Gilat Generic Antenna Interface Version 3

Reference Guide

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Notice

Contents

Chapter 1: Introduction

In This Chapter

Overview

The stabilized or in-motion antenna provides a monitoring SOTM (Satellite-On-the-Move) platform. Gilat SkyEdgeII modem (VSAT) provides highly reliable network communication means. This document proposes that these early mentioned systems generate two-channel interfacing loosely based on the NMEA 0183 data protocol. The interfacing occurs via RS232 serial port at 9600-N-8-1 baud without any authentication or encryption in the link. To enable interfacing, it is not required to log in to the SkyEdgeII system (none security settings are implemented within it).

This document describes the command - response sequence between the antenna and Gilat SkyEdgeII modem (VSAT).

Generic Antenna Protocol Format

All data in the Generic Antenna protocol are transmitted in the form of messages. Only printable ASCII characters and CR (carriage return) and LF (line feed) are allowed. Each message starts with a "$" sign and ends with <CR><LF>.

The general format of a sentence is: $ttsss,d1,d2,....<CR><LF>.

The first two characters "tt", following the "$", are the talker identifiers. The next three characters "sss" are the message identifiers. The "sss" characters are followed by a number of data fields (separated by commas), mandatory checksum, and terminated by carriage return and line feed. The data fields are uniquely defined for each message type.

A message may contain up to 80 characters, the "$" and CR/LF signs. If data for a field are not available, the field is omitted, but the delimiting commas still appear, with no space between them.

The checksum field consists of a "*" sign and two hex digits representing the exclusive OR (XOR) of all characters in-between, but not including the "$" and "*" signs.

Chapter 2: Interfacing Using the Generic Antenna Protocol (Versions 2 and 3)

In This Section

Protocol Sequence

This section illustrates the protocol (Versions 2 and 3) sequence between antenna and Gilat SkyEdgeII modem (VSAT).

Refer to the following key that explains the commands in protocol sequence (see Figure 1):

Talker ID

- **GA** - Generic Antenna
- **SE** - SkyEdge Modem
- **GP** - GPS Unit

Message ID

- **SMT** - Start Modem Tracking
- **TXM** - Transmission Mute
- **GGA** - Global Positioning System Fix Data
- **STS** - Mode Status

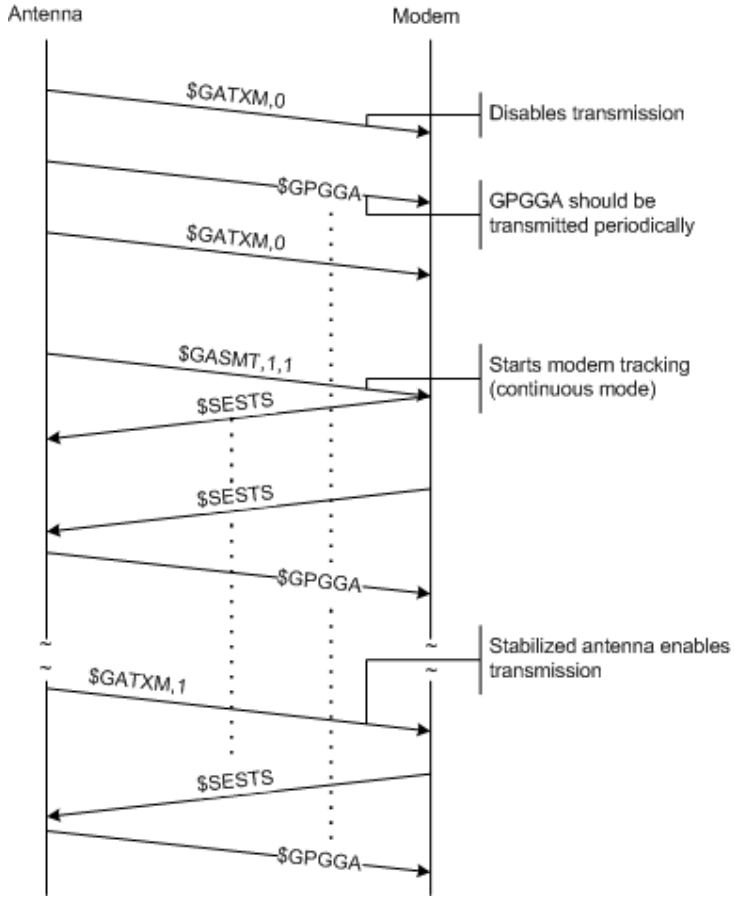

Figure 1: Protocol Sequence

Generic Antenna Commands

This section describes the messages issued by the antenna to Gilat SkyEdgeII modem (VSAT). These messages appear in Generic Antenna protocol of both versions (V.2 and V.3).

Table 1: Generic Antenna Protocol Commands

Command Name	Message	Message Details	Description
Poll Modem Lock Status	`$GASMT,S,R*XX<CR><LF>`	`$` - Open flag `GA` - Generic Antenna `SMT` - Start Modem Tracking `S` - (0) Stop; (1) Start `R` - Rate: (0) one time; (1..10) continuously, in Hz `*XX` - Check Sum	This message is issued by the antenna to Gilat SkyEdgeII modem (VSAT) to receive lock status response from the modem.

Command Name	Message	Message Details	Description
Tx mute	$GATXM,E*XX<CR><LF>	$GATXM,E*XX<CR><LF> $ - Open flag GA - Generic Antenna TXM - Transmission Mute E - Enable transmission : (0) Disable modem transmission (1) Enable modem transmission *XX - Check Sum	This message is issued to disable / enable transmission from Gilat SkyEdgeII modem (VSAT). The message can be issued more than once per state change.
Current Position	$GPGGA,hhmmss.ss,ddmm.mmm,a,dddmm.mmm,b,q,xx,p.p,a.b,M,c.d,M,x.x,nnnn *XX<CR><LF>	hhmmss.ss - UTC of position ddmm.mmm - Latitude of position a - N or S, Latitude hemisphere dddmm.mmm - Longitude of position b - E or W, Longitude hemisphere q - GPS Quality indicator (0) No fix; (1) Non-differential GPS fix; (2) Differential GPS fix; (6) Estimated fix; xx - Number of satellites in use p.p - Horizontal dilution of precision a.b - Antenna altitude above mean-sea-level M - Units of antenna altitude, meters c.d - Geoidal height M - Units of geoidal height, meters .x - Age of Differential GPS data (seconds since last valid RTCM transmission)	The current position is supplied to Gilat SkyEdgeII modem (VSAT) by the following NMEA0183 protocol message. The rate the message should be sent to the modem is between once a second to once a minute. It is recommended to send the message as often as possible to enable fast return link recovery.

Command Name	Message	Message Details	Description
		nnnn - Differential reference station ID, 0000 to 1023 *XX - Check Sum All fields marked in red are obligatory for Gilat's implementation	

Generic Antenna Commands - Examples

This section illustrates the Generic Antenna commands' examples.

Table 2: Generic Antenna Commands - Examples

Command Name	Message Example
Poll Modem Lock Status	• **$GASMT,1,0*4D** - start track, one shot • **$GASMT,1,1*4C** - start track, once a second • **$GASMT,1,10*7C** - start track, 10 times a second • **$GASMT,0,0*4C** - stop track
Tx mute	• **$GATXM,1*5A** - enable Tx • **$GATXM,0*5B** - disable Tx
Current Position	• **$GPGGA,141454,3205.8163,N,03451.3271,E,1,04,3.8,,M,19.2,M,,*64** - PGS location

Modem (VSAT) Response Commands

This section describes the message issued by Gilat SkyEdgeII modem (VSAT) to antenna.

Table 3: Modem Response Commands

Command Name	Message	Message Details	Description
Modem Lock Status	`$SESTS,A,BBBBBBB,SS.SS*XX<CR><LF>`	`$` - Open flag `SE` - SkyEdge `STS` - Status `A` - Modem CD: (0) – not locked on signal, (1) – Locked on signal `BBBBBBB` - Downlink center frequency in Khz `SS.SS` - Downlink SNR [dB], valid only when A=1 `*XX` - Check Sum	This message is transmitted from Gilat SkyEdgeII modem (VSAT) to antenna after receiving the poll modem command.

Modem (VSAT) Response Commands - Examples

This section illustrates the modem response commands' examples.

Table 4: Modem Response Commands - Examples

Command Name	Message Examples
Modem Lock Status	• **$SESTS,0,1121000,00.00*43** - modem status V.2 - no lock • **$SESTS,1,1121000,11.37*46** - modem status V.2 - OB lock

Chapter 3: Interfacing Using the Generic Antenna Protocol (Version 3)

In This Section

Protocol Sequence

This section illustrates the protocol (Version 3) sequence between antenna and Gilat SkyEdgeII modem (VSAT).

The Generic Antenna protocol (Version 3) enables higher communication baud rate and more detailed modem status (information about the return link and transmission status). It supports all legacy Generic Antenna protocol (Version 2) commands. Only the format of the `$SESTS` modem command response differs between the two early mentioned protocol versions.

Refer to the following key that explains the commands in protocol sequence (see Figure 2):

Talker ID

- **GA** - Generic Antenna
- **SE** - SkyEdge Modem

Message ID

- **PCL** - Set Protocol Version
- **GIN** - Get Modem Information
- **OPT** - Set Protocol Options
- **IGG** - Work without GGA Message
- **SIN** - Set Antenna Information
- **Ack** - Modem Acknowledgment
- **INF** - Modem Information
- **STS** - Mode Status

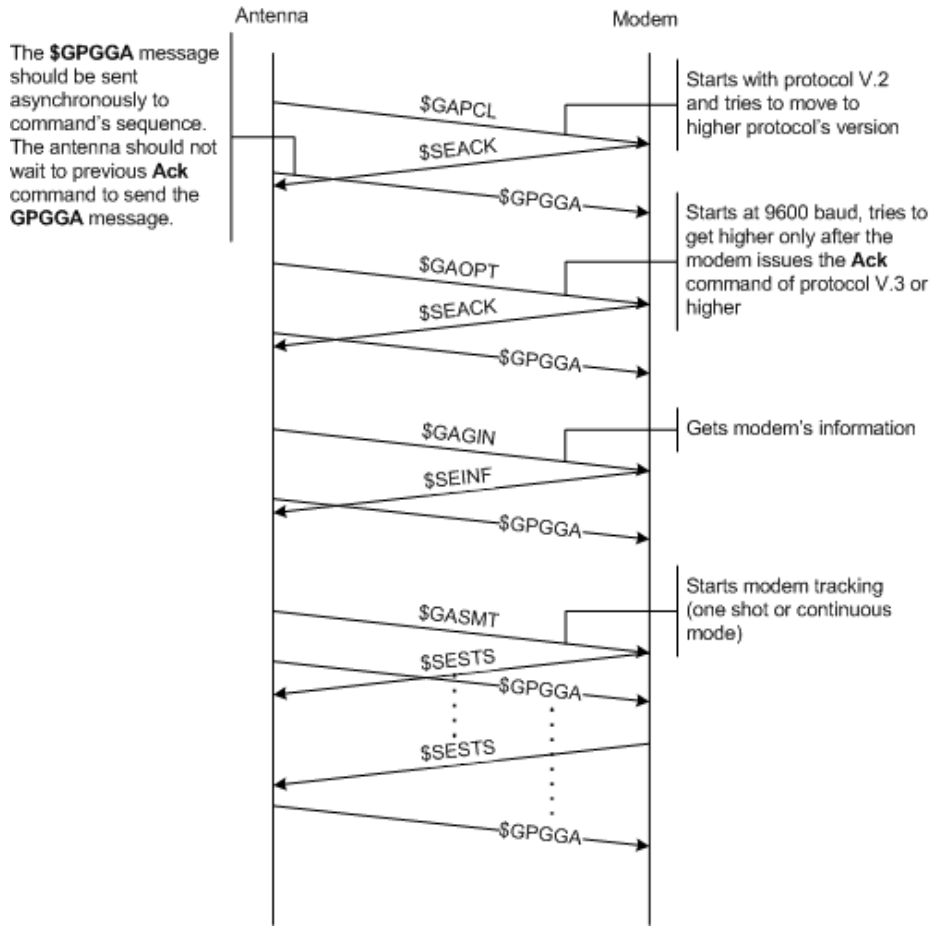

Figure 2: Protocol Sequence

Recovery from Modem Reset

When Gilat SkyEdgeII modem (VSAT) is reset or power-cycled, it returns to its default configuration (protocol V.2, baud rate 9600, GPS).

In the following scenarios, the antenna should assume that the Gilat SkyEdgeII modem (VSAT) has been reset. In these cases, it must re-negotiate the configuration:

- The modem does not issue **Ack** commands – the modem was returned to protocol V.2.
- Communication with modem has been lost for more than 60 seconds – baud rate mismatch after reset.

Recovery from Link Reset

When the antenna recognizes that the return link is down (online status in `$SESTS`, see below) or when the antenna issues **Tx resume** command, it is recommended to send the `$GPGGA` command every second for fast link recovery.

After the link is recovered, the rate can be decreased up to once a minute.

Generic Antenna Commands

This section describes the messages issued by the antenna to Gilat SkyEdgeII modem (VSAT). These messages appear in protocol V.3 only.

Table 5: Generic Antenna Commands

Command Name	Message	Message Details	Description

Negotiate Protocol Version	`$GAPCL,V*XX<CR><LF>`
	Reply:
	`$SEACK`
		`$` - Open flag
		`GA` - Generic Antenna
		`PCL` - Protocol's Version
		`V` - Version (currently only 3)
		`*XX` - Check Sum
			This message is issued by the antenna to Gilat SkyEdgeII modem (VSAT) to negotiate the protocol version.
			The antenna announces its desired protocol's version. The modem sends an **Ack** message with the highest supported protocol version.
			In case the modem sends a **Nack** message, the modem falls back to protocol V.2.

Get Modem Information	`$GAGIN*XX<CR><LF>`
	Reply:
	`$SEINF`
		`$` - Open flag
		`GA` - Generic Antenna
		`GIN` - Get Modem Information
		`*XX` - Check Sum
			This message is issued by the antenna to Gilat SkyEdgeII modem (VSAT) to receive VSAT's type information.
			This information can be used by the antenna to display the modem type in case it has user interface.
			In case in the future different types of Gilat modems behave differently, this information will enable the antenna to handle different types of modems.

Command Name	Message	Message Details	Description
Negotiate Protocol Options	$GAOPT,B *XX<CR><LF> **Reply**: $SEACK	$ - Open flag GA - Generic Antenna OPT - Protocol Options B - Baud Rate [9600, 14400, … 115200] *XX - Check Sum	This message is issued by the antenna to Gilat SkyEdgeII modem (VSAT) to negotiate the protocol options (currently only the baud rate can be modified). The command is issued at last negotiated baud rate. The antenna announces its desired baud rate. The modem sends an **Ack** message with the acceptable baud rate. In case the modem sends a **Nack** message, it sets its baud rate to default value of 9600 baud.
Enable working without GPS	$GAIGG*XX<CR><LF> **Reply**: $SEACK	$ - Open flag GA - Generic Antenna IGG - Ignore GGA message *XX - Check Sum	This message is issued by the antenna to Gilat SkyEdgeII modem (VSAT) to enable the modem working without up-to-date position information (in case there is no GPS in the system). In this mode, the modem does not wait for GPGGA command to establish the return link. The position information is updated by the user using the modem SkyManage web interface. This command replaces the **GPGGA** command when working in without GPS.

Command Name	Message	Message Details	Description
Set Antenna Information	$GASIN,V,M*XX<CR><LF> **Reply**: $SEACK	$ - Open flag GA - Generic Antenna SIN - Set Antenna's Information V - Antenna's Vendor name, null terminated string, up to 64 characters M - Antenna's Model name, null terminated string, up to 64 characters **V,M** are strings, max length of 64 characters. The strings are not NULL-terminated. They are delimited using the command's comma. It is the receiver's side responsibility to add the NULL terminator internally. *XX - Check Sum	This message is issued by the antenna to Gilat SkyEdgeII modem (VSAT) to update the modem with the Antenna's information. The received information is used for display only.

Generic Antenna Commands - Examples

This section illustrates the Generic Antenna commands' examples.

Table 6: Generic Antenna Commands - Examples

Command Name	Message Example
Negotiate Protocol Version	• **$GAPCL,3*46** - set protocol version to 3 - • **$SEACK,GAPCL,1*37** - ack on set protocol version -
Get Modem Information	• **$GAGIN*46** - get modem information -
Negotiate Protocol Options	• **$GAOPT,1152000*56** - set baud rate to 115200 - • **$SEACK,GAOPT,1*23** - ack on set baud rate
Enable Working without GPS	• **GPS - $GAIGG*4F** - ignore GGA - work without • **$SEACK,GAIGG,0*20** - Nack on ignore GGA

Command Name	Message Example
Set Antenna Information	• **$GASIN,AMERICOM,TS23L3*38** - set antenna information • **$SEACK,GASIN,1*3C** - ack antenna information

Modem (VSAT) Response Commands

This section describes the messages issued by Gilat SkyEdgeII modem (VSAT) in response to the modem commands.

Table 7: Modem Response Commands

Command Name	Message	Message Details	Description
Modem Ack	`$SEACK,C,S*XX<CR><LF>`	`$` - Open flag `SE` - SkyEdge `ACK` - Command Acknowledgment `C` - Antenna command, without the dollar ($) sign. `S` - Success (0) Fail (nack); (1) Success (ack) `*XX` - Check Sum	This message is transmitted from Gilat SkyEdgeII modem (VSAT) to acknowledge an antenna's command. The message includes the acknowledged command and success flag.
Modem Information	`$SEINF,P,V,S,T*XX<CR><LF>`	`$` - Open flag `SE` - SkyEdge `INF` - Status `P` - Protocol Version (3) `V` - Vendor (Gilat) `S` - System (SkyEdgeII) `T` - Modem Type ("IP", "IP Extend", "Access", "Pro") **V,S,T** are strings, max length of 30 characters. The strings are not NULL-terminated. They are delimited using the command's comma. It is the receiver's side responsibility to add the NULL terminator internally. `*XX` - Check Sum	This message is transmitted from Gilat SkyEdgeII modem (VSAT) after receiving the **Get Modem Information** command.

Command Name	Message	Message Details	Description
Modem Lock Status	$SESTS,A,BBBBBBB,SS.SS,CCCCCCC,O,T*XX <CR><LF>	$ - Open flag SE - SkyEdge STS - Status A - Forward channel Carrier Detect: (0) – Not locked on signal (1) – Locked on signal BBBBBBB - Downlink center frequency [KHz] SS.SS - Downlink SNR [dB], valid only when A=1 CCCCCCC - Return link center frequency [KHz] O - Online status (0) – Offline (out of network) (1) – Online (login the network) T - Tx Enable (0) – Tx Mute (1) – Tx Enable *XX - Check Sum	This message is transmitted from Gilat SkyEdgeII modem (VSAT) after receiving the poll modem status command. **Note**: This message format was modified in compare to protocol V.2.

Modem (VSAT) Response Commands - Examples

This section illustrates modem response commands' examples.

Table 8: Modem Response Commands - Examples

Command Name	Message Examples
Modem Information	• **$SEINF,3,GILAT,SkyEdgeII,IP*48** - get modem information - protocol V.3, vendor GILAT, system SkyEdgeII, modem IP
Modem Lock Status	• **$SESTS,1,1121000,08.24,1200000, 1, 0*4D** - modem status V.3 - OB lock, 1121000KHz, 8.24dB, 1200000KHz, online, Tx disable (mute)