

# CelloTrack Nano Evaluation Suite Manual



Cellocator Division  
Pointer Telocation Ltd.

Proprietary and Confidential

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**POINTER**



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# 1 Introduction

## 1.1 About this Document

The CelloTrack Nano Evaluation Suite Manual is a comprehensive guide that provides information required to run an initial appraisal and testing process of CelloTrack Nano and MultiSense units, without requiring a full and real installation. Other relevant information, such as release notes and protocols, can be found on the [Cellocator website](#).

The CelloTrack Nano 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 CelloTrack Nano system by integrators or service providers.

For additional information about setting up the CelloTrack Nano Evaluation environment, please refer to the *Cellocator 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:

- ◆ Cellocator Evaluation Suite (Section 4)
- ◆ Communication Center (Section 5)
- ◆ GSM GPRS Cellocator Unit Simulator (6)
- ◆ The Communication Logger (Section 7)
- ◆ PL Configuration Files Comparison Tool (Section 8)
- ◆ Serial CSF STK Flasher (Section 9)

The Cellocator Programmer, which is also one of the Evaluation Suite applications, is explained in a separate document, the *Cellocator Programmer Manual*.

## 1.2 Abbreviations and Terminology

| Abbreviation | Description                |
|--------------|----------------------------|
| CC           | Communication Center       |
| ACK          | Acknowledge                |
| CCC          | Command and Control Center |



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| Abbreviation | Description  |
|--------------|--|
| CSF          | Content Sealed Format                                |
| DB           | Database   |
| OTA          | Over the Air   |
| PDU          | Protocol Description Unit (Common name for data SMS) |
| SMS          | Short Message Service (GSM)                          |
| 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](http://www.Cellocator.com)).

| # | Reference  | Description  |
|---|--|--|
| 1 | CelloTrack Nano Product Overview                           | The document provides high-level information required by service providers considering the integration and operation of CelloTrack Nano.   |
| 2 | CelloTrack Nano - Installation Guide                       | This document provides all necessary information for a technician involved in the installation of a CelloTrack Nano. It describes how to install and verify the proper functioning of the installation elements.   |
| 3 | <a href="#">Programming Manual for Cellocator Cello</a>    | This document describes the features supported by the Cellocator unit and provides details about its configuration parameters.   |
| 4 | <a href="#">Cellocator Wireless Communication Protocol</a> | 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. The document also describes the CSA protocol and the CSA File Structure. |
| 5 | <a href="#">Cellocator Serial Communication Protocol</a>   | This document explains the unit's serial communication structure. It describes every byte of the incoming/outgoing packets, which can be sent or received by the unit via the serial interface.  |



## 1.4 Revision History

| Version | Date              | Description                         |
|---------|-------------------|-------------------------------------|
| 0.1     | November 23, 2015 | Initial version                     |
| 1.0     | July 20, 2016     | Formal version                      |
| 1.1     | November 15, 2016 | Updated part number of all variants |
|         |                   |                                     |
|         |                   |                                     |
|         |                   |                                     |
|         |                   |                                     |
|         |                   |                                     |
|         |                   |                                     |
|         |                   |                                     |





## 2 Preparation of the Evaluation Kit

### 2.1 Evaluation Kit – Hardware Components

This section describes the CelloTrack Nano Evaluation Kit hardware components required for setting up the evaluation environment. Specific descriptions of the various Evaluation Kits for each CelloTrack 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 CelloTrack Nano 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 Suitcase*







Figure 2: Suitcase Upper Layer



Figure 3: Harnesses and accessories in the kit

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

*Table 1: Common Components required for any CelloTrack Nano Evaluation Environment*

| Name/Part Number  | Description  | Picture   |
|---|--|---|
| <p><b>CelloTrack Nano 20 Hub</b><br/> <b>PN:</b> GC9770001-000 (Nano 20 – 2G),<br/>           or GC9770002-000 (Nano 10 – 2G),<br/>           or GC9771003-000 (Nano 10 – 3G),<br/>           or GC9771004-000 (Nano 20 – 3G)</p> | <p>The CelloTrack Nano 20 is used as a hub in a WSN.</p>           |    |
| <p><b>MultiSense device</b><br/> <b>PN:</b> 715-50100</p>   | <p>The MultiSense device.</p>                                      |   |
| <p><b>MultiSense-TH device</b><br/> <b>PN:</b> 715-50200</p>  | <p>The MultiSense-TH device with Humidity sensor.</p>              |  |
| <p><b>CelloTrack Nano Charger EU</b><br/> <b>PN:</b> 711-20083</p>  | <p>White charger with micro USB connector for European market.</p> |  |
| <p><b>CelloTrack Nano Charger US</b><br/> <b>PN:</b> 711-20082</p>  | <p>White charger with micro USB connector for US market.</p>       |  |



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| Name/Part Number   | Description   | Picture   |
|--|---|---|
| <b>CelloTrack Nano USB data cable</b>                              | Micro-USB- USB data cable   |    |
| <b>CelloTrack Nano Cradle Kit</b><br><b>PN: 805-60903</b>          | Includes cradle, 1 double-sided adhesive sticker, 3 screws.                 |   |
| <b>CelloTrack Nano Magnetic Cradle kit</b><br><b>PN: 815-60903</b> | Includes cradle, 2 coin magnets, 2 screws, 2 screw nuts.                    |   |
| <b>CelloTrack Nano Belt Clip</b><br><b>PN: 705-60904</b>           | Belt clip for Nano cradle.  |  |
| <b>CelloTrack Nano Accessories</b><br><b>PN: 712-00007</b>         | Includes 2 double-sided adhesive stickers, 3 screws, 1 cable micro USB-USB. |   |
| <b>CelloTrack MultiSense Accessories</b><br><b>PN: 712-00008</b>   | Includes 2 double-sided adhesive stickers, 2 screws.                        |   |



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| Name/Part Number   | Description   | Picture  |
|--|---|--|
| <b>CelloTrack Nano rechargeable battery</b><br>PN: 711-20081                   | Li-Ion 1000 mAh, 3.7 volt.  |   |
| <b>CelloTrack MultiSense battery</b><br>PN: 711-20079                          | 3V 620mAh Lithium coin battery CR2450.  |   |
| <b>CelloTrack MultiSense – Magnet device</b><br>PN: 712-00010                  | Installed in locations to work opposite the MultiSense (such as on a door).   |   |
| <b>CelloTrack Nano 20 Evaluation Kit</b><br>PN: K091-001 (EU)<br>K091-002 (US) | Includes the CelloTrack Nano 20, MultiSense and MultiSense-TH, Cradle kit, Magnetic kit, accessories, belt clip, modem recorder cable, recording adaptor, USB charger (EU or US). |  |



## 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:
  - **Cellocator Programmer:** Provides wire 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 5 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. Refer to Section 7 for further information.
  - **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 6 for further information.
  - **PL Comparison Tool:** PL information can be compared using this utility and this simplifies the customer's PL generation for different hardware and firmware configurations. Refer to Section 8 for further information.
  - **Serial CSF STK Flasher:** Enables the upgrading of the firmware of a Cellocator unit via a CSF file or STK file (a stack file that contains two or more CSF files). Refer to Section 9 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 XP and up.
  - 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.



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- 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 CelloTrack Nano unit **Error! Reference source not found..**
- ◆ Programming the communication parameters of the CelloTrack Nano 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.



## 3.2.2 Network Configuration

The following diagram illustrates how the CelloTrack Nano 20 works.

The CelloTrack Nano 20 is based on a multi-GNSS (GPS and GLONASS Hybrid positioning) engine for accurate positioning. The Nano communicates with up to 16 paired MultiSense devices via Short Range Low Energy Wireless Communication technology and communicates with the backend via Cellocator's enhanced OTA protocol over cellular networks (2G/3G).

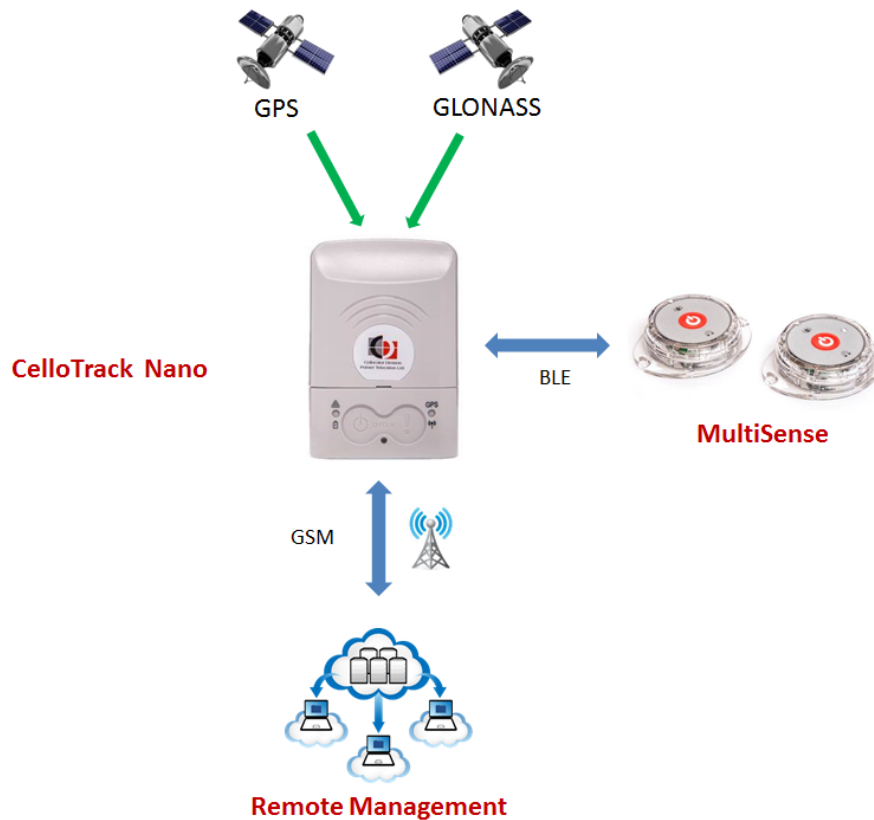


Figure 4: CelloTrack Nano 20 System Communications

## 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, refer to Section 4.2.

For information about the various applications that are installed with the Evaluation Suite, refer to the relevant sections later in this document.



### 3.3.1 *Evaluation Suite Installation*

#### To install the Evaluation Suite:

-----  
**NOTES:**

- 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.
  - Validate that Microsoft.NET v4.0 is installed.
- 

1. Double-click the **Evaluation suite setup [version number]** Installer Package file.
2. In the displayed Installation Wizard *Welcome* screen, click **Next**.
3. Select the relevant installation type:
  - **Typical**
  - **Custom**
  - **Complete** (Must choose this option for Nano)
4. Click **Next**. Note that if you selected **Custom** in the previous step, another screen is displayed in which you can define the components to install.
5. Click **Install**. The installation process is then launched.
6. Upon successful completion of the installation, click **Close** to close the Installation Wizard.

-----  
**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.  
-----

The next step is to activate each of the installed applications. Refer to the relevant section describing each application for further details.

### 3.3.2 *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 64bit:

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

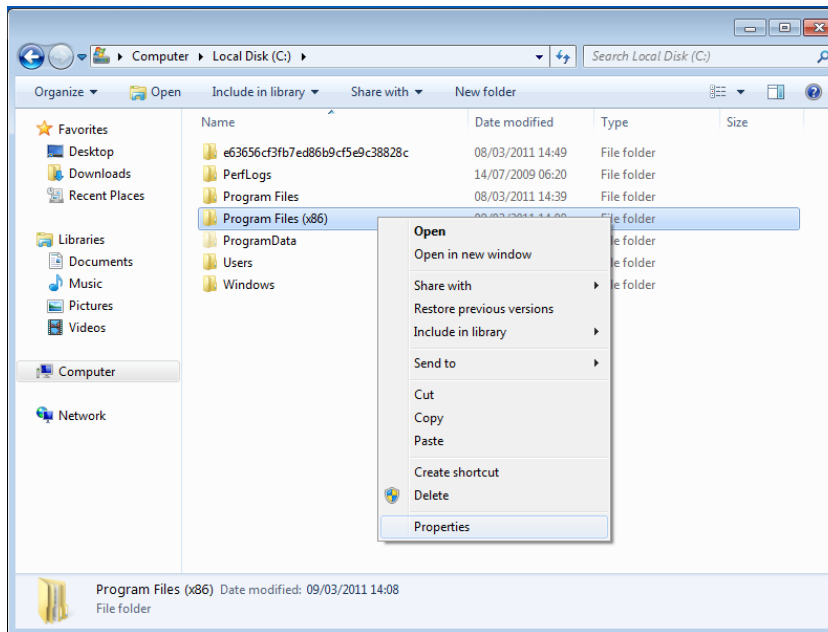


Figure 5: Windows 64bit Properties

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

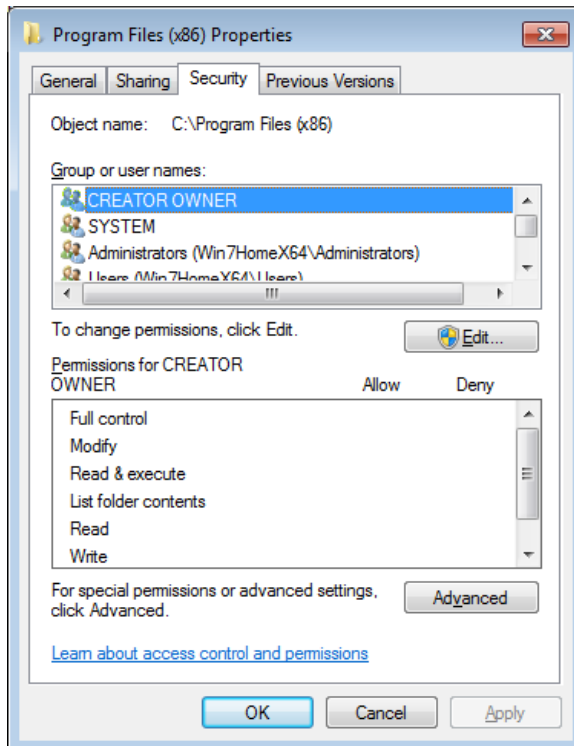


Figure 6: Windows Security Tab

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

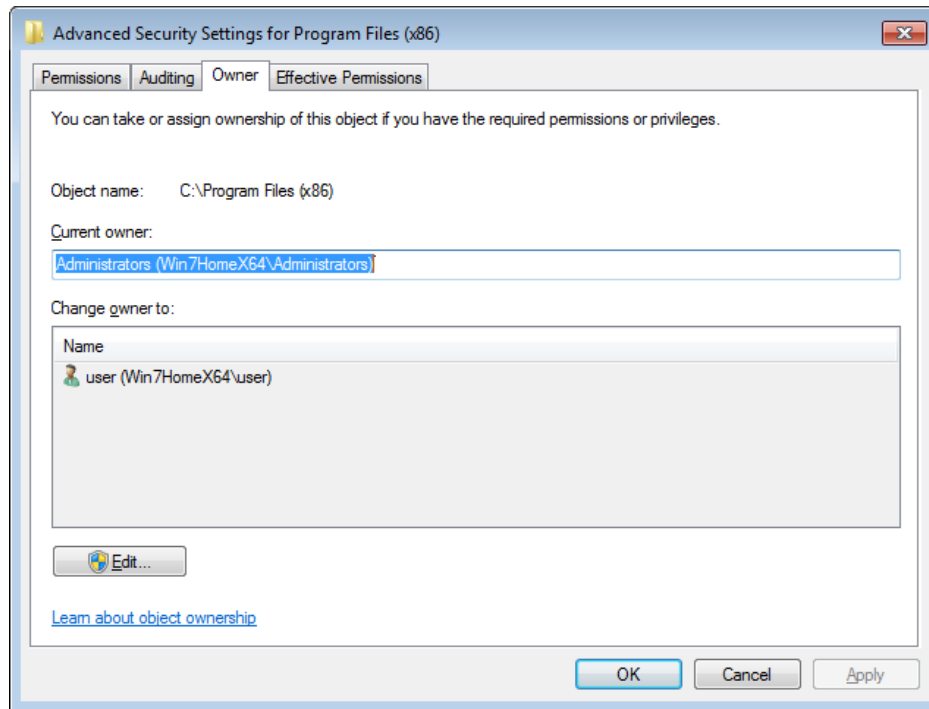


Figure 7: Owner Tab

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**.

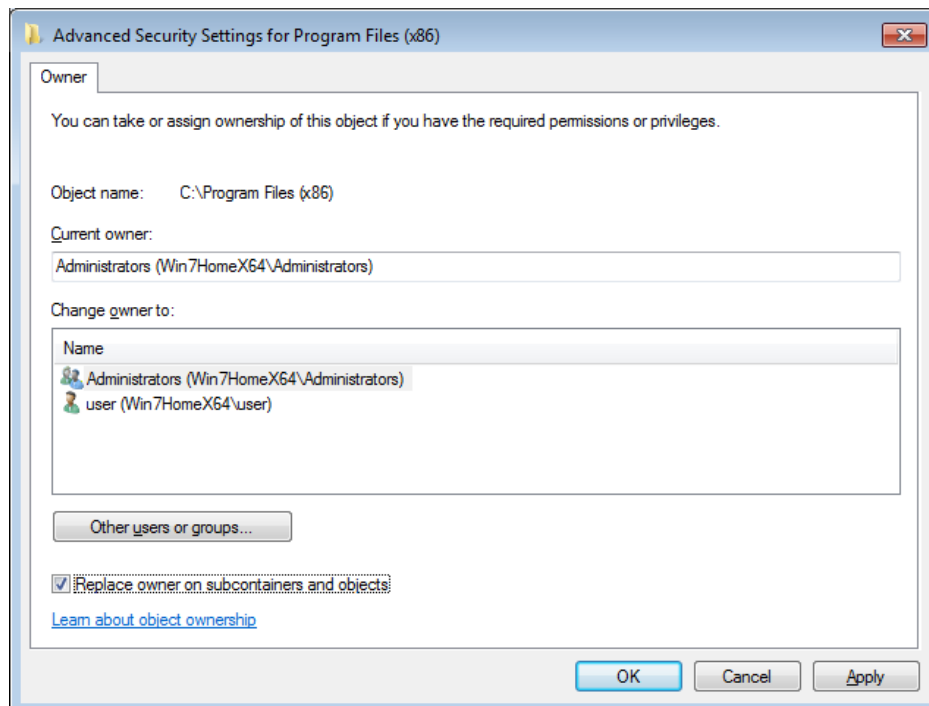
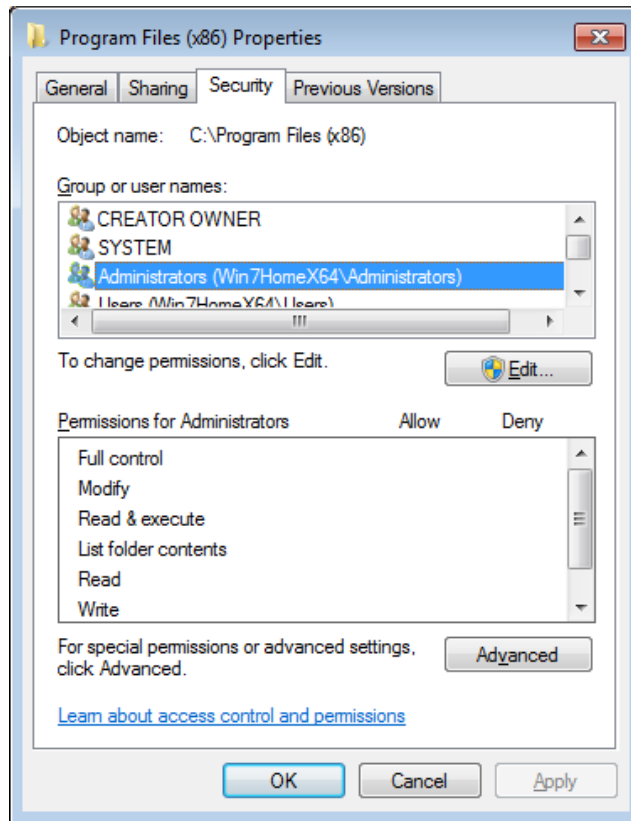


Figure 8: Changing Group Owner Tab

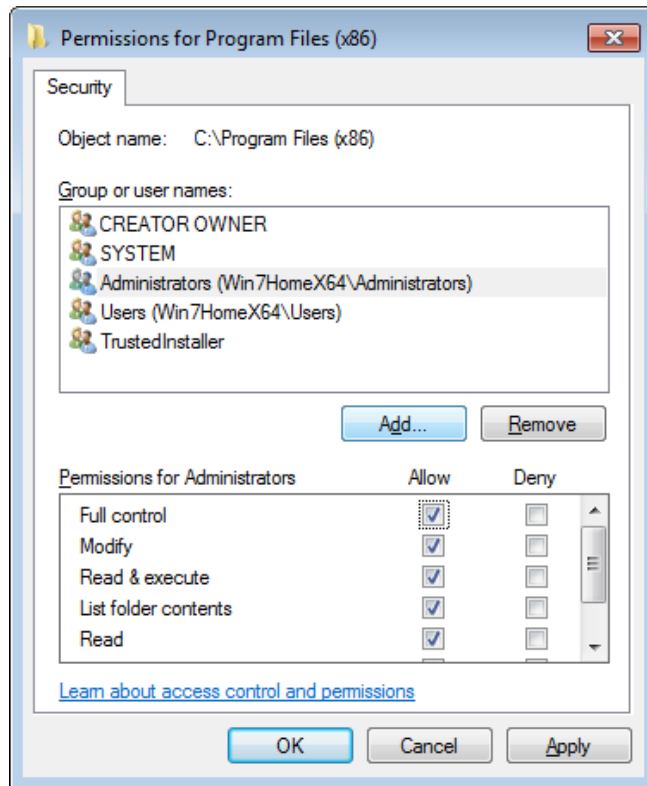
5. In the displayed confirmation message, click **OK**. Then close all the open Properties windows.

6. Access the Properties dialog again (as in Step 1). Then select the relevant group (Administrators in the example below) and click **Edit....**



*Figure 9: Selecting the Relevant Group*

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



*Figure 10: 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 5.

### 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**.

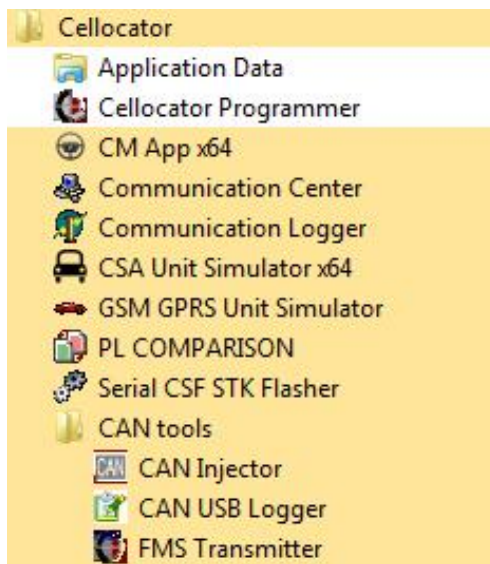


Figure 11: Cellocator Program Folder

2. In the displayed Select Hardware Type window, select the relevant type from the dropdown list and click **OK**.  
in the CelloTrack Nano case, please choose the CelloTrack family:



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

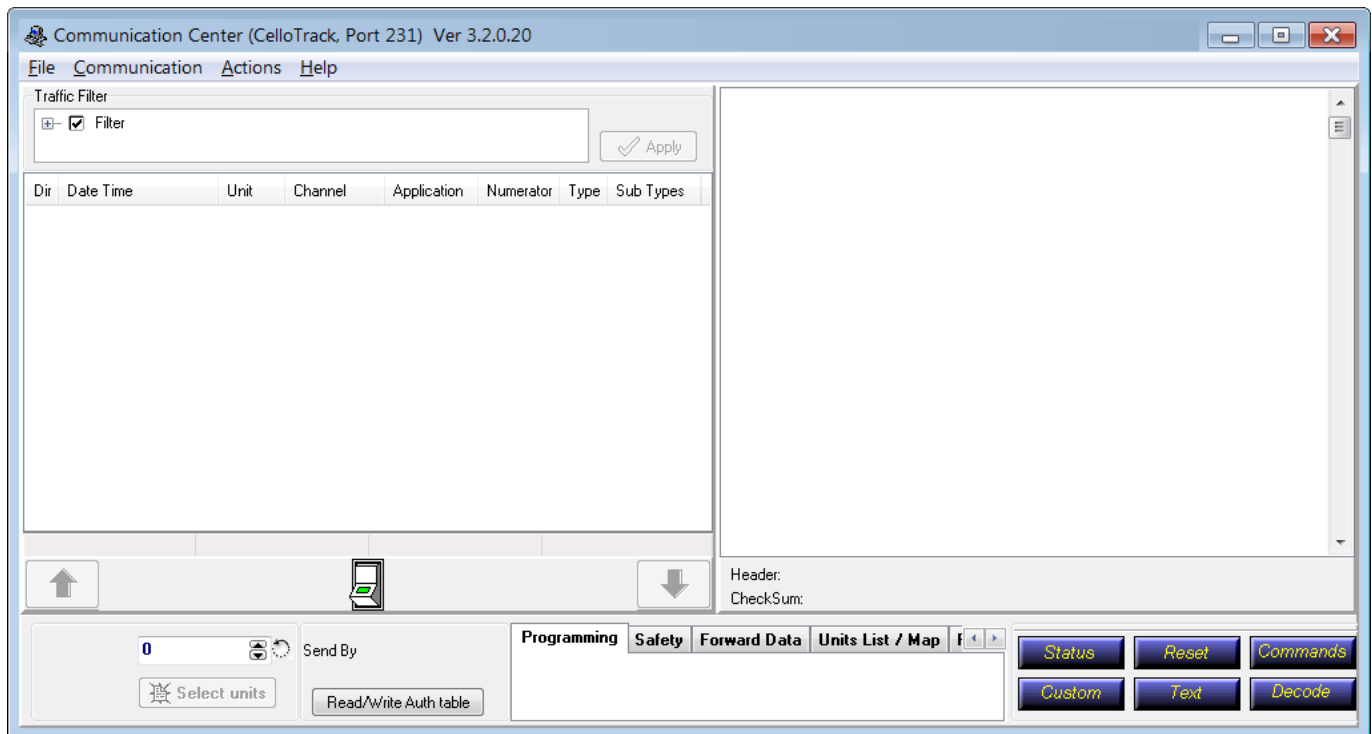


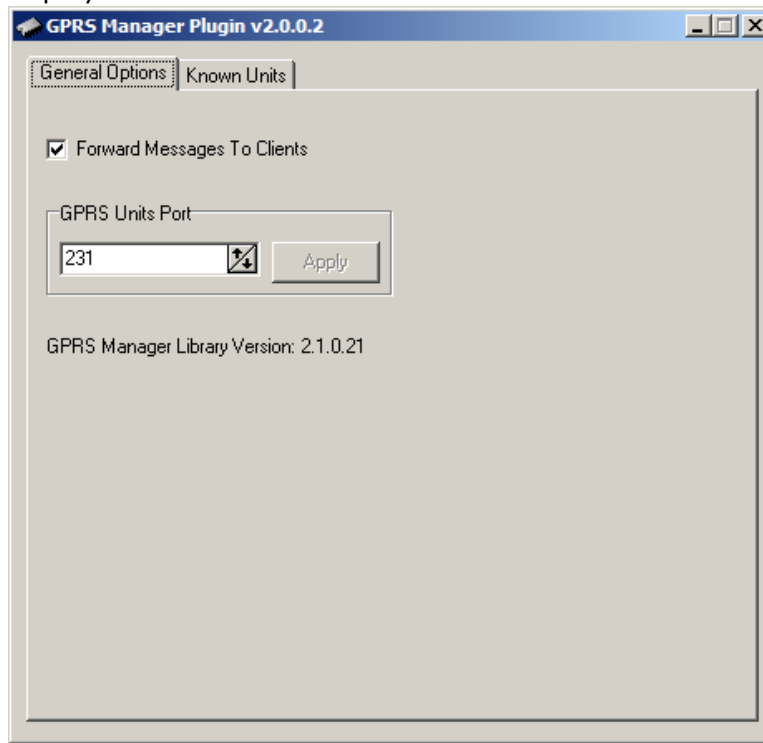
Figure 12: Communication Center Main Window

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





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



*Figure 13: 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 5.

## 3.5 Programming the Communication Parameters of the Unit

### 3.5.1 Cellocator Programmer Set Up and Configuration

The Cellocator Programmer is designed for wire communications with the unit, via a serial port. It is mainly used for the initial configuration of a unit's behavior and especially the communication setting.

Configurable features are explained in the relevant programming manual.

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

1. Make sure the Ignition switch of the simulator is in the **ON** position.
2. Activate the Cellocator Programmer. The application opens with an empty programming environment.

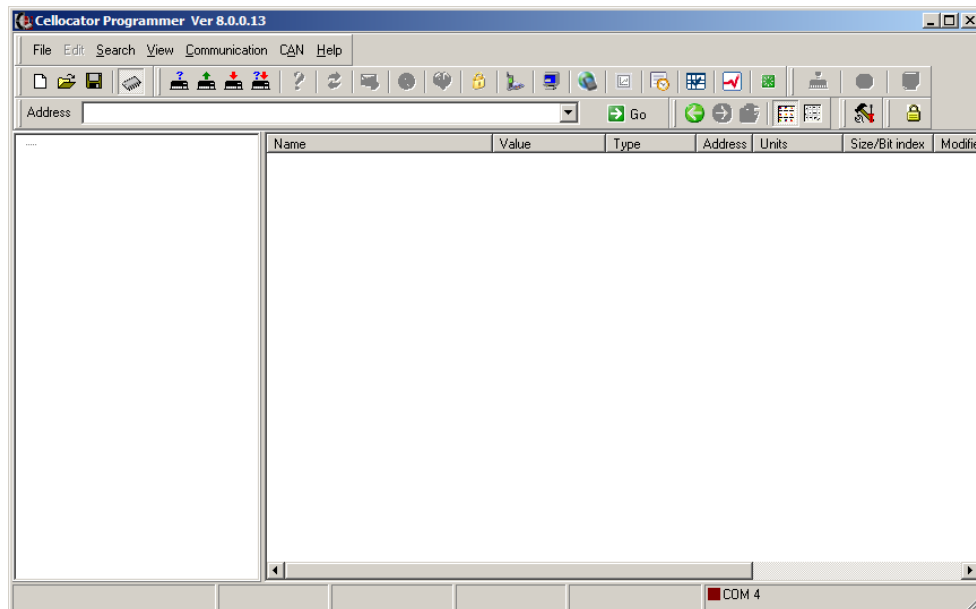
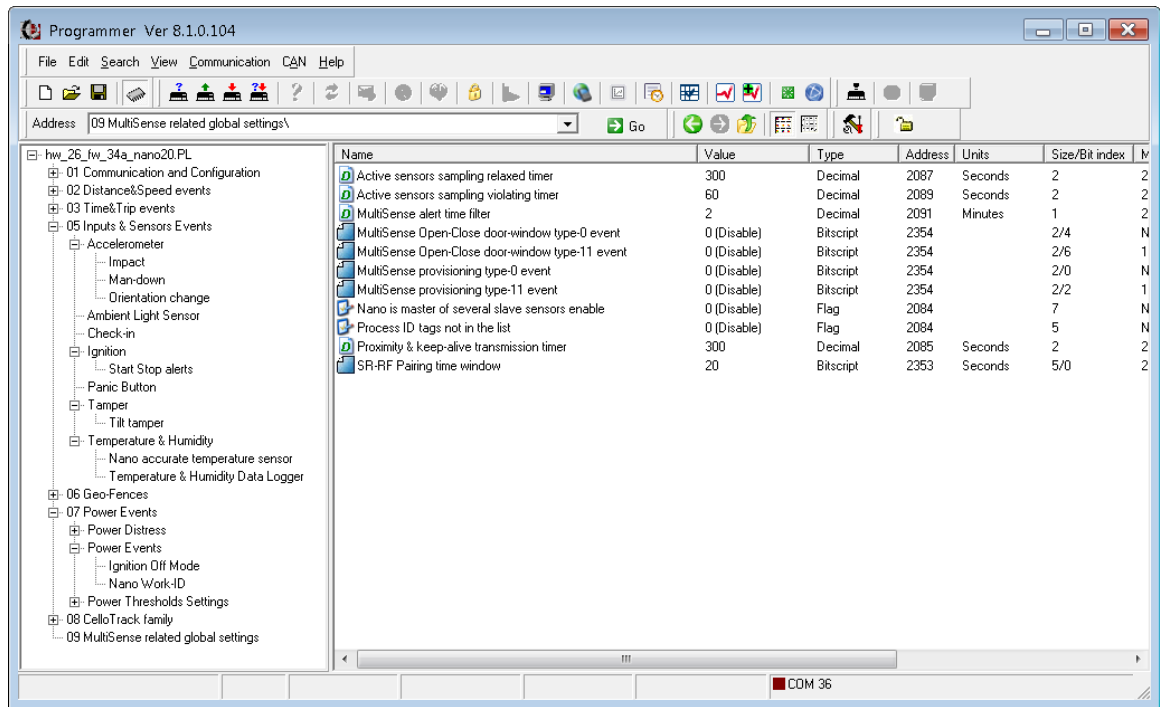


Figure 14: Cellocator Programmer

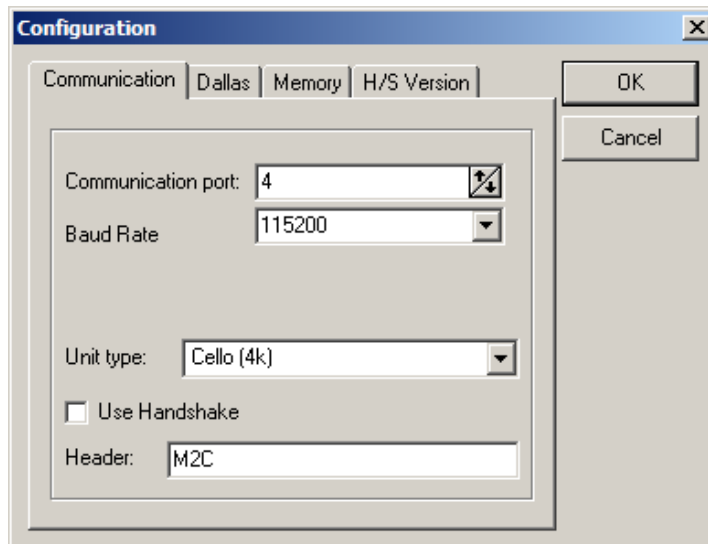
3. In the File menu, click **Open** and chose the PL file, in accordance with the unit's firmware and hardware. For additional information about the Cellocator Programmer, refer to the *Programmer Operating Instructions*.

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




*Figure 15: Selecting the PL*

4. In the Communication Menu chose **Configuration**. The following screen is displayed.



*Figure 16: Communication Settings Window*

5. In the Communication Port field select the port number used for communication with the unit (4 in this example).
6. The baud rate should be set to 115200 for Cello, CR and CelloTrack T family members.
7. The other fields should not be modified.
8. Click **OK**.

9. Query the unit by clicking the  button on the Programmer toolbar, or from the **Communications>Query unit** menu option. The unit should respond with its ID.

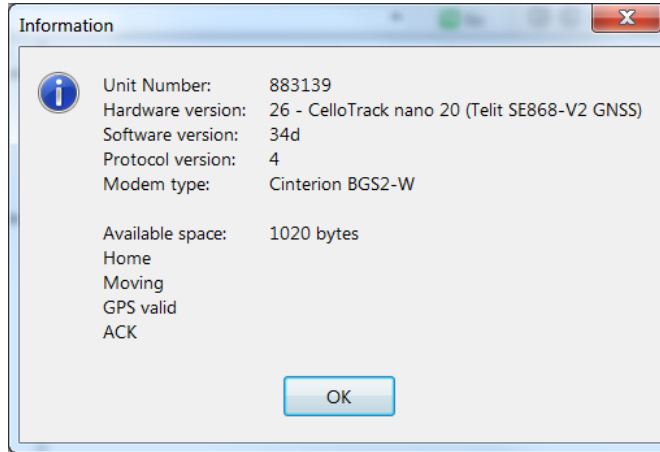


Figure 17: Unit ID Information Window

## 3.5.2 Setting up the Unit's Communication Parameters

**NOTE:** In order to see the parameters as they appear in this manual, select the **View>Details** menu option in the Cellocator Programmer.

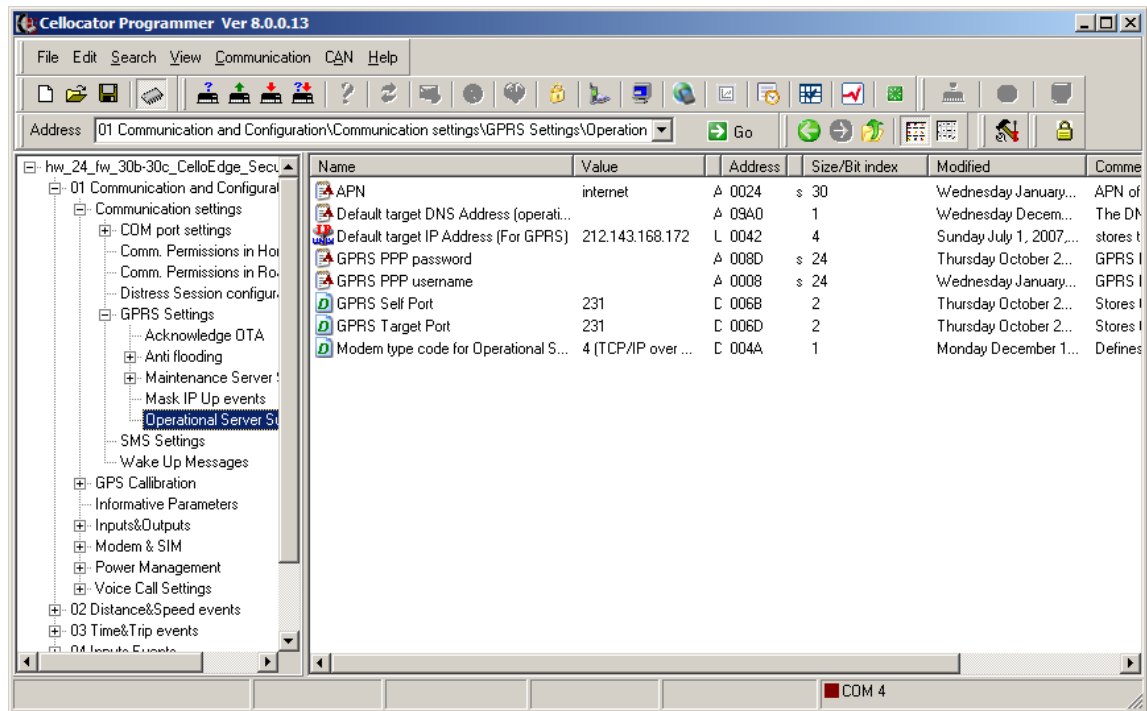
All Cellocator units require setting up the Fleet GPRS communication channel. If the SMS channel is required, it should be setup as well.

### 3.5.2.1 Fleet GPRS Communication Settings

The following procedure describes how to define the communication channel for fleet units and the GPRS Manager.

1. Open the 01 Communication and Configuration\Communication settings\GPRS Settings\Operational Server Support\ folder in the Cellocator programmer window and insert at least the destination Server IP (normally it will be the public IP of your gateway) or its DNS name, APN name, provided by the SIM card supplier, Port of your server (in Target Port field for TCP/IP communication).
2. If UDP/IP communication is being used, insert information for both ports (target and source).

**NOTE:** In some cases cellular operators require **username** and **password** authentication.



*Figure 18: GPRS Settings Window*

- **APN:** a parameter provided by your GPRS vendor, specifying the name of the GPRS Access point.
- **Default target DNS Address:** a parameter specifying the name of the communication server instead of its IP address. The DNS will be used for dial up only if the IP address field of the corresponding server is set to zero (e.g., 0.0.0.0).
- **Default target IP Address (For GPRS):** the IP address of the communication server listening to incoming traffic. As per the example provided in section 3.2.2, it will be 62.213.132.172.
- **PPP username and password:** some GPRS providers require a username and password to accomplish a dial up.
- **GPRS self port:** used by the device to listen to the incoming traffic.
- **GPRS target port:** the destination port to which the packets are to be sent. For TCP/IP communication only, the target port is used for storing the port of the TCP/IP server.
- **Modem type code:** selects between TCP/IP or UDP/IP communication type (Default option is TCP).
- **SIM PIN:** stores the PIN code of the SIM card. If the SIM PIN is required, it is very important to program the unit BEFORE sliding the SIM card into the unit, otherwise the SIM will lock up. Note this parameter is located under the following path: "01 Communication and Configuration\Modem & SIM\SIM PIN\".



## 3.5.2.2 SMS Settings

Open the 01 Communication and Configuration\Communication settings\SMS Settings\ folder and define the following parameters:

- ◆ **SMS Destination Address:** the SMS number, used by the unit for sending active SMS messages. Note that passive SMS messages (replies to commands) are sent to the command sender.
- ◆ **SMSC Address:** 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.

## 3.5.2.3 Communication Priorities

Programmed GPRS or/and SMS communications can be enabled and disabled separately on Home and Roam GSM networks. The SMS communication can be disabled completely (incoming and outgoing SMS traffic) or be the active traffic only (self-generated). In this case, the unit will reply to incoming SMS commands but will never try to actively generate any SMS messages.



## 3.6 Testing the Evaluation Set Up

### 3.6.1 Testing the Evaluation setup for CelloTrack Nano

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 CelloTrack 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 is 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**.

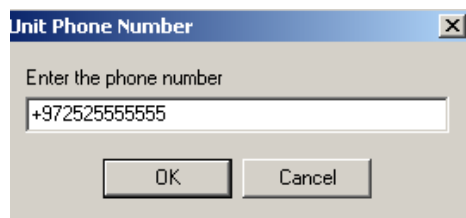


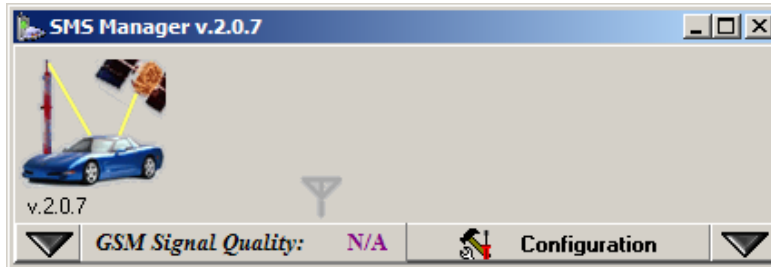
Figure 19: Unit Phone Number Window



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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 20: SMS Manager Window*





## 4 Cellocator Evaluation Suite

### 4.1 Overview

The Cellocator Evaluation Suite includes all components and applications relevant for evaluating any Cello unit, as listed below.

- ◆ **Cellocator Programmer** - enables you to program device parameters through the serial port
- ◆ **Communication Center** - monitors communication from the CSA and MCGP protocols
- ◆ **Communication Logger** - logs device internal serial communication
- ◆ **GSM Unit Simulator** - simulates (Fleet) unit MCGP communication
- ◆ **PL Comparison** - used to compare two PL files
- ◆ **Serial CSF STK Flasher** - serial flasher that enables you to update the unit Firmware

This section describes the process of installing the Evaluation Suite; for information about each of the various applications listed above, refer to the relevant sections later in this document.

### 4.2 Installing the Cellocator Evaluation Suite

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



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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   |
|---|--|
| <ul style="list-style-type: none"> <li>Application Data</li> <li>Cellocator Programmer</li> <li>Communication Center</li> </ul> | <ul style="list-style-type: none"> <li>Application Data</li> <li>Cellocator Programmer</li> <li>CSA Server</li> <li>Communication Center</li> <li>Communication Logger</li> <li>CSA Unit Simulator</li> <li>GSM GPRS Unit Simulator</li> <li>PL Comparison</li> <li>Serial CSF STK Flasher</li> <li>CAN tools (CAN Injector, CAN USB Logger, and FMS Transmitter)</li> </ul> |

**NOTE:** When the installation is complete, verify that no error messages were generated, the installation folder has been created in the selected destination (note that if you installed the 64-bit package the CSA Server will be located under the *Program Files* folder, and not *Program Files (x86)*), and the applications and the debugging tools appear in the *Start* menu, as shown below.

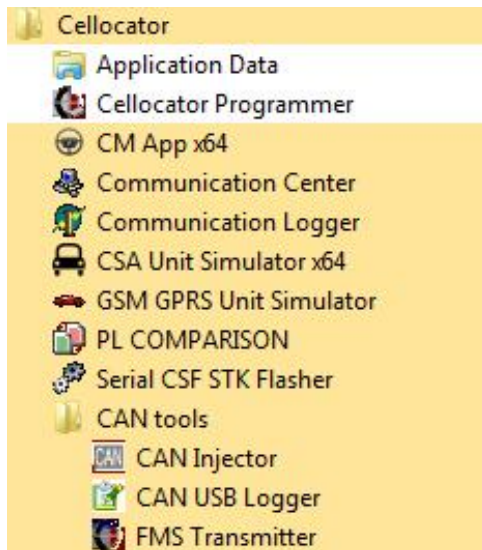


Figure 21: Cellocator Program Folder (Complete Install Type)

The next step is to activate each of the installed applications listed above. Refer to the relevant section describing each application for further details.



### 4.2.1 *Removing the Evaluation Suite*

1. Double-click the **Evaluation suite setup [version number]** Installer Package file.
2. 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.
3. Click **Repair / Remove**, and then click **Finish** to complete the removal/repair process and to exit the Installation Wizard.

## 5 Communication Center

### 5.1 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.

### 5.2 Architecture

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

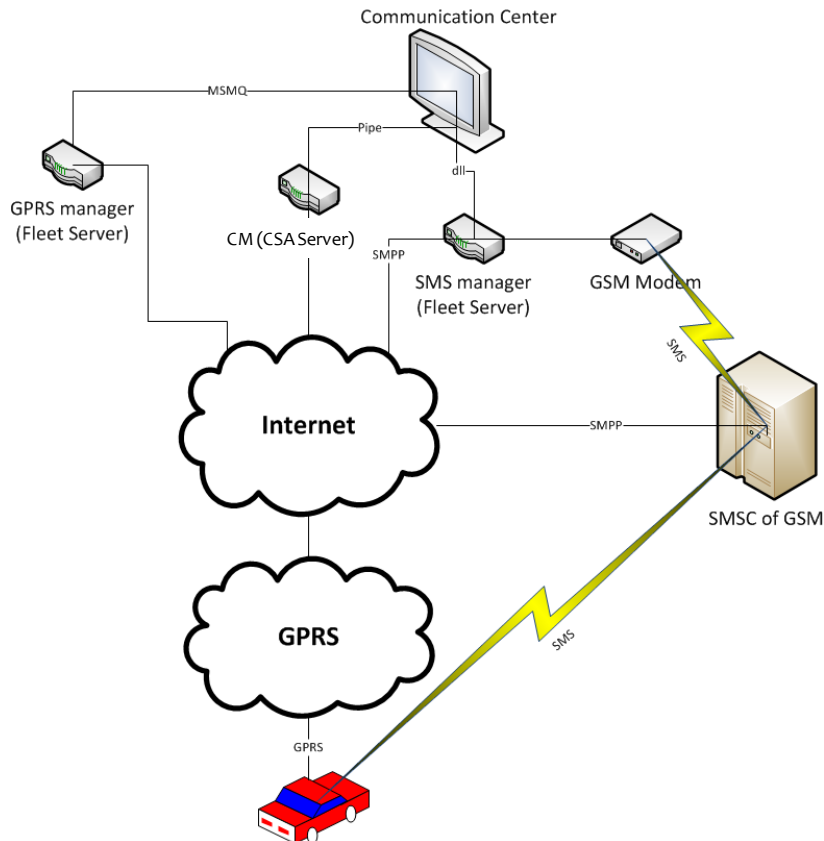


Figure 22: Communication Center Architecture

## 5.2.1.1 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.

## 5.2.1.2 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.

## 5.3 Communication Center Main Window

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

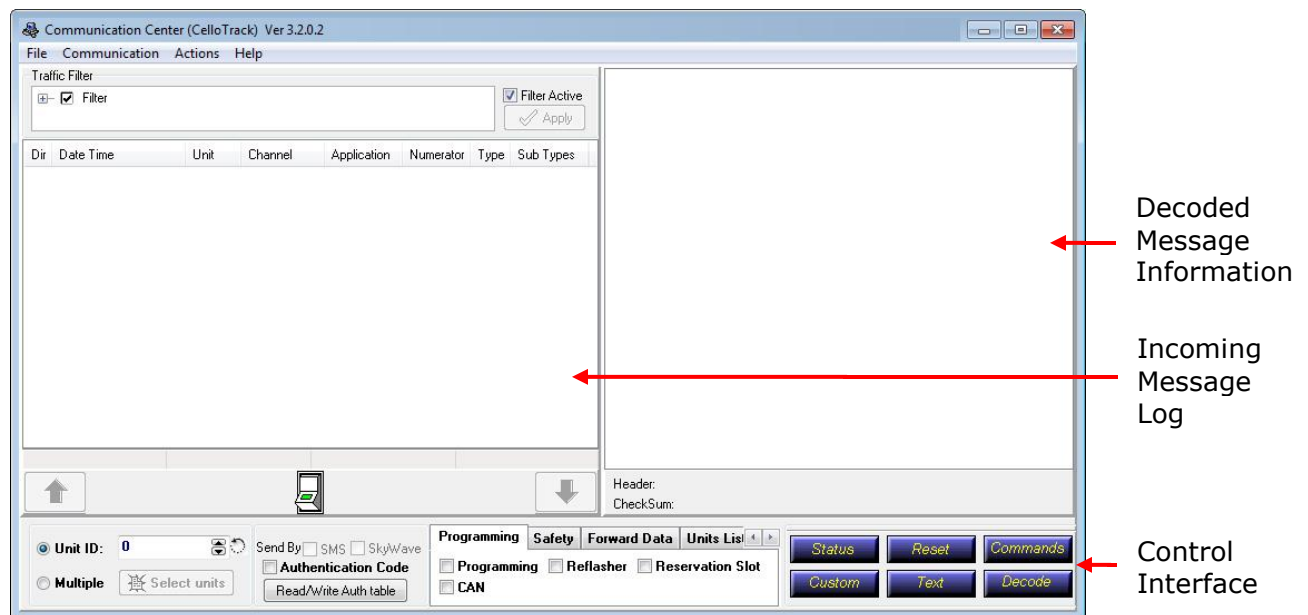


Figure 23: Communication Center Main Window

### 5.3.1 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.



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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.

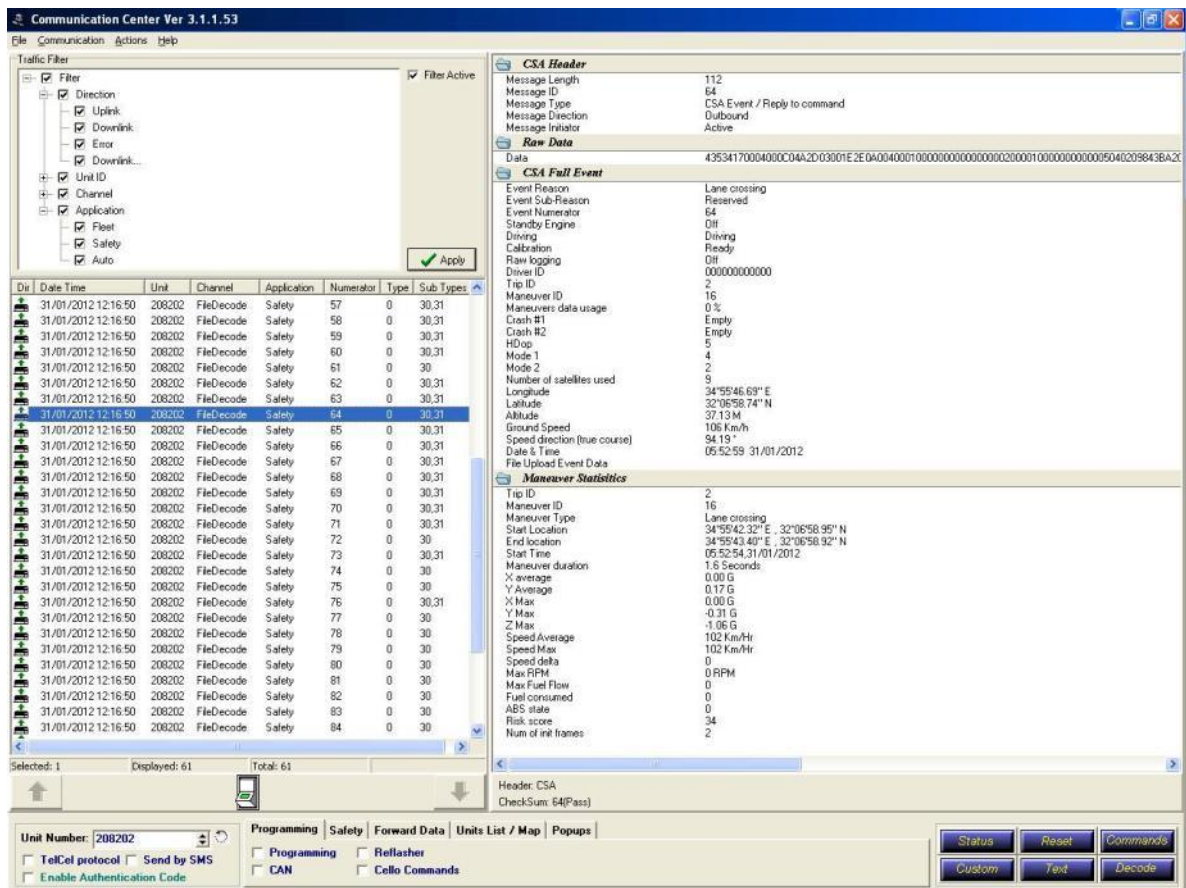


Figure 24: Message Log Screen

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)
- ◆ Clear all messages from the Incoming Messages Log window

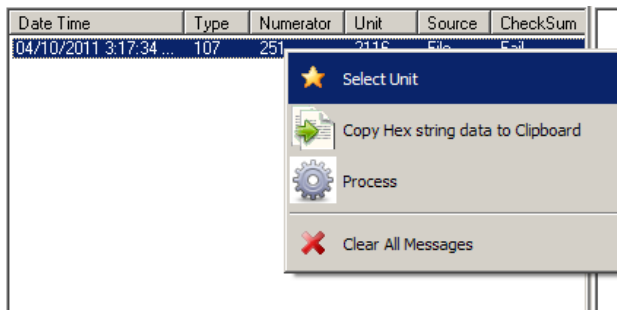


Figure 25: Right-click Menu Options

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.

## 5.3.2 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 **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 **Telemetry.ini** file. Do not change the definitions of this file. Changes can cause file corruption.

## 5.3.3 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.

## 5.4 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





### 5.4.1 The Debug Panel



Figure 26: 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.

#### 5.4.1.1 Enquire about the Unit Status

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

#### 5.4.1.2 Reset unit

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

#### 5.4.1.3 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.

#### 5.4.1.4 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.

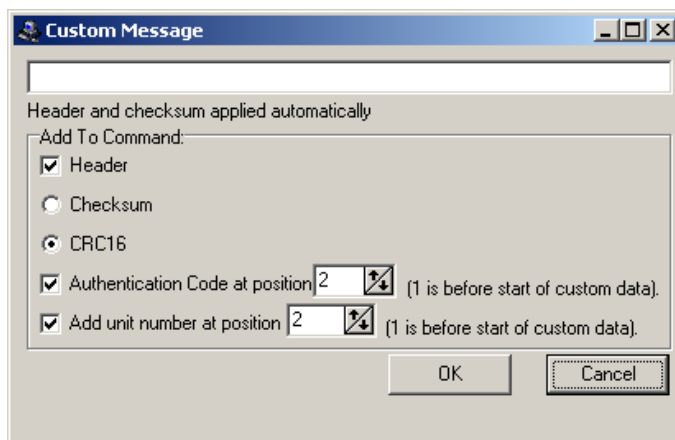


Figure 27: Custom Message Window

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.

### 5.4.1.5 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.

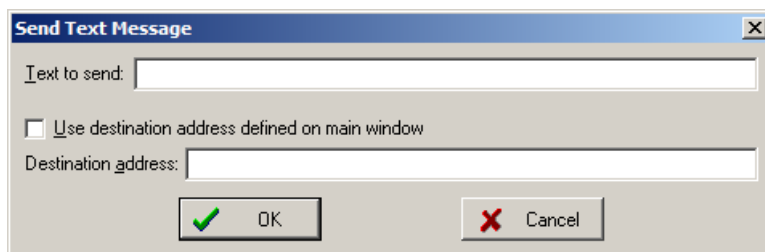


Figure 28: Send Text Message Window

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

### 5.4.1.6 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.

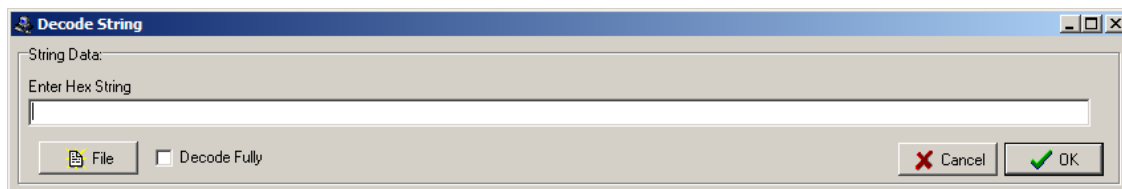


Figure 29: Decode String Window

The Decode String window includes the following:



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- ◆ **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.

## 5.4.2 The Communication Panel



Figure 30: 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.

### 5.4.2.1 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.

### 5.4.2.2 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.

### 5.4.2.3 Set Messages Authentication

Select the **Authentication Code** checkbox to add an authentication code to the sent messages.

Click the **Read/Write Auth table** button to display the Authentication table window, as shown below, and review /edit the authentication code.

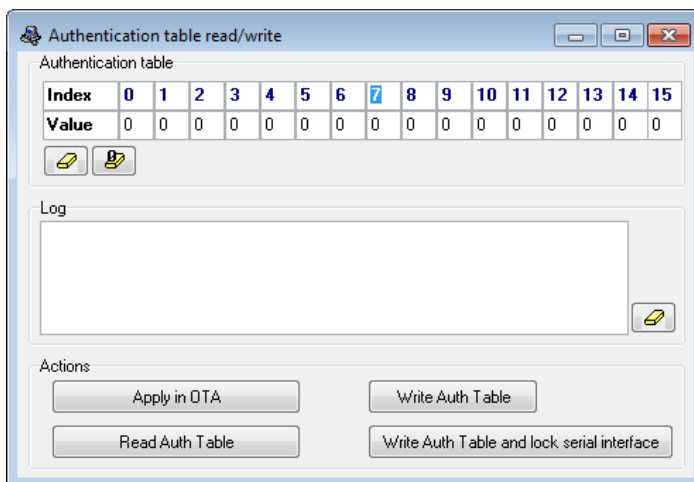


Figure 31: Authentication Table Window

### 5.4.3 The Evaluation Tools Panel



Figure 32: 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.

#### 5.4.3.1 OTA Programming

The OTA Programmer 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, select the **Programming** checkbox in the Programming tab. The OTA Programmer window is displayed, as shown below.

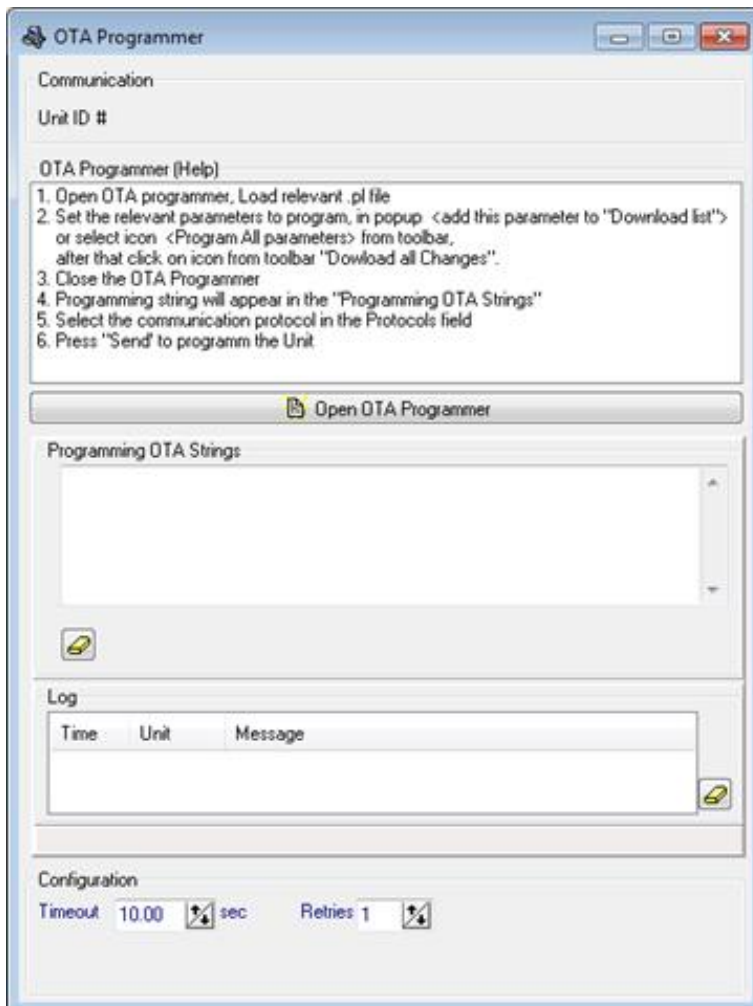


Figure 33: OTA Programmer Window

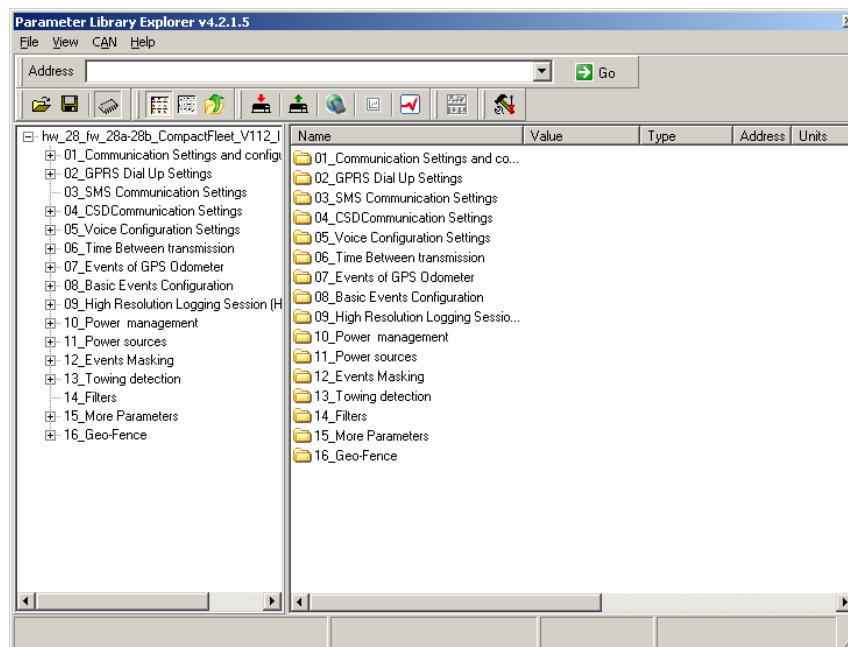
The OTA Programmer window includes a number of key components:

- ◆ **Communication:** This section at the top of the window displays the selected unit ID or indicates that multiple units are selected.
- ◆ **Open OTA Programmer:** This button opens the Parameter Library Explorer window, via which you can define the parameters in a PL file. See the procedure below for more details.
- ◆ **Programming OTA Strings:** This pane automatically displays any changes made to the PL. Click the **Send** button to send the modifications to the chosen destination. The **Eraser** button deletes all the strings displayed.
- ◆ **Log:** This pane displays all the transmissions communicated between the unit and the Programmer application. The **Eraser** button deletes all log entries.
- ◆ **Configuration:** This section enables the user to define Programmer settings. It is recommended to select the **Wait to ACK** checkbox to ensure the Programmer should wait for an ACK by the unit. The **Timeout** parameter defines how long the Programmer waits for an ACK; the **Retries** parameter defines how many times the Programmer should retry.

In addition, you should select the **Reset unit after programming** checkbox to ensure the unit is reset after programming changes have been sent, and select the **Enforce message type 11** checkbox to ensure Type 11 messages are sent to the relevant units that use Type 11 messages (such as the Cello IQ and Cello CANiQ).

The following process describes how to define the configuration memory of the unit.

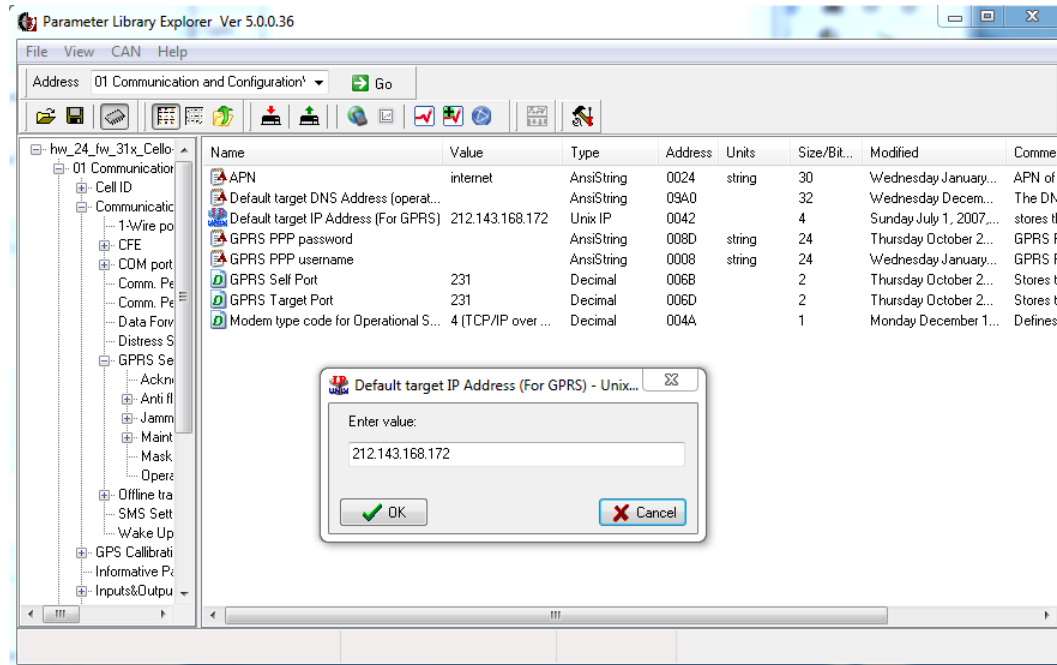
1. Ensure you have the correct ID(s) selected in the Communication Panel (see the *Select the Destination Unit IDs* section).
2. In the OTA Programmer window, click **Open OTA Programmer**. The Parameter Library Explorer window is displayed.



*Figure 34: Parameter Library Explorer Window*

1. In the Parameter Library Explorer window, click the Open icon to load the relevant PL file.
2. Locate the relevant parameters to program.


In the image below, the **Default target IP Address (for GPRS)** parameter is being modified.



*Figure 35: Programming a Parameter*

For example purposes, in this procedure we are modifying individual parameters in the PL and preparing the PL for downloading to the unit. See the following *Configuring Scenarios* section for other configuration scenarios.

3. Once the parameter value has been modified, click **OK**.
4. In the displayed confirmation message, you are prompted to add the parameter to the "Download List", which is the internal list included in the OTA Programmer application. Click **Yes** to confirm.

5. Click  (Download All Changes) to generate the relevant programming OTA strings to the parameters in the download list and add these strings to the list of OTA strings ready to be sent to the unit. These strings are displayed in the Programming OTA Strings pane in the OTA Programmer window.
6. Repeat steps 4-7 as required.
7. When all changes are completed, close the Parameter Library Explorer window.
8. Validate that the **Reset unit after programming** checkbox is selected.
9. Click **Send** to program the unit with the modification(s).



The messages communicated between the OTA Programmer and the unit are displayed in the Log pane. Validate that successful downloaded is reported in the Log pane at the end of the session.



**NOTE:** After OTA programming, a Reset Command must be sent to the unit if **Reset unit after programming** is not selected.

### Configuration Scenarios

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

- ◆ **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, upload the entire unit’s configuration memory by clicking  (Upload from unit icon) in the Parameter Library Explorer window, and save it to the appropriate PL file.
- ◆ **Scenario 2 – Download an existing PL file to a group of units:** In this scenario, first select the destination unit IDs in the Communication Panel, open the existing PL file in the Parameter Library Explorer window and click  (the Download to unit(s) icon), to generate the Programming OTA strings for the PL parameters. Then click Send in the OTA Programmer window.
- ◆ **Scenario 3 – Update existing PL according to existing values in the unit:** In this scenario, first select the destination unit ID in the Communication Panel, define the relevant configuration settings in the OTA Programmer window, and select the relevant PL file in the Parameter Library Explorer window. For each of the relevant parameters, right-click and select Upload this Parameter (as shown below). Then click Save.

| Name                                  | Value              | Type       | Address | Units  | Size/Bit... |
|---------------------------------------|--------------------|------------|---------|--------|-------------|
| APN                                   | internet           | AnsiString | 0024    | string | 30          |
| Default target DNS Address (operat... |                    | AnsiString | 0940    |        | 32          |
| Default target IP Address             |                    |            | 0042    |        | 4           |
| GPRS PPP password                     |                    |            | 008D    | string | 24          |
| GPRS PPP username                     |                    |            | 0008    | string | 24          |
| GPRS Self Port                        |                    | Decimal    | 006B    |        | 2           |
| GPRS Target Port                      | 231                | Decimal    | 006D    |        | 2           |
| Modem type code for Operational S...  | 4 (TCP/IP over ... | Decimal    | 004A    |        | 1           |

Upload this Parameter

Download this Parameter

Figure 36: Upload a Parameter

## 5.4.3.2 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.

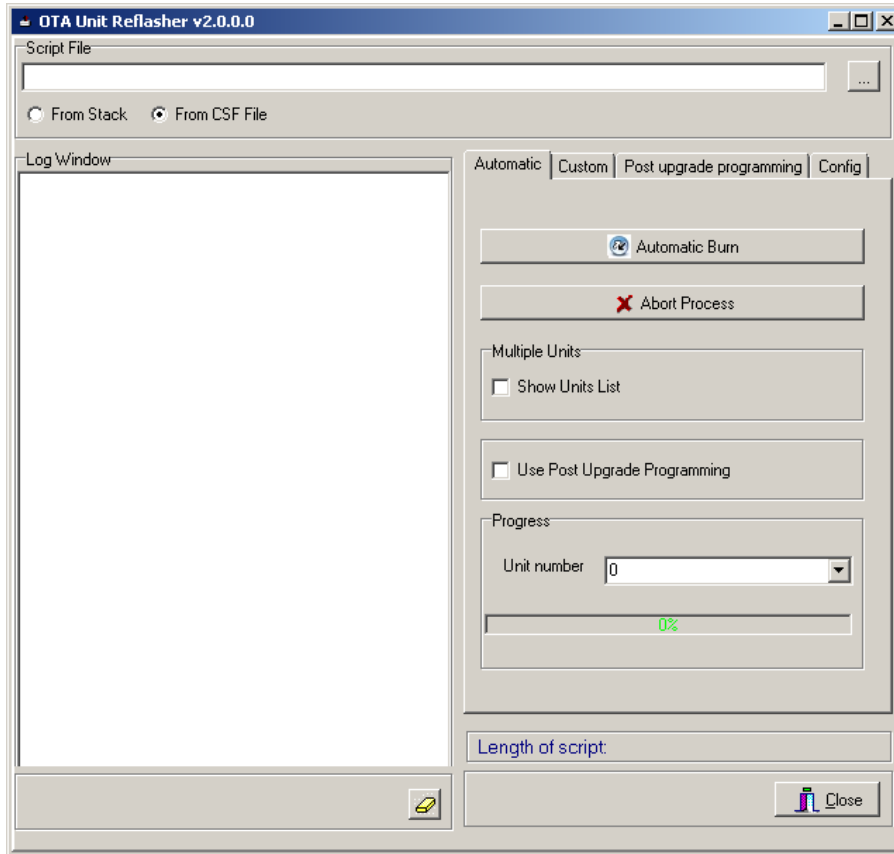


Figure 37: OTA Unit Reflasher

## 5.4.3.3 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.

## 5.4.3.4 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 38: Units List Tab





**Note that the MAP function is currently not implemented.**

### 5.4.3.5 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 39: 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.

## 6 GSM/GPRS Cellocator Unit Simulator

### 6.1 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.

### 6.2 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.

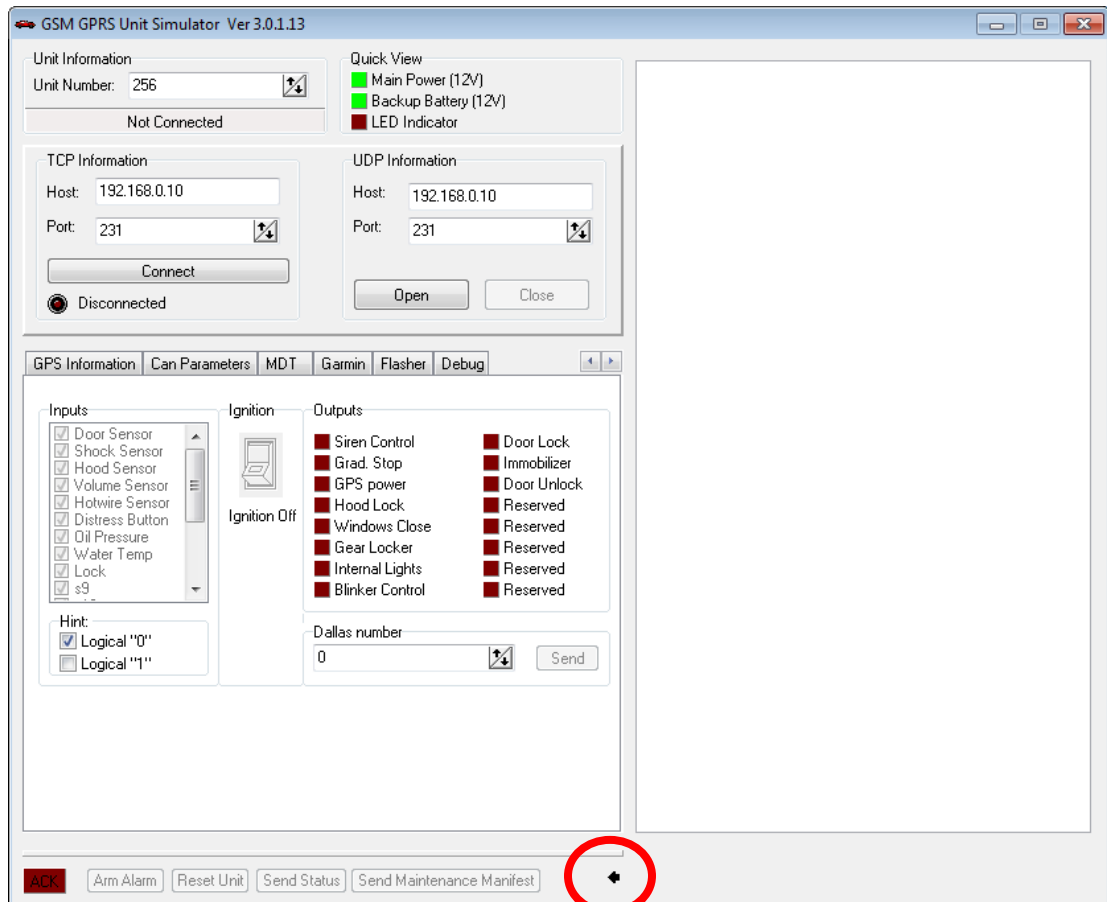




Figure 40: GSM Unit Simulator Window

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.

## 6.3 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.

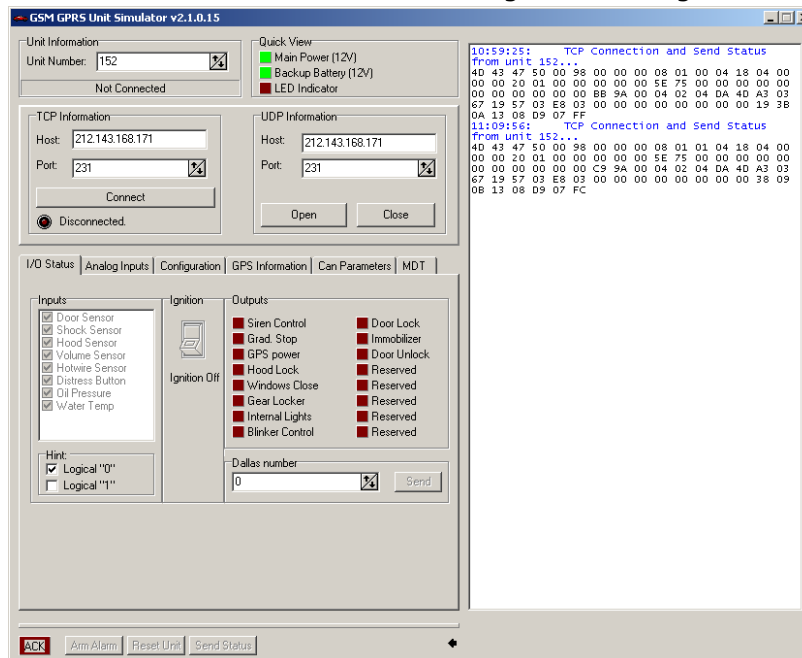


Figure 41: GSM Unit Simulator Window

## 6.4 Testing GPRS Communication with the GPRS Manager

The GPRS Manager is used to test GPRS communication with the CelloTrack 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 42: 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:

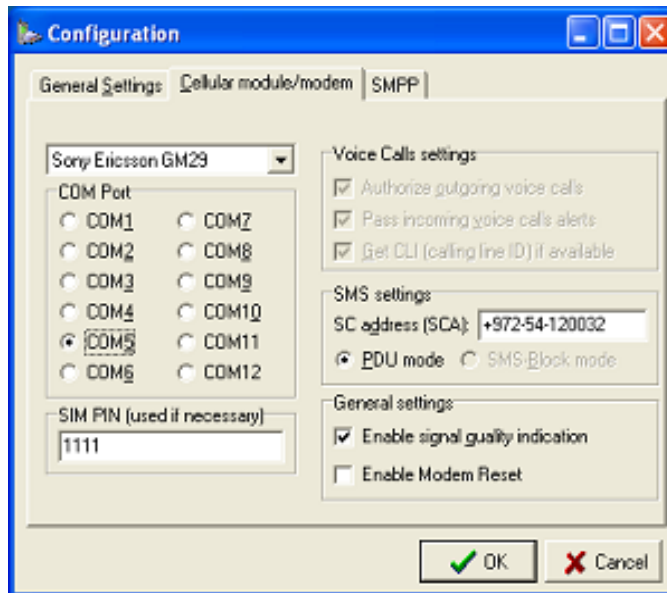


Figure 43: SMS Manager Configuration Window

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.

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.



## 7 The Communication Logger

The Communication Logger is a debugging tool used for recording the internal communication of the unit, according to specific demands from Cellocator customer support personnel. The information recorded includes the messages between the unit and the cellular service provider as well as the messages between the unit and the control center application.

The internal communication information can be obtained either externally using the debug connector, or by connecting special cables (interconnection harness and interconnection adapter) to a dedicated connector inside the unit. Generally the external method will be used as its set up is very simple and it does not require the opening of the Cello unit.

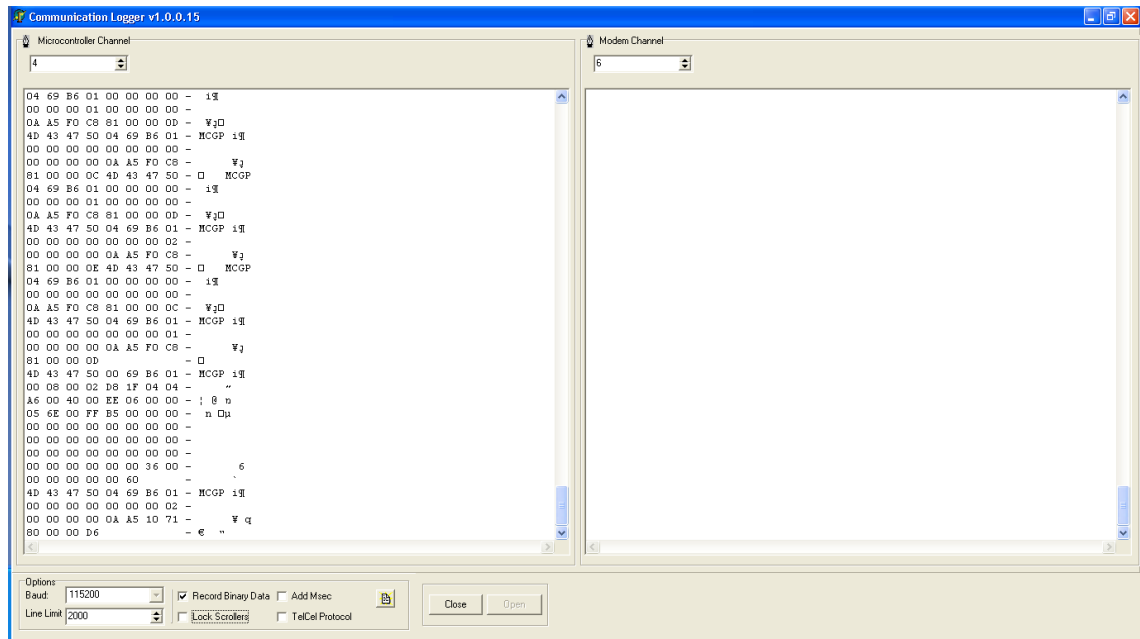
Set up instructions for connection inside the unit will be given by Cellocator technical support personnel when needed.

To setup the external logging, perform the following steps.

1. Setup the hardware connection:
  - If you are performing a regular installation connect the debug connector of the unit harness to the required PC COM port. Use the USB to RS232 adapter if needed.
  - For an evaluation environment connect the debug connector of the vehicle simulator harness to the required PC COM port. Use the USB to RS232 adapter if needed.

When connecting the USB to RS232 Adapter to the PC for the first time, the automatic installation process will be activated for installing the Driver for USB.

2. Start the Communication Logger software by selecting **Cellocator > Communication Logger** from the *Start* menu. The Communication Logger window is displayed (see Figure 44).
3. Set the microcontroller channel values to the COM port connected to the unit.
4. Set the modem channel values to an unused COM port.
5. Click the **Open** button. Make sure that **Record Binary Data** is not selected.
6. Validate that the unit is operable (connected to power and switched on).
7. After the application has run for a few minutes, a file, **communicationlog.txt**, is created in the default folder of the Communication Center application (usually: C:\Program Files\Cellocator\Communication Center).
8. Zip the file and send it to Cellocator.



*Figure 44: Communication Logger Window*

Note that the dialog between the microcontroller and the modem is transferred via the microcontroller channel. However, for proper operation, the communication logger requires allocation of two COM ports.

## 8 PL Configuration Files Comparison Tool

### 8.1 General configuration

The PL is a text file which includes the names of the programmable parameters, their addresses in the PL memory section, type, length, units and conversion factors. Each parameter is also accompanied by a short description, making it easier to understand, as well as a link to an online help file.

The PL utilizes a dedicated memory section in the Unit memory (dedicated memory for programming). PLs can be compared using this utility and this simplifies the customer's PL generation for different hardware and firmware configurations. It also helps diagnose problems due to faulty PL settings.

The Configuration Files Comparison Tool makes a clear comparison between two PL files.

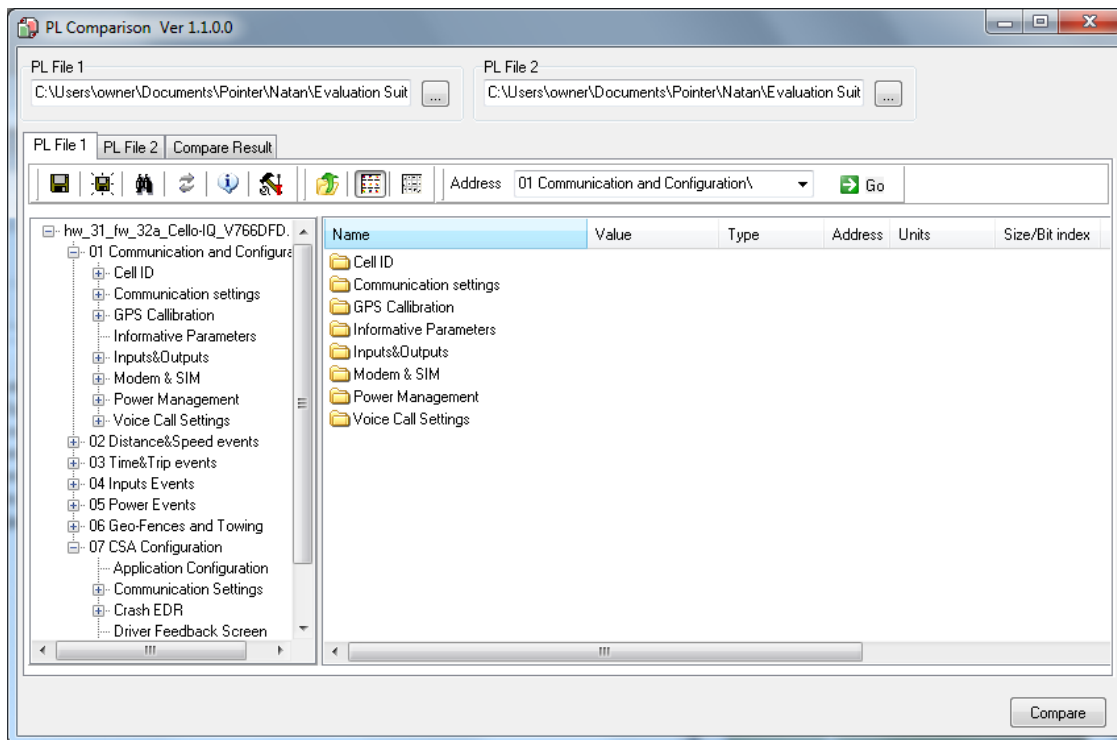


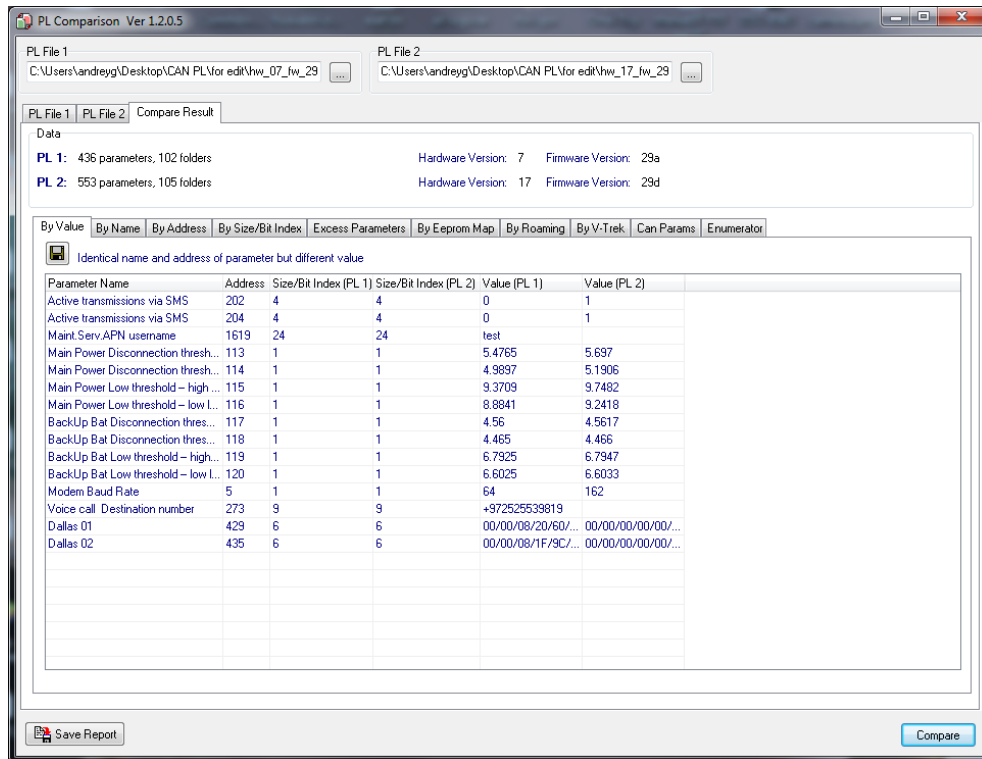
Figure 45: PL Configuration Files Comparison Window

1. Open the PL Configuration Files Comparison Window by selecting **Cellocator > PL Comparison** from the *Start* menu.
2. Select the PL file, in accordance with the unit's firmware and hardware.
3. To display the results of comparison between two PL files, perform the following steps:
  - a) Open PL file 1
  - b) Open PL file 2.
  - c) Click **Compare**.



In the Compare Results window, the differences between parameters on the PL files are shown according to the following criteria:

- **By Value:** Displays parameter(s) with identical name but different values.
- **By Name:** Displays parameter(s) with identical address but different name.
- **By Address:** Displays parameter(s) with identical name but different address.
- **By Size/Bit Index:** Displays parameter(s) with identical name and address but different size/bit.
- **Excess parameters:** Displays parameter(s) that exist in one PL file but do not exist in the other one.
- **By Eeprom Map:** Displays parameter(s) that have different values in the same physical address in the PL memory map.
- **By Roaming:** Displays parameter(s) in three different tabs: **By Address** – those parameters with the same address but different PLMN; **By PLMN** – those parameters with the same PLMN but different priority; **PLMN existence** – compares the PLMN existence of parameters.
- **By V-Trek:** Displays differences in the V-Trek feature parameters.
- **Can Params:** Displays differences in the CAN feature parameters.
- **Enumerator:** Displays differences in the drill-down menus.



*Figure 46: Compare Results Window*

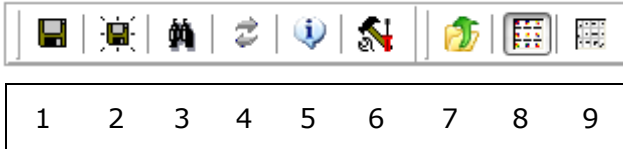
**NOTE:** You can save the displayed results in each tab by clicking the Save Report icon. The results are saved in HTML format.



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The menu bar of the PL Configuration Files Comparison Window facilitates a very simple comparison of files. See the table below for a description of each toolbar option.



| Number | Description  |
|--------|--|
| 1      | <b>Save</b> the PL file.   |
| 2      | <b>Change the name</b> of the PL file and save it.   |
| 3      | <b>Search</b> <ul style="list-style-type: none"> <li>• By address</li> <li>• By value</li> <li>• Display the last search</li> <li>• Replace/Remove: Remove or replace word(s) of Comment or Help link from all parameters in a PL file. For example, in order to remove the links from a PL file, go to the dropdown menu, select <b>Help</b>, leave the remaining fields empty and click <b>Replace</b>.</li> </ul> |
| 4      | <b>Copy the entire content of an EEPROM</b> (values of all parameters) from one PL to the other. For example, in order to copy the entire content of the EEPROM from the first PL to the second, click on <b>PL file1</b> and then click on this icon.   |
| 5      | <b>Information:</b> Software and hardware details are provided in accordance with the hardware uploaded.   |
| 6      | <b>Configuration:</b> The selected PL is automatically configured and is displayed in the Configuration Settings window. The user is provided with access to configuration of communications and memory parameters.  |
| 7      | <b>Go one level up:</b> Navigate to the previous highest level in the PL, where applicable.  |
| 8      | <b>Display the software and hardware version</b> of a PL file.   |
| 9      | <b>View memory:</b> Show Parameter Page and Show Memory Page.  |



## 9 Serial CSF STK Flasher

### 9.1 Overview

There are two options when upgrading the firmware of a Cellocator unit: via a CSF file or STK file (stack file that contains two or more CSF files). If you choose to upgrade the unit using a STK file, the software will pull from the STK file the appropriate CSF file, according to your hardware unit.

The new firmware file, supplied by Cellocator, is compiled for a specific hardware. There are different firmware files for units with different modems, microcontrollers and PCB modifications.

The unit will reject a file incompatible with its hardware.

The process of the firmware upgrade is performed in the following way:

1. The unit is requested to start the upgrade process.
2. It compares the platform of the firmware file to its own platform and accepts or declines the upgrade process.
3. Once the firmware upgrade process begins, the software uploads the firmware file by sending chunks of information to the unit.
4. After the entire firmware file is uploaded to the unit, the unit performs a CRC test of the received file.

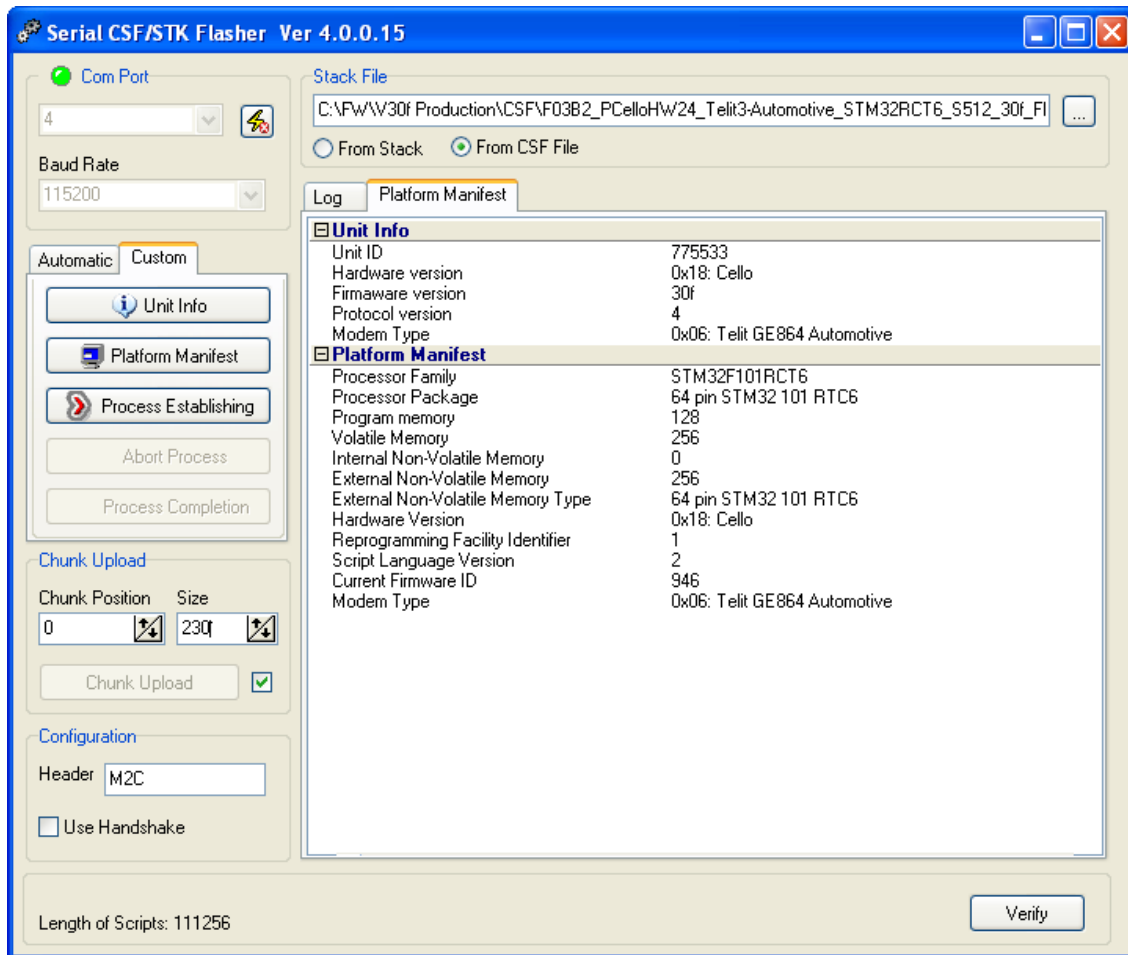
If the test fails, the unit erases the received firmware file from its memory, sends an appropriate event to the operator (NACK), and continues with normal operations with the old firmware file.

If the test passes, the unit re-writes its program memory. During the firmware chunks upgrade process (about 10 minutes, depending on the script's length) the unit functions normally, excluding storing the logged events into memory.

The Serial CSF STK Flasher does not overwrite the EEPROM settings, and after the upgrade the unit will automatically redial to the GPRS with its previous settings.

### 9.2 Reflash Procedure

1. Run the Serial CSF STK Flasher application.



*Figure 47: Serial CSF STK Flasher Window*

2. Click the Open button in the Com Port section.
3. In the Configuration section, validate that "M2C" is written in the Header field.
4. In the Stack File section, choose the kind of file (CSF or STK) you will use to upgrade the firmware of the unit.
5. Select the firmware file that should be flashed in to the unit. The length of your script is shown on the lower-left side of the window.
6. In the **Custom** tab, click **Unit Info** to validate communication with the unit. The information of your unit is displayed in the "Unit Info" section in the main pane together with an **ACK** message in the Log pane.
7. Click **Platform Manifest**. The unit platform data is displayed in the "Platform Manifest" section of the main pane, together with an **ACK** message in the Log pane.

**NOTE:** If you choose to upgrade the unit using an STK file, the software will at this point extract from STK file the appropriate CSF file, according to your hardware unit. The appropriate CSF file will be displayed in the bottom of the window.

There are two ways to reflash the unit:

- ◆ Manually - skip to the *Manual Reflash* section for further instruction
- ◆ Automatically – progress with the next instruction

8. Click the **Automatic** tab.

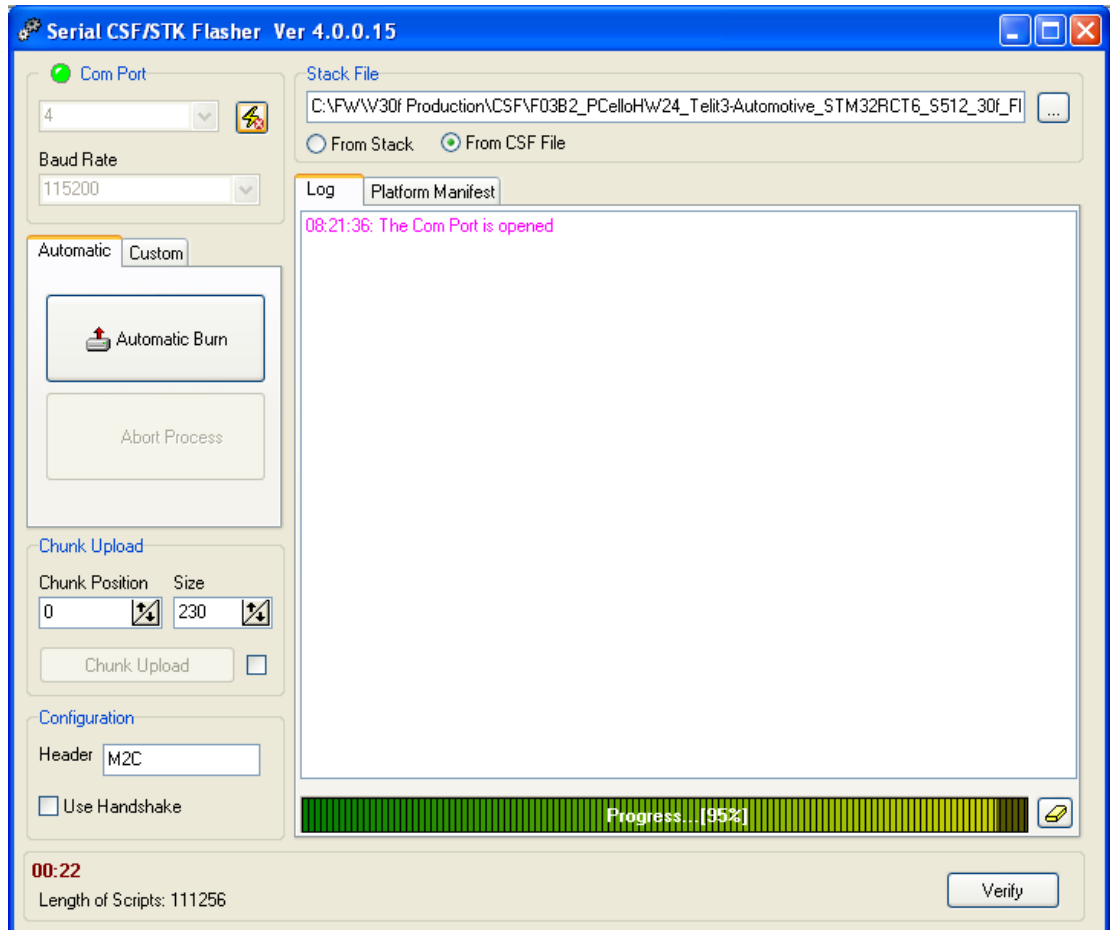


Figure 48: Serial CSF STK Flasher Automatic Tab

9. Click **Automatic Burn**. The uploading of the chunks starts immediately.

If a **NACK** message is displayed, it means that the software you are trying to reflash is not suitable for the hardware of your unit. In addition, a message is displayed explaining the problem (and you will not be able to reflash the unit).

The chunks are uploaded to the unit and the whole process is shown in the Log pane.

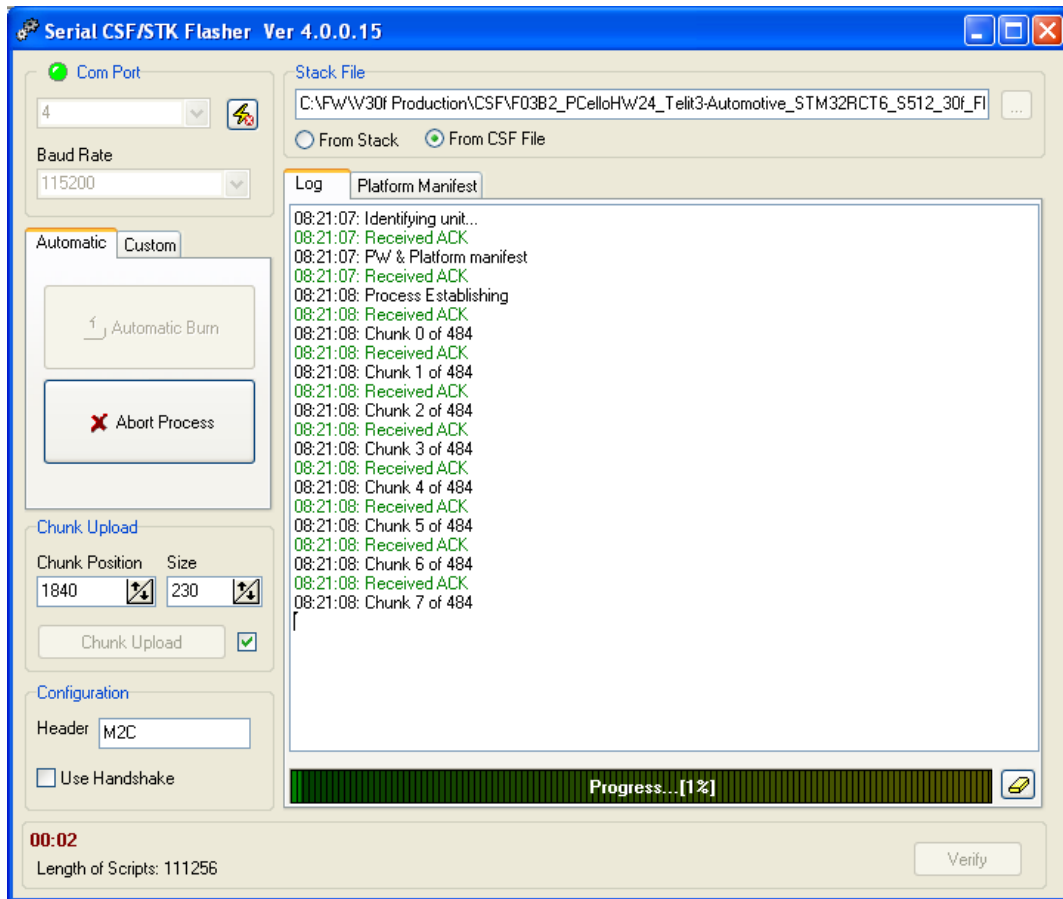


Figure 49: Serial CSF STK Flasher Upload Process

Note that as long as the upload is progressing you can stop the process by clicking **Abort Process**.

When the upload process is complete, an "End Chunk Upload" message is displayed in the Log pane.

We recommend you then wait one minute before verifying an **ACK** message is displayed in the Log pane. After the **ACK** from the unit is displayed, please wait another 6-7 minutes (as indicated in the progress bar shown below) before clicking the **Custom** tab and clicking **Unit Info** to confirm that the new parameters are displayed.

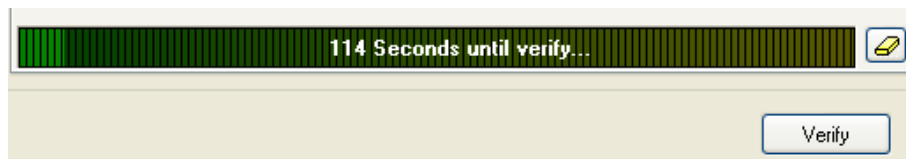


Figure 50: Serial CSF STK Flasher Progress Bar

**NOTE:** If for any reason you aborted the process, make sure that before you start a new reflash you reset the Chunk numbers back to zero.

## 9.3 Manual Reflash

1. Click **Process Establishing**. An ACK message should be displayed in the Log pane.  
If a **NACK** message is displayed, it means that the software you are trying to reflash is not suitable for the hardware of your unit. In addition, a message is displayed explaining the problem (and you will not be able to reflash the unit).
2. In the Chunk Upload section, select the checkbox alongside the **Chunk Upload** button. Then click the **Chunk Upload** button to upload the new software to the unit. The chunks are uploaded to the unit and the entire process is shown in the Log pane.

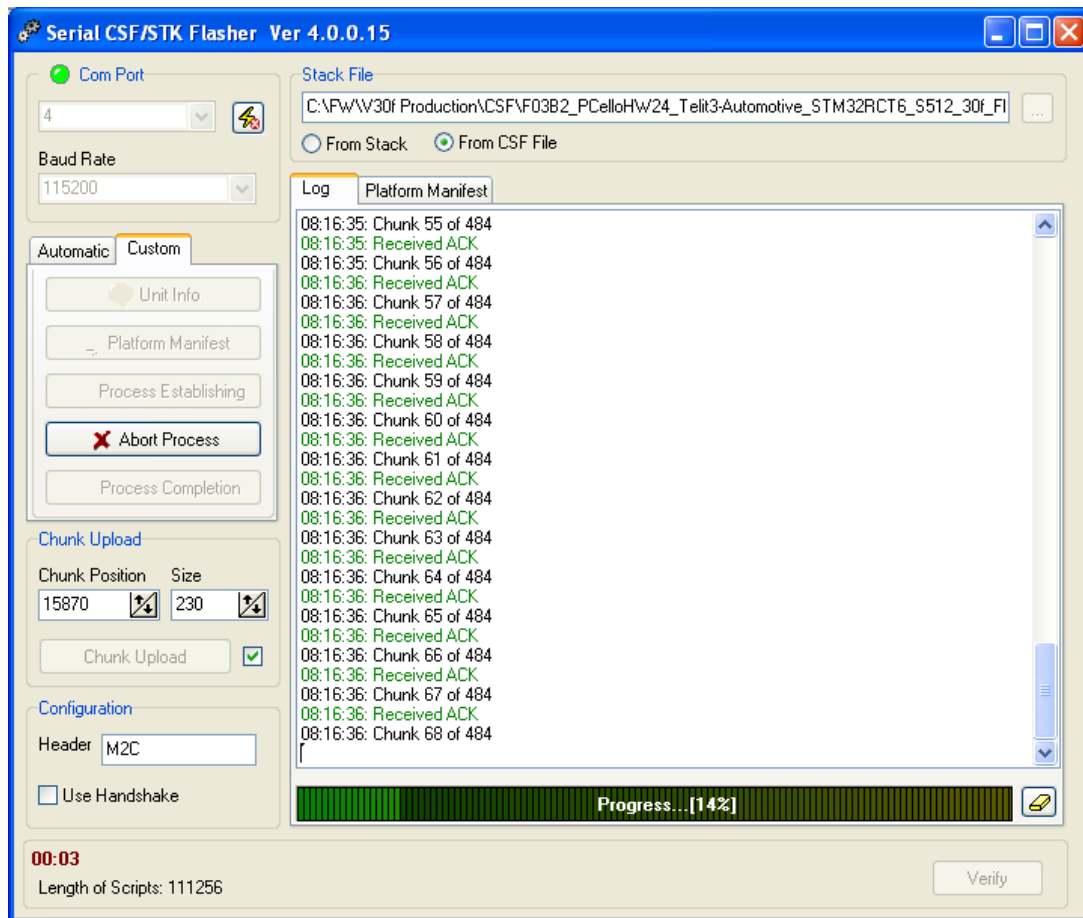


Figure 51: Serial CSF STK Flasher Manual Process

Note that as long as the upload is progressing you can stop the process by clicking **Abort Process**.

When the upload process is complete, an "End Chunk Upload" message is displayed in the Log pane.

3. Click **Process Completion**. The unit then reflashes the memory; it should take a few seconds for the unit to reply, and upon completion an **ACK** message is displayed in the Log pane. The verification process launches after the flashing process ends, and the log displays "Automatic verify process started...". This automatic verification attempts to verify several times (the default set in the ini file is 5 retries, 120 seconds apart).



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We recommend you wait two minutes before clicking the **Unit Info** button to confirm the new parameters are displayed.

**NOTE:** If for any reason you aborted the process, make sure that before you start a new refresh you reset the Chunk numbers back to zero.