HUGHES9502
Inmarsat BGAN Satellite IP Terminal

Internet Communication over Satellite

A complete package for end-to-end IP

Overview

The HUGHES9502 is a packaged solution for adding real-time IP communications to a remote station. Using the Inmarsat Broadband Global Area Network (BGAN) to provide reliable end-to-end IP connectivity, the Hughes 9502 terminal makes it easy to connect to a remote station with Campbell Scientific software or with the many IP protocols supported by our hardware. If cellular communications would be a perfect solution for an application, but the station is outside the area of cellular coverage, the Hughes 9502 is likely a great alternative.

The HUGHES9502 package includes all the hardware needed to get started. Simply add a power source and Ethernet-capable data logger or peripheral, and then provision the terminal with a data plan. The HUGHES9502 kit includes the Hughes 9502 terminal, directional antenna, antenna cable, all mounting hardware, and all the cables needed to connect the terminal to the data logger and power supply.

Note: The HUGHES9502 does not offer an omni/mobile antenna connection.

Benefits and Features

❯ Everything you need to get started in one package

❯ Easy to set up and use

❯ Designed for BGAN M2M network services

❯ Provides reliable end-to-end IP connectivity

❯ All-weather operation

❯ Ideal for remote locations where cellular service is not available

❯ Multiple low-power modes suitable for operation on battery-operated stations

Technical Description

The Inmarsat Broadband Global Area Network (BGAN) satellite network consists of three geostationary satellites: I-4 Asia Pacific, I-4 EMEA and I-4 Americas, which provide satellite data services around the world. A geostationary satellite does not change its position in the sky, allowing terminals to use much lower transmission power combined with a directional antenna, making low-power satellite services feasible. Because it uses L-band frequencies (1518 to 1675 MHz), the BGAN service is largely unaffected by

rain fade, which causes signal degradation in some satellite systems.

Stations using the Hughes 9502 must provide the flat, directional antenna with a good view of the southern (Northern Hemisphere) or northern (Southern Hemisphere) sky. Stations should be located between +75° and -75° latitude. Stations located at the extreme latitudes will need a better view of the horizon at low angles and are more

For comprehensive details, visit: www.campbellsci.eu/hughes9502

susceptible to line-of-sight issues introduced by nearby buildings or mountains.

There are also multiple methods for addressing average power consumption. The unit can idle in a low-power state or easily be put to sleep under data logger control. Therefore, the Hughes 9502 can be a good fit for stations with a sensitive power budget.

The 31447 HUGHES9502 Parts Included Kit that ships with the HUGHES9502 includes the following:

❯ (1) 31440 Power Wire Set of Red and Black Wires, 2 ft

❯ (1) 28899 CAT6 Ethernet Unshielded Cable, 2 ft

❯ (1) 17856 Serial Cable, DB9 Female to Pigtail, 2 ft

❯ (1) 17648 USB Cable, Type A Male to Type B Male, 6 ft

Communication Performance

Information provided by Inmarsat: "Send data using BGAN Standard IP at a rate of up to 448kbps with a low latency from 800* milliseconds, assuring real-time visibility of critical data."

"Please note latency is dependent on the end-to-end routing and this figure cannot be guaranteed."

Campbell Scientific has observed the following:

❯ Raw upload (data logger to Internet) speeds: 100 kbps typical

❯ PakBus payload upload speeds: typically greater than 12 kbps

❯ ICMP ping time: 1 second typical

❯ PakBus ping of 1000 bytes: 2.5 seconds typical

Note: Data transfer speeds can vary depending on location, signal strength, and the protocol used.

Specifications

Nominal Input Voltage	+12 Vdc or +24 Vdc
SIM Card Type	USIM
Water & Dust Ingress Protection Rating	IP-40 Compliant
Operating Temperature Range	-40° to +75°C
Storage Temperature Range	-55° to +75°C
Humidity Tolerance	95% RH (at +40°C)
Dimensions	150 x 200 x 45 mm (5.9 x 7.87 x 1.77 in.)
Weight	1.12 kg (2.47 lb)

Frequency

Satellite Transmit	1626.5 to 1675 MHz
Satellite Receive	1518 to 1559 MHz
GPS	1574.42 to 1576.42 MHz

Power Consumption

Transmit	< 20 W peak
Narrow Beam without Transmit	4 W
Idle (Regional Beam)	< 1 W
Sleep (Wake on Ethernet Packet)	< 10 mW (@ 12 Vdc)
Off, GPIO Sleep Pin Control	< 3 mW (@ 12 Vdc)

Interfaces

Power Input	Screw terminal, reverse polarity protected
Antenna Connector	TNC jack
Ethernet	10BaseT, RJ45 connector (used for data logger or PC communications)
USB Connector	Type B (used for PC communications)
RS-232 Connector	GNSS DB9 (used for GPIO sleep pin control)

Antenna

Wind Loading	Survival wind loading up to 160.93 kph (100 mph)
Water & Dust Ingress Protection Rating	IP-65 Compliant
Cable Connectors	Type N male-to-type N male (Type N-to-TNC adapter included for antenna-to-terminal connection)
Cable Length	10 m (30 ft)
Dimensions	38.5 x 38.5 x 3.3 cm (15.2 x 15.2 x 1.3 in.) without mount
Weight	1.85 kg (4.08 lb) without mount

For comprehensive details, visit: www.campbellsci.eu/hughes9502