

SatTerm SOFTWARE MANUAL

Version 8.7.0

May 10th, 2013



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1.0 INTRODUCTION

SatTerm is a satellite terminal emulator software package developed by NAL Research Corporation to communicate with the Iridium modem and tracker products. SatTerm 8.7.0 has removed functionality for obsolete NAL Research products. Use SatTerm 8.6.3 for 9601 series, A3LA-D series, and A3LA-X series products. See the table below for a list of supported products.

Modems	Trackers	Handhelds
9602-I/N	9602-LP/A	SHOUT nano
9603-I	9602-AB	SHOUT ts
A3LA-R/RS/RM/RG	9602-GSM	SHOUT gsm

NAL Research recommends the use of SatTerm software with all NAL Research's Iridium modems and trackers since it provides a complete reference manual of AT, extended AT and AT GPS commands specific to the Iridium satellite network. However, any terminal emulator users are accustomed to, such as Microsoft® HyperTerminal or Symantec® Procomm, can be used. Users must carefully read and accept the terms and conditions of the NAL Research's Limited License Agreement document listed in Appendix A before installing SatTerm software.

2.0 INSTALLING SatTerm

2.1 System Requirements

Before installing SatTerm software, make sure the Network Operating Centre server computer meets the following requirements:

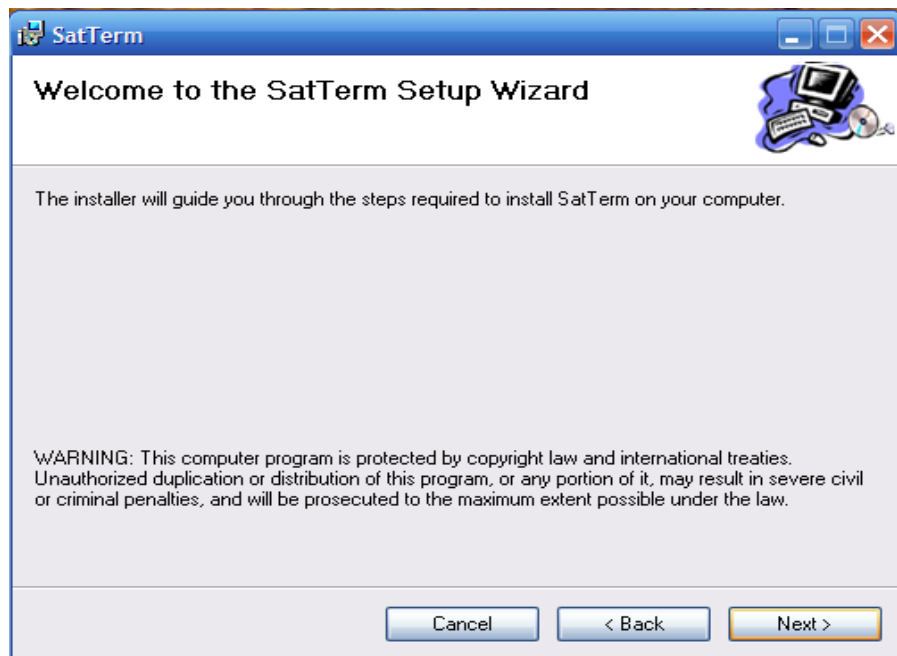
- Windows© operating system
- Compatible with Microsoft .NET 3.5
- Minimum of 50MB available on hard drive
- 800 x 600 screen resolution (looks best with a screen resolution of at least 1024 x 768)
- Any of NAL Research's modems and trackers

2.2 Installing

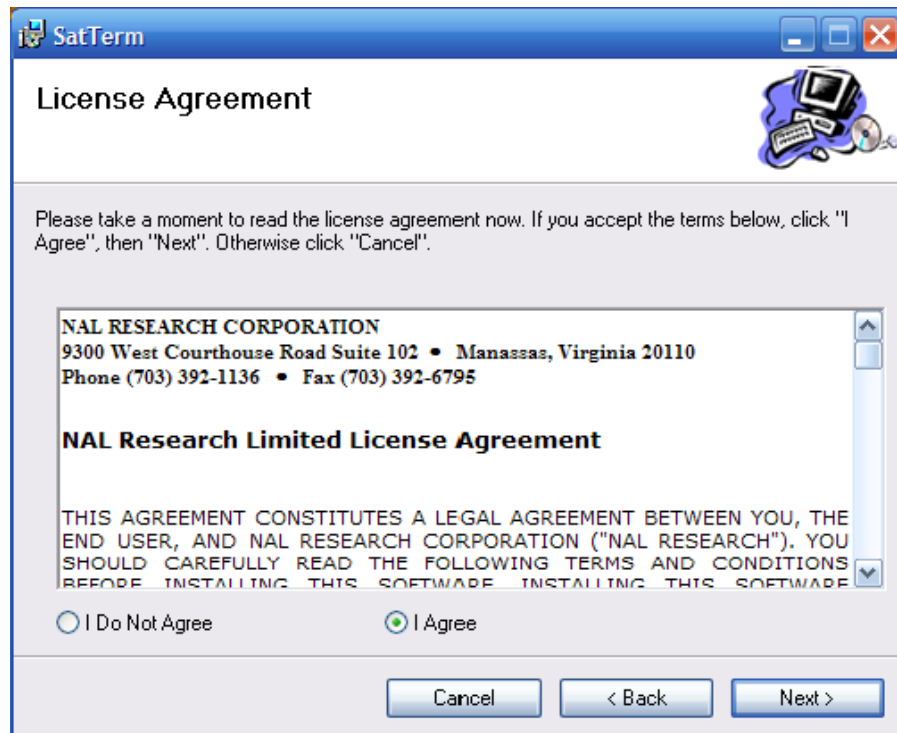
1. Close all application programs.
2. Insert CD provided with the modem/tracker package. SatTerm software can also be downloaded from NAL Research's website (www.nalresearch.com).
3. Double click on the setup SatTerm program.
4. Follow the instructions displayed on the screen to advance through the installation process. You can cancel at any time without affecting your system by clicking "Cancel". Click "Next" to continue.



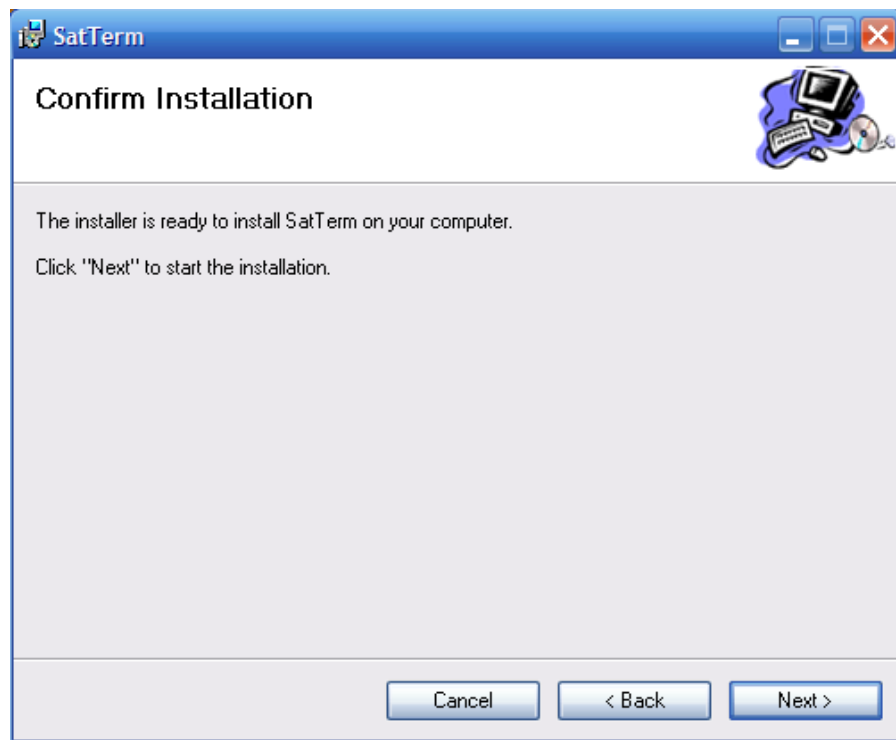
5. Once the Welcome screen appears, click "Next" to continue.



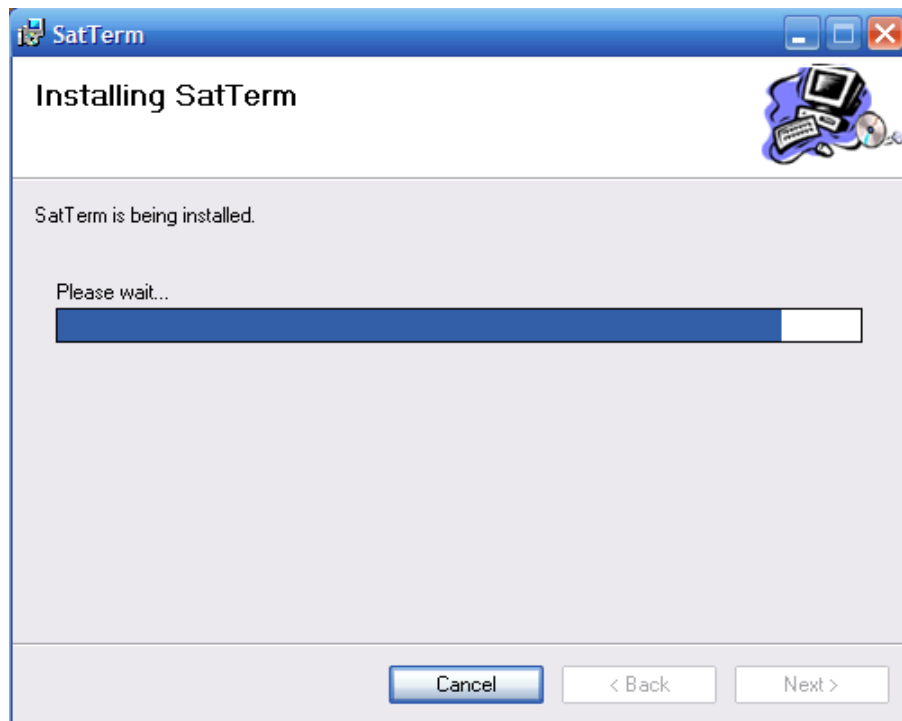
6. Please read the License Agreement and, if you accept the terms in the License Agreement, then click "Next" to continue.



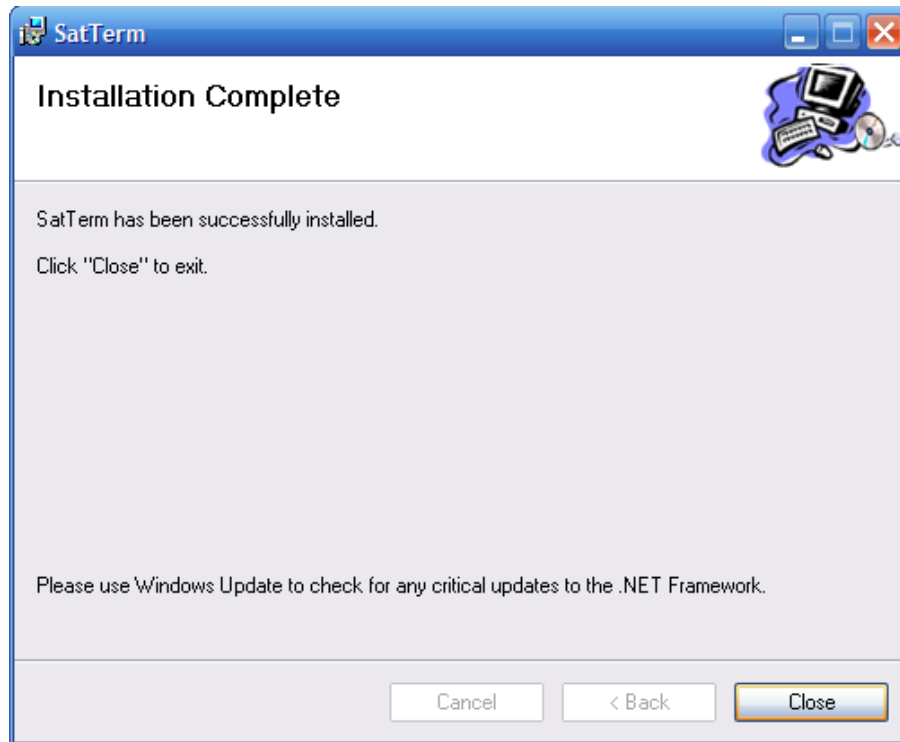
7. The Confirm Installation screen will appear next. Click Next to continue.



8. The following screen will appear.



9. When the "Installation Complete" screen appears, click "Finish". SatTerm software is now successfully installed.



2.3 Uninstalling

1. Click on the "Start" menu.
2. Choose "Control Panel".
3. From the "Control Panel" screen, click "Add or Remove Programs".
4. From the "Add or Remove Programs" screen, find the "SatTerm" on the list and click on the button "Change/Remove".
5. All files and libraries associated with the SatTerm software will be removed from your computer.

3.0 SETTING UP SatTerm

SatTerm can be accessed from the Windows® “Start” button under “All Programs/NAL Research” folder or by clicking on the NAL Research Logo on the Desktop. The modem/tracker may be either powered ON or OFF before starting SatTerm software. By default, SatTerm 8.7.0 will load settings associated with the SHOUT nano handheld tracker.

3.1 Setting SatTerm Software Properties

After SatTerm is loaded, its properties can be changed to reflect the hardware setup and user’s preferences. However, “Data bits”, “Parity” and “Stop bits” should be kept at their default settings unless the program is being used with an Iridium custom-designed modem. There are four types of properties that can be set—modem type, port properties, dialing properties and preference properties. In order to set the port properties and the dialing properties, the program must be disconnected from the COM port by clicking the disconnect  icon.

Modem Type

The SatTerm software is designed to support a number of different NAL Research’s modems and trackers. When you select a specific modem type, the corresponding AT commands, help menu, and properties available for that particular modem/tracker are appropriately adjusted. Figure 3.1 is an example. Some modem types also allow the selection of a specific version of the firmware for the GUI configuration.

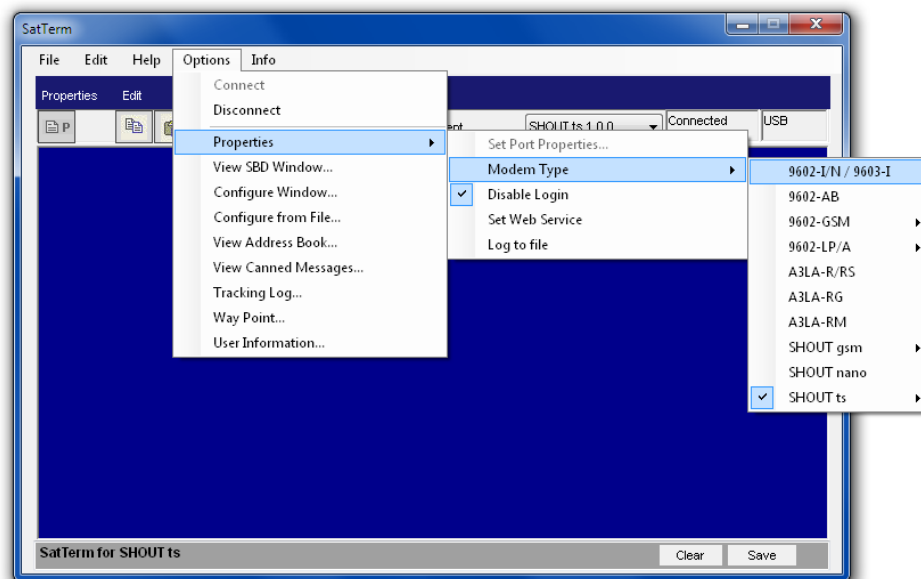


Figure 3.1 Steps to select the type of modem/tracker

Port Properties



To set the port properties, open the "Port Properties" window by choosing "Set Port Properties..." from the "Options/Properties" menu or clicking the "P" icon. The following table describes the port properties.

PROPERTY	DEFAULT	DESCRIPTION
COM Port	COM1	The COM/USB the modem/tracker is connected to
Bits per Second	19200	The baud rate setting of the COM port
Data Bits	8	The data bits setting of the COM port—DO NOT CHANGE THIS VALUE
Parity	None	The parity setting of the COM port—DO NOT CHANGE THIS VALUE
Stop Bits	1	The stop bits setting of the COM port—DO NOT CHANGE THIS VALUE
Flow Control	None	The flow control setting of the COM port—This should always be None for the 960x series trackers

NOTE: SatTerm 8.7.0 does not support the USB interface of the A3LA-XM and A3LA-XG modems. If the USB interface is required, use SatTerm 7.0 instead.

Dialing Properties



To set the dialing properties, open "Dialing Properties" by choosing "Set Dialing Properties..." from the "Options/Properties" menu or clicking the "D" icon. This option is only available for the A3LA series.

PROPERTY	DEFAULT	DESCRIPTION
SIM card type	Civilian	Type of SIM inside the A3LA—either "Civilian" or DoD. SatTerm uses this information to provide the correct help settings. This does not affect the Service Center used when sending SMS messages.
Phone number	(000) 000-0000	SatTerm uses this information to setup the ATD command
Country/region	1	This field appears only when the SIM card type is "Civilian." SatTerm uses this information to setup the ATD command.
Landline or Satellite	Landline	This field appears only when the SIM card type is "Civilian." SatTerm uses this information to setup the ATD command.
Call type	N/A	This field appears only when the SIM card type is DoD. SatTerm uses this information to setup the ATD command.

Preference Properties

To set the preference properties, click the appropriate item from the "Options/Properties" menu or click the appropriate icon on the main menu. The following table describes the preference properties.

PROPERTY	DEFAULT	DESCRIPTION
ECHO	Selected	If selected, characters typed locally will appear on the screen. SatTerm version with encryption will not echo when used with 9601-DGS.
ANS	Selected	If selected, incoming calls will be answered immediately.
Check SMS Automatically	Not Selected	If selected, the unit will automatically display SMS windows and alerts for SMS messages.
SMS	Selected	If selected, SMS messages are displayed unless the storage is full.
Use 3.1 Open/Save	Not Selected	Use Windows 3.1 Open/Save dialog style instead of the Windows XP open save dialog style.

Session File

The properties of SatTerm software can be saved as a session file for later retrieval by choosing "Save Session" from the "File" menu. All session files have an ssf extension, which stands for SatTerm session file. The information stored in an ssf file includes the modem type, all of the port properties, dialing properties, and preference properties. The default session file is stored as "Default.ssf" in the "Session" sub-folder of the installation directory. Users can either click on any ssf file to start SatTerm with the properties set to the values in that particular session file or can "Open" a ssf file from the "File" menu. Users can also overwrite the session file to load different values at startup.

3.2 Finding Help for AT Commands

The followings are three ways to get help with AT commands:

1. Choose the command from the "Help" menu
2. Or choose "Search..." from the "Help" menu or press the F1 key
3. Or click on one of the AT command buttons at the bottom of the screen. These buttons are for easier access to the most commonly used AT commands.

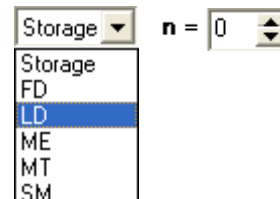
Once an AT command has been chosen using one of the three methods listed above, a window titled "AT Command Table" will pop up. Unless flashed with the most recent firmware, some AT commands may not work with the A3LA-I/IG/D/DG.

AT Command Table

The AT Command Table is a window that provides detailed usage information of a particular command. This window pops up whenever an AT command is chosen. If a command is applicable to multiple modems/trackers, then all options will be listed.

The "Send" button  is used to send the selected command to the modem/tracker without entering it directly.

If an AT command requires additional parameters, the AT Command Table will provide the appropriate GUI to set the values for the parameters. Examples for the GUIs are:



The “Read” button  and the “Test” button  will be provided whenever applicable. The “Read” button is the same as typing a command followed by a “?” and will return the current setting of the command. The “Test” button is the same as typing a command followed by a “=?” and will return all supported values for that command.

4.0 USING SatTerm WITH SBD

4.1 Using SBD Message Window

SBD Message Window is a graphical user interface for composing, sending, and receiving short-burst data (SBD) messages. The window can be started up by selecting Option | View SBD Window (Figure 4.1). From the SBD Message Window's Hex Editor, messages can be drafted or loaded, then sent and/or saved to the mobile originated buffer of an Iridium modem. Queued messages can be retrieved from the Iridium gateway with the click of one button. The SBD Window, found under the options menu of SatTerm, offers all of the essential SBD AT commands and options in one convenient and easy to use interface.

The main window of the interface shown below includes buttons to create a new message, retrieve a queued message at the Iridium gateway, read the mobile terminated buffer of an Iridium modem, initiate an SBD session with the Iridium gateway, and load an existing message. The radio buttons on the main window control whether a message is written to the mobile originated buffer using Write Binary(+SBDWB) or Write Text(+SBDWT), whether a message is read from the mobile terminated buffer using Read Binary(+SBD RB) or Read Text(+SBDRT), and whether a session is initiated using Standard SBD(+SBDI), SBD Extended(+SBDIX), or SBD with GPS(+PSIX).

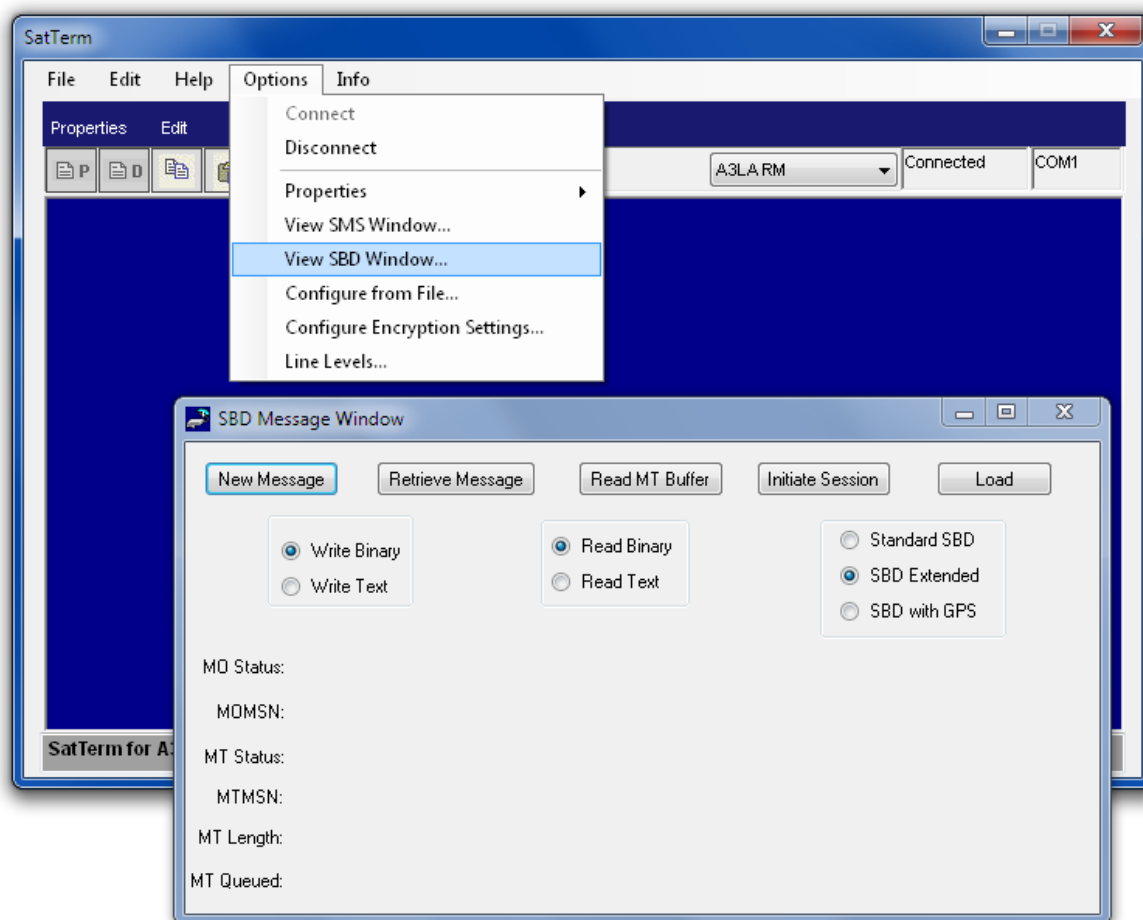


Figure 4.1 SBD Message Window

Below the buttons and the options controlling their functionality is a series of labels. These labels are the names of the parameters included in the response from an SBD session with the gateway. After a session is ended, a numeric response along with its textual description, where applicable, will appear to the right of each label.

The New Message button will launch the Hex Editor to allow drafting of new messages (Figure 4.2). The Retrieve Message button combines the functionality of the Initiate Session and Read MT Buffer buttons to provide a fast and convenient way of retrieving queued messages from the Iridium Gateway. The Read MT Buffer button simply reads the contents of the mobile terminated buffer into the Hex Editor. The AT command utilized for the read process is determined by the user-selected option. The Initiate Session button initiates a session with the Iridium Gateway. The type of session is determined by the currently selected option. An explanation of all commands and options can be found in either the AT command reference or the help menu of SatTerm. The Load button launches a dialog to open a file. The chosen file will be loaded into the Hex Editor.

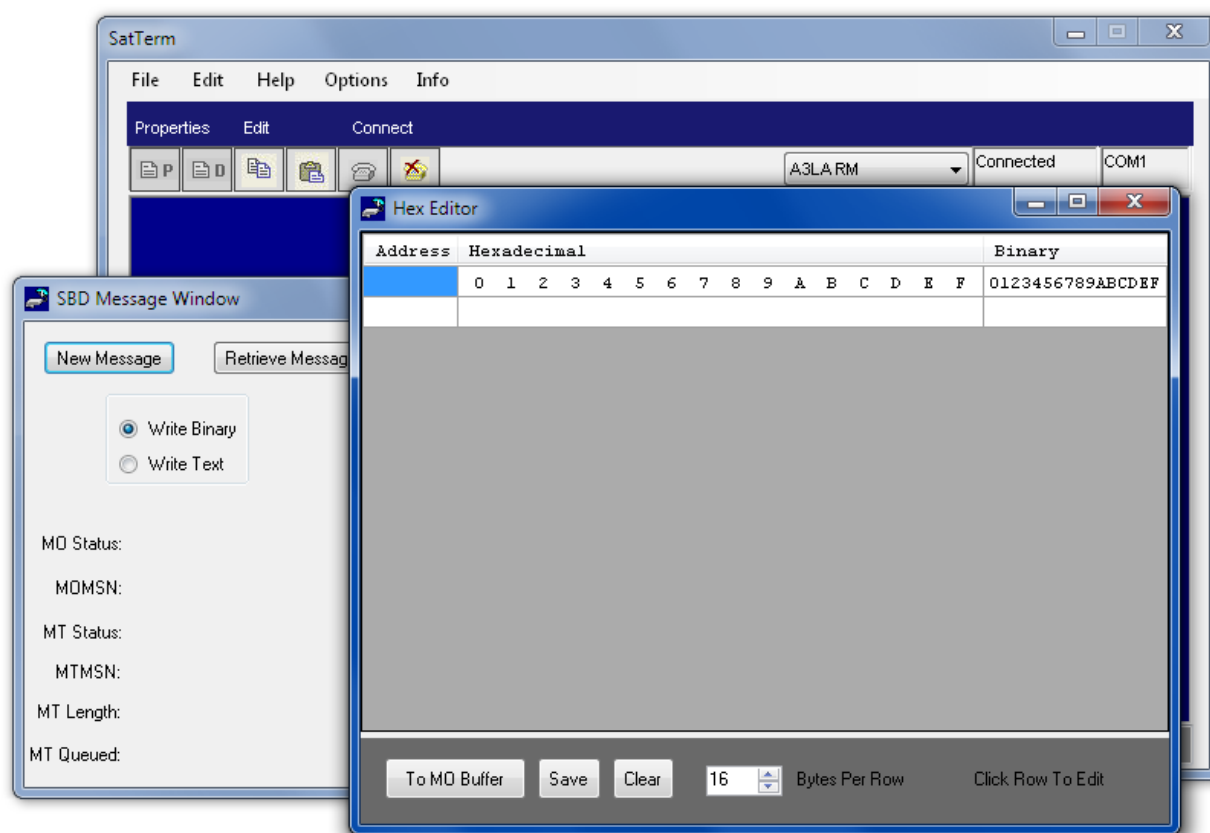


Figure 4.2 Hex Editor Window

The Hex Editor shown above is the window where messages can be drafted, loaded, edited, sent to the mobile originated buffer, and saved. The panel on the left-hand-side of the window will display ASCII data while the panel on the right will display hexadecimal values. The leftmost numbers in the window are row numbers in decimal form, to the immediate right are their equivalents in hexadecimal. The numbers lining the top of the editing windows are column numbers. Row numbers range from 0 to 1973; however, the largest message that can be sent is 1960 bytes. The column numbers range from 0 to 32. The number of visible columns may be adjusted by changing the value in the numeric panel labeled Bytes Per Row.

The Insert button of the Hex Editor is the only method available to enter data into the ASCII and hexadecimal panels. When pressed, the Insert button launches the Insert window (Figure 4.3). In this window either ASCII or hexadecimal values may be entered. Entering values in one format will result in the data being converted to and displayed in the alternate format.

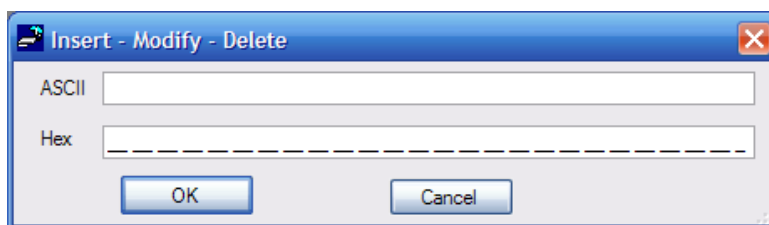


Figure 4.3 Insert – Modify – Delete Window.

Pressing the OK button of the Insert window will result in the content of the text boxes being transferred to the hex editor's ASCII and hexadecimal panels. If the Cancel button is pressed the data in the text boxes of the Insert window will be ignored. Although data may not be entered directly into either of the hex editor's panels, data may be removed directly from those panels. To remove characters use the backspace key (the delete key is nonfunctional).

The To MO Buffer button of the Hex Window sends the contents of the Hex Editor to the mobile originated buffer of the currently connected Iridium modem. Once the message has been sent to the buffer, the Initiate Session button will send its contents to the Iridium Gateway. The Save and Clear buttons provide the functionality expected. Those who have sent and received SBD messages at the command line of SatTerm will appreciate the convenience offered by this SBD graphical interface.

4.2 Sending SBD Messages Using E-Mail

Messages can be sent to an Iridium modem from almost any e-mail program (Outlook, Outlook Express, etc). The e-mail program must use the standard Multipurpose Internet Mail Extensions (MIME) Base64 encoding as defined in RFC 2045. The following instructions describe how to set this up for Outlook Express:

1. Select "Tools/Options"
2. Click the "Send" Tab
3. Under "Mail Sending Format", click "HTML Settings..."
4. Click MIME
5. Select "Base 64" for Encode text using
6. Click OK

7. Under "Mail Sending Format", click "Plain Text Settings..."

A message sent to an Iridium modem must be sent to the e-mail address Data@SBD.Iridium.com with its IMEI number placed in the subject line. The content of the attachment with an ".sbd" extension is forwarded to the modem. Figure 4.4 is an example of an e-mail message with an attachment SBMmessage.sbd sent to an Iridium modem with IMEI number 300025010004000.

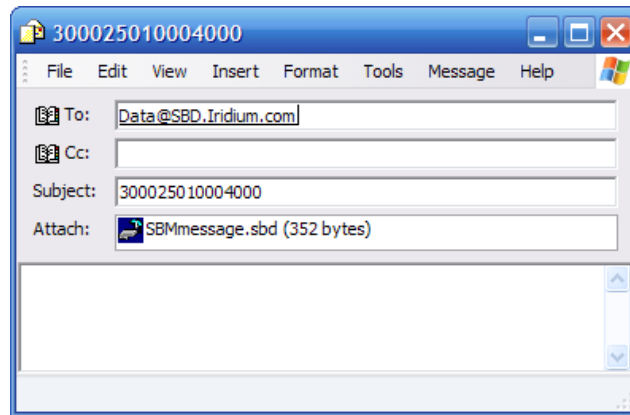


Figure 4.4 Outlook Express SBD E-Mail Window.

5.0 USING SatTerm WITH SMS

5.1 Setting SMS Indications

There are several ways that the modem handles received SMS messages. SMS indications determine how SMS messages are managed. SatTerm makes it easy to set the SMS indications to two useful settings by providing a "Display SMS Immediately" property. When this property is set, the modem will display SMS messages immediately without buffering them in the SMS storage of the modem. When this property is not set, the modem will buffer SMS messages in the SMS storage of the modem without displaying them. To set the "Display SMS Immediately" property, select "Options | Properties | Display SMS Immediately" (Figure 5.1). By default, the modem is set to buffer SMS messages without displaying them.

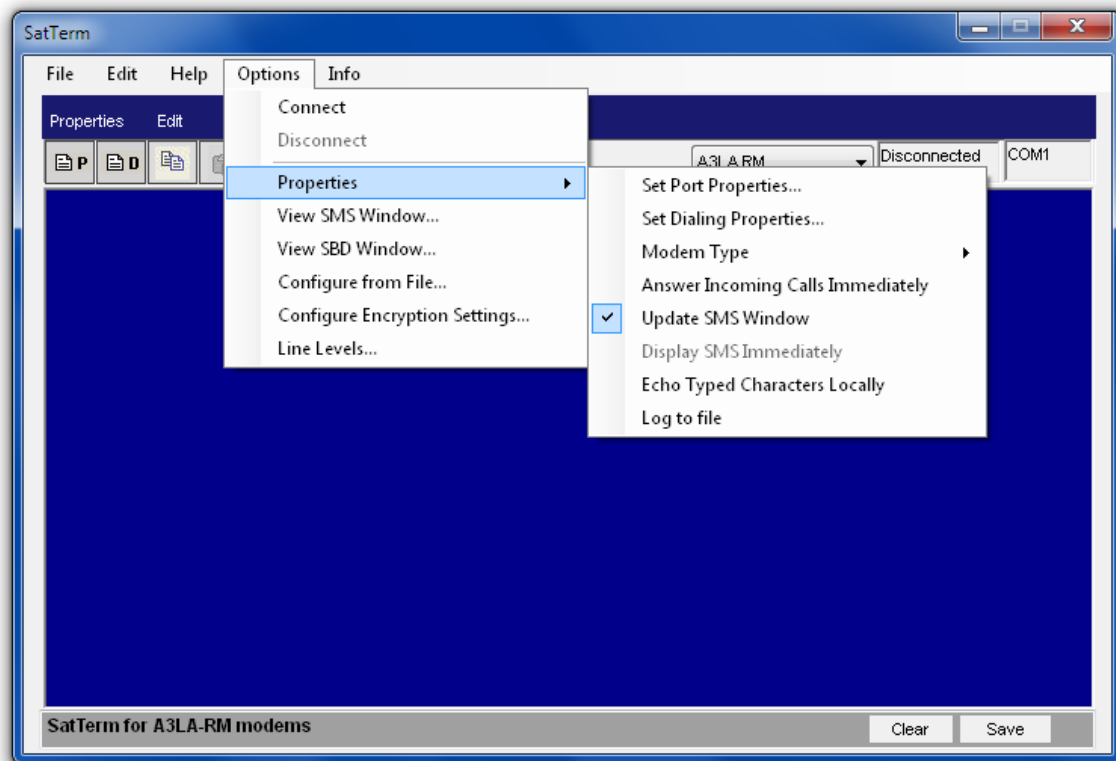


Figure 5.1 Steps in Selecting SMS Options

The "Display SMS Immediately" property can be set at any time except for the following cases:

- No SIM card installed or an invalid SIM card is used
- SMS storage of the modem is full
- While modem is connected in data mode
- While modem is executing a command

NOTE: If the SMS storage is full, SMS messages cannot be received, displayed immediately, or stored until at least one message is deleted from the storage. To see the capacity of the SMS storage of the modem, execute the "AT+CPMS?" command.

NOTE: In order for SatTerm to recognize the modem, it must be left off for at least 20 seconds in between power cycles.

When an SMS message is received by the modem, it is packaged in an unreadable format (non-text format). If the "Display SMS Immediately" property is set, the unreadable message will appear on the main screen with a leading "+CMT:" string and SatTerm will automatically translate it, log it in the "SMSLog.txt" log file, and display it in the "Short Message Service" window. Otherwise, if the "Display SMS Immediately" property is not set, the message will be stored in the SMS buffer of the modem and the "Short Message Service" window can be used at any time to view or delete the message.

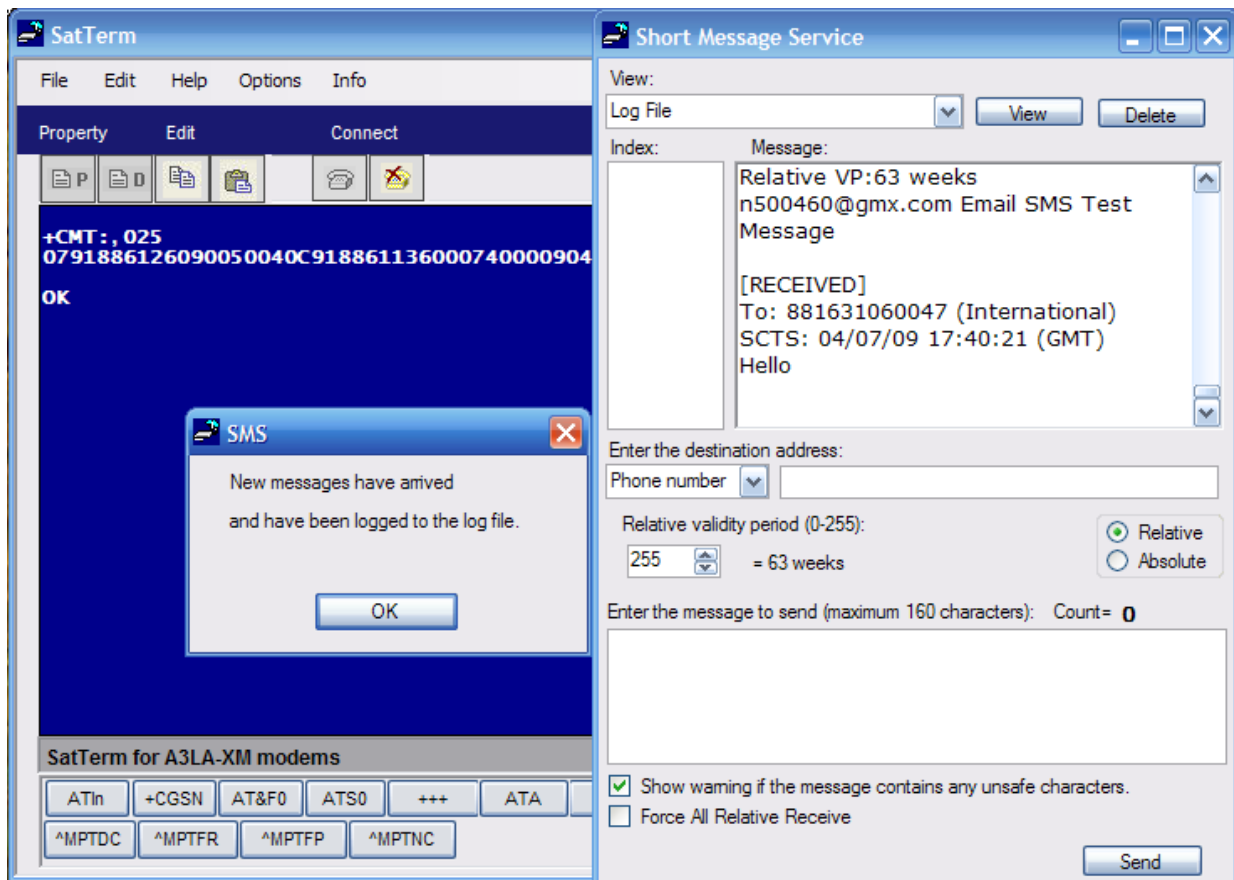


Figure 5.2 Short Message Service Window.

5.2 Using Short Message Service Window

The Short Message Service window shown in Figure 5.2 can be used to view, delete or send SMS messages at any time, if the modem is not busy and if the "Display SMS Immediately" property is set, regardless of the SMS indications. If "Display SMS Immediately" is not set, the Short Message Service window can be used only to view log file. The "View" button can be used to view any of the following messages:

- Received Unread Messages: Messages stored in the SMS memory of the modem that have not been viewed. Received Unread (i.e. new) Messages will be logged in the log file, "SMSLog.txt".

- Received Read Messages: Messages stored in the SMS storage of the modem that have been viewed.
- Stored Unsent Messages: Messages written by using AT+CMGW command and stored in the SMS storage of the modem that have not been sent. Currently, there is no command to send unsent messages in the SMS storage.
- Stored Sent Messages: Messages stored in the SMS storage of the modem that have been sent. However, currently, it is not supported to send unsent messages in the SMS storage.
- All Stored Messages: All of messages in the SMS storage. If there are unread (i.e. new) messages in the storage, they will be logged in the log file, "SMSLog.txt".
- Log File: The sent and received SMS messages will be logged in the "SMSLog.txt" file, which is in the same directory as the SatTerm software.

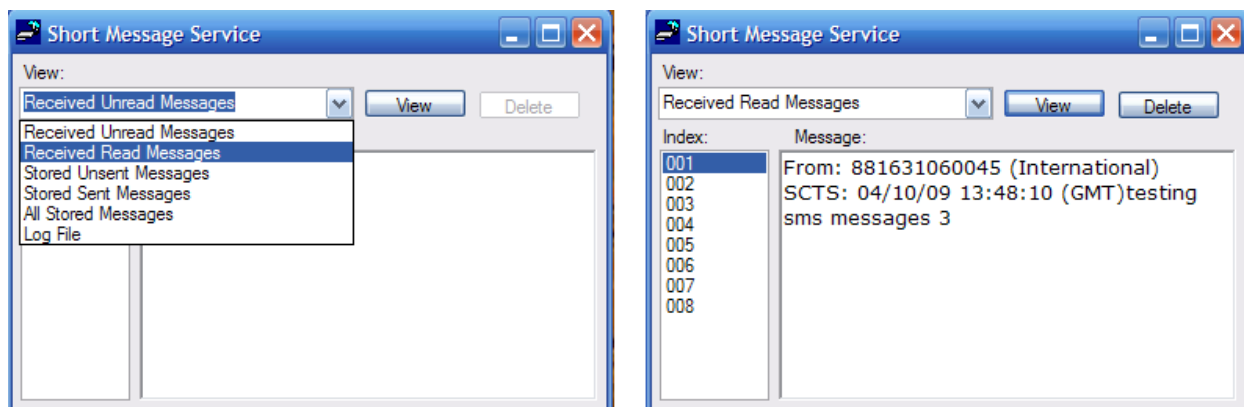


Figure 5.3 Short Message Service Window.

The "Delete" button can be used to delete messages in the SMS storage of the modem. The "Delete" button is enabled when there is at least one viewed message in the list.

The "Send" button allows an SMS message to be sent to a phone number or e-mail address. Follow the steps below to send an SMS message:

STEP 1 Enter the Destination Address: First choose the type of destination address (phone number or e-mail address) and then enter the destination address.

STEP 2 Set the Validity Period: The validity period determines how long the SMS service center will try to deliver the SMS message. The SMS service center will discard the message after the validity period expires if it has not been delivered. The validity period can either be absolute, meaning the SMS message will expire after a certain date and time, or relative, meaning the SMS message will expire after a certain amount of time passes once the SMS service center receives the message. The table below shows how the relative validity period is determined from the Relative VP Value.

Relative VP Value (RVPV)	Relative Validity Period
0 – 143	(RVPV + 1) * 5 minutes
144 – 167	((RVPV – 143) * 30 minutes) + 12 hours
168 – 196	(RVPV – 166) * 1 day
197 – 255	(RVPV – 192) * 1 week

STEP 3 Write the Message: An SMS message may be up to 160 characters. However, please note the following:

- The following characters are counted as two characters in SMS: ^, {, }, [, ~,], and |
- If sending the SMS message to an e-mail address, the length of the message includes the length of the e-mail address plus 1 for a space between the e-mail address and the message.
- If the SMS message contains any unsafe characters that might arrive or be converted differently, the software will send out a warning message if the box showing below is checked.

☒ Show warning if the message contains any unsafe characters.
☐ Force All Relative Receive

Send

STEP 4 Send: Use the "Send" button to send the SMS message. The button will be disabled if the modem is busy or not available.

The figure consists of four sequential screenshots of the SatTerm software interface, illustrating the process of sending an SMS message via email.

- Screenshot 1:** The "Enter the destination address:" field is populated with "n500460@gmx.com". The "Absolute validity period:" is set to "04/14/09 03:00:00 GMT" with the "Absolute" radio button selected.
- Screenshot 2:** The "Enter the message to send (maximum 160 characters):" field contains "This is an example". The "Count = 34" is displayed. The "Show warning if the message contains any unsafe characters." checkbox is checked.
- Screenshot 3:** The "Send" button is highlighted with a red circle, indicating the next step.
- Screenshot 4:** The "Short Message Service" window is open, showing the sent message details. The "Send" button in the bottom right is disabled.

Figure 5.5 An Example of How SatTerm Sends an SMS Message (E-mail Address, Absolute).

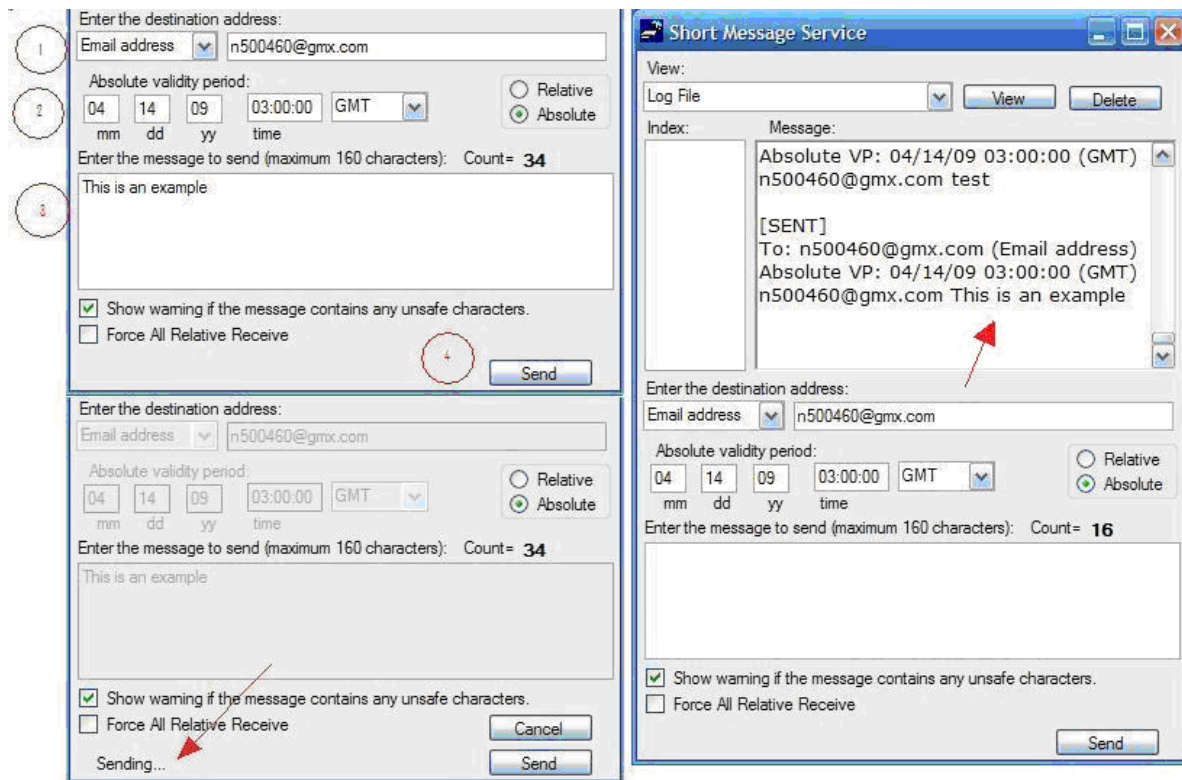


Figure 5.6 An Example of How SatTerm Sends an SMS Message (International Phone Number, Relative).

5.3 Sending SMS Messages using E-mail

SMS messages can also be sent to an Iridium modem using a standard e-mail account (Figure 5.7). In order to send an SMS message, perform the following steps:

- Choose the "None" option in "Mail Sending Format". If using Outlook Express, it can be found under "Tools | Options...".
- Place the phone number of the Iridium modem followed by "@msg.iridium.com" in the destination e-mail address line. For example: 881612345678@msg.iridium.com
- The sender's e-mail address will be included in the user data field of the SMS message automatically. It will be placed before the user's message starts and any data in the subject line will be ignored. To exclude the sender's e-mail address from the SMS message, place "NO" in the subject line.
- Enter the actual message in the text field. The maximum length of the user data of the SMS message is 160. Please note that the length of the user data includes the length of the sender's e-mail address plus 1 for a space unless "NO" is placed in the subject line.
- Press Send.

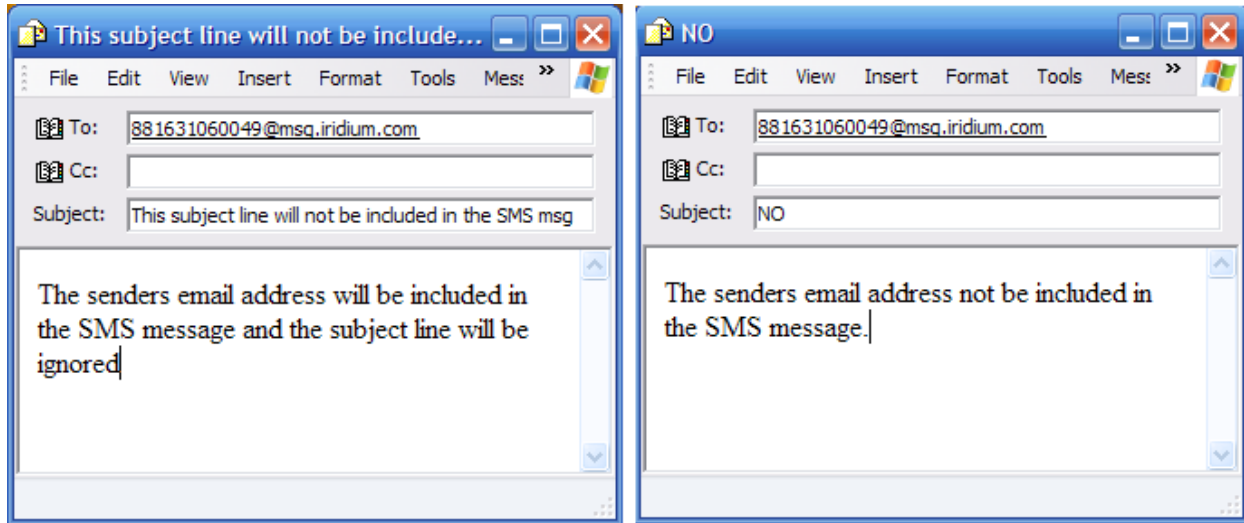


Figure 5.7 An Example of How to Send an SMS Message Using Outlook.

NOTE: When sending an SMS to an Iridium modem by e-mail account, some characters in the user data field of the SMS message may arrive differently in the modem. This happens because most e-mail servers use standard ASCII characters (ISO-8859-1 decimal codes) while SMS uses 7-bit character format. Therefore, some of the SMS characters might not be supported by the e-mail server or some of the ASCII characters might not be supported by SMS

5.4 Sending SMS Messages Using the Iridium Web Site

SMS messages can also be sent via the Iridium website www.iridium.com (Figure 5.8). Follow the steps below to send a SMS message to the Iridium modem:

- Log on to the www.iridium.com website using any Internet browser
- Click on "Send a Satellite Message"
- Enter the phone number of the modem
- Type the message to send
- Click "Send Message"

IMPORTANT: Due to certain restrictions at the U.S. DoD gateway (applied ONLY to the U.S. DoD gateway and NOT commercial gateways), users cannot send outgoing SMS messages by e-mail. Furthermore, incoming SMS messages are limited to 120 characters

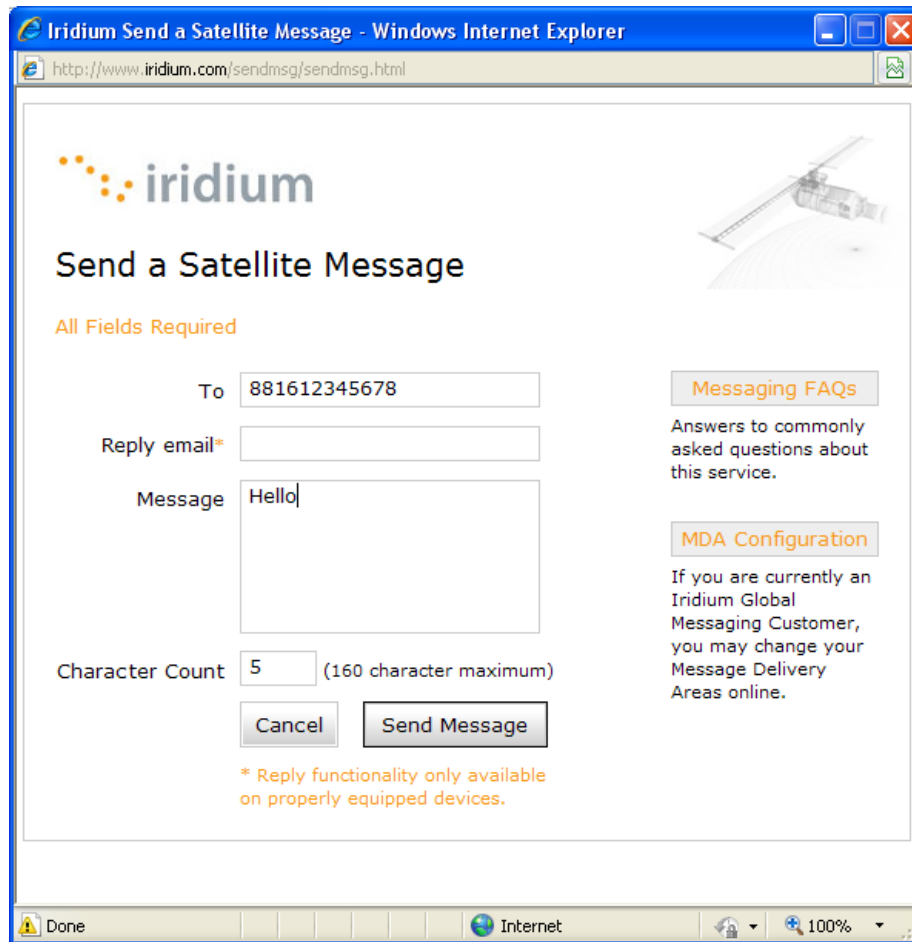


Figure 5.8 An Example of How to Send an SMS Message Using Iridium Web Site.

6.0 CONFIGURING THE TRACKERS

Each NAL Research tracking modem has a set of configurable parameters that determine how the device operates in its automated tracking mode. SatTerm has an interface, called the Configure Window, which provides easy access to all of these settings. Since each product is different, refer to the "General Description" document of the model for details on the available configuration parameters.

To access the Configure Window to configure the tracker, first follow the steps in section 3.1 for setting up the Modem Type and Port Properties. If the modem type selected has a configure window available, it can be opened by selecting Options > Configure Window... as illustrated in figure 6.1 below.

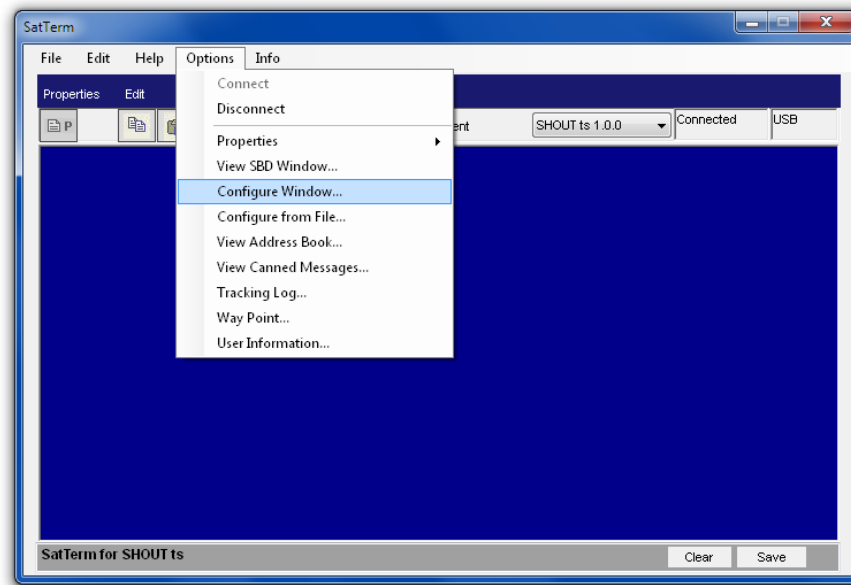


Figure 6.1 Configure Window Option for SatTerm software

Some trackers have additional menus for configuring features. When different modem types are selected the Options menu shows a different list of available menus based on the features for that product. For example the 9602-GSM has menus for Geofences and Call-out and the SHOUT has menus for Address Book and Canned Messages. Refer to the documentation for those products for details on using the menus.

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