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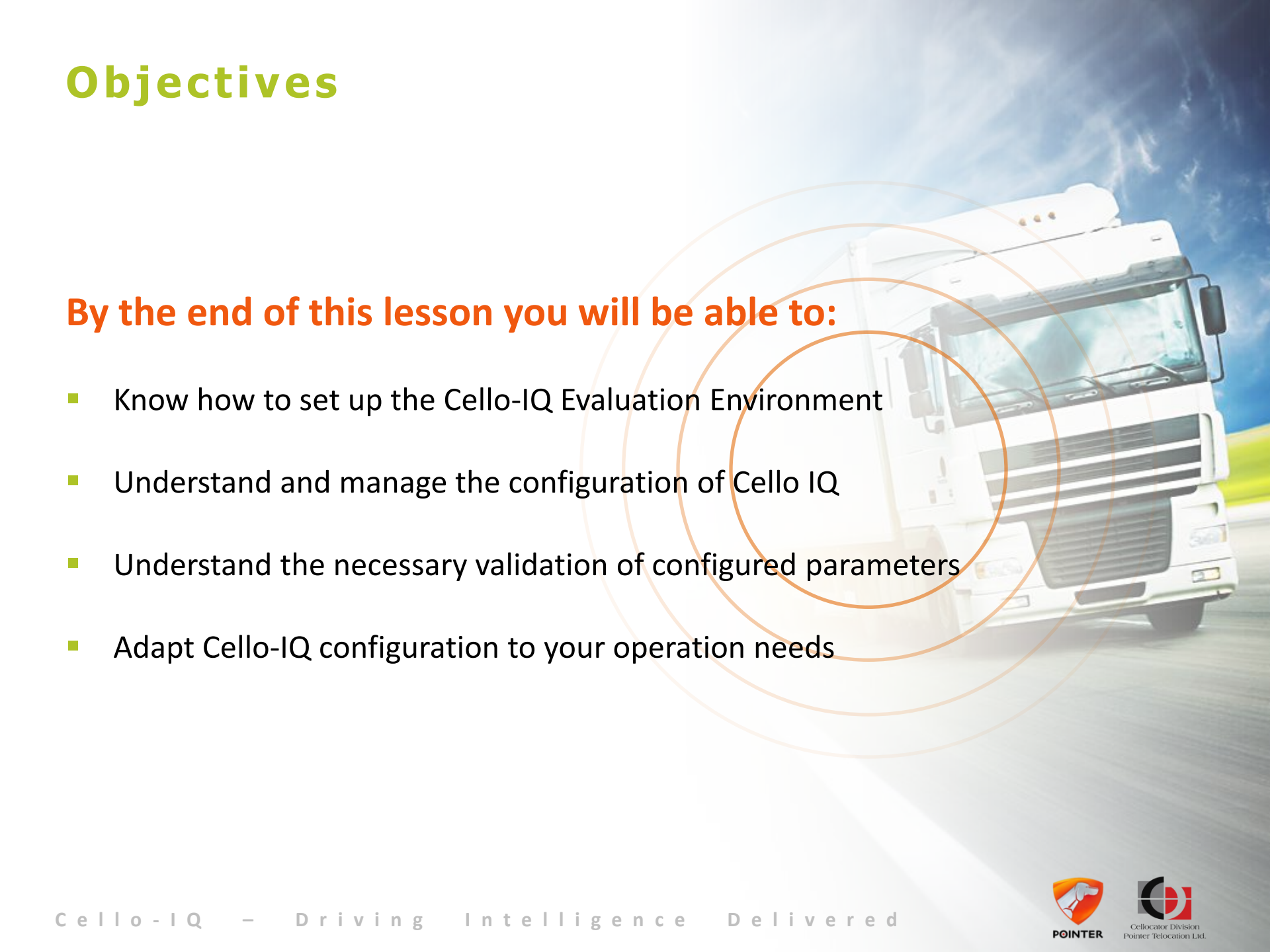
Pointer Telocation Ltd.
CELLOCATOR
Cello IQ Configurations & Operations
Cello-IQ – Driving Intelligence Delivered. January, 2013.

Objectives



By the end of this lesson you will be able to:

- Know how to set up the Cello-IQ Evaluation Environment
- Understand and manage the configuration of Cello IQ
- Understand the necessary validation of configured parameters
- Adapt Cello-IQ configuration to your operation needs

Topics

- **Introduction**
- Evaluation
  - Setting up evaluation environment
  - First Steps with Cello IQ
  - Initial setup scenario
- PL configuration Scenarios

Introduction

- **The Evaluation kit is used for appraisal and testing of the Cellocator Cello-IQ units and is a strong tool during Cellocator products integration**

- The Evaluation kit provides the option to test Cello-IQ without requiring a connection to an operational server
- The kit contains a complete set of components that simplify bench testing of the system
- The kit serve as a demonstration platform for understanding the operational aspects of the system
- It facilitates the development of Cellocator interfaces by integrators
- It also includes hardware and software required for in-vehicle installation

Introduction

- **The Evaluation Kit includes:**

- Cello-IQ device, simulator kit, cables, Cello-IQ harness, DFD and other components needed to simulate the device different functions

- Cello Evaluation Kit can be upgraded to Cello-IQ Evaluation Kit

- Software elements and documents which are available on the Pointer website

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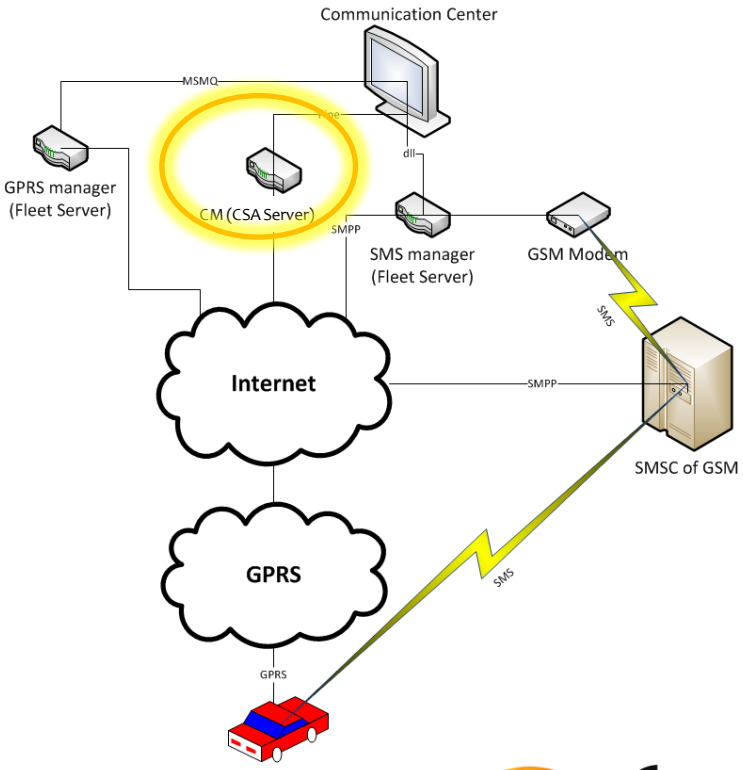
Cello-IQ Communication Center

- **Cello-IQ new CSA Server**

  - The **CSA** server was added to the **GPRS** and **SMS** servers, used in Cellocator's Communication Center for Fleet management, to support Cello-IQ's safety features

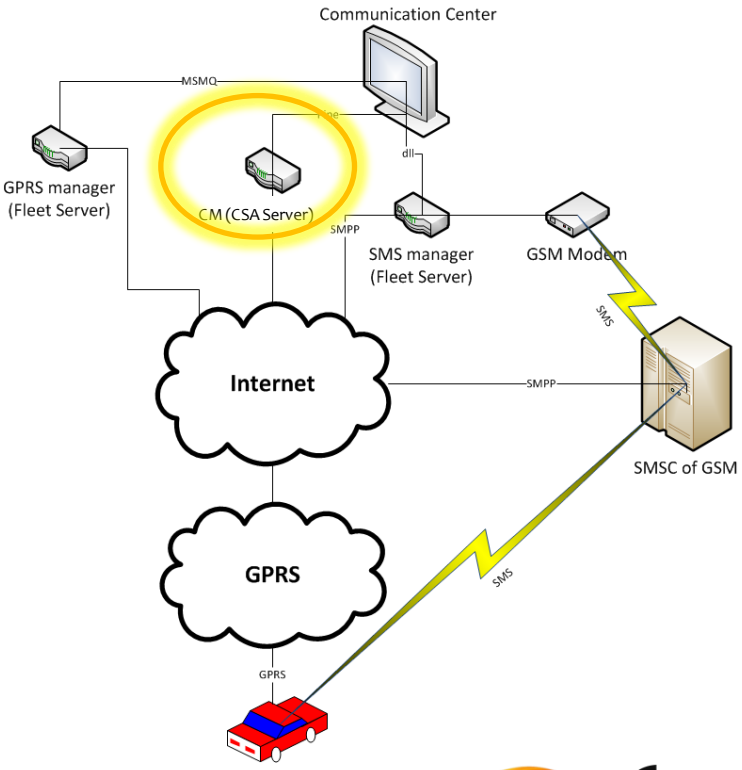


Cello-IQ Communication Center

- **Cello-IQ new CSA Server feature**

- Cellocator's CM Application interfaces with the **Communication Center**. It processes CSA uplink messages received from Cello-IQ units and sends them *TO* the Comm. Center. On the other direction it receives downlink commands *FROM* the Comm. Center

- CSA Server operates independently and can be installed on the same of different machine



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Cello-IQ Communication Center

- **Cello-IQ – FTP/TFTP server**

- **FTP / TFTP** servers - required to enable the Cello-IQ unit to upload CSA information files (Raw data) via FTP or TFTP

- FTP / TFTP servers are not included in the Cellocator Evaluation Suite

- Download the server from http://filezilla-project.org/

- Follow the installation procedure till the FTP server is installed and running

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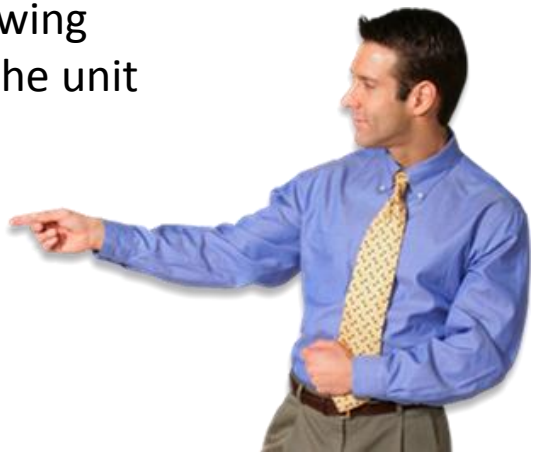
Typical Evaluation Setup Scenario

- **Prepare** hardware and software components
- **Set up** communication environment - including LAN configuration, Communication Server, GPRS manager and CSA Server and FTP server
- **Validate** proper operation of Communication Center - using the GPRS Unit Simulator Software
- **Set up** Cello-IQ unit and the vehicle simulator
- **Program** communication parameters of Cello-IQ unit - allowing communication between the Communication Center and the unit
- **Validate** evaluation environment proper functioning



Hardware and software components

Prerequisite Components Preparation

- **Download** the Evaluation Suite Software Tools files from Cellocator website
- **Provide** a computer running Windows XP or Windows 7
- **Ensure** GSM/GPRS good reception (avoid working in basements)
- **Provide** a SIM card that is open for GPRS and SMS use
- **Obtain** the Access Point Name (APN) for GPRS traffic, from the cellular provider
- **Provide** a 12-24 VDC, 2A min power supply
- **A USB** to serial multiport device is optional but is recommended

Evaluation Kit software components

- **Software Components available on Pointer website**

Cellocator Programmer
- Wire communication used to configure the unit

Communication Center
- OTA communication (IP or SMS) with the Cellocator unit

GPRS Manager
- TCP/IP and UDP/IP communication stack with Cellocator units

SMS Manager
- SMS communication Dll with the unit
- GSM modem connection to communication center software

CSA Manager
- TCP/UDP server designed to communicate with the Cello-IQ unit on a different port from the Fleet socket

GPRS Unit Simulator
- Simulates OTA activities of the unit
- Can integrate with GPS Simulator module

CSA Unit Simulator
- Simulates OTA messages associated with CSA events

Communication Logger
- Debugging tool recording the unit's internal communication
- Allows listening to communications between microcontroller and GSM modem

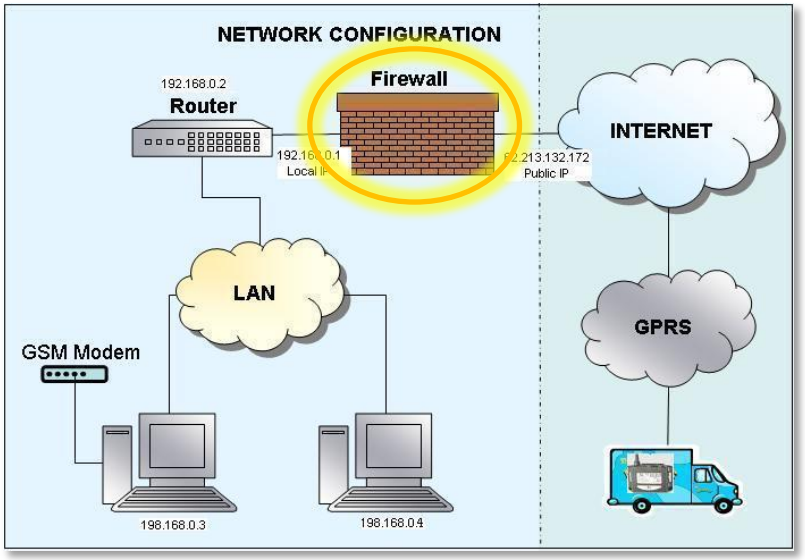
Configuration Files Comparison Tool
- PL information comparison
- Simplifies the customer's PL generation for different hardware & firmware configurations

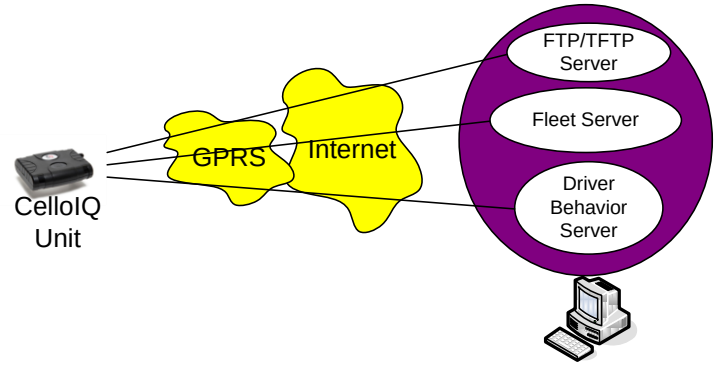
FTP / TFTP server
- Server managing the uploaded CSA raw data and EDR files
- CSA server must be installed with an FTP/TFTP server

Setting up the Communications Environment

- **Network and LAN Configuration**

  - **Make** sure your working station is connected to the internet
  - **Set up** the Fire wall to allow communication between the unit and the evaluation environment thru predefined IP and ports
  - **Set up** IP addresses for the 3 servers – FTP/TFTP (for Raw data), Fleet (for Fleet management) and CSA (for Safety massages) servers





- **Configure the three concurrent communication sessions**

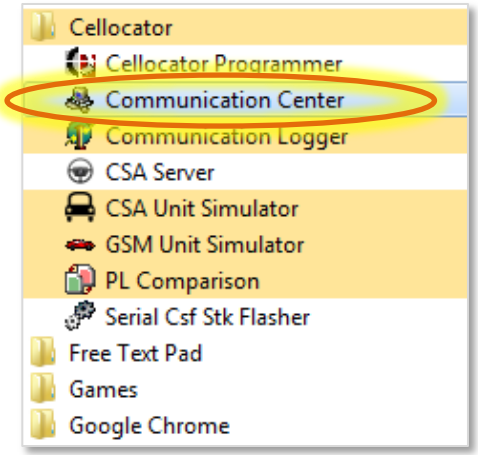
Install Cellocator Evaluation Suite

- **Installing Cellocator Evaluation Suite for Cello-IQ**

  - In the Evaluation suite installation wizard select the option of **Cello-IQ (Full installation)**. This installation includes all the applications and tools used for evaluating any Cello unit

  - Upon a successful installation, Cellocator applications and debugging tools will appear in the **Start** menu, including CSA Server and CSA Unit simulator, unique to Cello-IQ

  - The next step is to activate each of the installed applications



Communication Center Validation

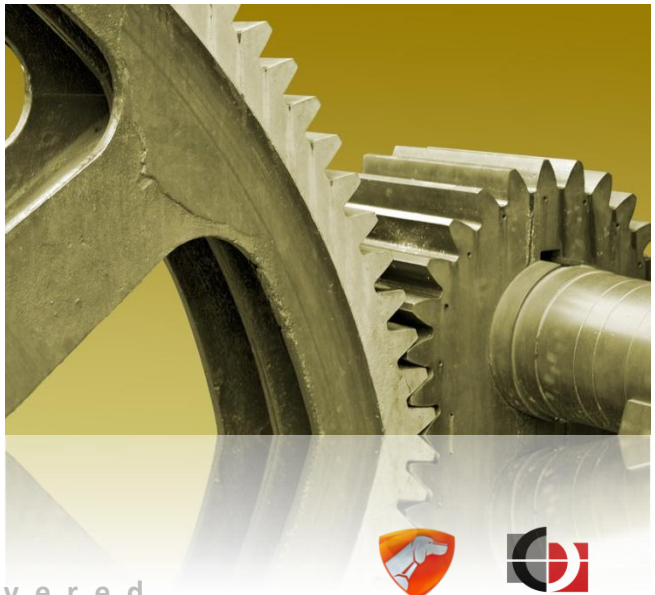
- **Validation of Communication Center Proper Operations**

- Validation can be performed using the **GSM Unit Simulator** for validating the GPRS Manager
- Set up the **GPRS settings** in the unit simulator and connect the unit
- **Change input states** (open/close door, turn ignition ON/OFF) and verify the simulator and the Communication Center PC receives the messages
- On the Communication Center PC, **send status requests** and verify that replies are received
- On the Communication Center PC **send commands** to activate outputs, e.g. Activate Siren and validate that the appropriate LED on the unit simulator lights up

CSA Communication Activation

- **CSA Communication Manager Server Setup**

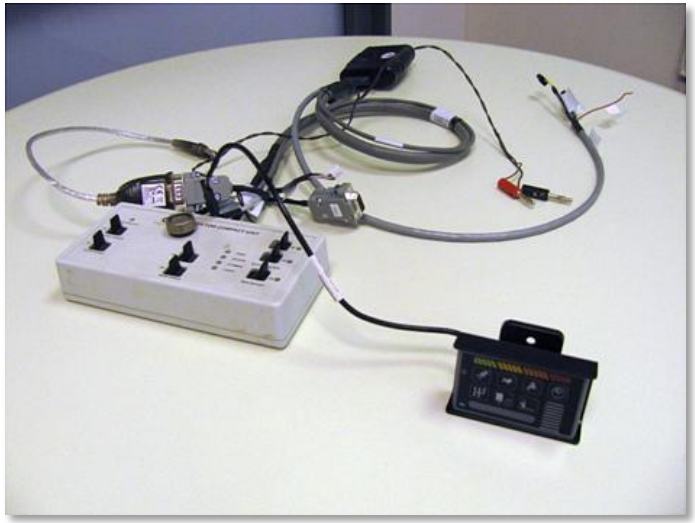
- The Communication Center uses the **CSA Server** for communication with the Cello-IQ unit regarding the CSA information
- Open the CSA server from the Cellocator program folder
- In the **CSA Communication Manager Server** you can view the TCP and UDP ports used by the CSA Server
- The ports can be edited in the CM APP.ini



Setting up Hardware

- **Set up Cello-IQ and vehicle simulator**

  - Set up Cello-IQ's SIM card and battery (if provided)
  - Set up the evaluation hardware environment
    For more information on the setting up of Cello-IQ SIM and battery and the evaluation hardware, please refer to the **Cellocator Evaluation Suite Manual**, chapter 3.6
  - Note that the PC and the DFD use the same serial port and cannot be connected together
  - If the DFD is required, disconnect the serial port from the PC and plug in the DFD connector to the simulator's connector named "DFD"



Programming Communication Parameters

- **Program communication parameters of Cello-IQ**

- The Cellocator Programmer is designed for wire communications with the unit, via a serial port, thus the DFD has to be disconnected
- The DFD can be connected and tested upon finalizing setting up of the communication between the unit and the Comm. Server
- Set up communication channels for the Fleet GPRS and SMS (if required) with the addition of CSA and FTP channels

Testing the Evaluation Set Up

- **Test Evaluation setup for Fleet Management and CSA**

- Check proper messages appear in the **Incoming Message Log** section in the CommCenter window as a result of manipulations of unit simulator
- Verify appropriate LEDs are activated and deactivated accordingly as a result of different commands in the CommCenter
- To Test CSA evaluation setup, shake the unit to simulate car crash
- Validate the expected CSA event and FTP file are received by the CSA server and can be viewed in the Communication Center screen
- This test is depended on the EDR feature being enabled in the unit's Communication Parameters. The default value is EDR enabled.

Congratulations! Your Evaluation Environment is set.

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- Introduction
- **Evaluation**
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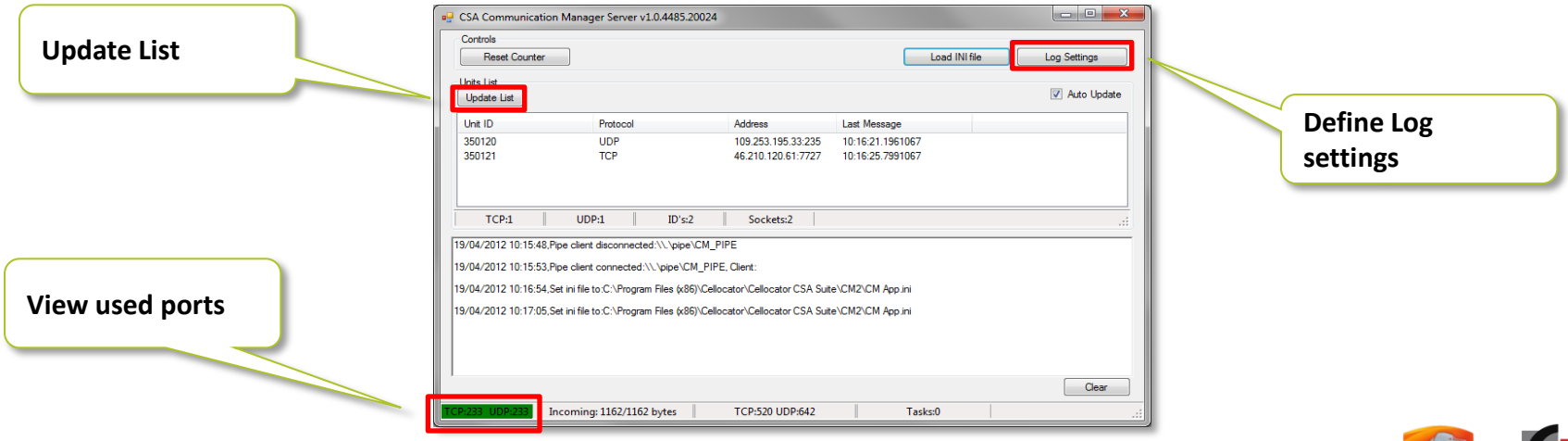
  - **First Steps with Cello IQ**
  - Initial setup scenario
- PL configuration Scenarios

CSA Communication Manager Server

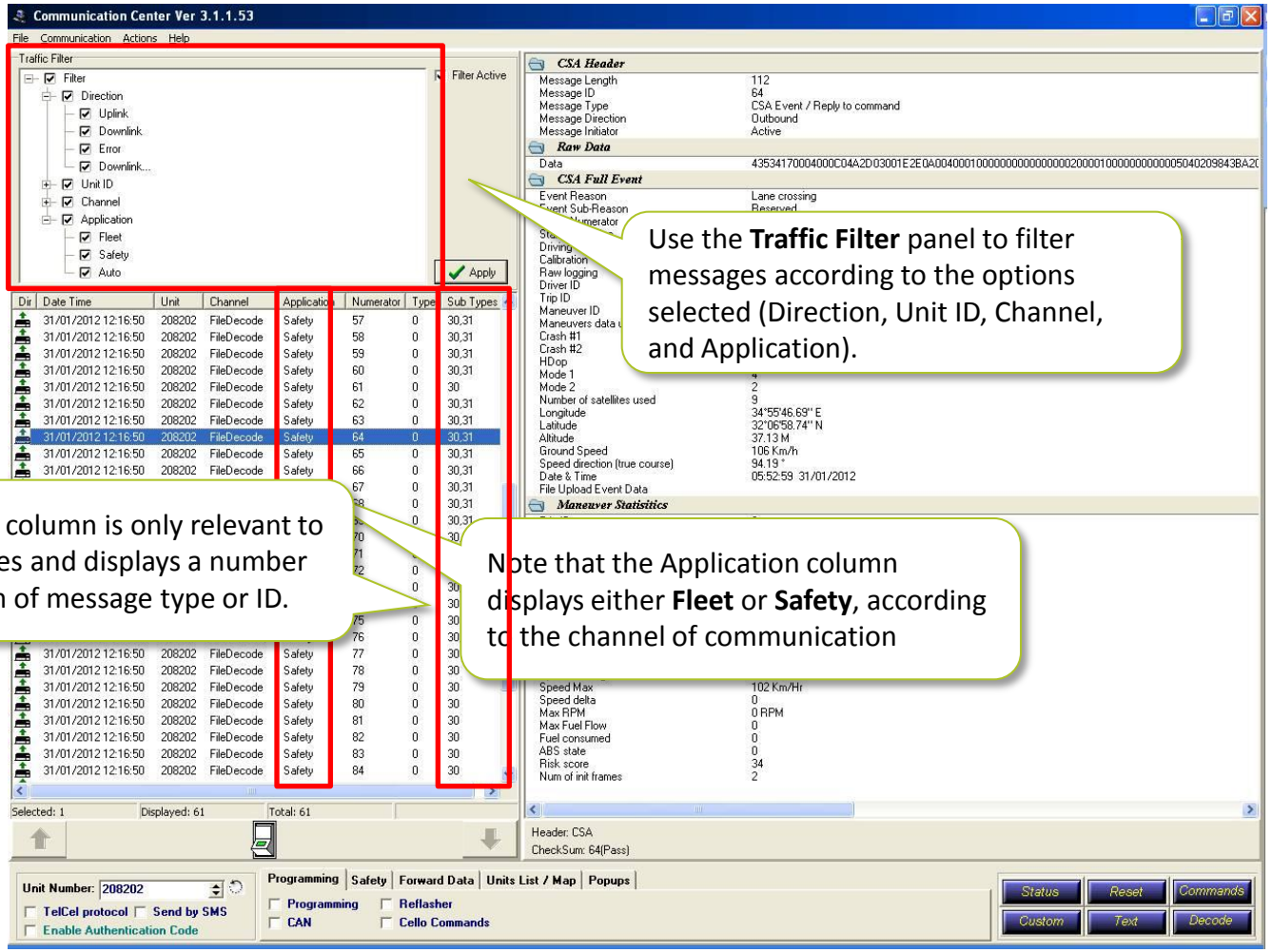
What is the CSA Communication Manager Server?

- Cellocator's **CSA Communication Manager Server** supports the CSA OTA protocol
- The CSA Server communicates directly by sending downlink commands and processing CSA related uplink messages from Cellocator units while communicating with the Communication Center
- From the CSA Communication Manager main window you can view the ports used and modify them, update the list of units, define which log settings to display in the main window and save the messages to and from the CSA Server



Communication Center Main Window

- **Incoming messages log - Traffic Filter**



Use the **Traffic Filter** panel to filter messages according to the options selected (Direction, Unit ID, Channel, and Application).

The **Sub Types** column is only relevant to **Safety** messages and displays a number which is a form of message type or ID.

Note that the Application column displays either **Fleet** or **Safety**, according to the channel of communication

CSA options in the Communication Center

- **Additional CSA options in the Communication Center**

KML file to view trip "story" in Google Earth

CSA File Display window

CSA Commands & Programming options in the Safety tab

Viewing trip "story" in Google Earth

- **Keyhole Markup Language (KML)**

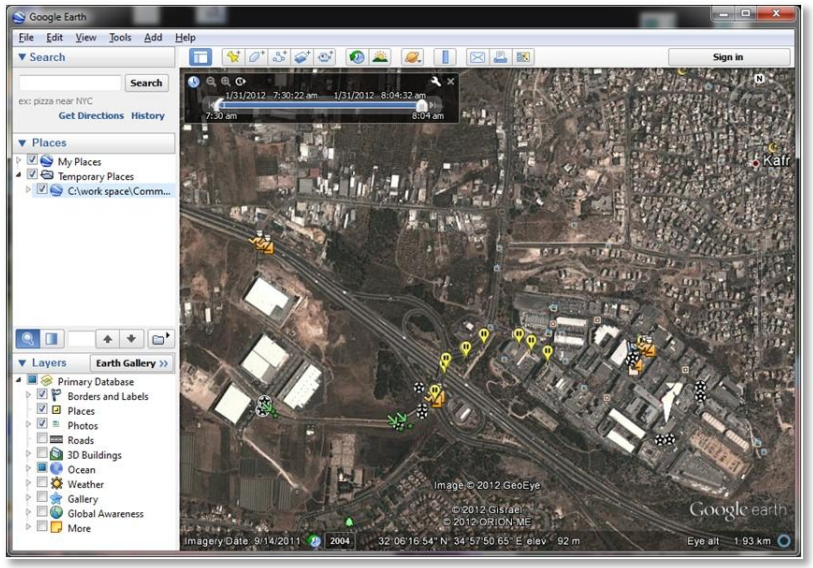
- **KML** - an XML notation for expressing geographic annotation and visualization within Internet-based, such as **Google Earth**, **Google Maps**, and **Google Maps for mobile**
- **Assists** in evaluating Cello-IQ functionality by visualizing CSA trips with their driving maneuvers detailed statistics, trip scores and other relevant information

Viewing trip units in Google Earth

- **Keyhole Markup Language (KML)**

  - Comm.Center allows to export Cello-IQ trips into KML files with dedicated icons
  - Clicking Export automatically launches Google Earth if installed locally
  - At the end of the trip an additional node is displayed which details the trip summary, including safety and eco scores

Icon sample:
Speeding Stop: Icon colored according to severity of safety score (green/yellow/red)



CSA File Display window

- **CSA File Display - enables analyzing trip maneuvers and crashes**

2 file Types of Raw data sent by the unit via the FTP/TFTP server

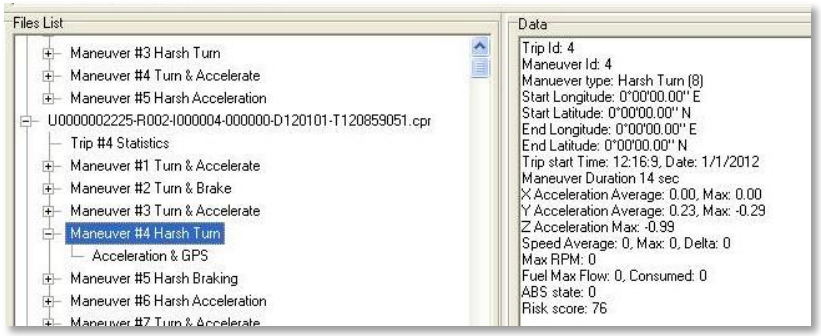
.ncp

- non-compressed file
- does not include GPS and acceleration data
- Can contain only maneuver statistics information

.cpr

- Compressed file
- Raw data for GPS and acceleration events

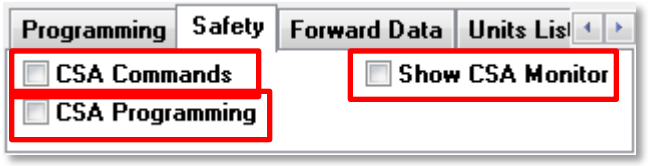
- **Double-clicking on a maneuver parses the data and displays it in summary**
- **The file can be exported to .CSV format**



CSA Commands & Programming

- **Safety - the Cello-IQ CSA application**

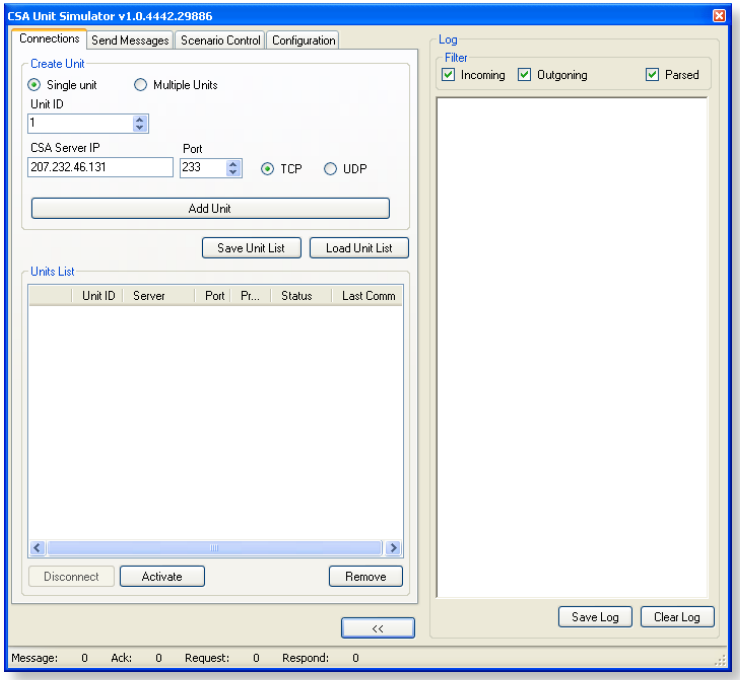
- The **Safety** tab is located at the bottom of the Communication Center main window
- The **Safety Commands** dialog enables you to send commands to units by selecting the unit and then the command from a list of default commands
- Click **Show OTA Strings** checkbox, which opens an expanded pane, to enter customized commands to the selected unit
- Useful while debugging command building routines / components in your SW platform
- You can configure the unit parameters by opening the **OTA Programmer** via the **Programming tab**



CSA Unit Simulator

- **Simulates Cello-IQ unit CSA communication**

- Provide the developer with a testing tool for his new application
- The software simulates OTA messages associated with the CSA events
- Enables the sending of CSA messages that include modular messages
- The simulator can simulate one or more units
- The simulator includes **Setting and Control** tabs, **Messages Log** and **Status bar** for CSA events and requests sent between the unit and the simulator
- CSA messages scenarios sent by the active unit simulators, can be edited and controlled via the **Scenario Control** tab



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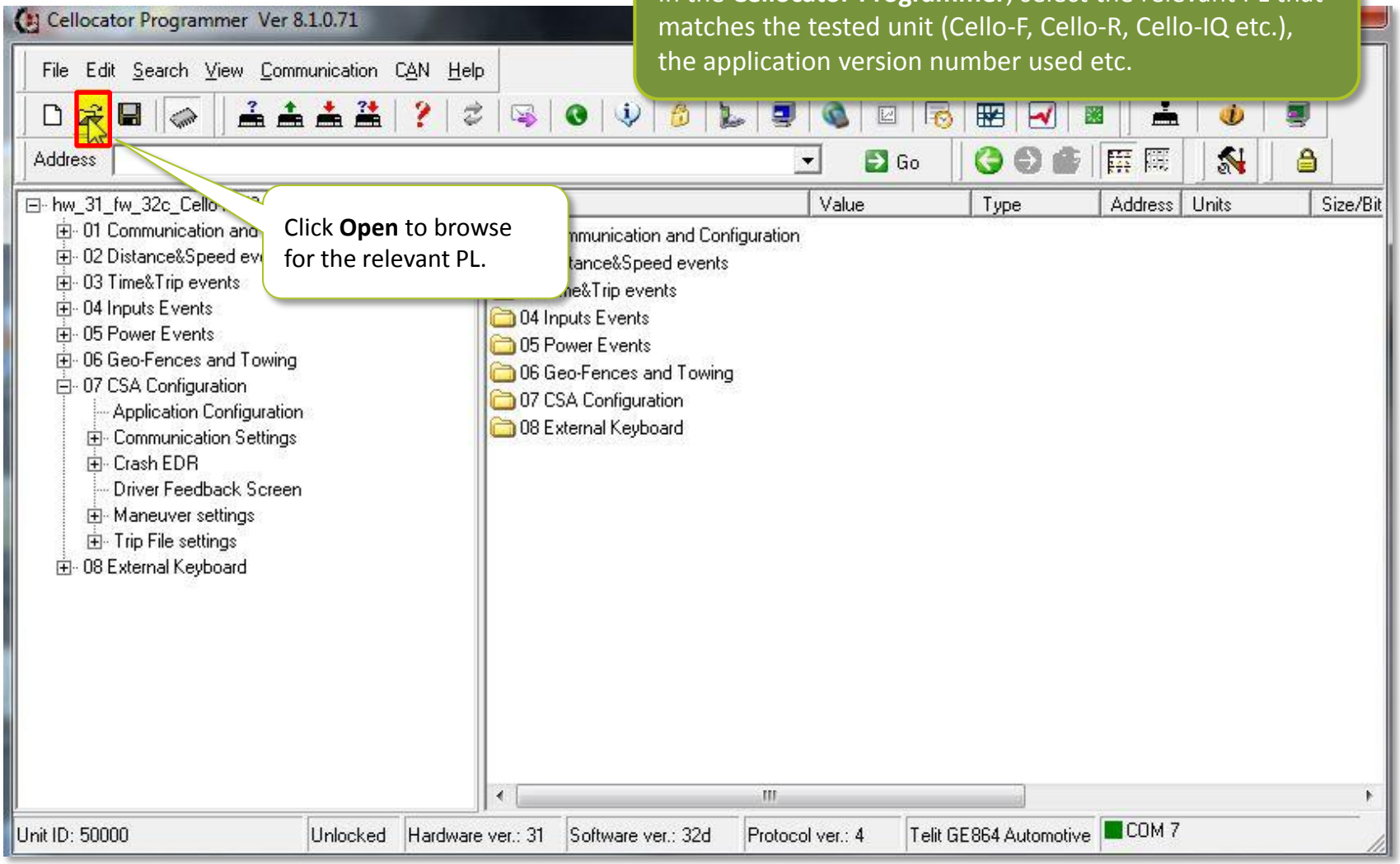
Initial configuration

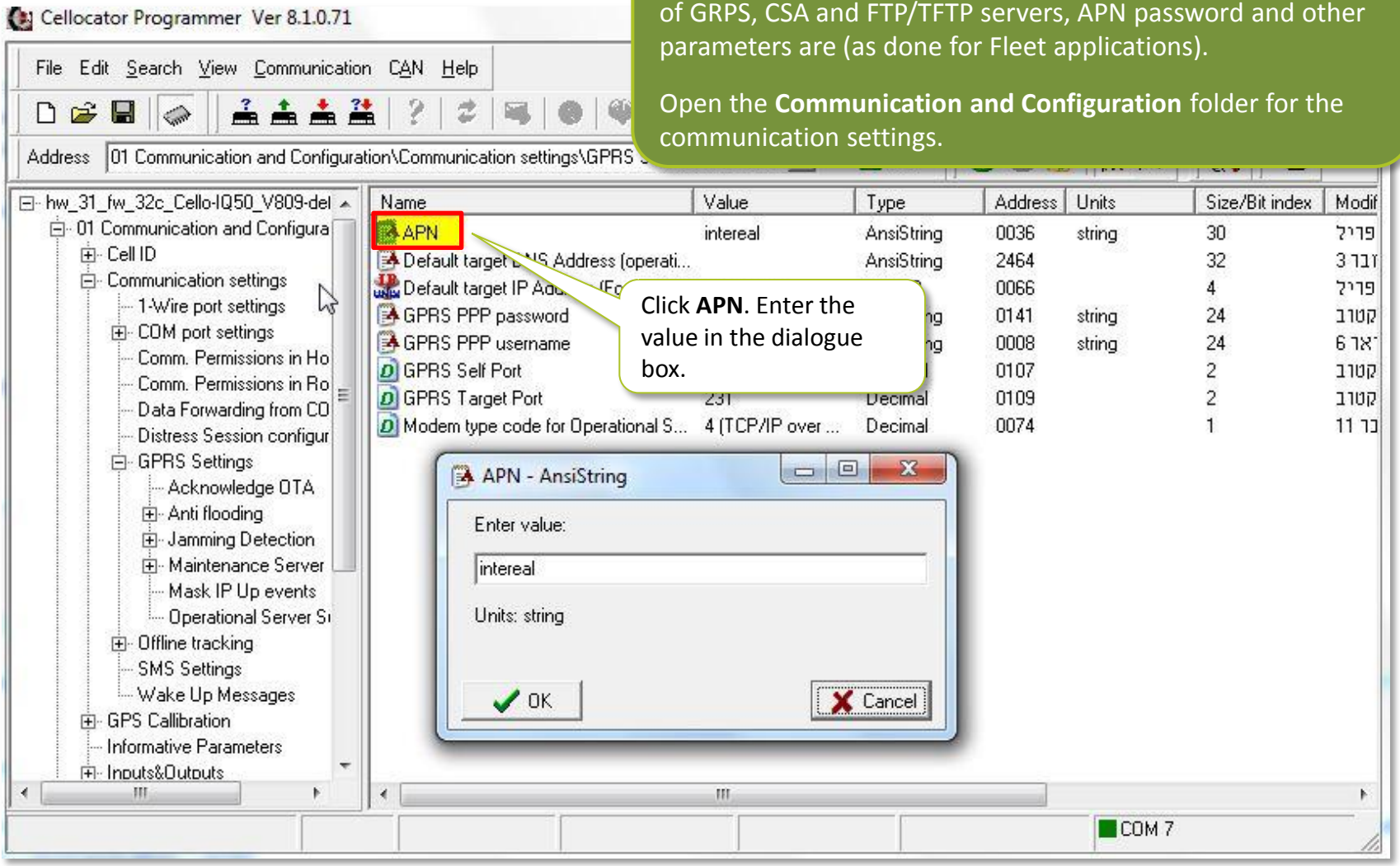
In the **Cellocator Programmer**, select the relevant PL that matches the tested unit (Cello-F, Cello-R, Cello-IQ etc.), the application version number used etc.



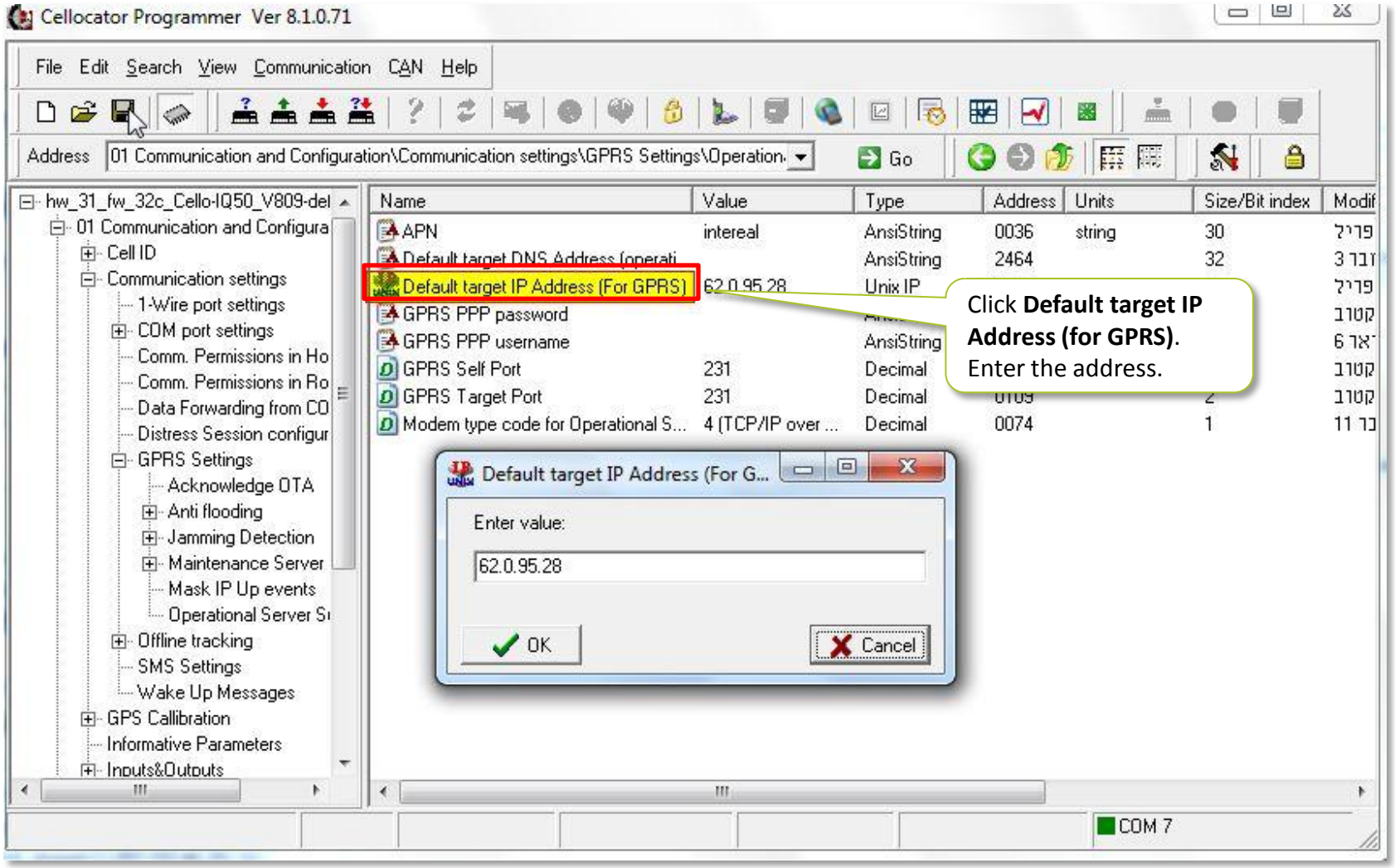
Initial configuration

At this point, proceed to initial configuration of IP addresses of GRPS, CSA and FTP/TFTP servers, APN password and other parameters are (as done for Fleet applications).

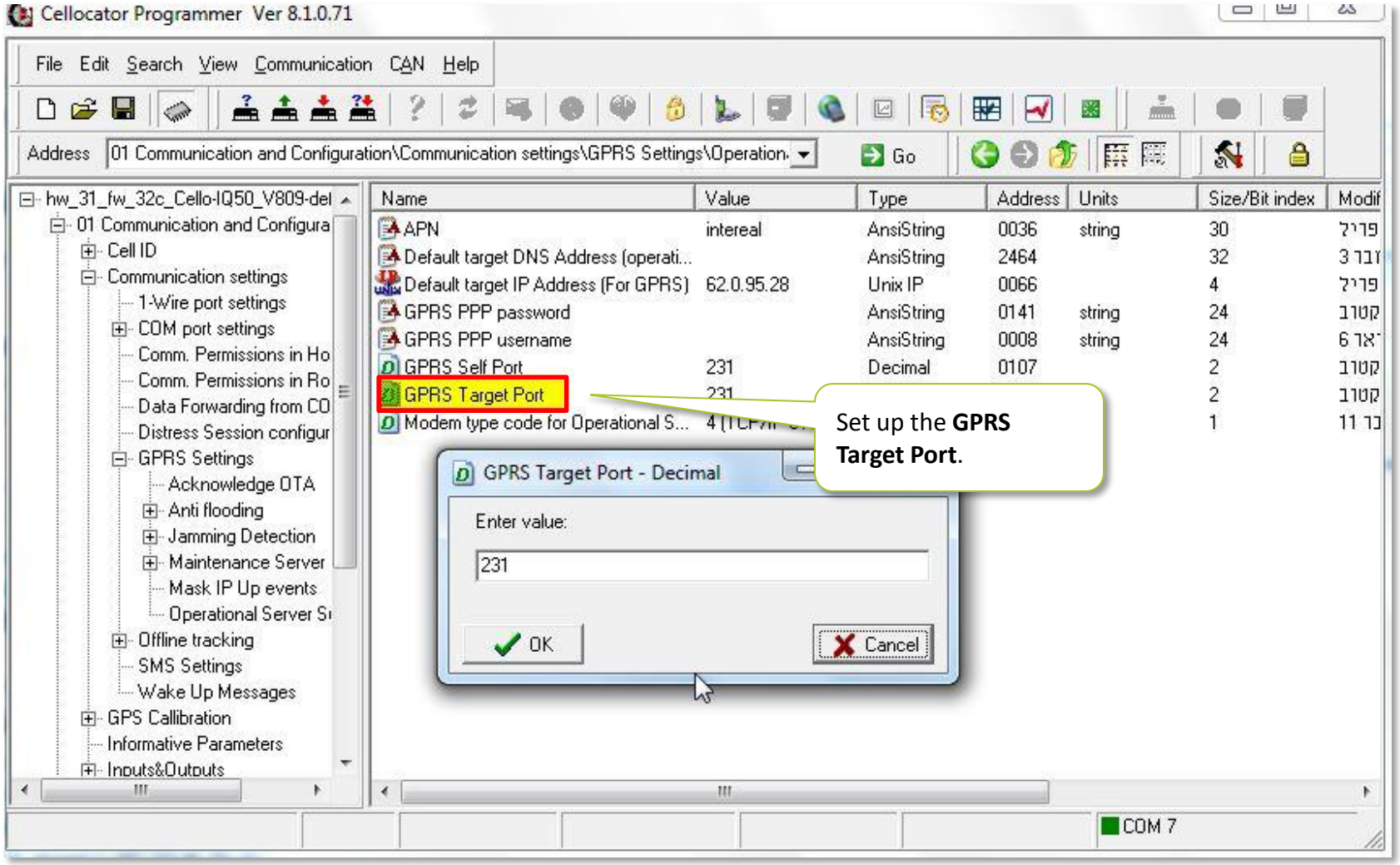
Open the **Communication and Configuration** folder for the communication settings.



Initial configuration

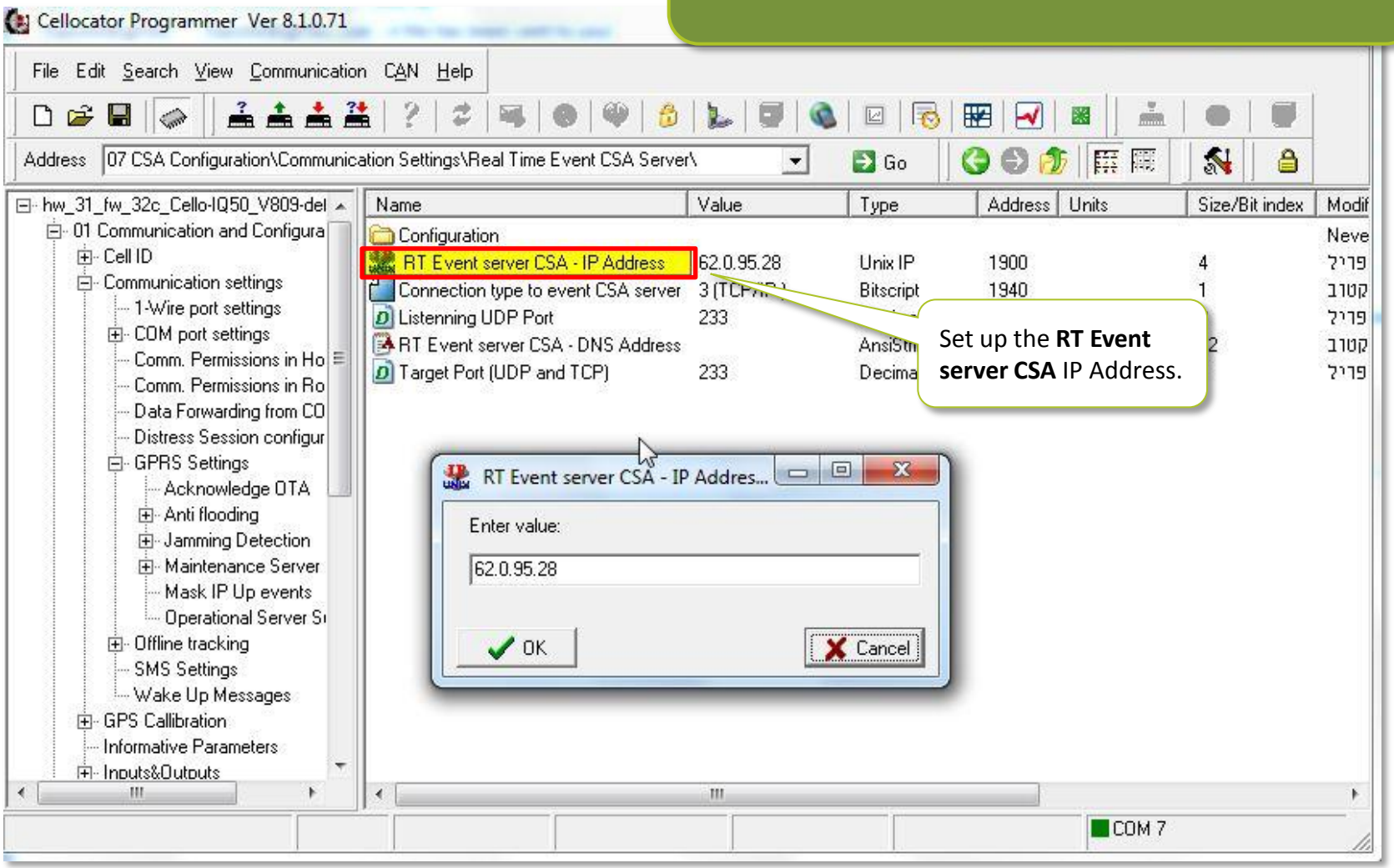


Initial configuration

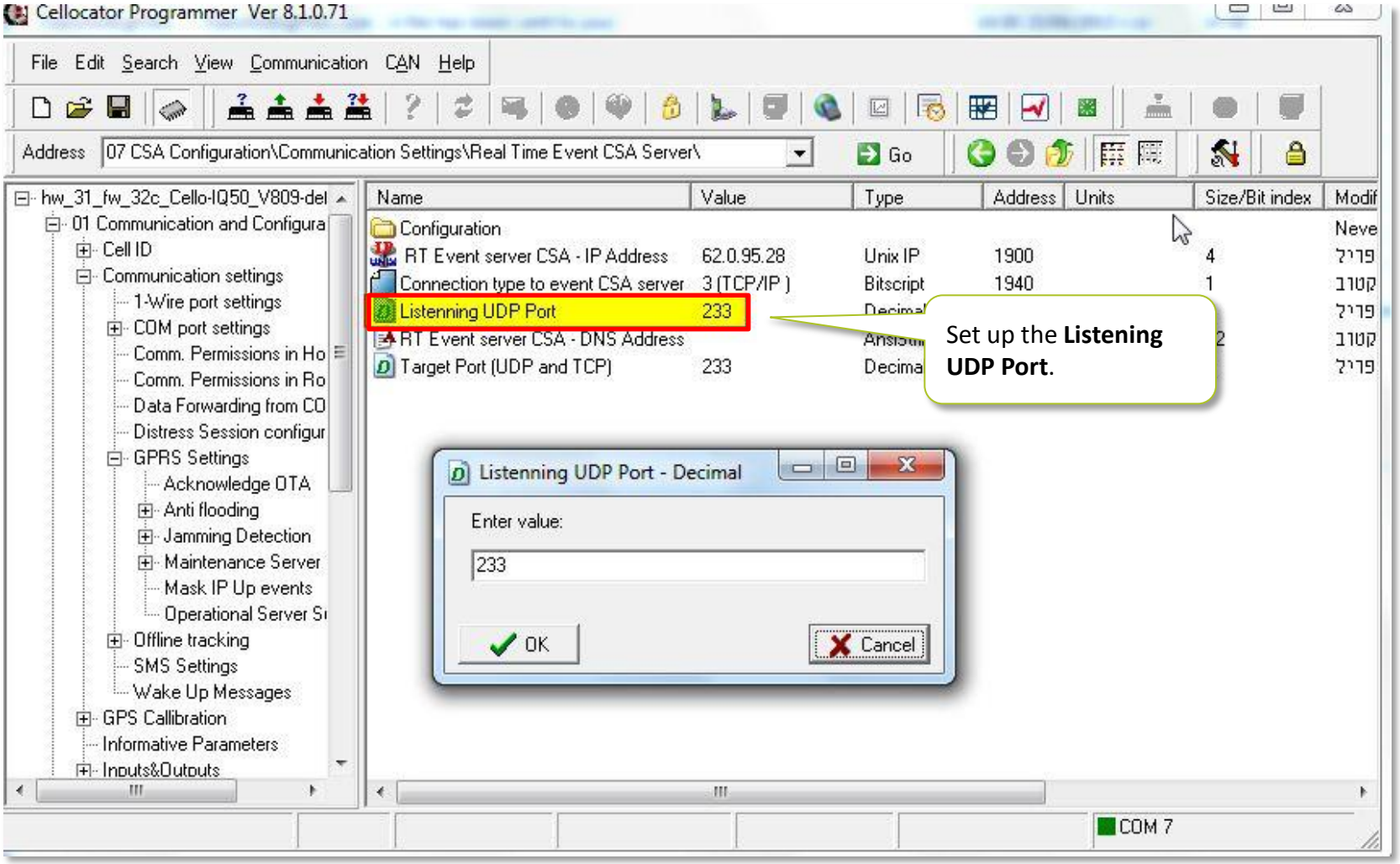


Initial configuration

In the **CSA Configuration\Communication Settings** you will set up the communications relevant to the CSA.



Initial configuration



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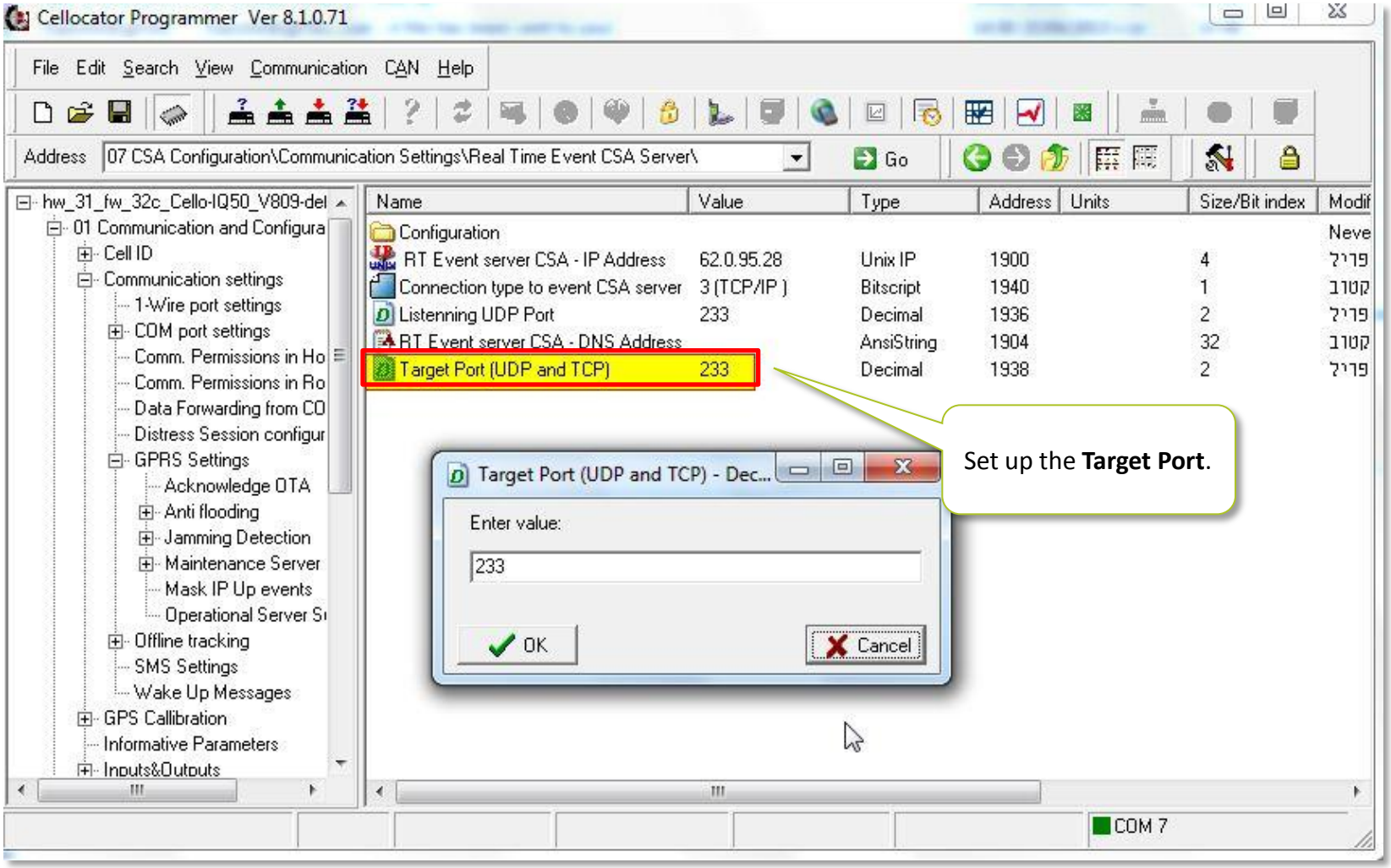

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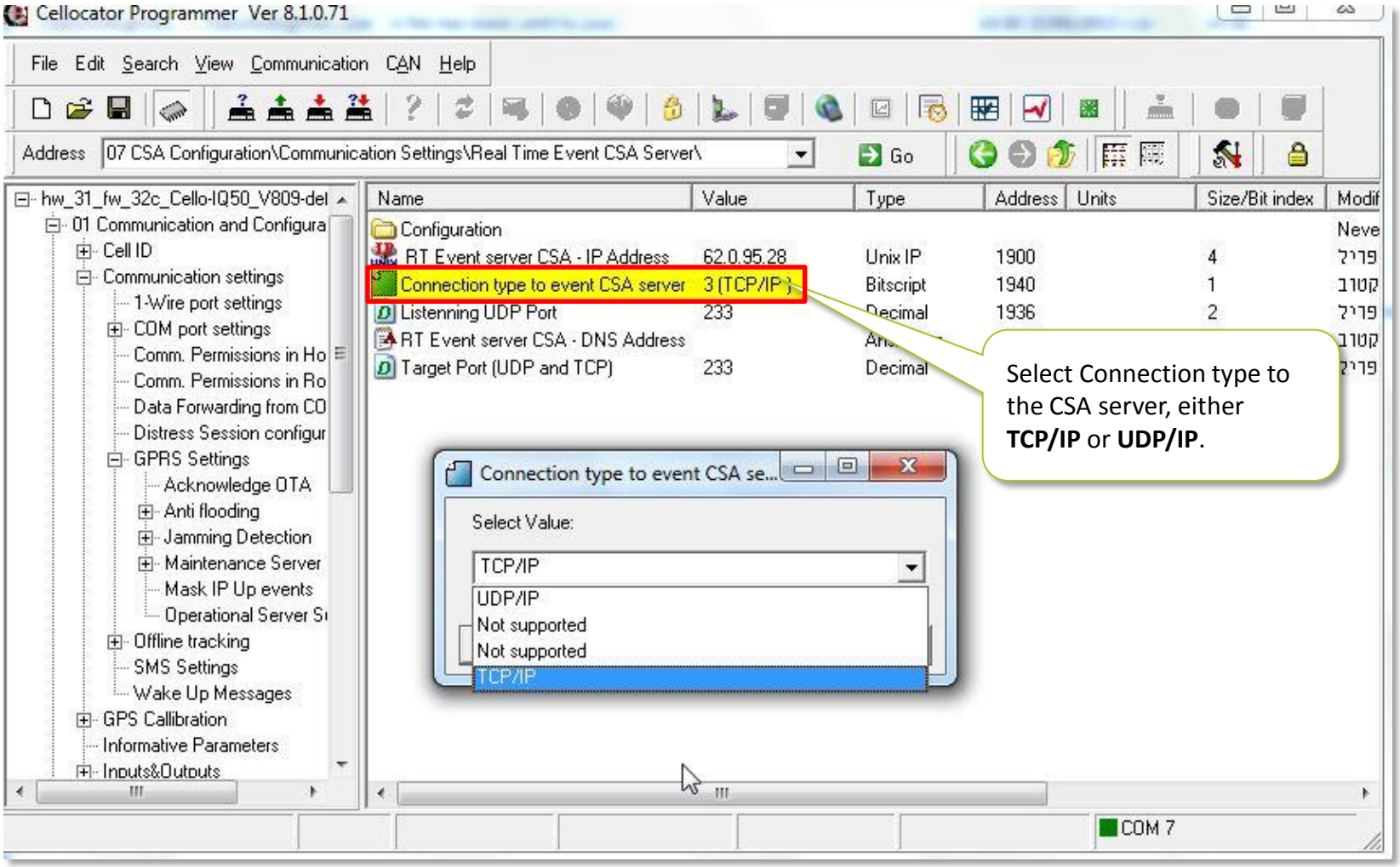

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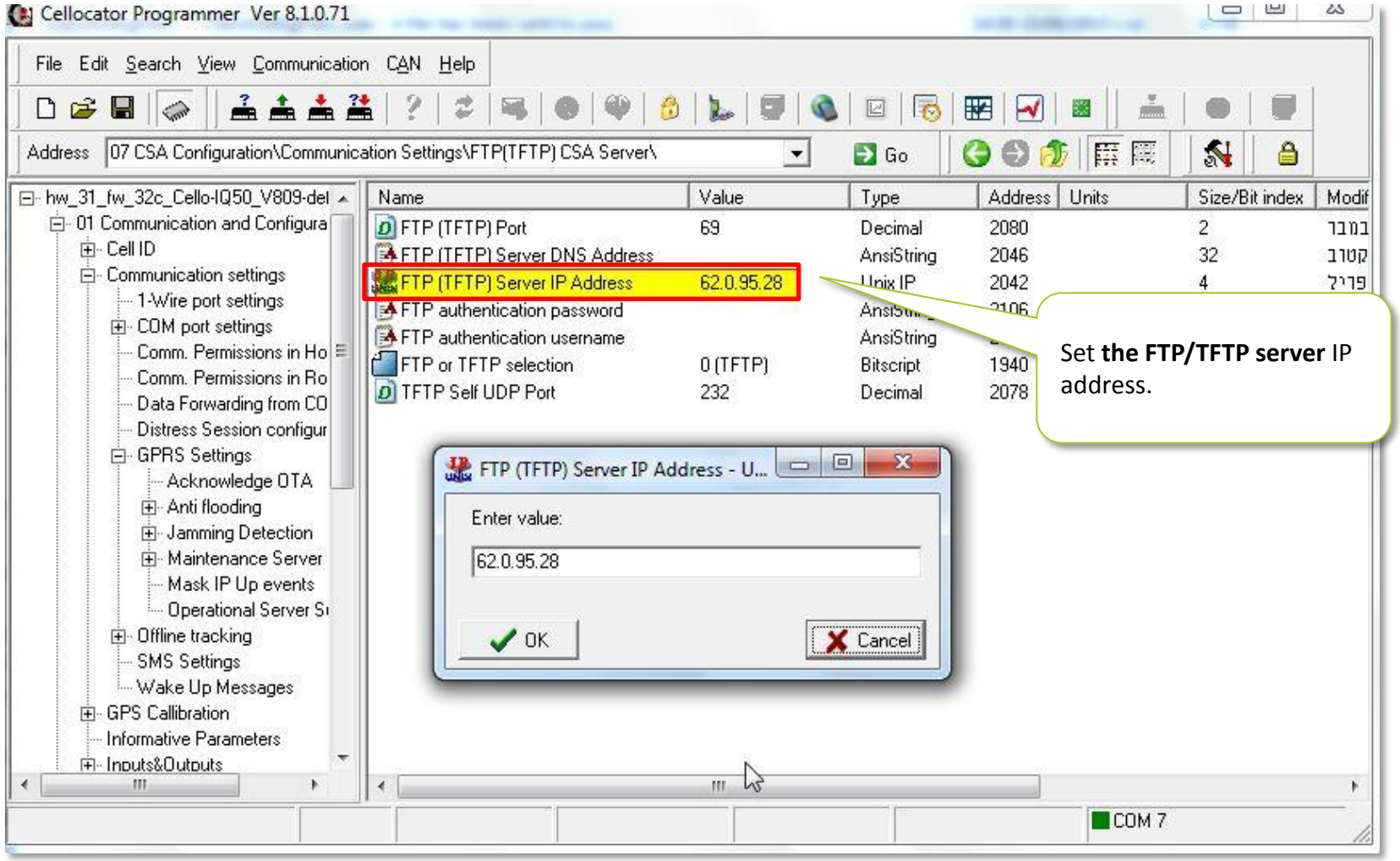
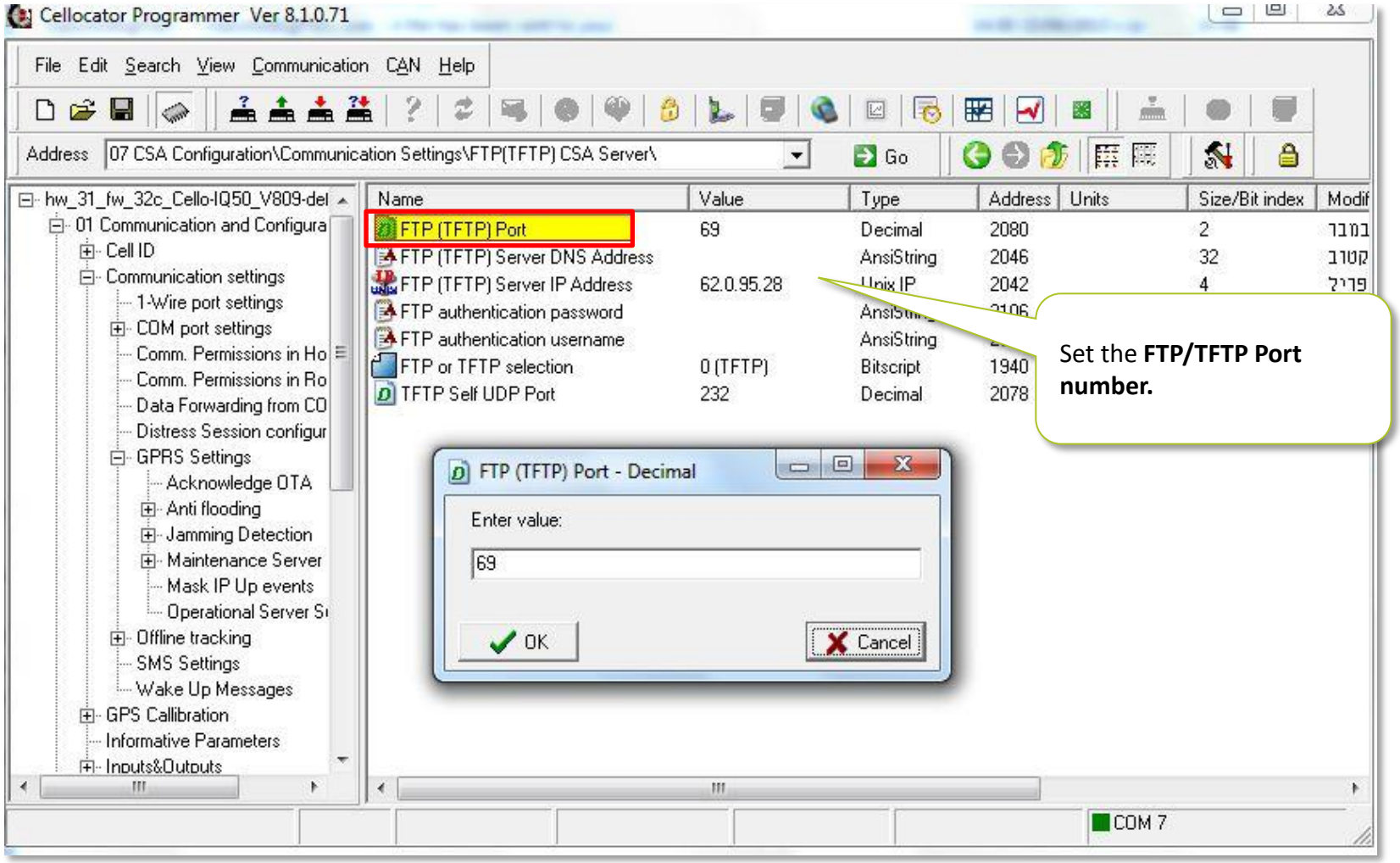
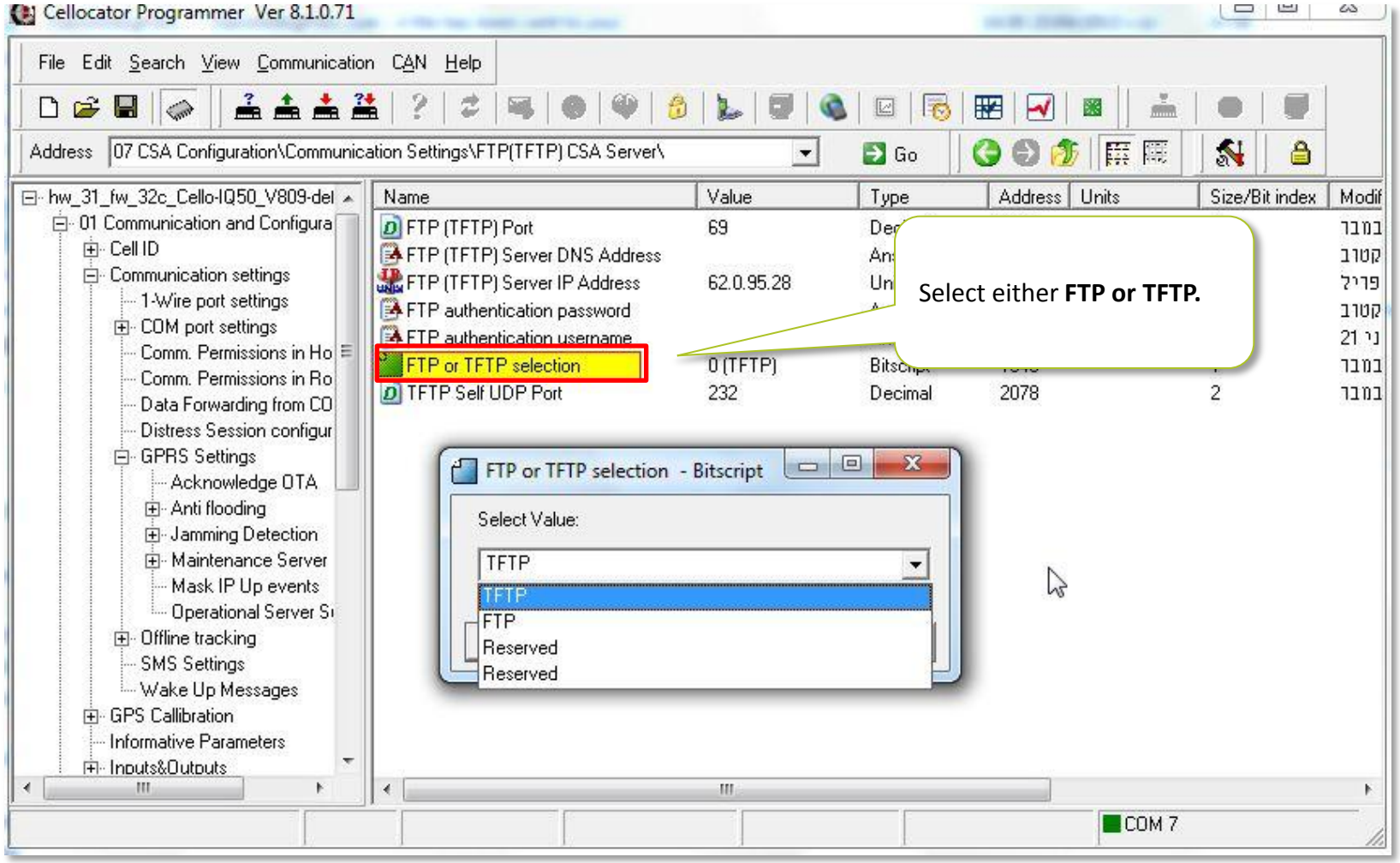


Initial configuration

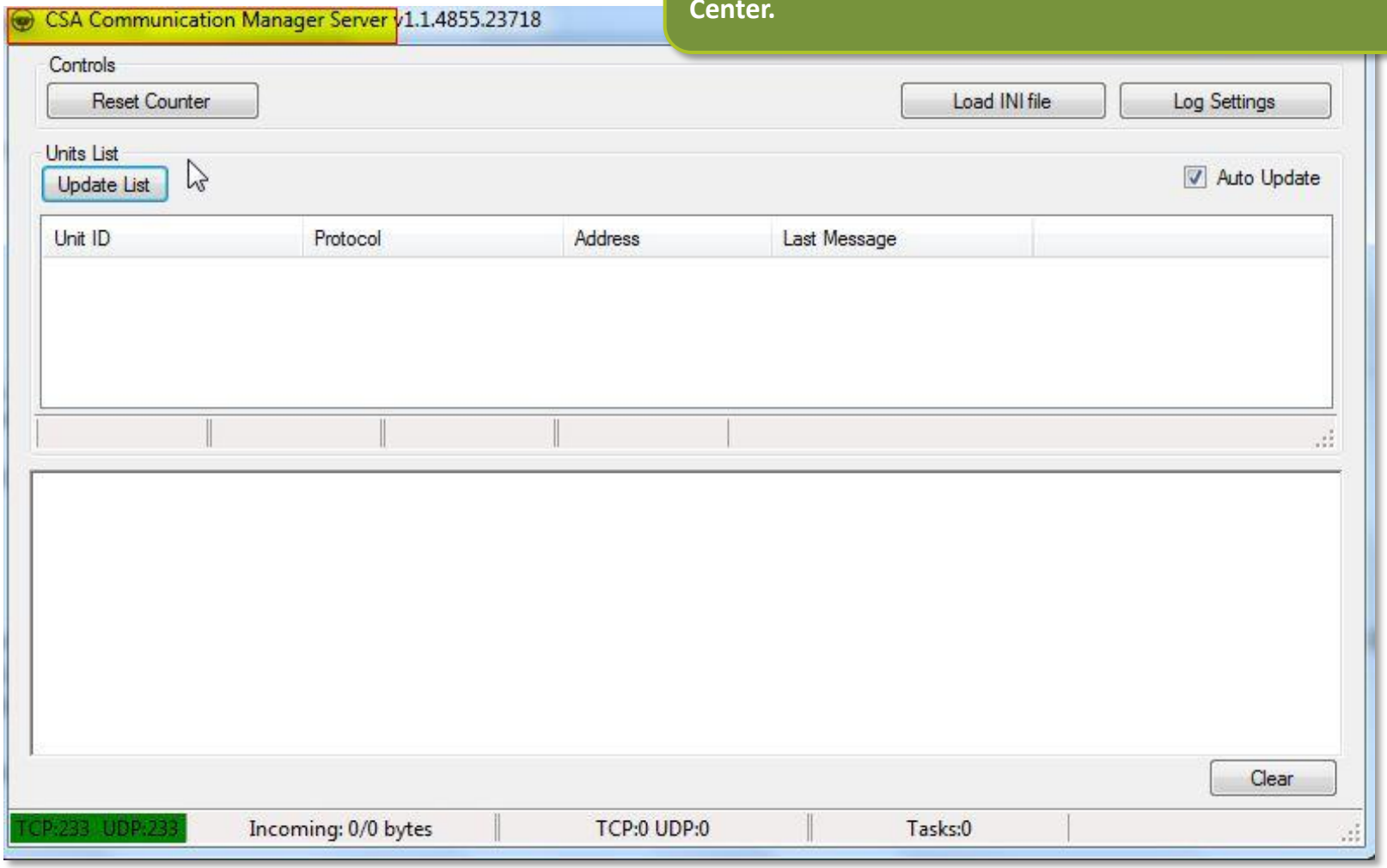


Initial configuration



Initial configuration

Launch the **CSA Communication Manager Server** to enable viewing CSA massages in the **Communication Center.**



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Introduction to PL Configuration

- Once the Evaluation environment is set up, you can proceed to test the unit, learn it's functionalities and test your settings, by checking different scenarios using PL configurations

- You will use the **Cellocator Programmer** for configuration and the **Communication Center** for viewing the results

We have prepared for you some scenarios that will demonstrate different PL parameters. Let's start!

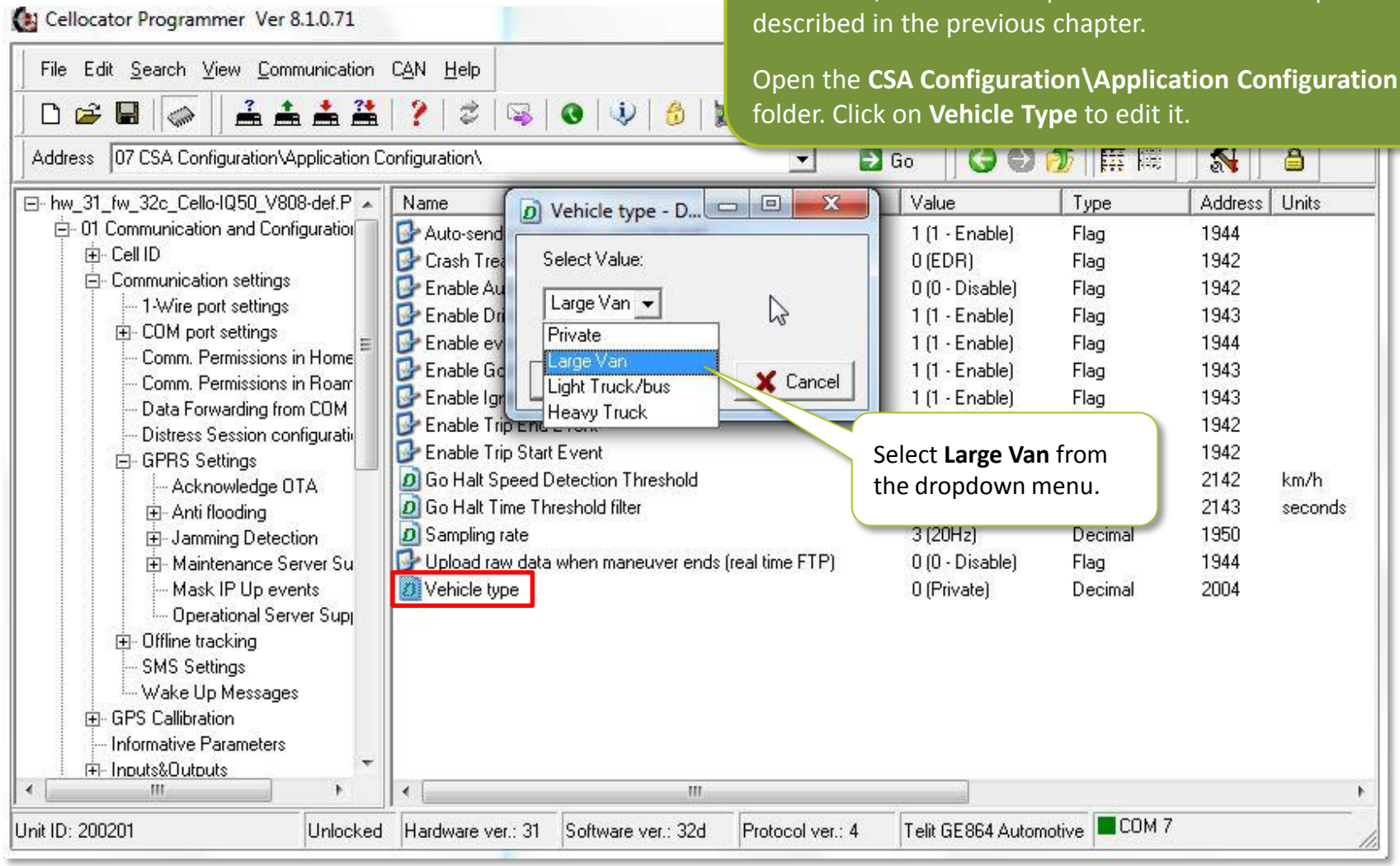
Scenario 1 – EDR enabled

Parameter name	PL configuration Scenario C	Simulation	Output expected
EDR	Enabled + custom pre and post values.	Crash (Impact on the table)	Unit Transmit pre and post EDR to FTP/TFTP + Crash event message to CSA server (GPRS or SMS)
Vehicle type	LCV	-	-

Scenario 1 – EDR enabled

Before you proceed to configure the PL according to **Scenario 1**, make sure to perform the initial setup as described in the previous chapter.

Open the **CSA Configuration\Application Configuration** folder. Click on **Vehicle Type** to edit it.



Select **Large Van** from the dropdown menu.

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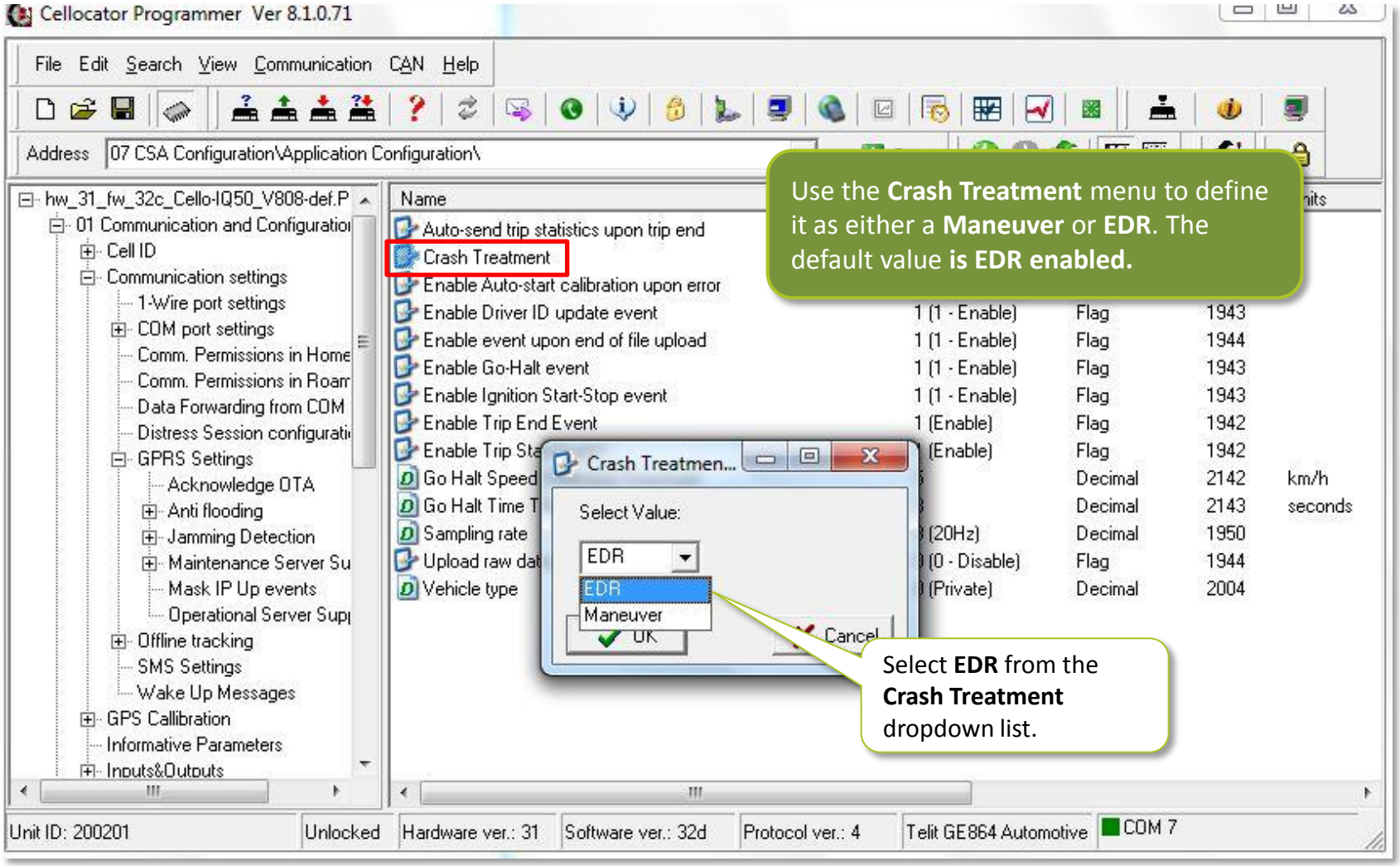
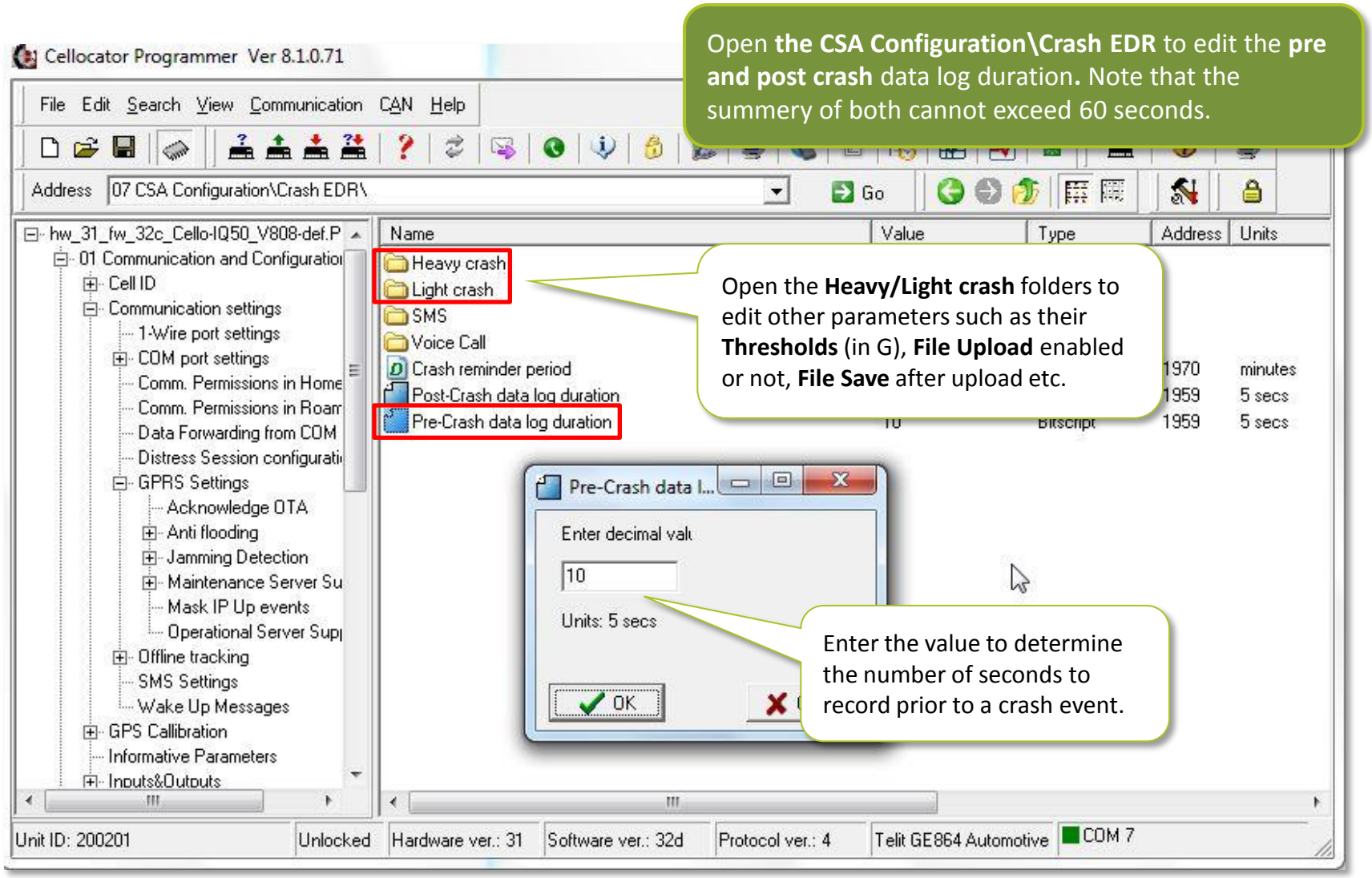
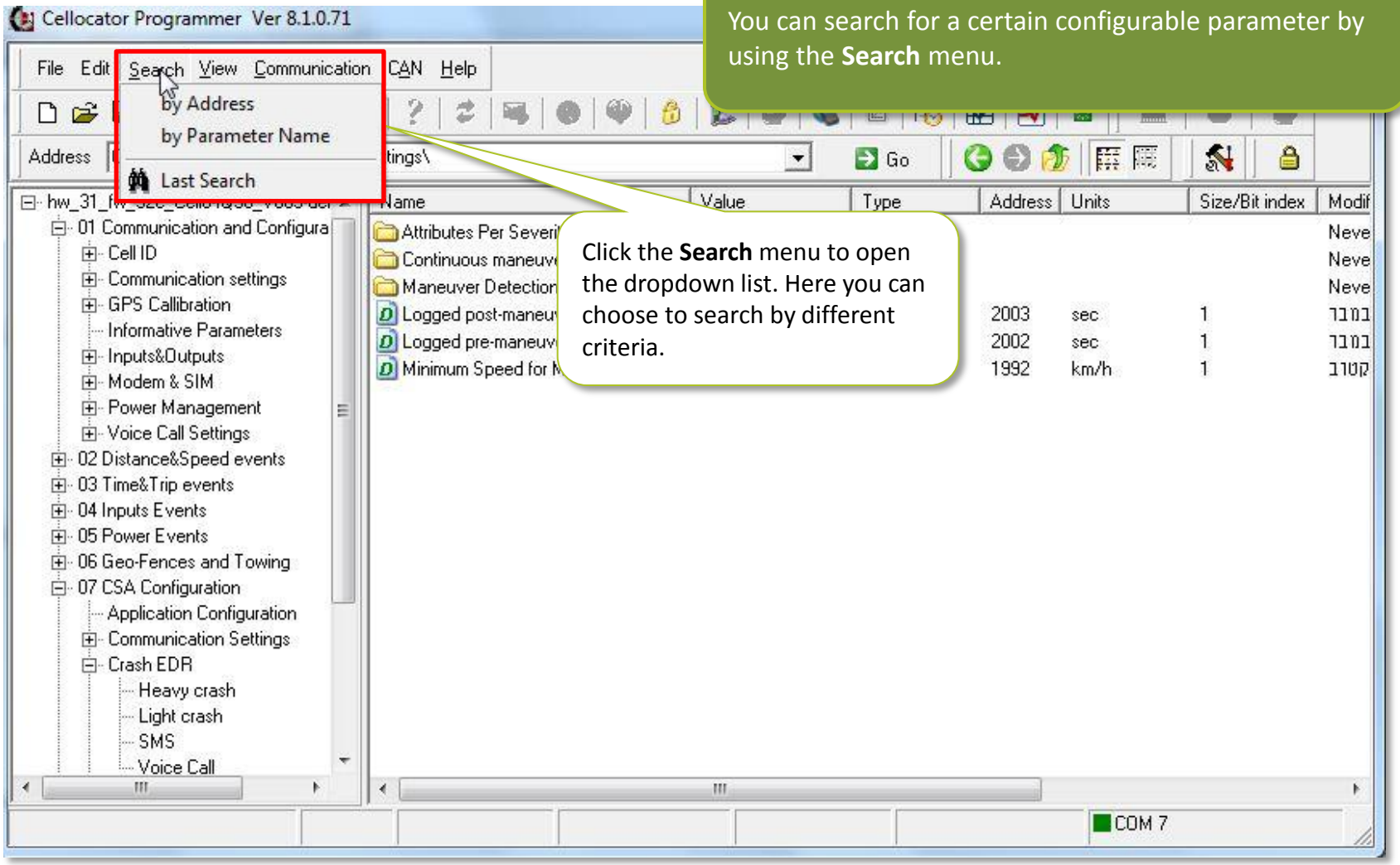
Scenario 1 – EDR enabled



Scenario 1 – EDR enabled



Scenario 1 – EDR enabled



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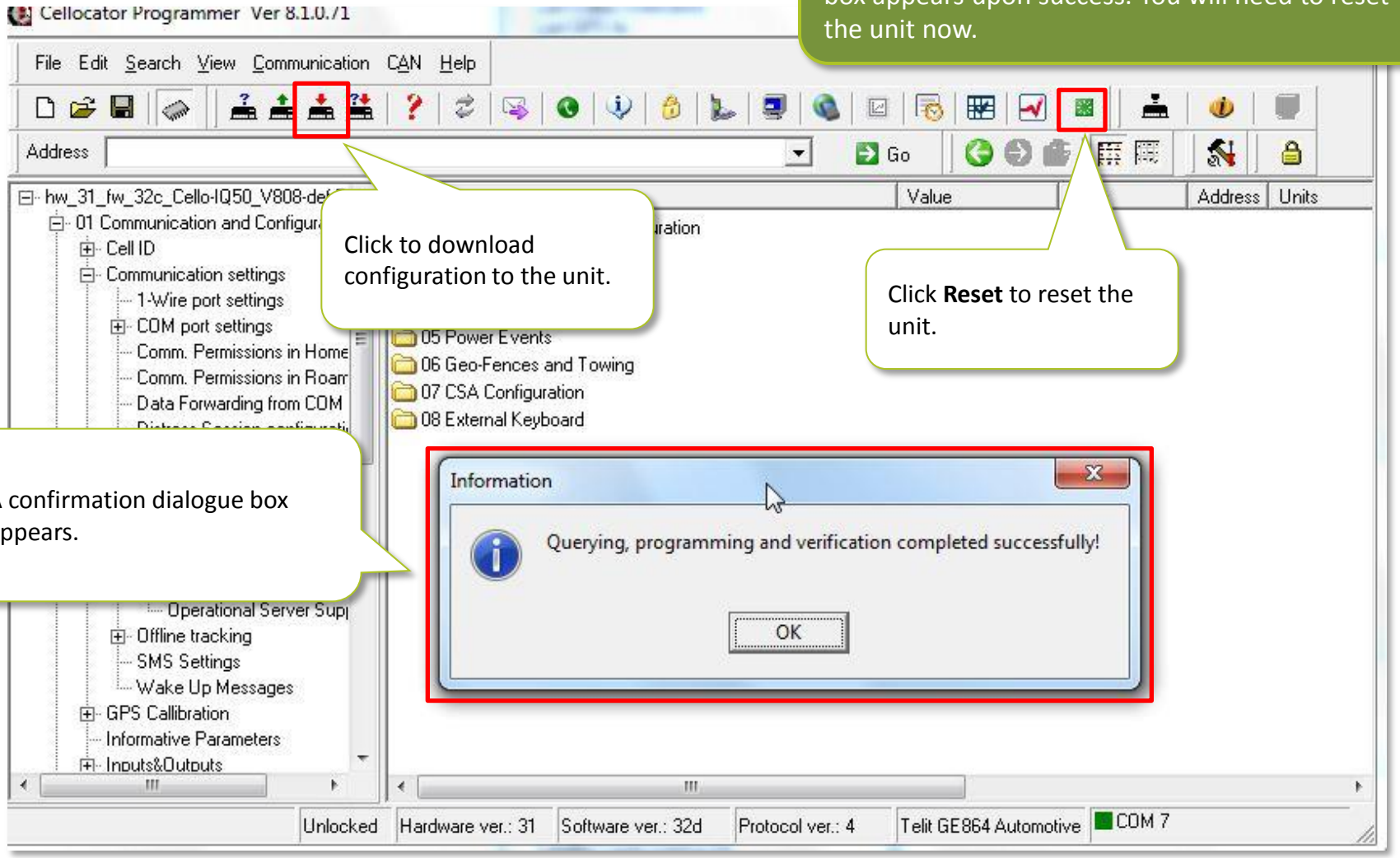
Scenario 1 – EDR enabled

One the PL configuration is complete, download the settings to the unit. A confirmation dialogue box appears upon success. You will need to reset the unit now.



Click to download configuration to the unit.

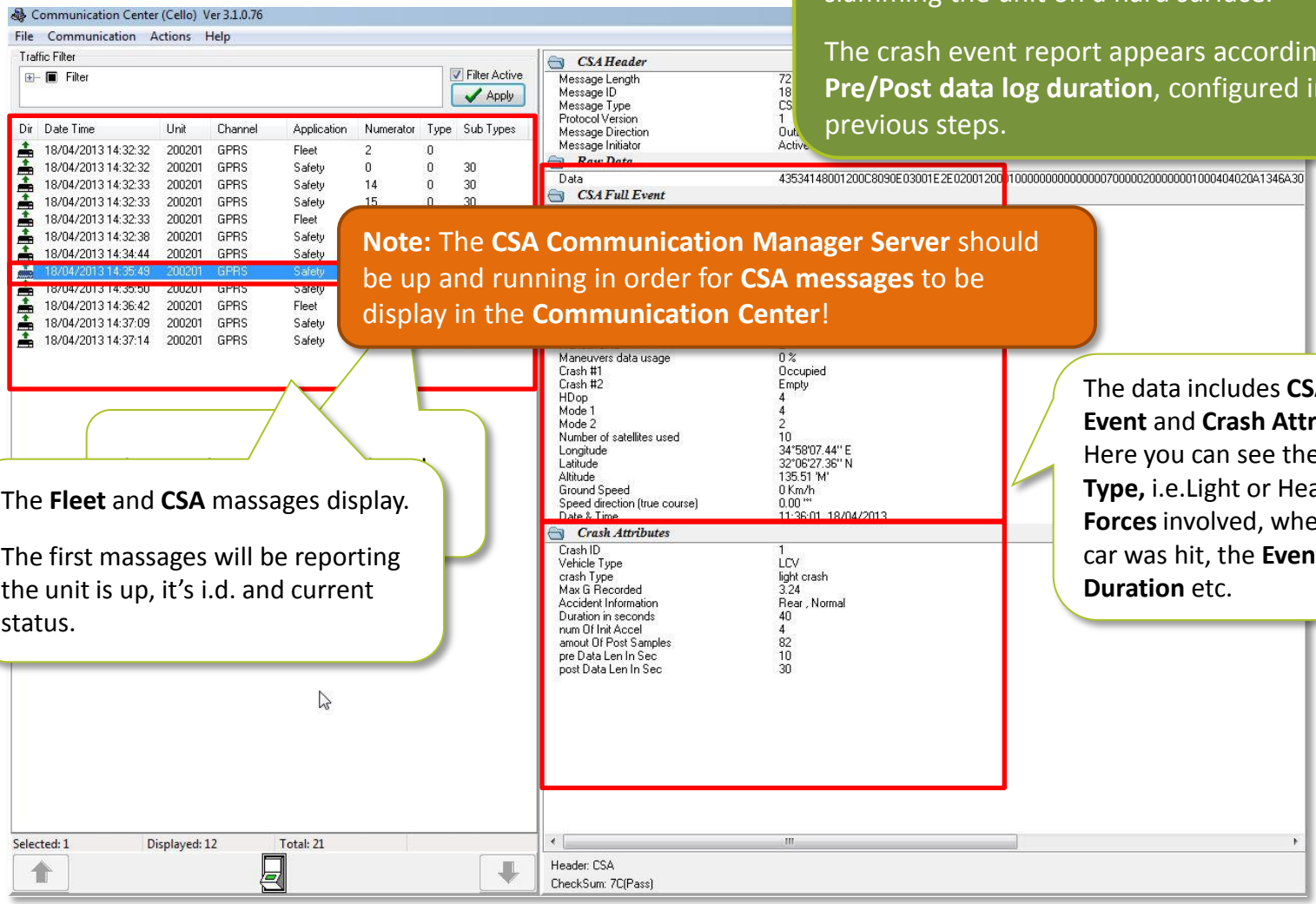
Click **Reset** to reset the unit.

A confirmation dialogue box appears.

Scenario 1 – EDR enabled

To test **EDR** configuration, you need to simulate a crash event. This is done by shaking and or slamming the unit on a hard surface.

The crash event report appears according to the **Pre/Post data log duration**, configured in the previous steps.



Note: The **CSA Communication Manager Server** should be up and running in order for **CSA messages** to be display in the **Communication Center**!

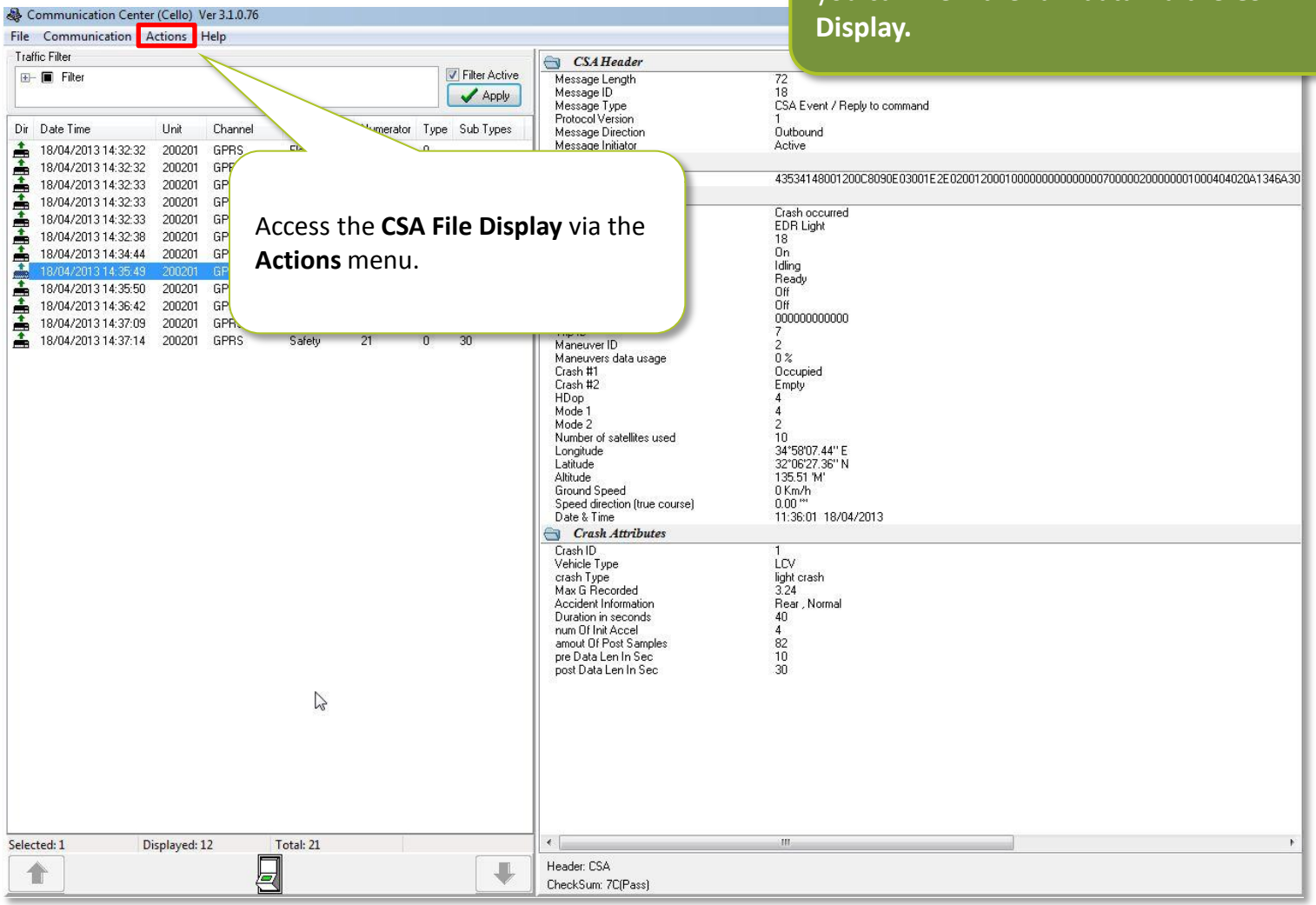
The **Fleet** and **CSA** massages display.

The first massages will be reporting the unit is up, it's i.d. and current status.

The data includes **CSA Full Event** and **Crash Attributes**. Here you can see the **Crash Type,** i.e.Light or Heavy, the **G Forces** involved, where the car was hit, the **Event Duration** etc.

Scenario 1 – EDR enabled

Once the file upload to the FTP/TFTP is complete, you can view the raw data via the **CSA File Display.**



Access the **CSA File Display** via the **Actions** menu.

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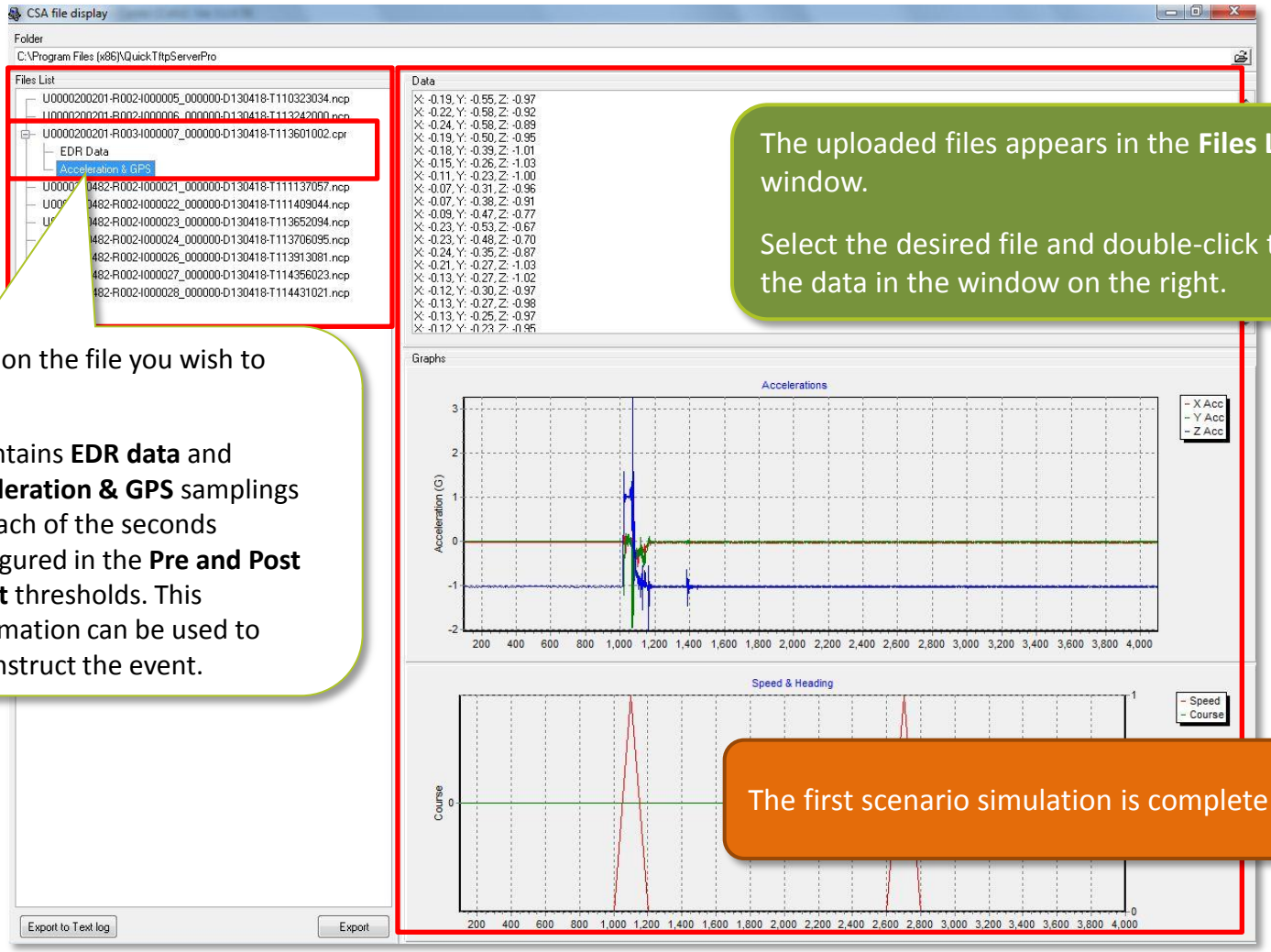
Scenario 1 – EDR enabled



The uploaded files appears in the **Files List** window.

Select the desired file and double-click to view the data in the window on the right.

Click on the file you wish to view.

It contains **EDR data** and **Acceleration & GPS** samplings for each of the seconds configured in the **Pre and Post event** thresholds. This information can be used to reconstruct the event.

The first scenario simulation is complete!

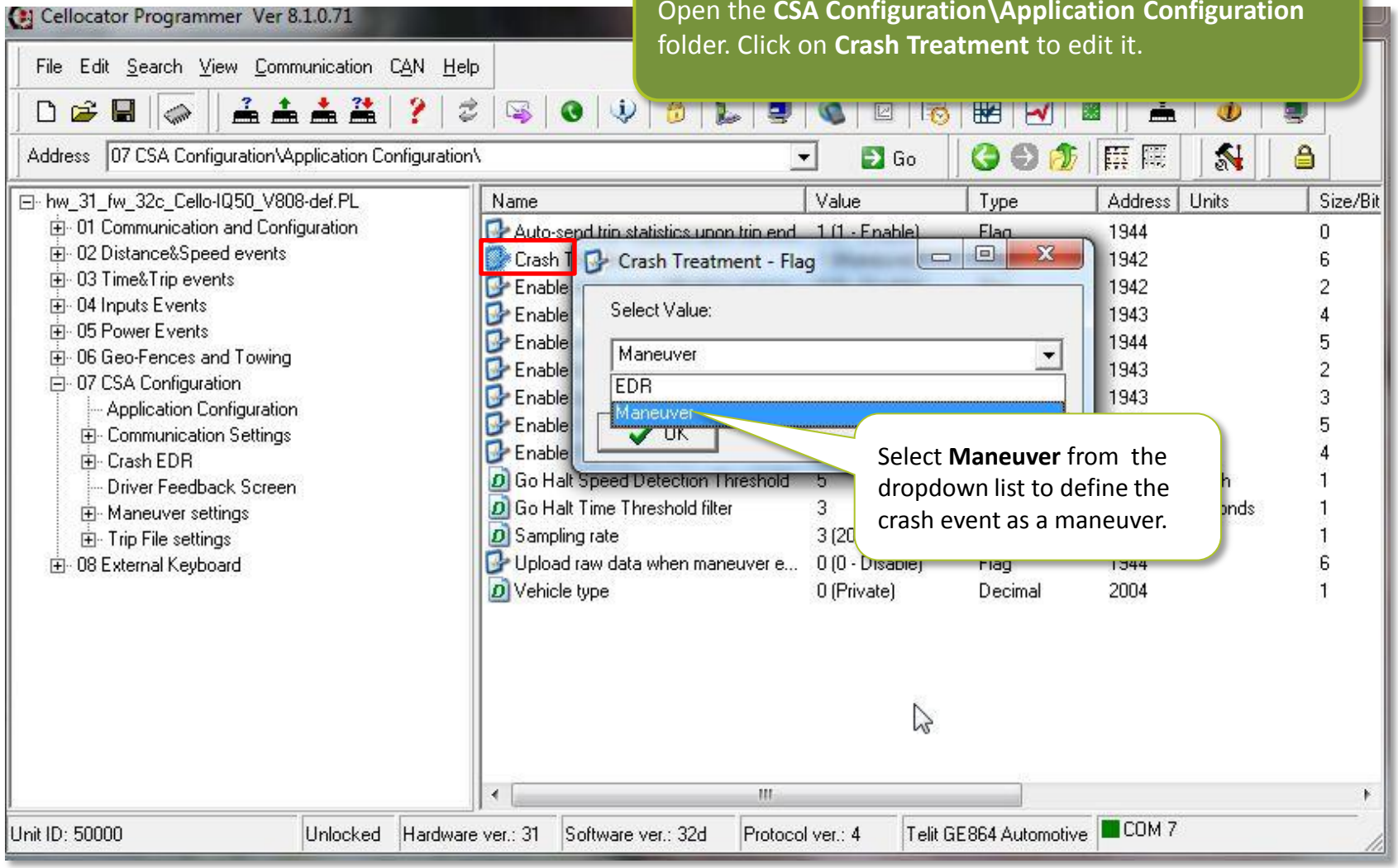
Scenario 2 – EDR disabled

Parameter name	PL configuration Scenario B	Simulation	Output expected
EDR	Disabled	Crash (Impact on the table)	Crash event is reported thru CSA only just like a maneuver but without any EDR / raw data to FTP at the end of the trip

- The crash can be detected and reported as an event only. In this scenario the EDR functionality is disabled.

Scenario 2 – EDR disabled

Open the **CSA Configuration\Application Configuration** folder. Click on **Crash Treatment** to edit it.

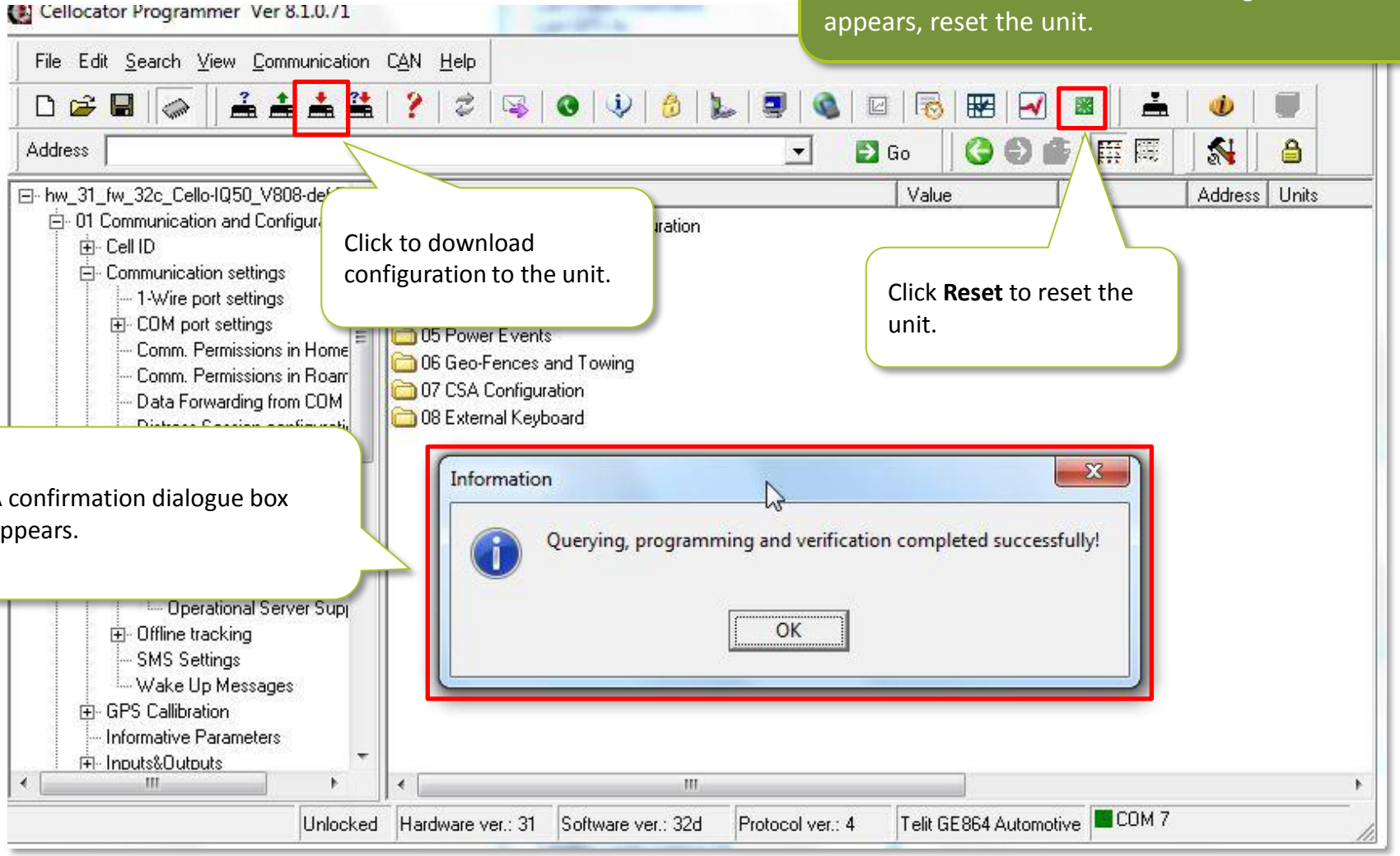


Select **Maneuver** from the dropdown list to define the crash event as a maneuver.

Scenario 2 – EDR disabled

Download the new settings to the unit.

After the success confirmation dialogue box appears, reset the unit.



Click to download configuration to the unit.

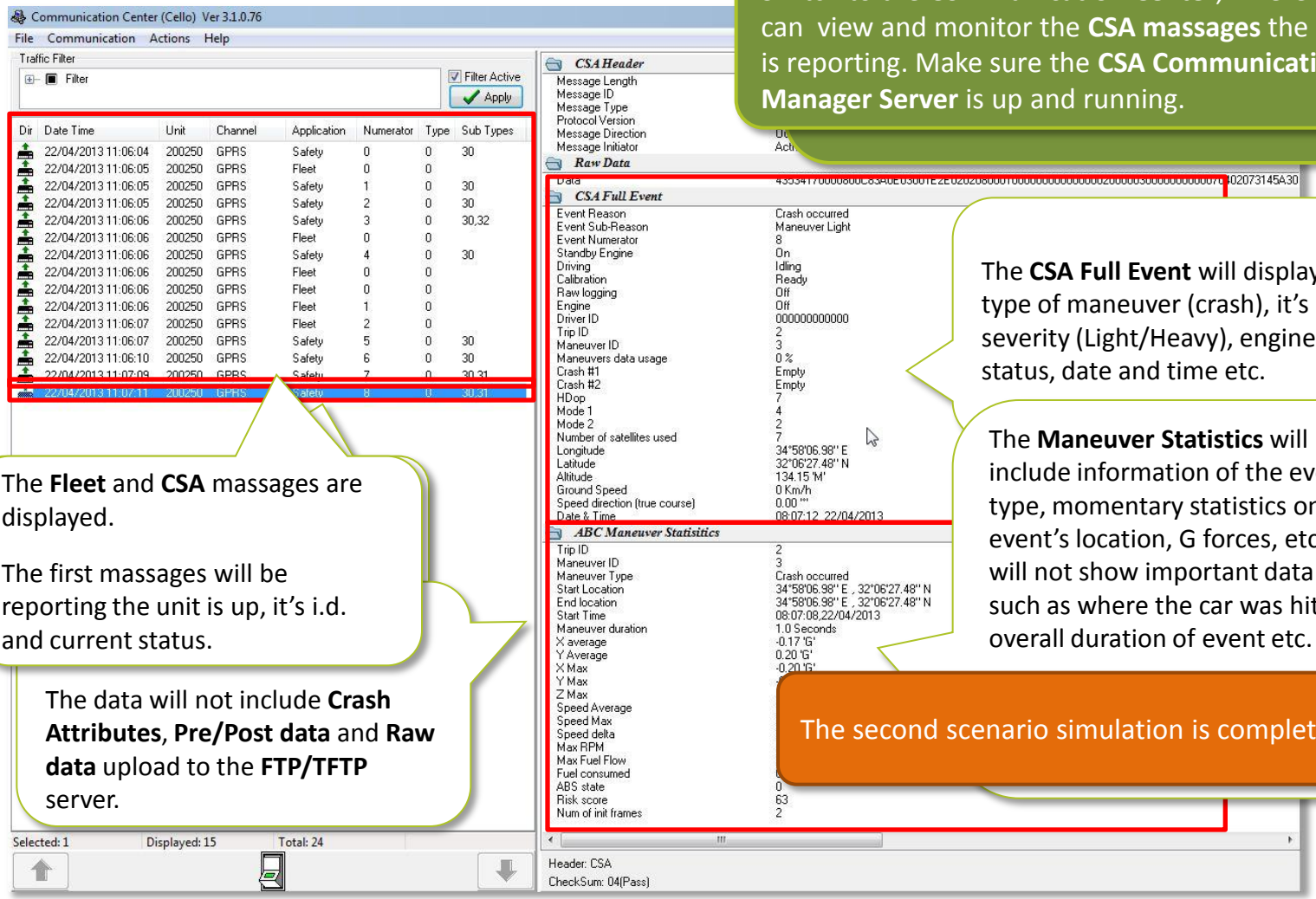
Click **Reset** to reset the unit.

A confirmation dialogue box appears.

Scenario 2 – EDR disabled

Simulate a crash event by shaking and or

Switch to the **Communication Center**, where you can view and monitor the **CSA massages** the unit is reporting. Make sure the **CSA Communication Manager Server** is up and running.



The **Fleet** and **CSA** massages are displayed.

The first massages will be reporting the unit is up, it's i.d. and current status.

The data will not include **Crash Attributes**, **Pre/Post data** and **Raw data** upload to the **FTP/TFTP** server.

The **CSA Full Event** will display the type of maneuver (crash), it's severity (Light/Heavy), engine status, date and time etc.

The **Maneuver Statistics** will include information of the event type, momentary statistics on the event's location, G forces, etc. but will not show important data such as where the car was hit, the overall duration of event etc.

The second scenario simulation is complete!

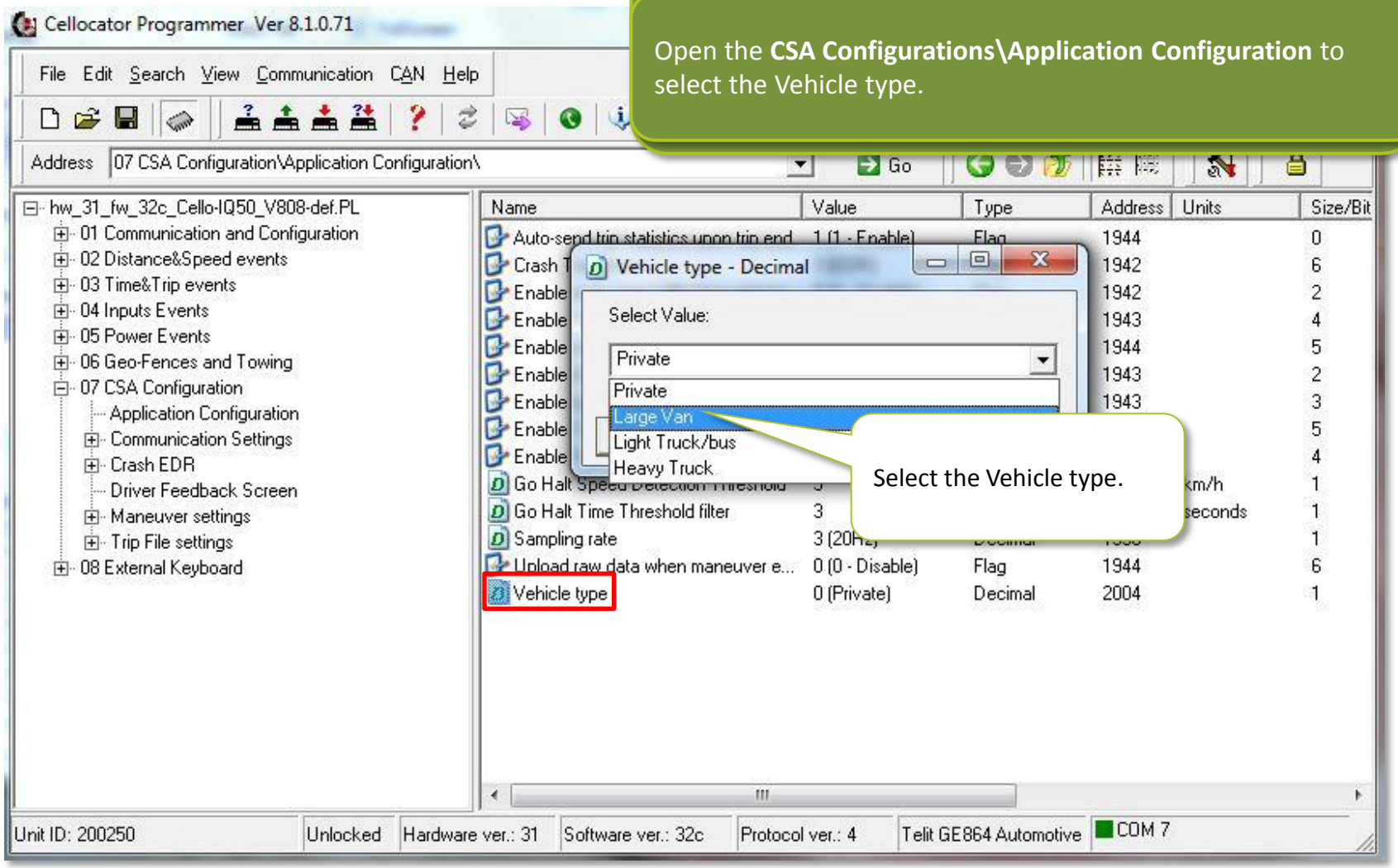
Scenario 3 – Maneuvers & DFD settings

Parameter name	PL configuration Scenario C	Simulation	Output expected
DFD	Disabled	DFD connected but does not project any kind of information. Notifies communication problem.	-
Maneuver reporting attributes	Event reporting – Yellow & Red. Statistics – Red only Raw data – Red & Yellow.	Test drive – Green events are not projected to server.	Yellow events are sent as events only. Red events are sent with statistics. Yellow and Red events send Raw data. However – trip score does not change. Demonstrated on KML file
RPM	Disabled	-	-
Speed	Off-board	Test drive	Over speeding events are not sent. GPS profile sent at the end of the trip.
Off-road	Disabled (this car is allowed to drive off-road as part of its job)	Test drive	Off road event is not reported.

Scenario 3 – Maneuvers & DFD settings

In **Cellocator Programmer**, configure the PL settings according

Open the **CSA Configurations\Application Configuration** to select the Vehicle type.



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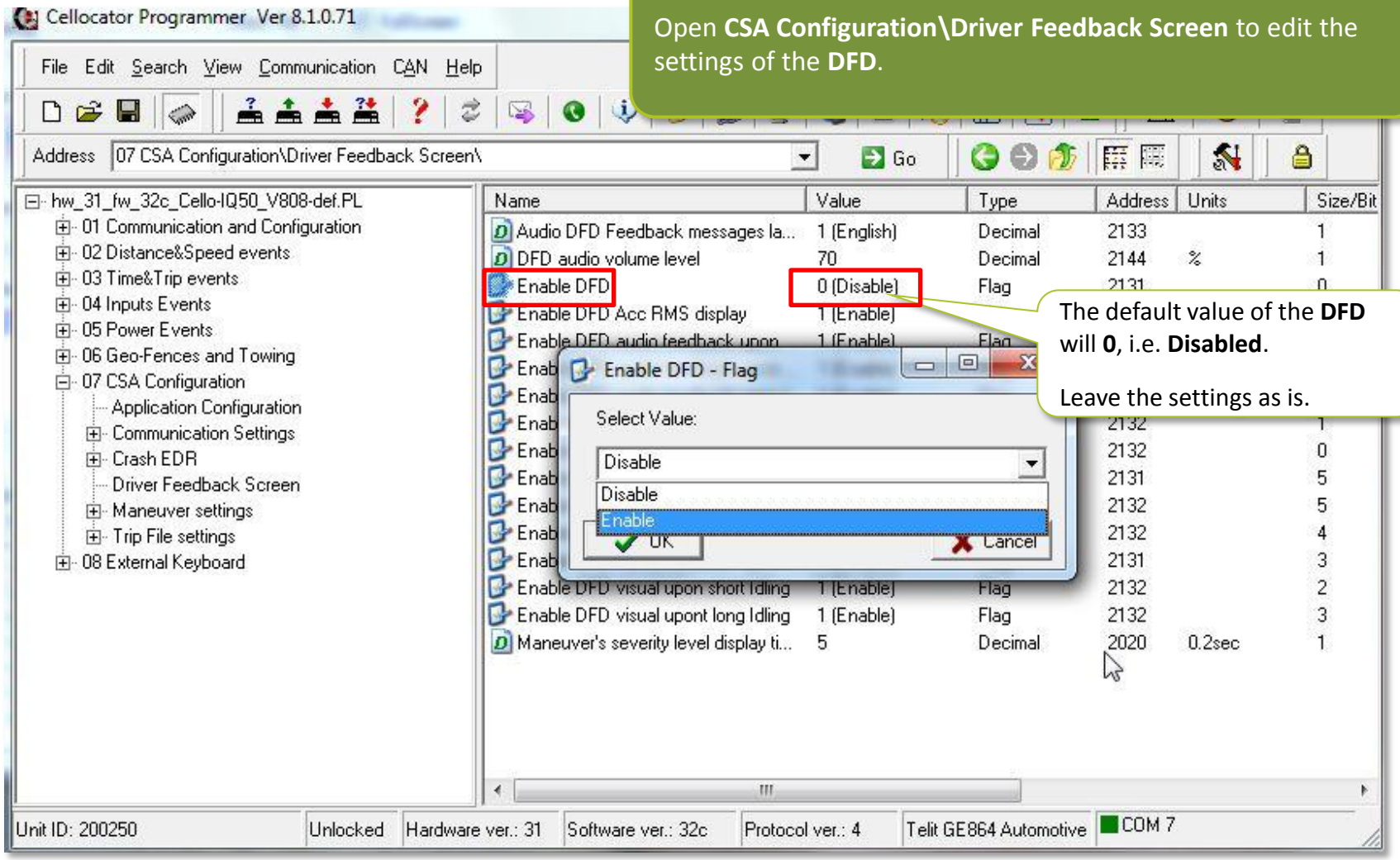
Scenario 3 – Maneuvers & DFD settings

Open **CSA Configuration\Driver Feedback Screen** to edit the settings of the **DFD**.



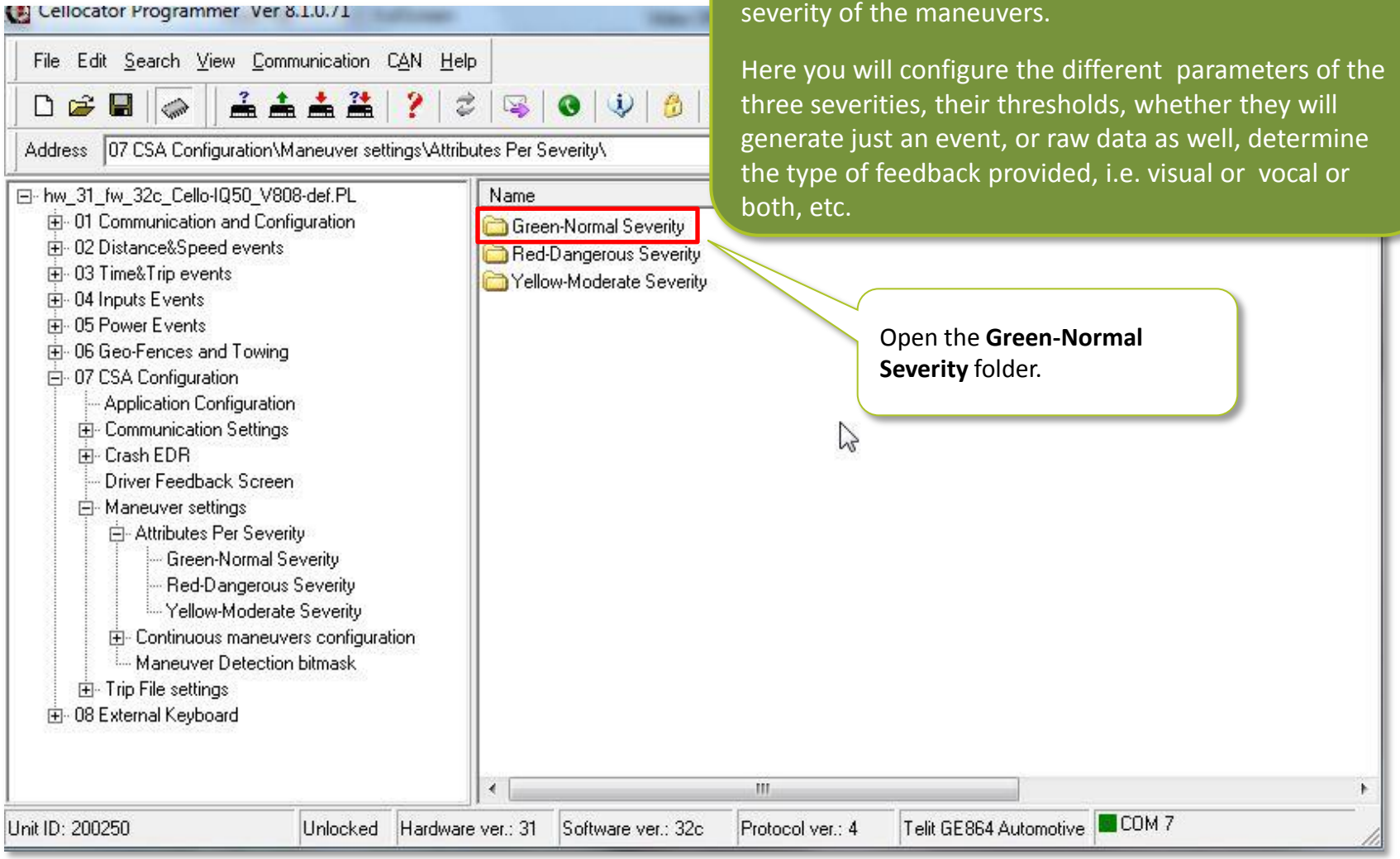
The default value of the **DFD** will **0**, i.e. **Disabled**.

Leave the settings as is.

Scenario 3 – Maneuvers & DFD settings

Open **CSA Configuration\Maneuver settings** to edit the severity of the maneuvers.

Here you will configure the different parameters of the three severities, their thresholds, whether they will generate just an event, or raw data as well, determine the type of feedback provided, i.e. visual or vocal or both, etc.



Open the **Green-Normal Severity** folder.

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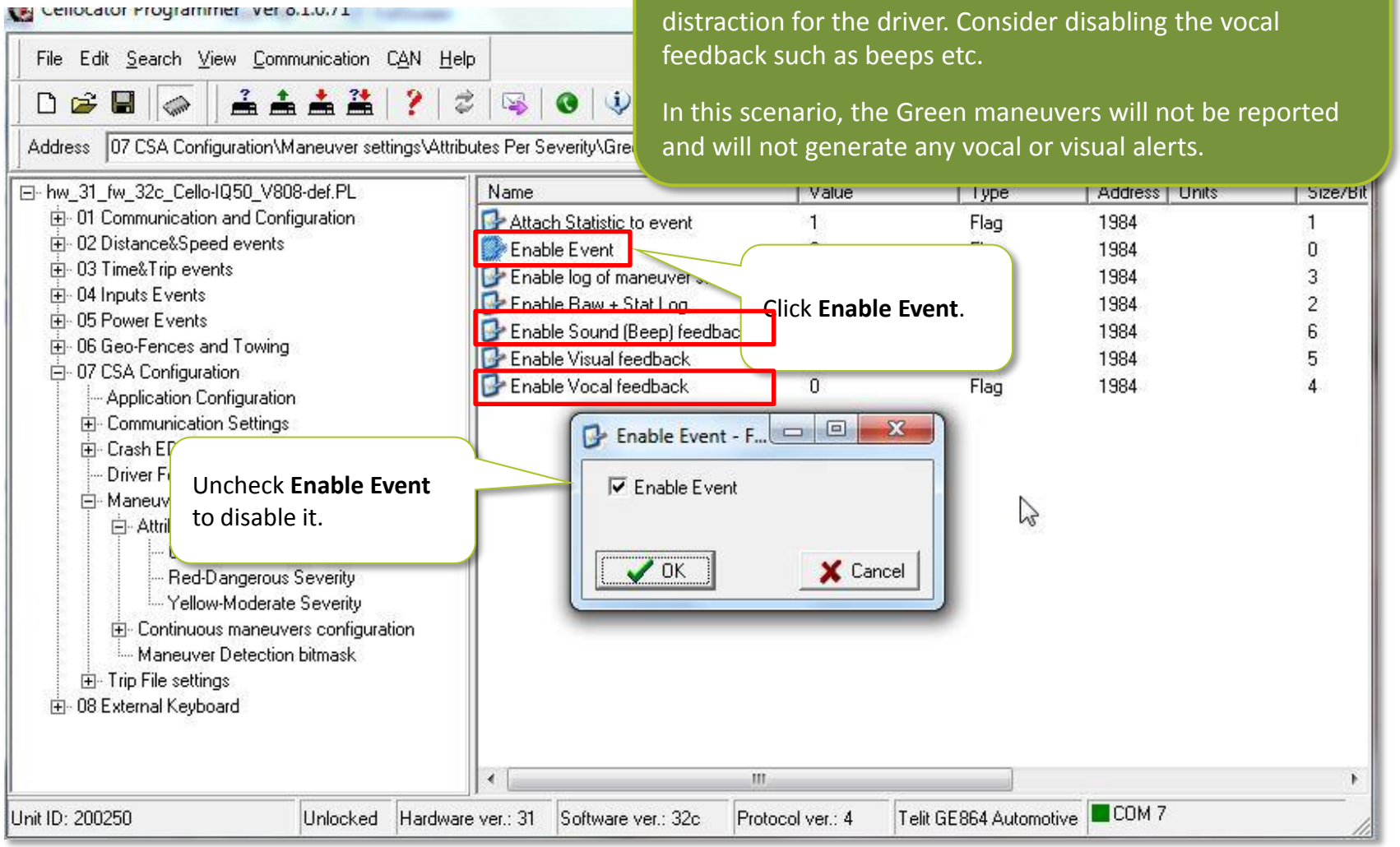
Scenario 3 – Maneuvers & DFD settings

In **Green maneuvers**, it is recommended to minimize distraction for the driver. Consider disabling the vocal feedback such as beeps etc.

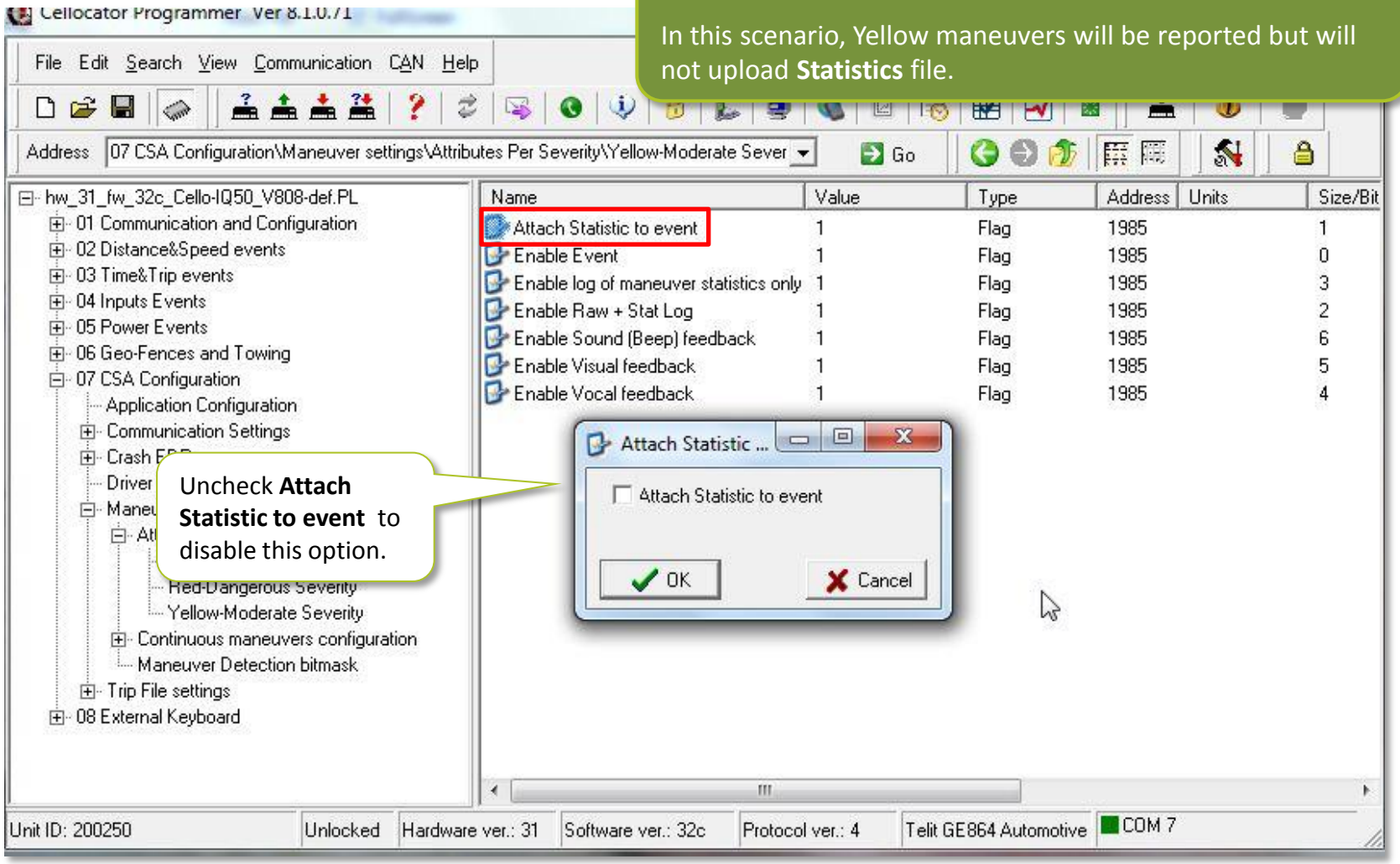
In this scenario, the Green maneuvers will not be reported and will not generate any vocal or visual alerts.



Scenario 3 – Maneuvers & DFD settings

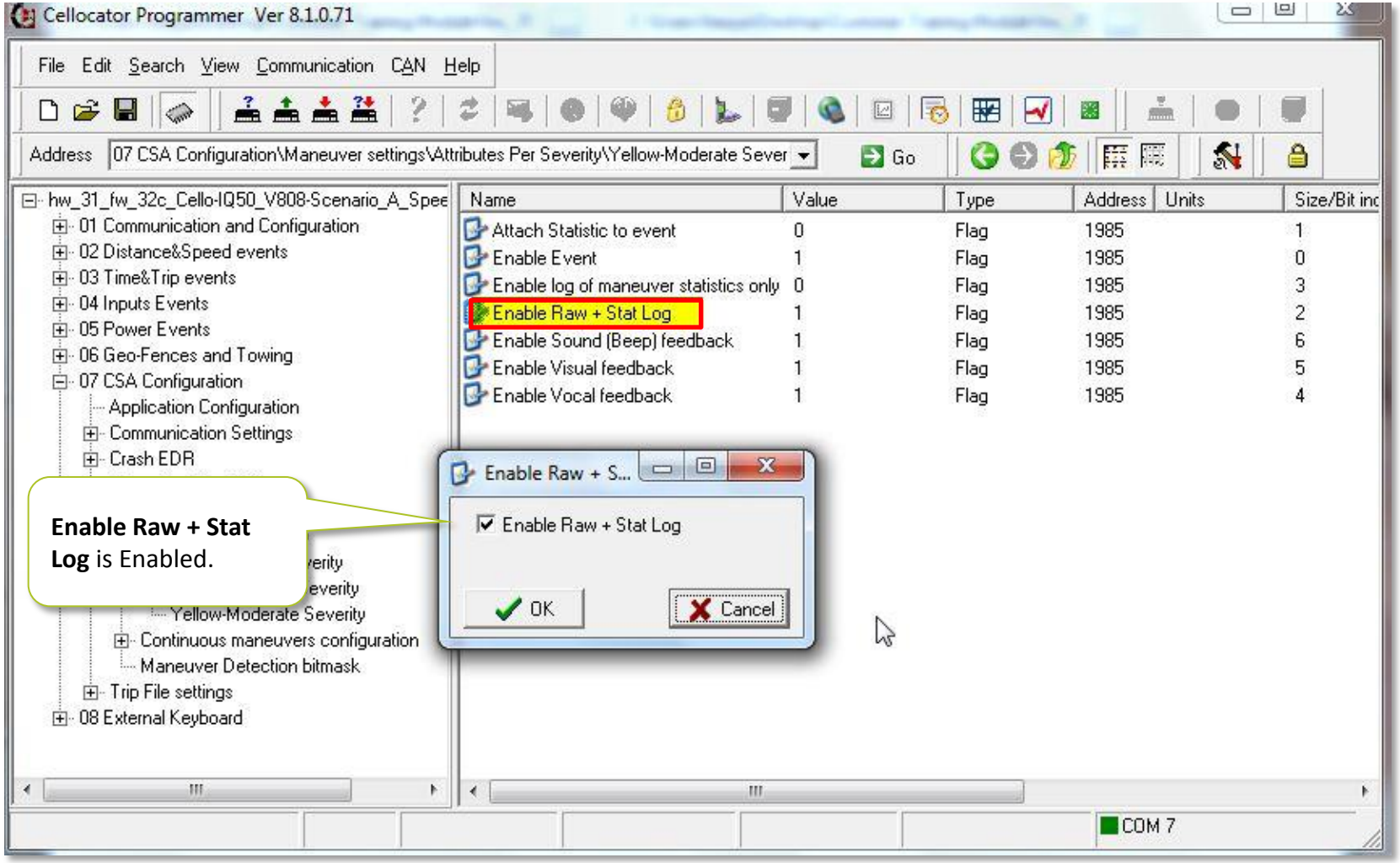
Proceed to set the **Yellow** maneuvers.

In this scenario, Yellow maneuvers will be reported but will not upload **Statistics** file.



Uncheck **Attach Statistic to event** to disable this option.

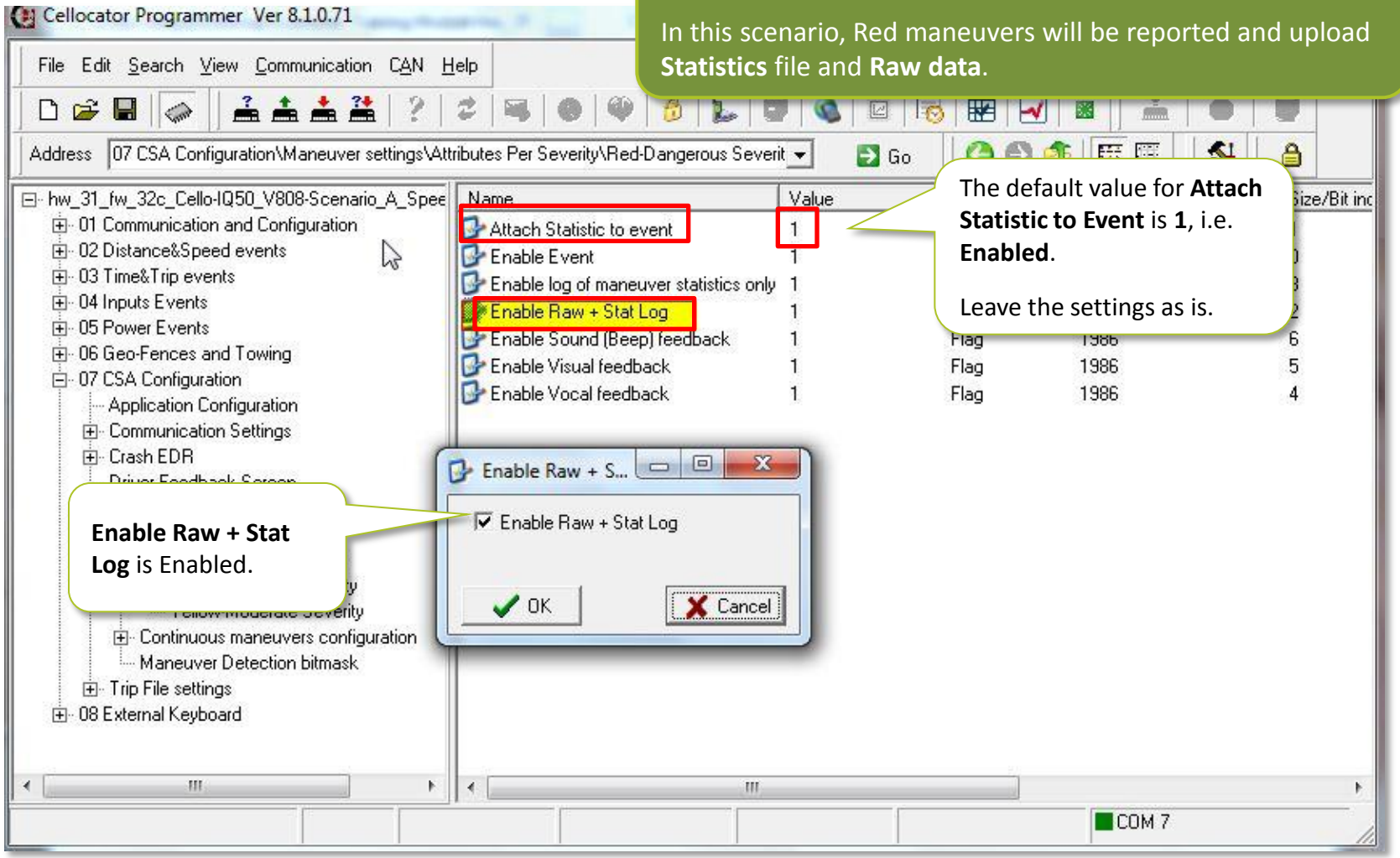
Scenario 3 – Maneuvers & DFD settings



Scenario 3 – Maneuvers & DFD settings

Proceed to set the **Red** maneuvers.

In this scenario, Red maneuvers will be reported and upload **Statistics** file and **Raw data**.



The default value for **Attach Statistic to Event** is **1**, i.e. **Enabled**.

Leave the settings as is.

Enable Raw + Stat Log is Enabled.

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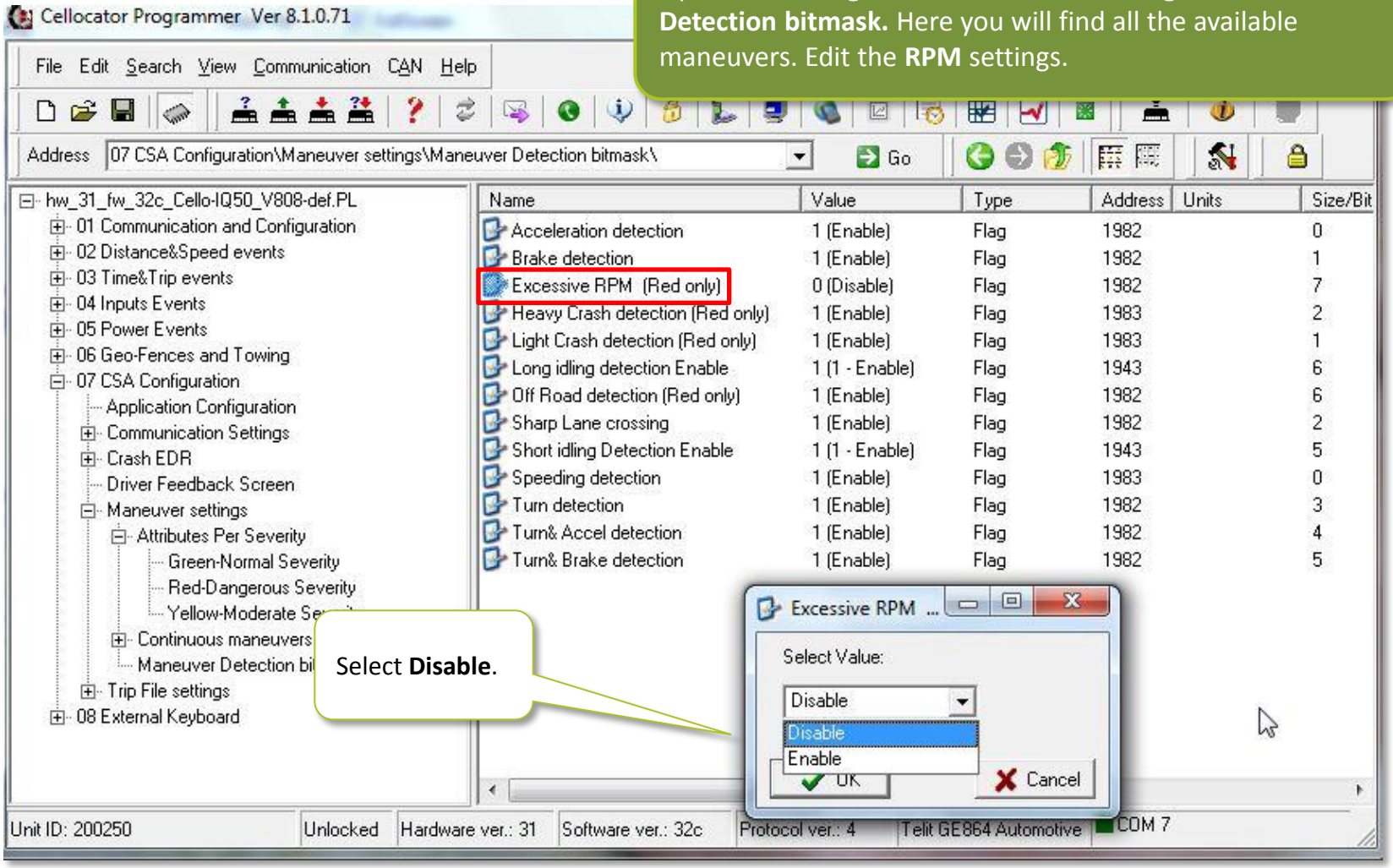
Scenario 3 – Maneuvers & DFD settings

Open **CSA Configuration\Maneuver settings\Maneuver Detection bitmask.** Here you will find all the available maneuvers. Edit the **RPM** settings.



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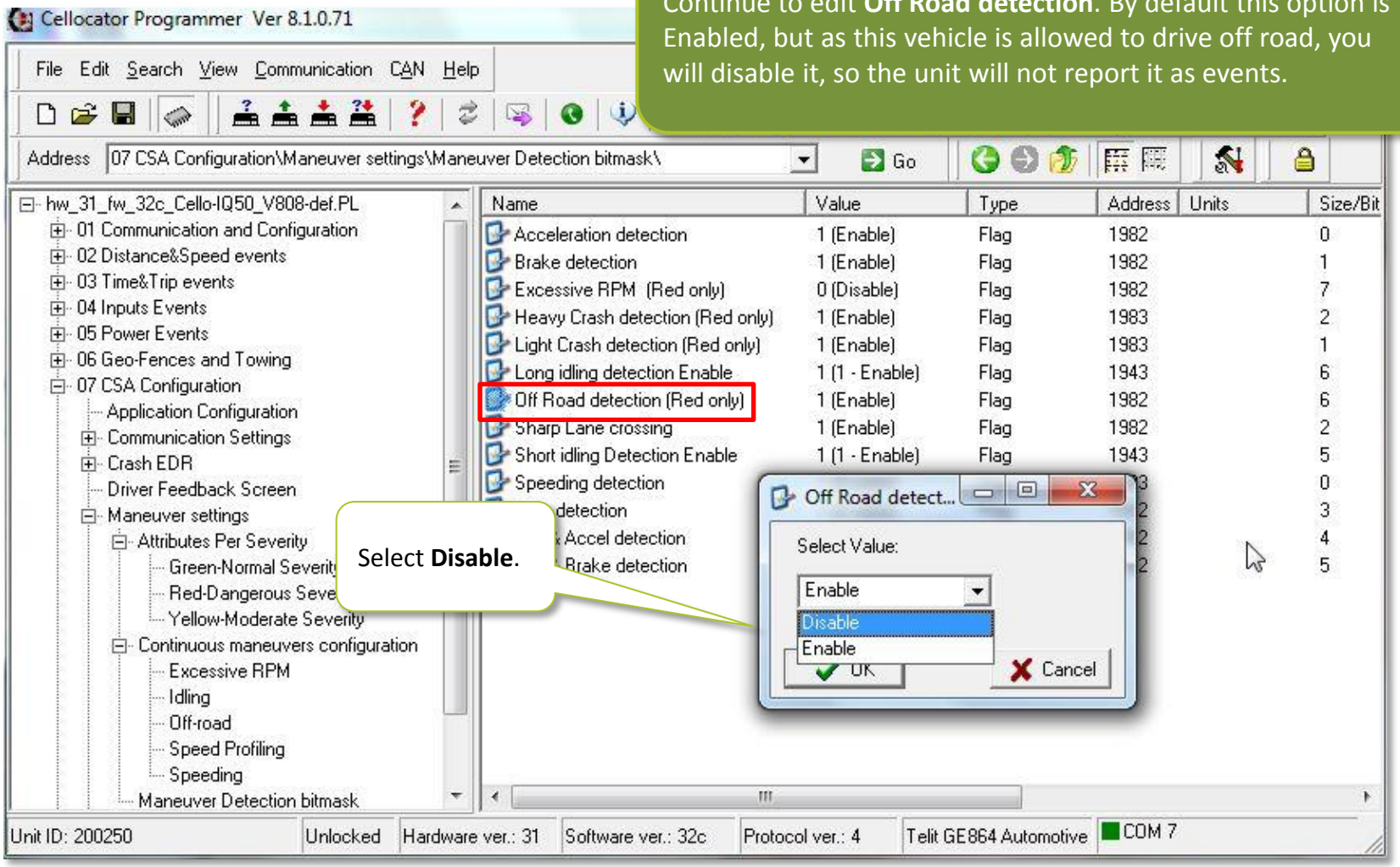
Scenario 3 – Maneuvers & DFD settings

Continue to edit **Off Road detection**. By default this option is Enabled, but as this vehicle is allowed to drive off road, you will disable it, so the unit will not report it as events.



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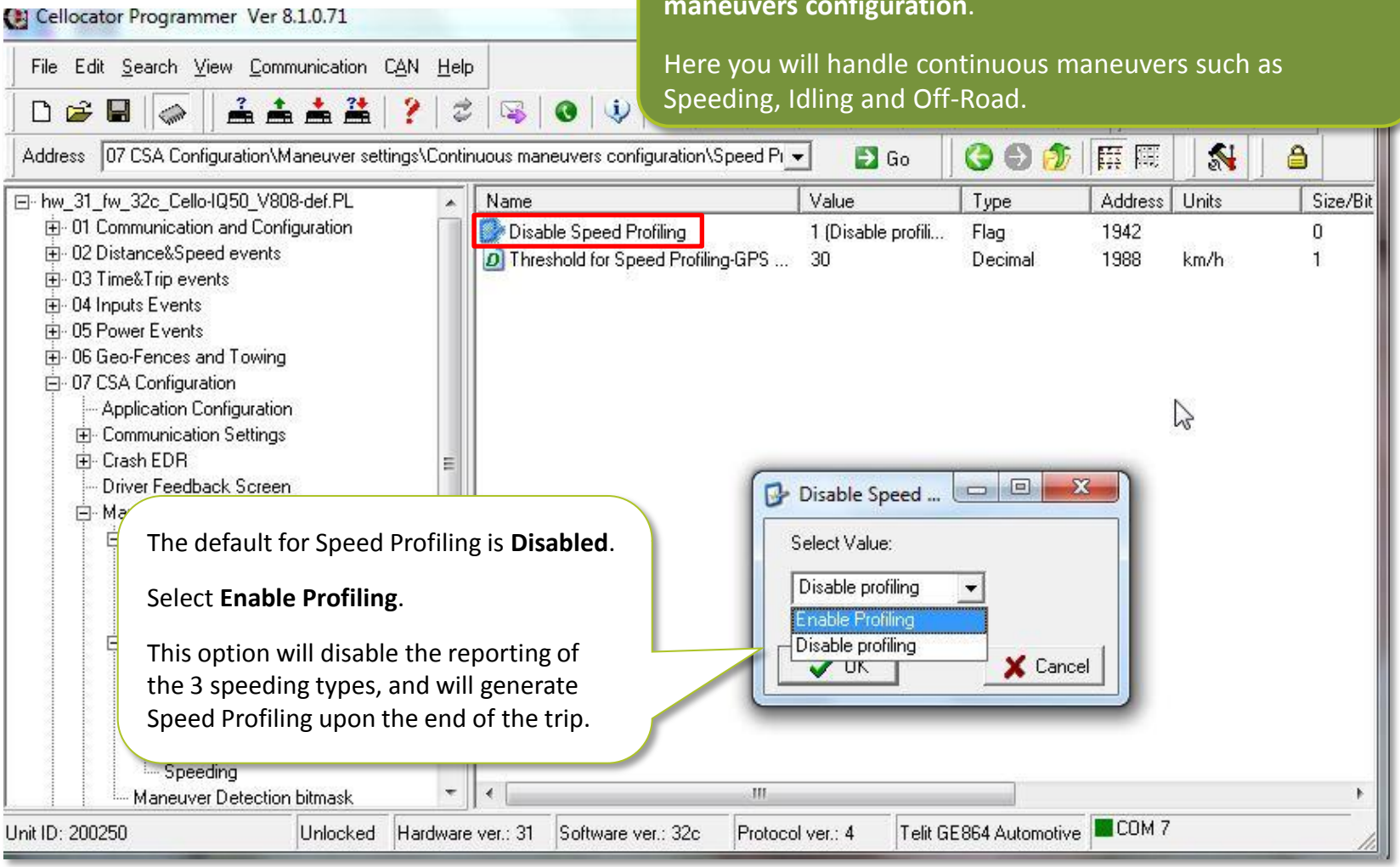
Scenario 3 – Maneuvers & DFD settings

Open **CSA Configuration\Maneuver settings\Continuous maneuvers configuration**.

Here you will handle continuous maneuvers such as Speeding, Idling and Off-Road.

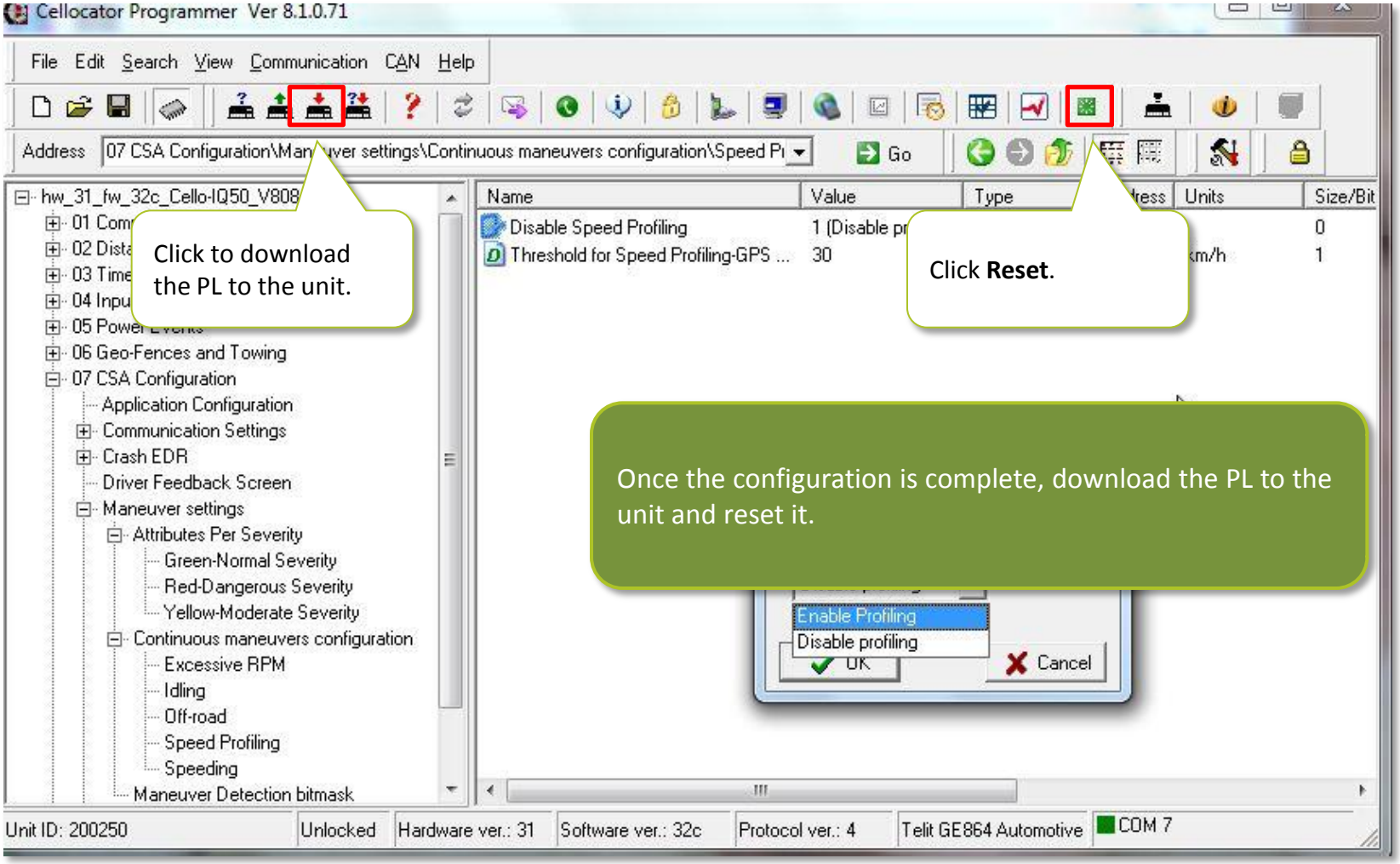


The default for Speed Profiling is **Disabled**.

Select **Enable Profiling**.

This option will disable the reporting of the 3 speeding types, and will generate Speed Profiling upon the end of the trip.

Scenario 3 – Maneuvers & DFD settings



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Scenario 3 – Maneuvers & DFD settings

The DFD will announce communication error, its status LED will blink continuously, and no visual and/or vocal announcements will be delivered.

Status LED blinking continuously.

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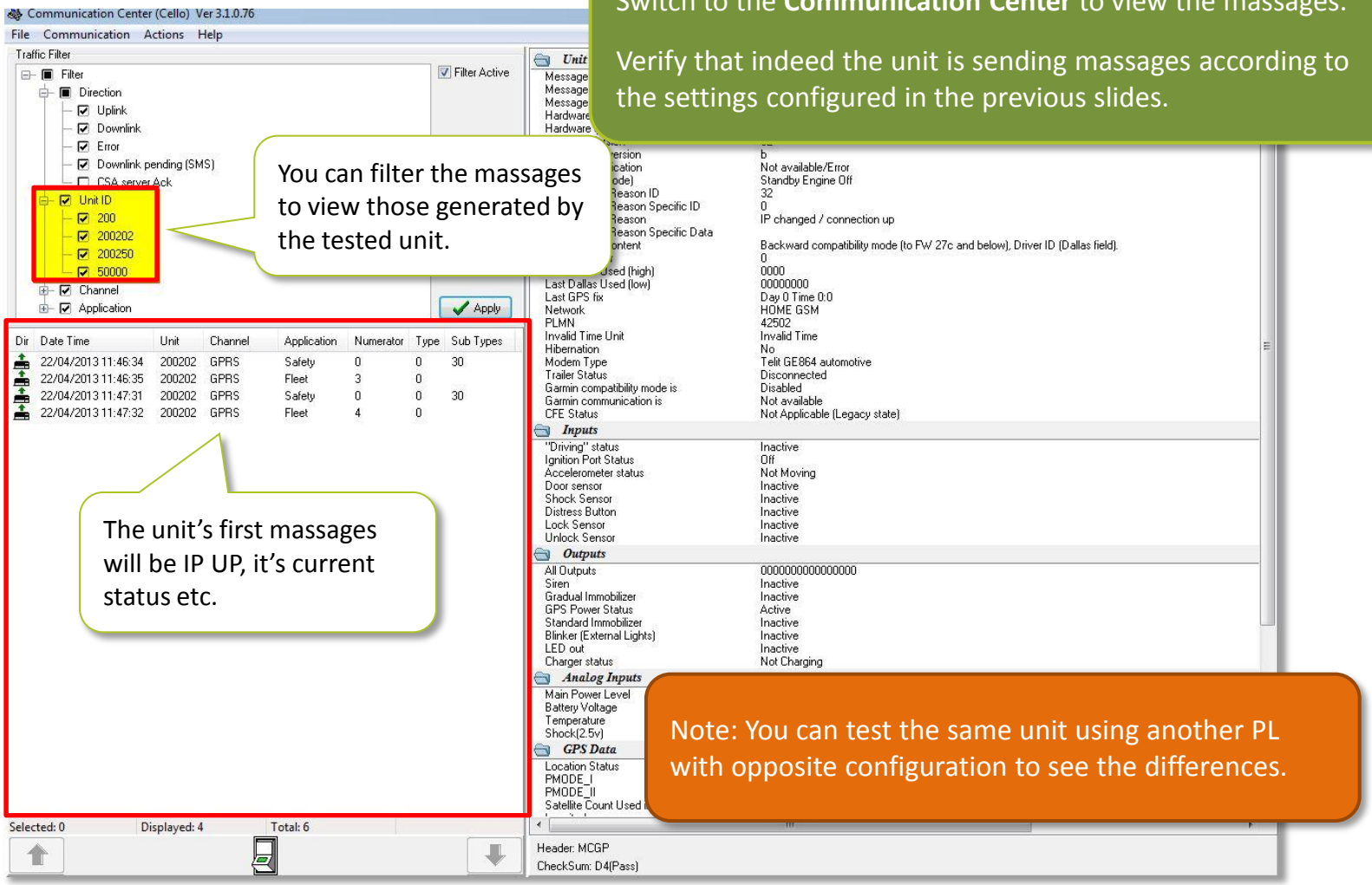
Scenario 3 – Maneuvers & DFD settings

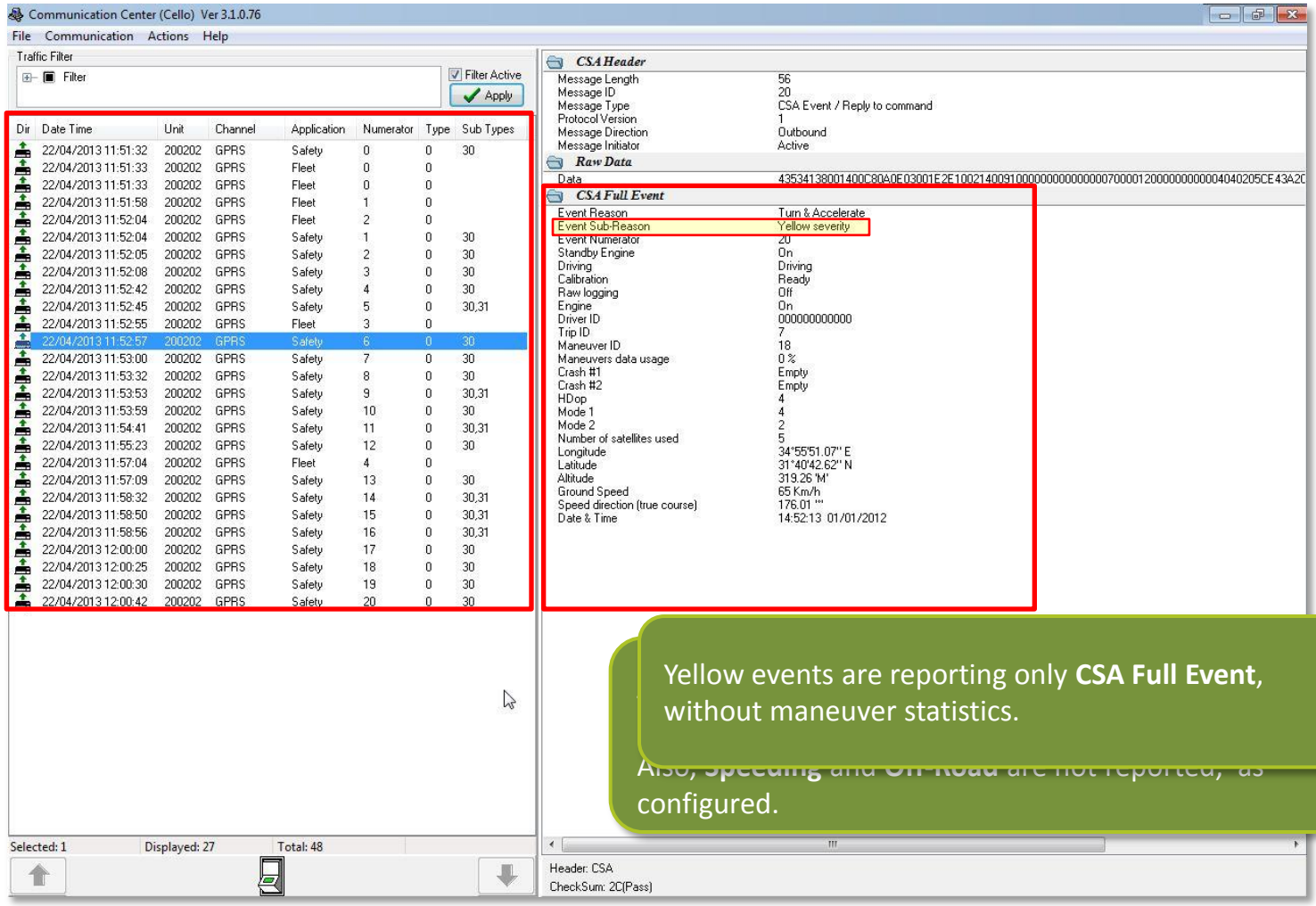
Switch to the **Communication Center** to view the massages.

Verify that indeed the unit is sending massages according to the settings configured in the previous slides.



Note: You can test the same unit using another PL with opposite configuration to see the differences.

Scenario 3 – Maneuvers & DFD settings



Yellow events are reporting only **CSA Full Event**, without maneuver statistics.

Also, **Speeding** and **Off-Road** are not reported, as configured.

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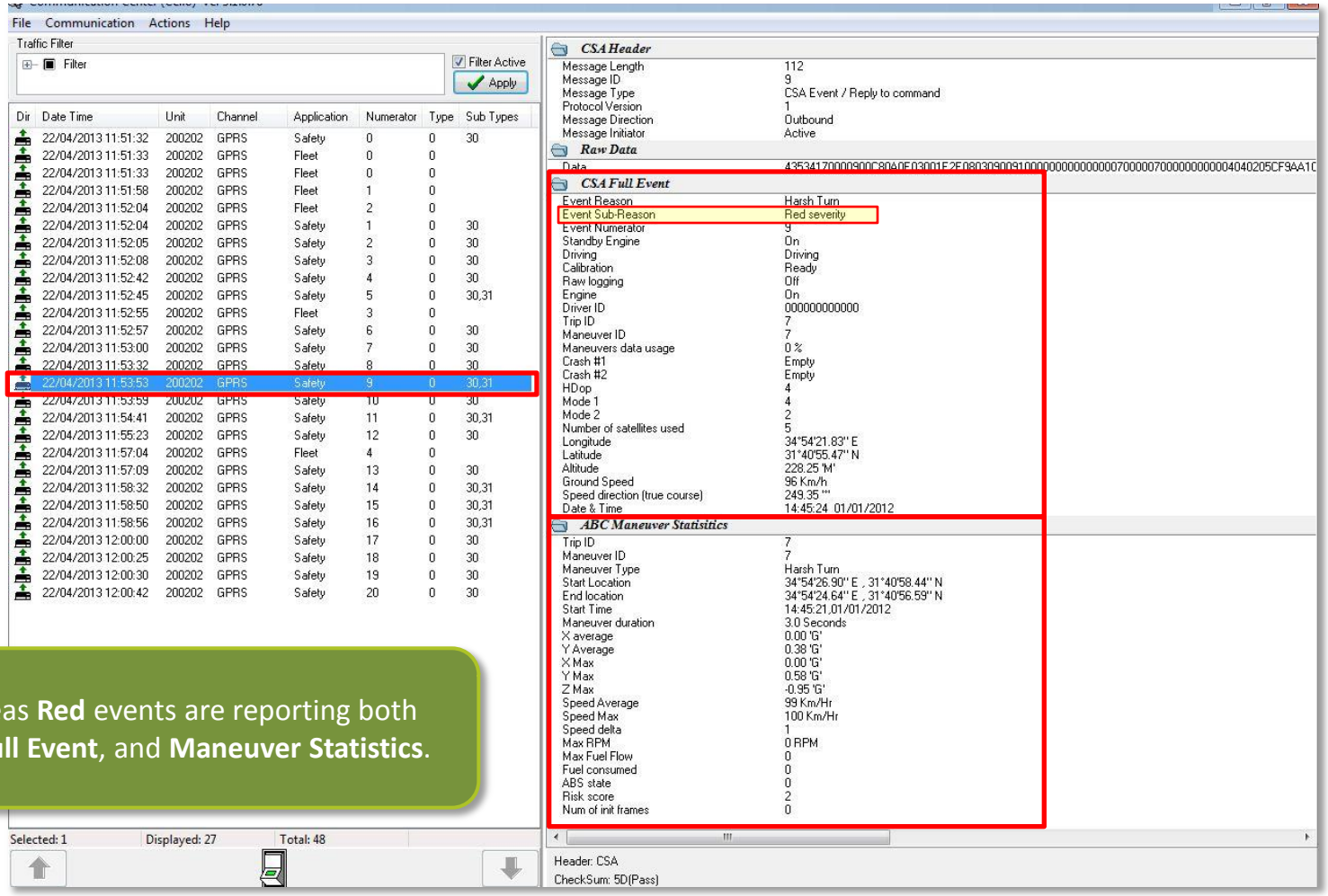
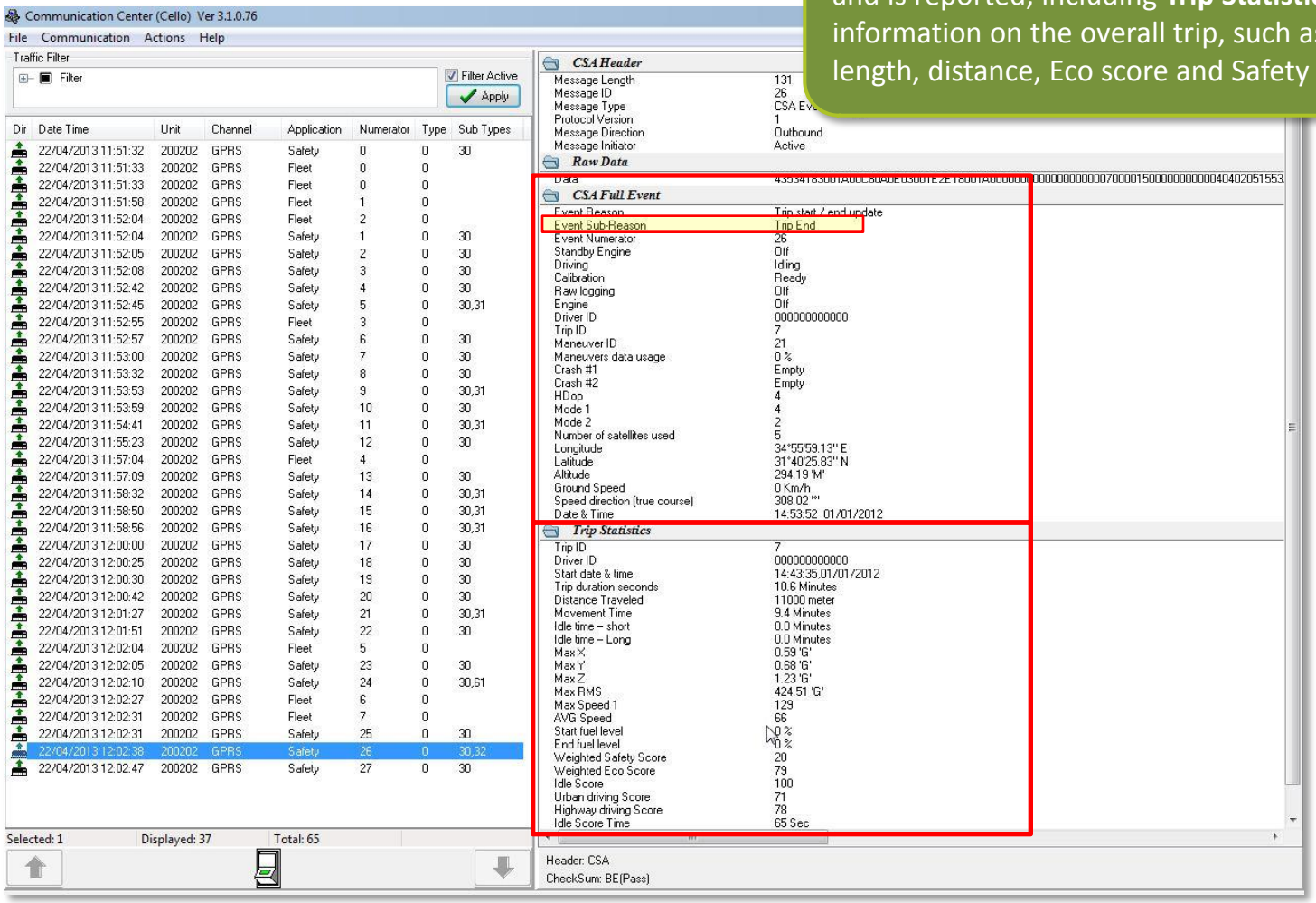
Scenario 3 – Maneuvers & DFD settings



Whereas **Red** events are reporting both **CSA Full Event**, and **Maneuver Statistics**.

Scenario 3 – Maneuvers & DFD settings

Upon the end of the trip, a massage of **Trip End** and is reported, including **Trip Statistics** information on the overall trip, such as trip's length, distance, Eco score and Safety score etc.



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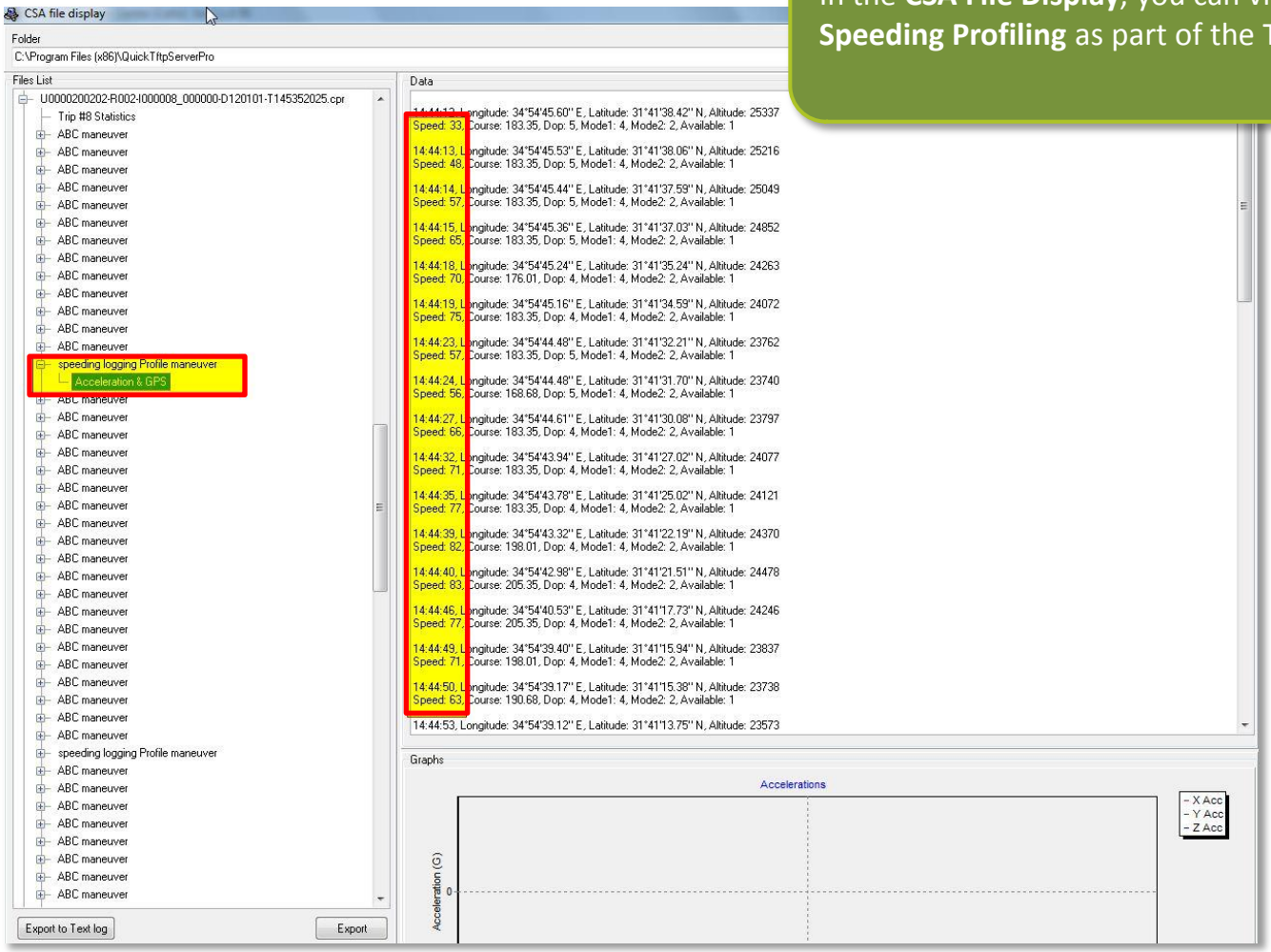
Scenario 3 – Maneuvers & DFD settings

In the **CSA File Display**, you can view the **Speeding Profiling** as part of the Trip file.



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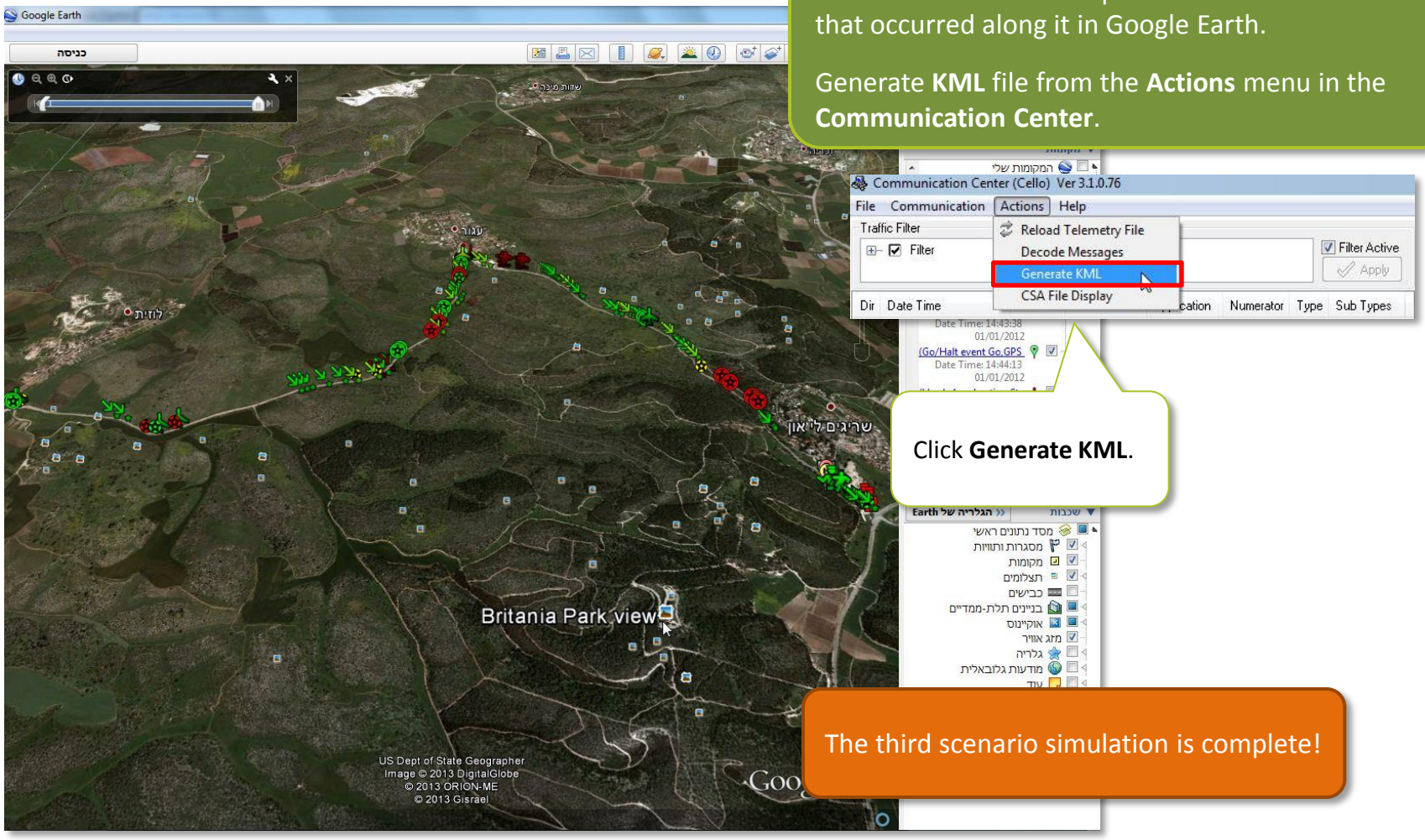
Scenario 3 – Maneuvers & DFD settings

You can also view the trip and the different events that occurred along it in Google Earth.

Generate **KML** file from the **Actions** menu in the **Communication Center**.



Click **Generate KML**.

The third scenario simulation is complete!

Scenario 4 – Maneuvers & DFD Exercise

Parameter name	PL configuration Scenario D	Simulation	Output expected
Vehicle type	MCV/BUS	-	-
DFD	Enabled. Red – speech, yellow- beeps, green – LEDs. With driver identification Language –English> French	Test drive	DFD reporting acts according to definition.
Maneuver reporting attributes	Event reporting – all Statistics – all Raw data – yellow & red.	Test drive	All events are projected on the DFD and sent to the CSA server but only yellow and red events are sent as raw data at the end of the trip. Trip score remains unchanged. Can be demonstrated on KML file
RPM	Disabled	-	-
Speed	On-board	Test drive	Over speeding events reported thru DFD and to the CSA according to their occurrence in the video.
Off-road	Enabled	Off road scenario	Off road event+ DFD output

Check out your knowledge. Set up the PL according to the scenario and verify that you receive the expected results. Good luck!

Cellocator Cello-IQ – Let’s take a ride

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