MiniTrack Evaluation Suite Manual

Cellocator – BY POINTER –

Proprietary and Confidential

Version 0.3

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POINTER

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Table of Contents

1 Introduction

1.1 About this Document

The MiniTrack Evaluation Suite Manual is a comprehensive guide that provides information required to run an initial appraisal and testing process of the MiniTrack unit, without requiring a full and real installation. Other relevant information, such as release notes and protocols, can be found on the Cellocator website.

The MiniTrack Evaluation Suite contains a complete set of components that simplify bench testing of the system and serve as a demonstration platform for people wishing to understand the operational aspects of the system. The Suite is also intended to facilitate the development of interfaces to the MiniTrack system by integrators or service providers.

For additional information about setting up the MiniTrack Evaluation environment, please refer to the *MiniTrack Programming Manual* and the *Cellocator Wireless Protocol* documents which can be downloaded from Cellocator website.

This document includes step by step instructions for setting up evaluation environment as follows:

- Preparation of the Evaluation Kit (Section 2)
- Setting up the Evaluation Environment (Section 3.2)
- Getting Started with the Cellocator Evaluation Suite (Section 3.3)
- Communication Center and GPRS Manager Setup (Section 3.4)
- Programming the Communication Parameters of the Unit (Section 3.5)
- Testing the Evaluation Set Up (Section 3.6)
- Setting up the SMS Manager (Section 3.7) if required.

This document also includes an overview of the various applications required for Cellocator unit evaluation, including:

- **Error! Reference source not found.** (Section **Error! Reference source not found.**)
- Communication Center (Section 4)
- GSM GPRS Cellocator Unit Simulator (5)

1.2 Abbreviations and Terminology

Abbreviation	Description
CC	Communication Center
ACK	Acknowledge
CCC	Command and Control Center
CSF	Content Sealed Format
DB	Database
OTA	Over the Air
PDU	Protocol Description Unit (Common name for data SMS)
SMS	Short Message Service (GSM)

Abbreviation	Description
EDR	Emergency Data Recording
PL	Programming library

1.3 References

All the reference documents listed in the following table can be downloaded from the support section of the Cellocator website (www.Cellocator.com).

#	Reference	Description
1	MiniTrack Product Overview	The document provides high-level information required by service providers considering the integration and operation of MiniTrack.
2	Cellocator Wireless Communication Protocol	This document explains the unit's wireless communication structure. It describes every byte of the incoming/outgoing packets, which can be sent or received by the unit over-the-air.
3	MiniTrack Programming manual	This document explains the unit's serial communication by AT commands to program the MiniTrack unit.

1.4 Revision History

Version	Date	Description
0.1	May 13, 2019	Initial version
0.2	May 20, 2019	After first iteration with technical writer
0.3	June 10, 2019	After more cleanup by technical writer

2 Preparation of the Evaluation Kit

2.1 Evaluation Kit – Hardware Components

This section describes the MiniTrack Evaluation Kit hardware components required for setting up the evaluation environment. Specific descriptions of the various Evaluation Kits for each MiniTrack unit type can be found in the following location:

http://www.cellocator.com/products/evaluation-kits/

The Evaluation Kit is packaged in a dedicated suitcase. The MiniTrack unit and the MultiSense units are packed in the upper layer of the suitcase. The power adapter, accessories and harnesses are packed in the lower layer of the suitcase. The arrangement of the devices and harnesses is shown in the following pictures.

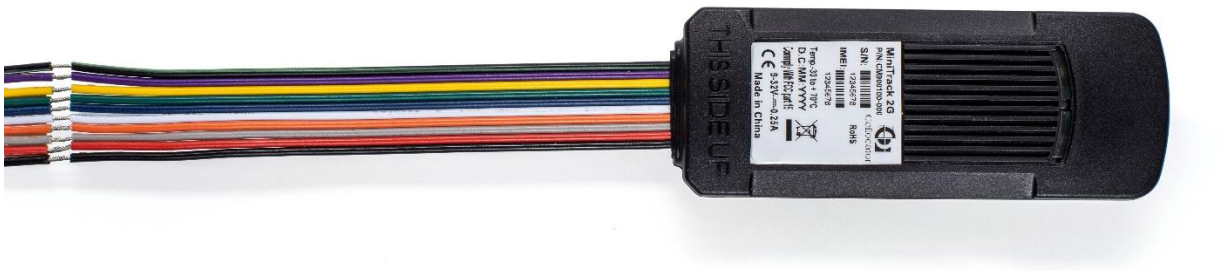


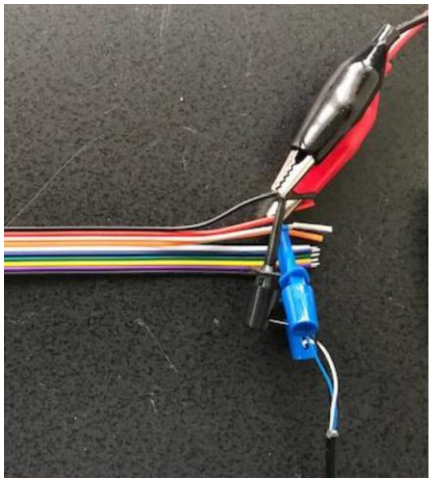
Figure 1: Evaluation Kit

Pinout of the MiniTrack:

Pin	Color	Function
1	Black	Ground
2	Red	Power In (9-32V)
3	Grey	RXD (Input to Device)
4	Orange	TXD (Output from Device)
5	White	Ignition Input (GPIOA)
6	Blue	Reserved
7	Green	Panic Input (GPIOB)
8	Yellow	Lock Input (GPIOC)
9	Violet	Relay 2 (GPIOE)
10	Green/Black	Relay 1 (GPIOD)

All the hardware elements required for setting up the evaluation environment for any MiniTrack are listed in Table 1.

Table 1: Common Components required for any MiniTrack Evaluation Environment

Name/Part Number	Description	Picture
MiniTrack	Connect to 12V power supply (the black and red wires in the picture), Connect the USB-UART converter wires as hereby described: • GND (black) to GND (black) at the MiniTrack • TXD (Blue) to RXD (Grey) at the MiniTrack • RXD (White) to TXD (Orange) at the MiniTrack	

2.2 Evaluation Software Components

The Cellocator Evaluation kit includes the following software elements which are available on the Cellocator website. Please refer to Section 2.4 for downloading instructions.

- The Evaluation Suite is an installation file which include the following software applications:
  - **MiniTrack Programmer:** Provides wire and wireless communication with the unit, and is used to configure the unit, i.e. destination IP address, target port phone, and SMS numbers. Refer to Section 3.5.1 for further information.
  - **Communication Center:** Used for real-time communications and SMS communications with the Cellocator unit. It can also be used to decode OTA Cellocator messages for debug purposes. The communication center contains the **GPRS Manager**, responsible for TCP/IP and UDP/IP communication with Cellocator units for Fleet Management application, and the **SMS Manager**, responsible for SMS communications with the Cellocator unit. The SMS Manager is required only if SMS communications is implemented. Refer to Section 4 for further information.
  - **Communication Logger:** A debugging tool used to record the internal communication of the unit. The tool records two channels on two serial ports in parallel. One port is connected to the microcontroller output and the other to the GSM modem output. This allows listening to communications between the microcontroller and the GSM modem. The tool is also used to capture serial interface activity while the Pi-shaped cable (PN 711-00009) is connected.
  - **GSM/GPRS Unit Simulator:** The software simulates the OTA activities of the Cellocator unit. The Simulator can also be integrated with a GPS Simulator module. Refer to Section 5 for further information.
  - **Serial USB driver:** for the USB Communication Adapter.

2.3 Additional Components Preparation (prerequisite)

The following steps should be performed as part of the initial setup procedures:

1. Provide a computer running Windows 7 and up (Windows 10 is preferable).
   - Microsoft.NET v4.0 should be installed.
   - The computer should be connected to the Internet.
   - In order for GSM/GPRS to work properly, a location close to a window is preferable.
2. Provide a SIM card that is open for GPRS and SMS use.
   - GPRS must be available (surf the Internet to confirm this).
   - For a simple evaluation environment set up, the SIM card should be PIN-free. Use a cell phone to remove PIN protection from the SIM card or order the SIM card without a PIN. You may program the unit for PIN protection and PIN locking using the Programmer after the initial set up.
   - Obtain the access point name (APN) for GPRS traffic, from the cellular provider. The APN usually contains the words "internet" and/or "GPRS". Some providers also provide access points for WAP. WAP-only APNs may not support TCP/UDP protocols, and therefore cannot be used with Cellocator applications.

2.4 Preparing Evaluation Software Tools

The Evaluation Software Tools files are located on the evaluation and integration page on the Cellocator website. To download the files, login at Knowledge Base Login then select the evaluation-and-integration page and download the following files and documents:

1. **Cellocator Evaluation Suite** Evaluation Suite
2. **Required protocols from protocol section in the** evaluation and integration page**.**

3 Setting up the Evaluation Environment

3.1 Typical Evaluation Setup Scenario

The following summary provides the sequence that should be followed in order to carry out a setup of the Cellocator Evaluation Suite.

- Preparing the hardware and software components (refer to Section 2).
- Setting up the communication environment which includes LAN configuration, Communication Server, validation of proper operation of the Communication Center using the GPRS Unit Simulator Software (refer to Sections 3.3)
- Setting up the MiniTrack unit (refer to Section 3.5.1).
- Programming the communication parameters of the MiniTrack unit allowing communication between the Communication Center and the unit (refer to Section 3.5).
- Acceptance test to validate that the evaluation environment is properly functioning (refer to Section 3.6). That completes the normal evaluation environment set up.
- If the evaluation also requires SMS communication, the instruction for setting up the SMS Manager can be found in Section 3.7.

3.2 Setting up the Communications Environment

3.2.1 *General*

The following section explains how to install and configure the network and the evaluation hardware and applications in order to communicate with the Cellocator unit using any of the available communication platforms: GPRS (UDP and TCP), or SMS.

3.3 Getting Started with the Cellocator Evaluation Suite

This section describes the process of installing the Cellocator Evaluation Suite with the default settings; for a full description of the installation process and the options available.

3.3.1 *Evaluation Suite Installation*

To install the Evaluation Suite, follow the steps in the procedure below.

NOTE: If a previous version of the Evaluation Suite has been installed, it must be removed before proceeding with the steps below. Similarly, if you have a version of the Full Package installed, remove it before proceeding.

---

1. Double-click the **Evaluation suite setup [version number]** Installer Package file.
2. In the displayed Installation Wizard *Welcome* screen, click **Next**.
3. In the displayed *License Agreement* screen, select the **I accept the terms in the License Agreement** checkbox, and then click **Next**.
4. In the displayed *Choose Setup Type* screen, select the relevant installation type:

- **Typical**: This installation includes the Cellocator Programmer and Communication Center.
- **Custom**: This installation enables you to select the applications you want to install. Recommended for advanced users only. When clicking **Next**, an additional screen is displayed, via which you can select the relevant programs to install.
- **Complete**: This installation includes all the applications and tools used for evaluating *any* Cellocator unit, including MiniTrack. This is the recommended setting in for this unit type.

5. Click **Install**. The installation process is then launched.
6. Upon successful completion of the installation, click **Finish** to close the Installation Wizard.

The following applications and tools are installed (note that if you selected the Custom installation type in Step 4, the list of programs will depend on those you selected):

Typical	Complete
▪ Application Data ▪ Cellocator Programmer ▪ Communication Center	▪ Application Data ▪ Cellocator Programmer ▪ Communication Center ▪ Communication Logger ▪ Minitrack Programmer ▪ GSM GPRS Unit Simulator ▪ PL Comparison ▪ CSA Server ▪ CSA Unit Simulator ▪ Serial CSF STK Flasher ▪ CAN tools (CAN Injector, CAN USB Logger, and FMS Transmitter)

NOTE: When the installation is complete, verify that no error messages were generated, the installation folder has been created in the selected destination, and the Cellocator applications and debugging tools appear in the *Start* menu.

3.3.2 *Removing the Evaluation Suite*

7. Double-click the **Evaluation suite setup [version number]** Installer Package file.
8. In the displayed Installation Wizard screen, select one of the following:
   - **Change:** Lets you change the way that features are installed. When selected, a new screen is displayed via which you can select the features to install/disable.
   - **Repair**: This option reinstalls the Evaluation Suite.
   - **Remove**: This option completely removes the Evaluation Suite from your computer.
9. Click **Repair** / **Remove**, and then click **Finish** to complete the removal/repair process and to exit the Installation Wizard.

3.3.3 *Windows 7 and later Security Configuration*

Note that this section is relevant only to Windows 7 or later.

In order to be able to install Cellocator tools on Windows 7 or later, you need to have the correct security privileges for the Program Files (x86) path and sub-directories.

To define the correct security privileges on Windows 64-bit:

1. From Windows Explorer, access your Computer directory. Right-click the **Program Files (x86)** folder and select **Properties**.

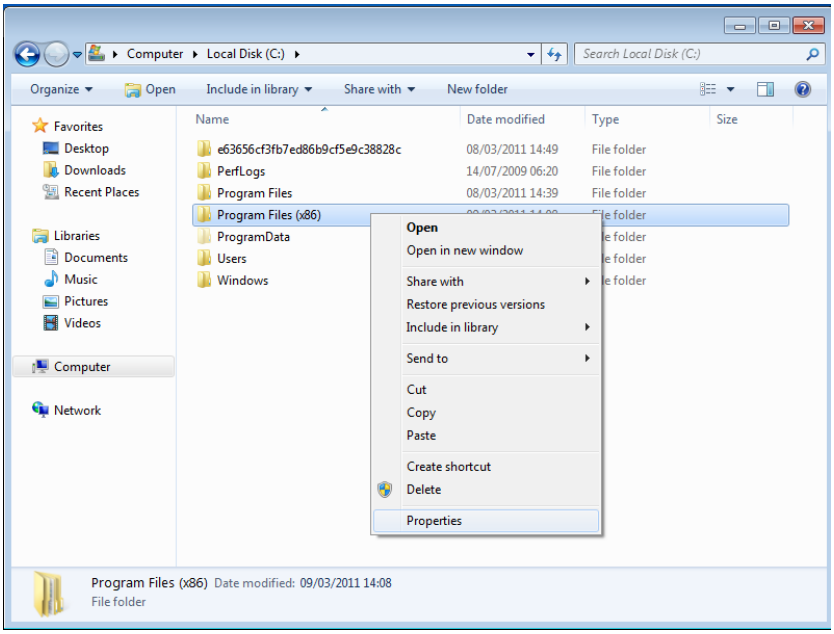


Figure 2: Windows 64bit Properties

2. Click the **Security** tab and then click **Advanced**.

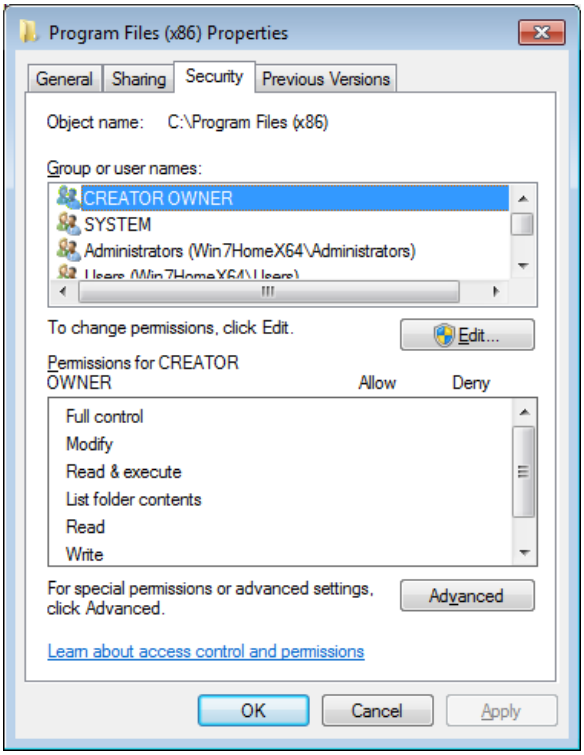


Figure 3: Windows Security Tab

3. In the Advanced Security Settings dialog, click the **Owner** tab and then click the **Edit...** button.

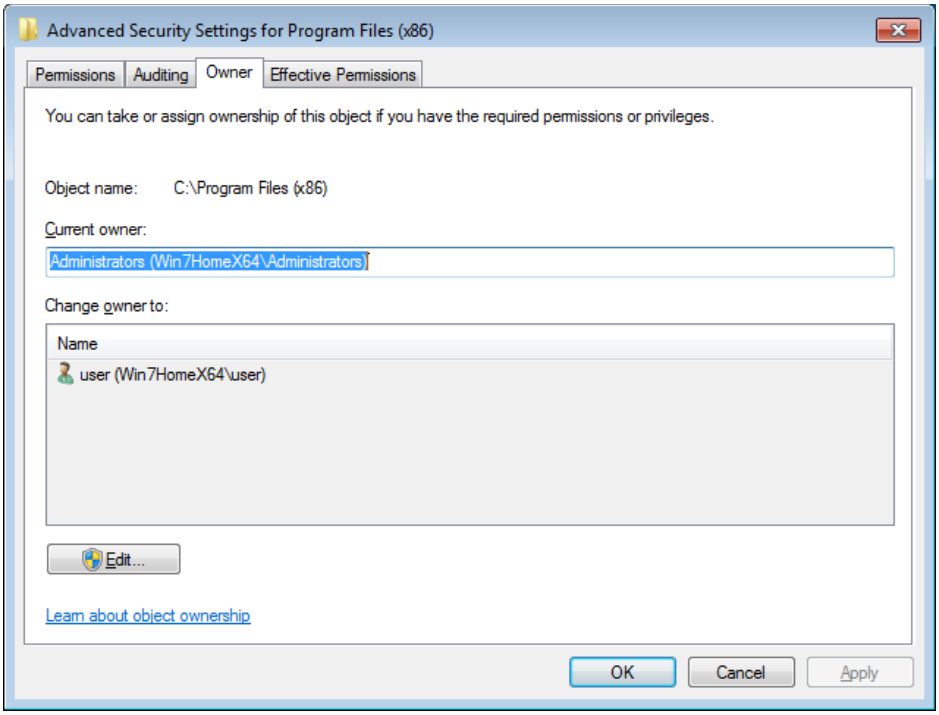


Figure 4: Owner Tab

4. Click **Other users or groups** to show the full list of groups. Select the relevant group, select the Replace owner on sub-containers and objects checkbox, and click **Apply**.

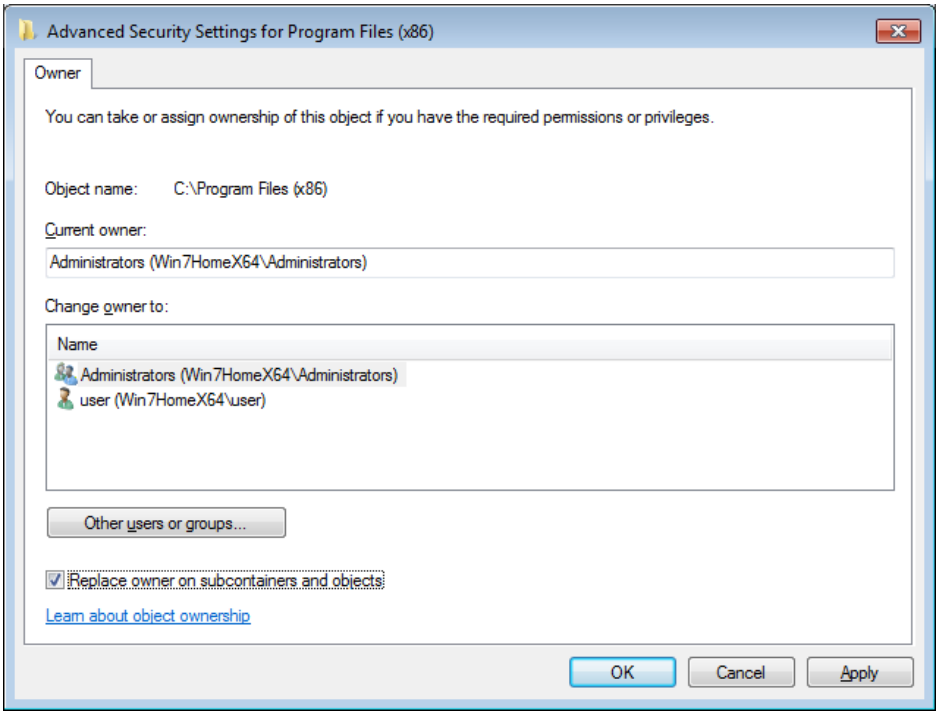


Figure 5: Changing Group Owner Tab

5. In the displayed confirmation message, click **OK**. Then close all the open Properties windows.
6. Access the Properties dialog again (as in Step 1). Then select the relevant group (Administrators in the example below) and click **Edit...**.

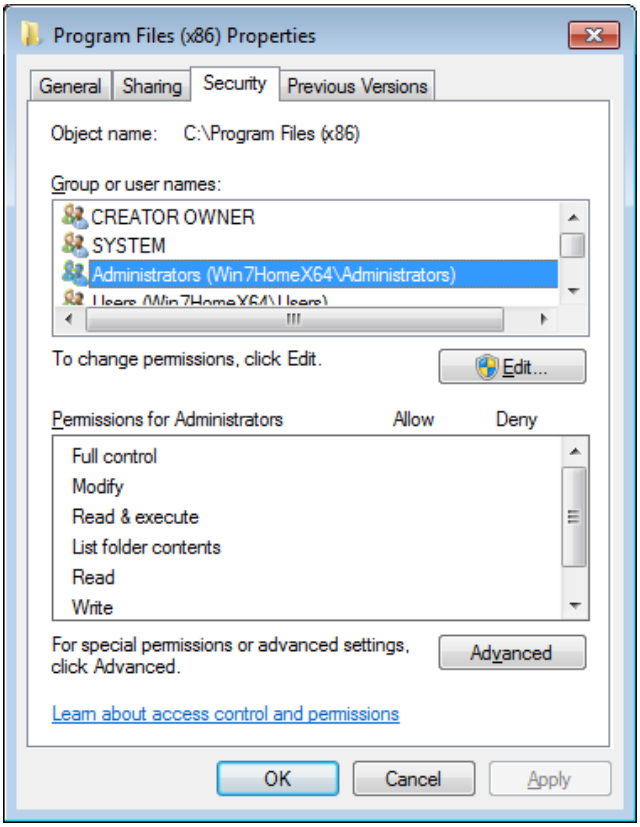


Figure 6: Selecting the Relevant Group

7. Select the group (Administrators) and ensure that the **Full Control** checkbox is selected in the *Allow* permissions column.

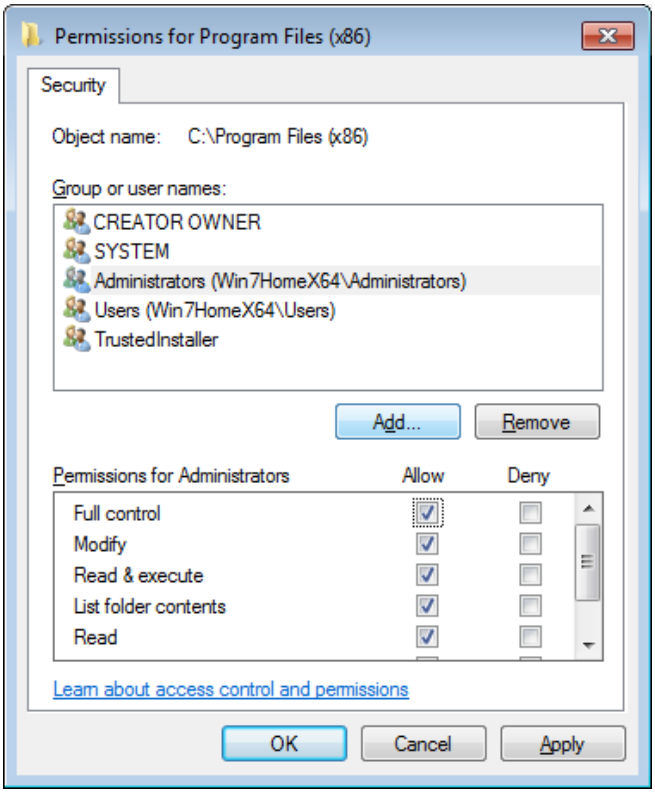


Figure 7: Defining Permissions

8. Click **Apply** and close all the open Properties windows.

3.4 Communication Center and GPRS Manager Setup

3.4.1 *Communication Center Overview*

The Cellocator Communication Center performs the following:

- Receives, parses and monitors GPRS and SMS messages.
- Sends commands through GPRS or SMS communications.
- Interrogates the unit in order to get the current location (in text format) and the unit's status (input's, outputs, GPS data, etc.).
- Receives and monitors emergency transmissions from the unit (input's triggering).
- Controls the unit's outputs.
- Programs the unit's behavior OTA (by changing the unit's EEPROM content).
- Upgrades the unit's firmware.

The Communication Center uses the GPRS Manager Module for GPRS communication with fleet applications. In order to use SMS communication, configure the SMS Manager (please refer to Section 3.7).

For further details on the Communication Center and its features, refer to Section 4.

3.4.2 *Communication Center Activation and Setup*

To set up the Communication Center and the GPRS Manager, perform the following steps:

To set up the Communication Center and GPRS Manager:

1. From the *Start* menu, go to the Cellocator program folder and click **Communication Center**.
2. In the displayed Select Hardware Type window, select the relevant type from the dropdown list and click **OK**. In the MiniTrack case, please choose the Cello family:

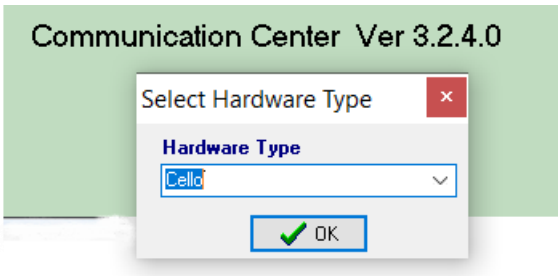


Figure 8: Hardware type

3.

Then the Communication Center window is displayed, as shown below.

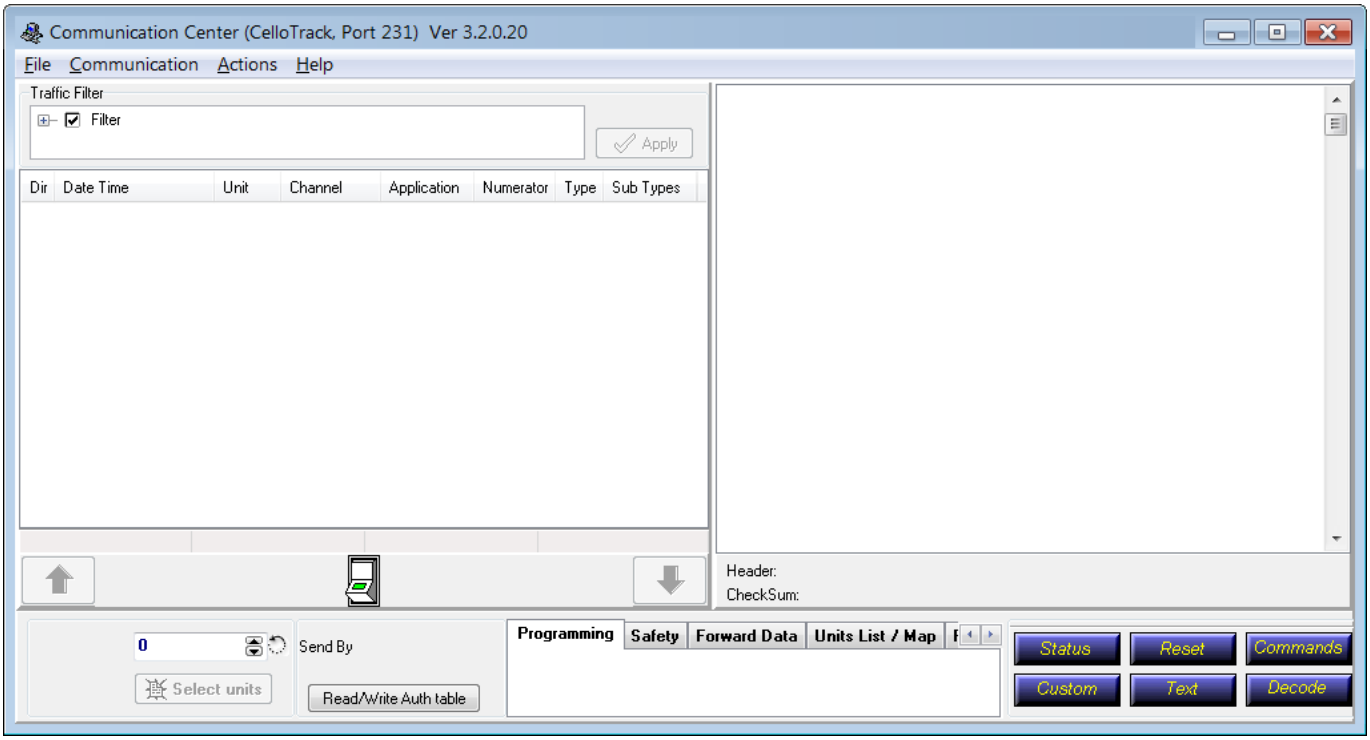


Figure 8: Communication Center Main Window

NOTE: The GPRS manager starts automatically and is launched minimized in the system tray, as shown here:

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4. Double-click **GPRS Manager** in the system tray. The GPRS Manager window is displayed.

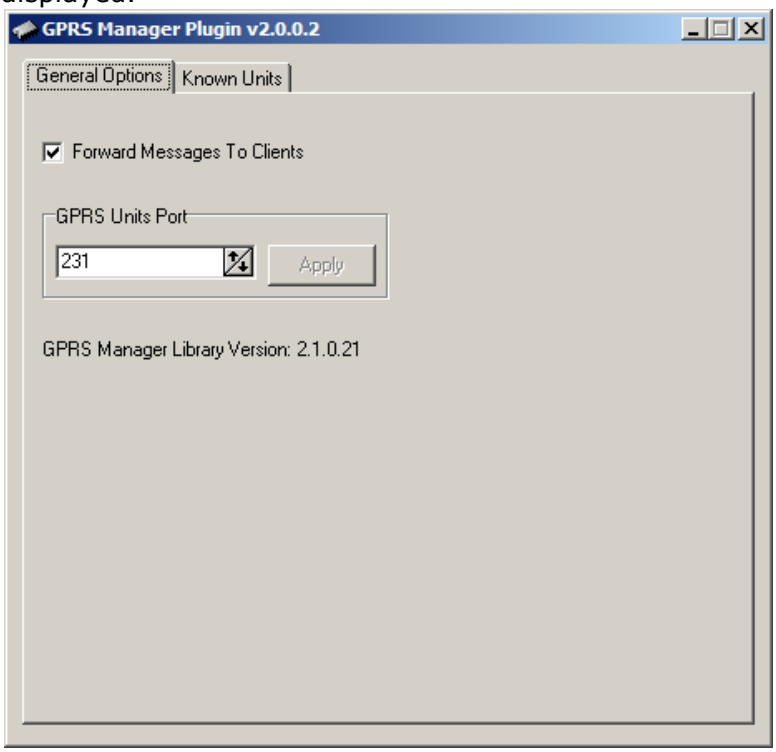

Figure 9: GPRS Manager Window

5. In the **General Options** tab of the GPRS Manager Plug-in window, as shown above, enter the number of the listening port that will be used by the Communication Center over both UDP/IP and TCP/IP. The default port is 231.

   For further information about working with the Communication Center, refer to Section 4.

3.5 Programming the Communication Parameters of the Unit

3.5.1 *MiniTrack Programmer Set Up and Configuration*

The MiniTrack Programmer is designed for wire communications with the unit via a serial port, and OTA. It is mainly used for the initial configuration of a unit's behavior and especially the communication settings. Configurable features are explained in the relevant programming manual.

The MiniTrack Programmer is installed as part of the Full Installation Package. To configure the MiniTrack Programmer parameters, perform the following steps:

1. Select **MiniTrack Programmer** from the Windows *Start* menu. The application opens with an empty programming environment.

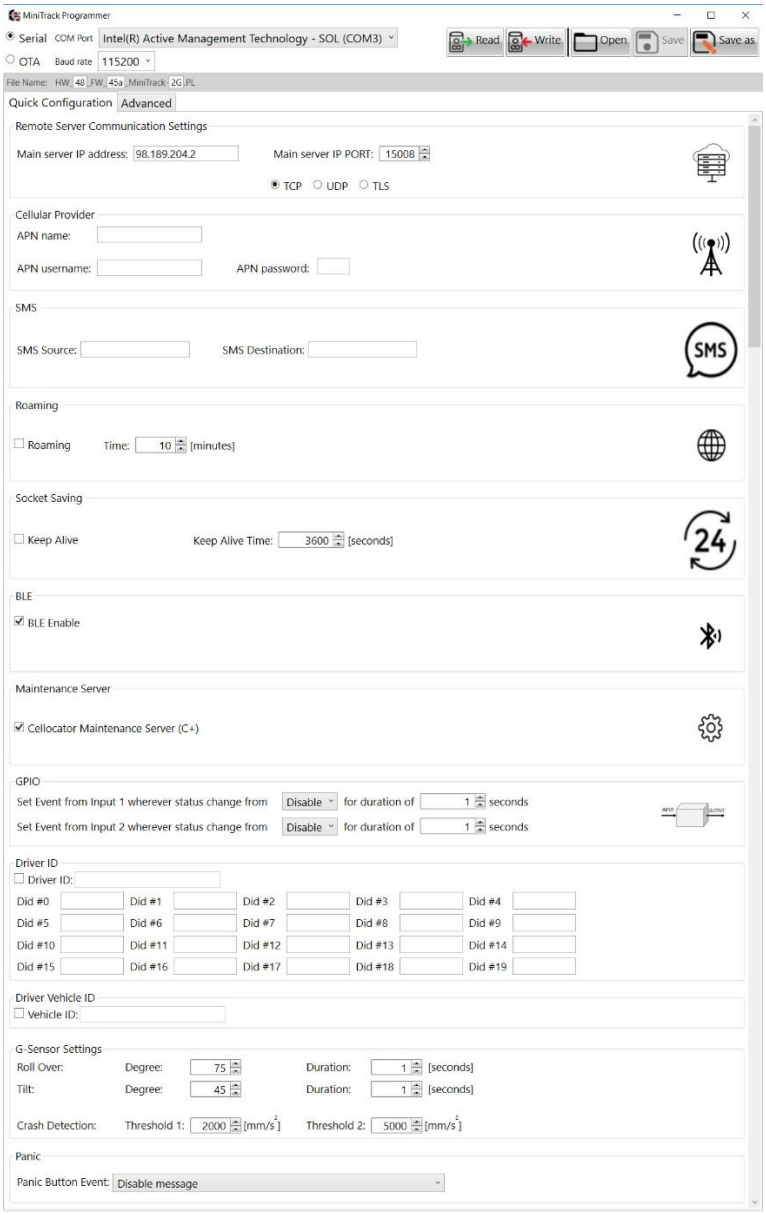

Figure 10: MiniTrack Programmer

2. In the top right menu bar, click **Open** and chose the PL file, in accordance with the unit's firmware and hardware.

IMPORTANT: The unit's PL file should be downloaded from the Cellocator website in accordance with the hardware and firmware used.

The MiniTrack Programmer window is refreshed with the contents of the selected PL.

3. Select the relevant port from the **COM Port** dropdown list at the top of the MiniTrack Programmer window.

   Or,

   Select the **OTA** option button to perform the configuration OTA.

4. In the **Baud rate** dropdown list, select **115200**.

5. As shown in Figure 10, the MiniTrack Programmer window contains a number of settings under two tabs, **Quick Configuration** and **Advanced**, as described below:

   - **Quick Configuration**: Under this tab, which is by default displayed when you access the MiniTrack Programmer, you can define a number of "quick" settings to get you up and running, as described in the table below.

Section	Description
	**Remote Server Communication Settings:** Includes the main server's IP address and port number.
	**Cellular Provider:** Details the name, username and password of the cellular provider's APN.
	**SMS:** Details the **SMS Source** (the SMS number of the cellular provider's SMSC; if this field is left empty the unit will use the default SMSC of the SIM) and the **SMS Destination** (the SMS number used by the unit for sending active SMS messages).
	**Roaming:** Select the checkbox to enable Roaming, as well as the frequency (in minutes).
	**Socket Saving:** Select the checkbox to Keep Alive this feature, as well as the frequency (in minutes).
	**BLE:** Select the checkbox to enable BLE (selected by default).

Section	Description
	**Maintenance Server:** Enables you to periodically check for FW updates from the Cellocator maintenance server (called C+). It is selected by default.
	**GPIO:** Enables you set events for inputs 1 and 2 whenever there are status changes for a defined period of time.
	Driver ID: Enables you to define up to 20 Driver IDs.
	Driver Vehicle ID: Enables you to define the Driver Vehicle ID.
	G-Sensor Settings: Enables you to define **Rollover** and **Tilt** settings (according to degrees and duration), and **Crash Detection** settings (based on configured Thresholds 1 and 2).
	Panic: Enables you to define panic button event settings, including to disable them completely (the default setting), and to send them when the button is pushed or released.

- **Advanced**: Under this tab, you can define a number of advanced settings, as described in the table below. Note that to view each section, click on the section name or arrow icon to expand the contents for that section.

Section	Description
Configuration: Communications	Enables you to define the following communication settings: • **SIM Lock:** When working with a locked SIM, select this checkbox and define Pin 1 and Pin 2. • **Anti-Flooding Delay:** Defines the delay period of server temporarily unavailable reports sent to the server. • **Alert Messages:** Defines the number of times an alert message is sent in case of failure to receive ACK, and the time interval between consecutive attempts to send it. • **Roaming List Forbidden/Preferred:** Defines the list of roaming carriers. Those in the Forbidden list will never be connected to; those in the Preferred list should be listed in order of preference. Each carrier is identified by its PLMN.

Section	Description
Configuration Driving	Enables you to define the following driver settings: • Drive Distance Interval (in minutes) • Drive Motion End Acceleration (Threshold/Debounce) • Drive Motion End Distance (Distance/Time) • Drive Motion End Speed (Speed/Debounce) • Drive Motion End Trigger (select from **No speed**, **No distance**, or **No speed + no distance**) • Drive Motion Start Acceleration (Threshold/Debounce) • Drive Motion Start Distance (Distance/Time) • Drive Motion Start Speed (Speed/Debounce) • Drive Motion Start Trigger (Select from **Speed**, **Distance**, or **Speed or Distance**) • Unauthorized Motion Start Distance (Distance/T-Time) • Unauthorized Motion Start Speed (Speed/Debounce) • Unauthorized Motion Start Trigger (Select from **Speed**, **Distance**, or **Speed or Distance**) • Ignition Voltage (in volts) • Drive Trip Start/Stop (Select from **Disable**, **Trip start**, **Trip stop**, or **Trip start and stop**)

Section	Description
Configuration Peripheral	Enables you to define the following peripheral settings: • **LEDs Off:** Defines the period for turning off LEDs. **T1** specifies the total time (up to 31 days) after power-up in which the LEDs remain active; **T2** specifies for how long the LEDs are on when the device is running on the battery. • **GPS Lock Parameters:** Defines GPS parameters for a reliable lock. **Satellite** defines the minimum number of satellites seen; **HDOP** defines the maximum HDOP acceptable. The first **Debounce** field defines the minimum length of time for these conditions to be present in order for GPS to be considered "locked"; the second **Debounce** field is optional and is used instead of the first Debounce field when GPS gets turned on (after reset/sleep/power-up) to potentially allow for a longer GPS convergence time in case of a cold start. • **Ignition Mode:** Defines the ignition On/Off detection method; the **Connection reset** option defines whether to perform a cellular connection reset upon an ignition state change. • **G-Motion Event:** Enables you to send event reports whenever the G-sensor detects motion according to the setting of the G-Motion Threshold command. Select **G-motion start** as a "wake-up" event when the device is asleep or in hibernation mode.
Configuration: Power	Enables you to define a number of internal and external power settings, based on whether the unit is mobile or stationary. You can also set a Reset action, from one of **Forced rest (h/w)**, **Hardware reset**, **Software reset**, **Reset GPS**, or **Reset cellular**.
Action Commands	Enables you to define the **Virtual Engine Hours** and **Virtual Odometer** (if you want to define a starting value other than 0), and **Company ID**.

Section	Description
Event Setting Commands	Enables you to define the following event setting commands: • **Backup Battery Events:** Sends an event report whenever the device switches from main power to BuB (BuB On) and/or vice versa (BuB Off) for at least the defined number of consecutive seconds. • **Cellular Connection Loss/Lock Events:** Sends an event report whenever cellular connection is lost and/or established. • **Drive Trip Trigger:** Select which trigger(s) identify the "driving trip start/stop". • **GPS Loss/Lock:** Select which trigger(s) identify the GPS loss/lock. • **Power Up:** Select **Enable** to send an event report after the device powers up. • **Idle Alert:** Select **Enable** to send an event report whenever the vehicle is idling for at least the defined number of consecutive seconds.
Configuration: Geo-Fence	Enables you to configure up to 16 Geo-fences, including their latitude, longitude, radius, trigger, and debounce settings.
Report Event	Enables you to define the following report events: • **Sleep Events:** Sends an event report before the device goes to sleep and/or once it wakes up. • **Speeding:** Sends an event report whenever the defined speed threshold is crossed for at least the set number of consecutive seconds. • **Towed Events:** Select **Enable** to send an event report whenever the vehicle is being towed based on the defined thresholds. • **Tamper Events:** Sends an event report when tampering is detected. • **Virtual Trip Odometer Events:** Sends an event report every defined number of km traveled. • **Unpowered Trip Events:** Select **Enable** to send an event report when the device is moving while powered from the battery.
Configuration: Misc	Enables you to define the time duration within which the Driver ID must be entered after ignition.

6. Click **Save** to save the configuration changes you made to the PL file.

   Or,

   Click **Write** to download the modified parameters to a connected unit's configuration memory.

3.6 Testing the Evaluation Set Up

3.6.1 *Testing the Evaluation setup for MiniTrack*

Several seconds after the reset is performed at the end of the programming session, the GSM LED (the right LED) begins to flash slowly, indicating that the MiniTrack is activated and registered to the cellular network.

To test proper installation of the evaluation environment, activate the Panic alert by pressing the right button for 2 seconds, and verify that a proper message appears in the incoming message log section in the CommCenter window. This indicates that the evaluation environment is installed properly.

3.7 Setting Up the SMS Manager

To evaluate the SMS service, please complete the Communication Center set up as explained below.

3.7.1 *Setting up the Terminal Modem*

NOTES:

- The terminal modem is necessary only if SMS communication in required.

- Cellocator cannot commit to support other modems and will provide a terminal modem upon request.

Cellocator currently supports the Enfora (SAG GSN 1208/1308) modem.

To set up the terminal modem, perform the following steps:

1. Slide in a PIN free SIM card into the terminal modem.
2. Plug in the 9-pin serial cable to the terminal modem and to the COM port of the PC.
3. Plug in the power connector and plug its power adapter into the power socket.
4. Verify that the LED on the modem indicates GSM registration.

3.7.2 *Configuring the Terminal Modem*

1. In the Communication Center, click **Communication>SMS Manager**.

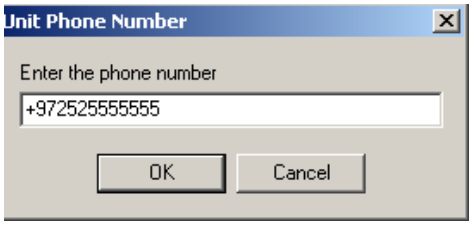

Figure 11: Unit Phone Number Window

2. Enter the cellular number of the SIM that is installed in the unit.

3. Click **OK**.
4. The SMS Manager window is displayed.

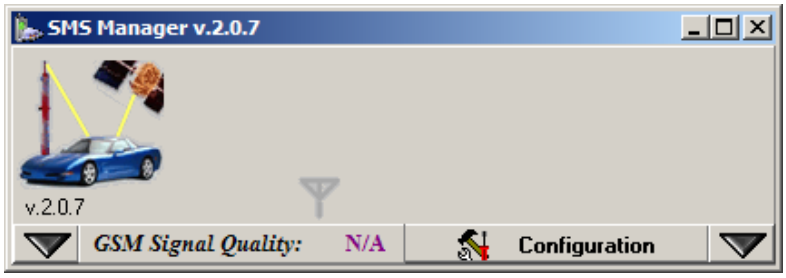

Figure 12: SMS Manager Window

4 Communication Center

4.1 Overview

The Cellocator Communication Center application is used for real time GPRS communication and/or SMS communication with the Cello unit. This software provides the ability to:

- Receive GPRS and SMS messages.
- Send commands through GPRS or SMS communication.
- Interrogate the unit in order to get current location (on the Show Parameters page) and unit's status (inputs, outputs, GPS data etc).
- Receive emergency transmissions from the unit (input's triggering).
- Operate unit's outputs.
- Program unit's behavior OTA (by changing unit's EEPROM content).
- Forward data message from CommCenter to a serial port on the unit and receive data message from the serial port.
- Control duration of time during which an ACK message is sent to unit.

4.2 Architecture

The following diagram shows the main Communication Center components and how they work with the Cellocator unit.

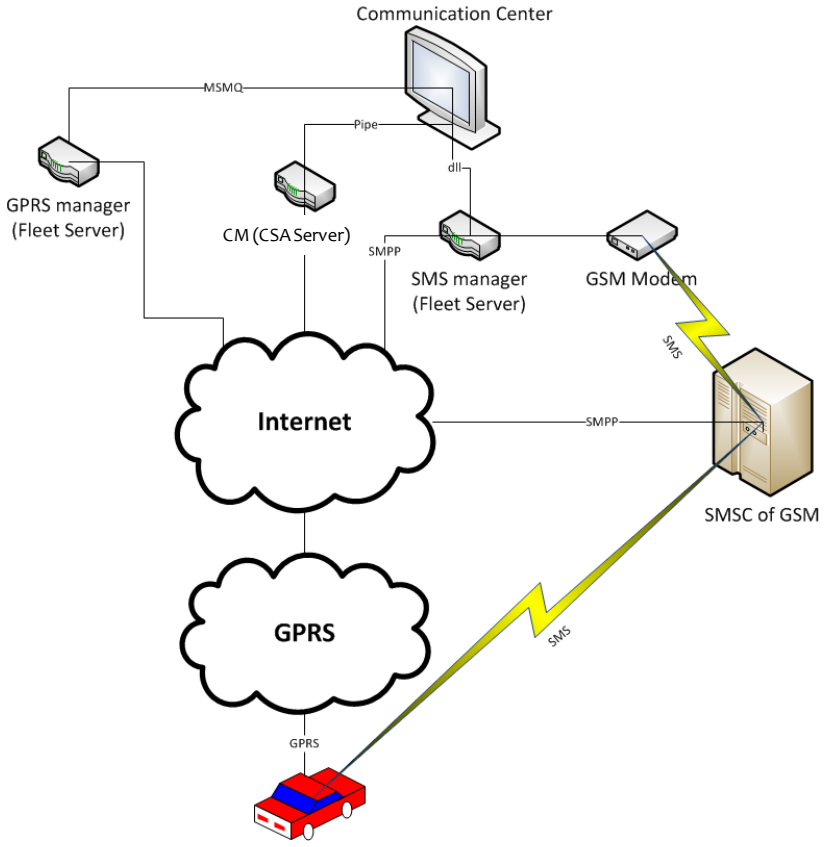

Figure 14: Communication Center Architecture

4.2.1.1 GPRS Manager

The GPRS Manager is a set of functions and APIs which enable bi-directional communication with Cellocator units through the MCGP OTA protocol, including IP/Port/Socket management, monitoring and other management features.

4.2.1.2 SMS Gateway

The SMS Gateway application maintains and manages the SMS communication between the Communication Center and the Cellocator unit. It supports the internet SMPP protocol or GSM modem allowing internet or cellular communication links to the unit, as shown in the diagram above.

4.3 Communication Center Main Window

The Communication Center main window has three parts: Incoming messages log, Decoded messages information, and a Control interface menu bar.

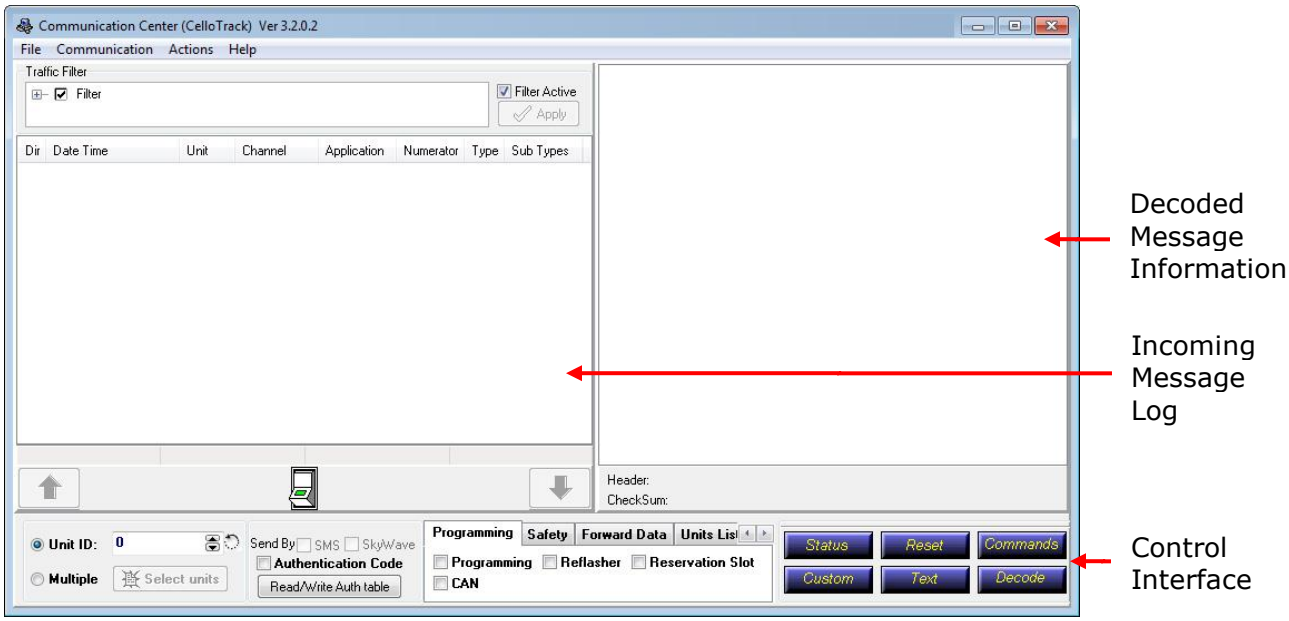

Figure 15: Communication Center Main Window

4.3.1 *Incoming Messages Log*

The log section of the main window displays a list of short entries about messages received and the result of the transmissions (if a message was sent). Each incoming message entry includes the type of message received and the source: GPRS *Message Type 0 received from unit #XXXX* or *SMS Message Type 0 received from unit #XXXX (*where XXXX is the ID of the unit (in its decimal representation) that sent the message.

This window also displays various action results. In the case of a transmission from the Communication Center to an end unit, an entry indicates the transmission results: *Command transmission terminated with error level XXX* (when XXX is the transmission result code given by the ComSrvr). For a complete list of transmission result code refer to the *Cellocator Wireless Protocol* document.

Below the Incoming Messages Log window, a Lock/Unlock button enables you to stop the display of incoming messages (by clicking it to Lock). This can be especially useful when

there are lot of incoming messages and you want to catch a specific message, or group of messages. To the right and left of the Lock/Unlock button are two arrow buttons, which enable you to change the selected message displayed.

In the Traffic Filter panel in the top left of the screen you can filter the incoming messages according to the options selected (**Direction**, **Unit ID**, **Channel**, and **Application**).

Note that the Application column displays either **Fleet** or **Safety**, according to the channel of communication. In addition, the Sub Types column is only relevant to Safety messages and displays a number which is a form of message type or ID.

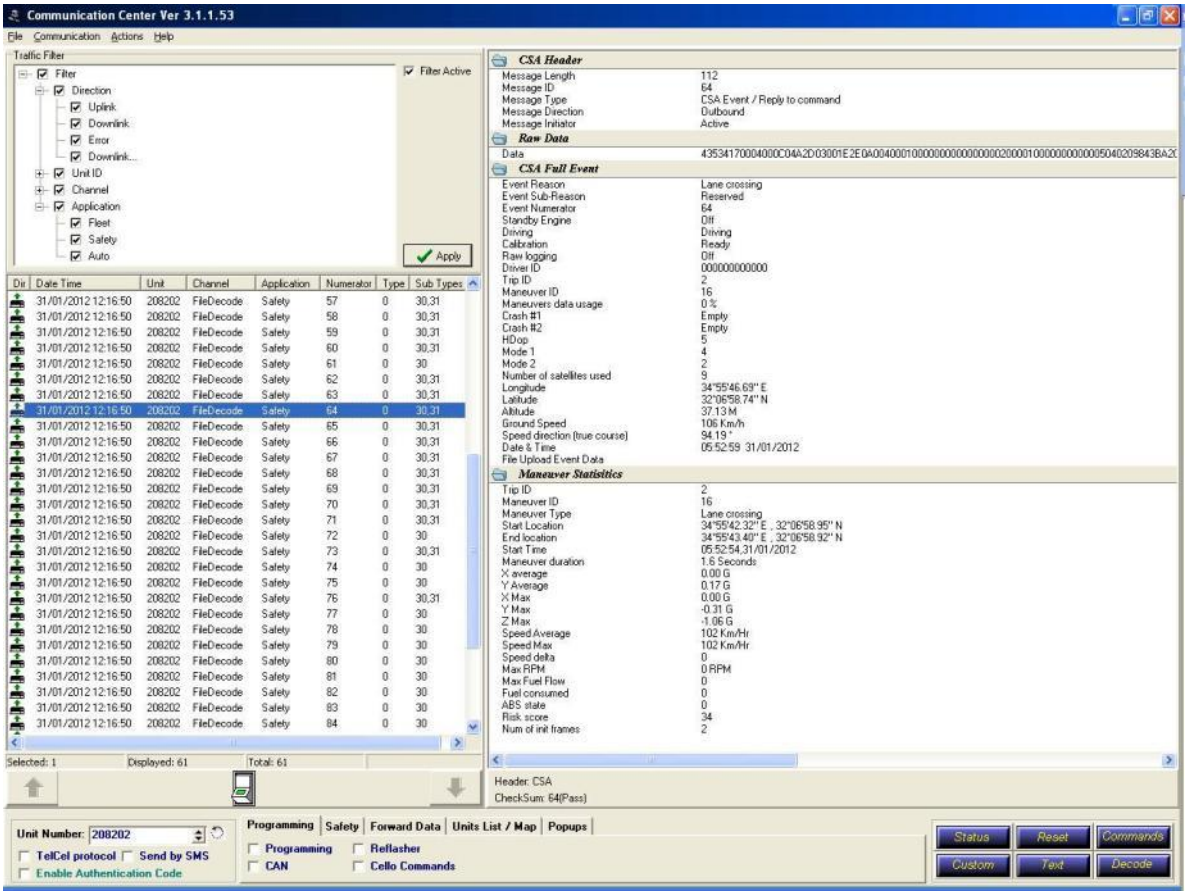

Figure 16: Message Log Screen

You can also right-click on a message to perform the following:

- Select a unit (all commands work on one selected unit)
- Copy the Hex string to your computer's clipboard
- Process (decode the message)
- Export Messages
- Export Messages to Excel / KLM
- Delete Selected Messages
- Clear all messages from the Incoming Messages Log window
- Display Location
- Wireless Protocol

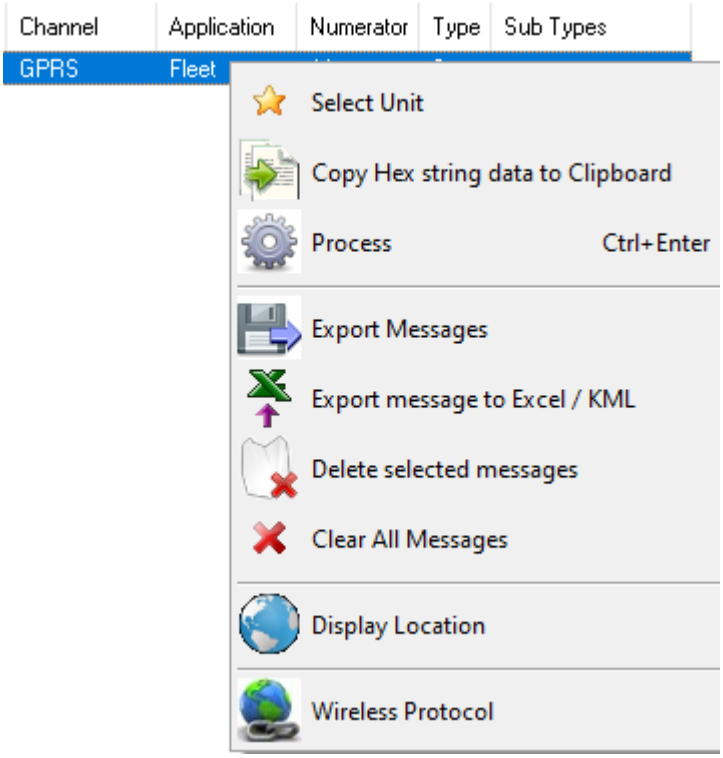

Figure 17: Right-click Menu Options

In addition, a small text box below the Lock/Unlock button displays the last outgoing message from the Communication Center to the unit. You can also right-click the text message and copy it to your clipboard.

4.3.2 *Decoded Messages Information*

This window is the heart of the software. The information is shown as a list of messages that can be expanded to show the data they hold. The basic text of the message includes the kind of message it was designed to decode and the type of data shown in the message. Right-click on a line to perform a number of operations, including shrink or expand the message, and choose display options (such as km/h or m/sec).

To display only those fields you are interested in, select the relevant messages and then right-click a message and select **Filter Marking**. This action filters and displays only those messages marked.

If you want to reload the **Cello_telemetry.ini** file, select *Actions* from the menu bar and then **Reload Telemetry File**. This will reset the current display.

NOTE: The definition information has its source in the **Cello_telemetry.ini** file. Do not change the definitions of this file. Changes can cause file corruption.

4.3.3 *Control Interface*

The control interface allows users to modify parameters in order to test the units. In general, a user must specify the unit's serial numbers in the Unit ID field and the end unit destination address (if one exists).

A set of buttons and tabs in the three Control interface panels provides the user with tools to send commands to the units.

4.4 Using the Control Interface

This section describes how to work with each of the three main panels of the Control interface:

- The Debug Panel
- The Communication Panel
- The Evaluation Tools Panel

4.4.1 *The Debug Panel*

Figure 18: Debug Panel Buttons

The Debug panel enables the user to send messages to the unit and decode received messages from the unit, as described in the following sections.

4.4.1.1 Enquire about the Unit Status

Click the **Status** button to send status commands. The command structures are defined in the **Commands.ini** file.

4.4.1.2 Reset unit

Click the **Reset** button to send reset commands. The command structures are defined in the **Commands.ini** file.

4.4.1.3 Send Predefined Commands

Click the **Commands** button to display a dropdown menu with commands defined in the **Commands.ini** file, including commands for output activation and deactivation, changing operational mode of the unit, setting tracking intervals, etc. Please refer to the *Cellocator Wireless Protocol* for additional information.

4.4.1.4 Send Custom Commands

Click the **Custom** button to display the Custom Commands window, which allows the user to send commands without the need to re-set the **Commands.ini** file, and to restart the software.

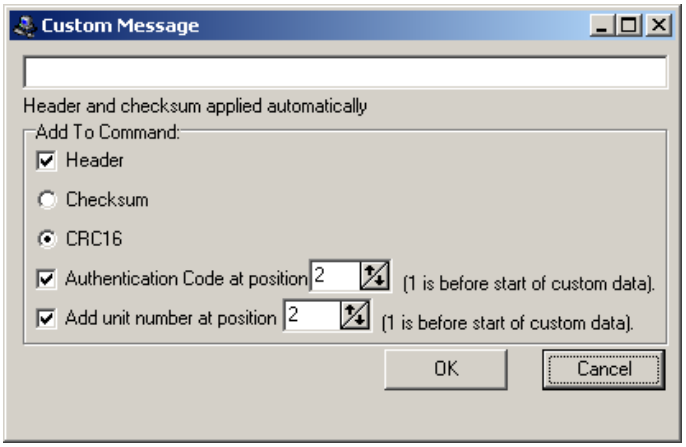

Figure 19: Custom Message Window

The Custom Commands window includes the following fields:

- **Hex string editor text field:** A user can add a custom command in the form of a hexadecimal string in the following format: XX XX XX XX XX (Example: 4D 43 47 50 00 00 00 00…).
- **Header:** Select the checkbox to determine if a default header, defined in the **Commands.ini** file, is added at the beginning of the custom message (nothing precedes it).
- **Checksum/CRC16:** Select the relevant option button to add an 8-bit additive checksum or a 16-bit cyclical redundancy check (CRC16) at the end of the custom message (nothing appears after this value).
- **Authentication Code at position:** Select the checkbox to add a 32-bit authentication code at any specified position, relative to the user custom hex string. Thus, a position of 1 is before the user's first defined byte and after the header. The Authentication Code which contains 4 bytes is added to the OTA message.
- **Add unit number at position:** Select the checkbox to add the unit number, as a 32 bit unsigned integer, at the position specified. The position is relative to the user custom hex string. Thus a position of 1 is before the user's first defined byte and after the synchronization string.

4.4.1.5 Send SMS Text Messages

Click **Text** and then **Send Text Message** to send an SMS text message. In the displayed window, enter the SMS text and the SMS address number in the relevant fields, as shown below.

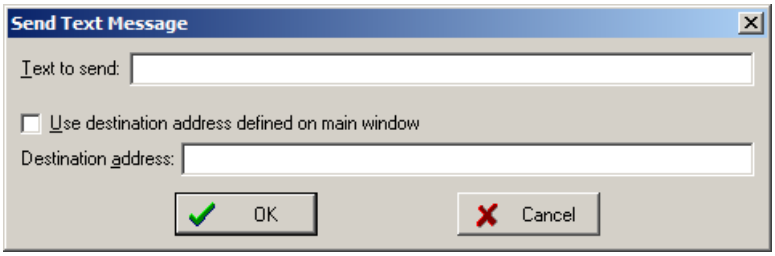

Figure 20: Send Text Message Window

The **Automatic text message** option is not implemented.

4.4.1.6 Decode Specific Messages (Hex Strings)

Click **Decode** to decode a message from a specific message (Hex string) or the log file (the Communication Center creates a log file **messagelogfile.txt**) via the Decode String window, as shown below.

Figure 21: Decode String Window

The Decode String window includes the following:

- **Enter Hex String text field:** Single or multiple messages can be copied from the **messagelogfile.txt** file and pasted in the Hex string box and then decoded by clicking **OK**.
- **File:** Click the **File** button to upload the relevant **messagelogfile.txt** file (every message that the Communication Center receives is written to this file).
- **Decode Fully:** Select the **Decode Fully** checkbox to simulate online decoding as if the messages are received by the Communication Center one after the other.

4.4.2 *The Communication Panel*

Figure 22: Communication Panel

The Communication panel enables the user to define the destination unit(s), the communication method (GPRS, SMS) and messages authentication, as described in the following sections.

4.4.2.1 Define the Destination Unit(s)

In order to send messages and commands to a unit, the unit ID must first be defined. Once defined, the selected unit ID is subject to all commands and actions activated via the Communication Center.

Click the **Unit ID** option button and enter the relevant ID (or use the arrow buttons to scroll to the relevant ID). Alternatively, select **Multiple** to enable the **Select units** button, via which you can select any number of units, all of which will use the commands and actions activated.

4.4.2.2 Define Communication Method (GPRS, SMS)

Select the **Send By SMS** checkbox to ensure all communications are sent by SMS rather than GPRS. Selecting this checkbox opens up a window in which you enter the unit's phone number.

4.4.3 *The Evaluation Tools Panel*

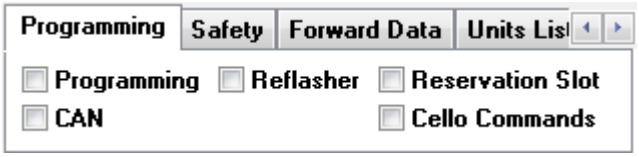

Figure 23: Evaluation Tools Panel

The Evaluation Tools panel provides the user with a number of tools and options to assist in evaluating the product, as described in the following sections.

4.4.3.1 OTA Programming via Minitrack Programmer

The **Minitrack Programmer OTA** enables the user to remotely manage (via OTA commands) the configuration memory of a unit or several units, including reading a full PL or specific parameters from a unit, edit a stored or uploaded PL, and download specific parameters or the whole PL to a single unit or group of units.

In order to define the configuration memory of a unit, open the **Minitrack Programmer** and choose OTA configuration Radio Button. The Minitrack Programmer OTA window is displayed, as shown below.

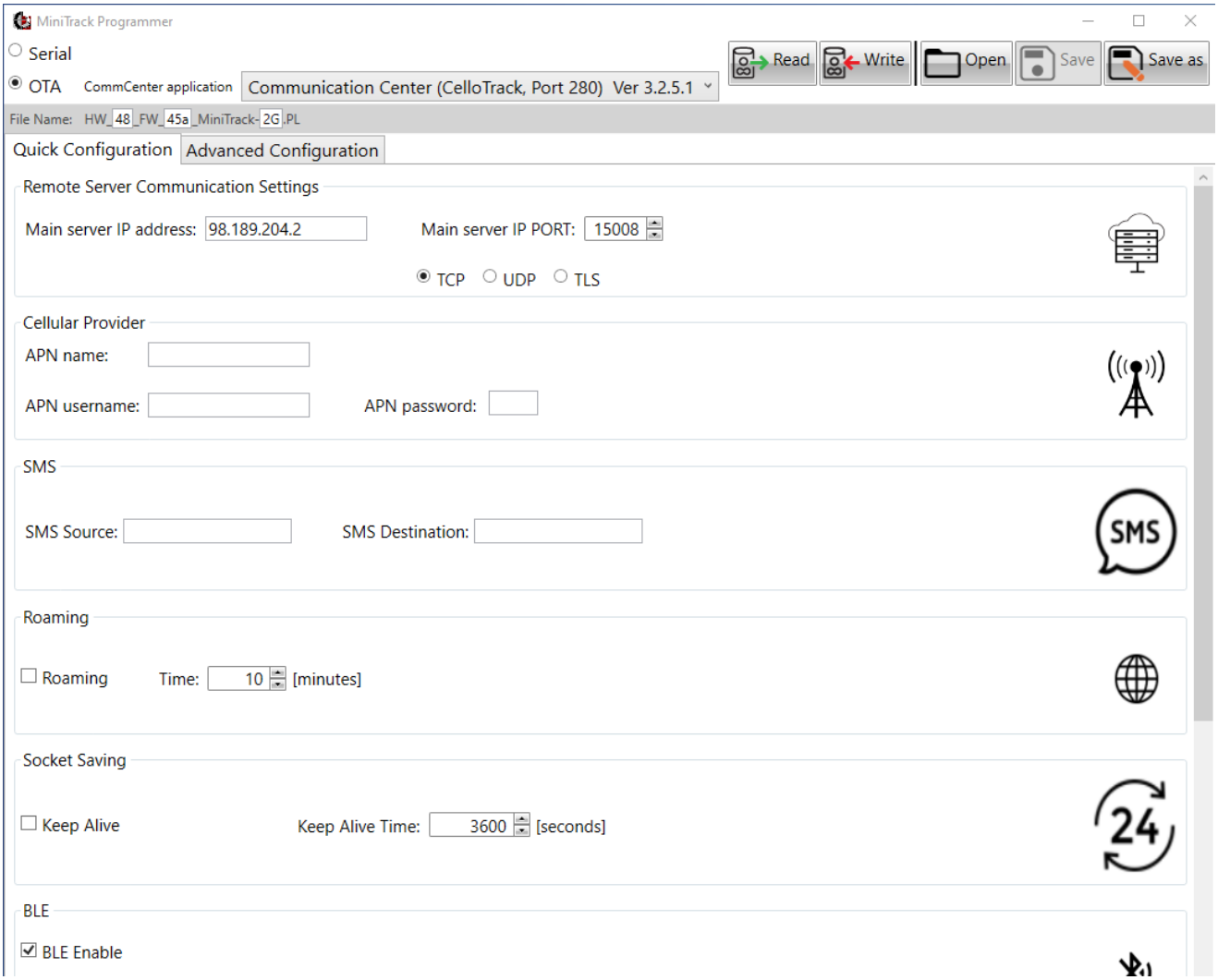

Figure 24: Minitrack Programmer OTA Window

- **Communication Center Application** Drop Down list enables selecting the active Communication Center out of the running instances of Communication Center. See the procedure below for more details.

NOTE: After OTA programming via Minitrack Programmer , the device automatically executes a Reset command.

Configuration Scenarios

In addition to the scenario mentioned in the procedure above, there are typically another three scenarios you may need to implement.

Reading and Writing configuration from the unit is done using type 3 in text format. Make sure that the Communication Center is running.

- **Scenario 1 – Saving the configuration memory of a unit to a PL file:** In this scenario, first select the destination unit ID in the Communication Panel of Communication Center. Read the entire unit's parameters memory by clicking 

Read Button (Make sure that the process is successful. There is confirmation message received after successful reading process).

  Press Save Button to save parameters to PL file or change to parameters and press Write Button to write them to the unit.

- **Scenario 2 – Write an existing PL file to a group of units:** In this scenario, first select the destination unit IDs in the Communication Panel of Communication Center.

  Open the existing PL file by clicking the Open pushbutton and click 

Write Button to generate the Programming OTA for the Unit.

- **Scenario 3 – Edit and modify an existing PL and Write to a unit:** In this scenario, first select the destination unit ID in the Communication Panel of Communication Center.

  Instead of reading parameters from the unit it is possible to open existing PL file (by pressing the Open Button), setting/modifying the relevant parameters in the Minitrack Programmer OTA window and Write to the unit.

After OTA Programming via Minitrack programmer, the device automatically executes a Reset command. The Minitrack Programmer Application waits for an ACK from the Unit and returns to Ready state after the OTA Programming. While waiting, the Write Button appears as unavailable until a confirmation is received from the unit.

4.4.3.2 OTA Firmware Upgrading

In order to perform an OTA firmware upgrade for compatible units, select the **Reflasher** checkbox in the Programming tab. This displays the OTA Unit Reflasher window.

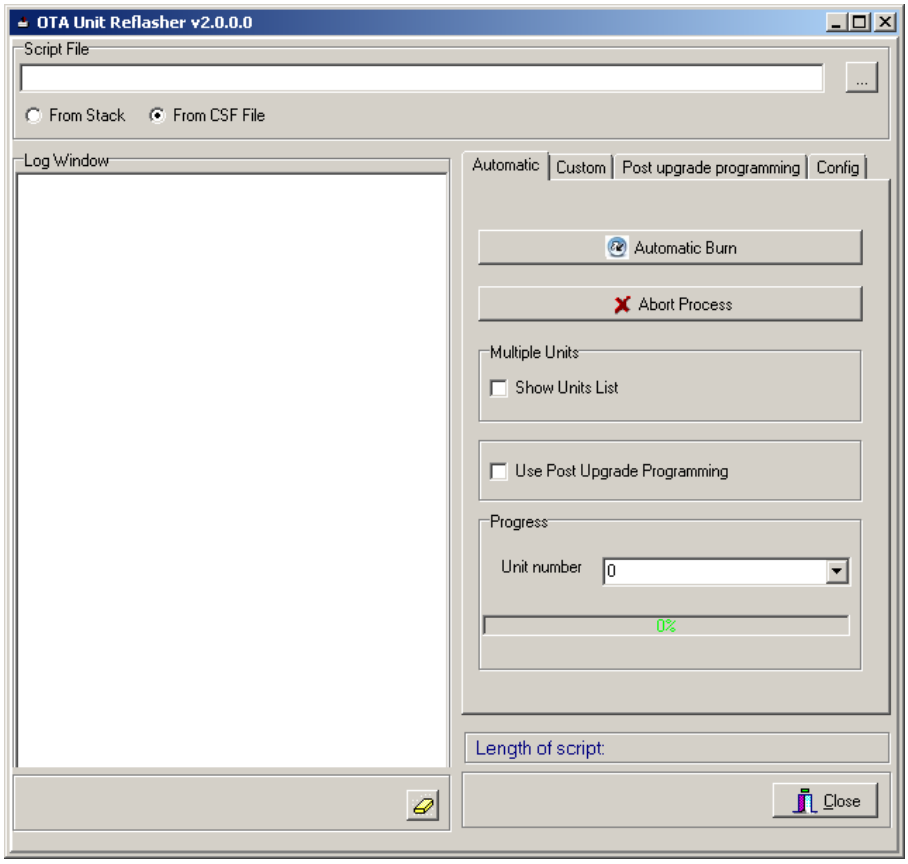

Figure 25: OTA Unit Reflasher

4.4.3.3 Working with Cello Commands

When the **Cello Commands** checkbox is selected on the **Programming** tab it activates the Cello Commands window. Operating the Cello Commands requires password and direct instructions from Cellocator CS personnel.

4.4.3.4 Viewing the units that have communicated with the Communication Center

Selecting the **Units List** checkbox in the Units List / Map tab displays the Unit List window. In this window the units that have made contact with the Communication Center, by sending at least one message, are listed.

Figure 26: Units List Tab

Note that the MAP function is currently not implemented.

4.4.3.5 Displaying Message Type 9 popup windows

To display the Message Type 9 message popup windows automatically, ensure the **Show Popup Screen** checkbox in the Popups tab is selected (by default it is selected).

Figure 27: Popups Tab

When the checkbox is not selected, double-click on the message to display the popup window.

Clear the checkbox if you do not want the popups to be displayed.

5 GSM/GPRS Cellocator Unit Simulator

5.1 Overview

The software is designed to simulate the OTA activity of the Cellocator unit via an IP network. The simulator is equipped with a GPS Simulation tool, I/O triggers, LED for outputs, CAN interface, UDP/IP and TCP/IP communication modules. The tool is useful for software testing and simulation of movement of multiple units.

5.2 Activation and set up

1. From the *Start* menu, go to the Cellocator program folder and click **GSM Unit Simulator**.
2. Set the following GPRS settings in the unit simulator:
   - Enter the required virtual unit number (256 in the example below).
   - Enter the TCP server settings of the GPRS Manager: the IP address ("local host" if the simulator software is running on the same machine) and port of the TCP Server (the same port that you set in the GPRS Manager configuration, which is 231 by default).
3. Open the log window by clicking the arrow in the lower right corner of the window.

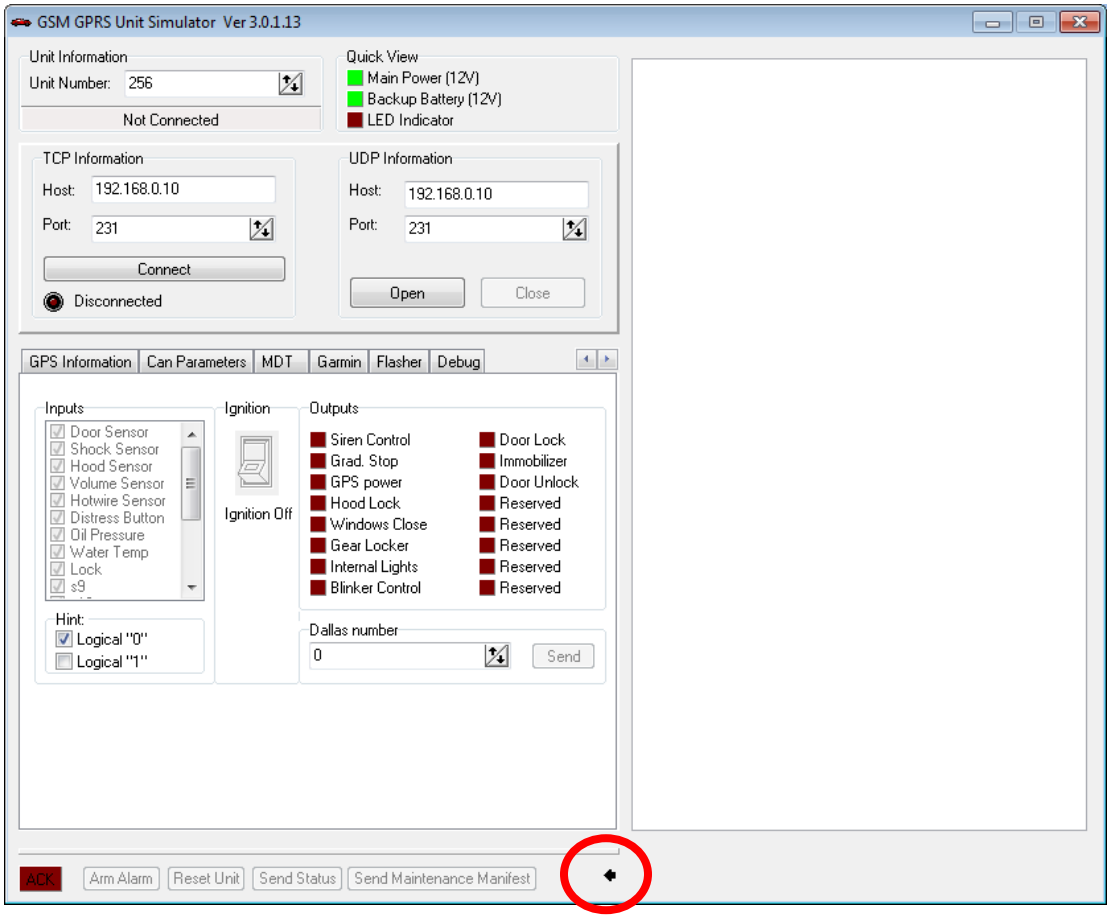

Figure 28: GSM Unit Simulator Window

4. Click **Connect**.

NOTE: Connection succeeds when the Connected LED color turns from red to green, "ACK Received" is displayed in the Log window, the ACK LED ( ) in the lower left corner of the window turns green for 1 second ( ) and a message from the unit (256 in the example) appears in the CommCenter window.

5.3 Features / capabilities

The simulator supports the following information / features / capabilities

- **Log window:** presents the protocol messages
- **Unit Information:** The unit details.
- **TCP Information/UDP Information:** Method of transporting unit's data. A user can define a target IP and target port of the actual server.
- **I/O Status:** Input/output state. The user can change input states and define the Dallas number and view the output status.
- **Analog Inputs:** A user can set the battery levels.
- **Configuration:** A user can set the unit's transmission rates and the message header. i.e. unit ID, hardware version, software version, etc. (message type 0).
- **GPS Information:** A user can use the GPS Simulator embedded as a module or use actual GPS.
- **Can Parameters:** the user can define CAN information to be sent by the unit (message type 9).
- **MDT:** A user can simulate MDT messages uplink messages (unit to server) and display downlink MDT messages. The user can also use live MDT.

The simulator screen with several messages in the Log window is presented below.

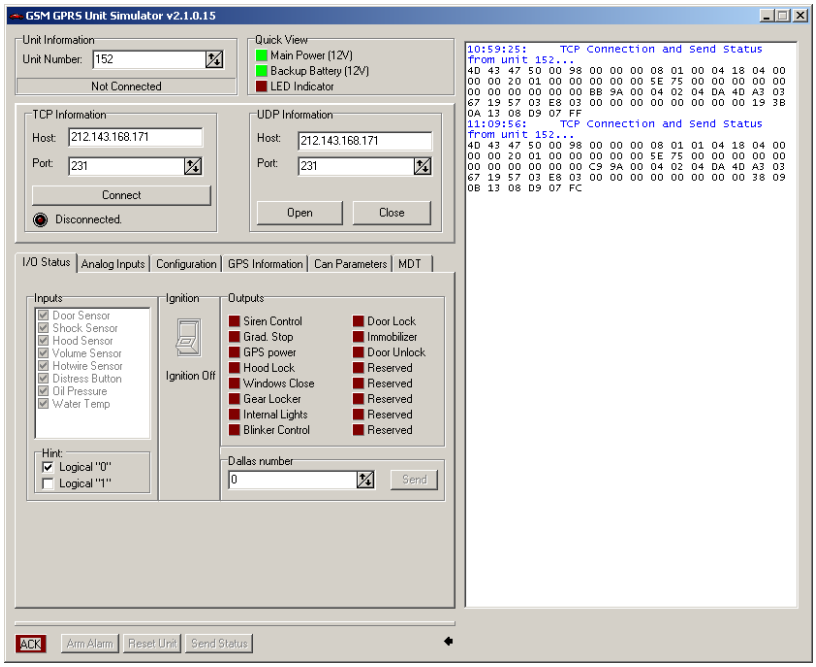

Figure 29: GSM Unit Simulator Window

5.4 Testing GPRS Communication with the GPRS Manager

The GPRS Manager is used to test GPRS communication with the Cellocator unit. To test GPRS communication with the GPRS Manager, perform the following steps:

1. Double-click on **GPRS Manager** in the system tray, to open the GPRS Manager window.
2. Enter a port number for listening UDP/TCP port of transmissions from the unit simulator. Once the command is delivered from the Communication Center, the GPRS manager sends it to the last known IP address of the appropriate unit.
3. Enter the unit number. The unit number is an embedded serial number programmed into the unit. This number is the unit's unique ID that identifies the unit when sending a command to the unit or receiving a telemetry message from the unit. This number can be found on the label on the unit casing.
4. Verify that GPRS dial up settings are correct:
   - Default target IP Address (for GPRS): Enter the IP address of the PC (Public IP) on which the Communication Center software running.
   - GPRS Self Port and GPRS Target Port: Enter the listening and outgoing GPRS port for UDP messages.
5. Verify that the first message arrives from the unit. It is displayed in the left hand text box: GPRS Message type 0 received from unit XXXX, as a normal message sent in response to a status request or other command/request.
6. Click **Status request.** A response should be received from the end unit.
7. Send an Activate Siren command (**Commands>Outputs>Activate Siren**).
8. Verify that the appropriate led on the tester lights. In the same way deactivate the siren.
9. In order to initialize SMS manager, in the Communication Center, click **Communication**>**SMS Manager>GSM Signal Quality.**

Figure 30: SMS Manager Report Window

10. Verify that the DLL is not configured to use the SMPP connection of the cellular provider's SMSC. Verify on the **SMPP** tab that **Use SMPP Connection** is not clicked.

11. Start the configuration session by clicking **Communication**>**SMS Manager>Configuration**. The following window opens:

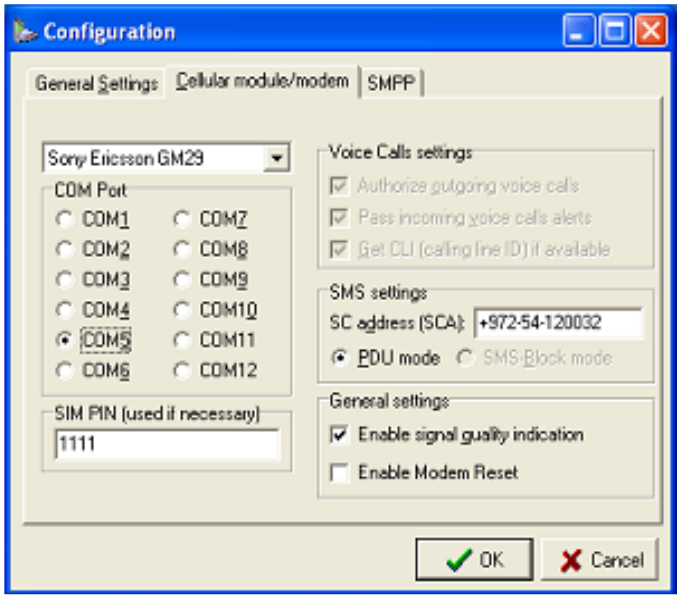

Figure 31: SMS Manager Configuration Window

12. Click the **Cellular module/modem** tab.
13. Define the COM port.
14. In the dropdown list of modems, select the appropriate modem. Define the COM port, and enter the SCA (SMSC) (SMS center cellular number of your operator) and the PIN code of the SIM card (if necessary).

NOTE: If a faulty SCA (SMSC) address is entered, SMS communication will not function.

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15. Click **OK**.
16. In the GSM Signal Quality window, verify that the system reports successful initialization of the terminal modem. If so, the SMS module is properly configured.
17. In order to send an SMS message to the unit, go to the control interface and select the **Send by SMS** checkbox.