Cellocator Programmer Manual

Proprietary and Confidential

Version 1.15

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Table of Contents

1 Introduction

1.1 About This Document

This document describes the Cellocator Programmer, which enables you to perform the following:

- Modify a PL file to suit your communication needs.
- Upload and download PL files to Cellocator units via its serial interface.
- Test and debug units using a variety of features, including a platform manifest, the ability to test a unit's inputs and outputs, and the ability to forward data to a wireless channel.

The Cellocator Programmer is mainly used for the initial configuration of a unit, and typically communication settings such as the destination IP address, target port phone, and SMS numbers.

There are actually two methods of configuring the Cellocator unit:

- Using a RS232 cable connected to the Programmer.
- Via OTA using the Communication Center.

The Cellocator Programmer is designed for wire communications with Cellocator units via a serial port.

This document describes how to configure the unit with the RS232 cable only.

NOTE: This guide does not describe each of the parameters available within a PL file. For further information about specific parameters, refer to the *Cellocator Programming Manual*.

1.2 Abbreviations

Abbreviation	Description
Cello-IQ	Cellocator Safety and Eco-driving monitoring device
CC	Communication Center
CSA	Cellocator Safety Application
CM	CSA Manager
CAN	Controller Area Network
CCC	Command and Control Center
DB	Database
FMS	Fleet Management System
OTA	Over the Air
PGN	Parameter Group Number

Abbreviation	Description
RMS	Root Mean Square
RSSI	Received Signal Strength Indication
SMS	Short Message Service (GSM)

1.3 Revision History

Version	Date	Description
1.0	May 30 2014	Separation from the Evaluation Manual. Reorganization and editing of the content. Add CAN Editor.
1.1	November 10, 2014	Updated the CAN Editor
1.2	February 8, 2015	Added the Nano Editor
1.3	May 3, 2015	Removal of the following archive products: Cello-F Cello-R Cello-IQ legacy CR200 CelloTrack Compact CAN
1.4	May 18, 2015	Updated *Selecting the correct PL for a Cellocator Unit* section
1.5	July 6, 2015	Added Protecting Unit Configuration Memory section
1.6	November 9, 2015	Updated the Nano Editor
1.7	December 22, 2015	Tech Writer edits plus new Find feature
1.8	April 20, 2016	Reworked CAN Editor section updated.
1.9	September 12, 2016	Updated the CAN editor due to CANiQ improvements and updated the Nano / MultiSense Editor due to integrating the MultiSense with the Cello via the BT Extender.
1.10	September 26, 2016	Further updates to the CAN Editor section and BT Extender compatibility.
1.11	October 31, 2016	Removal of AutoMode (Frame Format) in CAN Editor New Refresh icon in the Programmer's Configuration dialog box Right-click Parameter Help option Added new copy, cut and paste keyboard

Version	Date	Description
		functionality: `Ctrl+Shift+C`, `Ctrl+Shift+X`, `Ctrl+Shift+V` Select multiple parameters for editing New **Export to XML** or **Import from XML** options in Programmer New Platform Manifest window Added "Old FW Compatibility Mode" alert in CAN Editor Double-click on any warning or error message to jump to the relevant parameter or operator in the Diagram View PL signature Lock and Restore Double-click on Operator to open properties Press `Alt + Double-click` to automatically jump to the selected parameter or operator in the Table View When selecting **RX Only Mode**, additional Data columns (Data0 – Data7) are displayed in the **Custom Queries** tab Right-click on image icons in CAN Editor (OBDII Parameters tab) to select external image
1.12	December 7, 2016	New section: *Communication with Cello units equipped with the BT Extender* specific only to Cello units paired with MultiSense devices. Rearrange *Working with the Nano / MultiSense Editor* chapter separating instructions for MultiSense devices paired with Nano to MultiSense devices paired with Cello.
1.13	March 1, 2017	Revisions to the *Working with the CAN Editor* section, including new screenshots, renaming of tabs, a new section *The Information Tab* and changes due to encryption of certain parameters, queries and filters supplied by Cellocator in version 36n and above.
1.14	November 1, 2017	Revisions to the *Working with the Nano / MultiSense Editor* chapter, to include the Nano Quick Start application (chapter is now called *Working with the Nano application suite*).
1.15	January 2, 2018	Updates to *Working with the CAN Editor* chapter to reflect UI changes in 36v.

2 Installing the Cellocator Programmer

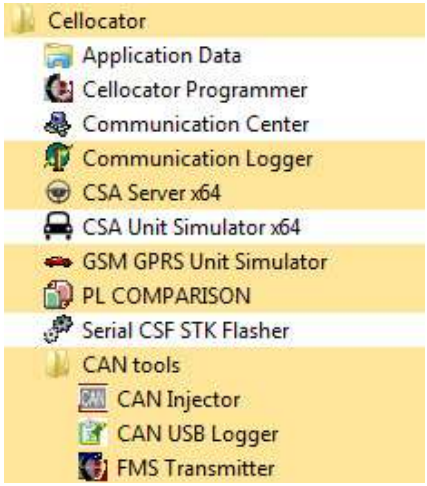
The Cellocator Programmer is installed as part of the Cellocator Evaluation Suite.

➢ **To install the Evaluation Suite:**

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** or **Complete**. Note that whichever type you select, the Cellocator Programmer is automatically installed.
4. Proceed with the wizard's onscreen instructions.
5. Upon successful completion of the installation, click **Close** to close the wizard.

   The Cellocator Programmer is installed.

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 Programmer and other debugging tools appear in the *Start* menu, as shown below.



Refer to the *Cellocator Evaluation Suite Manual* for further details.

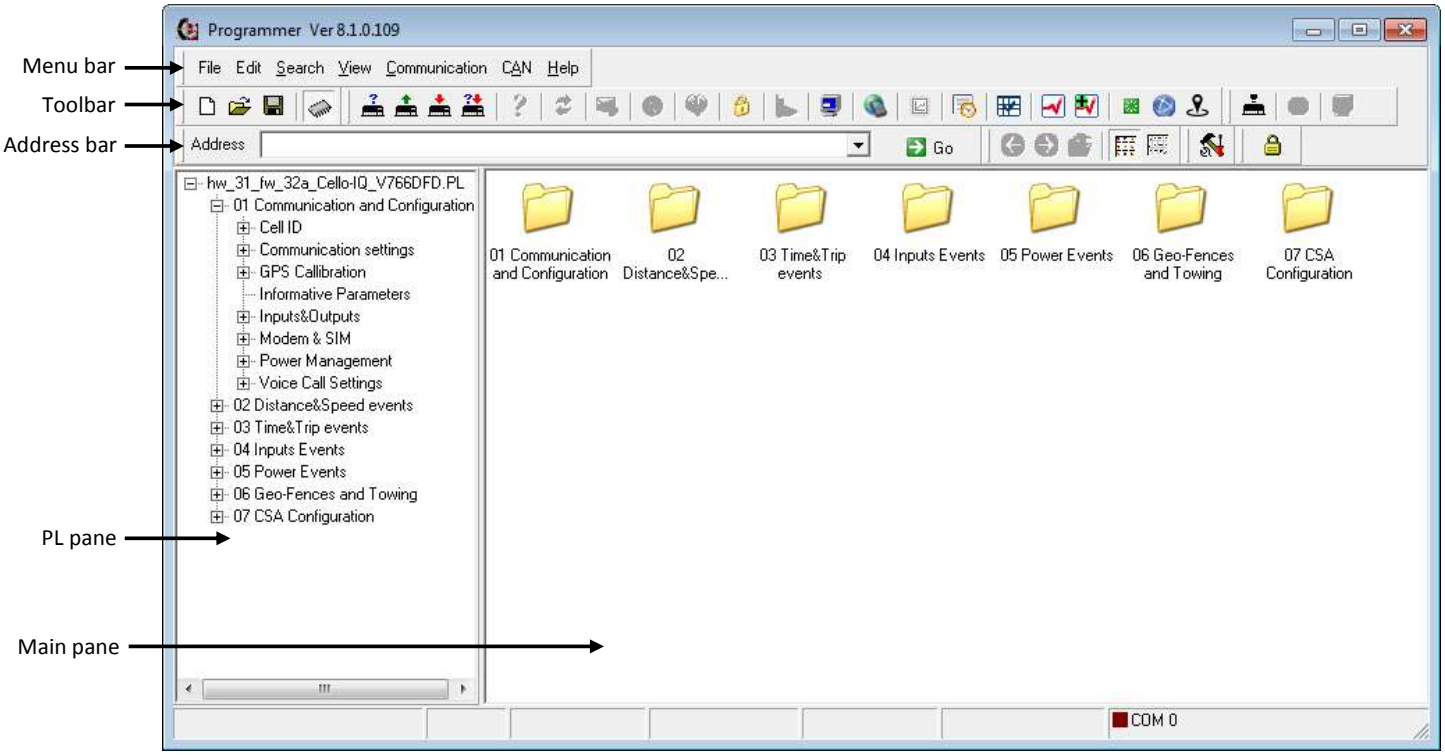
3 Getting Started with the Cellocator Programmer

This section describes the Cellocator Programmer window and its components, and how to initially set up and configure the Cellocator Programmer.

3.1 Cellocator Programmer Window

This section introduces the Cellocator Programmer window and its various components.

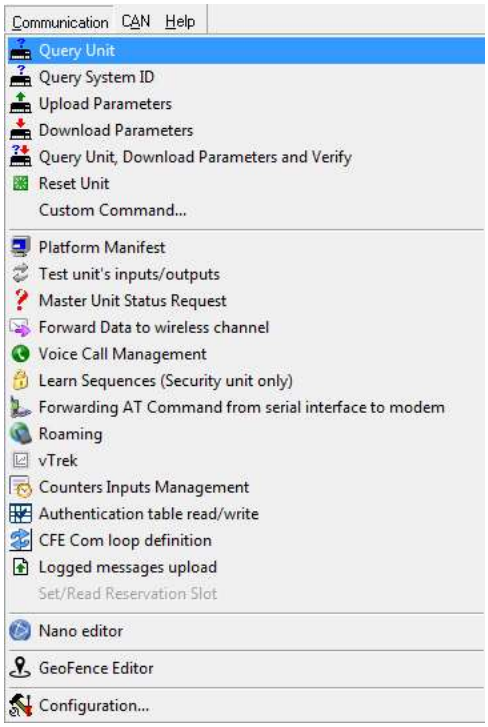
- Menu Bar
- Toolbar
- Address Bar
- PL Pane
- Main Pane



3.1.1 *Menu Bar*

The menu bar contains a number of menu options that enable you to fully operate the Cellocator Programmer, as listed in the table below.

Menu Name	Description

Menu Name	Description
File	Provides typical basic Windows functionality, including opening and saving files, and exiting the application, plus additional functionality such as including configuration values within the PL file, merging PL files, loading PL templates, and saving and loading memory maps. Note that memory maps are the pure data of the PL file parameters with their actual addresses in the memory of the device, without any textual descriptions.
Edit	Enables you to cut, copy and paste data. You can also perform these basic Windows functions from the right-click menu, or via the following keyboard shortcuts: `Ctrl+Shift+C`, `Ctrl+Shift+X`, `Ctrl+Shift+V`.
Search	Enables you to search for parameters by their address or by their actual parameter name. Refer to the *Searching for Parameters* section for further information.
View	Enables you to customize the view of the Programmer panes according to your preferences. Refer to the *Modifying your Programmer View* section for further information.
Communication	Provides access to the features that are also included on the main toolbar. Refer to the *Toolbar* section for further information. 
CAN	Enables you to work with the CAN filter editor (for Compact CAN – this is an archived product, for further information please contact Customer Support).

Menu Name	Description
Help	Provides information about the Cellocator Programmer version. Note that an additional Parameter Help option is available when right-clicking on a parameter. This option provides additional information on the selected parameter via an HTML page.

3.1.1.1 Modifying your Programmer View

From the *View* menu you can customize the view of the Cellocator Programmer window in a variety of ways. Apart from the usual Windows-type options, such as viewing the content in List, Tiles or Details format, you can also choose to display the main screen in Parameter or Memory (or hexadecimal) format.

It is recommended to switch to the Details format directly, otherwise the values are not monitored.

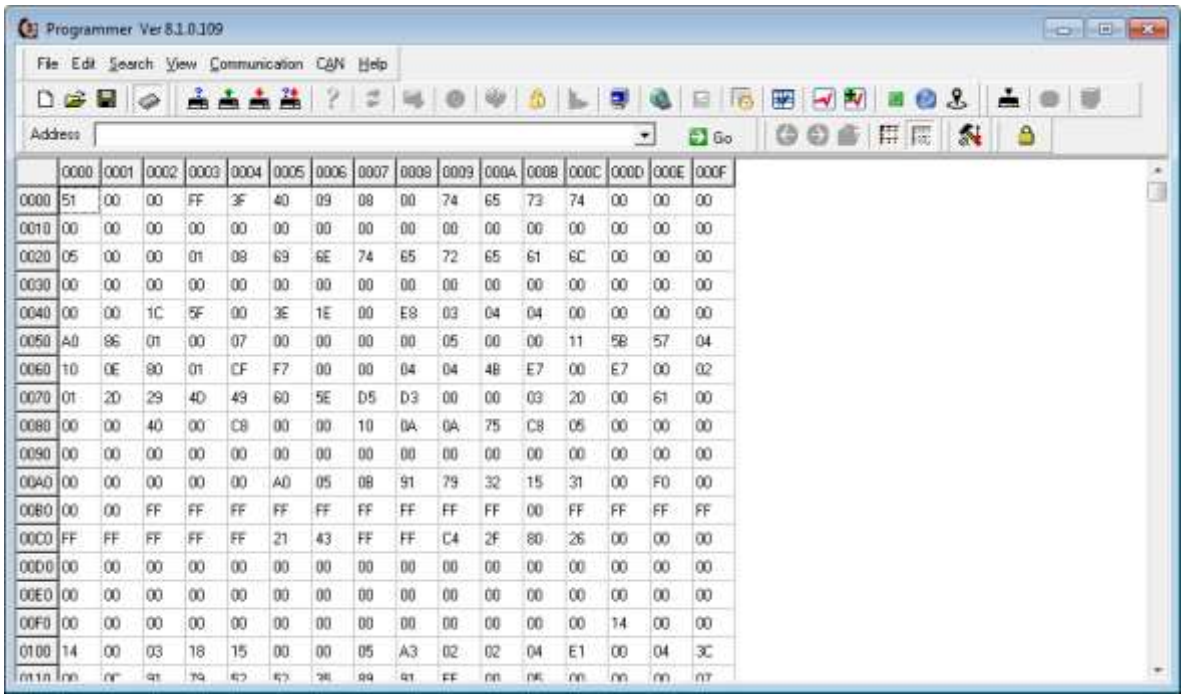
Note that you can also use the  and  toolbar icons to toggle between Parameter or Memory format.

➢ **To display the main screen in Parameters format:**

Select **View>Page>Parameters**. The Parameter format view is displayed, as shown on page 11. This is the default view when first launching Cellocator Programmer.

➢ **To display the main screen in Memory format:**

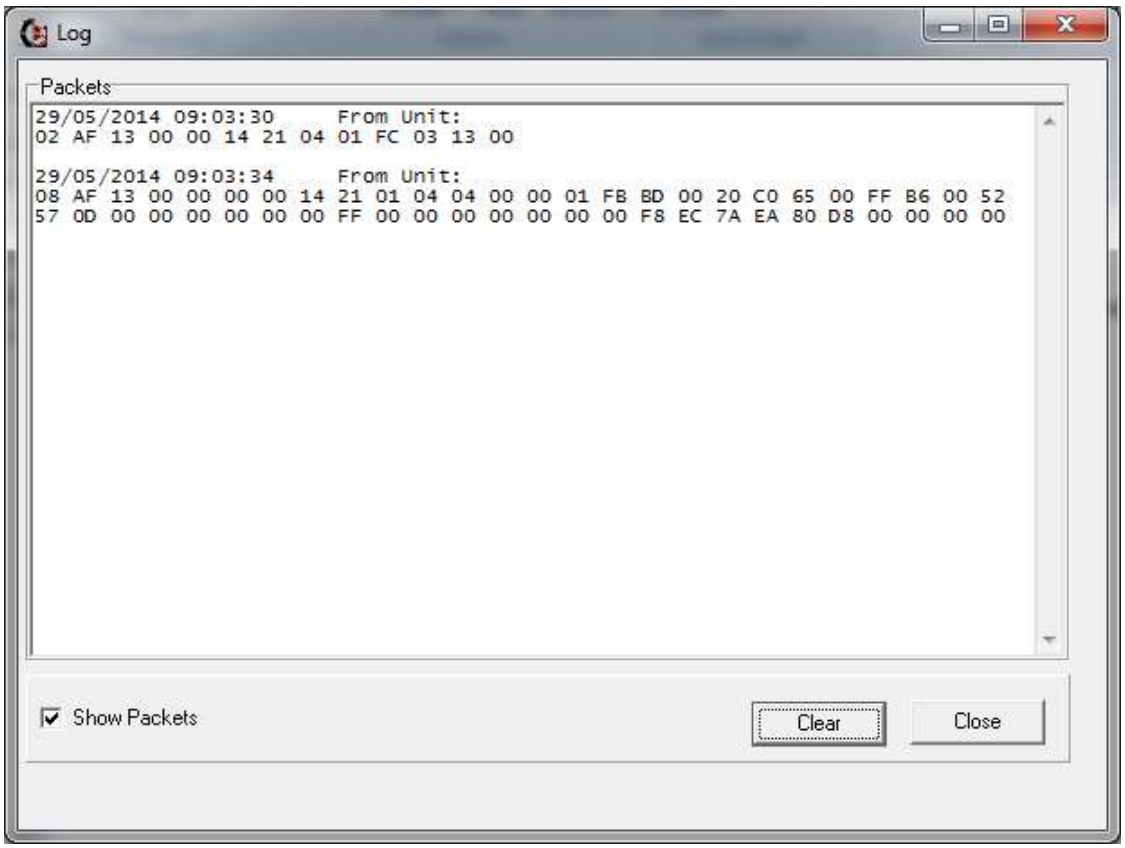
Select **View>Page>Memory**. The Memory format view is displayed (a memory map of the PL parameters in pure data format), as shown below.



	0000	0001	0002	0003	0004	0005	0006	0007	0008	0009	000A	000B	000C	000D	000E	000F
0000	51	00	00	FF	3F	40	09	08	00	74	65	73	74	00	00	00
0010	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
0020	05	00	00	01	08	69	6E	74	65	72	65	61	6C	00	00	00
0030	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
0040	00	00	1C	5F	00	3E	1E	00	E8	03	04	04	00	00	00	00
0050	A0	86	01	00	07	00	00	00	00	05	00	00	11	5B	57	04
0060	10	0E	80	01	CF	F7	00	00	04	04	4B	E7	00	E7	00	02
0070	01	20	29	40	49	60	5E	D5	D3	00	00	03	20	00	61	00
0080	00	00	40	00	C8	00	00	10	0A	0A	75	C8	05	00	00	00
0090	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
00A0	00	00	00	00	00	A0	05	08	91	79	32	15	31	00	F0	00
00B0	00	00	FF	FF	FF	FF	FF	FF	FF	FF	FF	00	FF	FF	FF	FF
00C0	FF	FF	FF	FF	FF	21	43	FF	FF	C4	2F	80	26	00	00	00
00D0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
00E0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
00F0	00	00	00	00	00	00	00	00	00	00	00	00	00	14	00	00
0100	14	00	03	18	15	00	00	05	A3	02	02	04	E1	00	04	3C

➤ **To display the Log window:**

Select **View>Log Window**. The Log window displays raw data of the communication between the unit and the Cellocator Programmer in binary format, as shown below.



3.1.2 *Toolbar*

From the Programmer toolbar you can perform a variety of actions, as described in the following table. For further explanations of the various toolbar options, refer to the *Cellocator Programmer Functionality* section on page 32.

Icon	Description
	Create a new PL file (this is normally used only by Cellocator personnel, as the user usually loads pre-configured PL files).
	Browse to open an existing PL file on your computer.
	Save the current PL file.
	Includes the configuration values in the parameter library: **this is the default configuration** meaning all names, details and values of the parameters are saved. By default, the icon button is pressed. If you click the button to deactivate this feature, only parameter definitions (such as caption, address, units, and hints) are saved to the library, *without* values.

Icon	Description
	Sends a basic query to the unit. The unit replies with the unit's ID, firmware and hardware type and modem type of the connected unit. Refer to the *Querying the Cellocator Unit* section on page 33 for further information.
	Enables you to upload values currently programmed in the unit's configuration memory. After the upload the values are monitored by relevant parameters.
	Enables you to download modified parameters and save their values to the unit's configuration memory. Refer to the *Modifying Parameters in the Cellocator Programmer* section on page 28 for further information. Note that after downloading a modified PL file, the unit must be reset by power disconnection or by serial/OTA reset.
	Enables you to download the modified parameters values to the unit's memory, but also includes verification of the programmed data.
	Provides debug information regarding the connection status of the unit. Refer to the *Master Unit Status Request* section on page 34 for further information.
	Enables you to test the unit's inputs and outputs. Refer to the *Testing a Unit's Inputs and Outputs* section on page 34 for further information.
	Enables you to set up a bidirectional communication link between the unit serial port and the cellular network, thus allowing communication from the Mobile Data Terminal, connected to the unit serial port, to the back office application. Refer to the *Forwarding Data to wireless channel* section on page 36 for further information.
	Allows the activating of voice features (e.g. initiate call, received call, reject call, etc.) for testing and integrating voice devices such as the Handsfree module. Refer to the *Voice Call Management* section on page 37 for further information.
	Manufacturing Info Request - to be used by Customer Support. Refer to the *Manufacturing Info Request* section on page 38 for further information.
	Learn vehicle locking/unlocking sequences. This function is relevant to the Cello-R unit only (this is an archived product, for further information please contact Customer Support).
	Allows the sending of AT commands to the unit's cellular modem, mainly for debug purposes. Refer to the *Forwarding AT Command* section on page 39 for further information.
	Platform Manifest. Provides maintenance information about the unit's hardware and software. Refer to the *Platform Manifest* section on page 40.
	Enables the configuration of a list of prioritized operators for roaming purposes. Refer to the *Configuring Roaming Settings* section on page 42 for further information.

Icon	Description
	Enables you to define the frequency of "time events" by linearly adjusting according to the speed of the vehicle. Refer to the *Configuring VTrek Settings* section on page 43 for further information.
	Enables you to test the usage counters. Up to two inputs can be defined. Refer to the *Configuring Counters Inputs Settings* section on page 40 for further information.
	Enables you to define the authentication parameter. Refer to the *Authentication Table* section on page 43 for further information.
	Compact CAN Filters parameters editor - relevant only for Compact CAN units (this is an archived product, for further information please contact Customer Support).
	Opens the CAN Editor (for Cello-CANiQ units). Refer to the *Working with the CAN Editor* section on page 46 for further information.
	Enables you to reset the unit. The actual reset is initiated 5 seconds after receipt of the reset command.
	Opens the Nano Editor (for CelloTrack Nano and MultiSense devices). Refer to the *Working with the Nano Editor* section on page 80 for further information.
	Opens the Geo-fence Editor: currently not implemented.
	For use by Cellocator personnel only.
	Enables you to activate shipment mode in the unit (available for the Cello and CR300 variants with battery only).
	Displays the Cello Platform Manifest, which provides more detailed hardware and software maintenance information than the standard Platform Manifest (see above).
	Assists in browsing between PL folders (click to go back to the previous folder view).
	Assists in browsing between PL folders (click to go forward to the next folder view in the browsing sequence). For example, if you clicked back a few steps you can click this button to return to your current folder view.
	Assists in browsing between PL folders (click to go up one level).
	Displays the default view of PL folders and parameters. Refer to the *Modifying your Programmer View* section on page 13 for further information.
	Displays a memory map. The memory map enables you to view the real allocation of configuration memory values, without any translation. Refer to the *Modifying your Programmer View* section on page 13 for further information.

Icon	Description
	Provides access to the configuration of communications and memory parameters. Note that only the Communication tab should be used; other tabs are for use by Cellocator personnel only. Refer to the *Configuring Communications and Memory Parameters* section on page 28 for further information.
	Enables you to open/close the Com Port.  The communication port is open.  The communication port is closed.

3.1.3 *Address Bar*

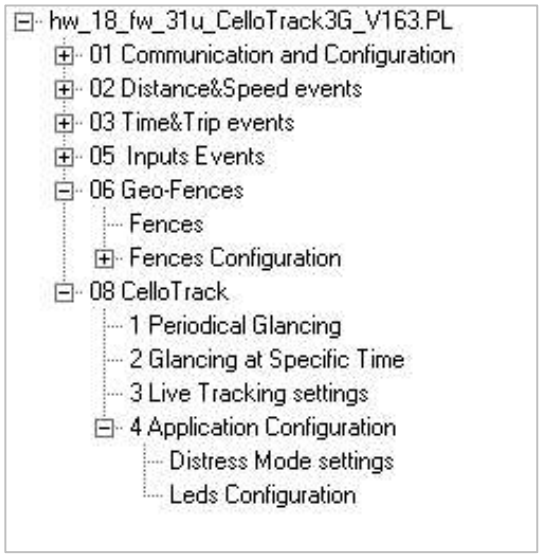
The Address bar is mainly used to show the current location in the PL tree.

In order to browse the PL tree, you can use the Address bar to access the parameter. Enter the correct path in the text area (for example: **16_Geo-Fence**) and then click **Go**.

You can also click the dropdown box arrow to select a previously used address and then click **Go** to select this address.

3.1.4 *PL Pane*

The PL pane lists the various sections of the PL file, as shown in the example below.

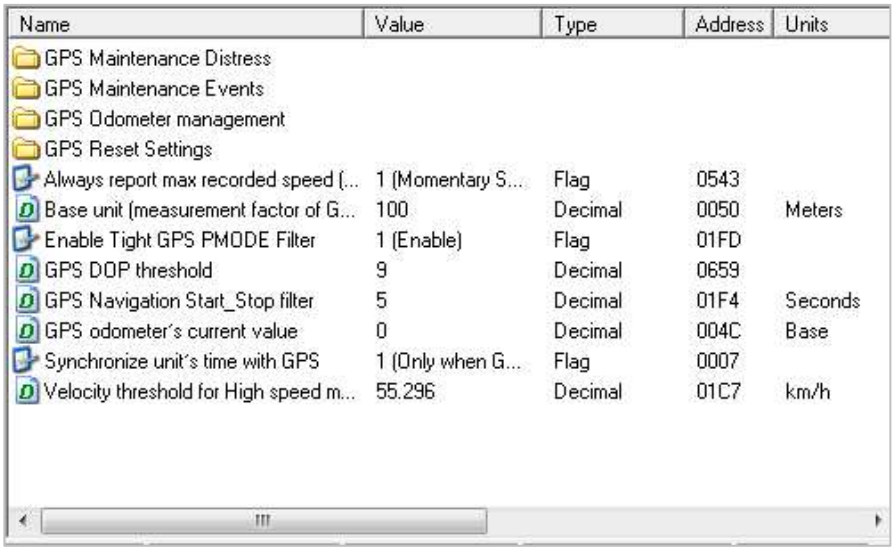


The PL pane also provides an additional method of searching for parameters. By drilling down to the relevant section, you can find the relevant parameters (which are displayed in the Main pane) for a specific section simply by clicking on the section.

3.1.5 *Main Pane*

The Main pane displays the parameters for the section you selected in the PL pane or entered in the Address bar. To modify a parameter's value, double-click on the parameter and in the displayed window modify as required. Refer to the *Modifying Parameters in the Cellocator Programmer* section for further information.

Note that you can modify the view of the parameters displayed in the Main pane, as described in the *Modifying your Programmer View* section.

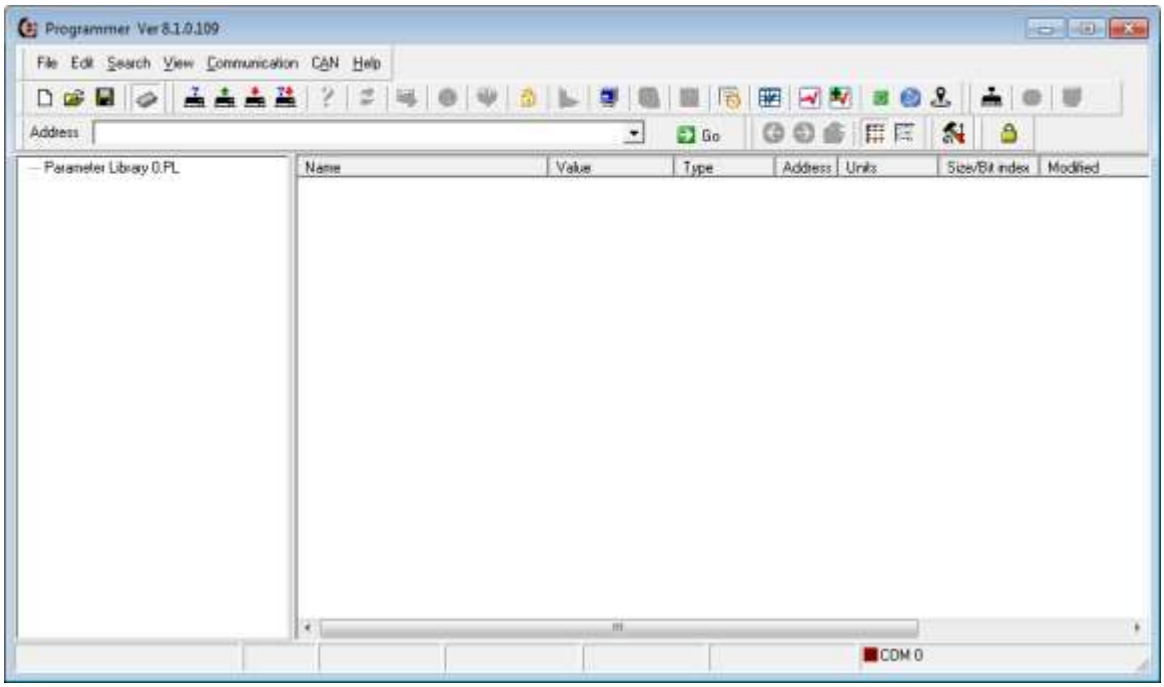


Note that a Parameter Help option is available when right-clicking on a parameter. This option provides additional information on the selected parameter via an HTML page.

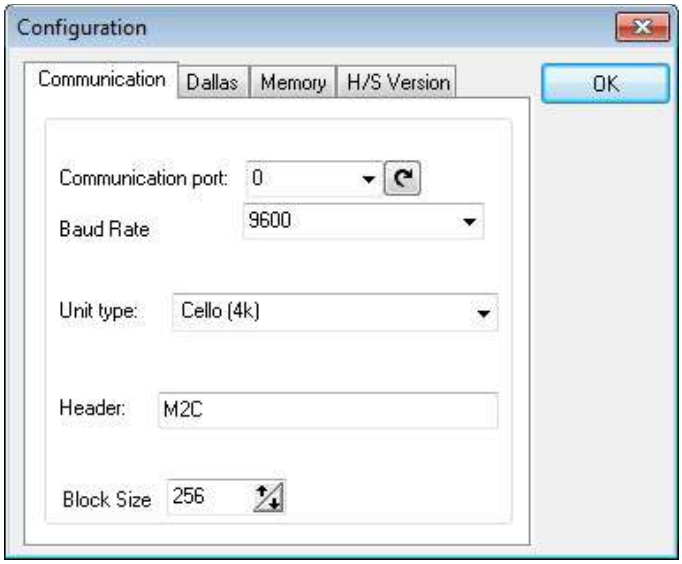
3.2 Starting the Cellocator Programmer

The Cellocator Programmer is installed as part of the Evaluation Suite package. To start the Cellocator Programmer software, perform the following steps:

1. Connect the COM port of the unit to a COM port with a known port number.
2. If the unit is connected to a simulator, make sure the Ignition switch of the simulator is in the **ON** position.
3. Open the Cellocator Programmer by selecting **Start > Programs > Cellocator> Cellocator Programmer**. The application opens with an empty programming environment, as shown below.



4. In order to be able to communicate with the unit, from the *Communication* menu, select **Configuration**. The following screen is displayed.



5. In the **Communication Port** field select the port number used for communication with the unit (0 in the example above).

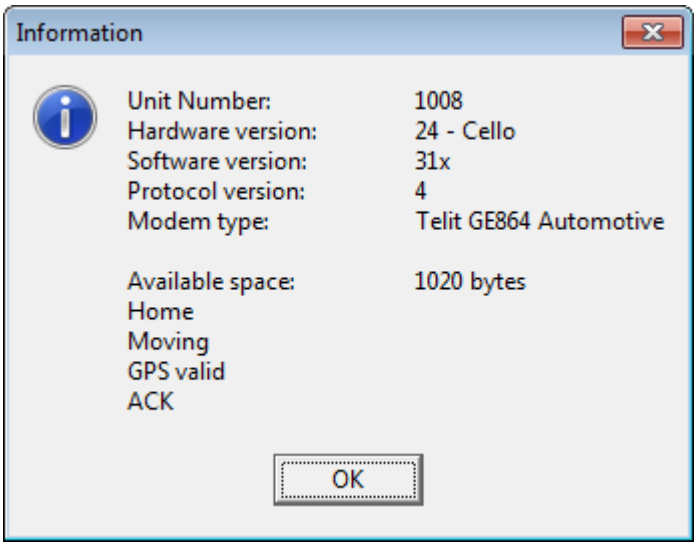
   Alternatively, click  to display a list of the available ports on your computer.

6. The **Baud Rate** should be set to 115000.
7. Click **OK.**

In order to be able to change the parameters in the unit memory and to select the appropriate PL for the unit you should query the Cellocator unit information.

➢ **To query the unit:**

From the Cellocator Programmer toolbar, click **Query** ( ), or select **Communications > Query unit** from the menu bar. The unit responds with its information, as shown below.



The Programmer saves the Unit Number for future communication with the unit.

NOTE: You can also use OTA (through Parsing Message Type 0 and also via the Cellocator Communication Center) to locate Cellocator unit information. These methods are described in the *Cellocator Programming Manual*.

3.3 Communication with Cello units equipped with the BT Extender

The Cellocator Programmer can communicate with Cello units equipped with the BT Extender via Bluetooth. Note that the Evaluation Suite should be installed on a PC or laptop equipped with Bluetooth which supports BT2.1.

To pair the Programmer with the Cello unit and the BT Extender perform the following steps:

1. Make sure that the BT Extender is connected to the Cello unit.
2. In your computer's Control Panel, access Hardware and Sound/Bluetooth Devices and click **Add a device**. A list of BT devices is displayed.
3. Select the BT Extender, identified by its BT friendly name (in a format of *BT-extnnnnnn*, where the *nnnnnn* stands for the unit ID of the attached Cello). No password is required.
4. In the Control Panel, access Device Manager to identify the COM port assigned to the BT Extender.
5. Proceed from Step 3 of the *Starting the Cellocator Programmer* section and select the COM port number when required.

4 Selecting the correct PL for a Cellocator Unit

This section describes how to select the correct PL for your Cellocator unit, and also includes how to merge two existing PL files into one new PL file.

4.1 Determining the correct PL file name

In order to select the correct PL for your Cellocator unit from the Cellocator website, the PL file name should include the following parameters:

- The product name
- The unit's HW version
- The unit's firmware version

  For example the PL file *hw_14_fw_33u_Cello-IQ30_V2278* relates to the product Cello-IQ30 with HW type 14 and FW version 33u.

  The HW version and the FW version are provided in the unit query information, as described in the previous section.

  You can retrieve the product name using a lookup table in the Cellocator Wireless Communication Protocol, in the *Unit's Hardware, Firmware and Protocol Versions* section.

In the example described in the previous section**:**

- Hardware Version = 24
- Software Version = 31x
- Modem Type = Telit GE864
- The associated product according to the lookup table is Cello-F.

4.2 Loading the PL file in the Programmer

There are three possible sources for the appropriate PL file:

- Downloading the default PL from the website
- From an existing file (on your computer)
- Uploading the PL from the connected unit

Note that you can also merge existing PL files into a new PL file, which is automatically loaded in the Programmer upon completion of the merge. Refer to page 23 for further details.

4.2.1 *Downloading the PL from the Cellocator Website*

Once you have the correct unit information (product name, firmware version and hardware type), you can download the relevant default PL from the Cellocator website.

PL files for newer FW versions and products can be found as part of FW release packages, on the FW & PL Released Packages page.

PL files for older FW versions and products can be found under PL Files (Programming Library).

For the example we used above, the PL required is: Fw. 31x for Cellocator Cello-F (HW 24), which can be found on the following page: http://www.cellocator.com/knowledgebase/fw-releases/pl-files-programming-library-2/cellofamily-pl-files/

Note that the above links require access to the Cellocator Knowledge Base section on the website. When downloading, save the default PL file in the relevant location on your computer; when required, it can be loaded in the Programmer.

4.2.2 *From an existing file*

The relevant PL file may already be located on your computer somewhere; perhaps you already downloaded it or it was sent to you by Cellocator Support or you have already prepared it for a specific fleet.

➢ **To load the PL file in the Programmer:**

In the File menu of the Programmer window, click **Open** and chose the PL file,

OR

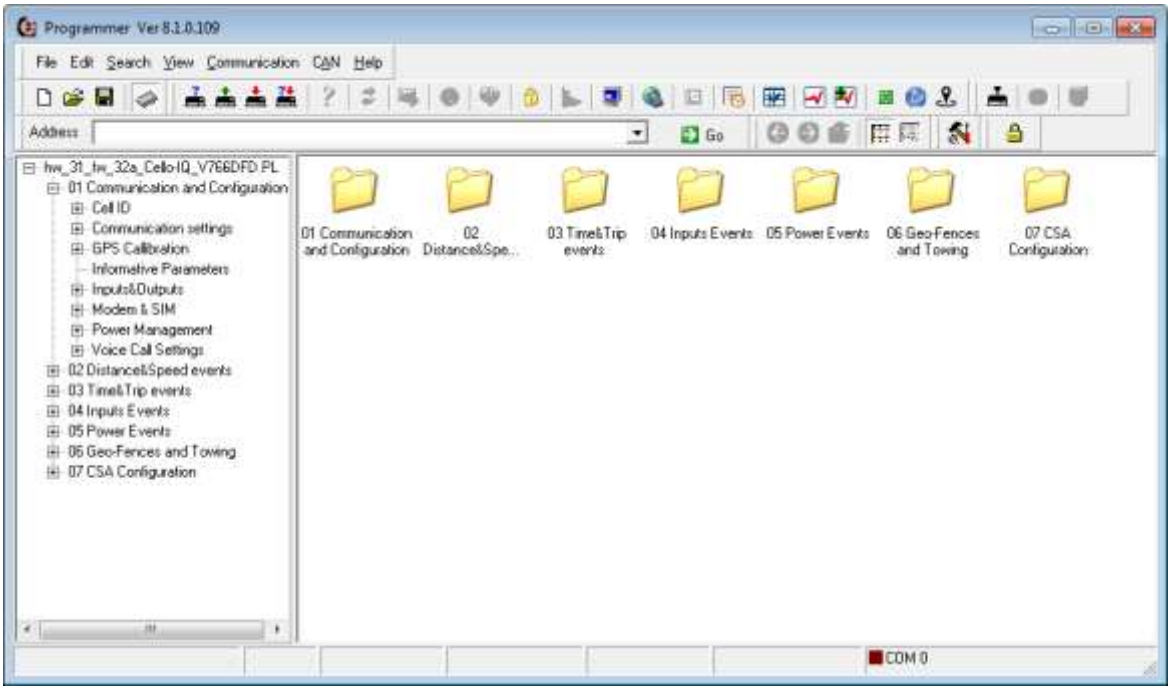
In the Programmer window, click the Open icon to load the relevant PL file.

4.2.3 *Uploading the PL from the connected unit*

A PL can be uploaded from a connected unit only if an appropriate PL file has been already loaded in the Programmer.

Upload the entire unit's configuration memory by clicking  (Upload Parameters icon) in the Programmer window, and save it to the appropriate PL file.

When loaded, the PL file settings are displayed in the Programmer window, with the PL name in the first line of the PL pane, as shown below. Note that depending on the product type, the contents of the window below may differ; refer to section 4.3 for further details.

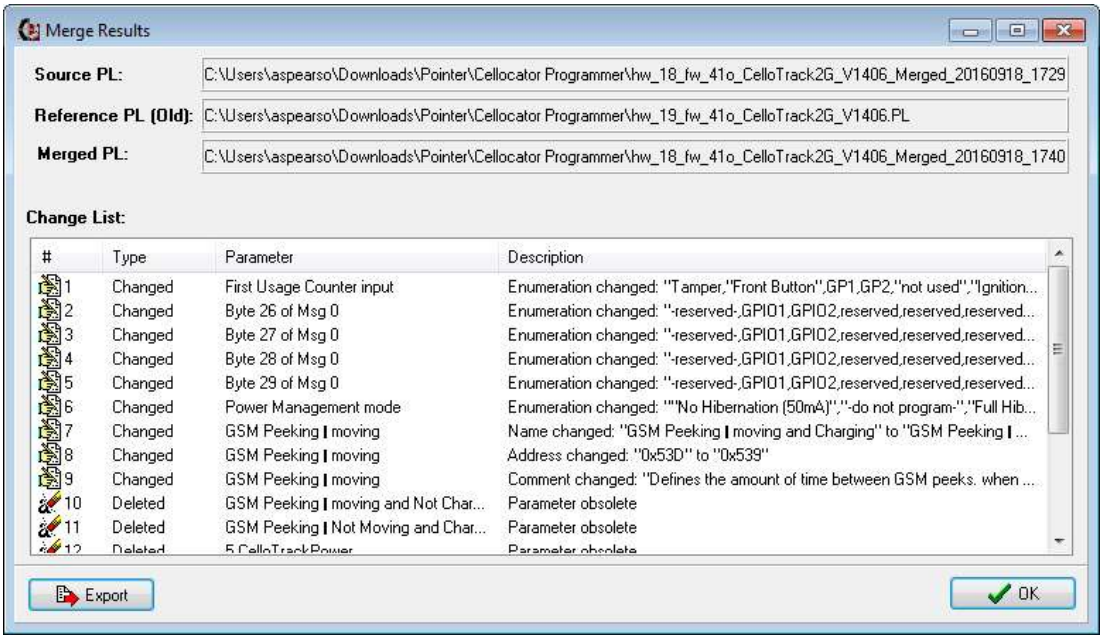


4.3 Merging PL files

PL files can be merged to create a new PL file; the new file includes the configuration settings of the two merged files.

➢ **To merge PL files:**

1. Using the **File>Open** menu option, open the relevant PL file. This PL file is the "source" file used in the merge process.
2. From the File menu, select **Merge**.
3. In the displayed confirmation message, which informs you that the currently loaded PL file (the "source" file) will be modified, click **Yes** to continue. The Open reference (old) PL window is displayed, via which you select the relevant PL file you want to merge with the "source" file.
4. After selecting the relevant file, the Merge Results window is displayed, as shown below.



Note that you can double-click on a change in the list to jump to the new parameter location in the PL file in the PL pane.

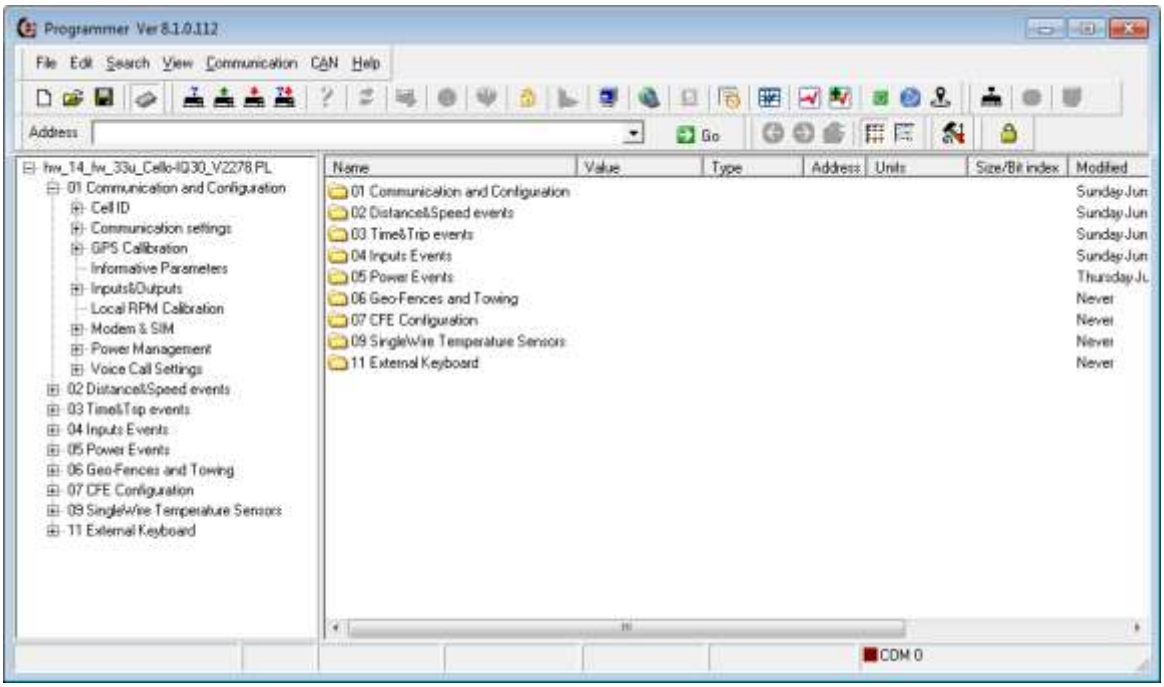
5. Click **Export** to export the list of merged results to a .CSV file.
6. Click **OK** to close the Merge Results window. The new merged file is displayed in the Programmer window, indicated by the suffix "_Merged_<date>_" in the PL pane.

   Note that the merged file is a new file; the source PL file you selected in Step 1 and the PL file you selected in Step 3 are not deleted.

4.4 The different PL layouts

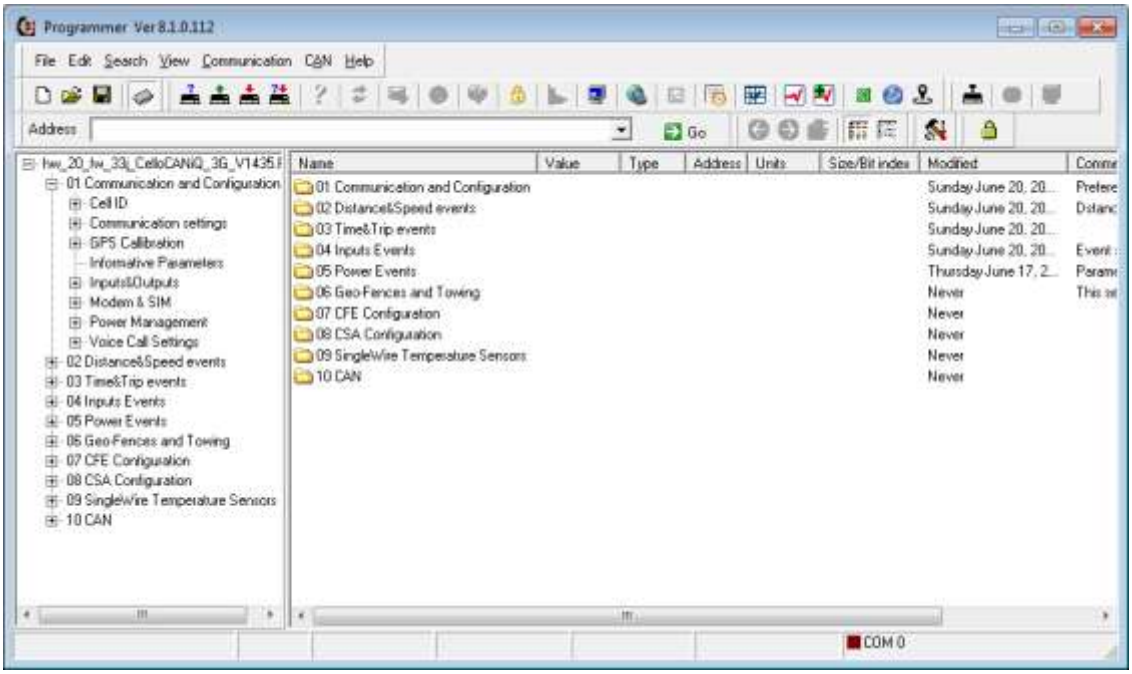
This section describes the various layouts for each of the PLs available for each of the main Cello products, and the differences between each PL.

4.4.1 *Cello-IQ 30 PL*



The Cello-IQ 30 PL contains all the parameters required for the Fleet Management application. These parameters are arranged in groups which are shown in the PL pane.

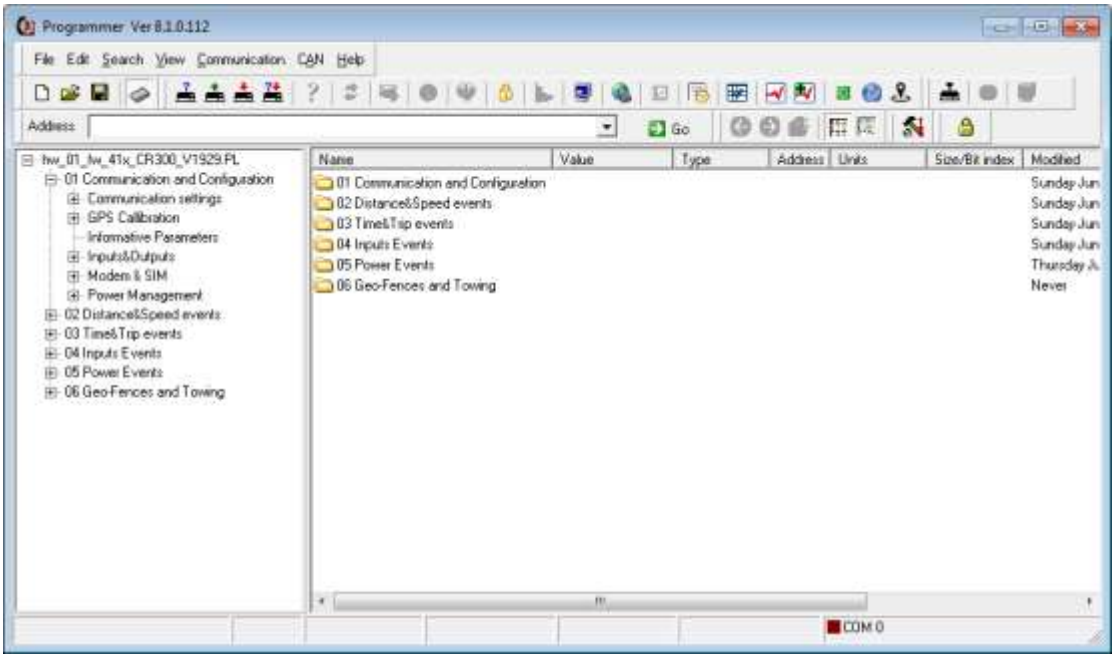
4.4.2 *Cello-CANiQ PL*



The Cello-CANiQ PL includes Fleet Management parameters similar to the Cello-IQ30. In addition, it includes the parameters for the CSA application (08 CSA Configuration) and the parameters for the CAN capabilities (10 CAN).

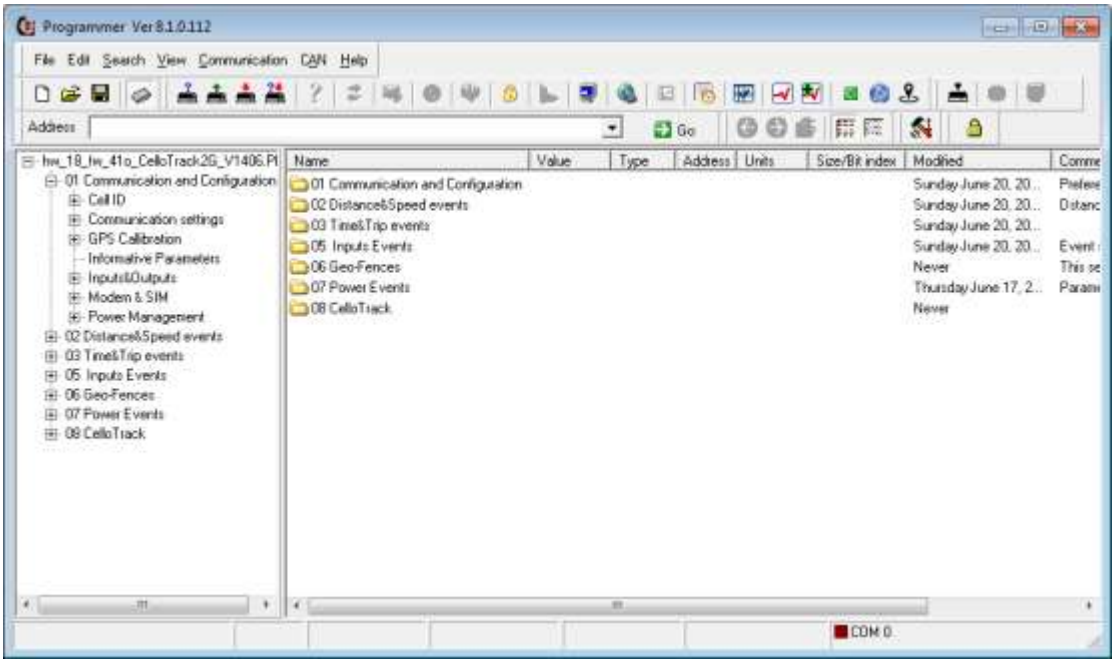
The CSA parameters are also available for the Cello-IQ 40/50.

4.4.3 *CR300 PL*



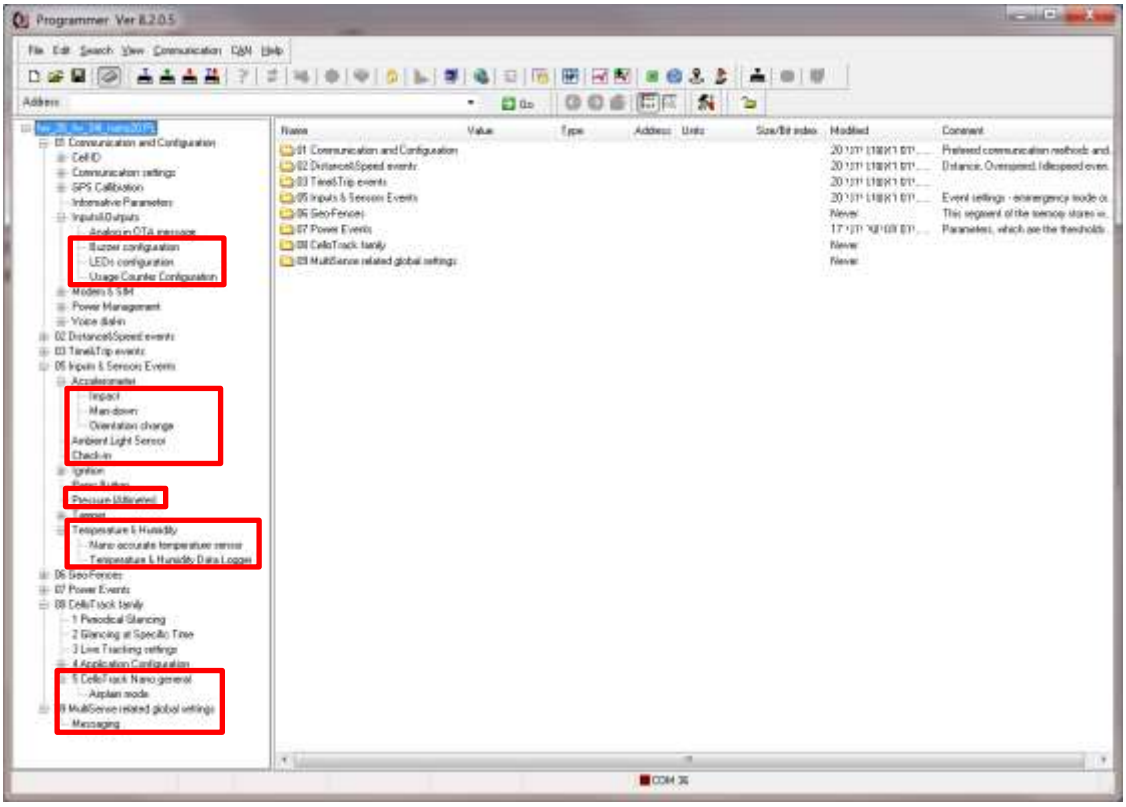
The CR300 PL includes subset of the Fleet Management parameters available for the Cello-IQ 30. Unavailable parameters are removed or grayed.

4.4.4 *CelloTrack PL*



The CelloTrack PL includes all appropriate Fleet Management parameters similar to the Cello-IQ. CelloTrack parameters and its unique capabilities can be updated in the 08 CelloTrack section.

4.4.5 *CelloTrack Nano PL*



NOTE: When double-clicking on a Nano-designated PL, the Nano Quick Start application is launched (see page 80). To edit the parameters beyond the basic settings, click on **Advanced Settings > Global Advanced Settings** (or press CTRL+F) to open the Cellocator Programmer (also known as the Nano (Advanced Mode)), as shown above.

CelloTrack Nano parameters and its unique capabilities are spread throughout several areas of the PL (shown expanded in the screenshot above).

The CelloTrack Nano PL includes all appropriate parameters to configure its internal sensors, data logger function, LEDs and buzzer, BLE, MultiSense units and unique features such as airplane mode.

The PL also comprises various predefined templates (sets of parameters) that you can choose to access certain use-cases more quickly, as described on page 89.

5 Modifying Parameters in the Cellocator Programmer

This section describes how to modify a parameter in Cellocator Programmer once you have downloaded or accessed the relevant PL file (see the previous section), and includes the following:

- Locating parameters to modify
- Modifying a parameter
- Saving the modified PL file and downloading it to the unit
- Configuration scenarios

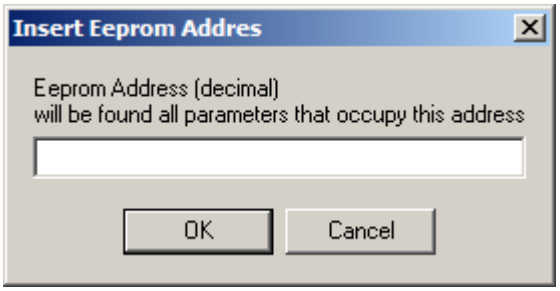
NOTE: This guide does not describe the values of each PL parameter. Parameter values are listed in the *Cellocator Programming Manual*.

5.1 Locating Parameters to Modify

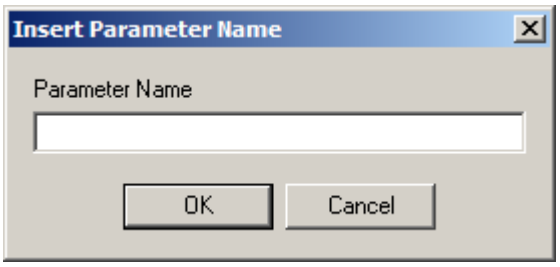
This section describes the various ways you can search for parameters within a PL file, including the following:

- Using the Address bar (see the *Address Bar* section for further information).
- Drilling down within the PL pane or Main pane (see the *PL pane* and *Main pane* sections for further information).
- Using the menu bar, as described below.

From the menu bar, select **Search > by Address** to display the following:



From the menu bar, select **Search > by Parameter Name** to display the following:

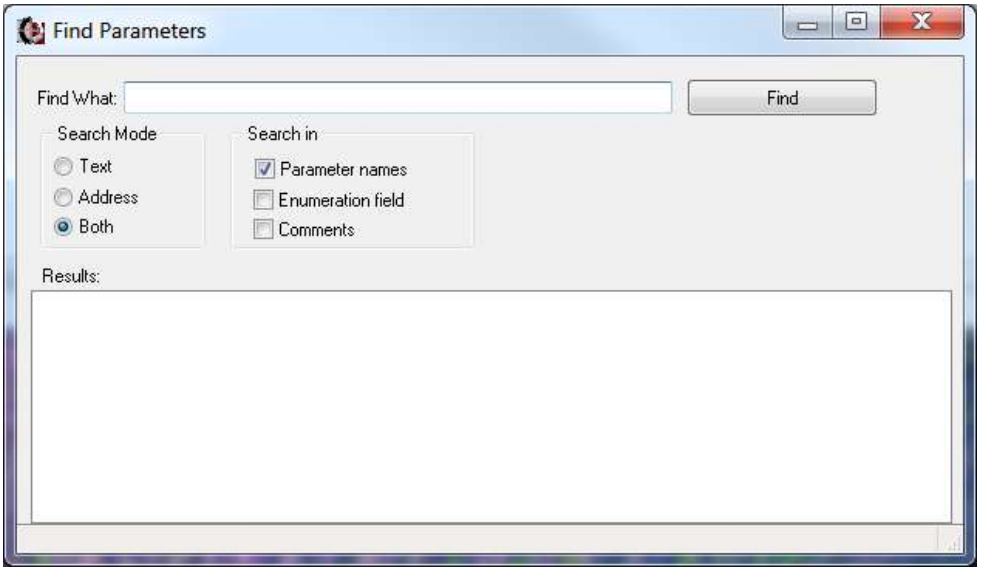


Note that you can only enter part of the parameter's name.

You can find a list of all parameters and their descriptions in the *Cellocator Programming Manual*.

Once you have located the relevant parameter, you can then proceed to modify it, as described in the following section.

Another alternative is to use the Find feature. From the menu bar, select **Search > Find** (also available via the keyboard shortcut of Ctrl+F, as in standard Microsoft Office applications), to display the *Find Parameters* window shown below.



In this window you can search for both addresses and parameter names simultaneously. You can also search for specific values in the enumeration fields and comments by entering the relevant search criteria, selecting the relevant checkbox, and then clicking **Find**.

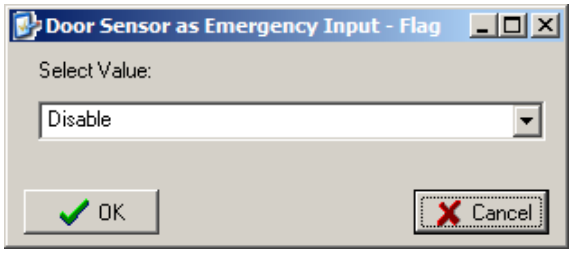
Once you have a number of search results displayed, clicking **Search > Find Next** (F3) jumps directly to the next found entry in the list of results.

5.2 Modifying a Parameter Value

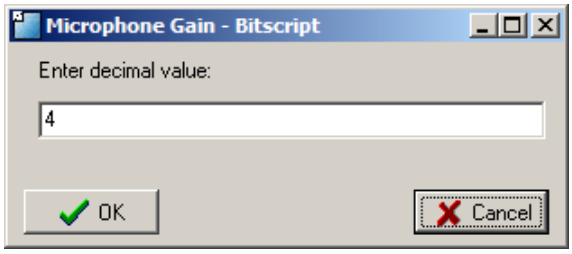
Modifying parameter values is easily done once you have located the relevant parameter (see the previous sections).

➢ **To modify a parameter value:**

1. After locating the parameter in the Main pane, double-click on the parameter to display the parameter value dialog box. Generally, there are two types of values you can enter.
   - There are parameters that can be defined with one of two values, usually selected from a dropdown list, as shown in the example below (Disable/Enable).



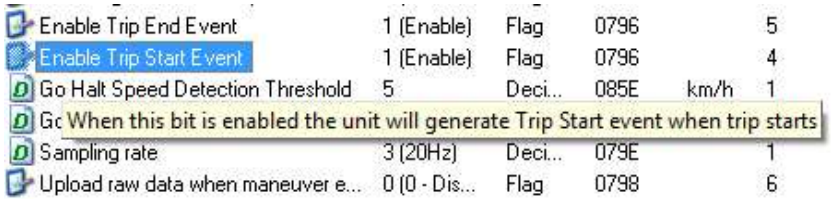
- There are other parameters that can be defined with a specific value, such as a decimal value, as shown in the example below.



NOTE: You can also select multiple parameters for editing (using standard Windows selection methods); then right-click and select **Properties** in the displayed popup, and modify as required.

Before modifying a parameter you should always verify via the *Cellocator Programming Manual* the specific values available for a parameter.

You can also view an information tooltip for each parameter by hovering over the parameter, as shown below. In addition, a Parameter Help option is available when right-clicking on a parameter. This option provides additional information on the selected parameter via an HTML page.



2. Enter or select the relevant value for the parameter.
3. Click **OK**.

NOTE: You can also import parameters to and from an XML file, meaning you can edit parameters in an XML editor and then re-import them into the PL file. Right-click on any parameter node and select **Export to XML** or **Import from XML**.

5.3 Saving the Modified PL File

This section describes how to save the PL file and how to download the modified PL file to the Cellocator unit.

➢ **To save the modified PL file:**

1. After modifying the PL file, click  on the toolbar, or from the *File* menu select **Save**.

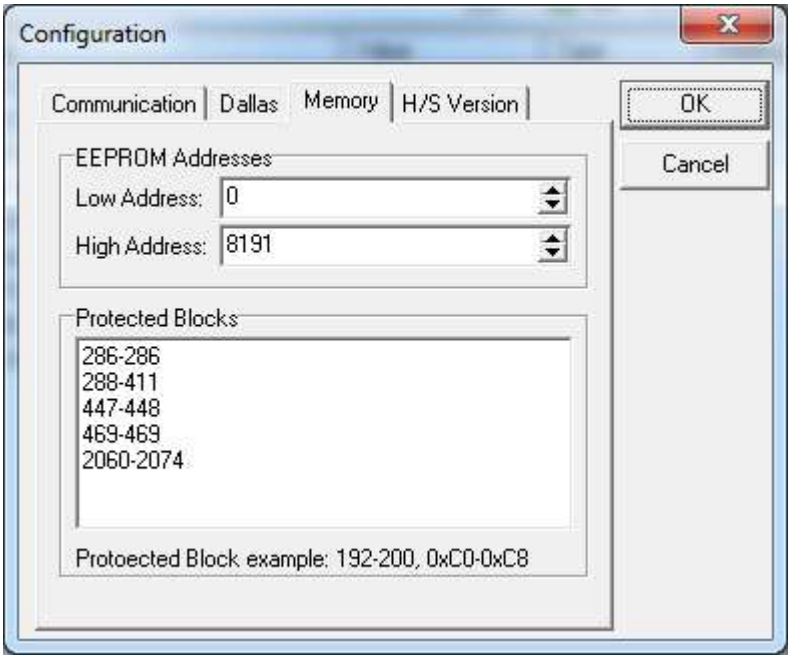
2. Download the modified parameters to the unit's configuration memory by clicking  or by selecting **Query** from the *Communications* menu option. When the download has completed, a confirmation message is displayed.

3. Reset the unit by clicking  on the toolbar. At this stage the unit dials up to GPRS and connects to the server. As a result, the unit will now be monitored by the Communication Center application.

NOTE: After downloading a modified PL file, the unit must be reset by power disconnection or by a serial/OTA reset.

5.4 Protecting unit configuration memory

In order to protect the configuration memory range from being changed when downloading a new PL to the unit, from the *Communication* menu select Configuration and then click the Memory tab, as shown below.



The Protected Blocks area lists several memory ranges provided by Cellocator. They should not be modified.

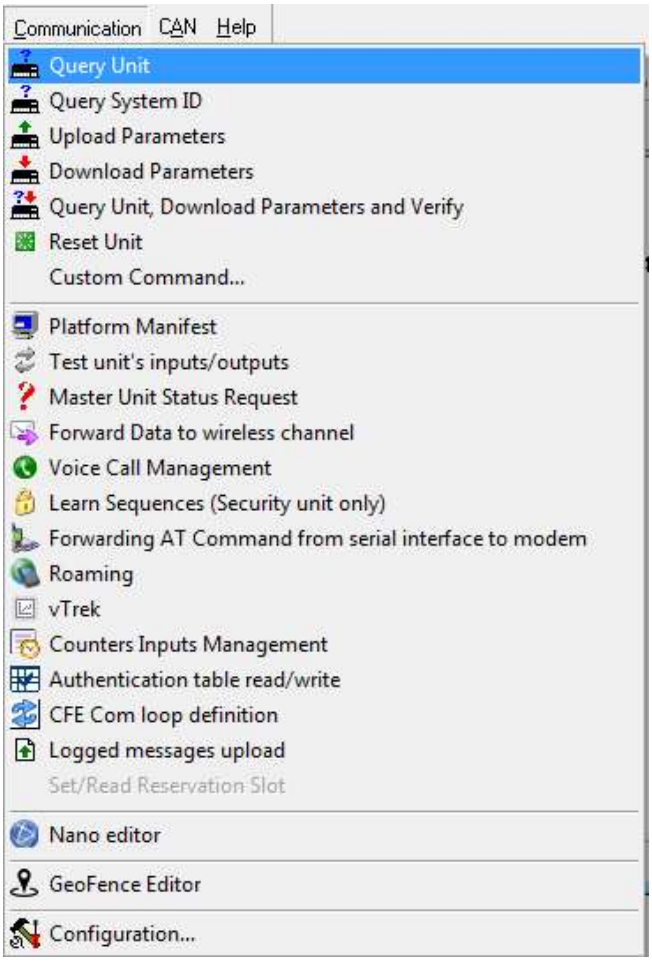
You can add additional memory ranges according to the example provided in the screen above.

Please note that for proper operation of the Cellocator+ application, the protected memory blocks ranges should be arranged in memory-range ascending order.

6 Cellocator Programmer Functionality

This section provides details of the Cellocator Programmer functionality (via the Programmer menu bar and toolbar), which can be divided into three main areas:

- **Maintenance:** the Programmer tools that enable you to monitor, test and analyze how the Cellocator unit is functioning.
- **PL Editing:** the Programmer tools with which you can actually program and edit the PL file.
- **PL Management:** the Programmer tools that enable you to manage the various PL files, such as opening and saving PL files, as well as downloading parameter values.



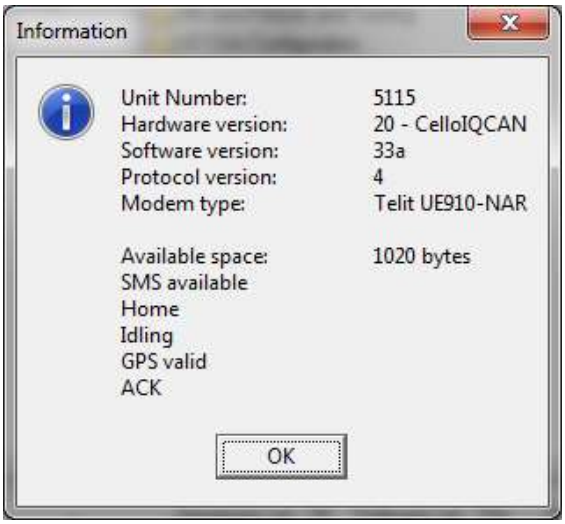
6.1 Maintenance

This section includes the following:

- Voice call management, page 37
- Manufacturing info request, page 38
- Forwarding AT Command, page 39
- Platform manifest, page 40
- Configuring counters inputs settings, page 40
- Resetting the unit (see the *Toolbar* section for further information)
- Custom commands, page 41
- Activating shipment mode (see the *Toolbar* section for further information)
- Cello Platform Manifest, page 41
- Configuring Communications and Memory Parameters, page 41
- Opening/closing COM port (see the *Toolbar* section for further information)

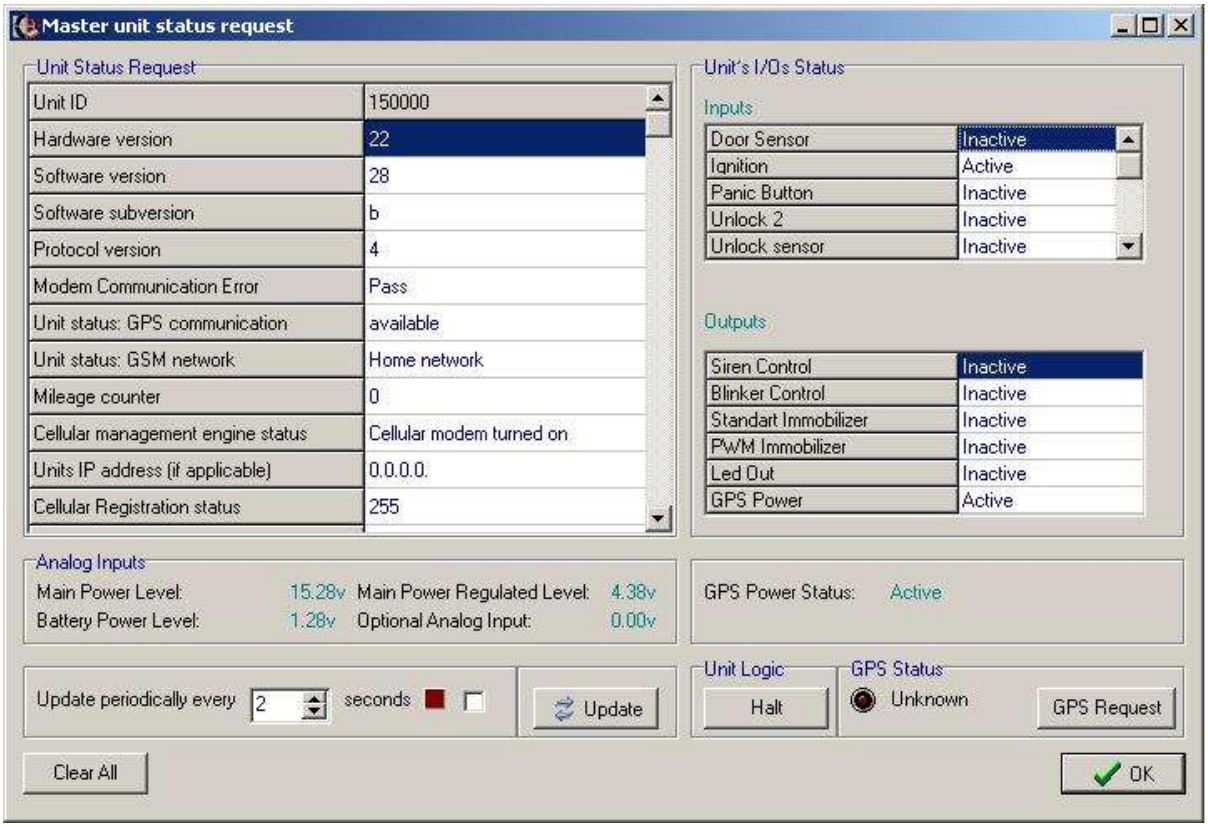
6.1.1 *Querying the Cellocator Unit*

Clicking  in the Cellocator Programmer toolbar initiates unit interrogation and the unit replies with its ID, as shown below.



6.1.2 *Master Unit Status Request*

The Master unit status request window provides debug information regarding the connection status of the unit. You can verify the status of current inputs and outputs, and also modify the time range of the updates (in seconds).



6.1.3 *Testing a Unit's Inputs and Outputs*

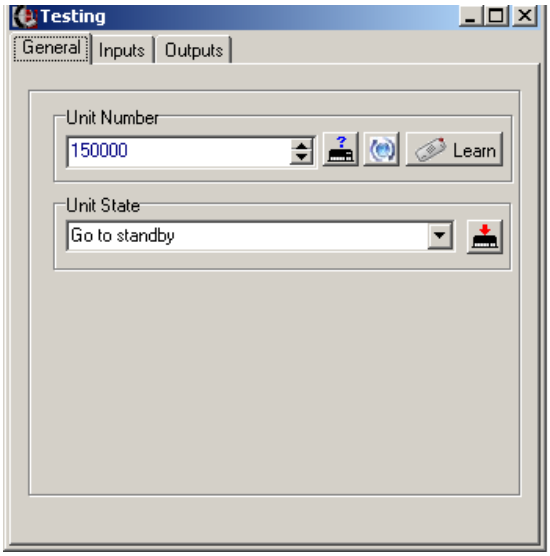
The Testing window, as shown below, is used to test the unit's inputs and outputs. Inputs can be read and outputs activated by commands from the serial port.

NOTE: If a unit is not identified, click  to provide identification.

The Testing window contains three tabs: **General**, **Inputs** and **Outputs**.

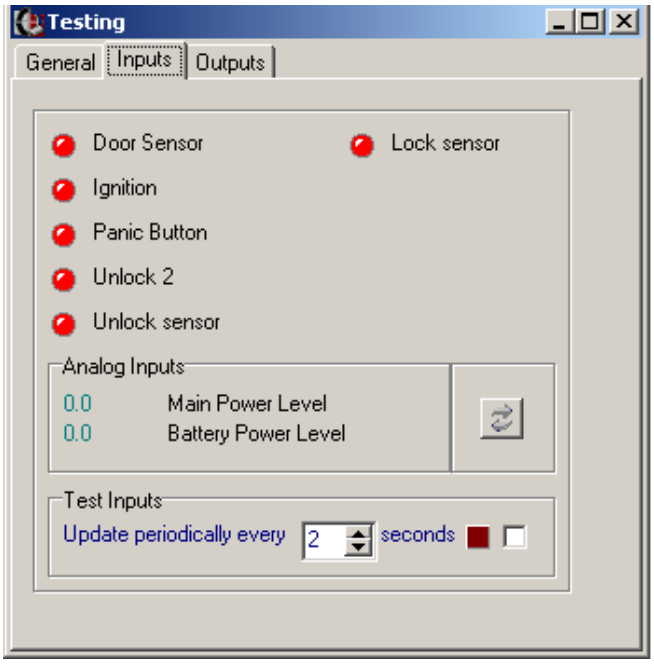
6.1.3.1 General Tab

The **General** tab enables you to select a specific unit number, query it, and also implement Learn settings. You can also define the unit state and download any modified data to the unit.



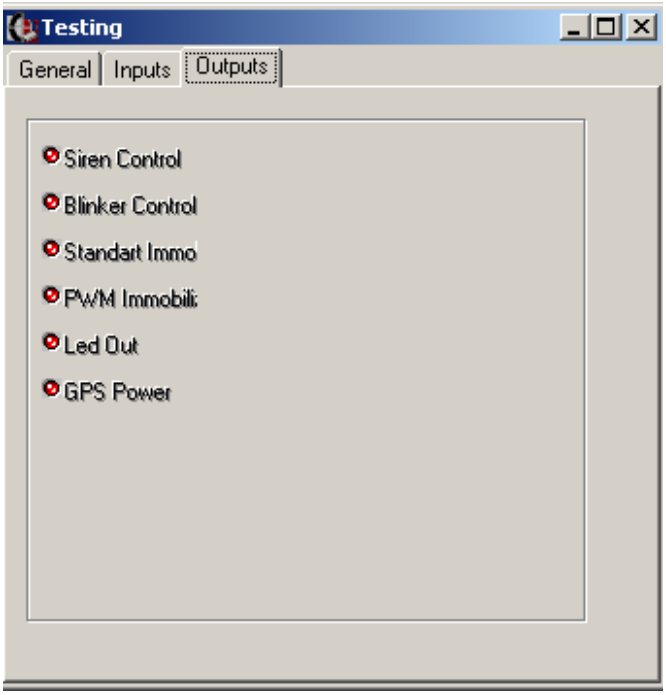
6.1.3.2 Inputs Tab

The **Inputs** tab enables you to monitor the unit inputs and define a test period for the inputs (updated periodically every *x* seconds). You must select the checkbox to enable periodic updates.



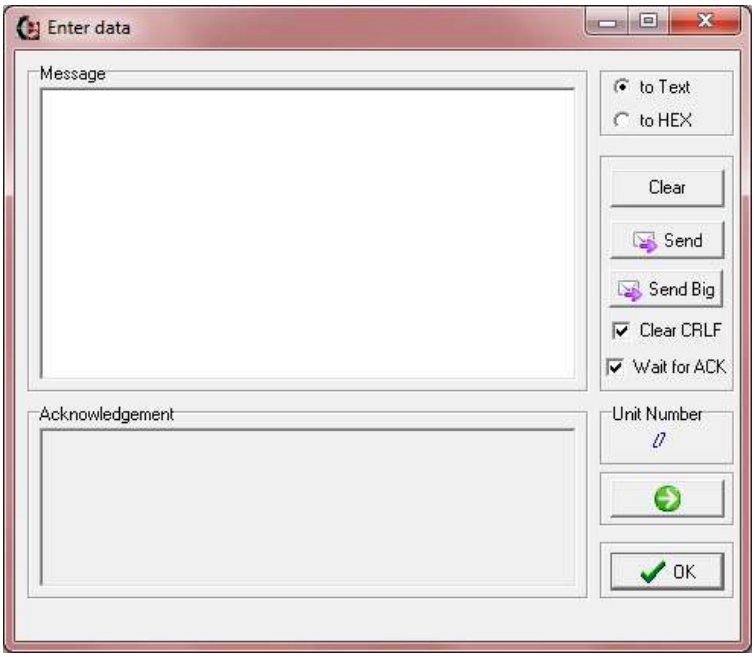
6.1.3.3 Outputs Tab

The **Outputs** tab lists the outputs for the unit. The outputs will be activated when you select the corresponding output. The unit ACKs every output change.

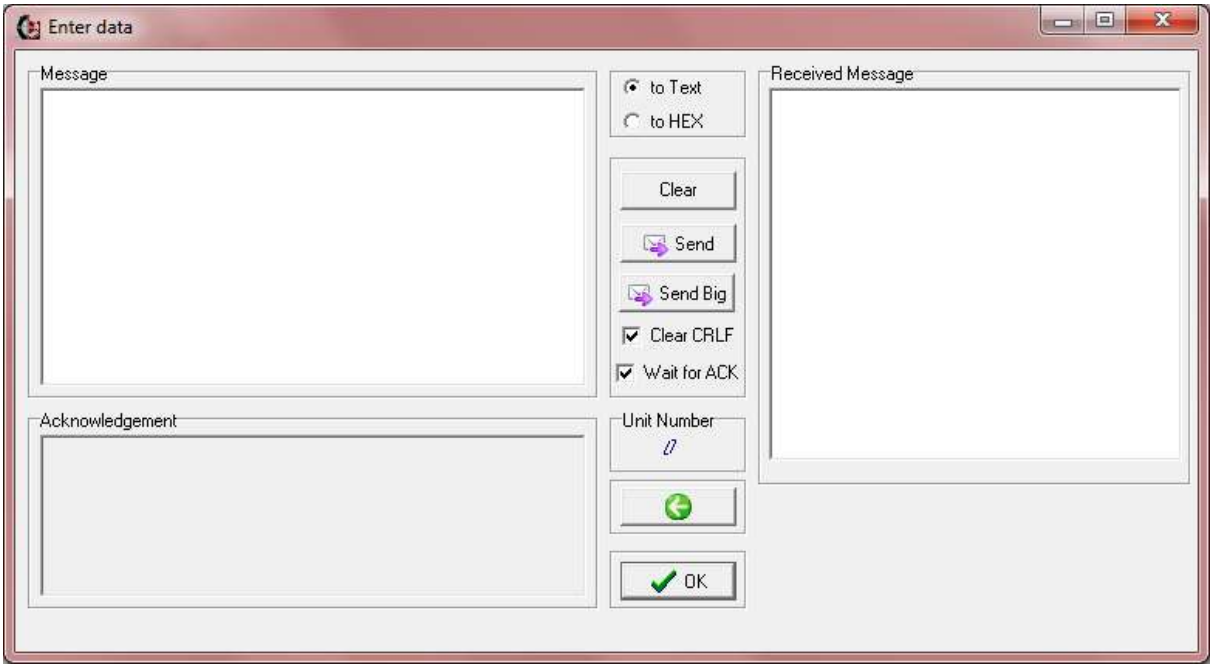


6.1.4 *Forwarding Data to Wireless Channel*

This function allows the user to forward and receive transparent data (such as text messages to/from the Mobile Data Terminal) to/from the wireless channel. The Cellocator unit acts as the modem when transparently connecting with cellular products.

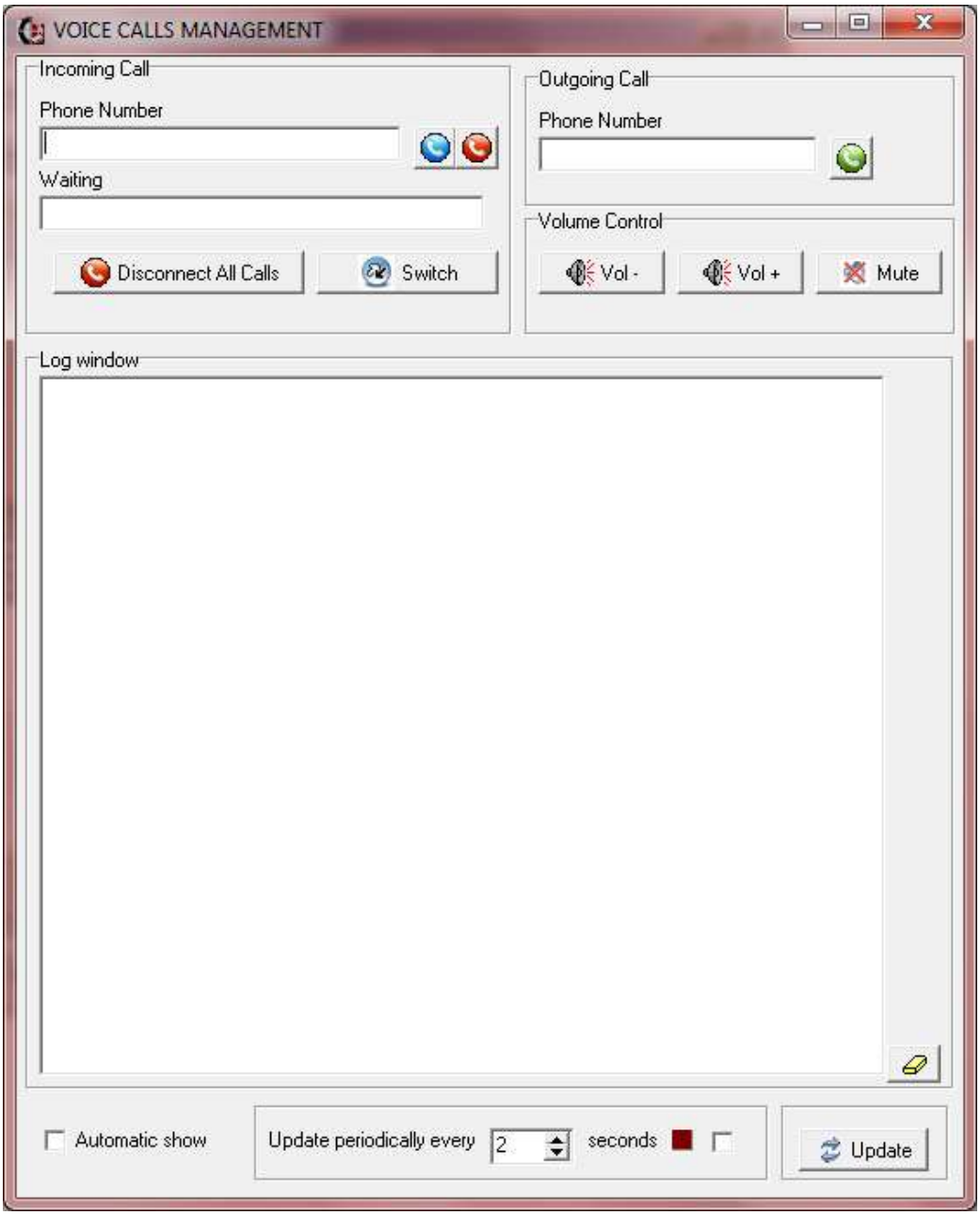


The green arrow in the lower right corner expands the window to display the Received Message pane.



6.1.5 *Voice Call Management*

This function enables the simulation of voice call management (such as initiating a call, receiving a call, rejecting a call, etc.) over the serial port. The Programmer communicates with the unit, when hands-free is activated/available. The feature generates the appropriate serial string following the command selected.

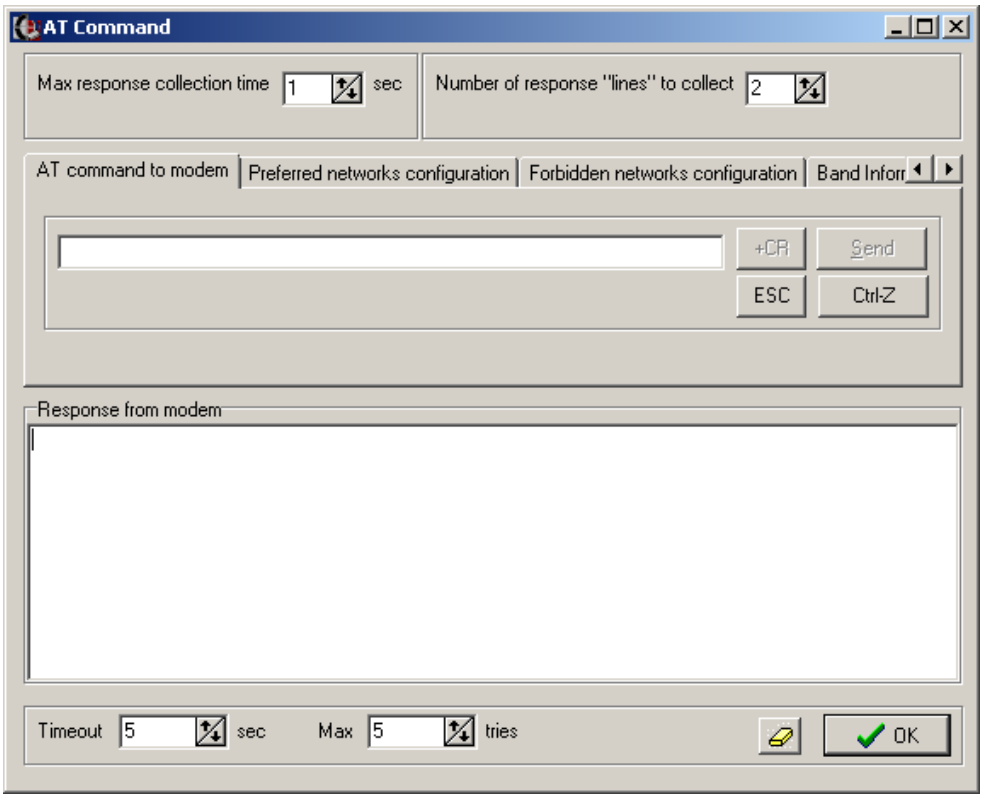


6.1.6 *Manufacturing Info Request*

This feature is used for debug purposes. A customer can use this feature to provide the Cellocator Customer Support with Production information about the unit.

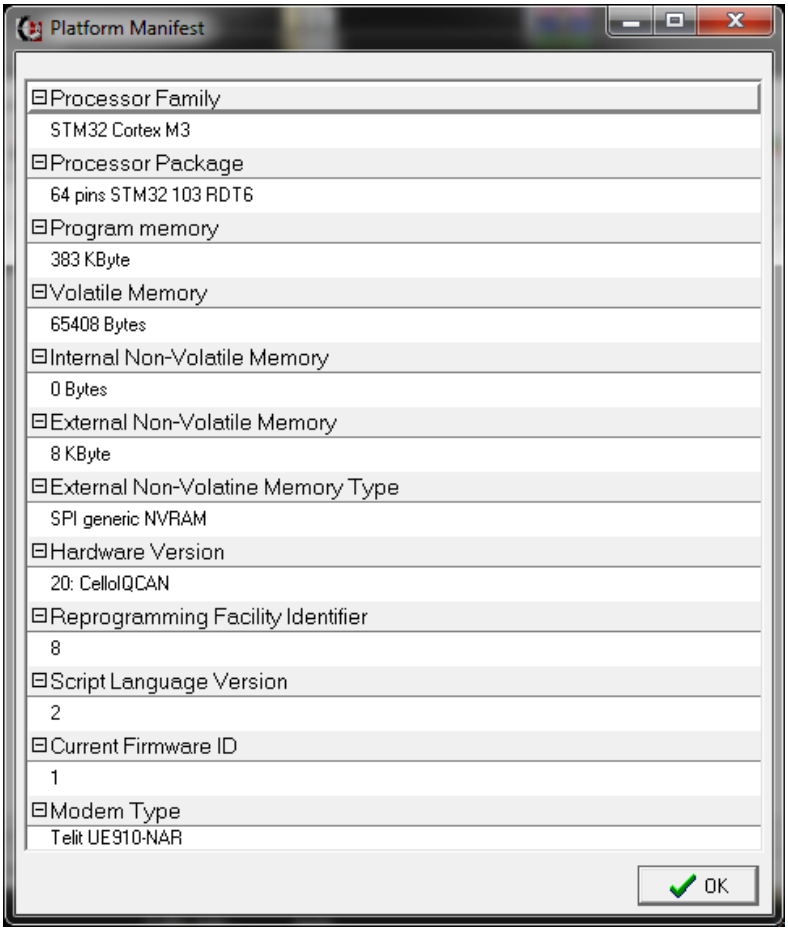
6.1.7 *Forwarding AT Command*

This feature provides a transparent interface to the cellular modem, mainly for debug purposes. Please note the unit will not allow the use of dial up commands. This feature should be used in tandem with Cellocator Support.



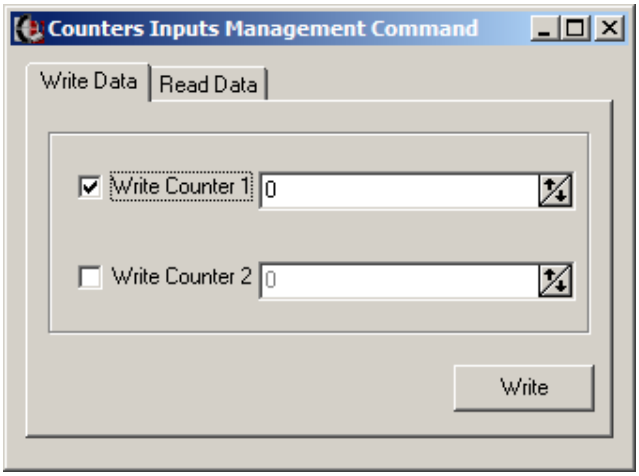
6.1.8 *Platform Manifest*

This feature is used for debug purposes and should be used in tandem with Cellocator Support.



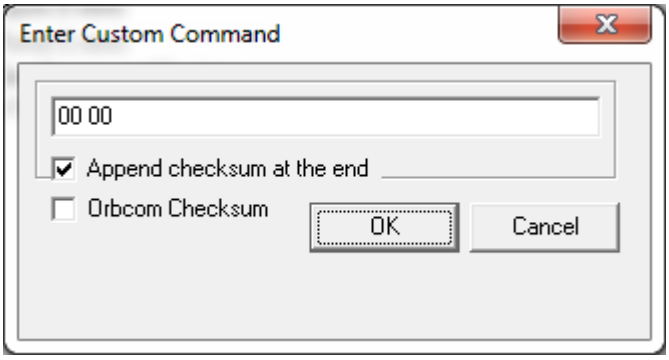
6.1.9 *Configuring Counters Inputs Settings*

The unit can measure the period of time during which an input is active. Up to two inputs can be defined.



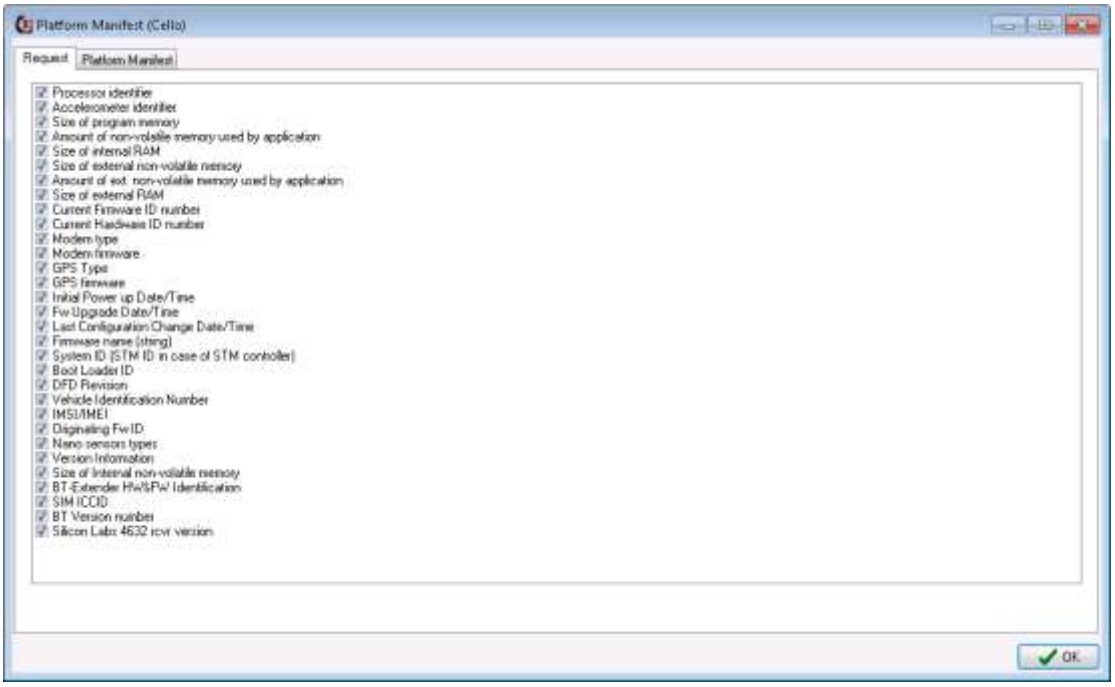
6.1.10 *Custom Commands*

The Custom Command feature enables you to enter a custom command, including an appended checksum, as shown in the following window.



6.1.11 *Cello Platform Manifest*

The Cello Platform Manifest provides more detailed hardware and software maintenance information than the standard Platform Manifest (see above). This feature should be used in tandem with Cellocator Support.

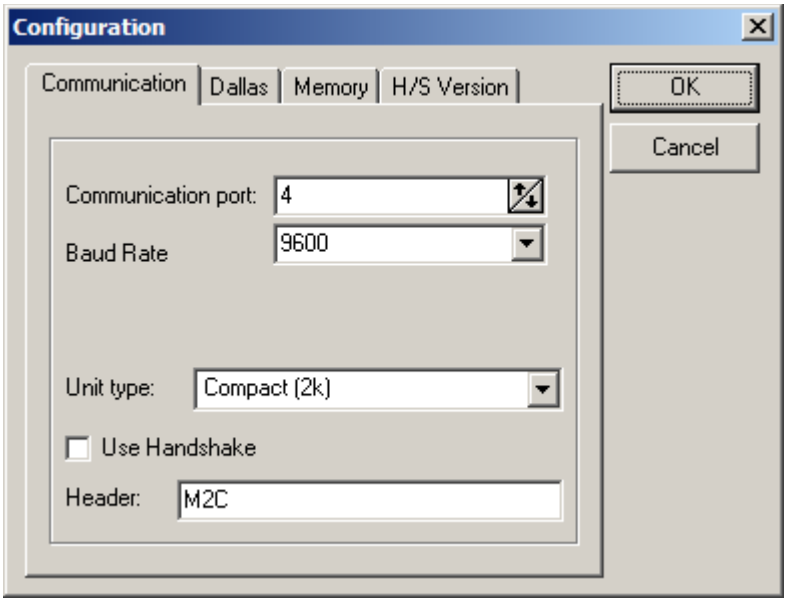


6.1.12 *Configuring Communications and Memory Parameters*

The Configuration window includes four tabs; note that only the Communication tab should be used, the other tabs are for use by Cellocator personnel only.

6.1.12.1 Communication Tab

This tab enables you to set a variety of communication settings, including the port and baud rate, according to the unit type.



6.2 PL Editing

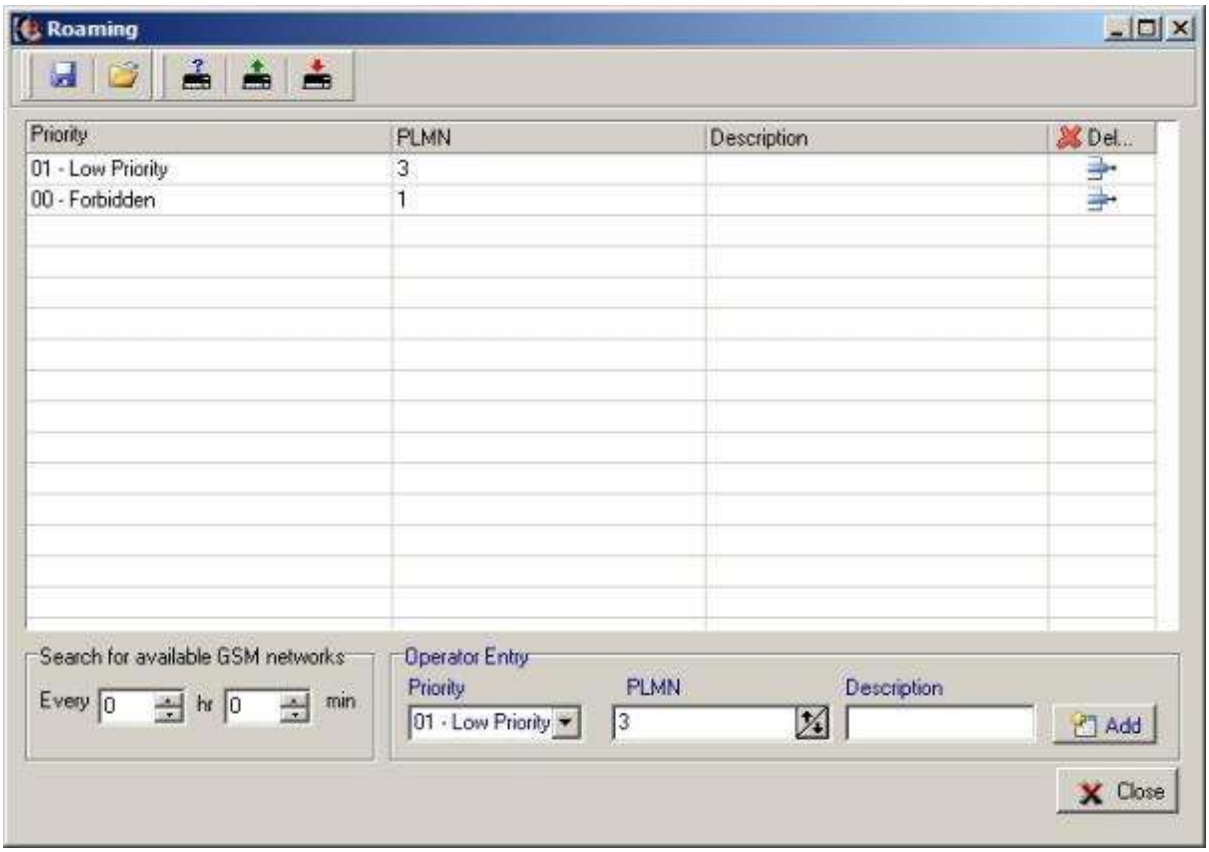
This section includes the following:

- Configuring roaming settings, see BELOW
- Configuring VTrek settings, page 43
- Authentication table, page 43
- Navigation options: go up a level, back/forward (see the *Toolbar* section for further information)
- Display parameters page or memory map (see the *Toolbar* section for further information)
- Dallas Key Code programming, page 44

For information about the CAN Editor, see the *Working with the CAN Editor* section on page 46. For information about the Nano Editor, refer to the *Working with the Nano Editor* section on page 80.

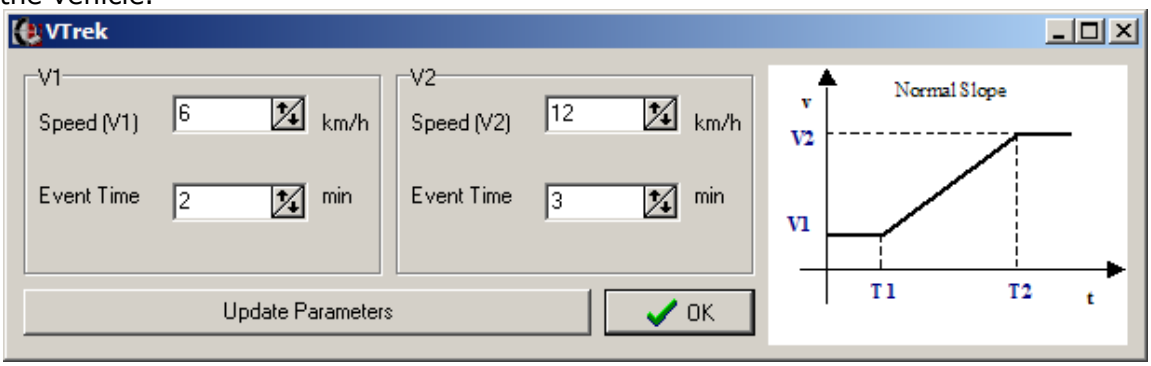
6.2.1 *Configuring Roaming Settings*

This feature enables priority to be given to certain providers. You can also define whether providers should be banned when roaming is enabled (by selecting **00-Forbidden**).



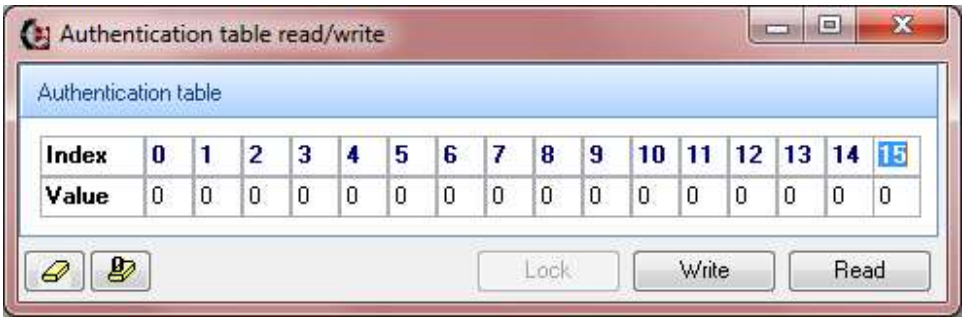
6.2.2 *Configuring VTrek Settings*

This feature enables the frequency of "time events" to be linearly adjusted to the speed of the vehicle.



6.2.3 *Authentication Table*

Confirms the reception of incoming message (server to unit) following proper authentication.



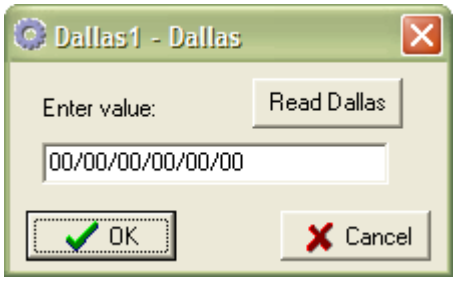
6.2.4 *Dallas Key Code Programming*

The Cellocator Programmer facilitates the programming of Dallas Key Codes. Each Dallas Key is supplied with a unique code which is written on the base of the button.

The most effective way to program the key code is to acquire the code using the Programmer and the evaluation set, and then to copy and paste it to the appropriate window of the Programmer.

To program the Dallas Key Code perform the following steps:

1. Verify that the Cellocator unit is connected to the appropriate evaluation kit and communication exists with the Cellocator Programmer.
2. Verify that the Ignition Switch of the vehicle simulator (tester) is turned **On**.
3. Touch the Dallas reader on the vehicle simulator with the Dallas button.
4. Click the **Master Status** button () on the Programmer tool bar.
5. Scroll down the **Unit's Status** data, where the last detected Dallas number is listed.
6. Copy the number and close the Master Status window.
7. In the **Security** >**Dallas** folder, select the required Dallas code entry and double-click it.



8. Paste the copied Dallas Code in the **Enter Value** field and click **OK**.
9. Repeat the steps above for the remaining Dallas buttons.

6.3 PL Management

This section includes the following:

- Creating, opening and saving PL files (see the *Toolbar* section for further information)
- Including configuration memory content in parameter library (see the *Toolbar* section for further information)
- Uploading parameters from unit (see the *Toolbar* section for further information)

- Downloading parameters to unit (see the *Toolbar* section for further information)
- Downloading and verifying parameters (see the *Toolbar* section for further information)

7 Working with the CAN Editor

This section provides details of the CAN Editor, which is only relevant for Cello units that support the CAN Bus and K-Line interfaces. This section describes the CAN Editor functionality for FW versions 33x and newer; the functionality of the CAN Editor for older versions is slightly different.

This section includes the following:

7.1 Overview

Using the CAN Editor, you can set up CAN configuration schemes using various CAN parameters and operators that will create trigger criteria that enforce events via the unit.

There are two options to work with the CAN Editor:

- Build the CAN configuration for a PL (complete with default rules and schema), as described on page 50.
- Build a vehicle library (meaning a library of the relevant parameters required for each car model), as described on page 63.

NOTE: All CAN configuration and vehicle library XML files provided by Cellocator from FW ver. 36n are encrypted. However, you can still add your own parameters, filters, and queries using the CAN Editor tool and include them with the same XML file that includes the encrypted fields generated by Cellocator (note that these encrypted fields are grayed out in the CAN Editor UI and cannot be edited).

The added encryption does not impact your use of Cello CANiQ in any way.

7.2 Introducing the CAN Editor Window

7.2.1 *Accessing the CAN Editor*

➢ **To access the CAN editor:**

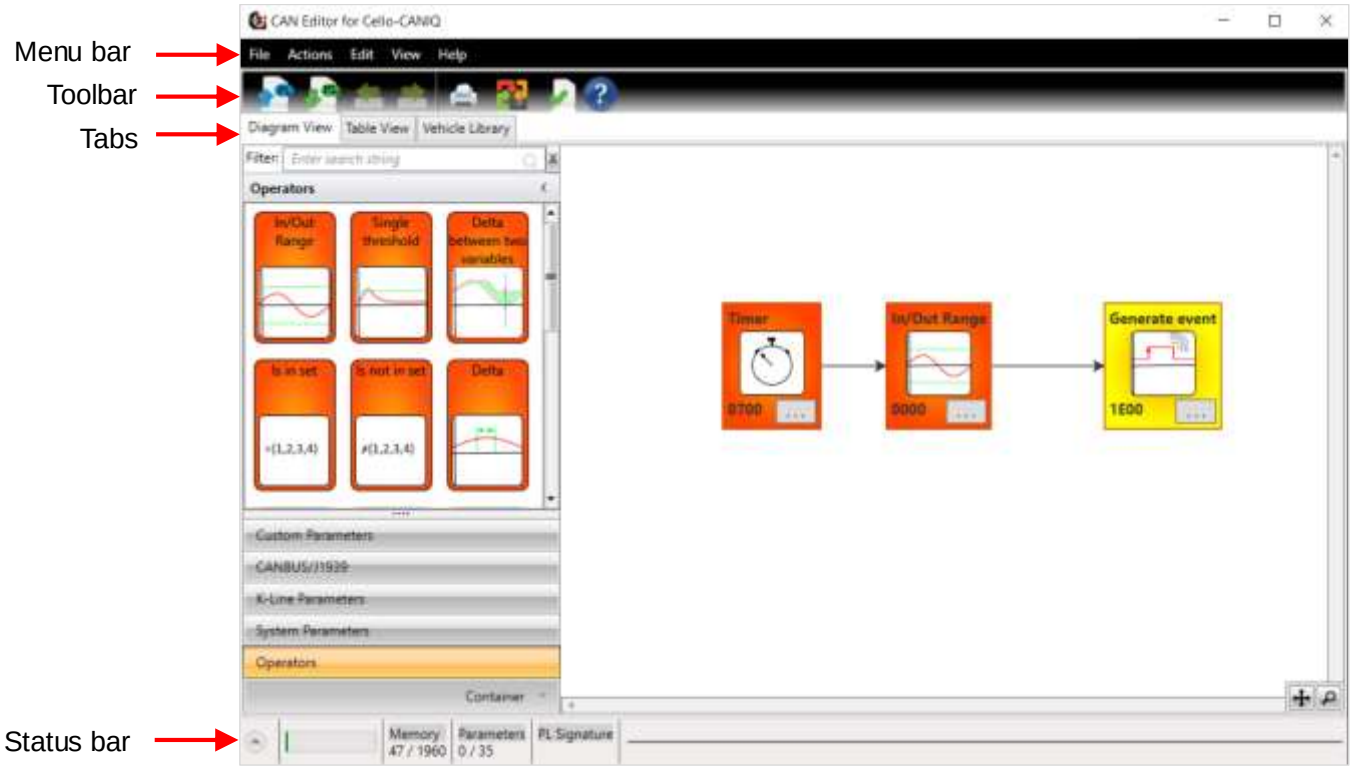
1. In the *Cellocator Programmer* window, click  to launch the CAN Editor.
2. In the displayed message box, click **Yes** to edit the CAN configuration file of the programmed PL, otherwise click **No**.

   The *CAN Editor* window is then displayed. See the following sections for a description of the *CAN Editor* window components.

   Note that when the version of your PL is incompatible with the current version of the CAN Editor, "Old FW Compatibility Mode" is displayed in the toolbar, as shown below. This may result in minor differences to some of the functionality described in this guide.

7.2.2 *CAN Editor Window Components*

This section describes the various components of the *CAN Editor* window, as shown below.



7.2.3 *Menu Bar*

The Menu options are either intuitive or explained in the table below.

Menu Option	Description
File	Includes the following options: • Load/Save configuration • Load/Save vehicle library • Print report • Export diagram to image • Exit

Menu Option	Description
Actions	Includes the following options: • Read from PL • Write to PL • Supported PIDs query • Verify logic • Clear vehicle library • Clear configuration
Edit	Includes standard UI options of Undo/Redo, Copy, Cut, and Paste.
View	Includes the following options: • Optimize diagram layout • Show parameters gallery visible • Zoom to fit • Zoom in / Zoom out
Help	Includes details about the version.

7.2.4 *Toolbar*

The Toolbar options are either intuitive or explained in the table below.

Icon	Description
	Read CAN configuration from PL
	Write CAN configuration to PL
	Undo
	Redo
	Print diagram view
	Optimize diagram layout
	Verify logic
	Queries supported standard parameters for the connected device (when clicked, the Programmer displays all relevant parameters in the Custom Parameters tab of the CAN Editor)

7.2.5 *Tabs*

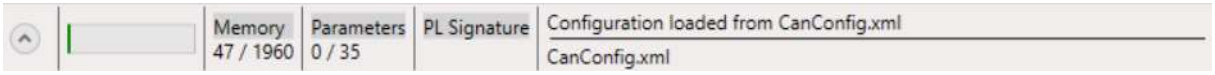
The CAN Editor window has three main tabs: the **Diagram View** tab, the **Table View** tab, and the **Vehicle Library** tab.

The Diagram View tab allows you to define a CAN configuration scheme by building a CAN configuration diagram using graphic tools. The CAN configuration scheme defines the required CAN parameters, the logic operations activated on these parameters and the event generated when the conditions are fulfilled. The Diagram View tab is described in the *Building the CAN Configuration for a PL* section.

The Table View tab allows you to view and edit the characteristics of each instance of CAN parameter, operator or event which are included in the CAN configuration diagram. The Table View tab is described in more detail in the *Building the CAN Configuration for a PL* section.

The Vehicle Library tab allows the definition of non-standard (custom) CAN parameters and their properties, and the functionality of CAN Bus characteristics. You can also prepare a set of CAN parameters, custom parameters, and K-Line parameters, and save them in a library file. The library files generally describe the CAN parameters of certain vehicle models and years. The Vehicle Library tab is described in more detail in the *Building Vehicle Libraries* section.

7.2.6 *Status Bar*



The Status bar, located at the bottom of the CAN Editor window, provides visual indication of the following:

- Current CAN Editor status, from one of **Ready** (before you create your configuration diagram), **Verified OK** (indication that your diagram logic is valid), or **Warnings/Errors** (see the warnings and errors in the panel just above the Status bar, accessed by clicking the arrow icon on the far left of the status bar, as shown below; note that you can also double-click on any warning or error message to jump to the relevant parameter or operator in the Diagram View).

- Memory usage; the value indicated (example: 60/1960) will change according to the number of non-standard and J1939 parameters used, as well as Operators, as they all have some memory volume. The standard parameters have no memory volume and will not impact this value. Note that the memory bar to the left of this value provides a visual "traffic light" indicator of the current memory usage.
- The number of parameters currently in use, up to a maximum of 35.

- The signature ID of the PL file. Note that because the PL signature is updated upon each download, you can 'lock' it to prevent a new signature being created (right-click on the PL signature and from the popup menu, select Lock). This is especially relevant when minimal changes have been applied to the PL file. To revert to the PL signature used in the previous session, right-click the PL signature and select Restore.
- The last performed action; a textual indicator of the last performed action, such as *Configuration cleared* or *Errors/warning found*. The name of the relevant XML file is also displayed in the line below the red text, for example when saving the configuration.

7.3 Building the CAN Configuration for a PL

This section describes how to build the CAN configuration for a PL using the CAN Editor visual composer tools. These tools help you create a configuration diagram that displays all the defined rules and configuration parameters.

7.3.1 *Use Case Scenarios*

The following use case scenarios are the three main ways you build your CAN configuration for a PL file.

- **Update an existing PL with an existing configuration file**: This scenario is relevant when you want to take an existing PL file and update it. Via the Cellocator Programmer, access the CAN Editor, and when prompted, click Yes to work on the PL. Then load the configuration file for the same PL as described in the section below.
- **Apply a configuration file to an existing PL**: This scenario is relevant for creating a CAN configuration scheme which is similar to an existing one, and when making a number of changes instead of creating the configuration from scratch. After accessing the CAN Editor and loading the relevant PL, then load the required configuration file. Upon completing your changes, the system will generate two files, the PL and an XML file, synched with the same name.
- **Create a CAN configuration from scratch with a library file**: This scenario is relevant for a PL file with no configuration file. Take a library file associated with the required vehicle model and load it in the CAN Editor as described in *Defining Custom Parameters and Characteristics in the Vehicle Library Tab*; the configuration diagram will be empty, but this enables you to start with the specific vehicle parameters you need.

7.3.2 *CAN Configuration Output*

When you have completed creating a configuration diagram, the CAN Editor generates two outputs:

- The PL file is updated with the CAN configuration data.
- An XML file is created (with the same name as the PL file but with an additional .Config suffix), which includes all the information regarding the CAN configuration schema. This XML file is designed specifically for application developers, as it provides all the necessary information regarding the triggered event which can be used as inputs for the SW application.

In order to ensure that these two outputs hold the same parameters and values, they are assigned with the same signature. The signature stored in the PL is shown in the *CAN Editor* window, as shown on page 46.

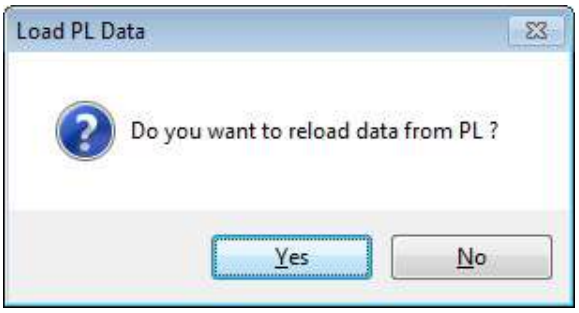
The signature stored in the XML file can be reviewed at the top of the file using a regular text editor.

7.3.3 *Loading a CAN Configuration*

When entering the CAN Editor or loading the PL file, there are no names assigned to the instances or parameters / operators (for example, in the **Table View** tab no names will be listed), since these are included in the XML configuration file only. In order to work correctly, the back office application will require named parameters and operators; therefore you will need to load the XML configuration file, which also includes all the configuration rules and diagrams.

➢ **To load a configuration file:**

When accessing the CAN Editor, you will be prompted to reload the CAN information from the existing PL.



Click **Yes** to reload the PL configuration data. If you have changed the CAN configuration these changes will be overwritten. If you have just the CAN Editor open, you can click **No**.

From the *File* menu in the *CAN Editor* window, click **Load Configuration** to load the appropriate configuration file in .XML format. Generally, you have to load a configuration file with the same name as the PL file (which can be verified in the PL signature). The parameters and operators relevant to that PL file are loaded and available for use in the configuration diagram.

If starting a configuration from scratch, you can take an existing configuration file that is similar to your requirements, load it (as described above) and modify as required. For example, if you want to create a new configuration file for a Chevrolet 2011 model and you have an existing, almost identical Chevrolet 2010 model, first load the 2010 model configuration file.

7.3.4 *Querying the vehicle for Standard PIDs*

From version 36v, you can query the device itself for all standard PIDs by clicking  ; when clicking this toolbar icon, all standard PIDs associated with the vehicle are displayed in the CAN Editor (in the Custom Queries and Custom Parameters tabs).

Once all standard PIDs are loaded from the vehicle, you can continue to edit and manage the CAN configuration, as described in the following sections.

7.3.5 *Editing a CAN Configuration*

There are two stages to editing the CAN configuration:

1. **Editing the configuration via the Diagram View tab**: this enables you to visually edit the configuration file in a visual composer. Refer to the *Building CAN Configuration Rules via the Diagram View Tab* for more information.

2. **Editing operators and parameters in the Table View tab**: in this step you view and edit the configuration in table form, and perhaps more importantly, add names to the relevant operators and parameters so that they can be used correctly by the CAN Editor. Refer to the *Modifying the CAN Configuration via the Table View Tab* section for more information.

7.3.6 *Managing a CAN Configuration File*

This section describes a number of options you have for managing your CAN configuration file, including how to complete the editing of a CAN configuration.

When you have completed editing your configuration file, it must be saved as described in the following procedure.

➢ **To save a CAN configuration:**

From the *File* menu, select **Save Configuration**, to save the CAN configuration diagram.

A warning message is displayed, informing you that the PL signature is no longer updated and that you need to write the changes to the PL file. Click **Yes** if you want to update the PL. The file is saved in XML format to your selected destination.

In addition, click  on the toolbar to write the CAN configuration diagram to a PL file to update the PL with your changes. The memory map in the Cellocator Programmer (or OTA Programmer) is updated according to the configuration in the CAN Editor; to update the unit you should download the PL with the Cellocator Programmer (or OTA Programmer) interface.

➢ **To clear a CAN configuration diagram:**

To clear the CAN configuration diagram, select **Clear Configuration** from the *Actions* menu.

➢ **To export the CAN configuration diagram as an image:**

You can export the CAN configuration diagram to an image; from the *File* menu, select **Export Diagram To Image**. The file is saved in PNG format.

➢ **To print a report of the CAN configuration diagram:**

You can also print a report of the CAN configuration diagram, by selecting **Print** from the *File* menu. The file is generated in PDF format.

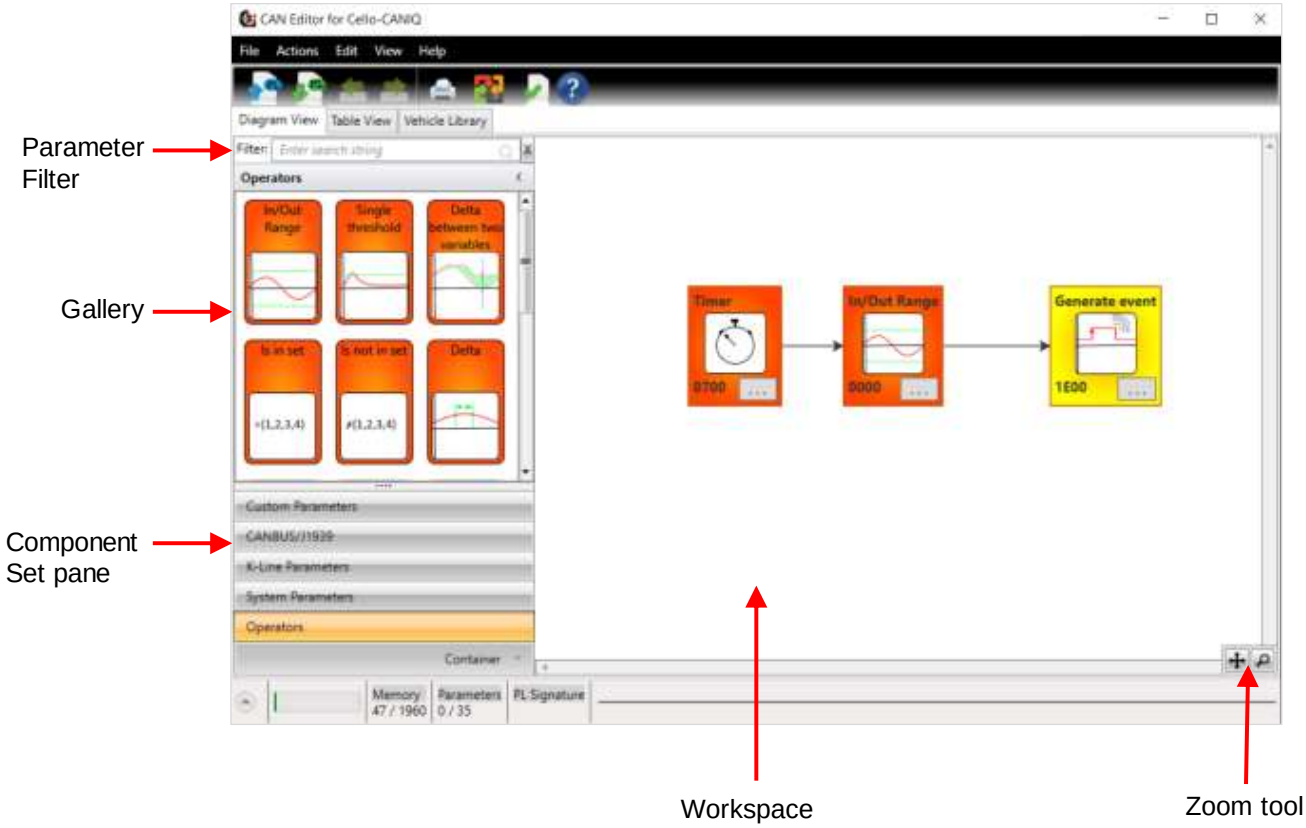
7.3.7 *Building CAN Configuration Rules via the Diagram View Tab*

7.3.7.1 Overview of the Diagram View Tab

The Diagram View tab is the visual composer that enables you to build a configuration diagram from operators and parameters selected in the Components Set pane and Gallery (see also the *Component Set Pane* and *Gallery* sections below).

A configuration diagram is a flow diagram consisting of filtering, triggering, and reporting elements. Note that in each configuration diagram, which flows from left to right, there must be at least one parameter (either CANBUS/J1939, Custom, or K-Line, shown in the workspace in a light green square), one Operator (shown in the workspace with an orange square), and one "Generate Event" Operator (shown in the workspace with a yellow square).

For details on how to build a configuration diagram, refer to page 54.



In the image above, the Operators component set is selected; the Gallery displays all the relevant operators and one basic CAN rule is presented in the workspace.

Note that there are a number of parameter types to choose from (select the relevant option from the Component Set pane column to display the available parameters). See the following *Component Set Pane* section.

7.3.7.2 Component Set Pane

The Component Set pane lists the various component sets available for use in the configuration diagram: **Custom Parameters, CANBUS/J1939**, **K-Line Parameters**, **System Parameters**, **Operators** and **Container**. When you click on the relevant option, the parameters for that option are displayed in the Gallery.

Note that the Container option enables you to combine a number of variables and operators together in a single structure. This can be especially useful when you have a large number of parameters and operators in your diagram as the Container can be collapsed as required, including all the parameters and operators within the Container (to expand/collapse the Container, click on the arrow icon in the top right corner of the Container).

7.3.7.3 Gallery

The Gallery lists the available parameters of the selected component set. For example, if **CANBUS/J1939** was selected in the Component Set pane, the Gallery displays only the CANBUS / J1939 parameters.

Note that the Gallery pane name changes to reflect the selected component set. Note that you can also collapse the left navigation panes by clicking the arrow icon to the right of the Gallery pane title, as shown below. This helps maximize the workspace available for building your CAN configuration diagram.

7.3.7.4 Workspace

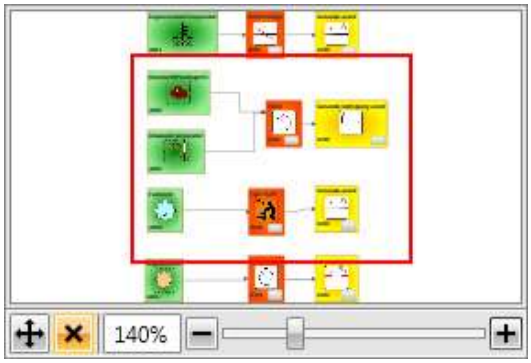
The workspace is where you build the CAN configuration diagram (subsequently it is only displayed in the Diagram View tab).

7.3.7.5 Parameter Filter

Use the parameter filter to locate a specific parameter in the gallery. Note that the filter applies to only the selected component set selected from the Component Set pane.

7.3.7.6 Zoom Tool

To zoom in on the diagram you have built, click  to "zoom to fit", use the magnifying glass located in the lower right corner of the window, or use the scroll button on your mouse. An additional smaller navigation screen is displayed in the lower right corner, as shown below:



You can also click  to automatically optimize the diagram layout.

The Zoom tool is only available in the Diagram View tab.

7.3.8 *Editing Configuration Rules in the Diagram View Tab*

The following procedure describes how to build a basic CAN configuration diagram.

When editing an existing PL, the PL comes with a defined CAN configuration, which should be loaded (as described on page 51). To ensure the configuration file is the correct file, verify the PL signature is correct in the status bar.

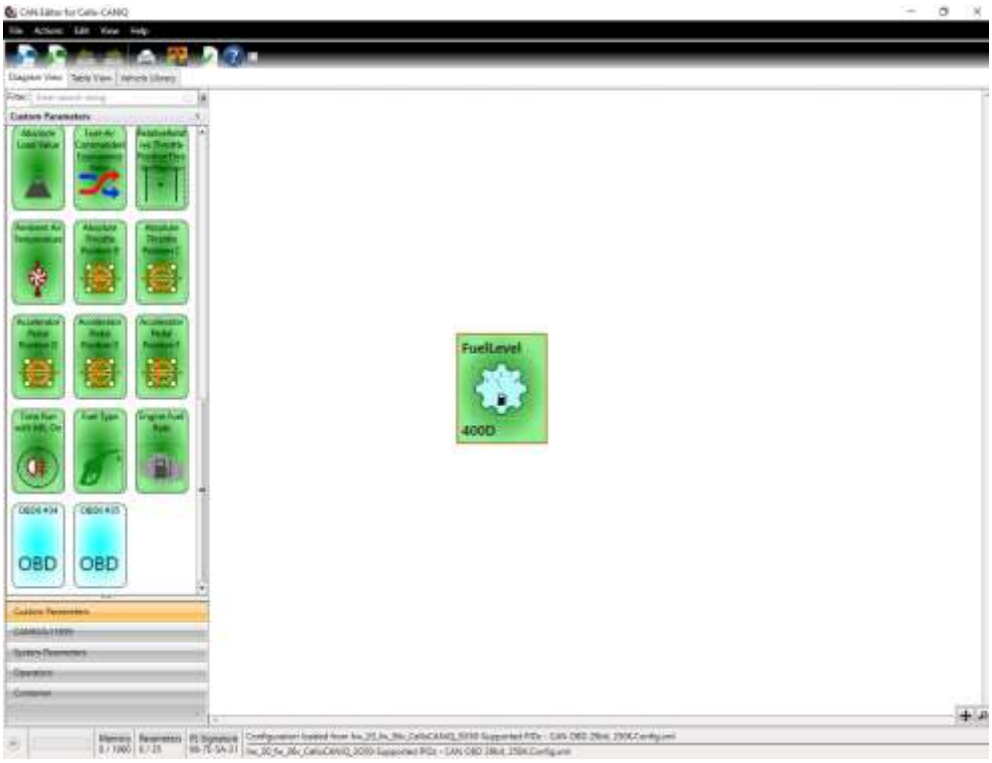
NOTE: Throughout the process of building a CAN configuration diagram, there may be errors and warnings displayed in the status bar; please pay attention to these errors and warnings as they will assist you in building an operational configuration diagram.

➢ To edit configuration rules in the Diagram View tab:

1. In the **Diagram View** tab, select the required set of parameters from the *Component Set* pane. The parameters specific to that set are displayed in the Gallery.
2. Drag the relevant parameters from the Gallery to the workspace.

NOTE: Parameters cannot be edited in the workspace, but can be moved or deleted by selecting them with your mouse. Define operator/parameter names in the **Table View** tab, as described on page 59.

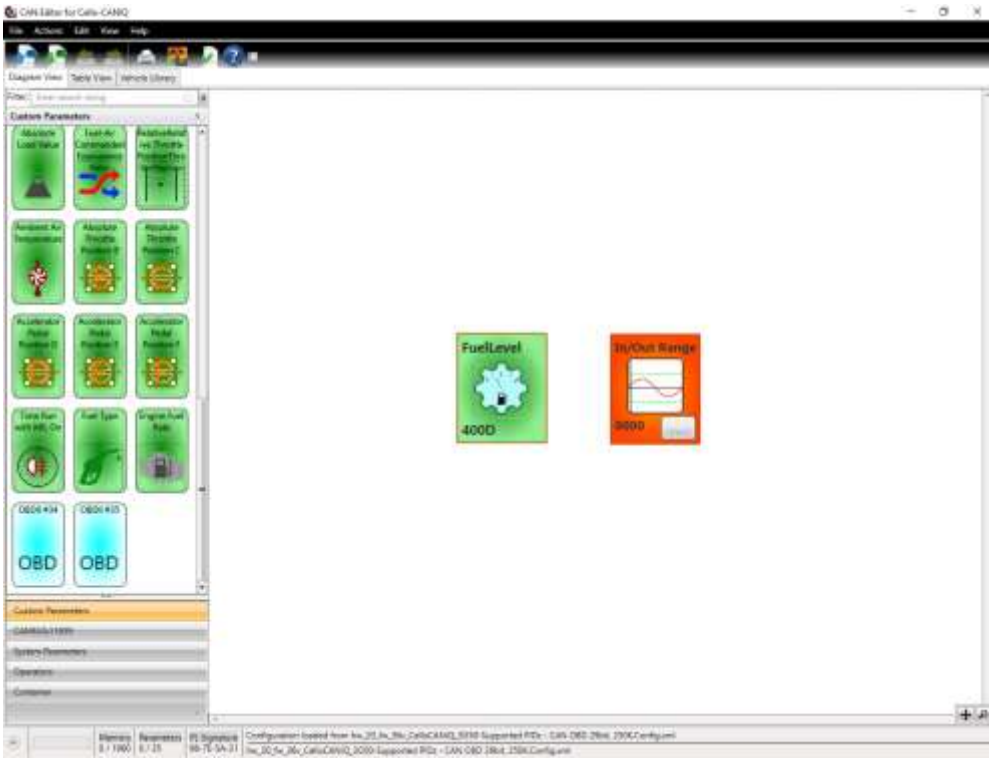
In the following example, the FuelLevel parameter has been selected from the Custom Parameters Gallery and is displayed in the workspace.



3. If required, after querying for standard PIDs you can change the periodic Polling Time (in seconds) for the selected parameter(s) by clicking the **Vehicle Library** tab and then the **Custom Queries** sub-tab. In the Polling Times column, click on the value to edit it.
4. In the Component Set pane, click on **Operators**. The available Operators are displayed in the Gallery.

5. Drag the required Operator from the list of available Operators and place it next to the parameters you selected in Step 2 in the workspace. In the example below, the In/Out Range Operator has been selected.

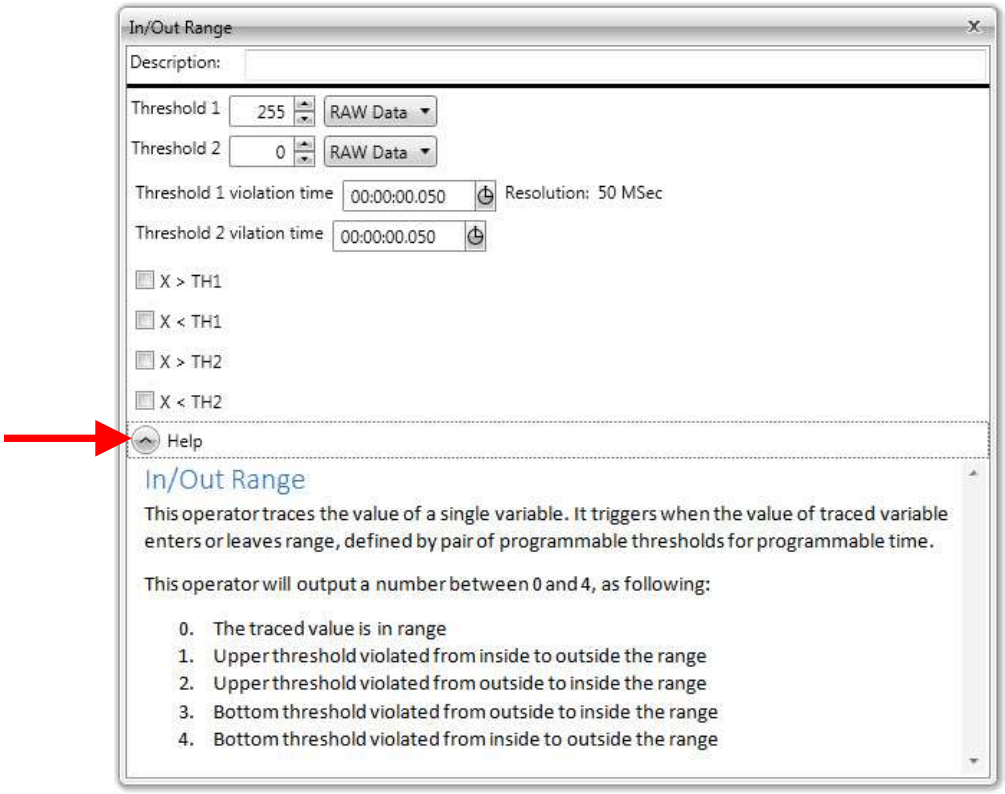
   You can use the same Operator more than once; in this case, the ID assigned to the Operator will increase sequentially, depending on the number of times used.



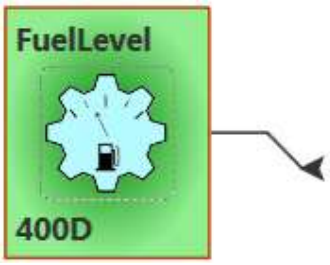
6. (Optional) To edit an Operator's properties, click  in the lower right-corner of the Operator (or double-click on the Operator itself). The Properties dialog for the specific Operator is displayed.

   In the Properties dialog box for each Operator you can add a description in the Description field, which will also be displayed in your CAN configuration diagram. This Description field is especially relevant for the Generate Event Operator, which is seen on the server side and gives backend personnel a better indication of events.

   After entering a Description, or modifying any of the available settings, close the Properties dialog to save your changes. Note that these changes are not applied to the PL file itself; see page 47 for details on how to save the PL file configuration. In addition, the Help option at the bottom of the Properties dialog (as indicated below - click to expand/collapse) provides additional information about the Operator.



7. To connect a parameter with the Operator, click on the parameter box to display the Connect output connector (on the right side of the parameter box, as shown below). Click on the Connect output connector and drag the connector arrow to the input connector of the Operator (which should automatically be displayed when dragging the connector towards it).



8. From the list of displayed Operators, drag the Generate Event Operator to the workspace. To edit the Generate Event properties to ensure its relevancy to your diagram, click  in the lower right-corner of the Operator (or double-click on the Operator itself). The Properties dialog is displayed via which you can edit the relevant properties (see Step 6 for further information).
9. To connect the Operator you selected in Step 6 with the Generate Event Operator, click on the Operator box to display the Connect output connector (on the right side of the Operator box). Click on the Connect output connector and drag the connector arrow to the input connector of the Generate Event Operator (which should automatically be displayed when dragging the connector towards it).

TIP: You can verify that the variables and Operators are correctly connected by opening the Properties dialog for the relevant Operator. If connected, the value of the variable should be displayed. For example, if you are connecting the VehicleSpeed variable with the In/Out Range Operator, the value in the Properties dialog box will display Km/h (instead of RAW Data) once connected.

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10. Repeat as required (you can use the same parameter more than once).

TIP: To zoom in on the diagram you have built, click  to "zoom to fit" or  to automatically optimize the diagram layout. See the *CAN Editor Window Components* section for further information.

TIP: To view the parameters and operators in the diagram you have built in the Table View tab, press Alt + Double-click to automatically jump to the selected parameter or operator in the Table View. To return to the diagram layout, press Alt + Double-click on the parameter or operator.

---

11. To verify the flow validity of your configuration diagram, click  . A list of any errors and/or warnings is shown in the status bar at the bottom of the *CAN Editor* window. See the *Status Bar* section on page 49 for further information.

NOTE: You can see a "dump" list of all the variables in your current configuration diagram by accessing the Properties dialog of the Generate Event Operator. In the *Message descriptor* section a list of variables and parameters is displayed (these will be seen on the server side), from which you can remove and add as required.

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12. Save your configuration, as described on page 52.

7.3.9 *Modifying the CAN Configuration via the Table View Tab*

As required, you can also edit and name the CAN configuration components in table format via the Table View tab. This is an important part of the CAN configuration process, because without defined names (which you *cannot* define in the Diagram View tab) integrators will not be able to identify the parameters and activate the required logic.

The Table View tab provides a data format view of what is displayed in the Diagram View tab, only displaying parameters and Operators that have been used in the Diagram View tab. The tab is divided into two sub-tabs, in which you can see and edit the hexadecimal values and raw data for Operators and Parameter Descriptors.

In addition, the Table View tab presents each instance of the parameters and operators according to the number of times they are used in the configuration diagram.

➢ **To work with the CAN configuration in table format:**

1. In the **Table View** tab, click on the relevant sub-tab according to the values and data you want to edit/view (**Operators** or **Parameter Descriptors**).

   A list of the currently used Operators / parameters is displayed.

2. Define values and data as relevant.

   Note that any changes you make in each sub-tab will be reflected automatically in the CAN configuration diagram.

3. Save the file, as and when required, as described on page 52.

TIP: To view the parameters and operators in the configuration diagram (in the Diagram View tab) you have built, press Alt + Double-click to automatically jump to the selected parameter or operator in the diagram layout. Note that to return to the Table View tab, press Alt + Double-click on the parameter or operator.

The following sections describe the two tabs and the fields in each tab.

7.3.9.1 The Operators Tab

Name	Description	Type	ID	Sources	Raw Data	Address	Length
Single threshold		1	0		01-00-09-FF-FF-01-FF-00-00-00-01-00	0	12
Delta		5	0	Single threshold #0100	05-00-07-00-01-00-00-00-00-00	0	10
Generate event		30	0	Delta #0500	1E-00-11-00-05-00-01-04-06-07-19-02-00-00-05-03-01-02-03-04	0	20

The operators are used to filter the parameters reported by the CAN Bus, allowing the generating of events only when all event conditions are fulfilled. The operator fields are listed in the following table.

Field	Description	Editable
⊞ (click to expand)	Displays the raw data of the operator properties, allowing the user to edit the values. It is advised to edit the logical values of the properties via the Diagram View tab.	Yes
Name	Name of the operator.	Yes
Description	Description of the operator as defined by the user.	Yes
Type	The predefined Operator type provided by the CAN Editor.	No
ID	Numerical number allocated for the operator instance by the CAN Editor.	No
Sources	The names of the actual sources (parameters or operators) of the operator's inputs.	No
Raw Data	Displays the raw data values which represents the operator in the PL. Note you can click on the arrow icon (next to the filter icon) to expand the column to display all the information.	No
Address	The operator address in the PL.	No
Length	The length of the operator raw data.	No

7.3.9.2 The Parameter Descriptors Tab

The Parameter Descriptors tab presents information regarding the Custom Parameters defined in the Vehicle Library tab. The Parameter Descriptor fields are listed in the following table. Note that if you modify values in this tab, the parameters will also be modified in the vehicle library definition for that specific vehicle model. Therefore, it is only recommended to modify the *Name* field; all other parameters should be modified in the Vehicle Library tab only.

NOTE: Parameters included with the XML files of FW ver. 36n and above, provided by Cellocator, come encrypted, and the following fields will be grayed out and cannot be edited: *Filter*, *Arbitration ID*, *Response mode (SID)*, *PID length*, *PID1*, *PID2*, *Start bit*, *Data length (bits)*, *Little Endean*, and *Consider PGN only*.

You can still add your own parameters using the CAN Editor and include them with the same XML file that includes the encrypted parameters generated by Cellocator.

Field	Description	Editable
#	The operator ID which these parameters are related to.	No
Name	Parameter name defined by the user.	Yes
Parameter ID	The ID allocated to the parameter by the CAN Editor.	No
Filter	Set the required filter name from the existing filters.	Yes
Arbitration ID	The application automatically displays the Arbitration IDs as defined in the vehicle library.	Yes
Trg	Currently not in use (infrastructure).	No
Trg Addr	Required to identify the receiving module on the K-Line bus (or unit).	Yes

Field	Description	Editable
Src	Enables filtering of parameters from a specific sending module on the K-Line bus. When Src is not selected, the related parameter will be accepted from any sending module (ignoring the specific source address, if indicated).	Yes
Src Addr	Required to identify a specific sending module on the K-Line bus.	Yes
Payload Length	The parameter payload (data) length.	Yes
Response mode (SID)	The SID related to the parameters according to the standard (all parameters should be associated with the same SID).	Yes
PID length	The parameter ID length.	Yes
PID1	The PID hex code as defined in the standard.	Yes
PID2	The PID hex code as defined in the standard.	Yes
Start bit	The location in the received information in which the parameter starts.	Yes
Data length (bits)	The parameter data length.	Yes
Little Endean	Set Little or Big Endean. Select the checkbox to ensure Little Endean is applied.	Yes
Consider PGN only	When selected, considers only the 18 bits of PGN from 29 bits of identifier structure.	Yes
Raw Data	The parameter raw data presentation in the PL.	No
Address	The address of the parameter raw data in the PL.	No
Function	Set the fleet function which will use the parameter as input. Select from **Not assigned**, **Speed**, **RPM**, **Fuel Tank Level**, **Fuel Consumption Direct**, **Odometer**, **Fuel Consumption Estimation** (one of **FR\MAF**, **FL**, **RPMFIQ RPM**, or **RPMFIQ FIQ**) **DTCO** (one of **Work States**, **Driver 1 States**, **Driver 2 States**, **Tachograph Status**, or **Tachograph Vehicle Speed**), or **Fuel Consumption Estimation** (one of **RPMIMAPIAT RPM**, **RPMIMAPIAT IMAP**, **RPMIMAPIAT IAT**, **MAFO2 MAF**, or **MAFO2 O2**).	

Field	Description	Editable
Multiplier	The signed number (b) in which the unit will multiply the received value (x) to accomplish the equation y=a+x*b/c.	Yes
Divider	The signed number (c) in which the unit will divide the received value (x) to accomplish the equation y=a+x*b/c	Yes
Coefficient	This value replaces the Multiplier/Divider value. For example, instead of b/c, 2.7 will be displayed.	Yes
Offset	The signed number (a) which will be added to the received value (x) to accomplish the equation y=a+x*b/c.	Yes
Units	The measurement units as defined by the user.	Yes
Decimal Places	Define the decimal representation of the result (y).	Yes

7.4 Building Vehicle Libraries

A vehicle library includes a set of parameters only, without the operators and configuration diagram information, and is stored as an XML file, typically with a .VehicleLibrary extension. Generally, vehicle libraries can be used to build a set of parameters per vehicle model, which can be used as input for any CAN configuration required for that specific vehicle model.

The CAN Editor enables you to save the parameters set of an existing configuration file or vehicle library file to a new or existing vehicle library file, to edit an existing vehicle library file, and to load a vehicle library file as the basis for a new configuration file when starting from scratch.

Cellocator provides a default vehicle library file, which includes the full set of FMS parameters, as part of the Cello-CANiQ release package.

Note that parameters can be copied from one XML file to another one using a standard XML editor.

NOTE: Parameters included with the XML files of FW ver. 36n and above, provided by Cellocator, come encrypted, meaning they are grayed out and cannot be modified. However, you can still add your own parameters using the CAN Editor and include them with the same XML files that include the encrypted parameters generated by Cellocator.

Note that you can also cut, copy and paste the values in many of the parameter fields.

7.4.1 *Use Case Scenarios*

The following use case scenarios are the four main ways you build a vehicle library file.

- **Use library files provided by Cellocator**: Cellocator maintains a database of library files. The specific vehicle models and the supported parameters are defined in the **Supported Vehicles Database**, which can be downloaded from the Cellocator website (the **Cello-CANiQ page**). This is a good option to use as a base for your vehicle library file. Load the file and modify according to your requirements (as described later in this section).
- **Load an existing library file**: if you have an existing library file that has a number of specific parameters you want to use in a new library file, load the existing file, make your changes (as described later in this section), and then save it as a new file.
- **Load a configuration file and save it as a library file**: If you have a configuration file that you want to use as the base for your library file, load the relevant XML file and save it as a library file.
- **Start from scratch**: To start a vehicle library file from scratch, load the default PL file provided in the release package in the Cellocator Programmer, enter the CAN Editor and then access the Vehicle Library tab to configure the relevant parameters.

7.4.2 *Supported CAN Parameters*

The CAN Editor supports configuration parameters based on either **OBDII** and/ or **J1939** standards. You can program the CAN editor to support either **OBDII** and/ or **J1939** standard and / or non-standard parameters as appropriate to the library of a specific vehicle model. These parameters should be defined in the Vehicle Library tab, as described later in this section.

7.4.2.1 Defining Custom Parameters and Characteristics in the Vehicle Library Tab

This section describes how to manage and edit custom parameters in the Vehicle Library tab. This tab enables you to view, add, modify or delete custom parameters and to save them to an existing parameter set of a vehicle library or specific configuration file.

The Vehicle Library tab includes the following sub tabs: **Filters**, **CANBUS/J1939 Parameters**, **Custom Parameters**, **Custom Queries**, **K-Line Parameters**, **K-Line Queries**, **Interfaces Settings**, and **Information**.

Note the following:

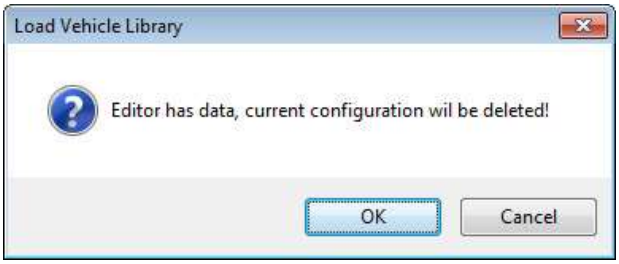
- When building a vehicle library, the first step is to define the CAN Bus settings, as described on page 66.
- The K-Line Parameters and K-Line Queries tabs are only displayed if the device supports K-Line parameters.
- Each J1939 parameter must be associated with an existing filter, and consequently that filter must be programmed before the parameter programming.

- Each custom parameter must be associated with the appropriate query, and consequently that query must be defined before the parameter programming (in the Custom Parameters tab).
- Each custom query (user defined type) must be associated with an existing filter, and consequently that filter must be defined before the query programming (in the Custom Parameters tab).

Adding or editing custom parameters requires a deep understanding of the appropriate standard on one hand and the unit behavior on the other hand. It is strongly recommended to contact Cellocator Customer Support for assistance.

➢ To load a vehicle library file:

1. Open the CAN Editor, and in the displayed message box prompting you to reload the CAN information from the existing PL, click **No**.
2. From the *File* menu, click **Load Vehicle Library**. The following message is displayed.



3. Click **OK** and then browse for an existing vehicle library file in XML format (with a *.VehicleLibrary suffix). The parameters and Operators relevant to that file are loaded and available for use in the configuration diagram

➢ To add or modify custom parameters or filters or queries:

1. In the **Vehicle Library** tab, click on the relevant sub-tab (**Filters**, **CANBUS/J1939 Parameters**, **K-Line Parameters**, **K-Line Queries**, **Custom Parameters**, or **Custom Queries**).
2. Click **Add Filter, Add Parameter**, or **Add Query**, and define the relevant fields for the new filter/parameter/query (if modifying an existing parameter or filter, refer to the following sections that describe each of the available parameters and filters).

   For example, when adding a Filter, in the **Filters** tab click **Add Filter** and then define the following:

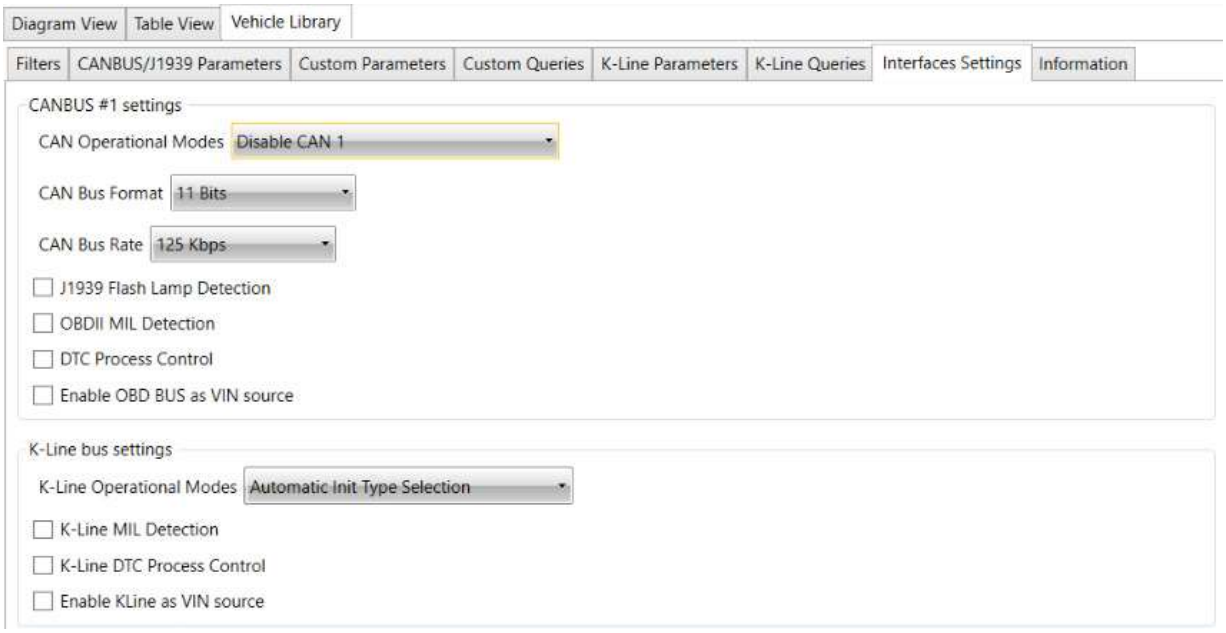
   - Title (or name) for the Filter
   - Select the **Enabled** checkbox to ensure the Filter is enabled and available for selection
   - The **Arbitration ID** value as defined in the PGN
   - **Bits Selection Mask** value (select from **Exact match**, **Ignore last 2 bits of filter**, **Ignore last 3 bits of filter**, or **Ignore last 4 bits of filter**)
   - FrameFormat (select from **Can11bit** or **Can29bit**)
   - **Arbitration IDs** automatically displays the selected Arbitration IDs (you cannot define it), according to the value you selected in the Bits Selection Mask column.
3. From the *File* menu, select **Save Configuration** to save the modified CAN configuration diagram; for vehicle libraries select **Save Vehicle Library** from the *File* menu. Note that when you modify a vehicle library file it should be saved with the relevant name.

➤ **To delete a custom parameter, filter, or query:**

1. Select the relevant filter / parameter / query by clicking in the left column (use your keyboard to select multiple filters / parameters).
2. Click **Delete Filter**, **Delete Parameter**, or **Delete Query**.
3. In the displayed confirmation message, click **Yes**. If the parameter is currently in use, you will be informed that you cannot delete it.

NOTE: You cannot delete parameters, filters, or queries that are in use (assigned in a configuration diagram) or bound to another (such as a filter used by a parameter).

7.4.3 *The Interfaces Settings Tab*



The Interfaces Settings tab allows you to define the following CAN Bus and K-Line characteristics:

- **CAN BUS settings:**
  - **CAN Operational Modes**: Select from **RX Only Mode**, **Disable CAN 1**, **Full OBD RX & TX mode**, or **Special RX & TX mode**.
  - **CAN Bus Format**: Select from **11 Bits** or **29 Bits**.
  - **CAN Bus Rate**: Select from the relevant rate available.
  - **J1939 Flash Lamp Detection**: Select the checkbox to enable a search for Bus detection statuses, which are sent to the server as events.
  - **OBDII MIL Detection**: Select the checkbox to enable a query to search the Bus, which receives status updates and reports on MIL changes to the server.
  - **DTC Process Control**: Select the checkbox to enable DTC Process Control. In this case, the unit will use DTC reports from the CAN bus.
  - **Enable OBD BUS as VIN source**: Select the checkbox to enable the OBD BUS as a VIN source. In this case, the unit will query and use the VIN from the CAN bus.

- **K-Line BUS settings:**
  - **K-Line Operational Modes**: Select from **Disable K-Line**, **Reserved**, **ISO 9141-2- / 14230-2 Slow Init**, **ISO 14230-2 Fast Init**, or **Automatic Init Type Selection**.
  - **K-Line MIL Detection**: Select the checkbox to enable a query to search the Bus, which receives status updates and reports on MIL changes to the server.
  - **K-Line DTC Process Control**: Select the checkbox to enable DTC Process Control. In this case, the unit will use DTC reports from the K-Line bus.
  - **Enable K-Line as VIN source**: Select the checkbox to enable the K-Line BUS as a VIN source. In this case, the unit will query and use the VIN from the CAN bus

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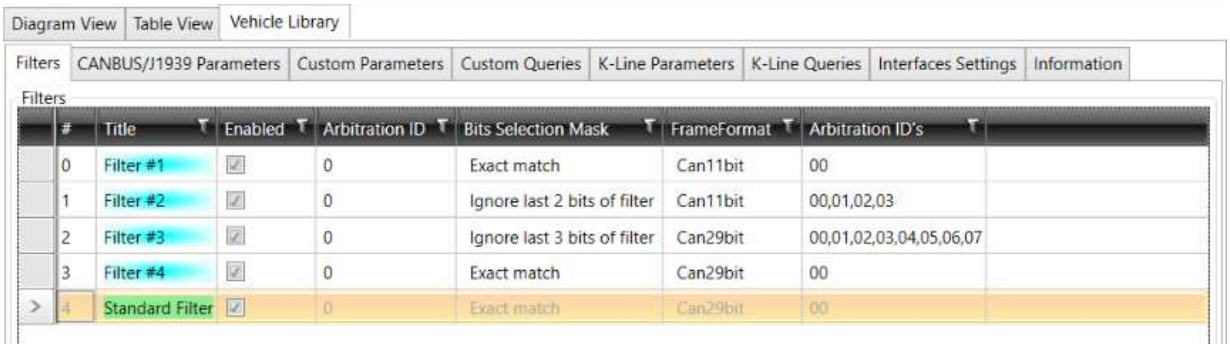
NOTE: When selecting any of the MIL Detection, DTC Process Control, or Enable as a VIN source checkboxes, be aware that selecting the option under the CAN BUS settings section will automatically disable the corresponding option in the K-Line BUS settings section, and vice versa.

7.4.4 *The Filters Tab*



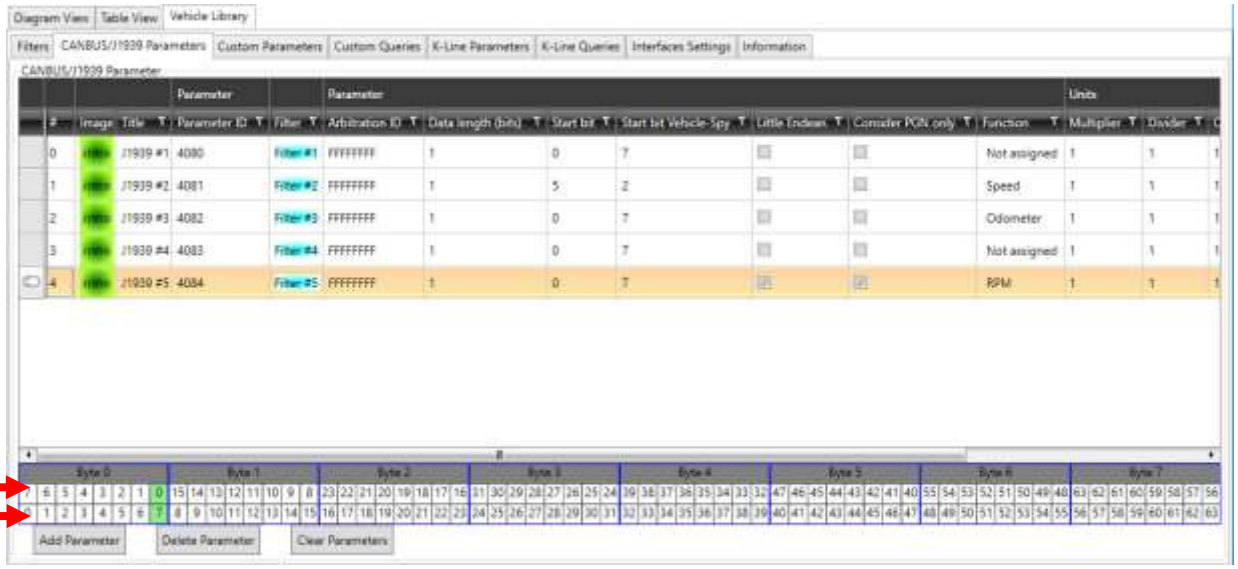
The Filters tab allows you to view and define the properties of the filters required for the definition of all parameters. The filter is required to isolate the bits of the required parameter from the information received from the CAN bus. The Filter fields are described in the following table.

NOTE: Fields grayed out in the Filters tab are encrypted parameters and cannot be edited.

Field	Description	Editable
Title	Name of the filter.	Yes
Enabled	Select the checkbox to enable the filter.	Yes
Arbitration ID	The application automatically displays the Arbitration IDs according to the value you selected in the Bits Selection Mask column.	Yes

Field	Description	Editable
Bits Selection Mask ID	Select from **Exact match**, **Ignore last 2 bits of filter**, **Ignore last 3 bits of filter** or **Ignore last 4 bits of filter**.	Yes
FrameFormat	Set the expected CAN frame format **Can11bit** or **Can29bit**.	Yes
Arbitration IDs	The application automatically Displays the Arbitration IDs according to the value you selected in the Bits Selection Mask column.	No

7.4.5 *The CANBUS/J1939 Parameters Tab*

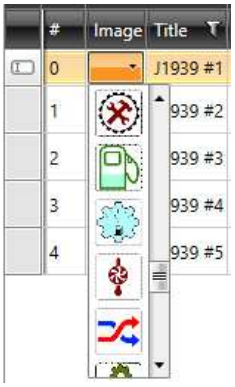


The CANBUS/J1939 Parameters tab allows you to view and define the properties of the custom CAN Bus and J1939 parameters. The parameter fields are listed in the following table.

NOTE: Fields grayed out in the CANBUS/J1939 Parameters tab are encrypted and cannot be edited.

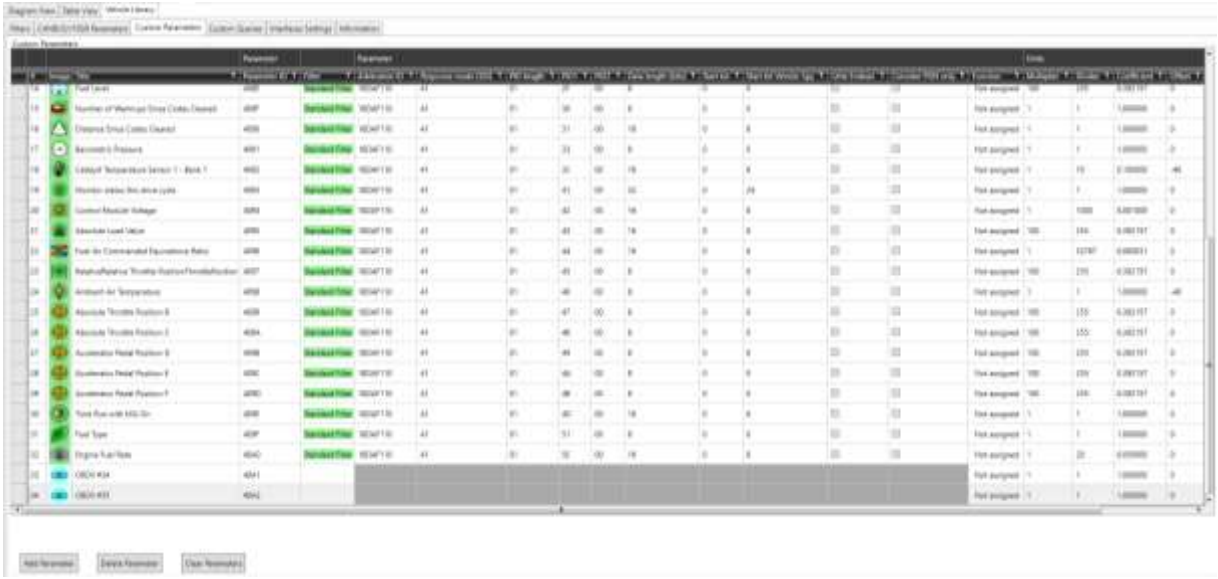
Note that in this tab an additional table of rows for each of the 8 bytes of the CAN frame is displayed at the bottom of the tab. The top row indicates what the CAN Editor and Cellocator products use for the CAN BUS frame presentation (shown in line **A** in the above image), while the second row shows the CAN BUS frame presentation that complies with a measuring device (Vehicle Spy) supporting the CAN Bus interface (shown in line **B** above).

The relevant bits location of the required parameter are automatically highlighted in green when you define the start bits and data length, as described in the following table and shown in the image above.

Field	Description	Editable
Image	When initially creating a CAN Bus or J1939 parameter, the default icon is displayed. To change this to something more relevant for the parameter, click to the right of the icon and select the relevant image from the displayed dropdown list of images.  Alternatively, you can right-click on the image icon and click **Select external image**. This option enables you to select any external image, which will be compressed automatically. You can also use a URL as the link to an image, which should be in PNG/BMP/JPG format. Note that as the image is not stored on your computer, the URL should be a static address.	Yes
Title	Name of the parameter.	Yes
Parameter ID	The associated parameter ID defined by the CAN Editor.	No
Filter	Set the required filter name from the existing filters.	Yes
Arbitration ID	The application automatically displays the Arbitration IDs according to the Arbitration group you selected in the Filters tab.	Yes
Data length (bits)	The parameter data length.	Yes
Start bit	The location in the received information in which the parameter starts.	Yes
Start bit Vehicle Spy	The location in the received information in which the parameter starts in the Vehicle Spy CAN Bus frame presentation.	Yes
Little Endean	Set Little or Big Endean. Select the checkbox to ensure Little Endean is applied.	Yes

Field	Description	Editable
Consider PGN only	When selected, considers only the 18 bits of PGN from 29 bits of identifier structure.	Yes
Function	Set the fleet function which will use the parameter as input. Select from **Not assigned**, **Speed**, **RPM**, **Fuel Tank Level**, **Fuel Consumption Direct**, **Odometer**, **Fuel Consumption Estimation** (one of **FR\MAF**, **FL**, **RPMFIQ RPM**, or **RPMFIQ FIQ**) **DTCO** (one of **Work States**, **Driver 1 States**, **Driver 2 States**, **Tachograph Status**, or **Tachograph Vehicle Speed**), or **Fuel Consumption Estimation** (one of **RPMIMAPIAT RPM**, **RPMIMAPIAT IMAP**, **RPMIMAPIAT IAT**, **MAFO2 MAF**, or **MAFO2 O2**).	Yes
Multiplier	The signed number (b) in which the unit will multiply the received value (x) to accomplish the equation y=a+x*b/c.	Yes
Divider	The signed number (c) in which the unit will divide the received value (x) to accomplish the equation y=a+x*b/c.	Yes
Coefficient	This value replaces the Multiplier/Divider value. For example, instead of b/c, 2.7 will be displayed.	Yes
Offset	The signed number (a) which will be added to the received value (x) to accomplish the equation y=a+x*b/c	Yes
Units	The measurement units as defined by the user.	Yes
Decimal Places	Define the decimal representation of the result (y).	Yes

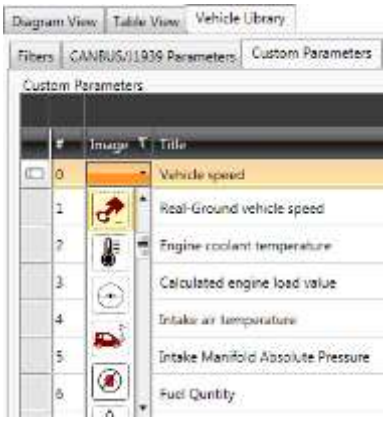
7.4.6 *The Custom Parameters Tab*



The Custom Parameters tab allows you to view and define the properties of custom parameters. The Parameter fields are listed in the table below.

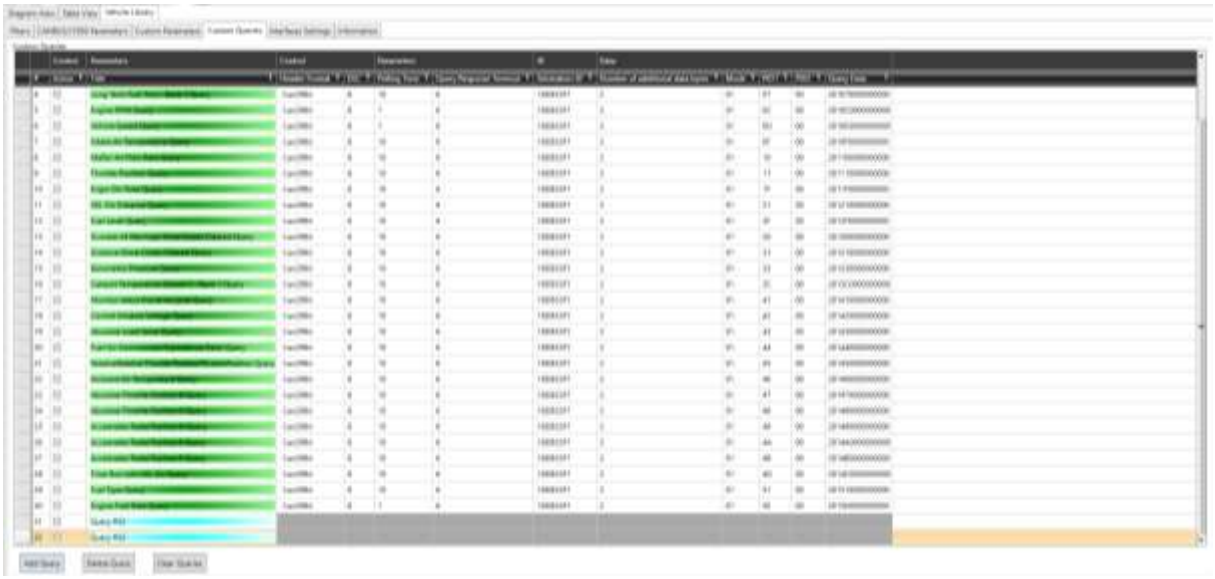
NOTE: Fields grayed out in the Custom Parameters tab (as shown above) are encrypted and cannot be edited.

Note that in this tab an additional table of rows describing the location of the parameter in the CAN frame is displayed at the bottom of the tab, as described in the *CANBUS/J1939 Parameters Tab* section on page 68.

Field	Description	Editable
Image	When initially creating a custom parameter, the default icon is displayed. To change this to something more relevant for the parameter, click to the right of the icon and select the relevant image from the displayed dropdown list of images.  Alternatively, you can right-click on the image icon and click **Select external image**. This option enables you to select any external image, which will be compressed automatically. You can also use a URL as the link to an image, which should be in PNG/BMP/JPG format. Note that as the image is not stored on your computer, the URL should be a static address.	Yes
Title	Name of the parameter defined by the user.	Yes
Parameter ID	The associated parameter ID defined by the CAN Editor.	No
Filter	Select from one of the available Filters (as defined in the **Filters** tab).	Yes
Arbitration ID	The application automatically displays the Arbitration IDs according to the Arbitration group you selected in the Filters tab.	Yes
Response mode (SID)	The SID related to the parameters according to the standard (all parameters should be associated with the same SID).	Yes
PID length	The parameter ID length.	Yes
PID1	The PID hex code as defined in the standard.	Yes
PID2	The PID hex code as defined in the standard.	Yes
Data length (bits)	The parameter data length.	Yes

Field	Description	Editable
Start bit	The location in the received information in which the parameter starts.	Yes
Start bit Vehicle Spy	The location in the received information in which the parameter starts in the Vehicle Spy CAN Bus frame presentation.	Yes
Little Endean	Set Little or Big Endean. Select the checkbox to ensure Little Endean is applied.	Yes
Consider PGN only	When selected, considers only the 18 bits of PGN from 29 bits of identifier structure.	Yes
Function	Set the fleet function which will use the parameter as input. Select from **NotAssigned**, **Speed**, **RPM**, **FuelTankLevel**, **FuelConsumption Direct**, **Odometer**, **Fuel Consumption Estimation** (one of **FR\MAF**, **FL**, **RPMFIQ RPM**, or **RPMFIQ FIQ**), **DTCO** (one of **Work States**, **Driver 1 States**, **Driver 2 States**, **Tachograph Status**, or **Tachograph Vehicle Speed**) or **Fuel Consumption Estimation** (one of **RPMIMAPIAT RPM**, **RPMIMAPIAT IMAP**, **RPMIMAPIAT IAT**, **MAFO2 MAF**, or **MAFO2 O2**).	Yes
Multiplier	The signed number (b) in which the unit will multiply the received value (x) to accomplish the equation y=a+x*b/c.	Yes
Divider	The signed number (c) in which the unit will divide the received value (x) to accomplish the equation y=a+x*b/c.	Yes
Coefficient	This value replaces the Multiplier/Divider value. For example, instead of b/c, 2.7 will be displayed.	Yes
Offset	The signed number (a) which will be added to the received value (x) to accomplish the equation y=a+x*b/c.	Yes
Units	The measurement units as defined by the user.	Yes
Decimal Places	Define the decimal representation of the result (y).	Yes

7.4.7 *The Custom Queries Tab*



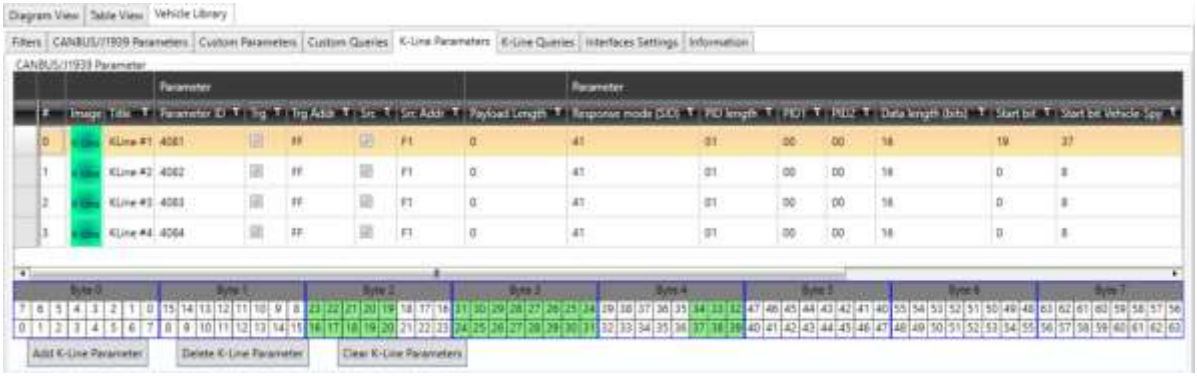
The Custom Queries tab allows you to view and define up to 16 queries which are not included in the set of queries built into the unit.

The query fields are listed in the table below.

Field	Description	Editable
Active	Select the checkbox to ensure the query is active.	Yes
Title	Name of the query.	Yes
Header Format	Define the frame format either as defined in the PL **(Global)** 11 bit **(Can11bit)**, or 29 bit **(Can29bit)**.	Yes
DLC	Define the Data Length Code which is the number of bytes the query data is comprised of.	Yes
Polling Time	The periodic Polling Time (in seconds).	Yes
Query Response Timeout	The expected response time of the CAN bus to the query. Should not exceed 300 msec.	Yes
Arbitration ID	The application automatically displays the Arbitration IDs according to the Arbitration group you selected in the Filters tab.	Yes
Number of additional data bytes	The number of bytes for the parameters, to be reported by the CAN bus, as defined in the standard.	Yes
Mode	The SID related to the parameters according to the standard (all parameters should be associated with the same SID).	Yes

Field	Description	Editable
PID1	The PID hex code as defined in the standard.	Yes
PID2	The PID hex code as defined in the standard.	Yes
Query Data	Define the query data. The number of bytes is defined in the *Number of additional data bytes* column.	Yes
Data0 – Data7	When in **RX Only Mode** (defined in the Interfaces Settings tab), additional Data columns (Data0 – Data7) are displayed. These columns provide a more advanced view that shows query data per bit.  The grayed out fields are for encrypted queries, which come by default with FW ver. 36n and above. These encrypted fields cannot be edited.	Yes

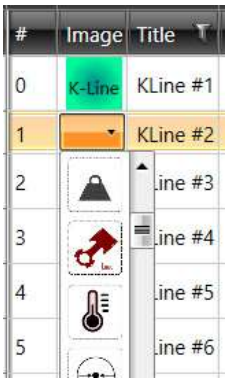
7.4.8 *The K-Line Parameters Tab*



The K-Line Parameters tab allows you to view and define the properties of K-Line parameters. The parameter fields are listed in the table below.

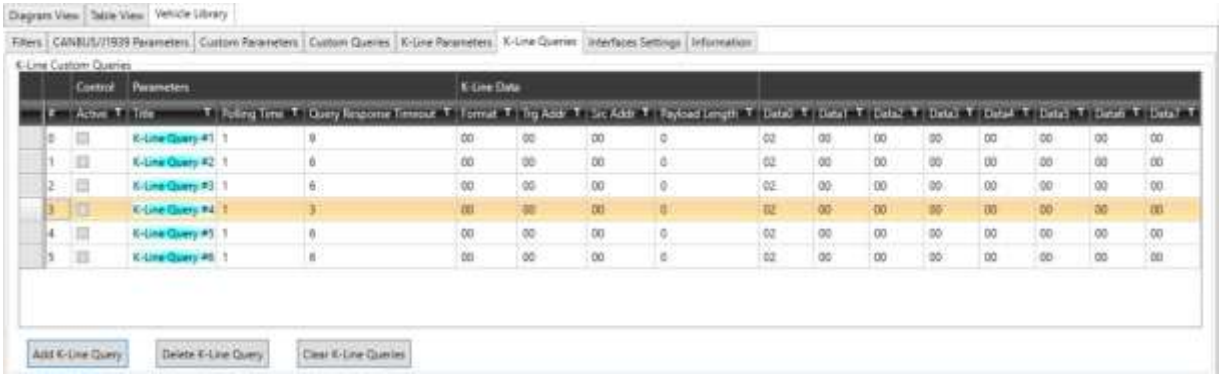
NOTE: Fields grayed out in the K-Line Parameters tab are encrypted and cannot be edited.

Note that in this tab an additional table of rows describing the location of the parameter in the CAN frame is displayed at the bottom of the tab, as described in the *CANBUS/J1939 Parameters Tab* section on page 68.

Field	Description	Editable
Image	When initially creating a K-Line parameter, the default green K-Line icon is displayed. To change this to something more relevant for the parameter, click to the right of the icon and select the relevant image from the displayed dropdown list of images.  Alternatively, you can right-click on the image icon and click **Select external image**. This option enables you to select any external image, which will be compressed automatically. You can also use a URL as the link to an image, which should be in PNG/BMP/JPG format. Note that as the image is not stored on your computer, the URL should be a static address.	Yes
Title	Name of the parameter defined by the user.	Yes
Parameter ID	The associated parameter ID defined by the CAN Editor.	No
Trg	Currently not in use (infrastructure).	No
Trg Addr	Required to identify the receiving module on the K-Line bus (or unit).	Yes
Src	Enables filtering of parameters from a specific sending module on the K-Line bus. When Src is not selected, the related parameter will be accepted from any sending module (ignoring the specific source address, if indicated).	Yes
Src Addr	Required to identify a specific sending module on the K-Line bus.	Yes
Payload Length	The parameter payload (data) length.	Yes
Response mode (SID)	The SID related to the parameters according to the standard (all parameters should be associated with the same SID).	Yes
PID length	The parameter ID length.	Yes

Field	Description	Editable
PID1	The PID hex code as defined in the standard.	Yes
PID2	The PID hex code as defined in the standard.	Yes
Data length (bits)	The parameter data length.	Yes
Start bit	The location in the received information in which the parameter starts.	Yes
Start bit Vehicle Spy	The location in the received information in which the parameter starts in the Vehicle Spy CAN Bus frame presentation.	Yes
Little Endean	Set Little or Big Endean. Select the checkbox to ensure Little Endean is applied.	Yes
Consider PGN only	When selected, considers only the 18 bits of PGN from 29 bits of identifier structure.	Yes
Function	Set the fleet function which will use the parameter as input. Select from **NotAssigned**, **Speed**, **RPM**, **FuelTankLevel**, **FuelConsumption Direct**, **Odometer**, **Fuel Consumption Estimation** (one of **FR\MAF**, **FL**, **RPMFIQ RPM**, or **RPMFIQ FIQ**), **DTCO** (one of **Work States**, **Driver 1 States**, **Driver 2 States**, **Tachograph Status**, or **Tachograph Vehicle Speed**) or **Fuel Consumption Estimation** (one of **RPMIMAPIAT RPM**, **RPMIMAPIAT IMAP**, **RPMIMAPIAT IAT**, **MAFO2 MAF**, or **MAFO2 O2**).	Yes
Multiplier	The signed number (b) in which the unit will multiply the received value (x) to accomplish the equation y=a+x*b/c.	Yes
Divider	The signed number (c) in which the unit will divide the received value (x) to accomplish the equation y=a+x*b/c.	Yes
Coefficient	This value replaces the Multiplier/Divider value. For example, instead of b/c, 2.7 will be displayed.	Yes
Offset	The signed number (a) which will be added to the received value (x) to accomplish the equation y=a+x*b/c.	Yes
Units	The measurement units as defined by the user.	Yes
Decimal Places	Define the decimal representation of the result (y).	Yes

7.4.9 *The K-Line Queries Tab*



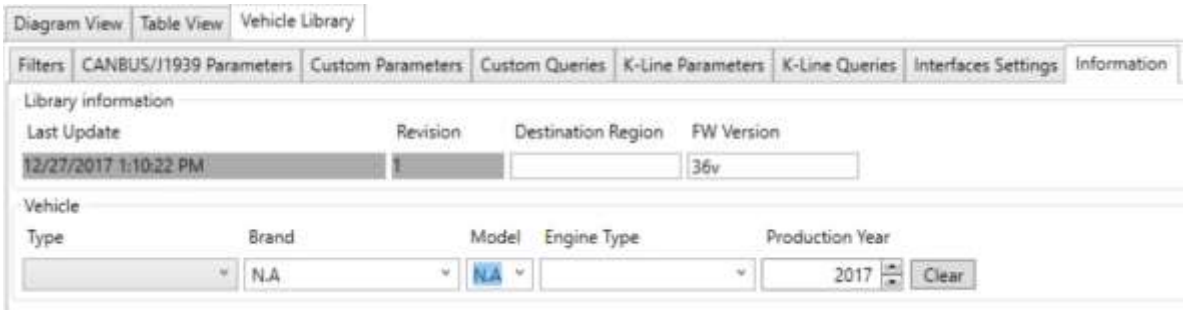
The K-Line Queries tab allows you to view and define up to 16 queries which are not included in the set of queries built into the unit.

The query fields are listed in the table below.

Field	Description	Editable
Active	Select the checkbox to ensure the query is active.	Yes
Title	Name of the query.	Yes
Polling Time	The periodic Polling Time (in seconds).	Yes
Query Response Timeout	The expected response time of the CAN bus to the query. Should not exceed 300 msec.	Yes
Format	A constant which is defined by the K-Line protocol.	Yes
Trg Addr	Required to identify the receiving module on the K-Line bus (or unit).	Yes
Src Addr	Required to identify a specific sending module on the K-Line bus.	Yes
Payload Length	The parameter payload (data) length.	Yes
Data0 – Data7	These columns provide a more advanced view that shows query data per bit.	Yes

7.4.10 *The Information Tab*

The Information tab enables you to define data that is saved in the XML file, and which, in turn, impacts the suggested vehicle library file name.



In the *Library Information* section, enter a **Destination Region** and **FW Version**, if relevant.

In the *Vehicle* section, select the relevant **Type**, **Brand**, **Model**, **Engine Type** and **Production Year**. The options you select will form the name of the library file name when you save it (from the *File* menu, select **Save Vehicle Library**); for example, if you selected a Ford Transit 2.4 tdCI gasoline engine model from 2016, when saving it the file will have the default name of **Ford_Transit 2.4 tdCI _2016_Gasoline_.VehicleLibrary.xml**.

8 Working with the Nano / MultiSense application suite

This section provides details of the Nano Quick Start, the Nano (Advanced Mode), and the Nano / MultiSense Editor, which are only relevant for CelloTrack Nano and Cello units. Note that the MultiSense can communicate with Cello family units equipped with the BT Extender unit.

This section includes the following:

8.1 Working with the Nano Quick Start

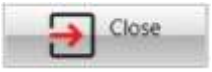
The Nano Quick Start application enables you to get up and running with a basic default configuration for the Nano unit.

The Nano Quick Start is the default application launched for Nano-designated PL files. Note that if you want to edit any of the additional parameters in the PL file that are not displayed in the Nano Quick Start you can access the Nano (Advanced Mode) application, as described in the *Working with the Nano (Advanced Mode)* section.

This section includes:

8.1.1 *Entering and Exiting the Nano Quick Start*

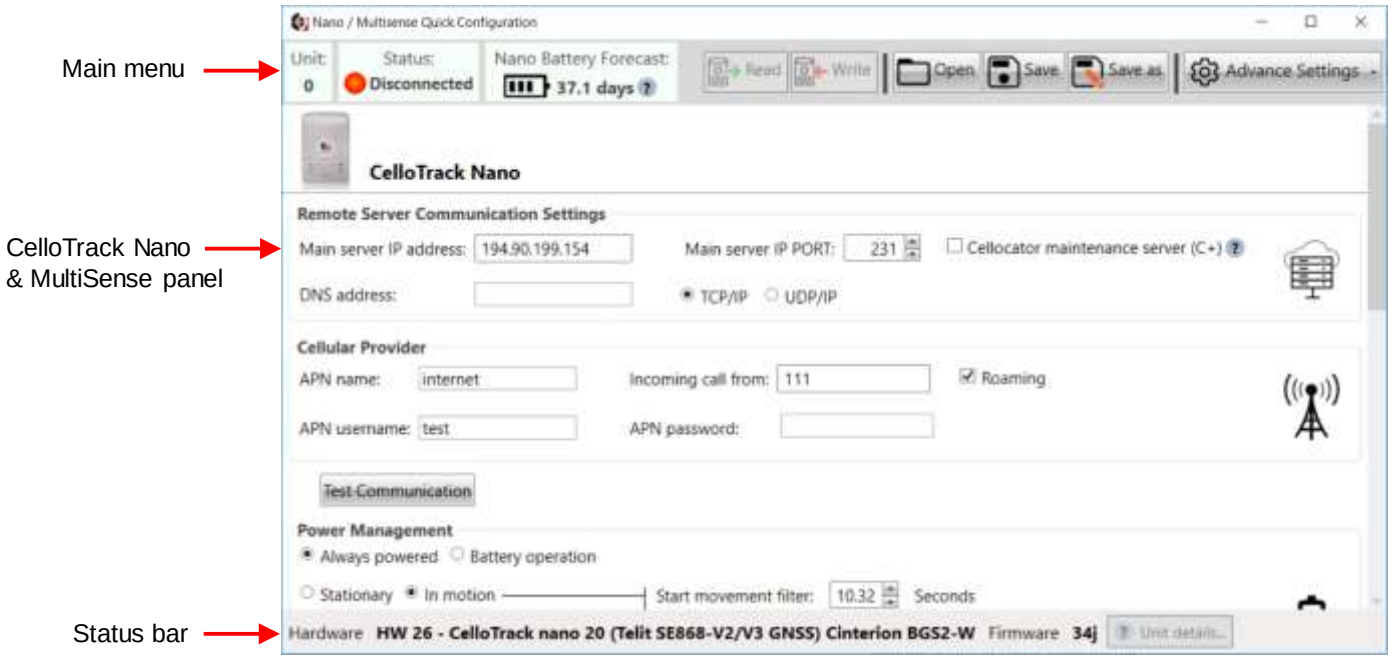
The Nano Quick Start is automatically launched when double-clicking on a designated PL or when opening the Cellocator Programmer (and the last PL used was for a Nano unit).

Click 

to exit the Nano Quick Start. If changes were made to the PL settings, you are prompted to save the changes.

8.1.2 *Nano Quick Start Window Components*

This section describes the various components of the Nano Quick Start window, as described in the following sections.



TIP: The Nano Quick Start window includes detailed tooltips for many of the components and settings displayed; hover your mouse over the setting to view the tooltip.

8.1.2.1 Main Menu

The Main menu options are explained in the table below.

Menu Option	Description
Unit	Displays the connected unit ID.
Status	Displays the selected COM port number (or **Disconnected** if a unit is not connected).
Nano Battery Forecast	Displays an estimation of the battery charge that remains for the connected Nano unit.
Read	Reads the existing settings from the connected unit.
Write	Writes the settings to the connected unit. The Write button turns active if any parameters were changed (since the last save operation) and those changes have not yet been downloaded to the unit. The Write button turns inactive if the configuration was written to the unit successfully and no changes have been made.

Menu Option	Description
Open	Enables you to search for the relevant PL file.
Save	Saves any changes to the selected PL file.
Save as	Saves the current PL settings to another file (by default, located under C:\ProgramData\Cellocator\Programmer).
Advanced Settings	Click on the **Advanced Settings** button to display two options: • **Nano/MultiSense Advanced Settings**: Launches the Nano / MultiSense Editor, in which you can modify and configure Nano and MultiSense devices in real-time. See *Getting started with the Nano / MultiSense Editor*. • **Global Advanced Settings**: Launches the Cellocator Programmer application (also known as Nano (Advanced Mode)), in which you can modify any of the PL's parameters, above and beyond the default, basic settings displayed in the Nano Quick Start. See *Getting Started with the Cellocator Programmer*.

8.1.2.2 CelloTrack Nano and MultiSense Panel

The Nano and MultiSense panel contains the main default settings for both the Nano and MultiSense units. Note that the MultiSense settings are only displayed when selecting the **MultiSense unit/s connected** checkbox, as shown on the following page.

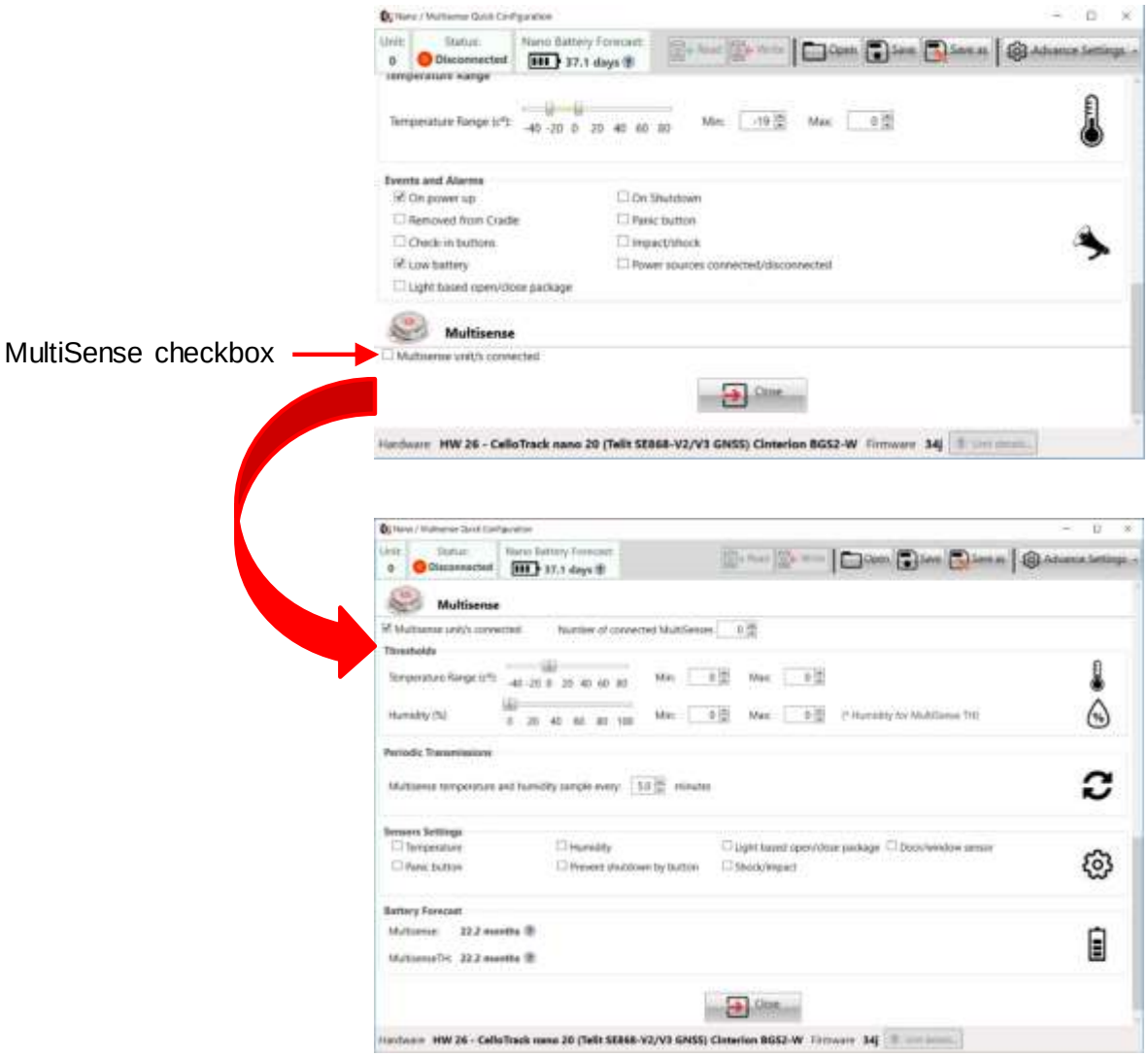
Nano settings

Nano Section	Description
	**Remote Server Communication Settings:** Includes the main server's IP address and port number, as well as an option to periodically check for FW updates from the Cellocator maintenance server (called C+).
	**Cellular Provider:** Details the name, username and password of the cellular provider's APN. If roaming is permitted, select the **Roaming** checkbox. To test the communication, click **Test Communication**; if successful, the following is displayed: 
	**Power Management:** Choose from **Always powered** or **Battery operation**, and from **Stationary** (for fixed installations) or **In motion** (for units that may be mobile, such as those installed on a vehicle).
	**Periodic Transmissions:** Defines the period of location transmissions and transmissions of samples of Nano sensors.

Nano Section	Description
	**Temperature Range:** Defines the Min – Max temperature range thresholds, beyond which alerts will be generated.
	**Events and Alarms:** Select the checkbox for the relevant events you want generated (and sent to the server).

MultiSense settings

The MultiSense settings are only displayed when selecting the **MultiSense unit/s connected** checkbox, as shown below.



After selecting the **MultiSense unit/s connected** checkbox, you should also define the **Number of connected MultiSenses** in the field next to the checkbox.

Note that when you add more MultiSense devices, the Nano Battery Forecast at the top of the window will automatically reduce.

MultiSense Section	Description
	**Thresholds:** Defines the temperature range and humidity thresholds (for the MultiSense TH only).
	Periodic Transmissions: Defines the period of transmissions for MultiSense temperature and humidity samples.
	**Sensors Settings:** Select the checkbox for the relevant sensor settings you want to activate.
	**Battery Forecast:** Displays an estimation of the battery charge that remains for the connected MultiSense devices.

8.1.2.3 Status Bar

The Status bar details the hardware/firmware for the selected PL file, and details of the Nano unit.

Field	Description
Hardware	Details the hardware version relevant to the selected PL. For example: *HW 122 – CelloTrack Nano 20 (Telit SE868-V2/V3 GNSS) Cinterion EHS6A*
Firmware	Details the firmware version relevant to the selected PL. For example: *34j*
Unit details	Click to open a popup dialog that includes the following details: • Firmware name • Modem type • Modem firmware • GPS type • GPS firmware • CBLE application version • CBLE MAC address

8.2 Working with the Nano (Advanced Mode)

The Nano (Advanced Mode), otherwise known as the Cellocator Programmer, enables you to edit any of the additional parameters in the PL file that are not displayed in the Nano Quick Start.

➤ **To access the Nano (Advanced Mode):**

In the Nano Quick Start window, click **Advanced Settings > Global Advanced Settings** (or press CTRL+F). The Nano (Advanced Mode) / Cellocator Programmer window is displayed.

For further details on how to work with the Cellocator Programmer, see earlier sections in this document.

NOTE: If you are working with a Cellocator Evaluation Suite version prior to 3.26.7.x, the Cellocator Programmer is automatically launched when double-clicking a Nano designated file.

8.3 Getting started with the Nano / MultiSense Editor

Using the Nano / MultiSense Editor, you can monitor the status of Nano and MultiSense devices in real-time (and also see statuses in a simulated environment), as well as configure each individual device so that it works at its optimum for the environment in which it is located. This section includes:

- **Entering and Exiting the Nano / MultiSense Editor**, see below
- **Nano / MultiSense Editor Window Components**, page 86

NOTE: The basic settings for the Nano and connected MultiSense devices are available in the Nano Quick Start, as described on page 80.

8.3.1 *Entering and Exiting the Nano / MultiSense Editor*

In order to ensure synchronization between the PL and the Nano / MultiSense configuration, the following instructions (and order) regarding entering and exiting the Nano / MultiSense Editor should be kept:

➤ **To enter the Nano / MultiSense Editor:**

In the Cellocator Programmer window, click  to launch the Nano / MultiSense Editor. The Editor window opens on top of the Cellocator Programmer window and is displayed with the data as included in the existing PL.

Note that if you loaded a Nano PL file, the title of the displayed window will show "Nano Editor"; if you load a Cello PL file, the title of the displayed window will show "MultiSense Editor".

➢ **To exit the Nano / MultiSense Editor:**

1. From the toolbar, click  (Write to PL) to update the PL with the edited Nano / MultiSense configuration parameters.
2. Exit the Editor by clicking **File>Exit**.

8.3.2 *Nano / MultiSense Editor Window Components*

This section describes the various components of the Nano and MultiSense Editor windows, as shown in the following sections.

8.3.2.1 Nano Editor Window

When working with the Nano and MultiSense devices, the Nano Editor enables you to configure and view the status of the relevant MultiSense components, and some aspects of the Nano (including sensor thresholds).

8.3.2.2 MultiSense Editor Window

When working with Cello units and MultiSense devices, the MultiSense Editor enables you to configure, pair, and view the status of the relevant MultiSense components.

NOTE: In the MultiSense Editor window, only MultiSense devices are listed; in the Nano Editor window the CelloTrack Nano unit is also listed, in addition to the (up to) 16 MultiSense devices.

8.3.2.3 Menu Bar

The Menu options are either intuitive or explained in the table below.

Menu Option	Description
File	Includes the following options: • **Select template** (Click to select the relevant template; the available templates help you set the configuration of parameters for the first time, as described on page 91) • **Exit**

Menu Option	Description
Actions	Includes the following options: • **Read from PL** (Click to resync the Nano / MultiSense Editor parameters with the existing PL. This is needed if you want to restart the Nano / MultiSense Editor parameters, or if you made changes to the PL parameters in the Cellocator Programmer window and want to update the Nano / MultiSense Editor with the changes.) • **Write to PL** (Click to update the PL with the edited Nano / MultiSense configuration parameters)
Communication	Includes the following options: • **Request active** (When checked, all the values in the Sensor Status tab are refreshed periodically according to the time defined in the status request cycle parameter below) • **Status request cycle** (Defines the frequency the cycle of values is refreshed in the Sensor Status tab)
Help	Includes details about the version.

8.3.2.4 Toolbar

The Toolbar options are explained in the Menu Bar table in the previous section.

Icon	Description
	Read from PL (see explanation in the Menu Bar section)
	Write to PL (see explanation in the Menu Bar section)
	Template selection (as described on page 91)

8.3.2.5 Tabs

The Nano / MultiSense Editor window has four main tabs: the **Dashboard** tab, the **Sensors status** tab, the **Sensors Configuration** tab, and the **Legacy events type-11 configuration** (this tab is only displayed when loading a Nano PL file) tab.

The Dashboard tab provides you with a real-time overview of the entire system when the Nano / Cello is connected to the Cellocator Programmer. The Dashboard tab is described on page 91.

The Sensors status tab provides you with a real-time view of the status of the CelloTrack Nano unit and any of the paired 16 MultiSense devices, when the Nano is connected to the Cellocator Programmer. When the Nano Editor is *not* connected, you can modify the fields to adjust the dashboard indicators (especially useful for simulation purposes). The Sensors status tab is described on page 92.

The Sensors Configuration tab enables you to adjust the settings of the Nano unit and up to 16 paired MultiSense devices. The Sensors Configuration tab is described on page 94.

The Legacy events type-11 configuration tab allows the definition of legacy events as type 11 or not. The Legacy events type-11 configuration tab is described on page 97.

8.3.2.6 Status Bar

The Status bar, located at the bottom of the Nano / MultiSense Editor window, provides visual indication of the following:

- Communication status: **green** means there is a connection between the unit and the Editor, **red** means there is no current connection.
- Last operation activated.

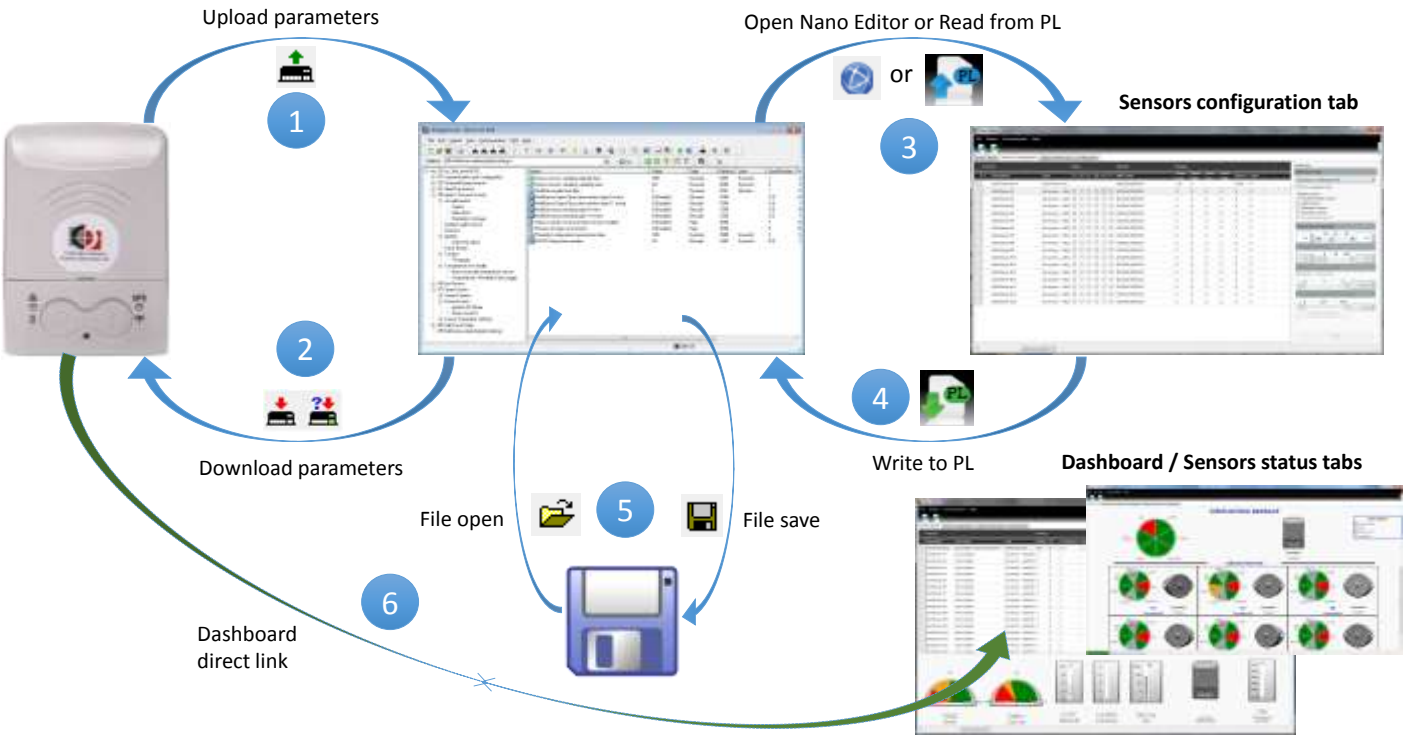
8.4 Working with the Nano and paired MultiSense devices

This section includes the following:

In order to make things easier in regards to defining the initial PL for use with the Nano and MultiSense devices, use the pre-defined template to help you set the configuration of parameters for the first time (see page 91). When working with the Nano / MultiSense Editor, as described in the following sections, you can select this template from the toolbar or menu bar.

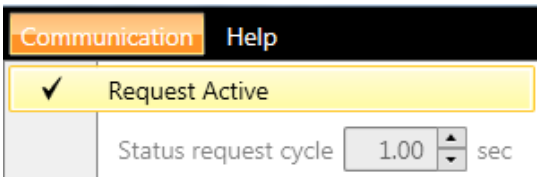
8.4.1 *Data flow between different parts of the Nano system*

The concept of operation and parameter flow between the four main entities (the HW, the main Programmer application, the storage of the PC, and the Nano Editor application (with its several tabs)) is as shown in the following image.



The Data Flow process

1. Clicking the Upload Parameters button (labeled above as **1**) reads the configuration file from the hardware unit to the main application.
2. Either of the Download Parameters buttons (**2**) can transfer the configuration file from the main application to the unit.
3. When the Nano / MultiSense Editor is launched (**3**), the data from the main application to the Nano / MultiSense Editor application is transmitted automatically.
4. Once the Nano / MultiSense Editor application is open, it will *not* transfer the parameters automatically back and forth to the main application. This has to be done manually when needed by pressing either the Read from PL (**3**) or Write to PL (**4**) buttons.
5. At any time, the configuration file from the main application only can be saved to a file or read from a file using the relevant buttons (**5**).
6. Only when actively watching the Dashboard or Sensors status tabs (when set as the foreground window on your PC), the application opens a direct live link (**6**) with the hardware and displays real-time status information coming from the unit.
7. You can disable the active link or change its pace from the Communication menu (as shown below). In order to change the pace, the link should first be disabled, and once modified, re-enabled.



8.4.2 *Selecting a predefined PL template for CelloTrack Nano*

The predefined templates that are included by default with the CelloTrack Nano PL enable you to access certain use-cases more quickly, for example by setting the configuration of parameters for the first time. Perform the following steps to select a template from the toolbar or menu bar.

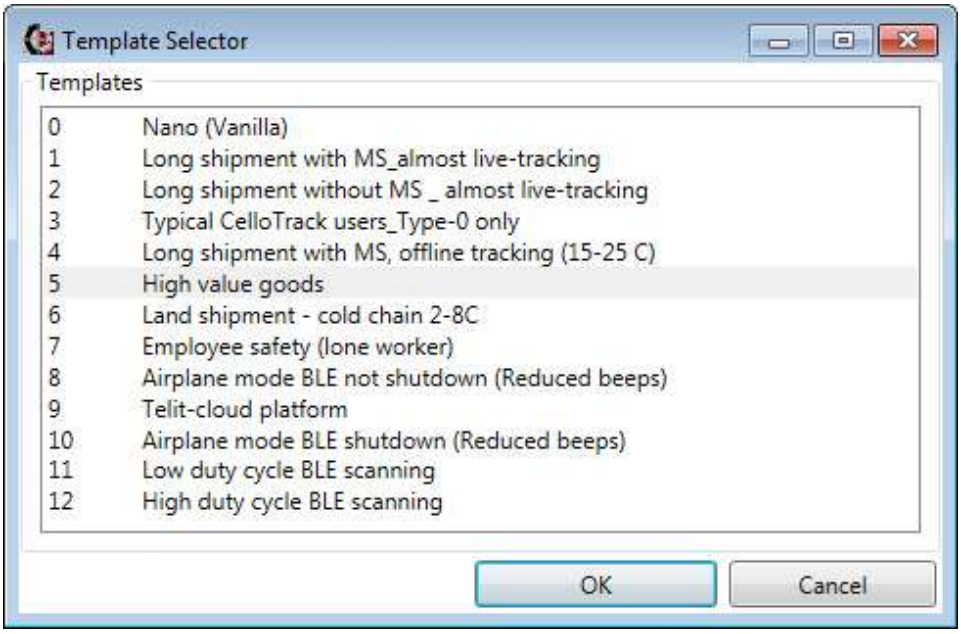
➢ **To select a predefined PL template:**

1. From the toolbar, click  ,

   OR

   From the menu bar, select **File>Select template**.

   The Template Selector window is displayed, as shown below.



   Note that you can also access the PL templates from the Cellocator Programmer menu bar by selecting **File>Select Template**.

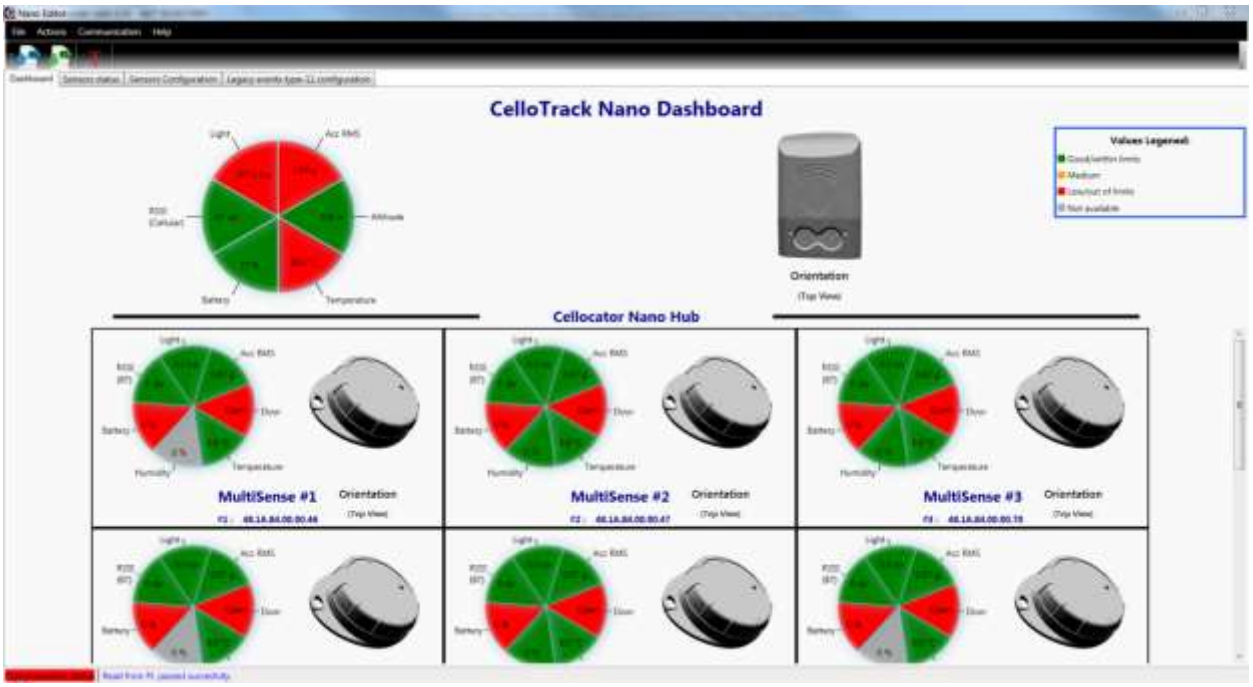
2. Select the relevant template from the displayed list and click **OK**.

   Note that these templates will not "lock" any parameter values. This means you can select a template and it will set a number of parameters to certain values, but after that you can change these predefined values manually.

8.4.3 *Viewing a real-time overview of MultiSense devices and the Nano*

The Dashboard tab is the initial tab which is displayed when opening the Nano / MultiSense Editor.

It provides a real-time system overview of the paired MultiSense devices and the Nano at a glance. For each MultiSense the label is displayed (by default "MultiSense #n" is displayed) in a large font, below which the index number and MAC address are also displayed.



8.4.4 *Viewing the Status of Nano units and MultiSense devices*

The following procedure describes how to view the status of Nano units and the attached MultiSense devices. Note that if a connection is valid, the fields and dashboard indicators display the *real-time status* of the Nano unit or MultiSense devices.

➢ **To view the status of Nano and MultiSense devices:**

1. Click on the **Sensors status** tab. The current status for each of the devices is displayed in tabular form, as shown below. Note that the Cellocator Nano row is displayed only when the Cellocator Nano PL is used.

2. Click on the relevant row to see the dashboard indicators (located at the bottom of the Nano Editor window) for a specific device.

   The following dashboard indicators are available:

   - Battery capacity (in % value)
   - RSSI – communication strength in dBm. The needle indicates if the communication strength is good (green) problematic (yellow) or bad (red). If a MultiSense line is selected this indicator shows the communication strength between the MultiSense and the Nano. If the Nano line is selected this indicator shows the communication strength of the Nano with the cellular network.
   - Temperature (in °C)
   - Humidity (in % value)
   - RMS acceleration (the acceleration strength)
   - Magnetic Sensor (OPEN means the MultiSense does not currently recognize the magnetic sensor alongside it (indicating the door or entry point is open), CLOSED means the MultiSense device recognizes the magnetic sensor (indicating the door or entry point is closed))
   - Orientation (displays the top view orientation of the MultiSense or Nano device)

3. Click on the Description label if you want to edit it.

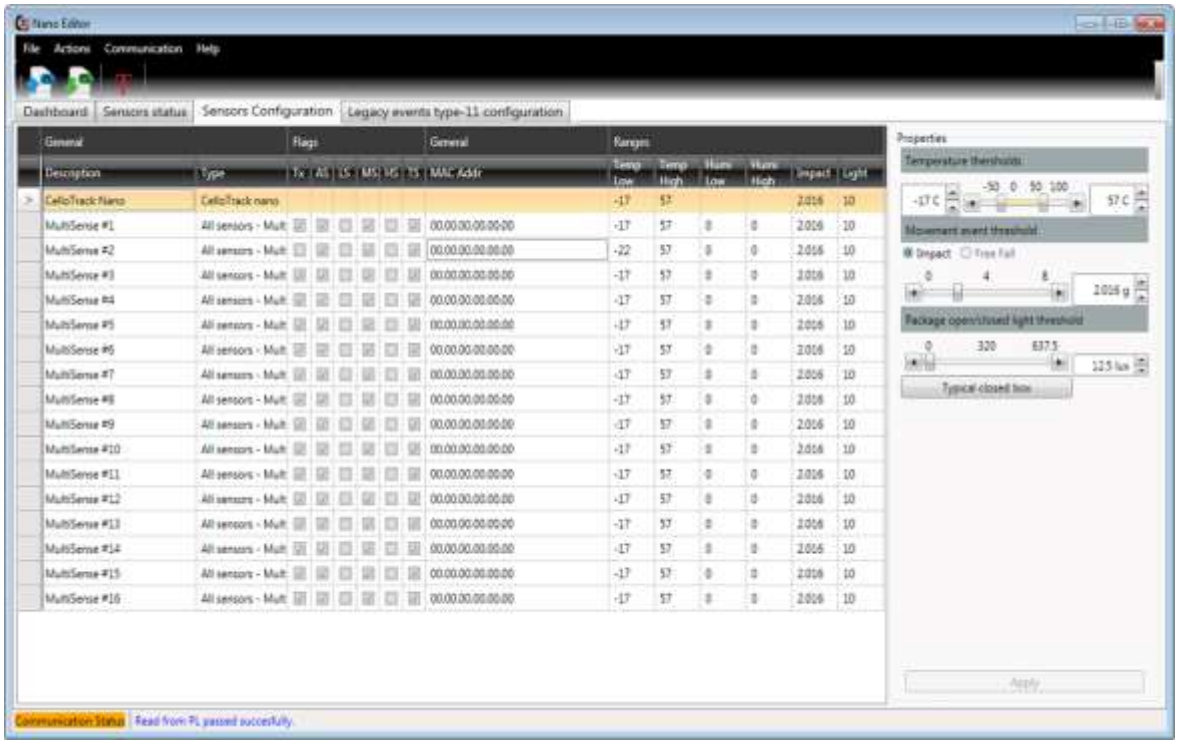
   - The new label will be associated with the MAC address and saved locally on your computer.
   - It will be retrieved from the local file whenever this MAC is displayed again.

NOTE: For simulation purposes (when not connected), you can adjust any of the fields to modify the dashboard indicators. For example, adjust the Acc X, Acc Y, and Acc Z fields to tilt the orientation view of the MultiSense device.

8.4.5 *Configuring Nano units*

➢ **To configure the Nano unit:**

1. Click on the **Sensors Configuration** tab. The list of Nano and attached MultiSense devices is displayed, as shown below.



2. Click on the CelloTrack Nano row (the top row) to select it. On the right of the Nano Editor window a *Properties* section is displayed.
3. Configure the following:
   - **Temperature thresholds**: Define the working temperature range for the Nano unit by adjusting the values in the left and right boxes using the arrow buttons alongside each box, or drag the slider bar accordingly to adjust the range.
   - **Movement event threshold**: By default **Impact** is selected (Freefall is not currently implemented); drag the slider or click on the arrows to define the impact threshold.
   - **Package open/closed light threshold**: Drag the slider or click on the arrows to define the open/close light threshold. Note that you can click **Typical closed box** to use the recommended default values.

NOTE: You can also manually adjust the values for the above thresholds in the main table of displayed values; simply click in the relevant field and enter/define the required value.

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4. Click **Apply** to implement your settings.

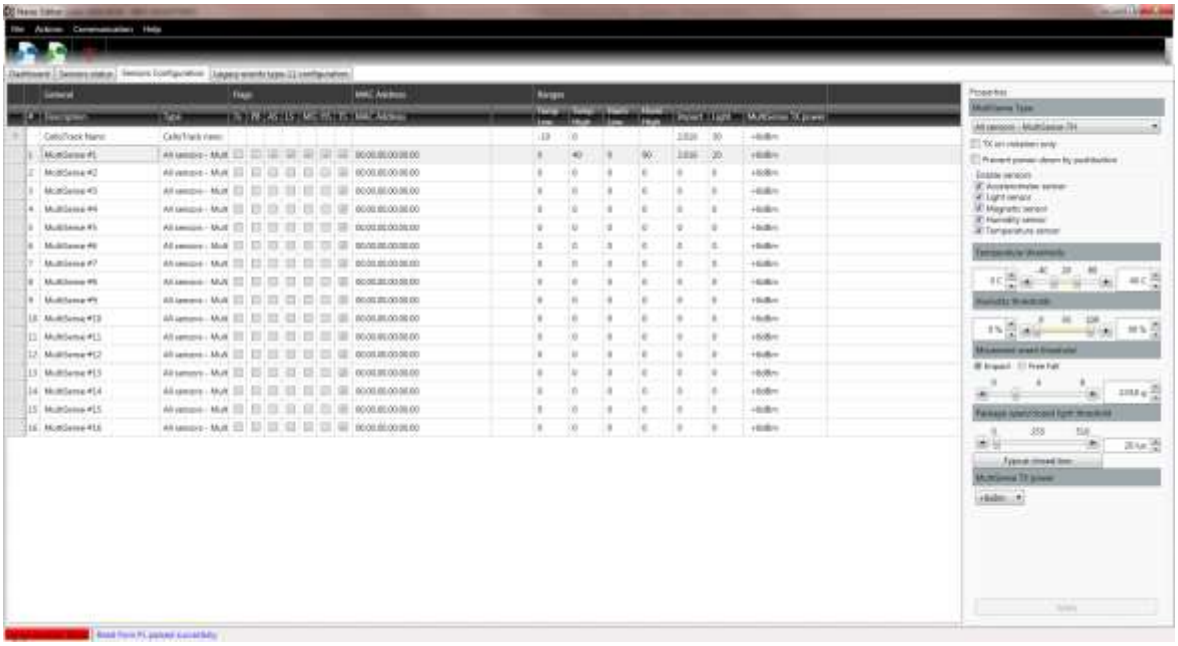
8.4.6 *Configuring MultiSense devices*

➢ **To configure a MultiSense device:**

NOTE: It is possible to configure the MultiSense devices (as described below) before they are paired in the field (possible only with Nano devices). This can be especially useful in scenarios where you need to define a configuration of units/devices before implementation.

---

1. Click on the **Sensors Configuration** tab. The list of Nano and attached MultiSense devices is displayed, as shown in the previous section.
2. Click on a MultiSense # row to select it (there are a maximum of 16 available MultiSense devices that can be paired). On the right of the MultiSense Editor window a *Properties* section is displayed.



NOTE: You can select multiple MultiSense lines and apply any changes to all of them (using the Shift / Ctrl keys).

---

3. Configure the following:
   - **MultiSense Type**:
     - Select from **All sensors – MultiSense TH** or **All sensors except humidity – MultiSense** according to the version of the selected MultiSense device. The relevant sensors are enabled in the *Enable sensors* section (see below).
     - **TX on violation only**: Select this checkbox if you want events to be transmitted only when they occur; otherwise transmissions will be made as defined (refer to the *Programming Manual* for more details).
     - **Prevent power-down by pushbutton**: Select this checkbox if you want to disable the option to switch the MultiSense device off via its push button.

- **Enable sensors**: Select the relevant checkboxes for the sensors you want to enable. Note that if you do not need all sensors enabled, disable those that you do not need to preserve the energy of the MultiSense battery.

- **Temperature thresholds**: If you selected the **Temperature sensor** option (in the Enable sensors section), you can also define the working temperature range for the MultiSense device by adjusting the values in the left and right boxes using the arrow buttons alongside each box, or drag the slider bar accordingly to adjust the range.
- **Humidity thresholds**: If you selected the **Humidity sensor** option (in the Enable sensors section), you can also define the working humidity range for the MultiSense device by adjusting the values in the left and right boxes using the arrow buttons alongside each box, or drag the slider bar accordingly to adjust the range.
- **Movement event threshold**: Select from **Impact** or **Freefall**; this immediately displays the selected option with a default threshold value which can be modified - you can change the value after selection by dragging the slider or clicking on the arrows to define the relevant threshold.
- **Package open/closed light threshold**: Drag the slider or click on the arrows to define the open/close light threshold. Note that you can click **Typical closed box** to use the recommended default values.
- **MultiSense TX power**: From the dropdown list of available options, select the rate at which the transmission power of the MultiSense device is set. It is recommended to leave at the maximum default value of 8dbm, but can be reduced as required (a lower transmission value will result in lower battery consumption).

NOTE: You can also manually adjust the values for the above thresholds in the main table of displayed values; simply click in the relevant field and enter/define the required value.

You can also right-click on any parameter field and select **Cut**, **Copy** or **Paste** as required.

---

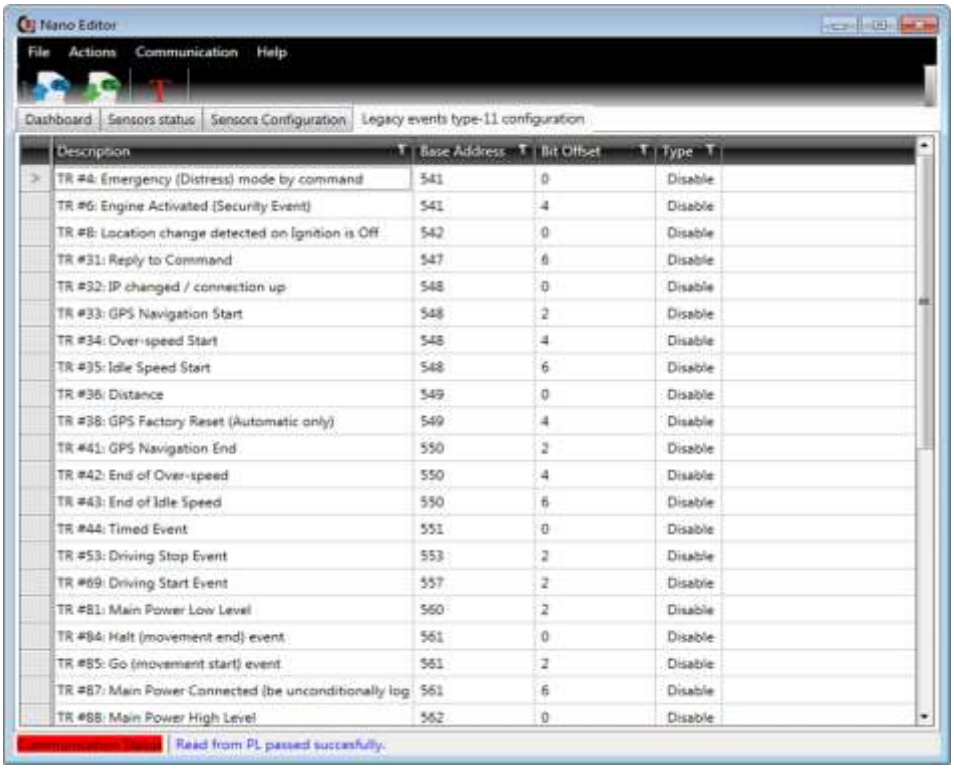
4. Click on the Description label if you want to edit it.
   - The new label is associated with the MAC address and saved locally on your computer.
   - It will be retrieved from the local file whenever this MAC is displayed again.
5. Click **Apply** to implement your settings.

8.4.7 *Defining Legacy Events as Type 11*

This section describes how to define legacy events as type 11 (by default legacy events are defined as type 0). This section is relevant for Nano PL files only.

➢ **To define legacy events as type 11:**

1. Click on the **Legacy events type-11 configuration** tab. The current type is displayed for each of the events, as shown below.



2. Click on a row to select it, and in the Type column, click on the current value (by default, **Disable**). In the displayed dropdown box, select from one of the following:
   - **Disable** (report with type 0 message)
   - **ActiveLogEvent** (report as active log event with type 11 message)
   - **Logged** (report as regular logged event with type 11 message)

   Note that you can select multiple rows for modification using the standard Windows Ctrl or Shift buttons on your keyboard.
3. Repeat as required.

NOTE: The Base Address and Bit Offset columns indicate the location of the specific bit in the memory.

8.5 Working with MultiSense devices paired with Cello units

This section includes references to the segments relevant for MultiSense devices that are paired with Cello units.

- **Viewing a real-time overview of MultiSense devices**, see below
- **Viewing the status of MultiSense devices**, see page 99
- **Configuring MultiSense devices**, see page 100

8.5.1 *Viewing a real-time overview of MultiSense devices*

The Dashboard tab is the initial tab which is displayed when opening the MultiSense Editor.

It provides a real-time system overview of the paired (with Cello) MultiSense devices at a glance. For each MultiSense device, the label is displayed (by default "#n" is displayed) in a large font, below which the index number and MAC address are also displayed.

8.5.2 *Viewing the status of MultiSense devices*

The following procedure describes how to view the status of MultiSense devices attached to the Cello units. Note that if a connection is valid, the fields and dashboard indicators display the real-time status of the MultiSense devices.

➤ **To view the status of MultiSense devices:**

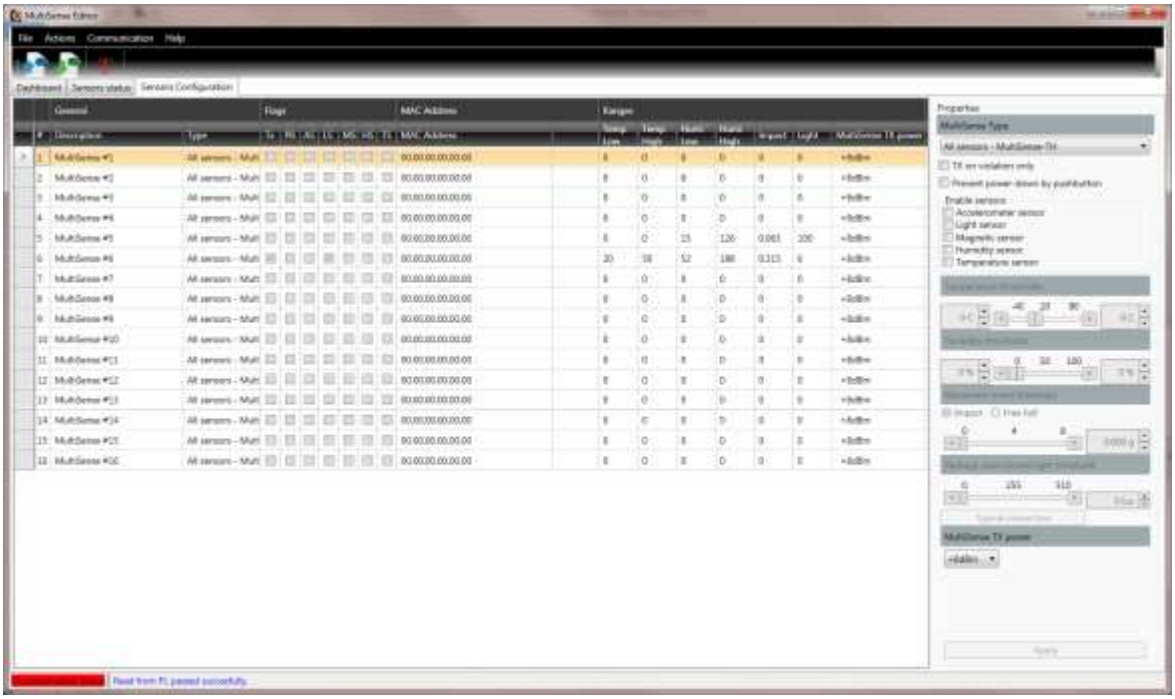
1. Click on the **Sensors status** tab. The current status for each of the devices is displayed in tabular form, as shown below.

2. For details on what can be modified, see page 92.

8.5.3 *Configuring MultiSense devices*

➢ **To configure a MultiSense device:**

1. Click on the **Sensors Configuration** tab. The list of MultiSense devices is displayed, as shown below.



2. Click on a MultiSense # row to select it (there are a maximum of 16 available MultiSense devices that can be paired). On the right of the MultiSense Editor window a *Properties* section is displayed.
3. You must pair the MultiSense device with the Cello; click in the MAC address field of the relevant device and enter the MAC address printed on its sticker.
4. For details on how to modify the parameters of the *Properties* section, see Step 3 on page 95.

NOTE: You can select multiple MultiSense lines and apply any changes to all of them (using the Shift / Ctrl keys).
