



Version 8.8
Linked Capacity Plus
Configuration Guide
February 2016

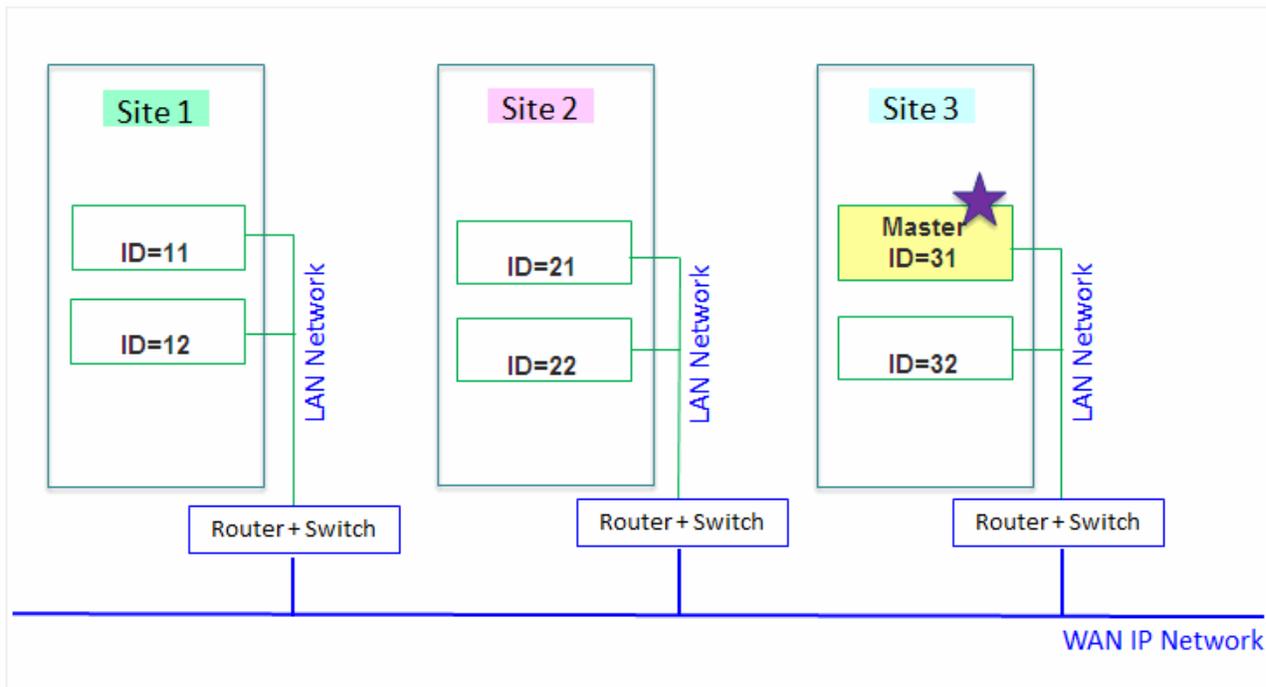
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Linked Capacity Plus

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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:



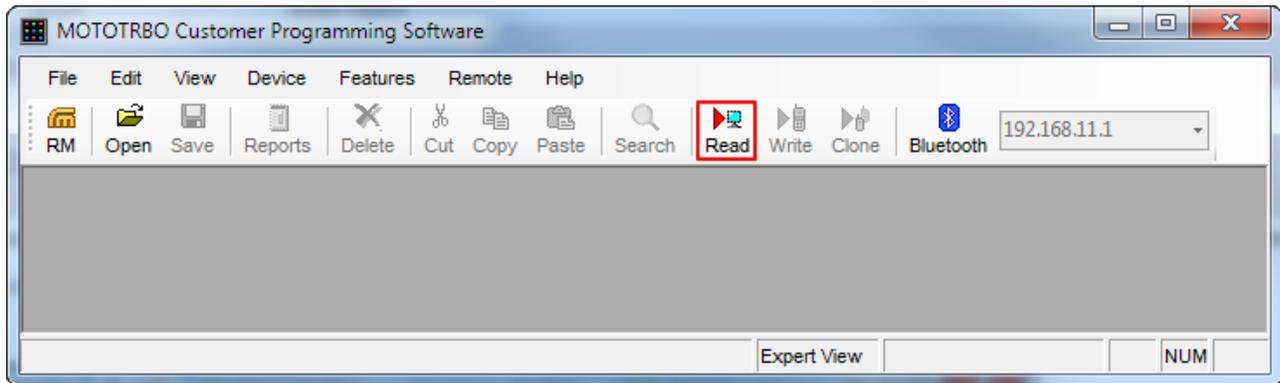
Each radio ID, either subscriber radio ID or repeater ID should be unique in the radio system. In this example you can see 2 repeaters with ID's 11 and 12 on Site 1, 2 repeaters with ID's 21 and 22 on Site 2, and 2 repeaters with ID's 31 and 32 on Site 3. The repeater with ID=31 is a Master.

MOTOTRBO Equipment Programming

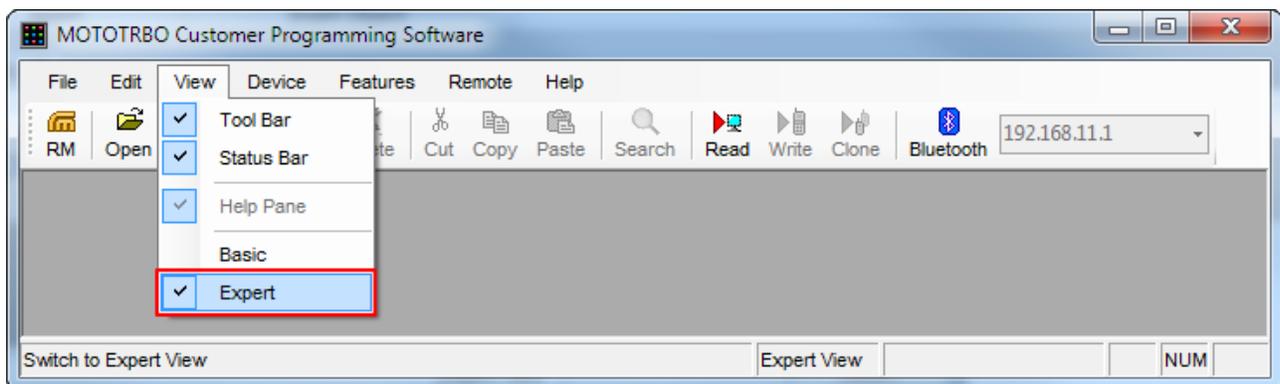
To program MOTOTRBO equipment you will need MOTOTRBO Customer Programming Software (CPS).

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.



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

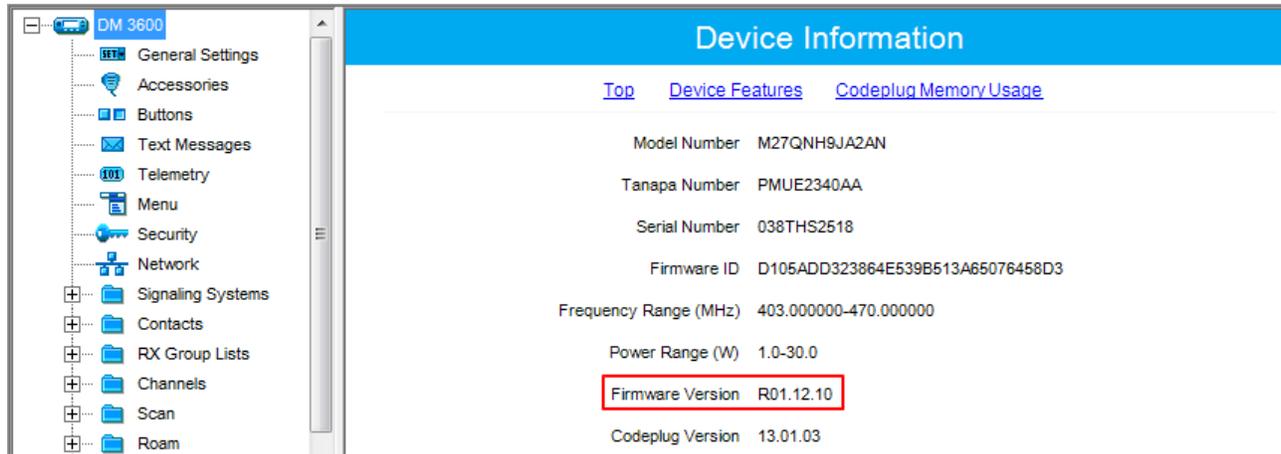


4. In the **Device Information** tab make sure that firmware version is no older than:

- 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.



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

MOTOTRBO Repeater Programming

Note: Only repeaters with 32 MB of internal memory (e.g., DR 3000 or MTR3000) can support the LCP configuration. Also, make sure that the repeater supports such features as **Network Application Interface Voice**, **Network Application Interface Data** and **Capacity Plus (Linked)**.

First of all, configure the Master repeater parameters. Each LCP system needs one repeater to act as a Master. The Master repeater has a static IP address, while other repeaters can have either static or dynamic IP addresses. All the repeaters in the LCP configuration register with the Master using the static IP address of the Master.

1. In the **General Settings** tab specify **Radio ID** and **Site ID**. In our case **Radio ID=31** and **Site ID=3**.



The screenshot shows the 'General Settings' configuration page for a radio. The page has a blue header with the title 'General Settings'. Below the header are three tabs: 'Top', 'CWID', and 'Microphone'. The 'Top' tab is selected. The configuration fields are as follows:

Radio Name	Master
Radio ID	31
Site ID	3
Site Alias	Site3
SIT (ms)	5000
Group Call Hang Time (ms)	3000
Private Call Hang Time (ms)	4000
Emergency Call Hang Time (ms)	4000

2. Add parameters in the **Network** tab.

DR 3000

- General Settings
- Accessories
- Security
- Network**
- Sites
- Talkgroups
- Channels

Network

[Top](#) [Radio Network](#) [Link Establishment](#) [IP Site Connect](#) [Capacity Plus](#) [IP Re](#)

Radio IP 192 . 168 . 10 . 1

Accessory IP 192.168.10.2

Netmask 255.255.255.0

Radio Network

CAI Network 12

CAI Group Network 225

Link Establishment

Link Type Master

Authentication Key

Master IP 10 . 150 . 0 . 20

Master UDP Port 50000

DHCP

Ethernet IP 10 . 150 . 0 . 20

Gateway IP 10 . 150 . 0 . 1

Gateway Netmask 255 . 255 . 255 . 0

UDP Port 50000

Peer Firewall Open Timer (sec) 6

Master Archive File

- In the **Link Type** field select *Master*.
- In the **Master IP** and **Master UDP Port** specify the IP address and port number of the Master repeater.
- Do not select **DHCP**. Master IP address should be static.
- In the **Ethernet IP** field specify the IP address of the Master repeater, the same as in the **Master IP** field.
- In the **Gateway IP** field specify the gateway IP address for the repeater.
- In the **Gateway Netmask** field specify the gateway netmask address for the repeater.

- In the **UDP Port** field specify the UDP port of the repeater. The default value is set to *50000*.

3. In the same **Network** tab specify **Rest Channel/Site IP** and **Rest Channel/Site UDP Port**.

The screenshot displays the configuration interface for a DR 3000 repeater. On the left, a navigation tree shows the following items: DR 3000, General Settings, Accessories, Security, Network (selected), Sites, Talkgroups, and Channels. The main configuration area is titled 'Network' and contains several tabs: Radio Network, Link Establishment, IP Site Connect, Capacity Plus, and IP Repeater. The 'Capacity Plus' tab is active, showing the following settings:

- Beacon Duration (ms): 180
- Beacon Interval (ms): 1920
- Rest Channel/Site IP: 10 . 150 . 2 . 58
- Rest Channel/Site UDP Port: 55000

Below these settings is the 'IP Repeater Programming' section, which includes an 'Enable' checkbox that is checked.

Rest Channel/Site IP is a virtual IP address that is required for correct operation of the LCP system. As the Rest Channel rotates through the channel pool of a site, this virtual IP address is associated with a different physical repeater only for the duration for which one of its slots is the Rest Channel. This IP address must be the same for all repeaters at the same site. **Rest Channel/Site IP** address should be at the same sub network as all repeaters of this site. No other device should use this IP address.

In the LCP system **Rest Channel/Site UDP Port** allows the user to configure the UDP port of site for communication with other sites connected within the LCP system.

- In the **Sites** tab set up the site map. In this example we have 3 sites (see the network scheme above). *Site 1* has only one neighbor – *Site2*. *Site 2* has 2 neighbors – *Site 1* and *Site 3*. And *Site 3* has only one neighbor – *Site 2*.

Site ID	Reserved Wide Area Channels	Neighbor 1	Neighbor 2	Neighbor 3	Neighbor 4
1	0	2	None	None	None
2	0	1	3	None	None
3	0	2	None	None	None

In the **Reserved Wide Area Channels** column you can specify how many channels are to be reserved for a wide group call per site, if necessary.

- In the **Talkgroups** tab, specify wide groups and sites on which these groups are available. You do not need to add local groups which are available only on one site.

Call ID	Site 1	Site 2	Site 3
1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

In our example we have only two wide groups. Group 1 is a wide group which is available on all sites. So when a subscriber initiates a call to Group 1, this call will be transmitted on all sites. Group 2 is also a wide group and is available on *Site 2* and *Site 3*.

- Set up channels. Click on **Channels**, right-click on **Zone**, select **Add** and then **Capacity Plus Voice Channel (Linked)** or **Capacity Plus Data Channel (Linked)**. Please remember that both repeater channels will be used for one and the same purpose. In LCP, a Data Revert Channel can be configured either as a local Data

Revert Channel, or as a wide area Data Revert Channel. In our configuration all repeaters will be used for voice, that is why in the Master repeater settings we add **Capacity Plus Voice Channel (Linked)**.

7. Specify **Color Code** and **Slot Channel ID**.

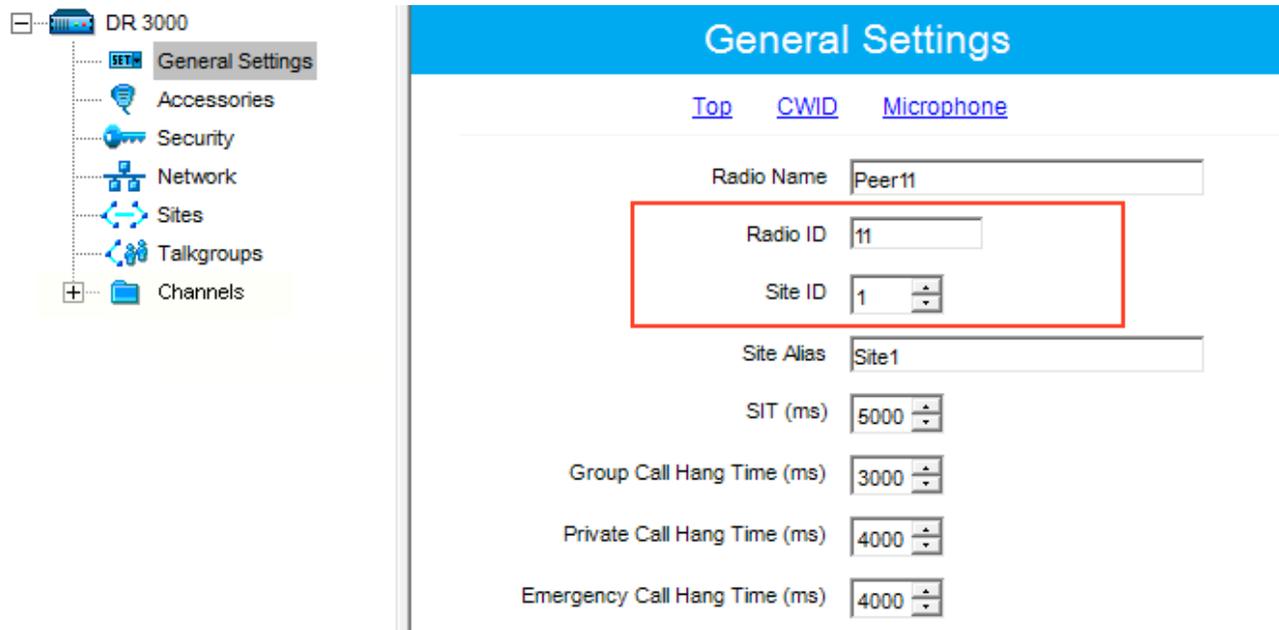
The screenshot displays the configuration for Channel 1. The 'Color Code' is set to 1, and the 'Slot 1 Channel ID' is also set to 1. The 'Slot 2 Channel ID' is set to 2. The RX frequency is 167.800000 MHz, and the TX frequency is 162.075000 MHz. The power level is set to Low, and the TOT is 60 seconds.

The color code is used to identify radio systems. Therefore, different color codes are used to identify different systems. Channels may have the same or different color codes. However, a repeater can only have one color code. Radios will ignore any channel activity not containing the matching color code for the system. Repeaters using the same frequency can be associated with different color codes.

Slot 2 Channel ID is set up automatically.

Now, configure parameters of one of the peer repeaters on *Site 1*.

1. In the **General Settings** tab specify **Radio ID** and **Site ID**. In our case **Radio ID=11** and **Site ID=1**.



The screenshot displays the configuration interface for a DR 3000 radio. On the left, a navigation tree shows the following options: DR 3000, General Settings (selected), Accessories, Security, Network, Sites, Talkgroups, and Channels. The main area is titled "General Settings" and includes navigation links for "Top", "CUID", and "Microphone". The configuration fields are as follows:

Radio Name	Peer11
Radio ID	11
Site ID	1
Site Alias	Site1
SIT (ms)	5000
Group Call Hang Time (ms)	3000
Private Call Hang Time (ms)	4000
Emergency Call Hang Time (ms)	4000

The "Radio ID" and "Site ID" fields are highlighted with a red rectangular box.

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

DR 3000

- General Settings
- Accessories
- Security
- Network**
- Sites
- Talkgroups
- Channels

Network

[Top](#) [Radio Network](#) [Link Establishment](#) [IP Site Connect](#) [Capacity Plus](#) [IP Repeater Programming](#)

Radio IP: 192 . 168 . 10 . 1
 Accessory IP: 192.168.10.2
 Netmask: 255.255.255.0

Radio Network

CAI Network: 12
 CAI Group Network: 225

Link Establishment

Link Type: Peer
 Authentication Key:
 Master IP: 10 . 150 . 0 . 20
 Master UDP Port: 50000
 DHCP:
 Ethernet IP: 10 . 150 . 2 . 56
 Gateway IP: 10 . 150 . 2 . 1
 Gateway Netmask: 255 . 255 . 255 . 0
 UDP Port: 50000
 Peer Firewall Open Timer (sec): 6

- In the **Link Type** field select *Peer*.
- In the **Master IP** and **Master UDP Port** specify the IP address and port number of the Master repeater.
- Do not select **DHCP**.
- In the **Ethernet IP** field specify the IP address of the repeater. Master IP address (*Site 3*) and Peer repeater IP address (*Site 1*) will be in different sub networks, because each site should be located in different sub network.
- In the **Gateway IP** field specify the gateway IP address for the repeater.
- In the **Gateway Netmask** field specify the gateway netmask address for the repeater.
- In the **UDP Port** field specify the UDP port of the repeater. The default value is set to *50000*.

3. In the same **Network** tab specify **Rest Channel/Site IP** and **Rest Channel/Site UDP Port**.

The screenshot shows the configuration interface for a DR 3000 repeater. The left sidebar lists the following settings categories: General Settings, Accessories, Security, Network (selected), Sites, Talkgroups, and Channels. The main panel is titled "Network" and contains the following sections:

- Network** (Header)
- Navigation tabs: [Radio Network](#), [Link Establishment](#), [IP Site Connect](#), [Capacity Plus](#), [IP Repeater Programming](#)
- Beacon Interval (sec): 60
- Capacity Plus** (Section Header)
- Beacon Duration (ms): 180
- Beacon Interval (ms): 1920
- Rest Channel/Site IP**: 10 . 150 . 0 . 21 (highlighted with a red box)
- Rest Channel/Site UDP Port**: 55000
- IP Repeater Programming** (Section Header)
- Enable:

Rest Channel/Site IP is configured in each repeater. Repeaters from the same site will have the same **Rest Channel IP** address.

4. Add channels. Click on **Channels**, right-click on **Zone**, select **Add** and then **Capacity Plus Voice Channel (Linked)**. Specify **Color Code** and **Slot Channel ID** for each channel.

The **Color Code** must match the color code set for other repeaters.

When configuring a new site, you need to start numeration with **Slot 1 Channel ID=1**.

Example:

Site 3 (with Master): 1-2-Master ID=31, 3-4-Peer ID=32,

Site 1: 1-2-Peer ID=11, 3-4-Peer ID=12,

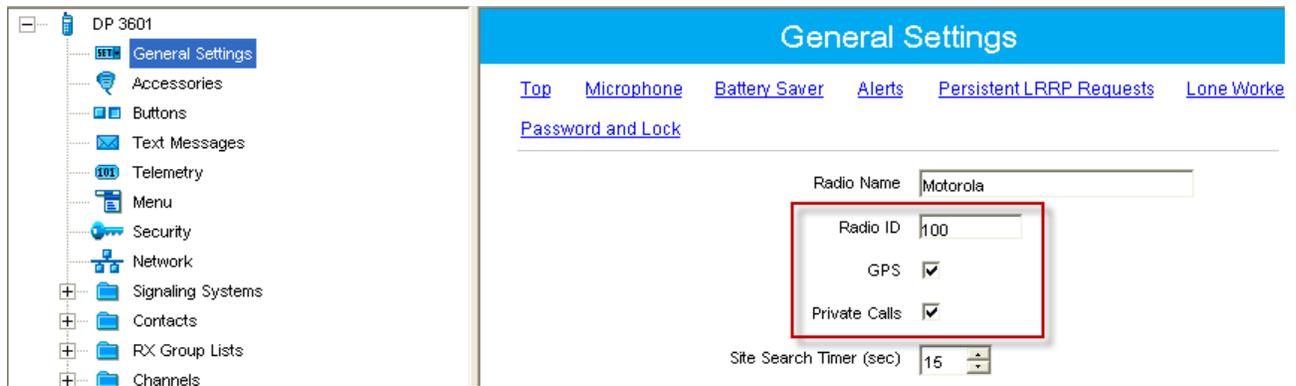
Site 2: 1-2-Peer ID=21, 3-4-Peer ID=22.

Other peer repeaters are configured likewise. When configuring, please keep in mind that:

- All repeaters from the same site should be in the same LAN.
- Each repeater must have **Master IP Address/Port** and **Rest Channel/Port**.

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 interface for a DP 3601 device, specifically the **Network** tab. The interface is organized into three main sections:

- Network:**
 - Radio IP: 192 . 168 . 10 . 1
 - Accessory IP: 192.168.10.2
 - Netmask: 255.255.255.0
- Radio Network:**
 - CAI Network: 12
 - CAI Group Network: 225
 - Max TX PDU Size (bytes): 500
 - Telemetry UDP Port: 4008
 - Forward to PC: Disabled
- Services:**
 - ARS Radio ID: 1
 - ARS IP: 13.0.0.1
 - ARS UDP Port: 4005
 - TMS Radio ID: 1
 - TMS IP: 0.0.0.0

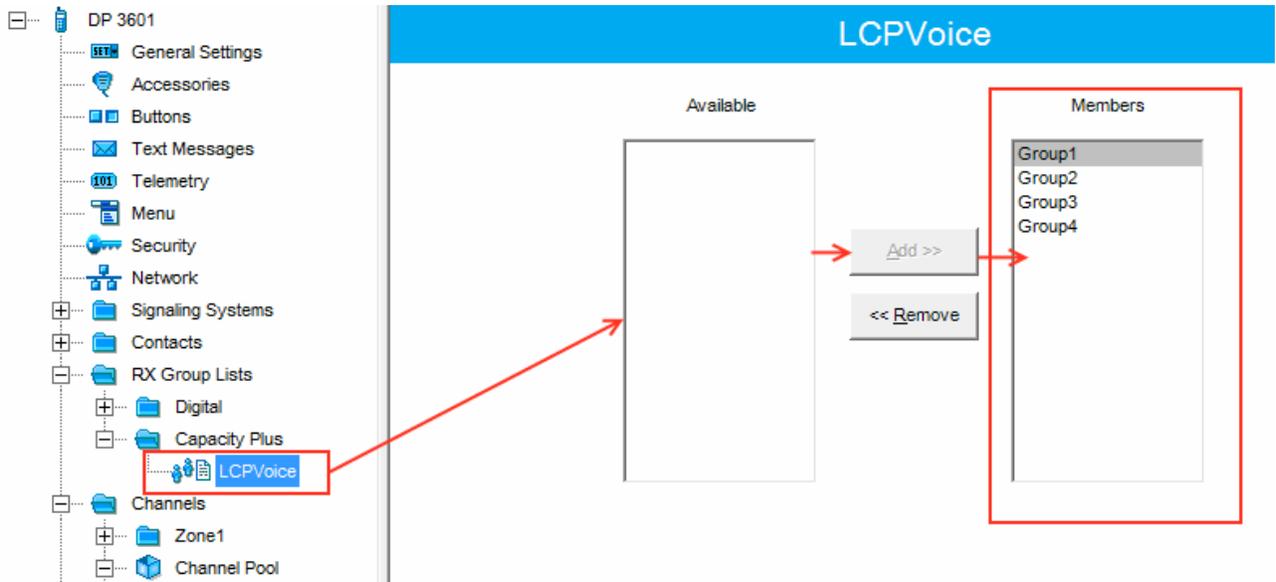
- In the **Forward to PC** field select *Disabled*.
- If you plan to work with SmartPTT application specify **ARS Radio ID** and **TMS Radio ID**. Remember that the **ARS Radio ID** and **TMS Radio ID** should match the **MNIS Radio ID** in the MOTOTRBO MNIS application and Slot ID in SmartPTT Radioserver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

3. 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.

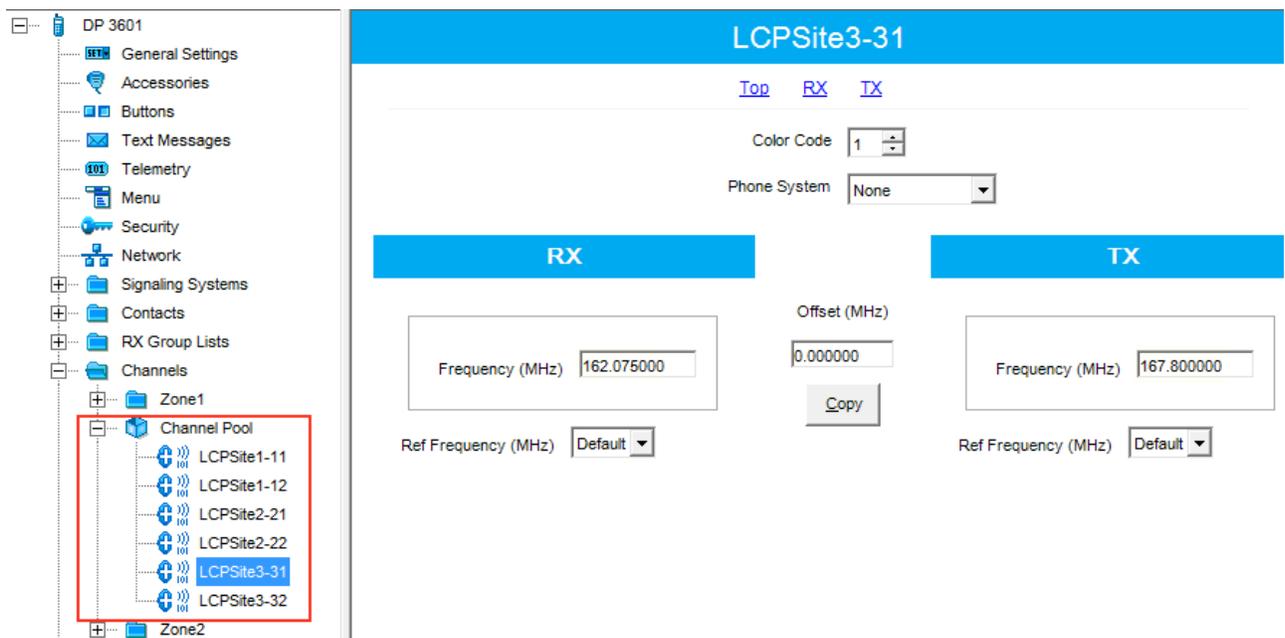
Contact Name	Call ID	Call Receive Tone	Ring Style	Text Message Alert Tone
Group1	1	<input type="checkbox"/>	No Style	Repetitive
Group2	2	<input type="checkbox"/>	No Style	Repetitive
AllCall	255	<input checked="" type="checkbox"/>	No Style	Repetitive
Dispatcher_Voice	1	<input type="checkbox"/>	No Style	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 configuration](#)).

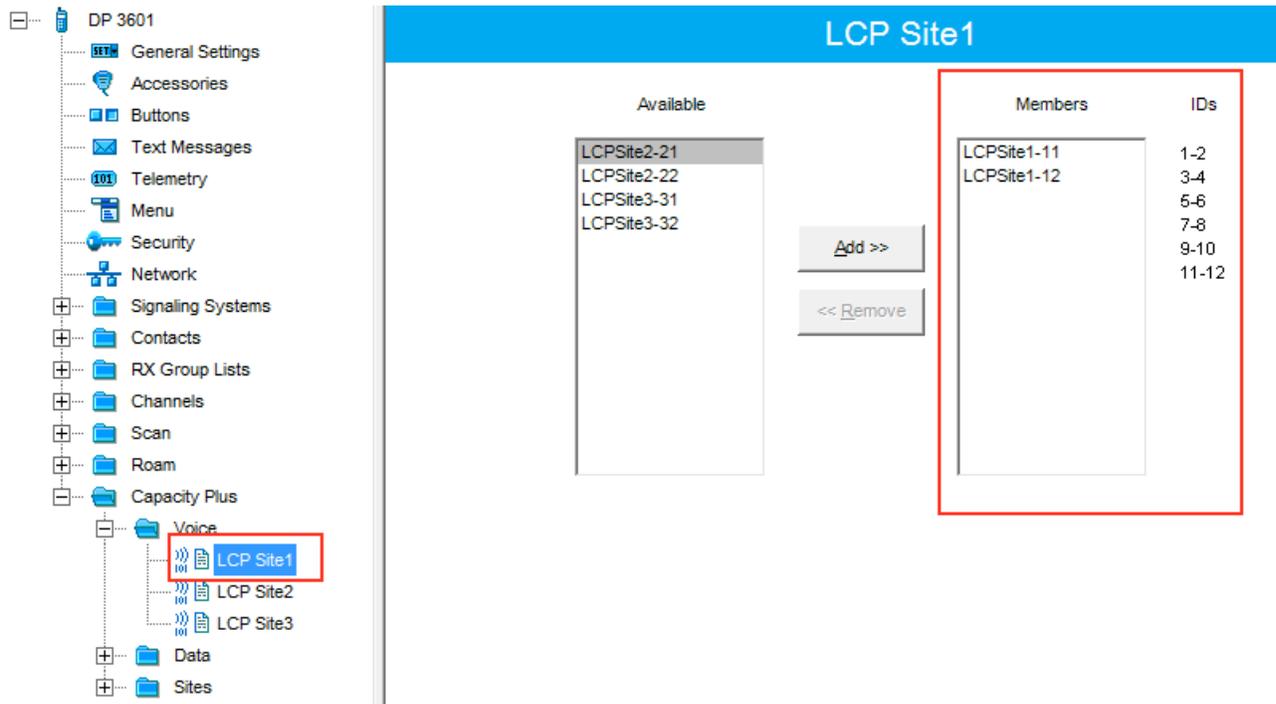
4. Add these groups to the **RX List**. In our example we use the same RX list for all sites. That is why the **RX List** contains all the groups.



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.

The screenshot displays the configuration interface for 'LCP Site1'. On the left, a navigation tree shows the 'Sites' folder expanded, containing 'LCP Site1', 'LCP Site2', and 'LCP Site3'. The main configuration area for 'LCP Site1' includes an 'RSSI Threshold (dBm)' field set to '-108' and an 'Add' button. Below this is a table with the following data:

	Site ID	Site Alias	Voice List	Data List	RX Group List
▶	1	Site1	LCP Site1	None	LCPVoice

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)**.

The screenshot shows the configuration for LCP Site1. On the left is a navigation tree with categories like General Settings, Accessories, Buttons, Text Messages, Telemetry, Menu, Security, Network, Signaling Systems, Contacts, RX Group Lists, Channels, Zone1 (containing LCP Site1, LCP Site2, LCP Site3), Channel Pool, Zone2, Scan, Roam, and Capacity Plus. The main area is titled 'LCP Site1' and has tabs for 'Top', 'RX', and 'TX'. The 'RX' tab is active, showing settings for Emergency Alarm Indication (checked), Emergency Alarm Ack (unchecked), and Emergency Call Indication (checked). The 'TX' tab is also visible, showing settings for Contact Name (Group1), Emergency System (Sys1), VOX (unchecked), Power Level (Low), TOT (60), TOT Rekey Delay (0), Allow Interruption (unchecked), TX Interruptible Frequencies (unchecked), Admit Criteria (Channel Free), In Call Criteria (TX Interrupt), RSSI Threshold (-90), Private Call Confirmed (checked), and Data Call Confirmed (unchecked). Red boxes highlight the ARS setting (On System/Site Change), the Auto Roam setting (checked), the Site List dropdown (LCP Sites), the Contact Name dropdown (Group1), and the Private Call Confirmed setting (checked).

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**.

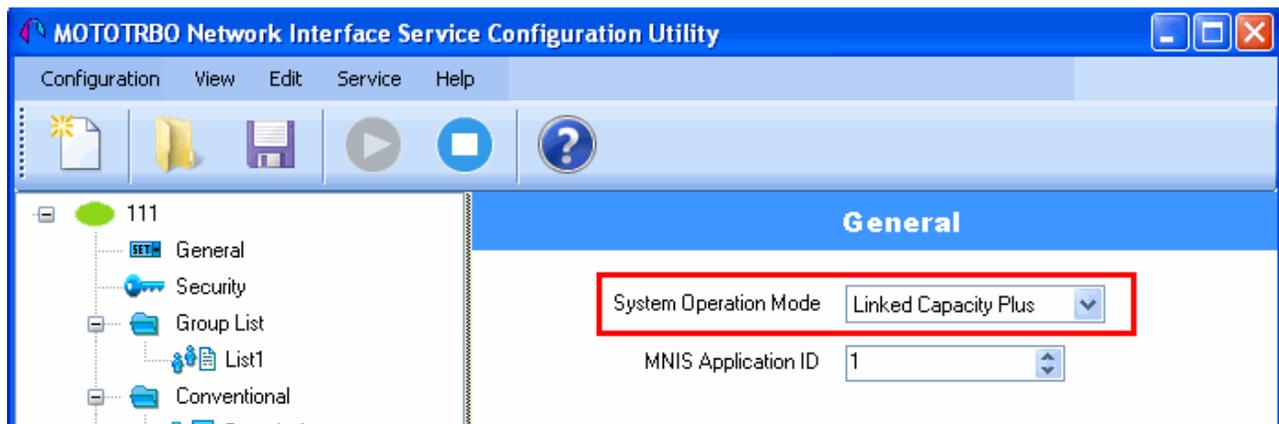
MNIS and DDMS Client Configuration

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.

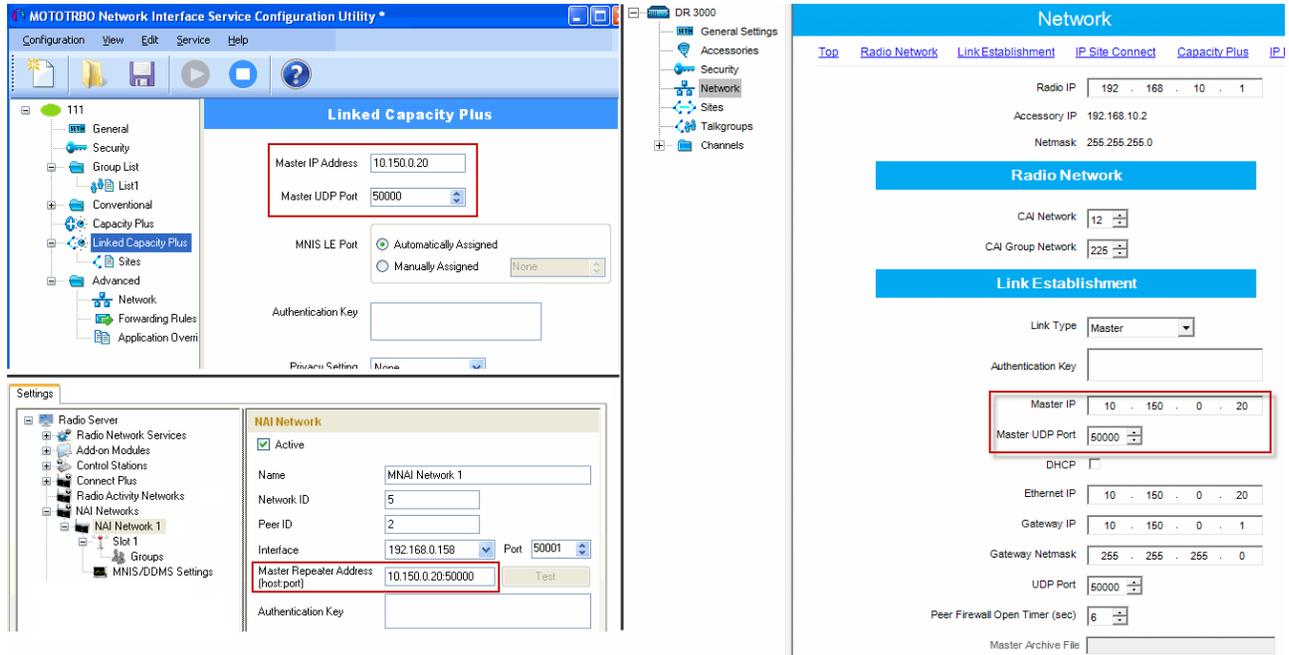
Let's start with MOTOTRBO Network Interface Service Configuration Utility (MNIS).

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).

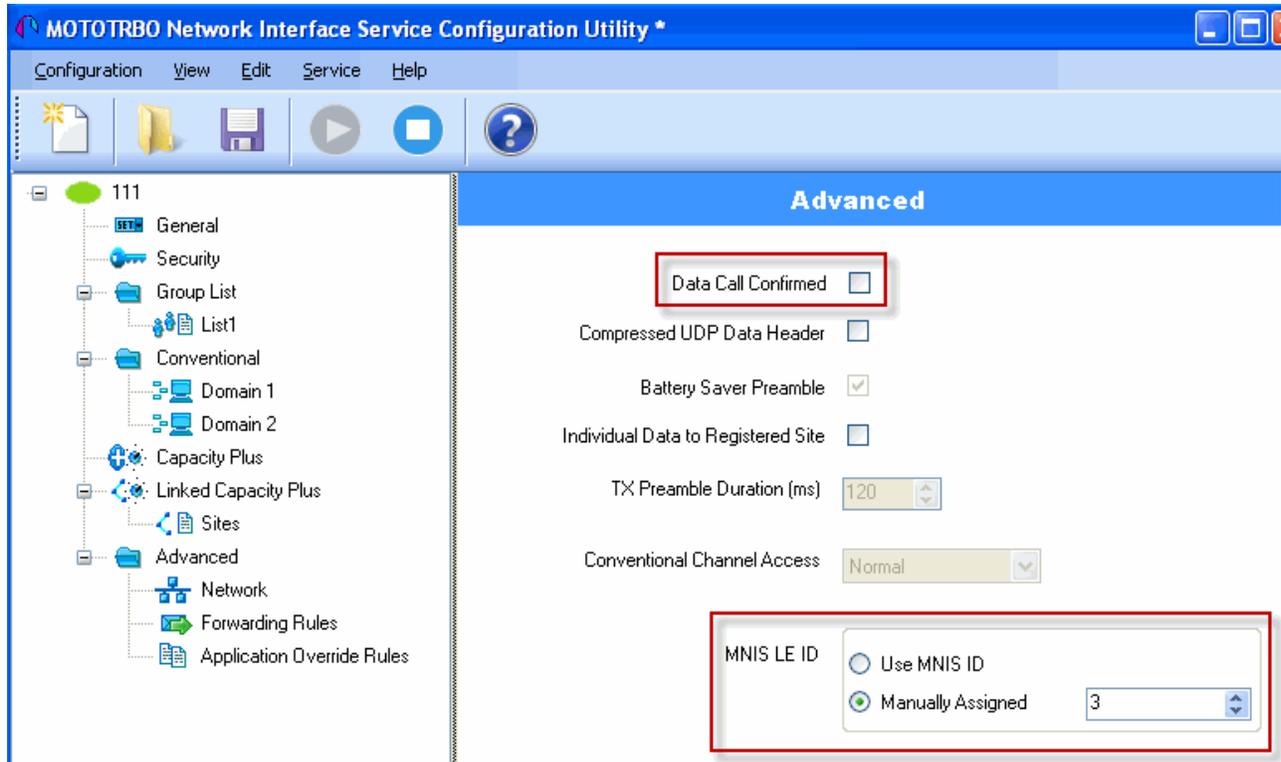
1. In the **General** section in the **System Operation Mode** field select network type. In our case, it is *Linked Capacity Plus*.



2. 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.

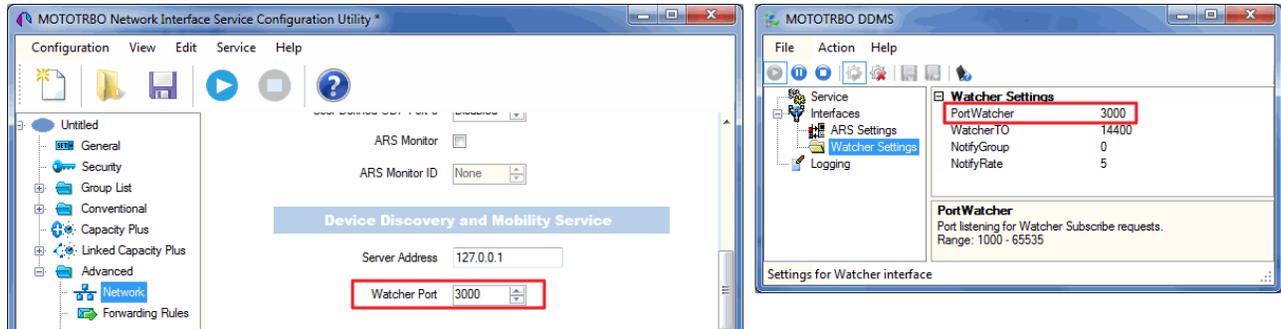


Note: In the Firewall settings add MNIS into the exception list.

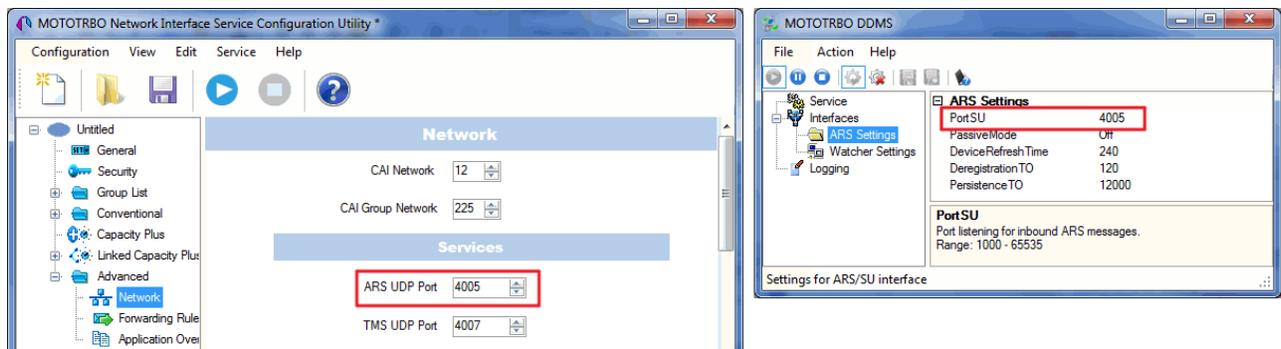
DDMS operation is closely connected to MNIS for data exchange (MNIS serves as DDMS Watcher). DDMS filters ARS packets, received by the repeater, and information on the radio presence in the network is sent to all systems for further processing.

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 future LCP network.

The screenshot displays the configuration interface for a SmartPTT Radioserver. On the left is a tree view of the configuration structure, and on the right is the configuration panel for a selected NAI system.

Configuration Panel: NAI - IP Site Connect Network

- Active
- Name: NAI - IP Site Connect 1
- Network ID: 10
- Peer ID: 5
- Interface: 192.168.37.13 Port: 50000
- Master repeater address (host:port): 10.150.0.20:50000 [Test]
- Authentication key: [Empty field]
- Voice transmission: Repeaters
- Group call hang time, ms: 3000
- Private call hang time, ms: 4000
- Max number of telephone calls: 100
- Data transmission
- Monitoring

Local Slots

[Add] [Delete]

Name	Peer ID	Slot

- **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.

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

The screenshot displays the configuration interface for a Slot 1 NAI Control Station. On the left, a tree view shows the hierarchy: Radio Server > NAI Systems > Slot 1. The right pane, titled 'NAI Control Station', contains the following settings:

- Active
- Name: Slot 1
- Radio ID: 1
- CAI Network: 12
- CAI Network for Groups: 225
- Allow Telephone Interconnect
- TX Time-Out Timer, s: 60
- Options:
 - Emergency Alarm Confirmed
 - Allow Transmit Interrupt
 - GPS Transmission Mode: Data
- Confirmed events:
 - Private Call Confirmed

- **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 Confirmation** – select this check box if you need the emergency alarm be acknowledged.
- **Private Call Confirmed** – 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.

- 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.

Name	Site Number	ID
Group 1	Wide	1
Group 2	Wide	2
Group 3	2	3
Group 4	3	4

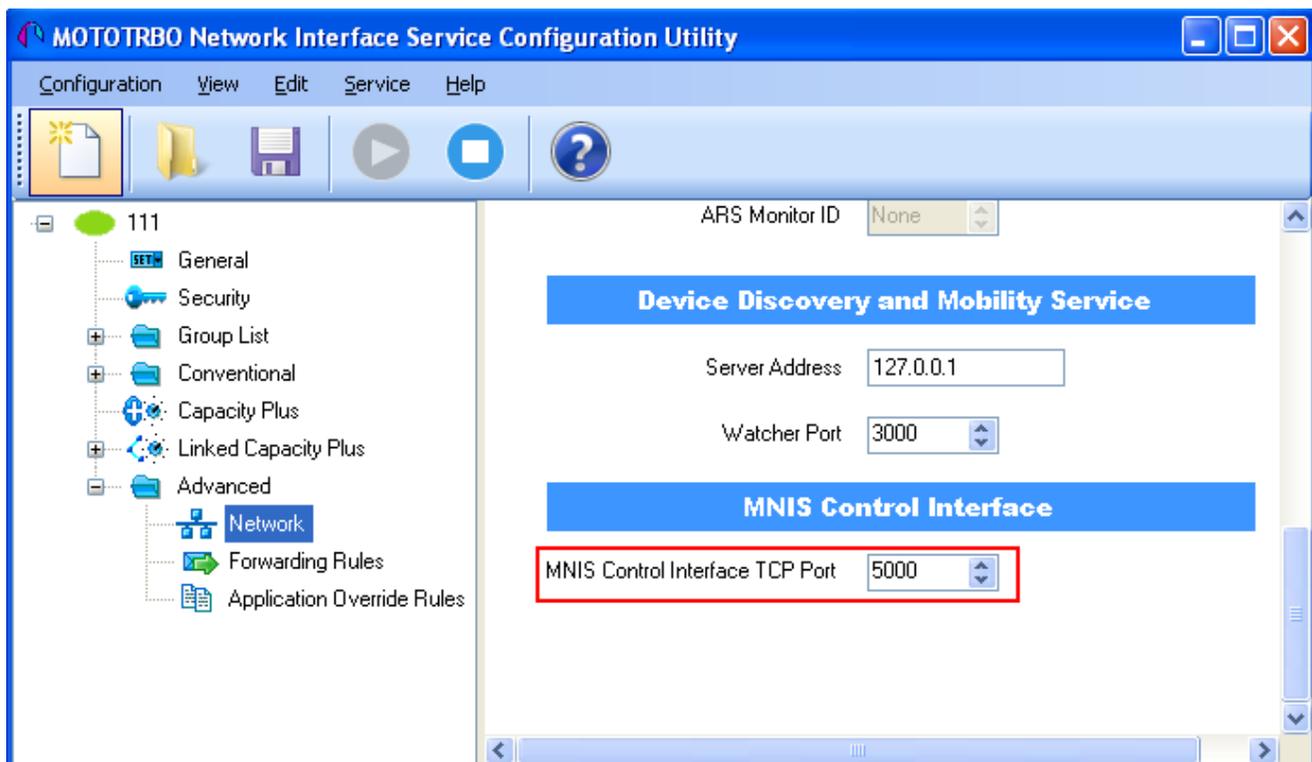
Talkgroups not specified in the repeater settings are regarded as local groups. Local group call does not go beyond the site on which the call was initiated.

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.

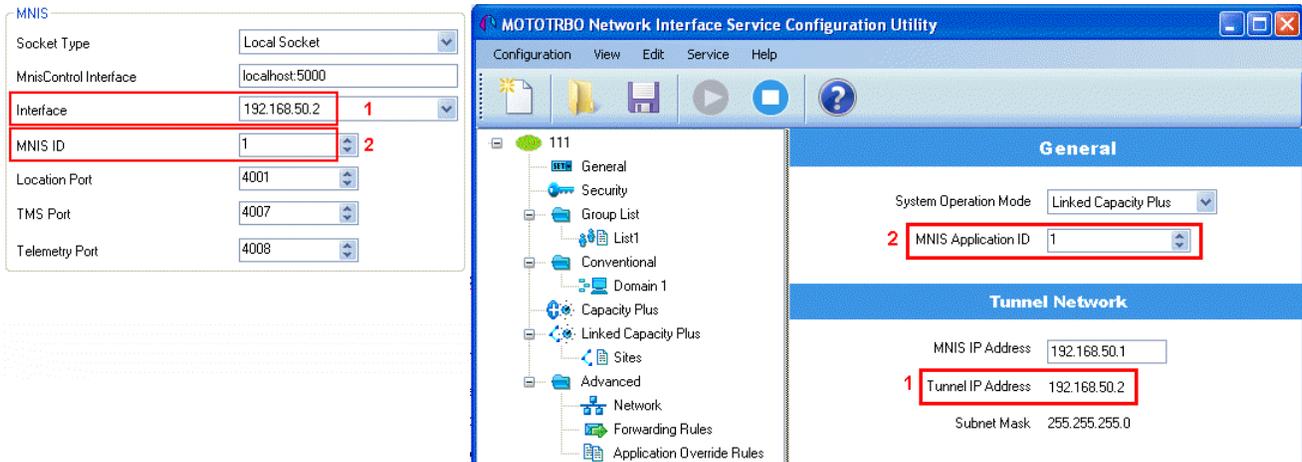
- Configure MNIS and DDMS settings for data transmission under **MNIS Settings** and **DDMS Settings**.

- 1) Under **MNIS settings** 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:

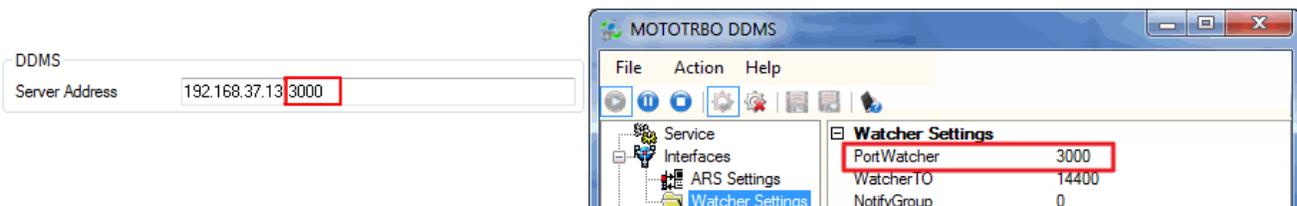


- 3) In the **Interface** field select the IP address of the PC where MOTOTRBO Network Interface Service is installed. It must match the IP address specified in the **Tunnel IP Address** field of MOTOTRBO Network Interface Service Configuration Utility.

- 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 .

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:

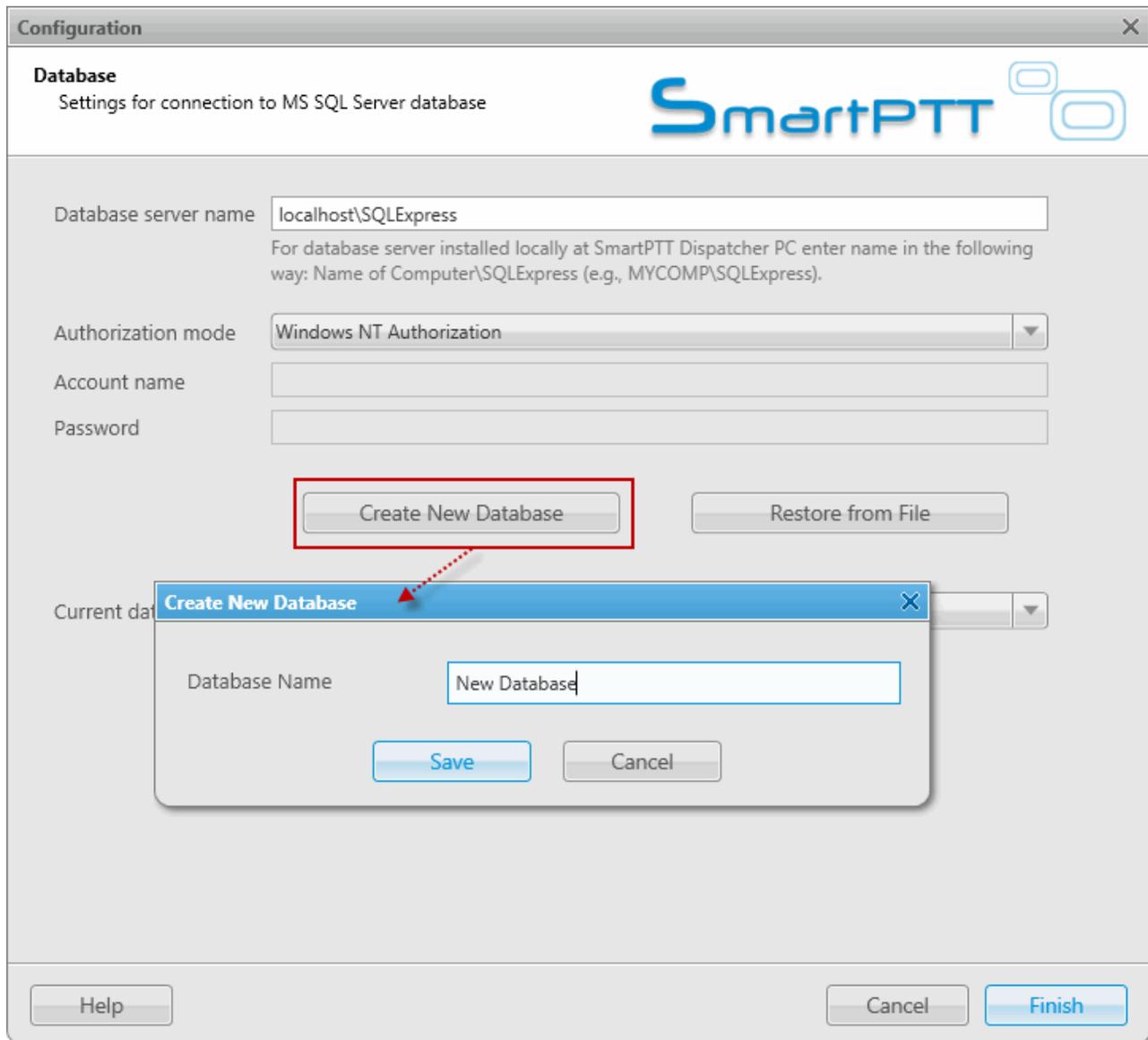
1. License installation
2. Database creation
3. Radioserver configuration
4. Audio setting configuration
5. Registration of radio subscribers

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.

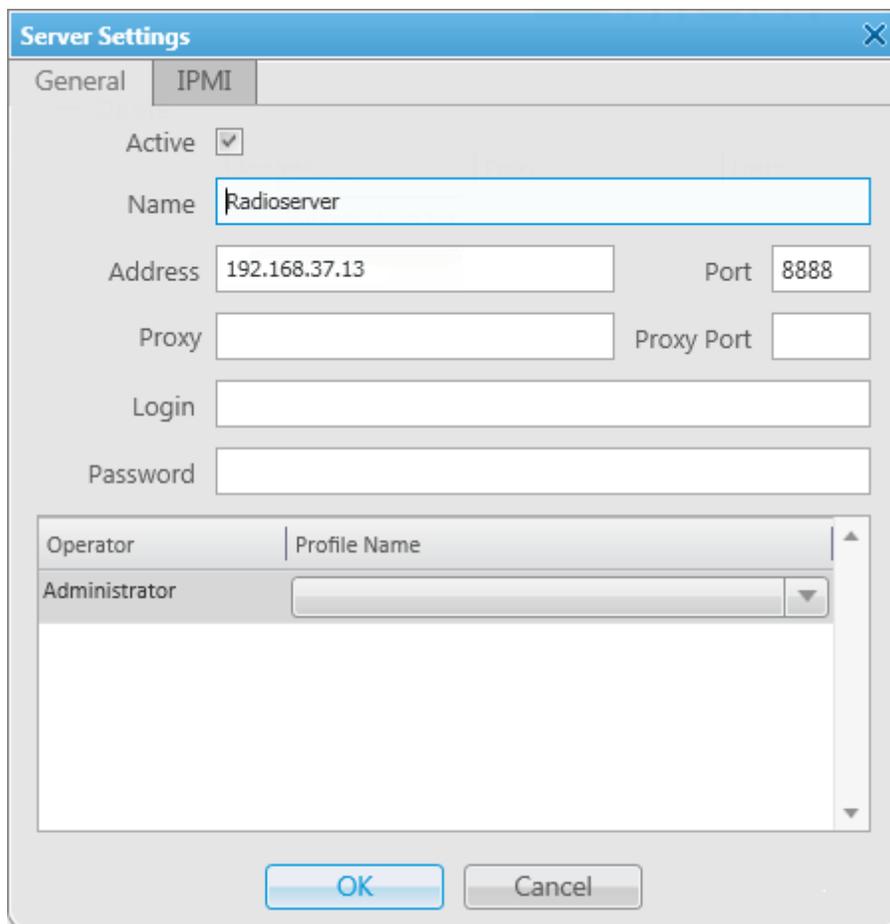
After you have finished, click **Finish** to save the changes. You will need to restart SmartPTT Dispatcher to apply

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.



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**.

The screenshot shows the 'Configuration' window with the 'Sound Settings' tab selected. The window title is 'Configuration' and it features the SmartPTT logo. The 'Sound Settings' section is titled 'Audio devices and VoIP settings'. It contains three main sections: 'General Settings', 'Audio Output Devices', and 'Other Settings'. The 'Audio Input' section includes dropdown menus for 'Device' (Microphone (2- USB audio CODEC)), 'Input Line' (Audio), and 'Noise Reduction' (Disabled), along with 'Record', 'Check', and 'Save' buttons. The 'Audio Output' section has a 'Device' dropdown (Default) and a 'Check' button. The 'VoIP Parameters' section includes dropdowns for 'Codec' (CCITT u-Law) and 'Codec Format' (8000 Hz, 20 ms, 64 (86) kbps), and a text input field for 'VoIP Port' (18501). At the bottom, there are 'Help', 'Cancel', and 'Finish' buttons.

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.

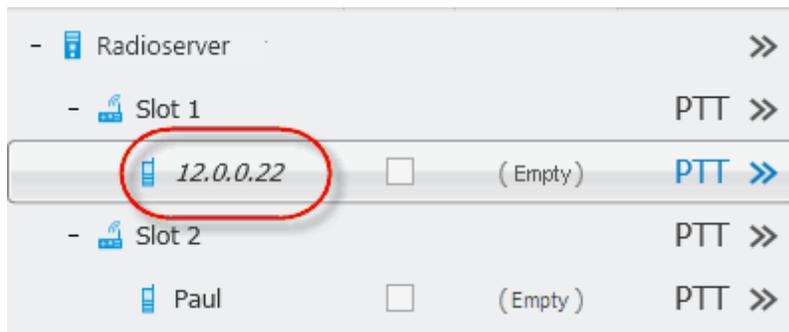
20 ms – the frame size.

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**.

The screenshot shows a 'Properties: Mike' dialog box with the following fields and controls:

- IP: 12.0.0.22
- MDC ID: [empty]
- 5 Tone ID: [empty]
- Name: Mike
- Status: (empty)
- Lone Worker:
- Security: [dropdown menu]
- Buttons: Save, Cancel