SatTerm Manual for SHOUT mcc

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REVISION HISTORY

Revision	Date	Description
A	05/03/2023	Formal Release

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1 INTRODUCTION

SatTerm, short for satellite terminal emulator, is terminal emulation software developed by NAL Research that runs on the Windows® operating system. It communicates with the family of NAL Research devices through RS232 or USB interface. The following sections cover how to use SatTerm 9.1.0 to configure the SHOUT mcc.

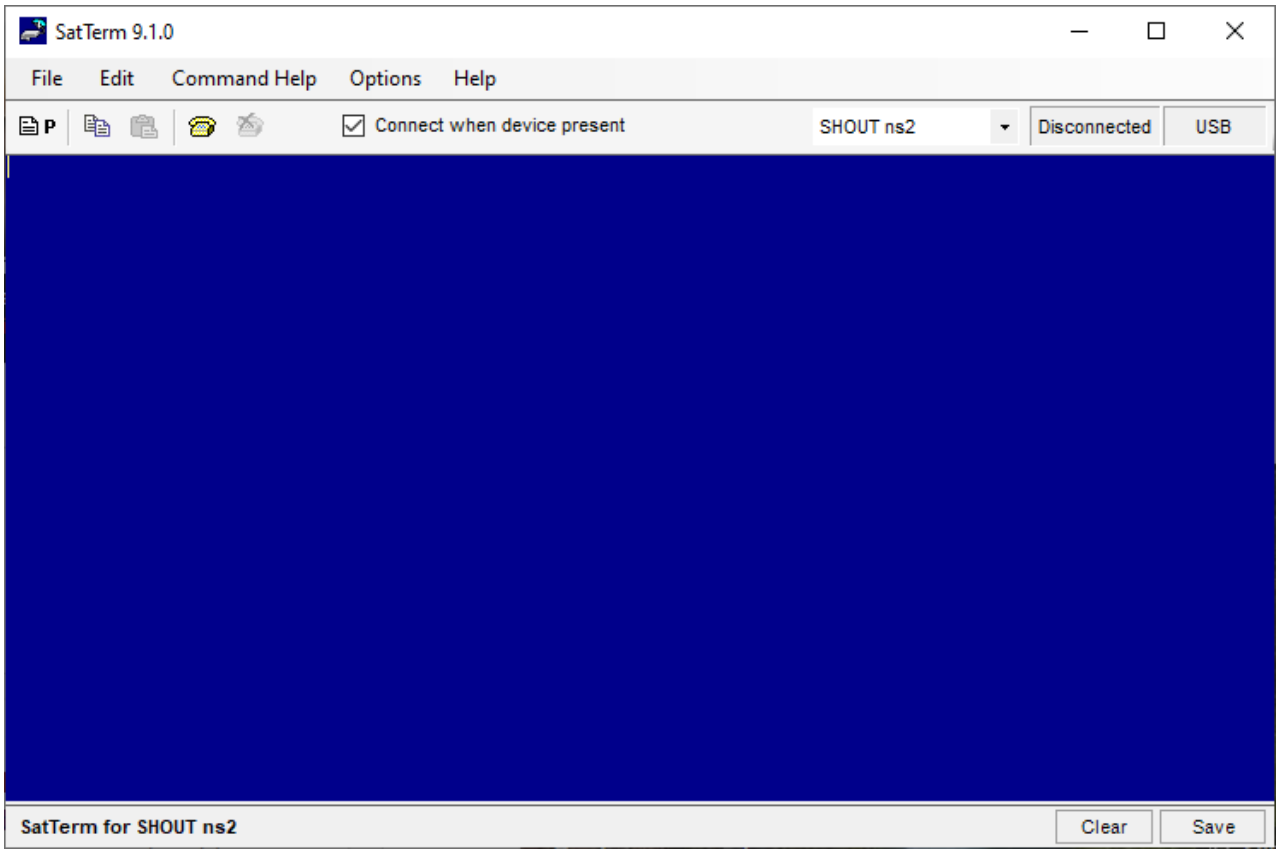

Figure 1: SatTerm Home Screen

1.1 INSTALLING SATTERM

To install SatTerm, run the "SatTerm V9.1.0 Setup" program under a Windows® based computer. Follow the on-screen instructions to advance through the installation process. You can cancel at any time without affecting your system by clicking the "Cancel" button. A copy of the SatTerm software is on the installation CD shipped along with the SHOUT mcc. The latest version can also be downloaded from NAL Research's website www.nalresearch.com.

1.2 CONNECTING SATTERM TO THE SHOUT MCC

The SHOUT mcc can be connected to SatTerm via a USB port of a Windows® PC. The SHOUT can also be connected to SatTerm through a Bluetooth link. A USB connected is required during the Bluetooth Pairing Process.

1. Connect the SHOUT mcc to an available USB port on your computer with the provided USB cable (or any standard USB cable).
2. Run the SatTerm application and wait for the main window to appear (see **Figure 1**).

   SatTerm can be accessed from the Windows® "Start" menu in the All Programs\NAL Research folder. The device may be powered ON or OFF before starting the SatTerm software. The functionality and tools available in SatTerm are determined by the selected device type. By default, the device Type may be set to a value other than SHOUT mcc. If necessary, this setting can be changed from the main window.
3. Select **Options>Properties>Device Type> SHOUT mcc** (see **Figure 2**).

   The selected device type displays on the main window in a gray status bar directly under the blue text area (see **Figure 3**).

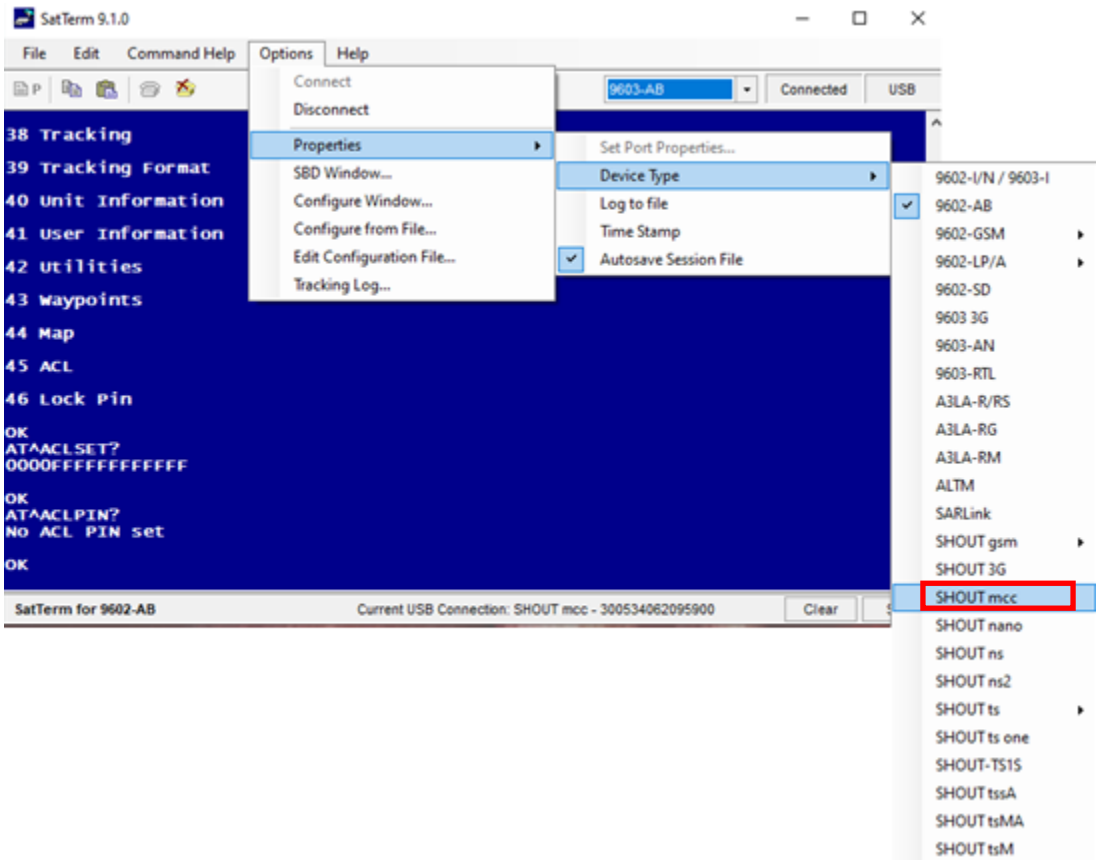

Figure 2: Select SHOUT mcc

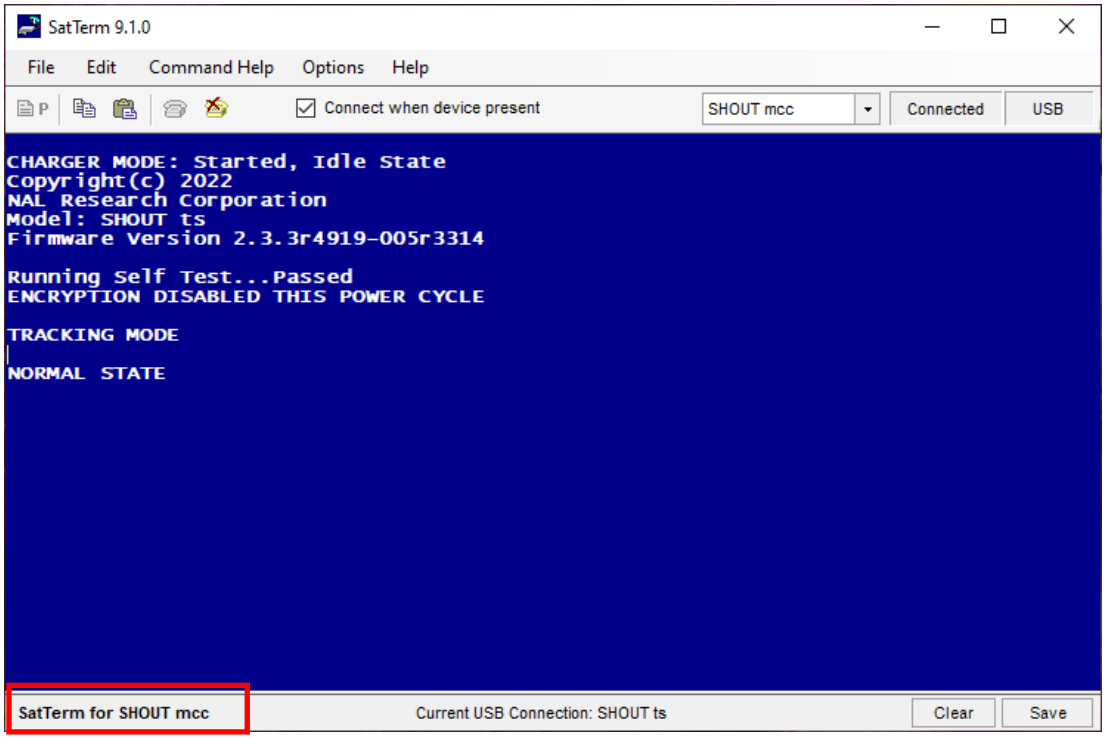

Figure 3: SatTerm for SHOUT mcc

The SHOUT mcc can be configured in one of three (3) ways from a computer connected to the SHOUT mcc USB port:

- Manually through the SatTerm PC-based application,
- Through a file download using SatTerm (Configure Settings), and
- Via AT commands.

1.3 PROFILE DESCRIPTIONS

A profile is a group of user-modifiable settings saved to nonvolatile memory. There are three (3) types of profiles on the SHOUT mcc: *General Profile, Tracking Profile*, and *Other Profile*).

1. **General Profile:** General Profile contain settings that have a general impact on the operation of the SHOUT mcc (see section 2.1 **General Profile Settings**). There are two (2) stored general profiles numbered 0 and 1. In addition to the stored general profiles, there is an “active" general profile, which is the set of general settings that are currently in effect.
   - At power-up, by default, general profile 0 is loaded into the “active” general profile. However, you can change the power-up profile using AT command **&Y**.
   - After power-up, you can load the “active” general profile with any stored general profile using the soft reset command **Z**.
   - Alternatively, you can use **&F** to load factory default settings back into the “active” general profile.
   - Any modifications made to general profile settings apply to the “active” general profile and are temporary. To save the modifications, write the “active” general profile to one of the stored general profiles using **&W**.
   - Settings that fall under general profiles can be displayed using **&V**.
2. **Tracking Profiles:** Tracking profiles contain settings that have an impact on the SHOUT mcc during tracking mode (see **section 2.2 Tracking Profile Settings**). There are 12 stored tracking profiles numbered from 0 to 11. In addition to the stored tracking profiles, there is an “active” tracking profile, which is a temporary tracking profile for purpose of modifying a

stored tracking profile. The “active” tracking profile is not used in tracking mode. Instead, tracking mode loads the stored tracking profiles directly based on the current state.

- At power-up, tracking profile 0 is always loaded into the “active” tracking profile. However, after power-up, you can load any of the stored tracking profiles using the soft reset AT command **ZT**.
- Alternatively, you can use **&FT** to load factory default settings back into the “active” tracking profile.
- Any modifications made to tracking profile settings apply to the “active” tracking profile and are temporary. To save the modifications, user must write the “active” tracking profile to one of the stored tracking profiles using **&WT**.
- Settings that fall under tracking profiles can be displayed using **&VT**.

3. **Additional Setup Parameters:** Additional setup parameters affect the SHOUT mcc globally and immediately. Unlike general profiles and tracking profiles, there is no “active” profile associated with these parameters to be saved or retrieved. Any modifications to these settings are saved to nonvolatile memory directly.

2 CONFIGURE WINDOW

Use the SatTerm *Configure Window* option to set up the profiles. Follow the steps below first to synchronize communication between the SHOUT mcc and a connected DTE (computer, laptop, etc.).

1. Connect the SHOUT mcc to an available USB port on your computer with the provided USB cable.
2. Launch SatTerm software from the Windows® *Start* tab.
   Note: If SatTerm is not installed; the software can be downloaded from NAL Research's website http://www.nalresearch.com.
3. Select **Options** > **Properties** > **Device Type** > **SHOUT mcc**. This option selects the type of device connected to the computer. Only NAL Research's devices appear on the list.
4. Again, use the *Options* menu to open *Configure Window.*

2.1 GENERAL PROFILE SETTINGS

This section describes the general profile settings using SatTerm, and covers the configuration tabs associated with the General Profile to include: *Miscellaneous, Tracking, Motion, display, and GPS.*

1. Select **Options>Configure Window** on the *Home* screen (see Error! Reference source not found.).

   The Configuration for *SHOUT mcc* screen displays (see **Figure 5**).

   The *Configuration* window organizes the general profile settings into five (5) tabs: *Miscellaneous*, *Tracking*, *Motion*, *Display*, and *GPS*.

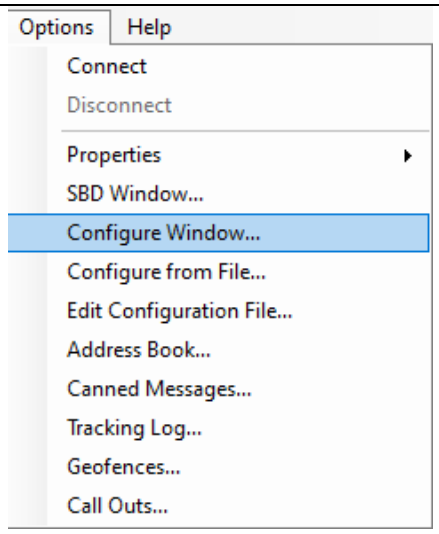

Figure 4: Home Screen –Configure Window

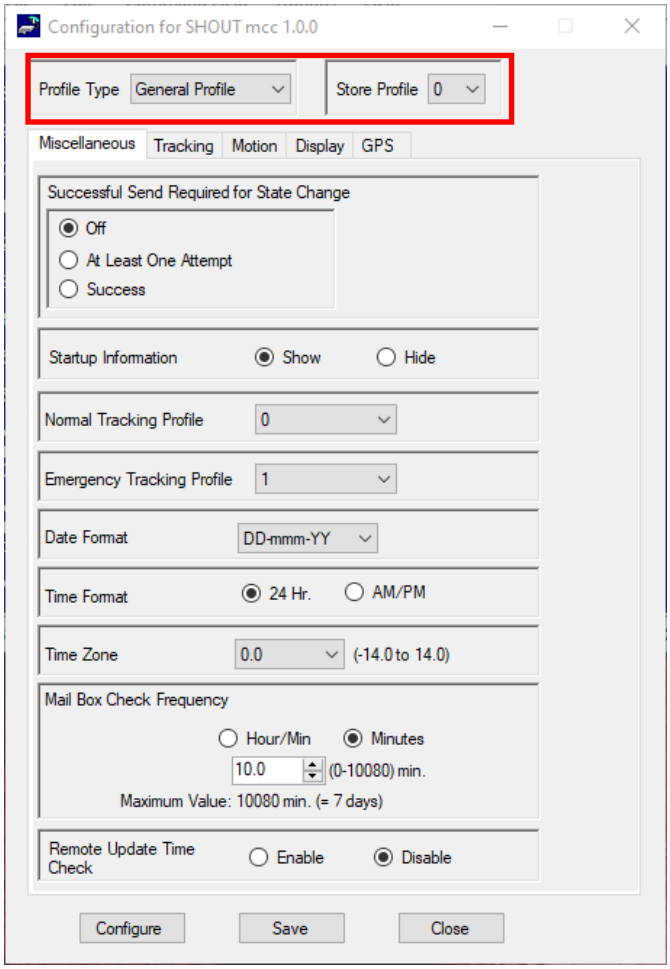

Figure 5: General Profile Window with Miscellaneous Tab

2. Select **General Profile** from the Profile Type drop-down list, if not already selected Error! Reference source not found., and then select the Store Profile value (**0** or **1**) from the Store Profile drop-down list (see **Figure 5**).

2.1.1 MISCELLANEOUS TAB

When selected the Miscellaneous tab offers nine (9) settings as shown in **Error! Reference source not found.** Below – *Successful Send Required for State Change, Startup Information, Normal Tracking Profile, Emergency Tracking Profile, Date Format, Time Format, Time Zone, Mail Box Check Frequency, And Remote Update Time Check.*

1. **Successful Send Required for State Change**: This option restricts the SHOUT mcc from changing to a lower priority tracking mode based on whether or not a tracking report has been transmitted. Among the three tracking modes, the order of priority is Emergency, Geofence, and then Normal. When set to off, a change to the tracking mode takes effect immediately (i.e. Emergency to Normal). When set to “At Least One Attempt”, the mode change will be delayed until at least one tracking cycle is complete. When set to “Success”, the mode change will be blocked until a tracking report is transmitted successfully.

a.The AT command associated with this setting is **AT^SSR**.

2. **Startup Information**: This option hides/shows the power-up text (copyright, model number, etc.) that is echoed to the SHOUT mcc’s USB port.
    a. The AT command associated with this setting is **AT^SSI**.
3. **Normal Tracking Profile**: This option selects the stored tracking profile to be used in Normal tracking mode.
    a. The AT command associated with this setting is **AT^TPN**.
4. **Emergency Tracking Profile**: This option selects the stored tracking profile to be used in Emergency tracking mode.
    a. The AT command associated with this setting is **AT^TPE**.
5. **Date Format**: Selects one of several date formats to use when displaying the date on the SHOUT mcc.
6. **Time Format**: This option selects between 24 hour or AM/PM time formats.
7. **Time Zone**: Sets the local time zone, measured in hours offset from UTC time.
8. **Mail Box Check Frequency**: Sets the frequency of the mailbox check in 30-second increments.
    a. The AT command associated with this setting is **AT^MBXCHK.**
9. **Remote Update Time Check**: This enables a time check for incoming remote updates. When enabled, remote updates with a timestamp less than or equal to the last remote update time are not applied.

a. The AT command associated with this setting is **AT ^RUTC**.

2.1.2 TRACKING TAB

When the **Tracking** tab is selected six (6) settings display as shown in **Figure 6**: *Remote Message Format, GPS Always ON, Start-up Mode, Tracking Log, Max Queued Reports, and Track Enabled.*

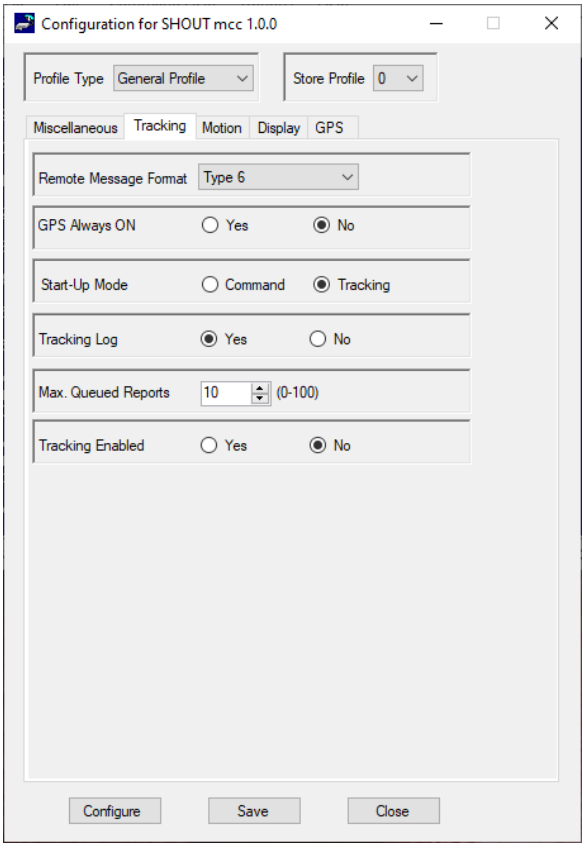

Figure 6: General Profile Window with Tracking Tab

1. **Remote Message Format:** Sets the format of the messages that are sent from the SHOUT mcc to the recipient.
   a. Currently, available message formats include:
      i. PECOS P3
      ii. PECOS P4
      iii. NAL Type 6: Includes short codes and free text fields
      iv. NAL 10 Byte Ver 0: A 10-byte message format to reduce data usage
   b. The AT command associated with this setting is **^RMF**

2. **GPS Always On:** Forces the GPS receiver to remain on between reports, allowing the SHOUT mcc to have immediate location information (GPS hot start, assuming the SHOUT mcc always has full view of the sky) each time it is ready to transmit a tracking report.
    a. When low-power consumption is not critical, enabling this option is recommended for faster GPS acquisition and more accurate location information. If the SHOUT mcc turns off to sleep while idle, the GPS receiver also turns off.
    b. The AT command associated with this setting is **^GAO**.
3. **Start-Up Mode:** Sets the operating mode for when the unit is powered on or wakes up from sleep. The default is to power up the unit in tracking mode to allow the unit to begin tracking after a power cycle and to automatically send reports at a predetermined interval. Alternatively, the SHOUT mcc can also be configured to turn on in command mode, allowing users to enter AT commands via a connected computer.
    a. The AT command associated with this setting is **^START**.
4. **Tracking Log:** Forces the SHOUT mcc to save all tracking reports, whether successfully sent or attempted during tracking mode, to nonvolatile memory.
    a. The device can save up to about 4,000 reports in a circular memory (oldest saved reports are overwritten when memory reaches maximum capacity).
    b. SatTerm can be used to retrieve tracking reports later using **Options** > **Tracking Log**.
    c. The AT command associated with this setting is **^DLTRK**.
5. **Max. Queued Reports:** Sets the maximum number of reports that can be queued on the SHOUT mcc for retransmit.
    a. This setting applies only if *Queue Failed Reports*, *Queue Restricted Reports*, or both are set (see section 2.2 **Tracking Profile Settings**).
        i. A restricted report is a report that attempts to send while the Iridium link is configured to be disabled. For example, if Iridium were disabled in a certain geographic area by a geofence, any reports that attempt to send while in the geofence would be considered a restricted report. In this case, queuing restricted reports would cause these reports to be queued to retransmit when outside that geographic area.

ii. Failed reports are reports that are unable to send after the specified *Time to Keep Trying* value (see section 2.2 **Tracking Profile Settings**).

b. When the number of queued reports reaches its maximum number, the oldest queued reports are overwritten.

c. The AT command associated with this setting is **^ERQM**.

6. **Tracking Enabled:** This option enables tracking.

a. The AT command associated with this setting is **AT^TRKE**.

2.1.3 MOTION TAB

The SHOUT mcc has a built-in sensor that can reliably detect motion. The *Motion* tab, as shown in **Figure 7**, provides ways to detect different motion characteristics without having to interpret the raw motion sensor signals. Motion detection can be enabled or disabled through the *Motion Enabled* option in the tracking profile (see section 2.2 **Tracking Profile Settings**).

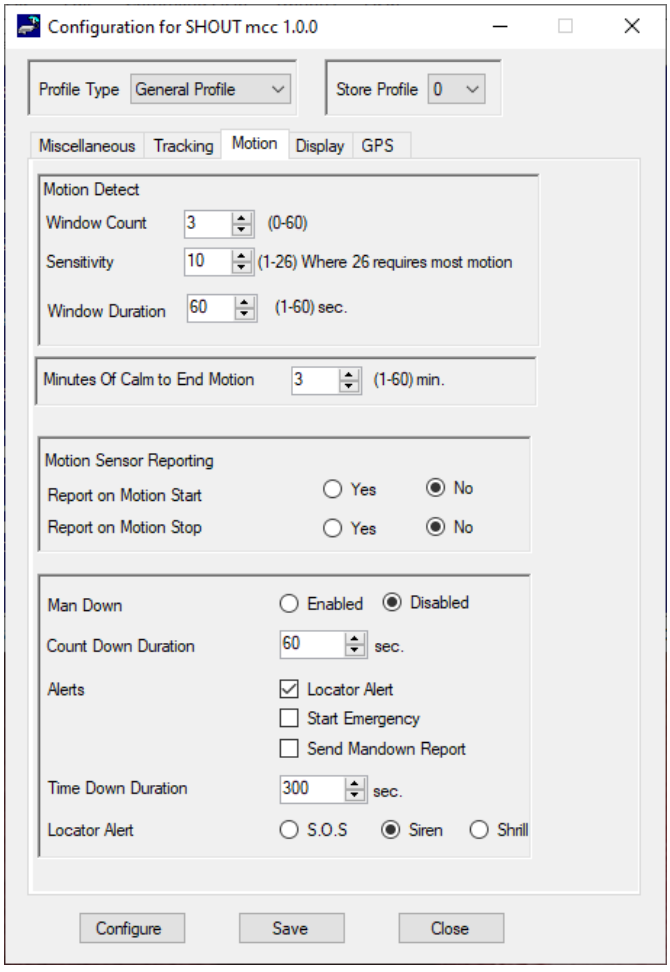

Figure 7: General Profile Window with Motion Tab

When motion detection is enabled, the device monitors the motion sensor to detect when the device is in motion. To detect the start of motion, an algorithm involving motion detection windows is used. This algorithm succeeds to detect motion when a certain number of contiguous windows are each satisfied by a minimum number of Transistor–Transistor Logic (TTL) pulses from the motion sensor. **Figure 8** illustrates the algorithm with a window count of 3, window duration of one (1) minute, and a sensitivity of two (2) TTL pulses.

Note: The motion detection algorithm starts over whenever the device receives a remote update. A remote update, in addition to restarting the motion detection algorithm, also resets the motion state of the device back to motionless.

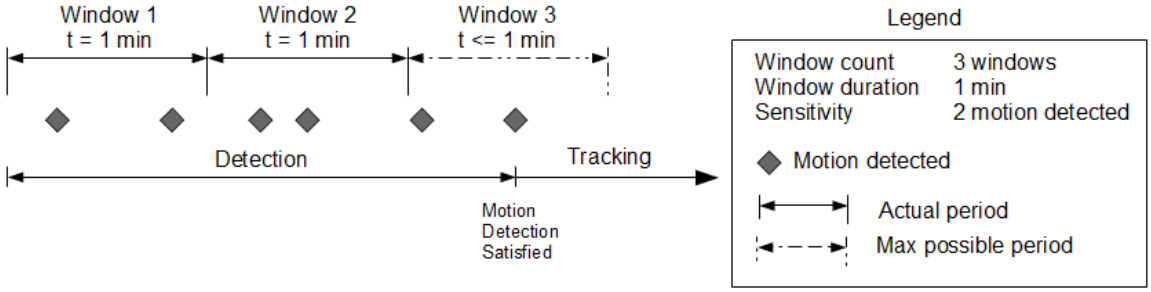

Figure 8: Motion Detection Example

Once motion has been detected using the motion detection algorithm, the device is considered in motion and report formats that support motion indication will have the motion indicator set. While in motion, the device switches to a different algorithm for detecting the end of motion. The device is considered motionless if there is a certain duration of calm. The definition of calm for this algorithm differs depending on whether the device is awake or sleeping. While awake, a single TTL pulse resets the calm timer; whereas while sleeping, the same algorithm used for detecting the start of motion is used to detect motion that will reset the calm timer. An example of this algorithm is shown in **Figure 9**.

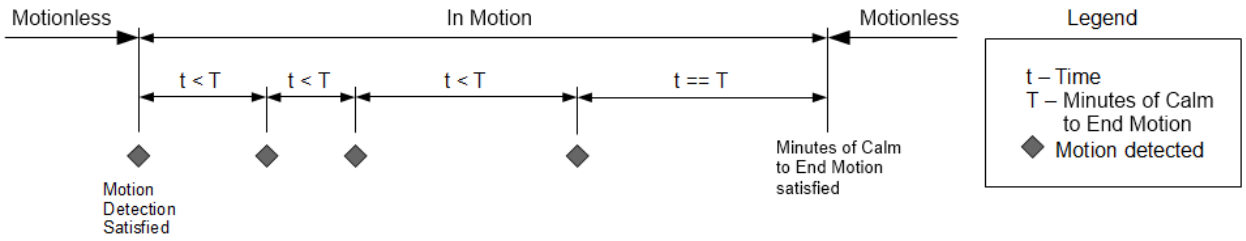

Figure 9: End of Motion Example

1. **Window Count:** Specifies the number of contiguous windows for the motion detection algorithm. If set to 0, then a single TTL pulse from the motion sensor will satisfy the motion detection algorithm.
    a. The AT command associated with this setting is **^MSB**.
2. **Sensitivity:** Specifies the minimum number of motion sensor TTL pulses that must be detected in order to satisfy a single motion detection window for the motion detection algorithm.
    a. The AT command associated with this setting is **^MSB**.
3. **Window Duration:** Specifies the duration of each motion detection window for the motion detection algorithm. The AT command associated with this setting is **^MSB**.
4. **Minutes of Calm to End Motion:** Specifies the duration of calm needed in order for the device to return to the motionless state.
    a. The AT command associated with this setting is **^MSE**.
5. **Motion Sensor Reporting:** Determines whether to send a report when motion starts and/or ends. For this setting to have an effect, it is required that the *Motion Enabled* option is enabled.
    a. If the *Report on Motion Start* option is enabled, a NAL format GPS version 6 report with short code 20 will be transmitted when motion starts. See document NAL GPS Report Version 6 Format [2] for details.
    b. If the *Report on Motion Stop* option is disabled, a version 6 report with short code 21 will be transmitted when motion ends.
    c. The AT command associated with this setting is **^MSR**.
6. **Man Down**: This setting enables/disables the mandown feature. When enabled, the mandown feature will being monitoring the motion sensor and look for motion based on ^MSB settings. If the device does not see motion often enough while it is monitoring, then a popup menu will show asking, “Are You OK?” When this menu is allowed to count down or the user selects “No”, up to three different mandown responses – Locator Alert, Start Emergency Mode, and Send Mandown Message will trigger.

   a. The AT command associated with this setting is **AT^MNDN**.

7. **Count Down Duration**: This sets the number of seconds to show the “Are You OK” screen before automatically triggering the response. The default is 60 seconds.
8. **Alerts:** This sets which of the three different mandown responses will trigger once the “Are You OK” screen has timeout or the user has hit no.
9. **Time Down Duration:** This sets the number of seconds of no detected motion that must pass before the “Are You OK?” screen will appear.
   a. The AT command associated with this setting is **AT^MNDNTD**.
10. **Locator Alert**: This sets which alert sound to play when Mandown Locator Alert triggers.
    a. The AT command associated with this setting is **AT^MNDNA**.

2.1.4 DISPLAY TAB

For applications where prolonging battery life is essential, the settings on SatTerm’s *Display* tab may be adjusted.

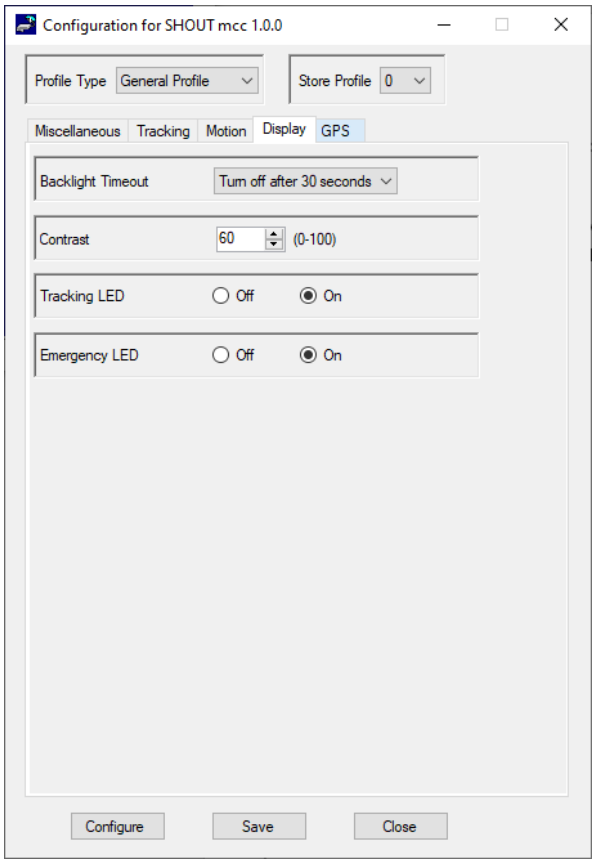

Figure 10: General Profile Window with Display Tab

1. **Backlight Timeout**: The SHOUT mcc LCD backlight can be set to turn off after a period of inactivity, to be always on, or always off.
2. **Contrast**: Adjust the contrast setting of the LCD screen.
3. **Tracking LED**: Determines whether the LED blinks once every five seconds while the device sleeps when tracking related tasks, such as geofences, mailbox checks, or call outs, are enabled. This setting can be turned off to save battery power while the device sleeps between tracking tasks.
4. **Emergency LED**: Whether the LED turns solid green when Emergency mode is enabled. This setting can be turned off to save battery power during emergency mode.

2.1.5 GPS TAB

The GPS tab provides the option to configure the GPS receiver and stream NMEA formatted GPS data from the SHOUT mcc USB port while in Command mode, Tracking mode, or both modes (see **Figure 11**).

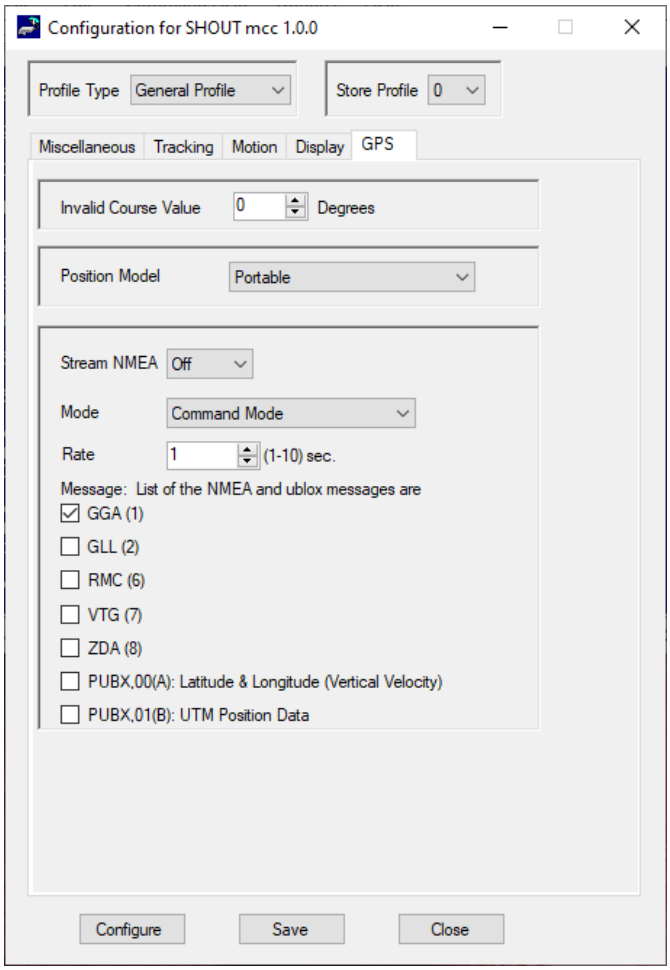

Figure 11: General Profile Window with GPS Tab

1. **Invalid Course Value**: This value is sent in GPS reports to indicate an invalid course when the GPS receiver is unable to determine the course.
    a. The AT command associated with this setting is **AT^ICV**.
2. **Position Model**: This setting allows the GPS receiver to be more accurate by telling the unit what it's environment is like. For applications operating below 12 km, the Portable setting is sufficient. Those requiring operation above 12 km should refer to the "AT Commands for SHOUT mcc" document for detail.
    a. The AT command associated with this setting is **AT+PNAV**.
3. **Stream NMEA**: This parameter sets NMEA streaming on or off.
    a. The AT command associated with this setting is **AT+PG**.

- **Mode**: This parameter selects the mode (Tracking, Command or both modes) in which GPS data streaming is active.
- **Rate**: This parameter sets the NMEA streaming update rate in seconds.
- **Message**: The checked boxes select which NMEA sentences stream through the SHOUT nano 100 USB port.

2.2 TRACKING PROFILE SETTINGS

This section describes the Tracking profile settings using SatTerm. The *Configuration* window organizes the Tracking profile settings into three tabs: *Interval, Geofence, and Tracking*.

1. Select **Options** > **Configure Window** on the Home screen (see Error! Reference source not found.).
2. Select **Tracking Profile** from the Profile Type drop-down list Error! Reference source not found.).
3. Select the **Store Profile** value (**0** thru **11**) from the Store Profile drop-down list (see **Figure 12**).

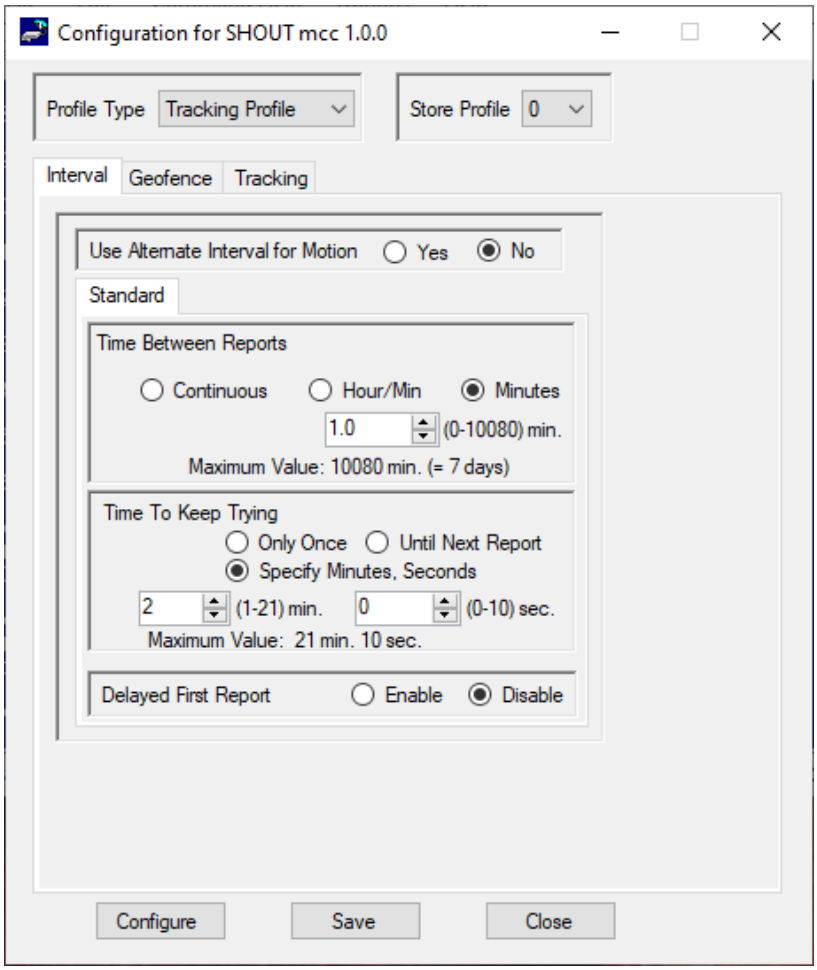

Figure 12: Tracking Profile Window with Interval Tab

2.2.1 INTERVAL TAB

The *Interval* tab provides four settings: *Use Alternate Interval for Motion*, *Time Between Reports*, *Time To Keep Trying*, and *Delayed First Report*, as shown **Figure 12**).

1. **Use Alternate Interval for Motion:** When this setting is set to *Yes*, the SHOUT mcc uses alternate *Time Between Reports*, *Time To Keep Trying*, and *Delayed First Report* settings while in motion. To set these alternate settings, use the *Motion* tab that appears when *Yes* is selected.
    a. The AT command associated with this setting is **^UAMS**.
2. **Time Between Reports:** Sets the interval between tracking report cycles. The interval can range from 0 and 10080 minutes in increments of 0.5 minutes (i.e., 30 seconds).
    a. The AT command associated with this setting is **^TBR** (Standard), and **^TBRA** (Motion).

3. **Time To Keep Trying:** Sets the duration in which the SHOUT mcc attempts to retry sending a tracking report. During a report cycle, the SHOUT mcc attempts to acquire a valid GPS fix and acceptable communication link signal strength. Once the tracking fix and signal strength requirements are met, the device sends a report. If the report fails to send, the SHOUT mcc retries until the specified *Time To Keep Trying* window expires.

    b. There are three (3) additional special values for *Time To Keep Trying (TTKT)*: *Only Once, Until Next Report, and Specify Minutes, Seconds*.

        I. *Only Once* forces the SHOUT mcc to send only once per report cycle regardless of whether the tracking report was successfully transmitted or not.

        II. *Until Next Report* forces the SHOUT mcc to retry sending a tracking report up to the next reporting cycle if there is no successful transmission.

        III. *Specify Minutes, Seconds* specifies the timeframe, in minutes and seconds, to retry sending a tracking report, if there is no successful transmission.

    c. *Time To Keep Trying* is specified in 5-second increments. It has a minimum value of 1.5 minutes and a maximum value of 21 minutes and 10 seconds.

    d. The AT command associated with this setting is **^TTKT** (Standard) and **^TTKTA** (Motion).

4. Delayed First Report: When enabled, this setting prevents the transmission of the first tracking report. This applies when tracking is turned on from off or if there is a mode change. A mode change occurs when entering/leaving a geofence and when emergency is enabled/disabled.

    a. An example of how this parameter might be useful is to avoid unwanted transmissions that may accumulate airtime costs. If tracking mode is restarting repeatedly because of frequent power cycling, reports are transmitted each time. Enabling *Delay First Report* would delay that first report and reduce the airtime usage.

    b. The AT command associated with this setting is **^DFR** (Standard), and **^DFRA** (Motion).

2.2.2 GEOFENCE TAB

The *Geofence* tab provides two settings, as shown in **Figure 13**: *Geofence Check Frequency* and *Allowed GPS Acquisition Time* (see **Figure 13**).

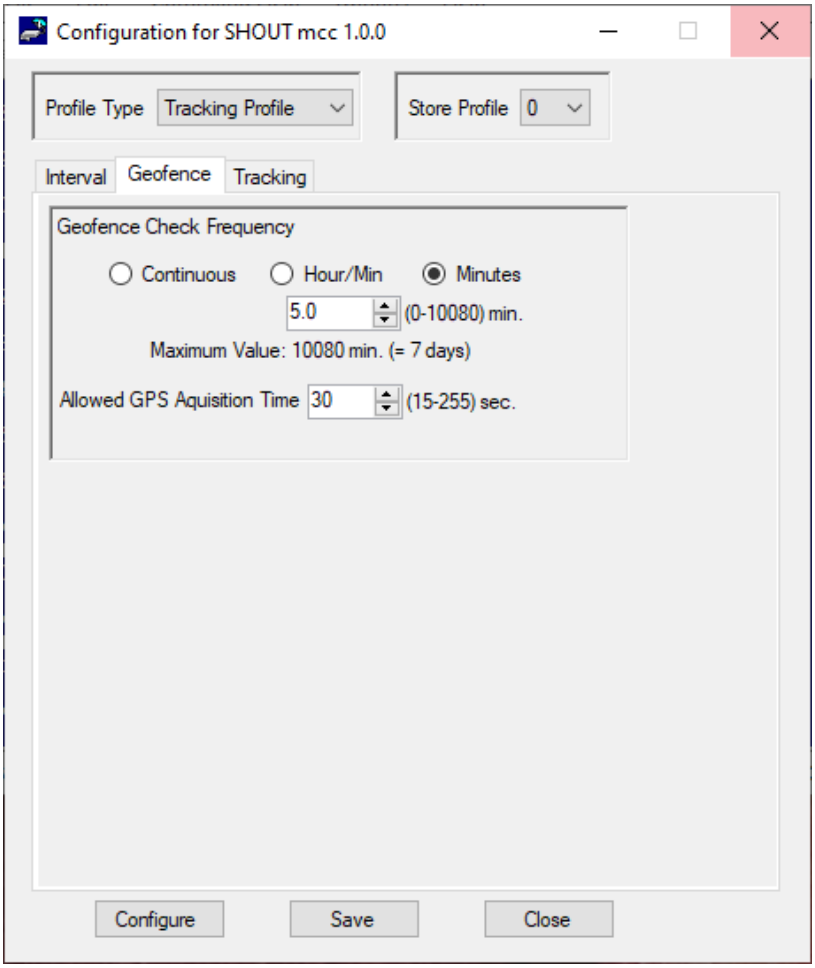

Figure 13: Tracking Profile Window with Geofence Tab

1. **Geofence Check Frequency:** Sets the maximum time between position updates to check if the device is in a geofence. If a valid GPS position is received before the next check, the countdown to the next check is restarted.
    a. The AT command associated with this setting is **^GFCF**.
2. **Allowed GPS Acquisition Time:** Sets the amount of time the geofence check attempts to acquire a GPS position. If the SHOUT mcc fails to acquire a position in the time allowed, the geofence check is aborted and occurs at the next scheduled check or the next time the GPS receiver has a valid position.

a. The AT command associated with this setting is **^GFCF**.

2.2.3 TRACKING TAB

The *Tracking* tab has eight (8) settings — *Report Flood*, *Block Invalid Reports*, *Queue Failed Reports*, *Queue Restricted Reports, Iridium Link*, and *Skip Reporting when Stationary*.

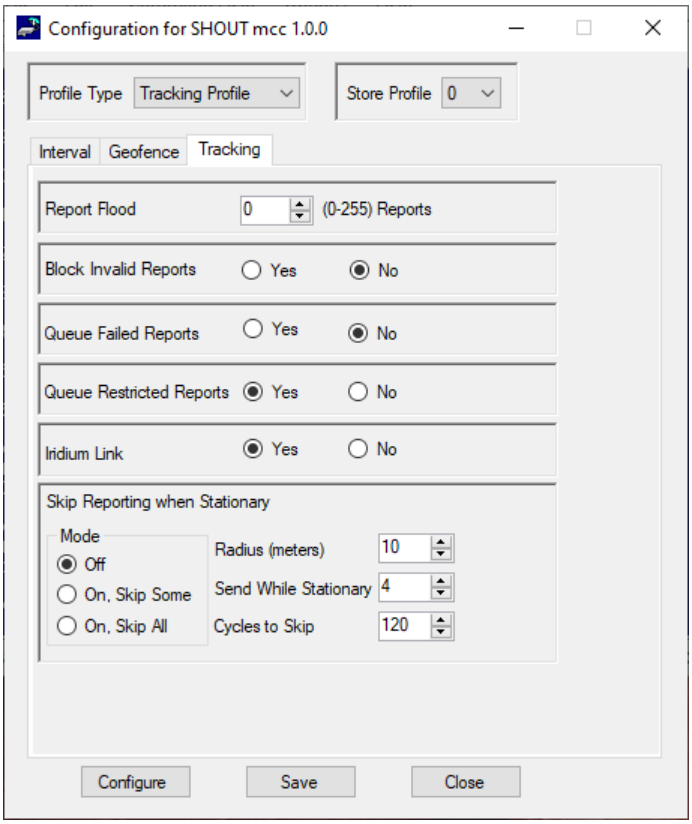

Figure 14: Tracking Profile Window with Tracking Tab

1. **Report Flood**: This parameter sets the number of tracking reports that are to be transmitted continuously when first entering Tracking mode and when the tracking mode changes (for example, from Normal to Emergency). After the specified tracking reports have been transmitted, the pre-programmed reporting interval will take effect. In the Emergency tracking mode, the report flood will be ended prematurely when an emergency acknowledgement is received.

   a. The AT command associated with this setting is **AT^RF**.

2. **Block Invalid Reports**: When this setting is enabled, only tracking reports with a valid GPS position fix are transmitted. This can be useful in filtering out possibly misleading GPS data points.
    a. The AT command associated with this setting is **AT^BIGR**.
3. **Queue Failed Reports**: When this setting is enabled, tracking reports that fail to transmit are queued in the Outbox for retransmission. A tracking report that cannot be sent before the specified *Time to Keep Trying* value is considered a failed report.
    a. The command related to this setting is **AT^ERQ**.
4. **Queue Restricted Reports**: When this setting is enabled, tracking reports that are restricted from transmitting will be queued for later transmission. A report is considered restricted when the Iridium link has been disabled. For example, in the case where Iridium is disabled in a certain geographic area by a geofence, tracking reports collected while in the geofence would be considered restricted reports. And, if configured for queuing, the restricted reports will be later transmitted when outside that geographic area or in an area that allows transmitting.
    a. The command related to this setting is **AT^ERQ**.
5. **Iridium Link**: This setting lets the user enable/disable the Iridium Link.
    a. The AT command associated with this setting is **AT^LNK**.
6. **Skip Reporting when Stationary**: This parameter limits the SHOUT mcc from sending tracking reports when it has not moved out of a specified radius. When enabled, this causes the unit to be bounded by a sphere with a specified radius. While the unit remains in the sphere, report sending skips a specified *Cycles to Skip* number of report cycles. When the *Cycles to Skip* value is reached, the SHOUT mcc will report for a specified *Send While Stationary* cycles. The process is repeated until the unit leaves the sphere. Upon leaving the bounding sphere, a new boundary will be created at the current location of the unit and the SHOUT mcc will report for the specified *Send While Stationary* cycles. If *On, Skip All* is selected, the *Cycles to Skip* parameter is disregarded and the unit only sends the *Send While Stationary* cycles each time a new sphere is established.

a. The AT command associated with this setting is **AT^SPSR**.

2.3 OTHER PROFILE SETTINGS

This section describes the Other profile settings using SatTerm. The *Configuration* window organizes the Other profile settings into two tabs: *Miscellaneous, Encryption, and Icon*. The Store Profile number has no effect for this profile type.

1. Select **Options** > **Configure Window** on the Home screen (see **Figure 4)**.
2. Select **Other** from the Profile Type drop-down list (see **Figure 15**).

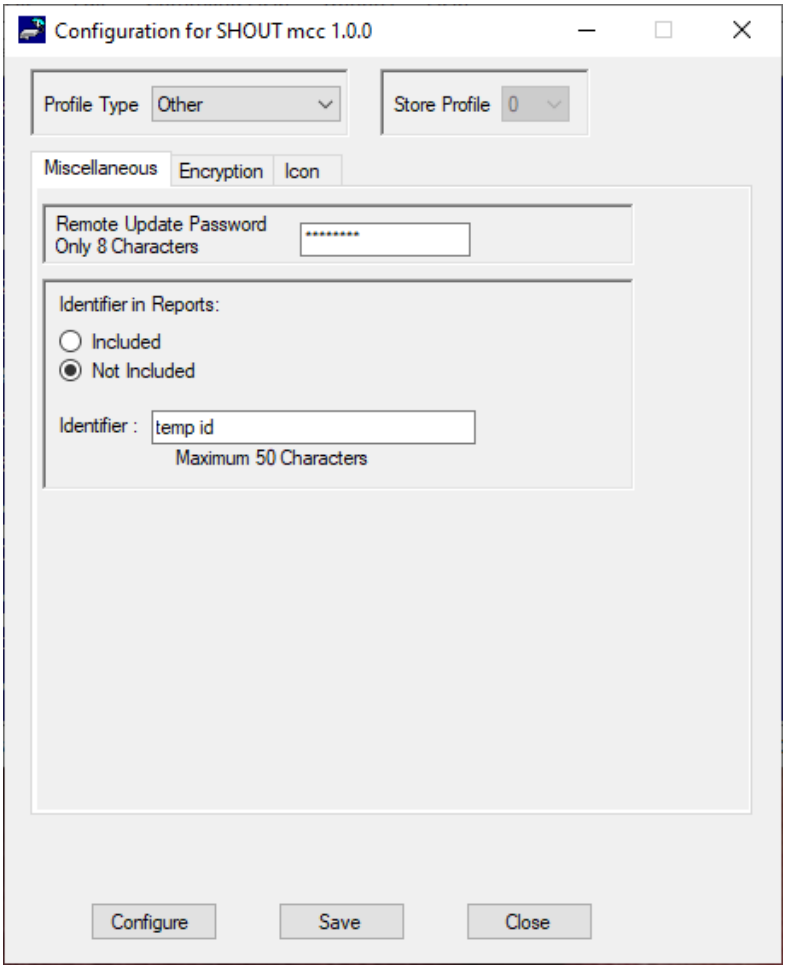

Figure 15: Other Profile Window with Tracking Tab

2.3.1 MISCELLANEOUS TAB

The *Miscellaneous* tab shown in **Figure 15** provides two (2) settings: *Remote Update Password*, and *Identifier in Reports*.

1. **Remote Update Password:** An unattended SHOUT mcc can be reconfigured without requiring direct access to the device. All of the tracking profile parameters and most of the general parameters can be configured via remote updates. This parameter sets the required remote update password. The password entered must be eight characters in length. All printable characters are allowed. The factory-set default password is 12345678 and there is no requirement to change this password.
    a. The AT command for this setting is **^RUP**.
2. **Identifier in Reports:** Sets an additional identifier of up to 50 characters that is included in Type 3, Type 4, and Type 5 tracking reports. Keep the identifier short to reduce airtime cost, especially when on the Iridium link.
    a. The AT command associated with this setting is **^ID**.

2.3.2 ENCRYPTION TAB

The SHOUT mcc can send and receive data in AES 256-bit encrypted format. Options include changing the *Crypto Officer Password*, enabling or disabling encryption, and setting the encryption and decryption keys. A factory-default *Crypto Officer Password* is initially set on the SHOUT mcc. This default password must be changed before any encryption properties can be set. The *Encryption* tab is shown in **Figure 16)**.

1. Select **Change** to open the *Change Crypto Officer Password* window and complete the form (see **Figure 16**).

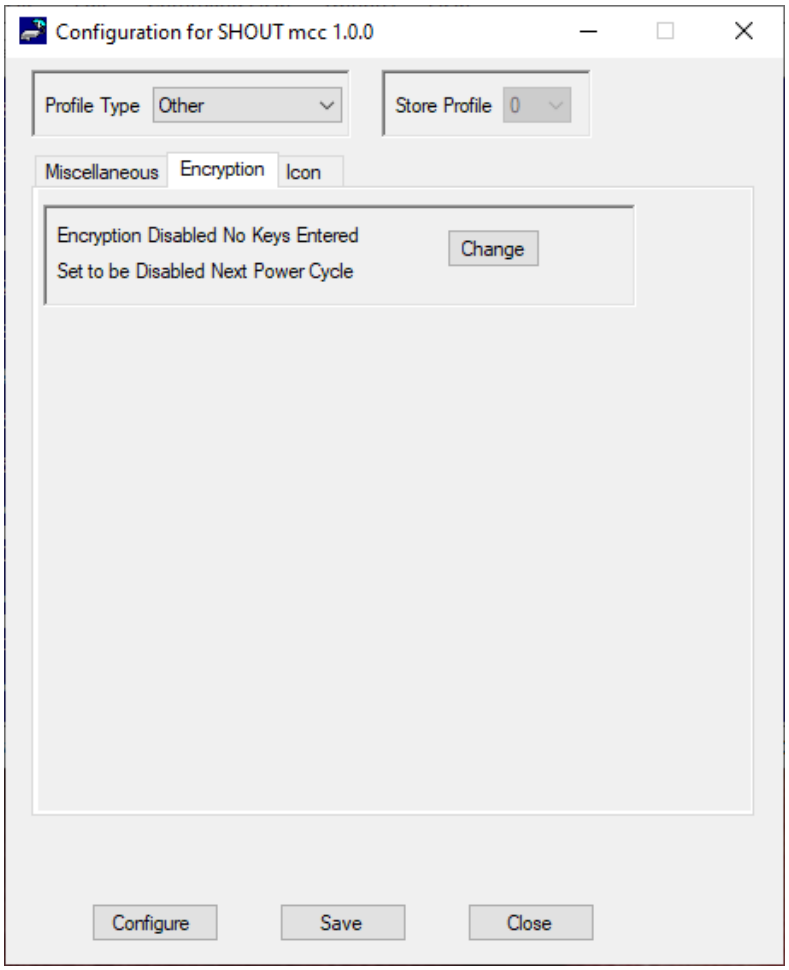

Figure 16: Other Profile Window with Encryption Tab

The *Change Encryption Setting* screen displays (see **Figure 17**).

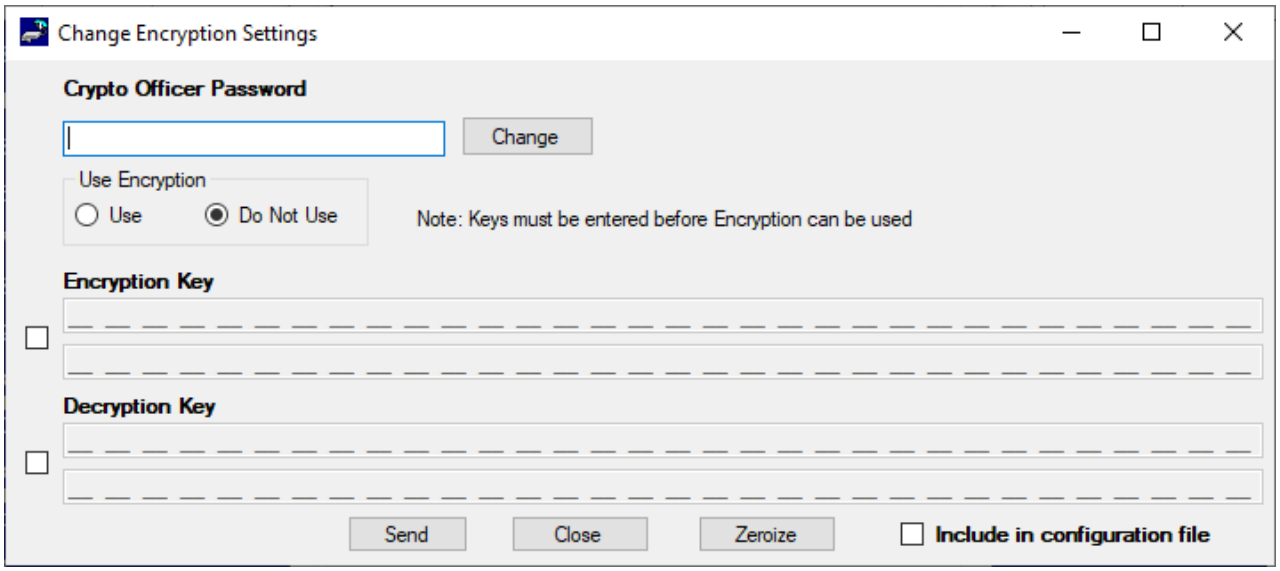

Figure 17: Change Encryption Settings

2. Enter the default password, “temp password,” in the *Old Password* box.
3. Select **Send**. Encryption properties can now be modified via the *Change Encryption Settings* window using the new Crypto Officer Password.
4. After the default password has been changed, set the encryption and decryption keys in order to use encryption.
5. In the *Change Encryption Settings* window, select **Use** under *Use Encryption*.
6. Select the **Encryption Key** checkbox and enter the key twice.
7. Select the **Decryption Key** checkbox and enter the key twice.
   NOTE**:** The *Decryption Key* is optional but required to receive encrypted data.
8. Select **Send**. The message *Update Made* is displayed to confirm successful configuration of the selected settings.

   The encryption settings are included in the configuration file when the *Save to file* checkbox is selected.

   NOTE 1: The *Zeroize* button erases the encryption/decryption keys on the SHOUT mcc.

   NOTE 2: Configuration can also be accomplished by using AT commands. The following five AT commands are used to configure the SHOUT mcc device’s cryptographic options: Change Crypto Officer Password (**^CCOP**), Key for Decryption (**^KD**), Key for Encryption (**^KE**), Use Encryption (**^UE**), and Key Zeroization (**^KZ**).

2.3.3 ICON TAB

The Icon tab sets up the Access Control List (ACL). The ACL controls which icons to display in the menu. A checked item indicates a shown icon, whereas an unchecked item indicates a hidden icon (see Figure **16**).

1. Select applicable ACL Control checkbox(s), or select **Set ALL** or **Set None** (see **Figure 18**).

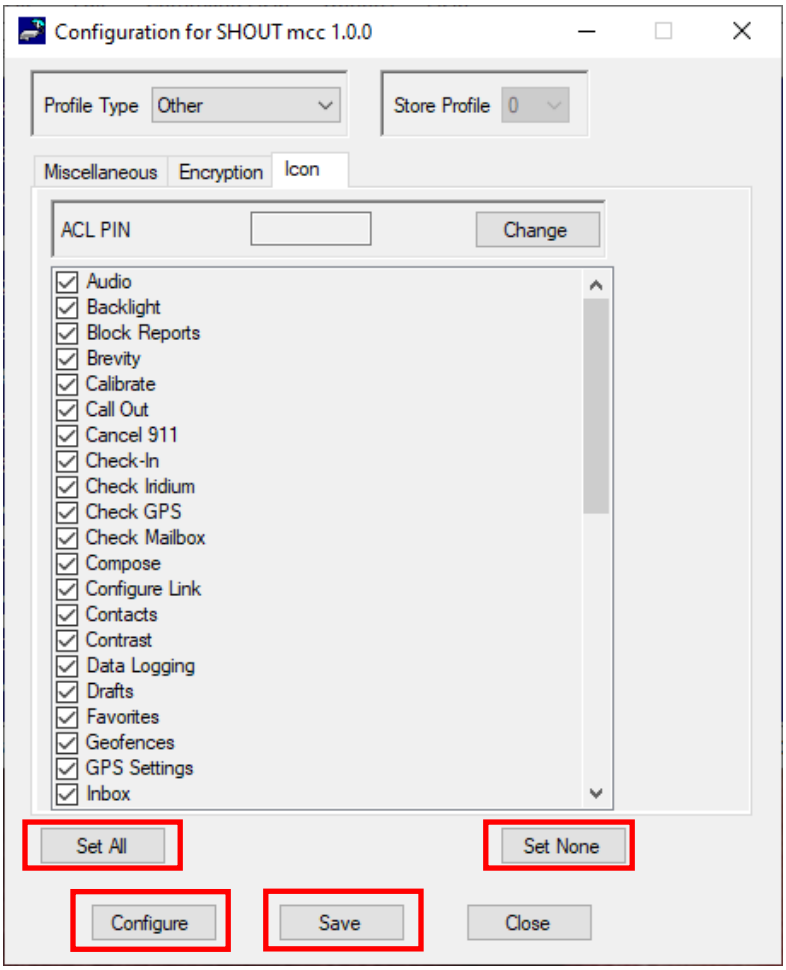

Figure 18: Other Profile Window with Icon Tab

2. **ACL PIN**: This parameter sets or clears a 4-digit PIN that must be used to change ACLs on the SHOUT mcc. Clearing the parameter will disable the ACL PIN on the device.

   a. The AT command associated with this setting is **^ACLPIN**.

2.3.4 CONFIGURE SETTINGS

1. Select **Configure** at the bottom of the *Configuration* window (see **Figure 18**).

   SatTerm displays the confirmation message (see **Figure 19**).

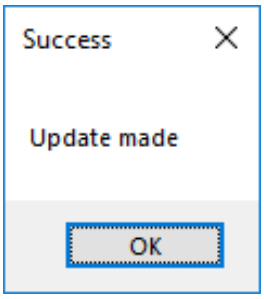

Figure 19: Successful Update Made Window

2. Select **OK** (see **Figure 19**).
3. Select **Save** to save the current *Configuration* window settings to a file (see **Figure 18**).

   NOTE: The SHOUT mcc can also be configured from an existing *.ncf configuration file.

4. To load an existing *.ncf configuration file into the SHOUT mcc:

   a. Select **Options** > **Configure from File** from the SatTerm main window.

      This opens a file browsing window prompting you to select a file.

   b. Locate the configuration file you wish to use, and select Open.

      SatTerm proceeds to configure the SHOUT mcc with the settings contained in the selected configuration file. When this has completed, the *Update Made* dialog window appears (See **Figure 20**).

   c. Select **OK**.

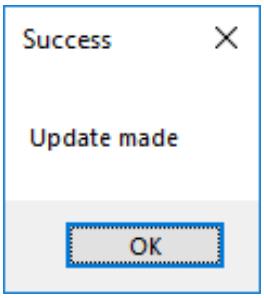

Figure 20: Successful Update Made Window

3 GEOFENCING

The SHOUT mcc can utilize location information from its GPS receiver to determine whether it has entered or exited the bounds of preconfigured geofences. A geofence is a set of connected latitude and longitude coordinates that defines a region or zone. A SHOUT mcc can be configured to send a report when entering or exiting a geofence, and to use a different tracking profile. This provides the ability to change the behavior of the SHOUT mcc based on its location.

Geofences can be configured two (2) ways: 1) using the AT commands and 2) using SatTerm. If latitude and longitude coordinates are known, geofences configuration can be done using the following AT commands: Start Geofence (**^GFS**), Add Geofence Point (**^GFAP**), and Finish Adding Geofence Points (**^GFF**).

Geofence maintenance and modification can be accomplished using the following AT commands: Geofence Check Frequency (**^GFCF**), Modify Geofence (**^GFM**), Delete Geofence (**^GFD**), Erase Geofence (**^GFE**), and Read Geofence Points (**^GFR**).

A Geofence forms-based GUI configuration tool is available using SatTerm. To configure Geofences with SatTerm, select **Options** > **Geofences** on the *Home* screen (see **Figure 21**)**.**

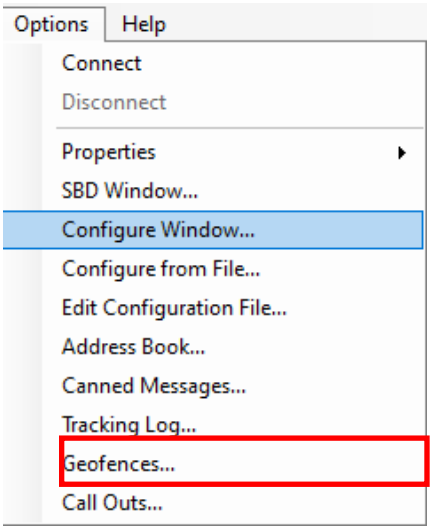

Figure 21: Geofences

The *Geofences* window displays (see **Figure 22**).

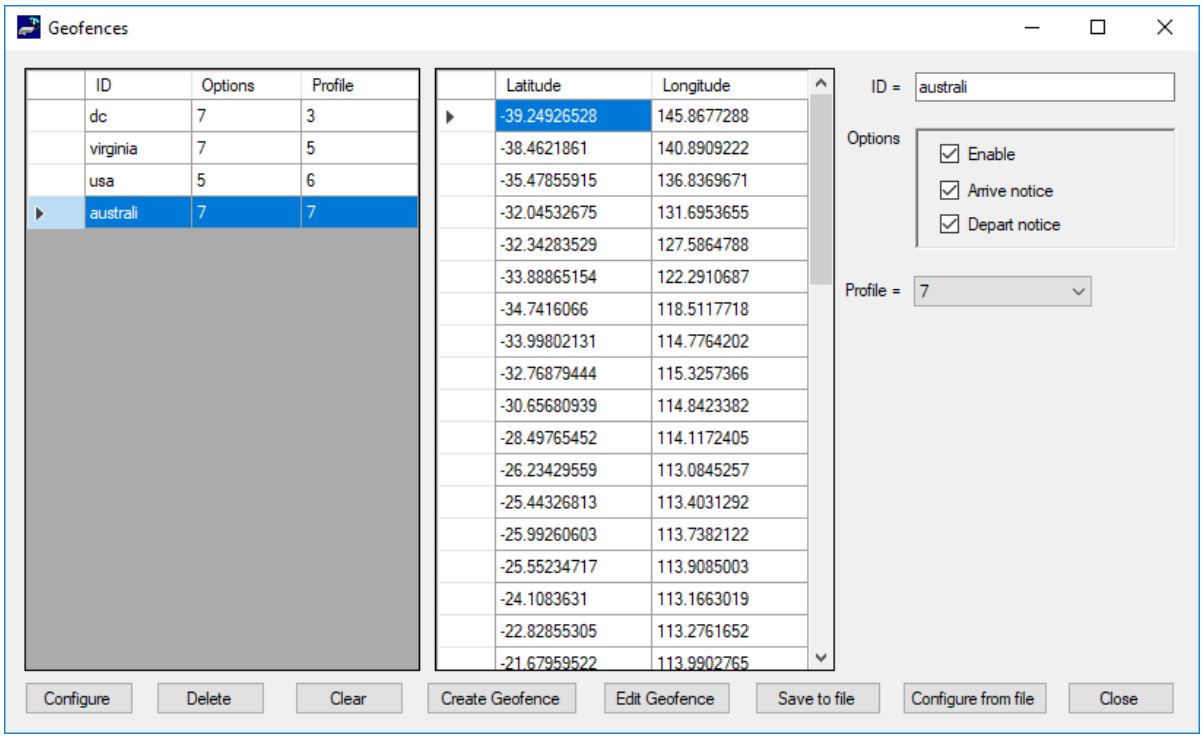

Figure 22: Geofences Window

Note that the visual map-based Geofence options *Create Geofence* and *Edit Geofence* utilize Google Maps, so an internet connection is required for a map to appear.

There are two (2) lists in the *Geofences* window. The one on the left shows a list of geofences, and the one on the right shows a list of coordinates corresponding to the selected geofence. To the far right are settings for the selected geofence. The list of Geofences contains three columns that reflect values set in the settings section on the right.

1. The *ID* column indicates the identifier assigned to the geofence. This identifier is used to reference the geofence when the SHOUT mcc sends arrival and departure notices and when updating geofence parameters via AT commands or remote updates.
2. The *Options* column shows a combined bit field value of the options parameters (000 (0) – 111 (7), with each digit corresponding to *Enable*, *Arrive notice*, and *Depart notice*).
3. The *Profile* column indicates the tracking profile assigned to the geofence.

Descriptions of the geofence settings listed on the right side of the window are as follows.

4. **ID:** Defaults to an incremented integer value. It can be set to any 8-character string to identify the geofence (e.g., "USA", "BASE", and “DANGERZN").

5. **Enable:** Enables this specific geofence.
6. **Arrive notice:** Sends a NAL format GPS version 6 tracking report with short code 18 when entering this specific geofence. See document NAL GPS Report Version 6 Format [2] for details.
7. **Depart notice:** Sends a GPS version 6 tracking report with short code 19 when exiting this specific geofence.
8. **Profile:** Sets a tracking profile to be used while inside this specific geofence.

   At the bottom of the *Geofences* window is a set of buttons. Descriptions of the buttons are as follows:

9. **Configure:** Selecting the *Configure* button saves the list of Geofences on the SHOUT mcc.
10. **Delete:** Deletes the selected geofence.
11. **Clear:** Deletes all configured Geofences.

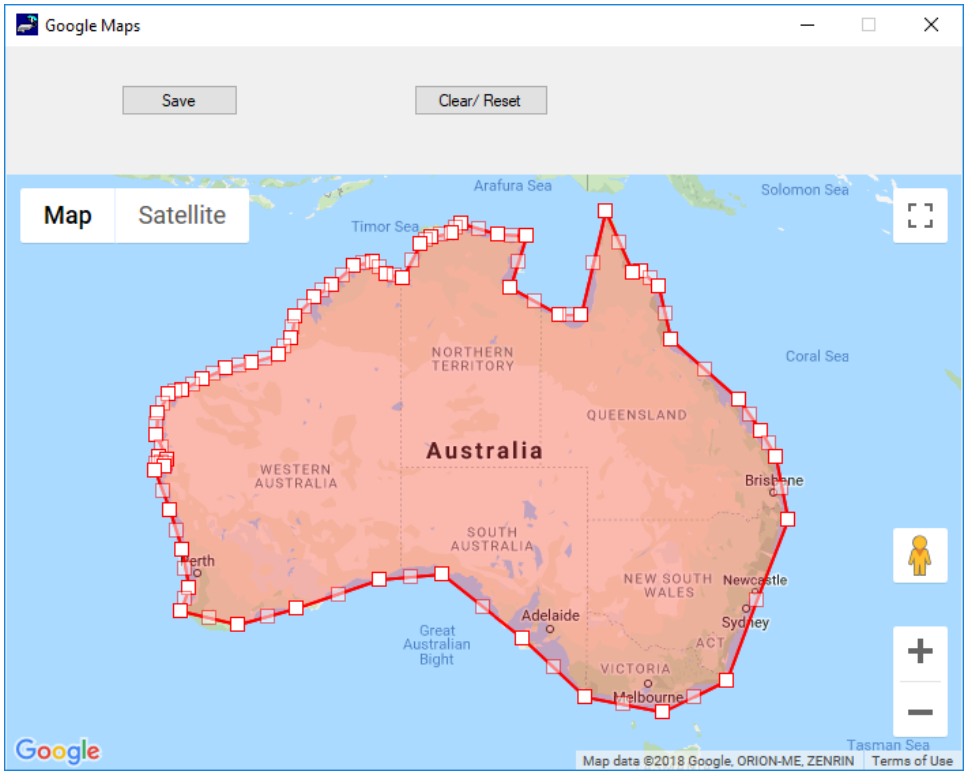

Figure 23: Create/Edit Geofence Window

12. **Create Geofence:** Opens a window to create a geofence by adding points on a map. The window is shown in **Figure 23**.

- Clicking anywhere on the map adds a point to the geofence. Each point is connected to its previous point.
- Clicking an existing point deletes it from the geofence.
- Dragging an existing point moves that point to where it is dragged.
- A geofence is complete when the start point is clicked.
- The *Save Points* button transfers the marked points to the coordinates list and closes the map.
- The *Clear/Reset* button clears all points on the map.
- The minimum number of points in a geofence is 3 and the maximum number of points is 50.

Note: The *Create Geofence* option utilizes Google Maps. An internet connection is required for the map to appear.

13. **Edit Geofence:** Opens a window to edit the coordinates of the selected geofence. The window is the same as *Create Geofence* with the same functionality, but it opens prepopulated with coordinates, as in **Figure 23.**
14. **Save to file:** Saves the list of geofences to a comma-separated values (CSV) file.
15. **Load from file:** Loads geofences from a CSV file.
16. **Close**: Closes the Geo Fencing Information window.

4 CALL OUTS

In addition to normal tracking reports sent at a predefined interval, the SHOUT mcc can also send daily tracking reports at specific UTC times. These daily reports are called Call Outs. Call Outs can be configured two ways: using AT commands and using SatTerm.

Call Outs configuration can be done using the following AT command: Add Call Out (**^COA**). Call Outs' maintenance and modification can be accomplished using the following AT commands: Delete Call Out (**^COD**), Erase Call Out (**^COE**), and Read Call Out (**^COR**).

1. Select **Options** > **Call Outs** to (see **Figure 24**).

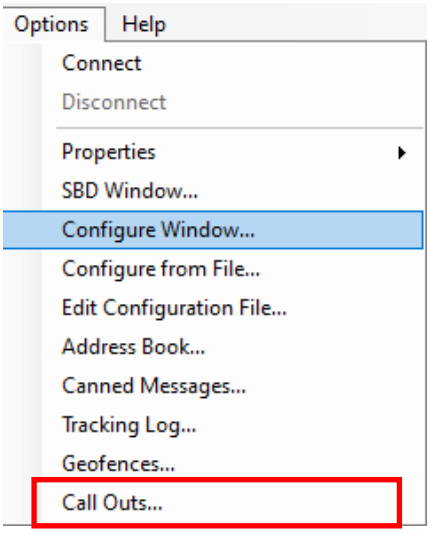

Figure 24: Call Out

The *Call Outs* window shown in **Figure 25** appears. As long as there is at least one enabled entry in the list, the Call Outs feature is enabled.

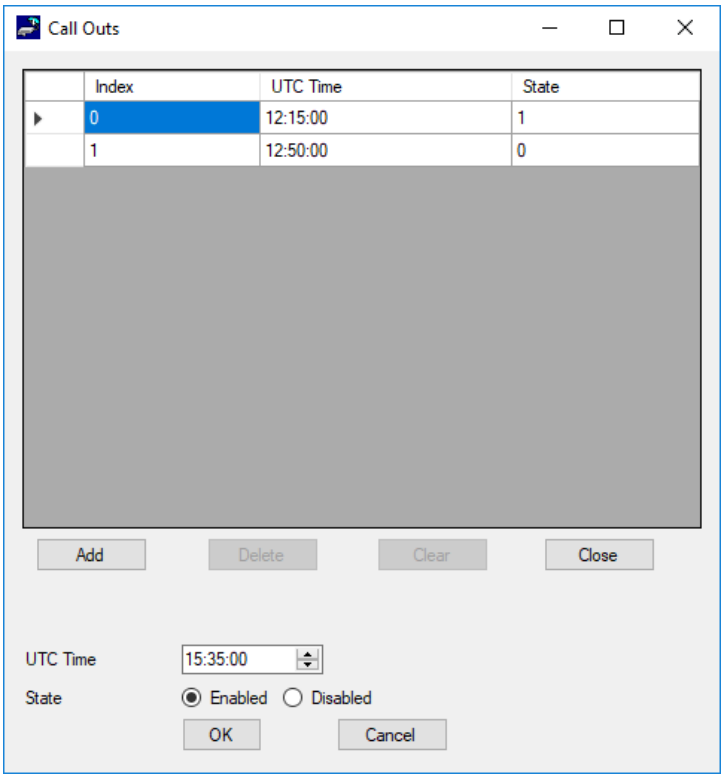

Figure 25: Call Outs Window

The main portion of the *Call Outs* window has a list of existing Call Outs. The list displays three (3) columns: *Index* is the position of the Call Out in the list, *UTC Time* is the time a Call Out is to be made (in HH:MM:SS format), and *State* indicates whether the Call Out is enabled (1) or disabled (0). Below the Call Out list is a set of buttons. Descriptions of the buttons are as follows:

- Add: Adds a Call Out to the list
- Delete: Deletes the selected Call Out
- Clear: Deletes all configured Call Outs
- Close: Closes the Callout Form window.

5 ADDRESS BOOK

SatTerm can be used to edit the SHOUT mcc's address book using the *Address Book* window. To access the *Address Book* window, select **Options > View Address Book…** from the SatTerm main window. SatTerm must have an open connection with a SHOUT mcc for the *Address Book* window to be available.

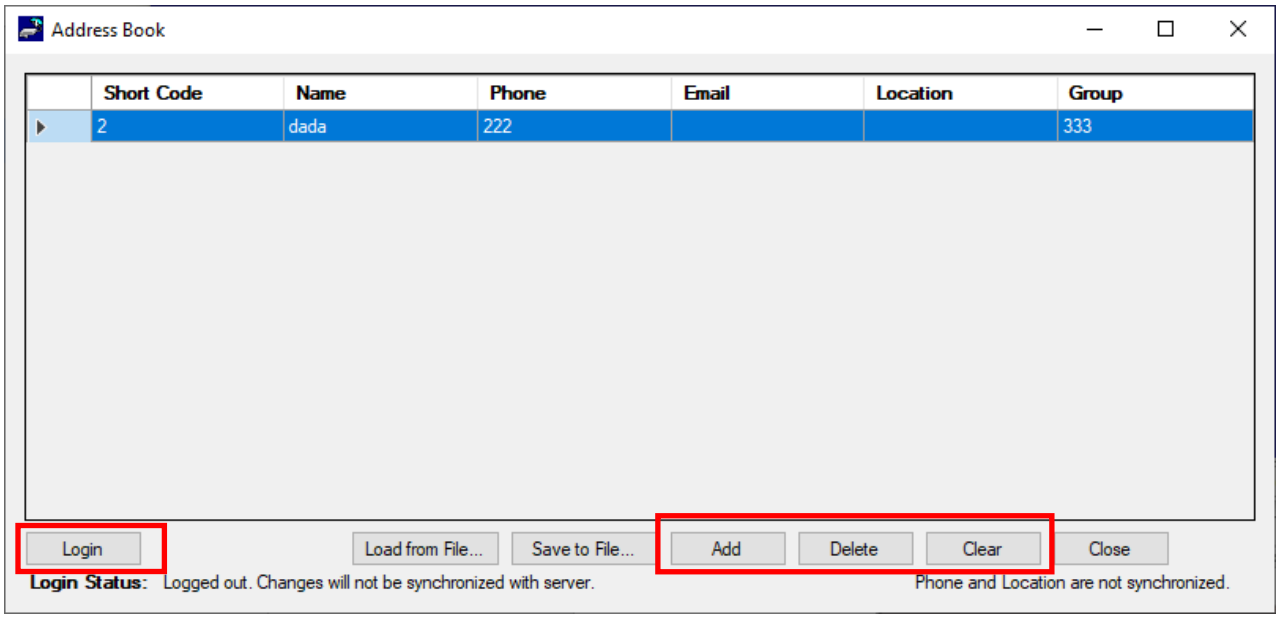

Figure 26: Address Book

To edit the address book you must log in as an administrator. To do this, press the **Login** button at the bottom left of the Address Book window (see **Figure 26**). Enter your login information and click **OK** (see **Figure 27**). Once you are logged in successfully, your Login Status on the Address Book window will display as "Logged In Successfully as Administrator" and additional buttons become available to edit the address book.

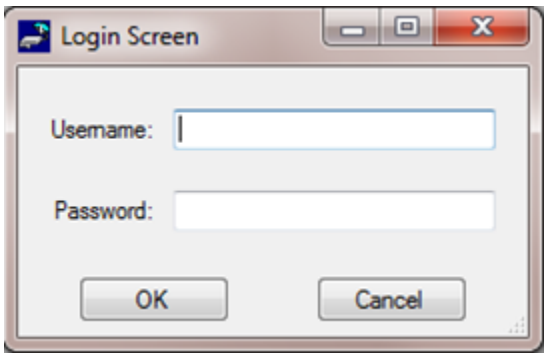

Figure 27: Login Screen

NOTE: If you have a firewall installed on your PC you may need to configure it to allow SatTerm to access the Internet.

NOTE: The login requirement is disabled by default and can be enabled by unselecting **Options > Properties > Disable Login** from the menu bar. Disabling the login allows SatTerm to change the address book and canned messages without synchronizing with the NOC server.

NOTE: SatTerm is setup specifically to communicate with NAL Research's network operation center (NOC) server using a web service. Application developers can configure SatTerm to use a different web service through the **Options > Properties > Set Web Service** menu option. When using the default web service, a login can be created at **http://nws.nalresearch.com/.**

To add a new contact to the address book, click the **Add** button (see **Figure 26**). This will pop up the *Add to Address Form* window. Here you can enter the contact's name, phone number, email, and location in the fields provided (name is required). Clicking **OK** adds the contact to the SHOUT mcc as well as the server.

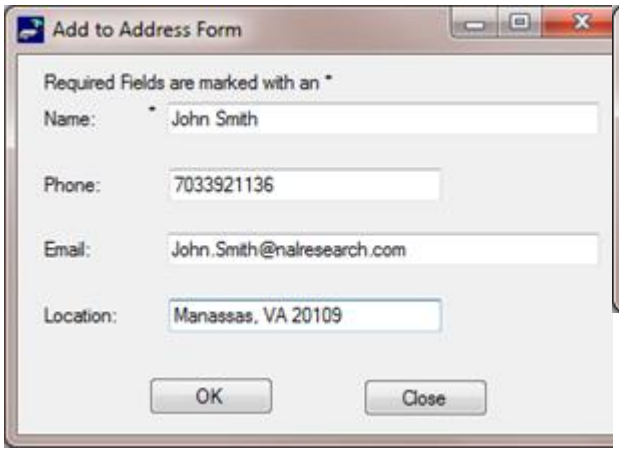

Figure 28: Add to Address Form

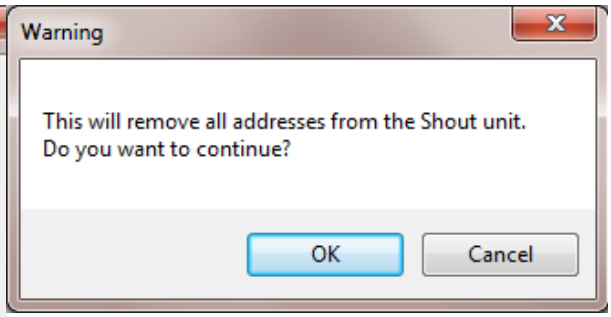

Figure 29: Warning

To edit an existing contact, double click the contact in the address book. This will pop up the *Edit Address Form* window. Click **Update** to update the contact's information on the SHOUT mcc and the server.

To delete a contact from the address book, single-click to select the contact you wish to delete then click the **Delete** button (see **Figure 26**). Clicking the Delete button erases the selected contact from the SHOUT mcc and the server.

To erase the entire address book, click the **Clear** button (see **Figure 26**). A warning message will pop up asking to confirm the removal of all addresses from both the SHOUT mcc and the server. Click **OK** to confirm or Cancel to reject (see **Figure 29**).

6 CANNED MESSAGES

The SHOUT mcc can be pre-programmed with user defined canned messages using SatTerm. Canned messages are useful to save time while composing messages on the SHOUT mcc, and also to reduce cost, as canned messages effectively shorten the transmitted message size in terms of the total number of bytes.

To access the *Canned Messages* window, select **Options > View Canned Messages…** from the SatTerm main window. SatTerm must have an open connection with a SHOUT mcc for the *Canned Messages* window to be available.

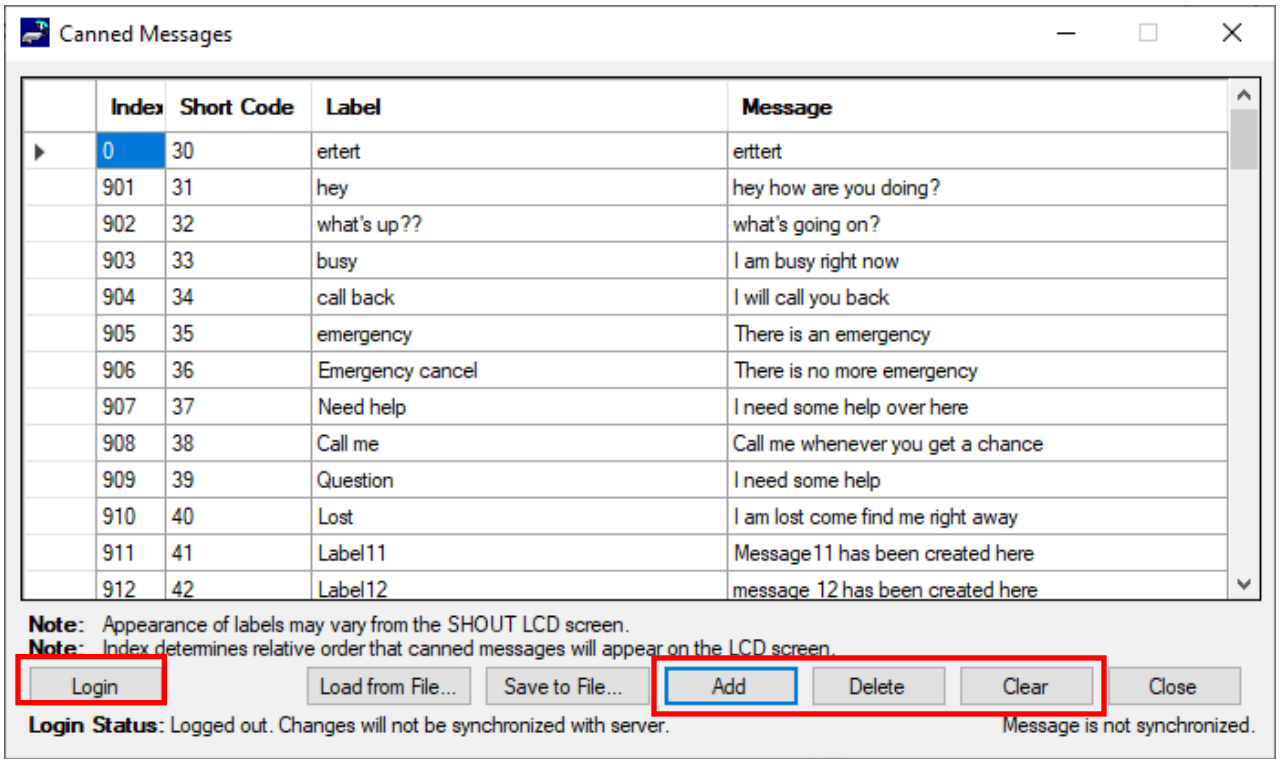

Figure 30: Canned Messages

To edit the canned messages you must log in as an administrator. To do this, click the ***Login*** button at the bottom left of the *Canned Messages* window (see **Figure 30**). Enter your login information and click ***OK*** (see **Figure 31**). Once you are logged in successfully, your *Login Status* on the *Canned Messages* window will display as "Logged In Successfully as Administrator" and additional buttons become available to edit the canned messages.

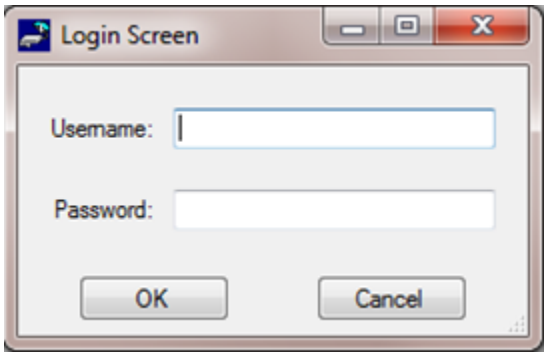

Figure 31: Login Screen

NOTE: If you have a firewall installed on your PC you may need to configure it to allow SatTerm to access the Internet.

To add a new canned message, click the **Add** button (see **Figure 30**). This will pop up the *Add Canned Message* window (see **Figure 32**). This form prompts you to enter a label for the canned message and optional message text. This label is displayed on the SHOUT mcc LCD screen while scrolling through the canned messages stored on the device. Clicking **Update** adds the canned message to the SHOUT mcc as well as the server.

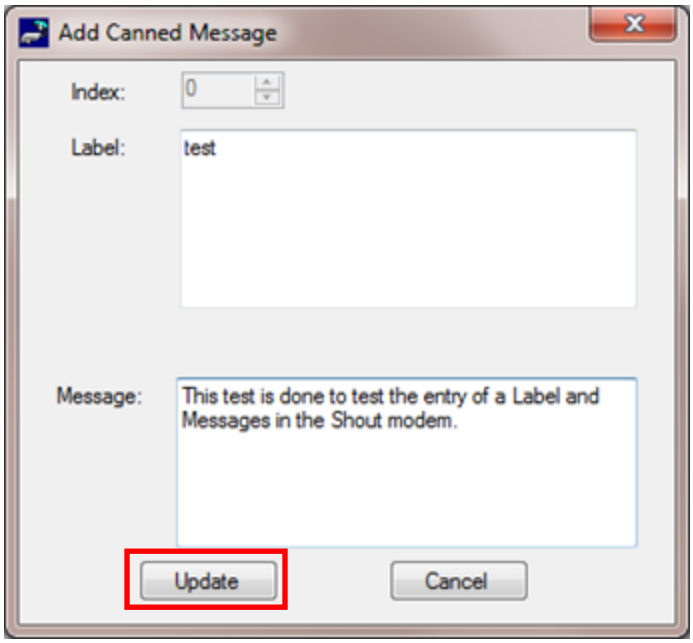

Figure 32: Add Canned Message Screen

To edit an existing canned message, double click its row in the Canned Message window (see **Figure 30**). This will pop up the Edit Canned Messages window. Click **Update** to update the canned message information on the SHOUT device and the server.

To delete a canned message, single-click to select the canned message you wish to delete then click the **Delete** button (see **Figure 30**). Clicking the Delete button erases the selected canned message from the SHOUT mcc and the server.

To erase all canned messages, click the **Clear** button (see **Figure 30**). A warning message will pop up asking you to confirm the removal of all canned messages from both the SHOUT mcc and the server. Click **OK** to confirm or **Cancel** to reject (see **Figure 33**).

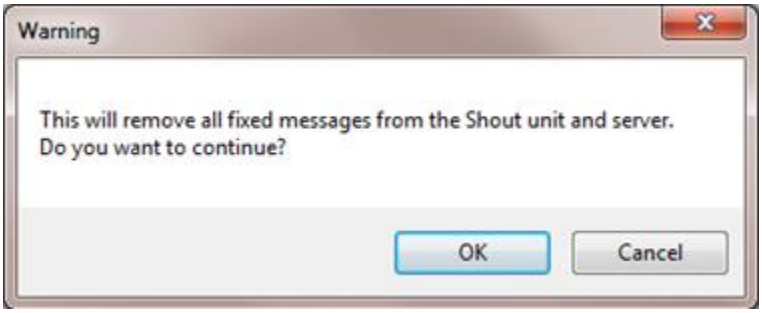

Figure 33: Warning Screen

7 TRACKING LOG

The Tracking Log is a collection of reports that may or may not have been transmitted from the SHOUT mcc. This log can be viewed, saved, and cleared using the *Tracking Log* window in SatTerm. To access the *Tracking Log* window, select **Options > Tracking Log…** from the SatTerm main window. SatTerm must have an open connection with a SHOUT mcc for the *Tracking Log* window to be available. When the Tracking Log Count screen displays (see **Figure 34**), click **OK**.

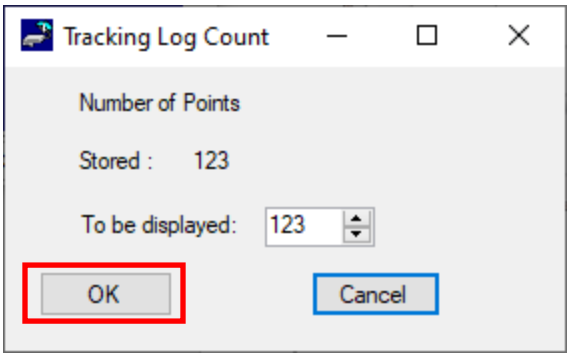

Figure 34: Tracking Log Count

When the *Tracking Log* window is opened (see **Figure 35**),it first queries the attached SHOUT mcc and displays the number of points in the unit's tracking log and allows you to choose how many points to display. Click **OK** to display the selected points. The Tracking Log screen displays (see **Figure 35**).

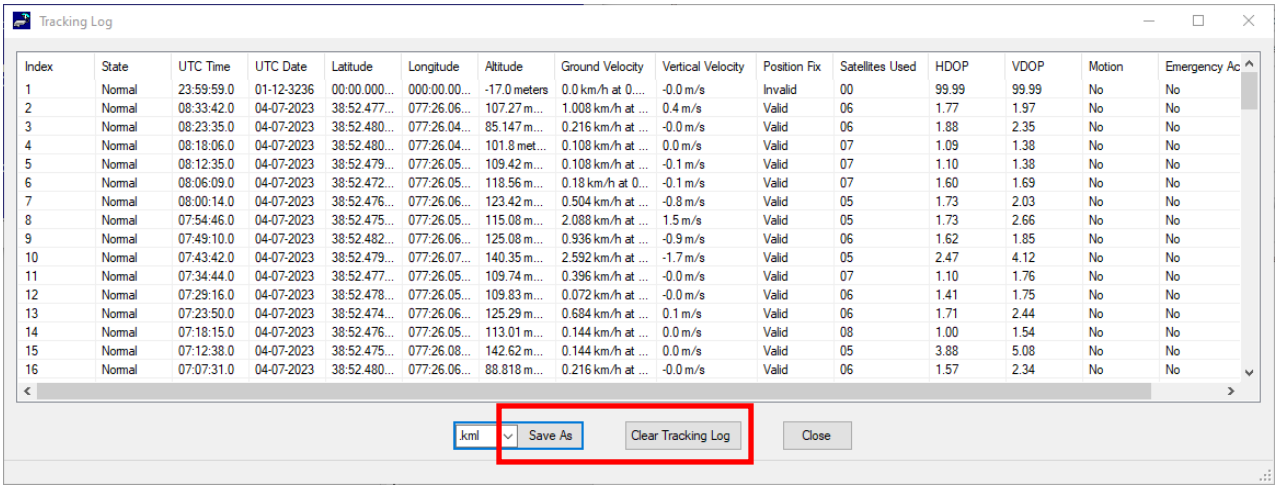

Figure 35: Tracking Log Screen

To save the points displayed in the *Tracking Log* window in a Microsoft Excel (CSV) or Google Earth (KML) compatible format, click the **Save As** button (see **Figure 35**) after selecting a file format from the drop down list. You will be prompted to enter a name for the file.

To clear the entire tracking log from the SHOUT mcc, click the **Clear Tracking Log** button (see **Figure 35**). You will be prompted to confirm deletion of all logged points on the device. Click **Yes** to confirm or **No** to cancel (see **Figure 36**).

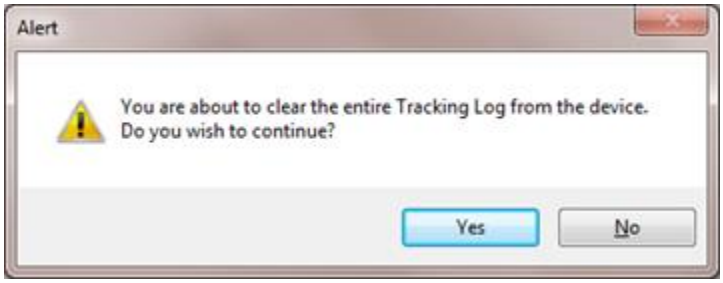

Figure 36: Alert Confirmation Screen

8 WAYPOINTS

The SHOUT mcc allows the user to create waypoints through the menu. SatTerm can be used to view these points and to save them as a spreadsheet or KML file. To access the *Way Points Form* window, select **Options > Way Point…** from the SatTerm main window. The Way Point Form screen displays (see **Figure 37**). SatTerm must have an open connection with a SHOUT mcc for the *Way Points Form* window to be available.

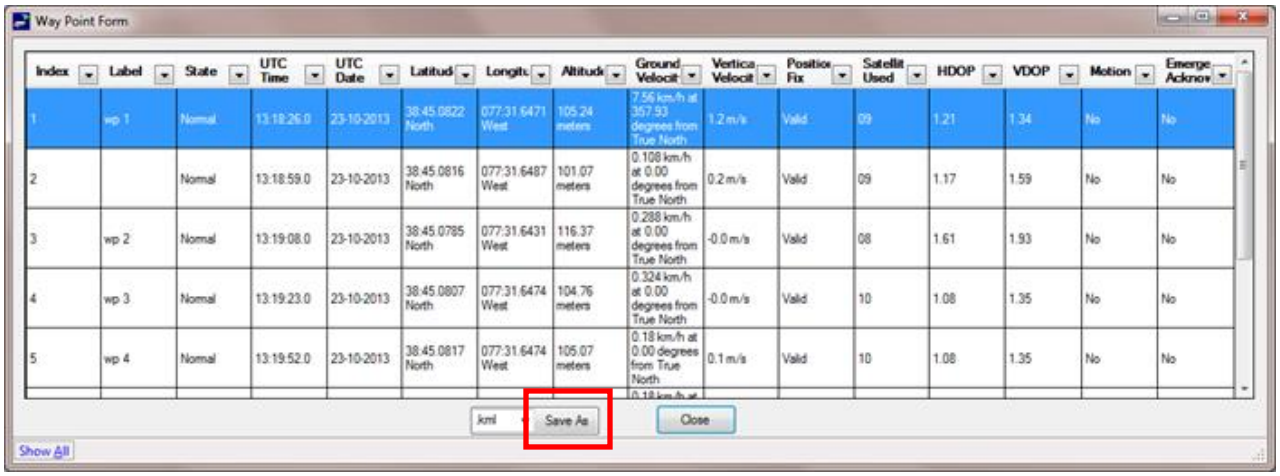

Figure 37: Way Point Form Screen

All waypoints saved in the connected SHOUT mcc will be read from the device and displayed in the *Way Point Form* window as shown in the figure above. To save the waypoints displayed in a Microsoft Excel (CSV) or Google Earth (KML) compatible format, click the **Save As** button after selecting a file format from the drop down list. You will be prompted to enter a name for the file.

9 USER INFORMATION

The User Information ties the device to the user's Personal Identifiable Information (PII) to include: Name, Address, City, State, Zip, Country, And Phone Number.

1. Select **Options>User Information** from the main menu.

   The user Information screen displays (see **Figure 38**).

2. Enter all the appropriate information, and press **OK**.

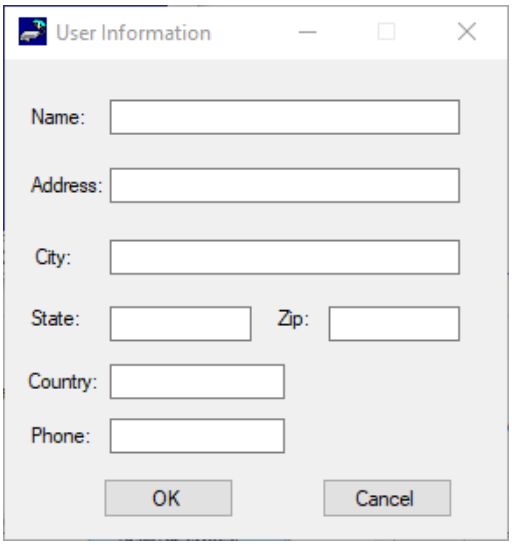

Figure 38: User Information Screen

10 AT COMMAND HELP

SatTerm uses a set of commands called “AT commands” to communicate with the SHOUT mcc. These commands allow access to the full range of settings and functionality of the SHOUT mcc. A list of these commands and descriptions of their functions are available from the *Cmd Help* menu. To access the *Cmd Help* menu, select *Cmd Help* from the SatTerm main window.

Selecting an AT command from the *Cmd Help* menu will pop up a window containing a description of the command (see **Figure 39**). This window also provides fields to enter the input parameters for the selected AT command. Press the **Send** button (see **Figure 39)** to send the command to the SHOUT mcc. You will see the response from the command in the main SatTerm window.

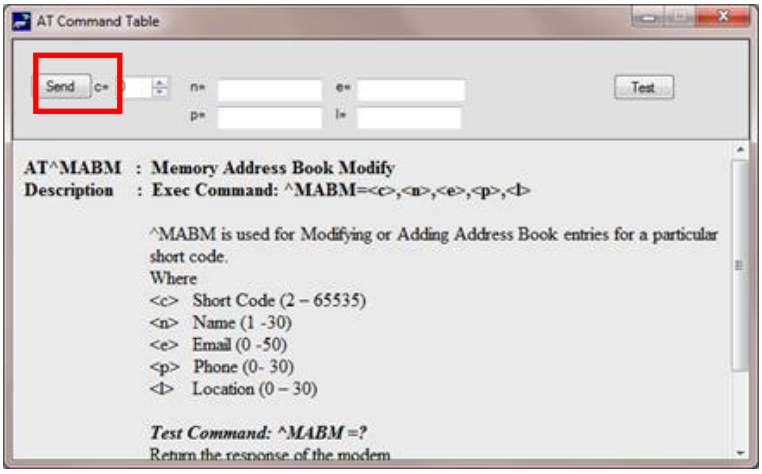

Figure 39: AT Command Table Screen

SatTerm also provides a search function for AT commands. To access the search tool, select **Cmd Help > Search…** from the SatTerm main window. Select a command from the list and select **Open** (see **Figure 40**) to view the AT command’s description.

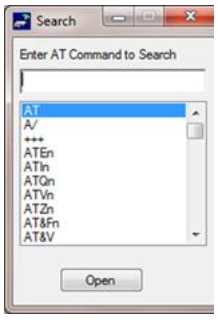

Figure 40: Search Screen