



MOTOTRBO™ IP Site Connect *Capability Guide*

Introduction

Avtec's Scout VoIP console system includes wireline support for MOTOTRBO™ IP Site Connect, Motorola’s professional, digital two-way radio system.

To extend the reach of conventional two-way radio systems, MOTOTRBO™ IP Site Connect enables communication across distributed geographical areas. Scout is the only console to offer a native IP interface directly to IP Site Connect repeater infrastructure, working as a peer.

Capabilities-at-a-Glance

In addition to all the standard features of Scout console, the following MOTOTRBO™ IP Site Connect features are available to the dispatcher:

Capability	Description
Interface Method	Scout uses a wireline console interface through a direct IP connection to Motorola XPR™ 8000 Series, MTR3000, SLR 5000 Series, and SLR 8000 Series radios.
Unit Calls (Private Calls)	Allows a unit to send and receive a direct voice call to and from a single unit. Units can be either dispatchers or subscribers in the system.
Group Calls	Allows a dispatcher to establish voice communication with a group of subscriber radios or consoles. All members of the group hear the conversation.
PTT-ID/ANI Alias	Gives a dispatcher a visual indication of the identity associated with the last voice transmission. An identity can represent the raw subscriber unit ID (PTT-ID) or an alphanumeric string representation of it (ANI Alias). The identity can display in the Activity History and on the associated endpoint pad using the ANI pad extender. For example, a PTT ID of 2527 can be aliased to “Fire 1.”
Console-Controlled Encryption	Allows a dispatcher to enable encryption to prevent unauthorized listening to outbound voice communication. The interface supports AES and Enhanced Privacy encryption. Encryption key management is handled using the Avtec Encryption Key Manager. The dispatcher can dynamically change encryption methods and keys.



Capability	Description
Encryption Key Manager	Allows a Scout System Administrator to load multiple encryption keysets for use by VPGate endpoints. Encryption keys can be entered manually.
Tone Generation	Allows a dispatcher to send tones or to send tone specifications when WAV files cannot produce the desired output. For example, a dispatcher could send an alert tone to announce bad weather or other alarm conditions. These tones include: <ul style="list-style-type: none"> • Alert Tones • Paging Tones • Channel Marker Tones • Keying Tones • Guard Tones • Function Tones • DTMF Tones
Channel Marker Tones	Allows a dispatcher to send channel marker tones or to send tone specifications when WAV files cannot produce the desired output. For example, a dispatcher could send a channel marker tone to indicate the channel is in priority status and should not be used for routine transmissions.
Unit Alert (Call Alert)	Allows a unit to send or receive a request for another unit to call them back. Units can be either dispatchers or subscribers in the system. Functionality is similar to a page.
Unit Check (Radio Check)	Allows a dispatcher to verify operational status of a subscriber.
Unit Monitor (Remote Monitor)	Allows a dispatcher to hear any audio picked up by a designated subscriber's microphone. Depending on the system, there might be no indication to the subscriber that a Unit Monitor is in progress.
Stun/Revive (Enable/Disable)	Allows a dispatcher to temporarily stun a radio so that it cannot transmit, receive, or power on and off. Reviving a stunned radio returns it to an operational state.
Emergency Calls/State	Notifies a dispatcher of an emergency situation in the field using a unique ring and visual indication. When a subscriber presses the emergency button or dials the emergency DTMF string, the endpoint generates an emergency call and activates the emergency state. Until the emergency state is cleared by the dispatcher, no further emergency calls from that subscriber can generate an Emergency Call.

Connections

A MOTOTRBO™ IP Site Connect system consists of one or more MOTOTRBO™ digital repeaters configured to intercommunicate. All the repeaters in the system are peers of one another. Each repeater transmits RF-received voice and data packets over the IP network to all other registered peers in the system.



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**106- 1515 Barrow Street
North Vancouver, BC, V7J1B7
604-985-0340
info@bccommunications.ca**

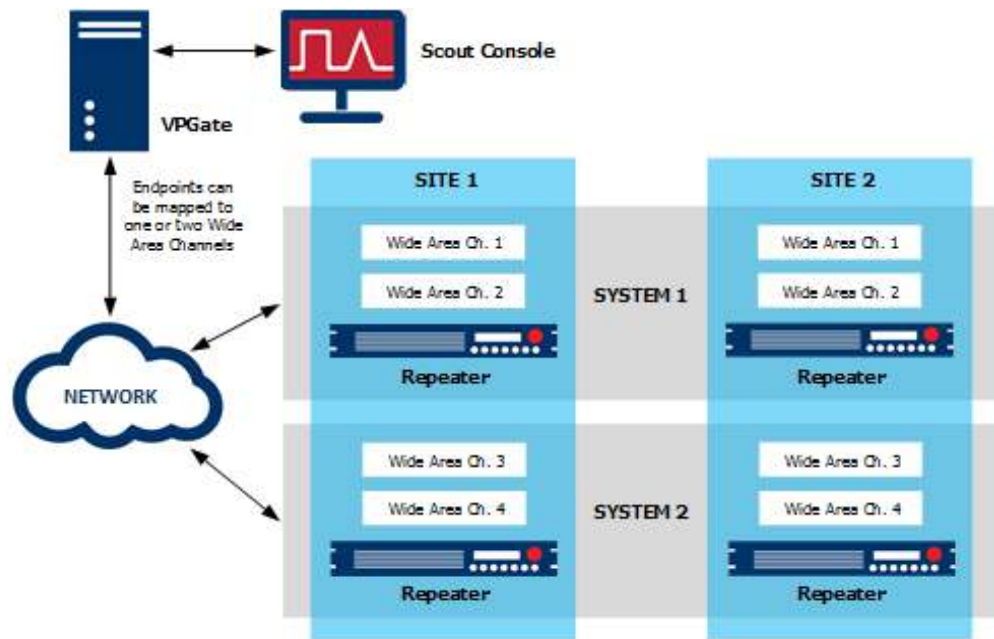
The Scout console system interfaces with IP Site Connect through the VPGate MOTOTRBO™ IP Site Connect driver. The driver provides options for settings unique to the IP Site Connect system such as:

- Timing of keepalive messages
- The Wide Area Channel (WAC) that the endpoint uses to register with the system
- The level for message propagation delay
- The Hang Time for group, unit-to-unit, and emergency calls

The following illustrations show some typical applications for Scout with IP Site Connect. Refer to Motorola's *MOTOTRBO™ System Planner* document for detailed information about different IP Site Connect configurations.

NOTE

Depending on the configuration, Scout uses either one or two Wide Area Channels when connecting to a MOTOTRBO™ IP Site Connect endpoint.



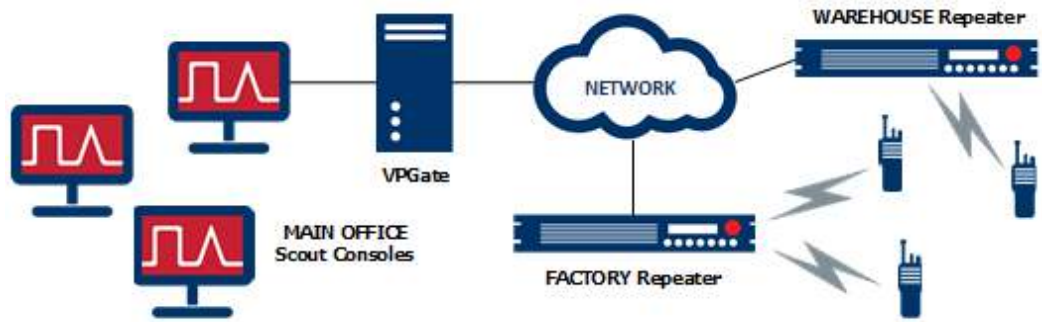
Single Site

Scout with IP Site Connect can also unify communication for a single site, whether it's a single building or a large campus. The IP connection to Scout consoles and multiple repeaters can provide seamless coverage in all areas.



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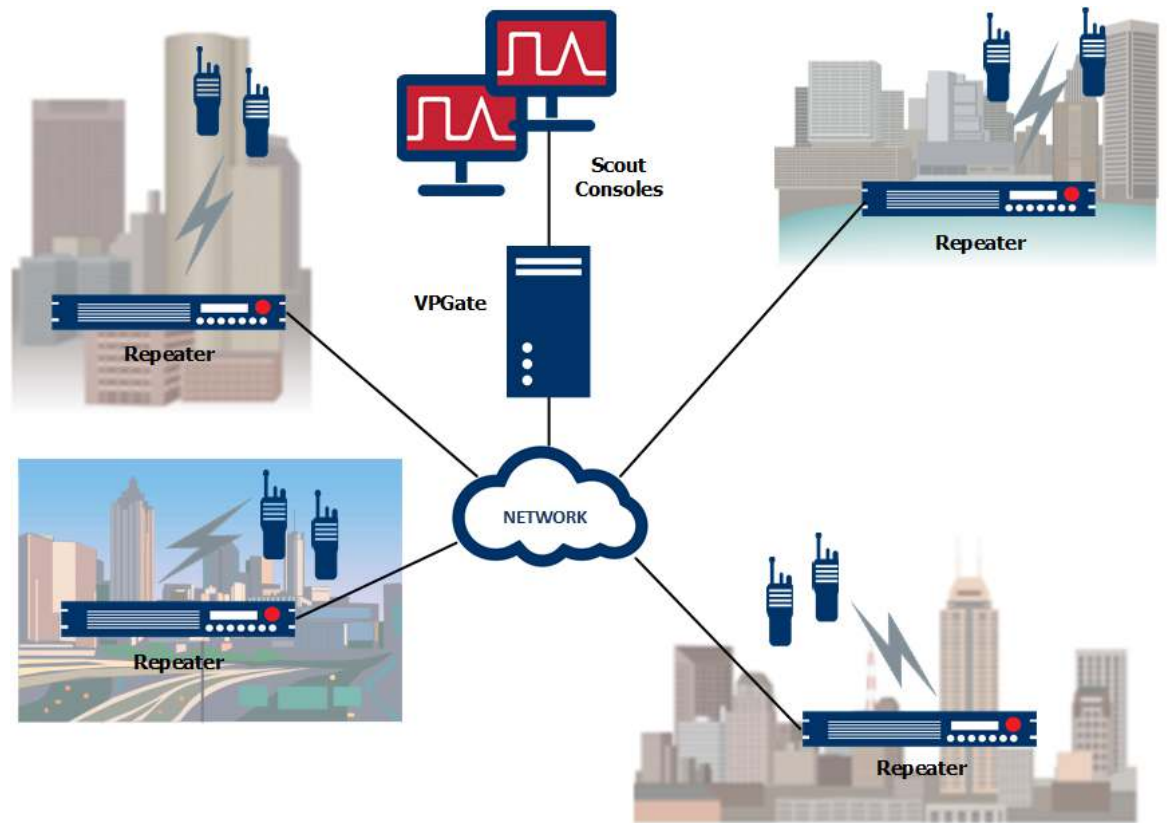


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Geographically Distributed Sites

The MOTOTRBO™ IP Site Connect solution supports a geographically distributed radio network, also called a wide area system, with multiple repeaters. With Scout consoles in a single communication center, an organization can coordinate activity in multiple remote locations.



Scalability

Scout systems using MOTOTRBO™ IP Site Connect are scalable from 1 to 100 console positions. Each IP Site Connect endpoint can have up to 32 separate channels or talkgroups defined and available for the Scout console.

IP Site Connect can link up to 15 repeaters in an IP network to share voice and data communications for up to 100 users. If VPGate registers 2 Wide Area Channel slots, the maximum number of repeaters in an IP Site Connect system is reduced to 13. If sufficient IP Site Connect supplemental licenses are available, Scout can connect to multiple IP Site Connect systems.

In addition, if a customer uses a MOTOTRBO™ Connect Plus trunking system in conjunction with IP Site Connect, Scout can communicate through both systems simultaneously.

Licensing

The MOTOTRBO™ IP Site Connect driver is licensed as a supplemental VPGate driver that requires its own license key. License keys are provided on either a dongle or through the software. Model numbers ending



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with -SK indicate software license keys. Model numbers without -SK indicate that license keys are provided on a dongle. The driver does not operate properly without the license key installed on the VPGate system.

MOTOTRBO™ IP Site Connect Model License Number	Maximum IP Site Connect Endpoints
SFW-VPG-TRBO-IPSC-10	10
SFW-VPG-TRBO-IPSC-10-SK	
SFW-VPG-TRBO-IPSC-30	30
SFW-VPG-TRBO-IPSC-30-SK	
SFW-VPG-TRBO-IPSC-60	60
SFW-VPG-TRBO-IPSC-60-SK	
SFW-VPG-TRBO-IPSC-100	100
SFW-VPG-TRBO-IPSC-100-SK	

For every IP Site Connect endpoint configured on a VPGate system, one VPGate Category A license plus one Supplemental Driver license is used from your available license totals.

The base VPGate license size represents the maximum number of endpoints that can be active at any one time on a single VPGate. The base license is available in several sizes: 24, 40, 80, or 160 endpoints. To use more endpoints, you need additional VPGate licenses.

VPGate License Model Number	Total Category A&B Endpoints	Maximum SIP Endpoints (Category B)	Redundant
SFW-VPG-L0-NR SFW-VPG-L0-NR-SK	24	12	No
SFW-VPG-L0 SFW-VPG-L0-SK	24	12	Yes
SFW-VPG-L1 SFW-VPG-L1-SK	40	20	Yes
SFW-VPG-L2 SFW-VPG-L2-SK	80	40	Yes
SFW-VPG-L3 SFW-VPG-L3-SK	160	100	Yes

NOTE

For each MOTOTRBO™ IP Site Connect license used, a corresponding Category A license is also used. For example, if you configure 10 MOTOTRBO™ IP Site Connect endpoints to your system, all 10 of your Category A licenses have been allocated.



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Refer to the VPGate Cut Sheet or contact your Avtec sales representative for more information about licensing for Scout and MOTOTRBO™ IP Site Connect endpoints.

Supported Versions

Avtec's MOTOTRBO™ IP Site Connect solution is supported with Motorola's firmware versions 1.9 through 2.8.

Network Requirements

The MOTOTRBO™ IP Site Connect network can be a local area network (LAN) or a wide area network (WAN) connection provided by an Internet Service Provider (ISP). Most customer networks are a combination of both types. Scout always connects to an IP Site Connect endpoint using a Wide Area Channel slot.

NOTE

The network cannot use a Proxy server that directs all IP devices to a home or logon page before they are allowed access to the WAN.

Jitter

IP Site Connect allows a jitter tolerance of 60 milliseconds (ms). If a delay of more than 60 ms occurs, audio quality begins to degrade. Scout allows for jitter ranging from 60 ms to 2.5 seconds.

NOTE

Packet loss and latency must be within the limits documented in the *MOTOTRBO™ System Planner* document from Motorola. The network cannot use a dial-up connection because of inadequate bandwidth. It also should not use satellite Internet access, such as a VSAT system, due to unacceptable delays during transmission and reception.

Bandwidth

Sufficient bandwidth must be available on the IP network. A fully populated repeater network can require more than 700 kbps.

QoS

VPGate supports Differentiated Services (DiffServ) values for audio and control packets from the VPGate to the MOTOTRBO™ endpoint. This allows VPGate to assign a high priority to VoIP packets and prevent unwanted network delays.

Addresses and Ports

A static IP address and UDP port for the master repeater must be made available to all peer devices on the IP Site Connect system.

When a peer device registers with the master repeater, the network supplies the return IP address and UDP port of the peer device to the master repeater. The IP address and UDP port must then be made available to all other MOTOTRBO™ IP Site Connect devices on the system.



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