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Satellite Modem

Installation and Configuration Guide

ViaSat® Document Number

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(Rev. B)

SurfBeam Release 1.2/1.3

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NOTICES

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Revision History

Revision	Rationale	Release Date	Affected
-	Initial Release	22 November, 2002	All pages
A	Revision update only to include SurfBeam Release 1.3. Note: Installation and configuration instructions are identical for SurfBeam Release 1.2 and 1.3.	3 February, 2003	All Pages
B	Modified for Intelsat Installer Training	15 October, 2003	

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Safety Precautions

If safety precautions or important information is presented in this manual, the information will normally be presented just before the point where the hazard is likely to be encountered. Symbols used to identify the information are defined as follows:

Warning This symbol indicates a procedure or practice that, if not correctly followed, could result in injury, death, or long term health hazard.

Caution This symbol indicates a procedure or practices that, if not correctly followed, could result in equipment damage or destruction.

This symbol indicates that electrostatic discharge (ESD) precautions must be observed or the equipment may be damaged.

Note This symbol indicates information that is important to observe.

General safety precautions are as follows:

Warning There are no user-serviceable parts inside any of the equipment in your system. There are potentially lethal voltages inside the equipment. It should only be opened by a technician trained and certified to service ViaSat® products.

Warning RF Radiation Hazard. The transmitting equipment is capable of generating RF levels above the maximum permissible uncontrolled exposure level. Do not enter the radiation beam pattern of the transmitter feed horn and / or antenna when the transmitter is on.

Warning ***When the SM is powered on, DC voltage is present on the rear panel TX and RX connectors.***

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1. Getting Started

Note *The Satellite Modem is complelely self-contained, and contains no user serviceable parts.*

Note *The Satellite Modem may be pre-configured before installing it at the customer's site. Refer to Section 2.*

This Installation and Configuration Guide contains information to assist you in installing and configuring the ViaSat® SurfBeam Satellite Modem (SM).

The SurfBeam Satellite Modem (Figure 1-1) is a compact, high-speed modulator-demodulator that provides high-speed Internet communications over satellite. The SM is normally located as an indoor unit (IDU) at the user's home or facility, and contains the components necessary to interface between the Customer Premise Equipment (CPE) (e.g., PC), and the transmitting and receiving equipment usually called the outdoor unit (ODU).

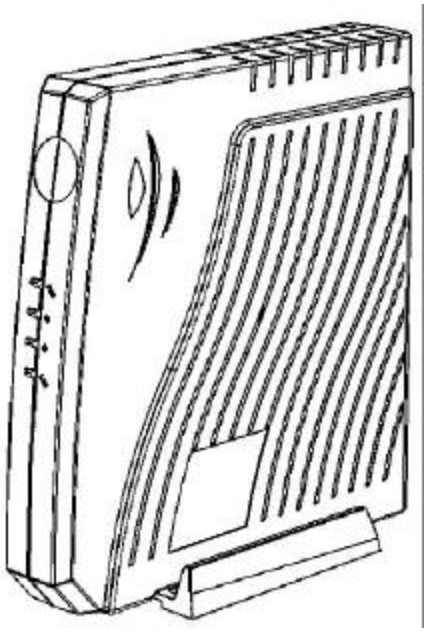


Figure 1-1 SurfBeam Satellite Modem

1.1 Required Items for Installation

To install the Satellite Modem, you will need the following items:

- ViaSat SurfBeam Satellite Modem
- In-Line Power Supply
- Ethernet cable (RJ-45)
- Preinstalled ODU including:
  - Transmitter/Receiver
  - Antenna
  - TX and RX coaxial cables from ODU (refer to paragraph 1.2)

1.2 Coaxial Cable Requirements

Warning ***When the SM is powered on, DC voltage is present on the rear panel TX and RX connectors.***

The SM and ODU must be connected using two runs (TX and RX) of Comscope type 5729 coaxial cable, not more than 120 feet [36.5 meters] long.

In addition to conveying the IF signal, each coaxial cable passes DC voltage supplied by the SM to power the TXB and LNB. The SM supplies 30V, 1.55A to the center conductor of the TX connector, and 30V, 150mA to the center conductor of the RX connector on the SM rear panel.

2. Connecting and Configuring the Equipment

Note *The Satellite Modem has no power on/off switch.*

To apply or remove power from the SM, connect or disconnect the in-line power supply from the power source. The SM will start-up every time power is applied.

Figure 2-1 shows the connectors on the SM rear panel. The **TEL**, **LINE**, and **USB** connectors are NOT currently used.

Connect the SM as follows:

1. Make sure the Support PC has been shut down normally, and is off.
2. Make sure the Satellite Modem is NOT connected to the in-line power supply.

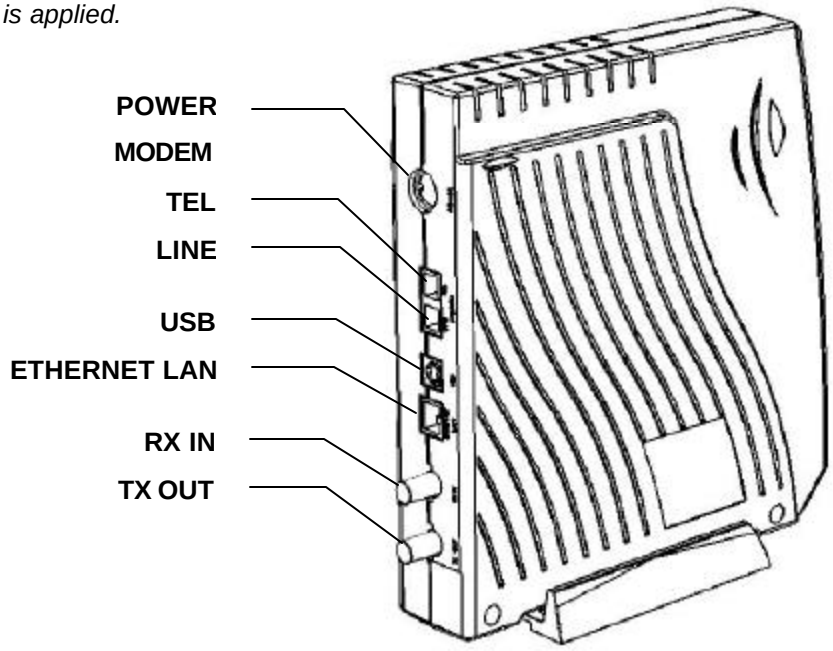


Figure 2-1 SurfBeam Satellite Modem Connectors

Note *Unless otherwise instructed, the modem comes preconfigured for the proper operating frequencies, and steps 3 through 13 should NOT be perfomed!*

3. Connect an Ethernet cable as shown in Figure 2-2. Do not plug the power cord on the in-line power supply to the power source. Do not use the USB port to connect the Support PC or the user's CPE.

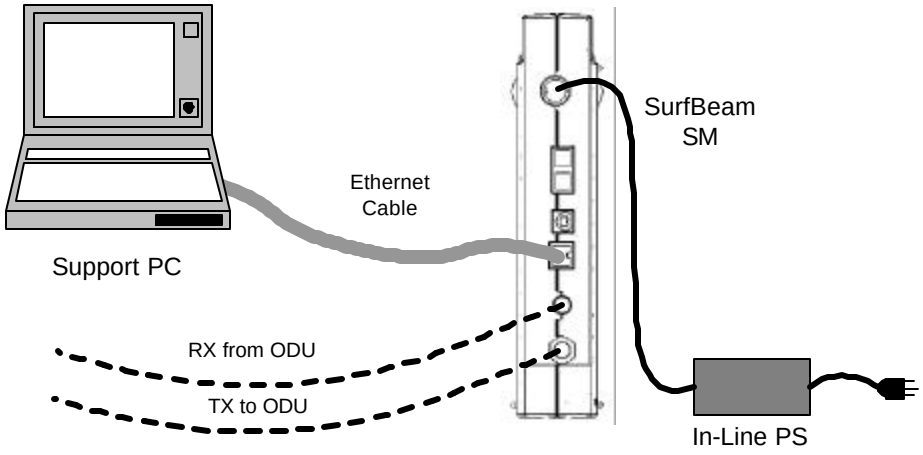
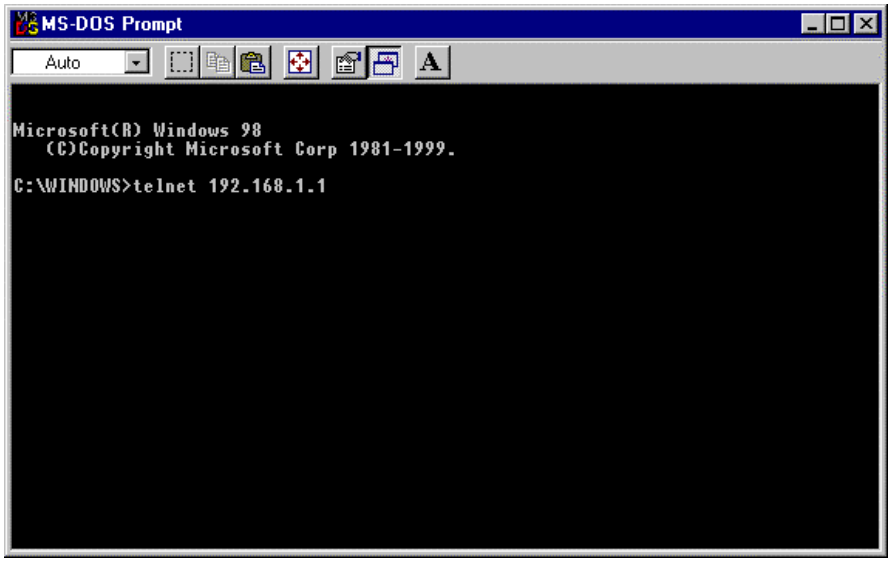
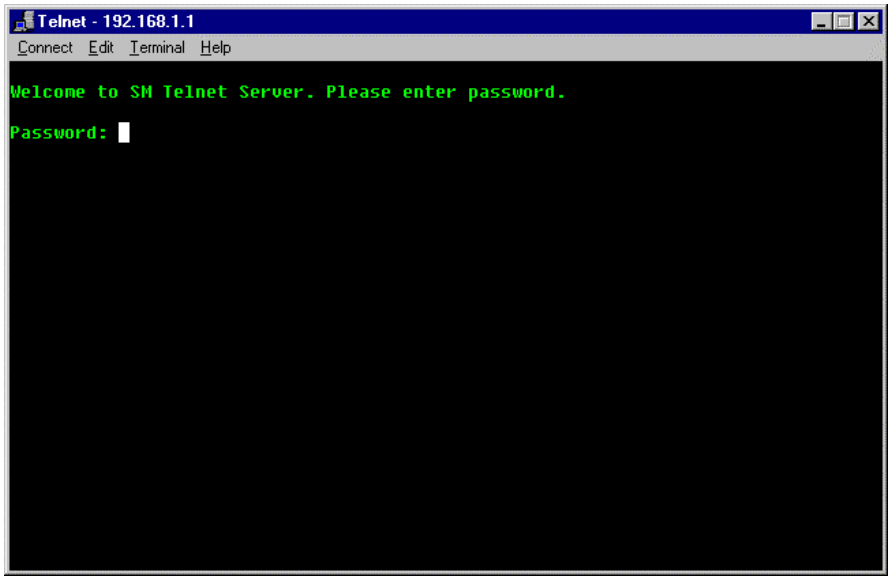


Figure 2-2 SurfBeam Satellite Modem Connections

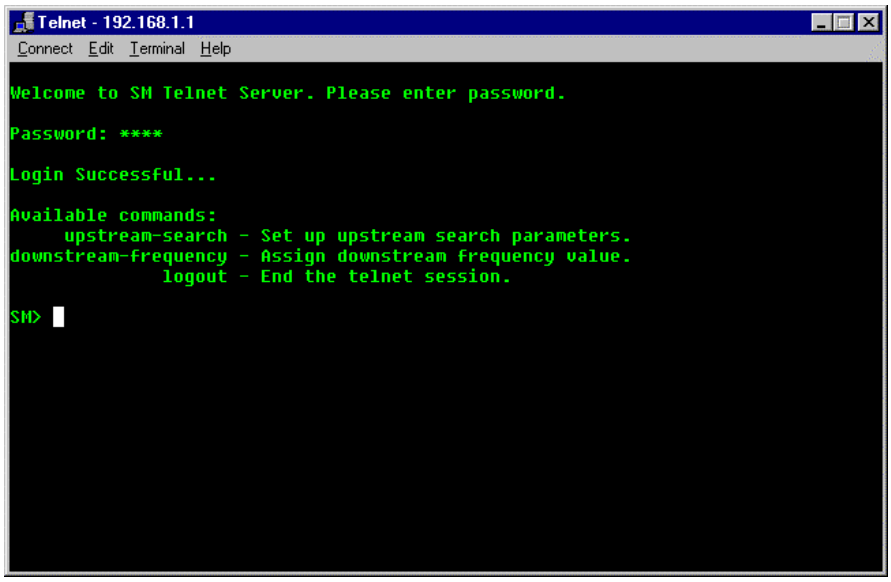
4. Power on the Support PC, and wait for it to complete the boot cycle.
5. Refer to the Support PC's Operating System documentation, and configure the Support PC for a static IP address of 192.168.1.2.
6. Plug the in-line power supply to the power source to turn on the Satellite Modem. The power indicator on the front of the modem will light.
7. Wait for the LAN indicator on the SM front panel to light indicating the Ethernet link between the SM and the Support PC is OK.
8. On the Support PC, open a Command Prompt Window. Connect to the Satellite Modem by typing ***telnet 192.168.1.1***. This will connect you to the SM using its fixed IP address (192.168.1.1) as shown in the example below.



9. When the SM Telnet Server Welcome screen appears, enter ***user*** as the password as shown in the example below.



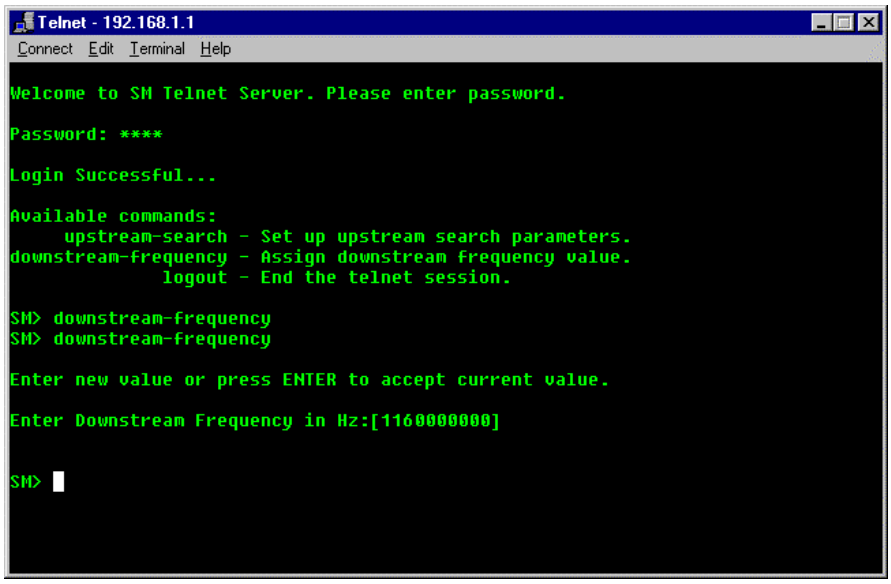
10. After the login is successful, you will see the Available commands screen as shown in the example below.



Note *Instead of typing the entire command, you may type the first few characters of the command and press Enter. (e.g., type "**dow**" instead of "**downstream-frequency**", or "**ups**" instead of "**upstream-search**").*

11. At the ***SM>*** prompt, enter ***downstream-frequency***. The existing downstream frequency will be displayed. You may either accept the current frequency, or enter a new frequency and press the ***Enter*** key. If you do not want to change the existing frequency, just press ***Enter***. An example is shown below.

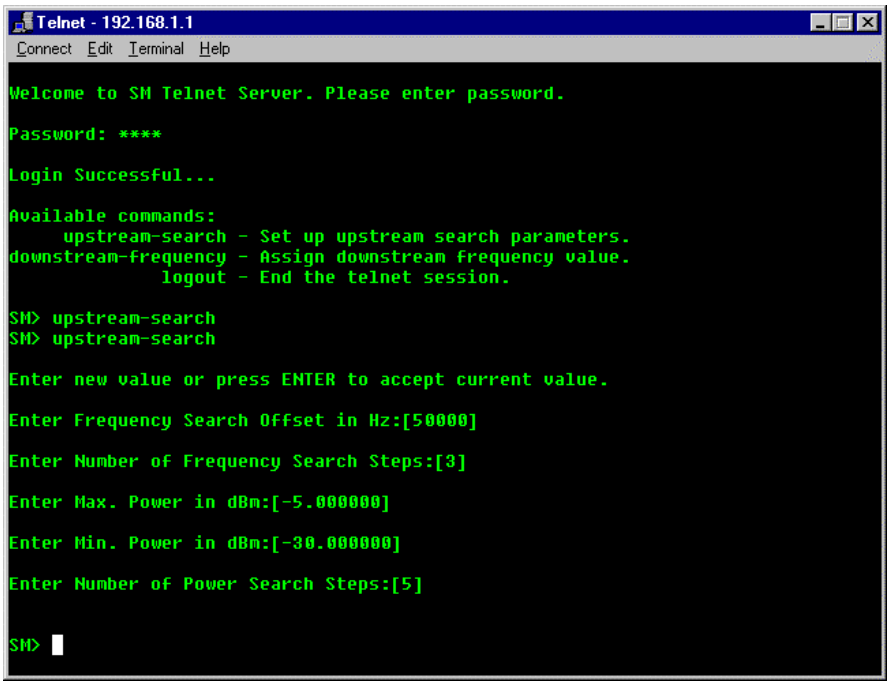
Note *The downstream frequency is the SM receive frequency, and the upstream frequency is the SM transmit frequency.*



Note *If an out-of-range value is entered, the program will display the correct range.*

12. At the ***SM>*** prompt, enter ***upstream-search***. Each of the upstream parameters and the current value will appear each time the ***Enter*** key is pressed. Either accept the current value, or enter a new value and press ***Enter***. If you do not want to change the existing value, just press ***Enter***. Refer to Table 2-1 for command parameter details. An example is shown below.

Note *Figure 2-3 shows the initial frequency/power search alogrithim that is used based on the entered values.*



13. Remove input power from the SM by unplugging the in-line power supply from the power source.
14. Disconnect the Ethernet cable from the Support PC, and connect it to the User's CPE.
15. Ensure the TX and RX coaxial cables are connected to the SM.
16. Apply input power to the SM, by plugging the in-line power supply into the power source. Observe the SM power indicator lights.
17. Turn on and boot the CPE. Observe the SM LAN indicator lights.

Note *No special software is required to be installed on the users computer to operate the SM.*

18. Refer to the CPE's Operating System documentation, and configure the CPE to automatically obtain an IP address from the DHCP server.

Note *Refer to the documents provided with your Internet browser to surf the Internet.*

19. See Figure 3-1 and refer to Table 3-1. Observe the SM front panel indicators as the SM acquires the downstream signal, and completes the ranging/registration process. The IP address is automatically obtained from the Internet Service Provider (ISP).

Note *The Provisioning Process may be different depending upon local ISP guidelines.*

20. After the satellite modem is installed and configured correctly, and the CPE obtains its IP address, you are ready to surf the Internet.

Table 2-1 Configuration Commands and Parameters

Command	Parameter	Purpose [1]
downstream-frequency	**Downstream Frequency Value in Hz**	Specifies the downstream frequency used by the SM to receive traffic.
upstream-search	**Frequency Search Offset (F_{MAX})**	The maximum offset frequency in Hz, from nominal frequency, that the SM will use in its search for upstream lock.
	Number of Frequency Search Steps (F_N)	The total number of frequency appraisals to be made over ± F_{MAX} range.
	Max. Power in dBm (P_{MAX})	The highest power to be used in the upstream search, in dBm (This is not necessarily equal to the highest possible SM power output).
	Min. Power in dBm (P_{MIN})	The lowest power to be used in the upstream search, in dBm (This is not necessarily equal to the lowest possible SM power output).
	Number of Power Search Steps (P_N)	The total number of power levels to be appraised between P_{MIN} and P_{MAX} during upstream search.
[1]Figure 2-3 shows the search pattern based on the parameter values entered at the command line interface.		

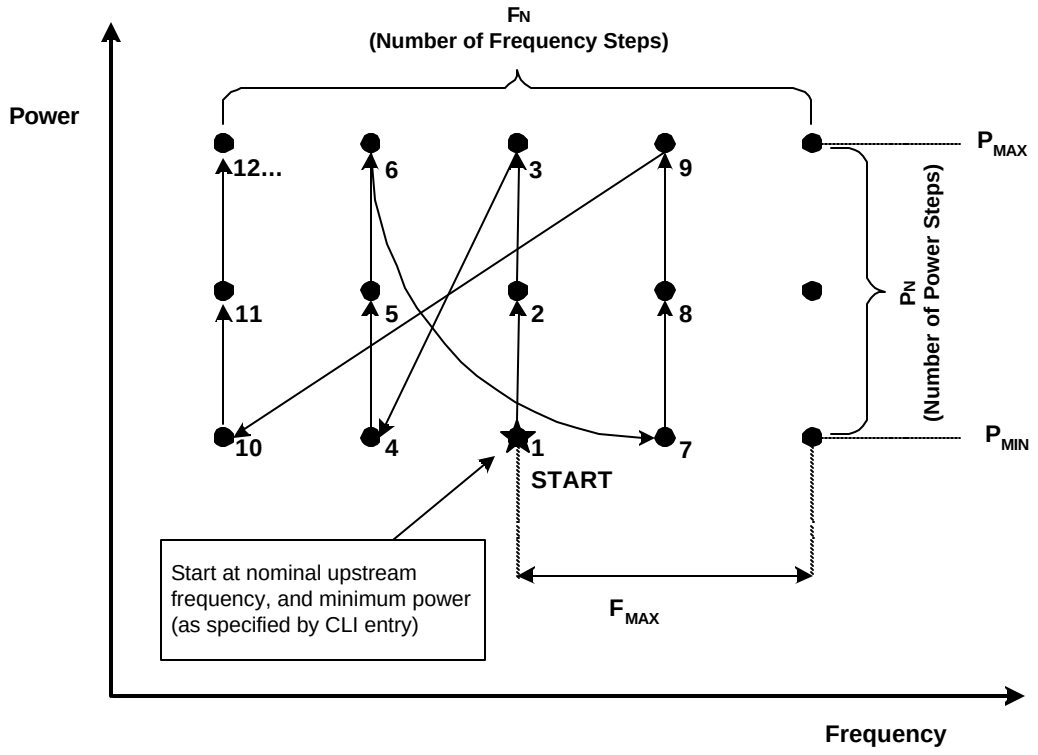


Figure 2-3 Upstream Frequency/Power Search Pattern

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3. Satellite Modem Indicators

Figure 3-1 shows the indicators on the satellite modem's front panel. Refer to Table 3-1 for a description of the indicators.

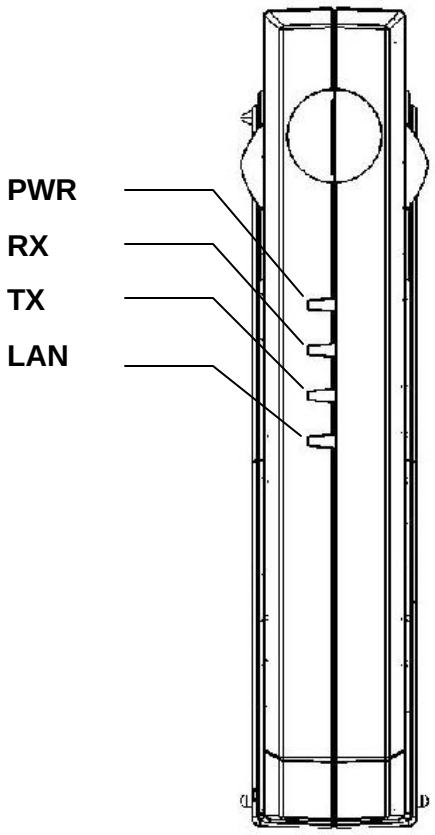

Figure 3-1 SM Front Panel Indicators

?

Table 3-1 SM Indicator Functions

Function	Indicator Conditions			
	PWR	RX	TX	LAN[1]
Power is not applied	OFF	OFF	OFF	OFF
Power is applied (startup)	ON	OFF	OFF	OFF
Power is applied (after startup)	ON	OFF	OFF	ON - CPE connected to Ethernet OFF - CPE not connected to Ethernet
SM acquiring Downstream	ON	"slow" blink (1-second period)	OFF	ON - CPE connected to Ethernet OFF - CPE not connected to Ethernet
Ranging/registration in process	ON	"fast" blink (½-second period)	FLASH during upstream traffic	ON - CPE connected to Ethernet OFF - CPE not connected to Ethernet
SM successfully ranged/registered (normal).	ON	ON	FLASH during upstream traffic	ON - CPE connected to Ethernet OFF - CPE not connected to Ethernet
Fault as a result of POST	ON	"very fast" blink (1/8-second period)	N/A	N/A
[1]If CPE is turned off, LAN indicator will not light.				

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4. Troubleshooting

This section contains information to aid in troubleshooting the equipment during or after installation. Refer to Table 4-1 and look for the symptom of your problem. Then go to the paragraph number as indicated in the Reference column.

Table 4-1 Fault Symptoms and Cross Reference

Symptom	Reference
PWR Indicator Does Not Light	4.1.1
RX Indicator Does Not Flash or Light	4.1.2
TX Indicator Does Not Blink	4.1.3
LAN Indicator Does Not Blink or Light	4.1.4
RX Indicator Flashing Very Fast (1/8 second rate)	4.1.5

4.1.1 PWR Indicator Does Not Light

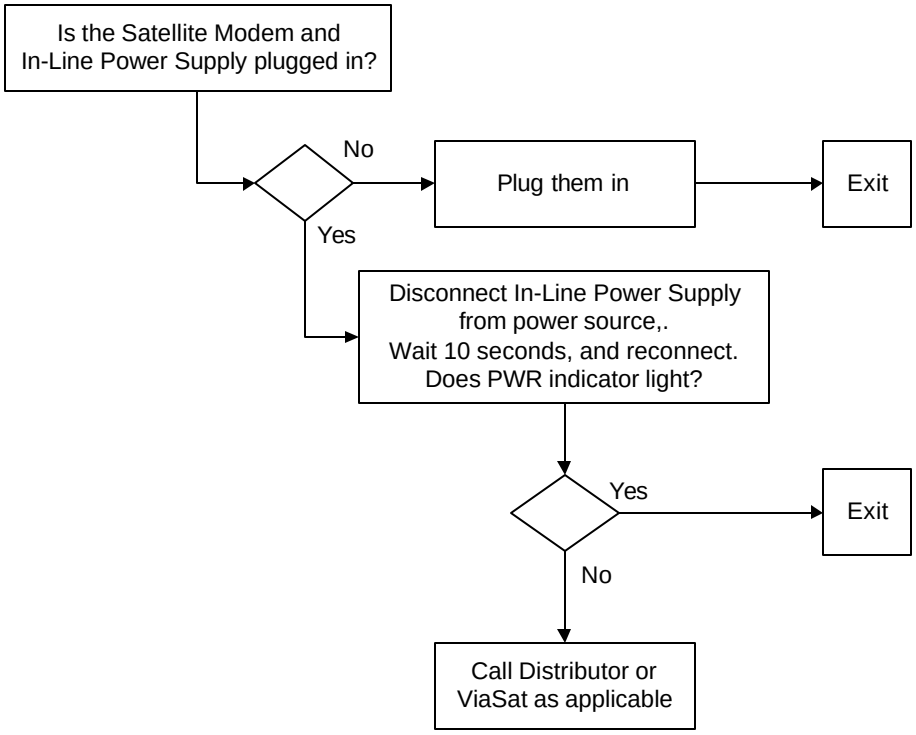

Figure 4-1 PWR Indicator Does Not Light

4.1.2 RX Indicator Does Not Flash or Light Steady

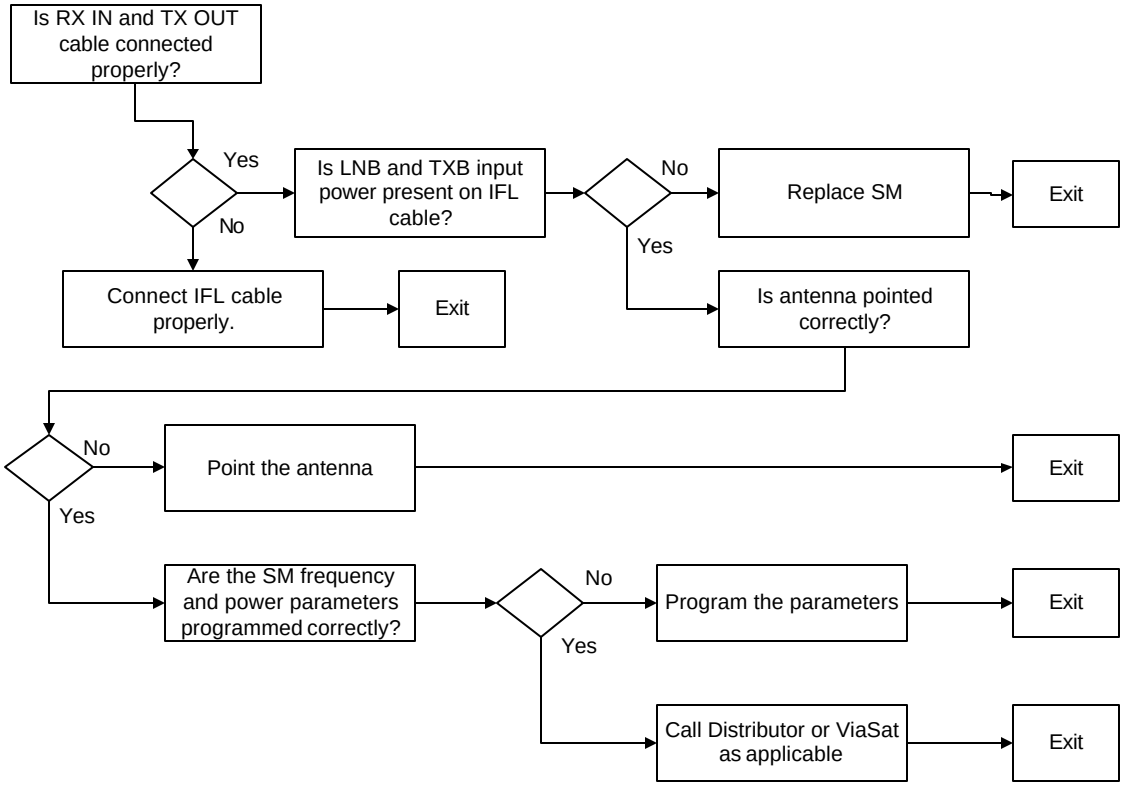

Figure 4-2 RX Indicator Does Not Flash or Light

4.1.3 TX Indicator Does Not Blink or Light

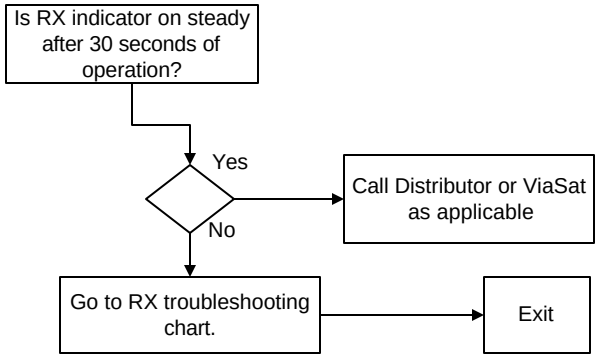

Figure 4-3 TX Indicator Does Not Blink or Light

4.1.4 LAN Indicator Does Not Blink or Light

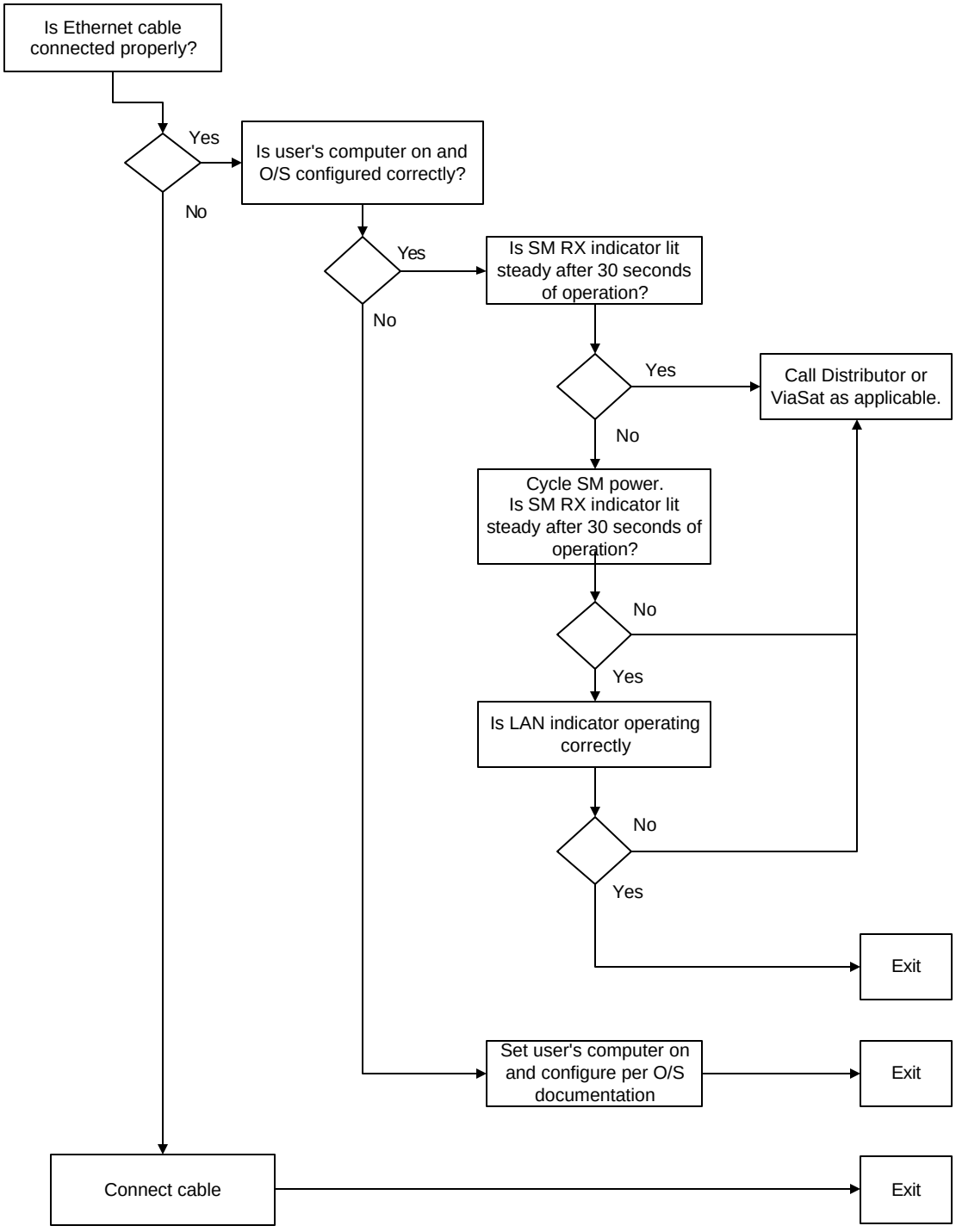

Figure 4-4 LAN Indicator Does Not Blink or Light

4.1.5 RX Indicator Flashing Very Fast (1/8 second rate)

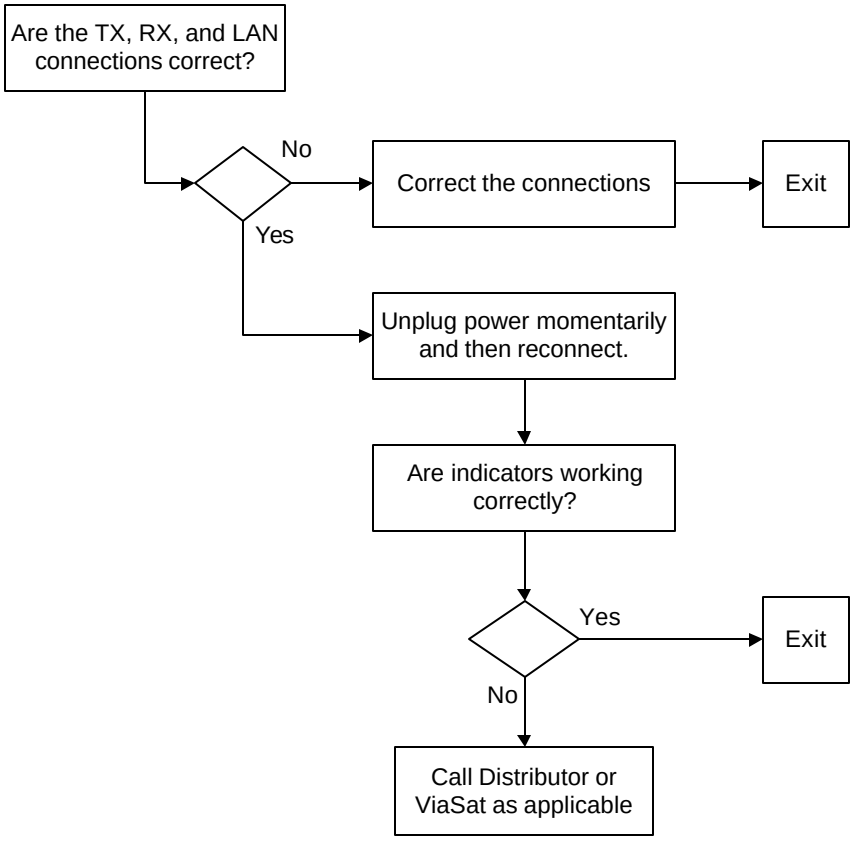

Figure 4-5 RX Indicator Flashing Very Fast

Appendix A Satellite Modem Network Parameter Values

The following table is provided for the Installer to record the initial parameter values required for SM installation.

Parameter	Value
Downstream Frequency Value in Hz	
Frequency Search Offset (F_{MAX}, Max frequency offset from nominal of ODU)	
Number of Frequency Search Steps (F_N, Number of Frequency steps between nominal and F_{MAX})	
Max. Power in dBm (P_{MAX}, Highest Power level to use in search)	
Min. Power in dBm (P_{MIN}, Lowest Power Level to use in search)	
Number of Power Search Steps (P_N, Number of Power Steps to use in search)	

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Appendix B Index

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