

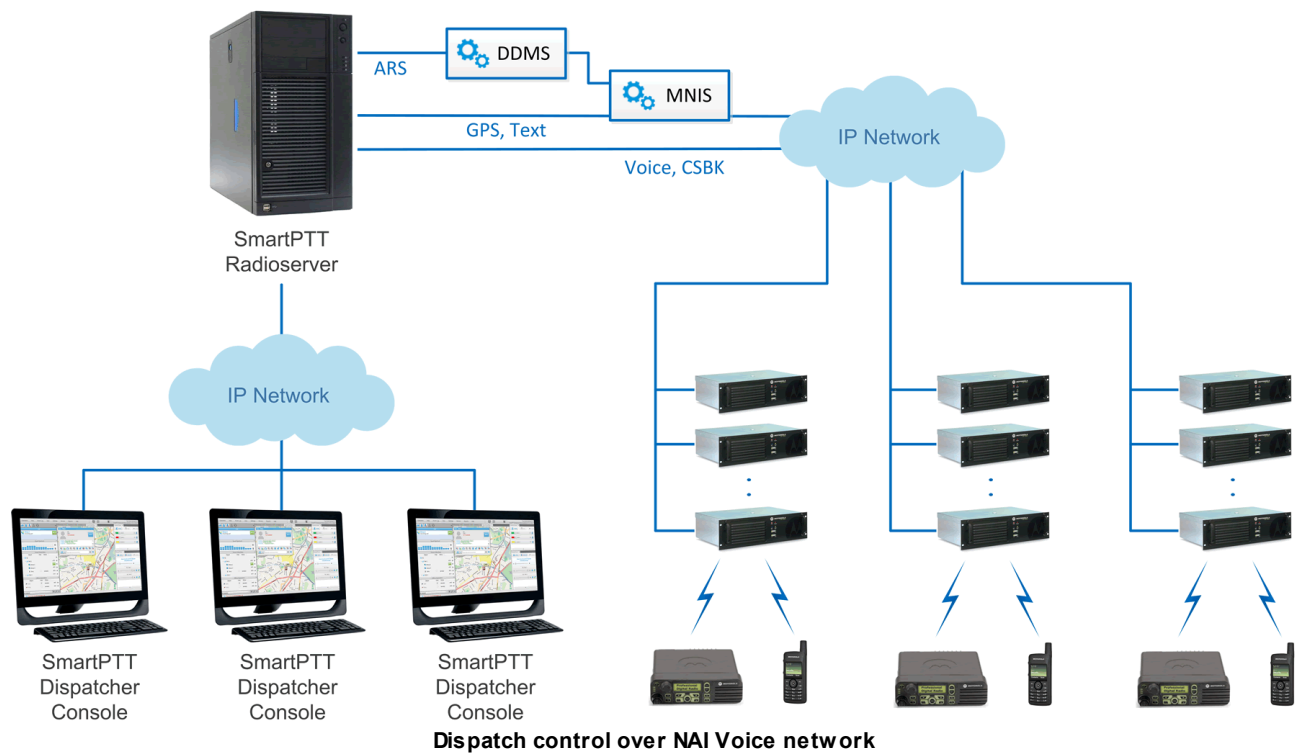


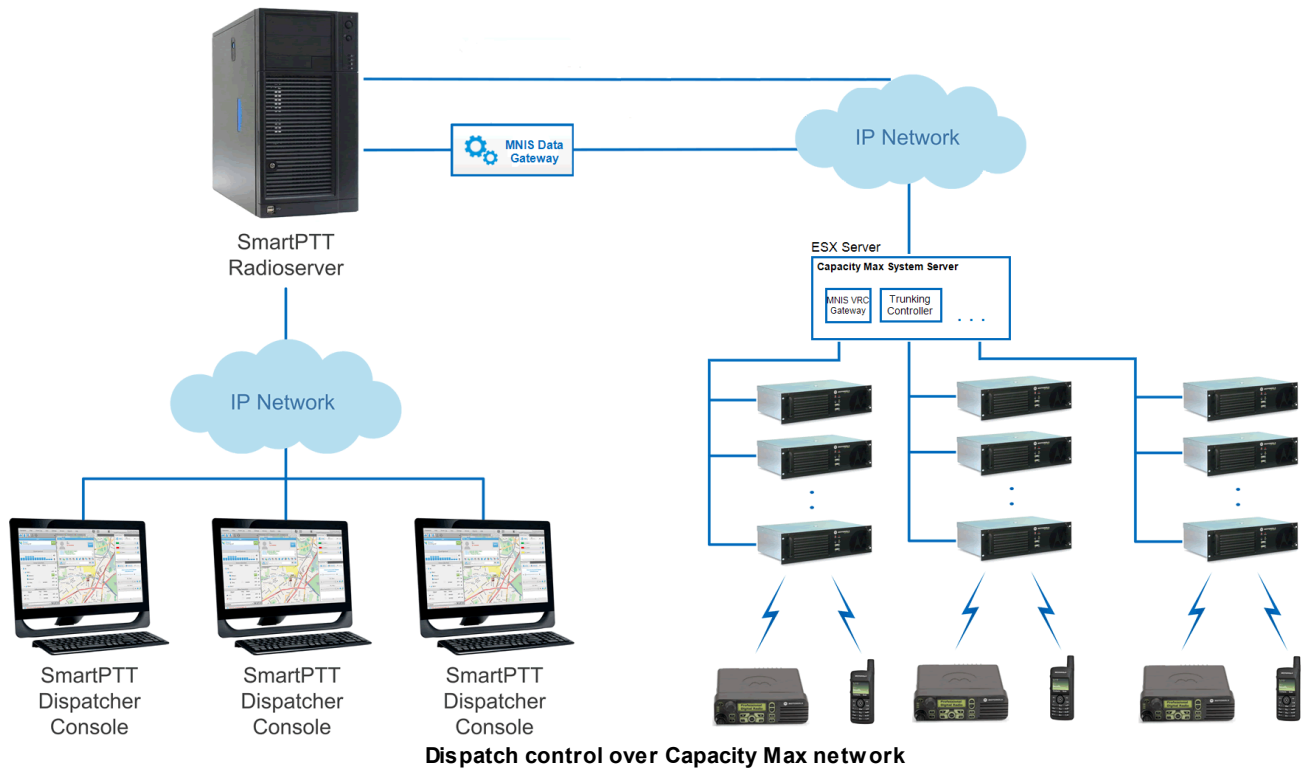
Version 9.1
SmartPTT PLUS
System Requirements
November 2016

System Requirements

The SmartPTT-based dispatching system can include several dispatch consoles, SmartPTT Radioservers and communication channels connecting them. Thus, technical requirements relate to three system components:

1. SmartPTT Dispatcher,
2. SmartPTT Radioserver Configurator,
3. Communication channels connecting SmartPTT Dispatcher and SmartPTT Radioserver, and communication channels connecting SmartPTT Dispatcher and MOTOTRBO repeaters.





However, the number of the required components can increase. This depends on the product type and required abilities. E.g., SmartPTT PLUS supports MOTOTRBO Network Application Interface protocol (NAI) for data and voice transmission over radio network, and Connect Plus. To support NAI protocol it is required to have MOTOTRBO Network Interface Service and Device Discovery and Mobility Service installed. And for Connect Plus it is obligatory to have XRC Controllers and an XRT Gateway.

1. Minimum system requirements for SmartPTT Dispatcher

1. Intel Core i5 processor.
2. Windows 7 SP1 operating systems.
3. 4 GB of RAM.

Note: If the dispatch system handles GPS data and the number of radio subscribers exceeds 80-100, it is recommended to use Intel Core i7 processor with 8 MB L3 cache and 8 GB RAM.

4. Video adapter. We recommend using PCI-E video cards with at least 1 GB RAM, for instance GeForce GT730 DDR3 1 GB or Radeon R5 230 DDR3 1 GB. For dispatch systems, which are used primarily for voice

transmission (i. e., without Indoor, maps or Monitoring), you can use CPU-integrated video cards, like Intel 4*** or 5***.

Note: If the dispatch system handles GPS data and the number of radio subscribers exceeds 80-100, it is highly recommended to use PCI-E video card with at least 2 GB RAM, for instance GeForce GT730 GDDR5 2 GB or Radeon R7 250X GDDR5 2 GB.

5. Hard drive 7200 RPM or SSD (enterprise class is recommended for reliable data storage). The hard drive size depends on the size of the database and recorded calls. There must be at least 20 GB of the hard drive space available if you install Microsoft SQL Server 2008 R2 Express. If you use SQL Enterprise, free space depends on the planned volume of data. By default, calls are recorded with a bit rate of 40 Kbps. One minute of a call record takes approximately 300 Kb of your hard disk space.
6. Sound card. Use a high-quality audio card. If you install the dispatch system on a desktop PC, we recommend using internal PCI-E Sound Blaster Audigy RX. If you install the dispatch system on a laptop, we recommend using gaming laptops, for they are usually equipped with high-quality audio cards. Also, you can use external audio cards, for example USB audio card Sound Blaster X-Fi Go.

Note: We recommend using desktop PCs equipped with USB 2.0 and USB 3.0 (SS) ports, because many modern audio devices work only via these ports.

7. Audio recording and playback devices (microphone and speakers). It is required to use high quality audio recording devices, as it affects the sound quality of the whole system.
8. Ethernet network adapter.

Note: Wireless connection can introduce significant latency that degrades sound quality. Do not use Wi-Fi connections for systems in field.

9. The display with the screen resolution greater than 1366 × 768.
10. Keyboard.
11. Mouse (a professional mouse and a hard mouse pad are recommended) or other pointing device.

2. Minimum system requirements for SmartPTT Radioserver

1. Intel Core i5 processor.
2. Windows 7 operating system.
3. 4 GB of RAM.

Note: If the dispatch system handles GPS data and the number of radio subscribers exceeds 80-100, it is recommended to use Intel Core i7 processor with 8 MB L3 cache and 8GB RAM.

4. Hard drive 7200 RPM or SSD (enterprise class is recommended for reliable data storage). The hard drive size depends on the size of the database and recorded calls. There must be at least 40 GB of the hard drive space available if you install Microsoft SQL Server 2008 R2 Express. If you use SQL Enterprise, there must be at least 10 GB of the hard drive space for the software and more free space for the database depending on the planned volume of data. By default, calls are recorded with a bit rate of 40 Kbps. A minute of a resulting audio takes approximately 300 Kb of your hard disk space.
5. Ethernet network adapter.

Note: Wireless connection can introduce significant latency that degrades sound quality. Do not use Wi-Fi connections for systems in field.

6. Sound card. When control stations are used in SmartPTT system, SmartPTT Radioserver must be equipped with a multi-channel sound card. The hardware/firmware of the sound card has the direct and strong impact on the sound (voice) quality of the whole SmartPTT system. Do not use cheap and non-brand-name sound cards. We recommend you to use high quality sound cards, such as M-AUDIO – Delta 1010LT, MAYA44XTe, ICON Digital Cube Pro USB. If you need more than 4 audio channels, please send your query to the [SmartPTT technical support service](#) for assistance.

Note: These are standard system requirements for SmartPTT Dispatcher and SmartPTT Radioserver. They can change depending on the configuration, complexity and/or workload of the system.

3. Calculation of the system capacity

Total channel capacity should take into account the following factors:

- voice transmission,
- data transmission (text messages, GPS information),
- monitoring activity.

Two lines should be considered:

- server to repeater/control station,
- client/server channel.

Consider the voice transmission:

- SmartPTT Radioserver to radio equipment:
 - 10 kbps per voice channel in case of the system with repeaters.
 - 86 kbps in case of remote control stations. Please refer to SmartPTT Radioserver Configuration Guide for more information.
 - each of the value should be multiplied by an assurance coefficient (110% is the recommended minimum).
 - irrelevant in case of MOTOTRBO control stations (they have a separate input and output for audio).
- SmartPTT Radioserver to SmartPTT Dispatcher:
 - 10 kbps per voice channel in case of the system with repeaters; doubles in case of active monitoring.
 - 10–367 kbps in case of control stations (depends on the codec selected on the “source” program), doubles in case of active monitoring. Please, refer to SmartPTT Radioserver Configuration Guide for more information.
 - Each of the value should be multiplied by an assurance coefficient (110% is the recommended minimum).

Consider the monitoring of the systems:

- Independently on the system monitoring will consume 25 kbps per channel.

System Requirements for MOTOTRBO Hardware

It's recommended to use firmware version of MOTOTRBO radios and repeaters not lower than R2.4. For Connect Plus network, the XRC Controllers and XRT Gateway should have firmware version 1.5 or higher. Only Capacity Max 2.7 is fully supported by the current software. Reliable operation with earlier version of MOTOTRBO firmware is not guaranteed.

Note: MOTOTRBO repeaters in one network must have same firmware versions. The firmware versions of the repeaters and MOTOTRBO Network Interface Service must be compatible (you can find compatibility information in MNIS Release Notes).

Note: Only repeaters with 32 MB of internal memory support NAI protocol. For all data functionality the required license should be installed. For voice transmission both licenses (**Network Application Interface Data** and **Network Application Interface Voice**) are required.

List of Ports Used by SmartPTT

5060: Port is set by default and can be changed.

4001: Port can't be changed.

SmartPTT Dispatcher (Source)

Transport Protocol	Source	Destination	Comments
TCP	X	8888	Server (Commands)
UDP	18501	18500	Server (Voice)
UDP	18501	18501	Intercom (Communication between Dispatchers), Data,
TCP	18501	18501	Commands Intercom (Communication between Dispatchers), Voice
UDP/TCP	5060	5060	Telephone Interconnect (Commands)
UDP	18700-18748	X	Telephone Interconnect (Voice)

SmartPTT Radioserver (Source)

Transport Protocol	Source	Destination	Comments
TCP	8888	X	Client (Commands)
UDP	18500	18501	Client (Voice)
TCP	X	110, 25, 587 (with SSL), 995 (with POP3), 993 (IMAP4)	E-mail gateway
UDP	161 162	161	SNMP (Monitoring)
UDP/TCP	5060	5060	Telephone Interconnect (Commands)
UDP	18650-18660	X	Telephone Interconnect (Voice)
TCP	X	8002	Connection to control station

UDP	4001 4005 4007 4008	4001 4005 4007 4008	For control station configuration only (4001 – Location, 4005 – Registration Service, 4007 – Messaging Service, 4008 – Telemetry Service)
UDP	50000	50000	For repeater configuration only
UDP	19000-(19000 + Talk Path number) 5005 5007 5001	X 4005 4007 4001	For Connect Plus network configuration only (19000 – used by SmartPTT radioserver for talk paths, 5001/4001 – Location Service, 5005/4005 – Registration Service, 5007/4007 – Messaging Service)