TRBOnet Swift CPS

User Guide

Version 1.9.0

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Contents

1   Introduction

1.1   About This Guide

This document is intended for engineers responsible for building MOTOTRBO radio networks and programming two-way radios for end users.

1.2   About TRBOnet Swift

TRBOnet Swift is a family of hardware products by Neocom Software, Ltd designed for use in MOTOTRBO radio networks. The TRBOnet Swift family hardware is presented by RoIP gateways A100 and A200, option board ST002.

1.3   Contacts

Region	Phone	Email & Support
EMEA	+44 203 608 0598	info@trbonet.com — general and commercial inquiries
Americas	+1 872 222 8726	support@trbonet.com — technical support
APAC	+61 28 607 8325	https://trbonet.com/kb/ — online knowledge base

2 Overview

2.1 About TRBOnet Swift CPS

TRBOnet Swift CPS is a configuration editor designed for programming MOTOTRBO GOB option boards and the TRBOnet Swift family electronic devices with Swift Event Logic on board.

TRBOnet Swift CPS can work with configuration files and with configurations loaded from devices. In addition, it can update the device firmware, read device memory, and program devices with an extended configuration provided by Neocom Software, Ltd by customer request.

The intuitive user interface serves to facilitate every step of device programming.

- Automatic detection of a connected device

  TRBOnet Swift CPS can connect devices using the USB, LAN, or OTAP interface. Devices connected to USB are detected automatically. The number of connected devices is only limited by the number of USB ports available on the computer.

- Device-specific settings only

  TRBOnet Swift CPS displays the configuration settings specific to a given type of device. Where possible, the recommended settings are set by default.

- Event Logic defined by rules

  Rule Editor facilitates the process of building Event Logic rules from configurable components. This tool allows the user to create new rules from copies with minimum effort.

- Sample configuration files

  TRBOnet Swift CPS comes with a set of sample configuration files for all supported devices. Sample configurations include the default device-specific settings and demonstrate the use of rules for setting up various Event Logic features. Sample files can serve as a starting point for creating device configurations when other configuration sources are not available.

2.2   About Swift Event Logic

TRBOnet Swift Event Logic is a unified programmable environment supported by TRBOnet Swift DT500, TRBOnet Swift ST002, and MOTOTRBO GOB. The basic configurable components of Swift Event Logic include events, conditions, and actions.

Swift Event Logic extends the capabilities of a standard radio network by implementing special features such as Lone Worker, Man Down, No Movement, Crash Detect, Speed Limit, Telemetry, GeoRoaming, and GeoFencing.

2.3   Software Requirements

Category	Requirements
CPU	Intel Core i3
Memory	4 GB
Display	1280x1024 minimal resolution, 1600x900 recommended resolution
Additional Devices	Speakers
Supported OS	Windows 7, Windows 8, Windows 10
Software	.NET Framework 4.6.1

2.4   Licensed Features

TRBOnet Swift Event Logic features are available on terms of commercial licensing. The following table describes the licenses that you need to purchase and activate on your device to use particular features.

Note: If a configuration uses commercial features, they do not work until the required license is purchased and activated on that device.

License	Description	Related features
Location Tracking	This license enables getting GNSS and iBeacon data from the radio.	Sending GNSS reports to TRBOnet Server, Speed Limit, GeoRoaming, Geofencing, etc.
Personal Safety	This license enables getting data from the G-meter.	Man Down, No Movement, Crash Detect, etc.
Voice Recording	This license enables downloading voice call records and playing them back.	Voice Recording

The Lone Worker feature is enabled on a device when any of the above licenses is activated.

3 Installation and Upgrade

The following table describes how to install, uninstall, upgrade, and load new firmware to your TRBOnet Swift CPS software.

> Notes: The distribution package for TRBOnet Swift CPS is available for download at www.trbonet.com. From the main page, go to **Downloads** and click **Firmware**. Click to download the latest version of Swift Utilities Pack.
>
> Before installing TRBOnet Swift CPS make sure that your computer meets the minimum software requirements. For more information, refer to section 2.3, Software Requirements (page 3).

To install TRBOnet Swift CPS:

- Double-click the TRBOnet Swift distribution file to run the TRBOnet Swift CPS setup wizard. Click **Next**.
- Accept the terms of the license agreement. Click **Next**.
- Click **Install**, then click **Finish** to exit the setup wizard.

To uninstall TRBOnet Swift CPS from your computer:

- Double-click the TRBOnet Swift distribution file to run the TRBOnet Swift CPS setup wizard. Click **Next**.
- Select the **Remove** option.
- Click **Remove**, then click **Finish** to exit the setup wizard.

To upgrade TRBOnet Swift CPS to a newer version:

- Install the new version on your computer as described above. Uninstalling the previous version of the product is not required.

To load new firmware to TRBOnet Swift CPS:

> Note: The firmware for all supported devices is integrated in TRBOnet Swift CPS. When new firmware is issued, you can load it to TRBOnet Swift CPS without upgrading the software to the next version.

- To load firmware to TRBOnet Swift CPS, open the SWU file. The firmware is unpacked and installed automatically.

4 Device Programming

This section describes how to connect your hardware to a computer for programming, how to update firmware, and how to create or update a configuration on a connected device.

4.1 Swift CPS Options

- On the toolbar, click **Tools > Options**.
- In the left pane, select **Options > General**.
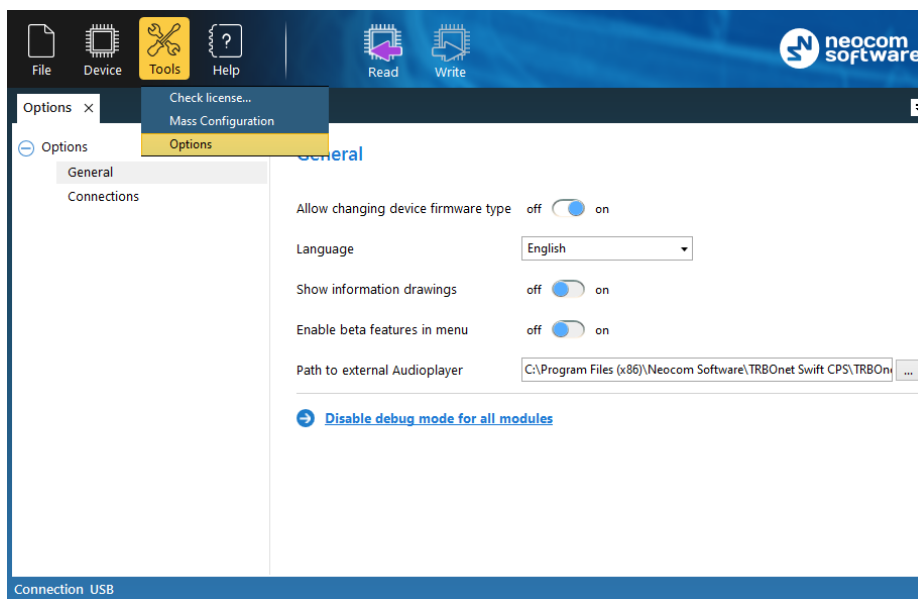
In the right pane, specify the following Swift CPS-related options:

- **Allow changing device firmware type**
  Setting this option to ON will allow you to select the device mode when updating firmware on the device (see section 4.3,Firmware Update, step 5).

- **Language**
  From the list, select the interface language.

- **Show information drawings**
  If you set this option to ON, useful information drawings will be shown at the bottom of the right pane when configuring device's Audio Settings and I/O Settings.

- **Enable beta features in menu**
  If this option is set to ON, all beta features will be shown in Logic section.

  Note: This option is intended for advanced users only.

- **Path to external Audioplayer**
  This is the full path to the TRBOnet audio player. If required, click the ellipsis button (**...**) and specify a different path for the audio player.

- **Disable debug mode for all modules**
  Click this link to disable the Debug mode in all available modules.

4.2   Device Connection

TRBOnet Swift CPS can communicate with supported hardware over USB, LAN, or OTA (Over the Air). To use a particular interface, launch TRBOnet Swift CPS, expand the **Connection** menu and choose the required option.
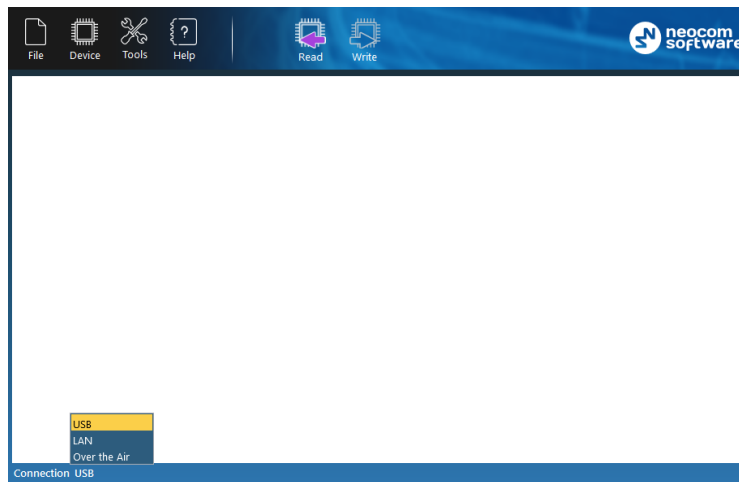
The selected connection appears on the status bar, for example, "Connection: USB".

USB connection

A USB connection is recommended for programming any supported hardware. This connection does not require any settings. Just connect the programming cable to the device and to a USB port of your computer, then launch TRBOnet Swift CPS and work with the device. Use the programming cable supplied with your device or recommended for use by the manufacturer of the device.

LAN connection

A LAN connection can be used for programming any hardware that can be connected to an IP network. Your device must be powered and connected to the same LAN where TRBOnet Swift CPS is installed. A brand new device has the following default IP settings:
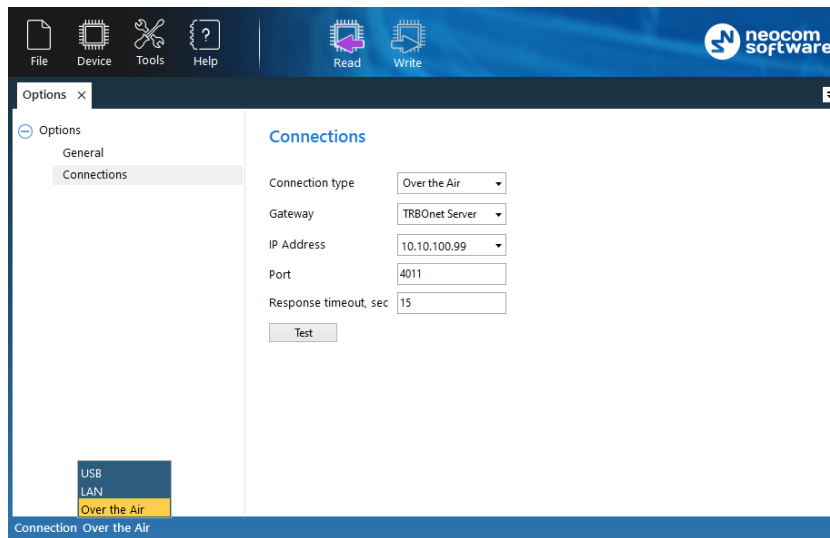
- IP address: 192.168.0.[xxx]
- Subnet mask: 255.255.255.0
- Default gateway: 192.168.0.1

You may need to adjust the IP settings of your computer accordingly.

4 Device Programming

Over the Air connection

An OTA connection is used for over-the-air programming of endpoint devices such as DT500 connected to a MOTOTRBO radio or an option board ST002 installed into a MOTOTRBO radio.

- On the **Connection** menu, select **Over the Air**, and go to **Tools> Options > Connections**.

- Specify the following OTA connection settings:

| Setting	Description
Gateway	The gateway that can establish an IP connection with TRBOnet Swift CPS and that can communicate with the device over the air. Values: - **TRBOnet Server** - **Swift IP Gate A100/A200**
IP address	The IP address of the gateway selected above.
Port	The Forward Data service port of the TRBOnet Server (if selected above). Default: 4011 To get the port number, launch the TRBOnet Enterprise (PLUS) Server application and select **Radio Systems > Services** in the left pane. Find the port number under the **Forward Data service** option. Note: Make sure that the **Forward Data service** option is selected.
Response timeout	The time period, in seconds, to wait for a response from the server side (TRBOnet Server, Swift IP Gate).

4.3   Firmware Update

Before you proceed to device programming, we recommend that you update the device firmware to the latest version using TRBOnet Swift CPS.

If your device is already configured, the configuration will be cleared from the device memory after you update the firmware. To preserve the current configuration, save it to a file and reload it to the device after the firmware update.

To update the firmware version:

1. Launch TRBOnet Swift CPS on your computer.
2. Connect your device to the computer and point the connection type in the TRBOnet Swift CPS settings. For details, refer to section 4.2, Device Connection (page 5).
3. On the **Device** menu, click **Read**, or click the **Read** button on the toolbar.
4. In the **Device Information** pane, click **Update Firmware**.
5. In the **Firmware update** window, select your device connected through USB.
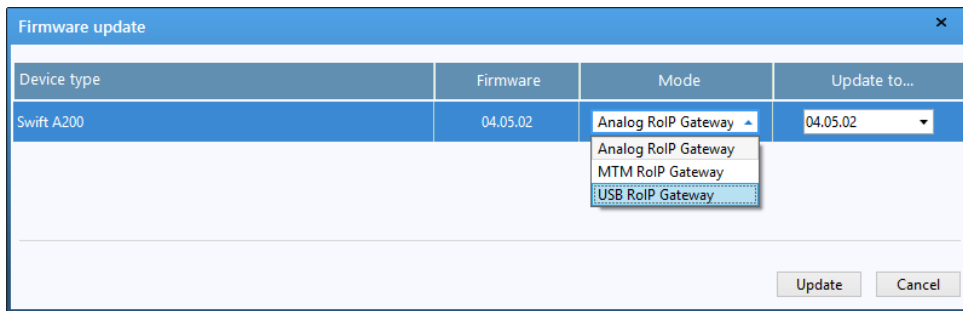
> Note: If TRBOnet Swift CPS cannot detect a USB device, the cause may be the hardware driver not found on your computer. For details, refer to the user manual provided for your device.

6. Open the **Mode** menu and click the preferred mode.

> Note: If the **Mode** menu is read-only, close the **Firmware update** window. Then open the **Tools** menu and click **Options**. Make sure that the **Enable changing device mode** option is set to ON.

7. In the **Firmware update** window, open the **Update to** menu and click the firmware version to which the device will be updated. You can select the latest version or roll back to an earlier version if required.
8. Click **Update** to start the firmware update. The progress bar shows the progress of the operation.

4.4   Device Configuration

This section describes how to configure Swift Event Logic and connections with external hardware, how to work with configuration files, and how to perform read and write operations on a device.

4.4.1 Configuration Files

This section describes operations with a configuration file in TRBOnet Swift CPS.

4.4.1.1 Opening a Configuration File

In TRBOnet Swift CPS, you cannot create a configuration file from scratch. Instead, you need to open an existing configuration file, make the required changes, and save the result to a file or load it to a connected device.

You can open a configuration from a file, for instance, from a sample file installed with TRBOnet Swift CPS. Or, you can read a configuration file from a connected device.

To read a configuration from the device:

- Connect a configured device to a computer. Select the connection type.
- On the **Device** menu, click **Read**, or click the **Read** button on the toolbar.
- (Optional) Specify the connection settings and click **Read**.
- (Optional) If more than one connected device is detected, click the required device in the dialog box. Then click **OK**.

To open an existing configuration file:

- On the **File** menu, click **Open**. Navigate to the required folder and select the configuration file. Then click **Open**.
- Double-click the SWR file in the folder.
- Drag the SWR file and drop it within the TRBOnet Swift CPS window.

To open a sample configuration file:

- On the **File** menu, click **Open Sample**.
- In the folder, click the sample file intended for your type of device. Click **Open**.

TRBOnet Swift CPS displays each opened configuration on a separate page. The label of the page displays the name of the opened file or the device and the used connection.

If you open multiple configurations, they appear each on a separate page. You can work with them in parallel.

4.4.1.2 Updating a Configuration File

An opened configuration appears on a separate page in the main window of TRBOnet Swift CPS. The left panel of the page displays the logical sections of the configuration. If you click a particular section, the right panel shows the related configuration settings.

The **Device** section includes the general information such as the type of device (model), the firmware version, the last date when the configuration was updated on the device, and the statuses of all features that require a license. To learn how to apply a license, refer to section 5, Licensed Features (page 39)
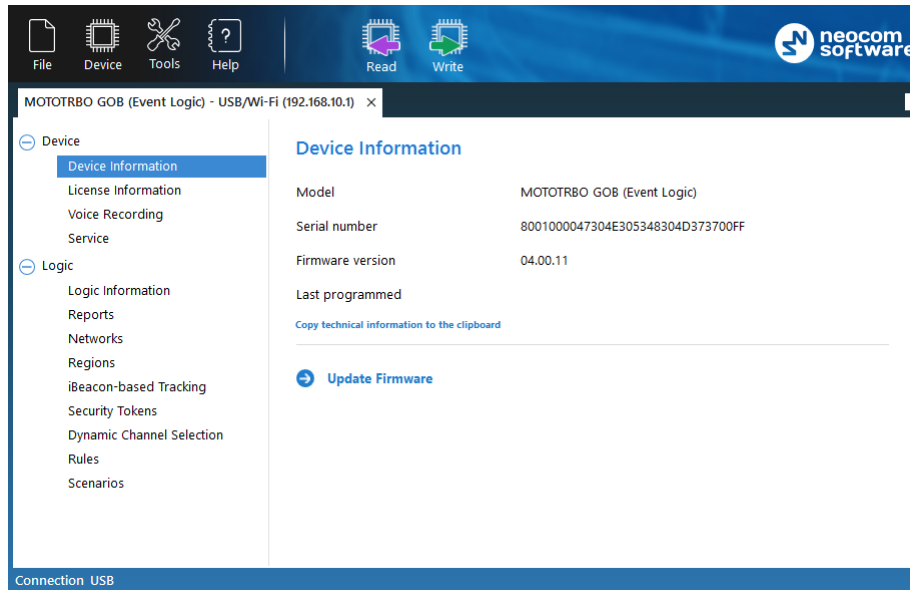
Note: When you open a configuration file, the device information and the license information apply to the device whose configuration has been saved to the file.

If a device has external interfaces (RS-232, GPS, GPRS, other), the **Device** section includes additional sub-sections to configure communication through each external interface. To learn how to configure external connections of a device, refer to section 4.4.2, Connection Settings (page 11).

The **Logic** section includes the Swift Event Logic configuration settings such as rules, report profiles, network profiles, and other. If a device does not support Swift Event Logic, the **Logic** section is hidden. To learn how to configure Swift Event Logic settings, refer to section 4.4.3, Swift Event Logic (page 13).

4.4.1.3 Saving a Configuration File

You can save an opened configuration to a file or load it to the memory of a connected device. If you just close the configuration page or the application window, you cancel all the changes without a prompt.

To write a configuration to a connected device:

- On the **Device** menu, click **Write**, or click the **Write** button on the toolbar.
- (Optional) Specify the connection settings and click **Write**.
- (Optional) If multiple connected devices are detected, point the required device in the dialog box. Click **OK**.
- (Optional) If you write the configuration initially created for a different type of device, confirm the operation.

Note: A configuration written to a different type of device includes all definitions from the **Logic** section of the left panel. Connection settings in the **Device** section are not written to a different type of device.

4 Device Programming

To save a configuration to a file:

- On the **File** menu, click **Save As**.
- Go to the required folder. Click an existing SWR file to be updated, or type the name of a new configuration file to be created. Click **Save**.

4.4.2 Connection Settings

This section describes how to configure connections between your device and external hardware. To configure connections, open a configuration in TRBOnet Swift CPS as described in section 4.4.1.1, Opening a Configuration (page 9). The **Device** section in the left pane includes all connection settings available for the given device.

4.4.2.1 Audio Settings

A configuration includes the **Audio Settings** section if you configure TRBOnet Swift A200 that is connected with the radio through the audio cable. Adjust the volume of the transmitted audio signal by changing the following settings.

Setting	Description
Level of the input audio signal	The level of the input audio signal in the range of -42Db to 20 Db.
Level of the output audio signal	The level of the output audio signal in the range of -42Db to 20 Db.
Level of amplification of the input audio signal	The amplifier of the input audio signal.
Input for Audio	The divider of the input audio signal. Values: • **IN1**: The divider is disabled (default). • **IN2**: Switch to this setting to the switch to lower the level of the input signal from the connected non-MOTOTRBO radio.

4.4.2.2 I/O Settings

When you configure TRBOnet Swift A200, a device configuration includes the **I/O Settings** section.
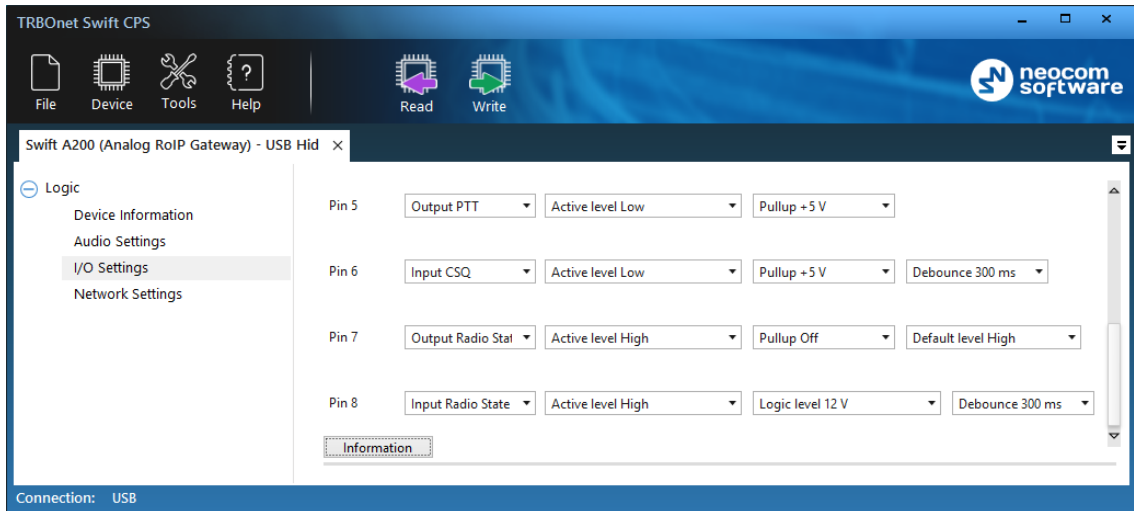
In the right panel, the physical I/O connector pins of Swift A200 appear as labels **Pin 1** through **Pin 8**. For each connected physical pin, specify the settings as described in the following table.

Setting	Description
Pin function	The function of the I/O pin. The value depends on the connected hardware: ▪ If the pin is connected to external hardware, select the matching logical pin in TRBOnet software. Values: **Input** [**1** : **10**], **Output** [**1**: **10**] ▪ If the pin is connected to a radio connector pin through the service cable, specify the pin function. Values: **Radio control input, Radio control output**, **Input CSQ**, **Output PTT**. ▪ If the pin is not connected, select **Unassigned**.
Active level	The active level of the physical pin. Values: **Active Level High**, **Active Level Low**.
Pullup	The pull-up. Values: **Pullup Off** , **Pullup +5 V**.
Logical level (pullup off, input pins only)	The logical level of the input pin. Appears if the pull-up is off. Values: **Logic level** [**1.8 V** | **3.3 V** | **5 V TTL** | **5 V CMOS** | **9 V** | **12 V**].
Default level (output pins only)	The level set on the output pin by default after restart of the device. Values: **Default level Low**, **Default level High**, **Save last state**.
Debounce	The debounce of the input signal. Values: **Debounce** [**off** | **100** | **200** | **300** | **500** | **700** | **900**] **ms**.

Note: To learn the details about configuring the I/O pins of Swift A200, refer to the *TRBOnet Swift A200 User Manual*. You can download the TRBOnet Swift A200 documentation from www.trbonet.com.

4.4.2.3 Network Settings

A configuration includes the **Network Settings** section when you configure Swift A200. To configure the IP connection between the device and the TRBOnet network, specify the following settings.

Setting	Description
IP address	The IP address assigned to the device.
Subnet mask	The mask of the subnet to which the device belongs.
Default gateway	The default gateway of the IP network.
MAC address	The network address of the device.

4.4.3 Swift Event Logic

This section describes how to configure the Swift Event Logic settings on a device.

4.4.3.1 Operations with Logic

You can import and export the **Logic** section of a configuration using commands on the **Logic Information** page.
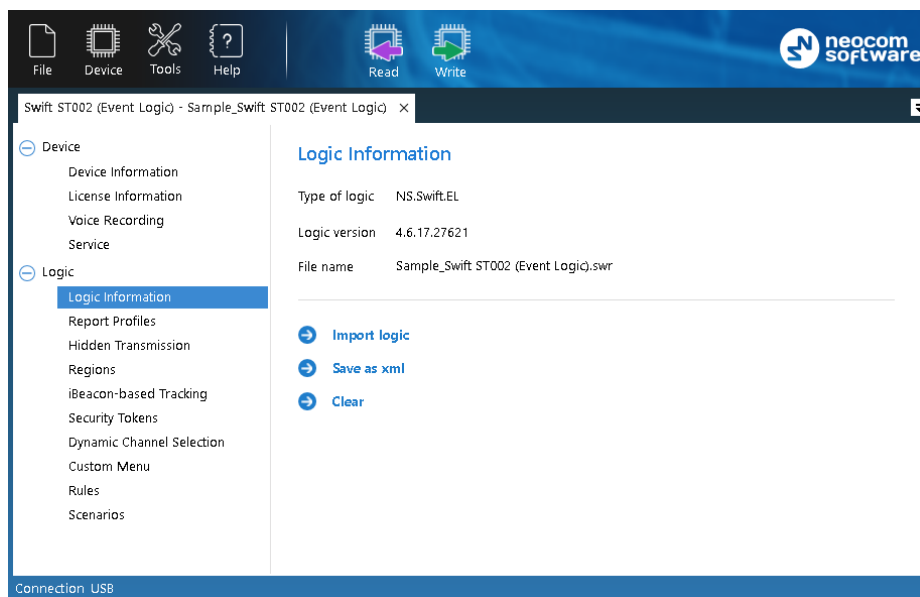
Use these commands only when requested by the support team of the product vendor. In all other cases, manage the device configuration as described in section 4.4.1, Configuration Files (page 9).

To save logic to XML file:

- On the **Logic Information** page, click **Save as xml** in the right panel.
- Go to the destination folder and save the file with the preferred name.

To import logic from XML or SWR file:

- On the **Logic Information** page, click **Clear** in the right panel. The **Logic** section now displays **Logic information** only.

- Click **Import logic**.

- In the system dialog box, select the type of file with the external logic – XML or SWR. Select the file and click **Open**.

  The logic imported from SWR is displayed in the **Logic** section. The logic imported from XML is not displayed, the **Logic** section only includes **Logic information**.

  The **Logic information** section shows the name of the source file.

4.4.3.2 Report Profiles

If configured accordingly, a device can collect incoming information in the memory, create data sequences (reports), and send them to TRBOnet Server over a radio channel or via a Wi-Fi connection. Reports typically include the current location of a connected radio and telemetry from the input pins.

To define rules for creating and sending reports, create a profile with report settings. You can create as many profiles as necessary. One profile must be indicated as default. The default profile is loaded to the device memory at startup.

To configure report settings in an opened configuration, click **Report Profiles** in the **Logic** section of the navigation panel.
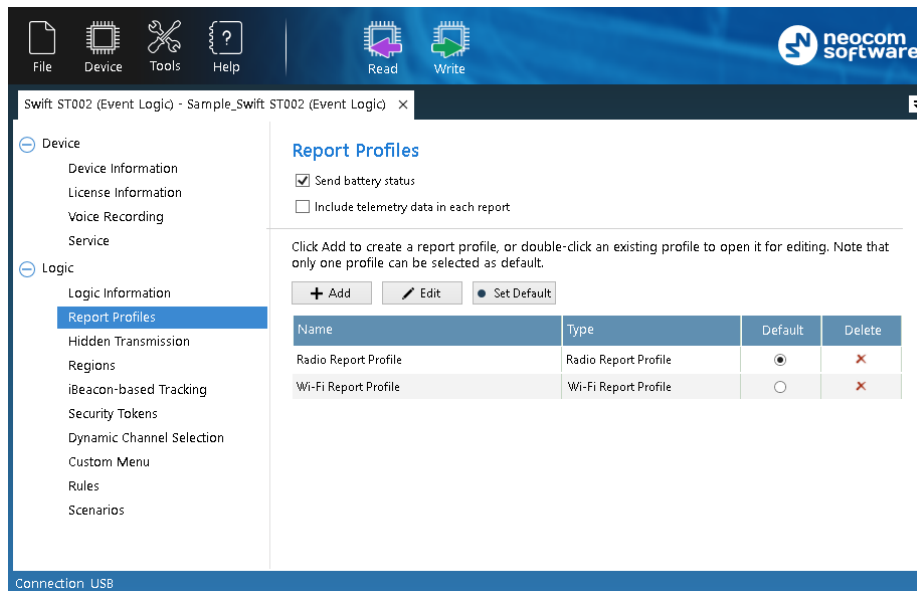
The **Report Profiles** page displays all profiles with report settings that are defined in the opened configuration.

- **Send battery status**
  Select this option so that the radio will include battery status each time it sends a data packet to TRBOnet Server.

- **Include telemetry data in each report**
  Select this option so that the radio will include telemetry data in each report.

In the default configuration, there are two predefined report profiles: **Radio Report Profile** and **Wi-Fi Report Profile**.

You can manage report profiles as described below.

To create a profile:

- Click **Add**. On the drop-down menu, click either **Radio Report Profile** or **Wi-Fi Report Profile**.

- In the **Radio Report Profile**/**Wi-Fi Report Profile** window, specify the report settings as described in section 4.4.3.2.1, Editing Report Profile (page 15).

- Click **OK**.

To set a default profile:

- Select the profile and click **Set Default**,
  or
  Click the appropriate radio button in the **Default** column.

To edit a profile:

- Select the profile in the list and click **Edit**,
  or double-click the profile.

- Edit the report settings as described in section 4.4.3.2.1, Editing Report Profile (page 15).

- Click **OK**.

To delete a profile:

- Click the appropriate Delete icon () in the **Delete** column.

  The profile will be deleted and cannot be restored. If you delete the default profile, the last profile in the list will become the default one.

Note: You cannot delete the last remaining profile.

4.4.3.2.1 Editing Report Profile

Specify the report settings in the **Report Profile** window. Click **OK** to save the profile.
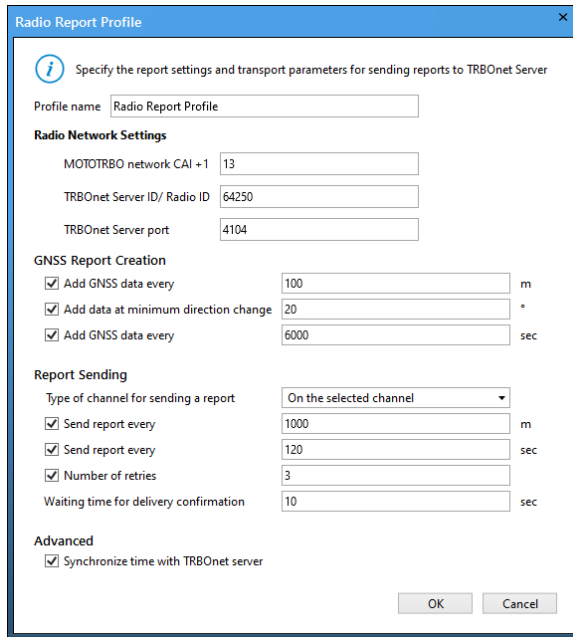
- **Profile name**
  Enter the name of the report profile.

Depending on the selected Report Profile type (Radio or Wi-Fi), you will see the corresponding network settings:

Radio Network Settings

- **MOTOTRBO network CAI +1**
  The MOTOTRBO network identity (CAI) increased by 1. This increment is required to send data to TRBOnet Server. Example: If MOTOTRBO CPS defines the network CAI 12, enter 13.

- **TRBOnet Server ID/Radio ID**
  The unique radio ID of TRBOnet Server in the MOTOTRBO network.

- **TRBOnet Server port**
  The port of the PC where TRBOnet Server is running (4104, by default).

Or:

Wi-Fi Network Settings

- **Device ID**
  Enter the Radio ID of the device.

- **TRBOnet Server IP**
  The IP address of the PC where TRBOnet Server is running.

- **TRBOnet Server port**
  The port of the PC where TRBOnet Server is running (4180, by default).

GNSS Report Creation

- **Add GNSS data every (m)**
  The GNSS data will be added to the report each time the specified distance (in meters) is traveled.

- **Add data at minimum direction change**
  The minimum direction change, in degrees, at which GNSS data is added to the report.

- **Add GNSS data every (sec)**
  The GNSS data will be added to the report each time the specified time interval (in seconds) elapses.

Report Sending

- **Type of channel for sending a report**
  From the drop-down list, select one of the following options:

  - **Do not send**
    Creating and sending GNSS reports is disabled.

  - **On the selected channel**
    The radio sends reports on the currently selected channel.

  - **On the data channel**
    The radio sends reports on the data channel.

- **Send report every (m)**
  The radio will send a report each time the specified distance (in meters) is traveled.

- **Send report every (sec)**
  The radio will send a report each time the specified time interval (in seconds) elapses. Note that in **Wi-Fi Report Profile**, the recommended value for this option is **6 sec**.

- **Number of retries**
  The number of retries for sending a report on the radio channel.

- **Waiting time for delivery confirmation**
 The time interval, in seconds, to wait for a delivery confirmation.

Advanced

- **Synchronize time with TRBOnet Server**
  Select this checkbox so that time on the radio will be synchronized with TRBOnet Server.

4.4.3.3 Regions

The Event Logic rules use geographical regions as input parameters. A region is an area selected on the online map and given a unique name. Allowed are polygonal regions and circular regions with the maximum radius of 65.00 kilometers.

To define regions, click **Regions** in the **Logic** section of the navigation panel.
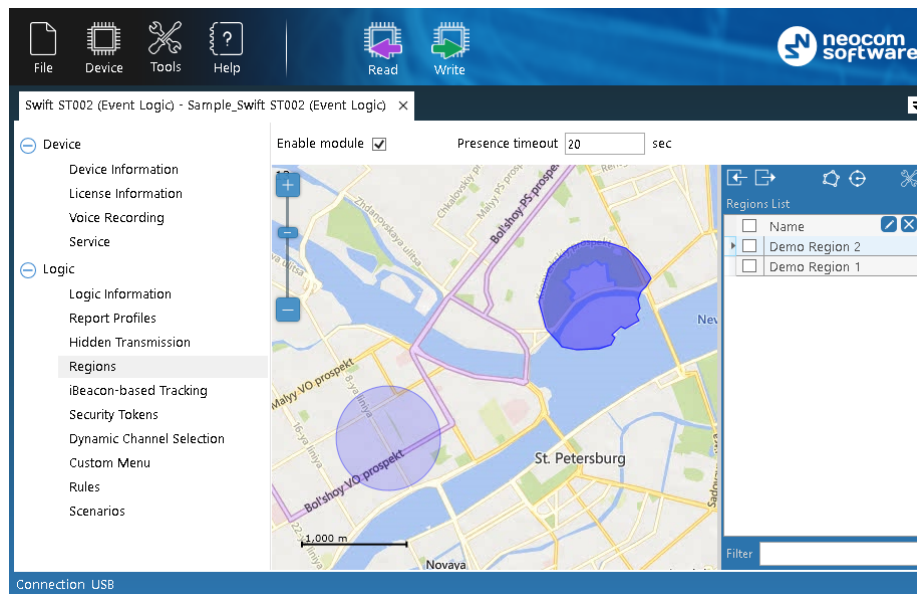
In the right pane, select the **Enable module** option.

In the **Presence timeout** box, specify the minimum duration of stay within (if entered) or out (if left) of the region. This value will be used for Geofencing events.

Regions appear on the map as colored areas. The region names are displayed in the right panel.

The following useful features will help you work with the map:

To pan the map:

- Keep the left mouse button pressed and move the mouse cursor to the required direction.

To adjust the scale level:

- Scroll the mouse wheel to zoom the map.

To select a different map:

- Click the **Edit Map Configuration** button () in the right panel.
- In the **Map Configuration** window, from the **Tile source** drop-down list, select the preferred map.
- Click **Apply**.

Note that in the offline mode, the map is loaded from cache.

To select the cache folder:

- Click the **Edit Map Configuration** button ( ) in the right panel.
- In the **Map Configuration** window, click the **Browse** button next to the **Root cache directory** field. Find the destination folder and confirm the choice. Or, specify the folder path manually.
- Click **Apply**.

You can perform the following operations with map regions.

To add a polygonal region:

- Click the **Create Polygonal Region** button ( ).
- Click the map where the region border will start. Draw the shape of the region, clicking where you want to place nodes. The added nodes connected with lines make a region border.
- Double-click to finish. The first and the last nodes will be connected with a line. The new polygonal region will appear in the right panel under the **Regions List**.

To add a circular region:

- Click the **Create Circular Region** button ( ).
- Click the map where the center of the region will be located.
- Release the mouse button and move the cursor away from the center. The distance from the center (in km) is displayed near the region. The radius of a circular region is restricted to 65 km.
- Double-click to finish. The new circular region will appear in the right panel under the **Regions List.**

To edit a region:

- Double-click inside the region on the map, or in the **Regions List**. The region on the map is highlighted and all of its nodes are displayed.
- To drag a node to a different position, click it and keep the mouse button pressed. To drop the node, release the mouse button.
- To delete a node, right-click it.
- To move the entire region, point to its central point, click and drag it to the new position on the map.
- To save changes, double-click on the map. Or, press Esc to cancel editing.
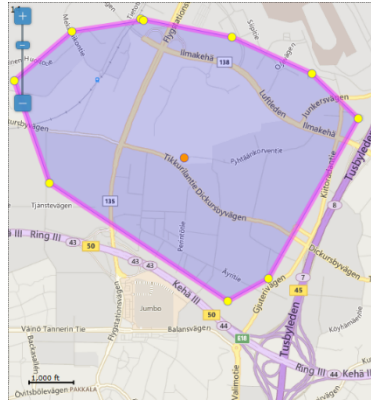
To import regions:

- Click the **Import from KML** button ().
- Confirm to replace all regions.
- In the **Import from KML** window that appears browse for the desired *.KML file, and click **Open**.

To export regions:

- Select desired regions.
- Click the **Export to KML** button ().
- In the **Export to KML** window that appears locate the folder where you want to save the file, type a filename, and click Save.
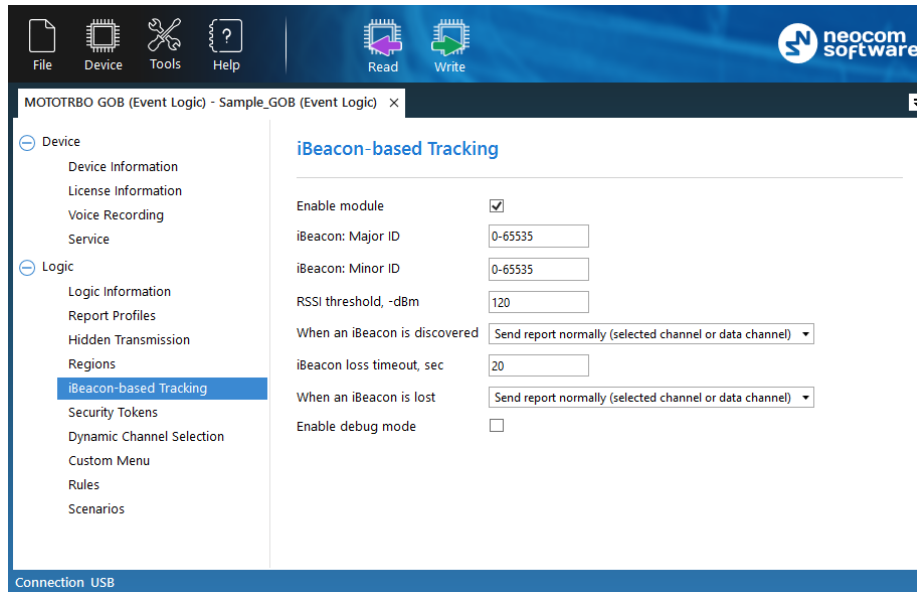
To delete a region:

- Select the region under the Regions List and click the Delete button.

Note: The deleted region cannot be restored with the Undo command.

4.4.3.4 iBeacon-based Tracking

To configure iBeacon tracking, select the **iBeacon-based Tracking** section in the left pane.
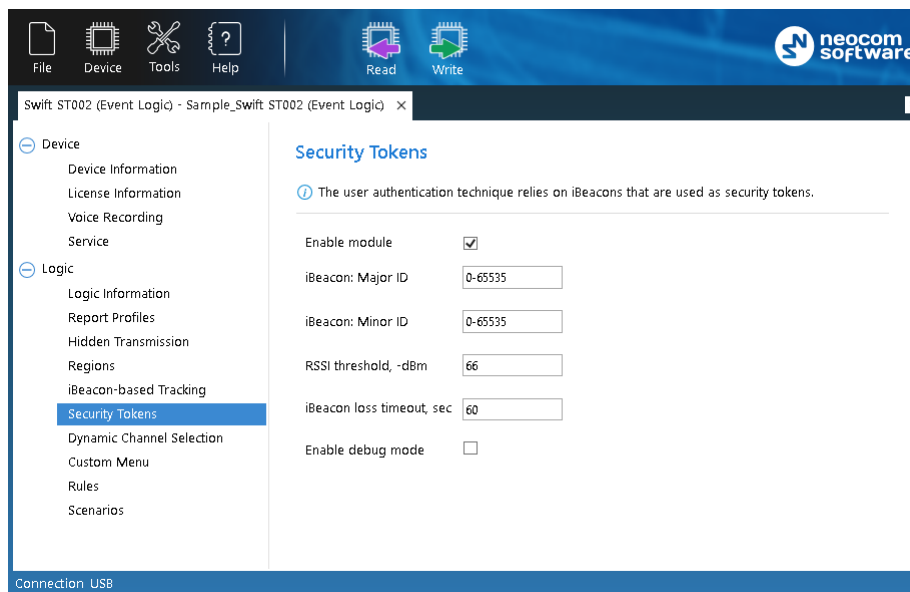
In the right pane, specify the following iBeacon-related settings:

- **Enable module**
  Select this option to enable the iBeacon-based Tracking module.

- **iBeacon: Major ID/ iBeacon: Minor ID**
  Enter the Major ID and Minor ID (the values or the ranges of values) of the iBeacons that will be used for iBeacon-based Tracking.

- **RSSI threshold**
  Set the minimum signal strength, in negative decibels, of an iBeacon to consider it as discovered.

- **When an iBeacon is discovered**
  From the drop-down list, select what to do when an iBeacon is discovered.

  - **Send report normally (selected channel or data channel)**
    This will add information on a discovered iBeacon to the report that will be sent to TRBOnet in the normal way.

  - **Immediately send report (selected channel)**
    This option means that the corresponding report will be sent to TRBOnet immediately on the selected channel.

  - **Send report with interrupt (selected channel)**
    This option means that the corresponding report will be sent to TRBOnet immediately, interrupting the current transmission, if the selected radio channel is busy.

- **iBeacon loss timeout**
  Enter the timeout, in seconds, within which an iBeacon is not considered as lost.

- **When an iBeacon is lost**
  From the drop-down list, select what to do when an iBeacon is lost.

- **Send report normally (selected channel or data channel)**
  This will add information on a lost iBeacon to the report that will be sent to TRBOnet in the normal way.
- **Immediately send report (selected channel)**
  This option means that the corresponding report will be sent immediately on the selected channel.
- **Send report with interrupt (selected channel)**
  This option means that the corresponding report will be sent immediately, interrupting the current transmission, if the selected radio channel is busy.

- **Enable debug mode**
  Select this option to show debug information on the radio display.

4.4.3.5 Security Tokens

To configure the iBeacon-based user authentication, select the **Security Tokens** section in the left pane.

In the right pane, specify the following Security Tokens-related settings:
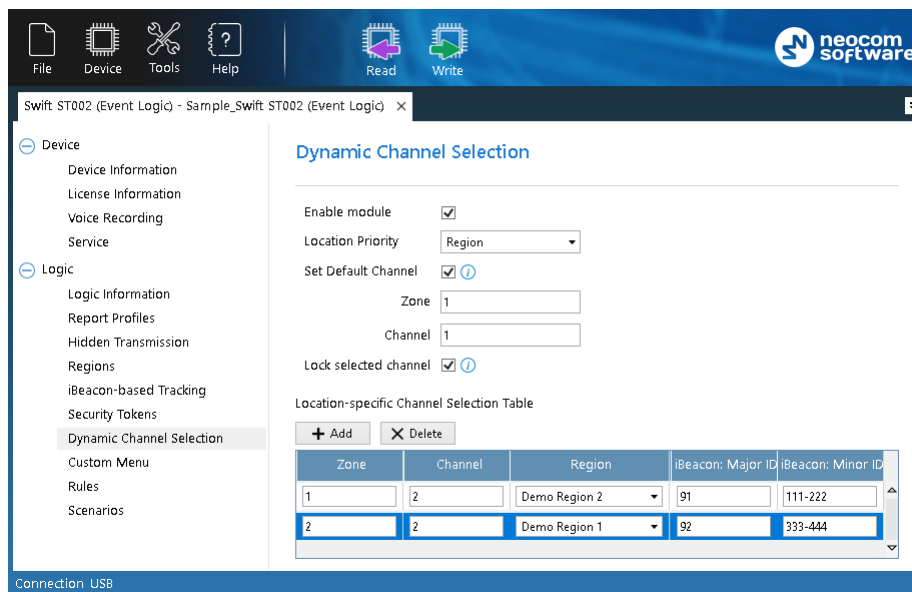
- **Enable module**
  Select this option to enable the Security Tokens module.

- **iBeacon: Major ID/ iBeacon: Minor ID**
  Enter the Major ID and Minor ID (the values or the ranges of values) of the iBeacons that will be used as security tokens.

- **RSSI threshold**
  Set the minimum signal strength, in negative decibels, of an iBeacon to be considered as discovered.

- **iBeacon loss timeout**
  Enter the timeout, in seconds, within which an iBeacon is not considered as lost.

- **Enable debug mode**
  Select this option to show debug information on the radio display.

4.4.3.6 Dynamic Channel Selection

The Dynamic Channel Selection feature allows for automatic selection of the radio zone/channel depending on the geographical region and/or the proximity of certain iBeacons.

- In the left panel, select the **Dynamic Channel Selection** section.

In the right pane, specify the following Dynamic Channel Selection-related settings:

- **Enable module**
  Select this option to enable the Dynamic Channel Selection module.

- **Location priority**
  From the list, select the priority to use for Dynamic Channel Selection.

- **Set default channel**
  Select this option and specify the default channel and zone. This channel/zone will be automatically set on the radio when its location is not available or outside designated regions/iBeacons.

  - **Zone**
    Enter the default zone.

  - **Channel**
    Enter the default channel.

- **Lock selected channel**
  Select this option so that the radio will prevent the user from changing the automatically selected channel.
- **Add**
  Click this button and specify the following Dynamic Channel Selection parameters:
  - **Zone**
    Enter the zone to be set automatically when the radio stays in the selected region and/or in the vicinity of the specified iBeacon(s). The value 0 means that the current zone won't be changed.
  - **Channel**
    Enter the channel to be set automatically when the radio stays in the selected region and/or in the vicinity of the specified iBeacon(s).
  - **Region**
    From the list, select the region within which the radio must stay so that the specified channel/zone will be set automatically.
  - **iBeacon: Major ID/ iBeacon: Minor ID**
    Specify the Major ID and Minor ID of the beacon(s) in the vicinity of which the radio must stay so that the specified channel/zone will be set automatically.
- **Delete**
  Click this button to remove the selected row from the Channel Selection Table.

4.4.3.7 Custom Menu

The Custom Menu module allows you to replace certain menu items on the radio (Contacts, Scan, or Zone) with your own menu items. To configure your custom menu, expand the **Logic** section and click **Custom Menu** in the left panel.
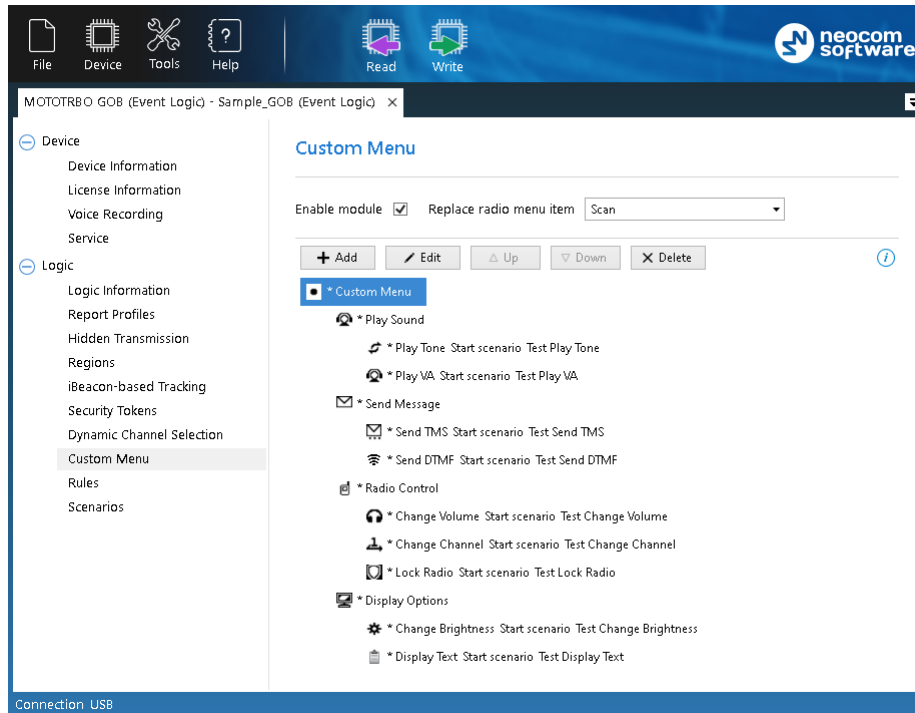
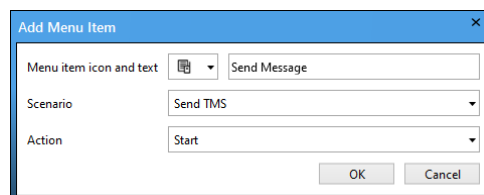In the **Custom Menu** pane, do the following:

- **Enable module**
  Select this option to enable the Dynamic Channel Selection module.

- **Replace radio menu item**
  From the list select one of the three radio menu items (Contacts, Scan, or Zone) that will be replaced with your custom menu.

To create a menu item:

- Select the menu item under which you want to create a submenu and click **Add**.

In the dialog that opens, enter the following:

- **Menu item icon and text**
  From the drop-down list, select the icon that will be displayed in front of the menu name.
  In the text box, enter the name of the menu item.

- **Scenario**
  From the drop-down list, select the scenario for the menu item.
  If you select 'None', the menu item will only contain submenu items and perform no actions.

> Note: Only enabled scenarios will be available in this list. See
> section <u>4.4.3.9, Scenarios</u>.

- **Action**
  From the drop-down list, select ether to Start or Stop the specified scenario.

4.4.3.8 Rules

A rule describes a specific event to which a programmed device will respond with a predefined sequence of actions, such as playing back tone or displaying text on the radio display, sending text to other radios, changing the radio channel, sending alarms, and other.
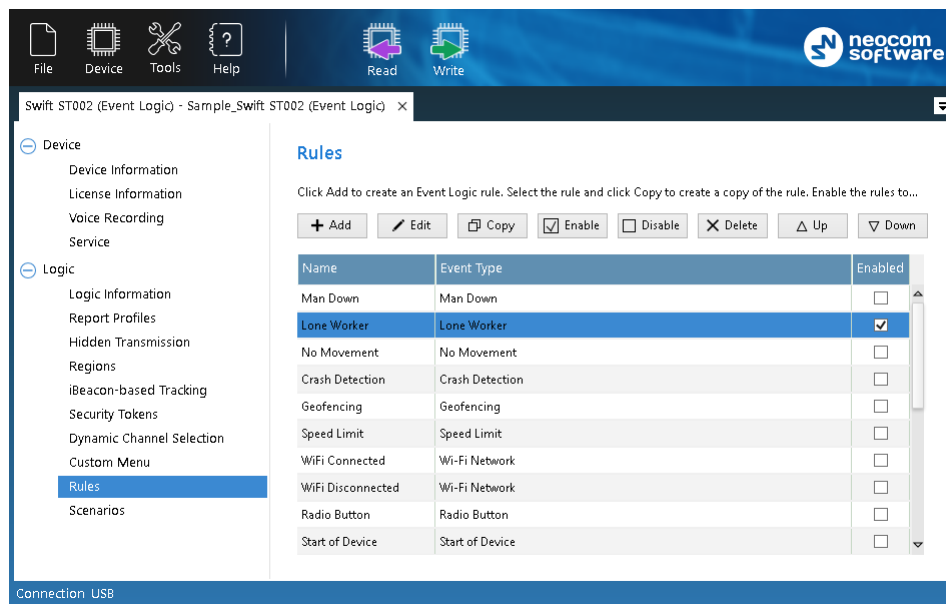
To configure rules, expand the **Logic** section and click **Rules** in the left panel.

The **Rules** page displays a predefined set of rules. You can manage rules as described below.

To create a rule:

- Click **Add** and on the drop-down menu click the event type.

- In the **Create Rule** window, define the rule as described in section <u>4.4.3.8.1, Creating/Editing a Rule</u> (page 27).

To create a copy of an existing rule:

- Select the rule in the list and click **Copy**.
  A copy of the selected rule is added to the list.

- Edit the rule name and settings as described below.

To edit a rule:

- Double-click the rule or select it in the list and click **Edit**.
- Modify the rule settings in the **Edit Rule** window as described in section 4.4.3.8.1, Creating/Editing a Rule (page 27).

Delete a rule

- Select the rule in the list and click **Delete**.
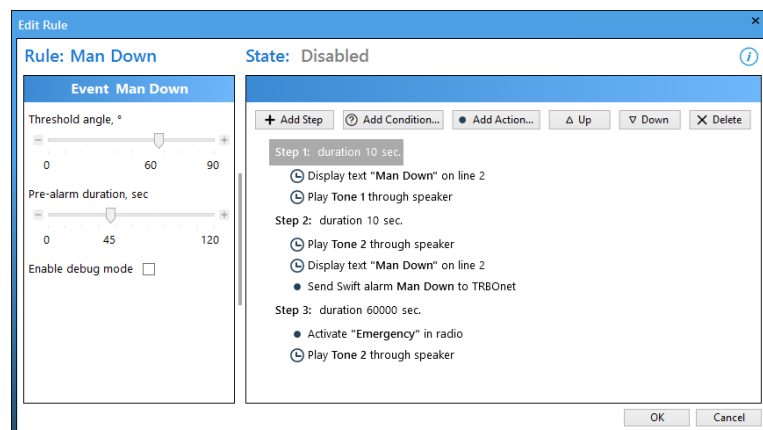- Confirm the deletion in the prompt dialog box.

Enable all rules that you want to write to the device memory and be executed at runtime.

To enable a rule:

- Select the rule in the list and click **Enable**,
  or select the **Enabled** box next to the rule name.

4.4.3.8.1 Creating/Editing a Rule

The **Create/Edit Rule** window serves for creating and/or editing the Event Logic rule.

To define a rule:

1. Specify the name of the rule in the **Name** field (**Rule: Name**).
2. Specify the state of the rule (**State: Disabled/Enabled**).
3. In the **Event** pane, specify the properties of the event. For a brief description of the event, click the *"i"* icon at the window's top right.
4. In the right pane, click **Add Step**. This will add an additional step to the set of actions. Double-click the step that appears and enter the duration, in seconds. If you click **Add Step > Add Restart**, a 'Restart all steps' action will appear at the bottom of the set of steps/actions.
5. In the right pane, select a step and click **Add Condition**. You can add as many conditions as required. Configure conditions as described in section 4.4.3.8.3, Conditions (page 30).
6. In the right pane, select a step add click **Add Action**. Configure each action as described in section 4.4.3.8.4, Actions (page 32).
7. Click **OK** to save the rule.

4.4.3.8.2 Events

The following table summarizes information about all supported events and their configurable properties.

| Event	Description
Start of Device	This event is triggered when the radio starts up.
Swift Command	This event is triggered when the Swift command is received from TRBOnet Server. Properties: optional parameters 1, 2.
Telemetry Input	This event is triggered when the status of any I/O pin has changed on the device. Properties: ▪ **Telemetry**: Select the Input pin #. ▪ **Trigger**: Select the type of change occurring to the pin (turned on, off or toggled)
Wi-Fi Network	This event is triggered when a Wi-Fi network is connected/disconnected. Properties: ▪ **Network trigger**: Select whether the Wi-Fi network is connected or disconnected. ▪ **Wait timeout**: Enter the minimum duration of staying connected/disconnected**.**
Sudden Acceleration Change	This event is triggered when the radio acceleration experiences a sharp change along the given axis. This event can be used, for example, to detect sudden braking of the vehicle. Properties: ▪ **Axis**: Select the axis along which to detect the sudden change of acceleration. ▪ **Acceleration threshold**: The maximum acceleration that shall be exceeded to trigger the event. ▪ **Enable debug mode**: Select this option to show debug information on the radio display.
Rollover Detection	This event is triggered when the mobile radio tilt is below the threshold angle for a time longer than the pre-alarm duration. ▪ **Threshold angle**: The minimum vertical angle (in degrees) at which the radio is still considered up. ▪ **Pre-alarm duration**: The timeout (seconds) after detecting the radio tilt. Note: After installing the radio in the working position in a car, you need to set a custom axis orientation of the accelerometer. This is done by clicking **Set a custom axis orientation of the accelerometer** in the **Service** page. ▪ **Enable debug mode**: Select this option to show debug information on the radio display.

Event	Description
Crash Detection	This event is triggered when the radio acceleration exceeds the impact threshold, the speed drops to zero within the idle timeout, and then there is no movement for the duration of the wait timeout. ▪ **Impact acceleration threshold**: The maximum acceleration that shall be exceeded to suspect a car crash. ▪ **Wait timeout**: The timeout, in seconds, that starts after the suspected car crash and during which no acceleration measurements are taken. ▪ **Acceleration threshold**: The minimum acceleration that must be gained during the control time to confirm the normal speed mode. ▪ **Idle timeout**: The timeout, in seconds, that starts after the wait timeout.
Lone Worker	This event is triggered when there is no user activity for a time longer than the response time. The timer will restart after pressing any radio button or knob. ▪ **Response time**: The timer, in seconds, that restarts after a button push, a talk, or use of the channel selector was detected on the radio.
No Movement	This event is triggered when the radio acceleration is below the threshold for a time longer than the wait time. ▪ **Acceleration threshold**: The minimum acceleration at which the radio is still considered to be at normal speed. ▪ **Wait time**: The timeout, in seconds, that starts after the radio acceleration has fallen below the threshold.
Man Down	This event is triggered when the radio tilt is below the threshold angle for a time longer than the pre-alarm duration. ▪ **Threshold angle**: The minimum vertical angle, in degrees, at which the radio is still considered up. ▪ **Pre-alarm duration**: The timeout (seconds) after detecting the radio tilt. ▪ **Enable debug mode**: Select this option to show debug information on the radio display. Note: Before enabling this event, you need to set a custom axis orientation of the accelerometer. This is done by clicking **Set a custom axis orientation of the accelerometer** in the **Service** page.
Speed Limit	This event is triggered when the measured speed exceeds or falls below the threshold. ▪ **Speed**: The math operator. Values: greater than, less than. ▪ **Threshold**: The maximum or minimum allowed speed in kilometers per hour. Note: The speed measurement error may be as high as 5 to 10%, depending on the type of a two-way radio (less for mobile, higher for portable) and on the satellite signal reception quality.

Event	Description
Geofencing	This event is triggered when the radio enters/exits the designated region for a time longer than the wait timeout. Properties: ▪ **Region**: Select the region the borders of which are monitored. ▪ **Direction**: Select if the region is entered or left.
Radio Call	This event is triggered when an incoming or outgoing call starts, or a call (either incoming or outgoing) ends. In addition, you can select the call type for this event. ▪ **Call trigger**: Select one of the three triggering conditions. ▪ **Call from**: Select the type of the call. ▪ **Enable debug mode**: Select this option to show debug information on the radio display.
Radio Channel	This event is triggered when a different channel and/or zone is selected on the radio. ▪ **Zone**: Enter the zone number. ▪ **Channel**: Enter the channel number.
Radio Button	This event is triggered when the designated radio button is pressed/released. ▪ **Button**: Select the radio button. ▪ **Action**: Select the type of action. This can be Short press, Long press, or Release.
Security Tokens	This event is triggered when one of the following Security Tokens event has occurred: ▪ User Logged In ▪ User Logged Out ▪ Token Not In Range.
iBeacon	This event is triggered when an iBeacon is discovered/lost. ▪ **iBeacon trigger**: Select whether the iBeacon is discovered or lost. ▪ **Major ID**: Enter the beacon's major ID exactly as specified in the iBeacon device. ▪ **Minor ID**: Enter the beacon's minor ID exactly as specified in the iBeacon device.

4.4.3.8.3 Conditions

In the **Conditions** panel of the **Create/Edit Rule** window, add one or more conditions for the event to be handled.

> Note: Adding conditions to a rule is optional. If you add multiple conditions, ALL OF THEM must be TRUE for the actions to be executed.

4 Device Programming
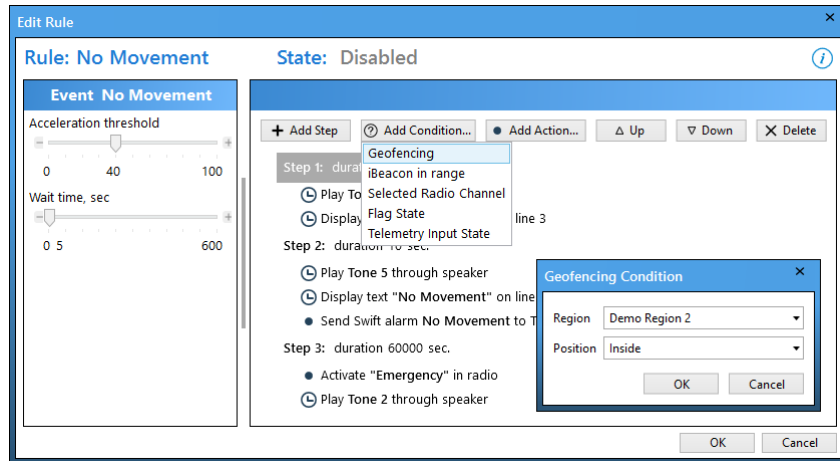
To add a condition:

- In the right pane of the **Create/Edit Rule** window, select a step and click **Add Condition**. In the drop-down menu, click the desired condition.

- In the dialog box that opens, specify the required condition parameters.
    - **Geofencing**

        In the **Geofencing Condition** dialog box specify the following parameters:
        - **Region**
          From the drop-down list, select the desired region.
        - **Position**
          From the drop-down list, select 'Inside' or 'Outside' position in a region.

    - **Selected Radio Channel**
      In the **Selected Radio Channel Condition** dialog box, specify the **Channel** and **Zone**.

    - **iBeacon In Range**

        In the **iBeacon In Range Condition** dialog box specify the iBeacon's **Major ID** and **Minor ID**.

    - **Flag State**

        In the **Flag State Condition** dialog box specify the **Flag** (a number from 1 to 32) and its **State** (On/Off).

    - **Telemetry Input State**

        In the **Telemetry Input State Condition** dialog box specify the **Telemetry** input (Input 1 – Input 8) and its **State** (On/Off).

Once added, the new condition will appear at the beginning of the corresponding step. The order of conditions in the list cannot be changed and does not affect the logic.

To edit condition settings:

- Double-click the desired condition.
  In the dialog box that opens, edit the required condition parameters.

To delete a condition:

- Select the desired condition and click the **Delete** button.

4.4.3.8.4 Actions

In the **Actions** panel of the **Create/Edit Rule** window, add one or more actions to execute when the event has occurred and all conditions have been confirmed.

To add an action:

1. In the right pane of the **Create/Edit Rule** window, click **Add Action** and in the drop-down menu click the desired action.
2. In the dialog box that opens, specify action properties and click **OK**.
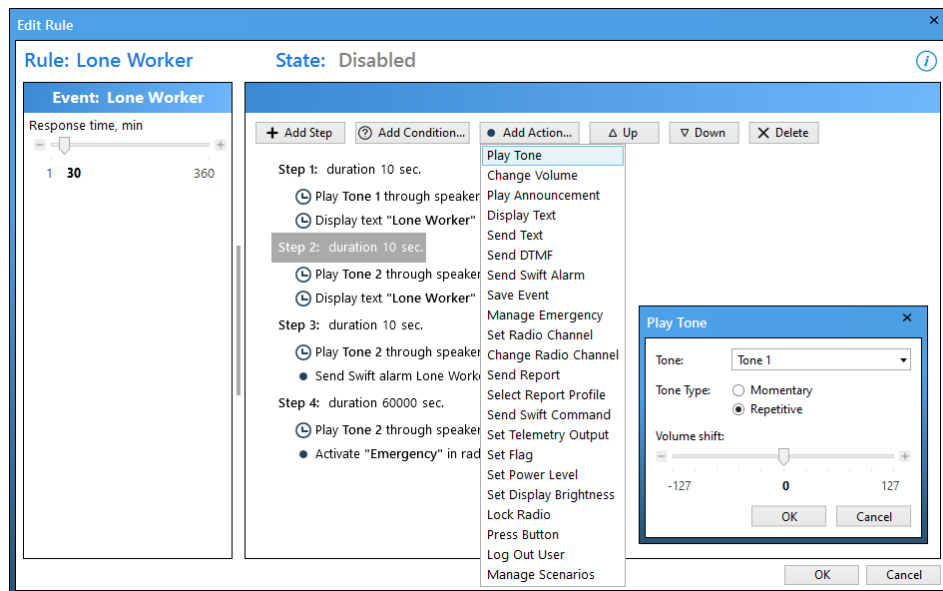
A new action with the specified name appears at the last position in the right pane of the **Create/Edit Rule** window. Use **Up** and **Down** arrow buttons to adjust the execution order of actions.

To delete an action, click the **Delete** button. Double-click the required action to open its properties for editing.

The following table summarizes information about all supported actions and their configurable properties.

| Action	Description
Play Tone	This action forces the radio to play back the specified tone. Properties: ▪ **Tone**: The tone to be played back. ▪ **Tone Type**: Choose whether to play the tone momentarily or repetitively. ▪ **Volume shift**: The volume boost (in MOTOROLA's units of measure).
Change Volume	This action forces the radio to change the volume of its speaker. Properties: ▪ **Action**: Select the action to be executed (Increase Volume or Decrease Volume).
Play Announcement	This action forces the radio to play back a pre-recorded voice announcement. ▪ **Voice Announcement**: Select one of the pre-recorded voice announcements.
Display Text	This action forces the radio to display text. Properties: ▪ **Text**: Enter the text to display on the radio. ▪ **Position**: The display line from which the text starts. Options: Line 1, Line 2, Line 3, Line 4. ▪ **Alignment**: Select the alignment of the text. ▪ **Font**: Select the font style (Normal or Bold).
Send Text	This action forces the radio to send text to a specified radio or radio group. Properties: ▪ **Destination**: The recipient of the message. Values: radio, radio group. ▪ **Radio ID**: The radio ID of the recipient. ▪ **Text**: The message to be sent.
Send DTMF	This action forces the radio to send the specified DTMF sequence on the radio channel. Properties: ▪ **Sequence**: The sequence of digits to be sent. ▪ **Pretime**: The duration of silence (ms) prior to sending the first DTMF tone. ▪ **Duration**: The duration of the DTMF tone digits in milliseconds (ms). ▪ **Interval**: The duration of the intervals between the DTMF tone digits in a transmission sequence in milliseconds (ms).
Send Swift Alarm	This action forces the radio to send an alarm to TRBOnet Server. The alarm type will depend on the triggered event (Crash Detection, Lone Worker, Man Down, No Movement, etc.).
Save Event	This action forces the radio to save the corresponding alarm event (along with the coordinates of the radio) to the option board's memory.
Manage Emergency	This action activates/deactivates the alarm mode on the radio.
Set Radio Channel	This action forces the radio to select a different radio channel/zone. Properties: ▪ **Channel**: The radio channel to be set. ▪ **Zone**: The zone to be set. Note: These are numerical values that are represented in *MOTOTRBO CPS, Channels>Zone>Channel* (in the Position column).

Action	Description

Send Report	This action will send a report to TRBOnet Server.
	
	▪ **Priority**:
	   o Normal (selected channel or data channel)
	   o High (selected channel)
	   o With Interrupt (selected channel)
	     This priority means that a report will be sent immediately over the selected channel, interrupting the current transmission, if the channel is busy.

Select Report Profile	This action forces a device to use the specified profile with report settings. Note: A profile with report settings defines rules for sending reports to TRBOnet Server. See also section 4.4.3.2, Report (page 14). ▪ **Profile**: Select the report profile to switch to.
Send Swift Command	This action will send a Swift command to TRBOnet Server. ▪ **Command**: Select the Swift command to be sent. ▪ **Parameter**: Enter the parameter if the Swift command contains a parameter. ▪ **Destination**: Select one of the destinations (TRBOnet, Radio, or Radio group). ▪ **Radio/Group ID**: Enter the Radio/Group ID if the Radio or Radio group are selected as the destination. ▪ **Target Device**: Select the device connected to the target radios: an option board (Swift OB, GOB) or a DT series controller (Swift DT200/ DT600). ▪ **Priority**: The values are: 'Immediately send to TRBOnet' and 'Immediately send to TRBOnet with interrupt'. The latter option means that the selected command will be sent immediately, interrupting the current transmission, if the radio channel is busy.
Set Telemetry Output	This action will set the selected telemetry output to the specified state. ▪ **Action**: Select the action for the output (Toggle, On, O). ▪ **Output**: Select the radio's output to perform the specified action on.
Set Flag	This action will set the selected flag to the specified state. ▪ **Action**: Select the action for the flag (Toggle, On, Off). ▪ **Flag**: Specify the flag (a number from 1 to 32).
Set Power Level	This action will set the radio's transmission power level for the current channel. ▪ **Power**: The values are 'Low' and 'High'.
Set Display Brightness	This action will set the radio display brightness to a specified level. ▪ **Brightness**: The values are 'Increase' (one step), 'Decrease' (one step), 'Maximum', 'Minimum' and 'Default'
Lock Radio	This action will lock/unlock the radio's keyboard.
Press Button	This action will short-press the specified Accessory Button on the radio (No Dot Button, 1-Dot Button, or 2-Dot Button). ▪ **Short press**: Select the desired Accessory Button.
Log Out User	This action will log out the user (deallocate the radio).

Action	Description
Manage Scenario	This action will start/stop the desired scenario. See section 4.4.3.9, Scenarios. ▪ **Scenario**: Select the desired scenario. ▪ **Action**: Select either to Start or Stop the desired scenario.

4.4.3.9 Scenarios

A scenario is a sequence of steps/conditions/actions that can be then started/stopped in a particular place of a rule by clicking **Add Action > Manage Scenario**.

To configure scenarios, expand the **Logic** section and click **Scenarios** in the left panel.
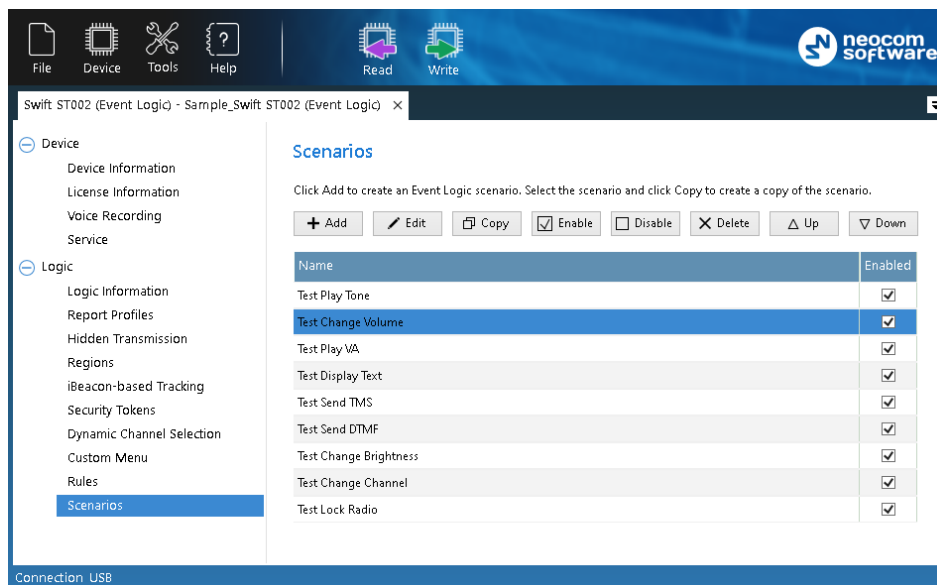
The **Scenarios** pane displays a set of the scenarios. You can manage the scenarios as described below.

To create a scenario:

- In the **Scenarios** pane, click **Add**.
- In the **Create Scenario** window, define the of steps/conditions/actions as described in section 4.4.3.9.1, Creating/Editing a Scenario (page 36).

To create a copy of an existing scenario:

- Select the scenario in the list and click **Copy**.
  As a result, a copy of the selected scenario is added to the list.
- Edit the scenario name and settings as described below.

To edit a scenario:

- Double-click the scenario or select it in the list and click **Edit**.

- Modify the scenario settings in the **Edit Scenario** window as described in section 4.4.3.9.1, Creating/Editing a Scenario (page 36).
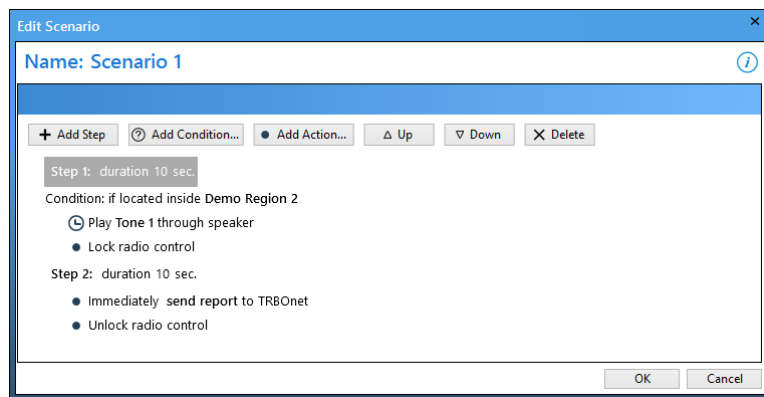
To enable a scenario:

- Select the scenario in the list and click **Enable**,
  or select the **Enabled** box next to the scenario name.

Delete a scenario

- Select the scenario in the list and click **Delete**.

4.4.3.9.1 Creating/Editing a Scenario

The **Create/Edit Scenario** window is used for creating and/or editing the scenario.

- Specify the name of the scenario in the **Name:** field.
- Click **Add Step**. This will add an additional step to the set of actions. Double-click the step that appears and enter the duration, in seconds. If you click **Add Step > Add Restart**, a 'Restart all steps' action will appear at the bottom of the set of steps/actions.
- Click **Add Condition** and in the drop-down menu, click the desired condition.
  For a description of conditions, see section 4.4.3.8.3, Conditions.
- Click **Add Action** and in the drop-down menu click the desired action.
  For a description of conditions, see section 4.4.3.8.4, Actions.
- Use **Up** and **Down** arrow buttons to adjust the execution order of steps/actions.

4.4.4 Mass Configuration

You can configure multiple option boards at once by using the Mass Configuration mode. The OTA connection is used for over-the-air programming of endpoint devices such as DT500 connected to a MOTOTRBO radio or an option board ST002 installed into a MOTOTRBO radio.

- On the toolbar, click **Tools > Mass Configuration**.
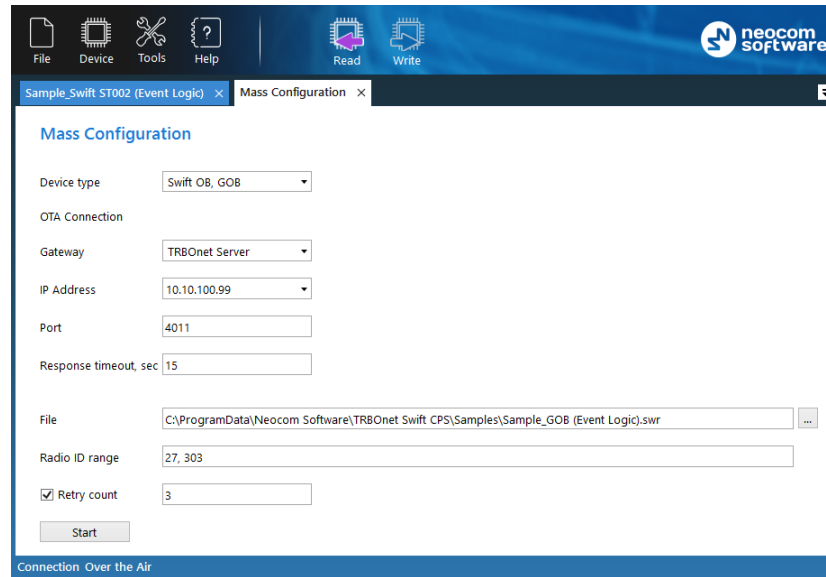
- In the **Mass Configuration** page, enter the following parameters:

  - **Device type**
    From the drop-down menu, select either 'Swift OB, GOB', 'Swift DT500' or 'Swift DT200/ DT600'.

  - **OTA Connection**
    In this section, specify the OTA (over-the-air) Connection-related settings.

    - **Gateway**
      The gateway that can establish an IP connection with TRBOnet Swift CPS and that can communicate with the device over the air.
      Values: TRBOnet Server, Swift IP Gate: Swift A100/ A200

    - **IP address**
      The IP address of the gateway selected above.

    - **Port**
      This is the Forward Data service port of the TRBOnet Server (if selected above). Default: **4011**.
      To get the port number, launch the TRBOnet Enterprise (PLUS) Server application and select **Radio Systems > Services** in the left pane. Find the port number under the **Forward Data service** option. Also make sure that the **Forward Data service** option is selected.

    - **Response timeout**
      The time period, in seconds, to wait for a response from the server side (TRBOnet Server, Swift IP Gate).

  - **File**
    Enter the full path name for the configuration file (*.swr) that will be sent to the radios specified below.

- **Radio ID range**
  Enter the range of Radio IDs to which the configuration file selected above will be sent.

  > Note: Separate each Radio ID with a comma, for example, "105,106,111", or enter the range using the following example: "105-111".
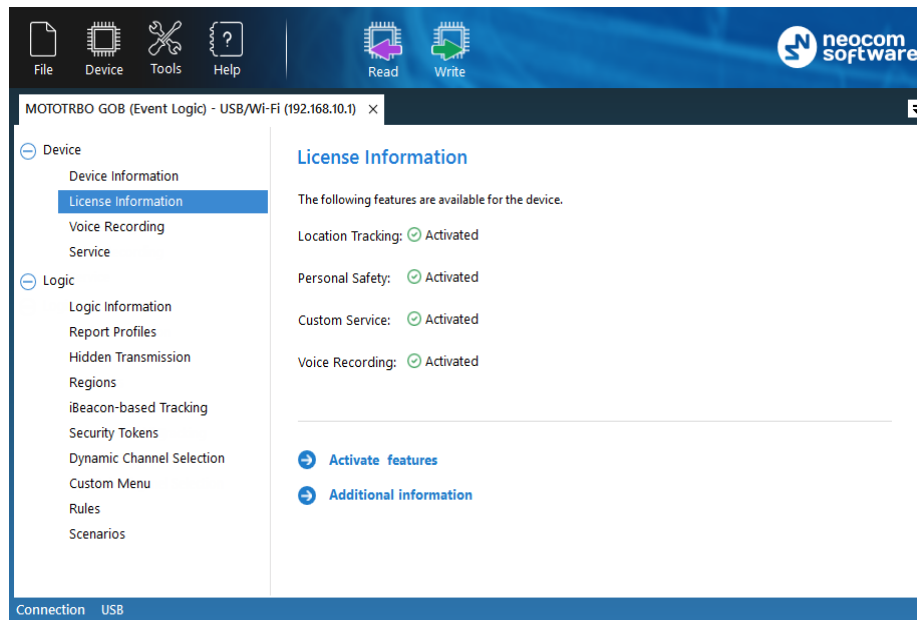
- **Retry count**
  Enter the number of retries allowed.

• Once you have specified the desired configuration settings, click **Start**.

5 Licensed Features

To learn the statuses of all licensed features on a device, connect the device to your computer and read the configuration of the device in TRBOnet Swift CPS. In the left panel, click **Device** and **License Information**.

In the right panel, all the licensed features that are supported by your device are marked as **Activated**, **Available for activation**, or **Not available** (not supported on your type of device).

- The **Location Tracking** license item allows the option board to receive GPS and iBeacon location data from the radio.

- The **Personal Safety** license item allows the option board to receive G-meter data from the radio.

- The **Voice Recording** license item allows the option board to receive voice recording data from the radio.

5.1 Activating Features

To activate features on a device:

1. Click **Activate features**.
2. In the **Activate features** window, enter the license key.
3. If the license key is valid, the **Activate features** window displays all features included into the license. You can learn how many times each feature was activated on different devices using this license, and how many more activations are allowed.
4. Click the **Activate features** button. If this button is unavailable (grayed out), your device works in the demo mode. Click the **Restore features**

button to return to the normal mode and activate all purchased features on the device.

Note: When you choose the demo mode and then the normal mode on a device, the license counter is not incremented.