FLEXIBLE, SCALABLE CONFIGURATIONS
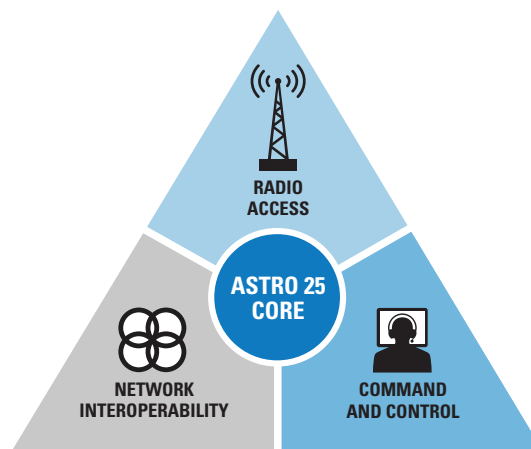
ASTRO® 25 CORE

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 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 wireless voice and data on an integrated, interoperable and easy to manage network they will not outgrow.

Scalable and virtualized, the 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 save money and positions you to take full advantage of technologies that help enhance safety and impact in the field.

ASTRO 25 CORE – FLEXIBLE, SCALABLE, SIZED RIGHT

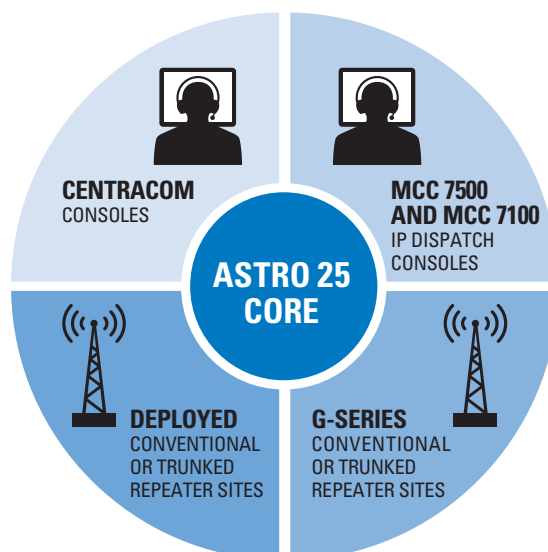| **RADIO ACCESS** | • ANALOG CONVENTIONAL |
	• P25 PHASE 1 DIGITAL CONVENTIONAL OR TRUNKING
	• P25 PHASE 2 TDMA TRUNKING
	• INTEGRATED VOICE AND DATA
	• ENHANCED DATA
	• MUTUAL AID
INTEROPERABILITY	• P25 MULTI-NETWORK CONNECTIVITY VIA ISSI
	• MULTI-BAND RADIOS
	• MULTI-MODE RADIOS
COMMAND AND CONTROL	• MCC 7500 IP DISPATCH CONSOLE
	• MCC 7100 IP DISPATCH CONSOLE
	• MCD 5000 DESKSET

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 Voice and Data, Enhanced Data and HPD

- Radio system management for centralized radio user and system configuration, fault monitoring and control

- Centralized IT management for 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, you can meet current functional requirements with the fewest IT resources and be confident your investment can evolve to meet future needs.

CENTRACOM CONSOLES

MCC 7500 AND MCC 7100 IP DISPATCH CONSOLES

ASTRO 25 CORE

DEPLOYED CONVENTIONAL OR TRUNKED REPEATER SITES

G-SERIES CONVENTIONAL OR TRUNKED REPEATER SITES

THE TECHNOLOGY AND FUNCTIONALITY YOU NEED

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.

K Core: Supports single and multi-channel, single zone, conventional system configurations and Integrated Voice and Data

L Core: Supports single zone trunked system configurations along with Integrated Voice and Data and Enhanced Data capabilities

M Core: Supports single or multi-zone, trunked and/or conventional system configurations along with Integrated Voice and Data, Enhanced Data and HPD capabilities

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 or ISSI 8000 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. Motorola is dedicated to working in partnership with you to evaluate other design considerations in order to help you meet your needs today, and into the future.

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 multi-zone M 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.

K CORE CONFIGURATION

P25 compliant single zone conventional configuration.

The K core supports conventional system configurations with up to 25 remote sites and 75 RF channels. The K 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 K core, organizations have the option to enable Integrated Voice and Data, expand system capacity or connect to a regional system. For added resiliency, the K core also supports the option for a fully redundant configuration to compliment the highly redundant ASTRO 25 system architecture. The configuration is available in either a single open rack or an enclosed cabinet.

L CORE CONFIGURATION

P25 compliant single zone trunked configuration.

The L 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. With an L core, agencies can enable Integrated Voice and Data, Enhanced Data, and can interoperate with other P25 networks. For added resiliency, the L core also supports the option for a fully redundant configuration to compliment the highly redundant ASTRO 25 system architecture. The server and the necessary transport equipment are all contained within a single open rack or enclosed cabinet.

M CORE CONFIGURATION

P25 compliant single or multi-zone trunked and/or conventional configuration.

The M core supports large scale trunked, conventional, or converged system types, in a single zone or a multi-zone configuration. 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 M core gives agencies the option to enable Integrated Voice and Data, Enhanced Data and/or HPD. The system also provides the capability to expand from an initial single zone configuration to a multi-zone configuration. For added resiliency, the M core supports the option for a fully redundant configuration to compliment the highly redundant ASTRO 25 system architecture. The server and necessary network transport equipment can be contained within a single open rack or enclosed cabinet, while high capacity, dual network transport equipment resides in a separate open rack.

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 the conventional ASTRO 25 K core, provides 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 Voice and Data, Enhanced Data and HPD, plus additional functional and security services.

SELECTING THE RIGHT CONFIGURATION

Motorola design engineers will 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	K CORE	L CORE	M CORE
CAPABILITY	Conventional voice Integrated Voice and Data (IV&D)	Trunked voice IV&D Enhanced Data	Conventional and trunked voice IV&D Enhanced Data HPD
CAPACITY	75 channels	150 channels system wide 1-5 sites	Single-zone: 300 channels per zone 1 - 24 sites Multi-zone: 1000 channels per zone 150 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
SYSTEM TOPOLOGIES SUPPORTED	Repeater, simulcast, multicast, voting	Repeater, IP simulcast	Repeater, simulcast, multicast, voting
CHANNEL TYPES SUPPORTED	Analog 4-wire, mixed mode, v.24, IP digital conventional	IP digital trunking, analog or IP digital conventional for mutual aid, SmartX, P25 Conventional Talkgroup	Analog 4-wire, mixed mode, v.24, IP digital conventional and trunking, SmartX, P25 Conventional Talkgroup
DISPATCH SOLUTIONS	CENTRACOM™ Gold Elite MCC 7500 Console MCC 7100 Console	MCC 7500 Console MCC 7100 Console	CENTRACOM Gold Elite MCC 7500 MCC 7100 Console
STATIONS SUPPORTED	QUANTAR™, G-series, MTR series, other analog 4-wire conventional stations	QUANTAR, G-Series Expandable Site Subsystem configuration	QUANTAR, G-series, MTR series, other analog 4-wire conventional stations
INTEROPERABILITY	N/A	ISSI.1 supported	ISSI 8000 supported

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 86ºF (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
motorolasolutions.com/ASTRO25

MOTOROLA