HELIOS

User Guide

Version 2.3

October 2016

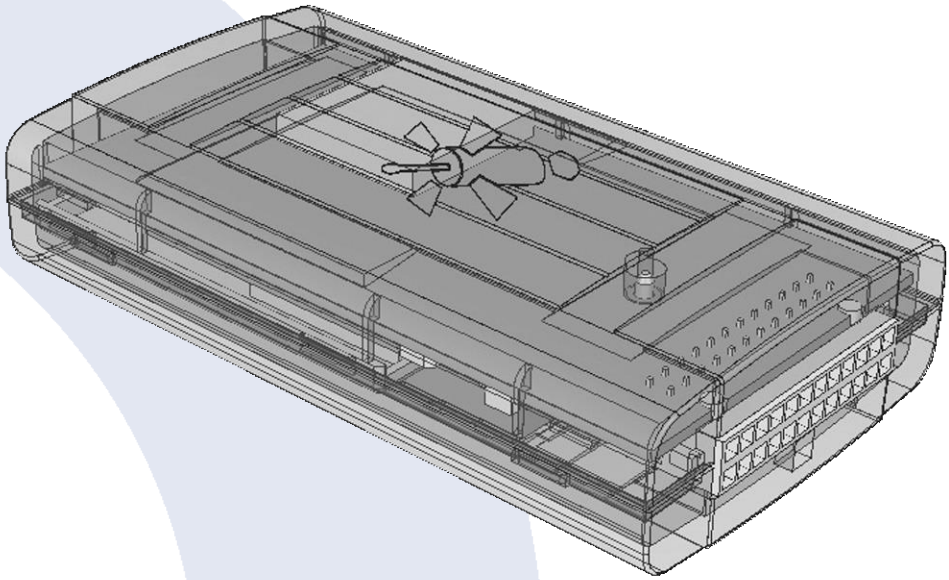
Contents

1. Introduction

Helios is a real-time vehicle tracking device designed for fleet management and security applications.

It offers over 200 unique features, such as fuel consumption monitoring, extra digital inputs for connection of various external sensors, offline communication option, built-in accelerometer, OTA (over-the-air) programming, and more.

The system allows to configure a wide variety of events for fleet manager and the communication channels which define where and how the notifications are transmitted.



2. Package Contents

1. Helios unit
2. Helios wire harness

Helios evaluation kit

Evaluation kit package includes:

1. Simulator
2. Simulator power supply
3. Simulator to Helios connection cable
4. Simulator USB to Mini USB cable
5. RS232 cable
6. Keypad
7. Two Dallas keys and Dallas socket
8. Three Helios units with wire harnesses

Simulator description

The Simulator was developed for Helios testing and presentation purposes. It simulates the vehicle behavior and alarm triggers. The LEDs light up to indicate the unit input/output response. It can serve as an efficient tool in training your employees and evaluating their performance. The Simulator is an effective, professional sales tool which can be used to demonstrate the system advantages and present them to your customers.

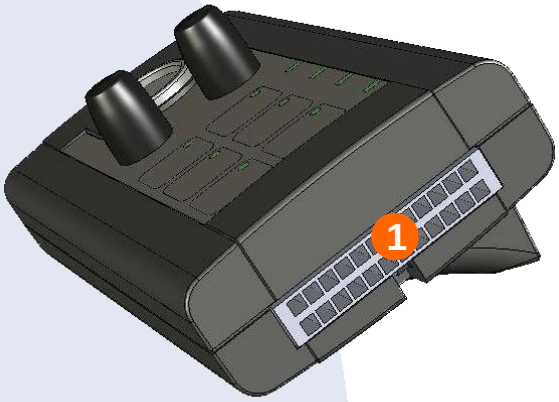
Front panel

1. Power LED
2. Dallas Key socket
3. Analog input knobs
4. Output simulator LEDs
5. Input simulator buttons and LEDs

Left panel

1. DLS/KYPD – Dallas Key / Keypad switch
2. Mini USB connector
3. ON/OFF – Power switch
4. Power connector

Right panel



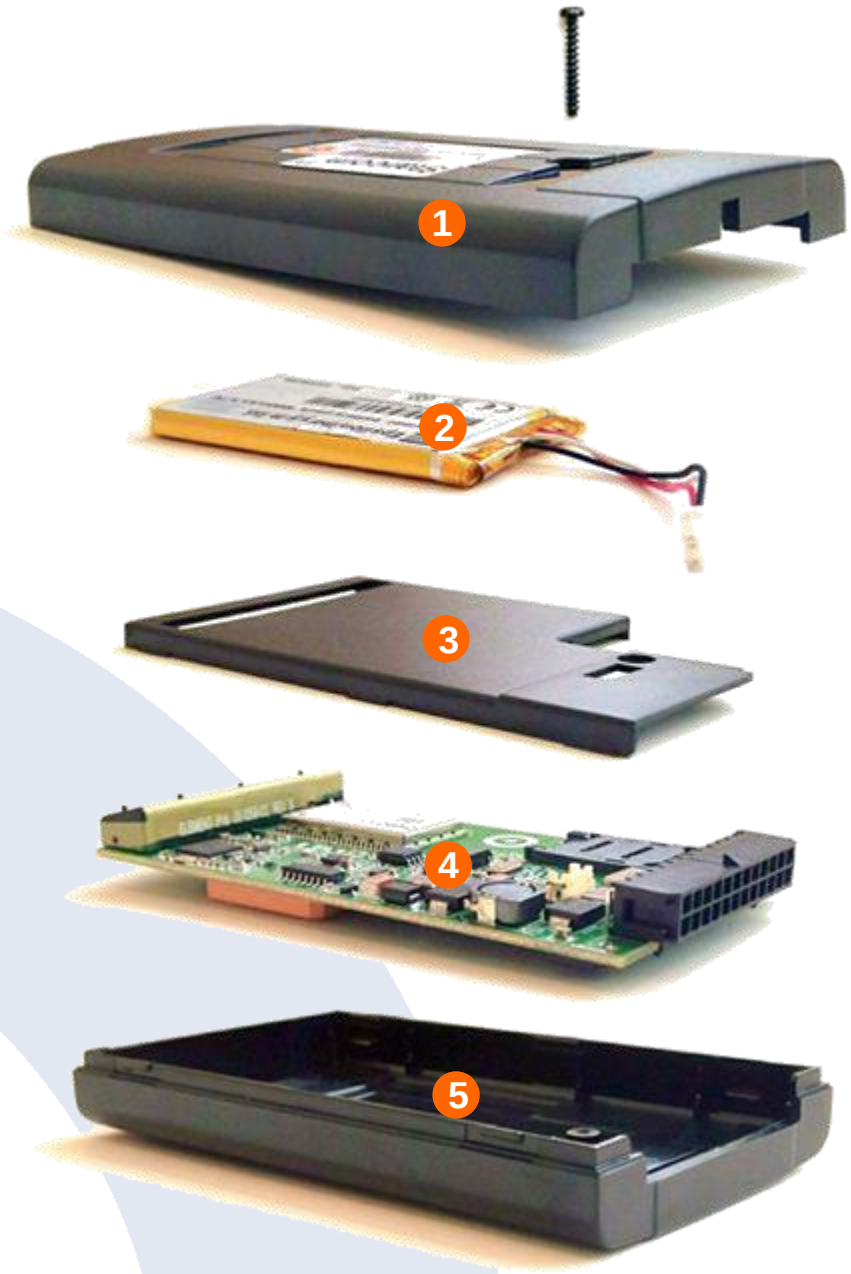
1. 24-pin connector

Back panel

1. Keypad connector

NOTE: When connecting a keypad, make sure to place the DLS/KYPD switch on the left panel in the KYPD position.

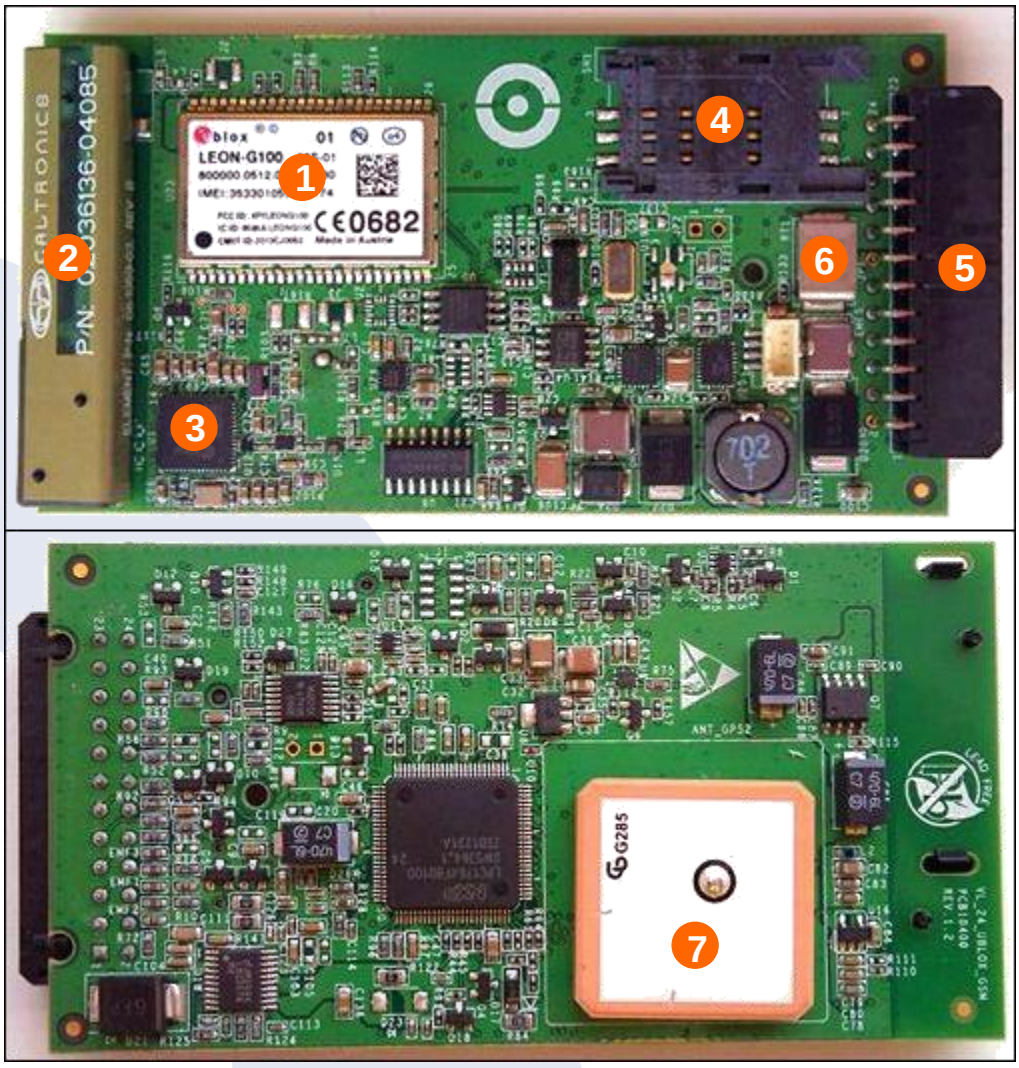
3. Product Description



1. Bottom cover – plastic cover which snaps onto the top cover and is secured with a screw.
2. Battery – backup battery (optional).

3. Divider – plastic divider which snaps onto the top cover. The backup battery is placed on top of this divider.
4. Unit board – printed circuit board with electronic components which is secured to the top cover.
5. Top cover – plastic cover which covers the GPS antenna. This side should be facing upwards when the unit is installed in the vehicle.

Unit board main components



1. GSM modem
2. GSM antenna
3. GPS chipset
4. SIM card holder
5. 24-pin / 10-pin connector
6. Fuse
7. GPS antenna

Helios models

	Helios TT	Helios Basic (discontinued)	Helios Advanced+	Helios Hybrid
GPS	✓	✓	✓	✓
GSM	✓	✓	✓ (optional 3G, HSDPA and CDMA)	✓ (optional 3G, HSDPA and CDMA)
Satellite Connectivity	-	-	-	✓
Connector	10 pin Molex	10 pin Molex	24 pins Molex	24 pins Molex + 10 pins Molex
Accelerometer	✓	-	✓	✓
CAN Bus	-	✓	✓	✓
Usage	Track and trace	Track and trace Basic functions	Full fleet and security features Can be used as standalone alarm system	Full fleet and security features Can be used as standalone alarm system
Advantages	Low cost Waterproof IP65 (optional) Allows a tow detection with very low power consumption	Low cost Quick installation	Additional inputs/outputs Built-in accident and harsh braking detection	Additional inputs/outputs Built-in accident and harsh braking detection Constant communication around the world, even without cellular coverage

I/O	2 digital inputs (one digital input can be used as an analog input) 1 digital output 1 COM port	1 digital input 1 analog / digital input 1 digital output RS232 iButton / Keypad / Remote Control input	8 digital inputs 3 analog inputs 4 digital outputs 1 pulse counter RS232 Can Bus *Hands Free input iButton / Keypad / RF Keypad / Remote Control input	8 digital inputs 3 analog inputs 4 digital outputs 1 pulse counter RS232 dedicated to Hybrid module Can Bus *Hands Free input iButton / Keypad / RF Keypad / Remote Control input
SIM card	 Micro-SIM (3FF)	 Mini-SIM (2FF or Standard SIM)	 Mini-SIM (2FF or Standard SIM)	 Mini-SIM (2FF or Standard SIM)

* When Hands Free Kit is used, the unit is left with 5 digital inputs and 2 analog inputs only.

For connector pin out information, see *Helios TT pin out, Helios Basic 10-pin pin out* and *Helios Advanced+ 24-pin pin out* (Chapter 6 – Installation).

Technical specifications

CPU	Type Memory	NXP ARM Cortex-M3 Static RAM: 128kb ROM: 34kb Flash: 2048kb
Power	Voltage Range Consumption	8 V – 28 V (supported in same unit) 3 mA in low power mode up to 120 mA in working mode can reach up to 300 mA if battery is charged
Backup Battery (optional)	Type Power	Lithium-ion Polymer 3.75 V, Helios Advanced+: 950 mAh / Helios TT: 550 mAh
GPRS – Cellular Modem **Satellite Modem (external device)** **Data Messages**	GSM Antenna Type Network Channels Connection SMS GPRS	Quad Band (850, 900, 1800, 1900). Built in (concealed) GSM, CDMA, HSDPA, SMS 3G (optional) RS232 Encrypted Protocol TCP/IP
Location	Type Time to First Fix (TTFF) Positioning Accuracy Antenna Type	GPS / GLONASS (optional) 2 sec (hot start) 10 m CEP (50%) Velocity: 0.2 m/s (50%) Built in (concealed)
COM Port	Type Speed	RS232 115,200 bps (default)
I/Os (check per model)	Digital Inputs Digital Outputs Analog Inputs Pulses Counter CAN Bus	Helios Advanced+: Max 8 / Helios TT: Max 2 Helios Advanced+: Max 4 / Helios TT: Max 1 Helios Advanced+: Max 3 / Helios TT: Max 1 Max 1 (Helios Advanced+ only)

		Included (Helios Advanced+ / Basic)
Accelerometer (check per model)	Type Purpose	3-Axis, 20 mg accuracy, up to 8 g Identify and report events of impact, accident
Alarm System	Immobilizer Disarming Options	External – Gradual Stop Keypad, Dallas Key, Remote Control, RF Keypad
Dimensions	Size Weight	Helios Advanced+: 21H x 60W x 107L (mm) 0.82H x 2.36W x 4.21L (inches) Helios TT: 21H x 60W x 57L (mm) 0.82H x 2.36W x 2.24L (inches) Helios Advanced+: 150 (grams) 5.29 (Oz) Helios TT: 120 (grams) 4.23 (Oz)
Environmental	Operating Temp Storage Temp Humidity	-40°C (-40°F) to 60°C (140°F) -40°C (-40°F) to 85°C (185°F) Max 50%

Industry approvals and certifications

For available certificates, see:
http://wiki.starcomsystems.com/wiki/index.php/Marketing#Certifications.

4. Configuration

Downloading the Software

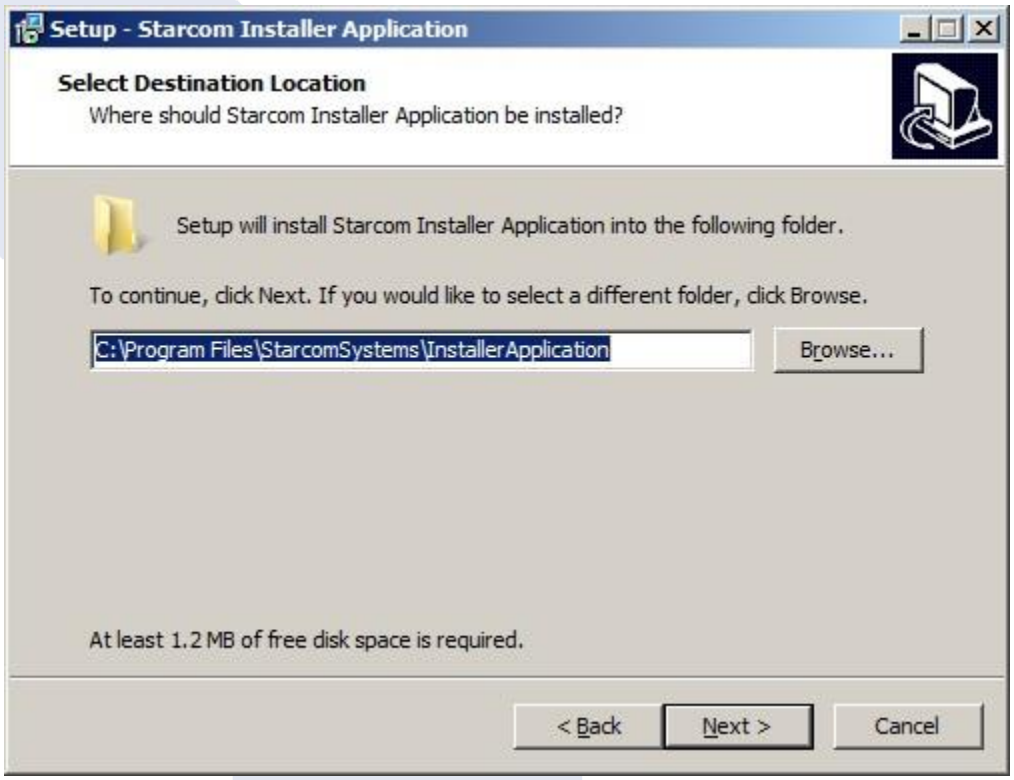
For the link to download the Installer application setup file, please contact Starcom technical support by **Email**: support@starcomsystems.com, or **Skype**: **starcom.support**.

Installing the Software

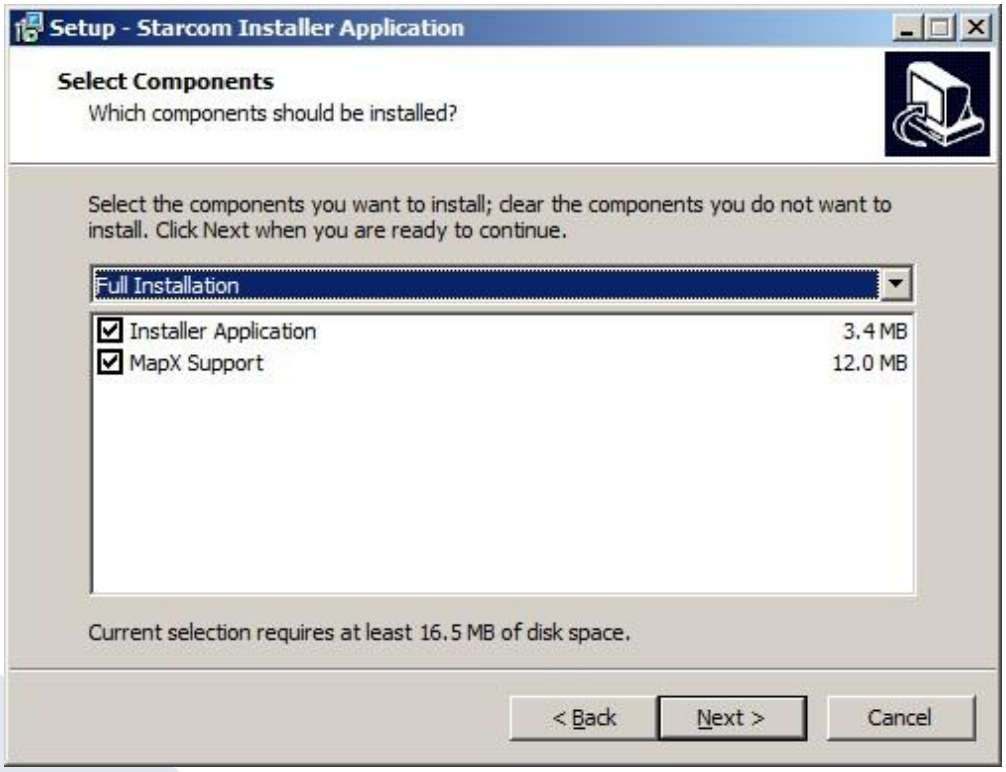
Locate the folder where you saved the installer setup file. Double-click the **InstallSetup.exe**. The Open File dialog box appears.

Click **Run**. A Windows Security dialog box appears. Click **Yes**. The Welcome to the Starcom Installer Application Setup Wizard window appears.

Click **Next**. The Select Destination Location window appears.



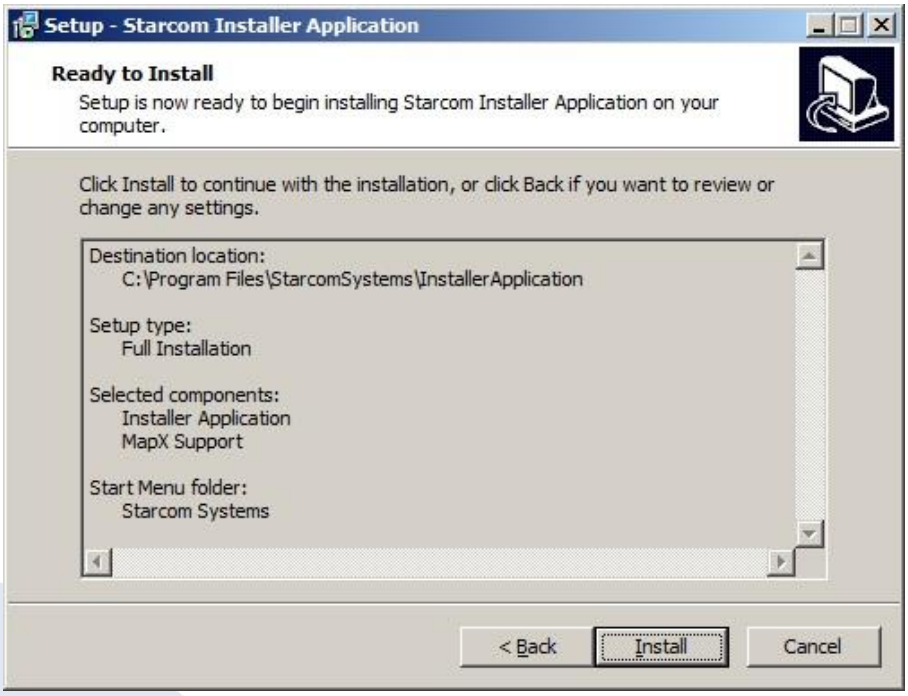
Click **Next**. The Select Components window appears.



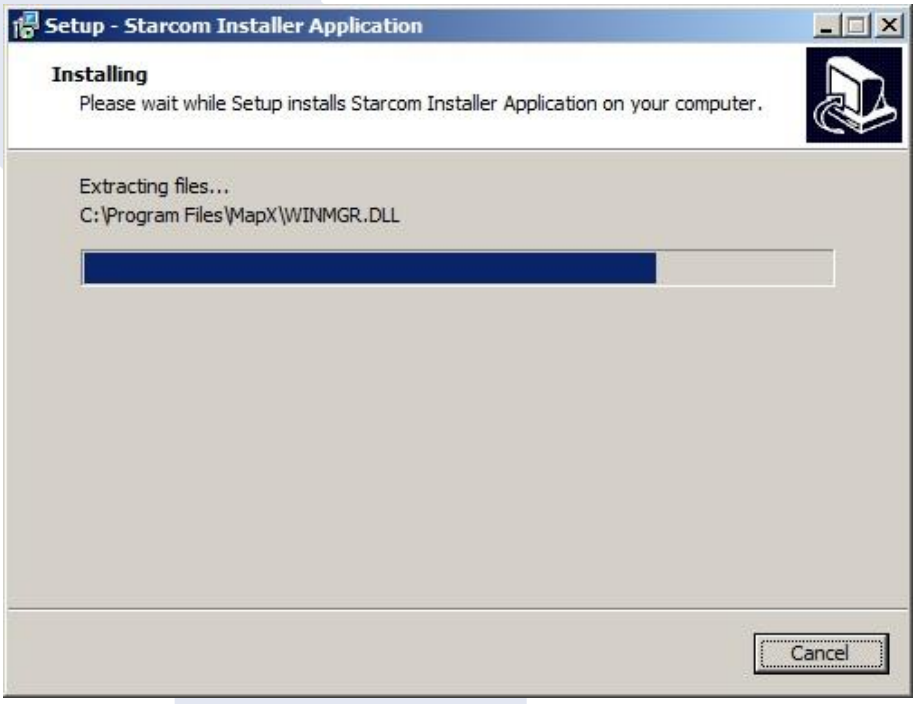
Click **Next**. The Select Start Menu Folder window appears.

NOTE: Select **Don't create a Start Menu folder** checkbox, if you do not want to create a start menu folder.

Click **Next**. The Ready to Install window appears.



Click **Install**. The installation starts and a progress bar appears in the window, indicating the progress of the installation.



When the installation is complete, the Completing the Starcom Installer Application Setup Wizard window appears.

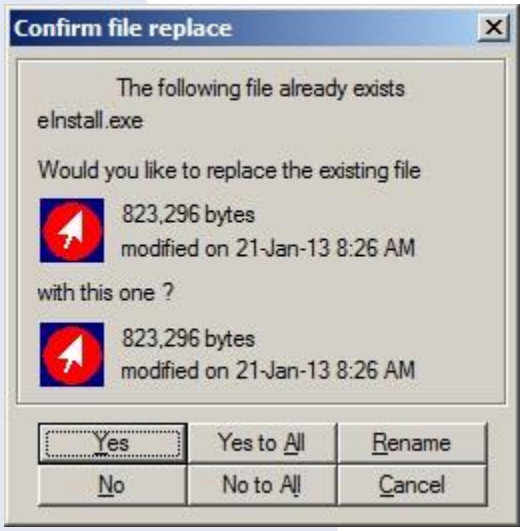
Click **Finish**.

Installing the Update

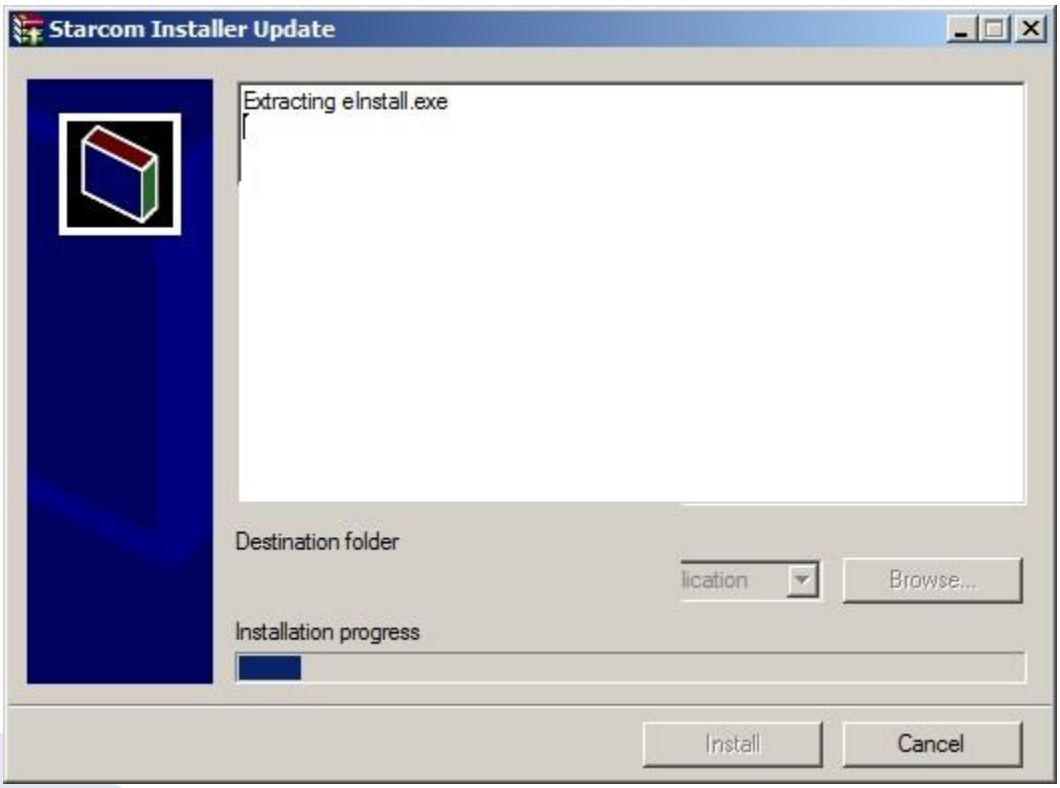
To install the Installer update software, locate the folder where you saved the update file. Double-click **IUpdate.exe**. The Open File dialog box appears.

Click **Run**. The Starcom Installer Update window appears.

Verify that the Destination folder points to the location where the Starcom Installer software is installed and click **Install**. A Windows Security dialog box appears. Click **Yes**. The Confirm file replace dialog box appears.



Click **Yes to All**. The installation starts and a progress bar appears in the window, indicating the progress of the installation.



The Starcom Installer Update window closes, when the update is complete.

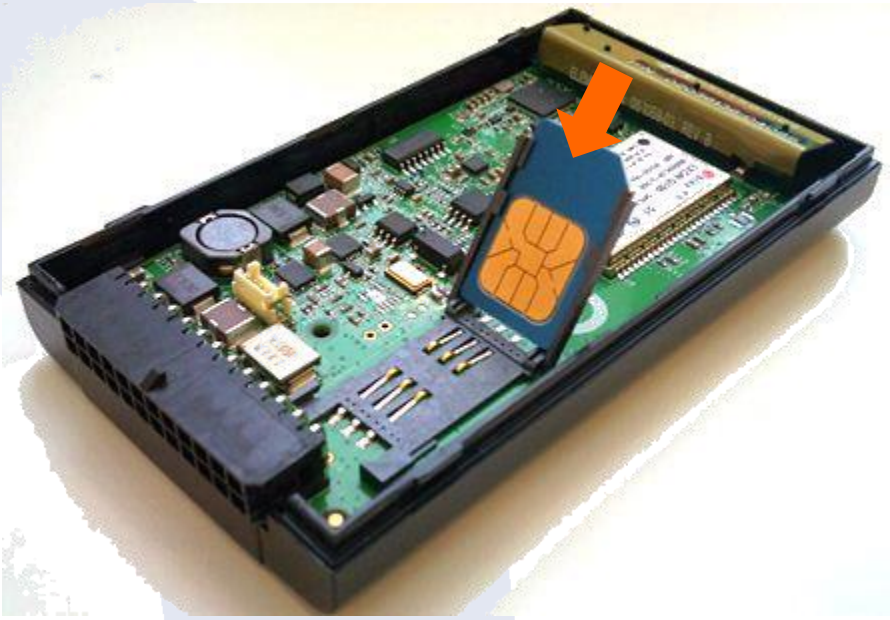
Inserting the SIM card

Use a small Phillips screwdriver to remove the screw from the bottom cover.

Insert a flat screwdriver in the slot between the unit covers. Carefully twist the screwdriver to lift and open the unit cover.

Gently push and pull back the plastic SIM card holder to release and open the SIM card slot. Raise it to an upright position.

Insert the SIM card in the SIM card slot with its gold contacts facing down and its cut-off corner facing out the SIM card slot, as shown in the following image.



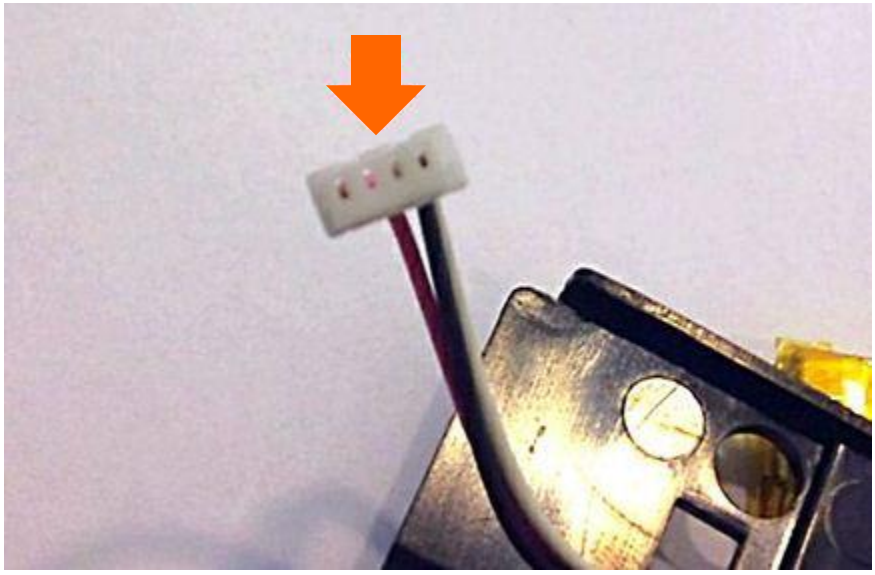
Lower the SIM card holder back to the horizontal position. Gently press and push the SIM card holder forward to snap it back into place.

Attaching the battery (optional)

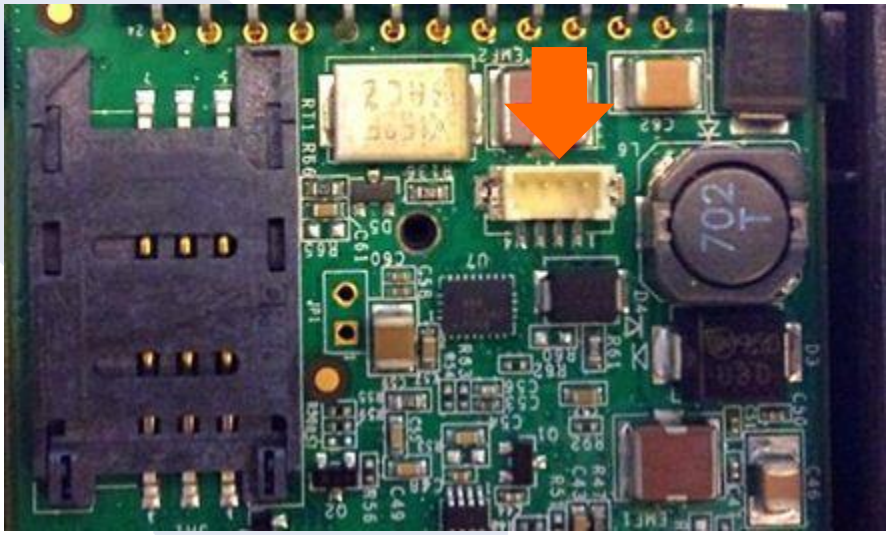
NOTE: Connecting the battery to the unit must be carried out very carefully. Use caution to avoid causing damage to the battery and the unit.

Place the battery on the divider, as shown in the following image.

Verify that you're connecting the battery connector to the connector on the unit board correctly. The side of the battery connector with the pinholes located closer to the edge



must be connected to the corresponding side of the connector on the unit board.

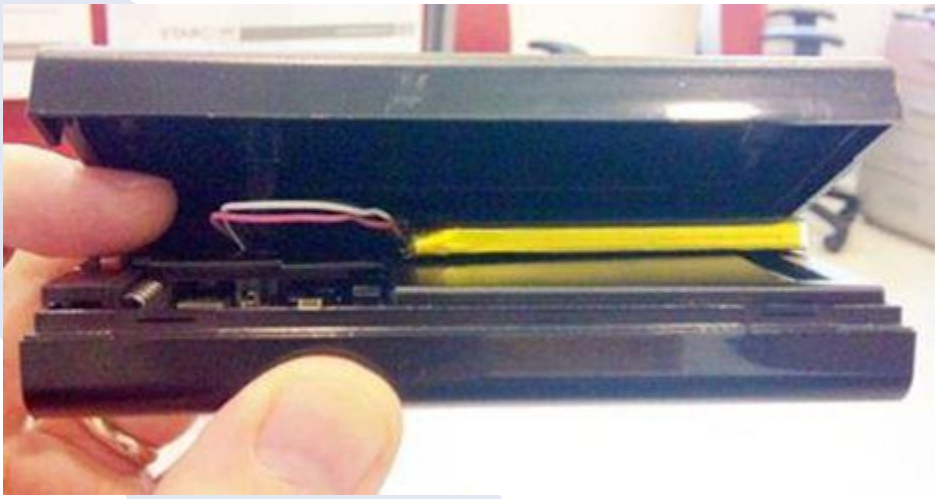


Carefully insert the battery connector into the connector on the unit board.

Gently push the battery connector into the connector on the unit board. If necessary, use a small flat screwdriver. Be careful, do not use excessive force!

Snap the divider on the top cover and place the battery on it as shown in the following image.

Place the bottom cover so that the battery cable is coiled around the plastic pin of the bottom cover screw.



Align the top and bottom covers, and push them firmly together until they click and lock into place. Insert and tighten the screw.

Connecting the unit to the computer

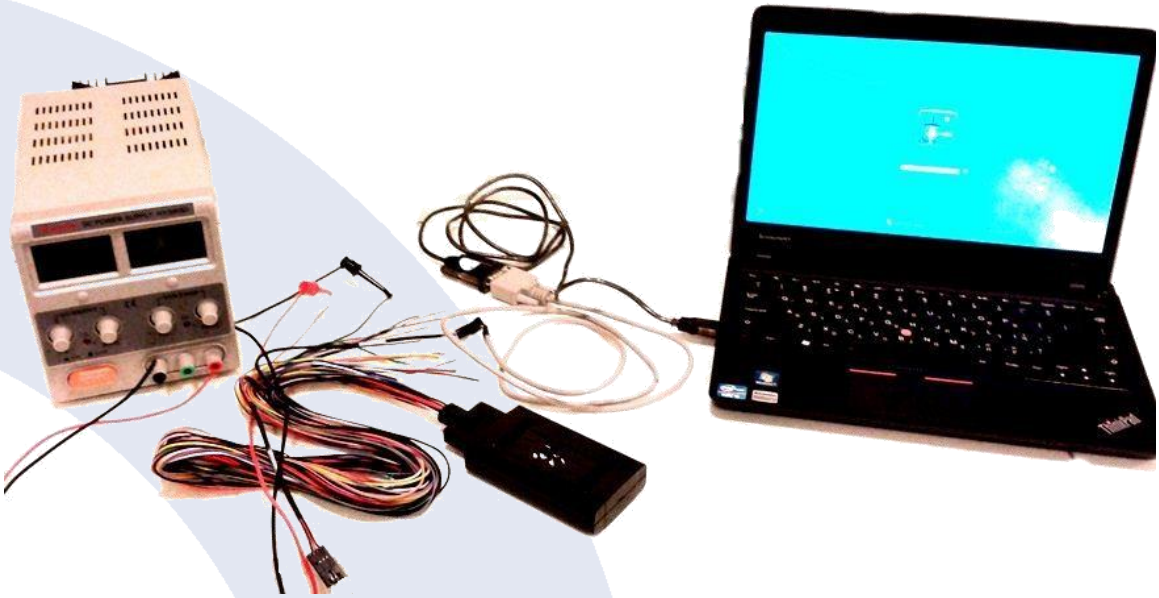
There are two ways to connect the unit to the computer:

1. Using an RS232 cable and a power supply

Connect the Helios wire harness **RED** Power cable (Pin 5) and **YELLOW** Key cable (Pin 4) to 12 or 24 V plus (+) on the power supply.

Connect the Helios wire harness **BLACK** GND cable to the 12 or 24 V ground (-) on the power supply.

Connect the RS232 cable to the RS232 connector on the Helios wire harness and to the COM / USB port on the computer. Install the RS232 cable driver on your computer.



For Helios TT, use the TTL cable supplied with the unit and the driver from the following link: http://www.ftdichip.com/Drivers/VCP.htm.

NOTE: This method can be used to connect the unit to a portable computer, when the unit is installed in the vehicle.

2. Using a Simulator

Connect the Simulator to the computer by using the USB to Mini USB cable. Connect the Helios unit to the Simulator. Connect the Simulator power supply and plug it into an electrical outlet. Turn the Simulator on.

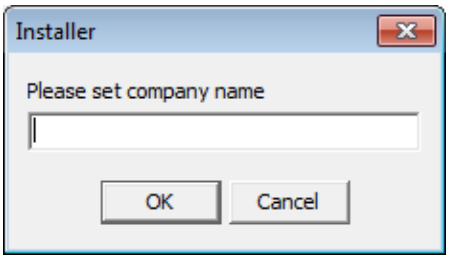
Install the Simulator driver on your computer. The Simulator driver can be downloaded from the following link:

http://wiki.starcomsystems.com/wiki/images/CP210x_VCP_Win_XP_S2K3_Vista_7.exe

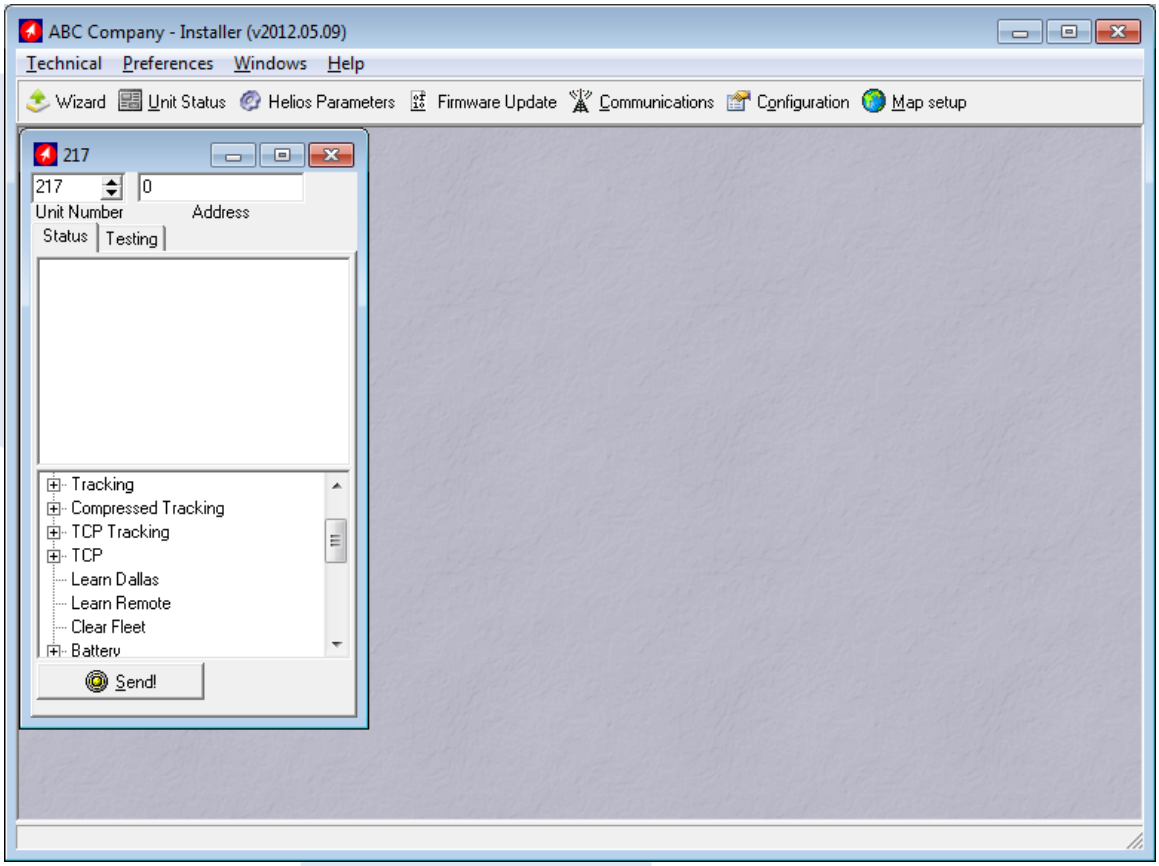
For connecting Helios TT and Helios Basic to the Simulator, see *pages 67 and 70 (Chapter 6 – Installation)*.

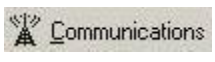
Configuring the unit

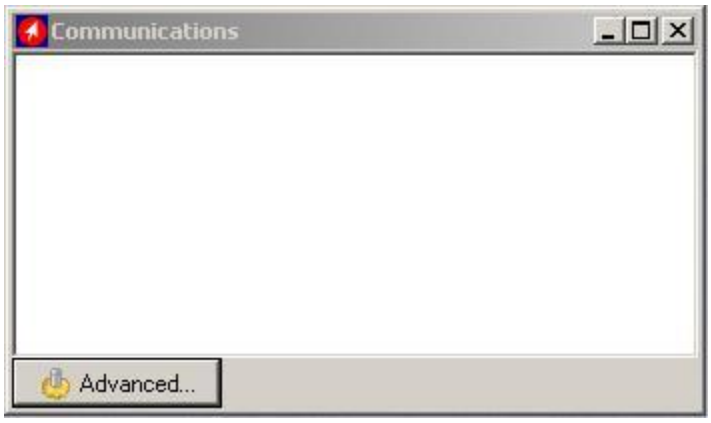
To open the Installer application, from the **Start** menu select **Starcom Systems > Installer Application**. The Installer company name window appears.

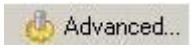


Enter your company name and click **OK**. The Installer window appears.

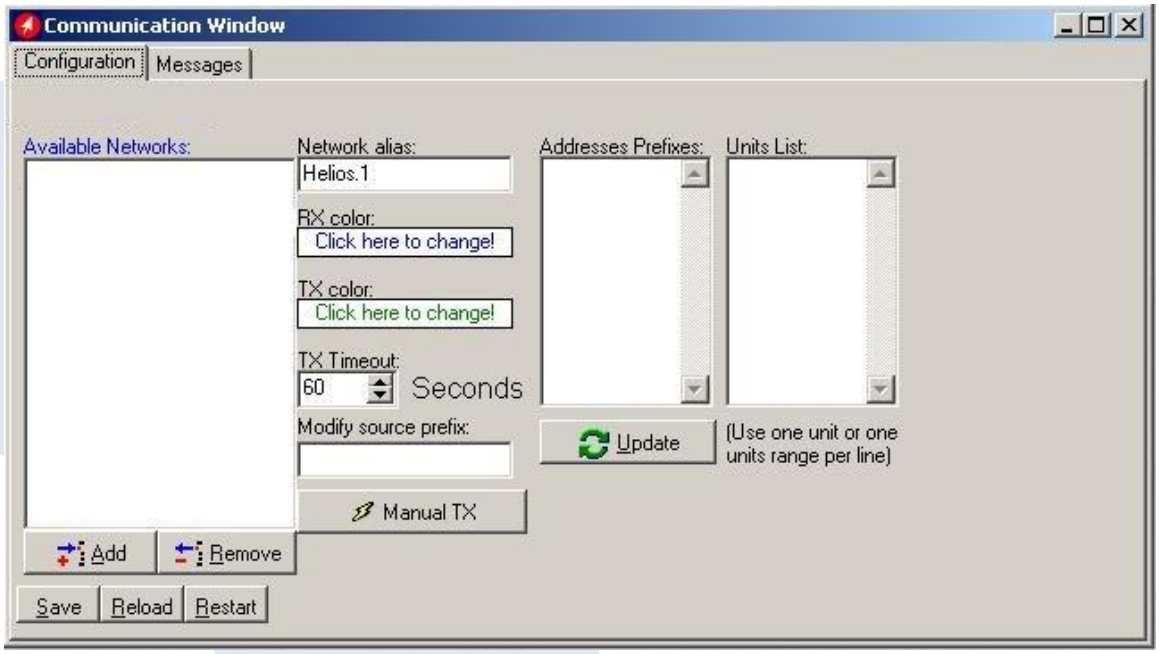


Click **Technical > Communications**, or press the **Communications** button  on the taskbar at the top of the window.



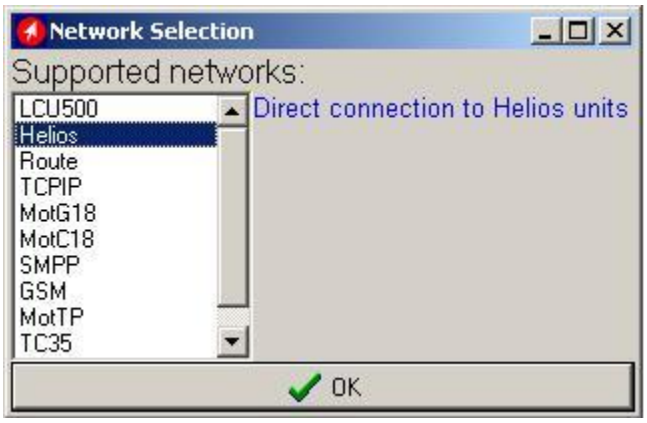
Click the **Advanced** button 

. The Communications Window will appear.



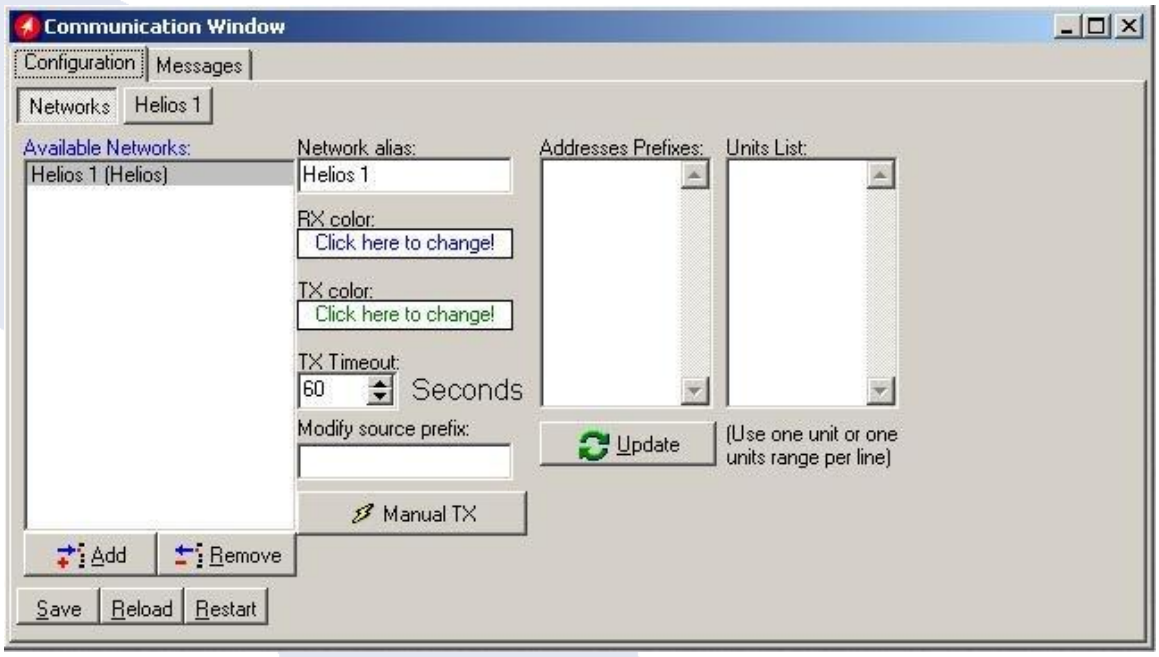
Click the **Add** button 

. The Network Selection window appears.

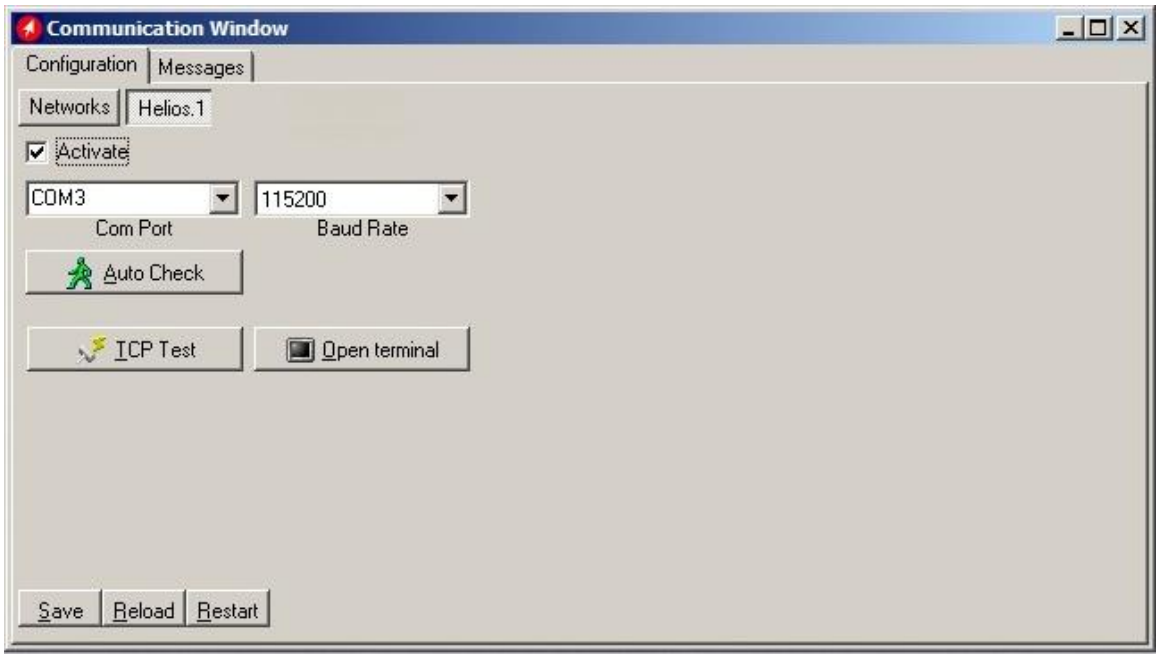


Select **Helios** from the list and press **OK** to add a Helios network.

The Communications Window will now display the new connection, which is named **Helios 1**, in the Available Networks list.

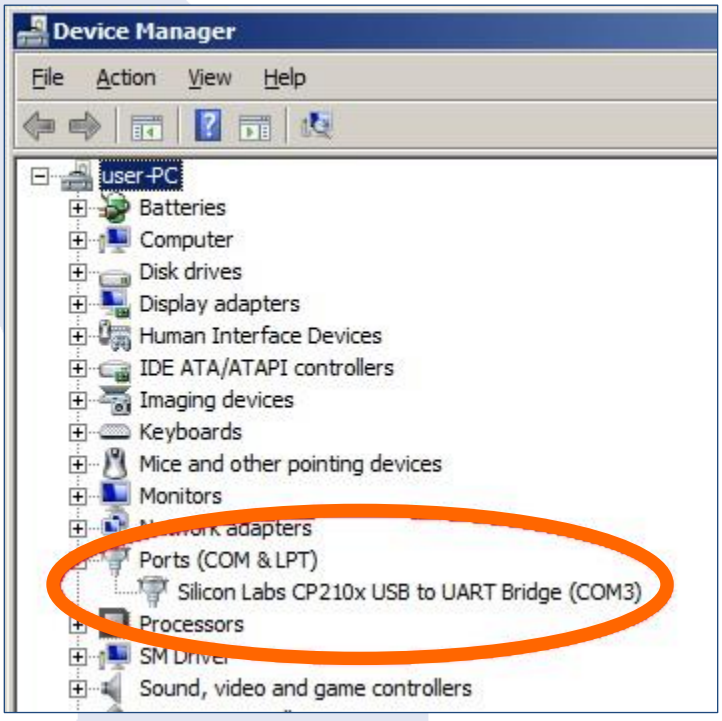


Click on **Helios.1** button to configure and activate the connection.

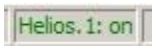


Select the COM port number of the RS232 or the Simulator cable port in the **Com Port** dropdown list.

In order to verify the COM port being used by the unit in your computer, go to **My Computer > Manage > Device Manager > Ports**.



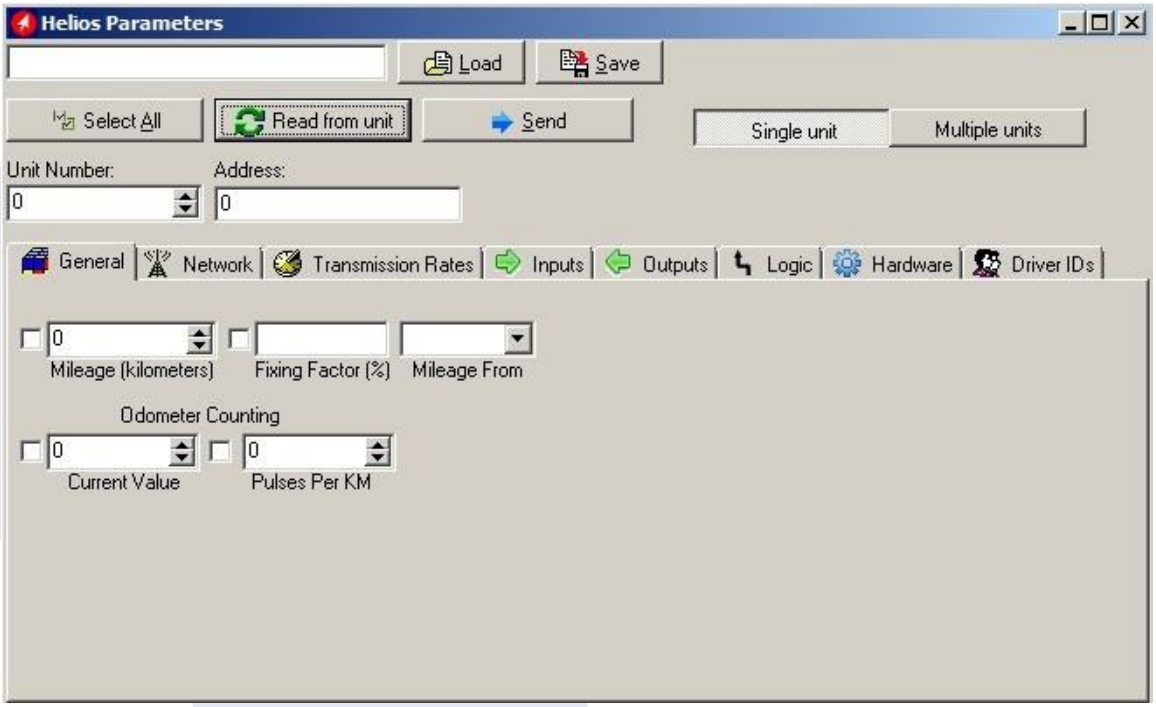
Set the **Baud Rate** to 115200. Check the **Activate** checkbox and click **Save**.

If Helios has connected successfully, a "Helios.1: on" notification will appear in green color at the bottom left corner of the Installer application main screen 

.

To access the unit parameters, press **Technical > Helios Parameters**, or click on the **Helios Parameters** button 

on the taskbar at the top of the Installer application window.

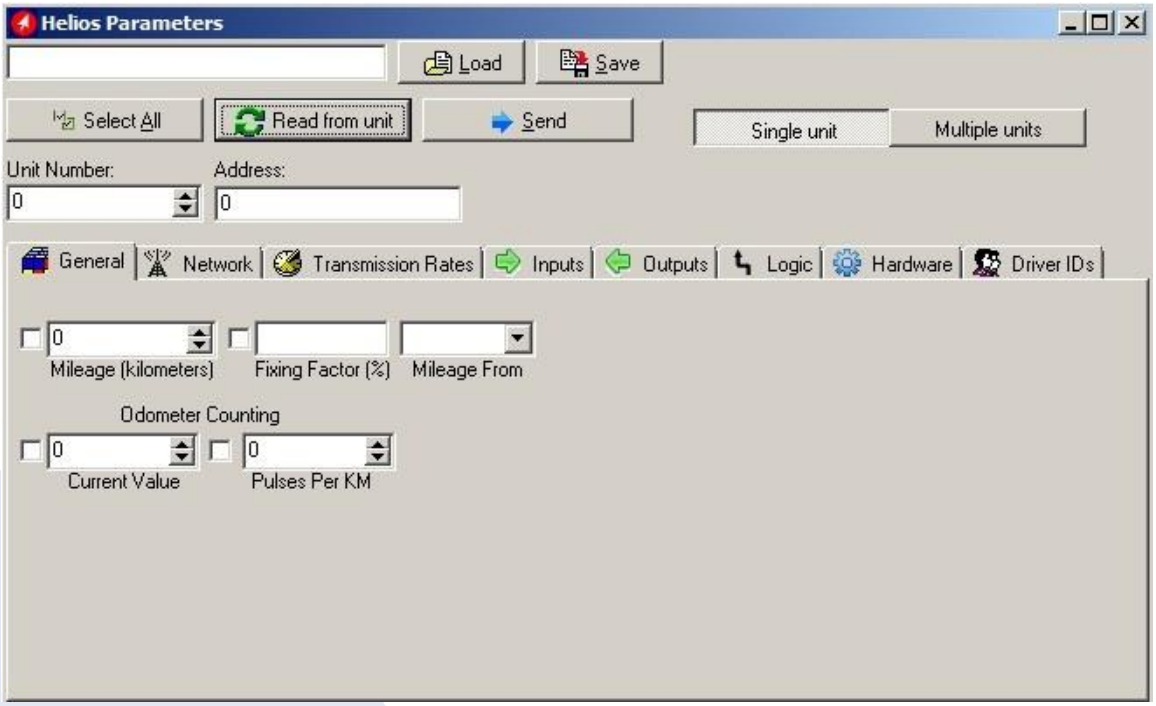


Press the **Read from unit** button 

to read the parameters already configured in the unit.

General settings

This tab allows you to configure the way the unit will register and calculate the distance traveled by the vehicle.



Mileage (kilometers) – current mileage displayed on the vehicle dashboard.

Fixing Factor (%) – a factor to use when calculating mileage by GPS. The default value is 100%. If, for example, there is a constant offset of 25% below the actual mileage, this value should be changed to 125%.

Mileage From – in this dropdown list, you can select the method to use for mileage calculation: **GPS** or **Odometer**.

Odometer Counting – if you chose to use odometer for mileage calculation, configure the following fields:

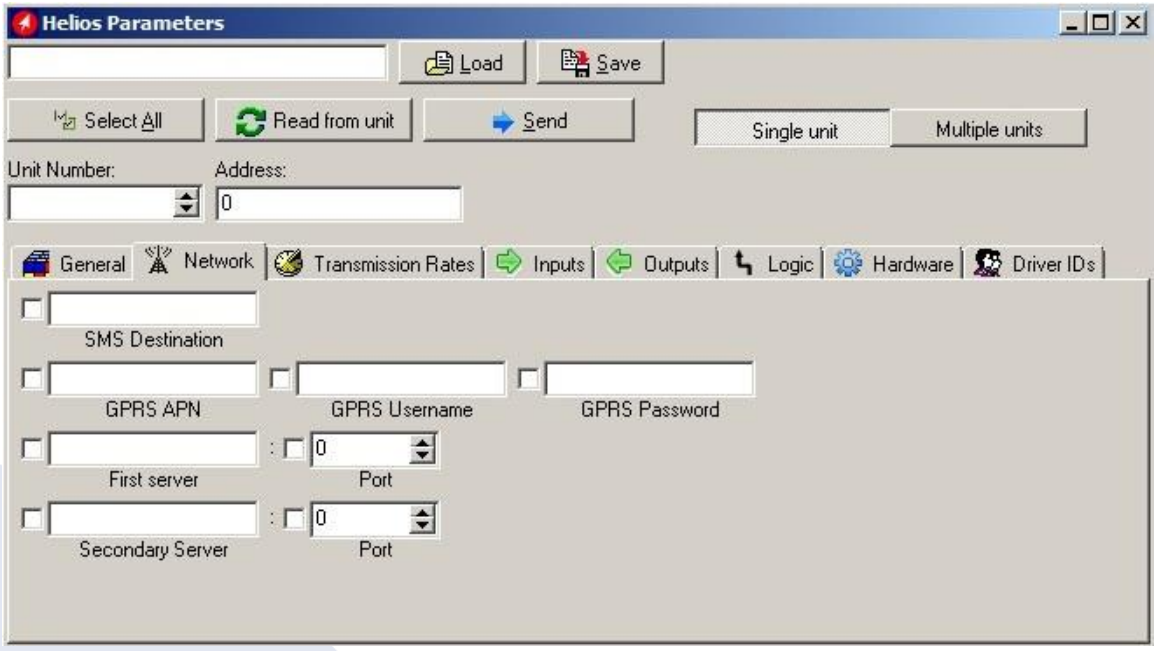
Current Value – number of kilometers as shown in odometer.

Pulses Per KM – odometer pulses per one kilometer.

For more information, see *Appendix B – Configuring Mileage*.

Network settings

This tab allows you to enter all the parameters necessary for the unit to connect to the network.



SMS Destination

The unit transmits via GPRS by default and via SMS as a backup, when GPRS connection is not available. The number to be entered in the **SMS Destination** field is the SIM card number used in the SMS Terminal unit connected to the routing server, or the SMPP target number. For more information, see *SMS Notifications guide*.

APN settings

The APN settings are essential for the unit to transmit messages and alerts. The APN settings are provided by your cellular operator with the SIM card you are using in the unit.

GPRS APN (Access Point Name) – the name of the gateway provided by your cellular operator (e.g. internet).

GPRS Username – username provided by your cellular operator (e.g. blank).

GPRS Password – password provided by your cellular operator (e.g. blank).

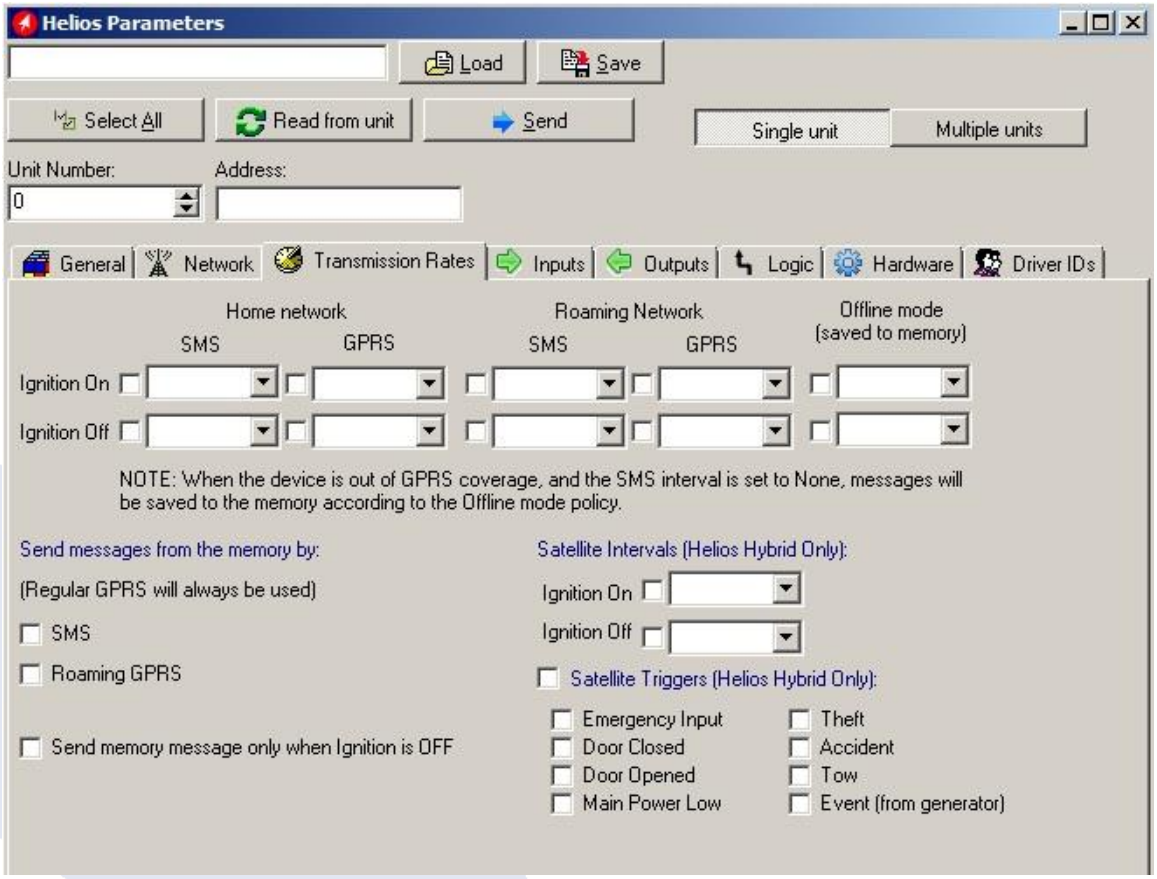
First server – main routing server, which the units transmit to (by default, it is Starcom Systems server 1).

Secondary server – auxiliary routing server, which the units transmit to (by default, it is Starcom Systems server 2).

Port – port open for communication on the routing server (default port is 6600).

Transmission Rates settings

This tab allows you to configure the intervals of regular tracking transmissions, which define how often the unit will transmit its status.



Home network – transmission rate in home GSM network.

Roaming network – transmission rate in roaming GSM network. Select this option if the unit will travel across borders. In order for this to work, the SIM card used in the unit must have a roaming service enabled by your cellular provider.

Offline mode (saved to memory) – transmission rate when the device is out of cellular coverage.

NOTE: When the device is out of GPRS coverage, and the SMS interval is set to None, the messages will be saved to the unit memory according to the intervals entered in the Offline mode fields.

SMS – transmission rate for transmissions via SMS.

GPRS – transmission rate for transmissions via GPRS.

NOTE: The unit transmits via GPRS by default and via SMS as a backup, when GPRS connection is not available. For more information, see *Appendix A – Unit Communication in Starcom Systems*.

Ignition On – transmission interval when the vehicle ignition is on.

Ignition Off – transmission interval when the vehicle ignition is off.

Send messages from the memory by:

SMS – if this option is selected, missed and buffered messages will be sent by SMS as well.

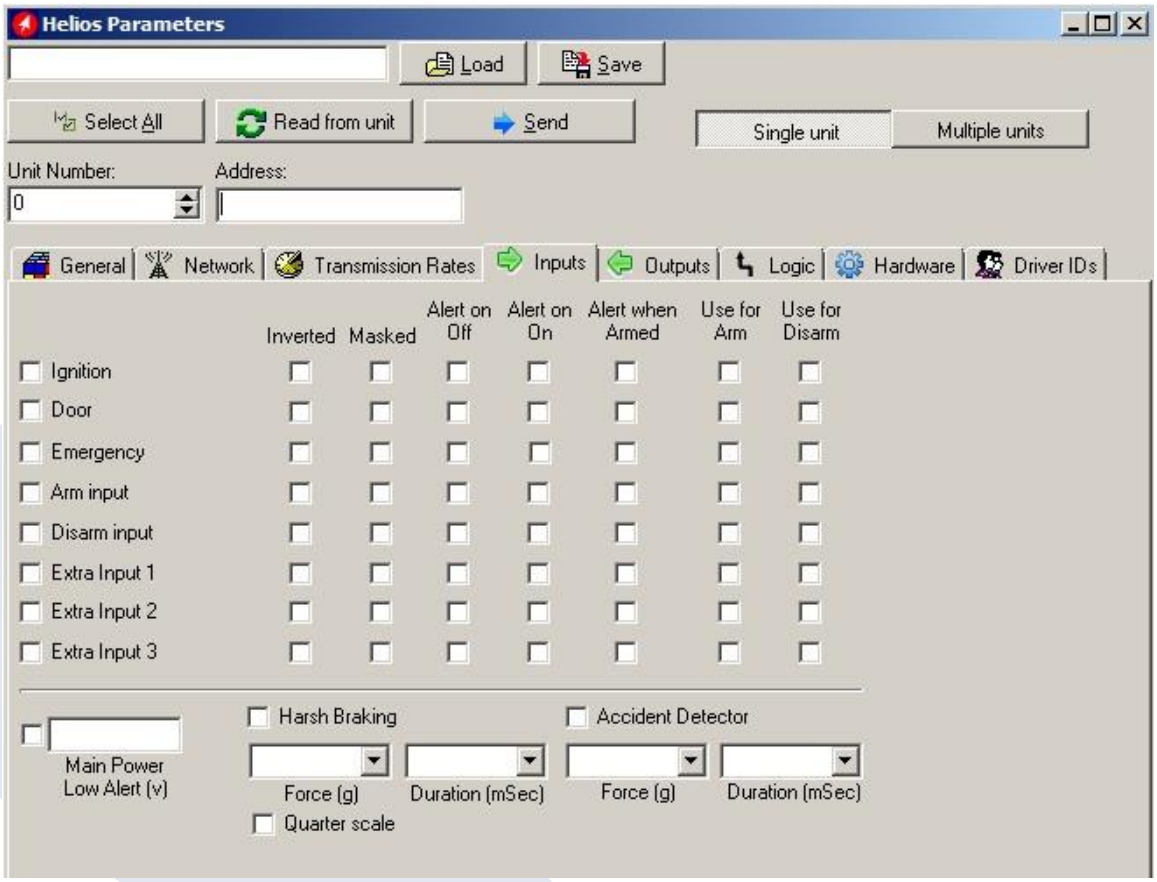
Roaming GPRS – if this option is selected, missed and buffered messages will be sent by GPRS in roaming networks as well.

Send memory messages only when Ignition is OFF – when enabled, all the messages saved in the unit memory will be sent only when the vehicle ignition is off. This is done to let the unit freely transmit ongoing messages when the vehicle is traveling.

Satellite Intervals – these parameters are to be used with Helios Hybrid only. For more information, see *Helios Hybrid Configuration, page 63*.

Inputs settings

This tab allows you to configure the unit inputs activities and alerts. In addition, this tab allows you to configure the Main Power Low alert and the accelerometer alerts.



Inverted – use to invert the input.

Masked – use to mask the input. If enabled, the input activity will not be transmitted.

Alert on Off – if activated, the unit will send the input Off alert.

Alert on On – if activated, the unit will send the input On alert.

Alert when Armed – if activated, the unit will send the input on alert when it is armed.

Use for Arm – will arm the unit when the state of the input changes.

Use for Disarm – will disarm the unit when the state of the input changes.

Ignition – ignition input, **YELLOW** cable on Helios wire harness (Pin 4).

Door – door input, **GREEN** cable on 24-pin Helios wire harness (Pin 16).

Emergency – emergency input, **WHITE** cable on 24-pin Helios wire harness (Pin 8).

Arm input – arm input, **ORANGE/WHITE** cable on 24-pin Helios wire harness (Pin 14).

Disarm input – disarm input, **PINK** cable on 24-pin Helios wire harness (Pin 17).

Extra Input 1 – **ORANGE** cable on 24-pin Helios wire harness (Pin 9).

Extra Input 2 – **GREEN/RED** cable on 24-pin Helios wire harness (Pin 21).

Extra Input 3 – **BLUE/RED** cable on 24-pin Helios wire harness (Pin 22).

Main Power Low Alert (v) – the unit will send a low power alert when the voltage drops below the indicated value.

Accelerometer alerts

Harsh Braking – used to determine the sudden stopping of the vehicle, which is not desirable in the case of buses, trucks, freight transportation, etc.

Accident Detector – determines a greater impact on the car and is usually used to track accidents.

Force (g) – determines the threshold of the force needed to be measured in order to send an alert. Select "Disabled", if you don't wish to use the alert.

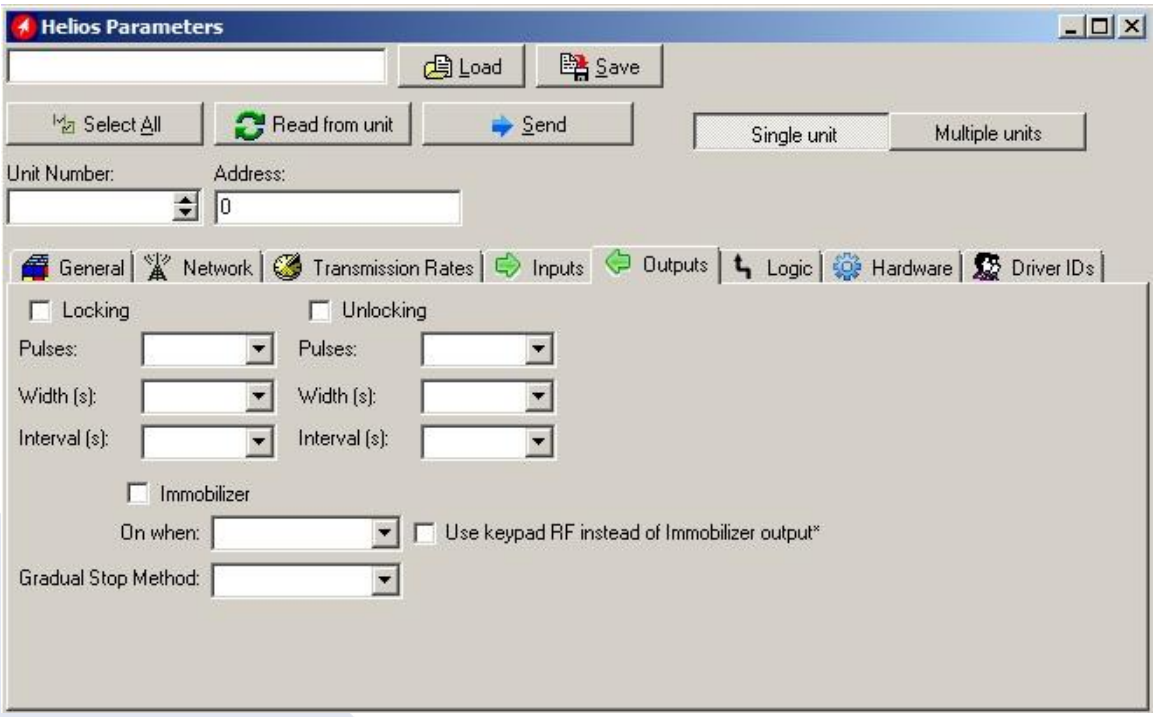
Duration (msec) – determines the duration of the force needed to be measured in order to send an alert.

Quarter scale – if on, the Weak Impact force will be scaled in quarter of a g. This option can be used to make the accelerometer more sensitive to smaller impacts.

NOTE: The default force and duration values are based on the laboratory testing results, they were found to be acceptable in most cases. These values can be tested and changed according to the specifics of your work. To change these values according to specific conditions, you need to test the unit with different values and choose the best option. The lower the setting, the more often the unit will respond to a weaker impact.

Outputs settings

This tab allows you to configure the unit outputs activities and alerts.



Locking – activates the settings for Helios Door Lock output.

Unlocking – activates the settings for Helios Door Unlock output.

Pulses – number of pulses to send in order to lock/unlock the vehicle.

Width (s) – width of pulses

Interval (s) – interval between the pulses, if there is more than one pulse.

For more information, see *Appendix C – Central Locking System Configuration*.

Immobilizer – activates the settings for Helios Immobilizer output.

On when Armed / Idle – the condition in which the unit will activate its immobilizer output. When connected using a Normally Open relay, this value should be set to Idle. When using a Normally Closed relay, set to Armed.

Use keypad RF instead of Immobilizer output – used instead of immobilizer, when keypad is used to transmit driver codes to wireless relays. For more information, see *Appendix H – Using Keypad with RF Relay*.

Gradual Stop Method – the unit can be used to bring the vehicle to a gradual stop, if necessary. For example, if the vehicle is reported as stolen, the control center can issue a Gradual Stop command. Here you can configure the method to use when a gradual stop command is sent to the unit. The Gradual Stop can be performed in **Pulses** – gradually, which is preferable, or **Constantly** – abruptly.

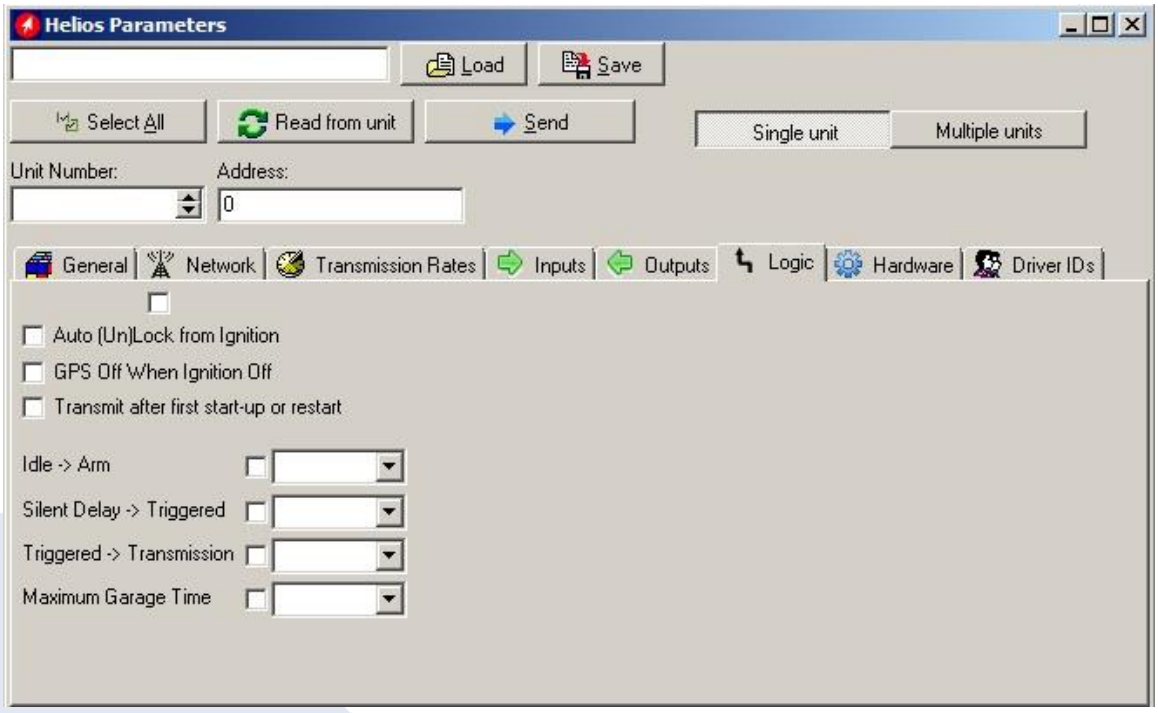
ON Constantly / ON Pulses – select, if you're using a Normally Closed relay.

OFF Constantly / OFF Pulses – select, if you're using a Normally Open relay.

For more information, see *Appendix D – Immobilizer and Gradual Stop*.

Logic settings

This tab allows you to configure the unit logic states.



Auto (Un)Lock from Ignition – if activated, the unit will send a lock signal when the ignition is turned on, and unlock when it is turned off.

GPS Off When Ignition Off – if enabled, turns the GPS off when the ignition is off. This helps to avoid the unit reporting vehicle movement, which can be caused by GPS "jumps", when it is actually stopped.

Transmit after first start-up or restart – if activated, a Power On message will be transmitted whenever the unit is either powered on for the first time, or restarted.

The unit remains in one of its logic states at all times. The logic state can be changed automatically, according to the parameters configured in this tab, or manually, by using remote control, keypad, iButton, or over-the-air command. The following are the unit logic states:

- **Unarmed** – unit state when immobilizer is not activated
- **Armed** – the immobilizer is activated and the engine is off. The alarm system is active and ready.
- **Garage** – the alarm system is disabled for a predefined period of time. This is useful, for example, when the vehicle is undergoing maintenance.
- **Silent Delay** – the unit enters this state if triggered while in the Armed state. In this state, only the blinkers are activated. After a predefined period of time has elapsed in Silent Delay mode, the unit enters the Alarm Triggered mode.
- **Alarm Triggered** – the system activates the siren.

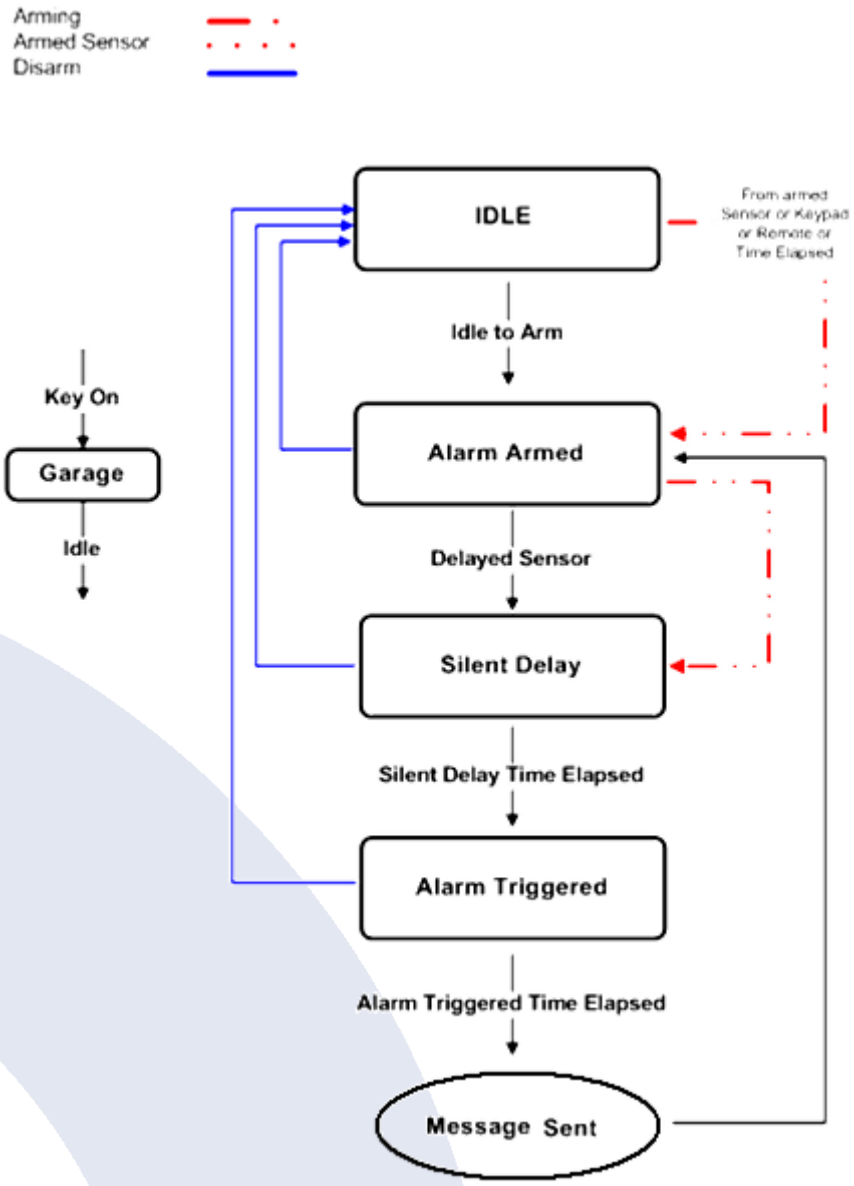
Unarm -> Arm – time to wait between the moment the ignition is turned off, and entering the arm state. If you do not want the unit to enter the arm state automatically, select None.

Silent Delay -> Triggered – time to wait from the moment the alarm system has detected a break-in (for example, the ignition was turned on while the unit is armed), and until the siren is triggered. When using a keypad, or a Dallas Key, this will give the driver enough time to disarm the vehicle.

Triggered -> Transmission – time to wait while sounding the siren until it will be stopped and a transmission will be sent.

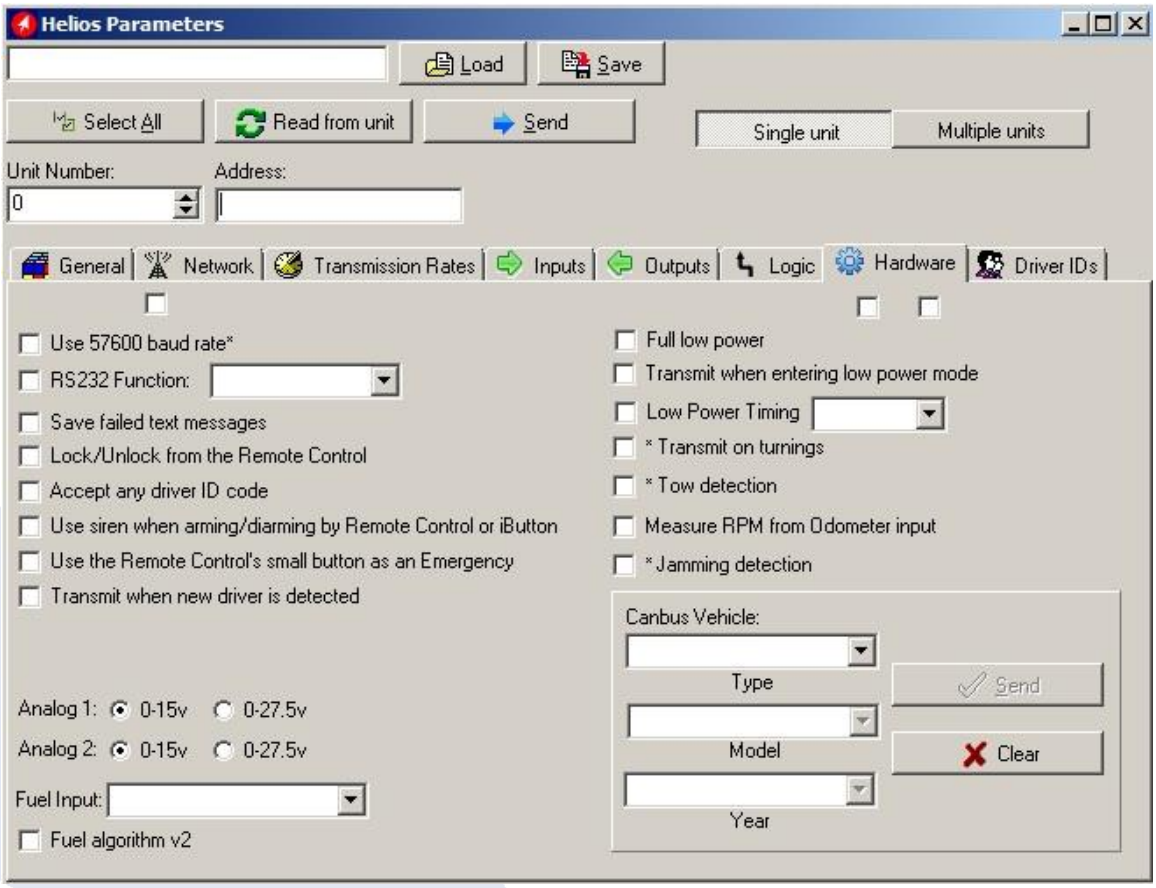
Maximum Garage Time – maximum time to stay in Garage mode. This setting is useful to avoid forgetting to disable the Garage mode manually.

The following image illustrates the logic states interchange.



Hardware settings

This tab allows you to configure various hardware settings.



The following settings relate to external text message devices.

Use 57600 baud rate – if activated, the device will use 57,600 bps to communicate with external devices (such as MDT) through its RS232 port. *NOTE*: if the unit is connected to the computer directly with a cable, you have to change the baud rate in the **Communications** > **Advanced** window.

RS232 Function – the protocol to be used by RS232 devices.

Save failed text messages – if activated, the unit will save failed text messages that were sent via the RS232 port, according to the same logic that the Tracking messages are saved.

The following settings relate to the driver ID, keypad, and remote control use.

Accept any driver ID code – if activated, any keypad code, remote control, or iButton can be used to disarm the unit.

Use siren when arming/disarming by Remote Control or iButton – whenever the vehicle is getting armed from the remote control, two beeps will sound from the siren, and whenever the vehicle is getting disarmed from the remote control or iButton, one beep will sound. Also, whenever a new remote control or iButton is detected, one beep will sound.

Use the Remote Control small button as an Emergency – if activated, the remote control small button will be used as an emergency button.

Transmit when new driver is detected – each time a new driver is detected (using keypad, remote control, or iButton) a message will be transmitted.

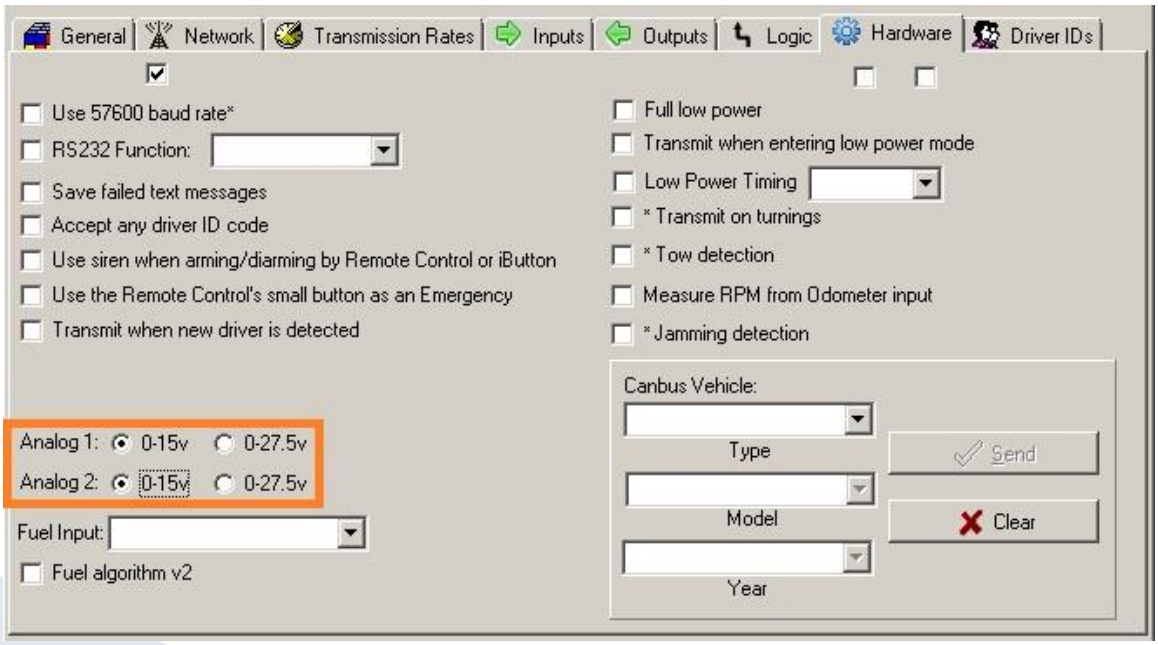
The following settings correspond to the unit Analog Inputs 1 and 2.

0 – 15 V – the device will measure 0 to 15 V on analog input with an accuracy of 15 mV.

0 – 27.5 V – the device will measure 0 to 27.5 V on analog input with an accuracy of 25 mV.

Fuel Input – the input that will be used for fuel measurement. For more information, see *Appendix F – Fuel Management*.

Analog input configuration on Helios TT and Basic



The analog / digital input on Helios TT and Basic units is configured as a digital (Door) input by default.

To configure this input as analog, go to **Helios Parameters** > **Hardware**, and select **0-15v** or **0-27.5v** in the **Analog 1** field according to the voltage range measured on Analog 1 input.

Use the **Analog 2** setting to indicate the input type as follows:

0-15v – Analog input

0-27.5v – Digital input

Fuel algorithm v2

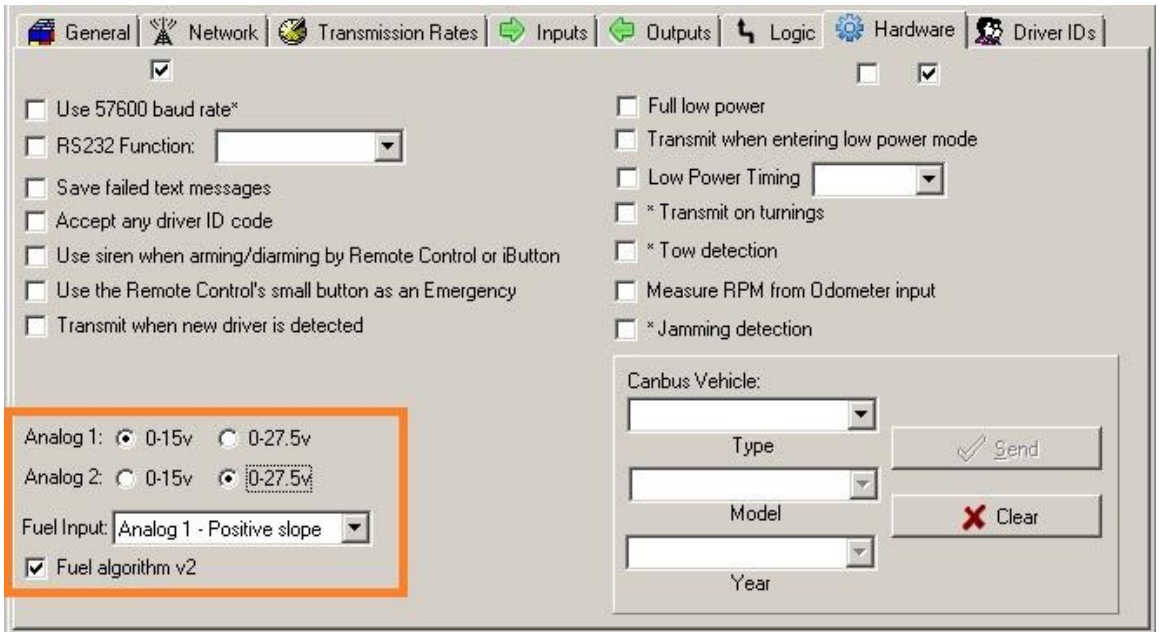
The new fuel calculation algorithm greatly improves the fuel level monitoring in Helios units. To use the new fuel algorithm, you must configure the Helios unit with the correct Analog **input** connected to the fuel tank, and the fuel graph **slope**.

The slope is determined as the ratio between the voltage on the fuel tank and its contents.

For example, if the voltage level is going down as the fuel tank is being emptied, then there is a direct ratio between them and therefore the slope is **positive**. In other words, a positive slope will appear if the full tank measurement is 10V, for example, and empty tank is 0V.

If the fuel tank voltage level is increasing as the fuel tank is being emptied (which is the most common case), then the ratio between the voltage level and the fuel tank is an inverse ratio, and therefore the slope is **negative**. In other words, if the full tank measurement is 0V and half-full tank is 6V, then the graph line slope will be negative.

In order to implement the new fuel algorithm, download and install the latest Installer version. In Installer, connect to the unit and run **Firmware Update**. Go to **Helios Parameters** > **Hardware** and enable the **Fuel algorithm v2** option.



Verify what kind of slope you receive from the fuel graph and select the **Fuel Input** option in the dropdown list accordingly:

Analog 1 - Positive slope – select this option, if you're using the Analog 1 input for fuel level monitoring, and if the fuel graph line slope is positive.

Analog 1 - Negative slope – select this option, if you're using the Analog 1 input for fuel level monitoring, and if the fuel graph line slope is negative.

Analog 2 - Negative slope – select this option, if you're using the Analog 2 input for fuel level monitoring, and if the fuel graph line slope is negative.

Analog 2 - Positive slope – select this option, if you're using the Analog 2 input for fuel level monitoring, and if the fuel graph line slope is positive.

Once all the necessary parameters are set, press the **Send** button to send the changes you made to the unit.

The following settings allow to configure full low power mode. If full low power is activated, when the vehicle ignition is turned off the unit shuts down all its major power consumers, such as modem, GPS, etc. This feature is intended for mopeds, motorcycles and other small vehicles, where the unit operation can drain the battery when the engine is off.

Full low power – if activated, the device will switch to full low power 30 seconds after the ignition is turned off, or when armed (if passive arming is available).

Transmit when entering low power mode – the unit will send a message upon entering low power mode.

Low Power Timing – how much time to wait after the ignition was turned off and until the unit enters low power mode.

The following features are experimental and should be used with care.

Transmit on turnings – if activated, the device will transmit each time a turn of over 30 degrees was detected.

Tow detection – the device will alert if it was moved over 1 km from the location where it first entered the armed state.

NOTE: This function works according to GPS readings. This means, if "GPS Off When Ignition Off" or "Full low power" options are activated in the unit, the Tow detection will not work.

Measure RPM from Odometer input – if activated, the device will count the pulses in the Odometer value to calculate the vehicle's RPM.

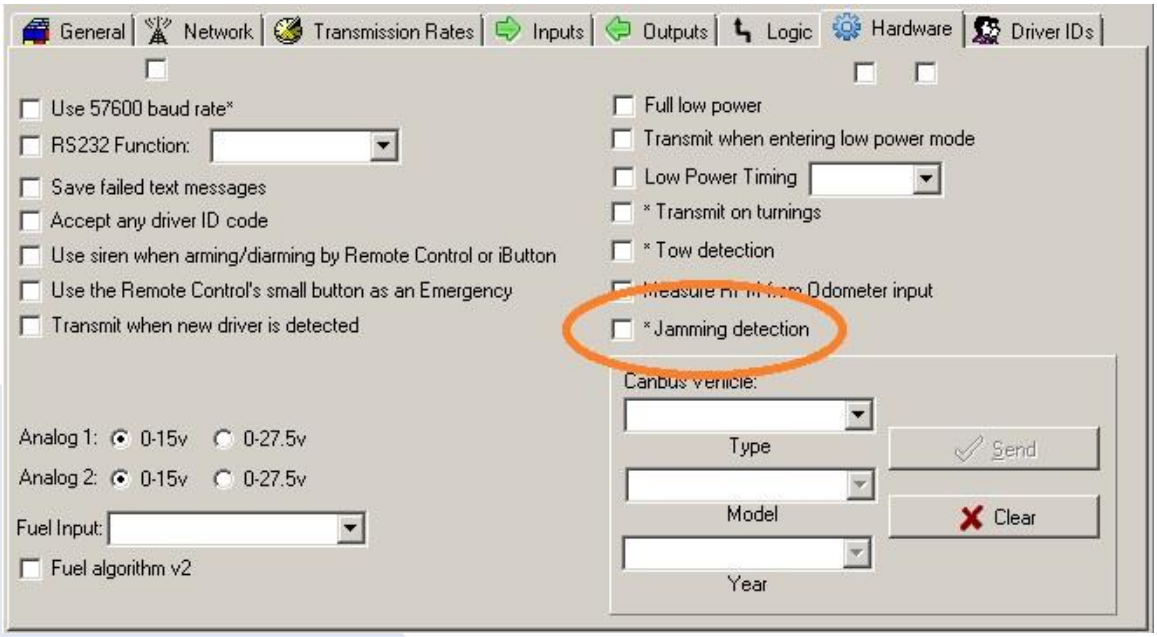
The following settings allow you to configure the use of vehicle CAN bus.

Can bus Vehicle / Type / Model / Year – here you can select the vehicle from the Helios database, which can be accessed from **Technical** > **Helios Can bus**. For more information, see *Appendix G – CAN Bus Connection*.

Jamming detection

The jamming detection function is triggered if the unit detects two of more cell towers, but cannot connect to them due to interference.

In order to implement this function, go to **Helios Parameters** > **Hardware** and enable the **Jamming detection** option. Press the **Send** button to send the changes to the unit.



To configure the jamming alert, go to **Starcom Online** > **Plans** > **Events** > **Types** and create a Jamming event type by selecting **Transmit Reason** > **Jamming** and **Set Output** > **Gradual Stop** type options.

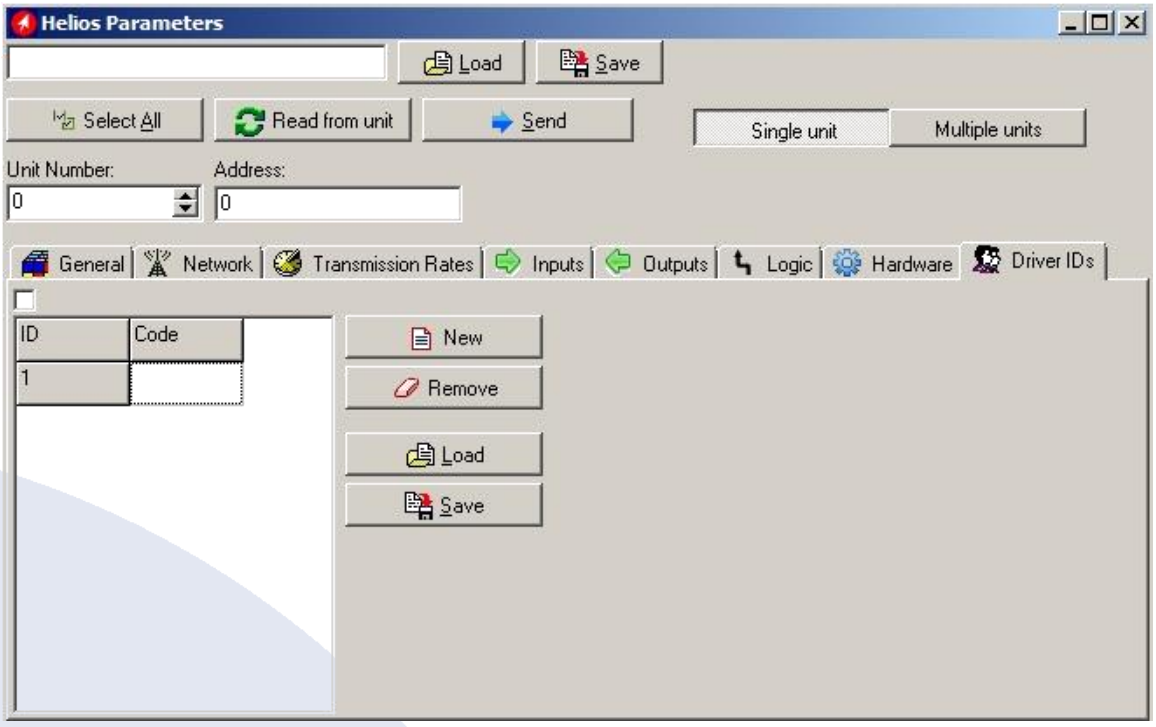
Click **Apply**, go to **Events** and create an event for the unit based on the Jamming type.

Click **Apply** and wait for several transmissions for the unit to receive the event and save it in its memory. For more information, see *Chapter 7 – Monitoring > Plans.*

If a jamming situation occurs, the unit will activate the event sequence immediately and send an alert once it reconnects to the cellular network.

Driver IDs settings

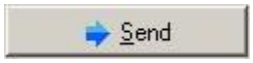
This tab allows you to enter the driver codes to be used for arming and disarming the unit.



To enter a code, click in the **Code** field and type the code. To add a new code, press **New** and enter a code. To remove a code, select it and press **Remove**.

You can save and load lists of driver codes in ***.csv** format by using **Load** and **Save** buttons.

You can enter up to 2000 codes.

Once all the necessary parameters are set, press the **Send** button 

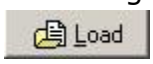
to send the changes you made to the unit.

Saving the configuration

If you are planning to configure other units with the same parameters, you can save these settings as a *.mem file. Click the **Save** button 

in the Helios Parameters window, select the location where you want the configuration file to be saved on your computer, name the file and press **Save**.

Configuring a new unit with the saved configuration

To configure a new unit with the saved parameters, click the **Load** button 

in the Helios Parameters window, browse to the location where you saved the configuration file, select the file and press **Open**. Click the **Select All** button 

to select all the parameters and press the **Send** button 

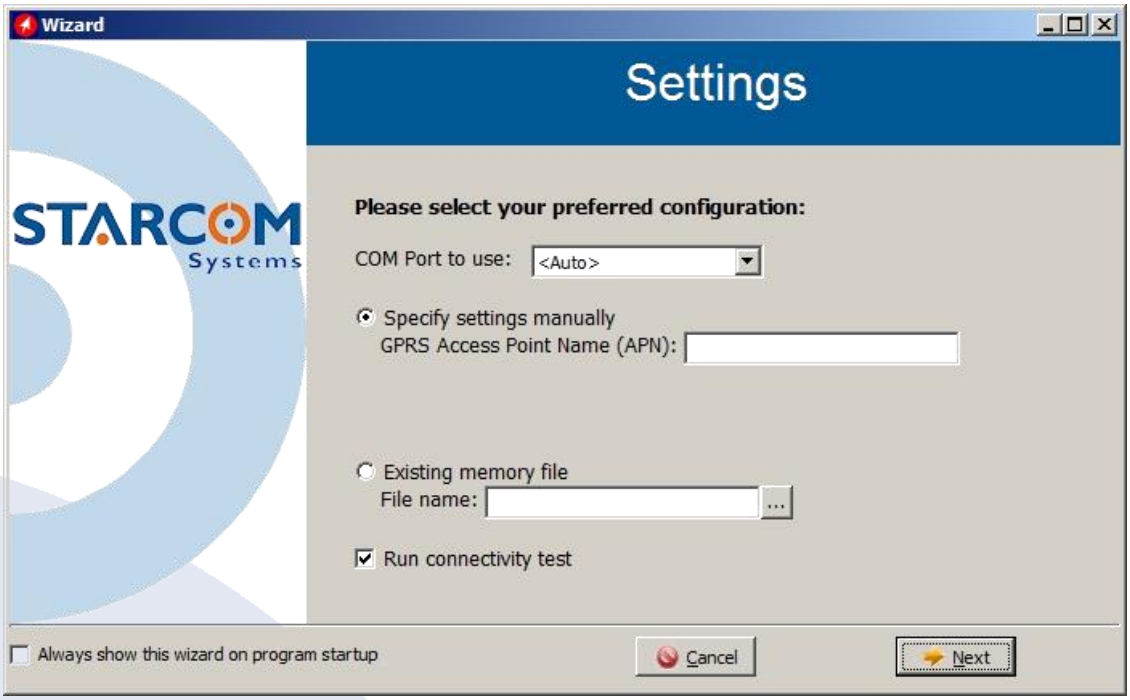
to send the changes to the unit.

Configuring multiple units using the wizard

In the toolbar, click **Wizard**. The Welcome to Starcom System window appears.

NOTE: Click the **Always show the wizard on program startup** checkbox, if you want the wizard to start each time you run the Installer application.

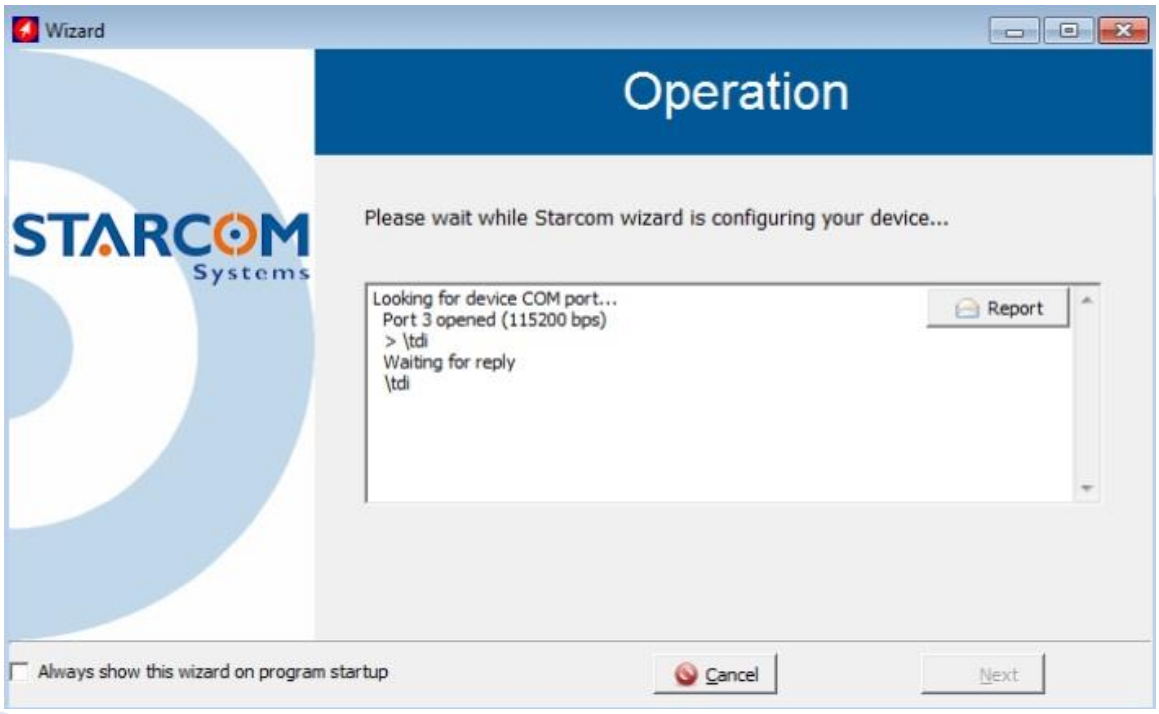
Click **Next**. The Settings window appears.



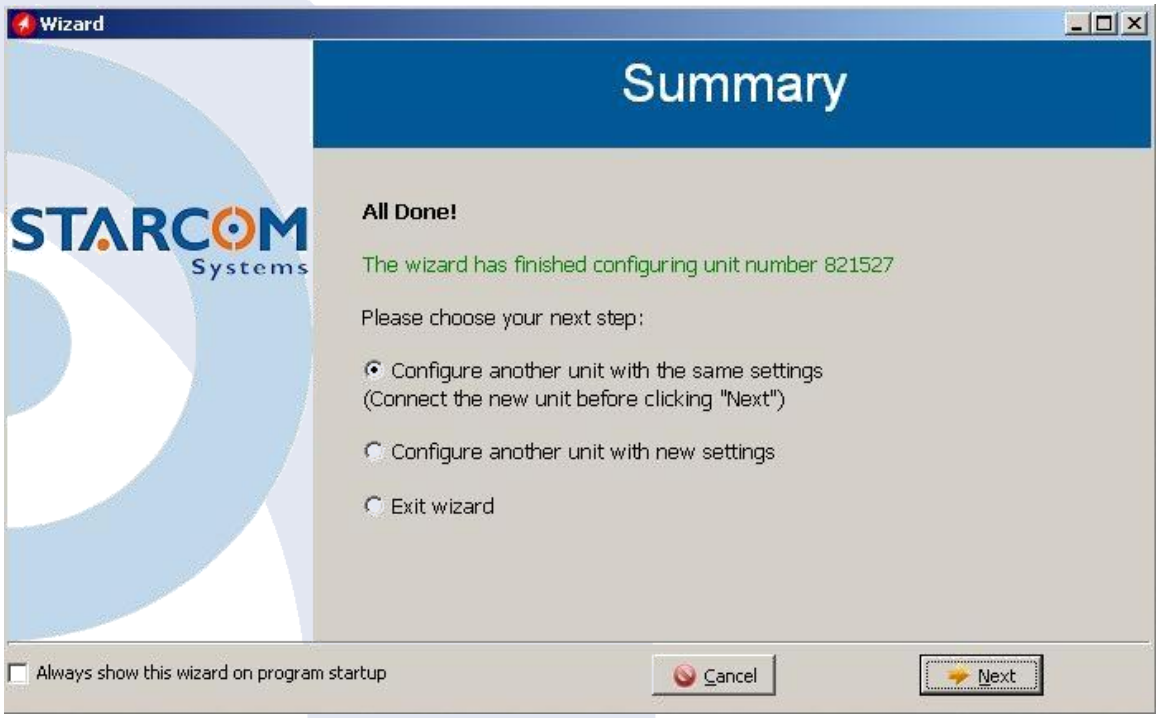
You can specify the settings manually by entering the **GPRS Access Point Name (APN)**, or use a saved *.mem file to configure the unit with by selecting it in the **Existing memory file** field.

Click **Run connectivity test**, if you want the wizard to perform a TCP test.

Click **Next**. The Operation window appears.



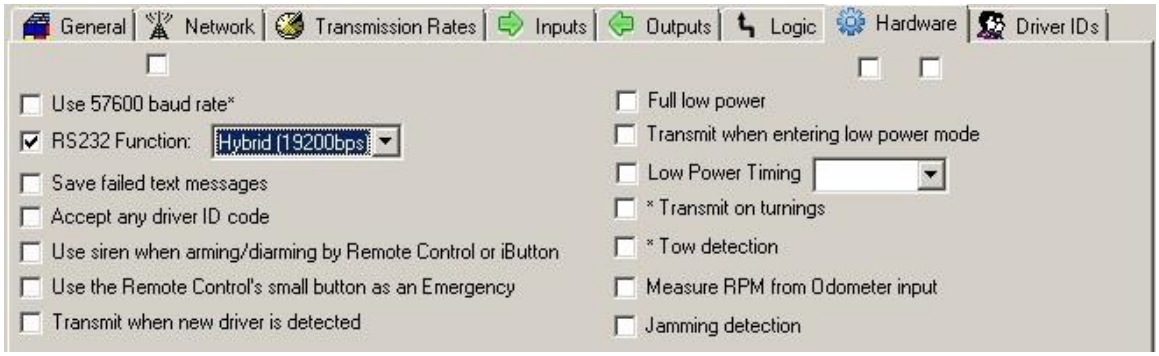
Click **Next**. The Summary window appears.



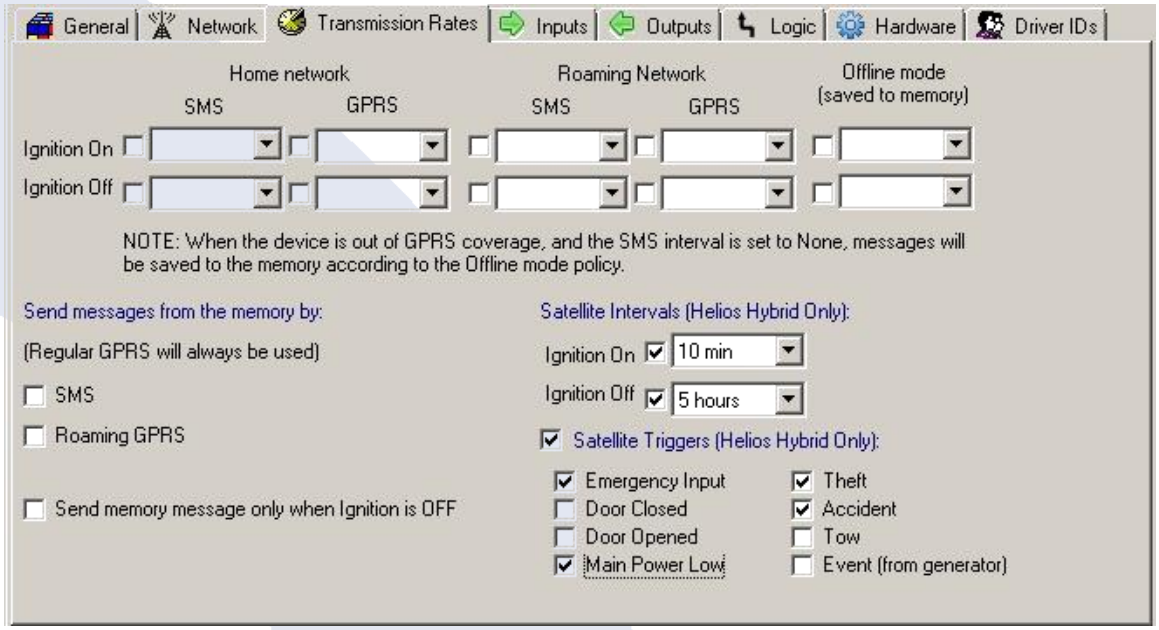
Select **Exit wizard**, and click **Next**. The unit is now configured and ready for testing and installation.

Helios Hybrid configuration

Go to **Helios Parameters** > **Hardware** > **RS232 Function** and select Hybrid (19200bps) from the dropdown list.



Then go to **Transmission Rates** > **Satellite Intervals (Helios Hybrid Only)** and configure the transmission rates. Use the **Satellite Triggers (Helios Hybrid Only)** fields to configure the event alerts.



5. Testing

It is important to test the unit connection to the network, the correct GPS location, the unit status and inputs response before installing the unit in the vehicle. In order to do this, you need to perform the following steps.

TCP test

This test verifies that the SIM card is open to the GPRS network, the unit can connect to the network and make successful TCP/IP transmissions.

Press the **TCP Test** button 

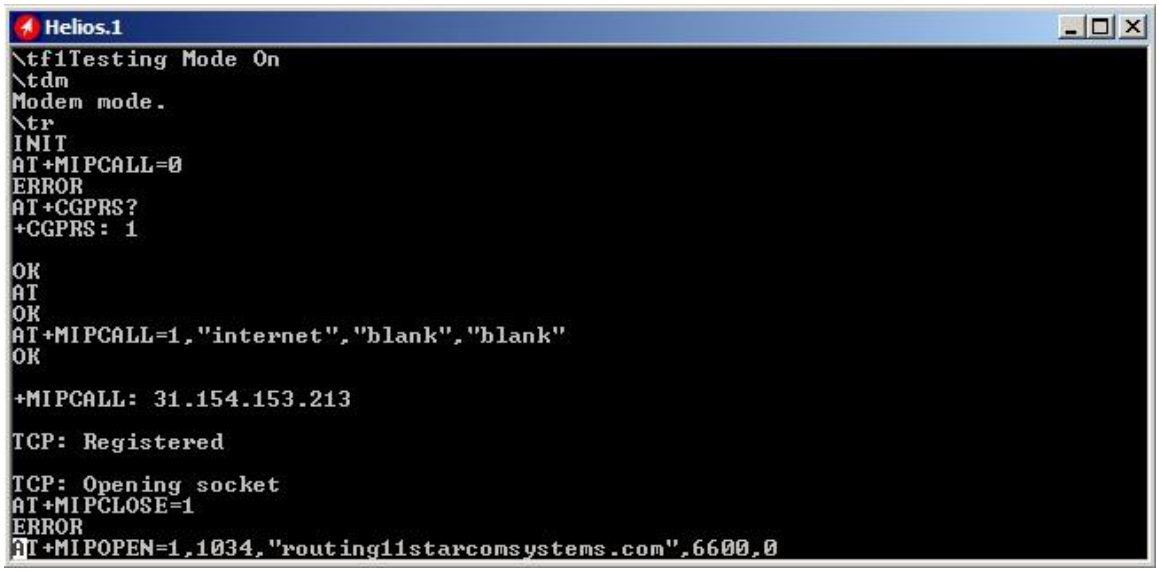
(**Communications > Advanced > Communication Window > Configuration > Helios.1**). Wait a few minutes until you receive a pop-up window with a successful connection message.

If at the end of the TCP Test you do not receive a successful message, check your APN settings (Helios Parameters > Network). Contact your cellular provider and make sure the SIM card is open for GPRS. Verify that your SIM card is not protected by a PIN code. If necessary, use a mobile phone to cancel the PIN code.

You can also perform the test manually using the **Terminal** window. Open the Terminal window (**Communications > Advanced > Communication Window > Configuration > Helios.1 > Open Terminal**) and type the following commands:

\tdm and press **Enter** (Modem mode). The modem will be turned on.

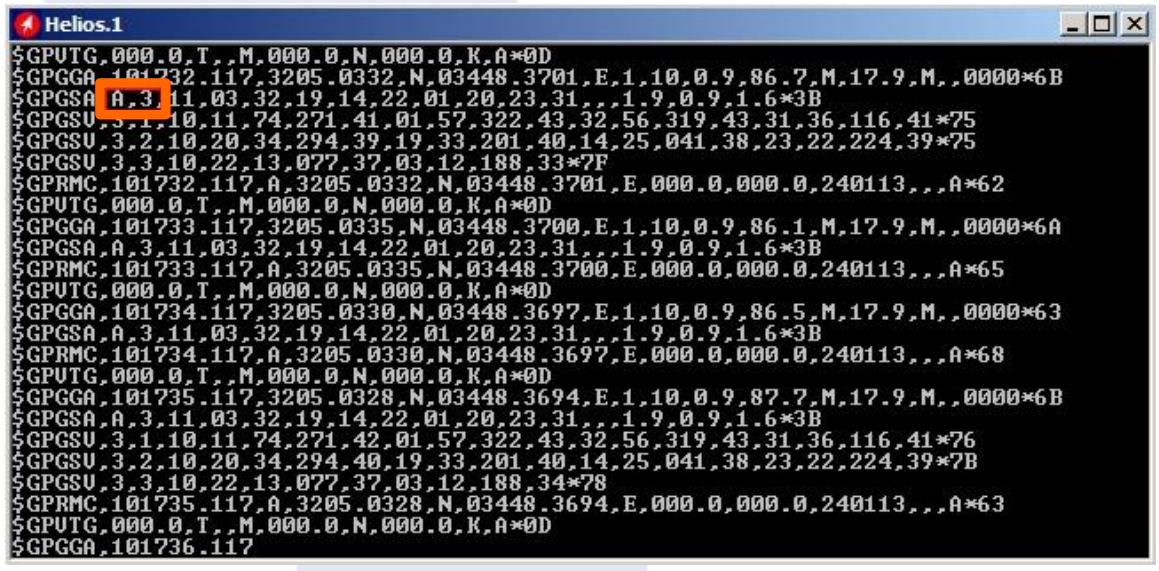
\tr and press **Enter**. This command runs a series of actions to check the parameters such as reception level, visible networks and registered network, SIM card state and information. It also attempts to connect to the routing server. If successful, a "TCP: Send+" message will appear in the Terminal window.



GPS test

NOTE: If you're testing the unit inside the building, it will not be able to get a GPS signal in most cases. In order to get a proper GPS location, the unit has to be placed outside the building, or outside the window, where it can access the satellites.

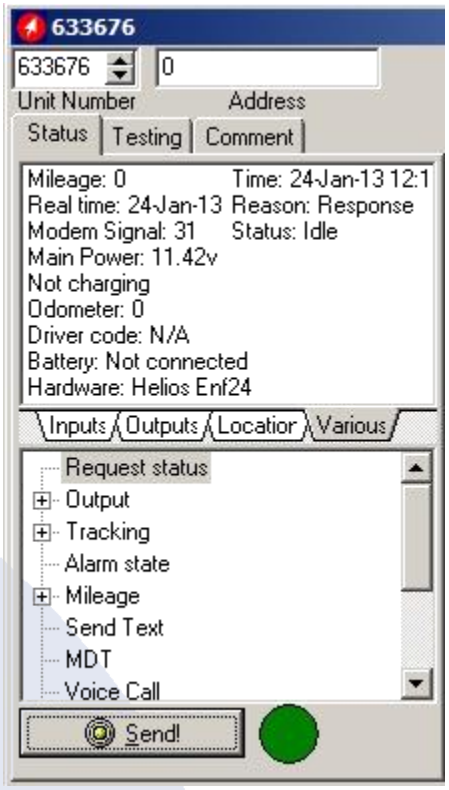
Open the Terminal window (**Communications > Advanced > Communication Window > Configuration > Helios.1 > Open Terminal**) and type **\tdg** (GPS mode). GPS readings will be displayed. When you see "A,3"... reading, it will indicate a GPS fix signal.



If you do not see any response, type **\tg1** to turn the GPS on and repeat the test.

Unit Status

Open the **Unit Status** window. Enter the unit number in the **Unit Number** field, select **Request status** and press **Send**. The unit information will appear.



Click on the **Inputs** tab, press on the Key, Arm, Doors, etc. buttons on the Simulator, press Request status and check the response in the Unit Status window. Use the **Outputs** tab to test the unit's outputs response. Use the **Location** tab to check the unit's GPS data. Use the **Various** tab to see the unit information.

After all the tests have been performed successfully, the unit is ready to be installed in the vehicle.

6. Installation

WARNING: Failure to closely adhere to installation instructions may result in system malfunction and ultimately compromise the reliability of the entire system.

It is assumed that installers are familiar with vehicle wiring and auto electrical devices.

This chapter contains a selection of wiring options. Select the options best suited to your application.

Wiring considerations and safety guidelines

Always adhere to safety instructions to prevent possible injury and avoid damage to existing vehicle systems.

Before beginning an installation, disconnect the vehicle battery. Notify the client that this erases the memory of all auto systems. It will have to be re-programmed.

Test the wiring only by using a LED test lamp or a voltmeter. Using other types of test lamps may cause high output currents and significant damage to the vehicle's electrical systems.

Solder all the connections created during installation and insulate them using the electrical insulation tape and/or insulation sleeves. Twisting wires together without soldering them can result in loose connections and serious failures.

There is the danger of explosion if the battery is incorrectly replaced. Replace the battery only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

Take special care to avoid damage to the cables of the vehicle's security systems, such as vehicle computer and air bags. Take note of this when testing voltage using a voltmeter or test lamp to prevent undesired system activation.

Only trained and qualified personnel should install, replace, and service the equipment.

When drilling the vehicle, verify that there are no cables in the vicinity. Failure to do so may result in severe damage.

Install a 5 A fuse on the Ignition and Main Power connections.

Never install the unit with exposed board (opened case). This can cause the inadvertent shorting and unit damage.

Connect all the required cables to the Helios wire harness before connecting it to the unit.

For vehicle wiring database, see the Wiring section on Starcom Online Help page (Chapter 7 – Monitoring > Help > Wiring).

Leave the RS232 wire set with Molex connector from the Helios wire harness accessible for easy connection with a portable computer.

Tools required for installation

The following tools are required for installing Helios:

- Electric drill and/or screwdriver
- Cone drill
- Adapter for Phillips (cross-head) screws
- Phillips, flat-tip, and star screwdrivers (various sizes)
- Wire cutter
- Test lamp and/or voltmeter (use of voltmeter is preferred and recommended)
- Electrical insulation tape
- Regular and drilling head screws
- Insulation sleeve or soldering iron and solder

Positioning the unit in the vehicle

Do not install Helios beneath metal parts, for example under a shelf supporting loudspeakers. To maintain high-quality reception, it is highly recommended to install Helios in a location that provides an uninterrupted view of the sky. Consider any of the following locations for installing the unit:

- Within the vehicle dashboard
- Near to the glove compartment
- Behind instrument panel
- In the center console
- Under the steering column

Ensure that Helios is not placed near heat sources, water pipes, or the vehicle computer.

The following image shows some of the possible installation locations.

Use alcohol to clean the surface to which you decided to attach the unit.

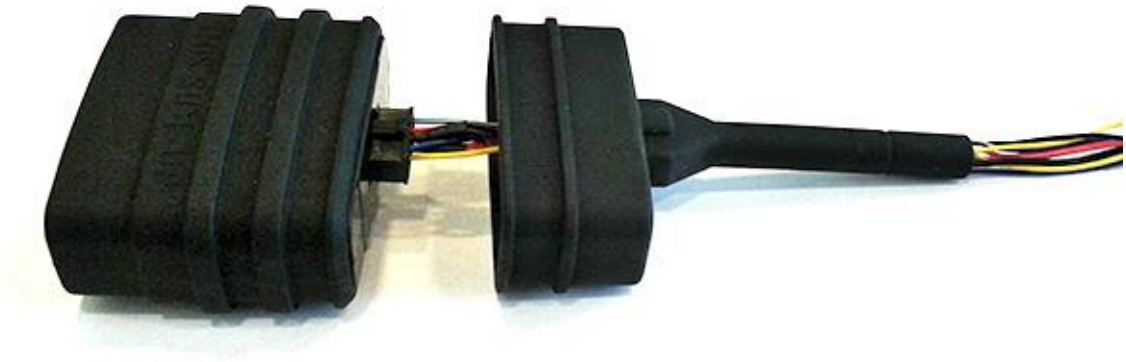
Secure the unit in its chosen location using cable ties and ensure proper concealment of all wires.

Donning the Helios TT waterproof casing

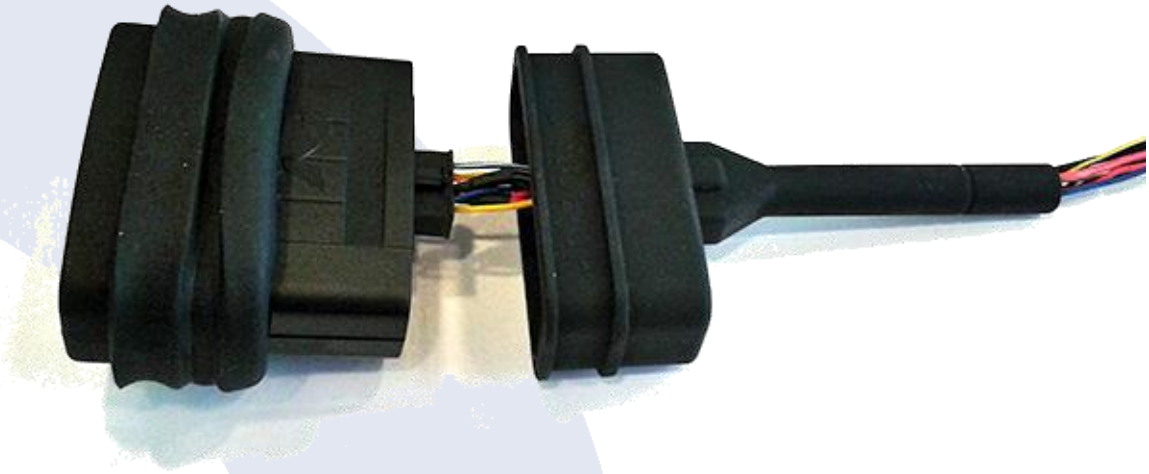
Insert the Helios TT unit in the larger part of the waterproof casing so that the GPS antenna side of the unit corresponds to THIS SIDE UP side of the casing, as shown in the image below.

Insert the Helios TT wire harness into the smaller part of the waterproof casing, as shown in the image below.

Connect the wire harness to the Helios TT unit.



Fold the sides of the larger part of the casing, as shown in the image below.



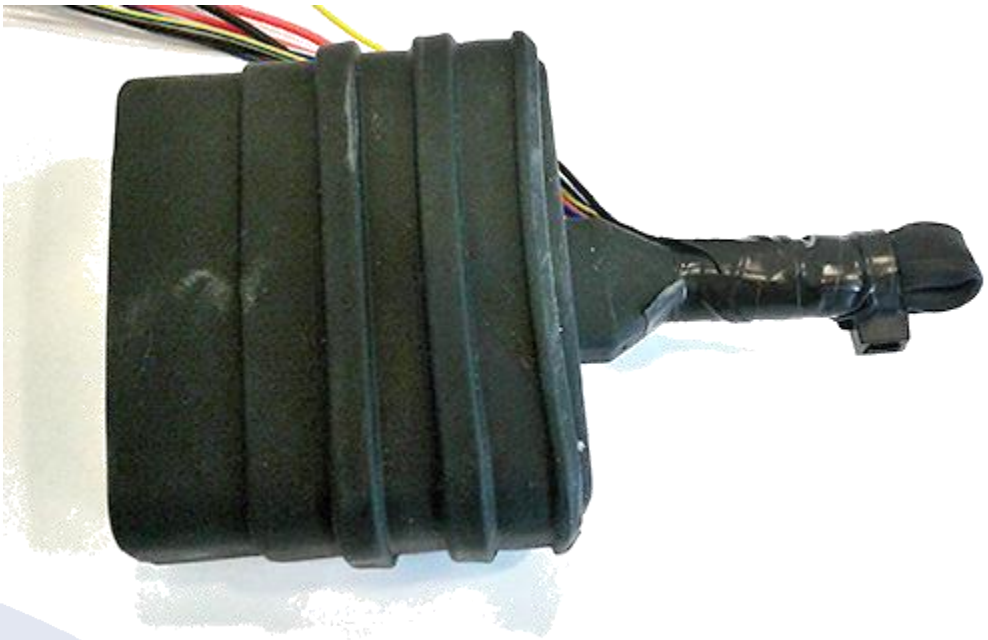
Slide the smaller part of the casing onto the device. Make sure that THIS SIDE UP sides of the casing parts correspond, as shown in the image below.

Unfold the sides of the larger part of the casing over the smaller part and pull them up as tight as possible, as shown in the image below.

Bend the wire harness sleeve on the smaller casing part.

Secure the sleeve with a zip tie.

Cover the sleeve with insulating tape.



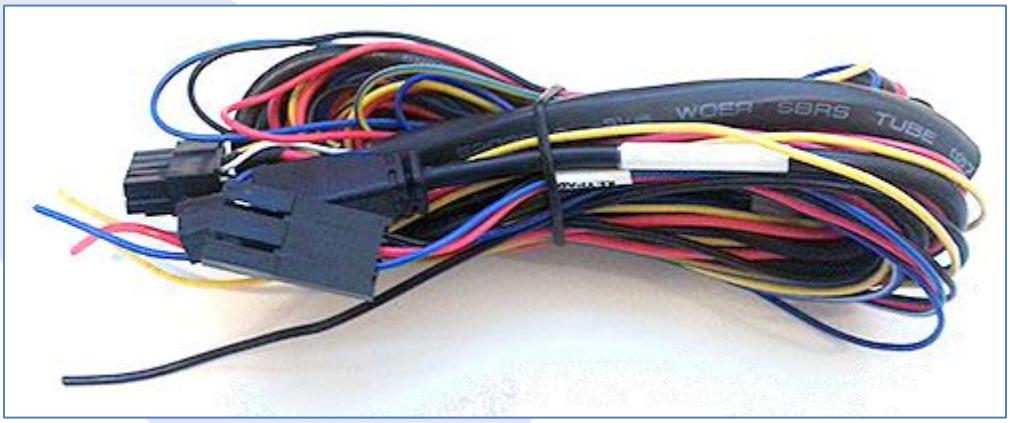
The unit is ready for installation.

Helios TT pin out

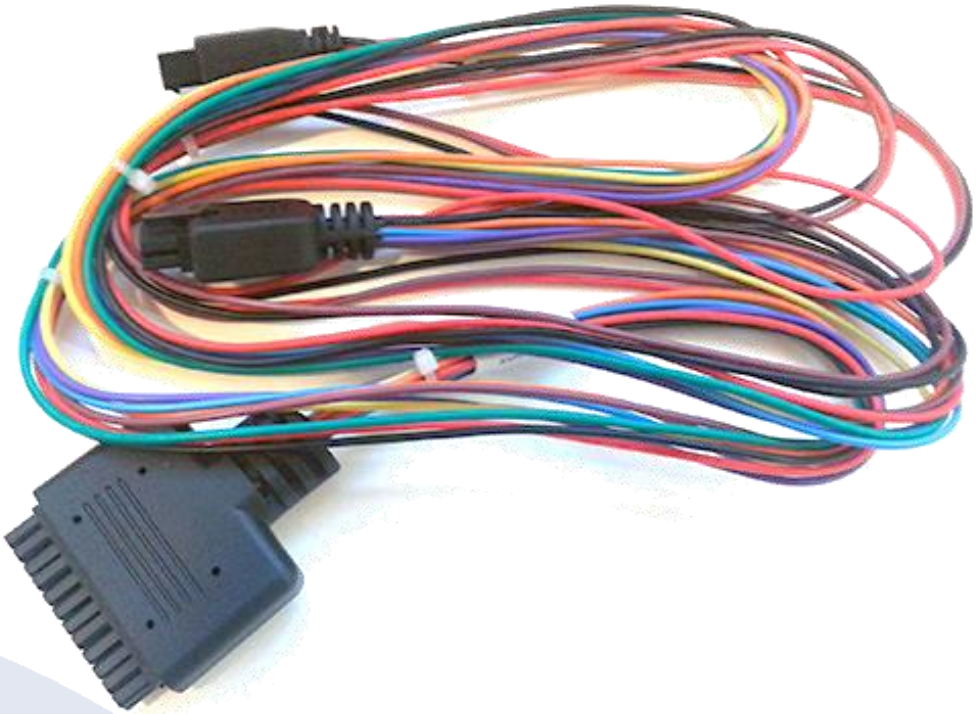
Pin No.	Function	Color	Designation	Notes
1	Analog / digital input	Yellow/Blue	Input (+)	Digital input is designated as "Door" by default. Analog can be used for fuel or temperature measurement. See *Chapter 4 – Configuration > Hardware > Analog input configuration on Helios TT and Basic*
2	RS232 RX	White	Communication	RS232 wire set with Molex connector
3	Main Power 8–28V DC, 1A	Red	Power Supply	Main +12V or +24 V supply. Must be protected by a 5 A fuse
4	Key (Ignition)	Yellow	Input (+)	Indicates the vehicle ignition state
5	N/A			
6	Keypad/Dallas	Blue/White		Keypad connector
7	RS232 TX	Red	Communication	RS232 wire set with Molex connector
8	GND	Black Black	GND	
9	Immobilizer and/or Gradual Stop	Blue	Output (-)	Install with an external relay. See *Appendix D – Immobilizer and Gradual Stop*
10	N/A			

The following images show Helios TT unit and Helios TT board with Micro-SIM card holder.

The following image shows Helios TT wire harness.



The following image shows Helios TT Simulator cable.



The following image shows Helios TT TTL computer cable.

The following image shows how to connect Helios TT unit to the Simulator.

Connect the Helios TT unit to the Simulator with the 10-pin wire harness.

Connect the Helios TT unit to the computer with the TTL cable. Connect the Simulator power supply and plug it into an electrical outlet. Turn the Simulator on.

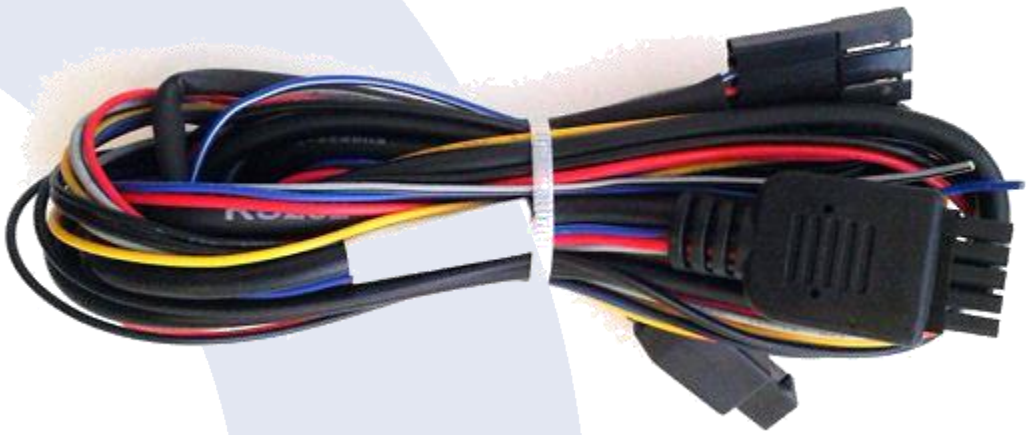
Download and install the Helios TT TTL cable driver from the following link: http://www.ftdichip.com/Drivers/VCP.htm

Helios Basic 10-pin pin out

Pin No.	Function	Color	Designation	Notes
1	Analog / digital Input	Yellow/Blue	Input (+)	Digital input is designated as "Door" by default. Analog can be used for fuel or temperature measurement. See *Chapter 4 – Configuration > Hardware > Analog input configuration on Helios TT and Basic*
2	RS232 RX	Brown	Communication	RS232 wire set with Molex connector
3	Main Power +12V or +24V	Red	Power Supply	Main +12V or +24V supply. Must be protected by a 5 A fuse
4	Key (Ignition)	Yellow	Input (+)	Indicates the vehicle ignition state
5	CAN High	Gray/Black	CAN Bus connection	CAN +
6	Keypad/Dallas	Blue/White Red Black		Keypad connector
7	RS232 TX	Red Black	Communication	RS232 wire set with Molex connector
8	GND	Black	GND	
9	Immobilizer and/or Gradual Stop	Blue	Output (-)	Install with an external relay. See *Appendix D – Immobilizer and Gradual Stop*
10	CAN Low	Gray/Blue	CAN Bus connection	CAN -

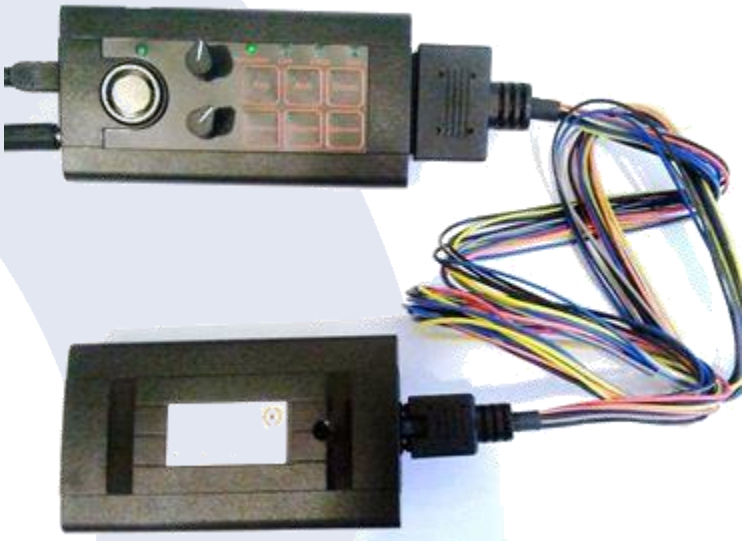
The following image shows Helios Basic 10-pin unit.

The following image shows Helios Basic 10-pin wire harness.



The following image shows Helios Basic 10-pin Simulator cable.

The following image shows how to connect Helios Basic 10-pin unit to the Simulator.



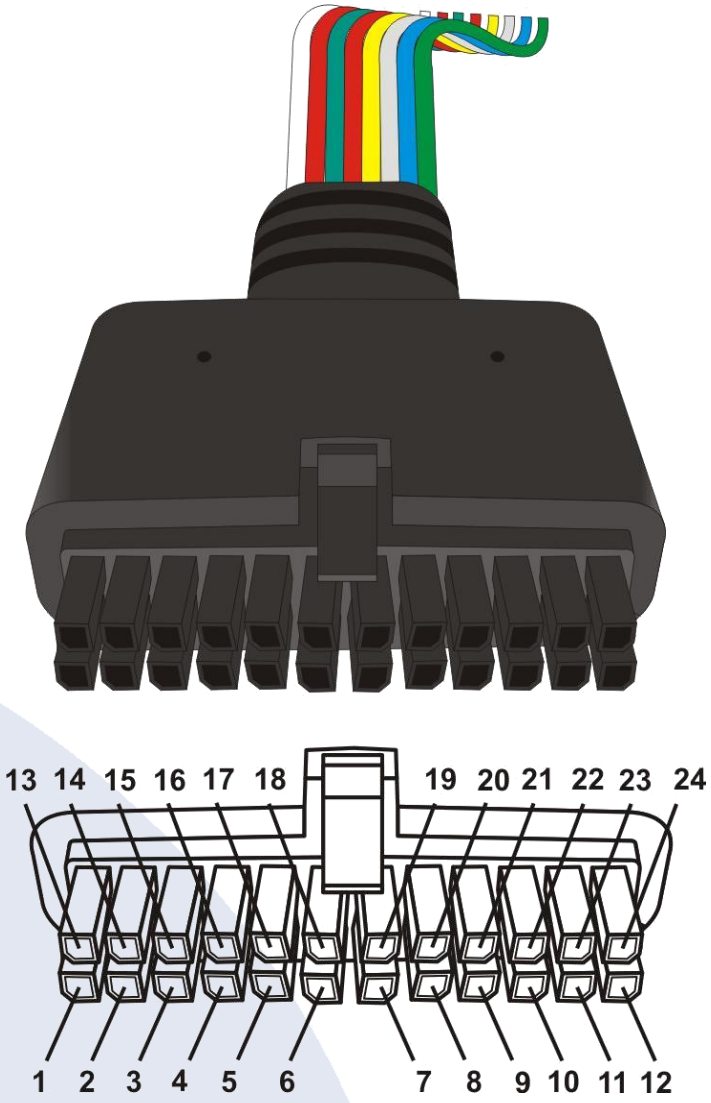
Helios Advanced 24-pin pinout

Pin No.	Function	Color	Designation	Notes
1	Immobilizer and/or Gradual Stop	Blue	Output (-)	Install with an external relay. See *Appendix D – Immobilizer and Gradual Stop*
2	Door Unlock	Gray	Output (-)	Install with an external relay. See *Appendix C – Central Locking System Configuration*
3	RS232 TX	Orange/Blue	Communication	RS232 wire set with Molex connector. Enables direct connection to a computer
4	Key (Ignition)	Yellow	Input (+)	Indicates the vehicle ignition state
5	Main Power +12V or +24V	Red	Power Supply	Main +12 or +24V supply. Must be protected by a 5 A fuse
6	GND	Black		
7	Keypad/Dallas	Blue/White	Communication	Keypad connector
8	Emergency Button	White	Input (-)	
9	Microphone (+) / or Extra Digital Input 1 (-)	Orange	Audio	Hands Free Kit connector. In case HFK is not connected, you can cut the connector and use pin 9 as Extra Digital Input 1
10	Speaker (+) / or Extra Analog Input 3 (-)	Violet	Audio	Hands Free Kit connector. In case HFK is not connected, you can cut the connector and use pin 10 as Extra Analog Input 3
11	Analog 1	Yellow/Blue	Input (+)	Usually used for fuel or temperature measurement
12	CAN High	Black/Gray	CAN Bus connection	CAN +
13	Door Lock	Gray/Orange	Output (-)	Install with an external relay. See *Appendix C – Central Locking System Configuration*
14	Arm	Orange/White	Input (-)	
15	RS232 RX	Blue/Black	Communication	RS232 wire set with Molex connector
16	Door	Green	Input (-)	

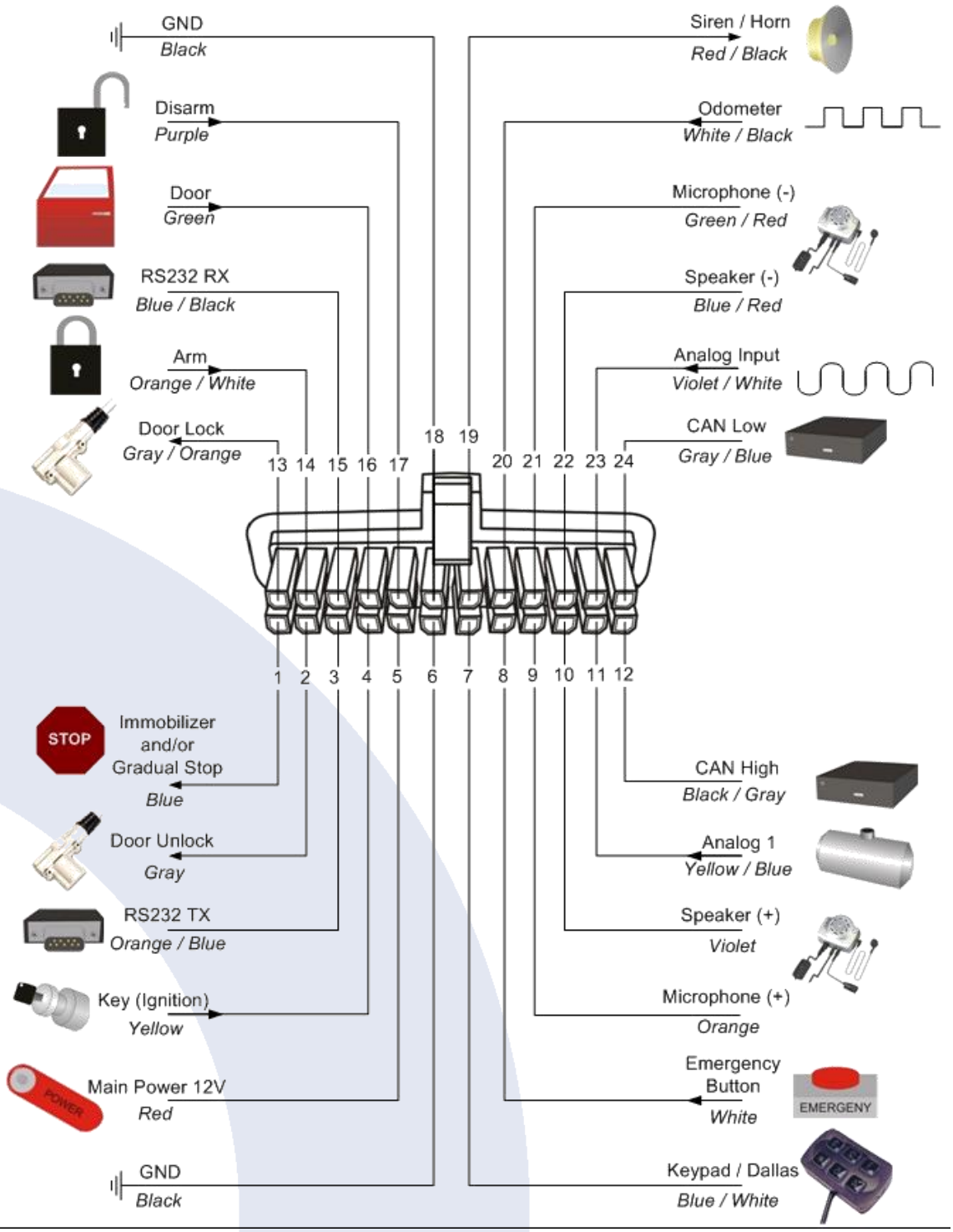
17	Disarm	Pink	Input (-)	Alarm system disarming input
18	GND	Black		
19	Siren/Vehicle Horn	Red/Black	Output (-)	Install with a relay (according to the vehicle voltage +12V or +24V)
20	Odometer	White/Black	Pulse Counting Input (+)	Connect to pulse generator*
21	Microphone (-) /or Extra Digital Input 2	Green/Red	Audio	Hands Free Kit connector. In case HFK is not connected, you can cut the connector and use pin 21 as Extra Digital Input 2
22	Speaker (-) /or Extra Digital Input 3	Blue/Red	Audio	Hands Free Kit connector. In case HFK is not connected, you can cut the connector and use pin 22 as Extra Digital Input 3
23	Analog 2	Violet/White	Input (+)	Usually used for fuel or temperature measurement
24	CAN Low	Gray/Blue	CAN Bus connection	CAN -

* The odometer input informs the system whether to measure mileage by counting odometer pulses or by calculating the distance traversed by the vehicle using GPS. The odometer can count pulses from any type of pulse generator.

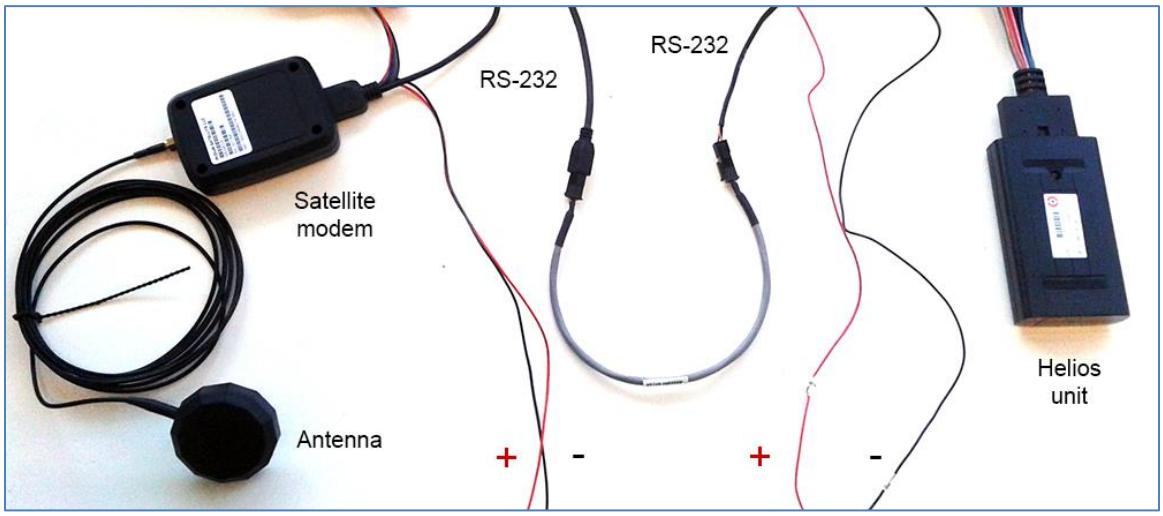
The following image shows the pin numbering on the Helios 24-pin J1 connector.



The following image shows the pin correspondence to different auto components.



Helios Hybrid connection



Connect the external antenna to the satellite modem.

Take a 10-pin wire harness and isolate the **RED** Power cable (+), **BLACK** GND cable (-) and RS232 connector from the rest of the harness.

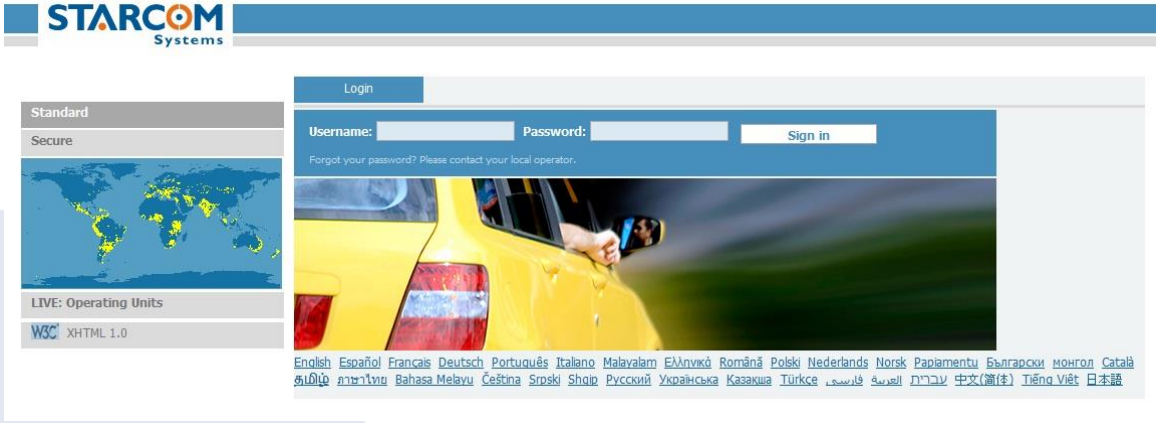
Connect the special RS232 Male to Male cable to RS232 connector on the satellite modem wire harness and to the RS232 connector on the Helios wire harness.

Connect the **RED** Power cable (+) from the satellite modem wire harness to +12V or +24V power source. Connect the **BLACK** GND cable (-) from the satellite modem wire harness to ground.

7. Monitoring

After the unit is installed in the vehicle, you can monitor its status on **Starcom Online**. Starcom Online is a web based fleet management application with a flexible event generator which allows to set customizable notifications and alerts.

In your browser, go to http://www.starcomsystems.com/online. Enter your username and password in the **Username** and **Password** fields, and click **Sign in**.

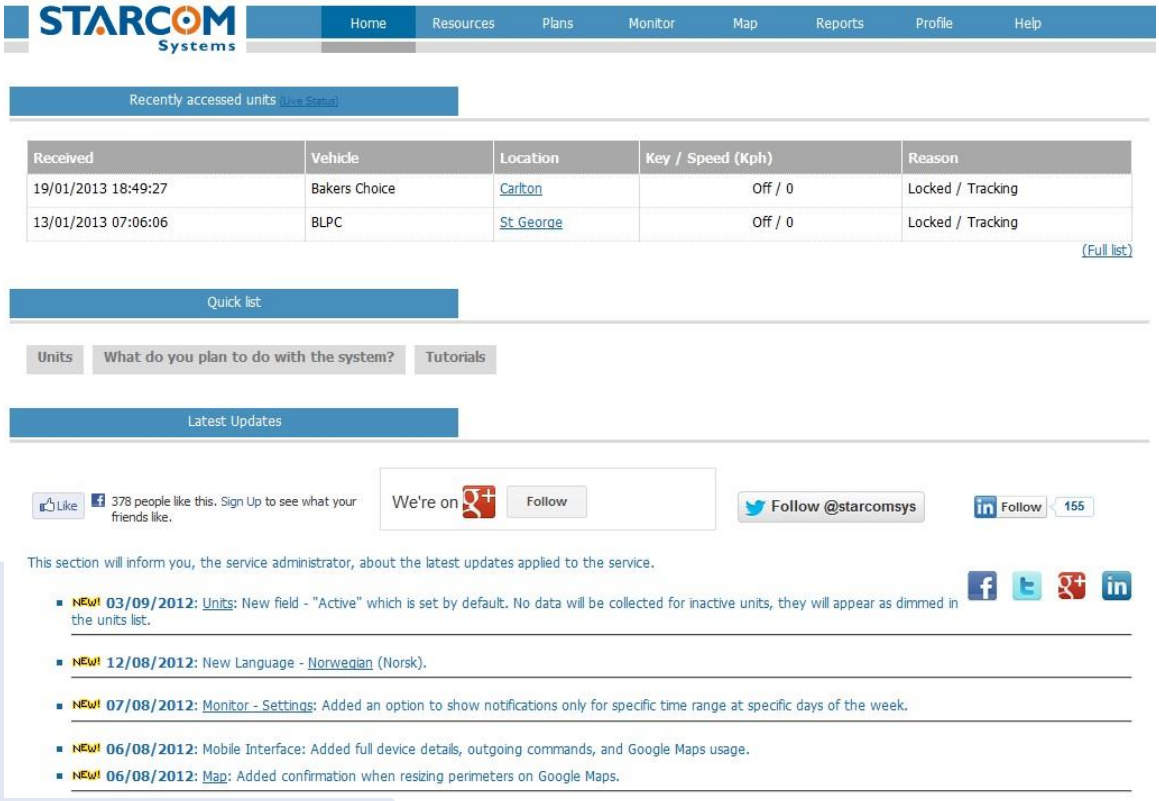


Starcom Online horizontal menu bar features the following categories:

- **Home** – lists the most recently accessed units, including their location.
- **Resources** – allows to manage the unit and customer information.
- **Plans** – allows to create and manage events and alerts.
- **Monitor** – monitors the events and alerts from the unit.
- **Map** – displays the actual location of the unit on the map.
- **Reports** – generates reports of the unit activity.
- **Profile** – allows to configure your user properties.
- **Help** – contains tutorials and knowledge base.

Home

The Home section shows recently accessed units and latest site updates.



In the Home section, you can find the following additional links:

Live status – displays the current status of all live units, as shown in the following image.

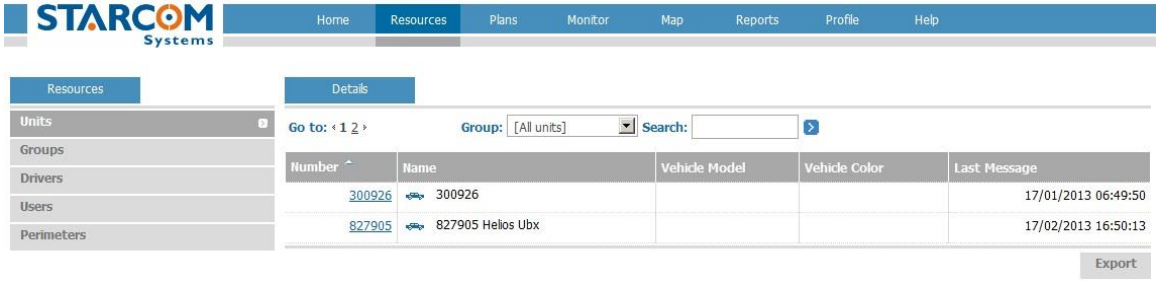
Full list – opens the Resources section that displays a full list of all your units.

Location – opens the Map section that displays a map showing the current location of the unit.

Quick List – links that enable you to access the Resources and Plans sections.

Resources

The Resources section shows all your units.



On the left side, the Resources section features the following tabs:

Units – lists the units.

Groups – lists the groups of units and helps you create new and modify the existing groups.

Drivers – lists the drivers.

Users – lists the users and helps you create new and modify the existing users.

Perimeters – lists perimeters and helps you define new and modify the existing perimeters.

Units

The **Units** page features the **Details** area, which arranges the unit information in the following columns:

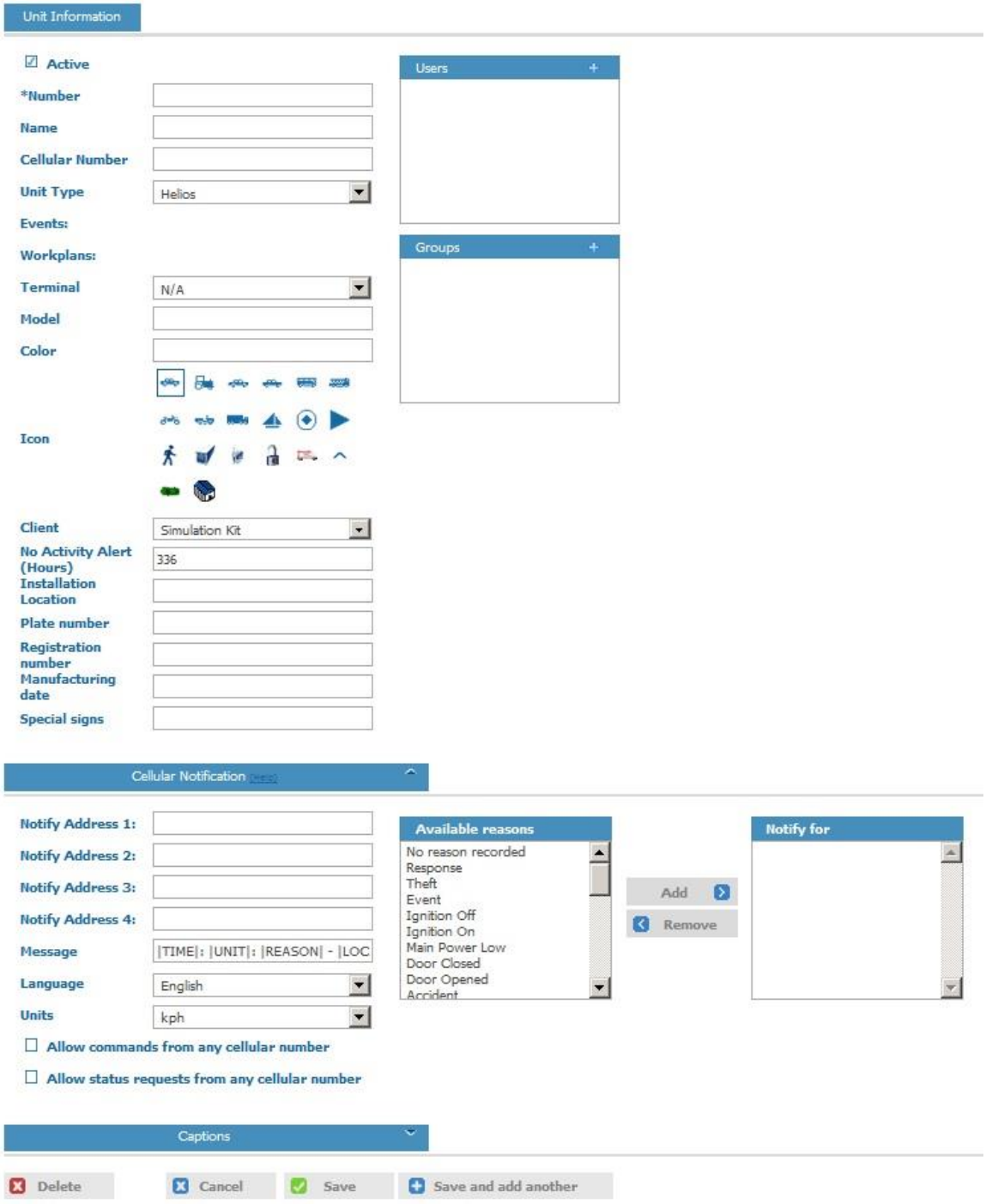
Number – the unit serial number. Clicking on the unit number link will display the **Unit Information** page, where you can modify the unit information.

Name – displays the icon and the name of the unit. Clicking on it will reveal a pop-up menu with the quick access links to the Map and the Reports sections.

Cellular Number – displays the phone number of the SIM card installed in the unit.

Last Message – displays the time and date of the last message transmitted by the unit.

To create a new unit, click **New** (not available for evaluation kit users). The Unit Information page opens.



Active – when selected (set by default), makes the unit active on Starcom Online. To make the unit inactive, deselect this checkbox. No data will be collected for inactive units; they will appear as dimmed in the units list.

Use this section to enter the unit **Number** and **Name**. In the **Cellular Number** field, enter the number of the SIM card installed in the unit. In the **Unit Type** list, select Helios. Use the **Terminal** list to select the type of terminal connected to the unit.

Specify **Vehicle Model** and **Vehicle Color**. Choose the **Icon** which will represent the unit.

No Activity Alert (Hours) – used to receive an alert when the unit has stopped transmitting. The default value is 336 hours (2 weeks).

In the **Users** window, click on the plus (+) sign on the right and start typing the name of the user you want to make the unit available for in the Search field. The name of the user will appear in the dropdown list. Click on it to add it to the Users list. To remove the user, click on the minus sign (-) on the left of the user name.

In the **Groups** window, click on the plus (+) sign on the right and start typing the name of the group you want to make the unit available for in the Search field. The name of the group will appear in the dropdown list. Click on it to add it to the Groups list. To remove the group, click on the minus sign (-) on the left of the group name.

Use the **Cellular Notification** section to configure the cellular notifications for different events.

Notify Address 1-4 – enter the cellular numbers you want to use to send commands to the unit, or to receive notifications on when the events occur.

Message – modify the notification message format. The following parameters are available: |TIME| |NUMBER| |VEHICLE| |REASON| |KEY| |DOOR| |HOOD| |SPEED| |MILEAGE| |XY| |BATTERY|.

Language – select the language in which you want to receive the message.

Units (kph/mph) – select the measurement you want to receive the speed data in.

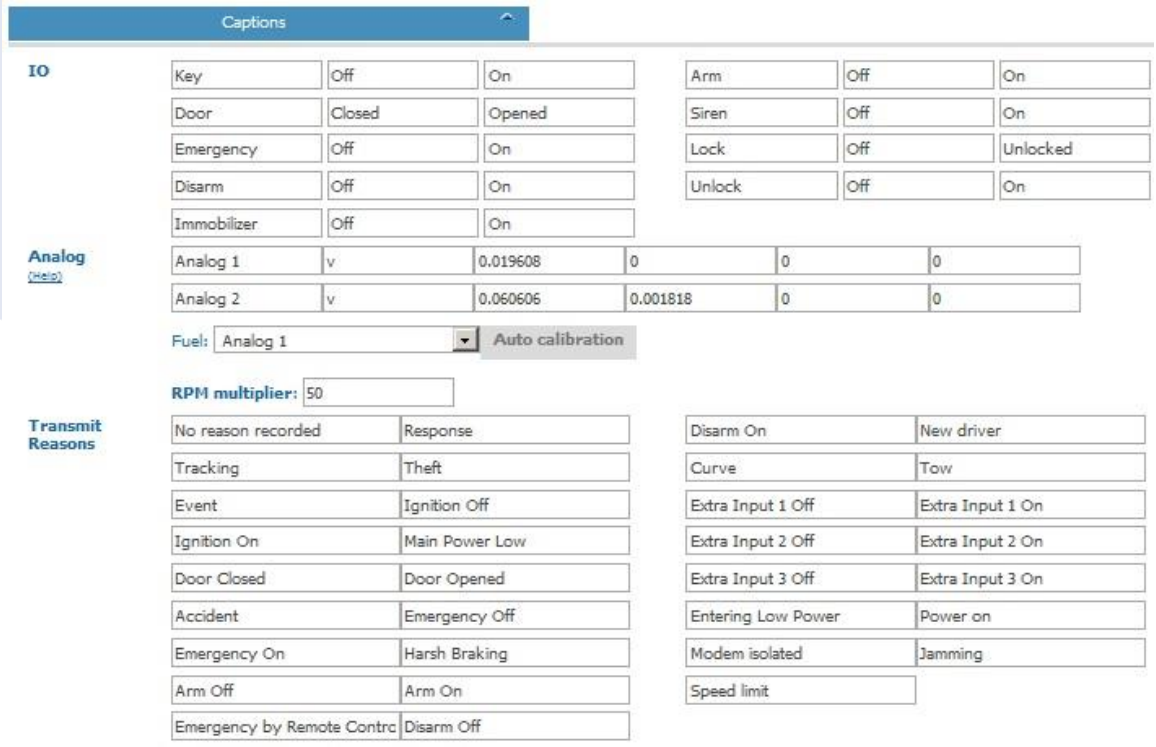
Allow commands from any cellular number – select this if you want to be able to send commands to the unit from any cellular phone, and not only from the addresses specified above.

Allow status requests from any cellular number – select this if you want to allow status requests from any cellular phone, and not only from the addresses specified above.

For more information, see *Appendix I – Cellular Phone Commands*.

In the **Available reasons** list, select the reasons you want to receive an alert for and click **Add**. The reasons will be moved to the **Notify for** list.

Clicking on **Captions** will reveal the Captions section.



This section features the captions for various fields, like unit inputs, outputs, transmit reasons, etc. which are used throughout the system.

The **Analog** settings help you configure the use of the unit analog inputs, which are usually used for fuel or temperature measurement. For more information, see *Appendix F – Fuel Measurement* and *Temperature Sensor* guide.

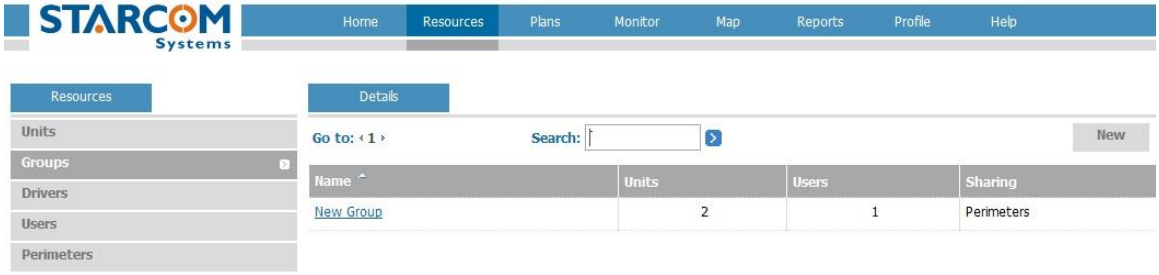
When finished, click **Apply**. The new unit is saved.

To modify a unit, in the **Units** page, click on the unit name link of the unit you want to modify. The Unit Information page appears. Modify the unit details as required. Click **Apply**. The modified unit details are saved.

To delete a unit, in the **Units** page, click on the unit name link of the unit you want to delete. The Unit Information page appears. Click **Delete**. The unit is deleted.

Groups

You can create new and modify the existing groups of units.



To create a new group, click **New**. The Group page opens.

In the **Name** field enter the name of the new group.

In the **Units** window, click on the plus (+) sign on the right and start typing the name of the unit you want to make the unit available for in the Search field. The name of the unit will appear in the dropdown list. Click on it to add it to the Units list. To remove the unit, click on the minus sign (-) on the left of the unit name.

In the **Users** window, click on the plus (+) sign on the right and start typing the name of the user you want to make the unit available for in the Search field. The name of the user will appear in the dropdown list. Click on it to add it to the Users list. To remove the user, click on the minus sign (-) on the left of the user name.

In the **Sharing** section, click the respective checkbox, if you want the group to **Share Perimeters**, **Share Events**, or **Share Drivers**.

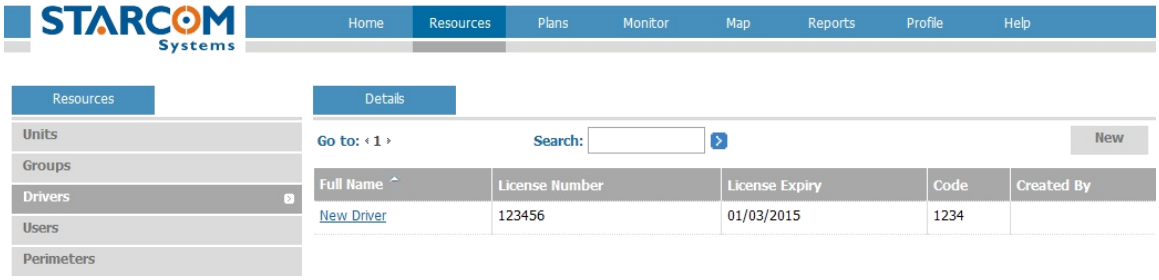
Click **Apply**. The new group is saved.

To modify a group, in the **Groups** page, click on the group name link of the group you want to modify. The Group page appears. Modify the group details as required. Click **Apply**. The modified group details are saved.

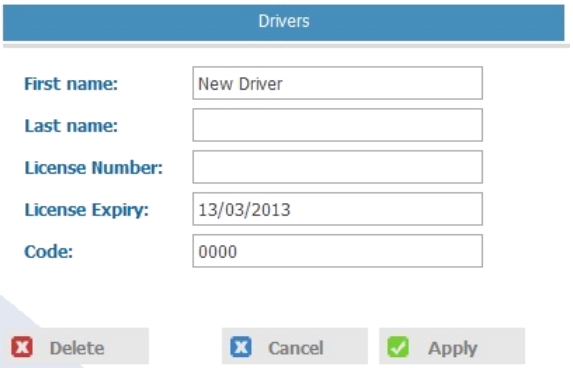
To delete a group, in the **Groups** page, click on the group name link of the group you want to delete. The Group page appears. Click **Delete**. The group is deleted.

Drivers

You can create new and modify the existing drivers.



To create a new driver, click **New**. The Drivers page opens. Here you can enter the new driver information.



In the **Code** field, you can specify the iButton or keypad code of the driver.

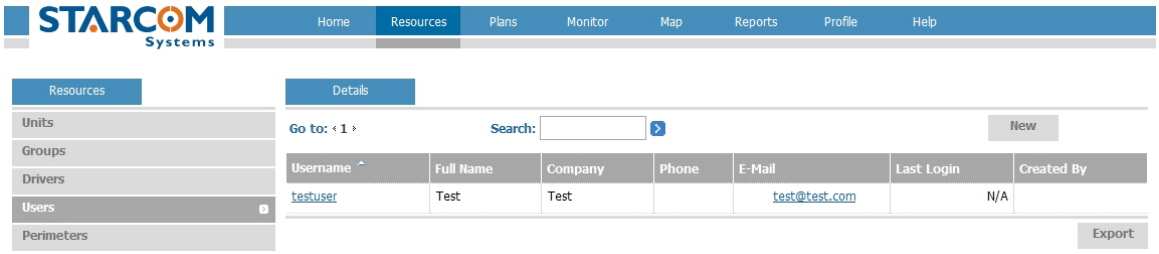
Click **Apply**. The new driver is saved.

To modify a driver, in the **Drivers** page, click on the driver name link of the driver you want to modify. The Drivers page appears. Modify the driver details as required. Click **Apply**. The modified driver details are saved.

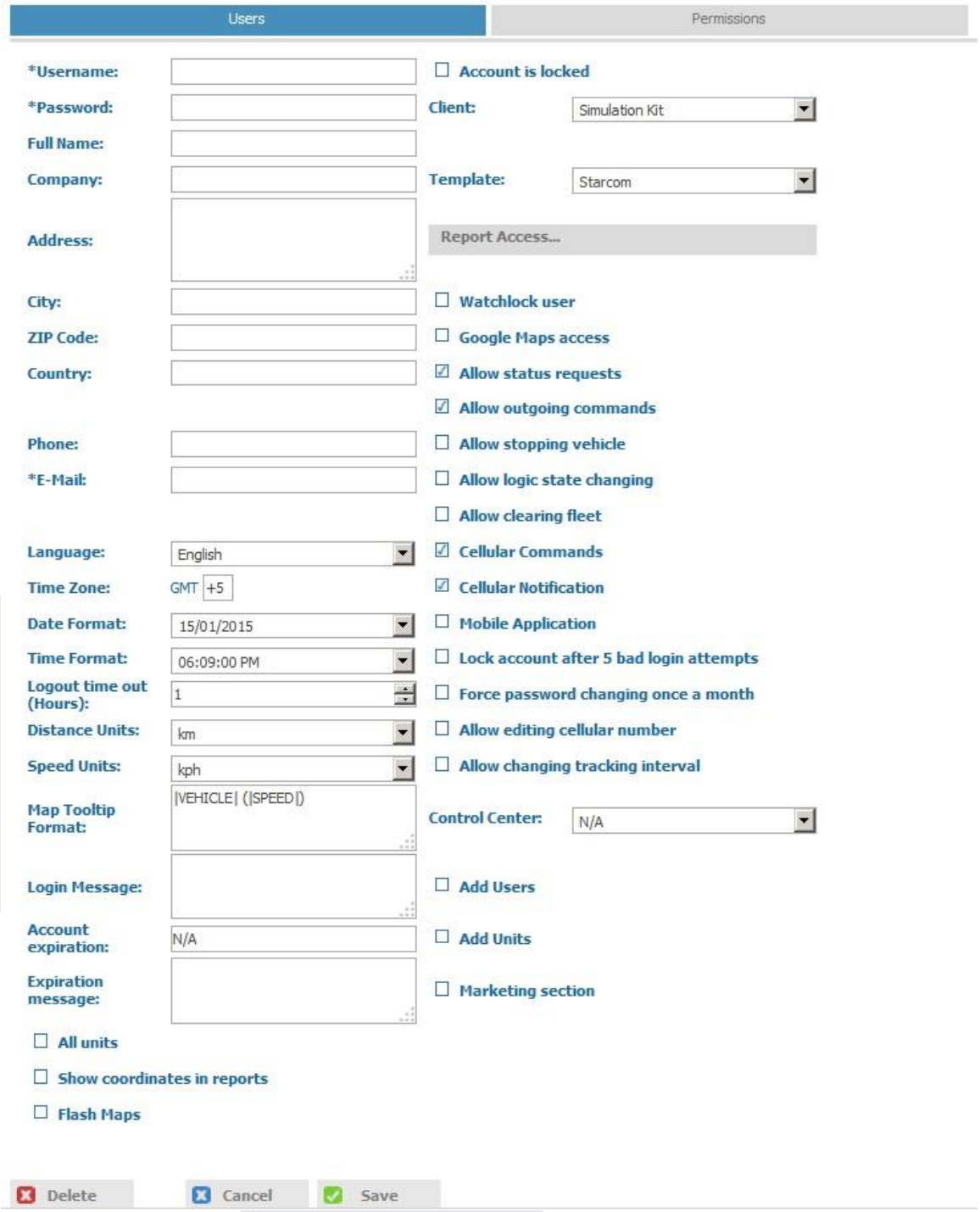
To delete a driver, in the **Drivers** page, click on the driver name link of the driver you want to delete. The Drivers page appears. Click **Delete**. The driver is deleted.

Users

You can create new and modify the existing users.



To create a new user, click **New**. The Users page opens. Here you can enter the new user information and define their access permissions.



Besides entering the user information, you can select the following options:

All units –all the user's units will be displayed on the Map page. If this option is disabled, only the selected unit will be displayed.

Show coordinates in reports – the user's reports will include the GPS coordinates.

Flash Maps – enables the user to see flash maps.

Report Access – allows to select which reports will be accessible for the user.

Google Maps access – enables Google Maps access on the Maps page.

Allow status requests – enables the user to make unit status requests.

Allow outgoing commands – enables the user to send commands to the unit.

Allow stopping vehicle – enables the user to send a command to the unit which will stop the vehicle.

Allow logic state changing – enables the user to change the unit logic state.

Allow clearing fleet – enables the user to send Clear Fleet command to the units.

Cellular Commands – enables the user to send commands to the unit from a cellular phone.

Cellular Notification – enables the user to receive cellular notifications.

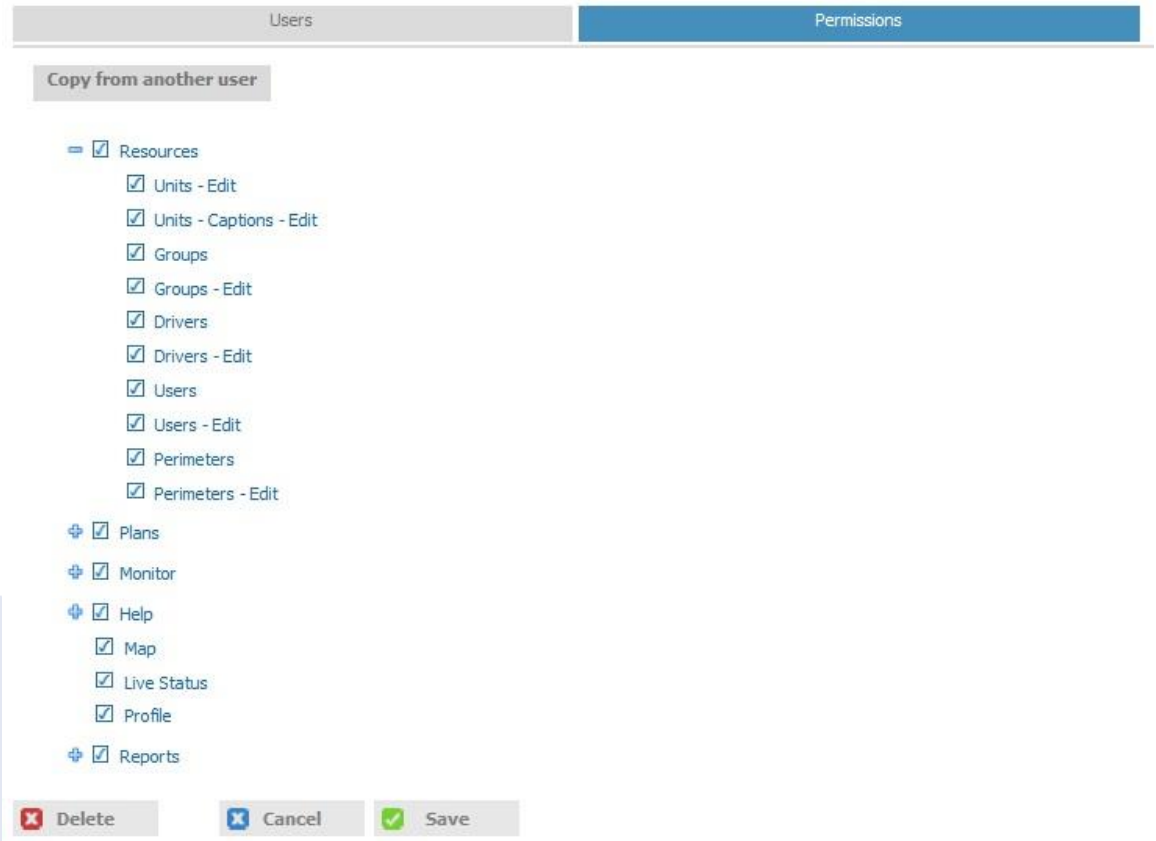
Mobile Application – enables the user to use Starcom Mobile application. **Olympia Tracking**, Starcom Mobile application, allows to receive cellular notifications to your mobile phone. To install, use the following link: http://starcomsystems.com/m/ (compatible with Android / Apple IOS).

Lock account after 5 bad login attempts – locks access to Starcom Online account after the user has made 5 bad login attempts.

Force password changing once a month – requires the user to change the password once a month.

Allow editing cellular number – enables the user to edit the phone number of the SIM card installed in the unit.

Allow changing tracking interval – enables the user to change the time of the unit tracking interval.



Permissions allow you to define the viewing and editing permissions of the user for all the sections of the site.

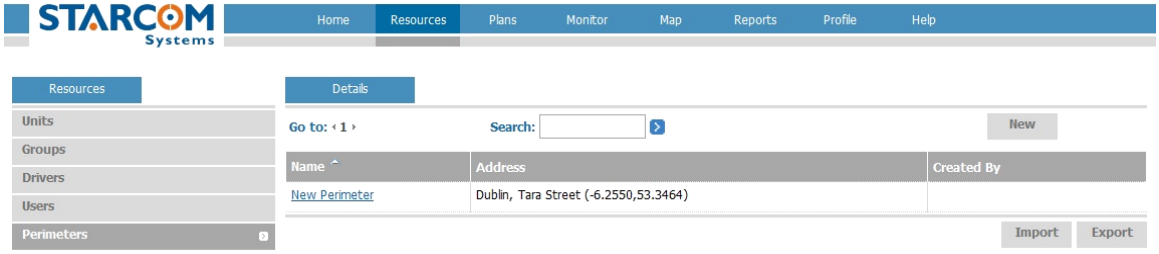
After you configured all the parameters, click **Apply**. The new user is saved.

To modify a user, in the **Users** page click on the user name link of the user you want to modify. The Users page appears. Modify the user details as required. Click **Apply**. The modified user details are saved.

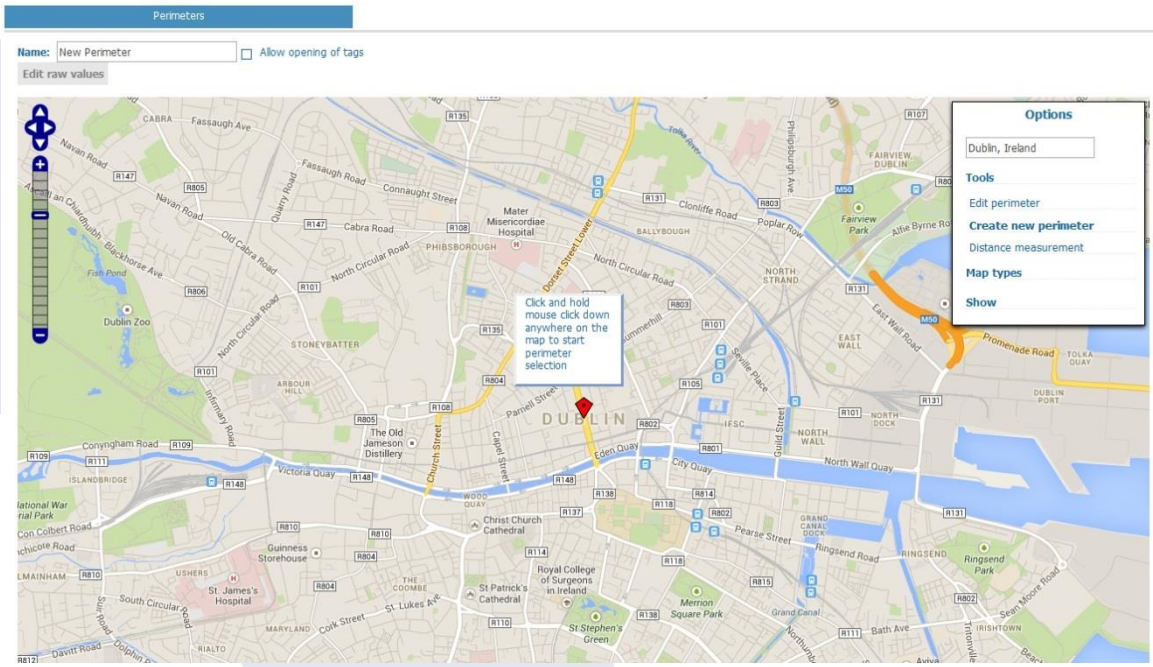
To delete a user, in the **Users** page click on the user name link of the user you want to delete. The Users page appears. Click **Delete**. The user is deleted.

Perimeters

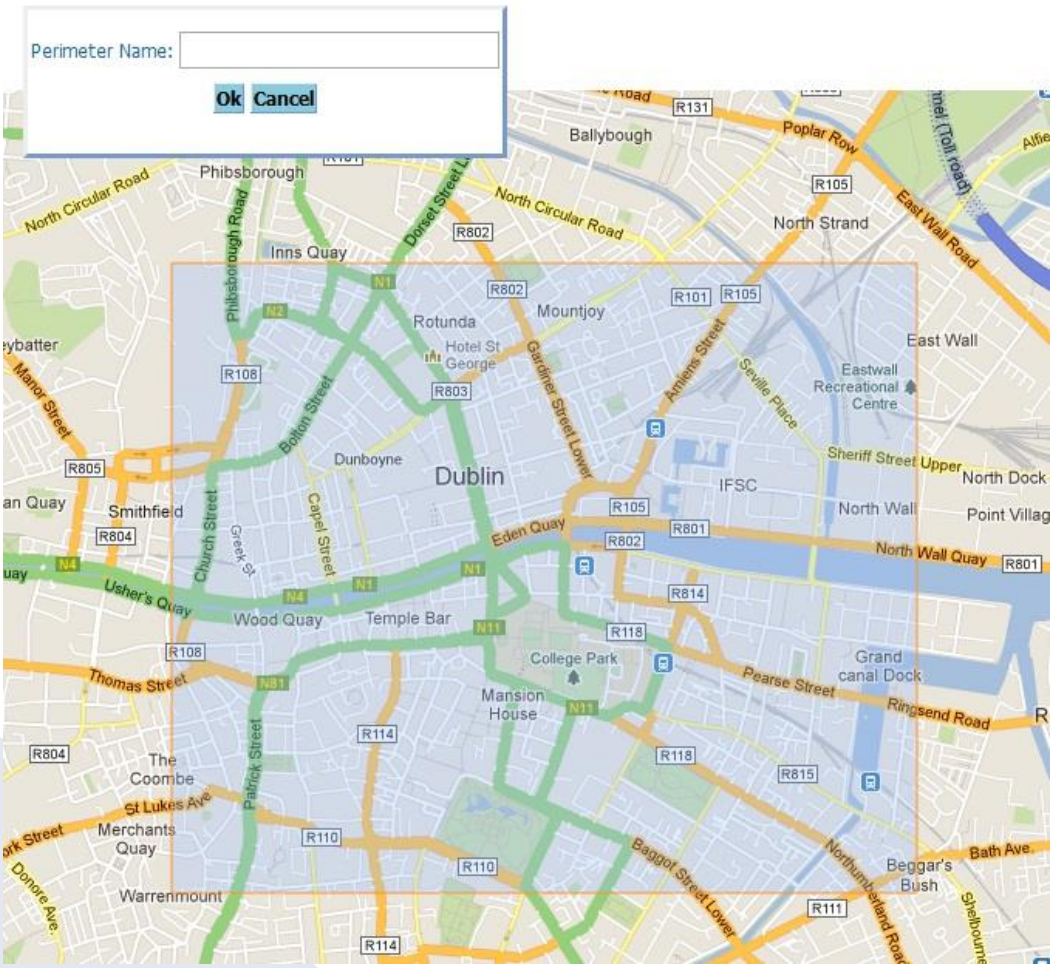
You can create new and modify the existing perimeters.



To create a new perimeter, click **New**. The Perimeters page opens. In the **Name** field, enter a name for the new perimeter.

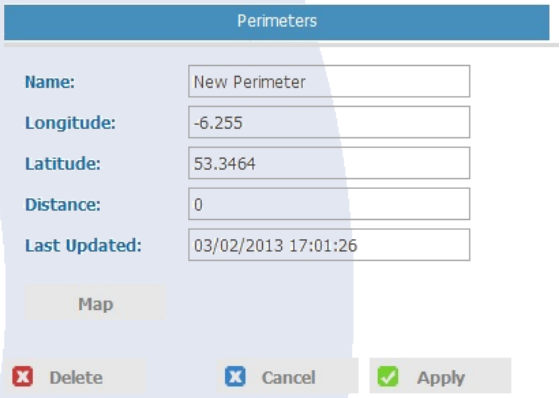


To create a new perimeter, click **Options > Tools > Create new perimeter** at the top right corner of the map. Click once anywhere on the map to start the perimeter selection (this point would be the top left corner of the perimeter). Move the mouse and click again anywhere on the map to finish the perimeter (this point would be the bottom right corner of the perimeter).



In the **Perimeter Name** field, enter the name of the perimeter. Click **Ok**. The new perimeter is saved and appears on the map.

To view/edit the GPS parameters of the perimeter, click **Edit raw values**. The raw parameters appear.



Modify the values as required. Click **Apply** to save the changes.

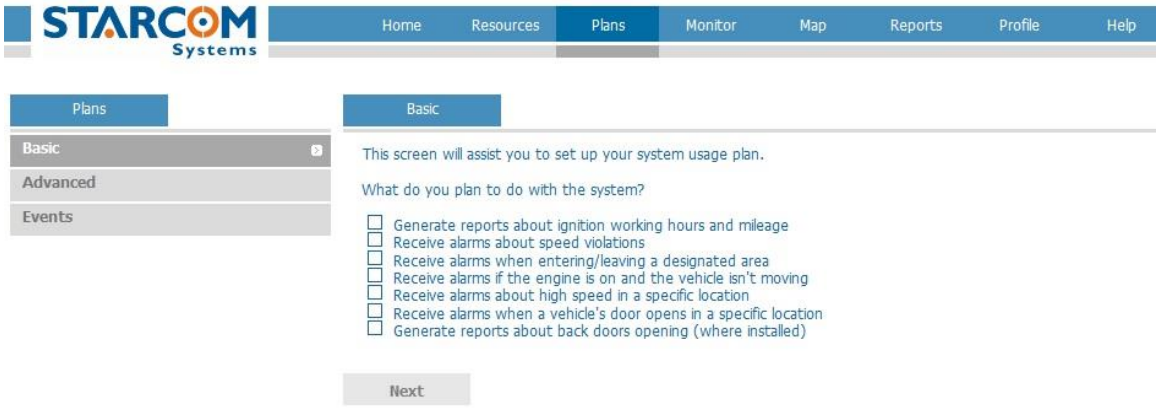
After you made all the changes on the Perimeters page, click **Apply**. The perimeter details are saved and the new perimeter appears in the list on the Resources section.

To modify a perimeter, in the **Perimeters** page click on the perimeter name link of the perimeter you want to modify. The Perimeters map page appears. Modify the perimeter as required. Click **Apply**. The modified perimeter is saved.

To delete a perimeter, in the **Perimeters** page click on the perimeter name link of the perimeter you want to delete. The Perimeters map page appears. Click **Delete**. The perimeter is deleted.

Plans

The Plans section enables you to create usage plans and to view plans that already exist.



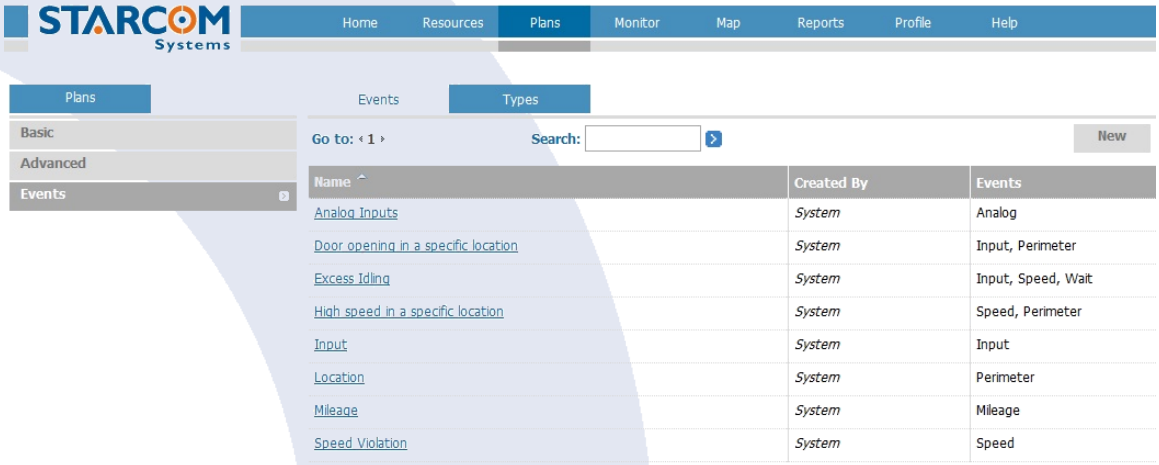
On the left side, the Plans section features the following tabs:

Basic – allows to set up basic plans for LCU500 units. Do not use.

Advanced – allows to set up advanced plans for LCU500 units. Do not use.

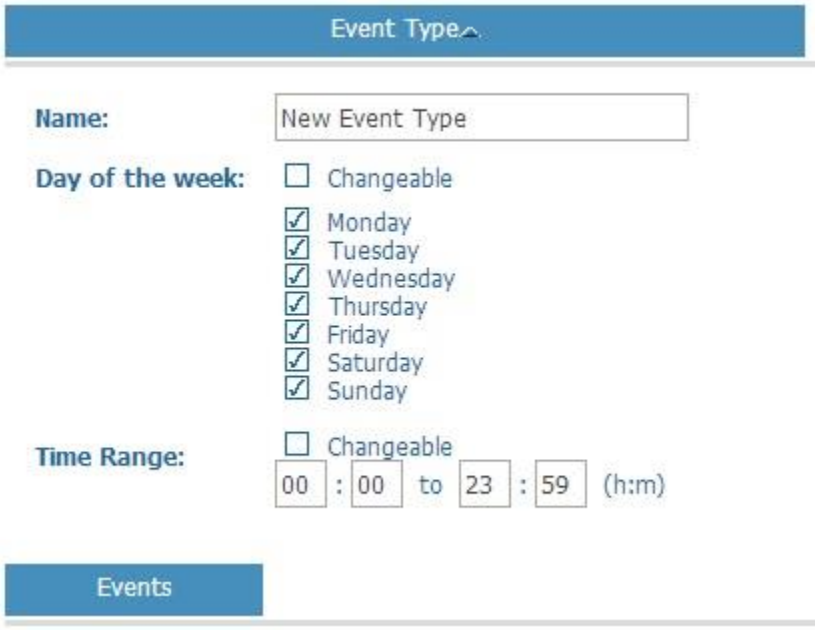
Events – allows to create events for your units.

To create a new event, you need to create an event Type first. Click **Types**. The Types page opens.

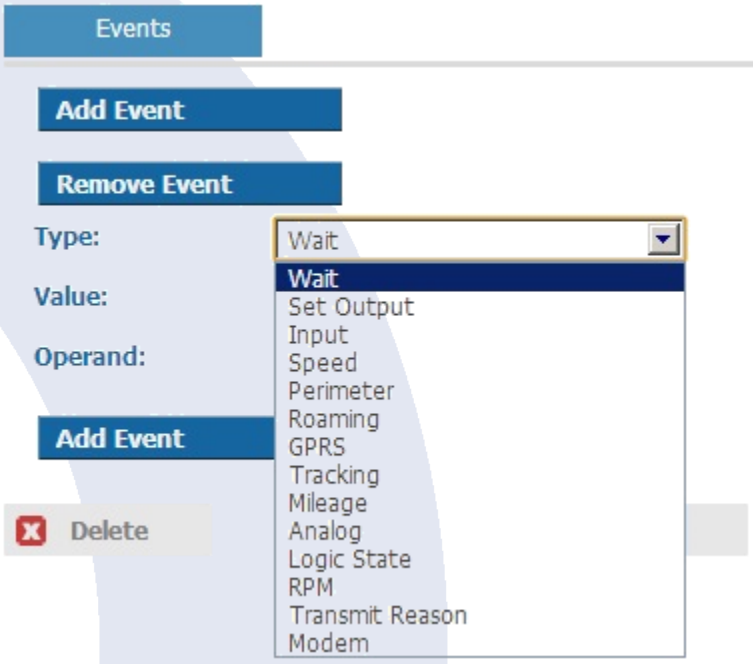


In this section, you can see the types of events already created in the system. You can use one of them, or create a new type.

To create a new event type, click **New**. Enter the name of the event type in the **Name** field. Leave **Day of the week** and **Time Range** as "Changeable", later you will be able to change these settings in the event itself.



Click the **Add Event** button and select the event type you want to create from the dropdown list.



Set the necessary **Value**. You can leave the **Condition** as "Changeable", later you will be able to change it in the event itself. Select the necessary operand in the **Operand** list, as follows:

And – when you create several events, this event and the following one will be performed simultaneously.

And then – when you create several events, the following event will start only after the first one is performed.

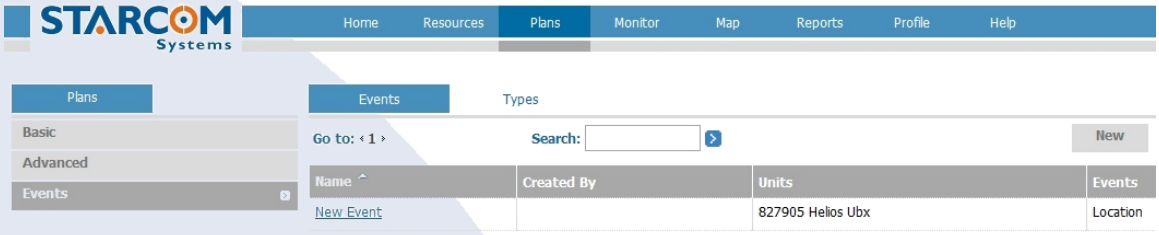
Transmit – the event will be transmitted.

End – ends an event. For example, you can create an output event, which after it performs the necessary actions will simply end.

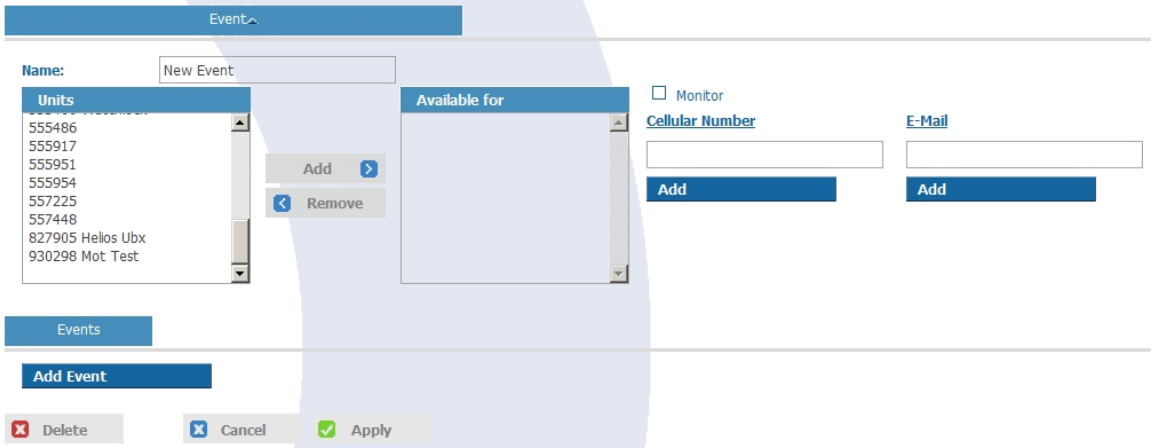
You can create a complex event type, which consists of several events.

When finished, click **Apply**. The new event type is saved.

To create a new event, click **New** in the Events section.

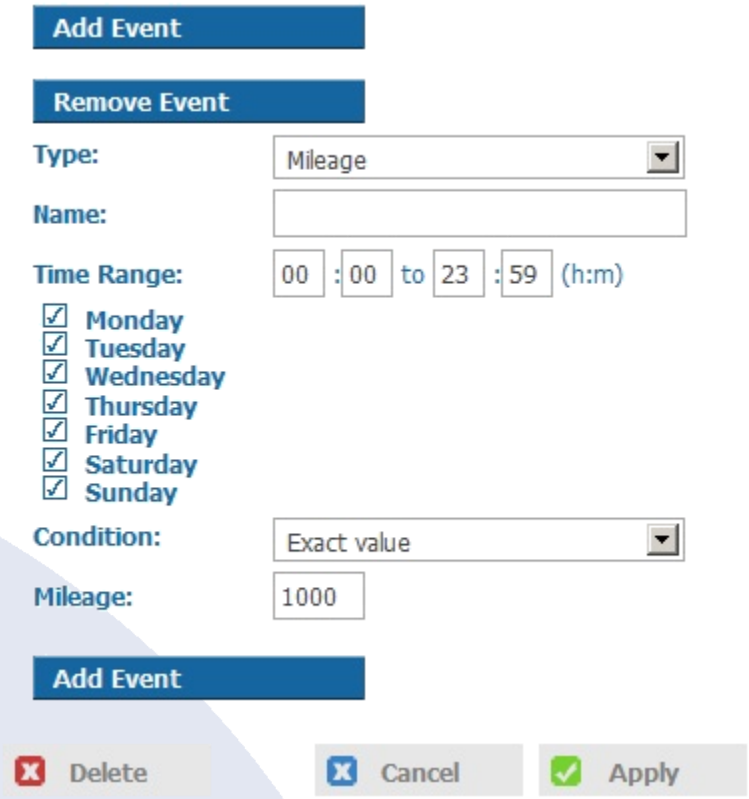


Enter the name of the event in the **Name** field. In the **Units** list, select the units you want to include in the event and click **Add**. The units will be moved to the **Available for** list.



Enter the cellular number and email address to receive the event notification. If you select the Monitor checkbox, the event will be displayed on the Monitor page (see below) in real time.

Click the **Add Event** button and select the type of the event you want to create from the dropdown list.



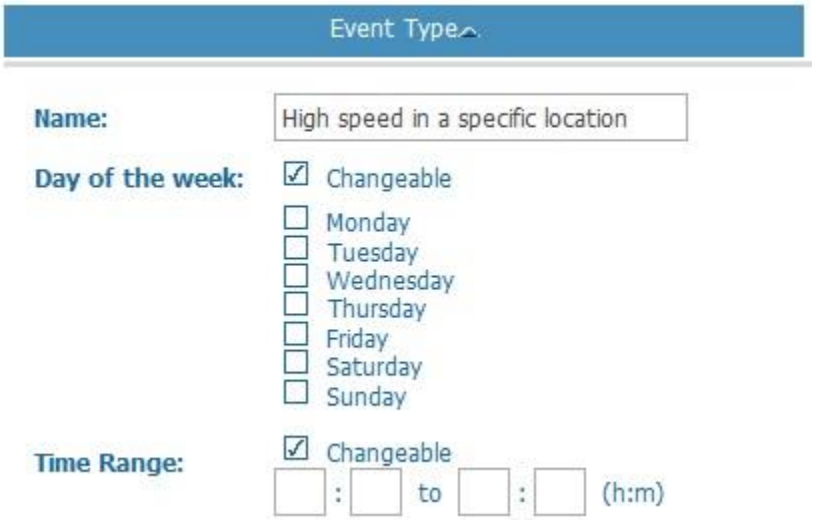
Specify the time and date range and the event condition.

When finished, click **Apply**. The new event is saved.

You can create a complex event, which consists of several events.

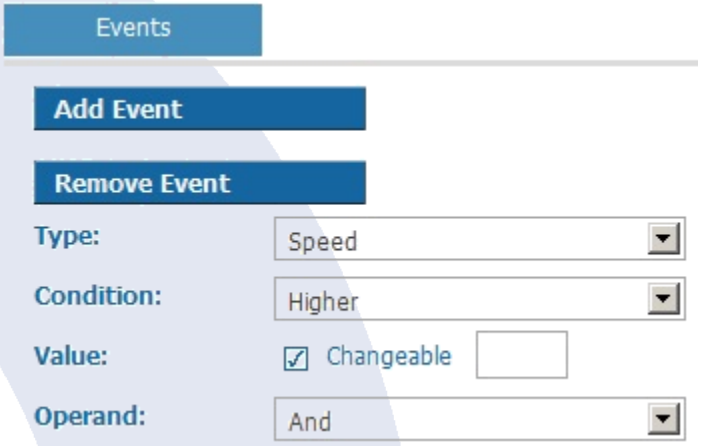
For example, let's create an event, which will send an alert when the vehicle goes over a certain speed in a specific location.

Go to **Types** and click **New**.



Enter the event type name and tick the Changeable checkboxes for the Day of the week and Time range.

Click **Add Event**.



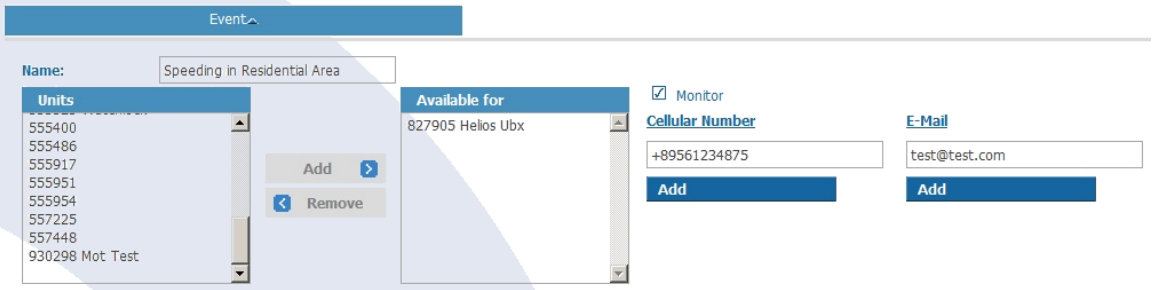
Select **Speed** in the **Type** list. Select **Higher** in the **Condition** list. Click the **Changeable** checkbox in the **Value** field. Select **And** in the **Operand** list.

Click the **Add Event** button again.

Select **Perimeter** in the **Type** list. Select **Changeable** in the **Perimeter** list. Select **Changeable** in the **Condition** field. Select **Transmit** in the **Operand** list.

Click **Apply**. The new event type is saved.

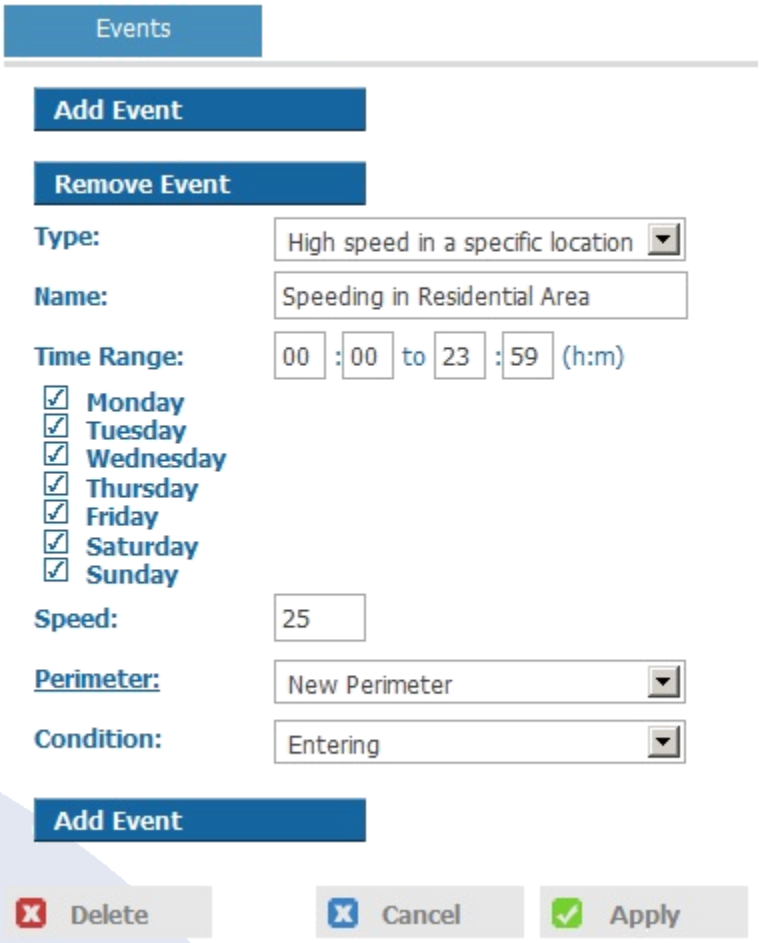
Now, go to **Events** and click **New**.



Enter the name of the event in the **Name** field. In the **Units** list, select the units you want to include in the event and click **Add**. The units will be moved to the **Available for** list.

Enter the cellular number and email address to receive the event notification. Select the Monitor checkbox, if you want the event will to be displayed on the Monitor page in real time.

Click the **Add Event** button and select the **High speed in a specific location** type in the **Type** list.



Enter the name of the event in the **Name** field. Select the necessary time and date range.

Specify the speed limit in the **Speed** field.

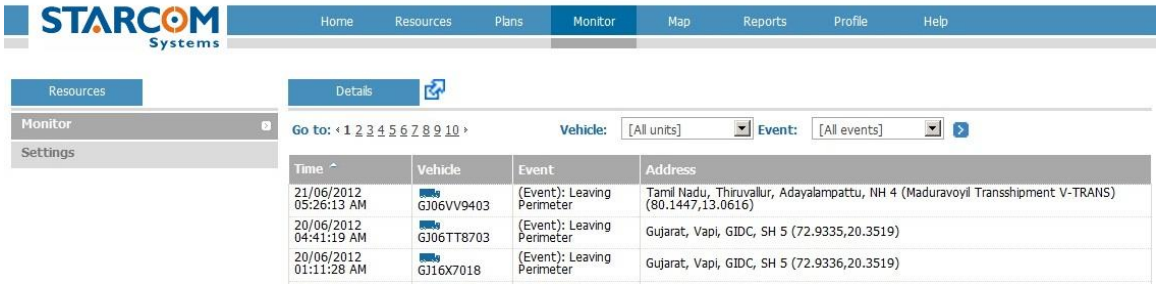
Select the necessary perimeter in the **Perimeter** list.

Select **Entering** in the **Condition** list.

Click **Apply**. The new event, which will send an alert when the vehicle goes over a certain speed in a specific location, is created.

Monitor

The Monitor section allows you to select a set of events for a specific unit type and to see them displayed in real time.

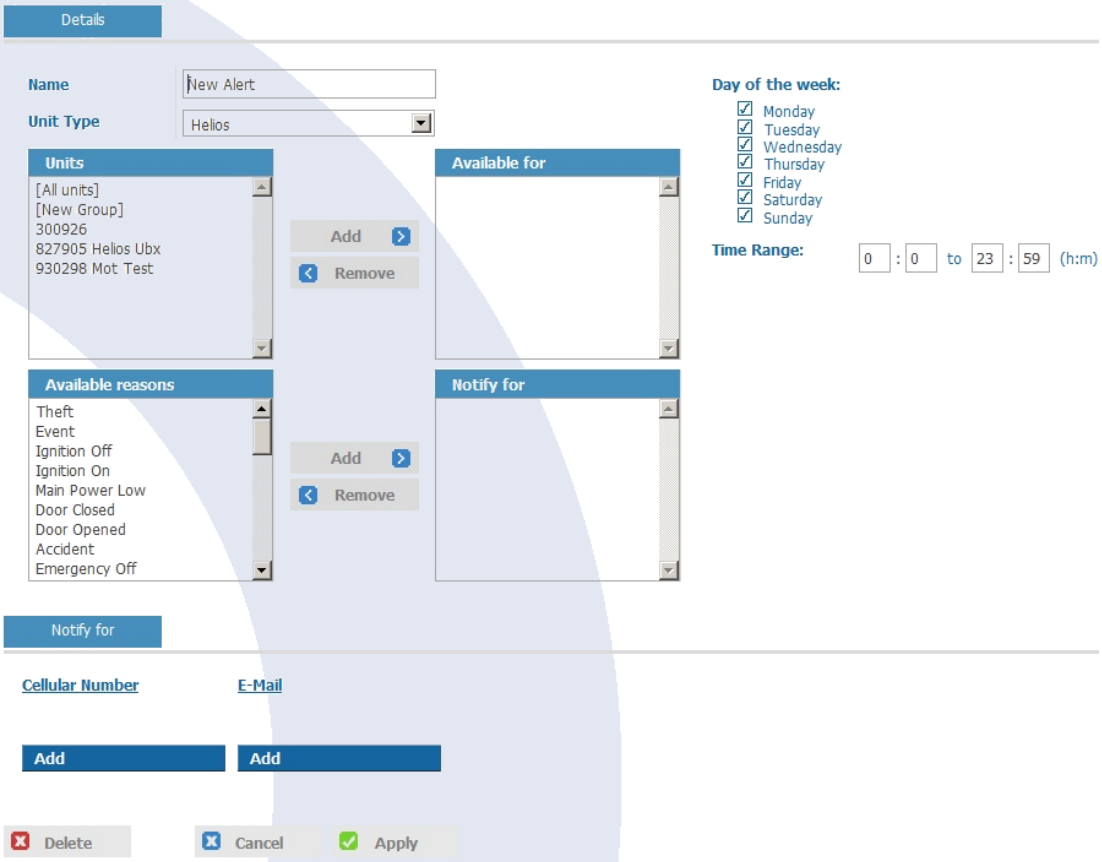


On the left side, the Monitor section features the following tabs:

Monitor – displays the events in real time.

Settings – allows creating new and modifying existing monitoring events.

To create a new event, go to the **Settings** tab and click **New**. The Details page opens. In the **Name** field, enter a name for the new event.



Select **Helios** in the **Unit Type** list.

In the **Units** list, select the units you want to include in the event and click **Add**. The units will be moved to the **Available for** list.

In the **Available reasons** list, select the reasons you wish to receive an alert for and click **Add**. The reasons will be moved to the **Notify for** list.

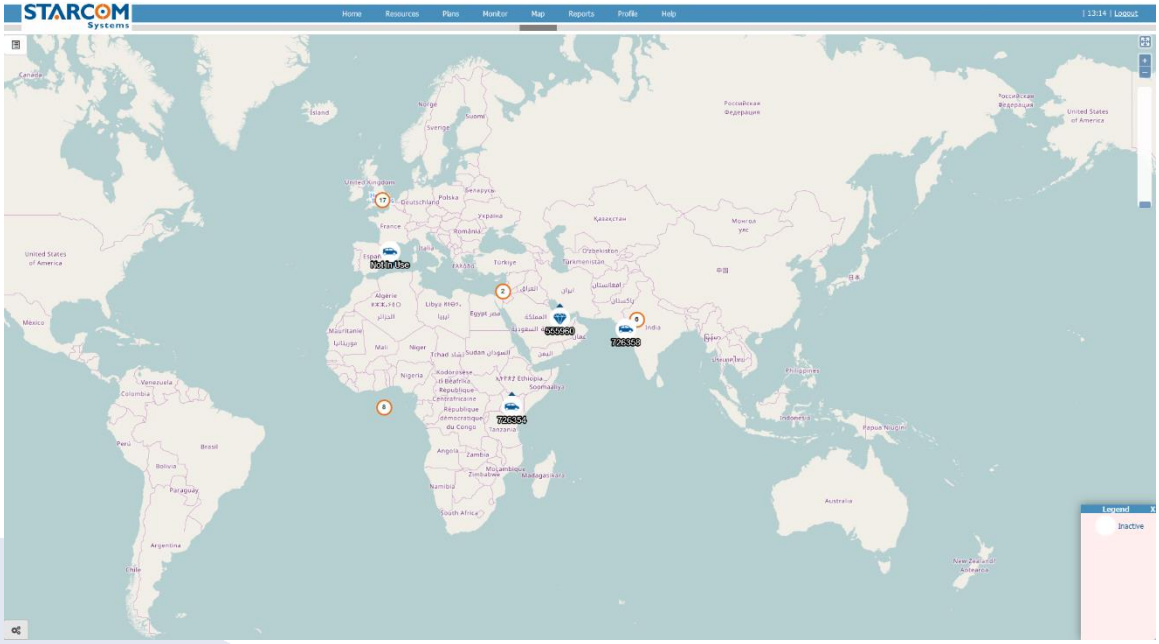
Enter the cellular number and email for the notification to be sent to in the **Notify for** section.

Press **Apply**. The new monitoring event is saved.

Once the events are generated by the units, they will appear on the Monitor page. You will also receive a notification by SMS. The email notifications are accumulated and sent once every half an hour to avoid spamming.

Map

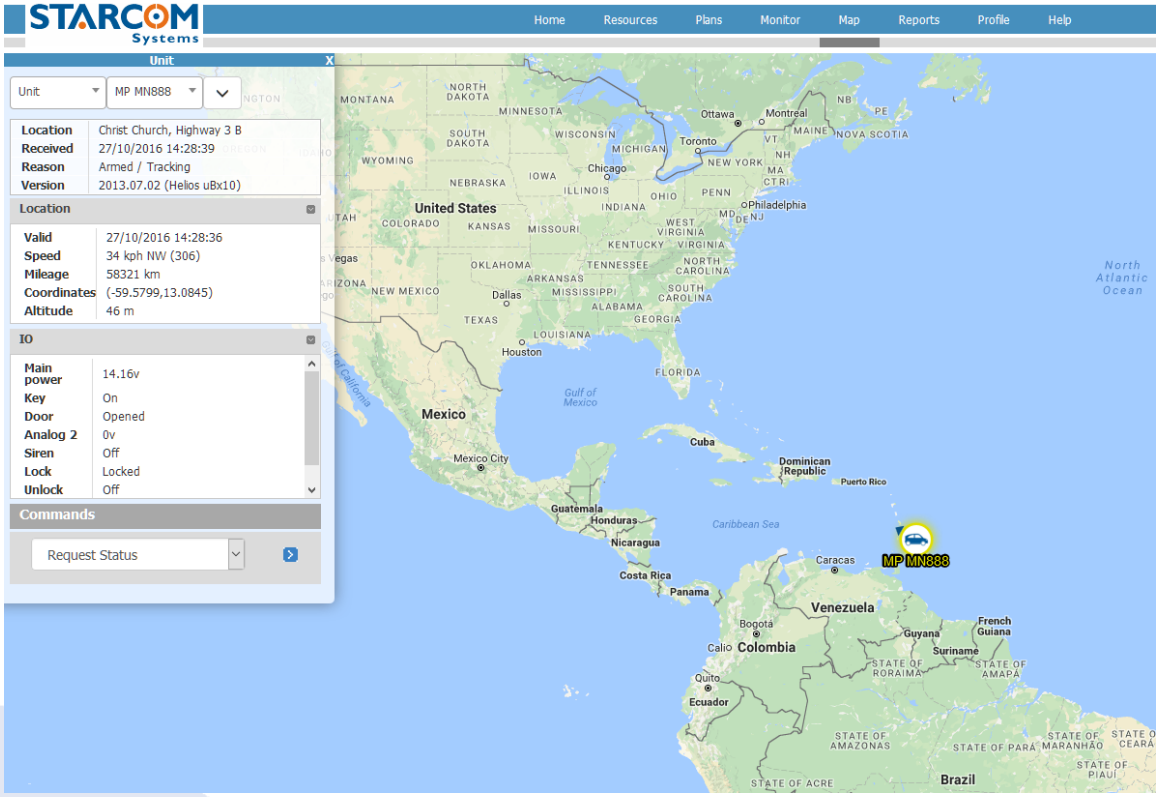
The Map page displays the location of a single unit, or a group of units. It also shows the unit information and commands.



You can select vehicle, group or driver in the dropdown list on the left.

In the Search field, you can enter the unit number or name to be displayed.

Once you select the unit, its location will be displayed on the map and its information will appear on the left.



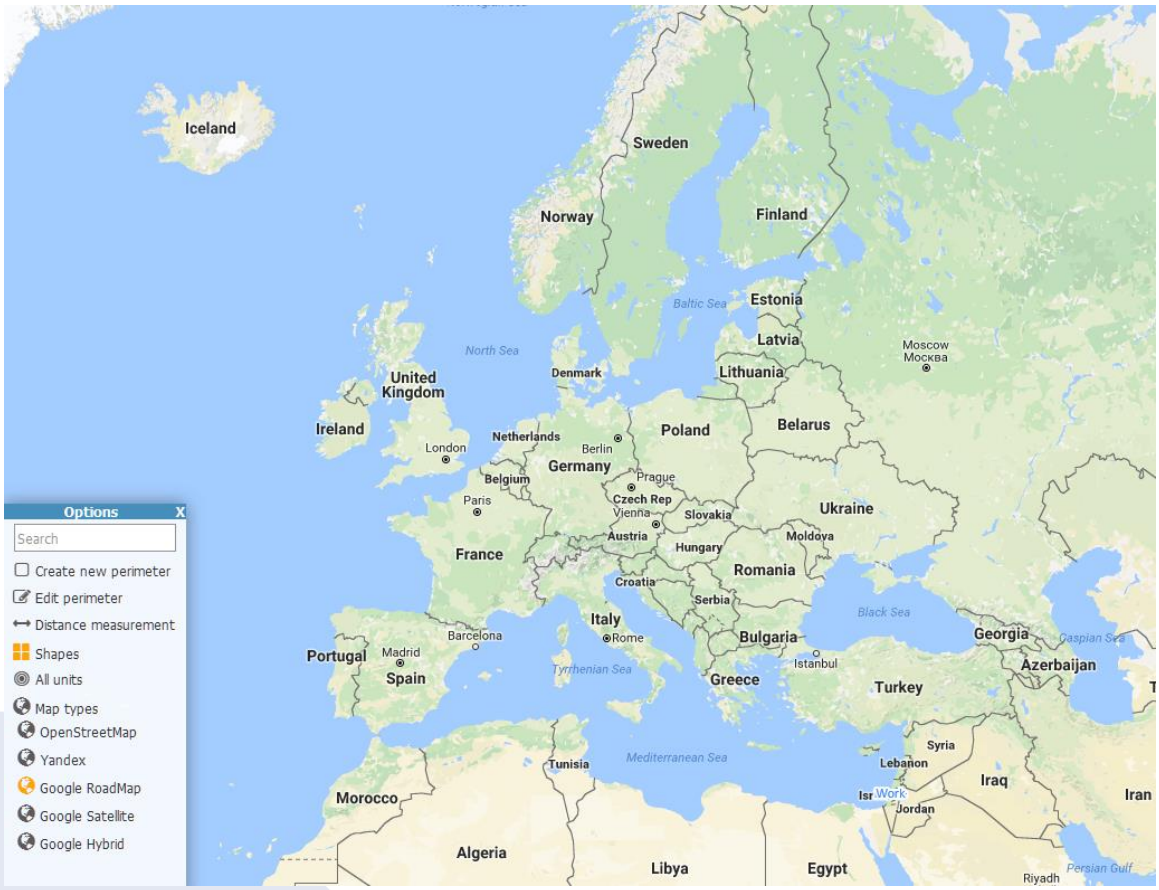
The following unit information is displayed:

- **Location** – the address of the last GPS position of the unit
- **Received** – the date and time of last transmission from the unit
- **Reason** – the reason for the transmission
- **Driver** – the vehicle driver name
- **Version** – the unit firmware version

- **Location** – the GPS location of the unit, including:
  - **Valid** – the date and time of the last location transmission from the unit
  - **Speed** – the last recorded speed of the unit
  - **Mileage** – the last recorded mileage of the unit
  - **Coordinates** – the last longitude and latitude of the unit
  - **Altitude** – the last altitude of the unit

- **IO** – unit input and output information

- **Commands**
  - **Request Status** – requests the current status of the unit
  - **Tracking** – overrides the unit transmission rate settings and forces the unit to transmit according to the specified interval.
  - **Stop Tracking** – stops the tracking command and returns the unit to its regular transmission rate
  - **Set Output** – sends a command to the unit output: Siren On/Off, Door Lock/Unlock, Gradual Stop On/Off, and Immobilizer Off.
  - **Voice Call** – initiates a voice call with the unit
  - **Set Mileage** – sets the specified mileage value in the unit
  - **Logic State** – changes the unit logic state



Click on the settings icon  in the bottom left corner to reveal the Map Options.

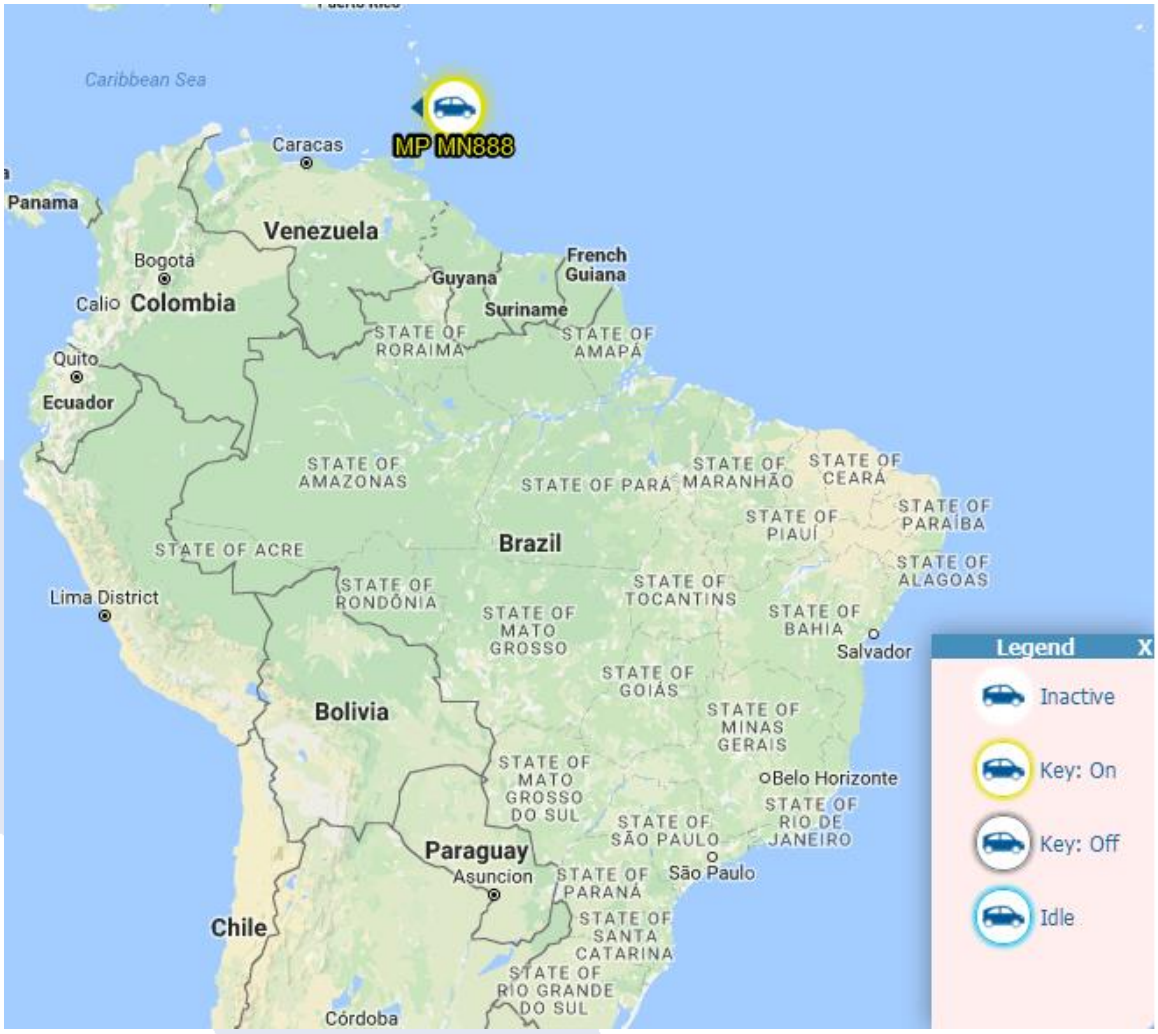
- **Search**

As you type the name of a search criterion in the search field, a list of matching names, from which you can select the required name, appears.

- **Create new perimeter** – allows to create a new perimeter.
- **Edit perimeter** – allows you to edit an existing perimeter.
- **Distance measurement** – allows to measure the distance between two points on the map.
- **Shapes** – shows your perimeters on the map.
- **All units** – shows all your units on the map at once.

- **Map types**

You can select the following map types: OpenStreetMap, Yandex, Google RoadMap, Google Satellite, and Google Hybrid.



In the bottom right corner, you can see the **Legend**, which describes the status of color border around the unit icon.

Reports

The Reports section allows you to generate different unit reports and to schedule automatically generated reports.

On the left side, the Reports section features the following tabs:

Instant – allows to generate reports on demand for a single unit or a group of units for a specific time period (date and time range).

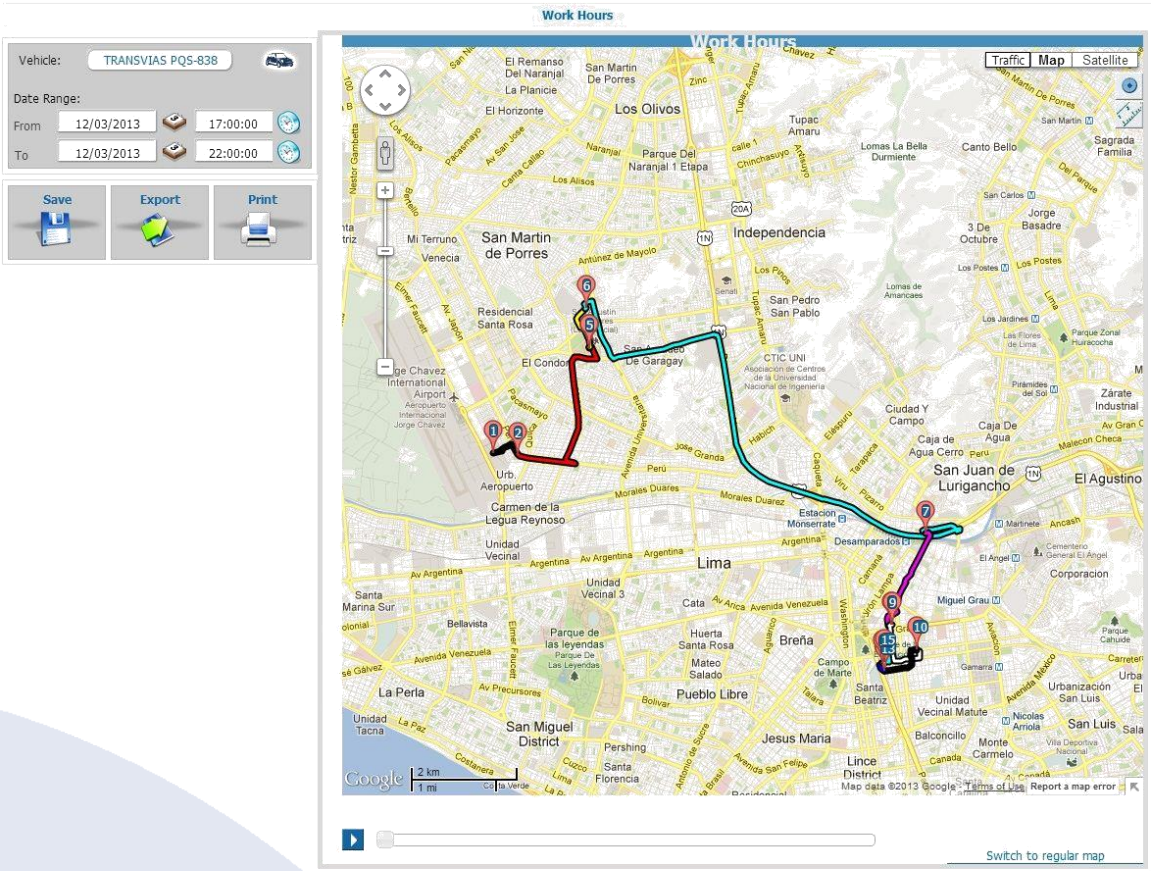
Schedule – allows to define scheduled reports that generate automatically on a daily, monthly or weekly basis.

NOTE: The reports can be generated for the last 30 days only.

You can generate the following types of reports: **Work Hours**, **Work Hours Summary**, **Work Hours Group Summary**, **History**, **History – Technical**, **Violations**, **Driver Work Hours**, **Driver History**, **Driver Vehicles**, **Live Status**, **Events**, **Perimeter Entry**, **Analog Inputs**, **Fuel Consumption**, **Transmit Reasons**, **Monitored events**, **Stop**.

To generate a report, select the report type in the **Report** dropdown list. Select the unit or group of units in the **Unit** dropdown list. Specify the dates and times in the **Date Range**. Click **Generate**.

The following is an example of a report generated for one unit on one day and for a specific time period.

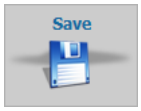


Start	End	Driver	Mileage (Km)	Work Time
12/03/2013 18:02:19 (1) Callao, Calle 6 (-77.1008,-12.029) (-77.1008,-12.0290)	12/03/2013 18:07:59 Callao, Peru (-77.0964,-12.0295) (-77.0964,-12.0295)		1	00:06
12/03/2013 18:11:07 (2) Callao, Peru (-77.0965,-12.0294) (-77.0965,-12.0294)	12/03/2013 18:21:32 San Martin De Porres, Nicolas Dueñas (-77.0841,-12.011) (-77.0841,-12.0110)		4	00:10
12/03/2013 18:33:38 (3) San Martin De Porres, Nicolas Dueñas (-77.0841,-12.011) (-77.0841,-12.0110)	12/03/2013 18:33:48 San Martin De Porres, Nicolas Dueñas (-77.0841,-12.011) (-77.0841,-12.0110)		0	00:00
12/03/2013 18:39:23 (4) San Martin De Porres, Nicolas Dueñas (-77.0841,-12.0111) (-77.0841,-12.0111)	12/03/2013 18:40:21 San Martin De Porres, Nicolas Dueñas (-77.0841,-12.011) (-77.0841,-12.0110)		0	00:01
12/03/2013 18:46:10 (5) San Martin De Porres, Nicolas Dueñas (-77.0841,-12.011) (-77.0841,-12.0110)	12/03/2013 18:49:40 San Martin De Porres, Juan Fermel (-77.0846,-12.0042) (-77.0846,-12.0042)		1	00:04
12/03/2013 19:00:53 (6) San Martin De Porres, Juan Fermel (-77.0846,-12.0042) (-77.0846,-12.0042)	12/03/2013 19:29:38 Rimac, Julian Piñeyro (-77.0252,-12.0428) (-77.0252,-12.0428)		11	00:29
12/03/2013 19:43:06 (7) Rimac, Julian Piñeyro (-77.0252,-12.0428) (-77.0252,-12.0428)	12/03/2013 19:53:34 Lima, Carlos Zavala Loayza (-77.0312,-12.0585) (-77.0312,-12.0585)		2	00:10
12/03/2013 19:53:35 (8) Lima, Carlos Zavala Loayza (-77.0312,-12.0585) (-77.0312,-12.0585)	12/03/2013 19:53:46 Lima, Carlos Zavala Loayza (-77.0312,-12.0585) (-77.0312,-12.0585)		0	00:00
12/03/2013 19:56:25 (9) Lima, Carlos Zavala Loayza (-77.031,-12.0585) (-77.0310,-12.0585)	12/03/2013 20:11:58 La Victoria, 28 De Julio (-77.0267,-12.0628) (-77.0267,-12.0628)		1	00:16
12/03/2013 20:16:38 (10) La Victoria, 28 De Julio (-77.0267,-12.0627) (-77.0267,-12.0627)	12/03/2013 20:26:21 La Victoria, Humboldt (-77.0324,-12.0663) (-77.0324,-12.0663)		1	00:10
12/03/2013 20:41:53 (11) La Victoria, Humboldt (-77.0324,-12.0662) (-77.0324,-12.0662)	12/03/2013 20:43:18 La Victoria, Humboldt (-77.0324,-12.0662) (-77.0324,-12.0662)		0	00:01
12/03/2013 20:45:49 (12) La Victoria, Humboldt (-77.0324,-12.0663) (-77.0324,-12.0663)	12/03/2013 20:46:00 La Victoria, Humboldt (-77.0324,-12.0663) (-77.0324,-12.0663)		0	00:00
12/03/2013 21:08:56 (13) La Victoria, Humboldt (-77.0324,-12.0663) (-77.0324,-12.0663)	12/03/2013 21:12:28 La Victoria, Jaime Bausate Y Meza (-77.0327,-12.065) (-77.0327,-12.0650)		0	00:04
12/03/2013 21:19:37 (14) La Victoria, Jaime Bausate Y Meza (-77.0327,-12.065) (-77.0327,-12.0650)	12/03/2013 21:22:46 La Victoria, Jaime Bausate Y Meza (-77.0323,-12.0649) (-77.0323,-12.0649)		0	00:03
12/03/2013 21:40:01 (15) La Victoria, Jaime Bausate Y Meza (-77.0323,-12.0649) (-77.0323,-12.0649)	12/03/2013 21:43:24 La Victoria, 28 De Julio (-77.0318,-12.0635) (-77.0318,-12.0635)		0	00:03
Total			21	01:37

The report includes a map area and tracking details area. The map area shows a map of the area in which the unit is located showing points of movement of the unit. The tracking details area lists the tracking data of the unit.

The pointers on the map correspond with the numbers in the address column of the detailed list of transmissions received from the unit. These numbers indicate the points of movement of the unit. The total number of map pointers available per report is 50.

On the bottom of the Map section there is a Play button that enables you to play back the movement of the unit on the map.

To save the report, click **Save** 

. The report can be saved as a PDF file, or as an HTML file in a zip.

To export a report, click **Export** 

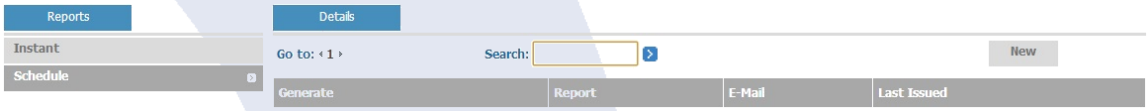
. The report is exported as a CSV file, which can be viewed in Excel.

To print a report, click **Print** 

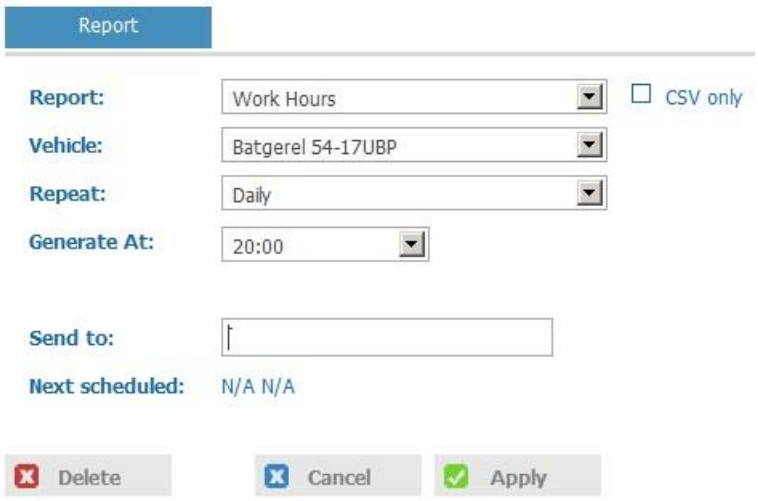
. The report appears in your default browser window where you can select the printer to print out the report.

Scheduled reports

To create a scheduled report, in the **Reports** section, click **Schedule**. The Schedule page appears



Click **New**. The Report Scheduling page opens.



From the **Report** dropdown list, select the type of report you want to create.

Tick the **CSV only** checkbox, if you do not want a map provided with the report.

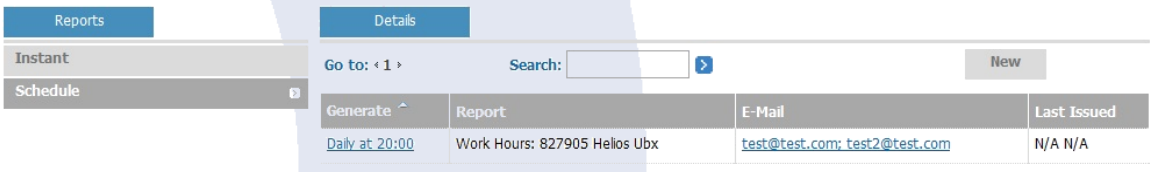
From the **Unit** dropdown list, select the unit or group of units for the report.

From the **Repeat** dropdown list, select if you want the report repeated **Daily**, **Weekly** or **Monthly**.

From the **Generate At** dropdown list, select the time at which you want to generate the report.

The **Send to** field is populated with the default email address for the unit. You can change this address or add additional email addresses, separated by a semicolon.

Click **Apply**. The report schedule is saved and added to the list of scheduled reports.

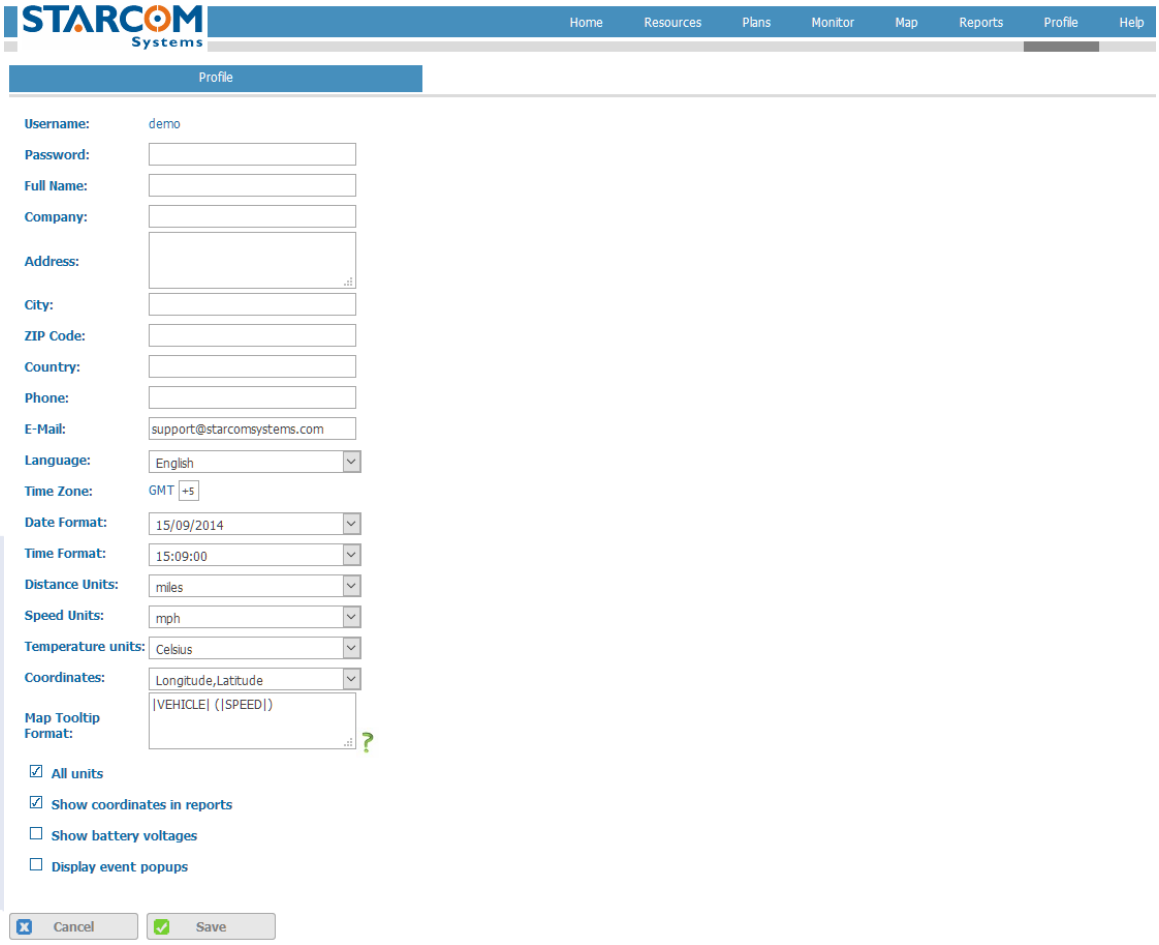


To modify a scheduled report, in **Reports**, click **Schedule**. In the **Details** section, under the Generate column, click the link of the report schedule you want to modify. The Report Scheduling page appears. Modify the report schedule as required. Click **Apply**. The modified schedule details are saved.

To delete a scheduled report, in **Reports**, click **Schedule**. In the **Details** section, under the Generate column, click the link of the report schedule you want to delete. The Report Scheduling page appears. Click **Delete**. The scheduled report is deleted.

Profile

The Profile section shows your profile details that were created when you purchased your units. You can view and modify these details as required.



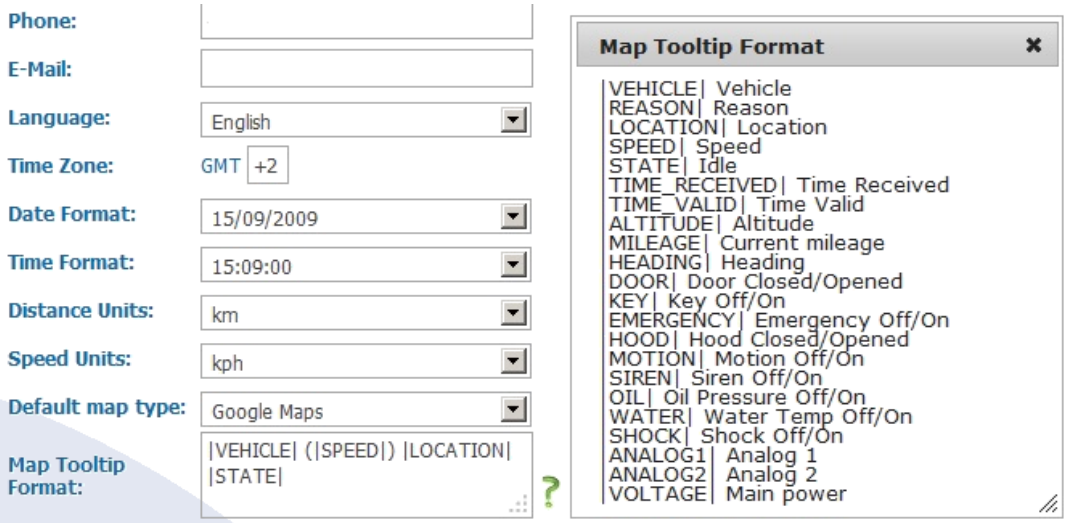
To view or modify your profile, click the **Profile** tab, and modify the information as required.

Click **Apply**. The changes are saved.

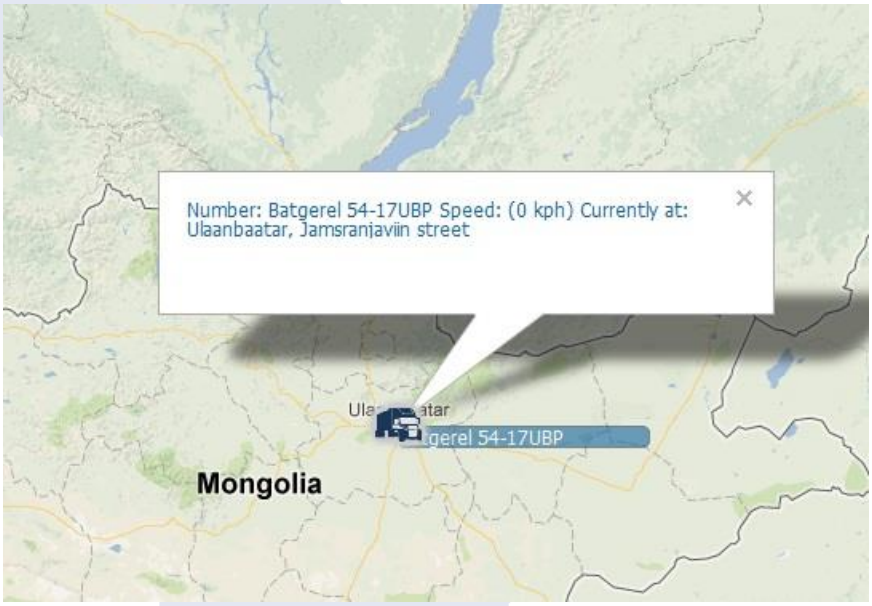
Using Map Tooltip Format

The Map Tooltip Format field lets you configure the information that will appear in the info window on the Map page when you select a unit.

To see all the parameters that can be configured in the Map Tooltip Format field, click on the green question mark located to the right of the field. The Map Tooltip Format legend window will appear.

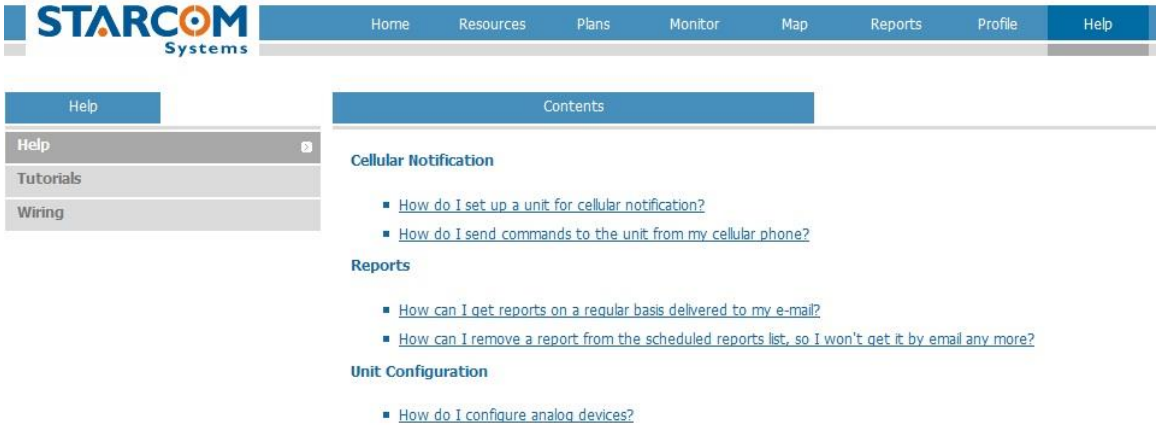


Once you made all the necessary changes, click **Apply**. Then go to the Map page and check the unit info window.



Help

The Help section contains answers to some frequently asked questions, Starcom Online tutorials, and vehicle wiring database.

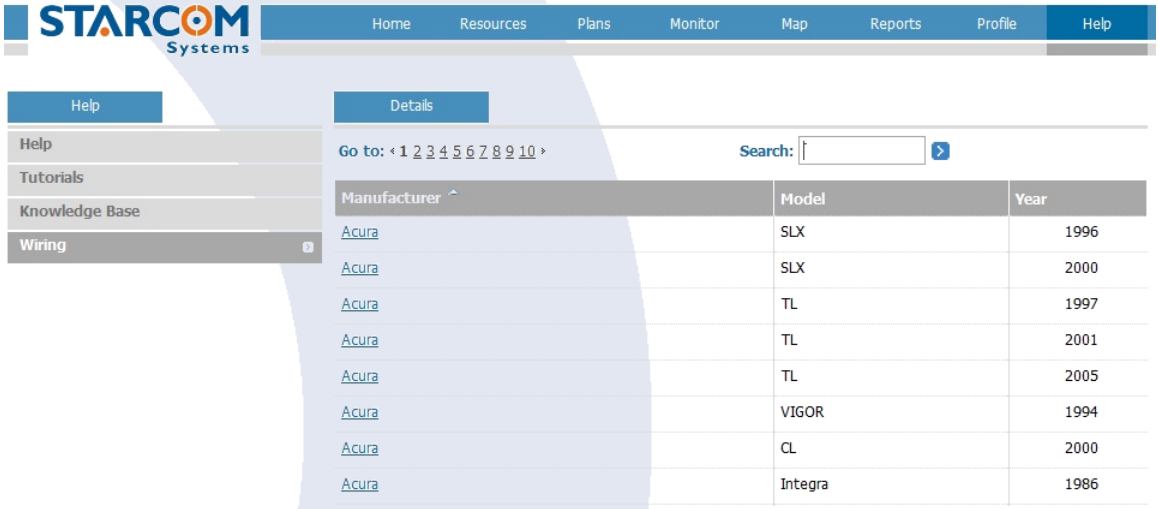


Click on the appropriate tab to access the necessary information.

Wiring

The wiring section on Help page contains the vehicle wiring database that can be useful when installing Helios in the vehicle.

To access the database, press on the Wiring tab.



Scroll through the pages to locate the necessary car model, or use the Search field.

Once you found the necessary car model, click on the manufacturer name link to see the wiring details.

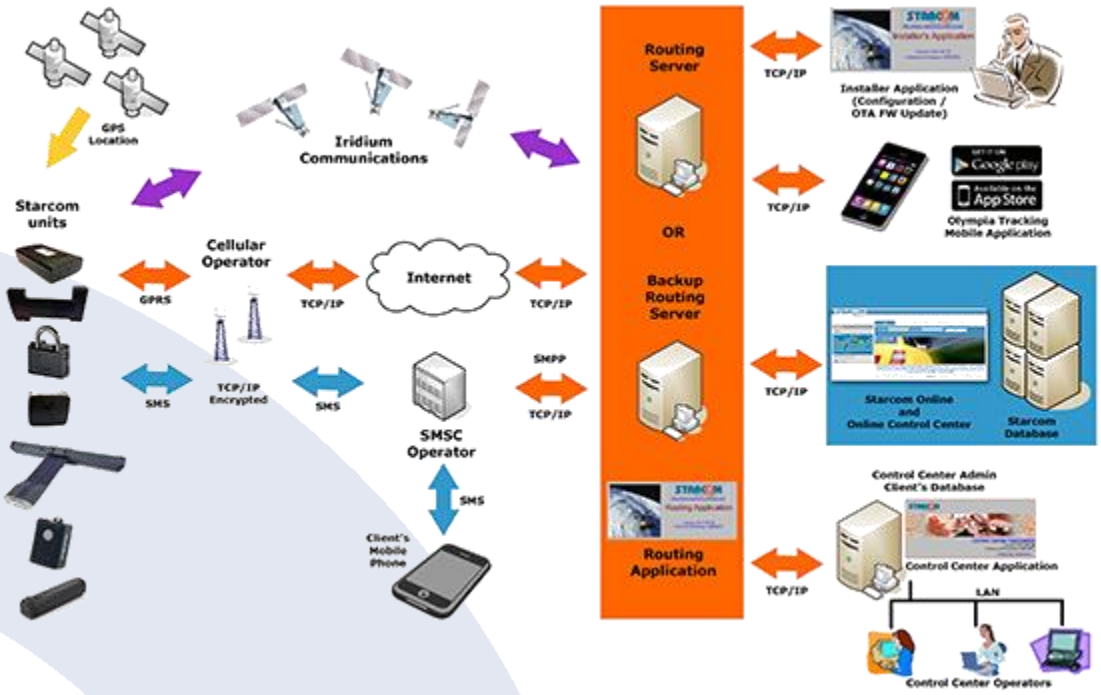
Alfa Romeo 145 (UK) 1994

Wire	Polarity	Color	Location
12volts		Battery	
Starter		Red/black	Ignition Switch
Ignition		Orange	Ignition Switch
Power Lock	-	Blue	Gry CDL Unit Behind Fusebox
Power Unlock	-	White	Gry CDL Unit Behind Fusebox
Parking Lights+		Blue And Blue/black	Behind Fusebox
Door Trigger	-	White/black	At Door Switch
Trunk/Hatch Pin		White/black	At The Bootlight

Back

Appendix A – Unit Communication in Starcom Systems

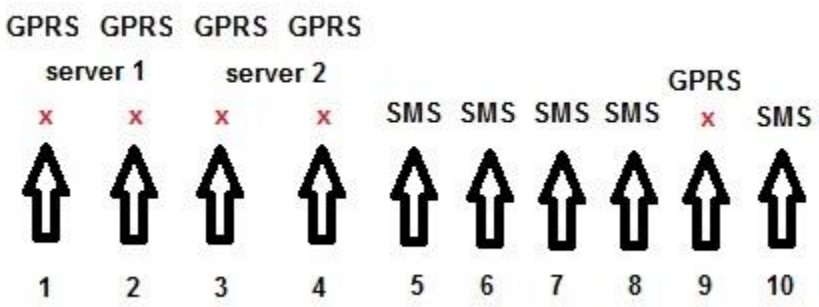
Helios is the mobile component of Starcom's advanced vehicle tracking and fleet management system. The system uses advanced software algorithms for field tracking of vehicles and provides customers with a selection of real-time information about the tracked vehicle. The following image illustrates the Starcom Systems communication channels.



The unit transmits messages according to the values specified in Helios Parameters > Transmission Rates settings (GPRS, SMS).

When the unit's modem is turned on, it tries to connect to the network and transmit via GPRS (4 attempts: 2 on the first server and 2 on the second server). If it fails to connect to the network, it will switch to the SMS channel (if it is configured to transmit via SMS) after about 4 minutes, because it makes four attempts to connect via GPRS. It will constantly try to transmit via SMS.

The next attempt to transmit via GPRS will be repeated in 5 minutes. Every 5 minutes, the unit will attempt to connect to the network and transmit via GPRS. This process is illustrated in the following figure.



The unit saves all the information that could not be sent in its memory. Once it is able to connect to the network again, it will transmit all the stored data.

The device sends encrypted data to the routing server. When the routing receives it, it is decoded and encoded at the same time and sent to all the recipients configured in the system.

The message size is 140 bytes (70 bytes data and 70 bytes header).

For more information, see *Routing*, *Control Center* and *SMS Notifications* guides.

Appendix B – Configuring Mileage

There are two ways the unit can receive the mileage readings: by GPS and by Odometer.

GPS

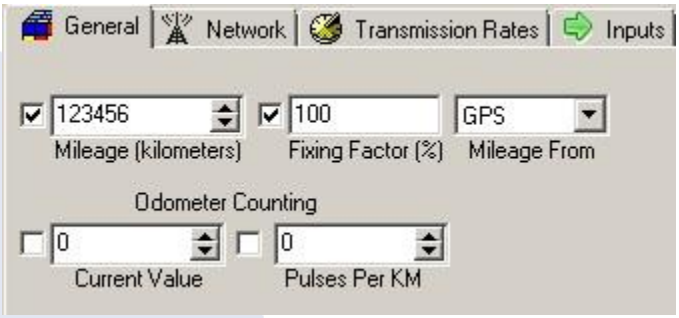
Initial settings

Connect the Helios unit to the computer. In **Installer** application, go to **Helios parameters** > **General** and change the settings as follows:

Mileage: Actual mileage reading that you see in the vehicle

Fixing Factor (%): 100

Mileage from: GPS



Click **Send** to send the parameters to the unit.

Accumulating data and performing calculations

Drive the car for some distance. The unit will register a certain mileage reading.

Compare the mileage reading in the car to the mileage reading registered by the unit. If they are the same, the calibration is done.

If the readings are different, enter the correct reading from the car in the **Mileage** filed and calculate the fixing factor as follows:

Divide the reading in the car by the reading in the unit. Enter the received number as percentage in the **Fixing Factor** field.

For example, if the reading in the car shows 10 and the reading in the unit shows 11, calculate as follows:

$$10 \div 11 = 0.90$$

In this case you will enter 90% in the Fixing Factor field.

If the reading in the car shows 10 and the reading in the unit shows 9, calculate as follows:

$$10 \div 9 = 1.11$$

In this case you will enter 111% in the Fixing Factor field.

Click **Send** to send the new parameters to the unit.

Odometer

Installation

Connect the odometer pulse to the Odometer **WHITE/BLACK** cable on 24-pin Helios wire harness (Pin 20).

Initial settings

Connect the Helios unit to the computer. In **Installer** application, go to **Helios parameters** > **General** and change the settings as follows:

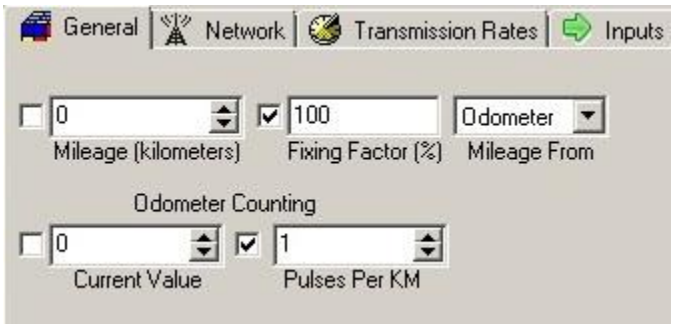
Mileage: 0

Fixing Factor (%): 100

Mileage from: Odometer

Current Value: 0

Pulses Per KM: 1



Click **Send** to send the parameters to the unit.

Accumulating data and performing calculations

Drive the car for some distance. The unit will count a certain amount of pulses.

Check the mileage reading in the car. Take this number and divide it by the actual number of kilometers that you've driven. For example, let's say that the mileage in the car was shown as 125,000, and you've driven 50 km.

125,000 ÷ 50= 2,500

The result (in this case 2,500) will be your new **Pulses per KM** value.

Final settings

After this, go back to **Installer** > **Helios parameters** > **General**. Read the data from the unit and change the following parameters:

Pulses Per KM: The value that you've calculated (for example 2,500).

Mileage: Actual mileage reading that you see in the vehicle.

Click **Send** to send the new parameters to the unit.

From that point on, the unit will show accurate mileage readings.

Appendix C – Central Locking System Configuration

When installed in a vehicle with central locking, the Helios unit can be configured in two ways:

1. Helios can control the central locking system to lock/unlock the vehicle doors when it changes the logic state from Armed to Disarmed and vice versa. The control can be performed manually, by sending a command, or automatically, when Helios enters Armed/Disarmed logic state according to the Logic settings, or specified event settings.

2. The central locking system can control the Helios logic state, changing the Helios logic state from Armed to Disarmed and vice versa each time the vehicle doors are locked/unlocked.

Installation

Before making any changes to the vehicle wiring, verify which type of locking system is in use. If you can identify the location of the locking engine and gain access to its terminals, you may be able to make a direct connection without adding external relays.

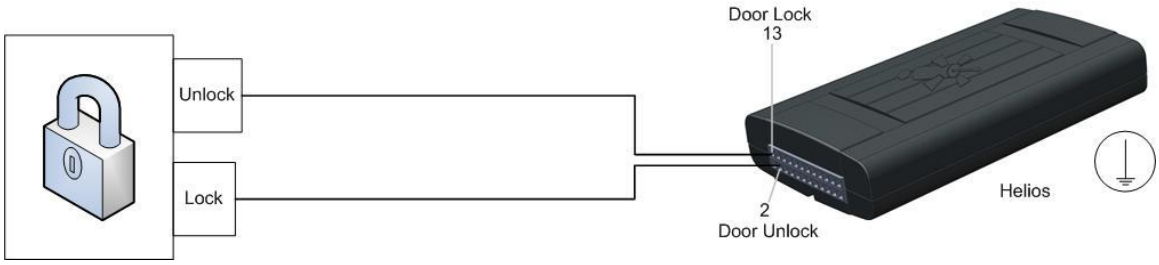
(–) (–) Locking

In this locking method, a negative pulse activates the locking mechanism and the next negative pulse activates the unlocking mechanism. This is called (–) (–). It is also possible to use (+) (+).

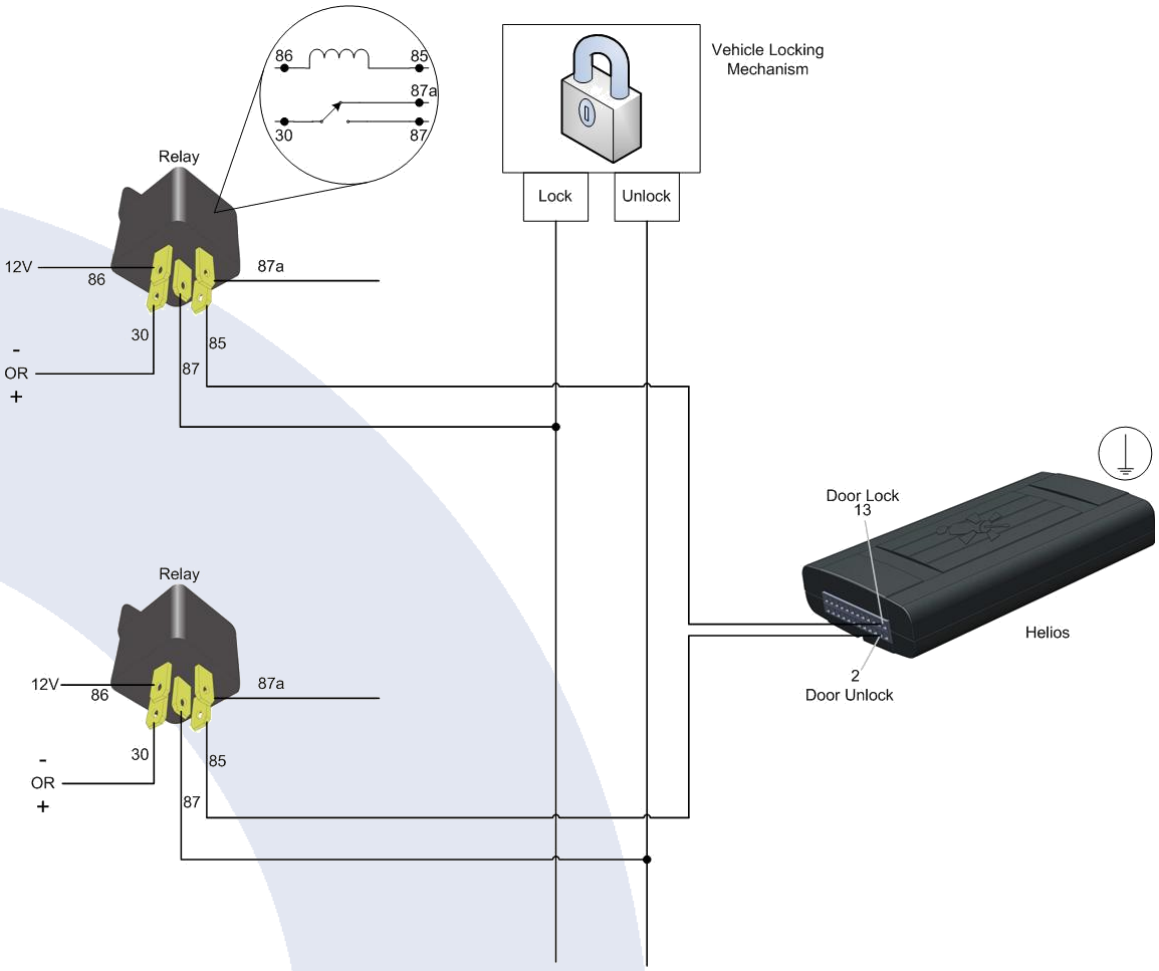
For vehicles with (–) (–) locking systems, you can wire the unit without adding any external relays, as follows:

Connect Door Lock **GRAY/ORANGE** cable on 24-pin Helios wire harness (Pin 13) to the vehicle central locking input responsible for the Lock command.

Connect Door Unlock **GRAY** cable on 24-pin Helios wire harness (Pin 2) to the vehicle central locking input responsible for the Unlock command.

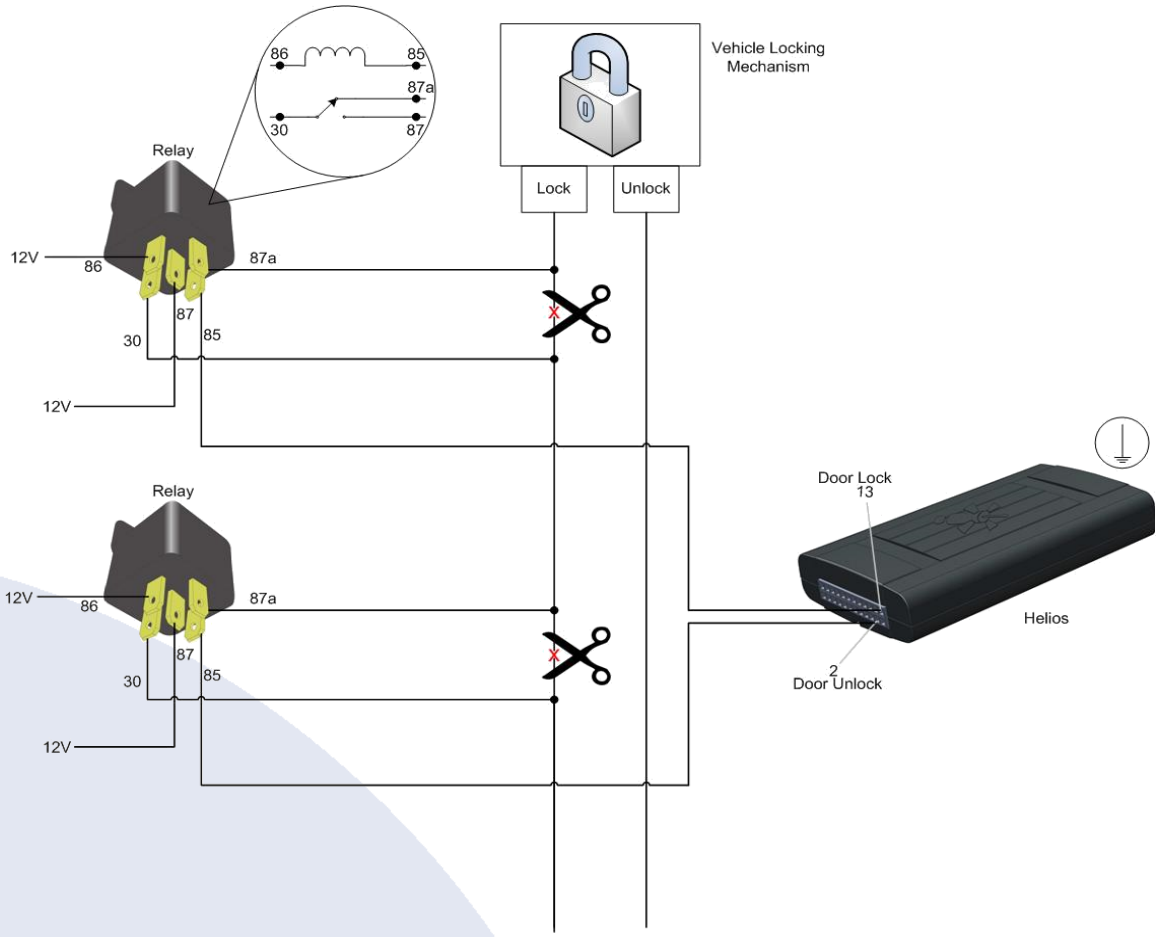


If you cannot gain access to the locking engine, you can use external relays and connect to the existing wires that lead to the locking engine. The following image illustrates this connection.



Serial Locking

This method requires the addition of two external relays. Wire them as follows:



Arm/Disarm

You can connect the Helios Arm/Disarm function either as a standalone system or in conjunction with the vehicle Arm/Disarm system.

Standalone Arming

Arming is performed by passive arming, remote control, or transponder.

Disarming is performed by unlocking the doors, keypad, remote control, or transponder.

Connecting to the vehicle Arm/Disarm system

Locate the vehicle alarm system and connect the Arm **ORANGE/WHITE** cable on 24-pin Helios wire harness (Pin 14) to the vehicle alarm system Arm cable with a diode. Also, connect the Disarm **PINK** cable on 24-pin Helios wire harness (Pin 17) to the vehicle alarm system Disarm cable with a diode.

NOTE: If the vehicle's existing alarm system uses (+) (+) commands, insert external relays to swap the logic to (–) (–).

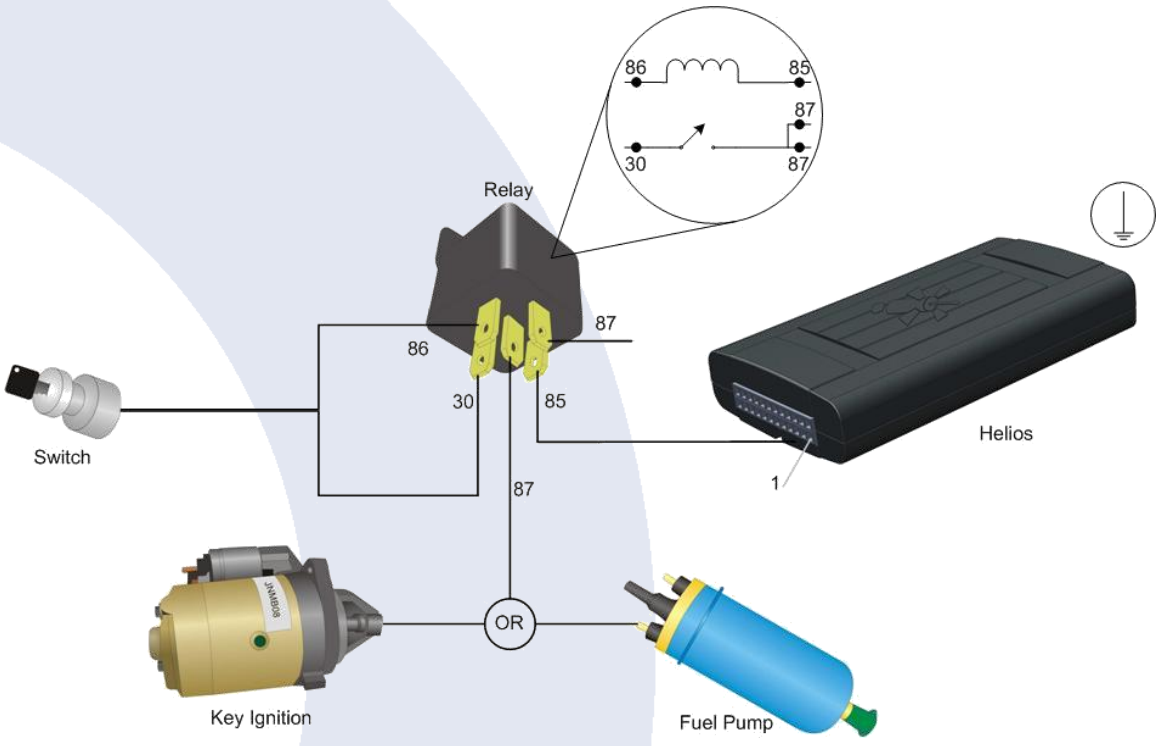
Appendix D – Immobilizer and Gradual Stop

NOTE: Check the vehicle voltage (+12 V or +24 V) before installation and use the proper voltage relays.

Helios can bring the vehicle to a gradual stop when necessary. For example, if the vehicle is reported stolen, the control center can issue a Gradual Stop command.

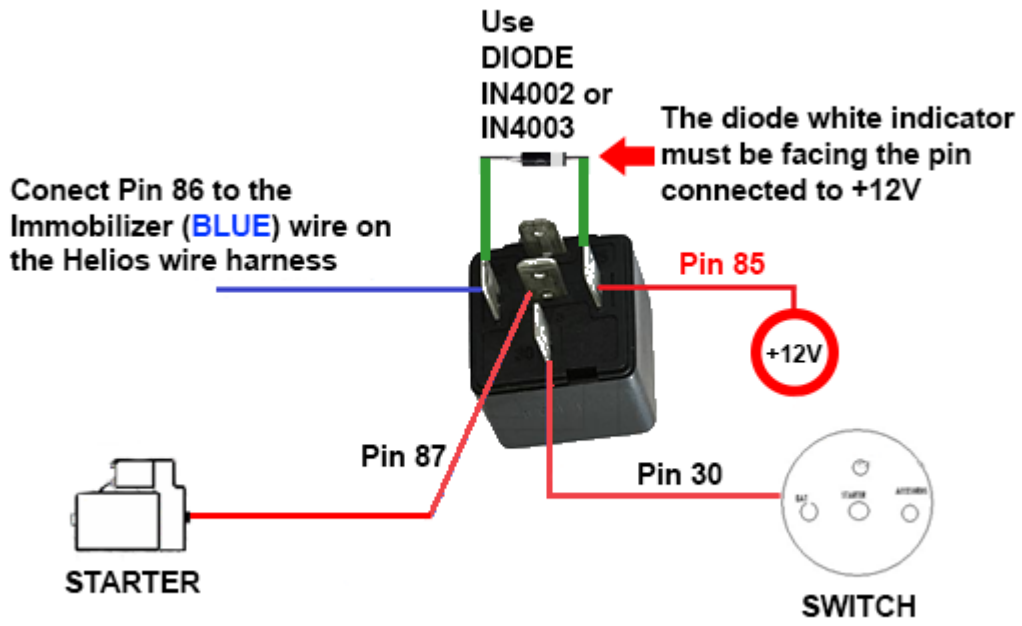
When there is no alarm, the Immobilizer/Gradual Stop **BLUE** cable on 24-pin Helios wire harness (Pin 1) grounds the coil **No. 85** (see diagram below) of the external relay. In this case, the relay powers the vehicle starter or fuel pump via pin **No. 87** (see diagram below).

When the Helios alarm is activated, the Immobilizer/Gradual Stop **BLUE** cable on 24-pin Helios wire harness (Pin 1) toggles the ground to the relay coil. As the duty cycle of pin 1 changes, the coil becomes gradually deactivated for longer and longer intervals until it is fully disconnected from ground. Consequently, the starter or fuel pump gradually becomes inactive, bringing the vehicle to a gradual stop.



ATTENTION!

To avoid damage to the unit, install a DIODE on the relay, as shown in the following image:



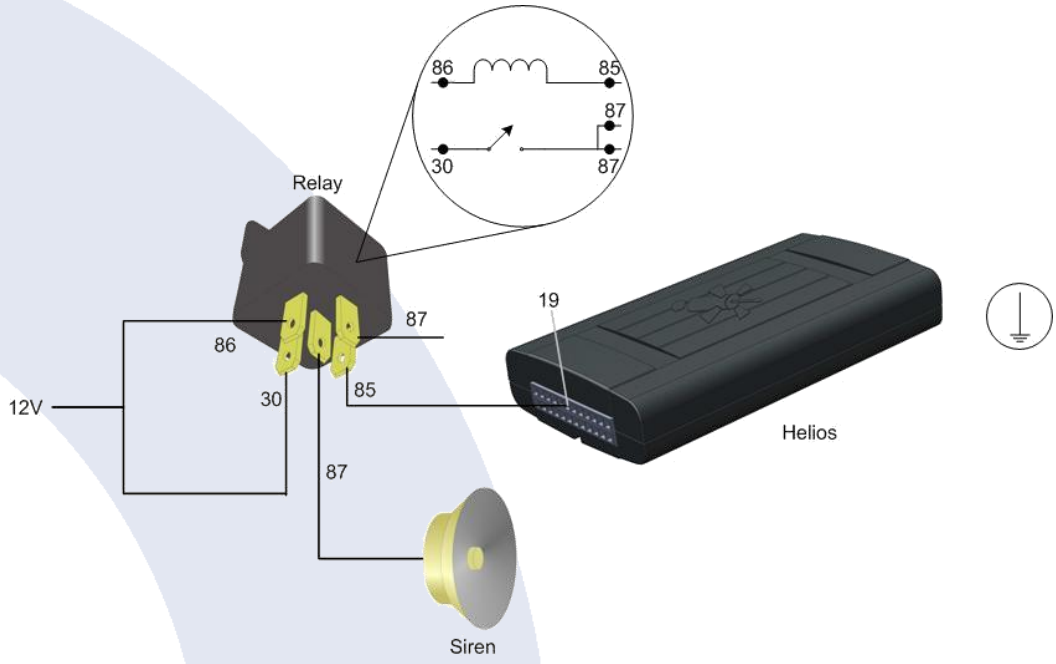
Appendix E – Connecting a Siren

Helios can be used to activate the siren. You can add an external siren or use the vehicle horn.

NOTE: The vehicle horn can consume large amounts of energy and drain the vehicle battery quickly.

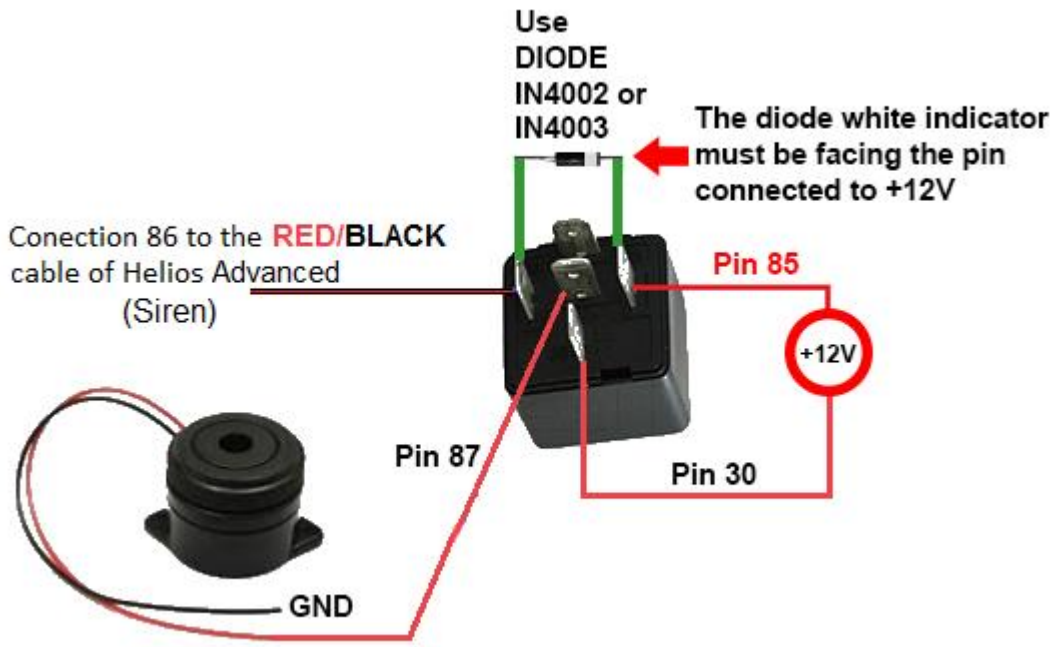
When there is no alarm, the Siren **RED/BLACK** cable on 24-pin Helios wire harness (Pin 19) disconnects the coil **No. 85** (see diagram below) of the external relay from ground. In this case, the relay disconnects the siren, which is connected through the pin relay **No. 87** (see diagram below).

When the Helios alarm is activated, the Siren **RED/BLACK** cable on 24-pin Helios wire harness (Pin 19) grounds the relay coil. As a result, the siren is activated through the relay.



ATTENTION!

To avoid damage to the unit, install a DIODE on the relay, as shown in the following image:



Appendix F – Fuel Management

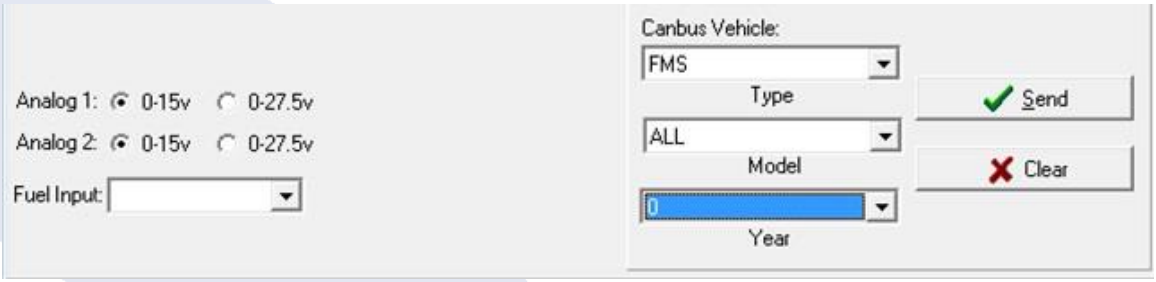
Fuel management allows the user to monitor the fuel level in the vehicle. This can be accomplished in several ways:

- CAN bus FMS protocol monitoring
- Connecting to the existing fuel gage in the vehicle
- Installing an external fuel sensor and connecting to the Helios Analog input.

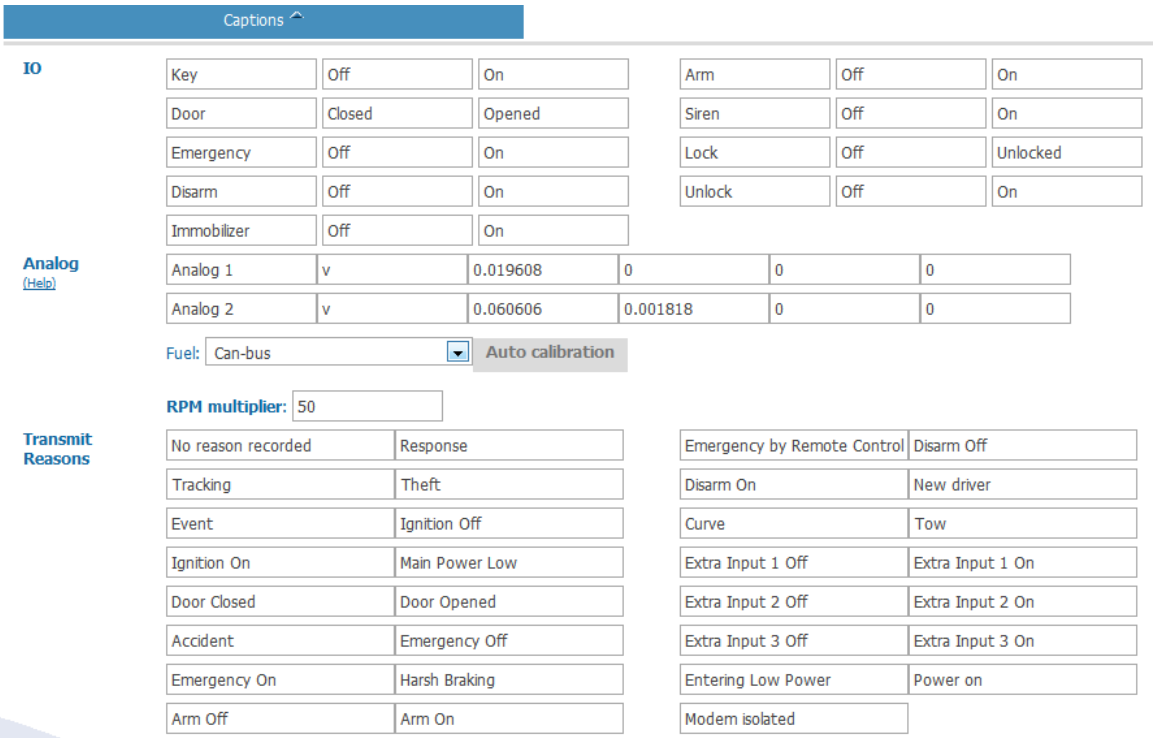
FMS

In heavy trucks that support FMS protocols J1939 and 1708 the Helios unit can monitor the fuel used by the vehicle per each trip. In order setup the Helios unit to monitor fuel used, the following settings should be performed:

In **Installer**, go to **Helios Parameters** > **Hardware** and setup the Can bus as follows:



On **Starcom Online**, go to **Unit Information** and open the **Captions** section. Select **Can-bus** in the **Fuel** dropdown list. When finished, press **Apply**.



Analog input

Installation

The fuel tank in passenger vehicles it is generally located under the back seats. Typically, it has three or five wires:

1. **Fuel pump wire** – can be identified, when the engine is running, by measuring +12V on this cable.

2. **Ground** – 1 or 2 wires.

3. **Fuel gauge (level) wire (analog)** – can be identified by grounding (connecting to the body of the vehicle) the analog wire. If the connection is correct, the fuel level will rise to FULL (*NOTE*: In some vehicles the gage will not rise at once, but gradually). When the engine is running, you can measure 0 up to +28V depending on the fuel level. This voltage may vary between different vehicles and requires calibration.

4. **Fuel warning LED (digital)** – Not present in all vehicles. When the fuel level falls below a critical level, this wire lights a warning lamp on the dashboard. Connecting your testing lamp to this wire also causes the warning lamp on the dash board to light up.

WARNING: Do not connect negative voltage to the fuel pump, as this may cause damage!

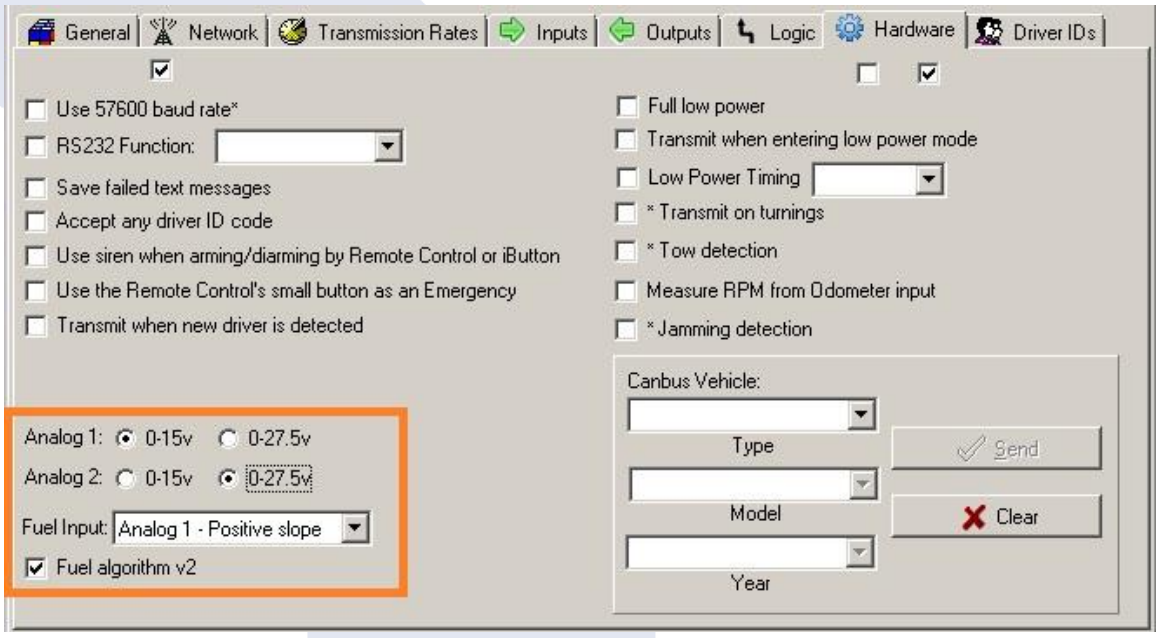
Connect the fuel gauge wire to Analog 1 **YELLOW/BLUE** cable on 24-pin Helios wire harness (Pin 11), or to Analog 2 **VIOLET/WHITE** cable on 24-pin Helios wire harness (Pin 23).

After connecting the analog input to the sensor, you need to configure the correct analog input that will be used for fuel level monitoring and calibrate the analog input to the correct values of the sensor.

Configuration

In **Installer**, go to **Helios Parameters** > **Hardware**.

Select **0-15v** or **0-27.5v** in the **Analog 1** or **Analog 2** field according to the voltage range measured on the analog input used for fuel level monitoring.



In the **Fuel Input** dropdown list, select the analog input and the slope of the monitored fuel level.

The slope is determined as the ratio between the voltage on the fuel tank and its contents.

For example, if the voltage level is going down as the fuel tank is being emptied, then there is a direct ratio between them and therefore the slope is **positive**. In other words, a positive slope will appear if the full tank measurement is 10V, for example, and empty tank is 0V.

If the fuel tank voltage level is increasing as the fuel tank is being emptied (which is the most common case), then the ratio between the voltage level and the fuel tank is an inverse ratio, and therefore the slope is **negative**. In other words, if the full tank measurement is 0V and half-full tank is 6V, then the graph line slope will be negative.

Analog 1 - Positive slope – select this option, if you're using the Analog 1 input for fuel level monitoring, and if the fuel graph line slope is positive.

Analog 1 - Negative slope – select this option, if you're using the Analog 1 input for fuel level monitoring, and if the fuel graph line slope is negative.

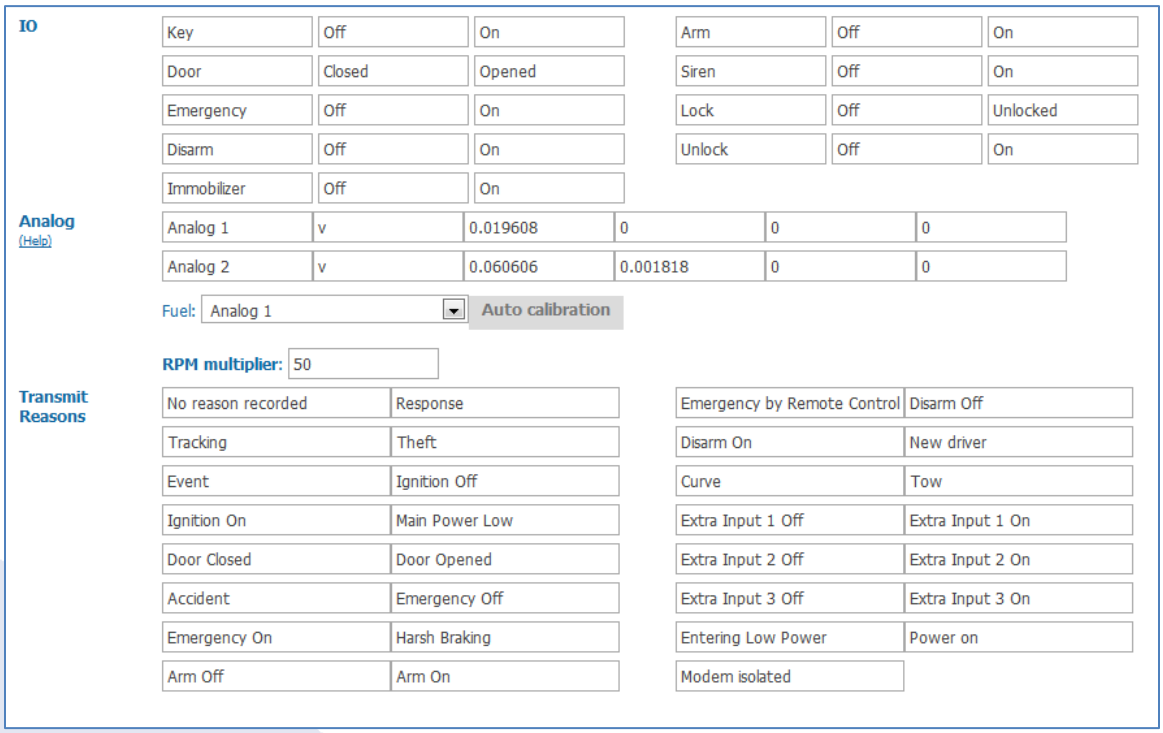
Analog 2 - Negative slope – select this option, if you're using the Analog 2 input for fuel level monitoring, and if the fuel graph line slope is negative.

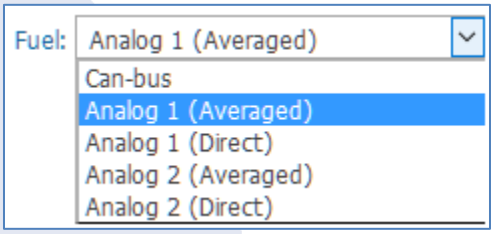
Analog 2 - Positive slope – select this option, if you're using the Analog 2 input for fuel level monitoring, and if the fuel graph line slope is positive.

Select the **Fuel algorithm v2** option for more accurate fuel level monitoring.

Once all the necessary parameters are set, press the **Send** button to send the changes you made to the unit.

On **Starcom Online**, go to **Unit Information** and open the **Captions** section. Select the correct analog input in the **Fuel** dropdown list. When finished, press **Apply**.





If you're using a direct connection to a **fuel gauge (tank)**, select the **Averaged** option.

When using an **external fuel sensor**, select the **Direct** option.

Calibration

When using the Analog input to read fuel the unit and the software should be calibrated to the sensor readings. The calibration can be done in 2 ways:

- **Manual calibration** – done by manual reading of the voltage levels of the sensors in different levels. To perform an accurate calibration at least 5 readings must be taken: 0%, 25%, 50%, 75% and 100% of the fuel tank. Once you have the readings, use the Fuel Calibration table that can be found at the following link: http://www.starcomsystems.com/jstoys/fuelcalc2.htm in order to calculate 2 linear parameters.

  Using the fuel calibration table:

  Select the correct voltage range measured on the analog input used for fuel level monitoring (0-15 V or 0-27 V).

  Enter the measured voltage against the percentage of the fuel level.

Voltage (v)	Gauge (%)
0	100
2.5	75
5	50
7.5	25
10	0

Click Calculate. The output will be displayed in the linear parameters.

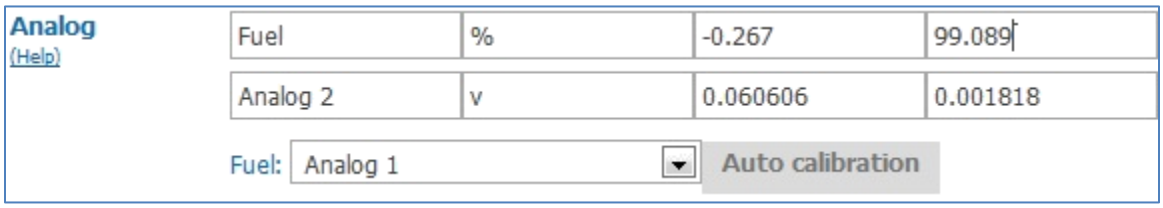
Linear

a: -0.267

b: 99.089

The received "a" and "b" parameters should be entered accordingly in the **Unit Information** > **Captions section** on **Starcom Online**.

In order to see the fuel level in percentages in the reports, enter "Fuel" instead of Analog 1 in the **Analog 1** field, and enter "%" instead of "v".



- **Automatic Calibration** – the voltage parameters of the fuel readings can be calculated automatically by the system. In order to do so, the vehicle must fuel the tank to 100% and then use the vehicle for a period of 2 additional refuels of 100%. Note that the lower the level of the fuel will be prior to the refuel, the more accurate the reading and calibration will be.

  In order to do the automatic calibration, after the 2nd refuel, on **Starcom Online**, go to **Unit Information** and open the **Captions** section. Select the correct analog input in the **Fuel** dropdown list and click on **Automatic calibration** button. When finished, press **Apply**.

Appendix G – CAN Bus Connection

Controller Area Network (CAN) bus is a multiplexed wiring system used to connect intelligent devices such as Electronic Control Units (ECU's) onto vehicles, allowing data to be transferred in a low-cost and reliable manner.

CAN bus uses two dedicated wires for communication. The wires are called CAN High and CAN Low. When the CAN bus is in idle mode, both lines carry 2.5 V. When data bits are being transmitted, the CAN high line goes to 3.75 V and the CAN low drops to 1.25 V, thereby generating a 2.5 V differential between the lines.

To identify the actual CAN bus wires look for a twisted pair of thin wires. They can be found all over the vehicle, sometimes in with a conventional main loom. In most vehicles, the CAN wires are placed in the diagnostic plug on the driver's side, usually from below.

While the vehicle is stationary and the ignition is on, the CAN wires run a speed pulse signal. You can use a LED device, which measures pulses above 1.5-2 V, to identify the CAN wires. The high speed pulses will signify the CAN High wire, the low speed pulses – the CAN Low wire.

Installation

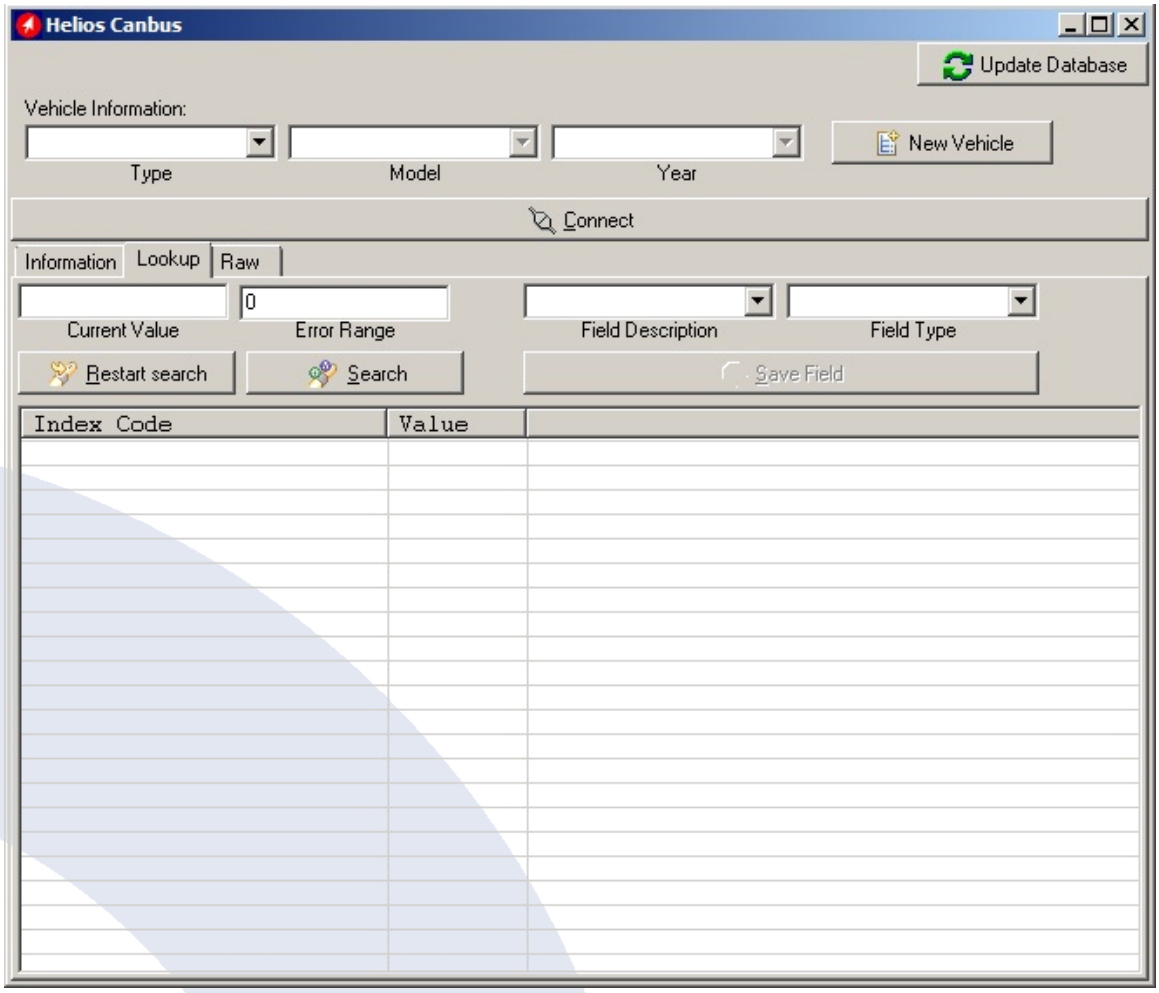
Connect the CAN High wire to CAN High **BLACK/GRAY** cable on 24-pin Helios wire harness (Pin 12).

Connect the CAN Low wire to CAN Low **GRAY/BLUE** cable on 24-pin Helios wire harness (Pin 24).

Configuration

After connecting the CAN wires, connect to the Helios unit with a computer and update the vehicle model from the existing database.

In **Installer**, go to **Technical** > **Helios Canbus**.



Press the **Update Database** button 

.

Select the vehicle type in the **Type** dropdown list. For trucks choose FMS. Select the vehicle model in the **Model** list, select the production year in the **Year** list, and click **Connect**.

The vehicle data will appear.

Adding a new vehicle to the database

When Helios is installed in the vehicle that is not present in the database, you need to create it by identifying the CAN bus signals and manually adding the vehicle to the database.

In the Helios Canbus window press the **New Vehicle** button 

.

Enter the new vehicle details, select the **Lookup** tab and start identifying the CAN signal.

Choose any input (for example Door) and identify the value of the pulse signal as follows. Select Door in the **Field Description** dropdown list and **Field Type** dropdown list.

The door can only have 2 values: Open – 1, or Closed – 0.Open the vehicle door. While the door is open, enter 1 in the **Current Value** field and click **Search**. The data of all the signals from the vehicle with the current value of 1 will be displayed in the Index Code window.

Close the door, change the **Current Value** to 0 and click **Search**. You will see less data in the window. About half of the signals will be eliminated. Only the signals that changed their values to 0 will be left.

Open the door again, enter 1 in the **Current Value** field and click **Search**. Even less data will appear in the window (the signals from the previous amount that changed their values to 1).

Repeat this process decreasing the number of signals until you're left with one identified Door signal.

After the signal has been found, select the row of the signal in the Index Code window. Click on the **Save Field** button to save this value to the new vehicle definition.

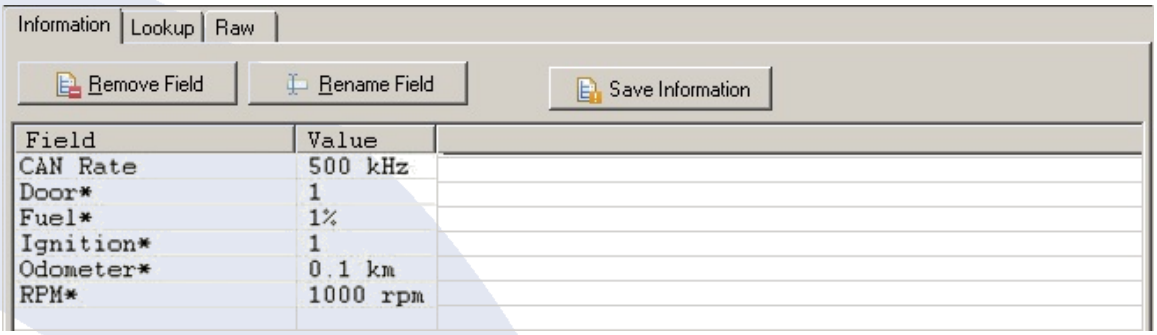
Use this procedure to find additional values.

If you want to identify the RPM value, accelerate the motor until it reaches 1000 RPM and search for its value at the same time. Then decrease number of signals by searching for the other values, such as 800 RPM, 500 RPM, etc.

For more complicated signals, you can use the **Error Range** field. For example, when the gas pedal is pressed hard, the RPM will show approximately 2, which would be about 2000. However, this value isn't accurate. You can enter an Error Range of about 200. Then perform the search while keeping the RPM around 2000.

Regarding fuel, for example, if you have approximately 70% fuel in the tank, look for the value of about 70 (the data displayed in percentage). Use an Error Range of around 5-10%.

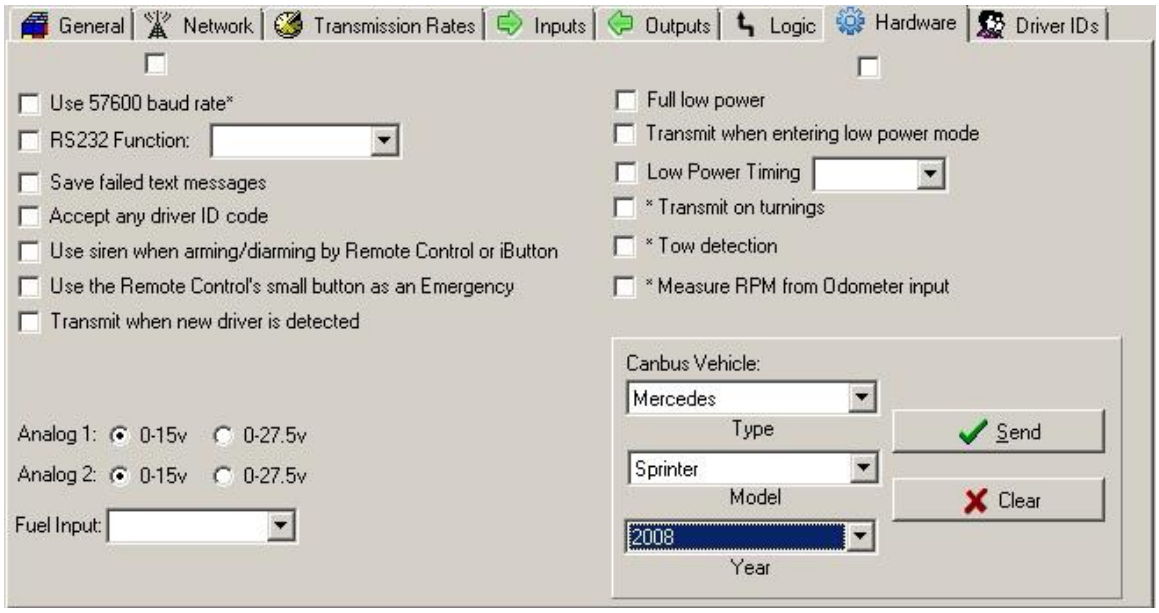
Once all the signals are identified, go to the Information tab and review the fields.



Click the **Save Information** button to save the data.

Click the **Update Database** button to save the new information to Starcom CAN Bus Database.

Open **Helios Parameters** > **Hardware**. In the Canbus Vehicle section, select your vehicle from the list and click **Send** button to send the definitions to the unit.



In the Unit Status window you will see a new RPM tab. Request status several times to see that the RPM data is updated, which means that Helios is receiving the readings from CAN Bus.

OBD II Connection

This direct connection to the vehicle's computer through the on-board diagnostics connector allows to receive the most accurate information about the vehicle's speed, mileage, RPM, and fuel (where available).

Installation

To establish Helios connection to OBD-II, connect the OBD-II connector pins to the Helios CAN wires the following way:

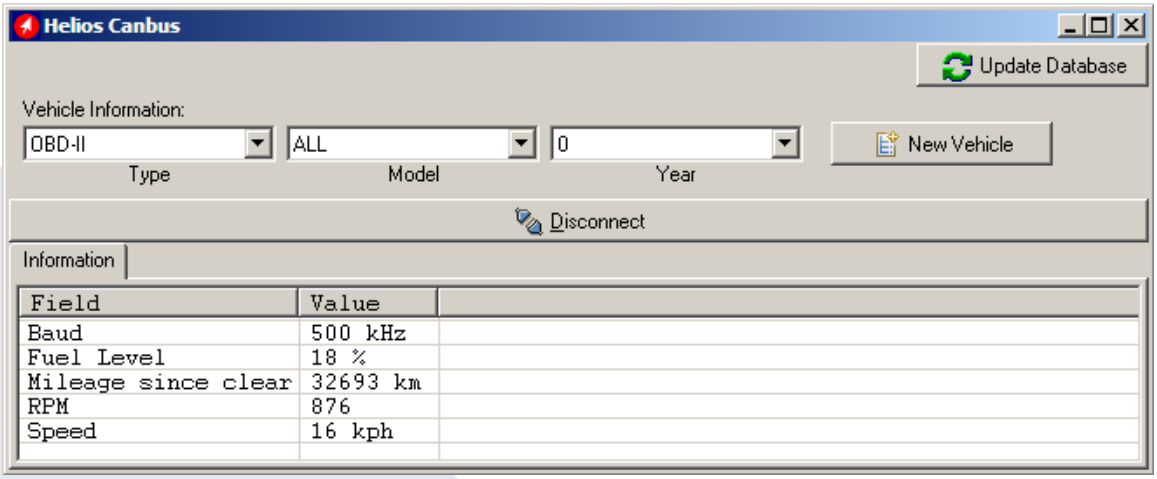
Helios wire harness:	**OBD-II connector:**
CAN High – **BLACK/GRAY** cable (Pin 12)	CAN-High – Pin 6
CAN Low – **GRAY/BLUE** cable (Pin 24)	CAN-Low – Pin 14

The OBD-II connector can usually be found either behind or below the dashboard, behind the glove compartment, behind the radio, or below it.

NOTE: Be careful, do not short the two wires!

Testing

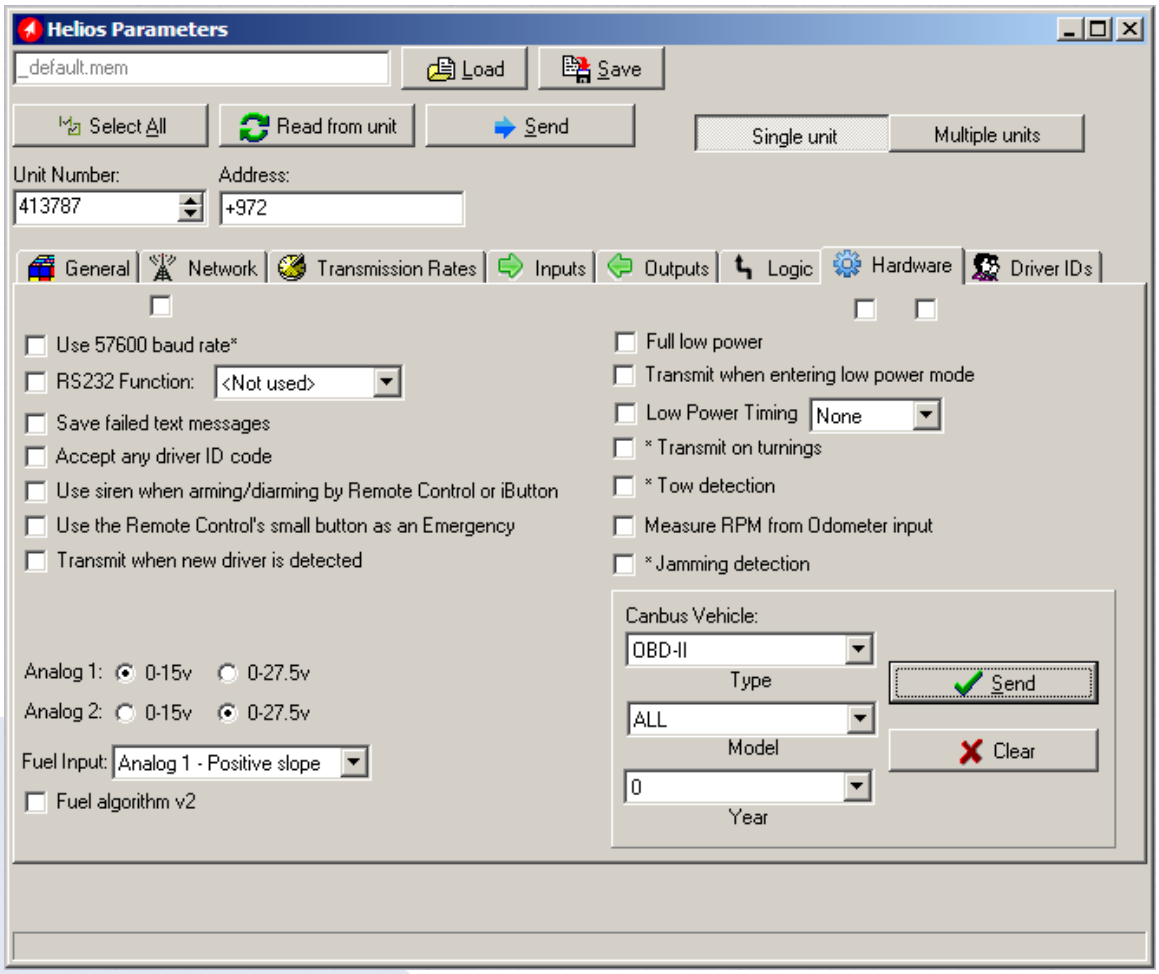
After the unit was properly installed, you should test the connection. Open the Installer Application, go to **Technical > Helios Canbus**, select **OBD-II** as the vehicle type, and click **Connect**. If everything is correct, you will see the information that the unit can retrieve from the vehicle, as shown in the following image.



NOTE: The mileage displayed is the mileage registered since the codes were last cleared. It will be used by the unit as a relative mileage to count the mileage the vehicle has covered and will not be used as an absolute value, so don't worry if it does not match the actual mileage in the vehicle.

Configuration

After validating that the data is correct, open **Helios Parameters > Hardware**. In the Canbus Vehicle section, select **OBD-II** in the Type list, **ALL** in the Model list, and **0** in the Year list. Click **Send** and make sure you receive a response from the unit.



Finally, use the **Unit Status** window to send a **Mileage-Set KM** command to the unit with the current vehicle's mileage.

Appendix H – Using Keypad with RF Relay

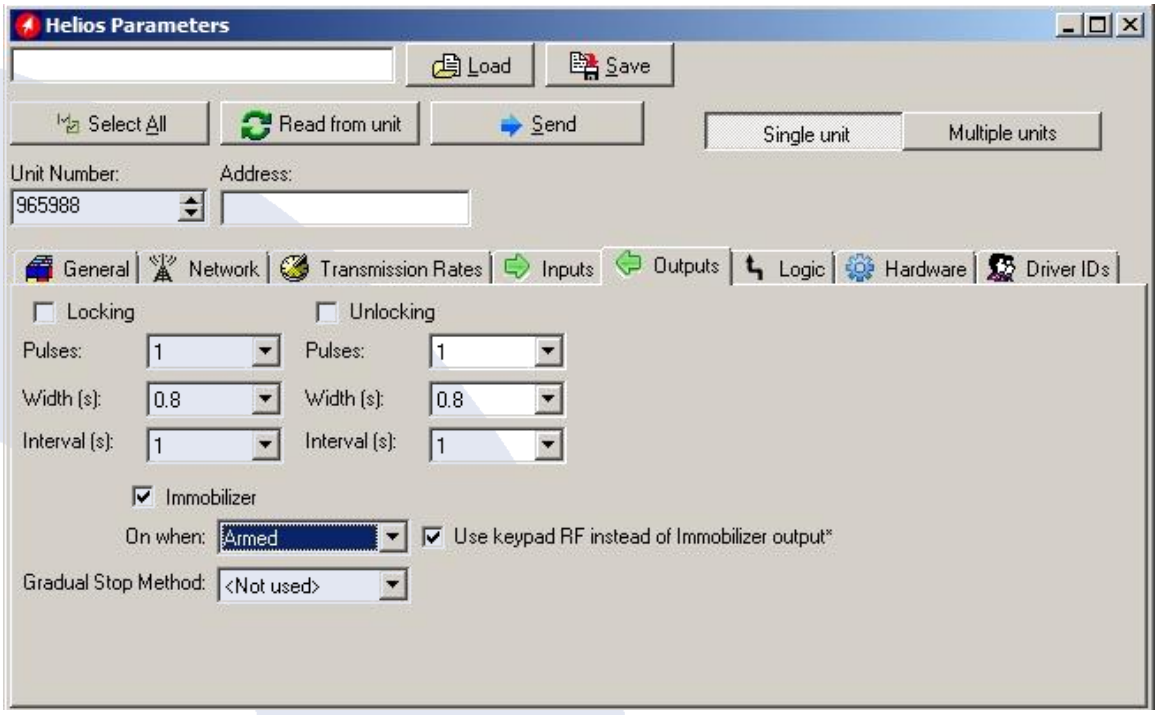
You can use an external RF relay (up to 3 units), which will be activated by a keypad code, to perform the immobilizer functions.

Configuration

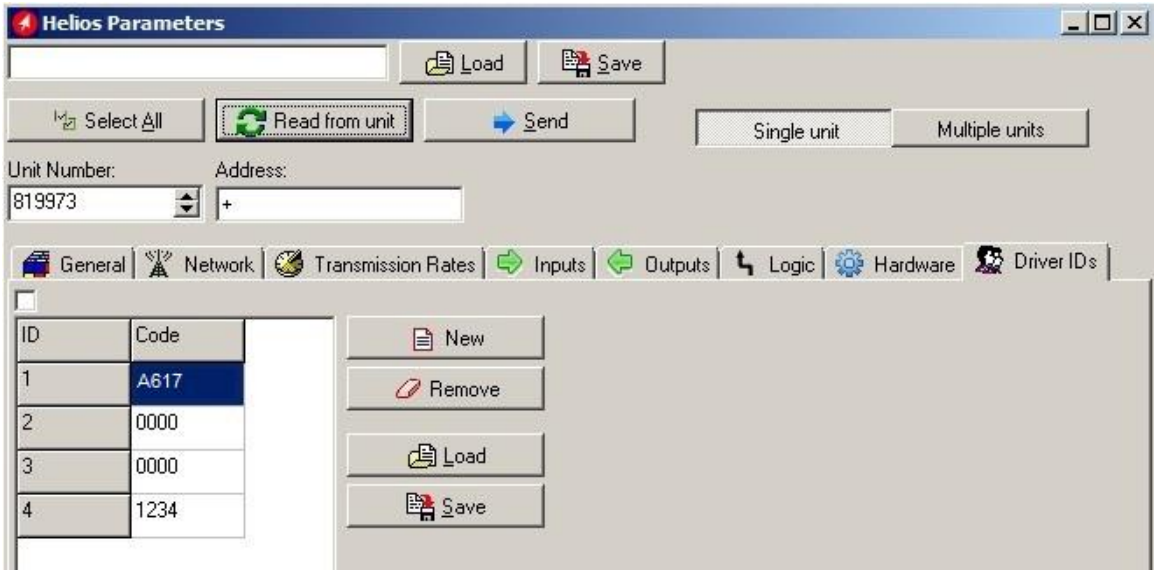
In **Installer** application, go to **Helios Parameters** > **Outputs**, enable the **Use keypad RF instead of Immobilizer output** option.

Select **Immobilizer** On when **Armed**, if you're using a Normally Closed relay.

Select **Immobilizer** On when **Idle**, if you're using a Normally Open relay.



In **Installer**, go to **Helios Parameters** > **Driver IDs** and configure the codes in the following way.



The first 3 code fields are reserved exclusively for the relay units (up to 3). If you're using one relay unit, enter its number in the first field and enter 0000 in the following two fields.

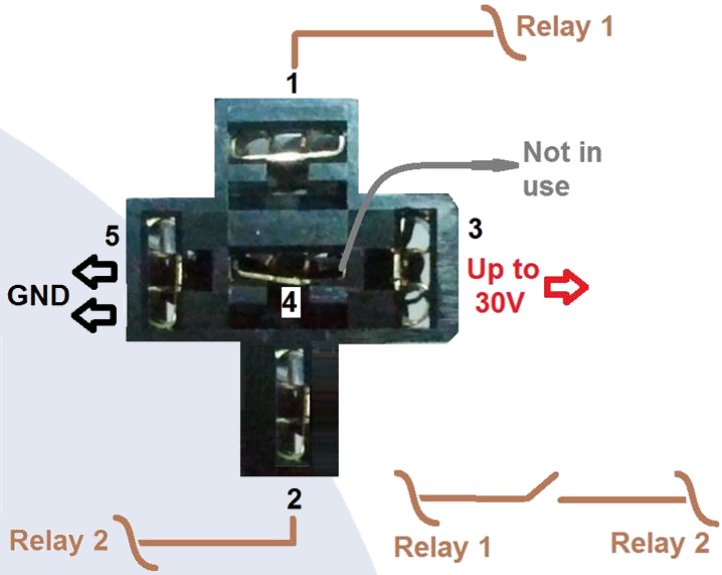
Code field number 4 and the remaining fields will be used for the driver codes, which will be activated by using the keypad. In this case code 1234 will be used on the keypad to close the relay and enable the vehicle ignition.

The relay code is indicated on the sticker. For example, the relay code in the following image is A617.

Installation

The following image shows the relay and socket with cables.

The following diagram illustrates the relay cables connection.



1. Relay connection 1
2. Relay connection 2
3. Main power +12V or +24V (usually **RED**)
4. Data (**GRAY**) – NOT IN USE
5. GND x 2 (-) (usually **BLACK**)

Appendix I – Cellular Phone Commands

You can use a cellular phone to send commands to Helios.

On Starcom Online, go to Unit Information and make sure that the unit is configured to receive commands from a cellular phone.

The following table lists the SMS text commands supported by the system.

Command	Description
AS	Activate Siren
DS	Deactivate Siren
AI	Activate Immobilizer
DI	Deactivate Immobilizer
LD	Lock Doors
UD	Unlock Doors
AG	Activate Gradual Stop
DG	Deactivate Gradual Stop
STAT	Status Request

Send an SMS text message in the following format:

COMMAND UNIT NUMBER STARCOM USERNAME STARCOM PASSWORD

Insert a space between the command, the unit number, and the password.

For example, if your login credentials for Starcom Online are username: starcom, password: starcom1, and the unit number is 123456, you can activate the siren by sending the following command:

AS 123456 starcom starcom1

Appendix J – Contacts

For more information about Starcom Systems Company and products, please visit: http://www.starcomsystems.com.

Support

Comprehensive support information is available online at: http://wiki.starcomsystems.com/wiki/index.php/Support.

Should you have any questions regarding our system, please contact Starcom technical support. For personalized support, use **Email**: support@starcomsystems.com, or **Skype**: **starcom.support**.