owners. © 2011 Motorola Solutions, Inc. All rights reserved. RO-26-1021





FLEXIBLE DESIGN – SOFTWARE CONFIGURABLE

G-SERIES SITE EQUIPMENT FOR ASTRO 25 SYSTEMS

Motorola's ASTRO® 25 networks are designed to meet the current and future requirements for Project 25 (P25) solutions. Our G-series portfolio of RF stations, receivers, site controllers and comparators is designed to maximize channel up-time, simplify system technology refresh, enable smaller, more efficient site design and minimize the cost of ownership.

Our G-series equipment is designed so that many upgrades, migrations, and conversions can be completed with only software installations, allowing new features to be quickly added to your existing system with a simple download. You can easily add P25 TDMA and Dynamic Channel Assignment; Information Assurance, Network Security and system release updates. Furthermore, you can migrate from conventional to trunking, 3600 to P25 trunking and from 12.5 kHz P25 FDMA to 6.25e kHz P25 TDMA.

Designed to carry your needs into the future, the G-series hardware platform has built-in functionality and flexibility with an AC/DC - 48VDC power supply and two-branch receive diversity capacity, as well as a linear power amplifier for improved coverage in P25 FDMA Simulcast systems.



GTR 8000 Expandable Site Subsystem

PRODUCT SPEC SHEET

G-SERIES SITE EQUIPMENT FOR ASTRO 25 SYSTEMS

SIMULCAST

Motorola is an industry leader in simulcast system solutions with more mission critical systems fully operational in the field than any other LMR systems provider. The G-series site equipment is designed with simulcast system design and functionality in mind. GTR 8000 Base Radios feature a linear modulation (LSM) that provides industry-leading P25 coverage in VHF, UHF, 700/800 MHz and 900 MHz. LSM enables simulcast systems to be deployed with greater site spacing without sacrificing coverage or capability, resulting in fewer sites to build and maintain. It also allows current systems to deploy IP-based simulcast without the need to add fill-in sites.

SERVICING MADE EASY

G-series site equipment has many features built in to support ease of service. Six basic modules create the entire G-series platform resulting in reduced spare parts inventory. Modules have front access to improve serviceability with hot-swap support to ensure channels are back on the air in minimum possible time. Standard Battery Revert and Charging capability is built into every G-series power supply. Integrating these capability eliminates the need for a large uninterrupted power supply and saves valuable site space.

SYSTEM CONFIGURATIONS

ASTRO 25 CONVENTIONAL

ASTRO® 25 Conventional is a feature-rich conventional system solution on the common-hardware G-series platform. The GTR 8000 Base Radios, GPW 8000 Receivers, and GCM 8000 Comparators can be used together or separately to build everything from a small, single repeater site to a large, countywide or statewide receiver-voting or simulcast conventional system.

The hardware will support IP-only circuit system design while connectivity with consoles can be either IP-based or 4-wire depending on migration plans and system specific operational requirements. GTR 8000 can be configured for either base station or standalone repeater operation. GPW 8000 Receivers and GCM 8000 Comparators improve the in-bound subscriber signal coverage and re-broadcast a quality improved composite signal respectively in simulcast or receiver voting systems.

Sixteen configurable channel personalities enable the station to change channel bandwidth and frequency setting via IP or v.24 commands. General purpose I/O offers 12 logic inputs and 12 logic outputs that can be programmed via the user-friendly GTR 8000 Configuration Service Software (Windows® application) for a highly customized alarm reporting solution and station operation.

A built-in GPS with frequency reference distribution is optionally available on the GTR 8000 Expandable Site Subsystem, which can significantly reduce or eliminate site visits.

Software upgrades are more stable and performed with less downtime in the GTR 8000 base radio. One version of software can run actively while another version is downloading. Using a remote IP connection, the user can decide when to switch between the two versions of software allowing the system manager to prepare for software downloads.

OPTIMIZED NETWORK SECURITY

Information Assurance capabilities are standard with G-series equipment and can be configured or disabled depending on your specific system maintenance and security requirements. G-series products provide the necessary boundary defense capabilities required in mission critical infrastructure today including local user accounts and password controls, user privilege model support (two levels), local and remote access services controls, secure shell services support, SNMPv3, central authentication, general operating system and network services hardening, and device test services controls.



GTR 8000 Site Subsystem

ASTRO 25 Conventional can also be deployed as a system overlay with ASTRO 25 Trunking systems by adding a GTR 8000 Base Radio configured for conventional operation to an existing trunking GTR 8000 Expandable Site Subsystem and sharing the common wide-area network connections as well as RF cavity combiners and receiver multicouplers.

ASTRO 25 DATA

ASTRO 25 trunking and conventional systems can be enabled with P25 Integrated Data functionality so users can leverage their investment in voice infrastructure for basic data needs. Enhanced Data is a software feature in systems with Integrated Data. Enhanced Data optimizes the data channels in an ASTRO 25 system for data applications that require short inbound data messages like location, telemetry and biometrics, and can improve data efficiency by 12x. For example, with Enhanced Data, customers can set quicker location polling rates for a larger number of users on their system, therefore providing better real-time view to resource locations. Based on customer requirements, ASTRO 25 Enhanced Data allows for data to be prioritized over voice, protecting channels for data use and enabling agency shared data channels. If higher data throughput is a requirement, Motorola offers HPD as an overlay on ASTRO 25 trunking systems to provide the same coverage footprint for both systems.

PRODUCT SPEC SHEET

G-SERIES SITE EQUIPMENT FOR ASTRO 25 SYSTEMS

ASTRO 25 TRUNKING

GTR 8000 Base Radios, GPW 8000 Receivers, GCP 8000 Site Controllers, and GCM 8000 Comparators are the building blocks of an ASTRO® 25 trunking system. Site repeater and simulcast system architectures in P25 FDMA and P25 TDMA offer the flexibility to deliver communications that fit user requirements.

G-series equipment is capable of both Project 25 FDMA and Project 25 TDMA in ASTRO 25 trunking systems. Dynamic Channel Assignment is optional for GTR 8000 Base Radios as part of the ASTRO 25 Dynamic Dual Mode system option, and offers seamless interoperability between P25 FDMA and P25 TDMA users, dynamically allocating a call based on available resources without any user intervention or awareness. The P25 TDMA trunking features are offered across the complete trunking portfolio to address the needs of users ranging from single site to statewide radio systems.

ASTRO 25 trunking is a fully scalable solution from as small as a single trunking site to large statewide systems that include a mix of site repeater and simulcast operation as well as additional data and mutual aid overlays. G-series equipment configured for trunking supports both V.24 circuit-based architectures as well as state-of-the-art IP-based system designs. GPW 8000 Receivers and GCM 8000 Comparators improve the in-bound subscriber signal coverage and re-broadcast a quality improved composite signal respectively in simulcast or receiver voting systems.

Motorola offers industry-leading channel resiliency in trunking systems with the GTR 8000 Expandable Site Subsystem. The architecture ensures that no single point of failure can remove more than one channel from service at the RF sites. Plus, the sites are simultaneously simplified through the integration of base station frequency references, Ethernet LAN switches and network gateways.

Motorola also offers a turn-key P25 trunking site with the ASTRO 25 Express system, a GTR 8000 Expandable Site Subsystem designed to operate as a single-site solution. Stations, site controllers, Ethernet switches,

RF combiners and multicouplers are all integrated into a single rack or cabinet. If more capacity is required, additional cabinets can be added to the site.

ANALOG CONVENTIONAL

The GTR 8000 and GPW 8000 products support analog conventional operation in 800 MHz, UHF 380-524 MHz and VHF 136-174 MHz. Analog standalone repeater, receiver voting and simulcast capabilities are available and include a 100 ppb/2 year internal frequency reference for optimal audio performance on 12.5 KHz analog channels.

The G-series equipment provides full support for analog 4-wire circuit connectivity. Over an IP network, technicians can remotely adjust line level settings and tone remote operational modes. 16 configurable analog personalities enable the station to change channel bandwidth and frequency settings via TRC (tone remote control) or WildCard general purpose I/O. The general purpose I/O offers 12 logic inputs and 12 logic outputs, which can be programmed via the user friendly Configuration Service Software (Windows® application) for a highly customized alarm-reporting solution and station operation.

3600 TRUNKING

The GTR 8000 base radio supports 3600 trunking operation, enabling new future-ready base radios to be added to existing SmartZone systems with SmartX. The GTR 8000 is software upgradeable to P25 trunking when the time is right to migrate to P25. 3600 trunking operation is available on both simulcast and intellirepeater systems, in either analog or digital mode.

The GTR 8000 supports WildCard general purpose I/O with 12 logic inputs and 12 logic outputs, which can be programmed via the user friendly Configuration Service Software (Windows® application) for a highly customized alarm-reporting solution and station operation.

Using an IP connection, the GTR 8000 can be monitored, configured and software updated from a convenient, remote location.

G-SERIES SITE EQUIPMENT PRODUCTS

GTR 8000 EXPANDABLE SITE SUBSYSTEM

A space-efficient, single rack design, the GTR 8000 Expandable Site Subsystem (ESS) integrates up to six GTR 8000 Base Radios, redundant GCP 8000 Site Controllers or GPB 8000 Reference Distribution Modules, redundant Ethernet LAN switches, redundant network gateways, transmit combiners, and receiver multicouplers. This enables a highly resilient architecture that provides industry-leading protection against single points of failure

at the RF sites while providing a turn-key site solution that minimizes site cabling connections and installation effort.

It supports ASTRO 25 simulcast and site repeater trunking operation, 3600 simulcast and intellirepeater trunking operation with SmartX, HPD, and P25 digital and analog conventional operation. When ordered as an ASTRO 25 Express System, the GTR 8000 Expandable Site Subsystem is the industry's only turn-key, single-site Project 25 trunking solution.

PRODUCT SPEC SHEET

G-SERIES SITE EQUIPMENT FOR ASTRO 25 SYSTEMS

GTR 8000 BASE RADIO

Designed to support ASTRO 25 trunking simulcast, 3600 trunking simulcast with SmartX, HPD, and P25 and analog conventional operation, GTR 8000 Base Radios offer additional design flexibility for infrastructure sites where equipment may have to be interchanged individually during a technology refresh or when used as a station replacement for QUANTAR™ or STR 3000 stations.

GPW 8000 RECEIVER

In conventional and trunking voting or simulcast voting applications, the GPW 8000 Receiver increases in-bound signal coverage for subscribers. Physical space is optimized at receive-only sites with the GPW 8000 space efficient dual receive module design.

GTR 8000 SITE SUBSYSTEM

This configuration supports HPD with the redundant site controllers and GTR 8000 Base Radio configured for data operation. The specially designed low-loss RF system ensures that HPD signal coverage equals the coverage available from the integrated voice and data solution allowing complete data coverage in an ASTRO® 25 system without the inconvenience of fill-in sites for coverage holes.

GCP 8000 SITE CONTROLLER

The GCP 8000 Site Controller is used at an ASTRO 25 trunking site to assign voice and data channels, manage and report alarms on site resources, provide Ethernet switching capability, and provide a frequency reference to GTR 8000 Base Radios. The frequency reference is provided either via a GPS receiver or an ultra high stability oscillator. The nature of these frequency references eliminates or minimizes site visits for frequency tuning servicing.

GCM 8000 COMPARATOR

The GCM 8000 Comparator supports up to 32 trunking sub-sites and up to 64 conventional sites for simulcast or receiver voting. It performs frame-by-frame voting on multiple received signals and recombines the frames to produce a signal with the best possible audio quality. GPS launch-delay timing ensures seamless broadcast of the voted frames from multiple voice signals into one high-quality transmit signal. GPS launch-delay timing ensures seamless broadcast of data packets from multiple voice signals into one high-quality transmit signal.

GTR 8000 EXPANDABLE SITE SUBSYSTEM (SQM01SUM7054A)

GENERAL PERFORMANCE

	HPD	INTEGRATED VOICE & DATA				
	700/800 MHz	900 MHz	700/800 MHz	UHF: 380-524 MHz	VHF: 136-174 MHz	High Power 800 MHz
Number of Channels	1-5	1-6	1-6	1-6	1-6	2-6
Height with 7.5 ft Rack	90.4 in (230 cm)	90.4 in (230 cm)	90.4 in (230 cm)	90.4 in (230 cm)	90.4 in (230 cm)	90.4 in (230 cm)
Footprint (W x D) with 7.5 ft Rack	20.5 x 23.5 in (52 x 60 cm)	20.5 x 23.5 in (52 x 60 cm)	20.5 x 23.5 in (52 x 60 cm)	20.5 x 23.5 in (52 x 60 cm)	20.5 x 23.5 in (52 x 60 cm)	20.5 x 23.5 in (52 x 60 cm)
Weight (fully configured) with 7.5 ft Rack	520 lbs (235 kg)	575 lbs (260 kg)	520 lbs (235 kg)	UHF 380-435 MHz: 475 lbs (215 kg) UHF 450-512 MHz: 565 lbs (260 kg)	475 lbs (215 kg)	538 lbs (246 kg)
Temperature Range	-22 to 140 °F (-30 to 60°C)	-22 to 140 °F (-30 to 60°C)	-22 to 140 °F (-30 to 60°C)	-22 to 140 °F (-30 to 60°C)	-22 to 140 °F (-30 to 60°C)	-22 to 140 °F (-30 to 60°C)
Power Requirements	AC: 90-264 VAC, 47-63 Hz DC: 43.2-60 VDC	AC: 90-264 VAC, 47-63 Hz DC: 43.2-60 VDC	AC: 90-264 VAC, 47-63 Hz DC: 43.2-60 VDC	AC: 90-264 VAC, 47-63 Hz DC: 43.2-60 VDC	AC: 90-264 VAC, 47-63 Hz DC: 43.2-60 VDC	AC: 90-264 VAC, 47-63 Hz DC: 43.2-60 VDC
Power Consumption (fully configured)						
Power Efficiency Package	2200 W	C4FM: 3700 W LSM: 4100 W	C4FM, FM: 2755 W LSM, H-DQPSK: 2900 W	C4FM, FM: 2325 W LSM, H-DQPSK: 2500 W	C4FM, FM: 2500 W LSM, H-DQPSK: 2100 W	C4FM, FM: 4310 W
Standard	2400 W	C4FM: 3700 W LSM: 4100 W	C4FM, FM: 2900 W LSM, H-DQPSK: 3100 W	C4FM, FM: 2500 W LSM, H-DQPSK: 2700 W	C4FM, FM: 2650 W LSM, H-DQPSK: 2200 W	C4FM, FM: 4580 W
Antenna Connectors	TX: 7/16 Female RX: N Female	TX: 7/16 or N Female RX: N Female	TX: 7/16 Female RX: N Female	TX: 7/16 Female RX: N Female	TX: N Female RX: BNC Female	TX: N Female RX: N Female
Channel Spacing	25 kHz	12.5 kHz	12.5/25 kHz	12.5/25 kHz	12.5/15/25/30 KHz	12.5/25 kHz
Transmit Combiner Spacing	150 kHz	12.5 kHz (Hybrid) 150 kHz (Cavity)	150 kHz	150 kHz (450 - 512 MHz) N/A (380-450, 512-524 MHz)	N/A	N/A
Modulation	TX: 64QAM, 16QAM, QPSK RX: 64QAM, 16QAM, QPSK	TX: C4FM, LSM RX: C4FM	TX: C4FM, LSM, H-DQPSK, FM RX: C4FM, H-CPM, FM	TX: C4FM, LSM, H-DQPSK, FM RX: C4FM, H-CPM, FM	TX: C4FM, LSM, H-DQPSK, FM RX: C4FM, H-CPM, FM	TX: FM, C4FM RX: C4FM, H-CPM, FM
Frequency Stability	GPS synchronized	Repeater Site: 100 ppb/2 yr Simulcast (Multisite): GPS synchronized	Repeater Site: 100 ppb/2 yr Simulcast (Multisite): GPS synchronized	Repeater Site: 100 ppb/2 yr Simulcast (Multisite): GPS synchronized	Repeater Site: 100 ppb/2 yr Simulcast (Multisite): GPS synchronized	Repeater Site: 100 ppb/2 yr Simulcast (Multisite): GPS synchronized

Specifications subject to change without notice.

PRODUCT SPEC SHEET

G-SERIES SITE EQUIPMENT FOR ASTRO 25 SYSTEMS

GTR 8000 EXPANDABLE SITE SUBSYSTEM (SQM01SUM7054A) CONTINUED

TRANSMITTER (CABINET OUTPUT)*

	HPD		INTEGRATED VOICE & DATA			
	700/800 MHz	900 MHz	700/800 MHz	UHF: 380-524 MHz	VHF: 136-174 MHz	High Power 800 MHz
Frequency Range	764-776, 851-870 MHz	935-941 MHz	764-776, 851-870 MHz	380-435, 435-524 MHz	136-174 MHz	851-870 MHz
Average Power output per channel	1-20 W	2-way Hybrid: 1-37 W 3-way Hybrid: 1-22 W 4-way Hybrid: 1-17 W 5-way Hybrid: 1-12 W 6-way Hybrid: 1-10 W	1-40 W	C4FM, FM: 2-110 W (380-450, 512-524 MHz) LSM, H-DQPSK: 2-100 W (380-450, 512-524 MHz) C4FM, FM: 1-33 W (450-512 MHz) LSM, H-DQPSK: 1-30 W (450-512 MHz)	C4FM, FM: 2-100 W LSM, H-DQPSK: 2-60 W	13-134 W
Modulation Fidelity	N/A	5%	5%	5%	5%	5%
EVM	10%	N/A	N/A	N/A	N/A	N/A
Intermodulation Attenuation	80 dB	80 dB	80 dB	80 dB (450-512 MHz) 65 dB (380-450, 512-524 MHz)	55 dB	55 dB
Spurious and Harmonic Emissions Attenuation	90 dB	90 dB	90 dB	90 dB	90 dB	90 dB
Analog FM Hum and Noise						
12.5 kHz	N/A	N/A	45 dB	45 dB	45 dB	
25 kHz	N/A	N/A	50 dB	50 dB	50 dB	
Analog Audio Distortion	N/A	N/A	Less than 2% at 1000 Hz	Less than 2% (1% typical) at 1000 Hz	Less than 2% (1% typical) at 1000 Hz	Less than 2% at 1000 Hz
Emissions Designators	17K7D7D	8K70D1W, 8K10F1E, 8K10F1D, 16K0F3E, 9K80D7W, 11K0F3E	8K70D1W, 8K10F1E, 8K70D7W, 8K10F7W, 8K10F1D, 16K0F3E, 9K80D7W, 11K0F3E	8K70D1W, 8K10F1E, 8K10F7W, 8K10F1D, 8K70D7W, 16K0F3E, 9K80D7W, 11K0F3E	8K70D1W, 8K10F1E, 8K10F7W, 8K10F1D, 8K70D7W, 16K0F3E, 9K80D7W, 11K0F3E	8K10F1E, 8K10F1D, 8K10F1W, 16K0F1D, 16K0F3E, 11K0F3E, 14K0F1D, 14K0F3

RECEIVER (TOP OF CABINET)

	HPD		INTEGRATED VOICE & DATA			
	700/800 MHz	900 MHz	700/800 MHz	UHF: 380-524 MHz	VHF: 136-174 MHz	High Power 800 MHz
Frequency Range	792-825 MHz	896-902 MHz	792-825 MHz	380-435, 435-524 MHz	136-174 MHz	806-825 MHz
Analog Sensitivity 12 dB SINAD	N/A	N/A	12.5 kHz: -123 dBm 25 kHz: -122 dBm	12.5 kHz: -117 dBm (380-450, 512-524 MHz) 12.5 kHz: -121.5 dBm (450-512 MHz) 25 kHz: -116 dBm (380-450, 512-524 MHz) 25 kHz: -120.5 dBm (450-512 MHz)	12.5/15 kHz: -118 dBm 25/30 kHz: -117 dBm	12.5 kHz: -123 dBm 25 kHz: -122 dBm
Digital Sensitivity 1% Bit Error Rate Static (BER)						
64 QAM	-101 dBm	N/A	N/A	N/A	N/A	N/A
16 QAM	-108 dBm	N/A	N/A	N/A	N/A	N/A
QPSK	-115 dBm	N/A	N/A	N/A	N/A	N/A
Digital Sensitivity 5% Bit Error Rate Static (BER)						
C4FM	N/A	-123 dBm	-123 dBm	-117 dBm (380-450, 512-524 MHz) -121.5 dBm (450-512 MHz)	-118 dBm	-123 dBm
H-CPM	N/A	N/A	-121 dBm	-119.5 dBm (450-512 MHz)	-116 dBm	N/A
Intermodulation Rejection	75 dB**	80 dB	80 dB	80 dB	80 dB	80 dB
Digital Adjacent Channel Rejection	50 dB**	60 dB	60 dB	60 dB	60 dB	60 dB

* Includes Transmitter RF Distribution System for 900 MHz, 700/800 MHz, and UHF 450-512 MHz. Does not include Transmitter RF Distribution System for VHF, UHF 380-450, 512-524 MHz and High Power 800 MHz.

** Reference signal is QPSK

Specifications subject to change without notice.

PRODUCT SPEC SHEET

G-SERIES SITE EQUIPMENT FOR ASTRO 25 SYSTEMS

GTR 8000 EXPANDABLE SITE SUBSYSTEM (SQM01SUM7054A) CONTINUED

RECEIVER (TOP OF CABINET)

HPD		INTEGRATED VOICE & DATA				
700/800 MHz		900 MHz	700/800 MHz	UHF: 380-524 MHz	VHF: 136-174 MHz	High Power 800 MHz
Analog Adjacent Channel Rejection (EIA603)						
Analog 12.5 kHz	N/A	N/A	75 dB	75 dB	75 dB	75 dB
Analog Adjacent Channel Rejection (TIA603D)						
Analog 12.5 kHz	N/A	N/A	50 or 60 dB (adjustable)	50 or 60 dB (adjustable)	50 or 60 dB (adjustable)	50 or 60 dB (adjustable)
Analog 25 kHz	N/A	N/A	80 dB	80 dB	80 dB	80 dB
Spurious and Image Response Rejection		100 dB	100 dB	85 dB (380-435 MHz) 100 dB (450-512 MHz)	90 dB	100 dB
Analog Audio Response		N/A	+1, -3 dB from 6 dB per octave de-emphasis; 300-3000 Hz referenced to 1000 Hz at line output	+1, -3 dB from 6 dB per octave de-emphasis; 300-3000 Hz referenced to 1000 Hz at line output	+1, -3 dB from 6 dB per octave de-emphasis; 300-3000 Hz referenced to 1000 Hz at line output	+1, -3 dB from 6 dB per octave de-emphasis; 300-3000 Hz referenced to 1000 Hz at line output
Analog Audio Distortion		N/A	3% or 5% (adjustable)	3% or 5% (adjustable)	3% or 5% (adjustable)	3% or 5% (adjustable)
Analog FM Hum and Noise						
12.5 kHz	N/A	N/A	45 dB	45 dB	45 dB	45 dB
25 kHz	N/A	N/A	50 dB	50 dB	50 dB	50 dB
Intermediate Frequency		1st: 73.35 MHz 2nd: 2.16 MHz	1st: 73.35 MHz 2nd: 2.16 MHz	1st: 73.35 MHz 2nd: 2.16 MHz	1st: 44.85 MHz 2nd: 2.16 MHz	1st: 73.35 MHz 2nd: 2.16 MHz

TRANSMITTER RF DISTRIBUTION SYSTEM

	700/800 MHz Cavity	900 MHz Hybrid	UHF: 450-512 MHz Cavity
Frequency Range	764-776, 851-870 MHz	935-941 MHz	450-512 MHz
Insertion Loss (150 kHz spacing)	3.1 dB typ	2-way loss: 4.4 dB typ 3-way loss: 6.3 dB typ 4-way loss: 7.6 dB typ 5-way loss: 8.8 dB typ 6-way loss: 9.7 dB typ	4.5 dB typ
Tx-Tx Isolation (150 kHz spacing)	32 dB	20 dB	32 dB

RECEIVER RF DISTRIBUTION SYSTEM

	700/800/900 MHz		UHF: 450-512 MHz	
Frequency Range	792-825 MHz or 896-902 MHz		450-512 MHz	
	Typical	Limit	Typical	Limit
Noise Figure	3.8 dB	5 dB	4.6 dB	5.5 dB
Gain	13 dB	-16 to 24 dB adjustable	10 dB	-16 to 24 dB adjustable
3rd Order Output Intercept	21 dBm		19 dBm	
Amplifier Intercept	35 dBm		40 dBm	
Preselector Bandwidth	792-825 MHz or 896-902 MHz		2 or 3.5 MHz	
RF Input Connector Type	N		N	
RF Output Connector Type	BNC		BNC	

* Includes Transmitter RF Distribution System for 900 MHz, 700/800 MHz, and UHF 450-512 MHz. Does not include Transmitter RF Distribution System for VHF, UHF 380-450, 512-524 MHz and High Power 800 MHz.

** Reference signal is QPSK

Specifications subject to change without notice.

PRODUCT SPEC SHEET

G-SERIES SITE EQUIPMENT FOR ASTRO 25 SYSTEMS

GCP 8000 SITE CONTROLLER (T7038A)**GENERAL PERFORMANCE**

	HPD	INTEGRATED VOICE & DATA
Channel Capacity	5	Repeater Site: 28 Simulcast (Multicast): 30
Size (HxWxD)	5.25 x 19 x 18 in (133 x 483 x 457 mm)	5.25 x 19 x 18 in (133 x 483 x 457 mm)
Weight	40 lbs (18 kg)	40 lbs (18 kg)
Temperature Range	-22 to 140 °F (-30 to 60°C)	-22 to 140 °F (-30 to 60°C)
Rack Option	19 in standard rack mountable	19 in standard rack mountable
Frequency Stability	GPS Synchronized	Simulcast (Multisite): External
ELECTRICAL		
Power Requirements	AC: 90-264 VAC, 47-63 Hz DC: 43.2-60 VDC	AC: 90-264 VAC, 47-63 Hz DC: 43.2-60 VDC
Power Consumption	AC: 160 W DC: 80 W	AC: 130 W DC: 60 W

GCM 8000 COMPARATOR (T7321A)**GENERAL PERFORMANCE**

	INTEGRATED VOICE & DATA
Channel Capacity	1 or 2
Size (HxWxD)	5.25 x 19 x 18 in (133 x 483 x 457 mm)
Weight	40 lbs (18 kg)
Temperature Range	-22 to 140 °F (-30 to 60°C)
Rack Option	19 in standard rack mountable
Time Stability	External Reference
ELECTRICAL	
Power Requirements	AC: 90-264 VAC 47-63Hz DC: 43.2-60 VDC
Power Consumption	AC: 1 module 130 W AC: 2 modules 160 W DC: 1 module 60 W DC: 2 modules 80 W

PRODUCT SPEC SHEET

G-SERIES SITE EQUIPMENT FOR ASTRO 25 SYSTEMS

GTR 8000 BASE RADIO (T7039A)

GENERAL PERFORMANCE

	HPD	INTEGRATED VOICE & DATA			
	700/800 MHz	700/800 MHz	UHF: 380-524 MHz	VHF: 136-174 MHz	High Power 800 MHz
Size (HxWxD)	5.25 x 19 x 18 in (133 x 483 x 457 mm)	5.25 x 19 x 18 in (133 x 483 x 457 mm)	5.25 x 19 x 18 in (133 x 483 x 457 mm)	5.25 x 19 x 18 in (133 x 483 x 457 mm)	5.25 x 19 x 18 in (133 x 483 x 457 mm)
Weight	46 lbs (21 kg)	46 lbs (21 kg)	46 lbs (21 kg)	46 lbs (21 kg)	48 lbs (22 kg)
Temperature Range	-22 to 140 °F (-30 to 60°C)	-22 to 140 °F (-30 to 60°C)	-22 to 140 °F (-30 to 60°C)	-22 to 140 °F (-30 to 60°C)	-22 to 140 °F (-30 to 60°C)
Power Requirements	AC: 90-264 VAC, 47-63 Hz DC: 43.2-60 VDC	AC: 90-264 VAC, 47-63 Hz DC: 43.2-60 VDC	AC: 90-264 VAC, 47-63 Hz DC: 43.2-60 VDC	AC: 90-264 VAC, 47-63 Hz DC: 43.2-60 VDC	AC: 90-264 VAC, 47-63 Hz DC: 43.2-60 VDC
Power Consumption Power Efficiency Package	325 W	C4FM, FM: 405 W LSM, H-DQPSK: 425 W	C4FM, FM: 410 W LSM, H-DQPSK: 445 W	C4FM, FM: 405 W LSM, H-DQPSK: 315 W	C4FM, FM: 700 W
Standard	325 W	C4FM, FM: 430W LSM, H-DQPSK: 470 W	C4FM, FM: 435 W LSM, H-DQPSK: 455 W	C4FM, FM: 435 W LSM, H-DQPSK: 345 W	C4FM, FM: 725 W
Antenna Connectors TX	N female	N female	N female	N female	N female
Antenna Connectors RX	BNC female	BNC female N female **	BNC female N female **	BNC female N female **	BNC female N female **
Channel Spacing	25 kHz	12.5/25 kHz	12.5/25 kHz	12.5/15/25/30 kHz	12.5/25 kHz
Modulation	TX: 64QAM, 16QAM, QPSK RX: 64QAM, 16QAM, QPSK	TX: C4FM, LSM, H-DQPSK, FM RX: C4FM, H-CPM, FM	TX: C4FM, LSM, H-DQPSK, FM RX: C4FM, H-CPM, FM	TX: C4FM, LSM, H-DQPSK, FM RX: C4FM, H-CPM, FM	TX: FM, C4FM RX: C4FM, H-CPM, FM
Frequency Stability	External Reference	100 ppb/2 yr or External Reference	100 ppb/2 yr or External Reference	100 ppb/2 yr or External Reference	100 ppb/2 yr or External Reference

TRANSMITTER

	700/800 MHz	700/800 MHz	UHF: 380-435 MHz UHF: 435-524 MHz	VHF: 136-174 MHz	High Power 800 MHz
Frequency Range	764-776, 851-870 MHz	764-776, 851-870 MHz	380-435, 435-524 MHz	136-174 MHz	851-870 MHz
Power Output	2-50 W	2-100 W	C4FM, FM: 2-110 W H-DQPSK, LSM: 2-100 W	C4FM, FM: 2-100 W H-DQPSK, LSM: 2-60 W	15-150W
Electronic Bandwidth	Full Bandwidth	Full Bandwidth	Full Bandwidth	Full Bandwidth	Full Bandwidth
Modulation Fidelity	N/A	5%	5%	5%	5%
EVM	10%	N/A	N/A	N/A	N/A
Intermodulation Attenuation	80 dB	80 dB	65 dB	55 dB	55 dB
Spurious and Harmonic Emissions Attenuation	90 dB	90 dB	90 dB	90 dB	90 dB
Analog FM Hum and Noise 12.5 kHz 25 kHz	N/A N/A	45 dB 50 dB	45 dB 50 dB	45 dB 50 dB	45 dB 50 dB
Analog Audio Distortion	N/A	Less than 2% at 1000 Hz	Less than 2% (1% typical) at 1000 Hz	Less than 2% (1% typical) at 1000 Hz	Less than 2% at 1000 Hz
Emissions Designators	17K7D7D	8K70D1W, 8K10F1E, 8K70D7W, 8K10F7W, 8K10F1D, 16K0F3E, 9K80D7W, 11K0F3E	8K70D1W, 8K10F1E 8K10F7W, 8K10F1D, 8K70D7W, 16K0F3E, 9K80D7W, 11K0F3E	8K70D1W, 8K10F1E 8K10F7W, 8K10F1D, 8K70D7W, 16K0F3E, 9K80D7W, 11K0F3E	8K10F1E, 8K10F1D, 8K10F1W 16K0F1D, 16K0F3E, 11K0F3E 14K0F1D, 14K0F3

RECEIVER

	700/800 MHz	700/800 MHz	UHF: 380-435 MHz UHF: 435-524 MHz	VHF: 136-174 MHz	High Power 800 MHz
Frequency Range	792-825 MHz	792-825 MHz	380-435, 435-524 MHz	136-174 MHz	806-825 MHz
Analog Sensitivity (12 dB SINAD)	N/A	12.5 kHz: -118 dBm 25 kHz: -117 dBm	12.5 kHz: -118 dBm 25 kHz: -117 dBm	12.5 kHz: -119 dBm 25/30 kHz: -118 dBm	12.5 kHz: -118 dBm 25 kHz: -117 dBm
Digital Sensitivity 1% Bit Error Rate Static (BER) 64 QAM 16 QAM QPSK	-98 dBm -104 dBm -111 dBm	N/A N/A N/A	N/A N/A N/A	N/A N/A N/A	N/A N/A N/A
Digital Sensitivity 5% Bit Error Rate Static (BER) C4FM H-CPM	N/A N/A	-118 dBm -116 dBm	-118 dBm -116 dBm	-119 dBm -117 dBm	-118 dBm -116 dBm

* Reference signal is QPSK ** Optional Preselector Specifications subject to change without notice.

GTR 8000 BASE RADIO (T7039A) CONTINUED

RECEIVER

	HPD	INTEGRATED VOICE & DATA			
	700/800 MHz	700/800 MHz	UHF: 380-435 MHz UHF: 435-524 MHz	VHF: 136-174 MHz	High Power 800 MHz
Intermodulation Rejection	75 dB*	85 dB	85 dB	85 dB	85 dB
Digital Adjacent Channel Rejection	50 dB*	60 dB	60 dB	60 dB	60 dB
Analog Adjacent Channel Rejection (EIA603) Analog 12.5 kHz	N/A	75 dB	75 dB	75 dB	75 dB
Analog Adjacent Channel Rejection (TIA603D)					
Analog 12.5 kHz	N/A	50 or 60 dB (adjustable)	50 or 60 dB (adjustable)	50 or 60 dB (adjustable)	50 or 60 dB (adjustable)
Analog 25 kHz	N/A	80 dB	80 dB	80 dB	80 dB
Spurious and Image Response Rejection	85 dB*	85 dB 100 dB**	85 dB 100 dB**	90 dB 95 dB**	85 dB 100 dB**
Analog Audio Response	N/A	+1, -3 dB from 6 dB per octave de-emphasis; 300-3000 Hz referenced to 1000 Hz at line output	+1, -3 dB from 6 dB per octave de-emphasis; 300-3000 Hz referenced to 1000 Hz at line output	+1, -3 dB from 6 dB per octave de-emphasis; 300-3000 Hz referenced to 1000 Hz at line output	+1, -3 dB from 6 dB per octave de-emphasis; 300-3000 Hz referenced to 1000 Hz at line output
Analog Audio Distortion	N/A	3% or 5% (adjustable)	3% or 5% (adjustable)	3% or 5% (adjustable)	3% or 5% (adjustable)
Analog FM Hum and Noise 12.5 kHz					
25 kHz	N/A N/A	45 dB 50 dB	45 dB 50 dB	45 dB 50 dB	45 dB 50 dB
Intermediate Frequency	1st: 73.35 MHz 2nd: 2.16 MHz	1st: 73.35 MHz 2nd: 2.16 MHz	1st: 73.35 MHz 2nd: 2.16 MHz	1st: 44.85 MHz 2nd: 2.16 MHz	1st: 73.35 MHz 2nd: 2.16 MHz

GPW 8000 RECEIVER (T7540A)

GENERAL PERFORMANCE

	INTEGRATED VOICE & DATA					
	700/800 MHz		UHF: 380-435 MHz UHF: 435-524 MHz		VHF: 136-174 MHz	
Size (HxWxD)	5.25 x 19 x 18 in (133 x 483 x 457 mm)		5.25 x 19 x 18 in (133 x 483 x 457 mm)		5.25 x 19 x 18 in (133 x 483 x 457 mm)	
Weight	36 lbs (16 kg)		36 lbs (16 kg)		36 lbs (16 kg)	
Temperature Range	-22 to 140 °F (-30 to 60°C)		-22 to 140 °F (-30 to 60°C)		-22 to 140 °F (-30 to 60°C)	
Power Requirements						
AC	90-264 VAC, 47-63 Hz		90-264 VAC, 47-63 Hz		90-264 VAC, 47-63 Hz	
DC	43.2-60 VDC		43.2-60 VDC		43.2-60 VDC	
Power Consumption	1 Module	2 Module	1 Module	2 Module	1 Module	2 Module
AC – Power Efficiency Package	40 W	65 W	40 W	65 W	40 W	65 W
DC – Power Efficiency Package	30 W	50 W	30 W	50 W	30 W	50 W
AC	80 W	105 W	80 W	105 W	80 W	105 W
DC	50 W	75 W	50 W	75 W	50 W	75 W
Antenna Connectors RX	BNC female N female **		BNC female N female **		BNC female N female **	
Channel Spacing	12.5/25 kHz		12.5/25 kHz		12.5/15/25/30 kHz	
Modulation	C4FM, FM		C4FM, FM		C4FM, FM	
Frequency Stability	Conventional: 100 ppb/2 yr		Conventional: 100 ppb/2 yr		Conventional: 100 ppb/2 yr	

* Reference signal is QPSK ** Optional Preselector

Specifications subject to change without notice.

PRODUCT SPEC SHEET

G-SERIES SITE EQUIPMENT FOR ASTRO 25 SYSTEMS

GPW 8000 RECEIVER (T7540A) CONTINUED**RECEIVER**

INTEGRATED VOICE & DATA - CONVENTIONAL			
	700/800 MHz	UHF: 380-435 MHz UHF: 435-524 MHz	VHF: 136-174 MHz
Frequency Range	792-825 MHz	380-435 MHz, 435-524 MHz	136-174 MHz
Analog Sensitivity 12 dB SINAD	12.5 kHz: -118 dBm 25 kHz: -117 dBm	12.5 kHz: -118 dBm 25 kHz: -117 dBm	12.5/15 kHz: -119 dBm 25/30 kHz: -118 dBm
Digital Sensitivity 5% Bit Error Rate Static (BER)			
C4FM	-118 dBm	-118 dBm	-119 dBm
H-CPM	-116 dBm	-116 dBm	-117 dBm
Intermodulation Rejection	85 dB	85 dB	85 dB
Digital Adjacent Channel Rejection	60 dB	60 dB	60 dB
Analog Adjacent Channel Rejection (EIA603)			
Analog 12.5 kHz	75 dB	75 dB	75 dB
Analog 25 kHz			
Analog Adjacent Channel Rejection (TIA603D)			
Analog 12.5 kHz	50 or 60 dB (adjustable)	50 or 60 dB (adjustable)	50 or 60 dB (adjustable)
Analog 25 kHz	80 dB	80 dB	80 dB
Spurious and Image Response Rejection	85 dB 100 dB*	85 dB 100 dB*	90 dB 95 dB*
Analog Audio Response	+1, -3 dB from 6 dB per octave de-emphasis; 300-3000 Hz referenced to 1000 Hz at line output	+1, -3 dB from 6 dB per octave de-emphasis; 300-3000 Hz referenced to 1000 Hz at line output	+1, -3 dB from 6 dB per octave de-emphasis; 300-3000 Hz referenced to 1000 Hz at line output
Analog Audio Distortion	3% or 5% (adjustable)	3% or 5% (adjustable)	3% or 5% (adjustable)
Analog FM Hum and Noise			
Analog 12.5 kHz	45 dB	45 dB	45 dB
Analog 25 kHz	50 dB	50 dB	50 dB
Intermediate Frequency	1st: 73.35 MHz 2nd: 2.16 MHz	1st: 73.35 MHz 2nd: 2.16 MHz	1st: 44.85 MHz 2nd: 2.16 MHz

* Optional Preselector.

Specifications subject to change without notice.

PRODUCT SPEC SHEET

G-SERIES SITE EQUIPMENT FOR ASTRO 25 SYSTEMS

GTR 8000 SITE SUBSYSTEM (T7133A)

GENERAL PERFORMANCE

HPD	
700/800 MHz	
Number of Channels	1
Height	27 RU, 50.4 in (128 cm)
Footprint (W x D)	20.9 x 25.4 in (53 x 64.5 cm)
Weight	225 lbs (102 kg)
Temperature Range	-22 to 140 °F (-30 to 60°C)
Power Requirements	AC: 90-264 VAC, 47-63 Hz DC: 43.2-60 VDC
Power Consumption (fully configured)	AC: 615 W DC: 495 W
Antenna Connectors TX	N Female
Antenna Connectors RX	N Female
Channel Spacing	25 kHz
Modulation	TX: 64QAM, 16QAM, QPSK RX: 64QAM, 16QAM, QPSK
Frequency Stability	GPS synchronized

TRANSMITTER INCLUDING RFDS

HPD	
700/800 MHz	
Frequency Range	764-776, 851-870 MHz
Average Power output per channel	1-27 W
Electronic Bandwidth	Full Bandwidth
Error Vector Magnitude	10%
Spurious and Harmonic Emissions Attenuation	90 dB
Emissions Designators	17K7D7D

RECEIVER INCLUDING RFDS

HPD	
700/800 MHz	
Frequency Range	792-825 MHz
Sensitivity 1% Bit Error Rate Static (BER)	
64 QAM	-101 dBm
16 QAM	-108 dBm
QPSK	-115 dBm
Intermodulation Rejection	75 dB*
Adjacent Channel Rejection	50 dB*
Spurious and Image Response Rejection	90 dB*
Intermediate Frequency	
1st	73.35 MHz
2nd	2.16 MHz
Preselector Bandwidth	792-825 MHz

* Reference signal is QPSK.

Specifications subject to change without notice.

PRODUCT SPEC SHEET

G-SERIES SITE EQUIPMENT FOR ASTRO 25 SYSTEMS

FCC TYPE ACCEPTANCE

FCC DESIGNATION

Frequency Range	Type	Power Output	Type Acceptance Number
136-174 MHz	Transmitter	2-100 W	ABZ89FC3790B, ABZ89FC3799B
136-174 MHz	Receiver	N/A	ABZ89FR3791B
406-435 MHz	Transmitter	2-110 W	ABZ89FC4821B
406-435 MHz	Receiver	N/A	ABZ89FR4822B
435-512 MHz	Transmitter	2-110 W	ABZ89FC4819B
435-512 MHz	Receiver	N/A	ABZ89FR4820B
764-776 MHz	Transmitter	2-100 W 2-50 W (HPD)	ABZ89FC5812B
851-870 MHz	Transmitter	2-100 W 2-50 W (HPD)	ABZ89FC5810B
792-825 MHz	Receiver	N/A	ABZ89FR5811B
935-941 MHz	Transmitter	2-120 W	ABZ89FC5823B
896-902 MHz	Receiver	N/A	ABZ89FR5824B
851-870 MHz	Transmitter	15-150W	ABZ89FC5825B

EU REGULATORY COMPLIANCE

CE mark is available on the GTR 8000 Base Radio (T7039A) and GPW 8000 Receiver (T7540A) in the following frequency ranges: UHF 380-525 MHz and VHF 136-174 MHz.

Specifications subject to change without notice.

Motorola Solutions, Inc. 1301 E. Algonquin Road, Schaumburg, Illinois 60196 U.S.A. motorolasolutions.com/ASTRO25

MOTOROLA, MOTO, MOTOROLA SOLUTIONS and the Stylized M Logo are trademarks or registered trademarks of Motorola Trademark Holdings, LLC and are used under license. Microsoft, Windows, Windows Me and Windows Vista are registered trademarks of Microsoft Corporation in the United States and other countries. All other trademarks are the property of their respective owners. © 2014 Motorola Solutions, Inc. All rights reserved. R3-11-2034M





HP 2620 Switch Series

Data sheet

Product overview

The HP 2620 Switch Series consists of five switches with 10/100 connectivity. The HP 2620-24 Switch is a fanless switch with quiet operation, making it ideal for deployments in open spaces. The HP 2620-24-PPoE+ Switch, HP 2620-24-PoE+ Switch, and HP 2620-48-PoE+ Switch are IEEE 802.3af- and IEEE 802.3at-compliant switches and provide up to 30 W per powered port. The HP 2620-48 Switch has variable speed fans for quiet operation. All 2620 series switches include two 10/100/1000BASE-T ports and two SFP slots for Gigabit Ethernet uplink connectivity. An optional redundant external power supply is also available to provide redundancy in the event of a power supply failure. With IPv4/IPv6 static and RIP routing, robust security and management features, free lifetime warranty, and free software updates, the HP 2620 Switch Series is a cost-effective solution for customers who are building converged enterprise edge networks.

Key features

- Cost-effective access layer switches
- Lite Layer 3 IPv4/IPv6 static and RIP routing
- 30 W PoE+ support on PoE models
- Gigabit fiber uplinks
- Enterprise-class features



Features and benefits

Quality of Service (QoS)

- **Layer 4 prioritization:** enables prioritization based on TCP/UDP port numbers
- **Traffic prioritization (IEEE 802.1p):** allows real-time traffic classification into eight priority levels mapped to eight queues
- **Class of Service (CoS):** sets the IEEE 802.1p priority tag based on IP address, IP Type of Service (ToS), Layer 3 protocol, TCP/UDP port number, source port, and DiffServ
- **Rate limiting:** sets per-port ingress enforced maximums and per-port, per-queue guaranteed minimums

Connectivity

- **Auto-MDIX:** automatically adjusts for straight-through or crossover cables on all 10/100 and 10/100/1000 ports
- **IPv6:**
 - **IPv6 host:** allows the switches to be managed and deployed at the edge of an IPv6 network
 - **Dual stack (IPv4/IPv6):** provides a transition mechanism from IPv4 to IPv6; supports connectivity for both protocols
 - **MLD snooping:** forwards IPv6 multicast traffic to the appropriate interface; prevents IPv6 multicast traffic from flooding the network
- **IEEE 802.3af Power over Ethernet (PoE):** provides up to 15.4 W per port to IEEE 802.3af-compliant PoE-powered devices such as IP phones, wireless access points, and security cameras
- **IEEE 802.3at Power Over Ethernet Plus:** provides up to 30 W per port to IEEE 802.3 for PoE-/PoE+-powered devices such as video IP phones, IEEE 802.11n wireless access points, and advanced pan/tilt/zoom security cameras
- **Pre-standard PoE support:** detects and provides power to pre-standard PoE devices; see list of supported devices in the product FAQ at www.hp.com/networking/support
- **Single IP address management:** provides single IP address management for a virtual stack of up to 16 switches

Resiliency and high availability

- **External redundant power supply:** provides high reliability
- **IEEE 802.3ad Link Aggregation Protocol (LACP) and HP port trunking:** support up to 24 trunks, each with up to 8 links (ports) per trunk
- **IEEE 802.1s Multiple Spanning Tree:** provides high link availability in multiple VLAN environments by allowing multiple spanning trees

Manageability

- **Dual flash images:** provides independent primary and secondary operating system files for backup while upgrading
- **Friendly port names:** allow assignment of descriptive names to ports
- **Find-Fix-Inform:** finds and fixes common network problems automatically, then informs administrator
- **Multiple configuration files:** allow multiple configuration files to be stored to a flash image
- **Software updates:** free downloads from the Web
- **RMON, XRMON, and sFlow:** provide advanced monitoring and reporting capabilities for statistics, history, alarms, and events
- **Troubleshooting:** ingress and egress port monitoring enable network problem solving

Layer 2 switching

- **VLANs:** provide support for 512 VLANs and 4,094 VLAN IDs
- **Jumbo packet support:** supports up to 9220-byte frame size to improve the performance of large data transfers
- **IEEE 802.1v protocol VLANs:** isolate select non-IPv4 protocols automatically into their own VLANs

Layer 3 routing

- **Static IP routing:** provides manually configured routing; includes ECMP capability
- **Routing Information Protocol (RIP):** provides RIPv1 and RIPv2 routing

Security

- **Access control lists (ACLs):** provide IP Layer 3 filtering based on source/destination IP address/subnet and source/destination TCP/UDP port number
- **Source-port filtering:** allows only specified ports to communicate with each other
- **RADIUS/TACACS+:** eases switch management security administration by using a password authentication server
- **Secure Shell:** encrypts all transmitted data for secure remote CLI access over IP networks
- **Secure Sockets Layer (SSL):** encrypts all HTTP traffic, allowing secure access to the browser-based management GUI in the switch
- **Port security:** allows access only to specified MAC addresses, which can be learned or specified by the administrator
- **MAC address lockout:** prevents particular configured MAC addresses from connecting to the network
- **Secure FTP:** allows secure file transfer to and from the switch; protects against unwanted file downloads or unauthorized copying of a switch configuration file
- **Custom banner:** displays security policy when users log in to the switch
- **Identity-driven ACL:** enables implementation of a highly granular and flexible access security policy and VLAN assignment specific to each authenticated network user
- **STP BPDU port protection:** blocks Bridge Protocol Data Units (BPDUs) on ports that do not require BPDUs, preventing forged BPDU attacks
- **DHCP protection:** blocks DHCP packets from unauthorized DHCP servers, preventing denial-of-service attacks
- **Dynamic ARP protection:** blocks ARP broadcasts from unauthorized hosts, preventing eavesdropping or theft of network data
- **Multiple user authentication methods:**
 - **IEEE 802.1X:** is an industry-standard method of user authentication using an IEEE 802.1X supplicant on the client in conjunction with a RADIUS server
 - **Web-based authentication:** similar to IEEE 802.1X, it provides a browser-based environment to authenticate clients that do not support the IEEE 802.1X supplicant
 - **MAC-based authentication:** client is authenticated with the RADIUS server based on the client's MAC address
- **STP Root Guard:** protects the root bridge from malicious attack or configuration mistakes
- **Authentication flexibility:**
 - **Multiple IEEE 802.1X users per port:** provides authentication of multiple IEEE 802.1X users per port; prevents user "piggybacking" on another user's IEEE 802.1X authentication
 - **Concurrent IEEE 802.1X, Web, and MAC authentication schemes per port:** switch port will accept up to 32 sessions of IEEE 802.1X, Web, and MAC authentications
- **Port mirroring for network threats:** provides sampled port traffic using sFlow technology to the HP Network Immunity Manager (NIM) application for Network Behavior Anomaly Detection (NBAD) analysis to detect threats and mitigate threats at the port where the threat originated
- **Per-port broadcast throttling:** selectively configures broadcast control on heavy traffic port uplinks

Convergence

- **IP multicast snooping and data-driven IGMP:** automatically prevent flooding of IP multicast traffic
- **LLDP-MED (Media Endpoint Discovery):** is a standard extension of LLDP that stores values for parameters such as QoS and VLAN to automatically configure network devices such as IP phones
- **IEEE 802.1AB Link Layer Discovery Protocol (LLDP):** is an automated device discovery protocol that provides easy mapping of network management applications
- **PoE and PoE+ allocations:** support multiple methods (automatic, IEEE 802.3at dynamic, LLDP-MED fine grain, IEEE 802.3af device class, or user specified) to allocate and manage PoE/PoE+ power for more efficient energy savings

Monitor and diagnostics

- **Port mirroring:** enables traffic on a port to be simultaneously sent to a network analyzer for monitoring

Flexibility

- **Quiet operation:**
 - **Fanless design (2620-24 switch):** enables quiet operation for deployment in open spaces
 - **Variable-speed fans (2620-24-PPoE+, 2620-24-PoE+, 2620-48, and 2620-48-PoE+ switches):** improve fan speed for the operating environment while keeping noise and energy consumption levels to a minimum
- **Flexible mounting:**
 - **Rackable:** can be mounted in a standard 19-inch rack using included hardware
 - **Surface mountable:** can be mounted above or below a surface (such as on a desk or table) using included hardware

Warranty and support

- **Lifetime warranty:** for as long as you own the product with advance replacement and next-business-day delivery (available in most countries)*
- **Electronic and telephone support:** limited electronic and telephone support is available from HP; refer to www.hp.com/networking/warranty for details on the support provided and the period during which support is available
- **Software releases:** refer to www.hp.com/networking/warranty for details on the software releases provided and the period during which software releases are available for your product(s)

*Hardware warranty replacement for as long as you own the product, with next business day advance replacement (available in most countries) with a five-year hardware warranty replacement for the disk drive included with HP AllianceONE Services z1 Module, HP Threat Management Services z1 Module, HP PCM+ Agent with AllianceONE Services z1 Module, and HP MSM765 z1 Mobility Controller. For details, refer to the HP Software License, Warranty, and Support booklet at www.hp.com/networking/warranty.

HP 2620 Switch Series

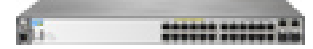
Specifications



HP 2620-24 Switch (J9623A)



HP 2620-24-PoE+ Switch (J9624A)



HP 2620-24-PoE+ Switch (J9625A)

Ports	<p>24 autosensing 10/100 ports (IEEE 802.3 Type 10BASE-T, IEEE 802.3u Type 100BASE-TX); Media Type: Auto-MDIX; Duplex: half or full</p> <p>1 RJ-45 serial console port</p> <p>2 autosensing 10/100/1000 ports (IEEE 802.3 Type 10BASE-T, IEEE 802.3u Type 100BASE-TX, IEEE 802.3ab Type 1000BASE-T); Duplex: 10BASE-T/100BASE-TX: half or full; 1000BASE-T: full only</p> <p>2 open mini-GBIC (SFP) slots</p>	<p>12 RJ-45 autosensing 10/100 ports (IEEE 802.3 Type 10BASE-T, IEEE 802.3u Type 100BASE-TX); Media Type: Auto-MDIX; Duplex: half or full</p> <p>12 RJ-45 autosensing 10/100 PoE+ ports (IEEE 802.3 Type 10BASE-T, IEEE 802.3u Type 100BASE-TX, IEEE 802.3at PoE+); Duplex: half or full</p> <p>1 RJ-45 serial console port</p> <p>2 autosensing 10/100/1000 ports (IEEE 802.3 Type 10BASE-T, IEEE 802.3u Type 100BASE-TX, IEEE 802.3ab Type 1000BASE-T); Duplex: 10BASE-T/100BASE-TX: half or full; 1000BASE-T: full only</p> <p>2 open mini-GBIC (SFP) slots</p>	<p>24 RJ-45 autosensing 10/100 PoE+ ports (IEEE 802.3 Type 10BASE-T, IEEE 802.3u Type 100BASE-TX, IEEE 802.3at PoE+); Media Type: Auto-MDIX; Duplex: half or full</p> <p>1 RJ-45 serial console port</p> <p>2 autosensing 10/100/1000 ports (IEEE 802.3 Type 10BASE-T, IEEE 802.3u Type 100BASE-TX, IEEE 802.3ab Type 1000BASE-T); Duplex: 10BASE-T/100BASE-TX: half or full; 1000BASE-T: full only</p> <p>2 open mini-GBIC (SFP) slots</p>
Physical characteristics			
Dimensions	10(d) x 17.44(w) x 1.73(h) in. (25.4 x 44.3 x 4.39 cm) (1U height)	10(d) x 17.44(w) x 1.73(h) in. (25.4 x 44.3 x 4.39 cm) (1U height)	14.5(d) x 17.44(w) x 1.73(h) in. (36.83 x 44.3 x 4.39 cm) (1U height)
Weight	5.7 lb. (2.59 kg), Fully loaded	7.04 lb. (3.19 kg)	10.67 lb. (4.84 kg), Fully loaded
Memory and processor			
Processor	PowerPC FreeScale 8313 @ 400 MHz, 512 MB flash, 512 MB SDRAM, 4 MB flash ROM; packet buffer size: 1 MB	PowerPC FreeScale 8313 @ 400 MHz, 512 MB flash, 512 MB SDRAM, 4 MB flash ROM; packet buffer size: 1 MB	Power PC FreeScale 8313 @ 400 MHz, 512 MB flash, 512 MB SDRAM, 4 MB flash ROM; packet buffer size: 1 MB
Mounting	Mounts in an EIA-standard 19 in. telco rack or equipment cabinet (hardware included); horizontal surface mounting only	Mounts in an EIA-standard 19 in. telco rack or equipment cabinet (hardware included); horizontal surface mounting only	Mounts in an EIA-standard 19 in. telco rack or equipment cabinet (hardware included); horizontal surface mounting only
Performance			
100 Mb Latency	IPv6 Ready Certified < 8.3 μs (LIFO 64-byte packets)	IPv6 Ready Certified < 8.3 μs (LIFO 64-byte packets)	IPv6 Ready Certified < 8.3 μs (LIFO)
1000 Mb Latency	< 2.9 μs (LIFO 64-byte packets)	< 2.9 μs (LIFO 64-byte packets)	< 2.9 μs (LIFO)
Throughput	up to 9.5 million pps	up to 9.5 million pps	up to 9.5 million pps
Routing/Switching capacity	12.8 Gbps	12.8 Gbps	12.8 Gbps
MAC address table size	16000 entries	16000 entries	16000 entries
Environment			
Operating temperature	32°F to 131°F (0°C to 55°C)	32°F to 131°F (0°C to 55°C)	32°F to 131°F (0°C to 55°C)
Operating relative humidity	15% to 95% @ 104°F (40°C), noncondensing	15% to 95% @ 104°F (40°C), noncondensing	15% to 95% @ 104°F (40°C), noncondensing
Nonoperating/Storage temperature	-40°F to 158°F (-40°C to 70°C)	-40°F to 158°F (-40°C to 70°C)	-40°F to 158°F (-40°C to 70°C)
Nonoperating/Storage relative humidity	15% to 90% @ 149°F (65°C), noncondensing	15% to 90% @ 149°F (65°C), noncondensing	15% to 90% @ 149°F (65°C), noncondensing
Altitude	up to 10,000 ft. (3 km)	up to 10,000 ft. (3 km)	up to 10,000 ft. (3 km)
Acoustic	Power: 0 dB, Pressure: 0 dB No Fan	Power: 37.1 dB, Pressure: 25.9 dB	Power: 34.0 dB, Pressure: 29.7 dB
Electrical characteristics			
	Achieved Miercom Certified Green Award	Achieved Miercom Certified Green Award	Achieved Miercom Certified Green Award
Voltage	100-127/200-240 VAC	100-127/200-240 VAC	100-127/200-240 VAC
Idle power	13.3 W	22.0 W	22.8 W
Maximum power rating	22.1 W	165.8 W	428.0 W
PoE power	0 W	128 W	382 W
Frequency	50/60 Hz	50/60 Hz	50/60 Hz
Notes	Idle power is the actual power consumption of the device with no ports connected. Maximum power rating and maximum heat dissipation are the worst-case theoretical maximum numbers provided for planning the infrastructure with fully loaded PoE (if equipped), 100% traffic, all ports plugged in, and all modules populated. PoE power is the power supplied by the internal power supply. It is dependent on the type and quantity of power supplies and may be supplemented with the use of an external power supply (EPS).	Idle power is the actual power consumption of the device with no ports connected. Maximum power rating and maximum heat dissipation are the worst-case theoretical maximum numbers provided for planning the infrastructure with fully loaded PoE (if equipped), 100% traffic, all ports plugged in, and all modules populated. PoE power is the power supplied by the internal power supply. It is dependent on the type and quantity of power supplies and may be supplemented with the use of an external power supply (EPS).	Idle power is the actual power consumption of the device with no ports connected. Maximum power rating and maximum heat dissipation are the worst-case theoretical maximum numbers provided for planning the infrastructure with fully loaded PoE (if equipped), 100% traffic, all ports plugged in, and all modules populated. PoE power is the power supplied by the internal power supply. It is dependent on the type and quantity of power supplies and may be supplemented with the use of an external power supply (EPS).
Safety	EN 60950/IEC 60950; CAN/CSA 22.2 No. 60950; EN 60825; UL 60950	EN 60950/IEC 60950; CAN/CSA 22.2 No. 60950; EN 60825; UL 60950	EN 60950/IEC 60950; CAN/CSA 22.2 No. 60950; EN 60825; UL 60950
Emissions	FCC Class A; VCCI Class A; EN 55022/CISPR 22 Class A	FCC Class A; VCCI Class A; EN 55022/CISPR 22 Class A	FCC Class A; VCCI Class A; EN 55022/CISPR 22 Class A

HP 2620 Switch Series

Specifications (continued)

	HP 2620-24 Switch (J9623A)	HP 2620-24-PoE+ Switch (J9624A)	HP 2620-24-PoE+ Switch (J9625A)
Immunity			
EN	EN 55024, CISPR 24	EN 55024, CISPR 24	EN 55024, CISPR 24
ESD	IEC 61000-4-2	IEC 61000-4-2	IEC 61000-4-2
Radiated	IEC 61000-4-3	IEC 61000-4-3	IEC 61000-4-3
EFT/Burst	IEC 61000-4-4	IEC 61000-4-4	IEC 61000-4-4
Surge	IEC 61000-4-5	IEC 61000-4-5	IEC 61000-4-5
Conducted	IEC 61000-4-6	IEC 61000-4-6	IEC 61000-4-6
Power frequency magnetic field	IEC 61000-4-8	IEC 61000-4-8	IEC 61000-4-8
Voltage dips and interruptions	IEC 61000-4-11	IEC 61000-4-11	IEC 61000-4-11
Harmonics	EN 61000-3-2, IEC 61000-3-2	EN 61000-3-2, IEC 61000-3-2	EN 61000-3-2, IEC 61000-3-2
Flicker	EN 61000-3-3, IEC 61000-3-3	EN 61000-3-3, IEC 61000-3-3	EN 61000-3-3, IEC 61000-3-3
Management	command-line interface; Web browser; Telnet	command-line interface; Web browser; Telnet	command-line interface; Web browser; Telnet
Services	3-year, 4-hour onsite, 13x5 coverage for hardware (HS980E) 3-year, 4-hour onsite, 24x7 coverage for hardware (HS982E) 3-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 SW phone support and SW updates (HS987E) 3-year, 24x7 SW phone support, software updates (HS986E) Installation with minimum configuration, system-based pricing (U4826E) Installation with HP-provided configuration, system-based pricing (U4830E) 4-year, 4-hour onsite, 13x5 coverage for hardware (HS990E) 4-year, 4-hour onsite, 24x7 coverage for hardware (HS992E) 4-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 software phone (HS997E) 4-year, 24x7 SW phone support, software updates (HS996E) 5-year, 4-hour onsite, 13x5 coverage for hardware (HT001E) 5-year, 4-hour onsite, 24x7 coverage for hardware (HT003E) 5-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 software phone (HT008E) 5-year, 24x7 SW phone support, software updates (HT007E) 3 Yr 6 hr Call-to-Repair Onsite (HS984E) 4 Yr 6 hr Call-to-Repair Onsite (HS994E) 5 Yr 6 hr Call-to-Repair Onsite (HT005E) 1-year, 4-hour onsite, 13x5 coverage for hardware (HS970E) 1-year, 4-hour onsite, 24x7 coverage for hardware (HS972E) 1-year, 6 hour Call-To-Repair Onsite for hardware (HS974E) 1-year, 24x7 software phone support, software updates (HS976E) 1-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 software phone support and software updates (HS977E) 1-year, 24x7 software phone support, software updates + Next Business Day Hardware Exchange (HS968E) 1-year, 24x7 software phone support, software updates + 4 hour hardware exchange (HS969E) 3-year, 24x7 software phone support, software updates + Next Business Day Hardware Exchange (HS978E) 3-year, 24x7 software phone support, software updates + 4 hour Hardware Exchange (HS979E)	3-year, 4-hour onsite, 13x5 coverage for hardware (HS980E) 3-year, 4-hour onsite, 24x7 coverage for hardware (HS982E) 3-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 SW phone support and SW updates (HS987E) 3-year, 24x7 SW phone support, software updates (HS986E) Installation with minimum configuration, system-based pricing (U4826E) Installation with HP-provided configuration, system-based pricing (U4830E) 4-year, 4-hour onsite, 13x5 coverage for hardware (HS990E) 4-year, 4-hour onsite, 24x7 coverage for hardware (HS992E) 4-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 software phone (HS997E) 4-year, 24x7 SW phone support, software updates (HS996E) 5-year, 4-hour onsite, 13x5 coverage for hardware (HT001E) 5-year, 4-hour onsite, 24x7 coverage for hardware (HT003E) 5-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 software phone (HT008E) 5-year, 24x7 SW phone support, software updates (HT007E) 3 Yr 6 hr Call-to-Repair Onsite (HS984E) 4 Yr 6 hr Call-to-Repair Onsite (HS994E) 5 Yr 6 hr Call-to-Repair Onsite (HT005E) 1-year, 4-hour onsite, 13x5 coverage for hardware (HS970E) 1-year, 4-hour onsite, 24x7 coverage for hardware (HS972E) 1-year, 6 hour Call-To-Repair Onsite for hardware (HS974E) 1-year, 24x7 software phone support, software updates (HS976E) 1-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 software phone support and software updates (HS977E) 1-year, 24x7 software phone support, software updates + Next Business Day Hardware Exchange (HS968E) 1-year, 24x7 software phone support, software updates + 4 hour hardware exchange (HS969E) 3-year, 24x7 software phone support, software updates + Next Business Day Hardware Exchange (HS978E) 3-year, 24x7 software phone support, software updates + 4 hour Hardware Exchange (HS979E)	3-year, 4-hour onsite, 13x5 coverage for hardware (HS980E) 3-year, 4-hour onsite, 24x7 coverage for hardware (HS982E) 3-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 SW phone support and SW updates (HS987E) 3-year, 24x7 SW phone support, software updates (HS986E) Installation with minimum configuration, system-based pricing (U4826E) Installation with HP-provided configuration, system-based pricing (U4830E) 4-year, 4-hour onsite, 13x5 coverage for hardware (HS990E) 4-year, 4-hour onsite, 24x7 coverage for hardware (HS992E) 4-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 software phone (HS997E) 4-year, 24x7 SW phone support, software updates (HS996E) 5-year, 4-hour onsite, 13x5 coverage for hardware (HT001E) 5-year, 4-hour onsite, 24x7 coverage for hardware (HT003E) 5-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 software phone (HT008E) 5-year, 24x7 SW phone support, software updates (HT007E) 3 Yr 6 hr Call-to-Repair Onsite (HS984E) 4 Yr 6 hr Call-to-Repair Onsite (HS994E) 5 Yr 6 hr Call-to-Repair Onsite (HT005E) 1-year, 4-hour onsite, 13x5 coverage for hardware (HS970E) 1-year, 4-hour onsite, 24x7 coverage for hardware (HS972E) 1-year, 6 hour Call-To-Repair Onsite for hardware (HS974E) 1-year, 24x7 software phone support, software updates (HS976E) 1-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 software phone support and software updates (HS977E) 1-year, 24x7 software phone support, software updates + Next Business Day Hardware Exchange (HS968E) 1-year, 24x7 software phone support, software updates + 4 hour hardware exchange (HS969E) 3-year, 24x7 software phone support, software updates + Next Business Day Hardware Exchange (HS978E) 3-year, 24x7 software phone support, software updates + 4 hour Hardware Exchange (HS979E)

Specifications (continued)

	HP 2620-24 Switch (J9623A)	HP 2620-24-PPoE+ Switch (J9624A)	HP 2620-24-PoE+ Switch (J9625A)
	<p>4-year, 24x7 software phone support, software updates + Next Business Day Hardware Exchange (HS988E)</p> <p>4-year, 24x7 software phone support, software updates + 4 hour Hardware Exchange (HS989E)</p> <p>5-year, 24x7 software phone support, software updates + Next Business Day Hardware Exchange (HS998E)</p> <p>5-year, 24x7 software phone support, software updates + 4 hour Hardware Exchange (HS999E)</p> <p>Refer to the HP website at www.hp.com/networking/services for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local HP sales office.</p>	<p>4-year, 24x7 software phone support, software updates + Next Business Day Hardware Exchange (HS988E)</p> <p>4-year, 24x7 software phone support, software updates + 4 hour Hardware Exchange (HS989E)</p> <p>5-year, 24x7 software phone support, software updates + Next Business Day Hardware Exchange (HS998E)</p> <p>5-year, 24x7 software phone support, software updates + 4 hour Hardware Exchange (HS999E)</p> <p>Refer to the HP website at www.hp.com/networking/services for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local HP sales office.</p>	<p>4-year, 24x7 software phone support, software updates + Next Business Day Hardware Exchange (HS988E)</p> <p>4-year, 24x7 software phone support, software updates + 4 hour Hardware Exchange (HS989E)</p> <p>5-year, 24x7 software phone support, software updates + Next Business Day Hardware Exchange (HS998E)</p> <p>5-year, 24x7 software phone support, software updates + 4 hour Hardware Exchange (HS999E)</p> <p>Refer to the HP website at www.hp.com/networking/services for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local HP sales office.</p>
<p>Standards and protocols (applies to all products in series)</p>	<p>Device management</p> <p>RFC 1591 DNS (client)</p> <p>HTML and telnet management</p>	<p>IPv6</p> <p>RFC 1981 IPv6 Path MTU Discovery</p> <p>RFC 2460 IPv6 Specification</p> <p>RFC 2710 Multicast Listener Discovery (MLD) for IPv6</p> <p>RFC 2925 Remote Operations MIB (Ping only)</p> <p>RFC 3019 MLDv1 MIB</p> <p>RFC 3315 DHCPv6 (client only)</p> <p>RFC 3513 IPv6 Addressing Architecture</p> <p>RFC 3596 DNS Extension for IPv6</p> <p>RFC 3810 Multicast Listener Discovery Version 2 (MLDv2) for IPv6</p> <p>RFC 4022 MIB for TCP</p> <p>RFC 4113 MIB for UDP</p> <p>RFC 4251 SSHv6 Architecture</p> <p>RFC 4252 SSHv6 Authentication</p> <p>RFC 4253 SSHv6 Transport Layer</p> <p>RFC 4254 SSHv6 Connection</p> <p>RFC 4293 MIB for IP</p> <p>RFC 4419 Key Exchange for SSH</p> <p>RFC 4443 ICMPv6</p> <p>RFC 4541 IGMP & MLD Snooping Switch</p> <p>RFC 4861 IPv6 Neighbor Discovery</p> <p>RFC 4862 IPv6 Stateless Address Auto-configuration</p>	<p>RFC 2863 The Interfaces Group MIB</p> <p>RFC 2925 Ping MIB</p>
	<p>General protocols</p> <p>IEEE 802.1D MAC Bridges</p> <p>IEEE 802.1p Priority</p> <p>IEEE 802.1Q VLANs</p> <p>IEEE 802.1s Multiple Spanning Trees</p> <p>IEEE 802.1v VLAN classification by Protocol and Port</p> <p>IEEE 802.1w Rapid Reconfiguration of Spanning Tree</p> <p>IEEE 802.3ad Link Aggregation Control Protocol (LACP)</p> <p>IEEE 802.3x Flow Control</p> <p>RFC 768 UDP</p> <p>RFC 783 TFTP Protocol (revision 2)</p> <p>RFC 792 ICMP</p> <p>RFC 793 TCP</p> <p>RFC 826 ARP</p> <p>RFC 854 TELNET</p> <p>RFC 868 Time Protocol</p> <p>RFC 951 BOOTP</p> <p>RFC 1058 RIPv1</p> <p>RFC 1350 TFTP Protocol (revision 2)</p> <p>RFC 2030 Simple Network Time Protocol (SNTP) v4</p> <p>RFC 2131 DHCP</p> <p>RFC 2453 RIPv2</p> <p>RFC 3046 DHCP Relay Agent Information Option</p>	<p>IP multicast</p> <p>RFC 3376 IGMPv3 (host joins only)</p>	<p>Network management</p> <p>IEEE 802.1AB Link Layer Discovery Protocol (LLDP)</p> <p>RFC 2819 Four groups of RMON: 1 (statistics), 2 (history), 3 (alarm) and 9 (events)</p> <p>RFC 3176 sFlow</p> <p>ANSI/TIA-1057 LLDP Media Endpoint Discovery (LLDP-MED)</p> <p>SNMPv1/v2c/v3</p> <p>XRMON</p> <p>QoS/CoS</p> <p>RFC 2474 DiffServ Precedence, including 8 queues/port</p> <p>RFC 2597 DiffServ Assured Forwarding (AF)</p> <p>RFC 2598 DiffServ Expedited Forwarding (EF) Ingress Rate Limiting</p> <p>Security</p> <p>IEEE 802.1X Port Based Network Access Control</p> <p>RFC 1492 TACACS+</p> <p>RFC 2138 RADIUS Authentication</p> <p>RFC 2866 RADIUS Accounting</p> <p>Secure Sockets Layer (SSL)</p>

HP 2620 Switch Series

Specifications (continued)



HP 2620-48 Switch (J9626A)



HP 2620-48-PoE+ Switch (J9627A)

Ports	<p>48 autosensing 10/100 ports (IEEE 802.3 Type 10BASE-T, IEEE 802.3u Type 100BASE-TX); Media Type: Auto-MDIX; Duplex: half or full</p> <p>1 RJ-45 serial console port</p> <p>2 autosensing 10/100/1000 ports (IEEE 802.3 Type 10BASE-T, IEEE 802.3u Type 100BASE-TX, IEEE 802.3ab Type 1000BASE-T); Duplex: 10BASE-T/100BASE-TX: half or full; 1000BASE-T: full only</p> <p>2 open mini-GBIC (SFP) slots</p>	<p>48 RJ-45 autosensing 10/100 PoE+ ports (IEEE 802.3 Type 10BASE-T, IEEE 802.3u Type 100BASE-TX, IEEE 802.3at PoE+); Media Type: Auto-MDIX; Duplex: half or full</p> <p>1 RJ-45 serial console port</p> <p>2 autosensing 10/100/1000 ports (IEEE 802.3 Type 10BASE-T, IEEE 802.3u Type 100BASE-TX, IEEE 802.3ab Type 1000BASE-T); Duplex: 10BASE-T/100BASE-TX: half or full; 1000BASE-T: full only</p> <p>2 open mini-GBIC (SFP) slots</p>
Physical characteristics		
Dimensions	10(d) x 17.44(w) x 1.73(h) in. (25.4 x 44.3 x 4.39 cm) (1U height)	14.5(d) x 17.44(w) x 1.73(h) in. (36.83 x 44.3 x 4.39 cm) (1U height)
Weight	6.48 lb. (2.94 kg), Fully loaded	11.53 lb. (5.23 kg), Fully loaded
Memory and processor		
Processor	Power PC FreeScale 8313 @ 400 MHz, 512 MB flash, 512 MB SDRAM, 4 MB flash ROM; packet buffer size: 2 MB	PowerPC FreeScale 8313 @ 400 MHz, 512 MB flash, 512 MB SDRAM, 4 MB flash ROM; packet buffer size: 2 MB
Mounting	Mounts in an EIA-standard 19 in. telco rack or equipment cabinet (hardware included); horizontal surface mounting only	Mounts in an EIA-standard 19 in. telco rack or equipment cabinet (hardware included); horizontal surface mounting only
Performance		
100 Mb Latency	IPv6 Ready Certified < 8.3 μs (LIFO)	IPv6 Ready Certified < 8.3 μs (LIFO)
1000 Mb Latency	< 2.9 μs (LIFO)	< 2.9 μs (LIFO)
Throughput	up to 13.0 million pps	up to 13.0 million pps
Routing/Switching capacity	17.6 Gbps	17.6 Gbps
MAC address table size	16000 entries	16000 entries
Environment		
Operating temperature	32°F to 131°F (0°C to 55°C)	32°F to 131°F (0°C to 55°C)
Operating relative humidity	15% to 95% @ 104°F (40°C), noncondensing	15% to 95% @ 104°F (40°C), noncondensing
Nonoperating/Storage temperature	-40°F to 158°F (-40°C to 70°C)	-40°F to 158°F (-40°C to 70°C)
Nonoperating/Storage relative humidity	15% to 90% @ 149°F (65°C), noncondensing	15% to 90% @ 149°F (65°C), noncondensing
Altitude	up to 10,000 ft. (3 km)	up to 10,000 ft. (3 km)
Acoustic	Power: 36.5 dB, Pressure: 24.5 dB	Power: 34.0 dB, Pressure: 25.3 dB
Electrical characteristics		
	Achieved Miercom Certified Green Award	Achieved Miercom Certified Green Award
Voltage	100-127/200-240 VAC	100-127/200-240 VAC
Idle power	19.4 W	29.6 W
Maximum power rating	34.4 W	448 W
PoE power		382 W
Frequency	50/60 Hz	50/60 Hz
Notes	Idle power is the actual power consumption of the device with no ports connected. Maximum power rating and maximum heat dissipation are the worst-case theoretical maximum numbers provided for planning the infrastructure with fully loaded PoE (if equipped), 100% traffic, all ports plugged in, and all modules populated.	Idle power is the actual power consumption of the device with no ports connected. Maximum power rating and maximum heat dissipation are the worst-case theoretical maximum numbers provided for planning the infrastructure with fully loaded PoE (if equipped), 100% traffic, all ports plugged in, and all modules populated. PoE power is the power supplied by the internal power supply. It is dependent on the type and quantity of power supplies and may be supplemented with the use of an external power supply (EPS).
Safety	EN 60950/IEC 60950; CAN/CSA 22.2 No. 60950; EN 60825; UL 60950	EN 60950/IEC 60950; CAN/CSA 22.2 No. 60950; EN 60825; UL 60950
Emissions	FCC Class A; VCCI Class A; EN 55022/CISPR 22 Class A	FCC Class A; VCCI Class A; EN 55022/CISPR 22 Class A
Immunity		
EN	EN 55024, CISPR 24	EN 55024, CISPR 24
ESD	IEC 61000-4-2	IEC 61000-4-2
Radiated	IEC 61000-4-3	IEC 61000-4-3
EFT/Burst	IEC 61000-4-4	IEC 61000-4-4
Surge	IEC 61000-4-5	IEC 61000-4-5
Conducted	IEC 61000-4-6	IEC 61000-4-6
Power frequency magnetic field	IEC 61000-4-8	IEC 61000-4-8
Voltage dips and interruptions	IEC 61000-4-11	IEC 61000-4-11
Harmonics	EN 61000-3-2, IEC 61000-3-2	EN 61000-3-2, IEC 61000-3-2
Flicker	EN 61000-3-3, IEC 61000-3-3	EN 61000-3-3, IEC 61000-3-3

Specifications (continued)

	HP 2620-48 Switch (J9626A)	HP 2620-48-PoE+ Switch (J9627A)
Management	command-line interface; Web browser; Telnet	command-line interface; Web browser; Telnet
Services	<p>3-year, 4-hour onsite, 13x5 coverage for hardware (HS980E)</p> <p>3-year, 4-hour onsite, 24x7 coverage for hardware (HS982E)</p> <p>3-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 SW phone support and SW updates (HS987E)</p> <p>3-year, 24x7 SW phone support, software updates (HS986E)</p> <p>Installation with minimum configuration, system-based pricing (U4826E)</p> <p>Installation with HP-provided configuration, system-based pricing (U4830E)</p> <p>4-year, 4-hour onsite, 13x5 coverage for hardware (HS990E)</p> <p>4-year, 4-hour onsite, 24x7 coverage for hardware (HS992E)</p> <p>4-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 software phone (HS997E)</p> <p>4-year, 24x7 SW phone support, software updates (HS996E)</p> <p>5-year, 4-hour onsite, 13x5 coverage for hardware (HT001E)</p> <p>5-year, 4-hour onsite, 24x7 coverage for hardware (HT003E)</p> <p>5-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 software phone (HT008E)</p> <p>5-year, 24x7 SW phone support, software updates (HT007E)</p> <p>3 Yr 6 hr Call-to-Repair Onsite (HS984E)</p> <p>4 Yr 6 hr Call-to-Repair Onsite (HS994E)</p> <p>5 Yr 6 hr Call-to-Repair Onsite (HT005E)</p> <p>1-year, 4-hour onsite, 13x5 coverage for hardware (HS970E)</p> <p>1-year, 4-hour onsite, 24x7 coverage for hardware (HS972E)</p> <p>1-year, 6 hour Call-To-Repair Onsite for hardware (HS974E)</p> <p>1-year, 24x7 software phone support, software updates (HS976E)</p> <p>1-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 software phone support and software updates (HS977E)</p> <p>1-year, 24x7 software phone support, software updates + Next Business Day Hardware Exchange (HS968E)</p> <p>1-year, 24x7 software phone support, software updates + 4 hour hardware exchange (HS969E)</p> <p>3-year, 24x7 software phone support, software updates + Next Business Day Hardware Exchange (HS978E)</p> <p>3-year, 24x7 software phone support, software updates + 4 hour Hardware Exchange (HS979E)</p> <p>4-year, 24x7 software phone support, software updates + Next Business Day Hardware Exchange (HS988E)</p> <p>4-year, 24x7 software phone support, software updates + 4 hour Hardware Exchange (HS989E)</p> <p>5-year, 24x7 software phone support, software updates + Next Business Day Hardware Exchange (HS998E)</p> <p>5-year, 24x7 software phone support, software updates + 4 hour Hardware Exchange (HS999E)</p> <p>Refer to the HP website at www.hp.com/networking/services for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local HP sales office.</p>	<p>3-year, 4-hour onsite, 13x5 coverage for hardware (HS980E)</p> <p>3-year, 4-hour onsite, 24x7 coverage for hardware (HS982E)</p> <p>3-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 SW phone support and SW updates (HS987E)</p> <p>3-year, 24x7 SW phone support, software updates (HS986E)</p> <p>Installation with minimum configuration, system-based pricing (U4826E)</p> <p>Installation with HP-provided configuration, system-based pricing (U4830E)</p> <p>4-year, 4-hour onsite, 13x5 coverage for hardware (HS990E)</p> <p>4-year, 4-hour onsite, 24x7 coverage for hardware (HS992E)</p> <p>4-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 software phone (HS997E)</p> <p>4-year, 24x7 SW phone support, software updates (HS996E)</p> <p>5-year, 4-hour onsite, 13x5 coverage for hardware (HT001E)</p> <p>5-year, 4-hour onsite, 24x7 coverage for hardware (HT003E)</p> <p>5-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 software phone (HT008E)</p> <p>5-year, 24x7 SW phone support, software updates (HT007E)</p> <p>3 Yr 6 hr Call-to-Repair Onsite (HS984E)</p> <p>4 Yr 6 hr Call-to-Repair Onsite (HS994E)</p> <p>5 Yr 6 hr Call-to-Repair Onsite (HT005E)</p> <p>1-year, 4-hour onsite, 13x5 coverage for hardware (HS970E)</p> <p>1-year, 4-hour onsite, 24x7 coverage for hardware (HS972E)</p> <p>1-year, 6 hour Call-To-Repair Onsite for hardware (HS974E)</p> <p>1-year, 24x7 software phone support, software updates (HS976E)</p> <p>1-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 software phone support and software updates (HS977E)</p> <p>1-year, 24x7 software phone support, software updates + Next Business Day Hardware Exchange (HS968E)</p> <p>1-year, 24x7 software phone support, software updates + 4 hour hardware exchange (HS969E)</p> <p>3-year, 24x7 software phone support, software updates + Next Business Day Hardware Exchange (HS978E)</p> <p>3-year, 24x7 software phone support, software updates + 4 hour Hardware Exchange (HS979E)</p> <p>4-year, 24x7 software phone support, software updates + Next Business Day Hardware Exchange (HS988E)</p> <p>4-year, 24x7 software phone support, software updates + 4 hour Hardware Exchange (HS989E)</p> <p>5-year, 24x7 software phone support, software updates + Next Business Day Hardware Exchange (HS998E)</p> <p>5-year, 24x7 software phone support, software updates + 4 hour Hardware Exchange (HS999E)</p> <p>Refer to the HP website at www.hp.com/networking/services for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local HP sales office.</p>

Specifications (continued)

HP 2620-48 Switch (J9626A)

Standards and protocols (applies to all products in series)

Device management

RFC 1591 DNS (client)
HTML and telnet management

General protocols

IEEE 802.1D MAC Bridges
IEEE 802.1p Priority
IEEE 802.1Q VLANs
IEEE 802.1s Multiple Spanning Trees
IEEE 802.1v VLAN classification by Protocol and Port
IEEE 802.1w Rapid Reconfiguration of Spanning Tree
IEEE 802.3ad Link Aggregation Control Protocol (LACP)
IEEE 802.3x Flow Control
RFC 768 UDP
RFC 783 TFTP Protocol (revision 2)
RFC 792 ICMP
RFC 793 TCP
RFC 826 ARP
RFC 854 TELNET
RFC 868 Time Protocol
RFC 951 BOOTP
RFC 1058 RIPv1
RFC 1350 TFTP Protocol (revision 2)
RFC 2030 Simple Network Time Protocol (SNTP) v4
RFC 2131 DHCP
RFC 2453 RIPv2
RFC 3046 DHCP Relay Agent Information Option

IP multicast

RFC 3376 IGMPv3 (host joins only)

HP 2620-48-PoE+ Switch (J9627A)

IPv6

RFC 1981 IPv6 Path MTU Discovery
RFC 2460 IPv6 Specification
RFC 2710 Multicast Listener Discovery (MLD) for IPv6
RFC 2925 Remote Operations MIB (Ping only)
RFC 3019 MLDv1 MIB
RFC 3315 DHCPv6 (client only)
RFC 3513 IPv6 Addressing Architecture
RFC 3596 DNS Extension for IPv6
RFC 3810 Multicast Listener Discovery Version 2 (MLDv2) for IPv6
RFC 4022 MIB for TCP
RFC 4113 MIB for UDP
RFC 4251 SSHv6 Architecture
RFC 4252 SSHv6 Authentication
RFC 4253 SSHv6 Transport Layer
RFC 4254 SSHv6 Connection
RFC 4293 MIB for IP
RFC 4419 Key Exchange for SSH
RFC 4443 ICMPv6
RFC 4541 IGMP & MLD Snooping Switch
RFC 4861 IPv6 Neighbor Discovery
RFC 4862 IPv6 Stateless Address Auto-configuration

MIBs

RFC 1213 MIB II
RFC 1493 Bridge MIB
RFC 1724 RIPv2 MIB
RFC 2021 RMONv2 MIB
RFC 2613 SMON MIB
RFC 2618 RADIUS Client MIB
RFC 2620 RADIUS Accounting MIB
RFC 2665 Ethernet-Like-MIB
RFC 2668 802.3 MAU MIB
RFC 2674 802.1p and IEEE 802.1Q Bridge MIB
RFC 2737 Entity MIB (Version 2)

RFC 2863 The Interfaces Group MIB
RFC 2925 Ping MIB

Network management

IEEE 802.1AB Link Layer Discovery Protocol (LLDP)
RFC 2819 Four groups of RMON: 1 (statistics), 2 (history), 3 (alarm) and 9 (events)
RFC 3176 sFlow
ANSI/TIA-1057 LLDP Media Endpoint Discovery (LLDP-MED)
SNMPv1/v2c/v3
XRMON

QoS/CoS

RFC 2474 DiffServ Precedence, including 8 queues/port
RFC 2597 DiffServ Assured Forwarding (AF)
RFC 2598 DiffServ Expedited Forwarding (EF) Ingress Rate Limiting

Security

IEEE 802.1X Port Based Network Access Control
RFC 1492 TACACS+
RFC 2138 RADIUS Authentication
RFC 2866 RADIUS Accounting
Secure Sockets Layer (SSL)

HP 2620 Switch Series accessories

Transceivers

HP X121 1G SFP LC SX Transceiver (J4858C)
HP X121 1G SFP LC LX Transceiver (J4859C)
HP X121 1G SFP LC LH Transceiver (J4860C)
HP X121 1G SFP RJ45 T Transceiver (J8177C)
HP X111 100M SFP LC FX Transceiver (J9054C)
HP X112 100M SFP LC BX-D Transceiver (J9099B)
HP X112 100M SFP LC BX-U Transceiver (J9100B)
HP X122 1G SFP LC BX-D Transceiver (J9142B)
HP X122 1G SFP LC BX-U Transceiver (J9143B)

Cables

HP 0.5 m Multimode OM3 LC/LC Optical Cable (AJ833A)
HP 1 m Multimode OM3 LC/LC Optical Cable (AJ834A)
HP 2 m Multimode OM3 LC/LC Optical Cable (AJ835A)
HP 5 m Multimode OM3 LC/LC Optical Cable (AJ836A)
HP 15 m Multimode OM3 LC/LC Optical Cable (AJ837A)
HP 30 m Multimode OM3 LC/LC Optical Cable (AJ838A)
HP 50 m Multimode OM3 LC/LC Optical Cable (AJ839A)
NEW HP 0.5 m PremierFlex OM3+ LC/LC Optical Cable (BK837A)
NEW HP 1 m PremierFlex OM3+ LC/LC Optical Cable (BK838A)
NEW HP 2 m PremierFlex OM3+ LC/LC Optical Cable (BK839A)
NEW HP 5 m PremierFlex OM3+ LC/LC Optical Cable (BK840A)
NEW HP 15 m PremierFlex OM3+ LC/LC Optical Cable (BK841A)

NEW HP 30 m PremierFlex OM3+ LC/LC Optical Cable (BK842A)

NEW HP 50 m PremierFlex OM3+ LC/LC Optical Cable (BK843A)

Mounting Kit

HP X410 1U Universal 4-post Rack Mounting Kit (J9583A)

HP 2620-24 Switch (J9623A)

HP 600 Redundant and External Power Supply (J8168A)

HP 2620-24-PPoE+ Switch (J9624A)

HP 600 Redundant and External Power Supply (J8168A)

HP 2620-24-PoE+ Switch (J9625A)

HP 630 Redundant and/or External Power Supply (J9443A)

HP 620 Redundant/External Power Supply (J8696A)

HP 2620-48 Switch (J9626A)

HP 600 Redundant and External Power Supply (J8168A)

HP 2620-48-PoE+ Switch (J9627A)

HP 630 Redundant and/or External Power Supply (J9443A)

HP 620 Redundant/External Power Supply (J8696A)



Products within this series have achieved sufficient scores in each of the rated criteria to achieve the Miercom Certified Green distinction Award. See the Specifications section of this series for more information.

Products within this series are IPv6 Ready certified. See the Specifications section of this series for more information.

To learn more, visit www.hp.com/networking

© Copyright 2011 Hewlett-Packard Development Company, L.P. The information contained herein is subject to change without notice. The only warranties for HP products and services are set forth in the express warranty statements accompanying such products and services. Nothing herein should be construed as constituting an additional warranty. HP shall not be liable for technical or editorial errors or omissions contained herein.

4AA3-7117ENW, Created September 2011





HP 3800 Switch Series

Data sheet

Product overview

The HP 3800 Switch Series is a family of fully managed Gigabit Ethernet switches. There are a total of nine switch models—a 24-port switch, a 48-port switch, a 24-port PoE+ switch, a 48-port PoE+ switch with either SFP+ or 10GBASE-T uplinks, and a 24-port SFP switch with 2 SFP+ uplinks. HP 3800 Series Switches utilize the latest HP ProVision ASIC technology and combine the latest advances in hardware engineering to deliver one of the most resilient and energy-efficient switches in the industry. The 3800 series implements the HP FlexChassis Mesh technology to deliver chassis-like resiliency in a flexible stackable form factor.

Key features

- Fully managed Layer 3 stackable switch series
- Low-latency, highly resilient architecture
- SFP+, 10GBASE-T, PoE+, modular stacking
- FlexChassis Mesh allows stacking up to 10 switches
- Industry-leading lifetime warranty



Features and benefits

Quality of Service (QoS)

- **Layer 4 prioritization:** enables prioritization based on TCP/UDP port numbers
- **Class of Service (CoS):** sets the IEEE 802.1p priority tag based on IP address, IP Type of Service (ToS), Layer 3 protocol, TCP/UDP port number, source port, and DiffServ
- **Bandwidth shaping:**
 - **Port-based rate limiting:** provides per-port ingress-/egress-enforced maximum bandwidth
 - **Classifier-based rate limiting:** uses an access control list (ACL) to enforce maximum bandwidth for ingress traffic on each port
 - **Guaranteed minimum:** provides per-port, per-queue egress-based guaranteed minimum bandwidth
- **Advanced classifier-based QoS:** classifies traffic using multiple match criteria based on Layer 2, 3, and 4 information; applies QoS policies such as setting priority level and rate limit to selected traffic on a per-port or per-VLAN basis
- **Remote Intelligent Mirroring:** mirrors selected ingress/egress traffic based on ACL, port, MAC address, or VLAN to a local or remote HP 8200 zl, 6600, 6200 yl, 5400 zl, 3800, or 3500 switch anywhere on the network
- **RMON, XRMON, and sFlow v5:** provide advanced monitoring and reporting capabilities for statistics, history, alarms, and events
- **Traffic prioritization:** allows real-time traffic classification into eight priority levels mapped to eight queues

Management

- **Friendly port names:** allow assignment of descriptive names to ports
- **IEEE 802.1AB Link Layer Discovery Protocol (LLDP):** automated device discovery protocol provides easy mapping by network management applications
- **Command authorization:** leverages RADIUS to link a custom list of CLI commands to an individual network administrator's login; also provides an audit trail

- **Uni-Directional Link Detection (UDLD):** monitors cable between two switches and shuts down the ports on both ends if the cable is broken, turning the bidirectional link into a unidirectional one; this prevents network problems such as loops
- **Multiple configuration files:** can be stored to the flash image
- **Dual flash images:** provide independent primary and secondary operating system files for backup while upgrading
- **Out-of-band Ethernet management port:** for management over a separate physical management network; keeps management traffic segmented from network data traffic

Connectivity

- **Jumbo frames:** on Gigabit Ethernet and 10-Gigabit ports, they allow high-performance remote backup and disaster recovery services
- **IPv6:**
 - **IPv6 host:** enables switches to be managed and deployed at the IPv6 network's edge
 - **Dual stack (IPv4 and IPv6):** transitions from IPv4 to IPv6, supporting connectivity for both protocols
 - **MLD snooping:** forwards IPv6 multicast traffic to the appropriate interface
 - **IPv6 ACL/QoS:** supports ACL and QoS for IPv6 network traffic, preventing traffic flooding
 - **IPv6 routing:** supports static and OSPFv3 routing protocols
- **IEEE 802.3at Power Over Ethernet Plus (PoE+):** provides up to 30 W per port to IEEE 802.3 for PoE-/PoE+-powered devices such as video IP phones, IEEE 802.11n wireless access points, and advanced pan/zoom/tilt security cameras
- **Pre-standard PoE support:** detects and provides power to pre-standard PoE devices; see list of supported devices in the product FAQs at www.hp.com/networking
- **Choice of uplinks:**
 - **SFP+ uplink models:** for fiber optic (up to 70 km) or direct attach cable (DAC) connectivity
 - **10GBASE-T uplink models:** for 10 GbE speeds using standard RJ-45 connectors and standard twisted pair cabling up to 100 m
- **Auto-MDIX:** automatically adjusts for straight-through or crossover cables on all RJ-45 ports

Performance

- **Selectable queue configurations:** allow you to increase performance by selecting the number of queues and associated memory buffering that best meet the requirements of your network applications
- **Energy-efficient design:**
 - **High-efficiency power supplies:** 80 PLUS GOLD certified power supplies for increased power savings
 - **Energy-efficient Ethernet support:** IEEE 802.3az support for reduced power consumption
- **FlexChassis Mesh technology:**
 - **High-performance stacking:** up to 336 Gbps of stacking throughput; each 4-port stacking module can support up to 42 Gbps in each direction per stacking port
 - **Ring, chain, and mesh topologies:** support up to a 10-member ring or chain and 5-member fully meshed stacks; meshed topologies offer increased resiliency vs. a standard ring
 - **Virtualized switching:** when stacked, switches appear as a single chassis for simplified management
- **HP ProVision ASIC architecture:** designed with the latest HP ProVision ASIC, with very low latency, increased packet buffering, and adaptive power consumption

Resiliency and high availability

- **IEEE 802.3ad Link Aggregation Protocol (LACP) and HP port trunking:** support up to 24 trunks, each with up to 8 links (ports) per trunk
- **IEEE 802.1s Multiple Spanning Tree:** provides high link availability in multiple VLAN environments by allowing multiple spanning trees; provides legacy support for IEEE 802.1d and IEEE 802.1w
- **Virtual Router Redundancy Protocol (VRRP):** allows groups of two routers to dynamically back each other up to create highly available routed environments
- **Dual hot-swappable power supplies:**
 - **Increased resiliency:** second power supply can allow for complete switch power redundancy in case of power line or supply failure
 - **Increased PoE+ power:** second power supply can increase total available PoE+ power

Layer 2 switching

- **HP's switch meshing:** dynamically load balances across multiple active redundant links to increase available aggregate bandwidth
- **GARP VLAN Registration Protocol:** allows automatic learning and dynamic assignment of VLANs
- **IEEE 802.1ad QinQ:** increases the scalability of an Ethernet network by providing a hierarchical structure; connects multiple LANs on a high-speed campus or metro network
- **VLAN support and tagging:** supports the IEEE 802.1Q standard and 2,048 VLANs simultaneously
- **IEEE 802.1v protocol VLANs:** isolate select non-IPv4 protocols automatically into their own VLANs

Layer 3 services

- **Loopback interface address:** defines an address in Routing Information Protocol (RIP) and OSPF that can always be reachable, improving diagnostic capability
- **Route maps:** provide more control during route redistribution; allow filtering and altering of route metrics
- **User Datagram Protocol (UDP) helper function:** allows UDP broadcasts to be directed across router interfaces to specific IP unicast or subnet broadcast addresses and prevents server spoofing for UDP services such as DHCP

Layer 3 routing

- **Routing Information Protocol (RIP):** provides RIPv1 and RIPv2 routing
- **Static IP routing:** provides manually configured routing for both IPv4 and IPv6 networks
- **OSPF:** provides OSPFv2 for IPv4 routing and OSPFv3 for IPv6 routing

Security

- **Source-port filtering:** allows only specified ports to communicate with each other
- **RADIUS/TACACS+:** eases switch management security administration by using a password authentication server
- **Secure Shell:** encrypts all transmitted data for secure remote CLI access over IP networks
- **Secure Sockets Layer (SSL):** encrypts all HTTP traffic, allowing secure access to the browser-based management GUI in the switch

- **Port security:** allows access only to specified MAC addresses, which can be learned or specified by the administrator
- **MAC address lockout:** prevents particular configured MAC addresses from connecting to the network
- **Detection of malicious attacks:** monitors 10 types of network traffic and sends a warning when an anomaly that potentially can be caused by malicious attacks is detected
- **Secure FTP:** allows secure file transfer to and from the switch; protects against unwanted file downloads or unauthorized copying of a switch configuration file
- **Switch management logon security:** can require either RADIUS or TACACS+ authentication for secure switch CLI logon
- **Secure management access:** securely encrypts all access methods (CLI, GUI, or MIB) through SSHv2, SSL, and/or SNMPv3
- **ICMP throttling:** defeats ICMP denial-of-service attacks by enabling any switch port to automatically throttle ICMP traffic
- **Virus throttling:** detects traffic patterns typical of WORM-type viruses and either throttles or entirely prevents the virus from spreading across the routed VLANs or bridged interfaces without requiring external appliances
- **Identity-driven ACL:** enables implementation of a highly granular and flexible access security policy and VLAN assignment specific to each authenticated network user
- **STP BPDU port protection:** blocks Bridge Protocol Data Units (BPDUs) on ports that do not require BPDUs, preventing forged BPDU attacks
- **Dynamic IP lockdown:** works with DHCP protection to block traffic from unauthorized hosts, preventing IP source address spoofing
- **DHCP protection:** blocks DHCP packets from unauthorized DHCP servers, preventing denial-of-service attacks
- **Dynamic ARP protection:** blocks ARP broadcasts from unauthorized hosts, preventing eavesdropping or theft of network data
- **STP Root Guard:** protects the root bridge from malicious attack or configuration mistakes
- **Management Interface Wizard:** helps ensure that management interfaces such as SNMP, telnet, SSH, SSL, Web, and USB are secured at the desired level
- **Security banner:** displays a customized security policy when users log in to the switch
- **Switch CPU protection:** provides automatic protection against malicious network traffic trying to shut down the switch
- **USB Secure Autorun:** deploys, diagnoses, and updates switch using a USB flash drive; works with a secure credential to prevent tampering (requires HP PMC+)
- **Access control lists (ACLs):** provide filtering based on the IP field, source/destination IP address/subnet, and source/destination TCP/UDP port number on a per-VLAN or per-port basis
- **Multiple Authentication Methods:**
 - **IEEE 802.1X:** authentication of multiple IEEE 802.1X users per port; prevents user "piggybacking" on another user's authentication
 - **Web-based authentication:** authenticates from Web browser for clients that do not support IEEE 802.1X supplicant
 - **MAC-based authentication:** client is authenticated with the RADIUS server based on client's MAC address
 - **Concurrent authentication modes:** each switch port will accept up to 32 sessions of IEEE 802.1X, Web, and MAC authentications

Convergence

- **IP multicast snooping (data-driven IGMP):** automatically prevents flooding of IP multicast traffic
- **LLDP-MED (Media Endpoint Discovery):** is a standard extension of LLDP that stores values for parameters such as QoS and VLAN to automatically configure network devices such as IP phones
- **RADIUS VLAN for voice:** uses a standard RADIUS attribute and LLDP-MED to automatically configure a VLAN for IP phones
- **PoE allocations:** support multiple methods (automatic, IEEE 802.3af class, LLDP-MED, or user specified) to allocate PoE power for more efficient energy savings
- **IP multicast routing:** includes PIM Sparse and Dense modes to route IP multicast traffic

Warranty and support

- **Lifetime warranty:** for as long as you own the product with advance replacement and next-business-day delivery (available in most countries)*

*Hardware warranty replacement for as long as you own the product, with next business day advance replacement (available in most countries) with a five-year hardware warranty replacement for the disk drive included with HP AllianceONE Services z1 Module, HP Threat Management Services z1 Module, HP PCM+ Agent with AllianceONE Services z1 Module, and HP E-MSM765 z1 Mobility Controller. For details, refer to the HP Software License, Warranty, and Support booklet at www.hp.com/networking/warranty.

- **Electronic and telephone support:** limited electronic and telephone support is available from HP; refer to www.hp.com/networking/warranty for details on the support provided and the period during which support is available
- **Software releases:** refer to www.hp.com/networking/warranty for details on the software releases provided and the period during which software releases are available for your product(s)

HP 3800 Switch Series

Specifications



HP 3800-24G-PoE+-2SFP+ Switch (J9573A)



HP 3800-48G-PoE+-4SFP+ Switch (J9574A)



HP 3800-24G-2SFP+ Switch (J9575A)

Included accessories	1 HP 3800 Switch Fan Tray (J9582A) 1 HP X312 1000W 100-240VAC to 54VDC Power Supply (J9580A)	1 HP 3800 Switch Fan Tray (J9582A) 1 HP X312 1000W 100-240VAC to 54VDC Power Supply (J9580A)	1 HP 3800 Switch Fan Tray (J9582A) 1 HP X311 400W 100-240VAC to 12VDC Power Supply (J9581A)
Ports	24 RJ-45 autosensing 10/100/1000 PoE+ ports (IEEE 802.3 Type 10BASE-T, IEEE 802.3u Type 100BASE-TX, IEEE 802.3ab Type 1000BASE-T, IEEE 802.3at PoE+); Duplex: 10BASE-T/100BASE-TX: half or full; 1000BASE-T: full only 2 fixed 1000/10000 SFP+ ports 1 RJ-45 serial console port 1 RJ-45 out-of-band management port 1 Stacking module slot	48 RJ-45 autosensing 10/100/1000 PoE+ ports (IEEE 802.3 Type 10BASE-T, IEEE 802.3u Type 100BASE-TX, IEEE 802.3ab Type 1000BASE-T, IEEE 802.3at PoE+); Duplex: 10BASE-T/100BASE-TX: half or full; 1000BASE-T: full only 4 fixed 1000/10000 SFP+ ports 1 RJ-45 serial console port 1 RJ-45 out-of-band management port 1 Stacking module slot	24 RJ-45 autosensing 10/100/1000 ports (IEEE 802.3 Type 10BASE-T, IEEE 802.3u Type 100BASE-TX, IEEE 802.3ab Type 1000BASE-T); Duplex: 10BASE-T/100BASE-TX: half or full; 1000BASE-T: full only 2 fixed 1000/10000 SFP+ ports 1 RJ-45 serial console port 1 RJ-45 out-of-band management port 1 Stacking module slot
Power supplies	2 power supply slots 1 minimum power supply required includes: 1 x J9580A (HP X312 1000W 100-240VAC to 54VDC Power Supply)	2 power supply slots 1 minimum power supply required includes: 1 x J9580A (HP X312 1000W 100-240VAC to 54VDC Power Supply)	2 power supply slots 1 minimum power supply required includes: 1 x J9581A (HP X311 400W 100-240VAC to 12VDC Power Supply)
Fan tray	includes: 1 x J9582A 1 fan tray slot	includes: 1 x J9582A 1 fan tray slot	includes: 1 x J9582A 1 fan tray slot
Physical characteristics			
Dimensions	18.4(d) x 17.43(w) x 1.7(h) in. (46.74 x 44.27 x 4.32 cm) (1U height)	18.4(d) x 17.43(w) x 1.7(h) in. (46.74 x 44.27 x 4.32 cm) (1U height)	18.4(d) x 17.43(w) x 1.7(h) in. (46.74 x 44.27 x 4.32 cm) (1U height)
Weight	15.9 lb. (7.21 kg) switch chassis with 1 power supply and fan tray installed	16.84 lb. (7.64 kg) switch chassis with 1 power supply and fan tray installed	15.25 lb. (6.92 kg) switch chassis with 1 power supply and fan tray installed
Memory and processor			
Processor	HP ProVision ASIC/ARM @ 350 MHz; Freescale PowerPC @ 1200 MHz, 4 GB flash, 2 GB SDRAM; packet buffer size: 18 MB dynamic	HP ProVision ASIC/ARM @ 350 MHz; Freescale PowerPC @ 1200 MHz, 4 GB flash, 2 GB SDRAM; packet buffer size: 36 MB dynamic	HP ProVision ASIC/ARM @ 350 MHz; Freescale PowerPC @ 1200 MHz, 4 GB flash, 2 GB SDRAM; packet buffer size: 18 MB dynamic
Mounting	Mounts in an EIA-standard 19 in. telco rack or equipment cabinet (hardware included); horizontal surface mounting only	Mounts in an EIA-standard 19 in. telco rack or equipment cabinet (hardware included); horizontal surface mounting only	Mounts in an EIA-standard 19 in. telco rack or equipment cabinet (hardware included); horizontal surface mounting only
Performance			
1000 Mb Latency	< 2.8 μ s (LIFO 64-byte packets)	< 2.8 μ s (LIFO 64-byte packets)	< 2.8 μ s (LIFO 64-byte packets)
10 Gbps Latency	< 1.9 μ s (LIFO 64-byte packets)	< 1.9 μ s (LIFO 64-byte packets)	< 1.9 μ s (LIFO 64-byte packets)
Throughput	65.4 million pps (64-byte packets)	130.9 million pps (64-byte packets)	65.4 million pps (64-byte packets)
Switching capacity	88 Gbps	176 Gbps	88 Gbps
Routing table size	10000 entries	10000 entries	10000 entries
MAC address table size	65500 entries	65500 entries	65500 entries
Environment			
Operating temperature	32°F to 131°F (0°C to 55°C); max temperature is 45°C when transceivers are installed	32°F to 131°F (0°C to 55°C); max temperature is 45°C when transceivers are installed	32°F to 131°F (0°C to 55°C); max temperature is 45°C when transceivers are installed
Operating relative humidity	15% to 95% @ 104°F (40°C), noncondensing	15% to 95% @ 104°F (40°C), noncondensing	15% to 95% @ 104°F (40°C), noncondensing
Nonoperating/Storage temperature	-40°F to 158°F (-40°C to 70°C)	-40°F to 158°F (-40°C to 70°C)	-40°F to 158°F (-40°C to 70°C)
Nonoperating/Storage relative humidity	15% to 90% @ 149°F (65°C), noncondensing	15% to 90% @ 149°F (65°C), noncondensing	15% to 90% @ 149°F (65°C), noncondensing
Altitude	up to 10,000 ft. (3 km)	up to 10,000 ft. (3 km)	up to 10,000 ft. (3 km)
Acoustic	Power: 49 dB, Pressure: 33.7 dB	Power: 57 dB, Pressure: 41.2 dB	Power: 36 dB, Pressure: 26.4 dB
Electrical characteristics			
Maximum heat dissipation	434 BTU/hr (457.87 kJ/hr)	635 BTU/hr (669.93 kJ/hr)	434 BTU/hr (457.87 kJ/hr)
Voltage	100-120/200-240 VAC	100-120/200-240 VAC	100-127/200-240 VAC
Current	9.4/7.8 A	9.4/7.8 A	6/3 A
Idle power	70 W	97 W	66 W
Maximum power rating	127 W	186 W	127 W
PoE power	720 W	1080 W	
Frequency	50/60 Hz	50/60 Hz	50/60 Hz

HP 3800 Switch Series

Specifications (continued)

	HP 3800-24G-PoE+-2SFP+ Switch (J9573A)	HP 3800-48G-PoE+-4SFP+ Switch (J9574A)	HP 3800-24G-2SFP+ Switch (J9575A)
Notes	<p>Idle power is the actual power consumption of the device with no ports connected.</p> <p>Maximum power rating and maximum heat dissipation are the worst-case theoretical maximum numbers provided for planning the infrastructure with fully loaded PoE (if equipped), 100% traffic, all ports plugged in, and all modules populated.</p> <p>PoE Power is the power supplied by the internal power supply, it is dependent on the type and quantity of power supplies and may be supplemented with the use of an External Power Supply (EPS).</p> <p>With a single power supply @ 120 V input, a maximum of 572 W of PoE power is available.</p>	<p>Idle power is the actual power consumption of the device with no ports connected.</p> <p>Maximum power rating and maximum heat dissipation are the worst-case theoretical maximum numbers provided for planning the infrastructure with fully loaded PoE (if equipped), 100% traffic, all ports plugged in, and all modules populated.</p> <p>PoE Power is the power supplied by the internal power supply, it is dependent on the type and quantity of power supplies and may be supplemented with the use of an External Power Supply (EPS).</p> <p>With a single power supply @ 120 V input, a maximum of 514 W of PoE power is available.</p> <p>With a single power supply @ 240 V, a maximum of 814 W of PoE power is available.</p>	<p>Idle power is the actual power consumption of the device with no ports connected.</p> <p>Maximum power rating and maximum heat dissipation are the worst-case theoretical maximum numbers provided for planning the infrastructure with fully loaded PoE (if equipped), 100% traffic, all ports plugged in, and all modules populated.</p>
Safety	EN 60950/IEC 60950; UL 60950; CAN/CSA 22.2 No. 60950; EN 60825	EN 60950/IEC 60950; UL 60950; CAN/CSA 22.2 No. 60950; EN 60825	EN 60950/IEC 60950; UL 60950; CAN/CSA 22.2 No. 60950; EN 60825
Emissions	FCC Class A; VCCI Class A; EN 55022/CISPR 22 Class A	FCC Class A; VCCI Class A; EN 55022/CISPR 22 Class A	FCC Class A; VCCI Class A; EN 55022/CISPR 22 Class A
Immunity			
EN	EN 55024, CISPR 24	EN 55024, CISPR 24	EN 55024, CISPR 24
ESD	IEC 61000-4-2	IEC 61000-4-2	IEC 61000-4-2
Radiated	IEC 61000-4-3; 3 V/m	IEC 61000-4-3; 3 V/m	IEC 61000-4-3; 3 V/m
EFT/Burst	IEC 61000-4-4; 1.0 kV (power line), 0.5 kV (signal line)	IEC 61000-4-4; 1.0 kV (power line), 0.5 kV (signal line)	IEC 61000-4-4; 1.0 kV (power line), 0.5 kV (signal line)
Surge	IEC 61000-4-5; 1 kV/2 kV AC	IEC 61000-4-5; 1 kV/2 kV AC	IEC 61000-4-5; 1 kV/2 kV AC
Conducted	IEC 61000-4-6; 3 V	IEC 61000-4-6; 3 V	IEC 61000-4-6; 3 V
Power frequency magnetic field	IEC 61000-4-8; 1 A/m, 50 or 60 Hz	IEC 61000-4-8; 1 A/m, 50 or 60 Hz	IEC 61000-4-8; 1 A/m, 50 or 60 Hz
Voltage dips and interruptions	IEC 61000-4-11; >95% reductions, 0.5 period; 30% reduction, 25 periods	IEC 61000-4-11; >95% reductions, 0.5 period; 30% reduction, 25 periods	IEC 61000-4-11; >95% reductions, 0.5 period; 30% reduction, 25 periods
Harmonics	EN 61000-3-2, IEC 61000-3-2	EN 61000-3-2, IEC 61000-3-2	EN 61000-3-2, IEC 61000-3-2
Flicker	EN 61000-3-3, IEC 61000-3-3	EN 61000-3-3, IEC 61000-3-3	EN 61000-3-3, IEC 61000-3-3
Management	HP PCM+; HP PCM; command-line interface; Web browser; configuration menu	HP PCM+; HP PCM; command-line interface; Web browser; configuration menu	HP PCM+; HP PCM; command-line interface; Web browser; configuration menu
Services	<p>3-year, 4-hour onsite, 13x5 coverage for hardware (HT021E)</p> <p>3-year, 4-hour onsite, 24x7 coverage for hardware (HT023E)</p> <p>3-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 SW phone support and SW updates (HT028E)</p> <p>3-year, 24x7 SW phone support, software updates (HT027E)</p> <p>4-year, 4-hour onsite, 13x5 coverage for hardware (HT031E)</p> <p>4-year, 4-hour onsite, 24x7 coverage for hardware (HT033E)</p> <p>4-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 software phone (HT038E)</p> <p>4-year, 24x7 SW phone support, software updates (HT037E)</p> <p>5-year, 4-hour onsite, 13x5 coverage for hardware (HT041E)</p> <p>5-year, 4-hour onsite, 24x7 coverage for hardware (HT043E)</p> <p>5-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 software phone (HT048E)</p> <p>5-year, 24x7 SW phone support, software updates (HT047E)</p> <p>3 Yr 6 hr Call-to-Repair Onsite (HT025E)</p> <p>4 Yr 6 hr Call-to-Repair Onsite (HT035E)</p> <p>5 Yr 6 hr Call-to-Repair Onsite (HT045E)</p> <p>1-year, 4-hour onsite, 13x5 coverage for hardware (HT011E)</p>	<p>3-year, 4-hour onsite, 13x5 coverage for hardware (HT021E)</p> <p>3-year, 4-hour onsite, 24x7 coverage for hardware (HT023E)</p> <p>3-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 SW phone support and SW updates (HT028E)</p> <p>3-year, 24x7 SW phone support, software updates (HT027E)</p> <p>4-year, 4-hour onsite, 13x5 coverage for hardware (HT031E)</p> <p>4-year, 4-hour onsite, 24x7 coverage for hardware (HT033E)</p> <p>4-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 software phone (HT038E)</p> <p>4-year, 24x7 SW phone support, software updates (HT037E)</p> <p>5-year, 4-hour onsite, 13x5 coverage for hardware (HT041E)</p> <p>5-year, 4-hour onsite, 24x7 coverage for hardware (HT043E)</p> <p>5-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 software phone (HT048E)</p> <p>5-year, 24x7 SW phone support, software updates (HT047E)</p> <p>3 Yr 6 hr Call-to-Repair Onsite (HT025E)</p> <p>4 Yr 6 hr Call-to-Repair Onsite (HT035E)</p> <p>5 Yr 6 hr Call-to-Repair Onsite (HT045E)</p> <p>1-year, 4-hour onsite, 13x5 coverage for hardware (HT011E)</p>	<p>3-year, 4-hour onsite, 13x5 coverage for hardware (HT021E)</p> <p>3-year, 4-hour onsite, 24x7 coverage for hardware (HT023E)</p> <p>3-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 SW phone support and SW updates (HT028E)</p> <p>3-year, 24x7 SW phone support, software updates (HT027E)</p> <p>4-year, 4-hour onsite, 13x5 coverage for hardware (HT031E)</p> <p>4-year, 4-hour onsite, 24x7 coverage for hardware (HT033E)</p> <p>4-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 software phone (HT038E)</p> <p>4-year, 24x7 SW phone support, software updates (HT037E)</p> <p>5-year, 4-hour onsite, 13x5 coverage for hardware (HT041E)</p> <p>5-year, 4-hour onsite, 24x7 coverage for hardware (HT043E)</p> <p>5-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 software phone (HT048E)</p> <p>5-year, 24x7 SW phone support, software updates (HT047E)</p> <p>3 Yr 6 hr Call-to-Repair Onsite (HT025E)</p> <p>4 Yr 6 hr Call-to-Repair Onsite (HT035E)</p> <p>5 Yr 6 hr Call-to-Repair Onsite (HT045E)</p> <p>1-year, 4-hour onsite, 13x5 coverage for hardware (HT011E)</p>

Specifications (continued)

HP 3800-24G-PoE+-2SFP+ Switch (J9573A)	HP 3800-48G-PoE+-4SFP+ Switch (J9574A)	HP 3800-24G-2SFP+ Switch (J9575A)
<p>1-year, 4-hour onsite, 24x7 coverage for hardware (HT013E)</p> <p>1-year, 6 hour Call-To-Repair Onsite for hardware (HT015E)</p> <p>1-year, 24x7 software phone support, software updates (HT017E)</p> <p>1-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 software phone support and software updates (HT018E)</p> <p>1-year, 24x7 software phone support, software updates + Next Business Day Hardware Exchange (HT009E)</p> <p>1-year, 24x7 software phone support, software updates + 4 hour hardware exchange (HT010E)</p> <p>3-year, 24x7 software phone support, software updates + Next Business Day Hardware Exchange (HT019E)</p> <p>3-year, 24x7 software phone support, software updates + 4 hour Hardware Exchange (HT020E)</p> <p>4-year, 24x7 software phone support, software updates + Next Business Day Hardware Exchange (HT029E)</p> <p>4-year, 24x7 software phone support, software updates + 4 hour Hardware Exchange (HT030E)</p> <p>5-year, 24x7 software phone support, software updates + Next Business Day Hardware Exchange (HT039E)</p> <p>5-year, 24x7 software phone support, software updates + 4 hour Hardware Exchange (HT040E)</p> <p>Refer to the HP website at www.hp.com/networking/services for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local HP sales office.</p>	<p>1-year, 4-hour onsite, 24x7 coverage for hardware (HT013E)</p> <p>1-year, 6 hour Call-To-Repair Onsite for hardware (HT015E)</p> <p>1-year, 24x7 software phone support, software updates (HT017E)</p> <p>1-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 software phone support and software updates (HT018E)</p> <p>1-year, 24x7 software phone support, software updates + Next Business Day Hardware Exchange (HT009E)</p> <p>1-year, 24x7 software phone support, software updates + 4 hour hardware exchange (HT010E)</p> <p>3-year, 24x7 software phone support, software updates + Next Business Day Hardware Exchange (HT019E)</p> <p>3-year, 24x7 software phone support, software updates + 4 hour Hardware Exchange (HT020E)</p> <p>4-year, 24x7 software phone support, software updates + Next Business Day Hardware Exchange (HT029E)</p> <p>4-year, 24x7 software phone support, software updates + 4 hour Hardware Exchange (HT030E)</p> <p>5-year, 24x7 software phone support, software updates + Next Business Day Hardware Exchange (HT039E)</p> <p>5-year, 24x7 software phone support, software updates + 4 hour Hardware Exchange (HT040E)</p> <p>Refer to the HP website at www.hp.com/networking/services for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local HP sales office.</p>	<p>1-year, 4-hour onsite, 24x7 coverage for hardware (HT013E)</p> <p>1-year, 6 hour Call-To-Repair Onsite for hardware (HT015E)</p> <p>1-year, 24x7 software phone support, software updates (HT017E)</p> <p>1-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 software phone support and software updates (HT018E)</p> <p>1-year, 24x7 software phone support, software updates + Next Business Day Hardware Exchange (HT009E)</p> <p>1-year, 24x7 software phone support, software updates + 4 hour hardware exchange (HT010E)</p> <p>3-year, 24x7 software phone support, software updates + Next Business Day Hardware Exchange (HT019E)</p> <p>3-year, 24x7 software phone support, software updates + 4 hour Hardware Exchange (HT020E)</p> <p>4-year, 24x7 software phone support, software updates + Next Business Day Hardware Exchange (HT029E)</p> <p>4-year, 24x7 software phone support, software updates + 4 hour Hardware Exchange (HT030E)</p> <p>5-year, 24x7 software phone support, software updates + Next Business Day Hardware Exchange (HT039E)</p> <p>5-year, 24x7 software phone support, software updates + 4 hour Hardware Exchange (HT040E)</p> <p>Refer to the HP website at www.hp.com/networking/services for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local HP sales office.</p>

Specifications (continued)

	HP 3800-24G-PoE+-2SFP+ Switch (J9573A)	HP 3800-48G-PoE+-4SFP+ Switch (J9574A)	HP 3800-24G-2SFP+ Switch (J9575A)
Standards and protocols (applies to all products in series)	Device management RFC 1591 DNS (client) HTML and telnet management		

HP 3800 Switch Series

Specifications (continued)



HP 3800-48G-4SFP+ Switch (J9576A)



HP 3800-24G-2XG Switch (J9585A)



HP 3800-48G-4XG Switch (J9586A)

Included accessories	1 HP 3800 Switch Fan Tray (J9582A) 1 HP X311 400W 100-240VAC to 12VDC Power Supply (J9581A)	1 HP 3800 Switch Fan Tray (J9582A) 1 HP X311 400W 100-240VAC to 12VDC Power Supply (J9581A)	1 HP 3800 Switch Fan Tray (J9582A) 1 HP X311 400W 100-240VAC to 12VDC Power Supply (J9581A)
Ports	48 RJ-45 autosensing 10/100/1000 ports (IEEE 802.3 Type 10BASE-T, IEEE 802.3u Type 100BASE-TX, IEEE 802.3ab Type 1000BASE-T); Duplex: 10BASE-T/100BASE-TX: half or full; 1000BASE-T: full only 4 fixed 1000/10000 SFP+ ports 1 RJ-45 serial console port 1 RJ-45 out-of-band management port 1 Stacking module slot	24 RJ-45 autosensing 10/100/1000 ports (IEEE 802.3 Type 10BASE-T, IEEE 802.3u Type 100BASE-TX, IEEE 802.3ab Type 1000BASE-T); Duplex: 10BASE-T/100BASE-TX: half or full; 1000BASE-T: full only 2 RJ-45 10-GbE ports IEEE 802.3an-2006 Type 10GBASE-T; Duplex: full only 1 RJ-45 serial console port 1 RJ-45 out-of-band management port 1 Stacking module slot	48 RJ-45 autosensing 10/100/1000 ports (IEEE 802.3 Type 10BASE-T, IEEE 802.3u Type 100BASE-TX, IEEE 802.3ab Type 1000BASE-T); Duplex: 10BASE-T/100BASE-TX: half or full; 1000BASE-T: full only 4 RJ-45 10-GbE ports IEEE 802.3an-2006 Type 10GBASE-T; Duplex: full only 1 RJ-45 serial console port 1 RJ-45 out-of-band management port 1 Stacking module slot
Power supplies	2 power supply slots 1 minimum power supply required includes: 1 x J9581A (HP X311 400W 100-240VAC to 12VDC Power Supply)	2 power supply slots 1 minimum power supply required includes: 1 x J9581A (HP X311 400W 100-240VAC to 12VDC Power Supply)	2 power supply slots 1 minimum power supply required includes: 1 x J9581A (HP X311 400W 100-240VAC to 12VDC Power Supply)
Fan tray	includes: 1 x J9582A 1 fan tray slot	includes: 1 x J9582A 1 fan tray slot	includes: 1 x J9582A 1 fan tray slot
Physical characteristics			
Dimensions	18.4(d) x 17.43(w) x 1.7(h) in. (46.74 x 44.27 x 4.32 cm) (1U height)	18.4(d) x 17.43(w) x 1.7(h) in. (46.74 x 44.27 x 4.32 cm) (1U height)	18.4(d) x 17.43(w) x 1.7(h) in. (46.74 x 44.27 x 4.32 cm) (1U height)
Weight	16 lb. (7.26 kg) switch chassis with 1 power supply and fan tray installed	15.8 lb. (7.17 kg) switch chassis with 1 power supply and fan tray installed	16.35 lb. (7.42 kg) switch chassis with 1 power supply and fan tray installed
Memory and processor			
Processor	HP ProVision ASIC/ARM @ 350 MHz; Freescale PowerPC @ 1200 MHz, 4 GB flash, 2 GB SDRAM; packet buffer size: 36 MB dynamic	HP ProVision ASIC/ARM @ 350 MHz; Freescale PowerPC @ 1200 MHz, 4 GB flash, 2 GB SDRAM; packet buffer size: 18 MB dynamic	HP ProVision ASIC/ARM @ 350 MHz; Freescale PowerPC @ 1200 MHz, 4 GB flash, 2 GB SDRAM GB; packet buffer size: 36 MB dynamic
Mounting	Mounts in an EIA-standard 19 in. telco rack or equipment cabinet (hardware included); horizontal surface mounting only	Mounts in an EIA-standard 19 in. telco rack or equipment cabinet (hardware included); horizontal surface mounting only	Mounts in an EIA-standard 19 in. telco rack or equipment cabinet (hardware included); horizontal surface mounting only
Performance			
1000 Mb latency	< 2.8 μs (LIFO 64-byte packets)	< 2.8 μs (LIFO 64-byte packets)	< 2.8 μs (LIFO 64-byte packets)
10 Gbps Latency	< 1.9 μs (LIFO 64-byte packets)	< 1.9 μs (LIFO 64-byte packets)	< 1.9 μs (LIFO 64-byte packets)
Throughput	130.9 million pps (64-byte packets)	65.4 million pps (64-byte packets)	130.9 million pps (64-byte packets)
Switching capacity	176 Gbps	88 Gbps	176 Gbps
Routing table size	10000 entries	10000 entries	10000 entries
MAC address table size	65500 entries	65500 entries	65500 entries
Environment			
Operating temperature	32°F to 131°F (0°C to 55°C); max temperature is 45°C when transceivers are installed	32°F to 131°F (0°C to 55°C)	32°F to 131°F (0°C to 55°C); max temperature is 45°C when SFP+ transceivers are installed
Operating relative humidity	15% to 95% @ 104°F (40°C), noncondensing	15% to 95% @ 104°F (40°C), noncondensing	15% to 95% @ 104°F (40°C), noncondensing
Nonoperating/Storage temperature	-40°F to 158°F (-40°C to 70°C)	-40°F to 158°F (-40°C to 70°C)	-40°F to 158°F (-40°C to 70°C)
Nonoperating/Storage relative humidity	15% to 90% @ 149°F (65°C), noncondensing	15% to 90% @ 149°F (65°C), noncondensing	15% to 90% @ 149°F (65°C), noncondensing
Altitude	up to 10,000 ft. (3 km)	up to 10,000 ft. (3 km)	up to 10,000 ft. (3 km)
Acoustic	Power: 36 dB, Pressure: 25.4 dB	Power: 39 dB, Pressure: 25.5 dB	Power: 34 dB, Pressure: 24.5 dB
Electrical characteristics			
Maximum heat dissipation	635 BTU/hr (669.93 kJ/hr)	434 BTU/hr (457.87 kJ/hr)	635 BTU/hr (669.93 kJ/hr)
Voltage	100-127/200-240 VAC	100-127/200-240 VAC	100-127/200-240 VAC
Current	6/3 A	6/3 A	6/3 A
Idle power	70 W	70 W	74 W
Maximum power rating	186 W	127 W	186 W
Frequency	50/60 Hz	50/60 Hz	50/60 Hz
Notes	Idle power is the actual power consumption of the device with no ports connected. Maximum power rating and maximum heat dissipation are the worst-case theoretical maximum numbers provided for planning the infrastructure with fully loaded PoE (if equipped), 100% traffic, all ports plugged in, and all modules populated.	Idle power is the actual power consumption of the device with no ports connected. Maximum power rating and maximum heat dissipation are the worst-case theoretical maximum numbers provided for planning the infrastructure with fully loaded PoE (if equipped), 100% traffic, all ports plugged in, and all modules populated.	Idle power is the actual power consumption of the device with no ports connected. Maximum power rating and maximum heat dissipation are the worst-case theoretical maximum numbers provided for planning the infrastructure with fully loaded PoE (if equipped), 100% traffic, all ports plugged in, and all modules populated.

HP 3800 Switch Series

Specifications (continued)

	HP 3800-48G-4SFP+ Switch (J9576A)	HP 3800-24G-2XG Switch (J9585A)	HP 3800-48G-4XG Switch (J9586A)
Safety	EN 60950/IEC 60950; UL 60950; CAN/CSA 22.2 No. 60950; EN 60825	EN 60950/IEC 60950; UL 60950; CAN/CSA 22.2 No. 60950; EN 60825	EN 60950/IEC 60950; UL 60950; CAN/CSA 22.2 No. 60950; EN 60825
Emissions	FCC Class A; VCCI Class A; EN 55022/CISPR 22 Class A	FCC Class A; VCCI Class A; EN 55022/CISPR 22 Class A	FCC Class A; VCCI Class A; EN 55022/CISPR 22 Class A
Immunity			
EN	EN 55024, CISPR 24	EN 55024, CISPR 24	EN 55024, CISPR 24
ESD	IEC 61000-4-2	IEC 61000-4-2	IEC 61000-4-2
Radiated	IEC 61000-4-3; 3 V/m	IEC 61000-4-3; 3 V/m	IEC 61000-4-3; 3 V/m
EFT/Burst	IEC 61000-4-4; 1.0 kV (power line), 0.5 kV (signal line)	IEC 61000-4-4; 1.0 kV (power line), 0.5 kV (signal line)	IEC 61000-4-4; 1.0 kV (power line), 0.5 kV (signal line)
Surge	IEC 61000-4-5; 1 kV/2 kV AC	IEC 61000-4-5; 1 kV/2 kV AC	IEC 61000-4-5; 1 kV/2 kV AC
Conducted	IEC 61000-4-6; 3 V	IEC 61000-4-6; 3 V	IEC 61000-4-6; 3 V
Power frequency magnetic field	IEC 61000-4-8; 1 A/m, 50 or 60 Hz	IEC 61000-4-8; 1 A/m, 50 or 60 Hz	IEC 61000-4-8; 1 A/m, 50 or 60 Hz
Voltage dips and interruptions	IEC 61000-4-11; >95% reductions, 0.5 period; 30% reduction, 25 periods	IEC 61000-4-11; >95% reductions, 0.5 period; 30% reduction, 25 periods	IEC 61000-4-11; >95% reductions, 0.5 period; 30% reduction, 25 periods
Harmonics	EN 61000-3-2, IEC 61000-3-2	EN 61000-3-2, IEC 61000-3-2	EN 61000-3-2, IEC 61000-3-2
Flicker	EN 61000-3-3, IEC 61000-3-3	EN 61000-3-3, IEC 61000-3-3	EN 61000-3-3, IEC 61000-3-3
Management	HP PCM+; HP PCM; command-line interface; Web browser; configuration menu	HP PCM+; HP PCM; command-line interface; Web browser; configuration menu	HP PCM+; HP PCM; command-line interface; Web browser; configuration menu
Services	<p>3-year, 4-hour onsite, 13x5 coverage for hardware (HT021E)</p> <p>3-year, 4-hour onsite, 24x7 coverage for hardware (HT023E)</p> <p>3-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 SW phone support and SW updates (HT028E)</p> <p>3-year, 24x7 SW phone support, software updates (HT027E)</p> <p>4-year, 4-hour onsite, 13x5 coverage for hardware (HT031E)</p> <p>4-year, 4-hour onsite, 24x7 coverage for hardware (HT033E)</p> <p>4-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 software phone (HT038E)</p> <p>4-year, 24x7 SW phone support, software updates (HT037E)</p> <p>5-year, 4-hour onsite, 13x5 coverage for hardware (HT041E)</p> <p>5-year, 4-hour onsite, 24x7 coverage for hardware (HT043E)</p> <p>5-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 software phone (HT048E)</p> <p>5-year, 24x7 SW phone support, software updates (HT047E)</p> <p>3 Yr 6 hr Call-to-Repair Onsite (HT025E)</p> <p>4 Yr 6 hr Call-to-Repair Onsite (HT035E)</p> <p>5 Yr 6 hr Call-to-Repair Onsite (HT045E)</p> <p>1-year, 4-hour onsite, 13x5 coverage for hardware (HT011E)</p> <p>1-year, 4-hour onsite, 24x7 coverage for hardware (HT013E)</p> <p>1-year, 6 hour Call-To-Repair Onsite for hardware (HT015E)</p> <p>1-year, 24x7 software phone support, software updates (HT017E)</p> <p>1-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 software phone support and software updates (HT018E)</p> <p>1-year, 24x7 software phone support, software updates + Next Business Day Hardware Exchange (HT009E)</p>	<p>Refer to the HP website at www.hp.com/networking/services for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local HP sales office.</p>	<p>Refer to the HP website at www.hp.com/networking/services for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local HP sales office.</p>

Specifications (continued)

HP 3800-48G-4SFP+ Switch (J9576A)

1-year, 24x7 software phone support, software updates + 4 hour hardware exchange (HT010E)
 3-year, 24x7 software phone support, software updates + Next Business Day Hardware Exchange (HT019E)
 3-year, 24x7 software phone support, software updates + 4 hour Hardware Exchange (HT020E)
 4-year, 24x7 software phone support, software updates + Next Business Day Hardware Exchange (HT029E)
 4-year, 24x7 software phone support, software updates + 4 hour Hardware Exchange (HT030E)
 5-year, 24x7 software phone support, software updates + Next Business Day Hardware Exchange (HT039E)
 5-year, 24x7 software phone support, software updates + 4 hour Hardware Exchange (HT040E)
 Refer to the HP website at www.hp.com/networking/services for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local HP sales office.

HP 3800-24G-2XG Switch (J9585A)

RFC 2460 IPv6 Specification
 RFC 2464 Transmission of IPv6 over Ethernet Networks
 RFC 2710 Multicast Listener Discovery (MLD) for IPv6
 RFC 2925 Remote Operations MIB (Ping only)
 RFC 3019 MLDv1 MIB
 RFC 3315 DHCPv6 (client only)
 RFC 3484 Default Address Selection for IPv6
 RFC 3587 IPv6 Global Unicast Address Format
 RFC 3596 DNS Extension for IPv6
 RFC 3810 MLDv2 (host joins only)
 RFC 4022 MIB for TCP
 RFC 4113 MIB for UDP
 RFC 4251 SSHv6 Architecture
 RFC 4252 SSHv6 Authentication
 RFC 4253 SSHv6 Transport Layer
 RFC 4254 SSHv6 Connection
 RFC 4291 IP Version 6 Addressing Architecture
 RFC 4293 MIB for IP
 RFC 4294 IPv6 Node Requirements
 RFC 4419 Key Exchange for SSH
 RFC 4443 ICMPv6
 RFC 4541 IGMP & MLD Snooping Switch
 RFC 4861 IPv6 Neighbor Discovery
 RFC 4862 IPv6 Stateless Address Auto-configuration
 RFC 5095 Deprecation of Type 0 Routing Headers in IPv6
 RFC 5340 OSPFv3 for IPv6
 RFC 5453 Reserved IPv6 Interface Identifiers
 RFC 5722 Handling of Overlapping IPv6 Fragments

MIBs
 RFC 1213 MIB II
 RFC 1493 Bridge MIB
 RFC 1724 RIPv2 MIB
 RFC 1850 OSPFv2 MIB
 RFC 2021 RMONv2 MIB
 RFC 2096 IP Forwarding Table MIB
 RFC 2613 SMON MIB
 RFC 2618 RADIUS Client MIB
 RFC 2620 RADIUS Accounting MIB
 RFC 2665 Ethernet-Like-MIB
 RFC 2668 802.3 MAU MIB
 RFC 2674 802.1p and IEEE 802.1Q Bridge MIB
 RFC 2737 Entity MIB (Version 2)
 RFC 2787 VRRP MIB
 RFC 2863 The Interfaces Group MIB
 RFC 2925 Ping MIB

HP 3800-48G-4XG Switch (J9586A)

Network management
 IEEE 802.1AB Link Layer Discovery Protocol (LLDP)
 RFC 2819 Four groups of RMON: 1 (statistics), 2 (history), 3 (alarm) and 9 (events)
 RFC 3176 sFlow
 ANS/TIA-1057 LLDP Media Endpoint Discovery (LLDP-MED)
 SNMPv1/v2c/v3
 XRMON

OSPF
 RFC 2328 OSPFv2
 RFC 3101 OSPF NSSA
 RFC 5340 OSPFv3 for IPv6

QoS/CoS
 RFC 2474 DiffServ Precedence, including 8 queues/port
 RFC 2597 DiffServ Assured Forwarding (AF)
 RFC 2598 DiffServ Expedited Forwarding (EF)

Security
 IEEE 802.1X Port Based Network Access Control
 RFC 1492 TACACS+
 RFC 2865 RADIUS (client only)
 RFC 2866 RADIUS Accounting
 Access Control Lists (ACLs)
 MAC Authentication
 MAC Lockdown
 MAC Lockout
 Port Security
 Secure Sockets Layer (SSL)
 SSHv1/SSHv2 Secure Shell
 Web Authentication

Standards and protocols (applies to all products in series)

Device management

RFC 1591 DNS (client)
 HTML and telnet management

General protocols

IEEE 802.1ad Qin-Q
 IEEE 802.1D MAC Bridges
 IEEE 802.1p Priority
 IEEE 802.1Q VLANs
 IEEE 802.1s Multiple Spanning Trees
 IEEE 802.1v VLAN classification by Protocol and Port
 IEEE 802.1w Rapid Reconfiguration of Spanning Tree
 IEEE 802.3ad Link Aggregation Control Protocol (LACP)
 IEEE 802.3af Power over Ethernet
 IEEE 802.3x Flow Control
 RFC 768 UDP
 RFC 783 TFTP Protocol (revision 2)
 RFC 792 ICMP
 RFC 793 TCP
 RFC 826 ARP
 RFC 854 TELNET
 RFC 868 Time Protocol
 RFC 951 BOOTP
 RFC 1058 RIPv1
 RFC 1350 TFTP Protocol (revision 2)
 RFC 1519 CIDR
 RFC 1542 BOOTP Extensions
 RFC 2030 Simple Network Time Protocol (SNTP) v4
 RFC 2131 DHCP
 RFC 2453 RIPv2
 RFC 2548 (MS-RAS-Vendor only)
 RFC 3046 DHCP Relay Agent Information Option
 RFC 3576 Ext to RADIUS (CoA only)
 RFC 3768 VRRP
 RFC 4675 RADIUS VLAN & Priority
 UDLD (Uni-directional Link Detection)

IP multicast

RFC 3376 IGMPv3 (host joins only)
 RFC 3973 Draft 2 PIM Dense Mode
 RFC 4601 Draft 10 PIM Sparse Mode

IPv6

RFC 1981 IPv6 Path MTU Discovery
 RFC 2375 IPv6 Multicast Address Assignments

HP 3800 Switch Series

Specifications (continued)



HP 3800-24G-PoE+-2XG Switch (J9587A)



HP 3800-48G-PoE+-4XG Switch (J9588A)



HP 3800-24SFP-2SFP+ Switch (J9584A)

Included accessories	1 HP 3800 Switch Fan Tray (J9582A) 1 HP X312 1000W 100-240VAC to 54VDC Power Supply (J9580A)	1 HP 3800 Switch Fan Tray (J9582A) 1 HP X312 1000W 100-240VAC to 54VDC Power Supply (J9580A)	1 HP 3800 Switch Fan Tray (J9582A) 1 HP X311 400W 100-240VAC to 12VDC Power Supply (J9581A)
Ports	24 RJ-45 autosensing 10/100/1000 PoE+ ports (IEEE 802.3 Type 10BASE-T, IEEE 802.3u Type 100BASE-TX, IEEE 802.3ab Type 1000BASE-T, IEEE 802.3at PoE+); Duplex: 10BASE-T/100BASE-TX: half or full; 1000BASE-T: full only 2 RJ-45 10-GbE ports IEEE 802.3an-2006 Type 10GBASE-T; Duplex: full only 1 RJ-45 serial console port 1 RJ-45 out-of-band management port 1 Stacking module slot	48 RJ-45 autosensing 10/100/1000 PoE+ ports (IEEE 802.3 Type 10BASE-T, IEEE 802.3u Type 100BASE-TX, IEEE 802.3ab Type 1000BASE-T, IEEE 802.3at PoE+); Duplex: 10BASE-T/100BASE-TX: half or full; 1000BASE-T: full only 4 RJ-45 10-GbE ports IEEE 802.3an-2006 Type 10GBASE-T; Duplex: full only 1 RJ-45 serial console port 1 RJ-45 out-of-band management port 1 Stacking module slot	24 SFP 100/1000 Mbps ports (IEEE 802.3u Type 100BASE-TX, IEEE 802.3ab Type 1000BASE-T); Duplex: 100BASE-TX: half or full; 1000BASE-T: full only 2 fixed 1000/10000 SFP+ ports 1 RJ-45 serial console port 1 RJ-45 out-of-band management port 1 Stacking module slot
Power supplies	2 power supply slots 1 minimum power supply required includes: 1 x J9580A (HP X312 1000W 100-240VAC to 54VDC Power Supply)	2 power supply slots 1 minimum power supply required includes: 1 x J9580A (HP X312 1000W 100-240VAC to 54VDC Power Supply)	2 power supply slots 1 minimum power supply required includes: 1 x J9581A (HP X311 400W 100-240VAC to 12VDC Power Supply)
Fan tray	includes: 1 x J9582A 1 fan tray slot	includes: 1 x J9582A 1 fan tray slot	includes: 1 x J9582A 1 fan tray slot
Physical characteristics			
Dimensions	18.4(d) x 17.43(w) x 1.7(h) in. (46.74 x 44.27 x 4.32 cm) (1U height)	18.4(d) x 17.43(w) x 1.7(h) in. (46.74 x 44.27 x 4.32 cm) (1U height)	18.4(d) x 17.43(w) x 1.7(h) in. (46.74 x 44.27 x 4.32 cm) (1U height)
Weight	16.45 lb. (7.46 kg) switch chassis with 1 power supply and fan tray installed	17.25 lb. (7.82 kg) switch chassis with 1 power supply and fan tray installed	16 lb. (7.26 kg) switch chassis with 1 power supply and fan tray installed
Memory and processor			
Processor	HP ProVision ASIC/ARM @ 350 MHz; Freescale PowerPC @ 1200 MHz, 4 GB flash, 2 GB SDRAM; packet buffer size: 18 MB dynamic	HP ProVision ASIC/ARM @ 350 MHz; Freescale PowerPC @ 1200 MHz, 4 GB flash, 2 GB SDRAM; packet buffer size: 36 MB dynamic	HP ProVision ASIC/ARM @ 350 MHz; Freescale PowerPC @ 1200 MHz, 4 GB flash, 2 GB SDRAM; packet buffer size: 18 MB dynamic
Mounting	Mounts in an EIA-standard 19 in. telco rack or equipment cabinet (hardware included); horizontal surface mounting only	Mounts in an EIA-standard 19 in. telco rack or equipment cabinet (hardware included); horizontal surface mounting only	Mounts in an EIA-standard 19 in. telco rack or equipment cabinet (hardware included); horizontal surface mounting only
Performance			
1000 Mb Latency	< 2.8 μ s (LIFO 64-byte packets)	< 2.8 μ s (LIFO 64-byte packets)	< 2.8 μ s (LIFO 64-byte packets)
10 Gbps Latency	< 1.9 μ s (LIFO 64-byte packets)	< 1.9 μ s (LIFO 64-byte packets)	< 1.9 μ s (LIFO 64-byte packets)
Throughput	65.4 million pps (64-byte packets)	130.9 million pps (64-byte packets)	65.4 million pps (64-byte packets)
Switching capacity	88 Gbps	176 Gbps	88 Gbps
Routing table size	10000 entries	10000 entries	10000 entries
MAC address table size	65500 entries	65500 entries	65500 entries
Environment			
Operating temperature	32°F to 131°F (0°C to 55°C)	32°F to 131°F (0°C to 55°C); max temperature is 45C when SFP+ transceivers are installed	32°F to 113°F (0°C to 45°C)
Operating relative humidity	15% to 95% @ 104°F (40°C), noncondensing	15% to 95% @ 104°F (40°C), noncondensing	15% to 95% @ 104°F (40°C), noncondensing
Nonoperating/Storage temperature	-40°F to 158°F (-40°C to 70°C)	-40°F to 158°F (-40°C to 70°C)	-40°F to 158°F (-40°C to 70°C)
Nonoperating/Storage relative humidity	15% to 90% @ 149°F (65°C), noncondensing	15% to 90% @ 149°F (65°C), noncondensing	15% to 90% @ 149°F (65°C), noncondensing
Altitude	up to 10,000 ft. (3 km)	up to 10,000 ft. (3 km)	up to 10,000 ft. (3 km)
Acoustic	Power: 48 dB, Pressure: 32.6 dB	Power: 57 dB, Pressure: 41.5 dB	Power: 36 dB, Pressure: 25 dB
Electrical characteristics			
Maximum heat dissipation	434 BTU/hr (457.87 kJ/hr)	635 BTU/hr (669.93 kJ/hr)	434 BTU/hr (457.87 kJ/hr)
Voltage	100-120/200-240 VAC	100-120/200-240 VAC	100-127/200-240 VAC
Current	9.4/7.8 A	9.4/7.8 A	6/3 A
Idle power	71 W	100 W	55 W
Maximum power rating	127 W	186 W	127 W
PoE power	720 W	1080 W	
Frequency	50/60 Hz	50/60 Hz	50/60 Hz

HP 3800 Switch Series

Specifications (continued)

	HP 3800-24G-PoE+-2XG Switch (J9587A)	HP 3800-48G-PoE+-4XG Switch (J9588A)	HP 3800-24SFP-2SFP+ Switch (J9584A)
Notes	<p>Idle power is the actual power consumption of the device with no ports connected.</p> <p>Maximum power rating and maximum heat dissipation are the worst-case theoretical maximum numbers provided for planning the infrastructure with fully loaded PoE (if equipped), 100% traffic, all ports plugged in, and all modules populated.</p> <p>PoE Power is the power supplied by the internal power supply, it is dependent on the type and quantity of power supplies and may be supplemented with the use of an External Power Supply (EPS).</p> <p>With a single power supply @ 120 V input, a maximum of 572 W of PoE power is available.</p>	<p>Idle power is the actual power consumption of the device with no ports connected.</p> <p>Maximum power rating and maximum heat dissipation are the worst-case theoretical maximum numbers provided for planning the infrastructure with fully loaded PoE (if equipped), 100% traffic, all ports plugged in, and all modules populated.</p> <p>PoE Power is the power supplied by the internal power supply, it is dependent on the type and quantity of power supplies and may be supplemented with the use of an External Power Supply (EPS).</p> <p>With a single power supply @ 120 V input, a maximum of 514 W of PoE power is available.</p> <p>With a single power supply @ 240 V input, a maximum of 814 W of PoE power is available.</p>	<p>Idle power is the actual power consumption of the device with no ports connected.</p> <p>Maximum power rating and maximum heat dissipation are the worst-case theoretical maximum numbers provided for planning the infrastructure with fully loaded PoE (if equipped), 100% traffic, all ports plugged in, and all modules populated.</p>
Safety	EN 60950/IEC 60950; UL 60950; CAN/CSA 22.2 No. 60950; EN 60825	EN 60950/IEC 60950; UL 60950; CAN/CSA 22.2 No. 60950; EN 60825	EN 60950/IEC 60950; UL 60950; CAN/CSA 22.2 No. 60950; EN 60825
Emissions	FCC Class A; VCCI Class A; EN 55022/CISPR 22 Class A	FCC Class A; VCCI Class A; EN 55022/CISPR 22 Class A	FCC Class A; VCCI Class A; EN 55022/CISPR 22 Class A
Immunity			
EN	EN 55024, CISPR 24	EN 55024, CISPR 24	EN 55024, CISPR 24
ESD	IEC 61000-4-2	IEC 61000-4-2	IEC 61000-4-2
Radiated	IEC 61000-4-3; 3 V/m	IEC 61000-4-3; 3 V/m	IEC 61000-4-3; 3 V/m
EFT/Burst	IEC 61000-4-4; 1.0 kV (power line), 0.5 kV (signal line)	IEC 61000-4-4; 1.0 kV (power line), 0.5 kV (signal line)	IEC 61000-4-4; 1.0 kV (power line), 0.5 kV (signal line)
Surge	IEC 61000-4-5; 1 kV/2 kV AC	IEC 61000-4-5; 1 kV/2 kV AC	IEC 61000-4-5; 1 kV/2 kV AC
Conducted	IEC 61000-4-6; 3 V	IEC 61000-4-6; 3 V	IEC 61000-4-6; 3 V
Power frequency magnetic field	IEC 61000-4-8; 1 A/m, 50 or 60 Hz	IEC 61000-4-8; 1 A/m, 50 or 60 Hz	IEC 61000-4-8; 1 A/m, 50 or 60 Hz
Voltage dips and interruptions	IEC 61000-4-11; >95% reductions, 0.5 period; 30% reduction, 25 periods	IEC 61000-4-11; >95% reductions, 0.5 period; 30% reduction, 25 periods	IEC 61000-4-11; >95% reductions, 0.5 period; 30% reduction, 25 periods
Harmonics	EN 61000-3-2, IEC 61000-3-2	EN 61000-3-2, IEC 61000-3-2	EN 61000-3-2, IEC 61000-3-2
Flicker	EN 61000-3-3, IEC 61000-3-3	EN 61000-3-3, IEC 61000-3-3	EN 61000-3-3, IEC 61000-3-3
Management	HP PCM+; HP PCM; command-line interface; Web browser; configuration menu	HP PCM+; HP PCM; command-line interface; Web browser; configuration menu	HP PCM+; HP PCM; command-line interface; Web browser; configuration menu
Services	Refer to the HP website at www.hp.com/networking/services for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local HP sales office.	Refer to the HP website at www.hp.com/networking/services for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local HP sales office.	Refer to the HP website at www.hp.com/networking/services for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local HP sales office.

Specifications (continued)

	HP 3800-24G-PoE+-2XG Switch (J9587A)	HP 3800-48G-PoE+-4XG Switch (J9588A)	HP 3800-24SFP-2SFP+ Switch (J9584A)
Standards and protocols (applies to all products in series)	Device management RFC 1591 DNS (client) HTML and telnet management		

HP 3800 Switch Series accessories

Modules

HP 3800 4-port Stacking Module (J9577A)

Cables

HP 3800 0.5m Stacking Cable (J9578A)

HP 3800 1m Stacking Cable (J9665A)

HP 3800 3m Stacking Cable (J9579A)

Fan Tray

HP 3800 Switch Fan Tray (J9582A)

Mounting Kit

HP X410 1U Universal 4-post Rack Mounting Kit (J9583A)

HP 3800-24G-PoE+2SFP+ Switch (J9573A)

HP X121 1G SFP LC SX Transceiver (J4858C)

HP X121 1G SFP LC LX Transceiver (J4859C)

HP X121 1G SFP LC LH Transceiver (J4860C)

HP X121 1G SFP RJ45 T Transceiver (J8177C)

HP X122 1G SFP LC BX-D Transceiver (J9142B)

HP X122 1G SFP LC BX-U Transceiver (J9143B)

HP X132 10G SFP+ LC SR Transceiver (J9150A)

HP X132 10G SFP+ LC LR Transceiver (J9151A)

HP X132 10G SFP+ LC LRM Transceiver (J9152A)

HP X132 10G SFP+ LC ER Transceiver (J9153A)

HP 0.5 m Multimode OM3 LC/LC Optical Cable (AJ833A)

HP 1 m Multimode OM3 LC/LC Optical Cable (AJ834A)

HP 2 m Multimode OM3 LC/LC Optical Cable (AJ835A)

HP 5 m Multimode OM3 LC/LC Optical Cable (AJ836A)

HP 15 m Multimode OM3 LC/LC Optical Cable (AJ837A)

HP 30 m Multimode OM3 LC/LC Optical Cable (AJ838A)

HP 50 m Multimode OM3 LC/LC Optical Cable (AJ839A)

NEW HP 0.5 m PremierFlex OM3+ LC/LC Optical Cable (BK837A)

NEW HP 1 m PremierFlex OM3+ LC/LC Optical Cable (BK838A)

NEW HP 2 m PremierFlex OM3+ LC/LC Optical Cable (BK839A)

NEW HP 5 m PremierFlex OM3+ LC/LC Optical Cable (BK840A)

NEW HP 15 m PremierFlex OM3+ LC/LC Optical Cable (BK841A)

NEW HP 30 m PremierFlex OM3+ LC/LC Optical Cable (BK842A)

NEW HP 50 m PremierFlex OM3+ LC/LC Optical Cable (BK843A)

HP X242 10G SFP+ to SFP+ 1m Direct Attach Copper Cable (J9281B)

HP X242 10G SFP+ to SFP+ 3m Direct Attach Copper Cable (J9283B)

HP X242 10G SFP+ to SFP+ 7m Direct Attach Copper Cable (J9285B)

HP X244 10G XFP to SFP+ 1m Direct Attach Copper Cable (J9300A)

HP X244 10G XFP to SFP+ 3m Direct Attach Copper Cable (J9301A)

HP X244 10G XFP to SFP+ 5m Direct Attach Copper Cable (J9302A)

HP X312 1000W 100-240VAC to 54VDC Power Supply (J9580A)

HP 3800-48G-PoE+4SFP+ Switch (J9574A)

HP X121 1G SFP LC SX Transceiver (J4858C)

HP X121 1G SFP LC LX Transceiver (J4859C)

HP X121 1G SFP LC LH Transceiver (J4860C)

HP X121 1G SFP RJ45 T Transceiver (J8177C)

HP X122 1G SFP LC BX-D Transceiver (J9142B)

HP X122 1G SFP LC BX-U Transceiver (J9143B)

HP X132 10G SFP+ LC SR Transceiver (J9150A)

HP X132 10G SFP+ LC LR Transceiver (J9151A)

HP X132 10G SFP+ LC LRM Transceiver (J9152A)

HP X132 10G SFP+ LC ER Transceiver (J9153A)

HP 0.5 m Multimode OM3 LC/LC Optical Cable (AJ833A)

HP 1 m Multimode OM3 LC/LC Optical Cable (AJ834A)

HP 2 m Multimode OM3 LC/LC Optical Cable (AJ835A)

HP 5 m Multimode OM3 LC/LC Optical Cable (AJ836A)

HP 15 m Multimode OM3 LC/LC Optical Cable (AJ837A)

HP 30 m Multimode OM3 LC/LC Optical Cable (AJ838A)

HP 50 m Multimode OM3 LC/LC Optical Cable (AJ839A)

NEW HP 0.5 m PremierFlex OM3+ LC/LC Optical Cable (BK837A)

NEW HP 1 m PremierFlex OM3+ LC/LC Optical Cable (BK838A)

NEW HP 2 m PremierFlex OM3+ LC/LC Optical Cable (BK839A)

NEW HP 5 m PremierFlex OM3+ LC/LC Optical Cable (BK840A)

NEW HP 15 m PremierFlex OM3+ LC/LC Optical Cable (BK841A)

NEW HP 30 m PremierFlex OM3+ LC/LC Optical Cable (BK842A)

NEW HP 50 m PremierFlex OM3+ LC/LC Optical Cable (BK843A)

HP X242 10G SFP+ to SFP+ 1m Direct Attach Copper Cable (J9281B)

HP X242 10G SFP+ to SFP+ 3m Direct Attach Copper Cable (J9283B)

HP X242 10G SFP+ to SFP+ 7m Direct Attach Copper Cable (J9285B)

HP X244 10G XFP to SFP+ 1m Direct Attach Copper Cable (J9300A)

HP X244 10G XFP to SFP+ 3m Direct Attach Copper Cable (J9301A)

HP 3800 Switch Series accessories (continued)

HP X244 10G XFP to SFP+ 5m Direct Attach Copper Cable (J9302A)

HP X312 1000W 100-240VAC to 54VDC Power Supply (J9580A)

HP 3800-24G-2SFP+ Switch (J9575A)

HP X121 1G SFP LC SX Transceiver (J4858C)

HP X121 1G SFP LC LX Transceiver (J4859C)

HP X121 1G SFP LC LH Transceiver (J4860C)

HP X121 1G SFP RJ45 T Transceiver (J8177C)

HP X122 1G SFP LC BX-D Transceiver (J9142B)

HP X122 1G SFP LC BX-U Transceiver (J9143B)

HP X132 10G SFP+ LC SR Transceiver (J9150A)

HP X132 10G SFP+ LC LR Transceiver (J9151A)

HP X132 10G SFP+ LC LRM Transceiver (J9152A)

HP X132 10G SFP+ LC ER Transceiver (J9153A)

HP 0.5 m Multimode OM3 LC/LC Optical Cable (AJ833A)

HP 1 m Multimode OM3 LC/LC Optical Cable (AJ834A)

HP 2 m Multimode OM3 LC/LC Optical Cable (AJ835A)

HP 5 m Multimode OM3 LC/LC Optical Cable (AJ836A)

HP 15 m Multimode OM3 LC/LC Optical Cable (AJ837A)

HP 30 m Multimode OM3 LC/LC Optical Cable (AJ838A)

HP 50 m Multimode OM3 LC/LC Optical Cable (AJ839A)

NEW HP 0.5 m PremierFlex OM3+ LC/LC Optical Cable (BK837A)

NEW HP 1 m PremierFlex OM3+ LC/LC Optical Cable (BK838A)

NEW HP 2 m PremierFlex OM3+ LC/LC Optical Cable (BK839A)

NEW HP 5 m PremierFlex OM3+ LC/LC Optical Cable (BK840A)

NEW HP 15 m PremierFlex OM3+ LC/LC Optical Cable (BK841A)

NEW HP 30 m PremierFlex OM3+ LC/LC Optical Cable (BK842A)

NEW HP 50 m PremierFlex OM3+ LC/LC Optical Cable (BK843A)

HP X242 10G SFP+ to SFP+ 1m Direct Attach Copper Cable (J9281B)

HP X242 10G SFP+ to SFP+ 3m Direct Attach Copper Cable (J9283B)

HP X242 10G SFP+ to SFP+ 7m Direct Attach Copper Cable (J9285B)

HP X244 10G XFP to SFP+ 1m Direct Attach Copper Cable (J9300A)

HP X244 10G XFP to SFP+ 3m Direct Attach Copper Cable (J9301A)

HP X244 10G XFP to SFP+ 5m Direct Attach Copper Cable (J9302A)

HP X311 400W 100-240VAC to 12VDC Power Supply (J9581A)

HP 3800-48G-4SFP+ Switch (J9576A)

HP X121 1G SFP LC SX Transceiver (J4858C)

HP X121 1G SFP LC LX Transceiver (J4859C)

HP X121 1G SFP LC LH Transceiver (J4860C)

HP X121 1G SFP RJ45 T Transceiver (J8177C)

HP X122 1G SFP LC BX-D Transceiver (J9142B)

HP X122 1G SFP LC BX-U Transceiver (J9143B)

HP X132 10G SFP+ LC SR Transceiver (J9150A)

HP X132 10G SFP+ LC LR Transceiver (J9151A)

HP X132 10G SFP+ LC LRM Transceiver (J9152A)

HP X132 10G SFP+ LC ER Transceiver (J9153A)

HP 0.5 m Multimode OM3 LC/LC Optical Cable (AJ833A)

HP 1 m Multimode OM3 LC/LC Optical Cable (AJ834A)

HP 2 m Multimode OM3 LC/LC Optical Cable (AJ835A)

HP 5 m Multimode OM3 LC/LC Optical Cable (AJ836A)

HP 15 m Multimode OM3 LC/LC Optical Cable (AJ837A)

HP 30 m Multimode OM3 LC/LC Optical Cable (AJ838A)

HP 50 m Multimode OM3 LC/LC Optical Cable (AJ839A)

NEW HP 0.5 m PremierFlex OM3+ LC/LC Optical Cable (BK837A)

NEW HP 1 m PremierFlex OM3+ LC/LC Optical Cable (BK838A)

NEW HP 2 m PremierFlex OM3+ LC/LC Optical Cable (BK839A)

NEW HP 5 m PremierFlex OM3+ LC/LC Optical Cable (BK840A)

NEW HP 15 m PremierFlex OM3+ LC/LC Optical Cable (BK841A)

NEW HP 30 m PremierFlex OM3+ LC/LC Optical Cable (BK842A)

NEW HP 50 m PremierFlex OM3+ LC/LC Optical Cable (BK843A)

HP X242 10G SFP+ to SFP+ 1m Direct Attach Copper Cable (J9281B)

HP X242 10G SFP+ to SFP+ 3m Direct Attach Copper Cable (J9283B)

HP X242 10G SFP+ to SFP+ 7m Direct Attach Copper Cable (J9285B)

HP X244 10G XFP to SFP+ 1m Direct Attach Copper Cable (J9300A)

HP X244 10G XFP to SFP+ 3m Direct Attach Copper Cable (J9301A)

HP X244 10G XFP to SFP+ 5m Direct Attach Copper Cable (J9302A)

HP X311 400W 100-240VAC to 12VDC Power Supply (J9581A)

HP 3800-24G-2XG Switch (J9585A)

HP X311 400W 100-240VAC to 12VDC Power Supply (J9581A)

HP 3800 Switch Series accessories (continued)

HP 3800-48G-4XG Switch (J9586A)

HP X311 400W 100-240VAC to 12VDC Power Supply (J9581A)

HP 3800-24G-PoE+-2XG Switch (J9587A)

HP X312 1000W 100-240VAC to 54VDC Power Supply (J9580A)

HP 3800-48G-PoE+-4XG Switch (J9588A)

HP X312 1000W 100-240VAC to 54VDC Power Supply (J9580A)

HP 3800-24SFP-2SFP+ Switch (J9584A)

HP X121 1G SFP LC SX Transceiver (J4858C)
HP X121 1G SFP LC LX Transceiver (J4859C)
HP X121 1G SFP LC LH Transceiver (J4860C)
HP X121 1G SFP RJ45 T Transceiver (J8177C)
HP X122 1G SFP LC BX-D Transceiver (J9142B)
HP X122 1G SFP LC BX-U Transceiver (J9143B)
HP X132 10G SFP+ LC SR Transceiver (J9150A)
HP X132 10G SFP+ LC LR Transceiver (J9151A)
HP X132 10G SFP+ LC LRM Transceiver (J9152A)
HP X132 10G SFP+ LC ER Transceiver (J9153A)
HP X111 100M SFP LC FX Transceiver (J9054C)
HP X112 100M SFP LC BX-D Transceiver (J9099B)
HP X112 100M SFP LC BX-U Transceiver (J9100B)
HP 0.5 m Multimode OM3 LC/LC Optical Cable (AJ833A)
HP 1 m Multimode OM3 LC/LC Optical Cable (AJ834A)
HP 2 m Multimode OM3 LC/LC Optical Cable (AJ835A)
HP 5 m Multimode OM3 LC/LC Optical Cable (AJ836A)
HP 15 m Multimode OM3 LC/LC Optical Cable (AJ837A)
HP 30 m Multimode OM3 LC/LC Optical Cable (AJ838A)
HP 50 m Multimode OM3 LC/LC Optical Cable (AJ839A)

NEW HP 0.5 m PremierFlex OM3+ LC/LC Optical Cable (BK837A)

NEW HP 1 m PremierFlex OM3+ LC/LC Optical Cable (BK838A)

NEW HP 2 m PremierFlex OM3+ LC/LC Optical Cable (BK839A)

NEW HP 5 m PremierFlex OM3+ LC/LC Optical Cable (BK840A)

NEW HP 15 m PremierFlex OM3+ LC/LC Optical Cable (BK841A)

NEW HP 30 m PremierFlex OM3+ LC/LC Optical Cable (BK842A)

NEW HP 50 m PremierFlex OM3+ LC/LC Optical Cable (BK843A)

HP X242 10G SFP+ to SFP+ 1m Direct Attach Copper Cable (J9281B)

HP X242 10G SFP+ to SFP+ 3m Direct Attach Copper Cable (J9283B)

HP X242 10G SFP+ to SFP+ 7m Direct Attach Copper Cable (J9285B)

HP X244 10G XFP to SFP+ 1m Direct Attach Copper Cable (J9300A)

HP X244 10G XFP to SFP+ 3m Direct Attach Copper Cable (J9301A)

HP X244 10G XFP to SFP+ 5m Direct Attach Copper Cable (J9302A)

HP X311 400W 100-240VAC to 12VDC Power Supply (J9581A)

To learn more, visit www.hp.com/networking

© Copyright 2011 Hewlett-Packard Development Company, L.P. The information contained herein is subject to change without notice. The only warranties for HP products and services are set forth in the express warranty statements accompanying such products and services. Nothing herein should be construed as constituting an additional warranty. HP shall not be liable for technical or editorial errors or omissions contained herein.

4AA3-7115ENW, Created September 2011





CONSTANT COMMUNICATION WHEN IT MATTERS MOST

ASTRO[®] 25 MCC 7500 IP DISPATCH CONSOLE

Designed to ensure optimal-quality audio, reliable communication and ease of use for dispatchers, the MCC 7500 IP Dispatch Console operator positions connect directly to the ASTRO 25 system for communication with both trunked and conventional radios, and for all other dispatch activity.

Integration of the MCC 7500 Console positions with the ASTRO 25 system enables full participation in end-to-end voice encryption for secure communication, priority handling of emergency calls and agency partitioning. Each console is centrally configured and managed from the network manager, providing vital efficiency.

EASY TO USE, FLEXIBLE, AND CUSTOMIZABLE USER INTERFACE

Featuring the Elite Graphical User Interface (GUI), which has been refined and proven through years of use in mission critical dispatch operations, the MCC 7500 Console eases migration and minimizes user training requirements.

The intuitive and familiar GUI is based on Microsoft Windows[®] and uses easily recognized icons and aliases. The GUI's powerful customization capabilities enable the colors, sizes and locations of resources on the screens

to be tailored to best meet each individual user's needs. Designated folders organize resources for flexibility in handling responsibilities from shift to shift and increased efficiency in responding to events and incidents.

Trunked and conventional radio channels are customizable with various controls, such as patch status, frequency select, coded/clear select and individual volume control, based on user preferences. Per-channel controls can be fully or partially shown, or hidden to save space on the screen.

Busy dispatchers can respond to a missed call by simply clicking on an entry in the Activity Log. The number of calls and call information displayed in the Activity Log is customizable to suit the needs of the user(s).

Telephone resources are accessed and easily patched with radio resources within the MCC 7500 Dispatch Console's GUI, eliminating the cost of having additional telephone equipment at the dispatch position and speeding communications between systems.

The status of auxiliary inputs and outputs is conveniently interpreted from the GUI with the use of familiar graphical icons, such as a door shown open or closed.

KEY INTEROPERABILITY FEATURES

Agency Partitioning

Multiple agencies can share a system to gain interoperability and cost savings benefits, while still maintaining control of their own channels, encryption keys, console configuration and more.

Priority for Emergencies

Transmit Priority Levels provide an orderly and consistent method for ensuring higher priority transmissions are able to take over resources from lower priority transmissions.

Optimized Patch Functionality

MCC 7500 Console users can patch communications between trunked and/or conventional radios that are normally unable to communicate with each other. Patched radio users see the ID or alias of the other patched radio(s), as opposed to that of the console. This minimizes confusion and the need for the dispatcher to intervene in the call. Patches are automatically re-established if interrupted so the MCC 7500 Console user can concentrate on continuing operations.

Enhanced Secure Operation

Encryption and decryption services within each dispatch operator position enable dispatchers to fully participate in secure communications while keeping the sensitive, vital information completely encrypted between the dispatcher and the radio users.

Dispatchers can interface with agencies that have different encryption configurations without any manual intervention or delay. Up to 60 calls using up to six different algorithms and multiple secure keys can be supported simultaneously.

To help reduce dispatcher stress and potential errors when managing encrypted audio situations, indicators and alerts are provided when the console mode does not match that of a received call, as well as when a patch or multi-select group is being set up between a mix of clear and secure channels.

MCC 7500 CONSOLE SOLUTION COMPONENTS

MCC 7500 Console Operator Position

MCC 7500 Console operator positions connect directly to the radio system's IP transport network without gateways or interface boxes. Audio processing, encryption, and switching intelligence for dispatch is performed within each software-based operator position, without additional centralized electronics. MCC 7500 Consoles function as integrated components of the total radio system, enabling full participation in system level features such as end-to-end encryption and agency partitioning.

Operator position hardware consists of a monitor, personal computer, keyboard and mouse/trackball/ touchscreen, speakers, audio accessories and a Voice Processor Module (VPM). The VPM allows analog devices to be connected to the digital console. The low-profile VPM can be rack mounted, furniture mounted or placed on the desktop.

The MCC 7500 Console does not require separate configuration or performance management equipment. The console system is configured and managed by the radio system's configuration manager, fault manager and performance reporting applications to provide the customer with a single point for configuring and managing the entire radio system. Changes are

automatically distributed throughout the system. This centralized approach saves valuable time and effort for system administrators and technicians. Aliases for Radio PTT IDs may be managed both locally and centrally in the same system to provide agencies sharing an ASTRO 25 radio system with the flexibility to meet their alias management needs.

CONVENTIONAL GATEWAY

The Conventional Channel Gateway (CCGW) enables both analog and digital channels to interface with MCC 7500 Consoles with no need for a separate hardware network and channel banks. Conventional calls are transported between the dispatch operator positions and CCGWs on the same IP network as trunked calls.

A CCGW provides 2-wire/4-wire analog ports for analog channels, V.24 ports for older ASTRO 25 conventional channels and IP connectivity for current architecture ASTRO 25 conventional channels. Enhanced digital control of consolettes can be achieved by using a combination of analog and V.24 ports. CCGWs are available in two capacities. The standard density CCGW supports up to eight "port based" channels and up to sixteen "IP based" channels for a total of twenty four channels. The high density CCGW supports up to sixteen "port based" channels and up to sixteen "IP based" channels for a total of thirty two channels.

The 2-wire/4-wire analog ports support tone remote and ear and mouth (E&M) station control. The V.24 ports and IP connections support digital station control while a combination of analog and V.24 ports support enhanced digital control of consolettes. The CCGW also supports simple analog, MDC 1200 analog, digital-only and mixed-mode analog/digital channels.

AUXILIARY INPUT/OUTPUT SERVER

The auxiliary input/output server enables console operators to control and monitor external devices, such as doors and lights, from the console user interface. Since the MCC 7500 Console does not rely on centralized electronics, contact closures and input buffers required to interface to these devices are housed in Remote Terminal Units (RTUs). These RTUs can be physically located close to where they are needed or at any console or radio frequency (RF) site. The dispatch consoles and RTUs communicate with each other across the radio system's IP transport network.

ARCHIVING INTERFACE SERVER (AIS)

The AIS is a digital logging interface, comprised of a personal computer and a voice processor module (VPM). Each AIS works with an IP-based logging recorder. Audio and call control information is sent across the IP network between the AIS and recorder. Highly configurable, the MCC 7500 Console logging solution includes:

- Recorded audio quality equivalent to audio heard at console position
- Information associated with radio calls recorded in addition to the call audio.

PRODUCT SPEC SHEET
MCC 7500 IP DISPATCH CONSOLE

- Dispatcher- and radio-initiated events on radio channels (such as changing the frequency, sending an alarm) are recorded.
- Recorder capacity based on the number of radio transmissions needed to record simultaneously, not on the number of channels it may record.
- Agency partitioning, enhancing control over which resources are recorded by what agency or department.
- Security and fault management centralized at the radio system’s network manager.

CONSOLE TELEPHONY MEDIA GATEWAYS

Media gateways are used to provide dispatchers with access to analog POTS and/or T1/E1 phone lines directly from their MCC 7500 Console positions. The Session Initiation Protocol (SIP) is used to communicate with the media gateways across the console IP network. A rich set of telephony features is supported by the media gateways, enabling dispatchers to do their jobs more effectively and efficiently.

SPECIFICATIONS

System Compatibility	ASTRO® 25 System and PremierOne™ CAD Application	
Vocoder Algorithms supported	AMBE, IMBE, ACELP, G.728, G.711	
Encryption Algorithms supported	AES (256 bit), DES-OFB, DVI-XL, ADP (Advanced Digital Privacy), DES-XL, DVP-XL	
Monitor requirements		
With Mouse or Trackball	17” minimum, 20” recommended	
Touchscreen	20” minimum	
Voice Processor Module (VPM) connections	Connector type	Device
	RJ45	One desktop microphone, eight desktop speakers, one local logging recorder, one radio instant recall recorder, one console telephony instant recall recorder, one external telephone set, one external paging encoder, one footswitch
	DB15	Two headset jacks connectors
VPM mounting options	EIA 19” rack mount, console furniture mount, Desktop – supports monitor up to 80 lbs	
VPM audio inputs and outputs	600 Ohm, balanced and transformer coupled (except for microphone which is 2000 Ohm, balanced, and does not use a transformer)	
Speaker Mounting Options	Desktop, furniture mount, or wall mount (with bracket accessory)	
Dispatch Console Cable Lengths	VPM to Speaker cable	10.1 feet (3.09 meters) standard
	VPM to Headset Jack cable	6 feet (1.8 meters) standard
	Headset Jack Extension cable	6 feet (1.8 meters) standard
	VPM to Microphone cable	10 feet (3.05 meters) standard
	VPM to Footswitch cable	10 feet (3.05 meters) standard
Supported Console Site Link types	Fractional T1/E1, Single T1/E1, Multiple T1/E1s Redundant and non-redundant versions IP site links	
MCC 7500 Dispatch Console Capacities	Up to 60 simultaneous audio sessions per operator position Up to 60 simultaneous encryption/decryption sessions per secure capable operator position Up to 3 Multi-Select groups per operator position (with up to 20 members per Multi-Select group) Up to 16 Patch groups per operator position (with up to 20 members per Patch group) Up to 160 resources per operator position	
Conventional Channel Gateway	Rack mountable, 1 rack unit high T1R1, T2R2, T4R4, T8R8, T12R12, T14R14 channels Simple analog, MDC 1200 analog, pure digital, mixed mode (analog/digital) channels, consolettes Standard density CCGWs provide interfaces for up to four analog conventional channels High density CCGWs provide interfaces for up to eight analog conventional channels Each analog conventional channel interface contains the following inputs and outputs <ul style="list-style-type: none"> • 600 Ohm, balanced analog audio input - To accept radio audio from the channel. Can be configured to support AGC, DLM, or no input conditioning. • 600 Ohm, balanced analog audio output - To send console transmit audio to the channel • 600 Ohm, balanced analog audio output - To send console transmit and radio receive audio to a logging recorder • 1 Amp, 24 VDC relay output - For relay keying of the channel • Input buffer - To detect Carrier Operated Relay (COR) closure in the channel • Input buffer - To detect Line Operated Busy Light (LOBL) closure in the channel • Input buffer - To detect Coded/Clear closure on an Advanced Securenet channel Standard density CCGWs provide interfaces for up to four V.24 based ASTRO 25 conventional channels High density CCGWs provide interfaces for up to eight V.24 based ASTRO 25 conventional channels <ul style="list-style-type: none"> • V.24 to station or comparator. No Digital Interface Unit (DIU) required. Standard density CCGWs can support up to 24 conventional channels simultaneously (four analog + four V.24 based ASTRO 25 conventional + sixteen IP based ASTRO 25 conventional) High density CCGWs can support up to 32 conventional channels simultaneously (eight analog + eight V.24 based ASTRO 25 conventional + sixteen IP based ASTRO 25 conventional)	

PRODUCT SPEC SHEET
MCC 7500 IP DISPATCH CONSOLE

SPECIFICATIONS

Auxiliary Input/Output Server Hardware	A simplified, user-friendly version of the MOSCAD SDM 3000 RTU is used to support most Aux I/O needs. The output relays are capable of switching 1A @ 24VDC or 1A @ 24VAC. Input buffers are capable of sensing a dry closure through 1000 feet or less (round trip) of 24 AWG wire. The RTU provides single pole Form A relay outputs. (Double pole, Form B or Form C relays must be implemented using external relays which are controlled by the RTU relays.)	
Auxiliary Input/Output Capacities	Number of Output Relays	Number of Input Buffers
Single SDM 3000 RTU	16	48
Single SDM 3000 RTU with 1 expansion chassis	32	96
Single SDM 3000 RTU with 2 expansion chassis	48	144
Auxiliary Input/Output Mounting	Each SDM 3000 RTU and each SDM 3000 RTU Expansion Chassis is rack mountable in a standard 19 inch rack and is one rack unit high.	
Console Telephony Media Gateway	The POTS version gateway supports up to eight analog POTS lines. The E1/T1 version gateway supports up to two E1 or two T1 connections. Each gateway is rack mountable in a standard 19 inch rack and is 1 rack unit high.	

SIZE AND WEIGHT

Device	Height	Width	Depth	Weight
VPM	1.75 in (44.5 mm)	16.9 in (430 mm)	12.3 in (312 mm)	3.6 lbs (1.6 kg)
Speaker	4.9 in (124 mm)	4 in (102 mm)	Without bracket: 3.5 in (89 mm) With bracket: 5.8 in (146 mm)	0.7 lbs (0.3 kg)
Headset Jack	1.6 in (41 mm)	5 in (127 mm)	6 in (152 mm)	1.2 lbs (0.5 kg)
Microphone	Gooseneck at 90°: 4.5 in (114 mm) Gooseneck at 180°: 21.8 in (552 mm)	4.8 in (121 mm)	6.6 in (168 mm)	2.4 lbs (1.1 kg)

POWER AND CONSUMPTION THERMAL

Device	Power Input	Thermal Output
VPM	0.4 Amps at 120VAC 0.2 Amps at 240VAC	171 BTUs/hour
Speaker	Add 0.05 Amps per speaker to VPM power Input at 120VAC (0.025 Amps at 240VAC)	Add 15 BTUs/hour per speaker to VPM thermal output
Headset Jack & Microphone	negligible	negligible

CERTIFICATIONS

	The various hardware elements of the Motorola MCC 7500 IP Dispatch Console product line are certified to meet the requirements for CSA and CE.	
Safety	CSA 60950-1-03 EN60950-1 2001	
EMC Emissions & Immunity	FCC part 15 Class A ICES-003 EN55022 1998 + A1: 2001 + A2:2003 (CISPR-22 Class A) EN55024 + A1:2001 + A2:2003 EN61000-3-2 2000 EN61000-3-3 1995 + A1:2001	
Energy Efficiency (PVM power supply only)	International Energy Efficiency Level V	

Motorola Solutions, Inc. 1301 E. Algonquin Road, Schaumburg, Illinois 60196 U.S.A. motorola.com/dispatch

MOTOROLA, MOTO, MOTOROLA SOLUTIONS and the Stylized M Logo are trademarks or registered trademarks of Motorola Trademark Holdings, LLC and are used under license. Microsoft and Windows are registered trademarks of Microsoft Corporation in the United States and other countries. All other trademarks are the property of their respective owners. © 2012 Motorola Solutions, Inc. All rights reserved. R3-13-2013C





MISSION CRITICAL CONNECTIVITY AND PERFORMANCE

ASTRO® 25 GGM 8000 GATEWAY

Government and industrial organizations rely on ASTRO 25 systems for mission critical communications. The GGM 8000 gateway has been designed and developed by Motorola as a critical sub-system in an ASTRO 25 system providing enhanced performance, capacity and security.

The GGM 8000 gateway is a purpose built device that supports numerous applications, interfaces and functions in the ASTRO 25 infrastructure system plus it provides a clean demarcation between the ASTRO 25 system and the customer's network. It provides static tunnels through the backhaul network so that it does not have to handle any special protocols, including multicast. As an integral part of the ASTRO 25 system Motorola manages the firmware, configurations and applications to ensure the highest level of system integrity, performance, and information assurance. As a modular designed gateway all modules can be replaced without removal of the chassis from the rack enhancing serviceability.

CONNECTIVITY PROVIDED

- ASTRO 25 Core
- ASTRO 25 Sites
 - MCC 7500 Dispatch
 - Trunking
 - Conventional – Analog 4 wire, Digital V.24 and/or IP
 - HPD
 - SmartX
 - ISSI
- Customer Enterprise Network (CEN)

FUNCTIONS PERFORMED

- Radio system traffic call routing (voice and data)
- Packet duplication
- High reliability control – fast failover
- Traffic Shaping (Packet fragmentation, Prioritization, and Queuing)
- Dynamic System Resilience site routing
- IP Simulcast traffic routing
- Zone Core Protection (ZCP)
- Conventional Channel Gateway (Station Control)
- Advanced Conventional Signaling (For example MDC1200 and ACIM)

PHYSICAL INTERFACES

- Ethernet and T1 interfaces for WAN connectivity
- Ethernet for Site LAN including IP Station Interfaces
- Analog and V.24 Conventional station interfaces
- FlexWAN interface for selected legacy networks

SECURITY FUNCTIONALITY

Supports data encryption over Ethernet and T1/E1 links using the IPSec and FRF.17 protocols and the optional encryption module.

- Data encryption – Data Encryption Standard (DES), Triple DES (3DES), and 256-bit Advanced Encryption Standard (AES) algorithms
- Data authentication – Message Digest 5 (MD5) algorithm and Secure Hash Algorithm (SHA)
- Public key execution – Diffie-Hellman Group 1, Group 2, and Group 5 negotiation, Group 14
- SSH (secure shell) client/server architecture – secure encrypted communications between two trusted hosts over insecure networks.
- Password Protection
- Zeroization of critical security parameters (CSPs) – Supports commands to zeroize all Key Encryption Key (KEK) related information and CSPs in the event of a security breach

CONFIGURATION

Base Platform Configuration	Enclosure; Power Subsystem (AC or DC); Base Module; Console Management Port (9 Pin); Four 10/100/1Gbps Base-T Ethernet Ports; Two T1/E1 WAN Telecommunication Ports
Optional Modules	Encryption module; Analog 4 wire/V.24 Interface kit: 4x4wire with E&M analog ports, 4xv.24 digital ports; Flexwan module: 1 multipurpose port, typically used for v.35 interface

PHYSICAL SPECIFICATIONS

Dimensions	44 cm (w) x 4.3 cm (h) x 37 cm (d)
Weight	7.3 kg (16 lb)

ENVIRONMENTAL SPECIFICATIONS

Temperature	–30 °C to 60 °C (–22 °F to 140 °F) operating for base unit with or without encryption module 0 °C to 50 °C (32 °F to 122 °F) operating for base unit configured with optional interface modules –40 °C to 85 °C (–40 °F to 185 °F) non-operating
Humidity	5 to 95% (Non-Condensing)
Heat Dissipation	163 BTU/Hour (Maximum)
Power Consumption	48 Watts (Maximum)

AC Power Configuration

Operating Range	100V to 240V, 50/60Hz
Current Draw	Less than 0.50A at 120VAC Less than 0.25A at 220VAC

DC Power Configuration

Operating Range	20 to 60 VDC
Current Draw	Less than 2.0A at 24VDC Less than 1.0A at 48VDC

PRODUCT SAFETY CERTIFICATIONS

North America	UL60950-1, CSA C22.2 No. 60950-1
---------------	-------------------------------------

EMC/EMI CERTIFICATIONS

North America	FCC Part 15; Class A Industry Canada ICES-003; Class A
---------------	---

Europe (EU)

EN 55022	Radiated Emissions; Class A
EN 55022	Conducted Emissions; Class A
EN 61000-3-2	Harmonics
EN 61000-3-3	Flicker
EN 55024	Immunity
EN 61000-4-2	ESD Immunity
EN 61000-4-3	Radiated Immunity
EN 61000-4-4	EFT/B Immunity
EN 61000-4-5	Surge
EN 61000-4-6	Conducted Immunity
EN 61000-6-11	Voltage Interruption / Dips

Australia /

New Zealand	AS/NZS CISPR 22; Class B
-------------	--------------------------

Japan

VCCI Class B

TELECOMMUNICATIONS APPROVALS

North America	FCC Part 68, IC CS-03
Europe (EU)	ETSI/TBR1, TBR2, TBR12, TBR13, TBR17
Australia / New Zealand	AS/ACIF S003, ACA TS016, TNA117

ENVIRONMENTAL REGULATORY

EU WEEE Directive	EN 50419 Compliant
China Management Methods (CMM)	Ministry Order #39

SC476-HF1LDF(DXX-E5749) Collinear omni, 6.5 dBd, low PIM, HD, PIP rated, 746-869 MHz

- Covers the 746-869 MHz frequency range
- 500W average power and 25KW PIP for multi-channel systems
- Low PIM and heavy-duty construction
- 0-10° electrical downtilt available

Sinclair's SC476-HL Series of antennas are broad band covering the entire 746-869 MHz frequency range and offers 6.5 dBd of gain, enclosed in a rugged, UV protected fiberglass radome. Designed for multi-channel systems, it features with low intermodulation products, highly rated average power and peak instantaneous power.

The Zero degree downtilt model can be mounted either upright or inverted, while downtilt models should be mounted in an upright position only.

When ordering, please refer to the chart below for the model number. Downtilt configurations are subject to various list price. Please contact your Sinclair Sales Representative or Customer Service Representative for more information.

Model Number	Downtilt
SC476-HF1LDF(D00-E5749)	0°
SC476-HF1LDF(D01-E5749)	1°
SC476-HF1LDF(D02-E5749)	2°
SC476-HF1LDF(D03-E5749)	3°
SC476-HF1LDF(D04-E5749)	4°
SC476-HF1LDF(D05-E5749)	5°
SC476-HF1LDF(D06-E5749)	6°
SC476-HF1LDF(D07-E5749)	7°
SC476-HF1LDF(D08-E5749)	8°
SC476-HF1LDF(D09-E5749)	9°
SC476-HF1LDF(D10-E5749)	10°

Application Notes

- D00 model refers to Customer Tech Manual 006204, EPR 018576.
Other downtilt models refer to Customer Tech Manual 006153, EPR 018528.



Region	United States	Europe, Middle East and Africa	Caribbean and Latin America	Canada and rest of the world
Telephone	USA: 1 800 263 3275	International: +44 (0) 1487 84 28 19	International: +1 905 726 7676	Canada: 1 800 263 3275 International: +1 905 727 0165
E-mail	salesusa@sinctech.com	salesuk@sinctech.com	salesla@sinctech.com	salescan@sinctech.com

Electrical Specifications

Frequency Range	MHz	746 to 869
Connector		7/16 DIN-Female
Gain (nominal)	dBd (dBi)	6.5 (8.6)
VSWR (max)		1.5:1
Polarization		vertical
Pattern		Omni-directional
Vertical beamwidth (typ)	degrees	12
Main Beam Electrical Tilt (Downtilt)	degrees	0 to 10
Average Power Input (max)	W	500
Passive intermod. (2x20W, 3rd ord.)	dBc	-150
Lightning protection		DC ground
PIP(KW, max)		25 ^{*1}

Mechanical Specifications

Width	in (mm)	3.5 (89)
Depth	in (mm)	3.5 (89)
Length/ Height	in (mm)	84 (2134)
Base pipe diameter	in (mm)	3.5 (89)
Base pipe mounting length	in (mm)	18 (457)
Radiating element material		copper
Radome material		fiberglass (UV protected)
Weight	lbs (kg)	21 (9.53)
Weight iced (1/2" ice)	lbs (kg)	36 (16.34)
Mounting Hardware (Optional)		Clamp147 or Clamp005 ^{*2}
Estimated Shipping Weight	lbs (kg)	31 (14.07)
Shipping dimensions	in (mm)	108x6x6 (2743x152x152)
Mounting configurations		upright, inverted ^{*3}
Recommended For Offset Side Mount:		Not Required

Environmental Specifications

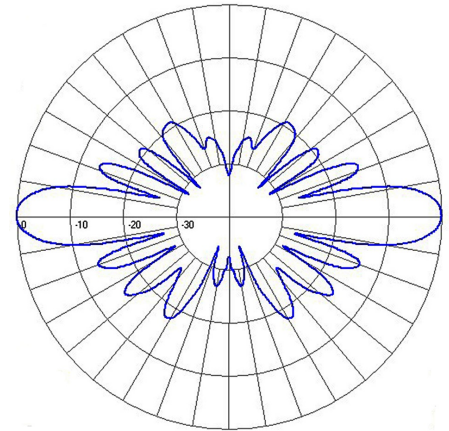
Temperature range	°F (°C)	-40 to +140 (-40 to +60)
Wind Loading Area (Flat Plate Equivalent)	ft² (m²)	1.19 (0.11)
Wind Loading Area (1/2" ice)	ft² (m²)	1.57 (0.15)
Rated wind velocity (no ice)	mph (km/h)	290 (467)
Rated wind velocity (1/2" radial ice)	mph (km/h)	255 (411)
Lateral thrust (100 mph No Ice)	lbs (N)	46 (204.6)
Bending moment (100 mph No Ice)	ft-lbs (Nm)	104 (140.4)
Tip deflection (100 mph No Ice)	degrees	0.13

Notes

- *1 : Quantified by Motorola 12 channel combining system
- *2 : Qty 2
- *3 : D00 version can be installed upright or inverted, downtilt versions can be installed upright only.

Ordering Information

When ordering, please refer to the model list on the previous page for specific model numbers and downtilt configurations.



Vertical, 0° DT

Region	United States	Europe, Middle East and Africa	Caribbean and Latin America	Canada and rest of the world
Telephone	USA: 1 800 263 3275	International: +44 (0) 1487 84 28 19	International: +1 905 726 7676	Canada: 1 800 263 3275 International: +1 905 727 0165
E-mail	salesusa@sinctech.com	salesuk@sinctech.com	salesla@sinctech.com	salescan@sinctech.com

SC479-HF1LDF(DXX-E5765) Collinear omni, 9 dBd, low PIM, PIP rated, Null fill, 746-869 MHz

- Covers the 746-869 MHz full frequency range with heavy-duty construction
- 500W average power and 25KW PIP for multi-channel systems
- Optimized null fill for close-in coverage enhancement
- 0-10° electrical downtilt available

**Recommend SMK-335-A3 or SMK-335-A7 for Offset Side Mount.
Available from Sinclair separately. Comply with EIA-3296F standard.**

This broadband, heavy duty, omni-directional antenna covers the entire 746-869 MHz frequency range. Designed for multi-channel systems, it features with low intermodulation products, highly rated average power and peak instantaneous power. Null fill radiation pattern improves close-in coverage.

This antenna comes with Null Fill feature, should be installed upright only.

When ordering, please refer to the chart below for the model number. Downtilt configurations are subject to various list price. Please contact your Sinclair Sales Representative or Customer Service Representative for more information.

Model Number	Downtilt
SC479-HF1LDF(D00-E5765)	0°
SC479-HF1LDF(D01-E5765)	1°
SC479-HF1LDF(D02-E5765)	2°
SC479-HF1LDF(D03-E5765)	3°
SC479-HF1LDF(D04-E5765)	4°
SC479-HF1LDF(D05-E5765)	5°
SC479-HF1LDF(D06-E5765)	6°
SC479-HF1LDF(D07-E5765)	7°
SC479-HF1LDF(D08-E5765)	8°
SC479-HF1LDF(D09-E5765)	9°
SC479-HF1LDF(D10-E5765)	10°



Region	United States	Europe, Middle East and Africa	Caribbean and Latin America	Canada and rest of the world
Telephone	USA: 1 800 263 3275	International: +44 (0) 1487 84 28 19	International: +1 905 726 7676	Canada: 1 800 263 3275 International: +1 905 727 0165
E-mail	salesusa@sinctech.com	salesuk@sinctech.com	salesla@sinctech.com	salescan@sinctech.com

Electrical Specifications

Frequency Range	MHz	746 to 869
Bandwidth	MHz	123
Connector		7/16 DIN-Female
Gain (nominal)	dBd (dBi)	9 (11.1)
Input VSWR (max)		1.5:1
Polarization		vertical
Impedance	Ω	50
Pattern		Omni-directional
Vertical beamwidth (typ)	degrees	5.7
Average Power Input (max)	W	500
Passive intermod. (2x20W, 3rd ord.)	dBc	-150
Lightning protection		DC ground
PIP(KW, max)		25
Electrical tilt (available)		0 to 10 degrees
Null fill	%	25

Notes

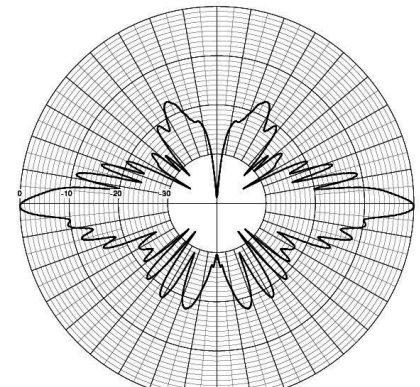
- *1 : Quantified by Motorola 12 channel combining system
- *2 : Qty 2

Mechanical Specifications

Width	in (mm)	3.5 (89)
Depth	in (mm)	3.5 (89)
Length/ Height	in (mm)	173.4 (4404)
Base pipe diameter	in (mm)	3.5 (89)
Base pipe mounting length	in (mm)	24 (610)
Radome material		fiberglass (UV protected)
Weight	lbs (kg)	34 (15.44)
Weight iced (1/2" ice)	lbs (kg)	66 (29.96)
Mounting Hardware (Optional)		Clamp006B, or Clamp147
Actual shipping weight	lbs (kg)	76 (34.5)
Shipping dimensions	in (mm)	192x6x6 (4877x152x152)
Mounting configurations		upright
Recommended For Offset Side Mount:		SMK-335-A3 or SMK-335-A7

Ordering Information

When ordering, please refer to the model list on the previous page for specific model numbers and downtilt configurations.



Vertical, 0° DT

Environmental Specifications

Temperature range	°F (°C)	-40 to +140 (-40 to +60)
Wind Loading Area (Flat Plate Equivalent)	ft² (m²)	2.46 (0.23)
Wind Loading Area (1/2" ice)	ft² (m²)	3.25 (0.3)
Rated wind velocity (no ice)	mph (km/h)	170 (274)
Rated wind velocity (1/2" radial ice)	mph (km/h)	155 (250)
Lateral thrust (100 mph No Ice)	lbs (N)	97 (431.5)
Bending moment (100 mph No Ice)	ft-lbs (Nm)	520 (702)
Tip deflection (100 mph No Ice)	degrees	1.52

Region	United States	Europe, Middle East and Africa	Caribbean and Latin America	Canada and rest of the world
Telephone	USA: 1 800 263 3275	International: +44 (0) 1487 84 28 19	International: +1 905 726 7676	Canada: 1 800 263 3275 International: +1 905 727 0165
E-mail	salesusa@sinctech.com	salesuk@sinctech.com	salesla@sinctech.com	salescan@sinctech.com

SDM 3000

Monitoring Devices in Communication Sites

ELEMENT MANAGER FOR COMMUNICATION SITES

Site Device Manager 3000 is an intelligent Remote Terminal Unit (RTU) specifically created for use in Network Fault Management systems. The SDM 3000 allows the system operators and technical staff to retrieve fault information via FullVision INM (Integrated Network Manager), MOSCAD GMC element manager or via a Web browser tool.

It connects to a variety of communications and support devices to monitor their activity and report problems to a supervisory center.

MULTI PROTOCOL AND PROXY CAPABILITY

The SDM 3000 unit incorporates a scalable, intelligent Network Manager proxy agent based on advanced hardware; Linux based firmware and Plug-In SW components. The SDM 3000 RTU can communicate with multiple devices using a variety of media and protocols such as serial/ASCII, Ethernet/TCP/IP and discrete digital I/O or analog inputs. The unit also supports XML for logging messages, NTP for Network Time Sync, HTTP for Web Browser, etc. Information from these multiple sources is translated to SNMP for forwarding.

The best modem protocols for the communication task are used while providing commonly accepted information exchange to other devices.

PORT AND I/O FLEXIBILITY

Serial and Ethernet/IP ports permit connectivity to on-site devices to remotely monitor their operation. In cases where additional I/O is required to monitor discrete devices such as security systems, HVAC equipment, Tower lighting and power systems, an expansion unit is available.

Multiple ports, multiple communication protocols and variable speed data handling allow most data devices to be interfaced to the SDM 3000.

BUILT IN WEB SERVER

Using a standard Web Browser, you can access the status of all monitored devices, view extensive Event or Diagnostic Logs or SNMP Traps as well as download new firmware and monitoring software.

The Web Server is a convenient tool that includes secure access from a technician's computer to the entire network.

REMOTE ACCESS TO LOCAL TERMINALS AND CONSOLES

Telnet support provides connectivity to local device consoles via SDM 3000 serial ports. Even without Telnet, device craft ports can be accessed by using the RSS application layer supplied with the SDM 3000 Builder configuration utility.

Reach-Through connectivity for continued support of all legacy equipment.

FULL CERTIFICATION FOR MOTOROLA SYSTEMS AND NETWORK MANAGERS

The SDM 3000 is certified for all ASTRO®25 6.7 and later and 7.X systems and Motorola Network Managers: FullVision INM and MOSCAD GMC.



The SDM 3000 is the newest unit in the Motorola Network Fault Management family of monitoring products. It adds two very important enhancements to the standard NMO monitoring supplied by the built-in box agents and FullVision INM manager. The first is providing important monitoring and control of critical RF and support equipment required at most remote sites. This includes third party devices such as Channel Banks, microwave radios, GPS, Antenna monitoring, power manage-

ment and site security. This crucial data is only available through the SDM 3000 which reports to its Graphic Master Central (GMC) manager or a subset to FullVision INM. The second is providing additional information on Motorola manufactured devices such as Base Stations, Site Controllers and Comparators through a separate IP polling mechanism in addition to receiving all the SNMP Trap messages.

TYPICAL THIRD PARTY NETWORK FAULT MANAGEMENT APPLICATIONS

Antenna Monitoring

- Forward Power
- Reflected Power
- Receive Path Test
- Antenna VSWR
- Tower Lighting

Power Management

- AC Power Status
- Main Battery Voltage
- Battery Charging Current
- Generator Status, Operation
- Fuel/Oil Levels, Remote Exercise

Site Security

- Intrusion Alarm
- Fire Alarm
- Smoke Alarm
- Access Control

Environmental Alarms

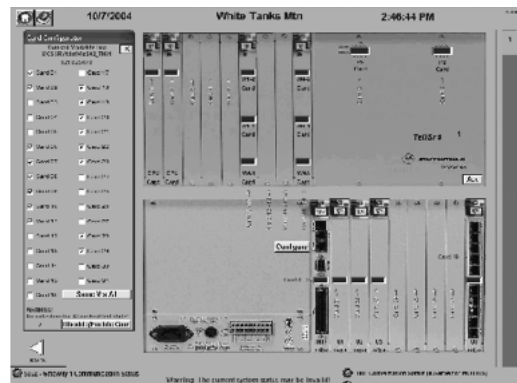
- HVAC Operation & Alarms
- Air Flow
- Ambient Temperature
- Relative Humidity
- Flood Water Level



Rear Panel View of F4544 and F4548

MOTOROLA NETWORK MANAGERS

The SDM 3000 reports all Status and Events information to MOSCAD GMC and a functional subset to FullVision INM Element Managers. The SDM 3000 is required to receive or output information to these devices.



GMC View of TeNSr channel bank at a Site



FullVision INM View of SDM 3000

The following tables include the Specifications and Model numbers for the four types of SDM 3000 units:

SDM 3000 SPECIFICATIONS – ADVANCED UNIT MODEL F4544A

Ethernet Port	Data rates	10/100 Mb/s
	Port Description	2 Ethernet user Ports; 1 Console Port
RS232 Port	Data rates	Up to 115,200 Kb/s
	Port Description	3 Full Flow Control RS232 1 Non Flow Control RS232
RS232/RS485 Port	Data rates	Up to 115,200 Kb/s
	Port Description	Full Flow Control RS232 or RS485
I/O RS485 Port	Data Rates	115,200 Kb/s
	Port Description	RS485 Port for I/O Communication
Discrete Inputs/Outputs	I/O Descriptions	48 Digital Inputs (wet/dry contacts) 16 Digital Outputs (SPST relay, contact rating 75 VA/30W, 0.5A@30Vac/60Vdc) 8 Analog Inputs (± 5 VDC, 12 bits including sign)
	CPU Display	Front Panel: Console Port LEDs (2 LEDs), Communication Ports LEDs (9 Bi-color LEDs), PWR LED, Diagnostic LED Rear Panel: Communication Ports LEDs on the connectors RJ45 - 16 LEDs (2 x 8)
LED Displays	I/O Display	48 Digital Input LEDs, 16 Digital Output LEDs
	Operating Power	Primary Power IN
Auxiliary Power IN		12 VDC /Max 12W Alternate/Backup power source
Two 12 VDC Power OUT		Combined drain from two outputs, max 12W (12V@1A). Each output can supply power to one SDM 3000 I/O expansion unit (1A fuse for each AUX OUT).
Physical	Dimensions	1 Rack Unit high (17"W x 1.65"H x 12.9"D, 435 x 42 x 328 mm)
	Weight	Approx. 2.5 kg (5.5 pounds)
	Temperature	Operating: -30 to +60°C (excluding lithium battery -20 to +60°C); Storage: -55 to +85°C
	Humidity	90-95% RH @ +50°C

SDM 3000 SPECIFICATIONS – BASIC UNIT, MODEL F4543A

Ethernet Port	Data rates	10/100 Mb/s
	Port Description	1 Ethernet user Port; 1 Console Port
RS232 Port	Data rates	Up to 115,200 Kb/s
	Port Description	Full Flow Control RS232
RS232/RS485 Port	Data rates	Up to 115,200 Kb/s
	Port Description	Full Flow Control RS232 or RS485
I/O RS485 Port	Data Rates	115,200 Kb/s
	Port Description	RS485 Port for I/O Communication
Discrete Inputs/Outputs	I/O Descriptions	48 Digital Inputs (wet/dry contacts) 16 Digital Outputs (SPST relay, contact rating 75 VA/30W, 0.5A@30Vac/60Vdc)
	LED Displays	CPU Display
I/O Display		48 Digital Input LEDs, 16 Digital Output LEDs
Operating Power	Primary Power IN	± 24 VDC (18.6-32V)/Max 14W or ± 48 VDC (36-60V)/Max 14W 100-240 VAC; 47-440 Hz, Max 20W
	Auxiliary Power IN	12 VDC /Max 12W Alternate/Backup power source
	Two 12 VDC Power OUT	Combined drain from two outputs, max 10W (12V@1A). Each output can supply power to one SDM 3000 I/O expansion unit (1A fuse for each AUX OUT).
Physical	Dimensions	1 Rack Unit high (17"W x 1.65"H x 12.9"D, 435 x 42 x 328 mm);
	Weight	Approx. 2.5 kg (5.5 pounds)
	Temperature	Operating: -30 to +60°C (excluding lithium battery -20 to +60°C); Storage: -55 to +85°C
	Humidity	90-95% RH @ +50°C

SDM 3000 I/O EXPANSION UNIT SPECIFICATIONS – ADVANCED UNIT, MODEL F4548A

Communication Ports I/O (RS485)	Data rates	115,200 Kb/s
	Number of Ports	2
	Port Description	Multiple RS485 Ports (IN/OUT)
Discrete Inputs/Outputs	I/O Descriptions	48 Digital Inputs (wet/dry contacts) 16 Digital Outputs (SPST relay, contact rating 75 VA/30W, 0.5A@30Vac/60Vdc) 8 Analog Inputs (± 5 VDC, 12 bits including sign)
LED Displays	CPU Display	Front Panel: I/O Comm. LED (1 Bi-color LED), PWR LED, Diagnostic LED Rear Panel: I/O Comm. Ports LEDs on the IN connector RJ45 (2 LEDs)
	I/O Display	48 Digital Input LEDs 16 Digital Output LEDs
Operating Power	Primary Power IN	± 24 VDC (18.6-32V)/Max 7W ± 48 VDC (36-60V)/ Max 7W 100-240 VAC, 47-440 Hz, Max 10W
	12VDC Power IN	12 VDC /Max 6W Alternate/Backup power source;
	Two 12 VDC Power OUT	Combined drain from two outputs, max 12W (12V@1A.) 1A fuse for each AUX OUT.
Physical	Dimensions	1 Rack Unit high (17"W x 1.65"H x 12.9"D, 435 x 42 x 328 mm)
	Weight	Approx. 2.5 kg (5.5 pounds).
	Temperature	Operating: -30 to $+60^{\circ}\text{C}$; Storage: -55 to $+85^{\circ}\text{C}$
	Humidity	90-95% RH @ $+50^{\circ}\text{C}$

SDM 3000 I/O EXPANSION UNIT SPECIFICATIONS – BASIC UNIT, MODEL F4547A

Communication Ports I/O (RS485)	Data rates	115,200 Kb/s
	Number of Ports	2
	Port Description	Multiple RS485 Ports (IN/OUT)
Discrete Inputs/Outputs	I/O Descriptions	48 Digital Inputs (wet/dry contacts) 16 Digital Outputs (SPST relay, contact rating 75 VA/30W, 0.5A@30Vac/60Vdc)
LED Displays	CPU Display	Front Panel: I/O Comm. LED (1 Bi-color LED), PWR LED, Diagnostic LED Rear Panel: I/O Comm. Ports LEDs on the IN connector RJ45 (2 LEDs)
	I/O Display	48 Digital Input LEDs, 16 Digital Output LEDs
Operating Power	Primary Power IN	± 24 VDC (18.6-32V)/Max 7W ± 48 VDC (36-60V)/ Max 7W 100-240 VAC, 47-440 Hz, Max 10W
	12VDC Power IN	12 VDC /Max 6W Alternate/Backup power source
	Two 12 VDC Power OUT	Combined drain from two outputs, max 12W (12V@1A.) 1A fuse for each AUX OUT.
Physical	Dimensions	1 Rack Unit high (17"W x 1.65"H x 12.9"D, 435 x 42 x 328 mm)
	Weight	Approx. 2.5 kg (5.5 pounds).
	Temperature	Operating: -30 to $+60^{\circ}\text{C}$; Storage: -55 to $+85^{\circ}\text{C}$
	Humidity	90-95% RH @ $+50^{\circ}\text{C}$

REGULATORY STANDARDS

Safety	UL listed: UL 60950-1, CSA 22.2-950-1, EN60950-1, IEC 60950-1
Radiated & Conducted Emission	CFR 47 FCC part 15, subpart B (class B); CE EMC: EN55022 (class B), EN50081-1, EN61000-6-3, EN61000-3-2, EN61000-3-3 (AC only)
Electro-Static Discharge	EN55024/EN61000-4-2 (air discharge 8 kV, contact discharge 4 kV)
Surge	EN55024/EN61000-4-5
Radiated Immunity	EN55024/EN61000-4-3 3 V/m 80%AM @ 1kHz
Electrical Fast Transients	EN55024/EN61000-4-4 AC: 1.0kV DC & I/Os: 0.5kV
Conducted RF Immunity	EN55024/EN61000-4-6 (3 Vrms)
Power Freq Magnetic Field	EN55024/EN61000-4-8 (1 A/m)
Voltage Dips & Interruptions	EN55024/EN61000-4-11 95% AC reduction for 0.5 period; 30% AC reduction for 25 periods; 95% AC reduction for 250 periods

Specifications subject to change without notice.



Motorola, Inc. 1301 E. Algonquin Road, Schaumburg, Illinois 60196 U.S.A.
www.motorola.com/governmentandenterprise 1-800-367-2346

MOTOROLA and the Stylized M Logo are registered in the U.S. Patent and Trademark Office.
All other product or service names are the property of their registered owners. © Motorola, Inc. 2006 (0604)
R3-11-2030



Modular Frequency/Time System

Model 9100



ISO 9001 Registered

Features

- Single or dual redundant operation
- GPS discipline of single or double oven crystal oscillators and/or rubidium oscillators
- Low phase noise and very low spurious on sinewave outputs
- Standard references, IRIG-B, and telecom outputs
- Off-line A/B switching in each distribution module, no single point switch failures
- All functional modules and power supplies are "Hot Swappable"
- Six, four channel output module positions available, optional expansion chassis for additional distribution
- RS-232 I/O (NTS/NTP, with 10 BaseT or 10 Base2 optional)

The Model 9100 Modular Frequency/Time System (MFTS) is a third-generation modular system providing ultra-stable reference outputs, all typically referenced to GPS. By selecting the appropriate functional modules, the system is easily configured for a wide variety of frequency and timing applications. The main frame and functional modules are described in the following paragraphs.

Model 9100

Main Frame Specifications:

Chassis dimensions	5.25 inches (3U) high, 19 inches wide, and 15 inches deep
Weight	21 pounds, maximum, with a full complement of modules
Color	Anodized clear aluminum or Satin Black, optional
Operating Temperature	-30°C to +60°C, with modules
Humidity	95% relative maximum, non-condensing, with modules

Model 9101

GPS Reference, with Rubidium Oscillator

This GPS Reference Module contains a GPS receiver, 10 MHz rubidium oscillator, signal generation circuitry, and microprocessor control circuitry.

The GPS receiver is an eight channel unit and is specifically designed for timing applications. Its primary outputs are 1 PPS for oscillator discipline, time, position, and status. Acquisition time is typically < 2 minutes for a "warm" start.

The rubidium oscillator is disciplined from the GPS receiver's 1 PPS, through the microprocessor. Discipline algorithms in the microprocessor smooth short term instabilities of the GPS 1 PPS. The following output signals, referenced to GPS, are derived from the rubidium oscillator and the signal generation circuitry.

- 10 MHz
- 5 MHz
- 1 PPS
- IRIG-B
- Others

Model 9101 - cont'd

GPS Reference, with Rubidium Oscillator

The microprocessor, as mentioned above, disciplines the rubidium oscillator. It also provides internal communications with functional sections of this module as well as external communications with other functional modules.

Front panel LED indicators include Fault (summation), GPS Locked, and On Line.

Rubidium Oscillator Characteristics

Accuracy while

GPS tracking $< 1 \times 10^{-11}$, one hour averaging
 $< 1 \times 10^{-12}$, one day averaging
(Frequency domain)

Accuracy while

GPS tracking 50 - 100 ns (Time domain)
Aging rate, no GPS $< 2 \times 10^{-11}$ / day, at +25°C, ±3°C
 $< 5 \times 10^{-12}$ / month, at +25°C, ±3°C

Holdover $\leq 5 - 10$ µsec/ week, after disciplining for at least 72 hours

Model 9101

GPS Reference, with Crystal Oscillator

This GPS Reference Module contains a 10 MHz crystal oscillator. With the exception of the crystal oscillator and discipline software, this module is functionally identical to the GPS Reference Module, with rubidium oscillator, Model 9101.

Crystal Oscillator Characteristics

Accuracy while

GPS tracking $< 1 \times 10^{-11}$, one hour averaging
 $< 1 \times 10^{-12}$, one day averaging
(Frequency domain)

Accuracy while

GPS tracking 80 - 100 ns (Time domain)
Aging rate, no GPS $< 2 \times 10^{-10}$ / day, at +25 °C, ±3 °C
Holdover ≥ 10 µsec/ day, after disciplining for at least 72 hours

Model 9104

Fault Sense Unit

The Fault Sense Unit detects system module failures, provides switching signals to output modules, and contains Alarm, RS-232 and NTS/NTP circuitry.

Alarm Output Form C relay contacts

RS-232 I/O

Message Format Consult factory for particulars

Baud rates 300 - 19.2 Kbaud, switch selectable

Data bits 7 or 8, switch selectable

Stop bits 1 or 2, switch selectable

Parity bits None, even, or odd, switch selectable

NTS/NTP (Optional)

Ethernet Interface 10 BaseT or 10 Base2, specified at time of order

Network Features Network Time Protocol Versions 2 and 3
Telnet, status and control

Consult factory for additional NTS/NTP information

Model 9120

AC Power Supply

The AC Power Supply provides operational power, for all functional modules, from an external AC power input. Output voltages are +5 V, +15 V, and -15 V. Status is provided to the FSU module. Three green LED's on front panel indicate functioning +5V, +15V, and -15V power supplies functioning. A red LED Fault indicator is a fault summation of any failed power supply. Two power supplies may be used for redundancy.

Input

Voltage Universal Input, 85 to 265 Vac, 47 to 63Hz

Power 150 watts maximum capability, 80 watts typical operation

Outputs

Voltages +5 Vdc and ±15 Vdc

Note: Front panel test points provided on all modules

Model 9121

DC Power Supply

The DC Power Supply provides operational power, for all functional modules, from an external DC power input. Output voltages are +5 V, +15 V, and -15 V. Status is provided to the FSU module. Three green LED's on front panel indicate functioning +5V, +15V, and -15V power supplies functioning. A red LED Fault indicator is a fault summation of any failed power supply. Two power supplies may be used for redundancy.

Input

Voltage	48 Vdc nominal, $\pm 20\%$
Power	150 watts maximum capability, 80 watts typical operation

Outputs

Voltages	+5 Vdc and ± 15 Vdc
----------	-------------------------

Model 9106

Digital Distribution Module

The Digital Distribution module is used for pulse distribution and provides four separate output buffers, from a common input. Up to six of these modules may be installed. Signal dropout status is returned to the Fault Sense Unit. Red LED on front panel indicates signal dropout on any of the four output channels.

Output Characteristics

Rise and all times	2 ns typical
Level	TTL
Drive	50 Ω drive, short circuit protected
Number of outputs	4 each
Connectors	4 each, BNC, female, other types available

Model 9107

Frequency Distribution Module

The Frequency Distribution Module is used for sinewave distribution and provides four separate output buffers, from a common input. Up to six of these modules may be installed. Signal dropout status is returned to the Fault Sense Unit. Red LED on front panel indicates signal dropout on any of the four output channels.

Output Characteristics

Frequency Response	DC to 50 MHz, ± 2 dB
Level	Fixed, 1.0 Vrms, (+13 dBm), ± 2 dB
Drive	50 Ω drive, short circuit protected
Number of outputs	4 each
Connectors	4 each, BNC, female, other types available

Model 9111

Telecommunications Signal Generator

The Telecommunications Signal Generator provides four channels of telecom signals in the following configuration: 1.544 MHz or 2.048 MHz rates or T1 or E1 framed signals.

Telecom Rates

Rates	1.544 MHz or 2.048 MHz
Output Level	TTL or RS-422
Connectors	BNC for single ended outputs Bantam or wirewrap for balanced outputs

T1 and E1 Framing

Data	Framed all ones
Consult factory for additional information	

GPS Antenna Characteristics

Type	Patch, with 35 dB LNA
Operating frequency	1.575 GHz
Supply voltage	+5 to +15 Vdc, +5 Vdc nominal
Supply current	< 65 ma
Coverage	Hemispherical
Connector	TNC female
Size	3.5 inches in diameter 3.0 inches high including mounting adapter

GPS Antenna Input (Model 9101)

Connector	TNC female
Antenna LNA	+5 V, 5 to 80 ma, short or open circuit voltage detection
Surge Suppressor	Polyphaser 095-0518C-A (Optional)
Cable	50 ft. RG-58/U, other types and lengths available

DATA SHEET

Network Management
Unified Event Manager



Network Management Unified Event Manager

Monitoring and Managing the Health of Your ASTRO® 25 System

The **Unified Event Manager (UEM)** allows you to monitor and manage the health of your ASTRO 25 system, helping to maximize your resources and minimize downtime to reduce maintenance costs. Developed from AdvnentNet WebNMS software®, the Simple Network Management Protocol (SNMP) communicates with your system's components and provide up to the second status of the health of your radio network. Real-time system device status is provided to effectively manage the network to reduce total cost of ownership.

INTUITIVE USER INTERFACE

Built into the tool is an improved GUI navigational interface which automatically discovers components in the current network environment and creates map views to monitor the status of the components. The maps provide a graphical aggregation of the system failures and can be customize to your preferences. The new interface allows you to never lose sight of where users navigated to in the system during the drill-down process. The UEM provides the user the capability to manage radio, transport, and environmental devices in a single view.

MONITORING THE SYSTEM FOR A DISTURBANCE IN THE NETWORK.

Using the Unified Event Manager the user can identify a device failure by the object symbol and color change on the physical summary or detail maps. Click on the icon to access the alarm summary view to determine more detailed information about the failure and other devices affected. The "Remote Command" operation can also be used to disable or restart the device directly from the manager in an effort to quickly correct a failure and restore communications to the site.

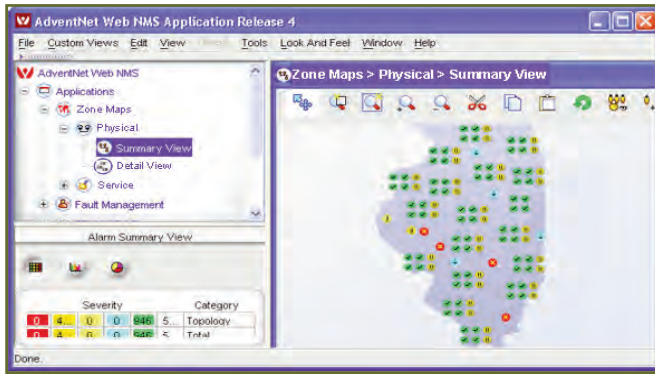
Using the Unified Event Manager the user can identify the link failure by the object symbol and color change on the services summary or detail maps. The user can click on the icon to access the alarm summary view to determine more detailed information about the failure and other devices affecting the communication to a site.

EXTERNAL NOTIFICATION SYSTEM

If a failure occurs while the system manager is away from the monitor, the system can automatically notify the user via an external notification system (email/cell phone/pager) so the user can return to the terminal to identify and diagnose the problem.

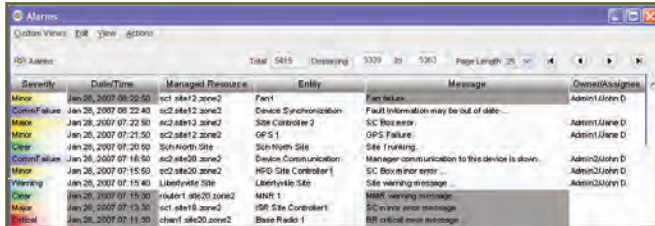
DATA SHEET

Unified Event Manager



Zone Physical Summary View

Allows users to view the health of the entire system in one easy-to-read display. Provides a visual display of all managed objects. Can be customized to show only selected objects.



Alarms View

Indicates the failures occurring on the system. Can be directly accessed from any icon on the Summary View to display any associated alarms.

ENHANCED FEATURES/ADVANTAGES

The Unified Event Manager provides the latest features and advantages in managing your system health.

Features such as:

- **Alarms View** – Provides a “What’s Down” view of all objects and their communication status by severity. Associated information allows the user to quickly identify the problem presented in an organized customizable format.
- **Remote Command Execution** – Allows the user to send commands to a network element and effect the operational mode of the device.
- **Northbound Interface** – Provides a real-time event stream to a northbound manager. Northbound manager can detect and obtain missed information sent from the fault application.
- **Role Based Access Control** – Allows for the assignment of access rights to the application's features and displays. The user can customize the information displayed upon login and quickly navigate to the information applicable to their responsibilities.
- **External Event Notification** – If customer is not continuously monitoring the system from the FM client the application can provide an email notification which can be forwarded to an external device (pda, phone, pager).

ASTRO 25 NETWORK MANAGEMENT SOLUTION

Fault

Unified Event Manager

Configuration
Accounting
Performance
Security

The unified Event manager allows you to monitor and manage the health of your networks. From one easy to use interface manage your radio, transport and environmental devices in a single view.

Motorola's Network management solutions manage complex ASTRO 25 mission critical systems with unprecedented simplicity. We integrate our capabilities in system technologies, program management, engineering and services to create solutions that are designed to help you manage your communication networks performance.



MOTOROLA

Motorola, Inc.
www.motorola.com/serviceproviders

The information presented herein is to the best of our knowledge true and accurate. No warranty or guarantee expressed or implied is made regarding the capacity, performance or suitability of any product. MOTOROLA and the Stylized M Logo are registered in the US Patent & Trademark Office. All other product or service names are the property of their respective owners. © Motorola, Inc. R3-7-2011