



Version 9.1

# SmartPTT PLUS

## Installation & Configuration Guide

November 2016

## Table of Contents

### Installation & Configuration Guide

Introduction	2
Installation of the SmartPTT software	2
General SmartPTT Radioserver Configuration	6
SmartPTT Dispatcher Configuration	10
Linked Capacity Plus	15
MOTOTRBO Equipment Programming	16
MOTOTRBO Radio Programming	18
MNIS and DDMS Client Configuration	26
SmartPTT Radioserver Configuration	30
Capacity Max	37
How to Configure Capacity Max	39
Trunking Controller	44
MNIS Data Gateway	49
MNIS VRC Gateway	56
Talkgroups	61
Security Settings in Capacity Max	62

# Installation & Configuration Guide

## Introduction

Installation and configuration of the SmartPTT PLUS system is a complex task and comprises the following steps:

1. Installation and configuration of SmartPTT Radioserver.
2. SmartPTT Dispatcher installation and configuration.
3. Configuration of MOTOTRBO devices, e.g., radios and repeaters.
4. Configuration of MOTOTRBO tools: MOTOTRBO Network Interface Service Configuration Utility and MOTOTRBO DDMS Administrative Client (for networks based on the NAI protocol).

The system configuration depends on the network used and the devices available. In this document, you will learn how to install and configure the system on the basis of Linked Capacity Plus (LCP) and Connect Plus networks consisting of 3 sites.

## Installation of the SmartPTT software

Installation of the SmartPTT software allows making the following:

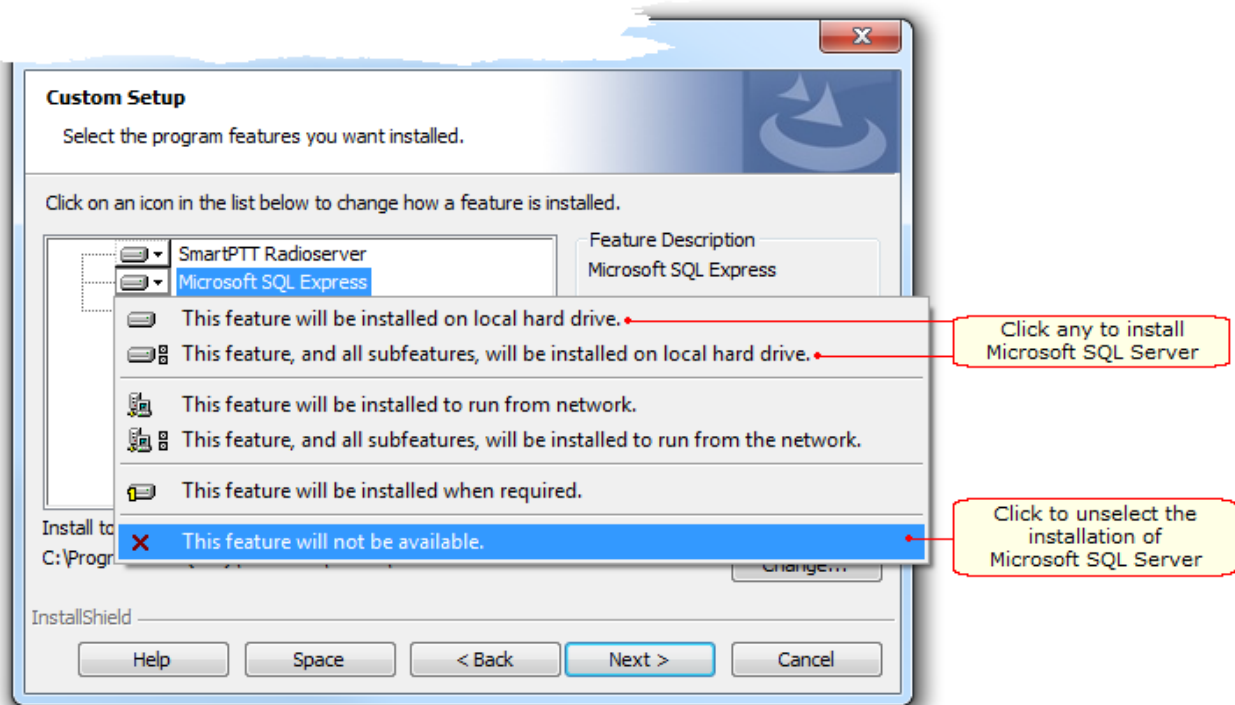
- Fresh installation of the SmartPTT software.
- Adding the programs and applications which were omitted during the previous installation.
- Repairing the errors occurred during the previous installation.
- Uninstallation of the SmartPTT software.

**Note.** If you wish to upgrade the SmartPTT software by means of the product or version, you should uninstall the current SmartPTT software and then install a new one.

Before the installation make sure the following:

- You have Microsoft .NET Framework installed (not earlier than 4.6):
  - YES: you will not be asked to install it.
  - NO: you should agree to install Microsoft .NET Framework when InstallShield Wizard will ask you.
- You have Microsoft SQL Server installed:
  - YES: specify if its version is not earlier than 2008:
    - YES: select **This feature will not be available** for Microsoft SQL Express during the installation of the SmartPTT software.

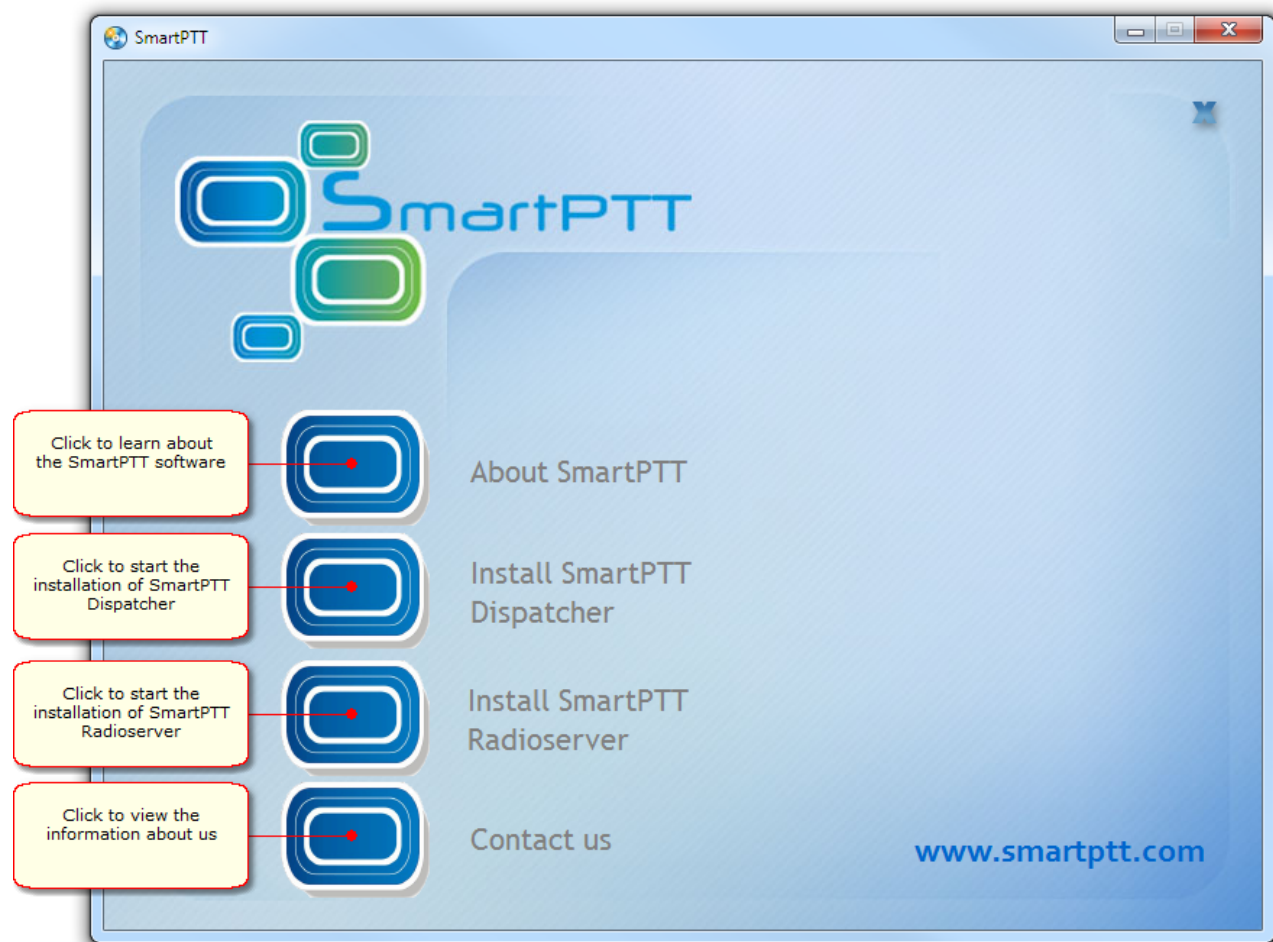
- NO: you should upgrade to at least Microsoft SQL Server 2008 before the installation of the SmartPTT software and select **This feature will not be available** during the installation of the SmartPTT software.
- NO: you should select **This feature will be installed on local hard drive** during the installation of the SmartPTT software.



To begin the installation of the SmartPTT software:

1. Run *autorun.exe* file from the folder where you copied SmartPTT installation package.

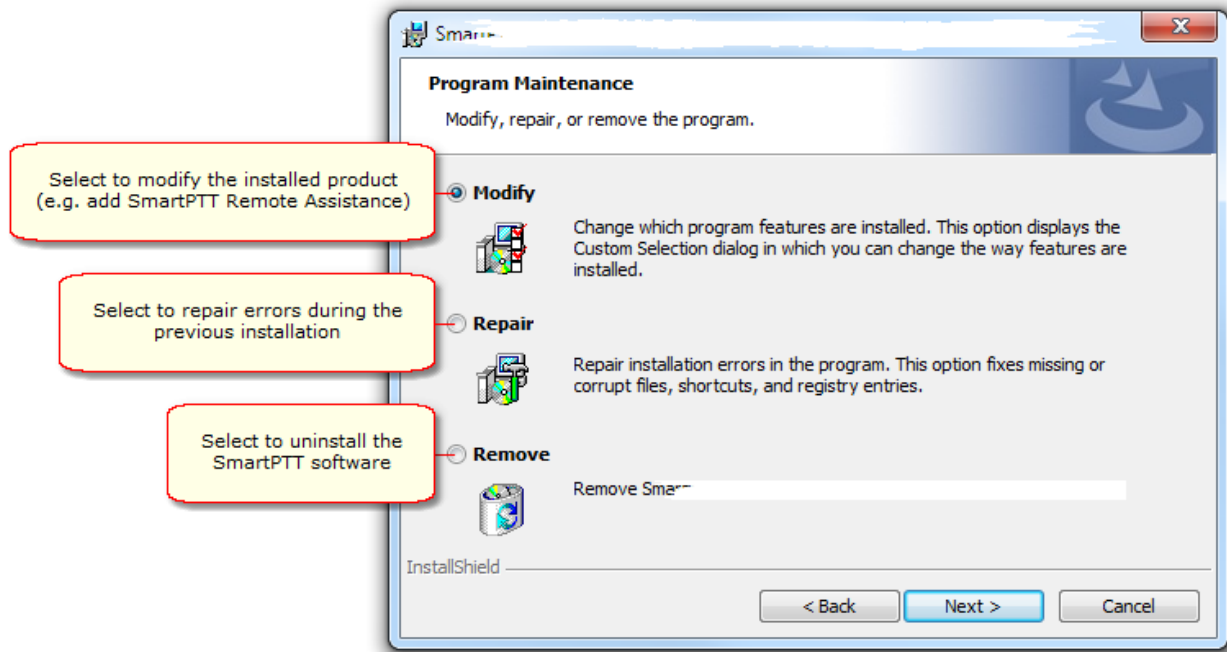
2. Choose between SmartPTT Radioserver and SmartPTT Dispatcher to install on the current PC. If you install both of them on the same PC, we would recommend you to start with Radioserver.



3. Follow the instructions of InstallShield Wizard. You should perform the following additional actions during the installation:
  - a. Install Microsoft .NET Framework if InstallShield Wizard asks you. It is needed for the work of the SmartPTT software.
  - b. Restart the PC after Microsoft .NET Framework installation if InstallShield Wizard asks you.

**Note.** In rare cases InstallShield Wizard will not ask you to restart the PC. However, the problem may occur in the work of the freshly installed SmartPTT software. If you notice them, please, start the installation and select **Modify** or **Repair** in the **Program Maintenance** window.

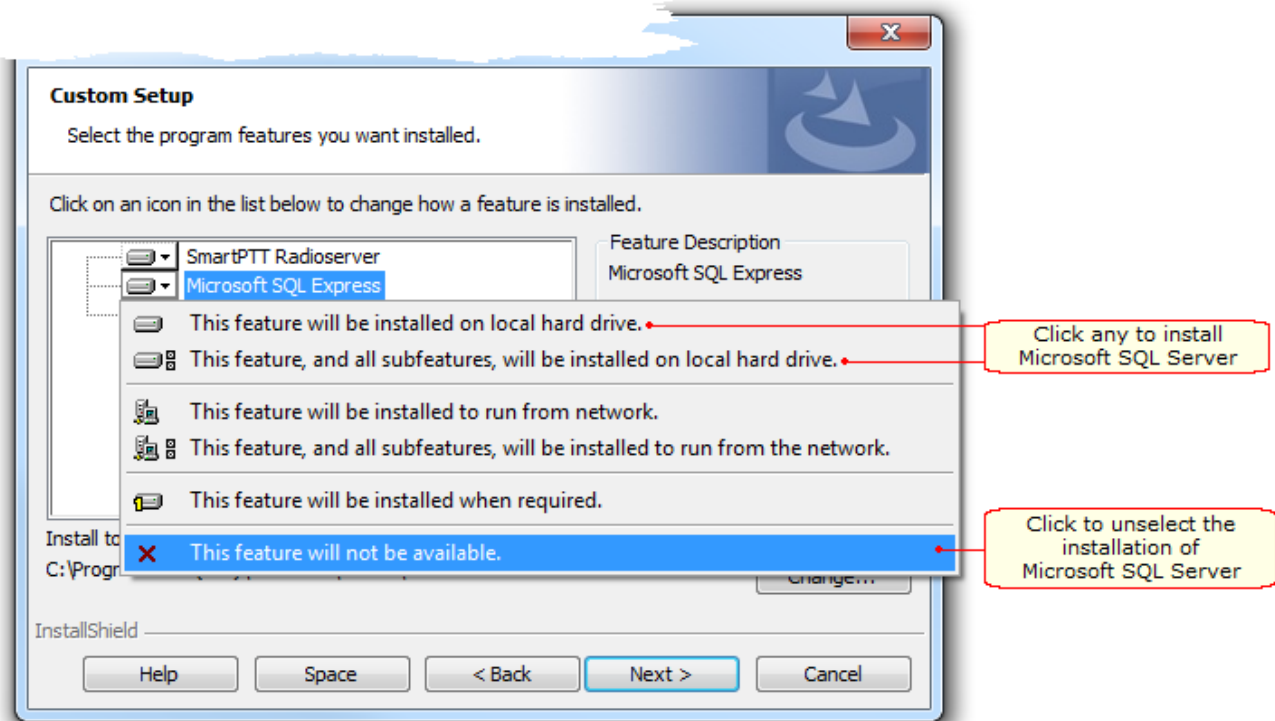
- c. Select the proper variant in the **Program Maintenance** window:



- d. Install or do not install Microsoft SQL Server:

- if you have Microsoft SQL Server not earlier than 2008 version, in the **Custom Setup** window click the **Microsoft SQL Express** icon and select **This feature will not be available**.
- if you have Microsoft SQL Server earlier than 2008 version, in the **Custom Setup** window click the **Microsoft SQL Express** icon and select **This feature will not be available**. Then you should upgrade to at least Microsoft SQL Server 2008.

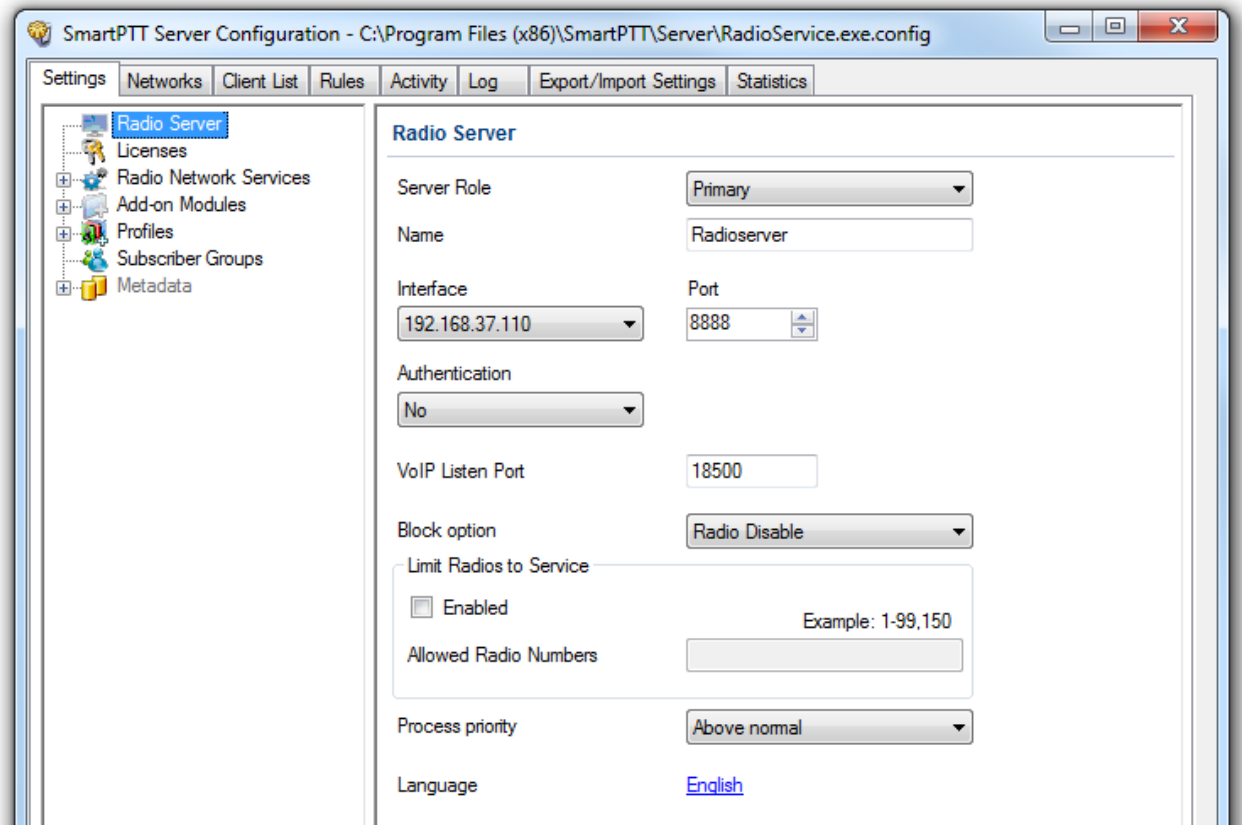
- if you do not have Microsoft SQL Server, you should select in the **Custom Setup** window. For this in the **Custom Setup** window click the **Microsoft SQL Express** icon and select **This feature will be installed on local hard drive** or **This feature, and all subfeatures, will be installed on local hard drive**.



## General SmartPTT Radioserver Configuration

General configuration includes parameters that are independent of the network type. To configure the general settings of the radioserver open SmartPTT Radioserver Configurator.

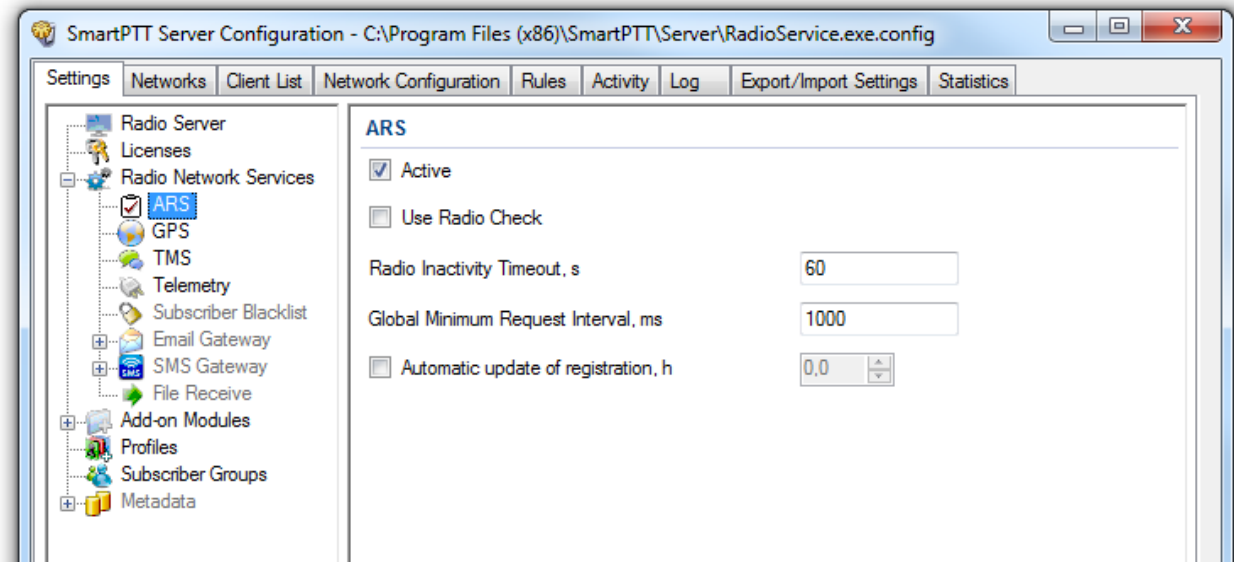
1. Set up parameters of the radioserver.



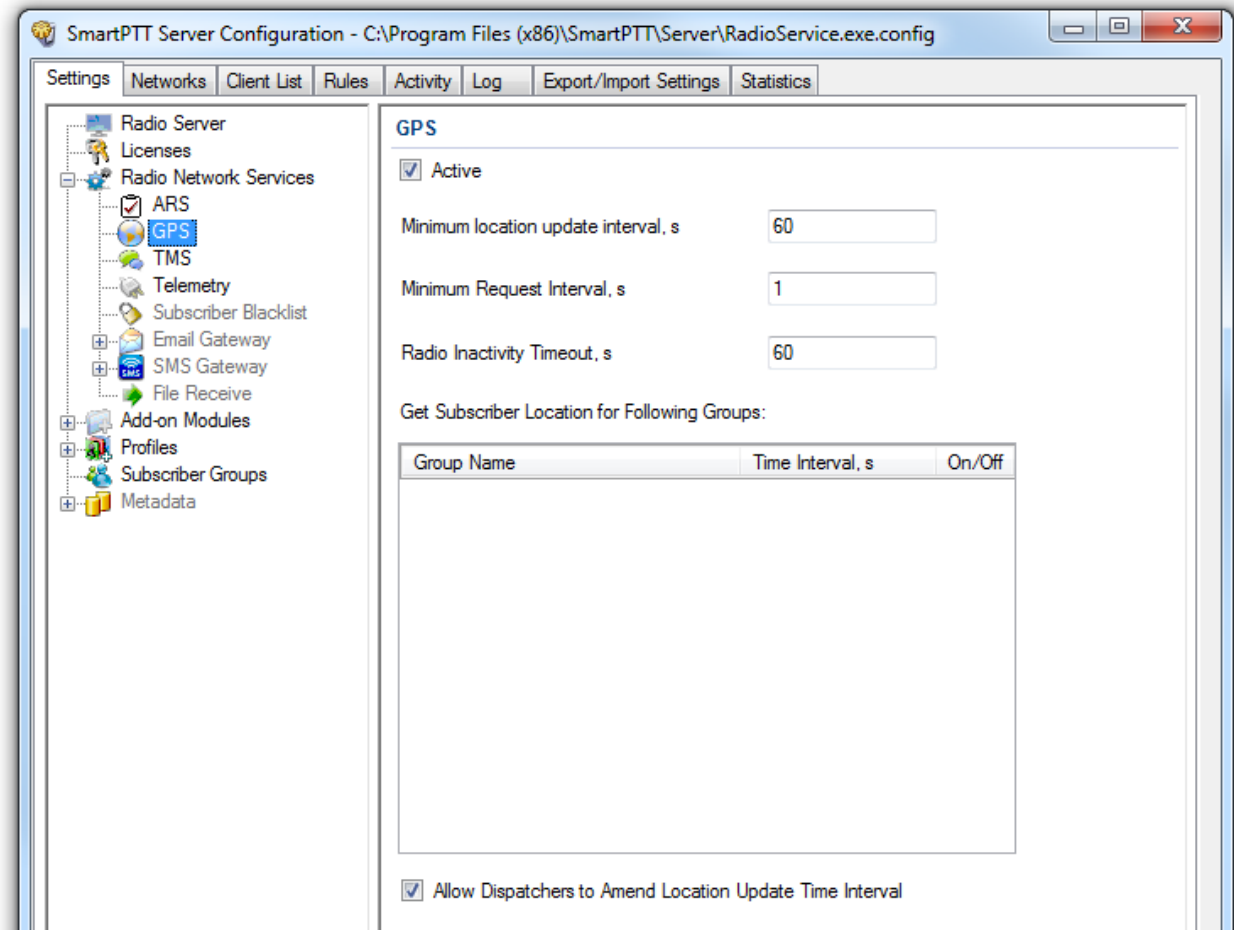
- In the **Name** field specify the radioserver name. This name is used only in SmartPTT Radioserver Configurator;
  - In the **Interface** field and the **Port** field specify the IP address and port of the PC where the radioserver is installed.
2. Enable radio network services, e.g., ARS, GPS and TMS support.



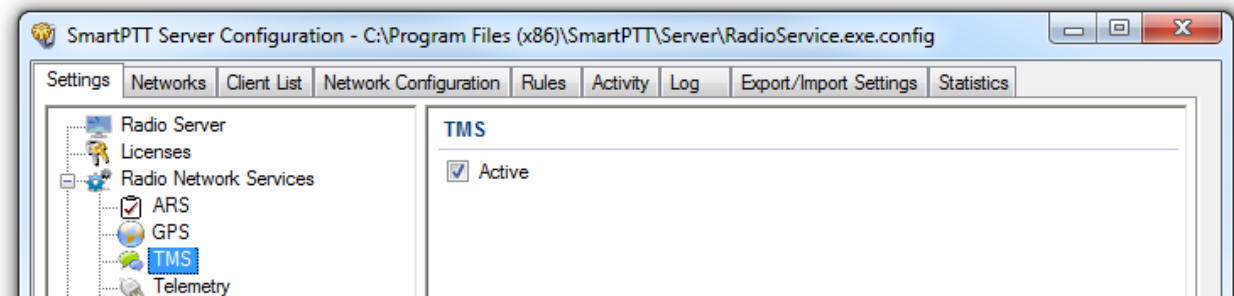
- To enable ARS support, select the **Active** check box under **ARS**:



- To enable GPS support, select the **Active** check box under **GPS**:



- To enable text messaging service, select the **Active** check box under **TMS**:



# SmartPTT Dispatcher Configuration

In this topic you will learn how to configure general settings of the SmartPTT Dispatcher console. The general configuration in the scope of the LCP or Connect Plus network implies that operators will be able to communicate with radio subscribers and the radio subscribers will be able to communicate with each other.

The general configuration of the SmartPTT Dispatcher console includes the following steps:

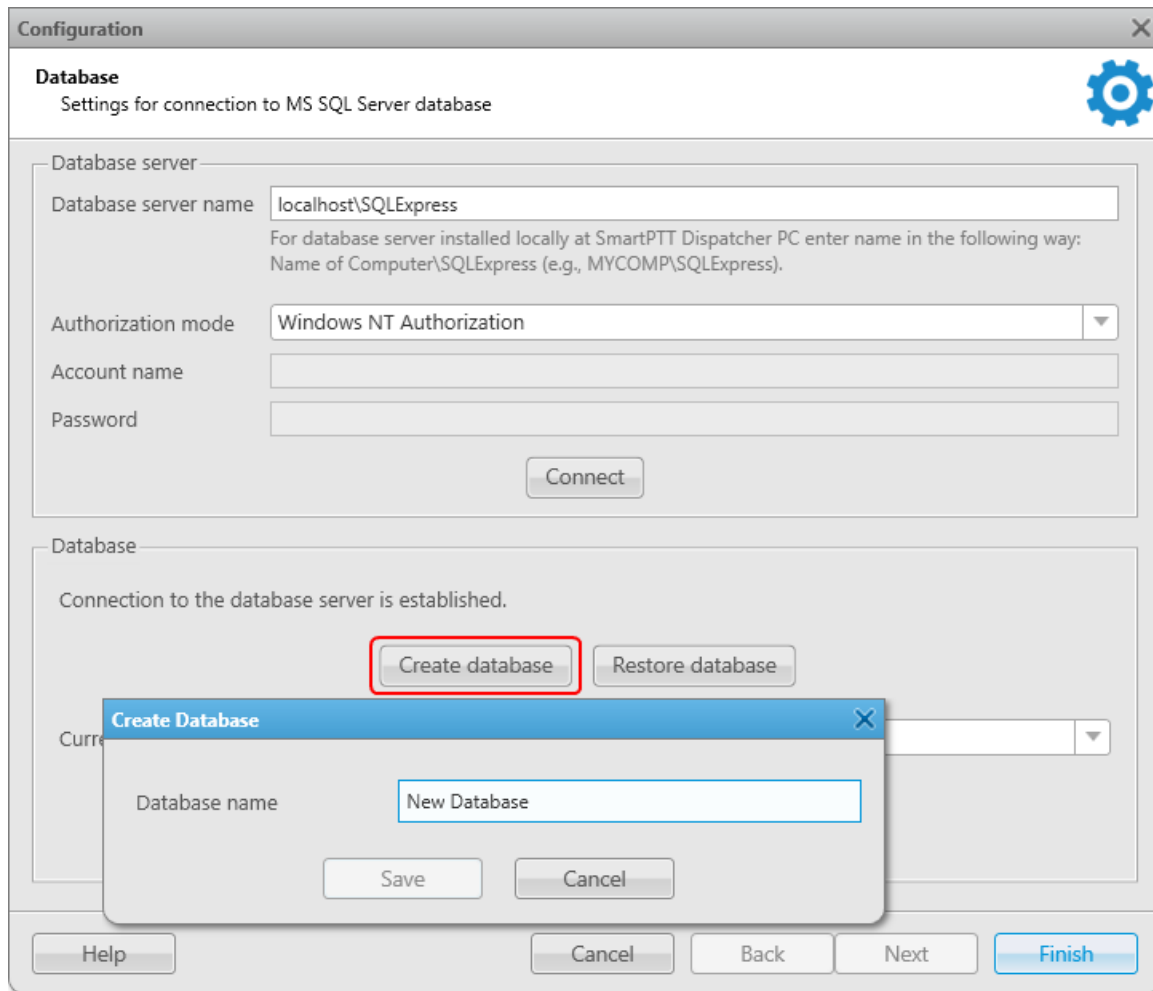
1. License installation
2. Database creation
3. Radioserver configuration
4. Audio setting configuration
5. Registration of radio subscribers

The description of the steps is given below:

1. Expand the **Settings** menu in the **Main Menu** bar of the SmartPTT Dispatcher window and click **Licenses**.  
Install the required license. After uploading the license, click **Finish** to apply.
2. Expand the **Settings** menu in the **Main Menu** bar of the SmartPTT Dispatcher window and click **Database**.  
In the opened window create the new database and then connect to it.

To create a new database, fill in the **Database Server Name** and click **Create New Database**. For a database server installed together with the SmartPTT Dispatcher application enter the name using the format: Name of PC\SQLExpress (for example, MYCOMP\SQLExpress).

In the window that opened enter the name of the new database and click **Save**.



If creation was successful, a message about successful database creation is displayed. If the database is not created, the reason will be displayed at the bottom of the window.

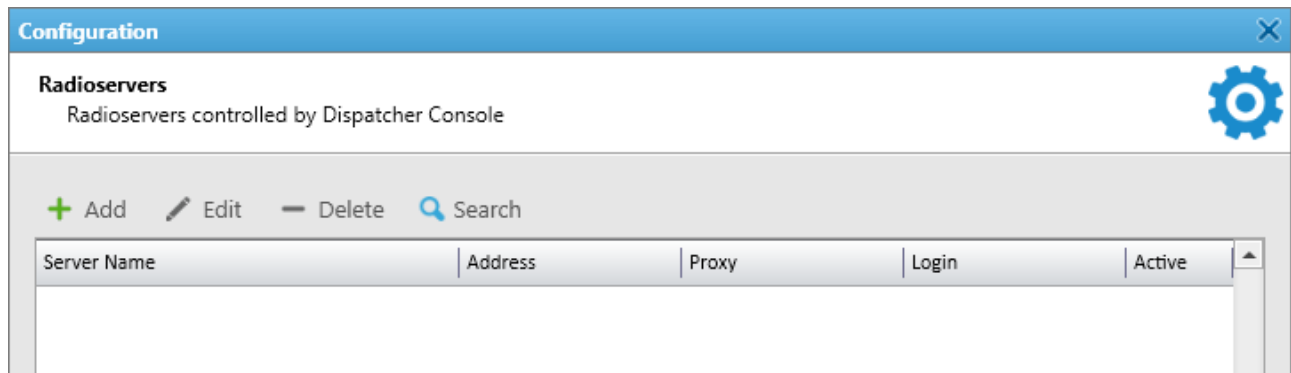
**Authorization Mode** – allows you to select authorization mode with the database.

**SQL Server Authorization** – you must have the login and password of the account which has access to the SQL server.

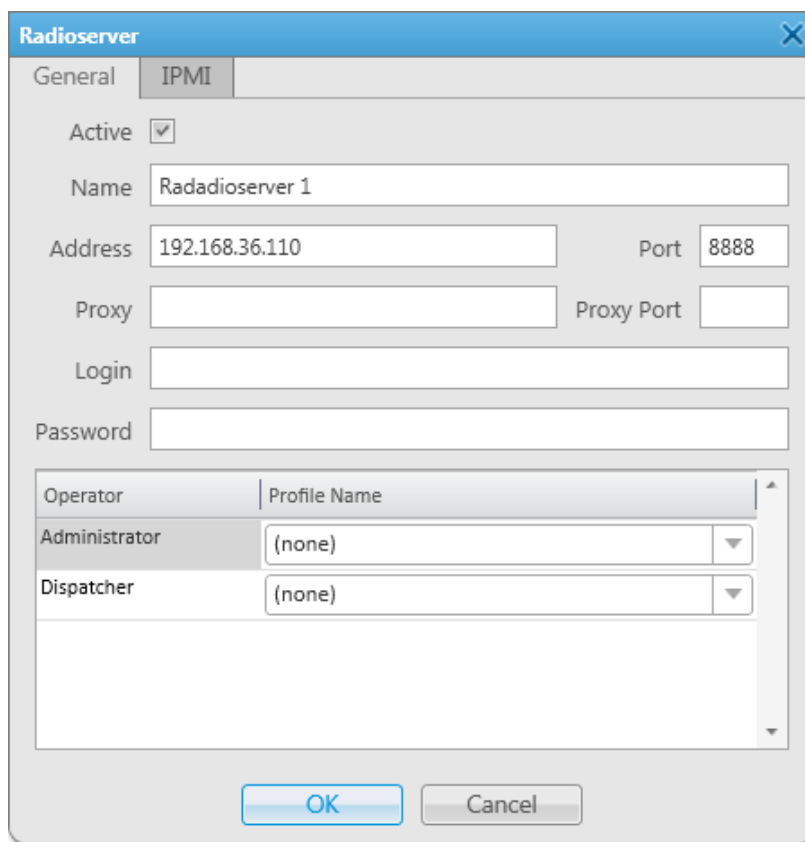
**Windows NT Authorization** – the user who has logged into the Windows system, must be listed in the SQL server's list of users to make connection.

After you have finished, click **Finish** to save the changes. You will need to restart SmartPTT Dispatcher to apply the changes.

3. In the **Settings** menu click **Radioservers** to add the radioserver and configure it properly.



Click **Add** to open the window for adding radioservers to the list.

The image shows a "Radioserver" configuration dialog box with a blue title bar and a close button. It has two tabs: "General" (selected) and "IPMI". In the "General" tab, there is an "Active" checkbox which is checked. The "Name" field contains "Radioserver 1". The "Address" field contains "192.168.36.110" and the "Port" field contains "8888". There are empty fields for "Proxy" and "Proxy Port". The "Login" and "Password" fields are also empty. Below these fields is a table with two columns: "Operator" and "Profile Name". The "Administrator" row has a dropdown menu showing "(none)". The "Dispatcher" row also has a dropdown menu showing "(none)". At the bottom of the dialog are "OK" and "Cancel" buttons.

Enter the name of the radioserver in the **Name** field. The name will be displayed in the SmartPTT Dispatcher console.

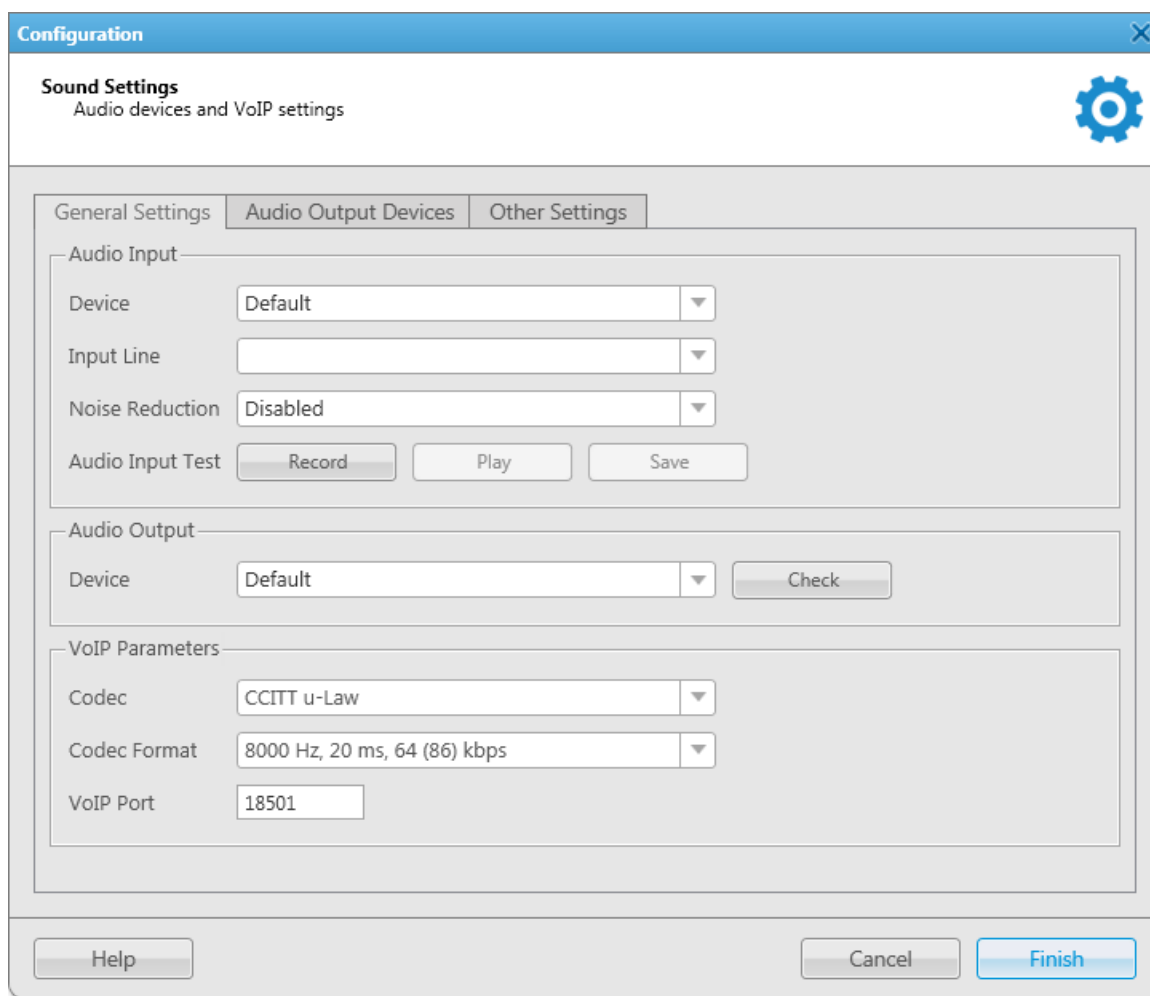
In the **Address** and **Port** fields enter the radioserver IP address and port number to connect with the dispatcher.

To find out the radioserver IP run the *ipconfig* command on the PC where the radioserver is installed. The default radioserver port number is *8888*.

Select the **Active** check box to enable the radioserver.

For more information about the radioserver settings see Help in the SmartPTT Dispatcher application.

4. Audio setting configuration is required to give the operator the ability to communicate with the radio subscribers. Expand the **Settings** menu in the **Main Menu** bar of the SmartPTT Dispatcher window and click **Sound**.



**Audio Input** – audio device to which the microphone is connected.

**Input Line** – audio mixer line used to connect a microphone.

**Audio Output** – audio device to which headsets or speakers are connected.

**Codec** – audio stream compression method.

**Bitrate** – audio stream sampling frequency.

**VoIP Port** – audio stream receive port.

Specifications of the codec format *8000 Hz, 20 ms, 64 (86) kbps*:

**8000Hz** – the sampling rate.

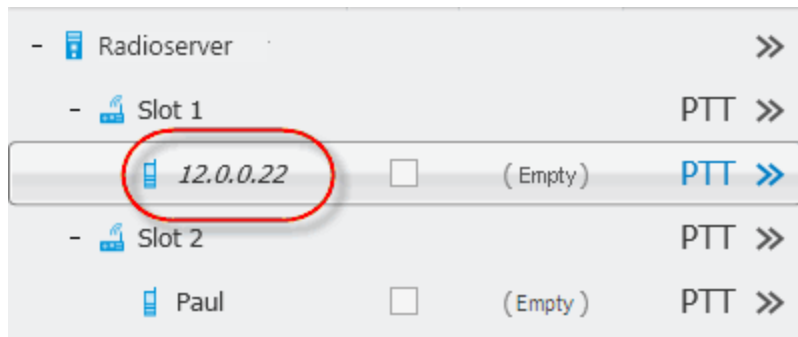
**20 ms** – the frame size.

**64 kbps** – the voice data bit rate.

**86 kbps** – a full bit rate (required network bandwidth).

For more information see Help in the SmartPTT Dispatcher application.

5. Register radio subscribers. Unregistered radio subscribers are displayed in italics in the **Radio Fleet** window and are not recorded into the database.



To register the radio subscriber, right-click on the radio subscriber, enter the name and click **Save**.

**Properties: Subscriber 1**

Common Location

CAI 12 Radio ID 105

MDC ID 5 Tone ID

Name Subscriber 1

Status Busy

Select x

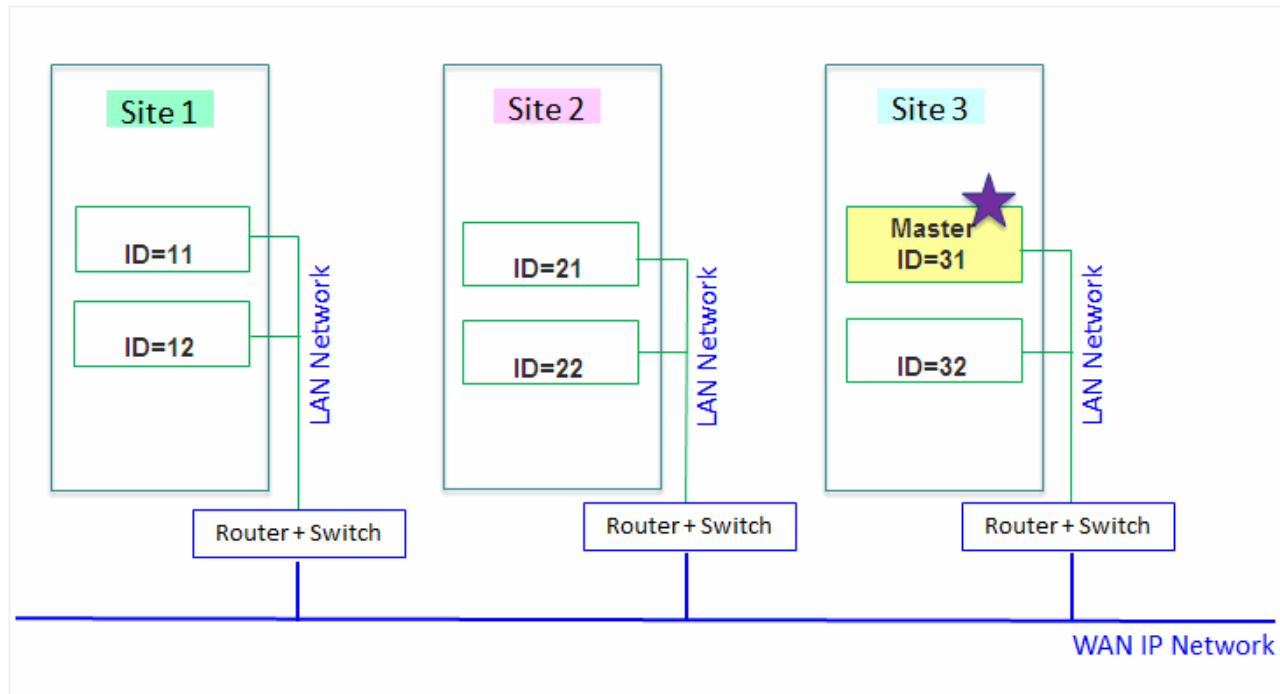
Lone Worker Default

Save Cancel

## Linked Capacity Plus

To configure Linked Capacity Plus (LCP) system consisting of 3 sites with 2 repeaters on each site, see the following network scheme:



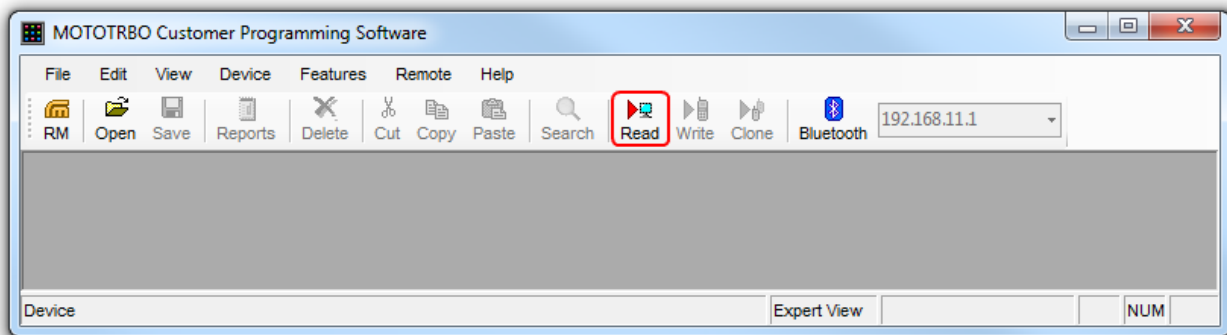


Each radio ID, either subscriber radio ID or repeater ID should be unique in the radio system. In this example you can see 2 repeaters with ID's 11 and 12 on Site 1, 2 repeaters with ID's 21 and 22 on Site 2, and 2 repeaters with ID's 31 and 32 on Site 3. The repeater with ID=31 is a Master.

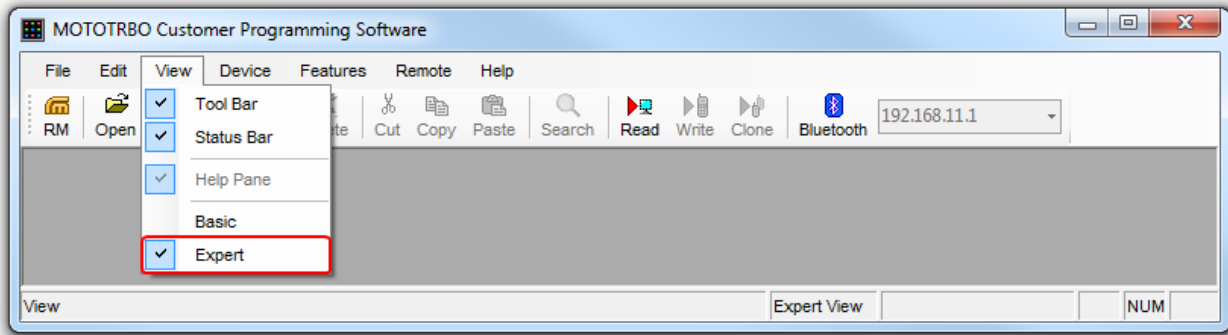
### MOTOTRBO Equipment Programming

To program MOTOTRBO equipment you will need MOTOTRBO Customer Programming Software (CPS).

1. Connect your device to the PC via a programming cable and launch MOTOTRBO CPS.
2. Switch on the device and check its settings by clicking the **Read** button on the menu bar.



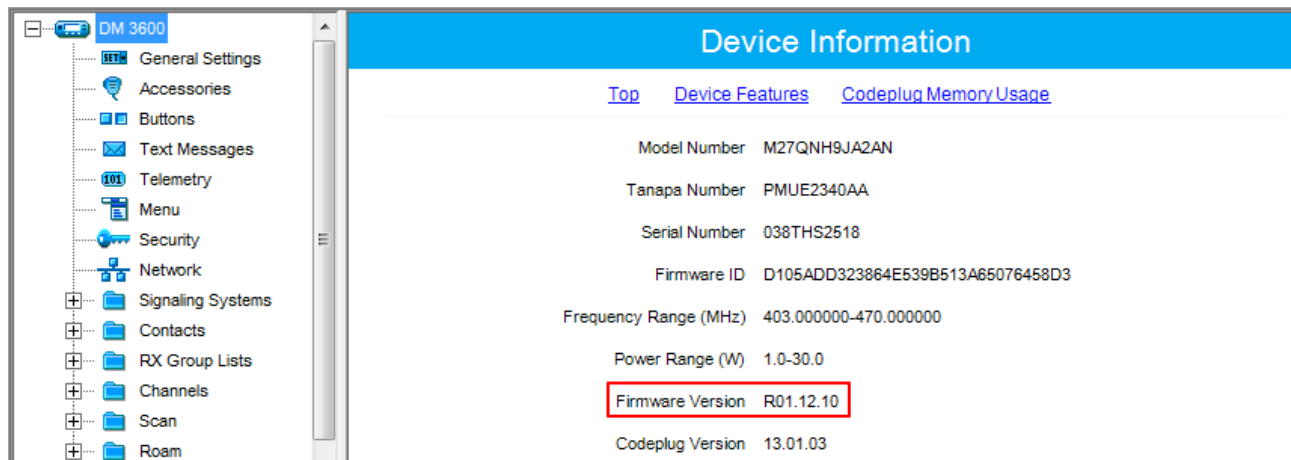
- In the **View** menu select **Expert** to gain access to all the setting parameters.



- In the **Device Information** tab make sure that firmware version is no older than:
  - R01.12.11 or R02.30.10 for mobile or portable radios;
  - R02.30.12 for repeaters.

Otherwise, contact the supplier to request firmware upgrade.

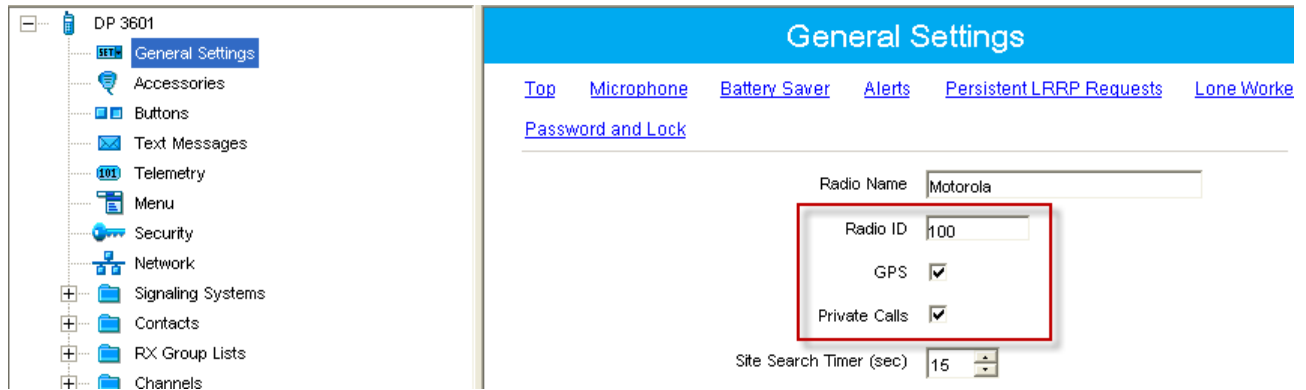
**Note:** It is recommended to use the same or compatible firmware versions for all MOTOTRBO equipment on the same network.



- To apply the changes in the settings, click **Write**.

## MOTOTRBO Radio Programming

1. In the **General Settings** specify **Radio ID**.



Select **GPS**, if you need to track the subscriber location (only for radios with GPS support DP/DM 3401, 3601, 4401, 4601, DP 4801, SL4010).

Select **Private Calls**, if radio subscriber needs to transmit private calls. If **Private Call** is not selected, radio subscriber won't be able to initiate a private call, but the user can continue to receive and respond to private calls, and is still able to initiate call alerts.

2. In the **Network** tab configure the necessary settings.

The screenshot displays the configuration page for a DP 3601 device, specifically the **Network** tab. On the left is a navigation menu with options like General Settings, Accessories, Buttons, Text Messages, Telemetry, Menu, Security, Network, Signaling Systems, Contacts, RX Group Lists, Channels, Scan, Roam, and Capacity Plus. The main content area is titled 'Network' and has sub-tabs for Top, Radio Network, Services, and IP Site Connect. Under the 'Radio Network' sub-tab, there are fields for Radio IP (192.168.10.1), Accessory IP (192.168.10.2), and Netmask (255.255.255.0). Below this is another section titled 'Radio Network' with fields for CAI Network (12), CAI Group Network (225), Max TX PDU Size (500), and Telemetry UDP Port (4008). A dropdown menu for 'Forward to PC' is set to 'Disabled'. The next section is titled 'Services' and contains fields for ARS Radio ID (1), ARS IP (13.0.0.1), ARS UDP Port (4005), TMS Radio ID (1), and TMS IP (0.0.0.0). Red boxes highlight the 'Forward to PC' dropdown, the 'ARS Radio ID' and 'TMS Radio ID' dropdowns, and the 'ARS IP' field.

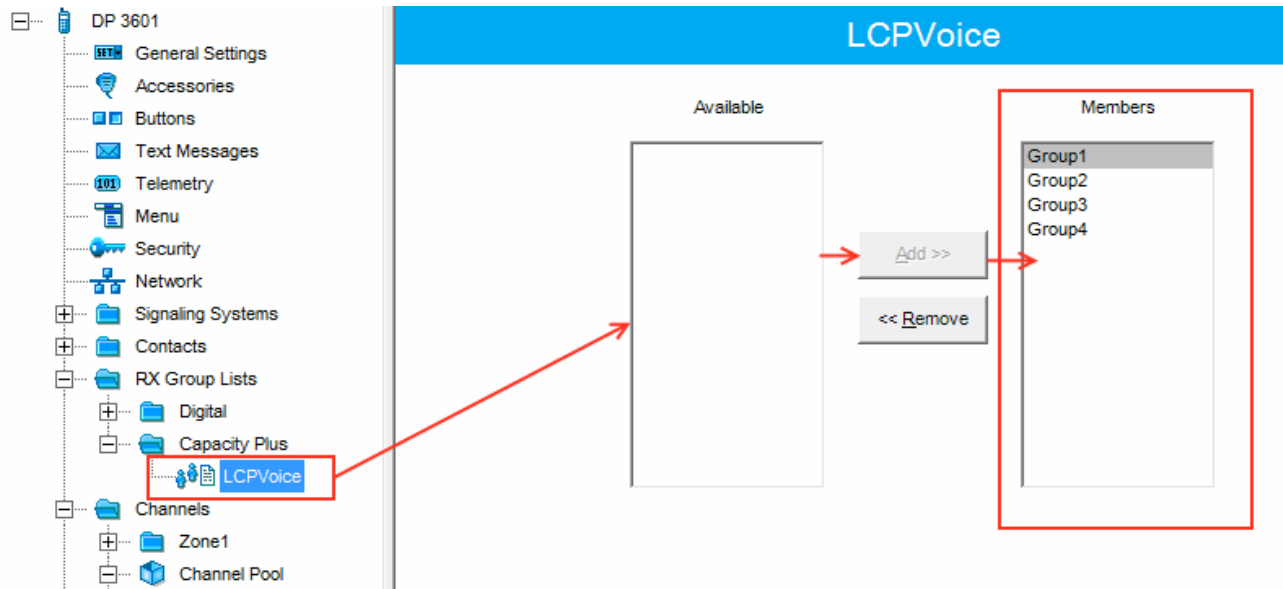
- In the **Forward to PC** field select *Disabled*.
- If you plan to work with SmartPTT application specify **ARS Radio ID** and **TMS Radio ID**. Remember that the **ARS Radio ID** and **TMS Radio ID** should match the **MNIS Radio ID** in the MOTOTRBO MNIS application and Slot ID in SmartPTT Radioserver Configurator. In our case, **ARS Radio ID=TMS Radio ID=Slot ID=MNIS ID=1**.

- In the **Contacts** tab right-click on the **Capacity Plus** system to add necessary contacts (**Private Call**, **Group Call**, **All Call**) to subscriber's contact list. When configuring the Master repeater, we added 2 groups as wide groups in the **Talkgroups** tab. Group 1 with ID=1 is available for all sites, Group 2 with ID=2 is available for *Site 2* and *Site 3*. Local groups should be added in the radio settings. In this example we will add 4 groups: Group 1, Group 2 – as wide groups, Group 3 and Group 4 as local groups, and other necessary contacts.

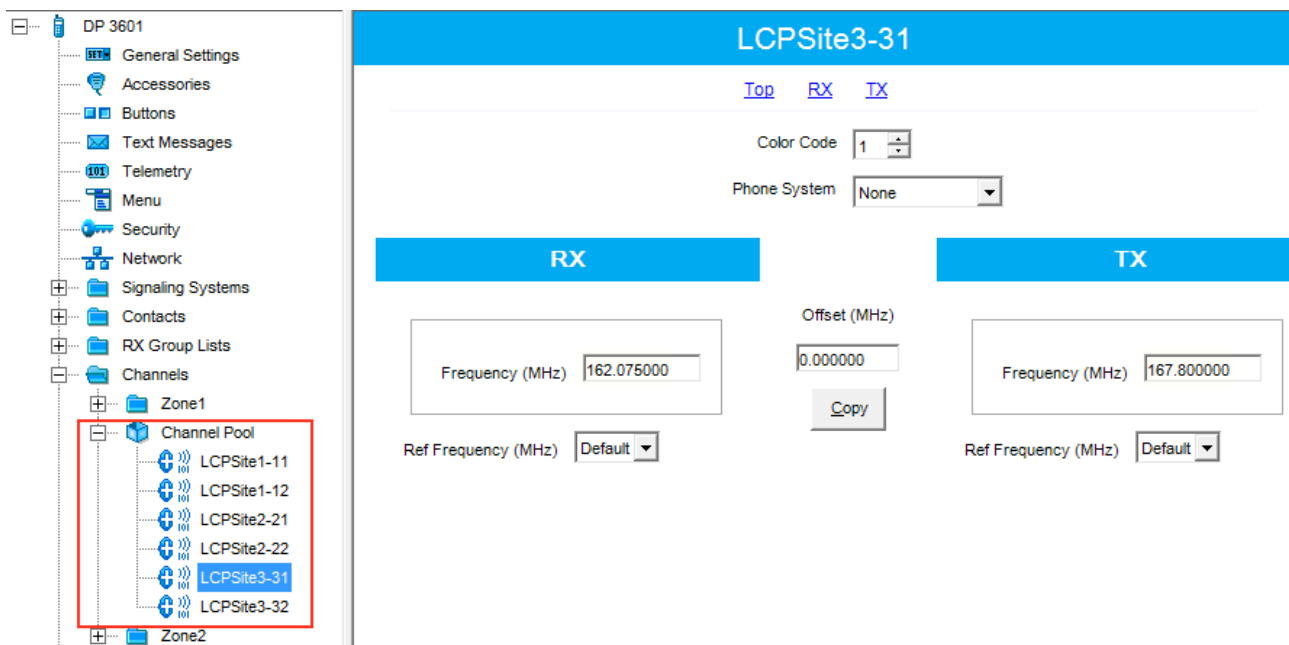
Contact Name	Call ID	Call Receive Tone	Ring Style	Text Message Alert Tone
Group1	1	<input type="checkbox"/>	No Style	Repetitive
Group2	2	<input type="checkbox"/>	No Style	Repetitive
AllCall	255	<input checked="" type="checkbox"/>	No Style	Repetitive
Dispatcher_Voice	1	<input type="checkbox"/>	No Style	Momentary
70	70	<input checked="" type="checkbox"/>	No Style	Momentary
Group3	3	<input type="checkbox"/>	No Style	Repetitive
Group4	4	<input type="checkbox"/>	No Style	Repetitive
Dispatcher-Data	1	<input type="checkbox"/>	No Style	Repetitive

Also, add **Dispatcher Call** for transmitting data to SmartPTT Radioserver and **PC Call** to be able to initiate calls to SmartPTT Dispatcher. Make sure that the **IDs** of these calls equal **Slot ID** in SmartPTT Radioserver Configurator (see [SmartPTT Radioserver Configurator](#)).

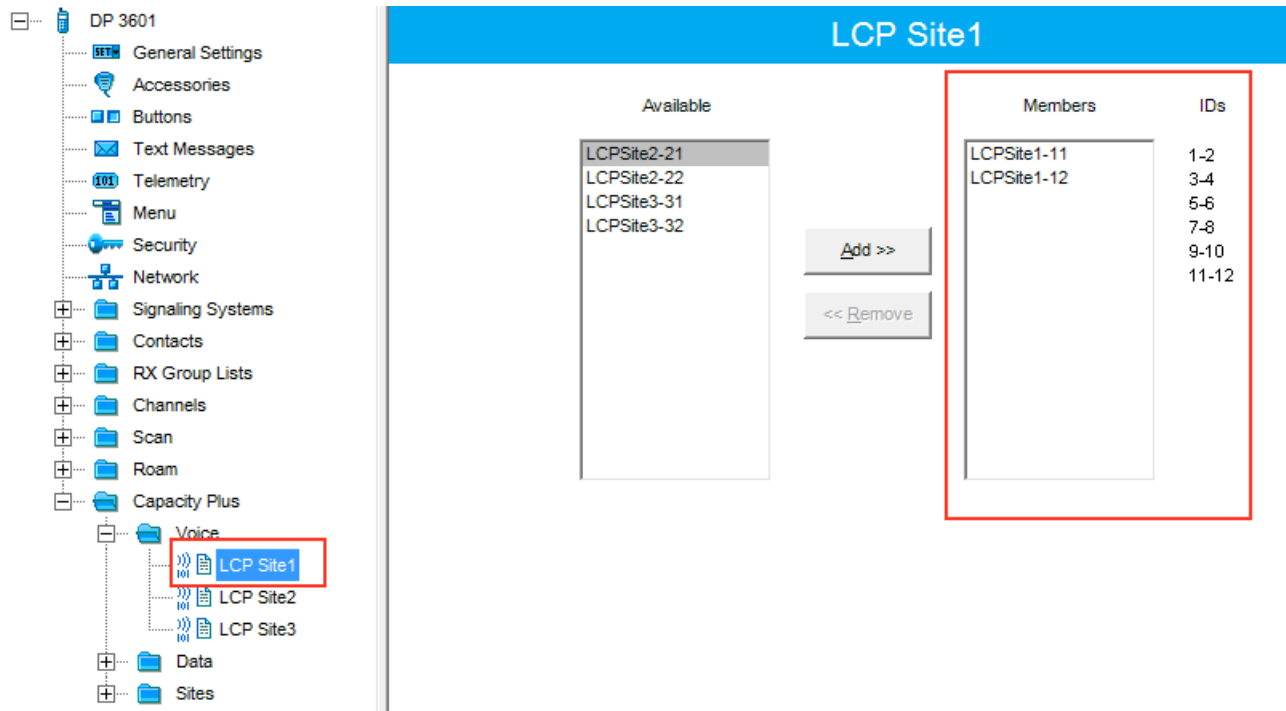
4. Add these groups to the **RX List**. In our example we use the same RX list for all sites. That is why the **RX List** contains all the groups.



5. Add all repeaters, which are in the LCP system, to the **Channel Pool**. The color code should equal the color code specified for repeaters. In our case **Color Code=1**. Define the RX and TX frequencies. They must correspond to the frequencies set in the repeater, but RX of the radio must correspond to TX of the repeater and TX of the radio must correspond to RX of the repeater.



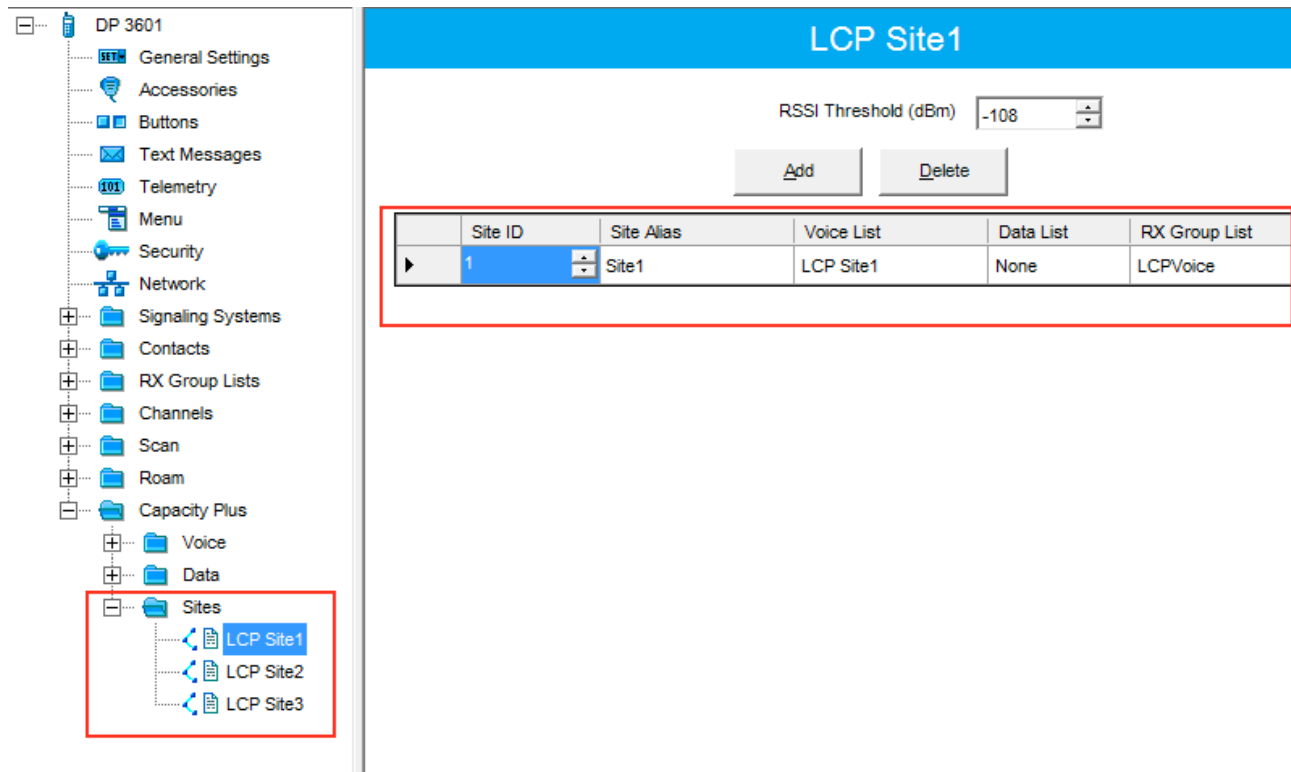
6. Create **Voice** lists and **Data** lists according to the amount of sites. As all of our repeaters are Trunk repeaters (transmit voice and data), create only **Voice** lists. When adding new **Voice** list, under the **Available** list you can see all the channels which were added to the **Channel Pool**. So, for *Site 1* add a **Voice** list (LCP Site 1) and add *LCP Site 1-11* and *LCP Site 1-12* to this list.



Please note that **IDs** in the **Members** list should correspond to **Slot 1 ID Channel** and **Slot 2 ID Channel** specified in repeater settings.

7. Create **Voice** lists for *Site 2* and *Site 3* accordingly.

8. Configure **Sites** lists. If you do not use roaming, create several site lists and add only one site per list.



Since in this example there are three Sites, add three **Sites** lists.

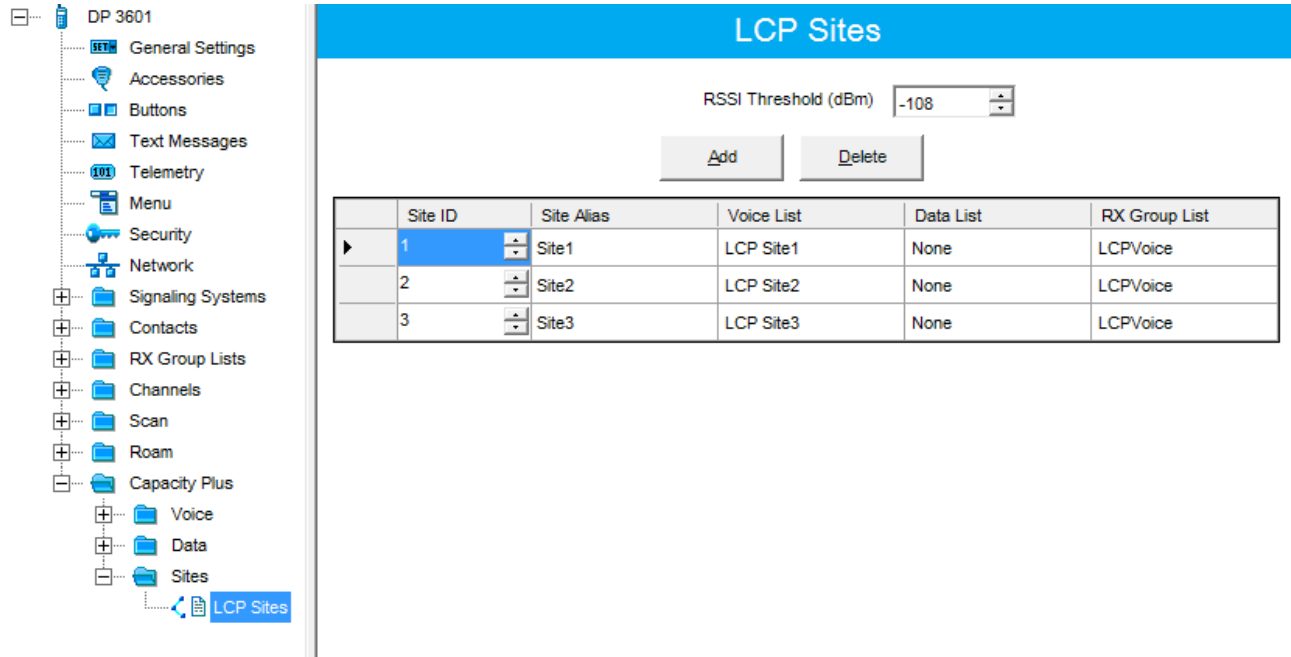
For each **Site** configure:

- **Site ID** – ID of the site to which the subscriber radio is connected.
- **Site Alias** – name of the site to which the subscriber radio is connected.
- **Voice List** – Voice Channel List which the subscriber radio will use to make voice calls when on the site.
- **Data List** – Data Channel List which the subscriber radio will use to make data calls when on the site.
- **RX Group List** – RX Group List which the subscriber radio will use to receive group calls when on the site.



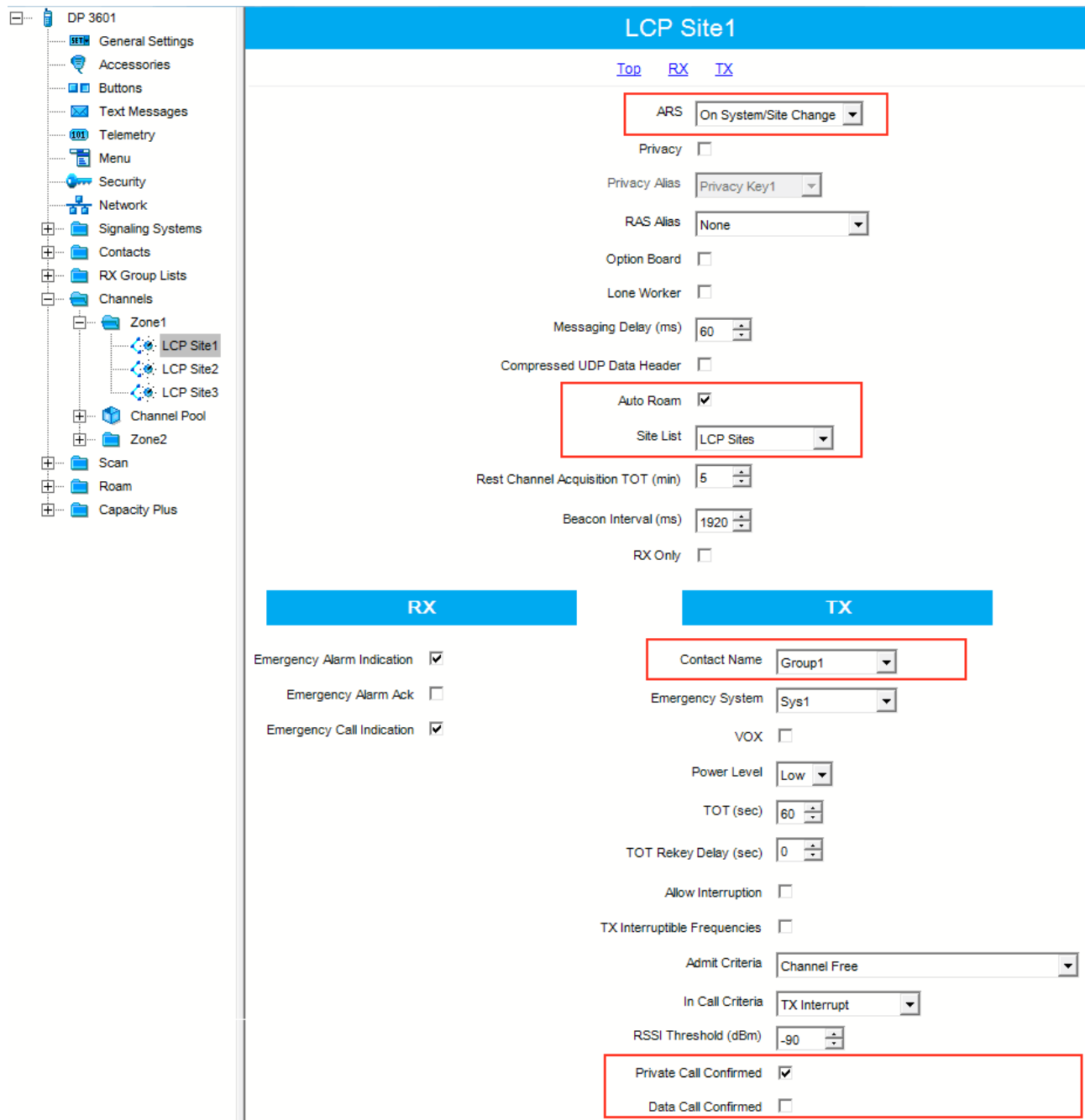
If subscriber roams between different sites, one site list will contain several sites.

In our case a subscriber with **Radio ID=100** can roam between all three sites, so we created one **Sites** list with all the sites.



Site ID	Site Alias	Voice List	Data List	RX Group List
1	Site1	LCP Site1	None	LCPVoice
2	Site2	LCP Site2	None	LCPVoice
3	Site3	LCP Site3	None	LCPVoice

9. Add LCP Personalities. To do this, right-click on **Zone** and add **Capacity Plus Personality (linked)**.



For each channel specify:

- **ARS** – select *On System/Site Change*. ARS feature provides an automatic radio registration. When the radio powers up, the radio automatically registers with the server. This feature is also used with Text Messaging or Location Services.

- **Auto Roam** – select **Auto Roam** if the radio is to roam between sites in the LCP system. If disabled, the radio subscriber won't be able to roam to another LCP site when moving from one site to another.
- For each channel select appropriate **Sites** list. The subscriber radio can roam to the sites listed in the **Sites** list.
- Select **Contact Name** which defines the call that may be initiated on the channel by pressing the PTT button, when there are no active calls on the channel.
- Select **Private Call Confirmed** and clear **Data Call Confirmed**.

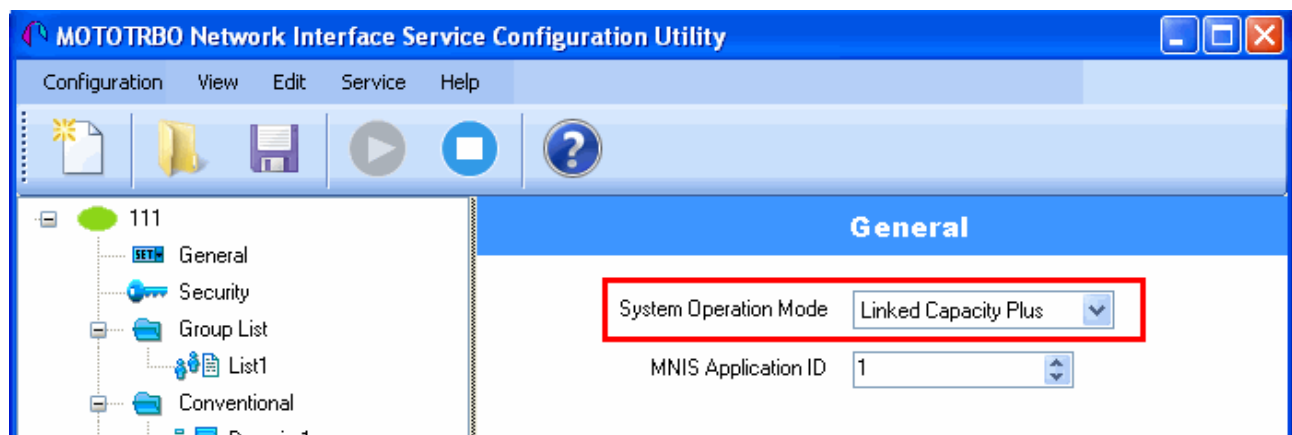
## MNIS and DDMS Client Configuration

In order to process data packets, ARS, Call Alerts, GPS, TMS, it is obligatory to have MOTOTRBO Network Interface Service Configuration Utility (MNIS) and MOTOTRBO DDMS Administrative Client properly installed and configured.

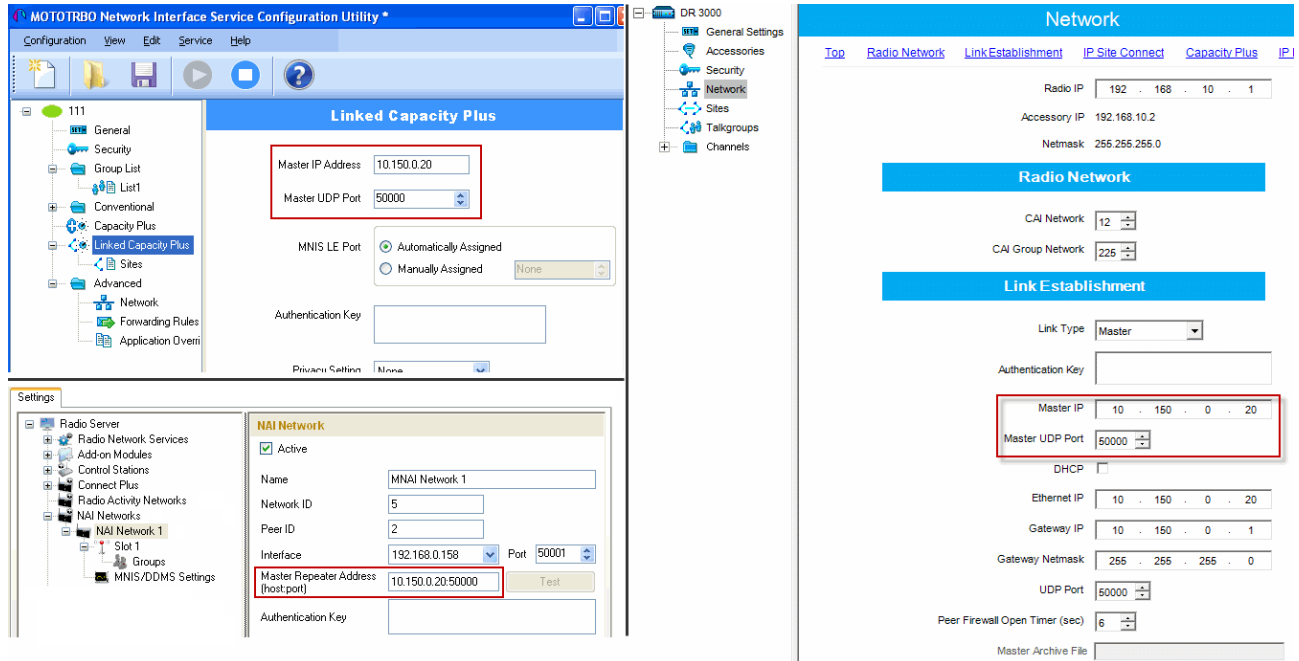
Let's start with MOTOTRBO Network Interface Service Configuration Utility (MNIS).

**Note:** Before configuring, make sure the firmware versions of the repeaters and MOTOTRBO Network Interface Service are compatible (please find compatibility information in MNIS Release Notes).

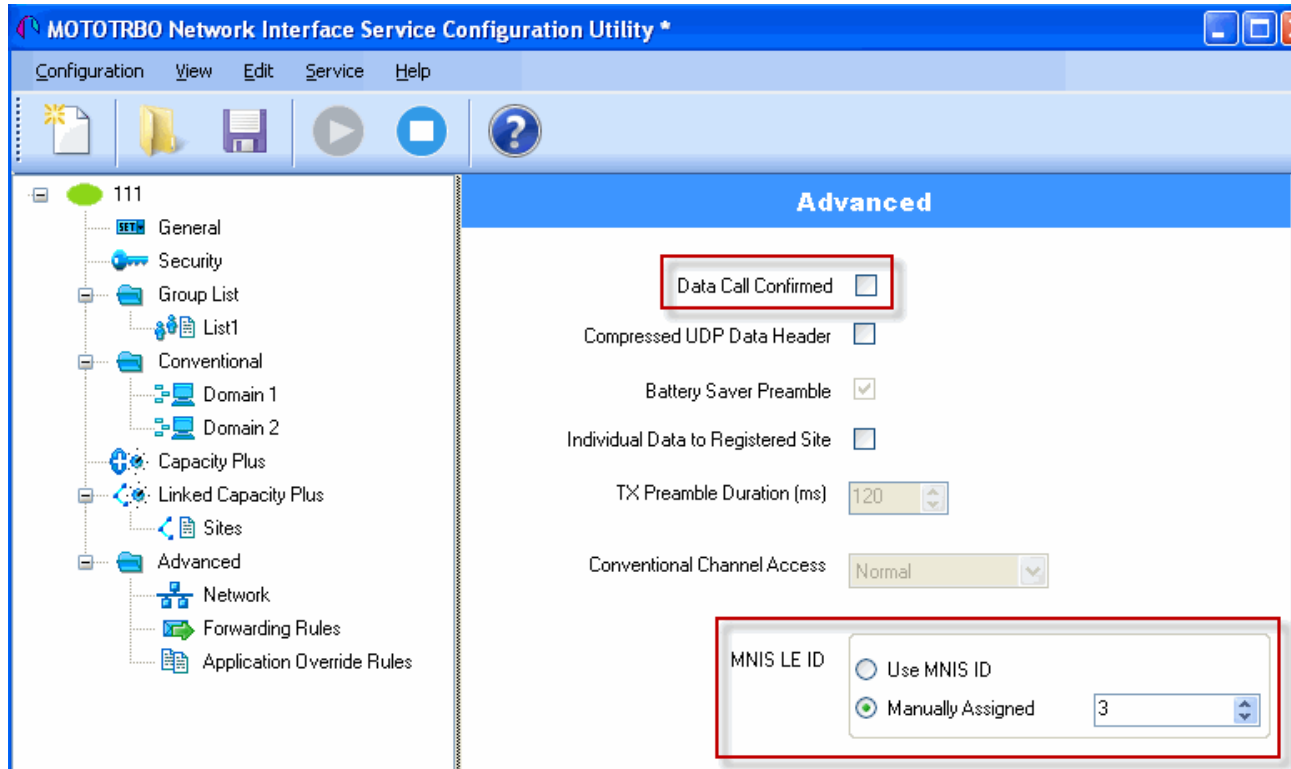
1. In the **General** section in the **System Operation Mode** field select network type. In our case, it is *Linked Capacity Plus*.



- In the **Linked Capacity Plus** section set up **Master IP Address** and **Master UDP Port** fields. These values should correspond to the same values in MOTOTRBO CPS and in SmartPTT Radioserver Configurator, which you will set up later.



- It is recommended to clear the **Data Call Confirmed** field in the **Advanced** section and to specify the identifier in the **MNIS LE ID** field explicitly. Make sure **MNIS LE ID** does not match **Peer ID** of any repeaters in the system.

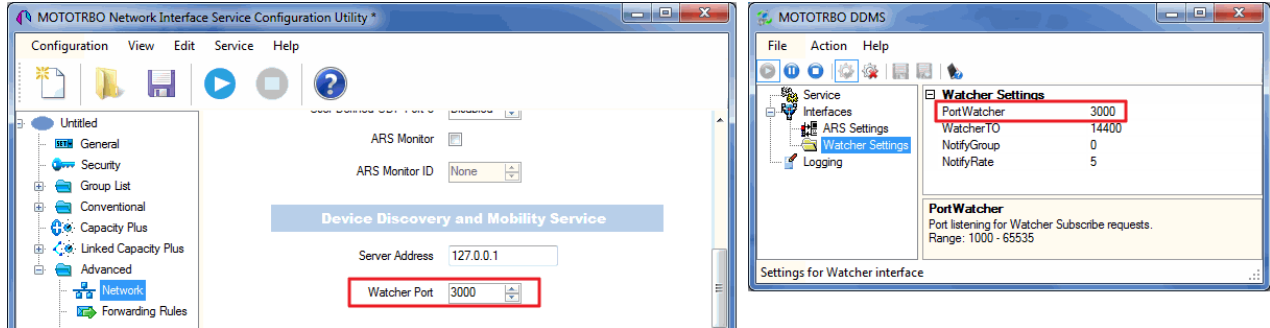


**Note:** In the Firewall settings add MNIS into the exception list.

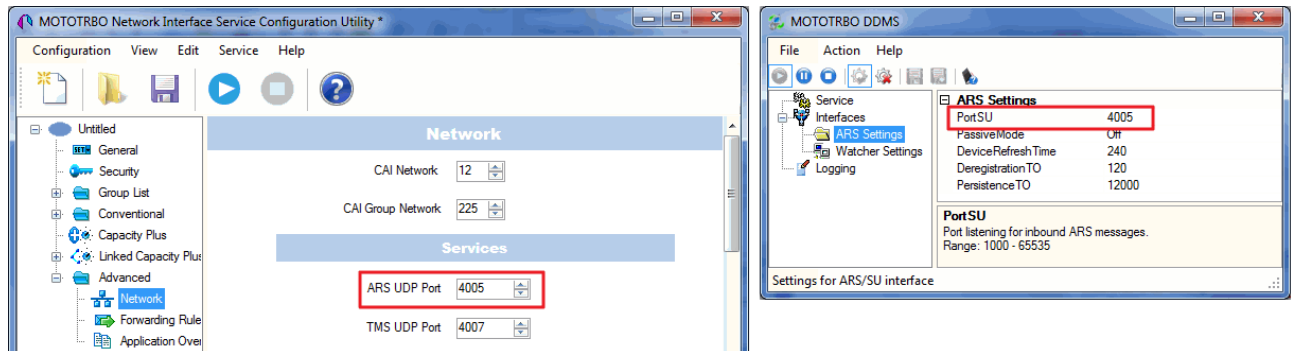
DDMS operation is closely connected to MNIS for data exchange (MNIS serves as DDMS Watcher). DDMS filters ARS packets, received by the repeater, and information on the radio presence in the network is sent to all systems for further processing.

Therefore, when you configure DDMS settings, make sure that:

1. The **PortWatcher** field in MOTOTRBO DDMS Administrative Client matches the **WatcherPort** field in MNIS settings (**Advanced > Network**).

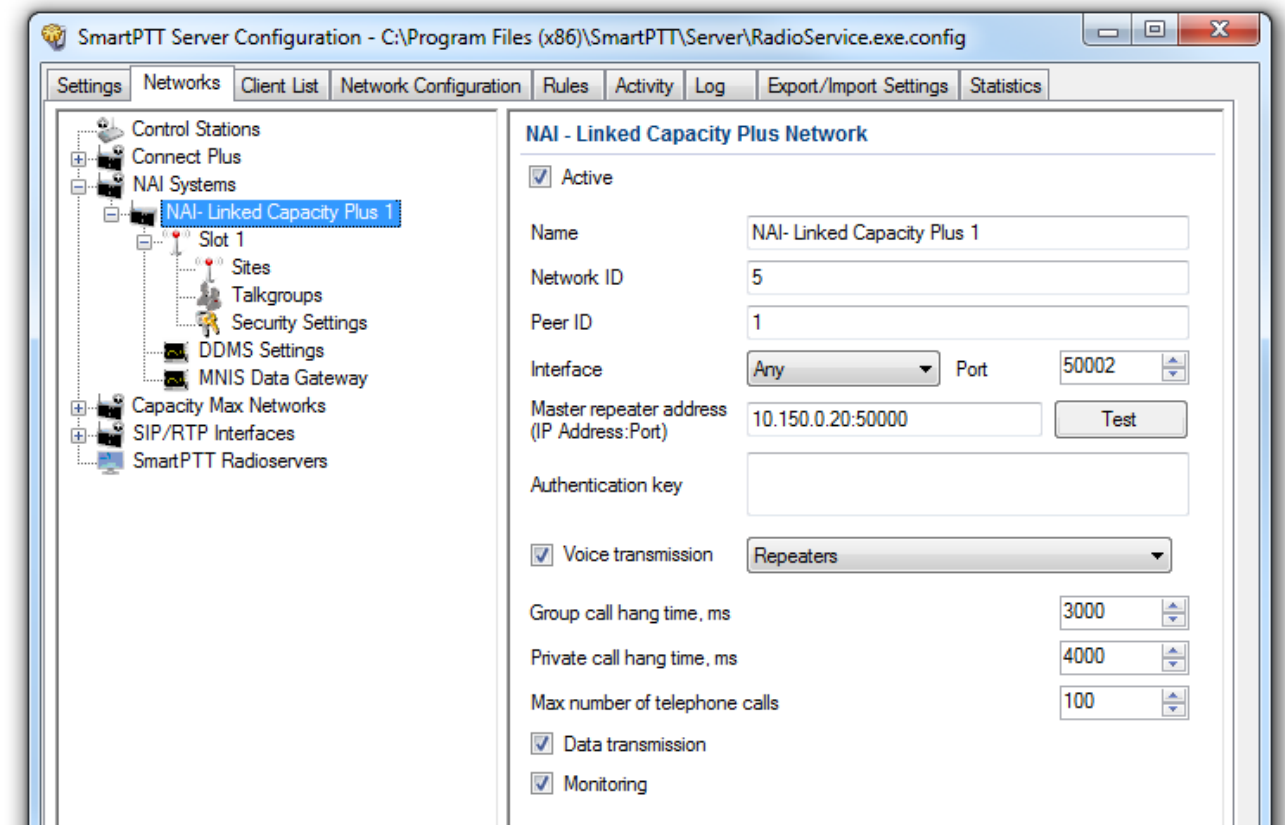


2. The **PORT SU** field (**Interfaces > ARS Settings**) in MOTOTRBO DDMS Administrative Client matches the **ARS UDP Port** field in MOTOTRBO Network Interface Service Configuration Utility (**Advanced > Networks**).



## SmartPTT Radioserver Configuration

1. Run SmartPTT Radioserver Configurator, which you have downloaded and installed, as described in [SmartPTT Software Installation](#).
2. In the setting tree on the left, right-click on **NAI Systems**, point to **Add** and click **NAI - Linked Capacity Plus**.
3. In the opened window specify the following settings of the LCP network:

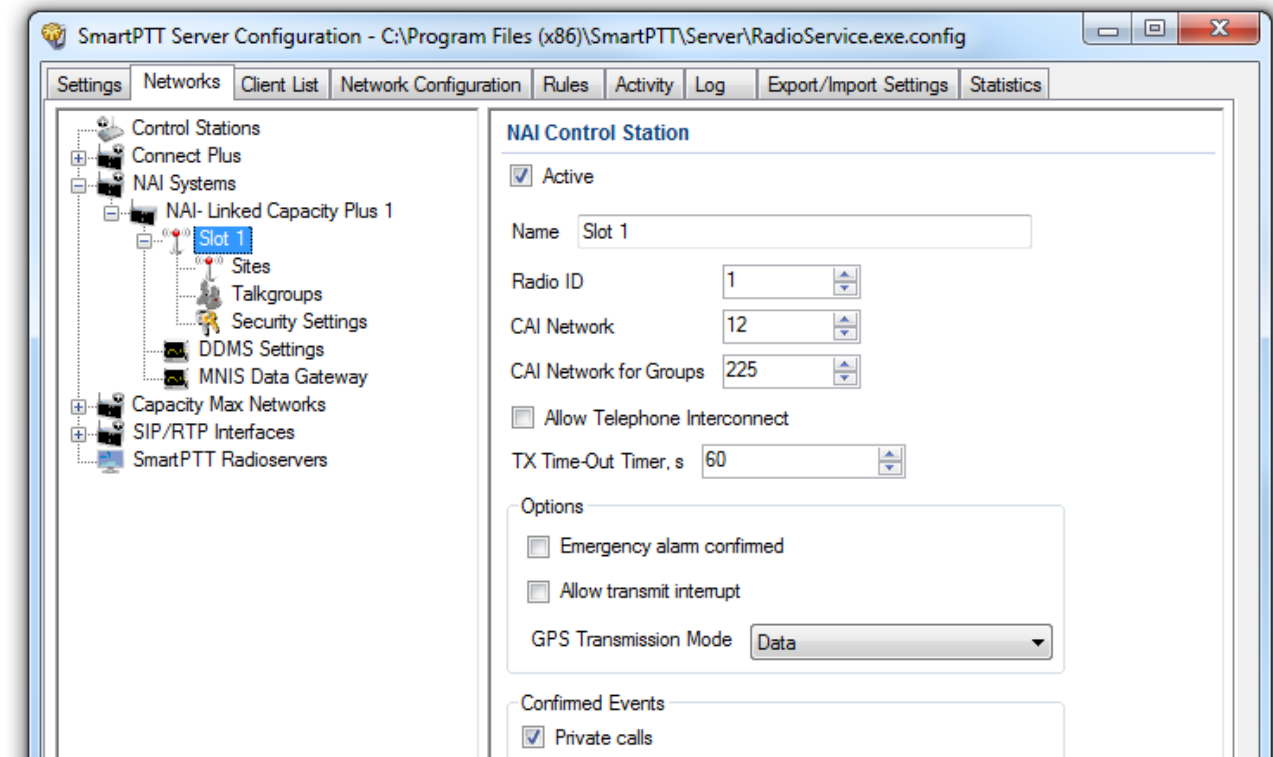


- **Name** – add network name.
- **Network ID** – specify unique ID of the network. The network ID must not match any ID of the other SmartPTT Radioserver networks.
- **Peer ID** – enter unique ID of the virtual repeater in the network. The virtual repeater ID must not match any of the other repeater IDs in this network.
- **Interface** – specify the IP address of the PC where SmartPTT Radioserver is installed.
- **Port** – set up port number of SmartPTT Radioserver. It should differ from the corresponding ports in other networks.

- **Master repeater address (host:port)** – specify IP address and port number of the Master repeater (see **Master IP** and **Master UDP Port** in MOTOTRBO CPS). In this example it is *10.150.0.20:50000*.
- Click **Test** to check connection between the virtual and Master repeaters.
- **Authentication Key** – enter repeater authorization key (to be equal to the **Authentication Key** in the repeater settings in MOTOTRBO CPS). In this example we are not setting any authentication keys.
- **Voice transmission** can be carried out in two ways: via repeaters and via control stations. To transmit voice via control stations, configure control station parameters and profiles for making private calls. To transmit voice via repeaters, configure virtual control station channels and talkgroups of the channel. The number of channels depends on the network type. To ensure data packets transmission over the network, configure the DDMS and MNIS services. To transmit CSBK commands use control stations for voice transfer. To transmit data and monitoring data select the corresponding check boxes (**Data transmission** and **Monitoring**). If **Data transmission** is not selected, all data packets will be gray and no data type differentiation will be applied in the **Monitoring** panel in SmartPTT Dispatcher. If **Data transmission** is selected, the data packets addressed to you will be defined, and other data packets, not addressed to you, will be gray.

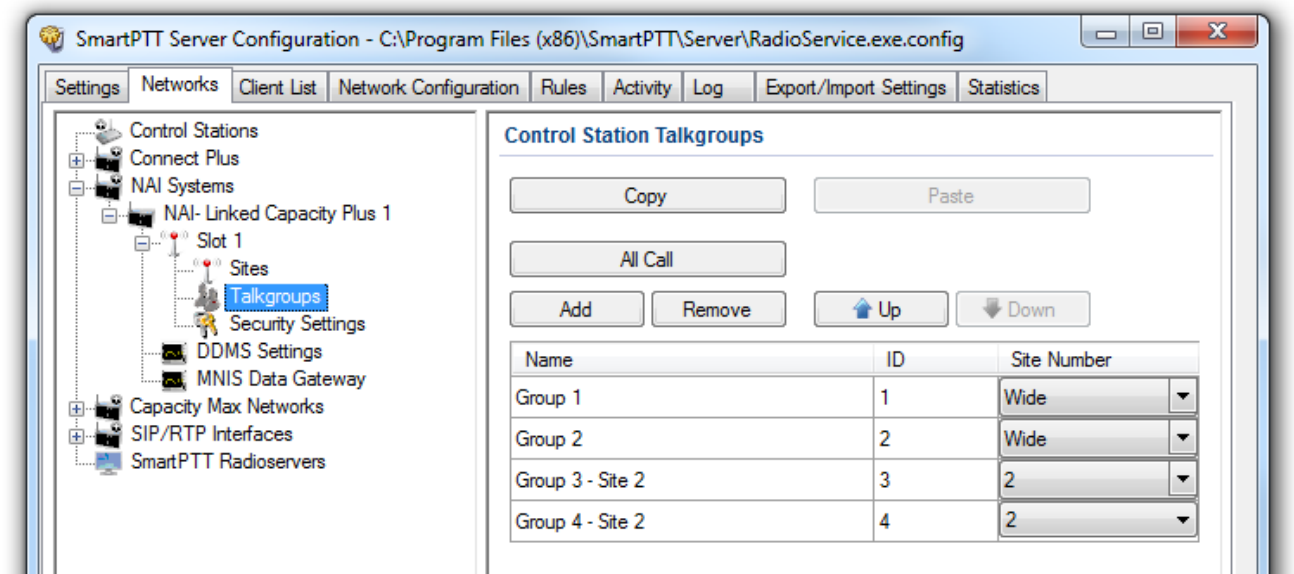


- Configure slot parameters. In order to do that, go to **Slot 1** in the setting tree of SmartPTT Radioserver Configurator.



- **Name** – specify the name of the slot.
- **Radio ID** – set unique ID of a virtual control station corresponding to the network slot. Remember that it should match **ARS Radio ID**, **TMS Radio ID** and **MNIS ID**, in this example it is **1**.
- **CAI Network** – CAI-network ID. Use the default value of 12 (must match MOTOTRBO CPS settings).
- **CAI Network for Groups** – CAI-network for groups ID. Use the default value of 225 (must match **CAI Group Network** in MOTOTRBO CPS settings).
- **Emergency Alarm Confirmed** – select this check box if you need the emergency alarm be acknowledged.
- **Private Calls** – select this check box if you need set private calls on the current digital channel as confirmed.
- **Allow Transmit Interrupt** – select this check box if you need the ability to interrupt a radio subscriber.
- **GPS Transmission Mode** – allows you to select the way how to transmit location updates: as a data packet in multiple bursts or as a single CSBK (Control Signaling Block). This time select **Data**.

- **Allow Telephone Interconnect** – select this check box if you need the ability to make telephone calls on the slot.
5. Configure talkgroup parameters. To do that, click **Talkgroups**. Parameters of wide area and local groups are set in the **Control Station Talkgroups** window. In order to display wide area talkgroups by the SmartPTT Dispatcher application, add necessary talkgroups in SmartPTT Radioserver Configurator, define group identifiers which correspond to the identifiers of the wide area groups in the repeater MOTOTRBO CPS settings and select *Wide* in the **Site Number** field. In this example we have two wide area talkgroups and two local talkgroups, so we add them into SmartPTT Radioserver Configurator.

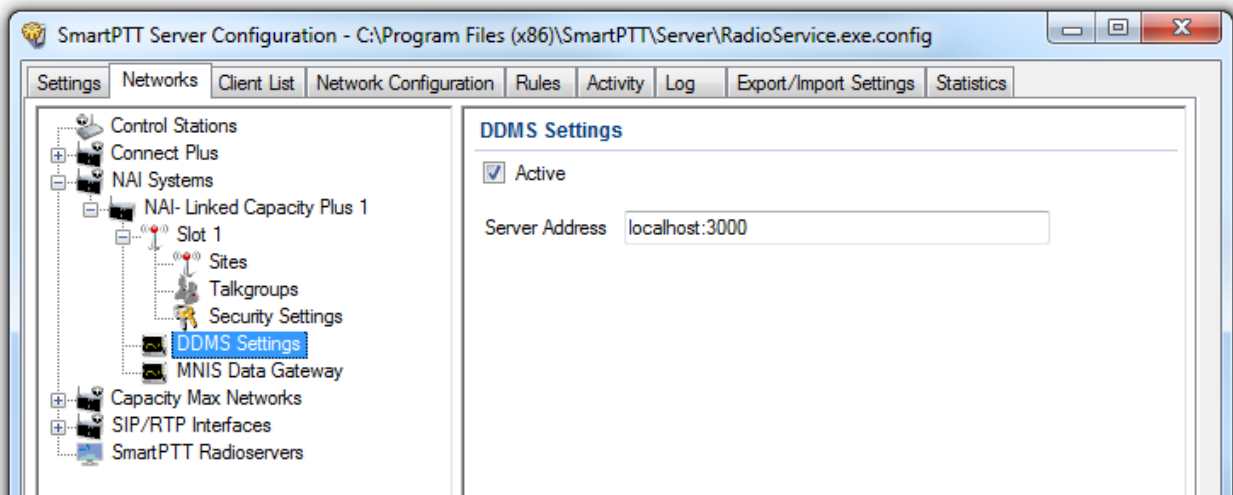
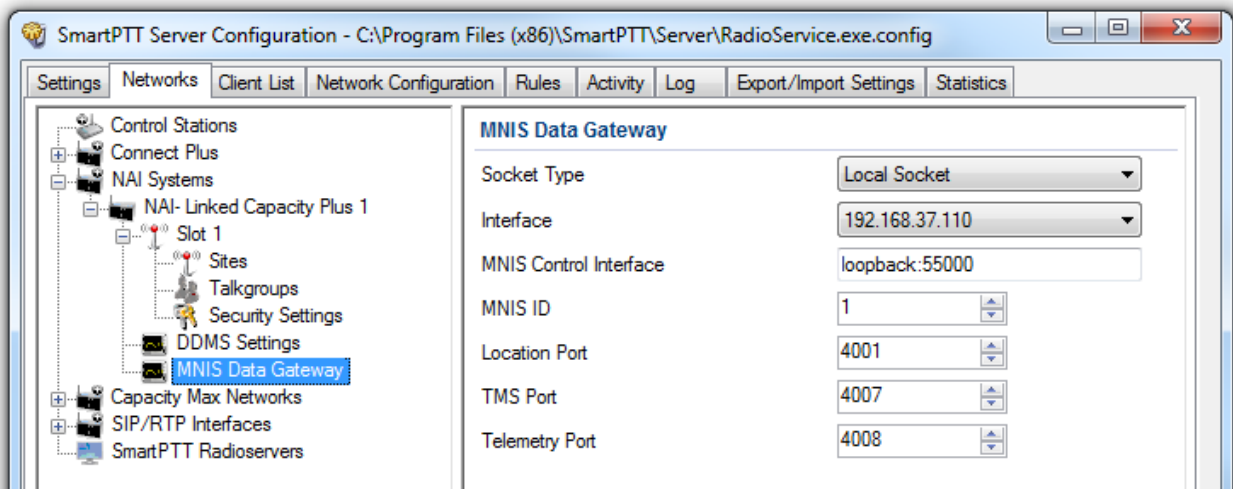


Talkgroups not specified in the repeater settings are regarded as local groups. Local group call does not go beyond the site on which the call was initiated.

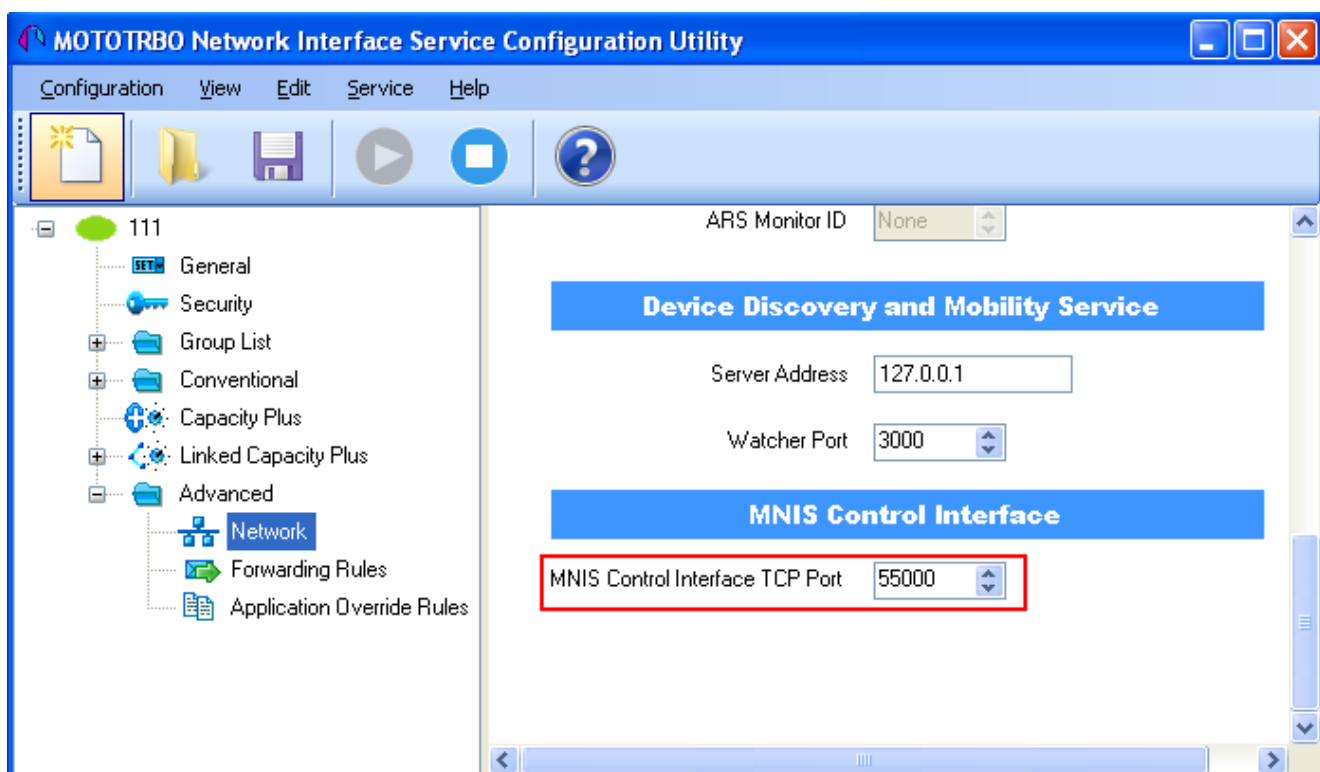
To add local talkgroups, just add them in SmartPTT Radioserver Configurator, define their identifiers and select site number from the list in the **Site Number** field.

**Note:** Wide area and local talkgroup identifiers must differ.

- Configure MNIS Data Gateway and DDMS settings for data transmission under **MNIS Data Gateway** and **DDMS Settings**.

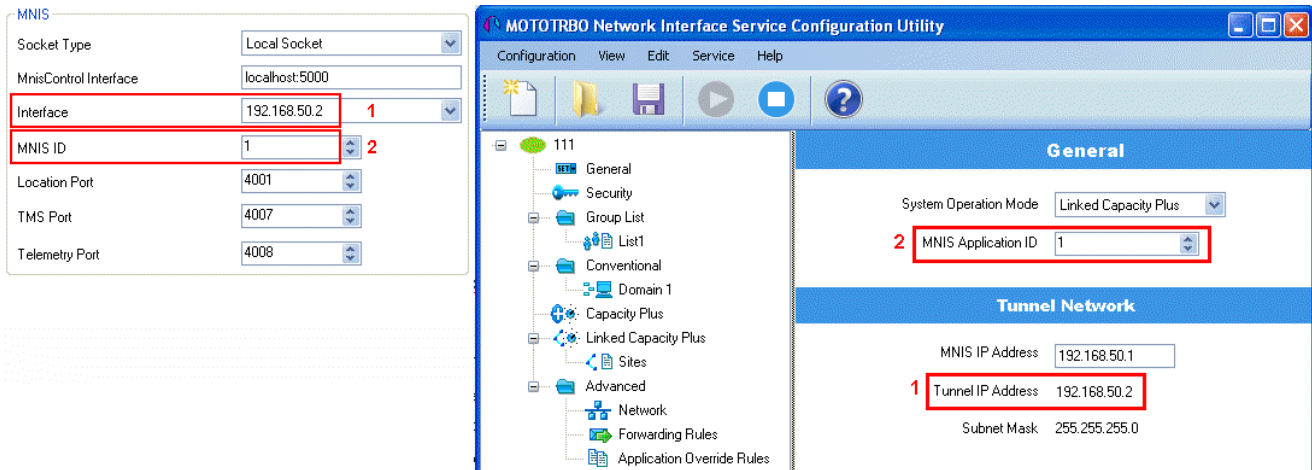


- 1) Under **MNIS Data Gateway** select *Local Socket* in the **Socket Type** field since the MOTOTRBO Network Interface Service Configuration Utility application is installed on the same PC as SmartPTT Radioserver.
- 2) **MNIS Control Interface** – use *localhost*, if MOTOTRBO Network Interface Service is installed on the same PC as the radioserver. If MOTOTRBO Network Interface Service and the radioserver are installed on different PCs, use the interface specified in the **MNIS Relay Address** field. The port should match the port number specified in the **MNIS Control Interface TCP Port** field in MOTOTRBO Network Interface Service Configuration Utility settings:

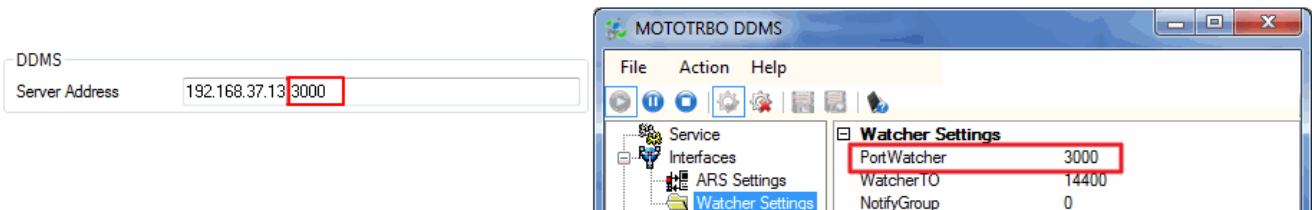







- 3) In the **Interface** field select the IP address of the PC where MOTOTRBO Network Interface Service is installed. It must match the IP address specified in the **Tunnel IP Address** field of MOTOTRBO Network Interface Service Configuration Utility.

- 4) In the **MNIS ID** field set up the Common Air Interface (CAI) ID of the MNIS in the radio network. The ID is used by other calling radios when addressing MOTOTRBO Network Interface Service. Make sure **MNIS ID** matches the **MNIS Application ID** field in the **General** tab in MOTOTRBO Network Interface Service Configuration Utility. It is also recommended that **MNIS ID** should match **Radio ID** in the radioserver slot settings.



- 5) In the **TMS Port**, **Telemetry Port** and **Location Port** fields specify ports where the radioserver will expect text messages, telemetry and GPS data. The ports should match the ports set in the **TMS UDP PORT**, **Telemetry UDP Port**, **Location Server UDP Port** fields in MOTOTRBO Network Interface Service Configuration Utility (**Advanced > Network**).
- 6) Under **DDMS settings** specify **Server Address**, i.e., IP address of the PC with the MOTOTRBO DDMS Administrative Client application installed, and port number of the DDMS server. In this case the DDMS server is installed on the same PC as the radioserver. The port number in this field must match the port number in the **PortWatcher** field of the MOTOTRBO DDMS Administrative Client (**Interfaces > Watcher Settings**).



7. Save changes by clicking **Save** . To cancel the changes made, click the **Restore** button . All the changes, made after the last save, will be restored. To apply the saved changes you must restart the service. The service is managed using the following buttons: Start , Stop and Restart  .

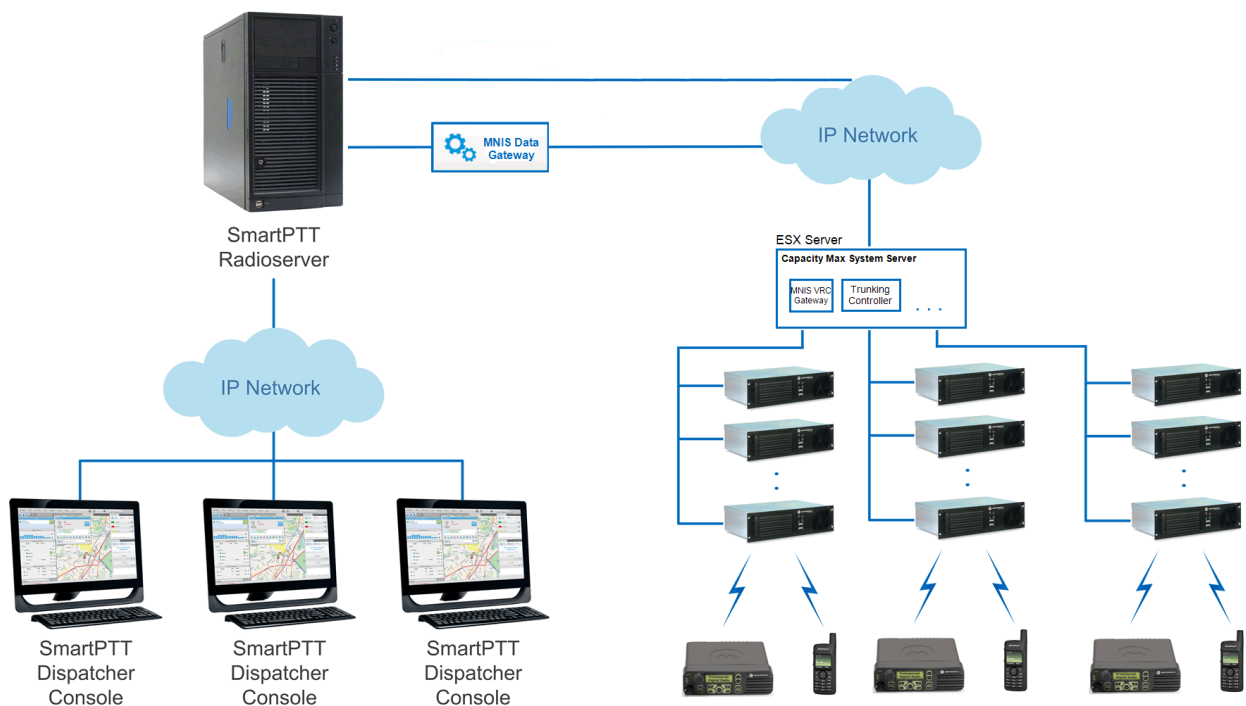
## Capacity Max

Capacity Max is a trunking MOTOTRBO system that supports the European Telecommunications Standards Institute (ETSI) Digital Mobile Radio (DMR) Tier III operation.

Capacity Max system represents the enhancement of the Linked Capacity Plus functionality. It can include up to 15 sites and up to 15 trunked repeaters with up to 3,000 users per site. One slot on each site is allocated as a control channel. Capacity Max also supports data revert repeaters: up to 6 per site and 12 time channels per site. Capacity Max system supports connection via control stations. The parameters of the control station correspond to the parameters of an ordinary MOTOTRBO control station.

Capacity Max systems offer the following advantages:

- The simple and efficient system architecture that utilizes standard Internet protocol (IP) network with a centralized Capacity Max System Server (CMSS).



CMSS represents the VMware Sphere version 5.5 ESX server and includes the following virtual resources:

- Trunking Controller based on the Red Hat Linux,
- MNIS VRC gateway, and
- Radio Management application that is used instead of MOTOTRBO Customer Programming Software (CPS) to configure the system.

The system architecture also includes the MNIS Data gateway, which is installed separately.

- High security. All voice, data and control traffic within the IP network is encrypted, and all radios are securely authenticated.
- High level of reliability and resilience. The system can include an optional redundant server in addition to the main server and up to three alternate control channels per site.

Capacity Max is compatible with all MOTOTRBO repeaters, except DR3000 series with the 8MB RAM, and all MOTOTRBO 4000 series portable and/or mobile radio stations.

To configure the Capacity Max system in SmartPTT Radioserver Configurator, you will need to use the following applications:

- Radio Management application—to get the settings of the preconfigured virtual resources, and
- MOTOTRBO Network Interface Service Configuration Utility—to set up the MNIS Data gateway.

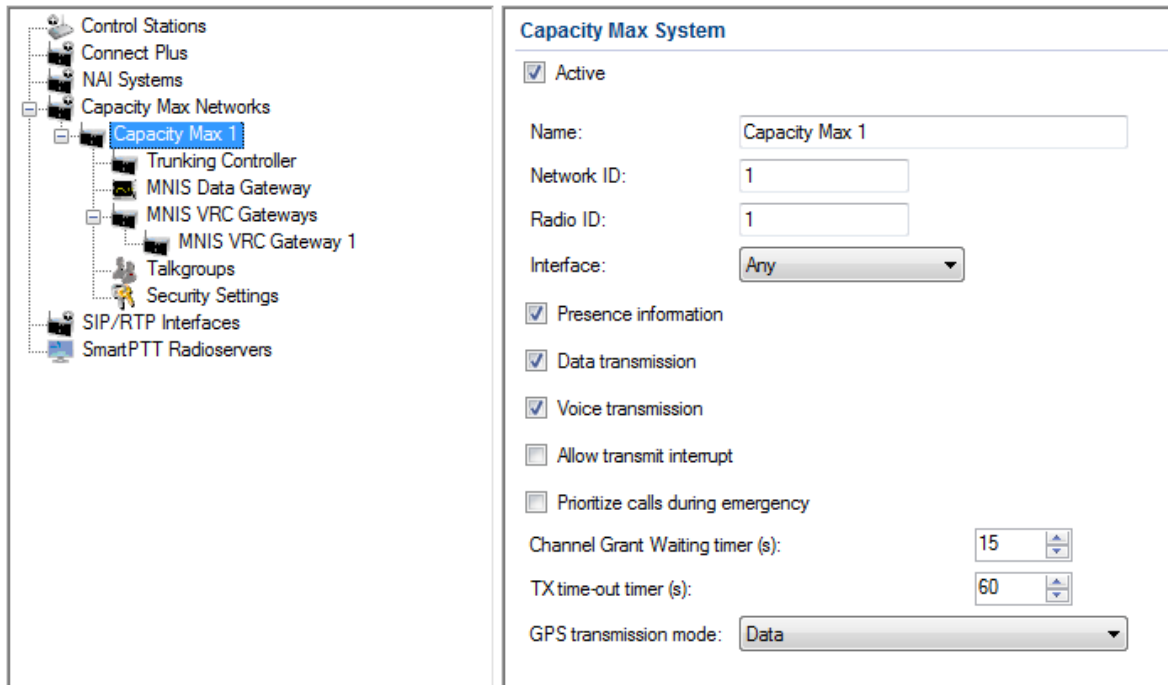
Capacity Max configuration in SmartPTT Radioserver Configurator includes the following steps:

1. [Adding new network and its basic configuration](#).
2. Setting up the [trunking controller](#).
3. Setting up [MNIS Data gateway settings](#) for data transfer.
4. Setting up the [MNIS VRC gateway](#) and the talkgroups.
5. Setting up the [security settings](#).

## How to Configure Capacity Max

To add a new Capacity Max system, right-click **Capacity Max Networks** in the **Networks** tab of SmartPTT Radioserver Configurator and click **Add**.

At that, **Capacity Max System** configuration menu appears on the right.



The screenshot displays the SmartPTT Radioserver Configurator interface. On the left, a tree view shows the network structure, with 'Capacity Max 1' selected under 'Capacity Max Networks'. On the right, the 'Capacity Max System' configuration panel is visible, containing the following settings:

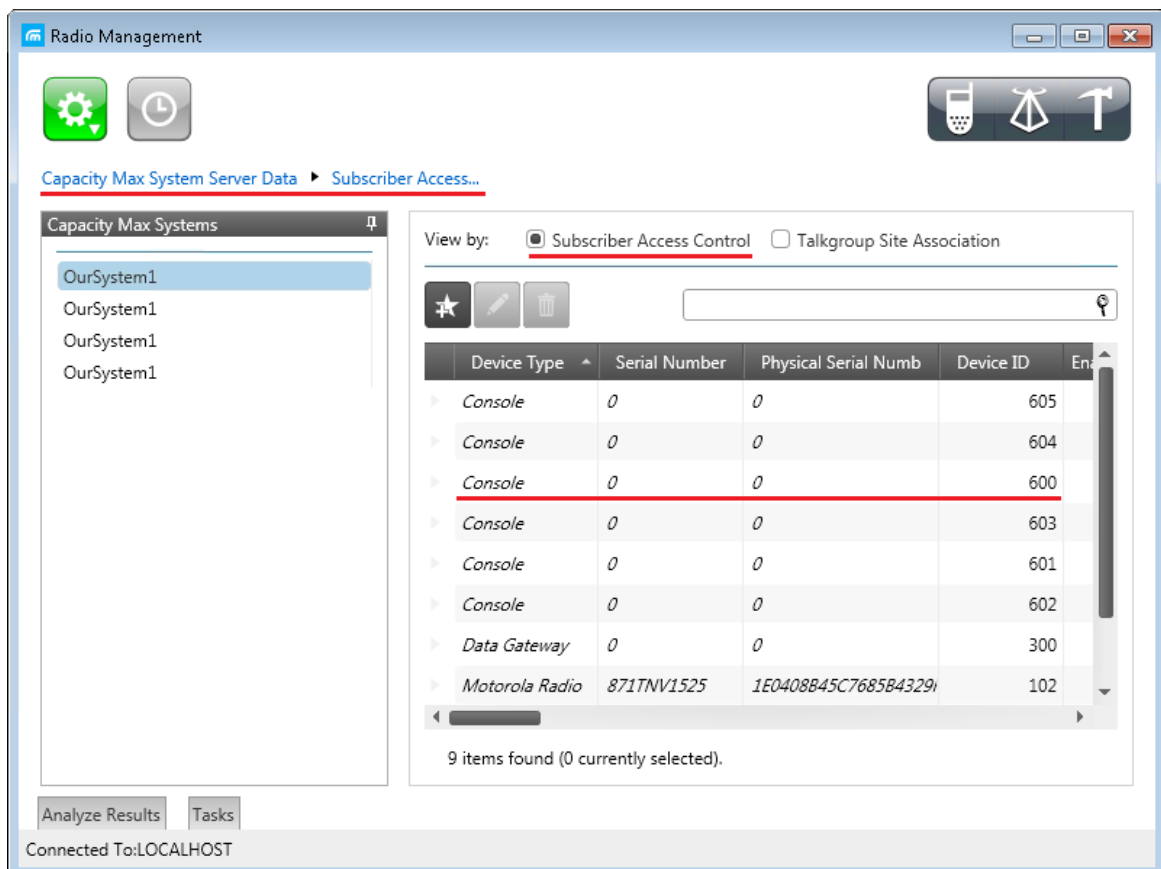
- Active
- Name: Capacity Max 1
- Network ID: 1
- Radio ID: 1
- Interface: Any
- Presence information
- Data transmission
- Voice transmission
- Allow transmit interrupt
- Prioritize calls during emergency
- Channel Grant Waiting timer (s): 15
- TX time-out timer (s): 60
- GPS transmission mode: Data

**Name:** Name of the created system.

**Network ID:** Unique ID of the network. The network ID must not match any ID of other SmartPTT Radioserver networks.



**Radio ID:** The identifier of the radioserver. This is the identifier radio subscribers will see at receiving private calls and text messages from the dispatcher. If there are several dispatchers, you can create a profile for each operator (Profiles) and define a unique identifier for each operator. **Radio ID** set in this window must correspond to the value set in the **Device ID** field for the preconfigured radioserver device in the Radio Management application (see the **Capacity Max Systems** settings, sorted by the **Subscriber Access Control** value).



**Note:** To open the **Capacity Max System** settings in the Radio Management application, click **Actions > Manage > Capacity Max System Server Data** or press the **Ctrl+Shift+G** together.

**Interface:** The IP address of the PC where SmartPTT Radioserver is installed.

**Presence information:** Select this check box to enable connection with [Trunking Controller](#).

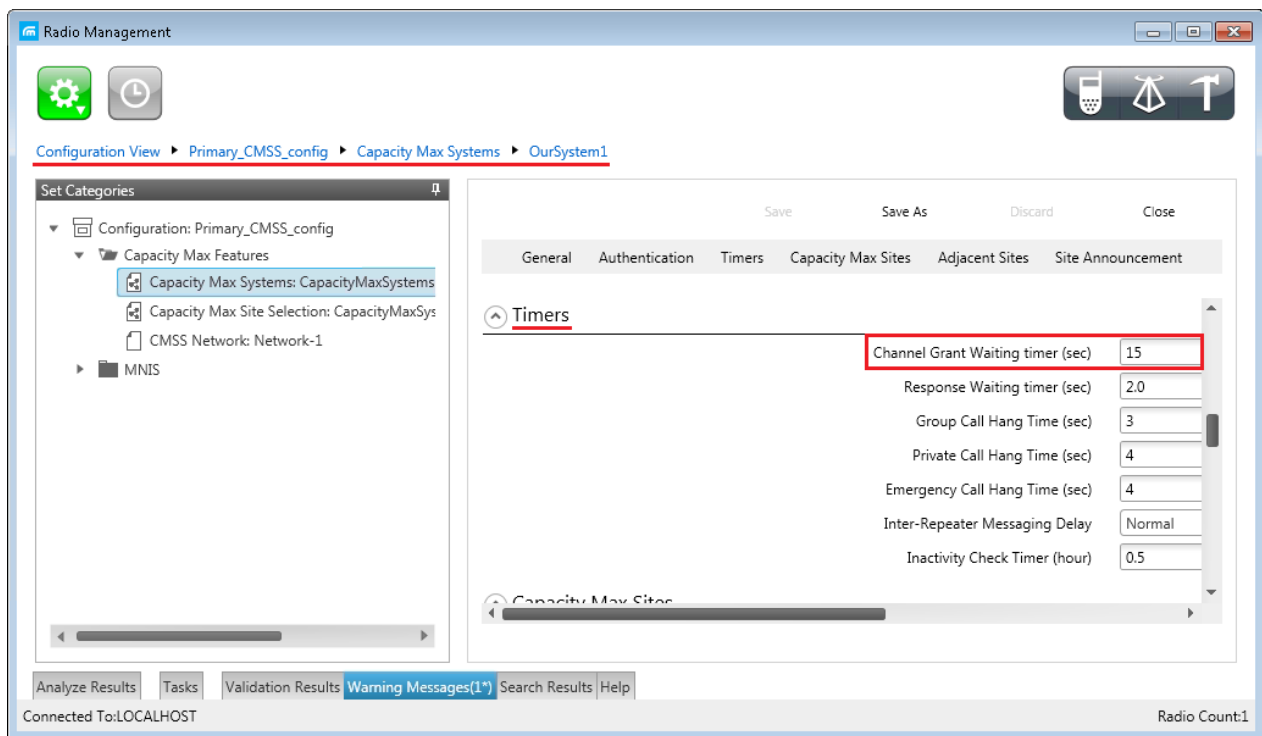
**Data transmission:** Select this check box to work with [MNIS Data Gateway](#).

**Voice transmission:** Select this check box to enable [MNIS VRC Gateway](#).

**Allow transmit interrupt:** Select this check box if you need the ability to interrupt a radio subscriber.

**Prioritize calls during emergency:** Sets a priority of the dispatcher call during the Emergency Call. If the check box is selected, the dispatcher call has the highest priority during the Emergency Call in relation to other calls and interrupts them in case of lack of resources.

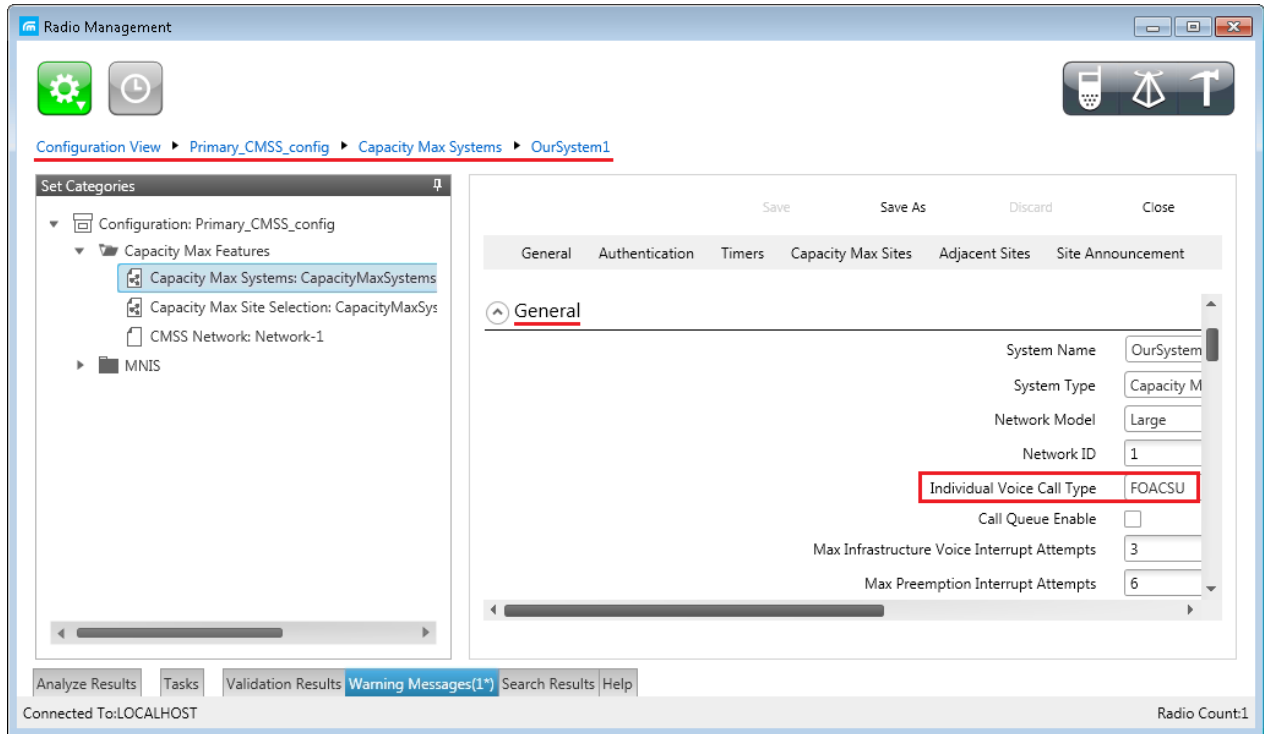
**Channel Grant Waiting timer (s):** Time period in seconds during which the caller expects a response from the called party (the FOACSU strategy). It is recommended to use the default value of 15 seconds that is set in the Radio Management application (see the **Capacity Max Systems:...** settings in the [Capacity Max Features](#) menu of the **Primary\_CMSS\_config** configuration, the **Channel Grant Waiting timer** field in the **Timers** tab).



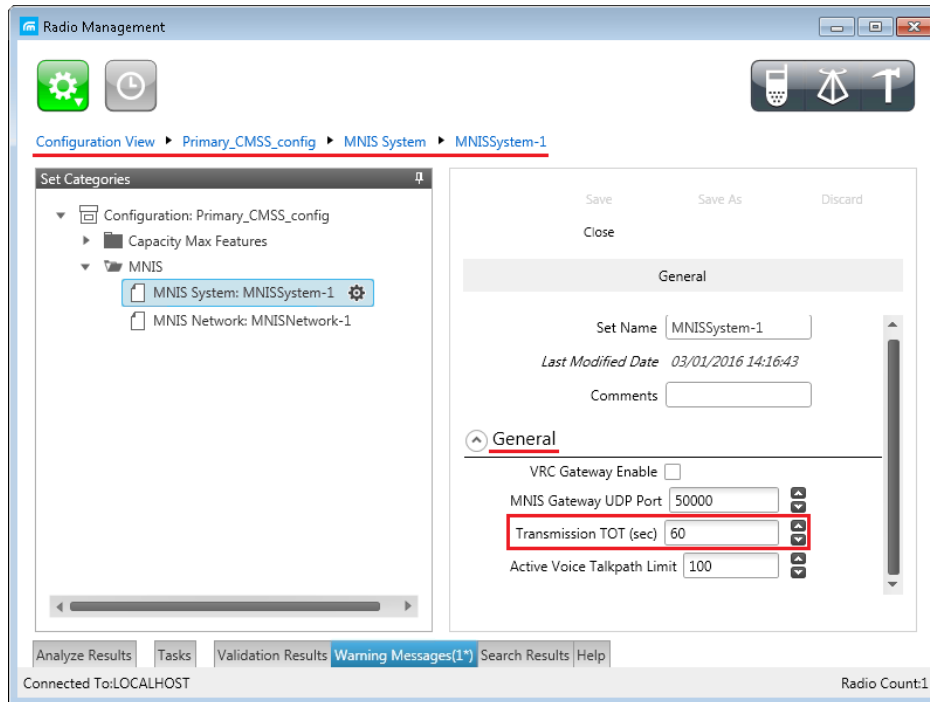
**Note:** To open the **Capacity Max Features** of the **Primary\_CMSS\_config** configuration in the Radio Management application, click **Actions > Manage > Configurations** or press **Alt+C** together. In the table that opened, select the **Primary\_CMSS\_config** item and click **Edit**. In the **Set Categories** tab that opened, click **Configuration: Primary\_CMSS\_config > Capacity Max Features**.

FOACSU (Full Off Air Call Set Up) stands for the strategy of assigning the traffic channel only when the called party user has specifically answered the call. During the timeout the traffic channel is not allocated for the call.

For correct work of the FOACSU private calls, make sure that it is configured in the Radio Management application (see the **Capacity Max Systems:...** settings in the [Capacity Max Features](#) menu of the **Primary\_CMSS\_config** configuration, the **Individual Voice Call Type** field in the **General** tab).



**TX time-out timer (s):** Time period during which the radio can transmit without interruptions. After this time is over, the transmission is interrupted. It is recommended to use the default value of 60 seconds, which is set in the Radio Management application (see the **MNIS System** settings in the **MNIS** menu of the **Primary\_CMSS\_config** configuration, the **Transmission TOT** field in the **General** tab).



**Note:** To open the **MNIS** menu of the **Primary\_CMSS\_config** configuration in the Radio Management application, click **Actions > Manage > Configurations** or press **Alt+C** together. In the table that opened, select the **Primary\_CMSS\_config** item and click **Edit**. In the **Set Categories** tab that opened, click **Configuration: Primary\_CMSS\_config > MNIS**.

**GPS Transmission Mode:** Allows you to select the way how to transmit location updates: as data packet in multiple bursts or as a single CSBK (Control Signaling Block).

Each solution has its own advantages and disadvantages:

GPS Transmission Mode	Advantages	Disadvantages
Data	<ul style="list-style-type: none"> <li>No need to configure additional settings for receiving GPS data</li> </ul>	<ul style="list-style-type: none"> <li>Increased traffic load on a channel</li> </ul>
CSBK	<ul style="list-style-type: none"> <li>Low traffic load on a channel</li> </ul>	<ul style="list-style-type: none"> <li>Not all radios support CSBK commands</li> </ul>

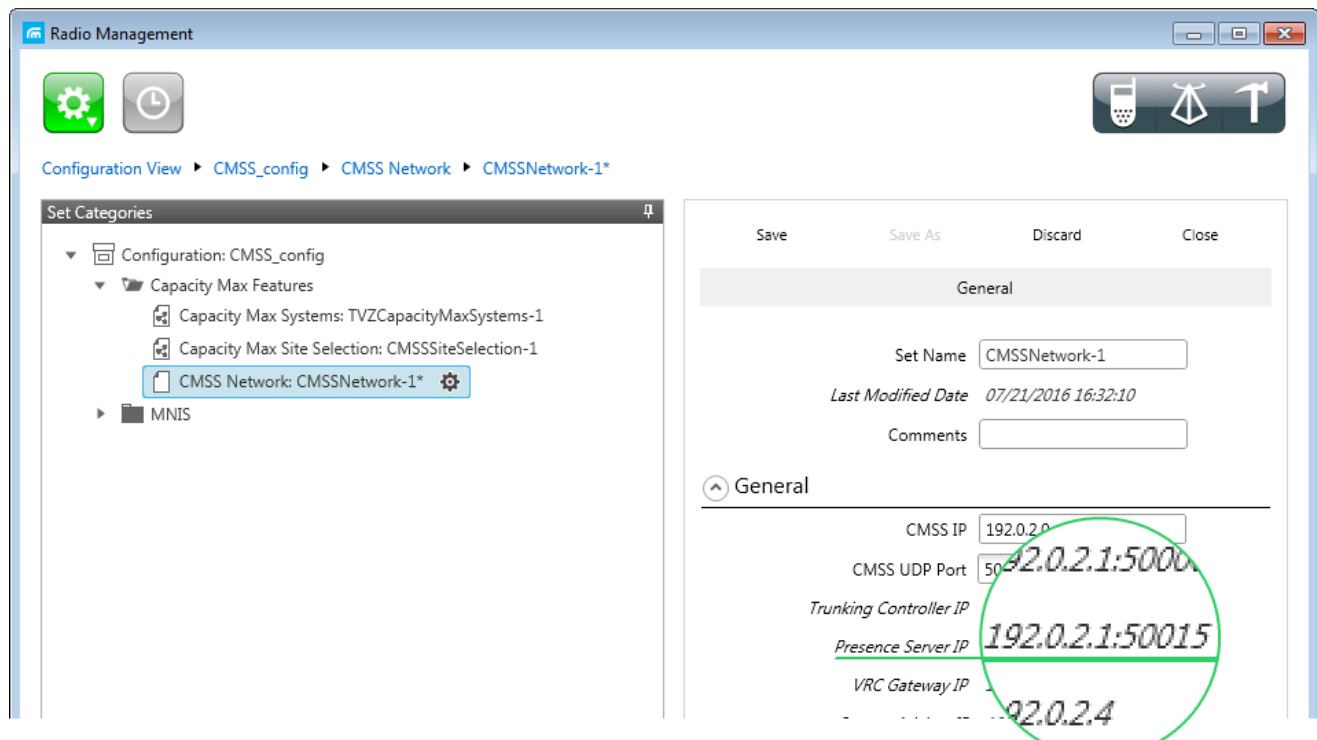
	<ul style="list-style-type: none"> <li>Increased GPS transmission frequency rate—once in 15 seconds</li> </ul>	
Enhanced CSBK	<ul style="list-style-type: none"> <li>Low traffic load on a channel</li> <li>Increased GPS transmission frequency rate—once in 7.5 seconds</li> </ul>	<ul style="list-style-type: none"> <li>Not all radios support CSBK commands</li> </ul>

## Trunking Controller

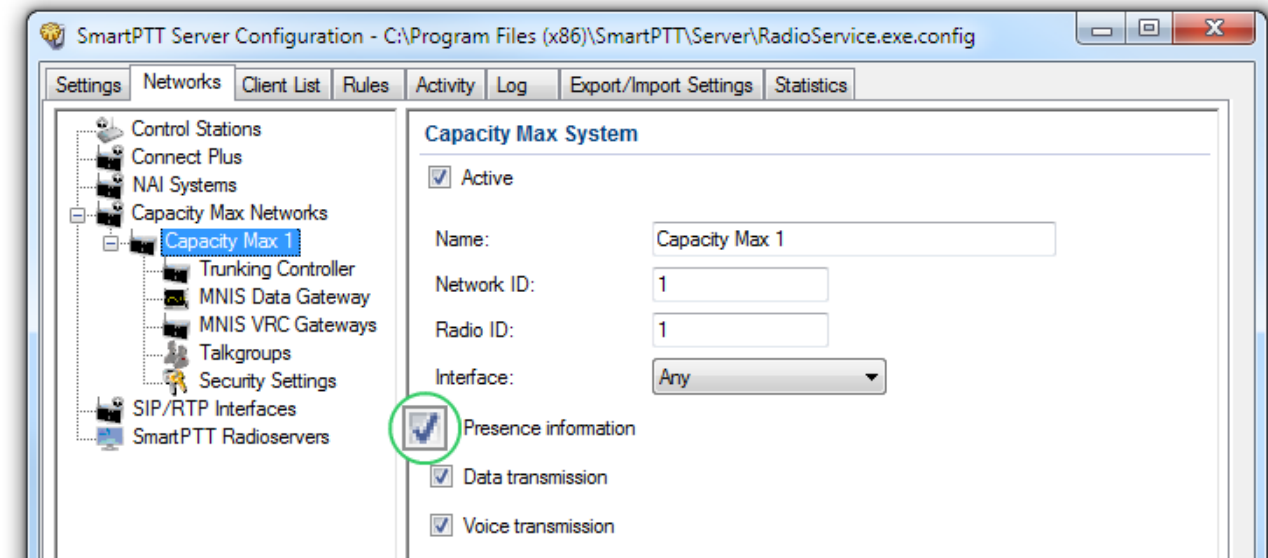
Trunking controller of the Capacity Max network provides the actual information about the network status (registered subscribers).

To configure primary trunking controller:

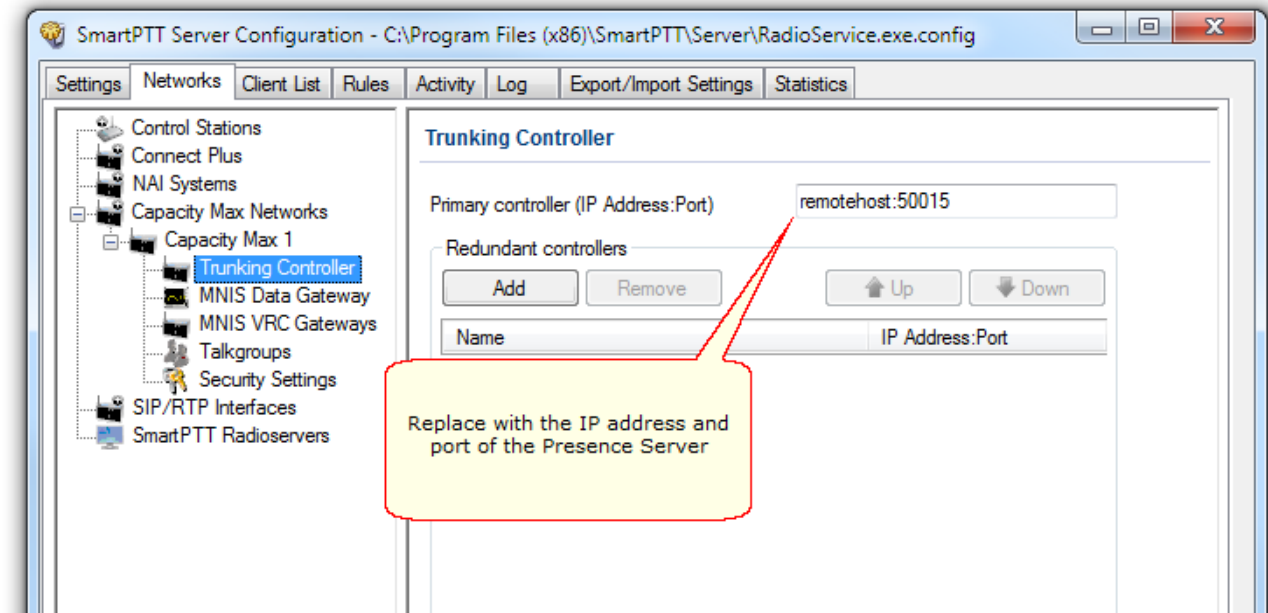
1. Make sure that trunking controller is configured via the Radio Management program, in particular, you can obtain IP address and port from the **Presence Server IP** field. For their configuration, please refer to the Motorola Radio Management User Guide.



2. [Add a new Capacity Max network](#) or select the existing one.
3. In your Capacity Max network select **Presence information** to make trunking controller settings available.



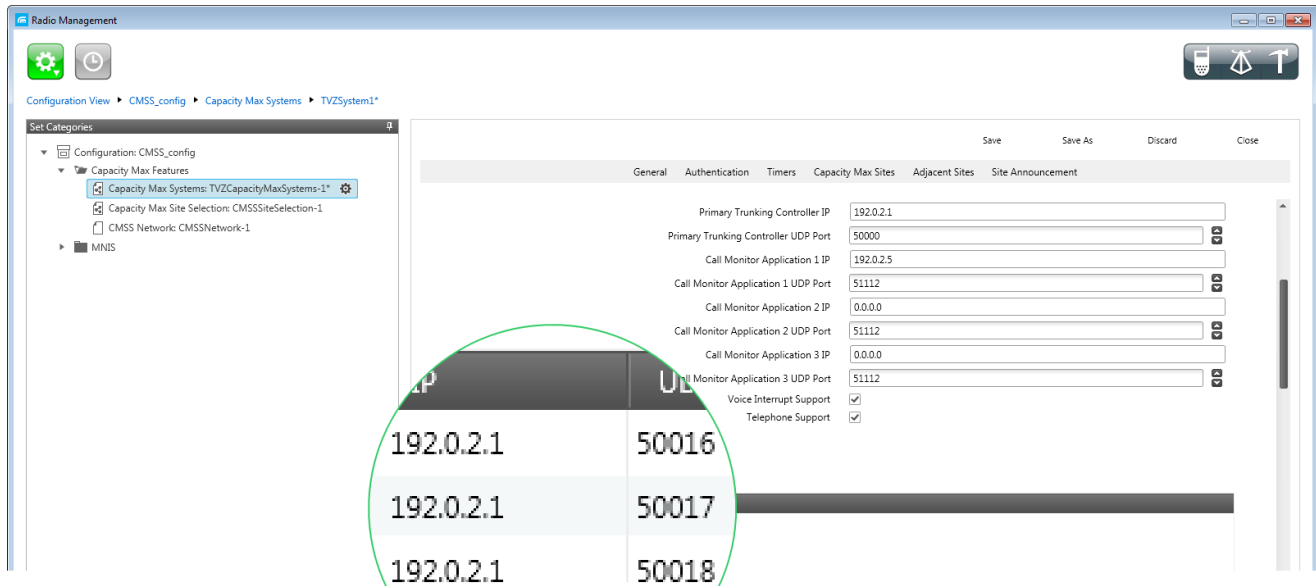
4. Select the **Trunking Controller** menu and replace the default text "remotehost:50015" in the **Primary controller (IP address:Port)** field with IP address and port of the Presence Server from Radio Management.



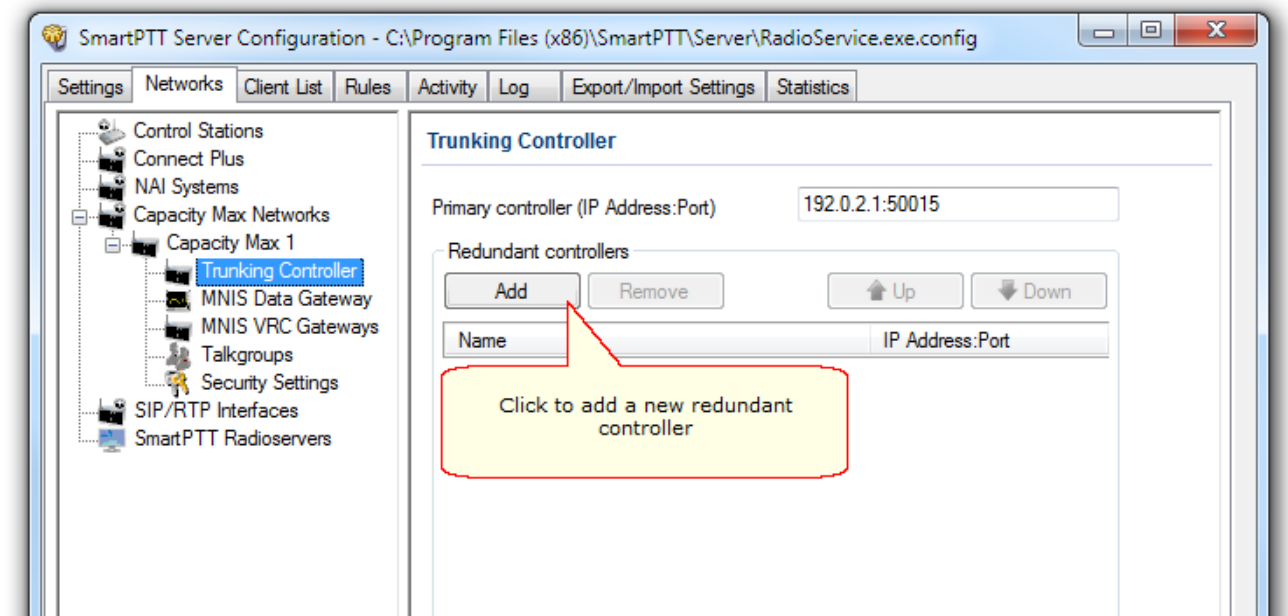
Capacity Max supports up to four redundant trunking controllers to keep the subscribers online when the primary controller goes offline. The order of redundancy is defined by the settings in Radio Management.

To configure additional trunking controllers:

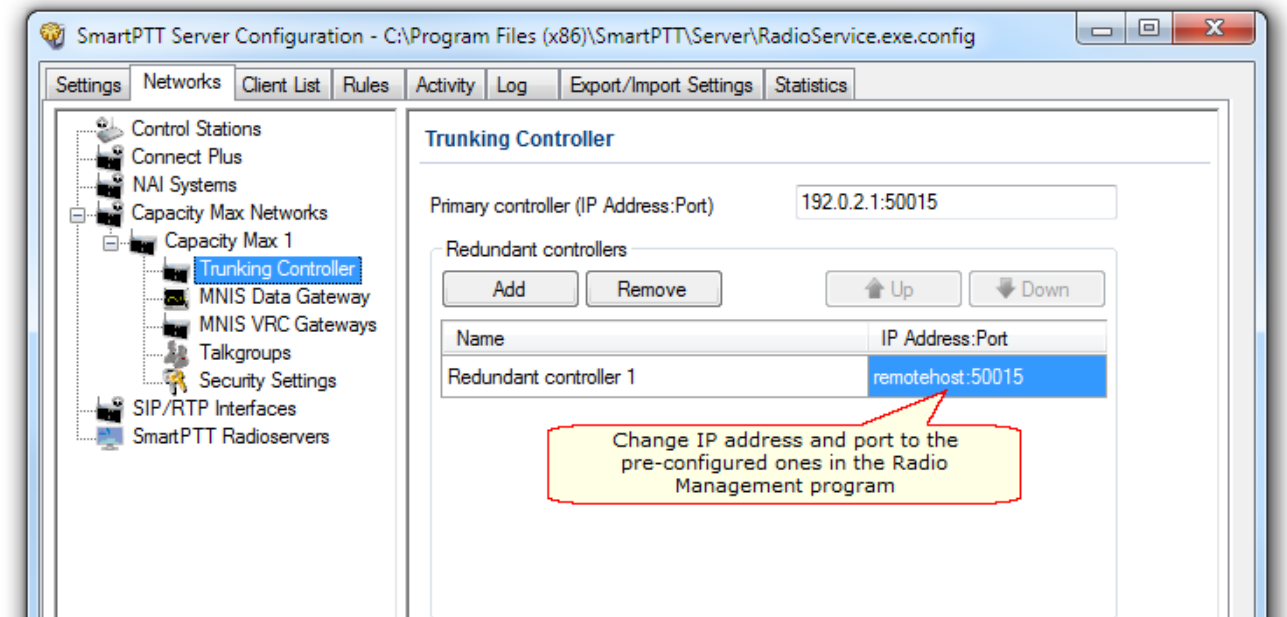
1. Make sure that redundant trunking controllers are configured in Radio Management.



- In your Capacity Max network select **Trunking controller**.
- Click **Add** in the **Redundant controllers** area. A new controller will appear in the table.



- Change the redundant controller IP address and port according to the settings in Radio Management. Rename the controller if needed. You should name controllers differently.



5. Add more redundant controllers if needed. Change their IP addresses and ports according to the settings in Radio Management.

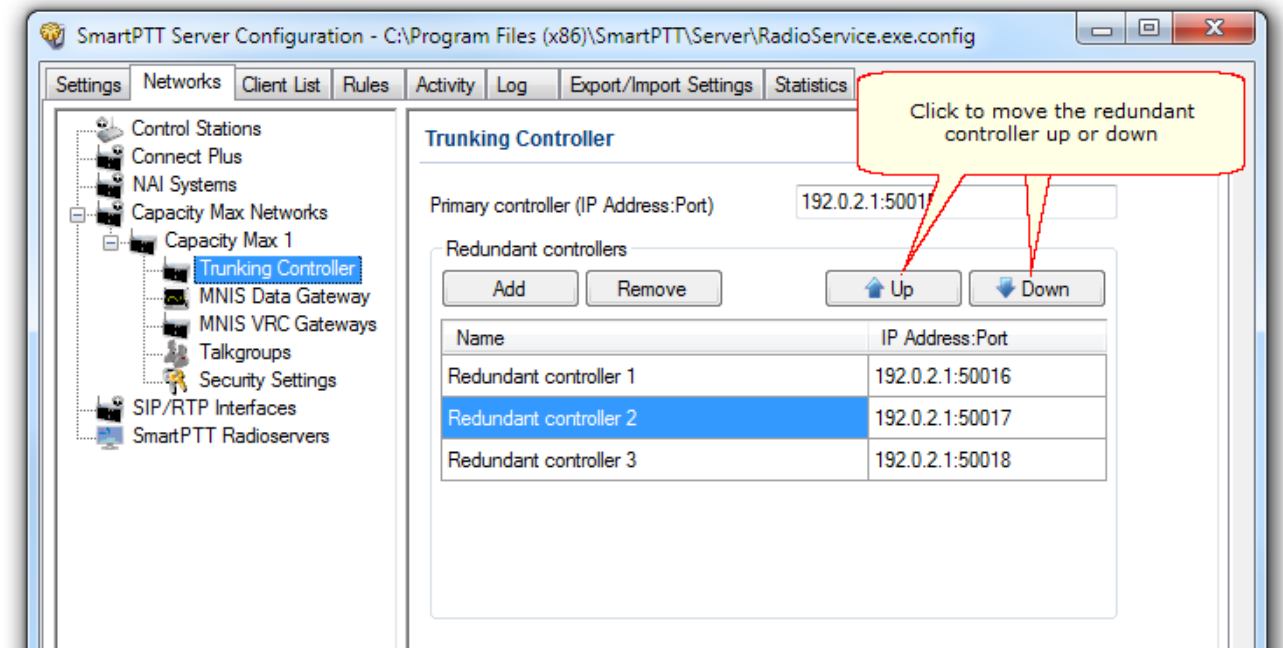
**Note:** If ports of some controllers will be the same you will see an exclamation marks near them (⚠). You cannot switch to another menu until you would change the ports.

You can change the order of the redundant controllers in the table. This helps to assign a new active controller in case when others disconnect from each other.

To change the order of the controllers in the table:

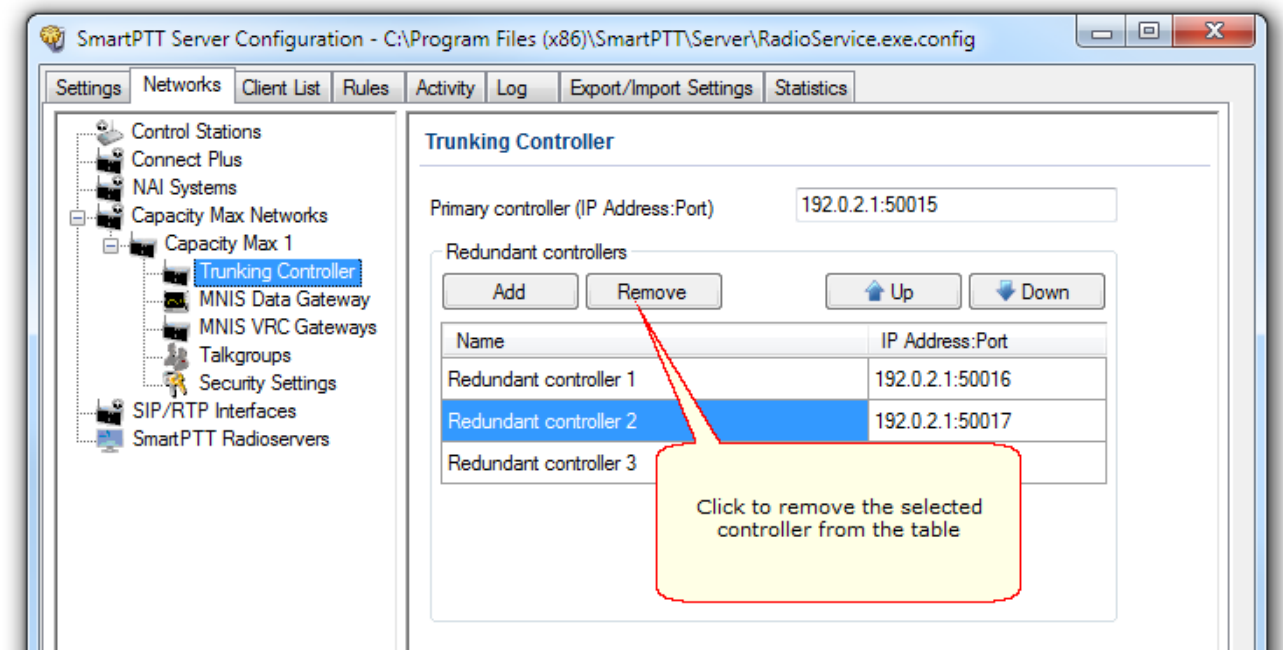
1. Select the redundant controller.
2. Click **Up** or **Down** to move the redundant controller up and down.





To delete a redundant trunking controller from the table:

1. In your Capacity Max Network select **Trunking Controller**.
2. Select the redundant controller.
3. Click **Remove** in the **Redundant controllers** area.



## MNIS Data Gateway

To set up data transfer over Capacity Max network, set up MNIS Data Gateway settings in SmartPTT Radioserver Configurator and in the MOTOTRBO Network Interface Service Configuration Utility.

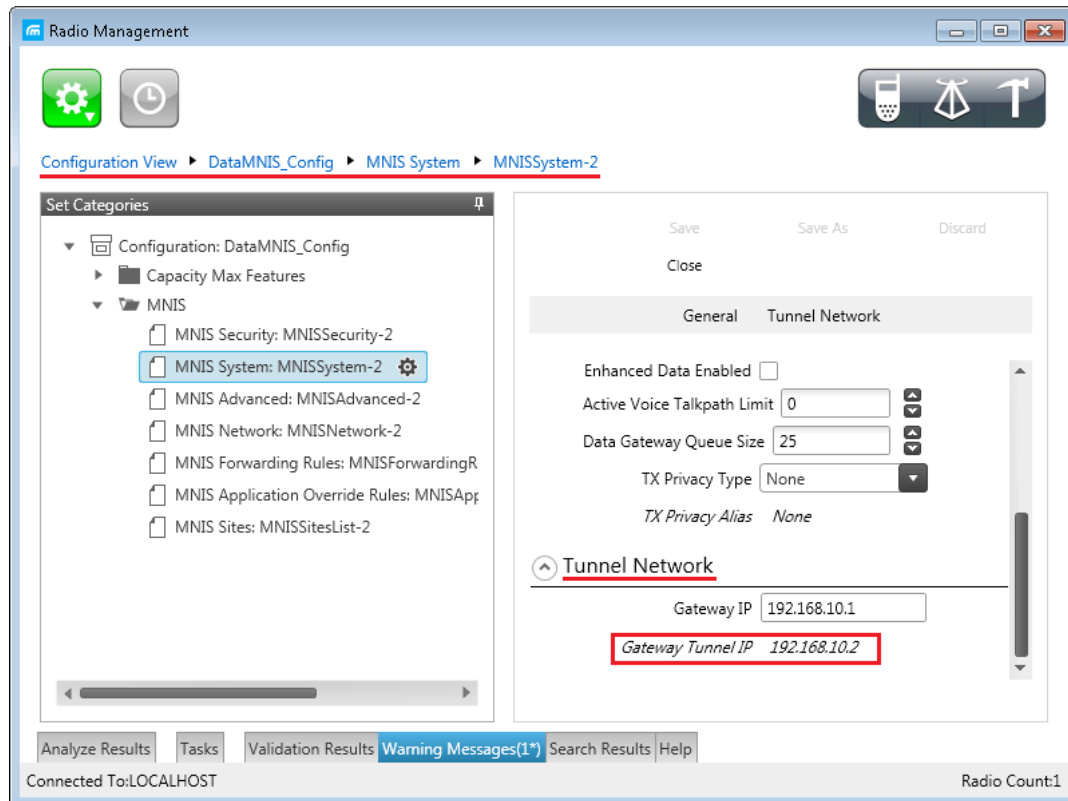
To set up MNIS Data Gateway settings in SmartPTT Radioserver, click **Capacity Max Networks > Capacity Max > MNIS Data Gateway**.

MNIS Data Gateway	
Socket Type	Local Socket
Interface	192.168.37.85
MNIS Control Interface	loopback:55000
MNIS ID	1
Location Port	4001
TMS Port	4007
Telemetry Port	4008
<input checked="" type="checkbox"/> Redundant MNIS data gateway	
Socket Type	Remote Socket
MNIS Control Interface (IP Address:Port)	remotehost:55000
MNIS Relay Address (IP Address:Port)	remotehost:8890
Location Port	4011
TMS Port	4017
Telemetry Port	4018

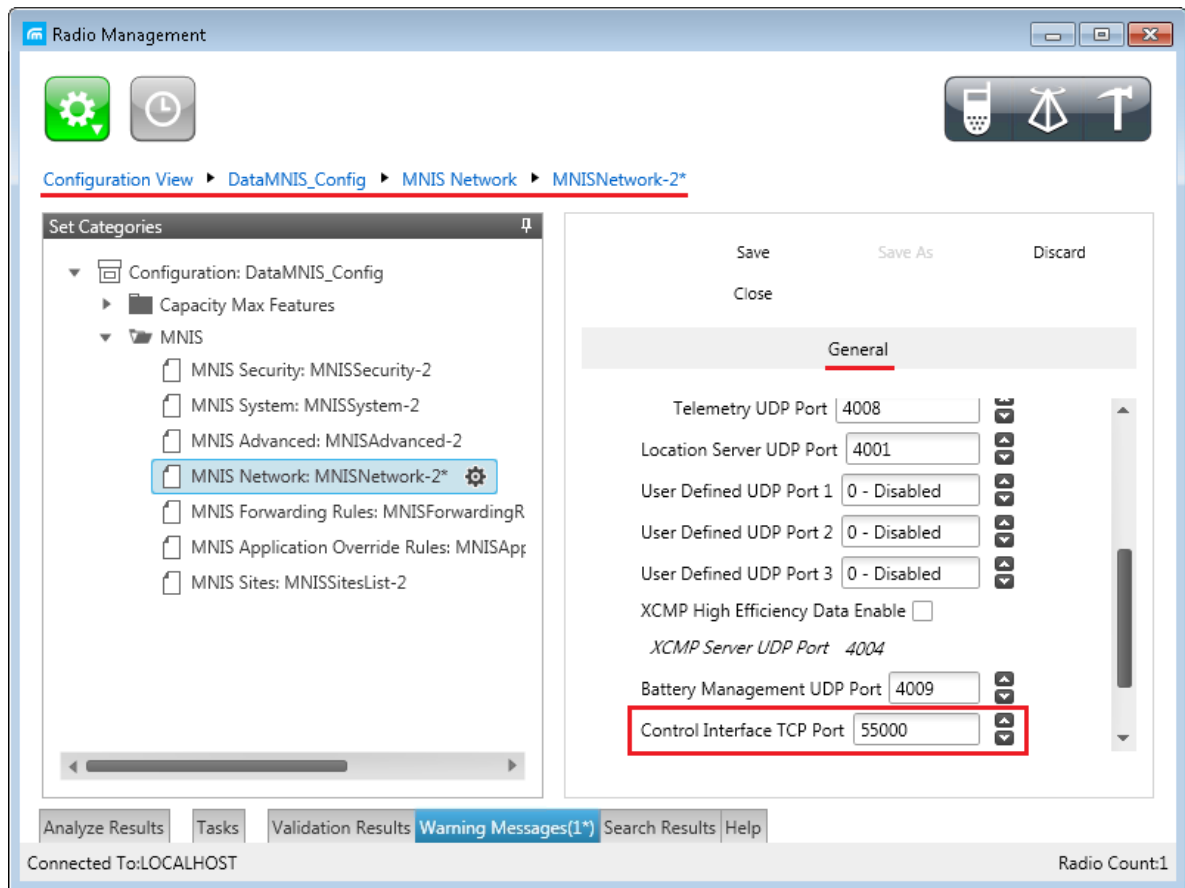
**Note:** The **Data transmission** check box in the **Capacity Max** window should be selected. Otherwise, the **MNIS Data Gateway** parameter will not be shown.

**Socket Type:** Defines the software interface type to enable communication between processes. Select the *Local Socket* value if the MOTOTRBO Network Interface Service Configuration Utility is installed on the same PC as SmartPTT Radioserver. Select *Remote Socket* if MOTOTRBO Network Interface Service Configuration Utility and SmartPTT Radioserver are installed on a different PCs. In this case, information exchange between the processes is supported by the MNIS Data Gateway Relay program.

**Interface:** MOTOTRBO Network Interface Service interface. It should match the interface specified in the “Radio Management” program (see the **MNIS System** settings in the **MNIS** menu of the **DataMNIS\_Config** configuration, the **Gateway Tunnel IP** field in the **Tunnel Network** tab).

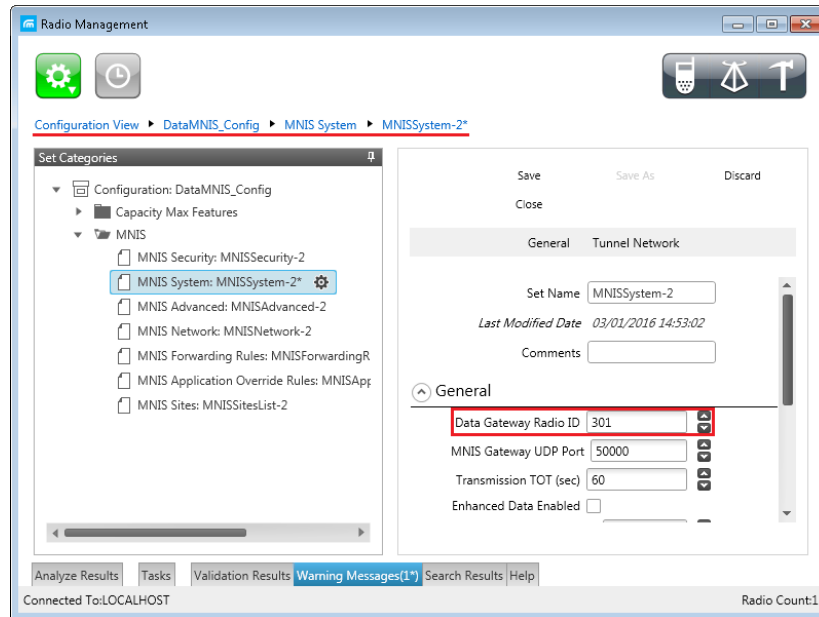


**MNIS Control Interface:** Use *localhost*, if MOTOTRBO Network Interface Service Configuration Utility is installed on the same PC as the radioserver. If MOTOTRBO Network Interface Service Configuration Utility and the radioserver are installed on different PCs, enter the IP address of the PC where MOTOTRBO Network Interface Service Configuration Utility is installed. The port should match the port number specified in the Radio Management application (see the **MNIS Network** settings in the **MNIS** menu of the **DataMNIS\_Config** configuration, the **Control Interface TCP Port** field in the **General** tab).



**Note:** To open the **MNIS** menu of the **DataMNIS\_Config** configuration in the Radio Management application, click **Actions > Manage > Configurations** or press **Alt+C** together. In the table that opened, select the **DataMNIS\_Config** item and click **Edit**. In the **Set Categories** tab that opened, click **Configuration: DataMNIS\_Config > MNIS**.

**MNIS ID:** The Common Air Interface (CAI) ID of the MNIS in the radio network. The ID is used by other calling radios when addressing MOTOTRBO Network Interface Service. Make sure **MNIS ID** matches the corresponding field in the Radio Management application (see the **MNIS System** settings in the [MNIS](#) menu of the **DataMNIS\_Config** configuration, the **Data Gateway Radio ID** field in the **General** tab).

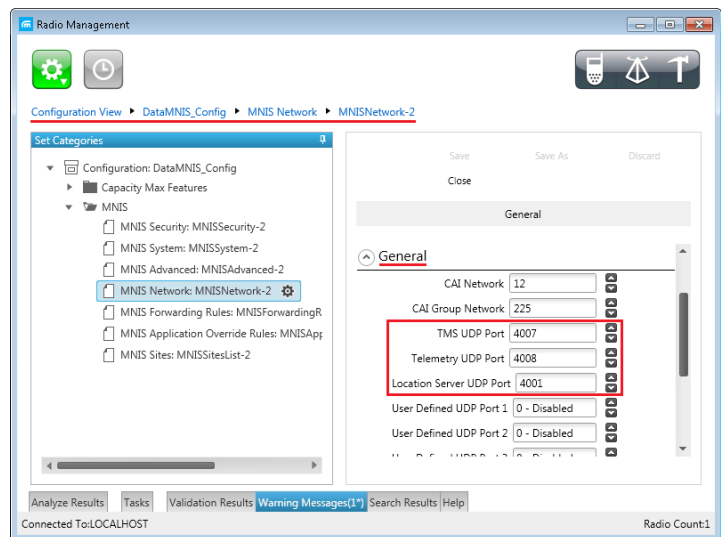


**Location Port:** The port where the radioserver will expect GPS data.

**TMS Port:** The port where the radioserver will expect text messages.

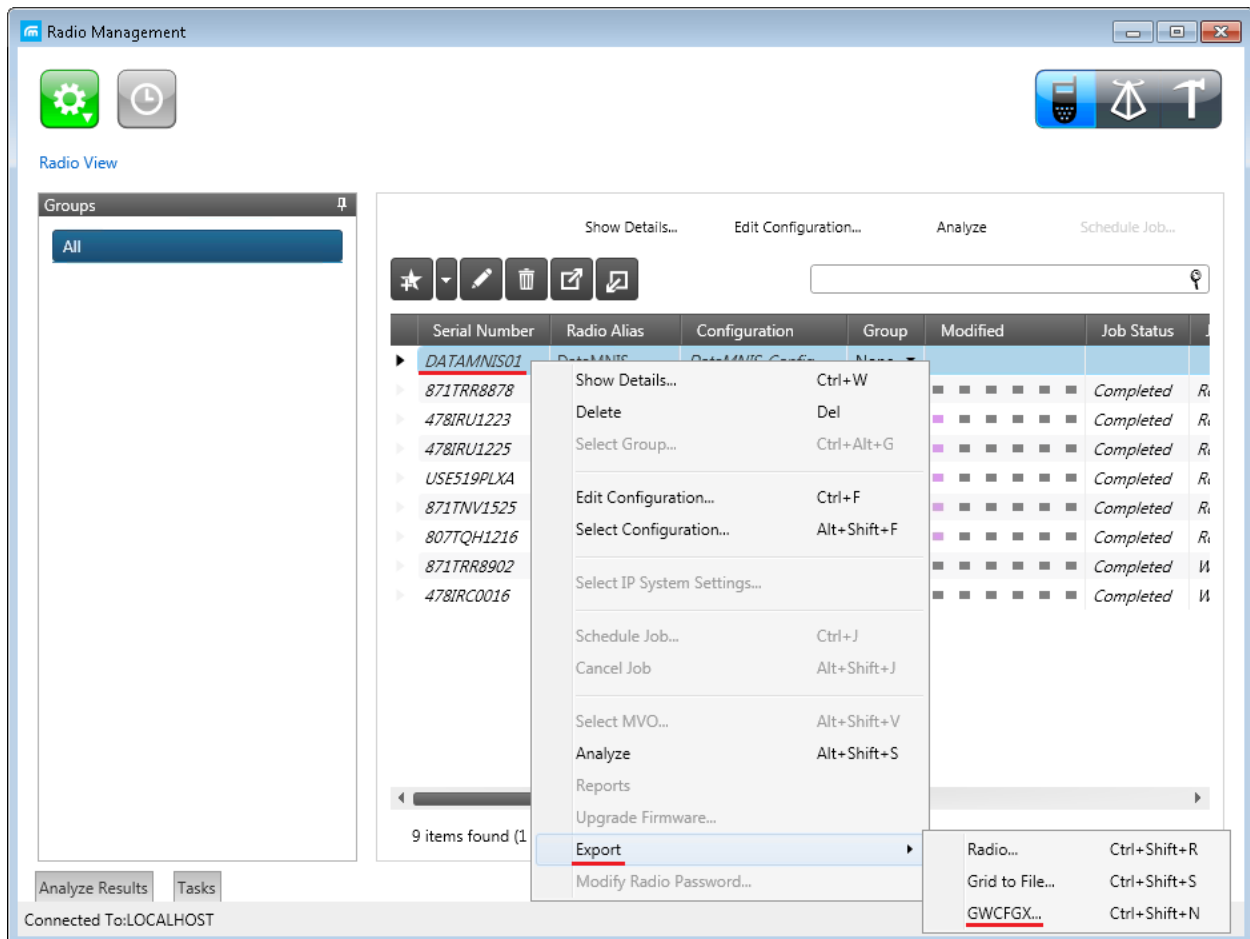
**Telemetry Port:** The port where the radioserver will expect telemetry data.

The ports should match the ports set in the corresponding fields in the Radio Management application (see the **MNIS Network** settings in the [MNIS](#) menu of the **DataMNIS\_Config** configuration, the **Location Server UDP Port** field, the **TMS UDP Port** field, the **Telemetry UDP Port** field in the **General** tab).

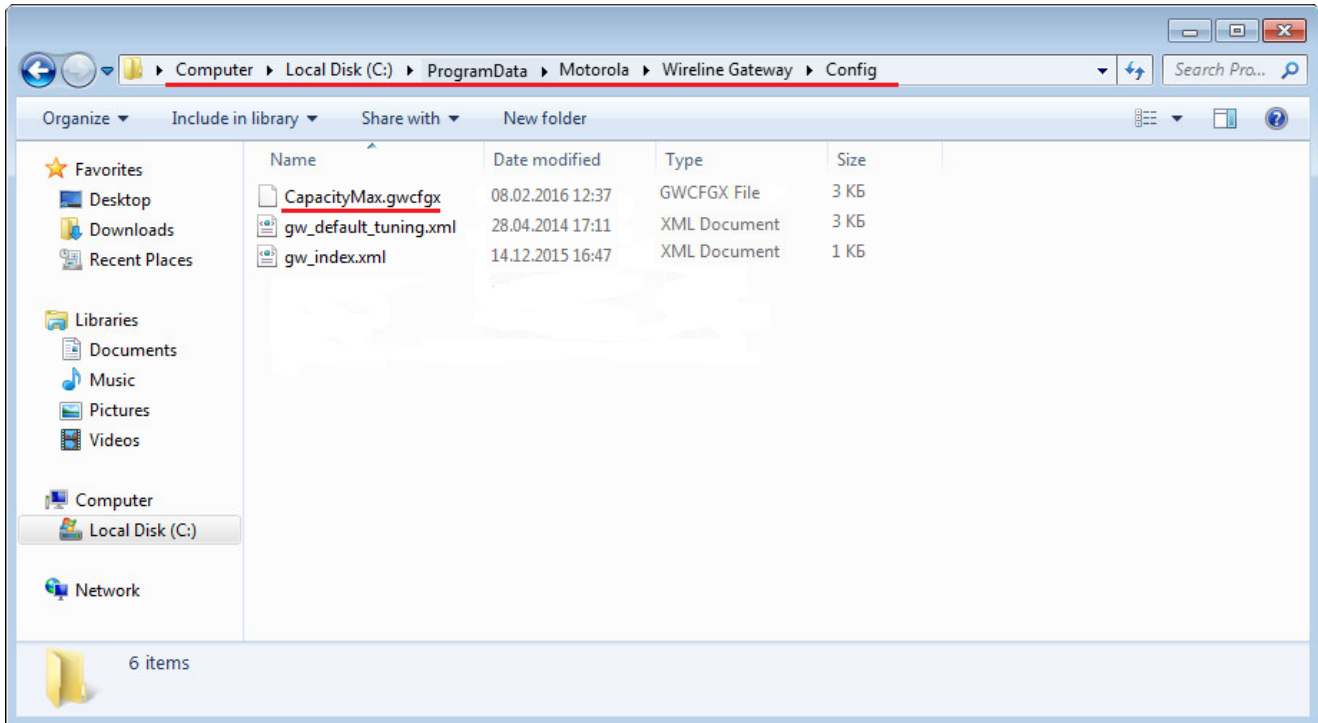


To set up MNIS Data Gateway settings in MOTOTRBO Network Interface Service Configuration Utility, do the following:

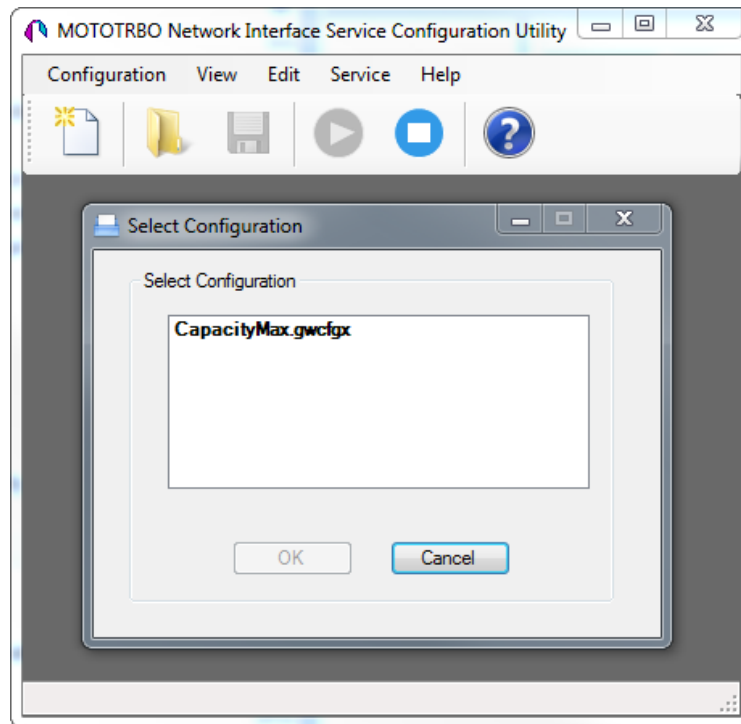
1. Save MNIS Data Gateway settings from the Radio Management application as GWCFGX file. For that, click **Radios**, right click the **DATA MNIS...** item in the table that opened and click **Export > GWCFGX...** or press **Ctrl+Shift+N** together. In the **Export GWCFGX** window that opened, specify the file name and click **OK**.



2. Transfer the saved GWCFGX file to your PC where the MOTOTRBO Network Interface Service Configuration Utility is installed, to the **Config** folder that is located on the local disk C:/ProgramData/Motorola/Wireline Gateway.

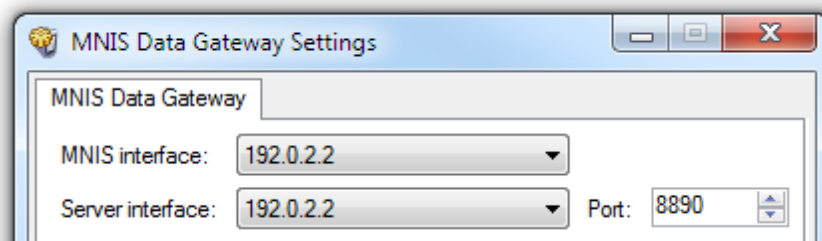


3. Launch MOTOTRBO Network Interface Service Configuration Utility and click **Configuration > Select Active Configuration**. In the **Select Configuration** window that opened, select the GWCFGX file saved before and click **OK**.



If MOTOTRBO Network Interface Service and the SmartPTT Radioserver are running on different computers, or you configure several MNIS Data Gateways, perform the following actions:

1. Install and run MNIS Data Gateway Relay on the computer where MOTOTRBO Network Interface Service is running.
2. Run the MNIS Data Gateway Relay Configurator.



3. In the **MNIS interface** field enter the same address as it is in the **Tunnel IP Address** of MOTOTRBO Network Interface Service Configuration Utility.
4. In the **Server interface** field enter the same address as you did in the previous step.
5. In the **Port** type the available port of the computer.



6. Save changes and restart MNIS Data Gateway Relay.
7. In SmartPTT Radioserver Configurator double-click your network and click **MNIS Data Gateway**.
8. In the **Socket Type** field select *Remote Socket*.
9. In the **MNIS Control Interface** field type IP address of the computer where MOTOTRBO Network Interface Service service is running and the port from the **MNIS Control Interface TCP Port** field of MOTOTRBO Network Interface Service Configuration Utility.
10. In the **MNIS Relay Address** field type IP address of the computer where MNIS Data Gateway Relay service is running and the port from the **Port** field of MNIS Data Gateway Relay Configurator.

MNIS Data Gateway	
Socket Type	Remote Socket
MNIS Control Interface	203.0.113.1:55000
MNIS Relay Address	203.0.113.1:8890
MNIS ID	1
Location Port	4001
TMS Port	4007
Telemetry Port	4008

11. Configure other settings as describer previously.
12. Save changes and restart radioserver.

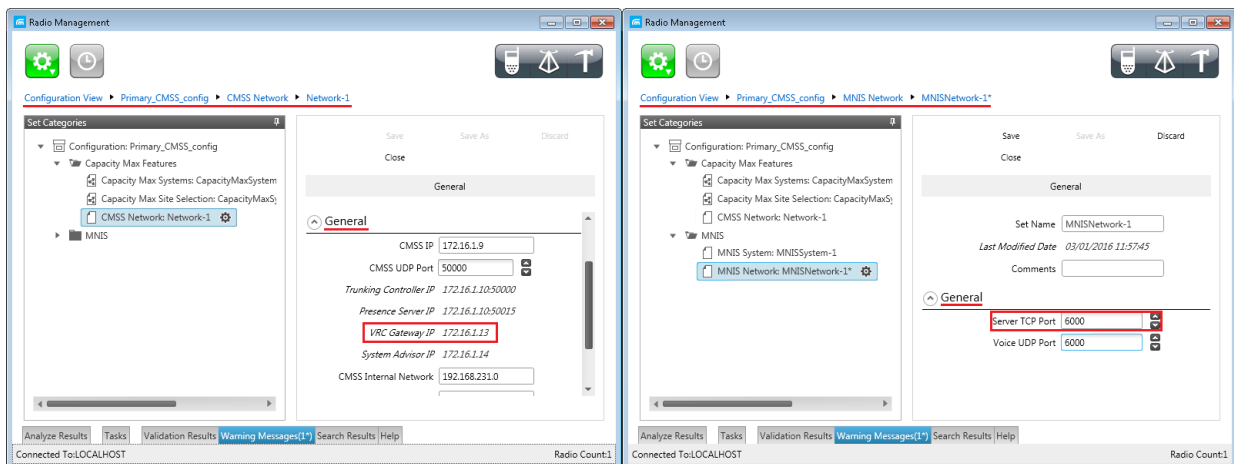
## MNIS VRC Gateway

Every Capacity Max network supports up to 15 MNIS VRC gateways. The first gateway is created always exists in the network, so you can add 14 gateways more.

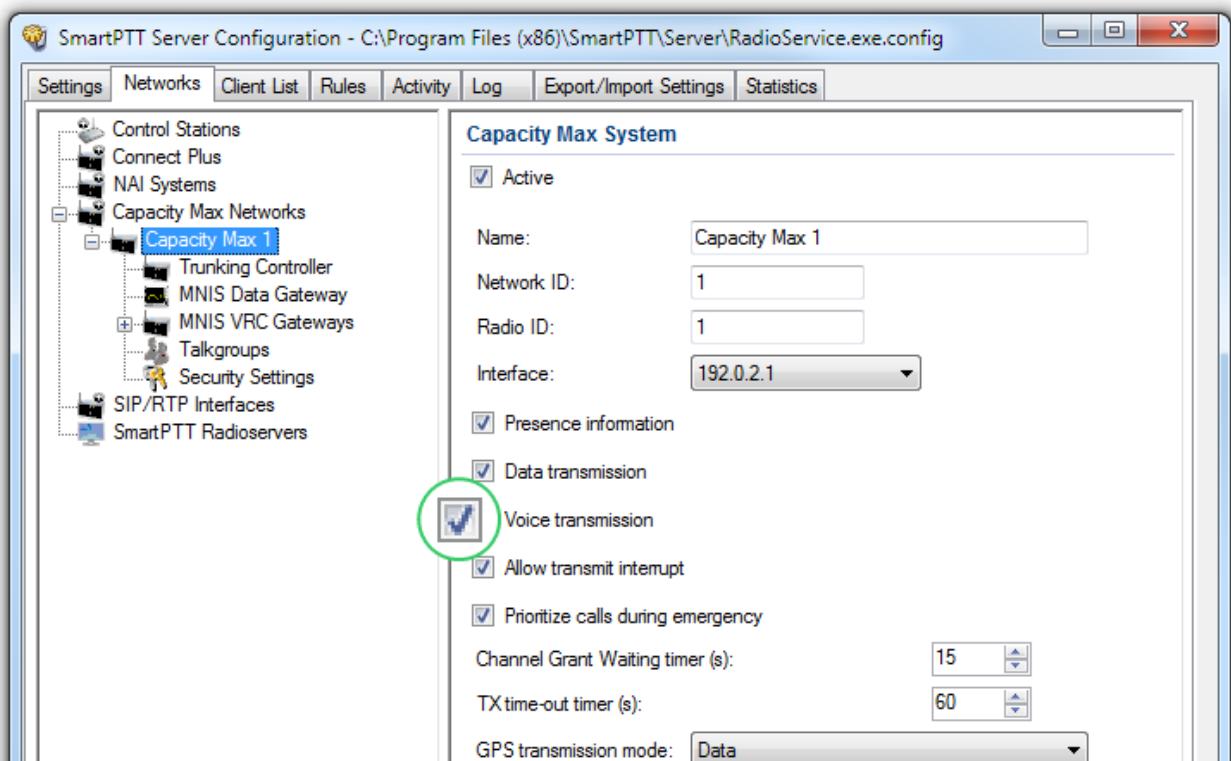
The order of the gateways matters a lot. All newly created profiles and talkgroups for your Capacity Max network will be assigned for the first MNIS VRC Gateway in the list. Therefore, you should be careful when configure several MNIS VRC Gateways.

To configure MNIS VRC gateway:

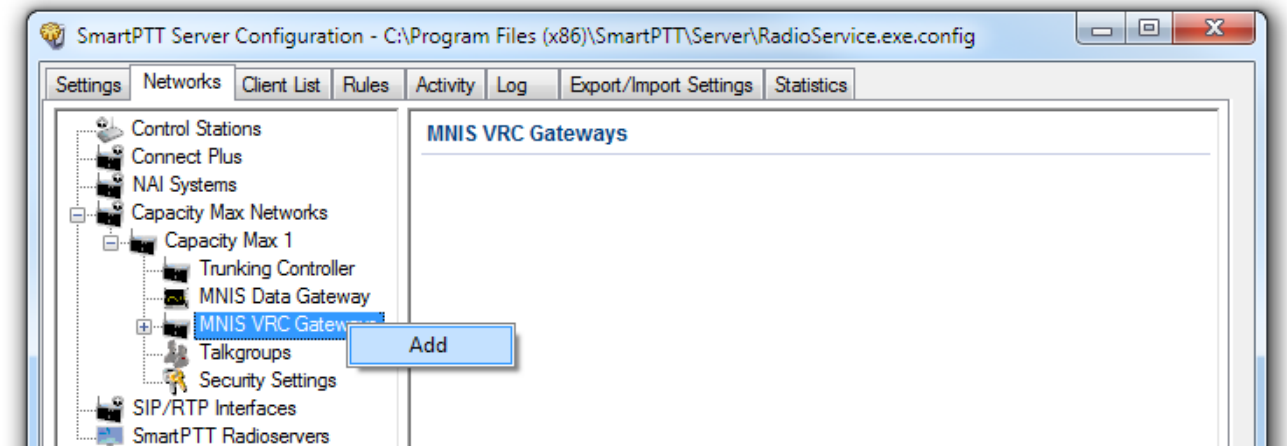
1. Make sure that VRC Gateway is configured in the “Radio Management” program. For more information please refer to Radio Management User Guide.



2. In your Capacity Max network select **Voice Transmission** to show and allow to configure MNIS VRC Gateways.



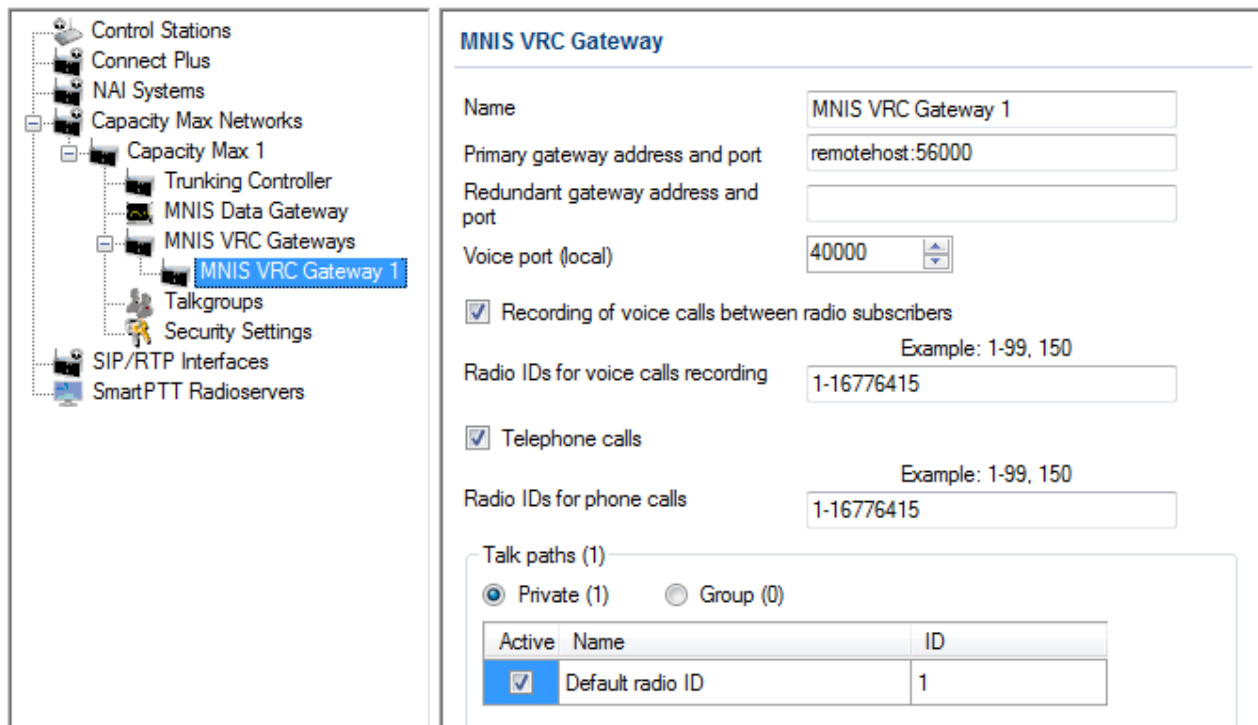
3. To add a new MNIS VRC Gateway right-click **MNIS VRC Gateway** and click **Add**.



4. Select the newly created or existing gateway.

**Note:** By default, all new gateways obtain equal IP addresses and ports. When you select one of those, you will not be able to leave the menu until you make its IP address and port unique within the site.

5. Configure the gateway options.



- **Name:** The name of the gateway in SmartPTT Radioserver Configurator. Rename your gateway if needed.
- **Primary gateway address and port:** IP address from **VRC Gateway IP** and port from **Server TCP port** which were configured in your CMSS Network in Radio Management.

- **Redundant gateway address and port:** IP address of **VRC Gateway IP** and port from **Server TPC port** of the additional CMS server you assign to be redundant. You can leave this field empty if you do not have redundant VRC gateway.
- **Voice port (local):** The port at which SmartPTT Radioserver will expect the voice data.
- **Recording of voice calls between subscribers:** Select this to activate voice recording feature, that allows the dispatcher to hear private calls made from radio subscribers to other radio subscribers, dispatchers or telephone subscribers.
  - **Radio IDs for voice call recording:** Enter radio IDs for which the recording should be active. Follow the example, to specify the IDs.
- **Phone calls:** Select this if you want to allow telephone calls for this gateway.
  - **Radio IDs for phone calls:** Enter radio IDs for which phone calls should be available. Follow the examples, to specify the IDs.
- **Talk paths:** You can reorganize the default gateway for radios and profiles here.
  - **Private:** Select this to view the subscriber profiles which assigned to the current gateway. Profiles can be assigned to the gateway (**Active** is selected), not assigned (**Active** is unselected) and unavailable on it (**Active** is unselected, profile name is discolored). If the profile is unavailable, it means that it is selected on the other gateway. By default all new profiles will be selected on the first gateway in the list and their ID will be the same as that of the first gateway in the list.

- **Group:** Select this to view talkgroups created for the current site. For more information see [Talkgroups](#) in the **Capacity Max** chapter.

Talk paths (5)

Private (2)     Group (3)

Active	Name	ID
<input checked="" type="checkbox"/>	Default radio ID, Profile 1, Profile 4	1
<input checked="" type="checkbox"/>	Profile 2, Profile 5, Profile 9, Profil...	2
<input type="checkbox"/>	Profile 3, Profile 6, Profile 7, Profil...	3

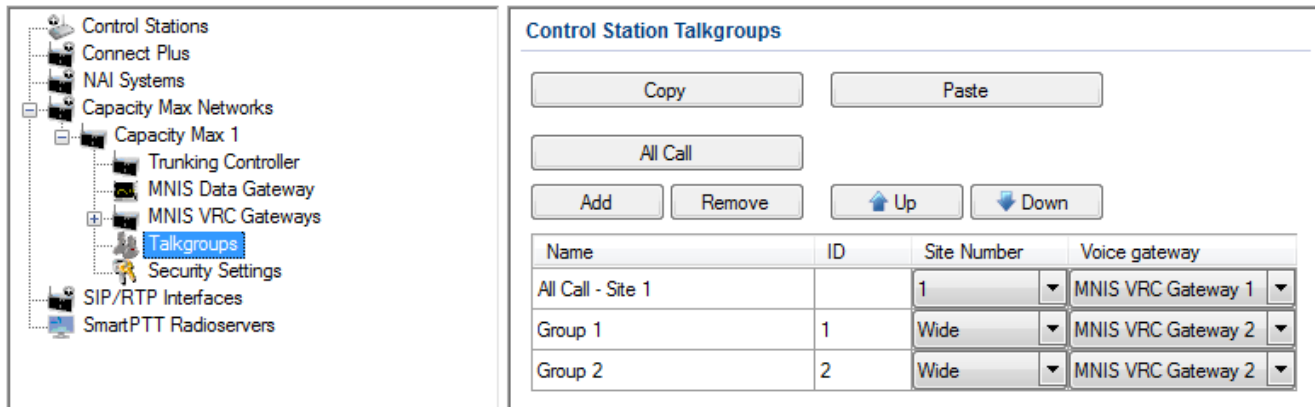
Talk paths (5)

Private (2)     Group (3)

Name	ID
All Call	
Group 2	2
Group 3	3

## Talkgroups

To configure Capacity Max talkgroups, click **Talkgroups**. At that the following window opens.



To add a talkgroup, click **Add**. To add an All Call, click **All Call**. The added talkgroups will also appear in the **Profiles** window. To change the order of groups in the list, use the **Up** and **Down** arrows. The order defined in the window will be used in SmartPTT Dispatcher. To copy added groups to the clipboard, click **Copy**. To paste copied groups from the clipboard, click **Paste**. To delete the selected talkgroup, click **Remove**.

**Name:** Talkgroup alias displayed by the control station.

**ID:** Talkgroup unique identifier used during communications. It should be set in the range of 1–65535 for a talkgroup, and in the ranges of 1–16776415, 16777056–16777183 or should be equal to 16777214 for an All Call.

To edit the talkgroup name or ID, set the cursor on the corresponding field and make changes.

**Site Number:** Site number list allowed for transmitting. In the Capacity Max network the talkgroups can be only wide-area, while All Call can be wide-area or local.

**Note:** In the Capacity Max network you can add only wide-area talkgroups, so only the *Wide* value is available for groups in the **Site Number** field. In order to display wide area talkgroups in SmartPTT Dispatcher, add necessary talkgroups in SmartPTT Radioserver Configurator, define talkgroup identifiers that correspond to the identifiers of the wide-area talkgroups in the Radio Management settings. You can add a wide-area All Call and a local All Call, which is limited to one site. To add a wide-area All Call, which is available to all sites, click **All Call**. Make sure that **Site Number** is set to *Wide*. To add an All Call limited to one site, click **All Call**, and in the **Site Number** field select the site number where the All Call will be heard. Please note, that you do not need any IDs for All Calls.

**Voice gateway:** List of available voice gateways. You can assign a certain voice gateway for each talkgroup.

**Note:** If there are some available voice gateways, all talkgroups will use by default the first voice gateway in the list. If the talkgroup is not registered on any voice gateway, the **Voice gateway** field will be empty. If [Voice transmission](#) is not selected in the Capacity Max network settings, the **Voice gateway** column will be hidden.

You should create talkgroups in accordance with the settings in the Radio Management program (see the **Capacity Max Systems** settings, sorted by the **Talkgroup Site Association** value). For more detailed information, please refer to the Motorola Radio Management User Guide.

The image shows two screenshots from the Capacity Max software. The left screenshot displays the 'Control Station Talkgroups' window, which contains a table of talkgroups and their associated settings.

Name	ID	Site Number	Voice gateway
All Call		Wide	MNIS VRC Gateway 1
All Call - Site 1		1	MNIS VRC Gateway 1
All Call - Site 2		2	MNIS VRC Gateway 1
Group 106	106	Wide	MNIS VRC Gateway 2
Group 107	107	Wide	MNIS VRC Gateway 2
Group 108	108	Wide	MNIS VRC Gateway 2
Group 109	109	Wide	MNIS VRC Gateway 2
Group 110	110	Wide	MNIS VRC Gateway 2
Group 111	111	Wide	MNIS VRC Gateway 3
Group 112	112	Wide	MNIS VRC Gateway 3
Group 113	113	Wide	MNIS VRC Gateway 3
Group 114	114	Wide	MNIS VRC Gateway 3

The right screenshot shows the 'Radio Management' window, specifically the 'Capacity Max System Server Data' > 'Talkgroup Site Association' view. It displays a table of talkgroups and their site associations.

Talkgroup ID	Queue Priority	Allowed Sites
106	6	Site Selection 1
107	6	Site Selection 1
108	6	Site Selection 1
109	6	Site Selection 1
110	6	Site Selection 1
111	6	Site Selection 1
112	6	Site Selection 1
113	6	Site Selection 1
114	6	Site Selection 1

At the bottom of the right window, it indicates '103 items found (0 currently selected)'.

**Note:** To open the **Capacity Max System** settings in the Radio Management program, click **Actions > Manage > Capacity Max System Server Data**.

## Security Settings in Capacity Max

Capacity Max network supports two types of privacy mechanisms – Enhanced and Advanced Encryption Standard (AES). The Enhanced Privacy utilizes Motorola proprietary algorithms and therefore is not interoperable with other vendor's privacy offerings. The Enhanced Privacy provides high level of protection by means of 40-bit key length and supports multiple keys in a radio. The Advanced Encryption Standard (AES) is a specification for the encryption of electronic data established by the U.S. National Institute of Standards and Technology (NIST). The AES feature supports 256-bit key length, unlike Enhanced Privacy. Similar to Enhanced Privacy, the AES also supports multiple keys. For AES encryption a special license is required.

The **Security Settings** window allows you to specify the encryption keys for incoming and outgoing traffic on the digital channel.

The screenshot shows the 'Security Settings' window. On the left is a tree view with the following items: Control Stations, Connect Plus, NAI Systems, Capacity Max Networks, Capacity Max 1, Trunking Controller, MNIS Data Gateway, MNIS VRC Gateways, MNIS VRC Gateway 1, Talkgroups, Security Settings (highlighted), SIP/RTP Interfaces, and SmartPTT Radioservers. The right pane is titled 'Security Settings' and contains three sections:

- Enhanced Privacy:** Includes 'Copy' and 'Paste' buttons at the top. Below are 'Add' and 'Remove' buttons, followed by a table with columns 'Key ID' and 'Key Value'.
- AES:** Includes 'Add' and 'Remove' buttons, followed by a table with columns 'Key ID' and 'Key Value'.
- TX Privacy:** Includes a 'Type' dropdown menu set to 'No' and a 'Key ID' dropdown menu.

**Copy:** Copy encryption settings of the channel to the clipboard.

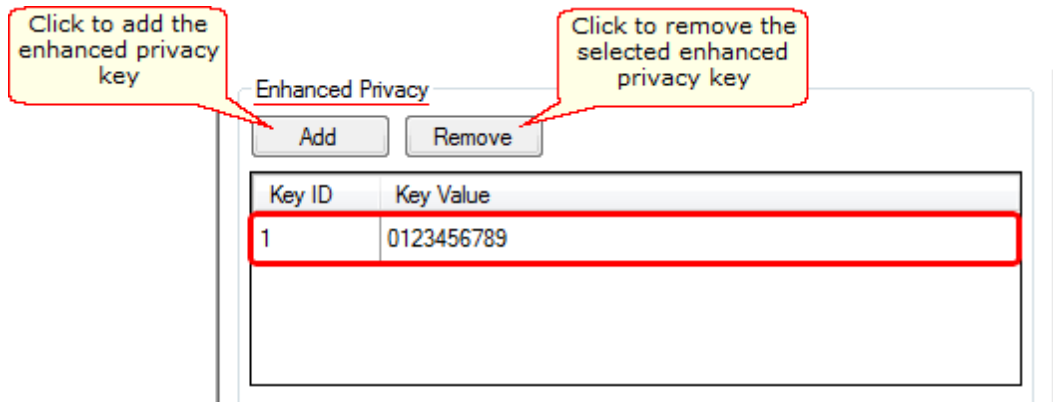
**Paste:** Paste encryption settings of the channel from the clipboard.



## Enhanced Privacy

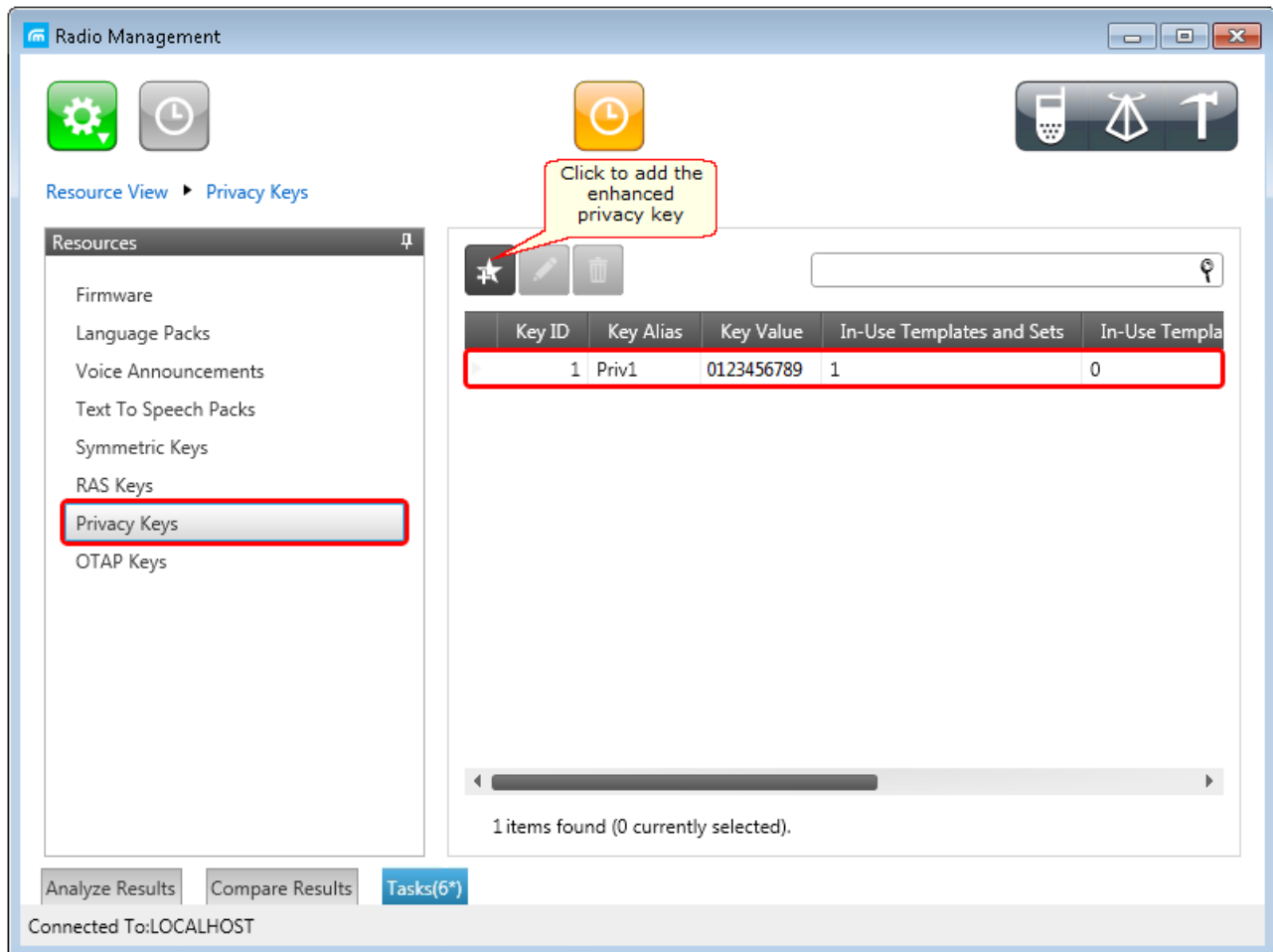
To configure **Enhanced Privacy**, perform the following actions:

1. In the **Security Settings** window of SmartPTT Radioserver Configurator add an enhanced privacy key for incoming traffic. Enter its ID and value in the corresponding fields.

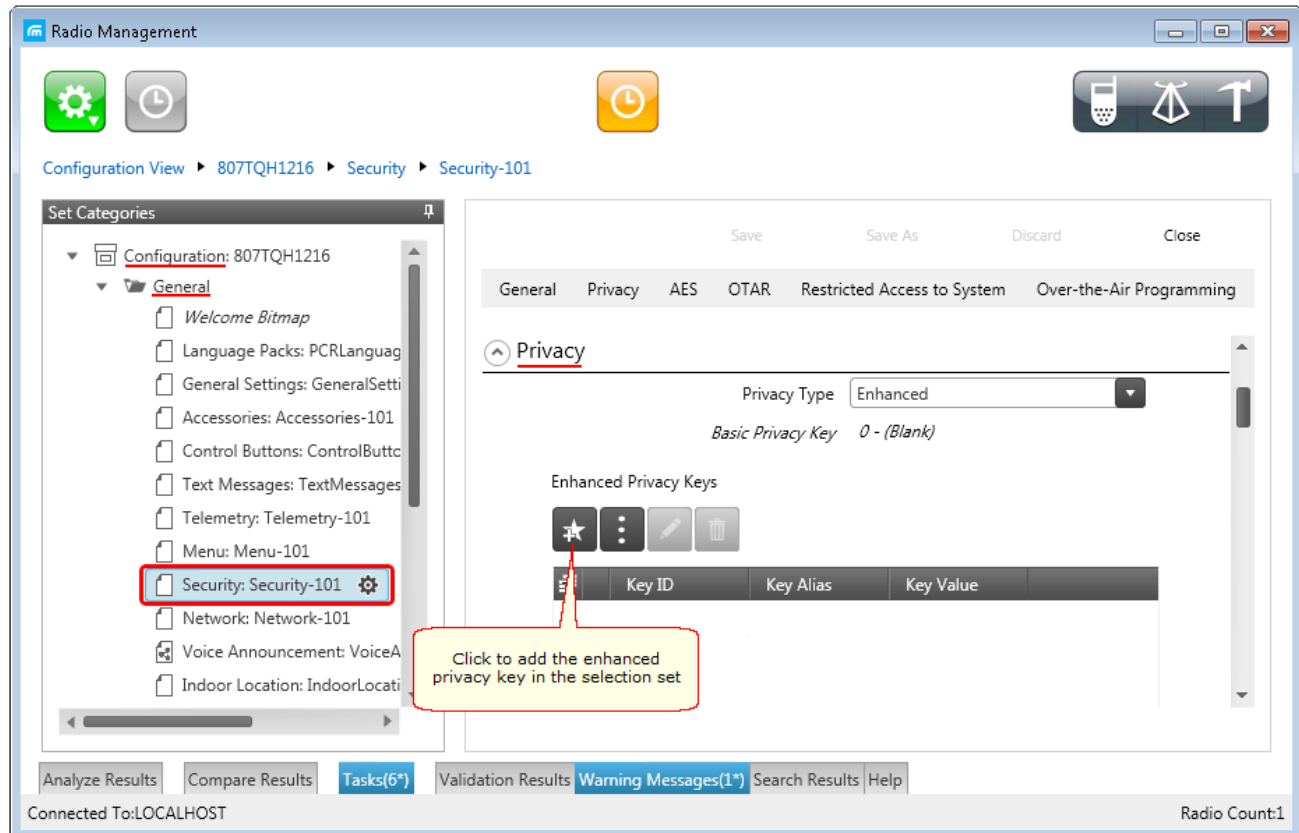


**Note:** **Key ID** and **Key Value** must match the values set in the radio settings in the Radio Management program and MOTOTRBO Network Interface Service Configuration Utility. If the values in the **Key ID** fields are the same, but the values in the **Key Value** fields do not match, the receiving side hears only a distorted voice. If the key identifier of the transmitting side does not coincide with one of the key identifiers in the list of the receiving side, then transfer to the receiving party will not be heard.

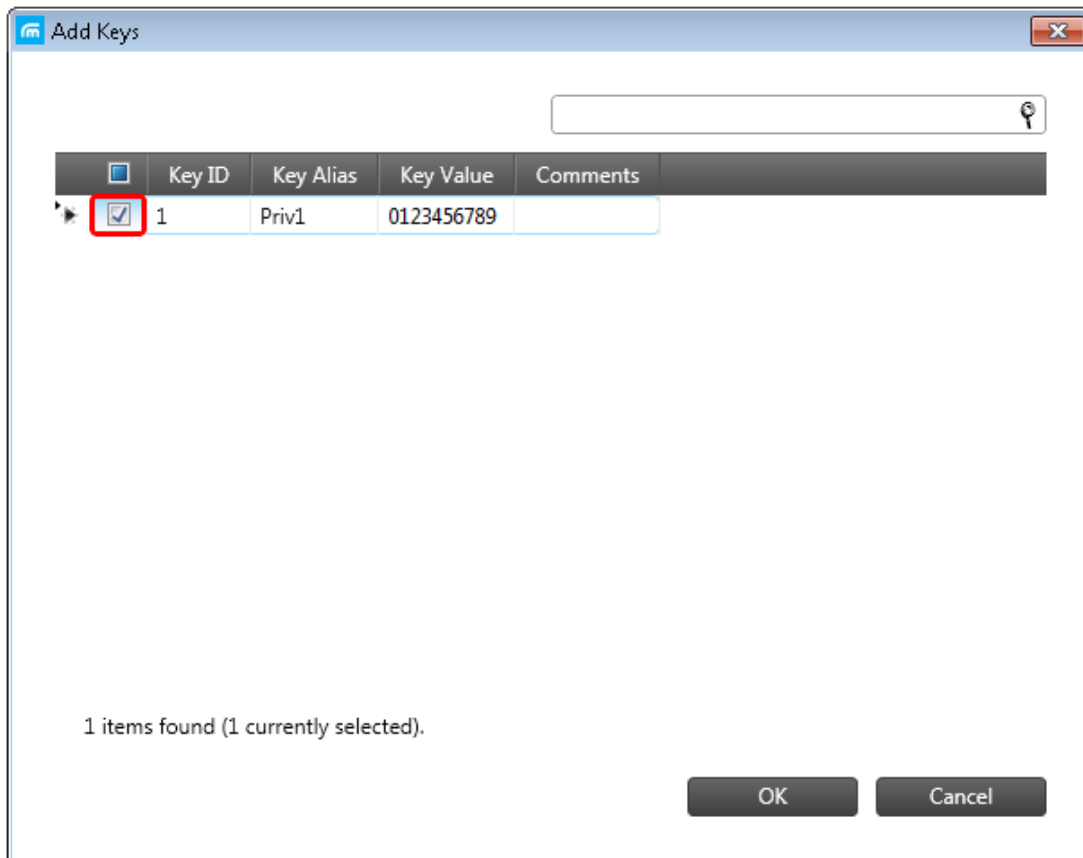
2. In the **Privacy Keys** tab of the Radio Management program add the enhanced privacy key. Enter its ID and value in the corresponding fields (see the [Note](#) above).



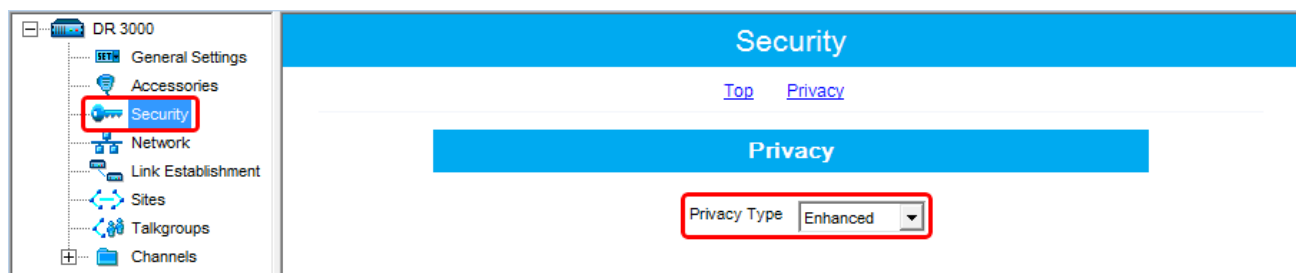
Then open the configuration of the required radio station and in the **Set Categories** menu click **General** > **Security**. To make the added enhanced privacy keys available for selection, add them in the selection set. To do that, in the **Privacy** field click the **Add** button.



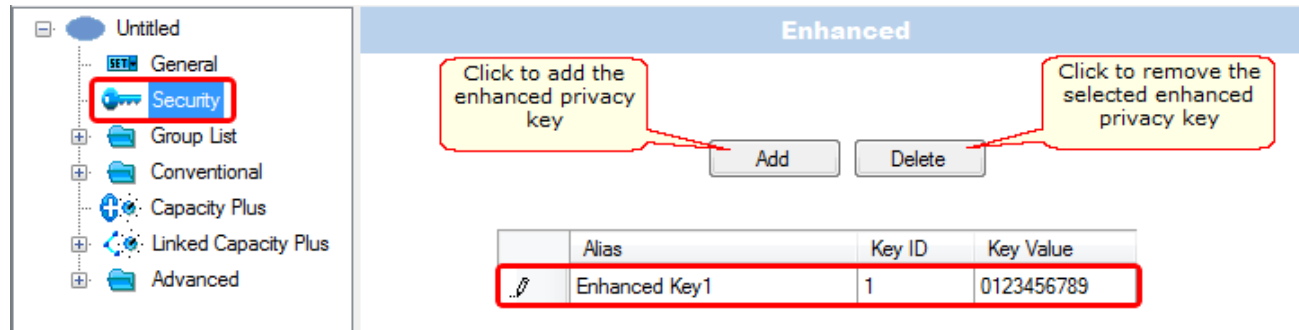
At that the **Add Keys** window will open. Select the required keys, which you want to be available for selection in the **Privacy Alias** field when specifying the enhanced key on the channel and click **OK**.



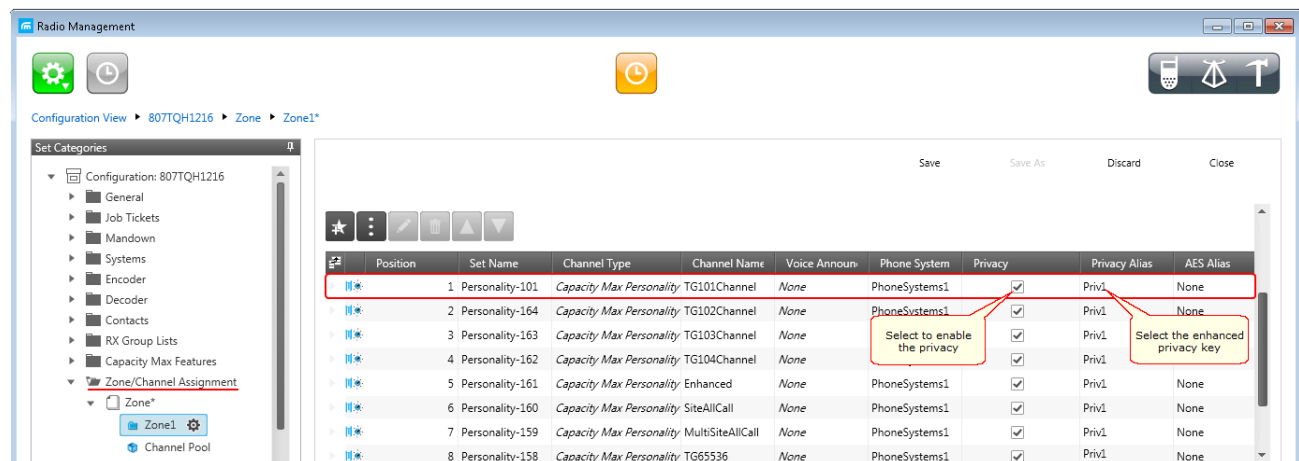
3. In the **Security** window of the repeater settings in MOTOTRBO CPS in the **Privacy Type** field select *Enhanced*.



4. In the **Security** window of MOTOTRBO Network Interface Service Configuration Utility in the **Enhanced** field add the enhanced privacy key. Enter its ID and value in the corresponding fields (see the [Note](#) above).



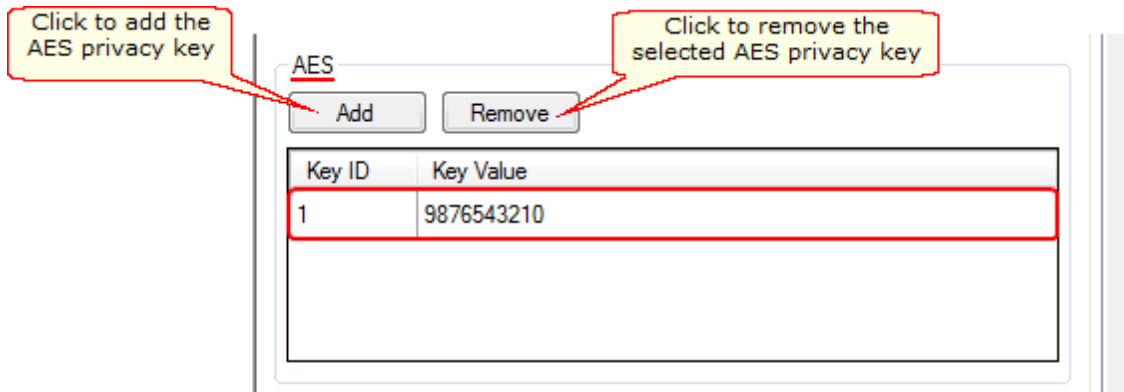
5. In the radio settings in the Radio Management program to enable the encryption mode on the required channel select the **Privacy** checkbox and in the **Privacy Alias** field select the enhanced privacy key for this channel.



## AES Privacy

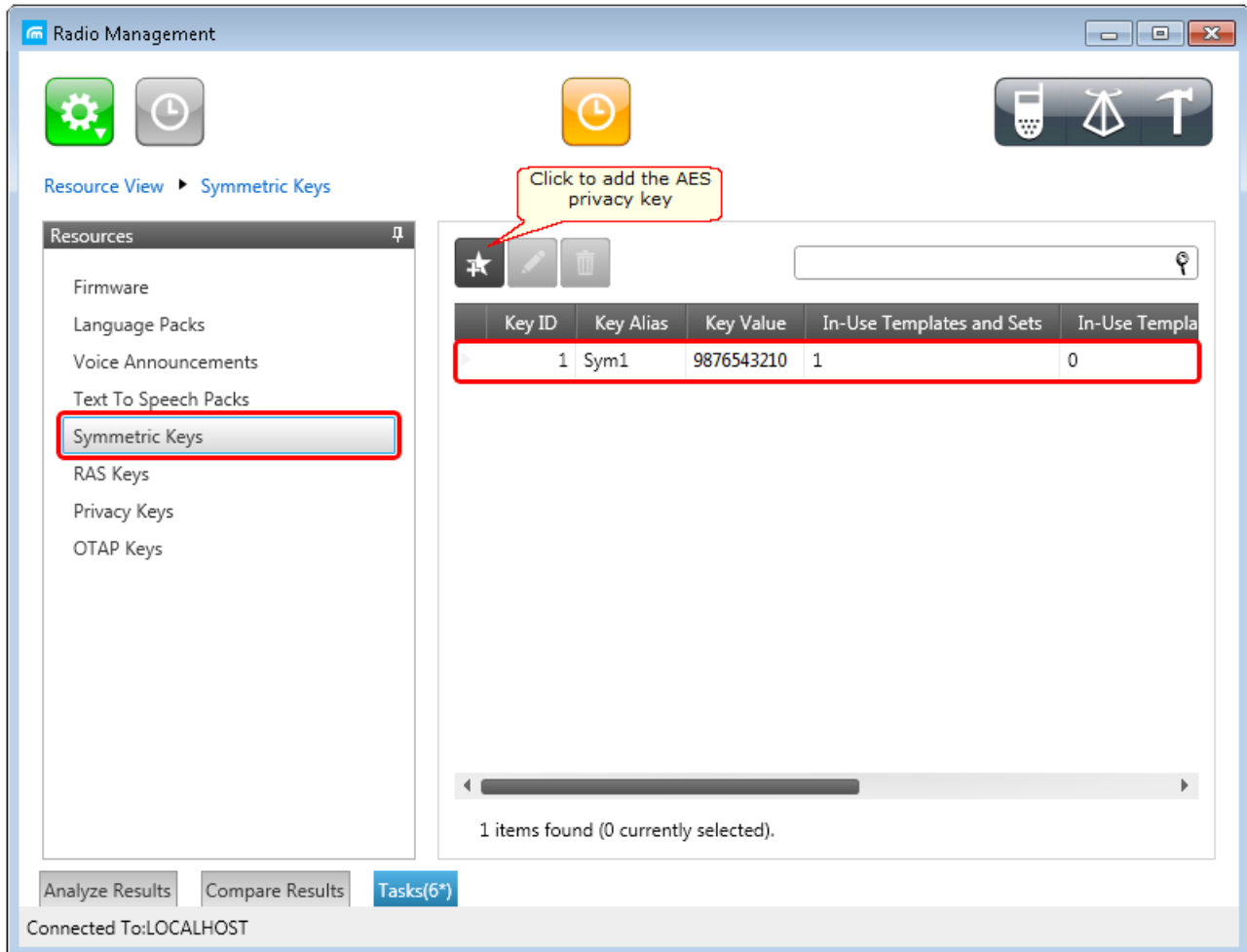
To configure the **AES** privacy, perform the following actions:

1. In the **Security Settings** window of SmartPTT Radioserver Configurator add an AES privacy key for incoming traffic. Enter its ID and value in the corresponding fields.

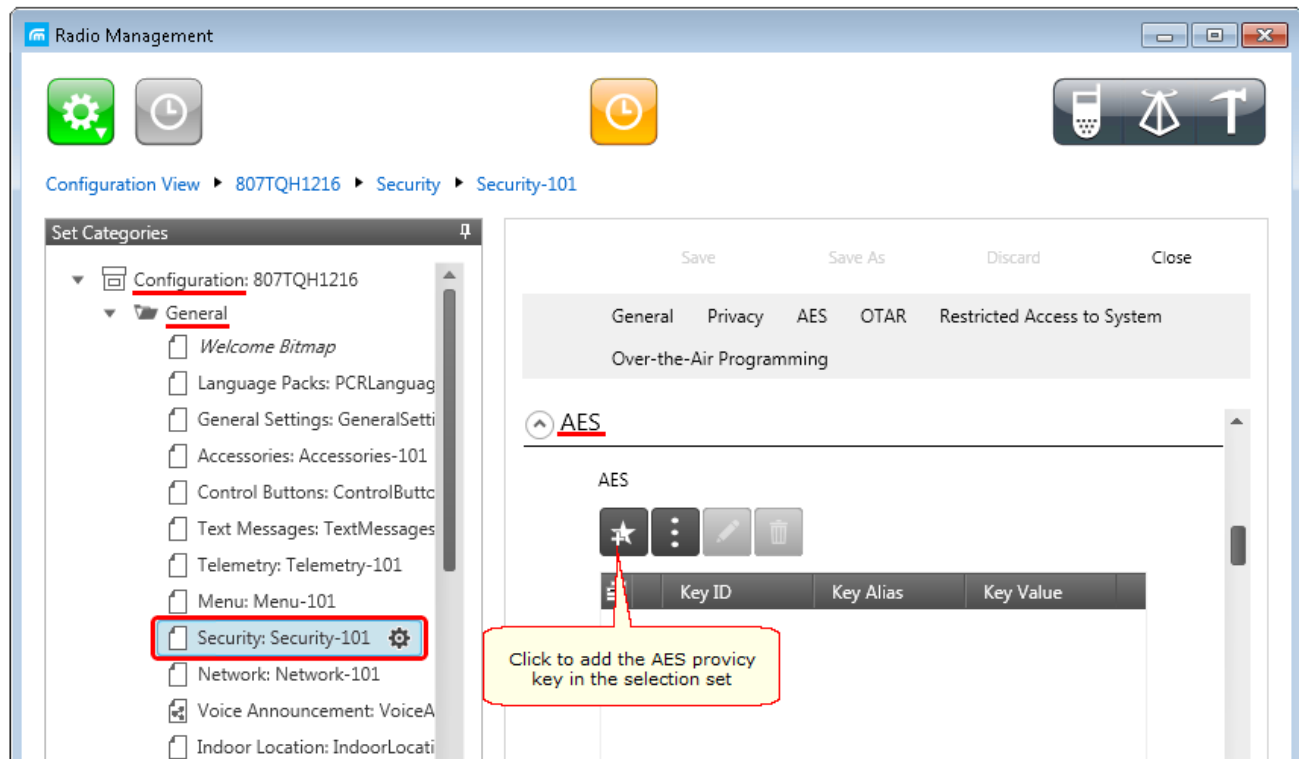


**Note:** **Key ID** and **Key Value** must match the values set in the radio settings in the Radio Management program and in MOTOTRBO Network Interface Service Configuration Utility. If the values in the **Key ID** fields are the same, but the values in the **Key Value** fields do not match, the receiving side hears only a distorted voice. If the key identifier of the transmitting side does not coincide with one of the key identifiers in the list of the receiving side, then transfer to the receiving party will not be heard.

2. In the **Symmetric Keys** tab of the Radio Management program add the AES privacy key. Enter its ID and value in the corresponding fields (see the [Note](#) above).

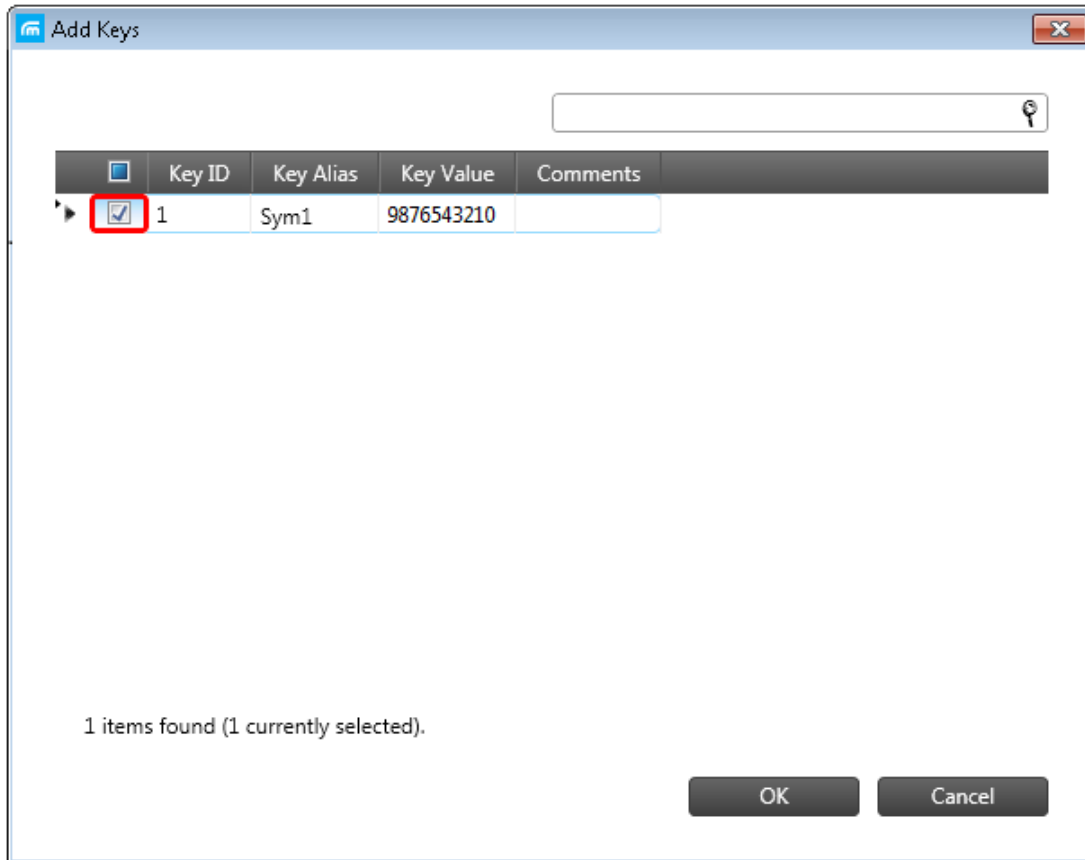


Then open the configuration of the required radio station and in the **Set Categories** menu click **General > Security**. To make the added AES privacy keys available for selection, add them in the selection set. To do that, in the **AES** field click the **Add** button.

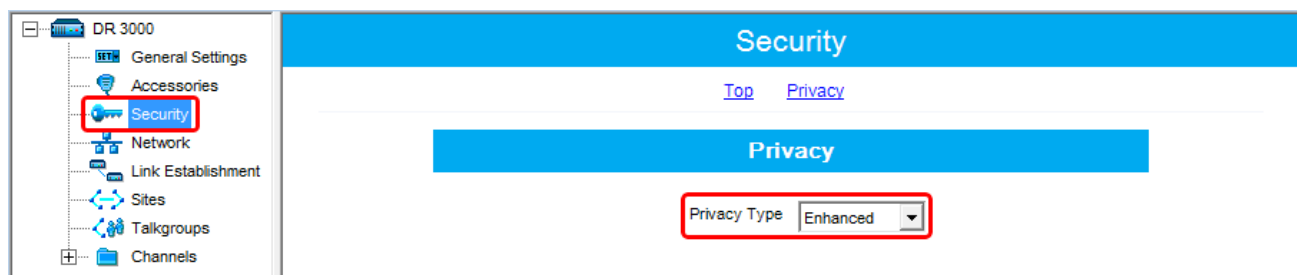




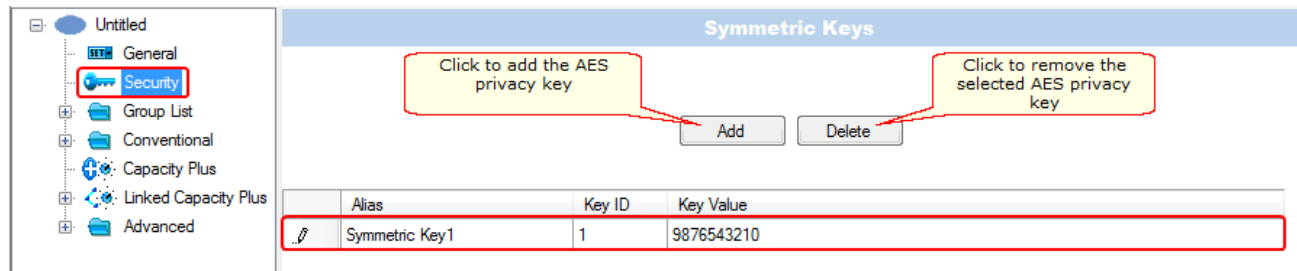
At that the **Add Keys** window will open. Select the required keys, which you want to be available for selection in the **AES Alias** field when specifying the AES privacy key on the channel and click **OK**.



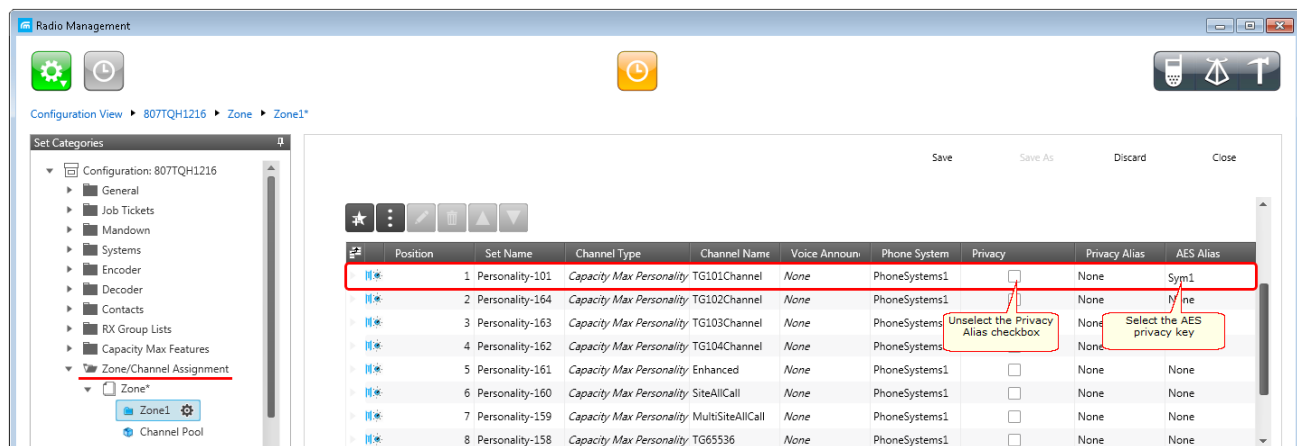
3. In the **Security** window of the repeater settings in MOTOTRBO CPS in the **Privacy Type** field select *Enhanced*.



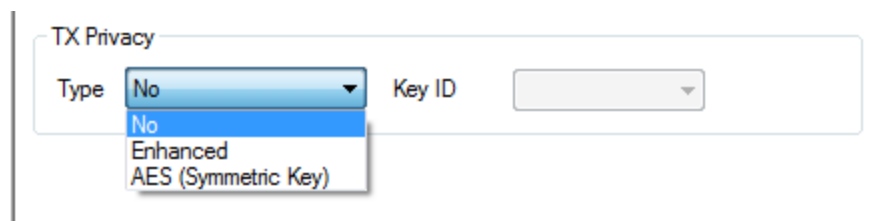
4. In the **Security** window of MOTOTRBO Network Interface Service Configuration Utility in the **Symmetric Keys** field add the AES symmetric privacy key. Enter its ID and value in the corresponding fields (see the [Note](#) above)



5. In the radio settings in the Radio Management program to enable the AES encryption mode on the required channel unselect the **Privacy** checkbox and in the **AES Alias** field select the AES privacy key.



## TX Privacy



**Type:** Allows you to select encryption mode for outgoing traffic on the side of SmartPTT Dispatcher.

If *No* is set, radioserver does not support outbound traffic encryption.

If *Enhanced* is set, specify the **Key ID** value from the **Enhanced Privacy** table, which will be used to encrypt outbound traffic.

Select AES (Symmetric Key), with the required Key ID, if you want to use AES (Symmetric Key) for outgoing traffic. If TX Privacy is not set, and you have AES encryption for incoming traffic, AES (Symmetric Key) will be used for incoming traffic by default.

AES (Symmetric Key) – AES encryption (DMR-compliant implementation, MOTOTRBO firmware R2.4 and later).