

ENABLE PROJECT 25 ISSI WIRELINE INTEROPERABILITY

ISSI.1 NETWORK GATEWAY SUBSYSTEM

When a disaster strikes or large events require complex coordination and interoperability among first responders, network operators require versatile and immediate interoperability solutions to enable them to respond to the sometimes highly unpredictable nature of emergency situations. This has created an immense and well-understood need for network interoperability and the creation of a system of systems interoperable network.

Today's ASTRO® 25 trunked systems use IP-based call processing and the Project 25 (P25) Common Air Interface, which allows P25 trunked systems to be connected using IP-based gateway technologies. The P25 Inter-RF Subsystem Interface (P25 ISSI) is one of the first end-to-end digital IP network interface standardized by TIA. Motorola has implemented this interface in a software application called the ISSI.1 Network Gateway (ISSI.1 NGW) Subsystem that enables P25 ISSI equipped trunked systems to implement end-to-end digital interconnectivity to meet interoperability needs.

The ISSI.1 NGW supports basic call services including ISSI Group Call, ISSI Emergency Call and end-to-end P25 encryption. It is simply added to an ASTRO 25 trunked core, and does not require any software upgrades to the core, site equipment, consoles or radios.

OPERATIONAL OVERVIEW

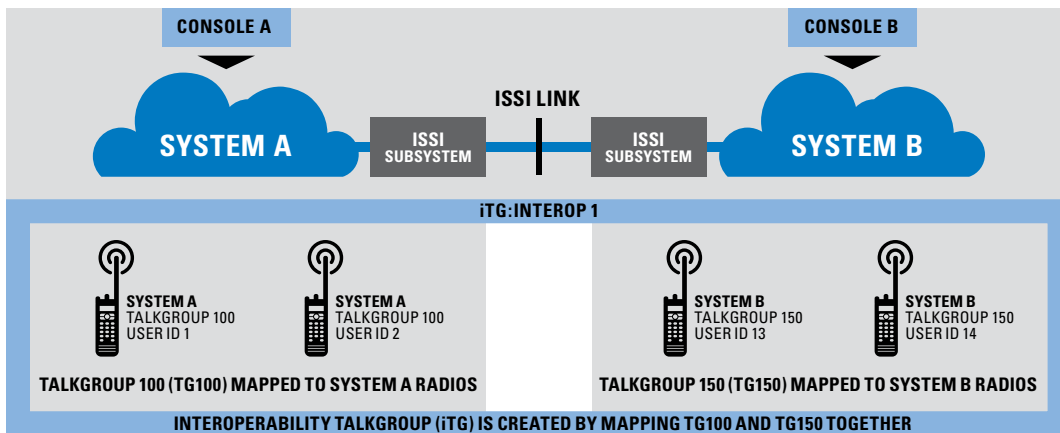
The P25 Common Air Interface allows P25 radio users, using radios on the appropriate RF band, to roam between P25 systems; in addition the P25 standard provides an interface between two systems – ISSI.

In a system that does not have an ISSI connection a user from one system can roam to another P25 system if they have been provisioned as a valid user on the roaming system. Communication with the home system is lost when the radio roams.

When roaming between two systems that have a P25 ISSI connection, the radio user will use an interoperability talkgroup (iTG) set up to include users from System A and System B. In addition, one of the benefits of an ISSI link is that the consoles can maintain communications with the home radio users when they roam onto another system.

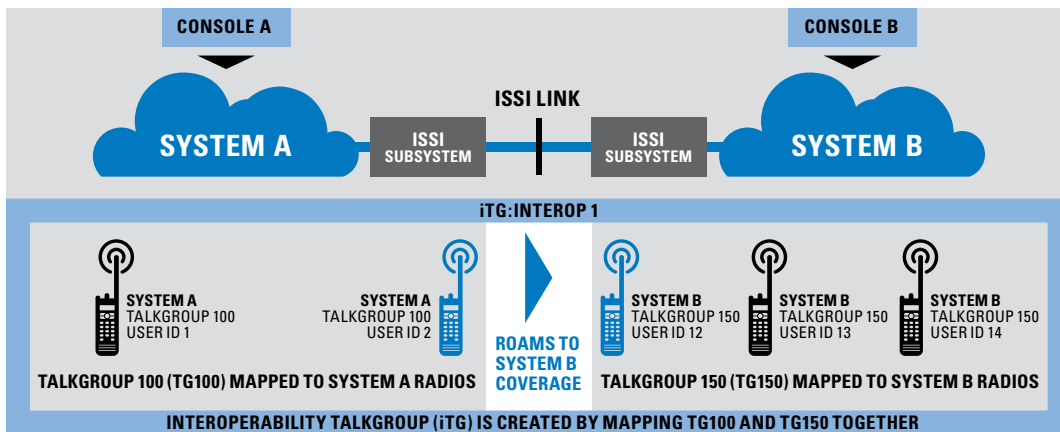
CONNECTING USERS ON MULTIPLE SYSTEMS

The ISSI.1 NGW subsystem enables connectivity between multiple systems. The P25 Radio users when in their home system operate on talkgroups that are found in their home system. When there is a need to interoperate across both systems, the P25 radios users operating on separate talkgroups, which are logically connected and “mapped” between the respective ISSI subsystems, create the operation of a single, logical Interoperability Talkgroup between the two systems. When a user in either system initiates a call all of the radio and console users affiliated to those iTGs in both systems hear the ISSI group call.



ROAMING ACROSS NETWORKS – MANUAL INTER-SYSTEM ROAMING

With ISSI connecting multiple systems together, when a radio user travels out of the range of System A and into the range of system B, the user if provisioned in system B can initiate a manual mode change if provisioned to affiliate into System Talkgroup while communicating to all users via the iTG Interop 1. The important enhancement for the user is that after he roams into System B, he will continue to communicate with the System A console operator as well as any users who are in iTG: Interop 1 in System A.



CONNECTING SYSTEMS OVER WIDE AREA NETWORKS

The ISSI.1 subsystem includes the server, ISSI.1 NGW application, router, Ethernet switch and firewall. It uses an ISSI Link to connect to other ISSI subsystems over a Wide Area Network (WAN). The ISSI Link is an Ethernet link which requires a fixed IP address and up to 384 kbps of bandwidth. Public safety agencies who require interconnectivity can select from a variety of last mile and WAN solutions.



MANAGING ISSI.1 NETWORK GATEWAY SUBSYSTEMS

Although the ISSI.1 NGW is a “bolt on” device, a variety of existing ASTRO 25 tools can be used to monitor the ASTRO 25 system. For instance, ZoneWatch and the Affiliation Display can be used to monitor ISSI traffic. A separate ISSI.1 administration application provides additional management capabilities, such as allowing an operator to view fault status of the application, view status of the ISSI Link and configure the gateway. The configuration tool allows both import and export of detailed iTG information from an Excel .CSV file format.

ISSI.1 NETWORK GATEWAY ADVANTAGES

The ISSI.1 Network Gateway is an easy and cost effective way to connecting P25 systems together for interoperability.

Connect disparate systems – enabling talkgroups from differing System IDs, WACN IDs, different P25 system vintages, RF bands, manufacturers and coverage areas to be connected.

Enable task force interoperability – connecting first and second level responders securely and digitally across multiple systems and vast coverage areas.

Permit multiple P25 ISSI enabled systems to interconnect – systems from other P25 trunked manufacturers can be connected together in a regional network interoperability solution.

Provide connected roaming without modifying subscribers – allowing wireline connectivity without requiring software upgrade to the subscriber devices to enable roaming.

Retain individual system and fleetmap – preserving the User Configuration Server databases on each system enables operational autonomy among the connected systems and fleetmaps.

‘Bolt-On’ to existing ASTRO 25 systems – adding ISSI.1 NGWs quickly and cost effectively to an existing and deployed ASTRO 25 system without requiring the system to be upgraded to a new version and without upgrading subscriber or Control Channel (CCH) software.

Enable end-to-end encryption without transcoding – using network connectivity to deliver performance with lower delays, better audio quality and more robust call services than can be accomplished when analog or transcoding methods are used.

SOLUTION DATA SHEET
ISSI.1 NETWORK GATEWAY SUBSYSTEM

TECHNICAL SPECIFICATIONS

CALL SERVICES SUPPORT	SUPPORTED	SPECIFIED IN TIA-102.BACA
ISSI Group Registration	Yes	Yes
ISSI Group Tracking	Yes	Yes
ISSI Group Call	Yes	Yes
ISSI Emergency Group Call	Yes	Yes
E2E Encrypted ISSI Group Call	Yes	Yes
Manual Inter-System Roaming	Yes	No

HARDWARE SPECIFICATIONS

Gateway Server	Sun Netra T5220
Processor	4-Core 1.2 GHz UltraSPARC T2
Memory	32 GB
Mass Storage	300GB, 10000 rpm SAS Disk
Optical Drive	1 DVD-RW
Networks & I/O Options	4 x 10/100/1000 Mbps Ethernet, 2 PCI-X, 4 PCIe
Power / Cooling	100-240 V AC or -40 to -75 V DC
Physical Specifications	2 Rack Units
Operating System / Software	Solaris 10 Pre-installed

SOFTWARE SPECIFICATIONS

ASTRO 25 Release Compatibility	Release 7.5 or higher
Maximum ISSI.1 NGW Applications	3 per Server
Maximum Interoperability Talkgroup Mappings	60 per ISSI.1 Application
Maximum Simultaneous Interop TG Calls	27 per ISSI.1 Application

ISSI LINK SPECIFICATIONS

Physical	Ethernet RJ45
Recommended Maximum Jitter Delay	3 per Server
Maximum Bandwidth Required Per GW App*	60 per ISSI.1 Application
Recommended Maximum End-to-End Delay	27 per ISSI.1 Application

ISSI.1 NGW SUBSYSTEM EQUIPMENT

SUBCOMPONENTS REQUIRED	REQUIREMENTS WITH 1 ISSI.1 NGW APPLICATION	REQUIREMENTS WITH 2 ISSI.1 NGW APPLICATION	REQUIREMENTS WITH 3 ISSI.1 NGW APPLICATION
Netra T5220 Server	1	1	1
ISSI.1 NGW Application	1	2	3
S2500 WAN Router	1	2	3
S2500 T1/E1 Daughter Board**	1	2	3
S2500 Ethernet Daughter Board**	1	2	3
S2500 Encryption Module***	1	2	3
2610-24 Ethernet Switch	1	1	1
SSG-140 Firewall	1	1	1

* Calculations for bandwidth identical to those for RF site links; 6 DSD0 assumes 27 simultaneous calls
 ** Each S2500 WAN Router can be connected to the ASTRO 25 Zone Controller via a T1 or an Ethernet Site Link
 *** If Encrypted Site Links are chosen as an option, then one S2500 Encryption Module is required for each S2500 WAN Router

To learn more about Network Interoperability and the P25 ISSI, contact your Motorola representative or visit motorola.com/project25.

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