



Linux Email and Data using IsatPhone Pro

How to set up IsatPhone Pro to
Access email and transfer data using
XGate

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Contents

Overview	1
1.1 Global Marine Networks (GMN) XGate satellite data software suite and IsatPhone Pro data services	1
1.1.1 Equipment Compatibility	2
1.1.2 Operating System Compatibility	2
1.2 XGate Services Overview	2
1.2.1 Email Acceleration	2
1.2.2 Crew Email Accounts	3
1.2.3 XWeb Internet Access	3
1.2.4 File Transfer	3
1.2.5 GPS Tracking	3
Setup	4
1.3 Prerequisites	4
1.3.1 Data Capable Firmware	4
1.3.2 Data Enabled SIM Card	4
1.3.3 IsatPhone Device Drivers	4
1.4 Software Installation	4
1.4.1 Download the XGate Software	4
1.4.2 Register an XGate Account	4
1.4.3 Testing the Account	6
1.5 Sending and Receiving Email with XGate	7
1.5.1 Creating and Reading Email	7
1.5.2 Checking the Status of Pending Emails	7
1.6 Configuring the IsatPhone Pro for use with XGate	8
1.6.1 Starting the GMN Dialup Installer	8
1.6.2 Installing the IsatPhone Location	9
1.6.3 Confirming XGate Connection Settings	10
1.7 A note on Skype and other Aggressive Internet Programs	10
1.8 Complete an Email Session with IsatPhone	10
1.9 Email Procedure Recap and Summary	11
Additional Specifications	12

1.10DES/PGP Public Key Encryption and Digital Signatures	12
1.11Virus Scanning and Spam Filtering	12
1.12Email Filtering	12
1.13Standard Internet Access	13

Additional Resources	14
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Overview

Accessing Email and Data on IsatPhone Pro using GMN XGate software

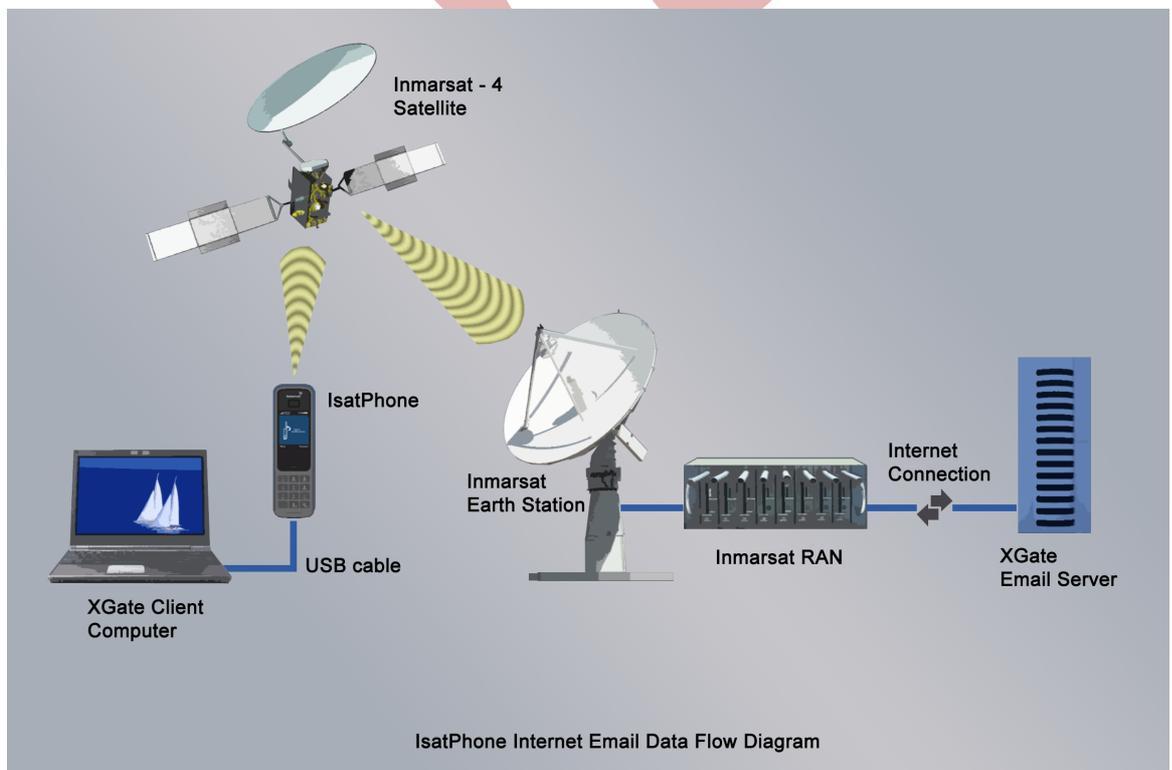
1.1 Global Marine Networks (GMN) XGate satellite data software suite and IsatPhone Pro data services

IsatPhone Pro offers reliable and affordable email and data access when used with GMN XGate, DP-Independent software.

GMN XGate is an email acceleration and data services suite designed for the specific requirements of the narrowband satellite data user, supporting the following services:

- Dial-up Installation
- Email, including crew accounts
- Web acceleration
- File transfer
- GPS tracking

GMN's XGate email client provides easy, reliable, and fast Internet Email (and other data services) to users in remote locations using Inmarsat's IsatPhone Pro satellite phone via the Inmarsat-4 satellites. The following flow diagram describes the data path between a user running the XGate email client on his computer and the GMN mail server on the Internet.



1.1.1 Equipment Compatibility

XGate works with any IP-based connection, including IsatPhone Pro, as well as higher-speed data-capable services including Inmarsat Fleet, Fleet Broadband, and BGAN. It works at all data rates with different benefits across the narrowband and satellite broadband services, and is specifically designed for narrowband satellite data equipment such as the IsatPhone Pro.

1.1.2 Operating System Compatibility

At the time of this writing Inmarsat's IsatPhone Pro supports Microsoft Windows XP through Win7 (both 32 and 64 bit), Mac OS X 10.6, and Linux. XGate is compatible with Macintosh, Windows, and Linux-based machines, and will support all platforms with IsatPhone Pro.

1.2 XGate Services Overview

The XGate suite of services can be used to address common situations for satellite data system users and installers, for example:

1.2.1 Email Acceleration

XGate is optimized specifically for email making it possible to transfer messages easily in time efficient manner. XGate does this by implementing a number of proprietary techniques that ensure that airtime usage is minimized while maximizing data transfer speed. These techniques include:

- Protocol overhead reduction
- Header pruning
- Data compression
- Aggressive SPAM and virus scanning
- Intelligent server side customizable mail filtering
- Pipelining
- Duplex data transfer
- Intelligent attachment management
- Mid-file restart capability
- Link management which dials, transfers and disconnects the satellite link automatically

By employing these techniques users can expect, on average, to send/receive ten 2 to 5 Kbyte sized mixed text and HTML messages in less than one minute of airtime over the IsatPhone Pro. The actual observed speed varies with the compressibility of the data. The more the data compresses the faster the effective transfer rate. HTML and plain text email offer very good compression ratios resulting, on average, in very good throughput. Pictures, on the other hand, offer slower effective transfer rates since the data is already compressed and can't be compressed further. One thing to keep in mind is that the more emails sent at one time the better the compression ratio and the faster the effective transfer rate. It's much more efficient to send 10 emails in one session than 10 emails one session at the time.

The following diagrams depict average data speeds experienced by Inmarsat when transferring email over the IsatPhone Pro using XGate.

X-Gate application test results

Data speeds seen when sending email with different file types attached

File Type	Sending rate Minimum	Average Bit rate	Sending rate Maximum
100kb	kbps	kbps	kbps
Plain text	19.504	20.170	46.760
JPEG	1.759	1.854	1.997
DOC	3.882	4.418	5.952
PDF	1.794	1.972	2.082



1.2.2 Crew Email Accounts

- Administrators can create, modify or delete temporary email addresses on site through the XGate Administrative Portal. This allows for customized and controlled email accounts for crewmembers or passengers.

1.2.3 XWeb Internet Access

- XWeb makes it possible to use the IsatPhone Pro to access mobile-optimized web sites with reliable success and reasonable download times. It is a web compression agent that offers three core technologies:
 - **Compression:** On average XWeb compresses pages by a factor of 3-5 times.
 - **Reducing photo resolution:** This technology reduces typical pictures down to 5% of their original size dramatically reducing download times.
 - **Elimination of background images, animations and pop-up advertisements.**

1.2.4 File Transfer

- XGate File Transfer handling provides automatic inventory control, regular reporting, and logging of data. Once set up, File Transfer automates regular reporting by taking local information from a computer and sending it as an email attachment automatically.

1.2.5 GPS Tracking

- XGate can transmit the user's GPS coordinates when provided by an independent GPS unit or from Inmarsat equipment.

Setup

Common Applications Setup

1.3 Prerequisites

The following prerequisites must be met before email can be done over IsatPhone Pro. Inmarsat supports Microsoft Windows XP through Win7 (both 32 and 64 bits), Mac OS X, and Linux. This guide is written for Linux users using Ubuntu Linux 10.04 LTS or higher. Note that other versions of debian-based Linux should also work.

1.3.1 Data Capable Firmware

IsatPhone Pro firmware must be v4.0.0 or above to support data. Check the firmware on IsatPhone by selecting **Menu > Settings > About**. Download the latest firmware from <http://www.inmarsat.com/Isatphone> or contact your service provider if the firmware version is not v4.0.0 or above.

1.3.2 Data Enabled SIM Card

Confirm with your service provider that the supplied SIM card has been activated with a data plan. SIM cards, which have not been enabled for data, cannot be used for email or other data transfers.

1.3.3 IsatPhone Device Drivers

The Linux kernel supplies USB drivers for the IsatPhone Pro natively. Other than the XGate application no other software needs to be installed. Note that when plugging the IsatPhone into Linux two serial port nodes with names `/dev/ttyACMX` are automatically created. The X is usually 0 and 1. The data port is the device with the lower number (i.e. `/dev/ttyACM0`) and should be used when configuring the phone for use with data.

1.4 Software Installation

Note: Your IsatPhone Pro is not required for set-up until section 1.6.1.

1.4.1 Download the XGate Software

Download and run the XGate installation software from www.globalmarinenet.com/downloads.php. Select the *XGate for Linux (LinuXGate)* and choose to open with the Package Installer (the default action). Once the download completes, the package manager will open automatically. Select *Install Package* to install XGate.

Use the package manager to install the Thunderbird email client if it has not been previously installed. Note that thunderbird must be installed in `/usr/bin/thunderbird` when using debian distributions other than Ubuntu.

1.4.2 Register an XGate Account

Double click the red X on the desktop to start XGate. A Registration Wizard automatically popup on the screen the first time your run XGate. You are presented with 3 choices:

- Create a New Account
- Enter a Pre-assigned Username and Password
- Register for a FREE 3 Day Demo

Existing XGate users should select the second choice to enter their current username and password. New users have the option to evaluate the service for free with no strings attached for 3 days or purchase a longer-term subscription.

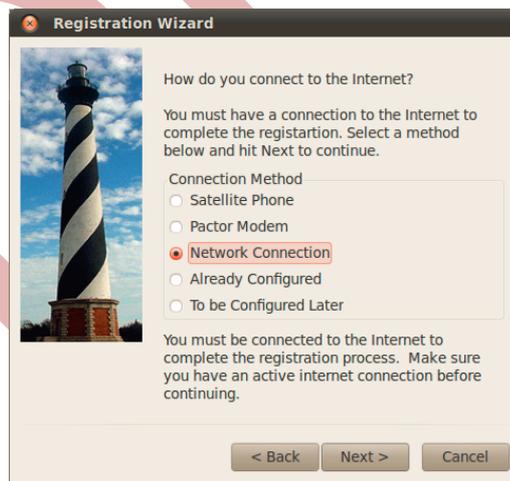
This document will discuss in detail creating a free 3-day demo account although the procedure for the other two activation methods is very similar.

Click on *Register for a FREE 3 Day Demo* to select it and then click *Next* to continue.

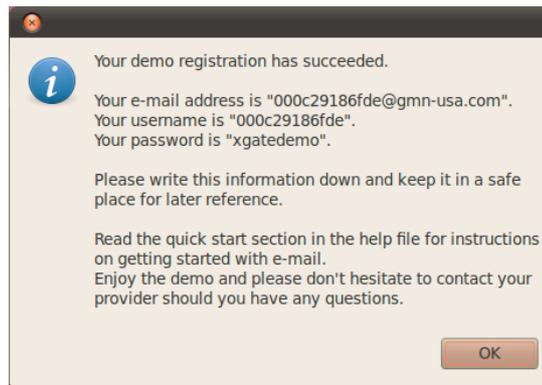


You will now be presented with options to connect to the Internet. Select *Network Connection* if you currently have an Internet connection. Select *Satellite Phone* if you don't have an Internet connection. The registration wizard will walk you through setting up a link to your satellite phone if you don't have an Internet connection. However, for purposes of this discussion select *Network Connection*. Selecting network connection as the method simplifies the demo registration process and allows you to test your e-mail account before tackling the set-up of the satellite link. Later on in this document we will show you how to configure your satellite phone link and modify the settings in XGate to use it.

Select *Network Connection* and then select *Next* to continue.



Acknowledge the Registration Notice and select OK to continue. Then read and agree to the Terms and Conditions to continue with the registration. Now fill out the registration form making sure that all fields marked with an asterisk (*) are filled in. Select OK to submit the registration form and create the demo account.



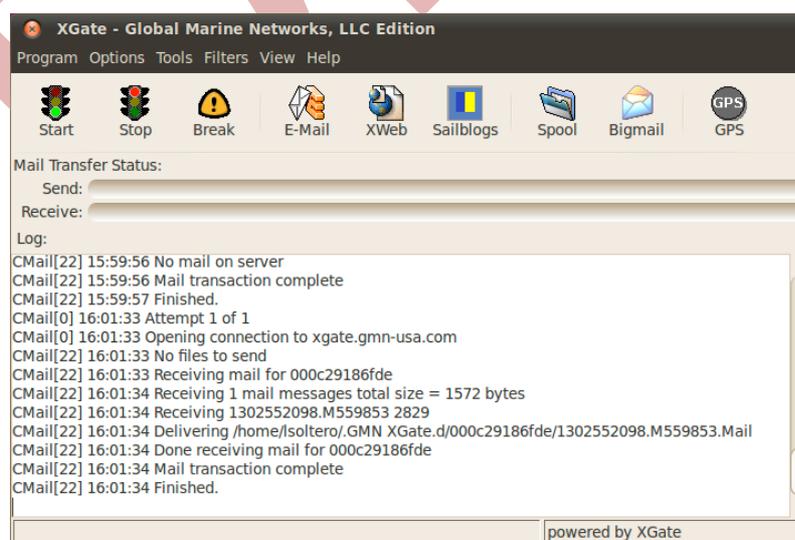
XGate will use an existing Internet connection to communicate with the email server to create the account. Once the account is created a dialog box will pop up with your assigned username, email address, and password. In this example the email address is *000c29186@gmn-usa.com*, the username is *000c29186*, and the password is *xgatedemo*. This information is encoded in the software so there is no need to jot it down or remember it. The email address will be in the header of any messages sent by the system so recipients can use their email clients reply feature to address correspondence to your demo account. Otherwise you may want to jot down the address to supply to users wanting to send emails to your demo account.

Note that users purchasing subscriptions from GMN or their dealers choose their username and email address. The cryptic numeric email address seen here is used only for 3-day demo accounts.

Select *OK* followed by *Finish* to complete the registration procedure. The XGate GUI screen will appear and be ready for user interaction.

1.4.3 Testing the Account

While still connected to the Internet press the *Start* button on the XGate toolbar to test the newly created demo account. Pressing the *Start* button will initiate a session to the server. XGate will establish a connection to the server, send any pending mail and receive emails queued on the server. When doing this using IsatPhone Pro (see discussion below) XGate will call, connect, send/receive email, and then disconnect the call when done. Since XGate is currently configured to use the Internet it will use your existing connection to perform the session.



The XGate window should look similar to the one displayed here. The log windows show a connection to the server with the downloading of email.

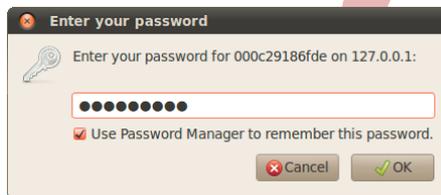
1.5 Sending and Receiving Email with XGate

There are two components to Email Acceleration with XGate. There is an offline component where emails are created and read; and, an online component where emails are transferred to/from the server.

1.5.1 Creating and Reading Email

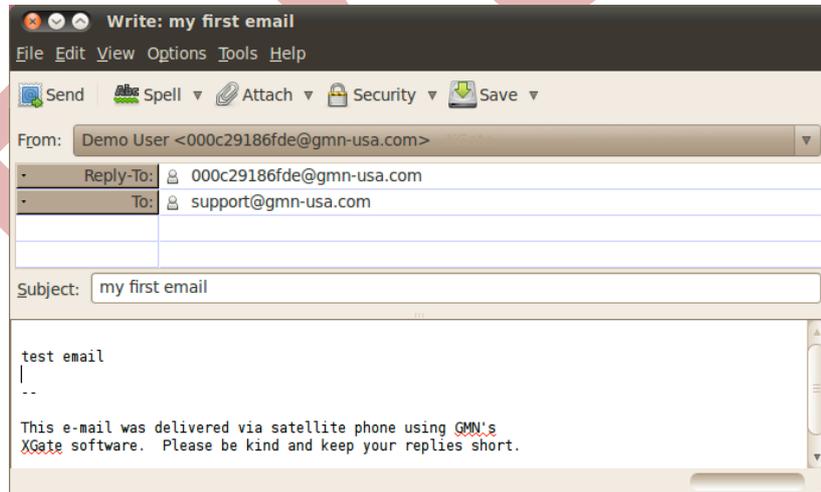
Emails are created or read using an email client. XGate includes a pre-configured to work with Mozilla Thunderbird. Thunderbird must be installed on the system before XGate can use it. Use the Linux package manager to install thunderbird if it is not currently installed on your system. Alternately, a third party email client such as Evolution, KMail, etc can be configured to work with XGate.

Execute the email icon on the XGate toolbar to run Thunderbird. The first time Thunderbird runs it prompts the email account password. Enter *xgatedemo* if you have registered for a 3day free trial; otherwise enter your assigned XGate account password. Make sure to select *Use Password Manager to remember this password to prevent Thunderbird* from asking for the password in the future. Clicking on the Inbox displays all mail received via XGate.



You will see two emails in the inbox. The first is an email from *Technical Support* that describes briefly how to use the product. The second email from info@gmn-usa.com is the 3-day demo welcome message that was downloaded on your first XGate session.

To create a test email for transmission with XGate, select the *Write* icon on the Thunderbird toolbar. Address the email to a user on the Internet, enter a subject, and type in a message. Select *Send* when done.



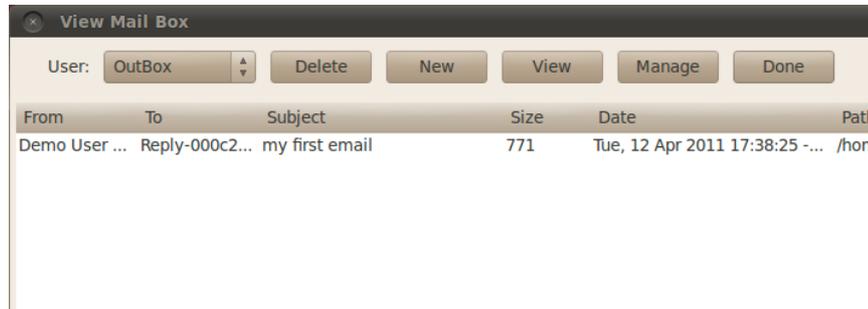
Selecting Send transfers the email to XGate for later transmission. It does **not** mean send the message over the Internet now. The message is now queued for transmission at a later date. Repeat the operation for the number of emails to be sent. Exit Thunderbird once you have finished reading and creating email.

1.5.2 Checking the Status of Pending Emails

The mailbox icon located in the system tray will tell you if there are email messages queued for transmission in XGate. The flag on the mailbox icon will wave up and down if there are pending messages to be sent.



Clicking the mailbox icon in the system tray or double clicking the XGate icon on the desktop will bring the XGate GUI back into view. Selecting the Spool icon on the XGate toolbar and then choosing the OutBox from the pull down menu will display the pending messages.



Pushing the *Start* icon on the toolbar will cause XGate to send all pending emails in the OutBox Spool and to receive any messages queued on the server.

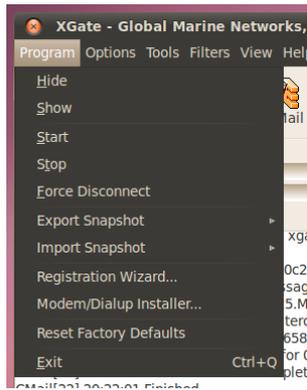


1.6 Configuring the IsatPhone Pro for use with XGate

Before IsatPhone Pro can be used with XGate a windows Dial-Up Networking (DUN) interface needs to be configured. Once the DUN has been created then XGate has to be configured to use it. Fortunately, XGate provides a wizard that simplifies the installation and configuration of the windows DUN.

1.6.1 Starting the GMN Dialup Installer

From XGate's Program menu select *Modem/Dialup Installer...* This will start the DUN configuration wizard.



The *Linux Dialup Networking Installer* should popup on the screen.

1.6.2 Installing the IsatPhone Location

Make sure that your IsatPhone Pro is connected to the computer and that it is powered on before you continue.



Select *IsatPhone Pro* for provider then select the data port for the IsatPhone. The Linux IsatPhone driver creates 2 interfaces for the phone. Both interface names have the form `ttyACMX` where X is an integer. On most systems these devices will be called `ttyACM0` and `ttyACM1` although the numeric value may vary from system to system. In all cases the lower numbered device is the data port. Make sure the data port is selected as the COM port. Then select *OK* to install the location. The installer will then create a new location called *IsatPhone Pro* and then display the XGate connection settings dialog. Set the Default Connection to *IsatPhone Pro* with type *INMARSAT* and then select *OK* to complete the dialup location setup.

1.6.3 Confirming XGate Connection Settings

This step is not necessary but it is always good to make sure that XGate is configured correctly to dial through the satellite phone. In XGate select the *Options->Settings* menu then click on *Connection*. Ensure that the *Default Connection* is set to *IsatPhone Pro* with type *INMARSAT*. This concludes the IsatPhone Pro installation.



1.7 A note on Skype and other Aggressive Internet Programs

When doing data and email over the IsatPhone Pro it is important to remember that the Internet connection is very limited. To optimize the performance of XGate over the satellite link it is very important to exit any applications that use the Internet. This is especially true for Skype and other instant messaging programs. Please exit all programs that are known to access the Internet before doing email over your satellite link.

1.8 Complete an Email Session with IsatPhone

Before you attempt an email session using IsatPhone Pro make sure the phone is ON, connected to your computer, and is connected to the satellite and registering a strong signal. Pressing the *Start* button in XGate will cause the program to dial up the connection, establish a link to the email server, send/receive pending emails, and then disconnect when done. It takes about 40 seconds to get connected to the server once the Start button is pushed. Once connected you should be able to transfer about ten, 5Kbyte text emails in a minute of airtime.

Looking at the log file for our session we note that it took 1:11 to connect, check for email, and then disconnect.

```
CMail[0] 20:07:02 Attempt 1 of 1
CMail[0] 20:07:02 Opening connection to xgate.gmn-usa.com
CMail[0] 20:07:02 Connecting to IsatPhone Pro...
CMail[0] 20:07:02 Dialing IsatPhone Pro
CMail[0] 20:07:28 Serial connection established.
CMail[0] 20:07:28 Using interface ppp0
CMail[0] 20:07:28 Connect: ppp0 <--> /dev/ttyACM0
CMail[0] 20:07:44 PAP authentication succeeded
CMail[0] 20:07:57 replacing old default route to eth1 [192.168.0.1]
CMail[0] 20:07:57 Cannot determine ethernet address for proxy ARP
CMail[0] 20:07:57 local IP address 216.129.170.46
CMail[23] 20:08:03 No files to send
CMail[23] 20:08:03 Receiving mail for 000c29186fde
CMail[23] 20:08:08 No mail on server
CMail[23] 20:08:13 Mail transaction complete
CMail[23] 20:08:13 Hanging up...
CMail[0] 20:08:22 Finished.
```

Congratulations! This concludes your IsatPhone data session.

1.9 Email Procedure Recap and Summary

Once the XGate software is installed and the satellite phone drivers are configured doing email is simple. The following steps outline the procedure for reading/creating and sending email over the IsatPhone Pro. Keep in mind that at all times reading and creating email is done off-line. You only go online to transfer the email and then disconnect as soon as the data transmission is complete.

1. Double click the big red X icon on the Linux desktop or click the small mailbox icon located in the system tray to bring up the XGate program.
2. When reading or creating emails select the email icon on the XGate toolbar. This will bring up the Thunderbird email client configured for use with XGate.
3. Mail, which has been received via XGate, will be located in Thunderbird's Inbox.
4. To create an email click on the *Write* icon on the Thunderbird toolbar. Enter a "To" email address, a "Subject", and then type the body of the message. If adding an attachment then either drag the file to be attached into the email or use the *Attach* icon to browse for the file. Finally select the *Send* button on the Thunderbird toolbar to transfer the file to XGate. Note that this does not send the email over the satellite phone. It simply transfers it to XGate for later transmission.
5. Exit Thunderbird once completed with either reading or creating email. Note that you can run Thunderbird at any time to add new outgoing email or to read existing mail.
6. To send/receive pending email press the *Start* button in XGate after connecting the satellite phone to the computer and registering it with the network. This will cause XGate to call, connect, send, receive, and then disconnect from the Internet.
7. You are done. Repeat steps 1-7 as needed.

Please consult the XGate help file for more information should you require additional instruction.

Additional Specifications

1.10 DES/PGP Public Key Encryption and Digital Signatures

XGate integrates full DES/PGP encryption/decryption into your messaging through your e-mail client such as with Outlook Express. Clients can send and receive email messages with the confidence that only encryption can provide. Encryption of incoming and outgoing e-mail is one click away. When an encrypted message arrives private messages can be read with a simple button push and key entry. To send an encrypted message the user simply composes the text as usual, hits the encrypt button, and then pushes the send button. Management of public keys is simplified via seamless integration with the address book. Public keys received via e-mail can be entered into the address book with the push of a button. Encrypted email security has never been simpler!

1.11 Virus Scanning and Spam Filtering

The XGate server scans every incoming and outgoing mail message for viruses and/or SPAM. This protection not only gives the users one more weapon to defend themselves against destructive e-mail viruses but also removes unwanted content, eliminating air time charges required to receive these unwanted e-mails.

1.12 Email Filtering

Mail filtering is an important component of the XGate mail system that removes undesired content from mail messages before they ever get delivered. Two types of email filtering are used by XGate to reduce the overhead of undesired emails destined for a wireless account.

Server side mail filtering applies a set of simple yet powerful mail filtering rules to mail that arrives on the server before it is delivered to the user's wireless mailbox. User accounts, by default, are preconfigured with two basic filters, one filters by the size of the incoming message and one filters mail by HTML content.

The default for the size filter is set to 50 Kbytes and is fully customizable by the user. Mail messages arriving that are larger than the configurable cut-off size are redirected to a special "Big Mail" box which is accessible via the servers webmail interface and are not transmitted to the user via the wireless device. Grandparents on the road, for example, can receive baby pictures of their latest grandchild without the overhead of long expensive airtime charges. The baby pictures are stored on the server for retrieval at some later convenient time using their web browser over a standard Internet connection.

HTML filtering is also customizable by the user and removes all HTML content sent to the wireless device. Plain text embedded in the e-mail is sent to the user along with a message stating that the HTML content has been removed. The original unadulterated message is stored on the mail server for later viewing over the Internet using a standard web browser and the XGate's webmail program.

Unlike server side mail filtering which happens before e-mail is delivered to a users mailbox, client side filtering works on messages that have been delivered to the inbox but before they are transferred via the wireless device. The XGate client allows messages that are larger than a certain customizable size to be tagged on the server and not downloaded via the wireless device. Users can specify that a few lines as well as the header of large mail messages be retrieved while the bulk of the message is left on the server. Once the mail header and a few lines of the mail message are examined, the user can then specify that the message be deleted from the server without ever retrieving it, or if the mail is important, to mark it for full download on the next connection. As in server side mail filtering, messages stored on the server can also be accessed with a standard web browser via the Internet.

1.13 Standard Internet Access

The GMN mail servers can be accessed in several ways. Not only can they be accessed via a satellite phone using the XGate software but they can also be accessed using a number of standard Internet protocols. These include:

- POP
- IMAP
- SMTP
- Webmail

Users can access their email using these standard protocols and software clients, when connected to a standard Internet connection.

Additional Resources

Additional resources can be found on GMN's website at <http://www.globalmarinenet.com/isatphone.php>. These resources include:

- Software
- Drivers
- How to videos http://www.globalmarinenet.com/downloads/videos/isat_xgate.mov (how to upgrade firmware and how to register for 3day email demo)
- Documentation
- Detailed description of the software and employed technology

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