

Assembly instructions: Windcube Communications BGAN M2M Satellite Kit



Windcube_BGAN_Instructions Rev. 2.0

Windcube Communications | BGAN M2M Satellite Kit



TABLE OF CONTENTS

SUMMARY
BEFORE HEADING TO THE SITE
TOOLS REQUIRED
SYSTEM BLOCK DIAGRAM
PROCEDURE
APPENDIX A 2.2 M TOWER INSTALLATION
2.1 Site Layout
2.2 Tower Assembly9
2.3 Guying and Tower Raising11
Anchor Loads – Imperial Units16
Anchor Loads – SI Units
APPENDIX B ANCHORING GUIDELINES DETERMINE SITE SOIL AND ANCHOR TYPE BEFORE YOU ORDER YOUR TOWER
Anchor Choices and other considerations17
Installing Screw-In Anchors
Installing Arrowhead Anchors19
Grounding20
APPENDIX C USING THE BGAN M2M SATELLITE TERMINAL WITH WINDCUBE
Introduction
Account Setup and Confirmation21
BGAN Antenna Mounting22
Power and Antenna Connections24
Configuration of the BGAN M2M Terminal24
Connect to BGAN
Point the Antenna



SUMMARY

Step-by-step instructions for the field installation of the Windcube BGAN M2M Satellite Kit are provided below.

This kit works by placing a firewall in-between the Windcube and a BGAN modem. This approach is necessary to keep data usage to a reasonable level, keeping communications costs similar to using cellular service.

By default, the firewall is set to upload files to an NRG Systems-administrated server, which will relay the data file to an FTP server of your choice. Also, remote access is enabled for NRG Tech Services. This firewall is fully customizable, but the simplest approach is to leave administration to NRG.

BEFORE HEADING TO THE SITE

- 1) Contact your IT administrator or data handler to get FTP credentials for the Windcube data files
 - a. Host address
 - b. Username
 - c. Password
 - d. Port number
- 2) Determine your IP addresses
 - a. Contact your IT administrator or use <u>www.whatismyip.com</u> to determine your public facing IP address for each location you'll want access from.
- 3) Activate your BGAN service with Wireless Innovation
- 4) Send above information to <u>support@nrgsystems.com</u> for pre-configuration

TOOLS REQUIRED

- 1. #2 Phillips screwdriver
- 2. Small flathead screwdriver
- 3. Ratchet set with 3/8" socket
- 4. 3/8" wrench
- 5. Large adjustable wrench (up to 1 1/8 inch capacity minimum)
- 6. Metal bar for anchor installation (tire iron or similar, 0.6 m / 2 feet minimum length)
- 7. Cordless Drill with 5/16-inch nutdriver bit (for tightening hose clamps)
- Laptop computer with configurable Ethernet adapter
 NOTE: Instructions in this document will be given for Windows 10 operating system
- 9. Ethernet cable
- 10. Cheap headphones or a speaker for BGAN antenna pointing tool (optional)
- 11. Plumbers' putty



SYSTEM BLOCK DIAGRAM





PROCEDURE

The process involves:

- Unpacking the equipment
- Deploying the 2.2m tower
- Installing the shelter box and antenna mount
- Initializing and configuring the BGAN modem
- Aiming the antenna
- Configuring the Windcube LAN settings
- Configuring the firewall
- A) Unpack the equipment, group pieces by:
 - a. Tower
 - b. Shelter box assembly
 - c. Antenna
 - d. BGAN Modem

B) Deploy the 2.2m tower

a. See Appendix A for installation instructions

C) Install the shelter box

- a. Attach the shelter box to the tower with the included hose clamps
- b. Insert the included SIM card into the BGAN terminal
- c. Mount the BGAN terminal in the shelter box
- d. Connect power to the BGAN terminal

D) Initialize and configure the BGAN modem

- a. See Appendix C for installation instructions
- E) Aim the antenna

F) Configure the Windcube LAN Settings

- a. Stop measurement on the Windcube (Click Running > Yes)
- b. Click Configure, scroll to bottom
- c. Click Configure Ethernet Device
 - i. IP = 10.10.10.10
 - ii. Netmask = 255.255.255.0
 - iii. Gateway = 10.10.10.1
 - iv. DNS ½ = [leave blank]

G) Connect PC to BGAN and confirm communications by going to <u>www.google.com</u>

H) Disconnect PC from BGAN

Windcube Communications | BGAN M2M Satellite Kit



 Configure the firewall (only necessary if not using NRG's pre-configuration) NOTE: Firewall is preconfigured for remote access by, and to transfer files to NRG Systems for handling.

Firewall rules allow communication from the Windcube to an FTP server, and allow for incoming connections from preset IP addresses. These rules are essential to limit excess data usage and keep the system operating as intended.

For remote connections, you will need to add rules that "whitelist" the IP addresses you will access the Windcube from.

- a. Connect PC to the configuration port on the firewall
- b. Change PC Ethernet adapter to:
 - i. IP Address = 10.10.1.10
 - ii. Subnet mask = 255.255.255.0
 - iii. Default gateway = 10.10.1.1
- c. Instructions for configuring the firewall are in Wireless Innovation's MichroCube user manual, a separate document.

J) Connect Ethernet cables to MichroCube firewall box

- a. Be sure Windcube bottom rack P2 is connected to the LAN port in the trap door (not 3G modem)
- b. Windcube LAN port- must be configured for DHCP (Note: Windcubes are by default)
- c. Laptop (for configuration)
- d. BGAN modem

Windcube Communications | BGAN M2M Satellite Kit





H) Close shelter box and plug pass-throughs with plumber's putty



APPENDIX A | 2.2 M TOWER INSTALLATION

(additional information in the SRA System Installation manual: https://www.nrgsystems.com/assets/resources/SRA-Manual2.pdf)

2.1 Site Layout

NRG recommends an anchor location of 67.5 inches (171.5 mm) radially from the tower center as shown in Figure 2-1. This distance can be increased 70-100 inches (1.7m-2.5m) if desired. Final site layout and anchor location will be driven by site requirements and is the ultimate responsibility of the installer.



Windcube_BGAN_Instructions Rev. 2.0

Windcube Communications | BGAN M2M Satellite Kit



Figure 2-1: Site Layout Map

2.2 Tower Assembly

Assemble the Baseplate

Figure 2-2 shows the 4 sections of your baseplace including the (4) 3/8" bolts and (4) nuts.



Figure 2-2: Baseplate Sections with hardware

Assemble the (4) baseplate sections by placing the two flat sections on the ground parallel to each other. Attach the (2) vertical baseplates to the horizontal baseplates by threading (4) 3/8" bolts from the



Windcube Communications | BGAN M2M Satellite Kit



top of the horizontal baseplates as shown in **Figure 2-3**. Secure each bolt with a 3/8" nut. Two sections provide vertical support for the tube and the other two sections provide stability on the ground.

Figure 2-3: Attach Vertical Baseplates to Horizontal Baseplates

Install Tube and Hardware

Lay the base tube on the ground with the lower hole lined up with the lower, centered hole in the baseplate assembly. Insert one ½ -inch tube support bolt through the lower hole and install the appropriate nut as shown in **Figure 2-4**.



Figure 2-4: Insert Tower Tube into Baseplate



Thread the tube guy ring over the top of the tube section with tabs angled towards the base of the assembly until it comes to rest against the preinstalled $\frac{3}{4}$ " screws as shown in **Figure 2-5**.



Figure 2-5: Thread Guy Ring onto Tower Tube

2.3 Guying and Tower Raising

Raise Tower Tube to Vertical Position

With the single $\frac{1}{2}$ " x 5" bolt installed in the bottom hole of the tower tube base, pivot the tower to a vertical position and install the second $\frac{1}{2}$ " x 5" bolt and tighten with nut as shown in **Figure 2-8**.



Figure 2-8: Tower in Vertical Position

Windcube Communications | BGAN M2M Satellite Kit



Once the assembled baseplate is in its final position, drive the ground rod through the appropriate hole in the assembly to provide additional anchoring for the assembly as shown in **Figure 2-9**.



Figure 2-9: Drive Ground Rod

Prepare and Attach Turnbuckles



Loosen all turnbuckles to their maximum length and apply anti-seize compound to the threads. Secure one end of each turnbuckle to the guy ring as shown in **Figure 2-10**.



Figure 2-10: Attach Turnbuckle to Guy Ring



Attach the other end of the turnbuckle to the thimble on the guy wire as shown in **Figure 2-11**.

Figure 2-11: Attach Turnbuckle to Guy Wire's Thimble

Windcube Communications | BGAN M2M Satellite Kit



Install the Anchors

Install the anchors according to proper installation procedure for the anchor style. See <u>Appendix B</u> Anchoring Guidelines for installation instructions. The 2.2m Tower uses 4-inch screw in anchors.

Install the anchors so that the thimbles are located approximately 67.5 inches radially from the tower tube when the anchor is fully installed. Refer to **Figure 2-12**, and <u>Appendix B</u>.



Figure 2-12: Anchor Installation

Prepare and Attach Guy Wires

After the guy wire thimble is attached to the turnbuckle, run the wire down through the anchor and attach back to itself using the 2- 3/16" wire rope clips as shown in **Figure 2-13**. Ensure that there is no slack in the guy wires before tightening the wire rope clips, but do not pull excessively taut. Repeat this process for the other 2 guy wires.

Windcube Communications | BGAN M2M Satellite Kit



Place the wire rope clip on the wire so the saddle (the forged, grooved part) cradles the wire coming from the tower and the "U" bolt part clamps down on the dead end of the guy wire ("Never saddle a dead horse" may help you to remember how to secure the wire rope clips).



Figure 2-13: Attach Guy Wire to Anchor

Plumb and Straighten

To secure and straighten the tower, place the magnetic angle finder on the tower tube as shown in **Figure 2-14**. Hand-tighten the guy wire turnbuckles while monitoring the angle of the tower. Do not use any tools for added leverage when tightening. The final guy wire tension should be sufficient to prevent substantial movement of the tower, but overtightening the wires can damage the turnbuckles.



Figure 2-14: Plumb Tower

Windcube Communications | BGAN M2M Satellite Kit



Anchor Loads – Imperial Units

90 mph wind speed, max anchor load=71.6 lbf

120mph wind speed, max anchor load=127.3 lbf/ 566 N

Anchor Loads – SI Units

145 kph wind speed, max anchor load = 318 N

193 kph wind speed, max anchor load= 566 N



APPENDIX B | ANCHORING GUIDELINES

DETERMINE SITE SOIL AND ANCHOR TYPE BEFORE YOU ORDER YOUR TOWER

Before the tower is ordered, the soil type should be determined and the correct anchors ordered. The purpose of this section is to give you the information needed to provide suitable anchoring for your tower.



Because anchor requirements are site specific, it is the responsibility of the customer to determine anchor requirements. If you are not sure what is required, seek professional guidance.

Local utility companies can often provide useful information regarding anchoring used in the site area. Do not use rebar anchors, especially when the surface soils are loose or wet.

Class	Common Soil Types	Geological Soil Classification
3	Dense clays, sands and gravel; hard silts and clays	Glacial till; weathered shales, schist, gneiss and siltstone
4	Medium dense sandy gravel; very stiff to hard silts and clays	Glacial till; hardpan; marls
5	Medium dense coarse sand and sandy gravels; stiff to very stiff silts and clays	Saprolites, residual soils
6	Loose to medium dense fine to coarse sand; firm to stiff clays and silts	Dense hydraulic fill; compacted fill; residual soils
7**	Loose fine sand; Alluvium; loess; soil- firm clays; varied clays; fill	Flood plain soils; lake clays; adobe; gumbo; fill

Table B-1: Soil Classes*

** In class 7 soils, it is advisable to place anchors deep enough to penetrate underlying class 5 or 6 soil.

* Charts reproduced by permission, The A.B. Chance Co.

Anchor Choices and other considerations

The choice of anchors must take into consideration soil type, maximum winds expected, icing or other weather that may affect the tower, and a safety factor suitable for the location and to meet any legal requirements. Considerations include but are not limited to: tornadoes, hurricanes or typhoons, locations where very high winds are expected, potential for flooding or periodic soaking of the soil, soil erosion, and icing events.

Windcube Communications | BGAN M2M Satellite Kit



Screw-In Anchor description

Screw-in anchors are the most commonly used anchors for normal clay soils without rocks and are the standard anchors supplied with the RNRG SRA System. They are installed by hand, using a cross bar to screw them into the earth like a corkscrew.

Arrowhead Anchor description

Arrowhead anchors can penetrate stiff and rocky soils because the unique triangular design threads its way between obstacles such as rocks, which can prevent successful installation of screw-in anchors. Arrowhead anchors are driven into the ground with a hardened steel drive rod. Once in the ground, upward force on the attached cable rotates the anchor perpendicular to the cable for maximum holding power.

Other Anchor types

There are other anchor types such as rock anchors and site-built concrete anchors. These types are not commonly used for a tower this size.

Installing Screw-In Anchors

Note: Unlike a tent stake, screw-in anchors are installed in line with the pull of the guy wires from the tower. It is important to install the anchor at an angle, so the eye of the anchor is toward the tower and the helix screws in away from the tower. If the anchor is incorrectly installed straight into the ground, the load will bend the rod and pull it through the ground, allowing the guys to go slack.



SCREW IN ANCHOR

Figure B-1: Screw-In Anchor Installation

Screw the anchor into the ground by placing a stout bar through the eye of the anchor and rotating clockwise. It is sometimes helpful to start the anchor into the ground straight down for the first turn,

Windcube Communications | BGAN M2M Satellite Kit



then push it down to the correct angle and complete the installation. Continue screwing the anchor into the ground until about 75 mm (3 inches) of the anchor rod remains above the ground.

If the anchor cannot be installed due to rocks in the soil, or other obstacles, try placing the anchor as much as 1 m (3 feet) from its ideal position to avoid the obstacle, or replace the screw-in anchor with the correct anchor for the soil. Arrowhead anchors are often suitable for rocky soils.

If necessary, a hole can be dug for the screw-in anchor to the proper installed depth, the anchor placed in the hole, and the hole back-filled. The earth must be tamped onto the anchor hard while back filling. The holding power of an anchor placed this way will not be as great as an anchor screwed into undisturbed soil. If in doubt, get professional advice on whether this option will work for your site.

Installing Arrowhead Anchors

Arrowhead anchors are designed for all soils but are especially effective in rocky soils. The arrowhead anchor is driven into the soil with a drive rod. The rod is removed and the anchor is left in the ground. Then the anchor must be pre-tensioned which will cause the anchor to rotate in the ground and develop its full holding potential.

Like screw-in anchors, the arrowhead anchor must be placed so the force from the guy wires pulls directly on the anchor. Drive the arrowhead anchor away from the tower at an angle into the ground.

Note: It is important to drive the anchor at an angle. If the anchor is incorrectly installed straight into the ground, the load will result in the anchor cable cutting through the ground until the angle is correct, resulting in significant slack in the tower guys, and possible tower failure.



ANCHOR, AS DRIVEN

ANCHOR, PRE-TENSIONED

Figure B-2: Arrowhead Anchor Installation

Windcube Communications | BGAN M2M Satellite Kit



To install the anchor, place the drive rod over the anchor's shank. Drive the anchor into the soil using a sledgehammer, fence post driver, or power jackhammer, until the cable eye attached to the anchor is 50 mm (2 inches) to 100 mm (4 inches) above the surface of the ground.

After the anchor is driven, remove the drive rod, leaving the anchor in the ground. The anchor must now be pre-tensioned by applying strain to the cable. This can be done using a lever, come-along, jack, or winch. Pre-tensioning causes the anchor to rotate in the ground and develop its full holding power. The pull distance will be approximately the length of the anchor head, 203 mm (8 inches). The tension should become significantly higher as the pre-tensioning is complete.

Note: The anchor must be properly pre-tensioned before attaching the tower guys. If it is not, the tower guy wire tension will turn the anchor later, resulting in significant slack in the guy wires and possible tower failure.

Grounding

Meteorological sensors, loggers, and towers accumulate static electrical charge unless they are properly grounded. High winds, low humidity, and the height of the tower above ground increase the rate of charge accumulation. Charge continues to accumulate until the developed voltage difference, sometimes thousands of volts relative to ground, causes dielectric breakdown and an electrostatic discharge (ESD). ESD will damage any scientific instrument or sensor, including RNRG loggers, RNRG 40C anemometers, or RNRG 200P wind vanes. By attaching an RNRG logger or other instrument to a properly grounded SRA tower, and sensors to the logger, the logger and sensors will also be electrically grounded.

Properly grounding your system helps protect your sensors, your measurement instruments, and your data!

It is your responsibility to provide proper earth grounding for the tower, logger, and sensors. All warranties on RNRG instruments and sensors are voided if your system is not properly grounded.



APPENDIX C | USING THE BGAN M2M SATELLITE TERMINAL WITH WINDCUBE

Introduction

This appendix describes the steps required to use the Hughes 9502 BGAN M2M satellite terminal with a Windcube Lidar and Wireless Innovation MichroCube firewall. The terminal and firewall get their power from the same source as the Windcube by way of a Y cable splitter, included in the kit.

Account Setup and Confirmation

The BGAN M2M satellite terminal includes an M2M SIM card and activation form for Wireless Innovation Windlinx service. Upon receipt of your BGAN system, use the details found on the included activation sheet to activate BGAN M2M service through the web portal at www.windlinx.net. If you are new to Wireless Innovation and WindLinx, please visit and review the information at www.windlinx.com.

It is strongly advised to activate the account several days before your field installation.

Once you have activated your account, Wireless Innovation will send you an "infopack" that contains the settings required for using the Packet-Mail SMTP server. Additionally, a public static IP address will be sent to you via confirmation email. You will need this information in order to set up your BGAN M2M terminal and enable Windcube communications.

Other Pre-Installation Considerations

Inmarsat's satellite constellation consists of geostationary satellites, which require the BGAN antenna to be installed (i.e., pointed) toward the appropriate satellite. It is advantageous to obtain the coordinates of the site ahead of the installation date, so that a Satellite Pointing Application or the Location Spreadsheet on the Hughes BGAN support page (<u>http://www.bgan.hughes.com</u>) can be referenced to determine the approximate azimuth (compass heading) and elevation (vertical angle) for pointing the BGAN Antenna. In complex terrain, or in installations near structures be sure to establish a clean line of sight between the antenna and satellite. Determining the optimal antenna mounting location prior to installation will save time for the field crew when on site to point the antenna.

Tools

- PC / laptop web browser
- Hughes 9502 manual
- Wireless Innovation Infopack
- Wireless Innovation confirmation email (contains static IP details)
- WindLinx SIM card
- Ethernet cable to connect BGAN terminal to PC
- Adjustable wrench (for antenna mounting)
- BGAN Pointer Application for iPhone (optional)
- Headphones or speaker for BGAN antenna pointing tool (optional)
- Small flat blade screwdriver for securing BGAN power leads
- Philips screwdriver for securing power leads to iPackACCESS

Windcube Communications | BGAN M2M Satellite Kit



Install SIM card

The provided Windlinx SIM card must be inserted in the BGAN M2M terminal to be able to establish satellite communications. Open the SIM Door on the terminal to insert the SIM card. The SIM card should be installed prior to the field installation.



Mount BGAN M2M Terminal inside the Shelter Box

1. Mount the shelter box to the tower and install the BGAN M2M terminal inside the shelter box using the provided bracket.

BGAN Antenna Mounting

The BGAN uses a directional plate antenna, which requires accurate pointing toward a BGAN Satellite.





The correct azimuth (heading) and elevation (vertical angle) of the BGAN antenna depend on location and can be looked up using the BGAN Pointer iPhone application or the Hughes BGAN support webpage. A hole and bolt arrangement in the bracket system allows the elevation to be adjusted in 2 degree increments, while the azimuth is continuously variable by moving the antenna bracket around the tower using the hose clamps. The inner portion of the bracket which affixes to the tower includes 5 holes A-E, with hole A closest to the tower. The outer bracket which pivots about the center contains 14 holes 1-14, with hole 1 located closest to the antenna plate.

tower / antenna	1	2	3	4	5	6	7	8	9	10	11	12	13	14
A	-	-	-	-	-	2	12	22	32	42	52	62	72	82
В	-	-	-	-	4	14	24	34	44	54	64	74	84	-
с	-	-	-	6	16	26	36	46	56	66	76	86	-	-
D	-	-	8	18	28	38	48	58	68	78	88	-	-	-
E	0	10	20	30	40	50	60	70	80	90	-	-	-	-

For example, the elevation will be 0° in position E1, 46° in C8, and 90° in E10.

Assemble the BGAN antenna bracket and mount it to the tower using the supplied hose clamps.

Windcube Communications | BGAN M2M Satellite Kit



Final elevation can be set after the BGAN has achieved a GPS lock. For expediency, GPS acquisition prefers the antenna to be mounted flat, pointing straiight up, which can be achieved either by placing the antenna on the ground, or by mounting on the bracket and adjusting the elevation to 90°.

Power and Antenna Connections

Connect the antenna to the BGAN M2M terminal using the supplied cable, and connect the power and ground cables from the terminal block in the shelter box.

Lay the antenna flat on the ground (facing up) so that it can achieve a GPS lock. When the modem is powered, it will automatically attempt to obtain a GPS lock, which can take up to 20 minutes. During this time, you can configure other settings.

Configuration of the BGAN M2M Terminal

The BGAN M2M terminal must be configured through the Hughes BGAN web user interface (WebUI). To access the configuration details, the terminal must be connected to a PC with a web browser (e.g. Internet Explorer, Firefox). *Take extra care during the configuration process, and only change settings as noted.*

Connect the BGAN M2M terminal to your laptop using the RJ45 Ethernet cable. The network adapter settings in the PC need to be on the same subnet as the BGAN; use the static address 192.168.128.199 for your PC.

To change your computer IP address, enter the "Network and Sharing" control panel, select change adapter settings, right-click on the Local Area Network connection, and select Properties. In the Local Area Network Properties window, select Internet Protocol Version 4, and click Properties.



Local Area Connection Properties										
Networking Sharing										
Connect using:										
Intel(R) Ethemet Connection (3) I218-V										
<u>C</u> onfigure										
This connection uses the following items:										
✓ In Client for Microsoft Networks ✓ In Client for Microsoft Networks										
Image: Construction of the state										
✓ → Internet Protocol Version 6 (TCP/IPv6)										
✓ Internet Protocol Version 4 (TCP/IPv4) ✓ Link-Laver Topology Discovery Mapper I/O Driver										
 ✓ Link-Layer Topology Discovery Responder 										
Install Uninstall Properties										
Description										
Transmission Control Protocol/Internet Protocol. The default wide area network protocol that provides communication										
across diverse interconnected networks.										
OK Cancel										

[Tip: At this point, if your computer is regularly connected to a LAN via Ethernet, you can optionally choose the Alternate Configuration tab for this information.]

You can get IP settings assigned automatically if your network sup this capability. Otherwise, you need to ask your network administr for the appropriate IP settings. © Detain an IP address automatically © Uge the following IP address: IP address:	pports rator
Detain an IP address automatically Uge the following IP address: IP address:	
Ouge the following IP address:	
IP address:	
Subnet mask:	
Default gateway:	
Obtain DNS server address automatically	
Use the following DNS server addresses:	
Preferred DNS server:	
Alternate DNS server:	

Select the radio button for "Use the following IP address:". Complete the fields below as follows:

- IP address = 192.168.128.199
- Subnet mask = 255.255.255.0
- Default gateway = 192.168.128.100

Windcube Communications | BGAN M2M Satellite Kit



Internet Protocol Version 4 (TCP/IPv4)	Properties	?	x					
General								
You can get IP settings assigned autor this capability. Otherwise, you need to for the appropriate IP settings.	natically if your network ask your network admir	suppor histrato	rts or					
Obtain an IP address automatical	У							
Use the following IP address:			— II					
IP address:	192 . 168 . 128 . 199	Э						
Subnet mask:	255.255.255.0							
Default gateway:	192 . 168 . 128 . 100)						
Obtain DNS server address automatically								
Use the following DNS server add	resses:	_						
Preferred DNS server:								
Alternate DNS server:								
Validate settings upon exit	Adv	anced						
OK Cancel								
or alternately								
internet Protocol Version 4 (TCP/IPv4) Properties								
General Alternate Configuration								
If this computer is used on more than o settings below.	ne network, enter the a	lternat	æ IP					
Automatic private IP address								
User configured			- 11					
IP address:	192 . 168 . 128 . 199	Э						
Subnet mask:	255.255.255.0							
Default gateway:	192 . 168 . 128 . 100	D						
Preferred DNS server:								
Alternate DNS server:								
Preferred <u>W</u> INS server:								
Alternate WINS server:								
Validate settings, if changed, upon exit								
	ОК	Car	icel					

Connect to BGAN

Once you click OK and close the window, the PC can communicate with the BGAN M2M terminal. In a web browser, enter the address 192.168.128.100. You should see the Hughes BGAN WebUI, served by the BGAN M2M terminal. Navigate the following webpages, and apply the settings as shown.

Home Page



The home page contains ID information for the BGAN including the IMEI, IMSI and APN. Note the APN "WILTD.BGAN.INMARSAT.COM" will only appear if the SIM card has been inserted.

<u>File Edit View History E</u>	<u>B</u> ookmarks <u>T</u> ools	<u>H</u> elp						
BGAN - Home	× +							
({ (i) 192.168.128.100/i	ndex.html							
		•						
HUGHE		all a	* 🗄					
	Home	Connections	Settings M2M	Security SMS				
9502 Home								
STATUS	Terminal Information							
Connection	Model	BGAN USER	R TERMINAL, Hughes 950)2				
Registering	IMEI	353938-03-0	11078-5					
Signal Strength: 43	Software Version	5.9.4.2						
GPS	SIM Information	90111211281	2008					
3D GPS Fix	APN	WILTD.BGA	WILTD.BGAN.INMARSAT.COM					
Location: 44.33858° N 73.11303° W	Subscriber Phone Nur	mber Not configu	configured by Service Provider.					
Last Fix: 04-May-2018, 20:23 UTC								
Pointing Info	Troubleshooting							
1-4 Americas	Terminal Logs	urrent Lan	Amblued Lan	Recetter				
	To download the lo	as to disk. Click or ri	nht-click the links below a	nd select 'Save Target As'				
	System Lon D	ownload Current						
	Event Log D	ownload Current	Download Archive	Reset Event Log				
	Packet Log D	ownload Current	Not Available	Reset Packet Log				
	Reset Terminal to Fa	ctory Defaults						
	Click this button to restore all terminal settings to their original default values.							
	Restore to Defaults							
	Reboot Terminal							
	Click this button to reboot the terminal software.							
	Reboot Terminal							

Settings Page

Configure the Ethernet Settings as follows:

- Wake On LAN = On
- Triggered after Idle timeout of 1 minute
- Triggered at Time Of Day = 0000



ile <u>E</u> dit <u>V</u> iew Hi <u>s</u> tory <u>I</u>	<u>B</u> ookmarks <u>T</u> ools <u>H</u> elp
BGAN - Settings - Etherne	et × +
 i 192.168.128.100/s 	settings_ethernet.html
HUGHE	S III S Setting MM Security SMS
0500	
9502	Etnemet Settings
ALL SETTINGS	Wake On LAN Settings Wake On LAN
IP Address / DHCP	Triggered after Idle Timeout of 1 Minutes (0=disabled)
Ethernet	Triggered at Time of Day (UTC) (eg: 1015 is 10:15AM; 0=disabled, 2400=midnight)
ATC Setup	Apply
D★D Features	MAC Address Filtering
	Enable MAC Address Filtering
	Allowed Map Addresses Add A Detroted Device IP Address IP Address 192.188.128.199 50:7b:9d:11:62:71
	Remove
	Apply

M2M Page

Configure the M2M Setup as follows:

Ping Configuration

- Context Watchdog = Off
- Primary Ping IP Address = 8.8.8.8
- Secondary Ping IP Address = 8.8.4.4
- Tertiary Ping IP Address = 0.0.0.0
- Ping Required = No

Windcube Communications | BGAN M2M Satellite Kit



Always ON Context

- Always On Context = On
- Static ACA IP Address = 192.168.128.200
- Qos = Standard
- APN Config = WILTD.BGAN.INMARSAT.COM

9502		M2M Setup					
STATUS	Ping Configuration						
Connection	Context Watchdog:	On O Off					
Registering		Sends a PING to keep the context alive and test connectivity. If ping fails and the unit can not recover, resets unit.					
Signal Strength: 41	Primary Ping IP Address:	8.8.8.8.					
40	Secondary Ping IP Address:	8.8.4.4. (Optional)					
GPS	Tertiary Ping IP Address:	0.0.0.0 (Optional)					
3D GPS Fix	Time between Pings:	60 minutes					
Location: 44.33840°N 73.11305°W Last Fix: 03-May-2016, 17:02 UTC	Ping Required:	Yes No (Always send ping even if other data sent recently)					
		Apply Changes					
Pointing Info							
A L4 Amoricas	Always ON Context						
	Always On Context:	🖲 On 🔘 Off					
	Static ACA IP Address:	192.168.128.20((If the Local IP address field is left blank, a context will be set up for the first device detected via an ARP)					
	QoS: Standard 👻						
	APN Config:	WILTD.BGAN.INMARSAT.COM					
		Apply Changes					

Check for GPS Lock

Once the above configuration is complete, go back to the Home screen and see if the GPS section is showing a 3D GPS Fix. Note that the Location coordinates may not yet be populated.





Point the Antenna

At this point, the BGAN antenna should be mounted to the bracket and properly oriented to point at the BGAN satellite. If you have an iPhone, there is a free application called "BGAN Pointer" which can help adjust the antenna. In some cases, no additional tool is needed. Alternatively, Satellite Pointing Applications are available on-line.

If the application is not available, the BGAN M2M module can be placed into a "pointing mode" where the user can plug headphones or a speaker into the audio port and follow the interval and pitch of the beeps to point the antenna. As the signal strength increases, the pitch will go higher and sound more frequently. Note: it is not recommended to put the headphones in your ears, because the beeps can be very loud.

To enter pointing mode, remove power from the BGAN, wait a few moments and then apply power. The BGAN enters a self-test for about 15 seconds and then the LED will start flashing for another 15 seconds. Within 15 seconds when the LED is blinking, press the function button on the BGAN M2M twice (short presses). When the BGAN terminal first enters pointing mode, all three LEDs will flash. The LEDs will be solid after establishing a GPS fix.