

## Modem 9502 BGAN M2M Satellite Terminal M71855 / M79205 / M71859

Order-No: M71855 - 9502 BGAN M2M satellite modem terminal  
 M79205 - Satellite communication set incl. modem, antenna, terminal, etc  
 M71859 - Mounting kit for satellite antenna (optional)

- **Cost-effective, ultra-low power consumption all-IP BGAN (Broadband Global Area Network) satellite terminal**
- **Auto-on/auto-context activation automatically restores power and PDP connection to itself following loss of power and/or IP connection**
- **Remote control via SMS**
- **Relay mode passes WAN IP address to the connected RTU**
- **Security enhancements with extended layers of embedded security options**



### Description

The Hughes 9502 IP satellite terminal provides reliable connectivity over the Inmarsat Broadband Global Area Network (BGAN) for IP SCADA and machine-to-machine (M2M) applications. The terminal delivers affordable, global, end-to-end IP data connectivity enabling applications in industry sectors such as environmental monitoring, video surveillance, and out-of-band management to primary site communications.

The exceptional low power consumption (<1 W idle) of the terminal makes it possible to provide end-to-end IP connectivity to sites that are off the grid. This breakthrough provides end-to-end IP connectivity to power-challenged locations that rely upon solar battery arrays involving sensitive power budgets.

The Hughes 9502 includes 10 meters of RF cabling, granting the user freedom to position the antenna remotely and away from the transceiver in complex installations while securing the SIM card inside a premise or enclosure to better protect against unauthorized use, theft, and vandalism.

### Connection charges

- No connection charge with BGAN M2M (normal BGAN charge is 100kB)
- Minimum CDRs only 1kB (normal BGAN charge is 10kB)
- No charge over-the-air modem software upgrades



### Technical Specifications

Characteristic	Description / Value
Satellite transmit frequency	1626.5 ... 1660.5 MHz
Satellite receive frequency	1525 ... 1559 MHz
GPS frequency	1574.42 ... 1576.42 MHz
SAT continuous TX time	Up to 3.25 hours at 128 kbps
SAT continuous RX time	Up to 5.5 hours at 128 kbps
SAT standby time	Up to 36 hours
Input voltage	+12 VDC / +24 VDC nominal
Power consumption	Transmit: < 20W Narrow beam w/o transmit: 3W Idle (regional beam): < 1W
Dimension and Weight	
Indoor unit	150 x 216 x 45 mm / 1.2 kg (2.64 lbs)
Outdoor unit	385 x 385 x 33 mm / 1.9 kg (4.18 lbs)
Operating temperature	-40 ... +75°C
Storage temperature	-55 ... +75°C
Humidity	95% RH @ +40°C
Wind loading (outdoor unit)	Survival wind loading (with optional mount) up to 100 mph
Protection	IP40 (indoor unit), IP65 (outdoor unit)
Interfaces	Ethernet connection (RJ45) USB-Type B for connection to configuration PC RS-232 (DB9) to external NMEA 0183-based GNSS device (e.g., GLONASS receiver) TNC connection on the IDU to the external antenna
Cable	10 meters RF antenna cable (included in delivery)
Manufacturer	Hughes Network Systems

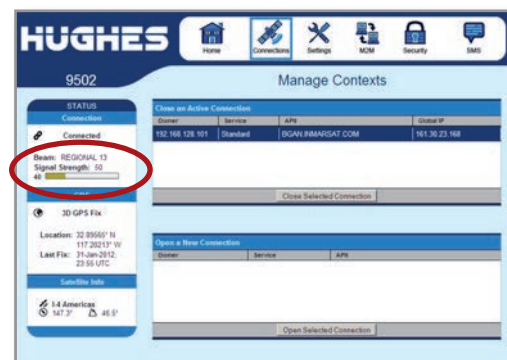
### Set up and test a satellite connection

Simply by powering up the BGAN modem and connecting the device to your Meteo-40 data logger via Ethernet, a satellite connection is established (plug&play) and the device is automatically registered in the network. Refer to page 3 of the data sheet to learn how the satellite communication is configured in the Meteo-40 web interface.

**Please note that the antenna of the BGAN modem should point directly to the sky without any obstacle which can interfere the signal, e.g., trees, buildings.**

If there occurs any problem with the satellite connection, we recommend **testing the signal strength of the BGAN modem**. To do so, connect the BGAN modem via Ethernet to your PC. Access the BGAN terminal by entering the IP address 192.168.128.100 in your browser.

You can see the signal strength in the *Status* box in the left column of the BGAN web interface. For a stable connection the signal strength should be >50db. If necessary, adjust the antenna to achieve a better receive level. The higher the better.



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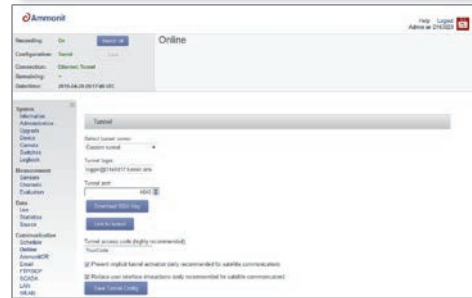
## Configuring Meteo-40 data loggers for BGAN communication

BGAN satellite modems are connected via Ethernet to Meteo-40. The BGAN modem itself is configured via the software provided by its manufacturer. Refer to the modem user manual for further details. e.g. network registration.

Select a **LAN switch** from the dropdown list in the Communication→LAN menu of the Meteo-40 web interface to supply the modem. Deselect the checkbox **LAN online, whenever CECS is on** to prevent excessive traffic.

Go to the Communication→Online menu and copy the Ammonit tunnel address of the data logger, e.g., <https://dnnnnnn.tunnel.ammonit.com>. Disconnect the data logger from your PC and / or LAN. After entering the copied address in your browser, you should be able to log into the Meteo-40 web interface via the satellite connection.

Refer to the Meteo-40 user manual for further details about the BGAN modem configuration.



## Cost-saving tips for satellite communication

We recommend configuring only one communication method, i.e., select between AmmonitOR, SCP/FTP and email. If more than one communication method is active, the bandwidth consumption can double or triple. By using the **SCP file upload** to AmmonitOR or your server, you consume approx. **20% less bandwidth** than using email communication.

We recommend setting the **online availability time** of the Meteo-40 data logger to a minimum, e.g., 3 times a week for 20 min. Perform firmware update and configuration changes only if absolutely necessary. As soon as you log into the web interface, data is updated. You might consume valuable satellite communication time. Hence, we recommend **reducing the log-in time to a minimum**. After closing the browser session, the connection is immediately shut down and no further data traffic occurs.

Set a **start date** for the file upload to prevent the data logger from sending previously sent files.

By activating the checkboxes **Prevent implicit tunnel activation** and **Reduce user interface interactions** in the Communication→Online menu of the Meteo-40 web interface, you can reduce the data traffic. The communication is only established according to the configured schedule. Other tunnel activations are prevented, e.g., when data is uploaded via SCP or set via email.

Deselect the checkbox **LAN online, whenever CECS is on**. Thus the satellite connection is only available, when any action is scheduled, e.g., data upload. You can check your BGAN settings in the Communication→LAN menu via the button **Check optimal BGAN settings**.

System	Action	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Start time	Duration	Quantity	Interval	Period	
Online		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	12:00	00:20	1	0:00	2016-04-26 12:00	Run now
AmmonitOR		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	12:00		1	0:00	2016-04-26 12:00	Run now
Email		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	12:00		1	0:00	2016-04-26 12:00	Run now
FTP/SCP		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	12:00		1	0:00	—	Run now
Only generate CSV		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	12:00		1	0:00	—	Run now

Statistics  
Source: 2016-01-01

Communication Schedule  
 Send CSV files  
 Send logbook data  
 Send configuration file  
 Send camera image  
 Send data snapshot

Reset send status  
Save and copy test data  
Save

Communication Schedule  
 Tunnel access code (highly recommended): YourCode  
 Prevent implicit tunnel activation (only recommended for satellite communication)  
 Reduce user interface interactions (only recommended for satellite communication)

Save Tunnel Config

Device Camera Switches Logbook  
 LAN online, whenever CECS is on  
 Use DHCP, fixed IP, or link-local: DHCP

Measurement Sensors Channels Evaluation  
 Connect to internet via modem only (recommended e.g. for SCADA and Ethernet camera)  
 LAN switch (typically S1): S2

Data Line Statistics Source  
 IP address: 192.168.40.40  
 DNS server: 192.168.40.1  
 Gateway: 192.168.40.1  
 Subnet mask: 255.255.255.0  
 Additional subnets:

Save  
Check optimal BGAN settings