ConSEL PLUS – Capacity Max

Installation Guide

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1. Introduction

1.1 The content of this document

This guide is designed for administrators who are configuring evaluation and proof-of-concept deployments of MOTOTRBO Dispatch over IP solutions. The document provides instructions for installing ConSEL PLUS and outlines the essential steps needed to configure communication with a MOTOTRBO Capacity MAX system.

1.2 About ConSEL PLUS

ConSEL PLUS stands out as a comprehensive suite of sophisticated applications meticulously crafted for MOTOTRBO digital two-way radio networks. Within this suite, ConSEL PLUS assumes a pivotal role in efficiently overseeing and orchestrating the intricate web of voice and data communication paths that span across network endpoints. This robust platform goes beyond conventional capabilities by delivering a unified graphical dispatcher workbench interface that seamlessly integrates with the complete spectrum of workforce fleet management tasks, providing a user-friendly and comprehensive solution for enhanced operational control and efficiency.

1.3 Contact us

Service & Support department – +48 32 42 95 112

Upon connecting with our Technical Support department, you will be redirected to the appropriate specialists who will endeavor to resolve the issue.

2. Consistuent parts of the System

2.1 ConSEL PLUS Radio Server

Radio Server is software designed for the Microsoft Windows operating system, with the purpose of communicating with Mototrbo systems. Its role is to facilitate data transmission between the Mototrbo system and dispatcher consoles. Another important task is to aggregate and store transmitted information from radio systems in databases. It is responsible for ensuring smooth and, consequently, secure voice communication.

The Radio Server is capable of operating in basic server mode without the need for an attached redundant server, as well as serving as a redundant server in relation to the primary server.

2.2 ConSEL PLUS Dispatch Console

ConSEL PLUS Dispatch Console Client stands as a Windows software application designed to establish a connection with the ConSEL PLUS Radio Server, offering operators an interface for seamless interaction with individual radio network subscribers and groups of subscribers. In a typical setup, each ConSEL PLUS Dispatch Console is linked to a specific ConSEL PLUS Radio Server.

In the event of a ConSEL PLUS Radio Server failure, the ConSEL PLUS Dispatch Console demonstrates its resilience by automatically transitioning to the redundant server specified next in the prioritized list. This intelligent failover mechanism ensures uninterrupted communication, assuring operators of a smooth transition and continued functionality even in the face of server-related challenges. This dual-server configuration enhances the reliability and robustness of the overall ConSEL PLUS system, providing a dependable solution for critical communication needs.

3. Building the Radio Communication Network with Dispatching Software

While strategizing the development of a radio system in conjunction with a dispatch console built on Capacity Max, it becomes imperative to verify the necessity of implementing redundancy for the radio system components such as CMSS, Presence Notifier, and MNIS Data Gateway. The consideration of

redundancy introduces two primary topological options, each bearing distinct advantages and implications.

Ensuring system reliability and fault tolerance, this pivotal decision influences the overall architecture, shaping the robustness and resilience of the deployed radio infrastructure. By thoroughly evaluating the specific requirements and operational priorities, clients can make choices that align with the objectives of the radio communication network, contributing to a seamless and dependable system implementation.

3.1 Simple One Server Topology

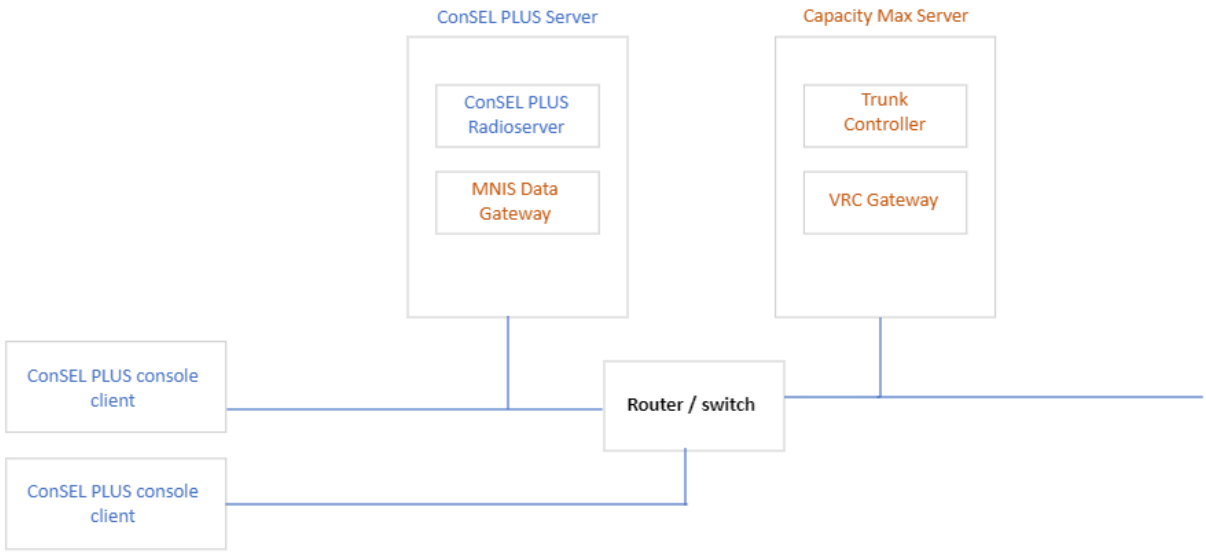


Figure 1: One Server Topology

3.2 Redundant Server Topology

It's beneficial to have a backup ConSEL PLUS server with a redundant Capacity Max system, enhancing system security and maintaining continuity. ConSEL PLUS allows configuring both redundant ConSEL PLUS and parameters for smooth switching between Capacity Max components.

Such a system should have:

- 2 x CMSS with Trunked Controller
- 2 x VRC Gateway
- 2 x MNIS Data Gateway
- 2 x ConSEL PLUS Radio Server

Figure 2: Redundant Server Topology

4. Installation

4.1 Requirements

ConSEL is a fully scalable solution that can be adapted to the user's requirements, capabilities and expectations.

ConSEL software modules can be installed and run on a single computer, or they can be installed and configured to run in a client-server configuration.

The choice of system installation and configuration depends on user requirements and the expected number and size of ICT systems to be integrated.

ConSEL is developed using best programming practices and we make every effort to ensure that it has the lowest possible use of system resources.

ConSEL software can be installed and run on computers running Windows operating systems (Windows 10, Windows 11) in 64- bit versions.

The database system for the ConSEL software is created and managed using a relational database management system.

A dispatcher system built on ConSEL in its basic version, for a small dispatching system (2-3 operator consoles, up to 15-20 users/monitored objects) can be run

on a standard office computer with a Pentium i3 class processor, 4 GB RAM, 500 GB HDD, equipped with a sound card (in case of using voice).

For more complex systems (several integrated radio communication systems, several or more dispatch consoles; e.g.: more than 500 users), primarily due to the need to correctly estimate the amount of data to be processed and stored, it is advisable to consult the hardware requirements.

ConSEL Plus Client minimum requirements tested for 1 module (system), 1 dispatcher, 10 objects

Minimum requirements – ConSEL PLUS client version	
Operating system	X64: Windows 10, Windows 11, Windows Server 2019
CPU	1 GHz
RAM	4GB
HDD	64 GB Type Flash
Network card	Yes
Sound Card	Yes
Additional Equipment	speakers, microphone, monitor, keyboard, mouse

ConSEL Plus Client recommended requirements tested for 10 modules (systems), 10 dispatchers, 1000 objects

Recomended requirements – ConSEL PLUS client version	
Operating system	x64: Windows 10, Windows 11, Windows Server 2019

CPU	Intel Core i5
RAM	8GB
HDD	256 GB Type Flash
Network card	Yes
Sound Card	separate microphone input and speaker output
Additional Equipment	speakers, microphone, monitor (1920x1080), keyboard, mouse

ConSEL Plus Radioserver minimum requirements tested for 1 module (system), 1 dispatcher, 10 objects

Minimum requirements - Server (IPSC, Capacity Plus, MultiSite CP)	
Operating system	x64: Windows 10, Windows 11, Windows Server 2019
CPU	Intel Core i5
RAM	8GB
HDD	256 GB Type Flash
Network card	Yes

ConSEL Plus Radioserver recomended requirements tested for 10 modules (systems), 10 dispatchers, 1000 objects

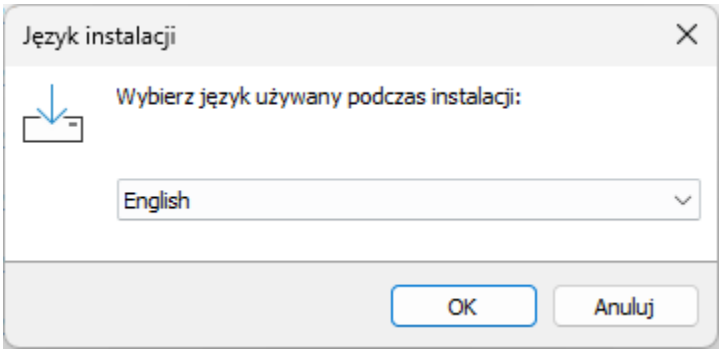
Recomended requirements - Server (IPSC, Capacity Plus, MultiSite CP)	
Operating system	x64: Windows 10, Windows 11, Windows Server 2019
CPU	Intel Core i5
RAM	16GB
HDD	512 GB Type Flash
Network card	Yes

4.2 Installation and basic configuration of ConSEL PLUS Radio Server

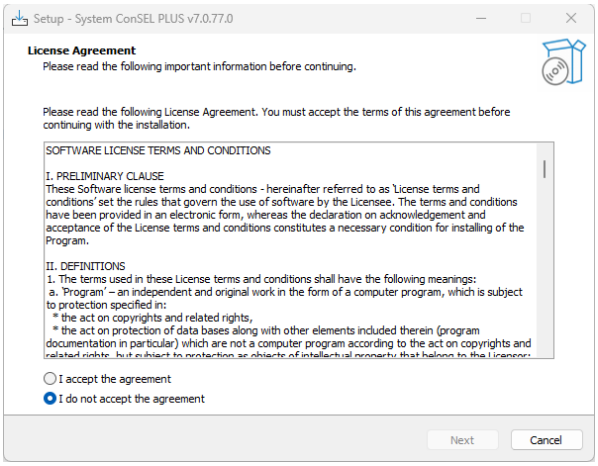
After downloading the latest version of ConSEL PLUS, initiate the installation process and follow the on-screen instructions displayed on the monitor.

4.2.1 Installation steps

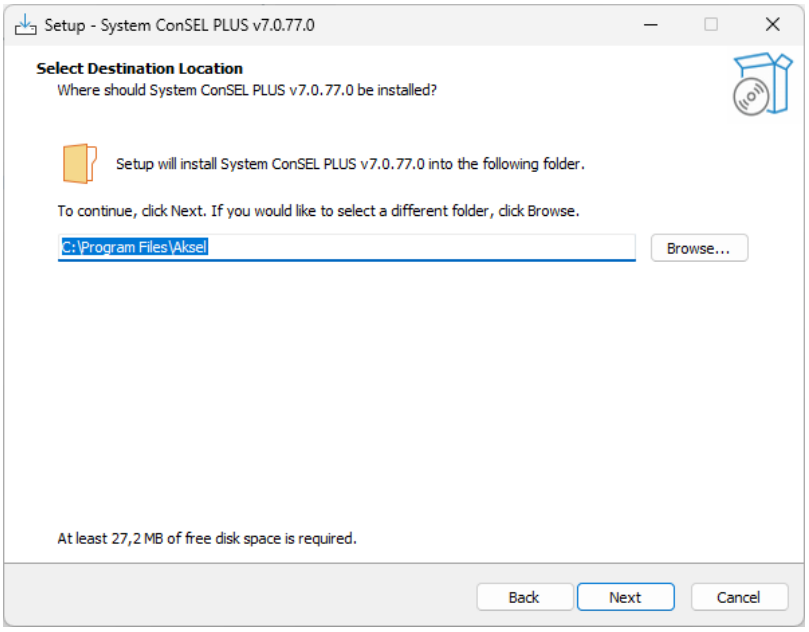
1. Choose language



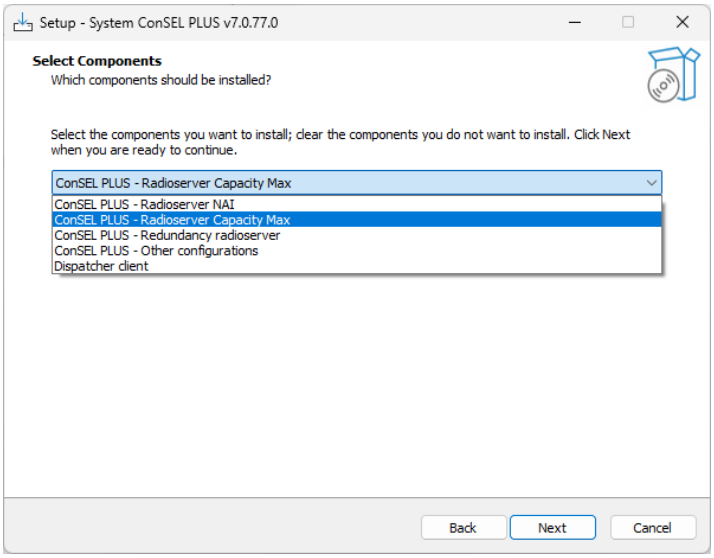
2. Accept the License Agreement



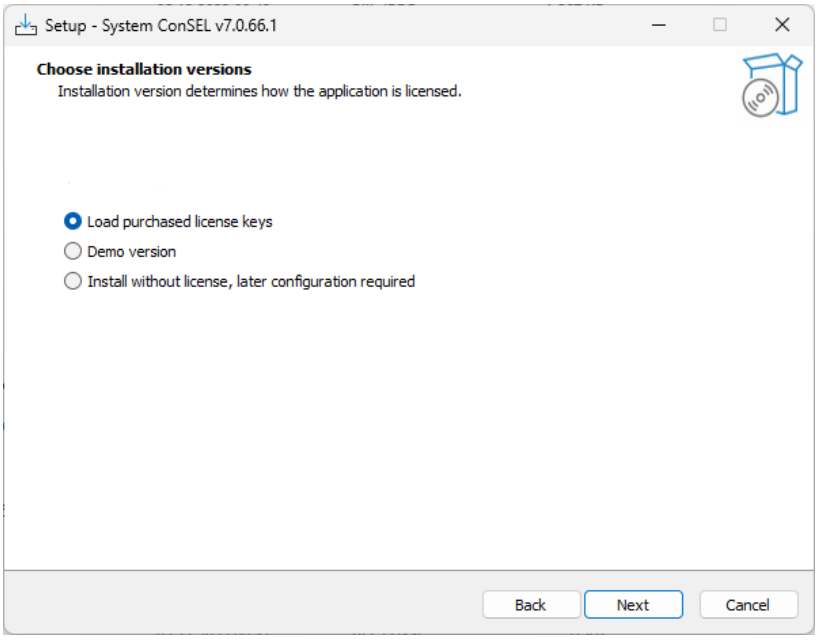
3. Select Destination Location



4. Choose ConSEL PLUS – Radioserver Capacity Max

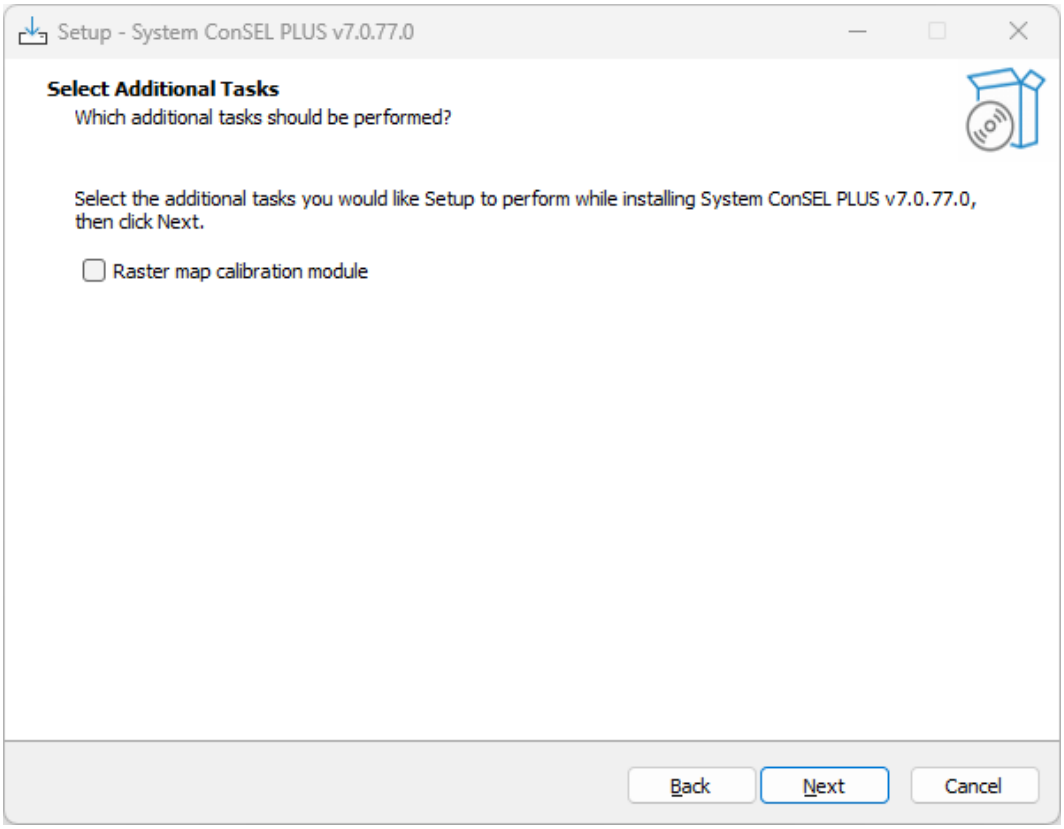


5. Choose instalation versions



If you have purchased license keys, you can choose 'Load purchased license keys.' In this case, you will be prompted to specify the location of the key for loading. If you plan to install the demo version for application testing, select 'demo version', which will generate a 30-day demo key.

6. If you wish to use raster maps, please check the 'Raster map calibration module' option

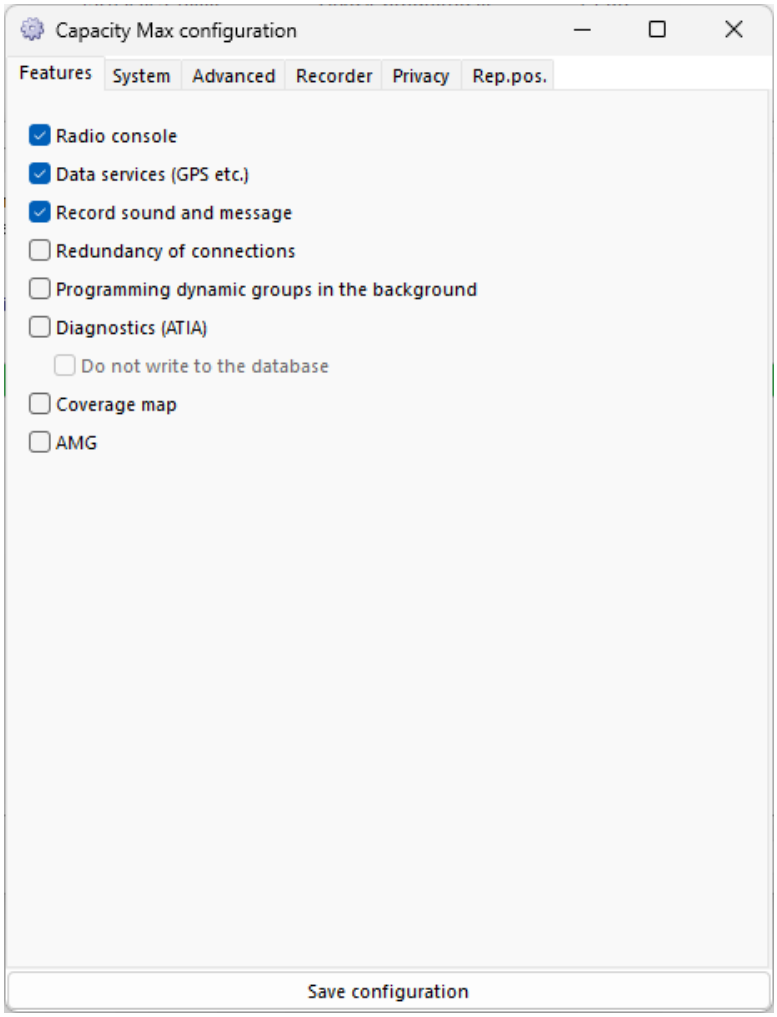


7. Following the above steps, the installation should proceed

4.2.2 Basic Configuration Steps

After the installation, you will be prompted to perform the basic configuration of the radio server.

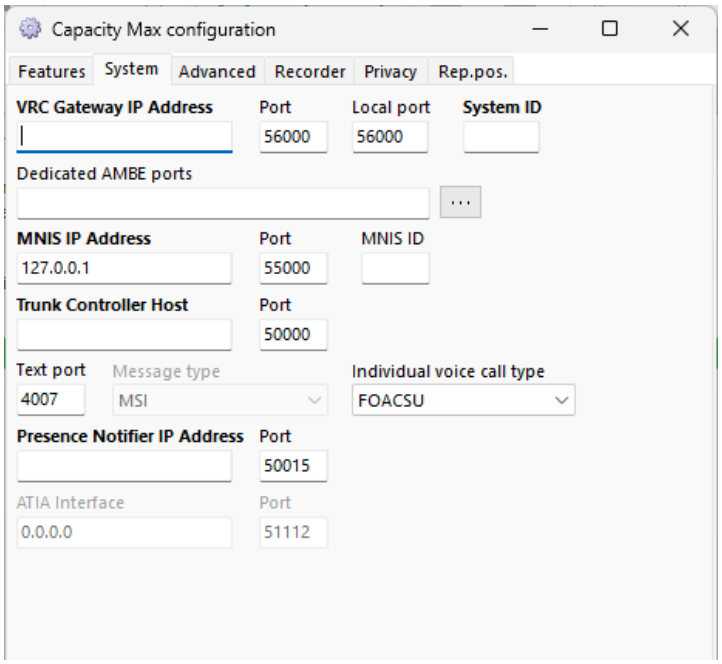
1. Features tab



- **Radio console** - Access to the radio console
- **Data services (GPS etc.)** - The ability to access data such as GPS information or messages
- **Record sound and message** - Recording and saving calls and messages
- **Redundancy of connections** - If you have a redundant radio infrastructure, you can utilize this option
- **Programming dynamic groups in the background** – The capability to program dynamic groups

- **Diagnostics (ATIA)** – Access to data from Advanced Telemetry Information Access
- **Coverage map** – Allows enabling the coverage map feature
- **AMG** - It allows for the retrieval of data shared in the API by other information systems

2. System tab

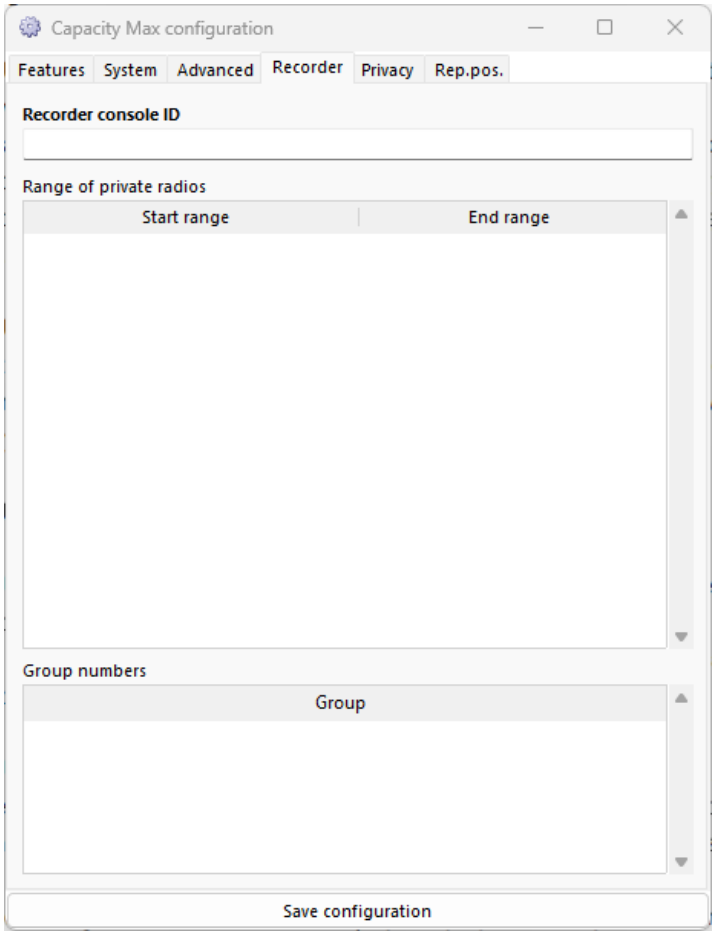


The required fields for completion:

- VRC Gateway IP Address
- System ID
- MNIS IP Address
- Trunk Controller Host
- Individual Voice Call Type (OASCU, FOASCU)
- Presence Notifier IP Address

If the ports used in the radio infrastructure are different from the default ones, they should also be changed.

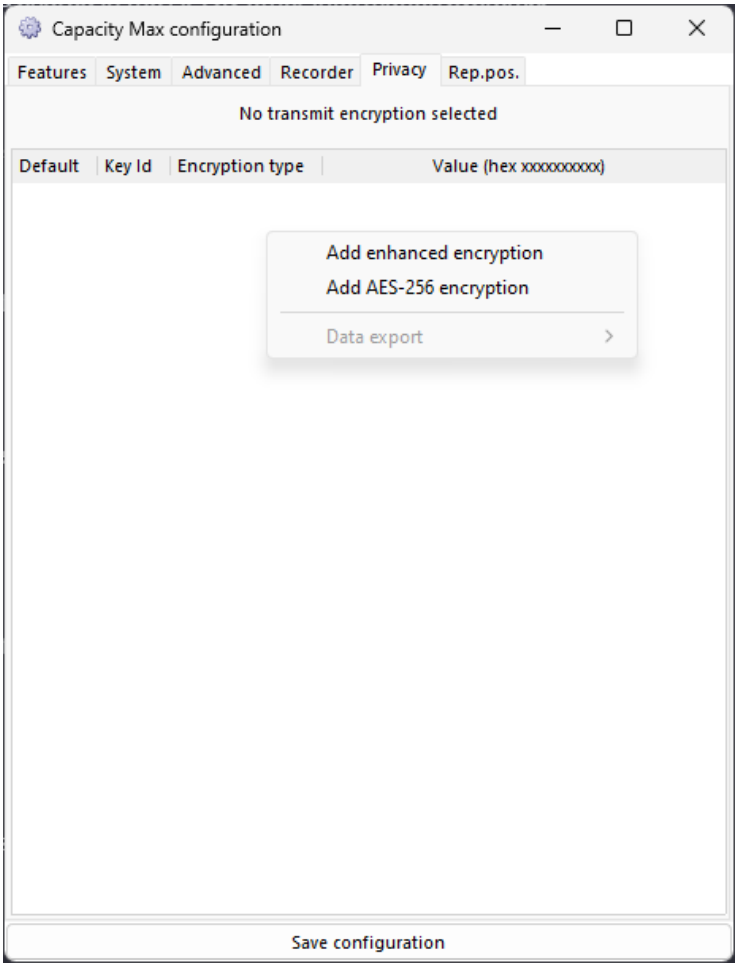
3. Recorder tab



The required fields for completion:

- Recorder console ID – The console ID through which the recorder will save conversations on the radio server
- Range of private radios – check in SAC in RM (Radio Management) range of radios (lowest and highest value of ID)
- Group numbers – groups that have been added in RM as TG

4. Privacy tab



If audio stream encryption is applied in the system, it is also necessary to add it in the privacy tab.

The available encryption includes enhanced encryption and AES256. In both cases, it is necessary to provide the key ID and the encryption key value.

4.3 Installation and basic configuration of ConSEL PLUS Console Client

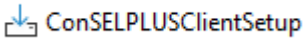
After installing the ConSEL PLUS radio server, you can install the ConSEL PLUS Console Client. To do this on the machine that will serve as the dispatcher console, you have two installation options:

a. The installation file is located in the "Aksel" folder within the directory where the radio server is installed. Its name is **ConSELPLUSClientSetup.exe**. This file should be copied and executed on the machine where you intend to install the client.
b. In a web browser, enter: **[radio server IP address]:5595**, which will initiate the client download.

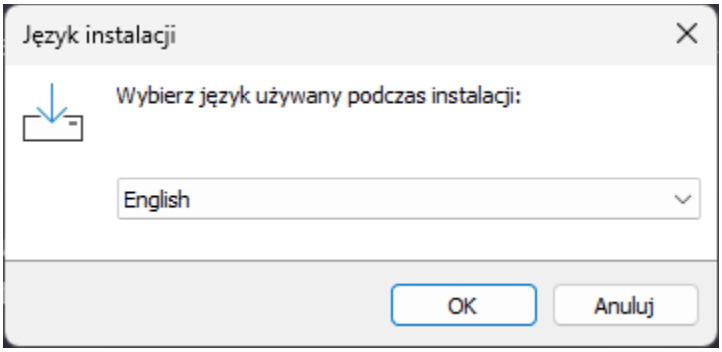
Please note that the ConSEL PLUS Console Client must be in the same IP network as the server!

4.3.1 The installation of the ConSEL PLUS client

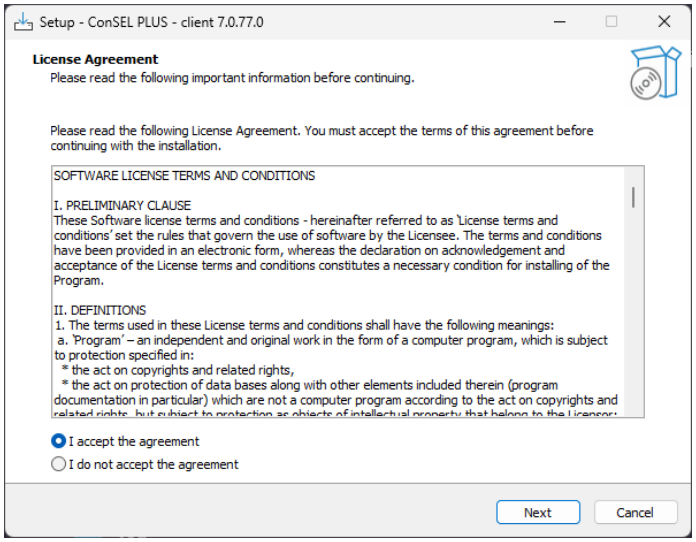
1. Run the client installation file



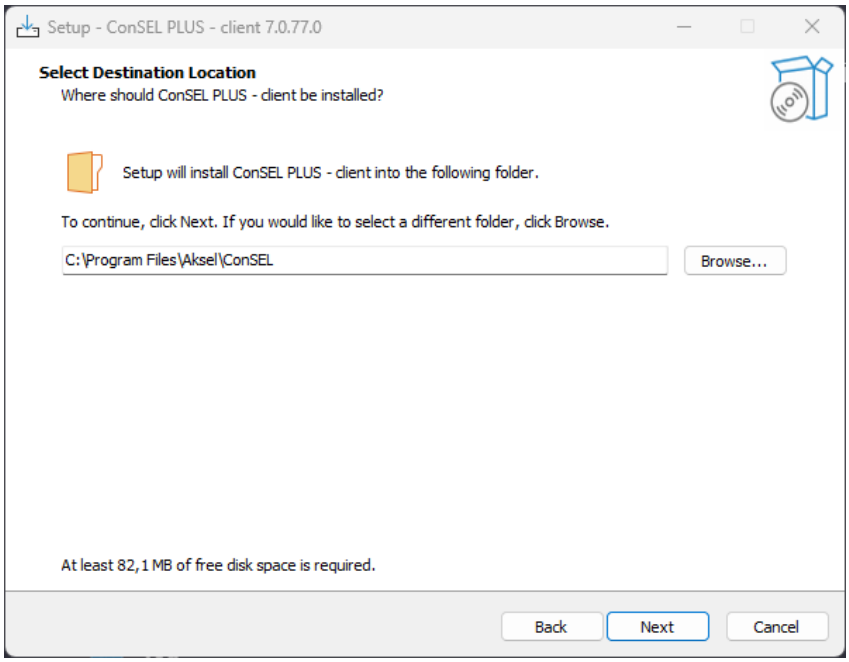
2. Chooose language



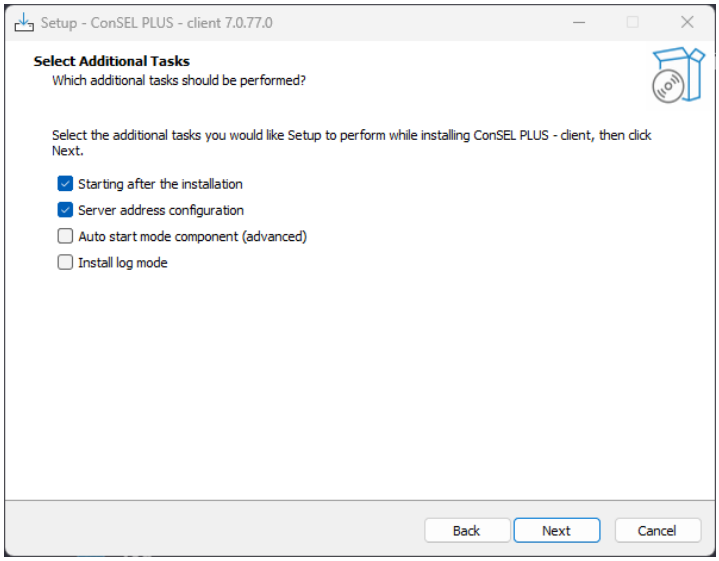
3. Accept License Agreement



4. Select Destionation Location



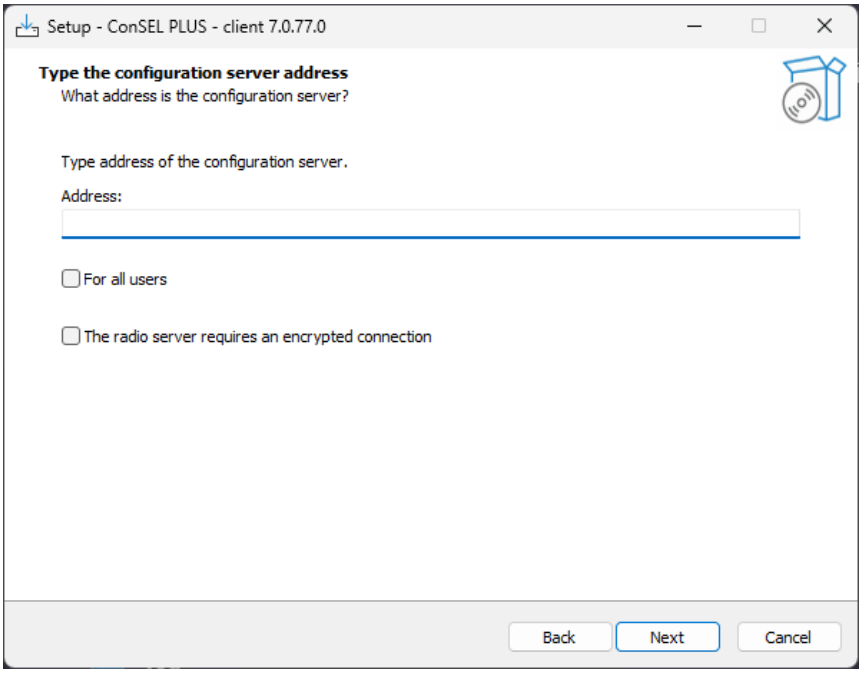
5. Select Additional Tasks



When installing the client, you can select additional tasks:

- **Launch after installation** – ConSEL PLUS client will be launched after installation.
- **Server address configuration** - during the installation, the server address configuration window will be displayed.
- **Auto-run component (advanced)** - an option thanks to which the client application will be automatically launched at system startup and after it is shut down.
- **Install in log mode** - during the installation, a window with the configuration of the log server address will be displayed.

6. Type the Configuration Server Address



The configuration address is the IP address of the machine where the radio server is installed.

If the radio server requires encryption of data transmission (not related to encrypting conversations), check this option for later entry of the password used in the radio server when enabling encryption.

7. After clicking 'Next,' the client will be installed, and application will run.

4.3.2 Basic configuration of ConSEL PLUS Console Client

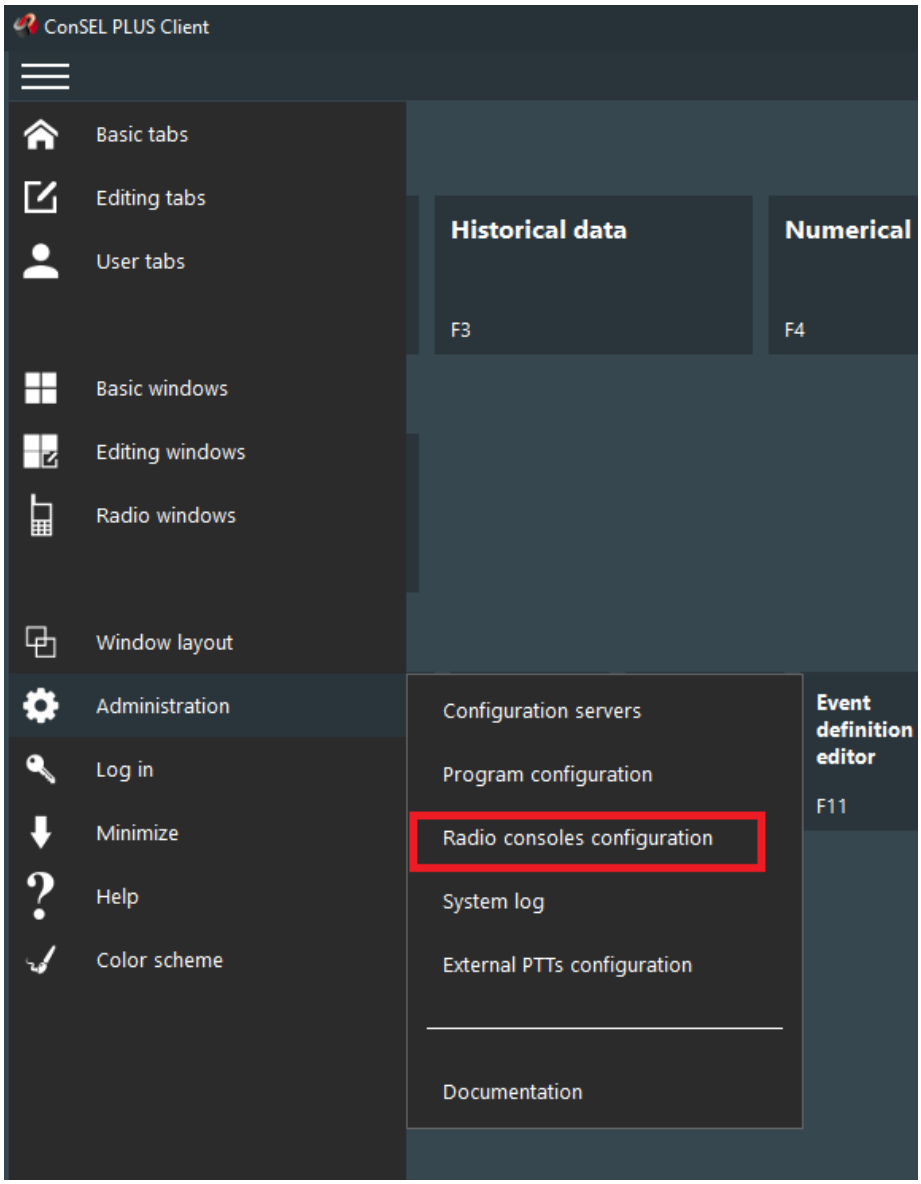
1. Setting up Administrators login and password

Create an administrative account by entering a login and password, and confirm the information.

2. After this step, the user will be prompted to re-enter the previously created login and password.

3. If all previous steps are completed successfully, After installing ConSEL PLUS, a shortcut on the desktop will be created. After pressing it twice, the ConSEL PLUS console client will start.

   In order for the system to work properly, the dispatcher's console must be additionally configured. The Console Administration window is available from the main program menu

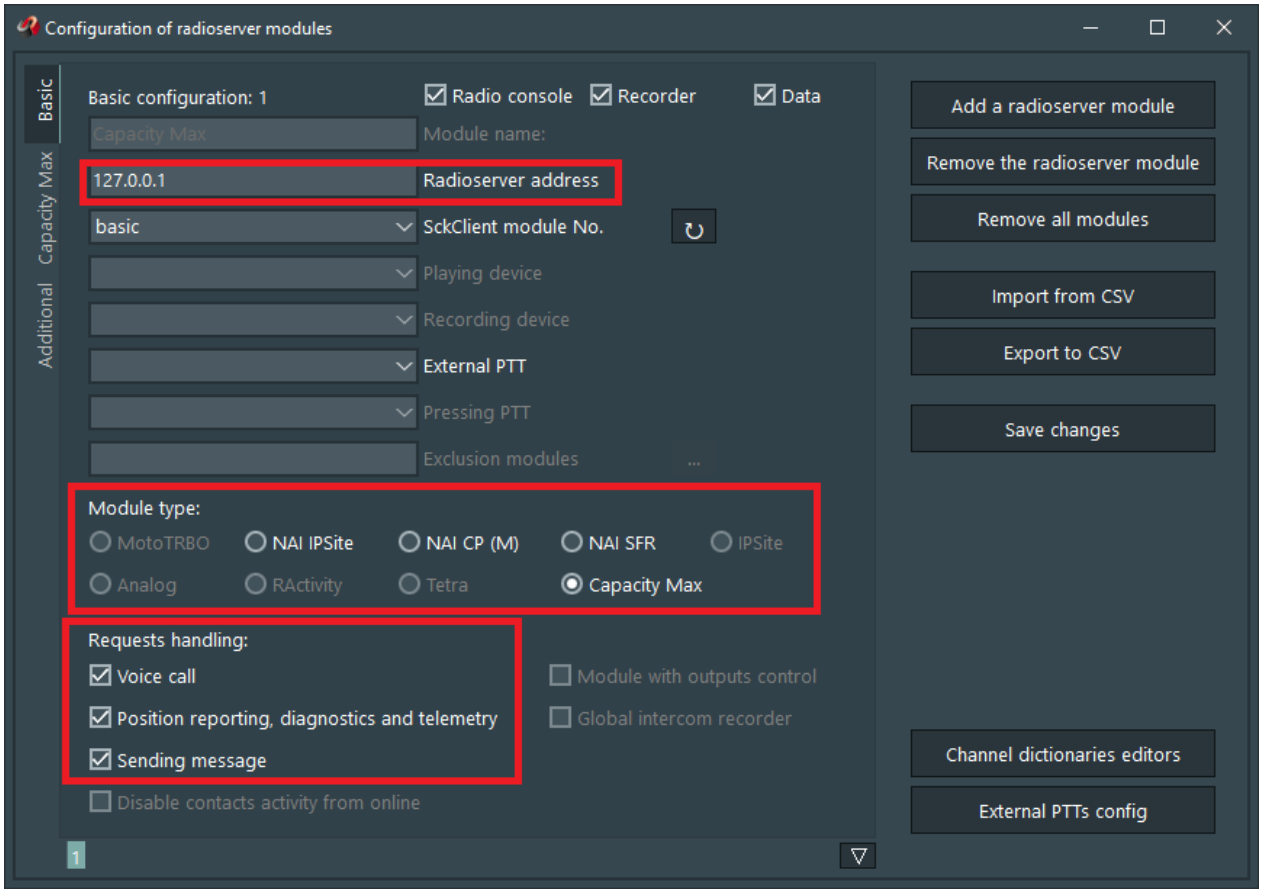


4. After opening the 'Radio Consoles Configuration' window, you should configure:

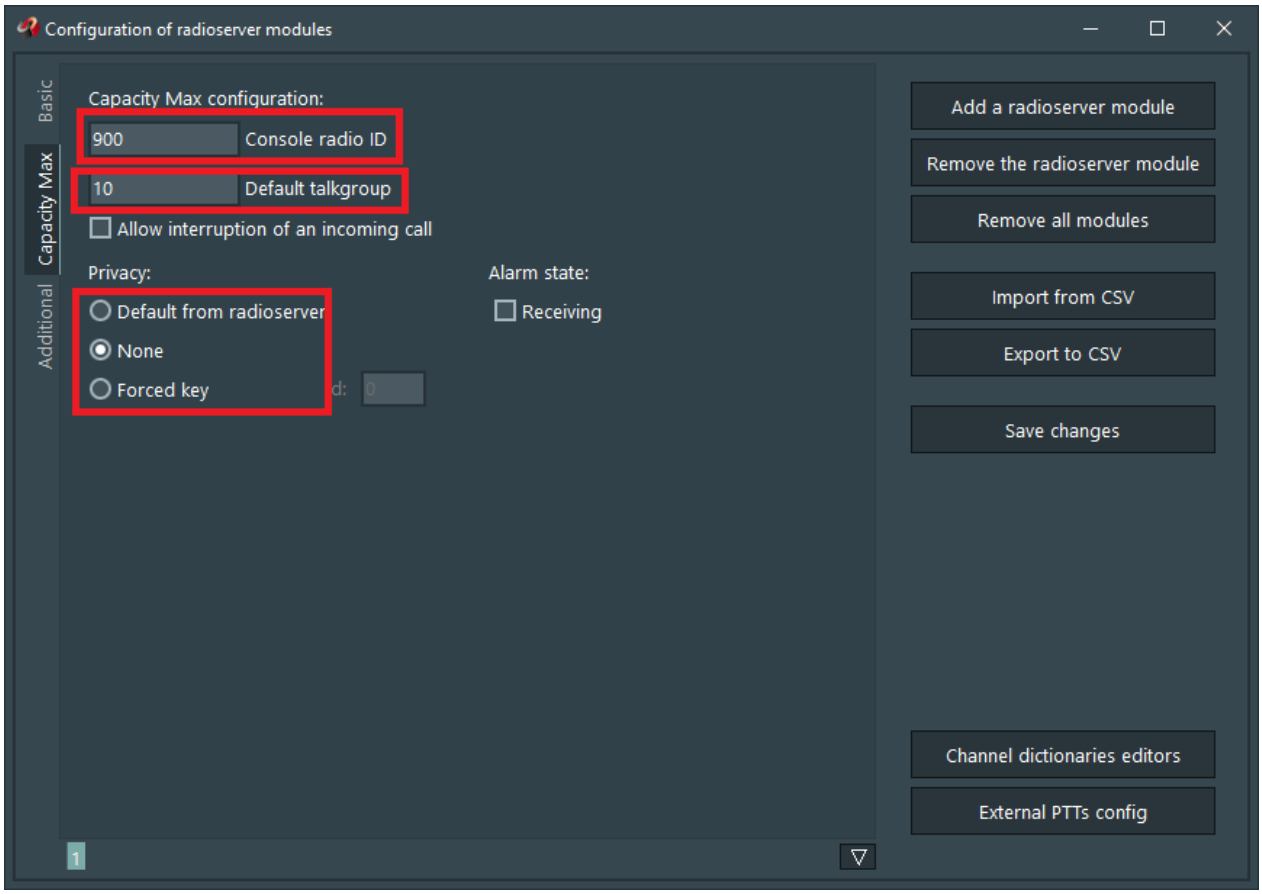
   - Radio server address

   - Module type (in our case, Capacity Max)

   - Requests handling (what our console should handle)



In the next step, moving to the 'Capacity Max' tab, enter the Radio Console ID and the default talkgroup. If privacy is enabled in the system, you can set it to 'default from radioserver.'



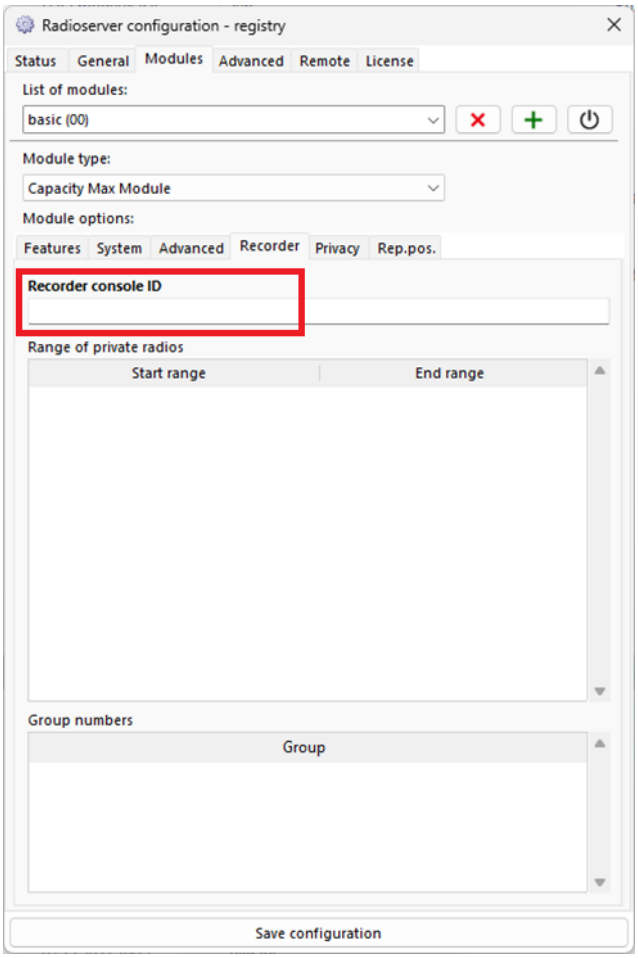
Important! The Radio Console ID must match the one set in the Radio Management dispatcher contact. The default group must also match one of the existing groups in Radio Management.

Additional information regarding the configuration of radio panels and other components of ConSEL PLUS software can be found in additional documents prefixed with 'HowTo,' as well as in the user manuals.

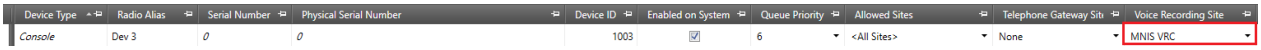
5. Critical configuration elements

1. Recorder Console ID

To enable the use of the recorder, you need to specify the appropriate ID of the recording console in the radio server under the Modules tab.



Remember to set the appropriate parameter in the 'Voice Recording Site' column in Subscriber Access Control in the Radio Management tool for this ID.



2. HeGPS in ConSEL PLUS

To use HeGPS, on the CoSEL PLUS side, in the radio server application, go to the 'Modules' tab, then 'Pos. Rep.' (Position Reporting). In the bottom part of the window, in the 'Reporting type' column, select 'CSBK Enhanced.' On the Radio Management side, set CSBK as the GPS type and configure the geographic coordinates for SITE.

3. Enhanced GNSS Window Size

To properly set the Enhanced GPS Window Size parameter in Radio Management, first, during the configuration of GPS position reporting on the object (Properties - right mouse button - edit), use a calculator to calculate the window size value.

After determining the window size, set this parameter in Radio Management.

4. Private Call Type

In both the 'module' section of the Radio Server Configuration and in Radio Management, set the type of private calls (FOASCU, OACSU). The parameter must be the same in both cases.

5. Dispatcher and radio contact

To both send messages to the console and make private calls, add two contacts with the same ID in Radio Management. One contact is the dispatcher contact, and the other is the radio contact. In this setup, messages from the radio will be sent to the dispatcher contact, while private messages will be made to the radio contact.