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USER GUIDE

BGAN

Installation & antenna orientation

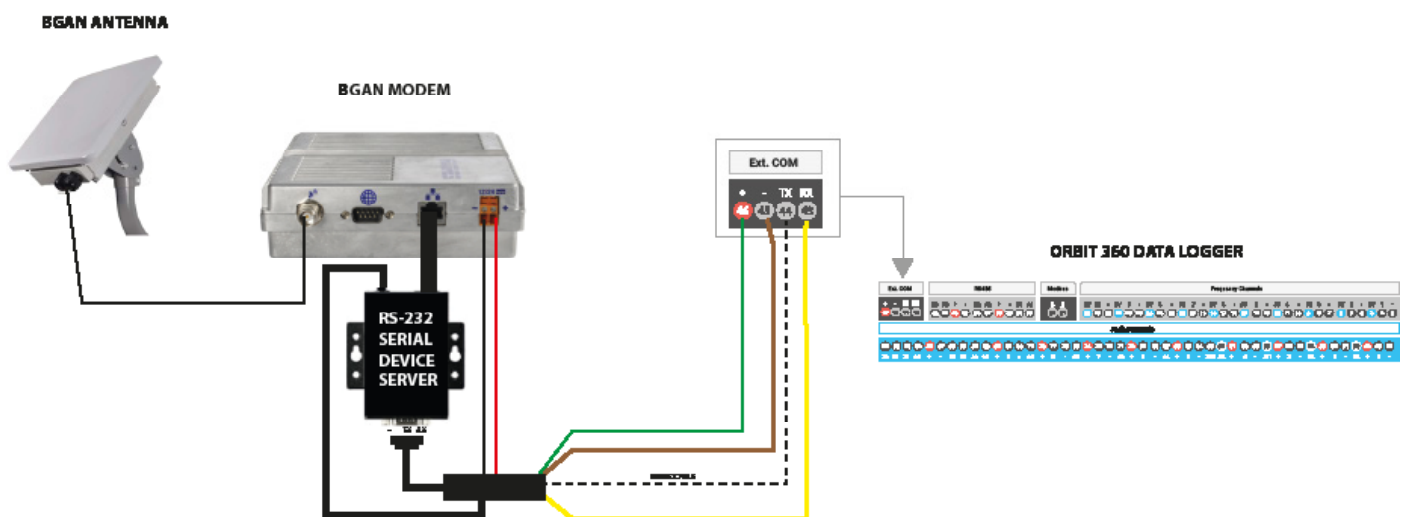
How to prepare the Orbit, Moxa & BGAN modem
How to install and pre-orientate the BGAN Antenna
How to fine adjust the BGAN antenna
How to configure BGAN communication in Atlas
Tests in case of not being able to communicate & to check the correct configuration

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HOW TO PREPARE THE ORBIT 360 DATA LOGGER, MOXA & BGAN MODEM

1. Verify that all cables are plugged in correctly and check for continuity (according to the wiring diagram shown below).
2. Make sure the data logger has the correct .sit file configured with BGAN communication in Atlas (see chapter 4 of the Orbit 360 user manual).
3. Verify that the BGAN SIM card is activated correctly with remaining data on the subscription.
4. Make sure that the IP from which you are trying to connect to the BGAN has permission in the Inmarsat Firewall to make the communication. To avoid this requirement you can use the option in Atlas to use a "M2M Gateway in BGAN connections". This setting can be found in "Settings>Process" in Atlas (see screenshot here below).

Use M2M Gateway in BGAN connections



HOW TO INSTALL AND PRE-ORIENT THE BGAN ANTENNA

The BGAN system operates with a directional antenna which means that the orientation of the antenna is crucial for its operation and good coverage.

Before installing the antenna support boom to the mast make sure the antenna will be located and orientated in such a way that it has a clear line of sight between the antenna and the satellite (unobstructed).

Follow these steps to verify in what direction to point the antenna. These steps should be performed outside:



Do not stand in front of the antenna. This device emits high-energy radiofrequency waves. Do not place the head or other body parts in front of the satellite antenna when the system is operational. Keep a distance of at least 1 m from the front of the satellite antenna.

1. Connect the BGAN RF antenna and screw the antenna onto the support boom (final antenna orientation will be adjusted later).
2. Connect the cross-wire ethernet cable from the BGAN modem to your laptop.
3. Power on the BGAN modem.
4. Wait until the Power and the GPS LEDs are on (fixed).

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5. Set the IP address 192.168.128.150 / 255.255.255.0 on your laptop

5A. Start by disabling the Wifi connection on your laptop.

5B. Open the "Control Panel" > "Network and Internet" > "Network and Sharing Center" > "Ethernet". Now right-click the "Ethernet Status" icon and click on "Settings".

5C. In the "Ethernet Settings" tab, click on "Internet Protocol version 4 (TCP/IPv4)" and then click "Properties".

5D. In the properties window set the following configuration:

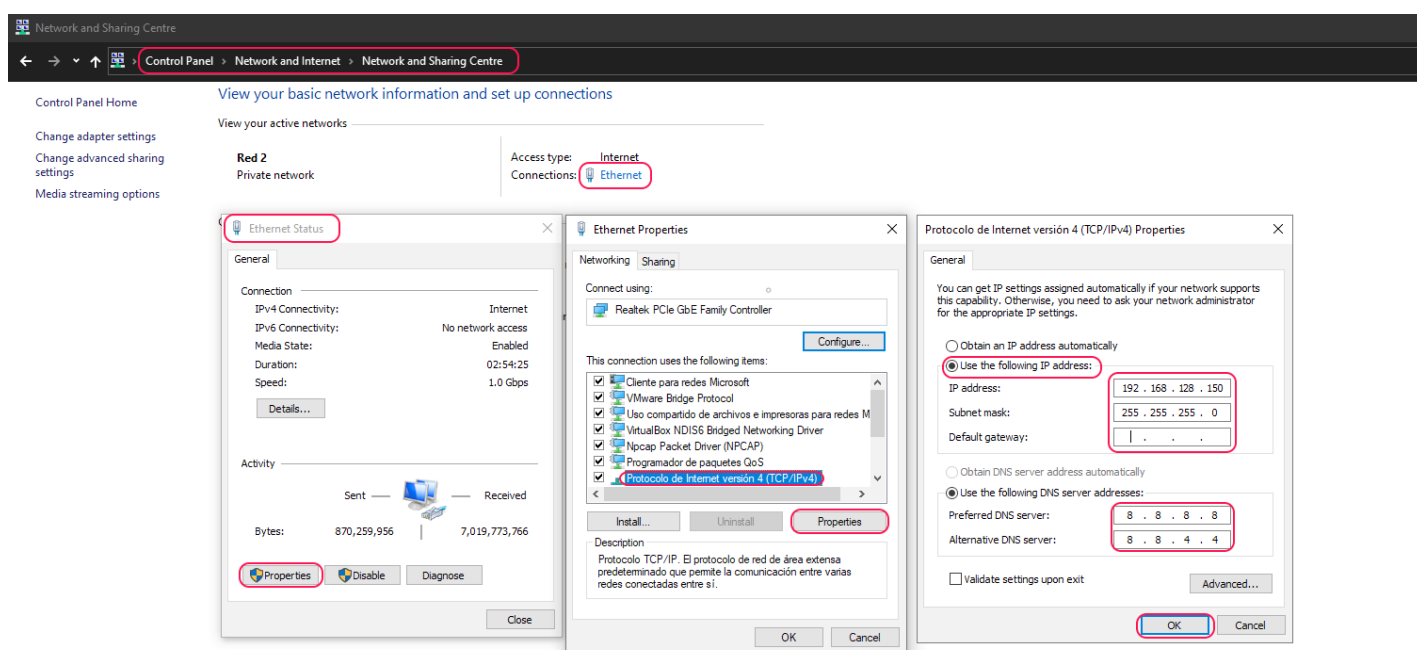
Click on "Use the following IP address:"

IP Address: 192.168.128.150

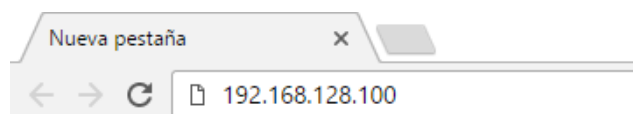
Subnet mask: 255.255.255.0

Default gateway: Leave empty --> (Important as this avoids consuming data from your BGAN data plan)

5E. Now click on "OK" until you exit the menu.

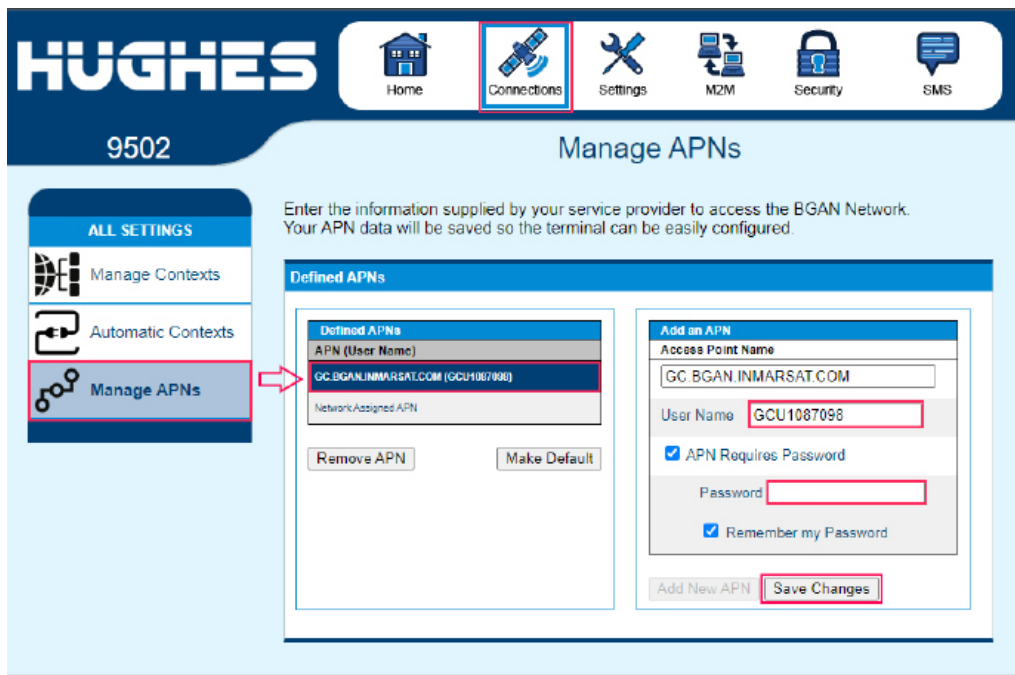


6. Now open your web browser to access the BGAN terminal by typing the following default IP address: 192.168.128.100.

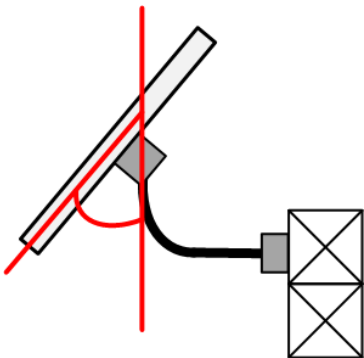
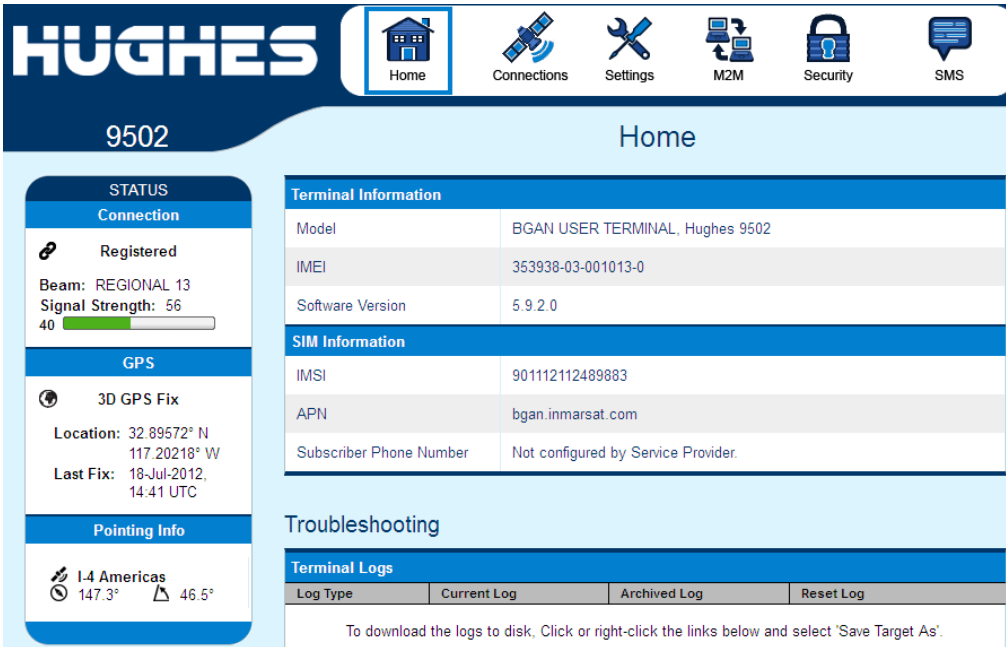


7. In case you have received an email from Kintech Engineering with a unique APN username and password you must use these for the BGAN configuration.

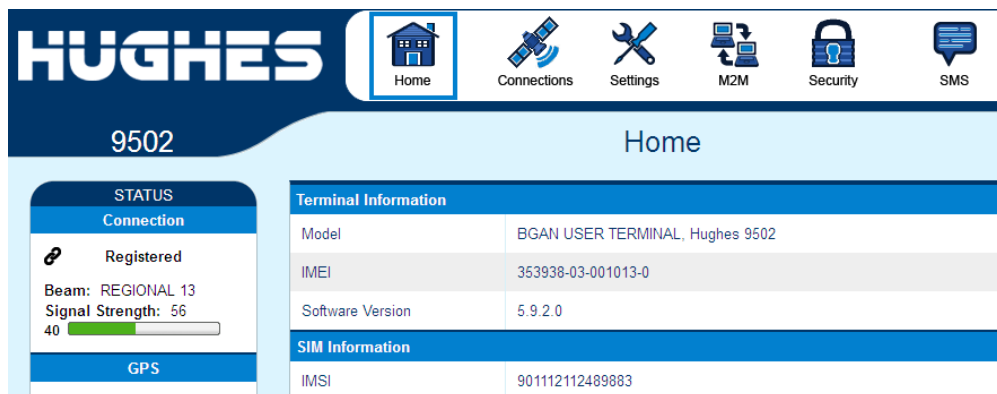
To do this, click on the "Connections" section and select Manage APN's and the window shown in the manual below will appear. To display the APN parameters click on the QC:BGAN.INMARSAT.COM... (indicated by an arrow in the screenshot below). This will allow you to edit the parameters and you will be able to add the username and password you received by email. Once added, save the changes. These parameters are unique for each BGAN sim card, so they cannot be used for other installations.



8. In the lower part of the STATUS box (indicated in the screenshot below) you can find the recommended orientation and inclination of the BGAN antenna. Now screw on the support boom to the mast according to this orientation and incline the BGAN antenna as indicated. Roughly adjust the BGAN antenna as indicated below in the inclination angle diagram (in the example below for that specific location the inclination should be 46,5° and the orientation should be 147.3°, however both of these settings are unique to each location so please look carefully what is shown in your case).



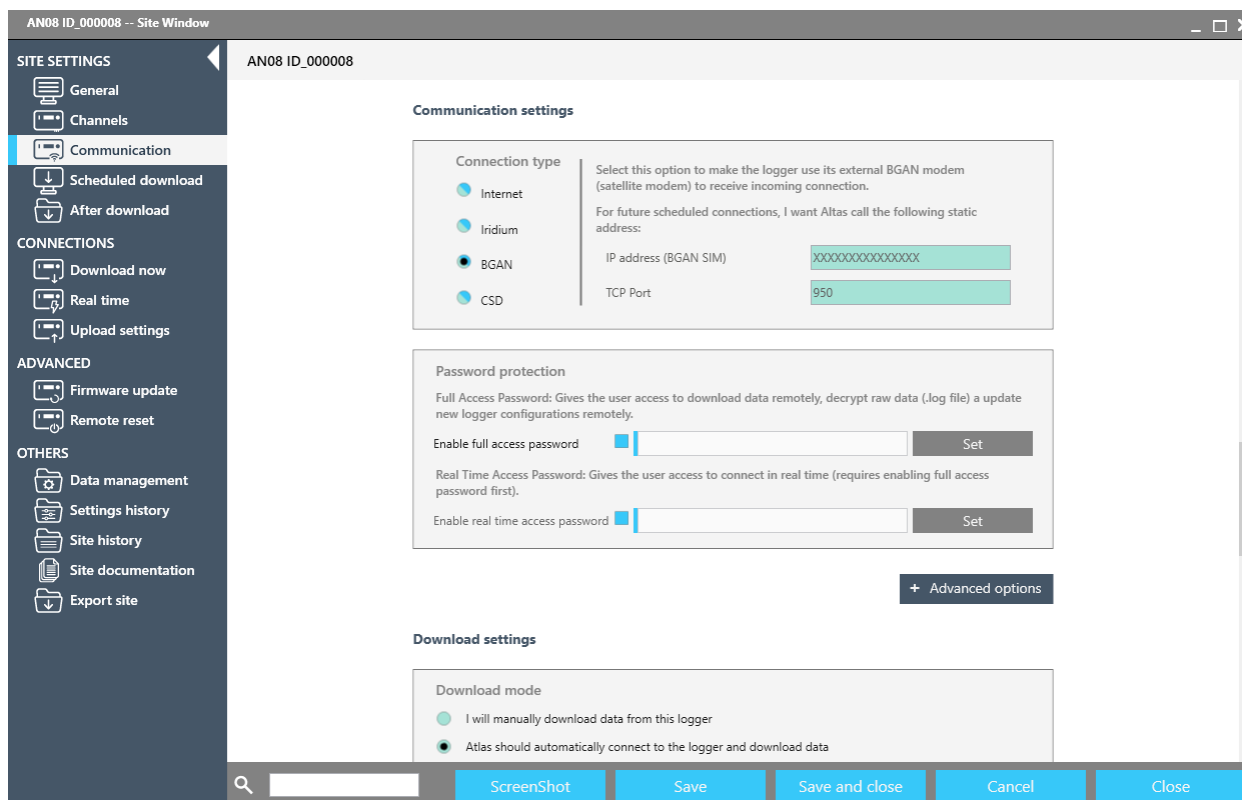
9. In the upper part of the STATUS box (indicated as Connection as shown below) check the green bar in order to verify the Signal Strength. Any value over 50 dB will be suitable for a good coverage (i.e. 56 dB as in example below).



10. You should fine adjust the BGAN antenna until the signal strength is as strong as it can be on the given location.
11. Exit the BGAN terminal in your web browser and turn off the BGAN modem.
12. Disconnect the ethernet cable from your PC and plug it back into the Moxa Nport.
13. Now turn on the BGAN modem, the data logger and the Moxa unit. If the BGAN modem and the Moxa unit and data logger are already turned on, then just turn the data logger off and then on again.

HOW TO CONFIGURE BGAN COMMUNICATION IN ATLAS

1. Open the corresponding data logger in Atlas and click on "Site Settings"
2. Click on the "Communication" on the left-hand menu and select BGAN in the "Connection type" section.
3. Type the IP address associated to your BGAN SIM card (this was sent to you by Kintech Engineering) and "950" in TCP Port.



If you have followed all of the above mentioned instructions you should now be able to connect to the data logger directly from Atlas. Make a short (not to consume too much data) realtime connection from Atlas to the data logger to verify this.

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TESTS IN CASE OF NOT BEING ABLE TO COMMUNICATE & TO CHECK THE CORRECT CONFIGURATION

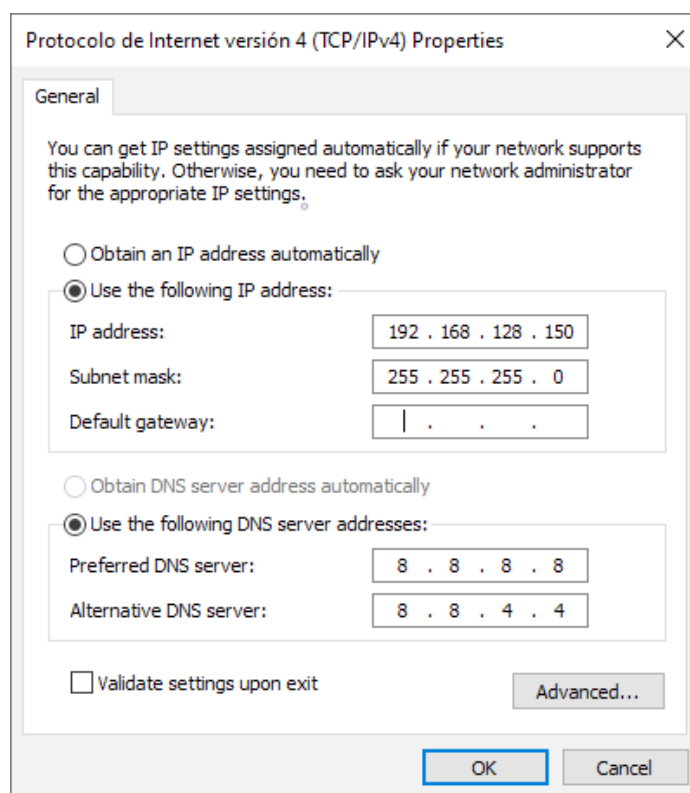
There are two different points to test:

A. How to test the communication between Moxa NPORT 5110 and the Orbit 360 data logger

To test the communication with the data logger through a Moxa (RS232/TCP converter), previously configured for working with a BGAN, the following steps must be carried out:

1. Using the Ethernet cable from the Moxa unit connect this cable to the laptop.
2. The IP in the Moxa has to be set to 192.168.128.101. The laptop should have its IP address in this same range. You can set the IP address in the laptop to 192.168.128.150 with the network mask 255.255.255.0.

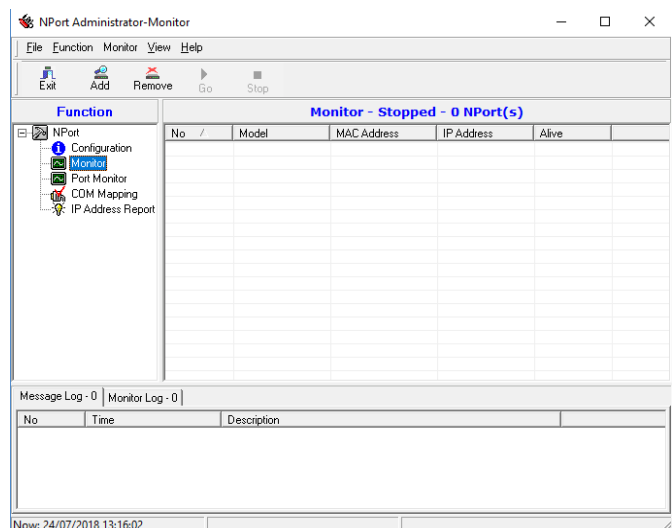
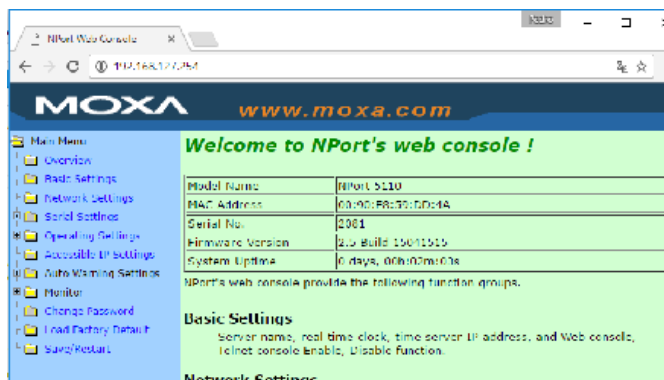
In the following screenshot it is shown how to setup the IP address of the Laptop.



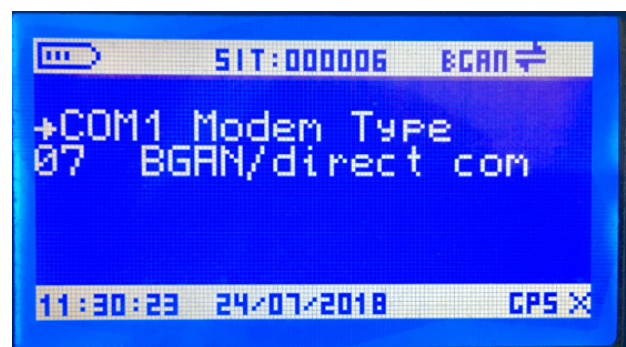
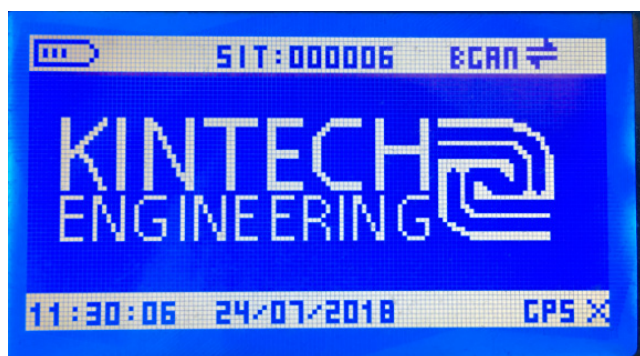
3. Now open a web browser and type the IP address of Moxa (192.168.128.101). You will be requested to type in the password of the Moxa unit (the password is "eol2020" or "moxa"). You should now see the Moxa configuration page (see below screenshot)

In case you can not access the configuration page of the Moxa unit you should contact Kintech Engineering for further support and help to use the software 'NPort Administrator' to check the Moxa configuration. This software must be ALWAYS opened as an administrator.

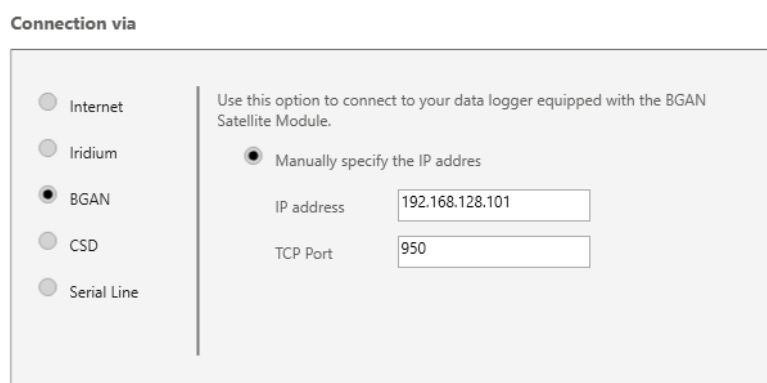
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4. Now verify that the data logger is correctly configured for working with the BGAN communication: The modem type in the data logger must be set to "7 - BGAN / Direct com" and the word "BGAN" should appear in the upper right corner of the data logger display.

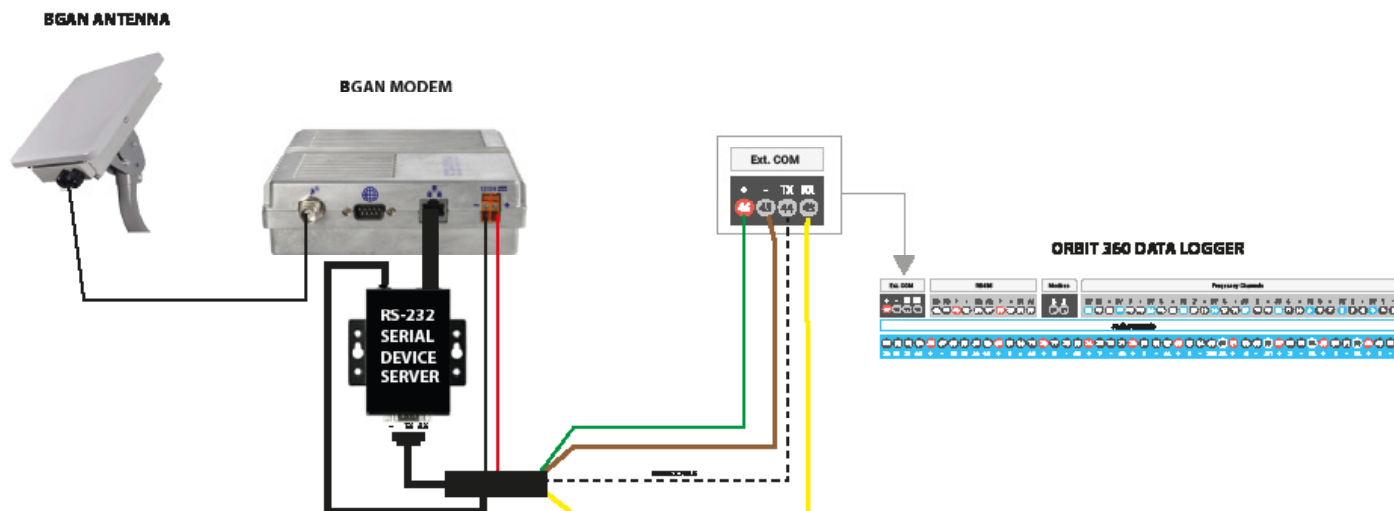


5. Now make a real time connection with the data logger (using Atlas installed on your laptop). with the laptop changing the Ip defined by the Moxa IP (192.168.128.101).



* In case its not working, check the serial cable between the data logger and Moxa. It is necessary to verify that the cable is connected following the diagram. * The connection of the TX and RX cables is very important because if they are connected in an inverted way, communication will not be possible.

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B. Final test of the communication between Atlas and the data logger (via internet and BGAN Modem and MOXA NPORT).

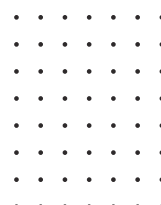
Check that the Ethernet cable is correctly connected between the Moxa unit and BGAN modem. Make sure that the Ethernet cable in use is a "crossed ethernet cable".

Configure the .sit file in Atlas and try to make a communication in real time using the IP address of the BGAN modem (This IP address was sent to you by Kintech Engineering).

* In case you can not make a real time connection between Atlas and the data logger do the following:

- Make sure that the SIM card inserted in the BGAN modem is active and with data available.
- Make sure that the IP from which you are trying to connect to the BGAN has permission in the Inmarsat Firewall to make the communication. To avoid this requirement you can use the option in Atlas to use a "M2M Gateway in BGAN connections". This setting can be found in "Settings>Process" in Atlas (see screenshot here below).
- Open a browser and type the IP address of the BGAN provided by Kintech Engineering. The Moxa configuration page should appear. **ATTENTION:** Only do this in the case of communication problems, as you will be consuming data from the BGAN satellite subscription.

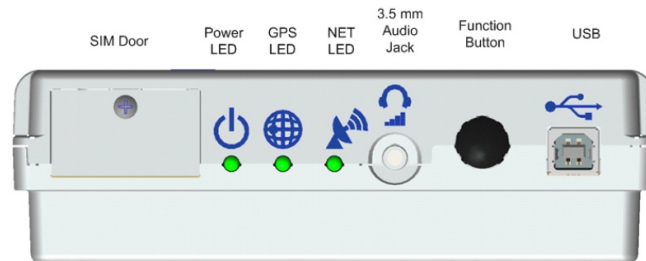
Use M2M Gateway in BGAN connections



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IN CASE YOU DONT HAVE A LAPTOP FOLLOW THESE STEPS TO ADJUST THE ANTENNA

1. Power on the BGAN modem.
2. The BGAN LEDs carry out a startup sequence that lasts 25-30 seconds. Wait until the Power LED on the front panel starts blinking with the other two LEDs off.
3. With the Power LED blinking, press the Function Button (less than 2 seconds, without holding it). If done correctly, the three LEDs will start blinking at the same time. The modem now enters orientation mode.



4. Once the modem is in orientation mode, there are two options to fine adjust the BGAN antenna:
 - a. Headphones: Insert the headphones into the 3,5 mm Audio Jack on the modem. These headphones are not supplied with the equipment, although most of the ones supplied with mobile phones are compatible. The BGAN modem will emit a beep proportional to satellite coverage. The better your orientation and therefore the coverage, the sharper and faster the beep.
 - b. Voltmeter (recommended): Insert the supplied audio jack cable with the white connection terminal into the BGAN modem. Now measure DC voltage with a voltmeter (see photo on the right). The modem will generate a voltage directly proportional to the correct orientation of the BGAN antenna and therefore to the satellite coverage signal. It is recommended to leave the BGAN antenna screwed onto the support boom with a value of 2,5 V or more for an optimal connection and never less than 2 V. The better your orientation and therefore the coverage, the higher the voltage value.
5. When you are done with the final adjustment of the antenna fix its position onto the support boom.
6. Press the Function Button (< 2 seconds, without holding it) to exit orientation mode.
7. To confirm that the orientation of the BGAN antenna is correct and the modem is available to communicate, wait until all three LEDs remain on. It may take about 2-5 minutes to stay on after a sequence of on and off. If the 3 LEDs do not remain fixed (on) after a few minutes, start the orientation process again (starting from chapter 2).
8. Make a real-time connection using Atlas from the office to verify that everything is OK.

SUMMARY OF THE THREE LEDs

See on the right the LED flow chart of the BGAN modem.

1. Power LED fixed: power OK.
2. GPS LED blinking: BGAN modem searching for GPS signal.
3. GPS Fixed LED: GPS signal OK.
4. NET LED blinking: registering on the network.
5. NET LED fixed (three fixed LEDs): BGAN modem with satellite coverage and ready for communication.

Note: The three LEDs turn off after one minute of inactivity to save power. To turn them back on and check the modem status short press the Function Button (<2 seconds).

