

DATA SHEET

TRIMMARK 3 RADIO MODEM

KEY FEATURES

Versatile: Use as base, repeater or rover

Flexible: 2 W, 10 W, or 25 W power output

Channel spacing programmable at 12.5 kHz or 25 kHz

Easy to use and configure

Built-in channel selector and monitor

Rugged and weatherproof



RUGGED AND VERSATILE MULTICHANNEL RADIO MODEM

The TRIMMARK™ 3 radio modem provides a convenient, versatile means of establishing a robust wireless data broadcast network for real-time, high-precision GPS survey and telemetry applications.

The rugged, compact TRIMMARK 3 radio modem is designed for use in tough environments and in a variety of situations. The single unit is usable as a base station, repeater station, or rover receiver for maximum versatility. However you use it, you'll appreciate its simplicity and famous Trimble reliability and quality.

SELECT THE POWER YOU NEED

The TRIMMARK 3 radio modem provides selectable power outputs of 2 W, 10 W, or 25 W to support both short and long-range operations, conserve battery life and minimize risk of interference with other systems.

A 25 W base unit broadcasts up to 15 km (8 miles) line-of-sight, under optimal conditions. Path obstructions and terrain can reduce the typical effective range to 10 km to 12 km (6 miles to 7 miles). One or two additional units can be networked as repeater stations to extend range, minimize base station moves, and provide seamless coverage around local obstacles such as large buildings or hills. The typical range of a 2 W repeater is 5 km to 8 km (3 miles to 5 miles).

A TRIMMARK 3 radio modem broadcasts or repeats data to Trimble survey-grade GPS receivers, such as the Trimble R8, 5800, Trimble R7, and 5700, that either contain an internal radio modem or are being used with an external rover radio. The TRIMMARK 3 is fully backward compatible with the TRIMMARK IIe radio modem, so it can be used in both new and existing systems.

CONFIGURE IT TO YOUR NEEDS

The TRIMMARK 3 radio modem can be configured completely and easily in the office by using the supplied WinFLASH utility on your computer. Many functions also can be configured in the field from the front panel or from the Trimble Survey Controller™ software used with your GPS survey receivers. The serial port communication settings are easily set to match the default settings on the GPS receiver.

You can configure each broadcast network to operate on one of up to 20 programmed channels via a built-in channel selector. Channel spacing of either 12.5 kHz or 25 kHz is programmable at the factory or by a service provider.

To reduce the risk of interference in a congested RF environment, you can use the built-in audio speaker to monitor activity on the selected channel. The unit also can automatically monitor the channel using its software selectable carrier detect function to detect other users on the channel before transmitting.

The TRIMMARK 3 radio modem is available as a stand-alone product as well as in convenient base and repeater equipment sets. Available in three frequency bands, the TRIMMARK 3 radio modem is designed to meet the licensing requirements of many countries around the world.

TRIMMARK 3 RADIO MODEM

STANDARD FEATURES

- Selectable 20-channel capacity
- Rugged weatherproof construction
- Configurable from front panel, survey controller, or from supplied WinFLASH utility on your computer
- Up to 15 km line-of-sight range
- Same unit can function as base station, repeater station, or rover receiver
- Selectable power outputs of 2 W, 10 W, or 25 W
- Programmable channel spacing of 12.5 kHz or 25 kHz
- Built-in channel selector
- Supports up to two repeaters in a network
- 4800, 9600 and 19200 baud rate over the air
- Retrieval/storable radio diagnostic information

TRIMMARK 3 BASE/REPEATER

Physical

Size 12.5 cm W x 22.9 cm D x 7.9 cm H
(4.9" W x 9.0" D x 3.1" H)

Weight 1.59 kg (3.5 lb)

Electrical

Power:

Input 12 V DC to 16 V DC, nominal

Connectors:

Power 2-pin LEMO (+VDC, GND)

Data 7-pin female LEMO (supports RXD, TXD and SGND)

Antenna TNC female

Environmental

Temperature:

Operating -40 °C to +65 °C (-40 °F to +149 °F)

Storage -55 °C to +75 °C (-67 °F to +167 °F)

Humidity 100%, fully sealed, weatherproof

TECHNICAL SPECIFICATIONS

Transmit Power¹ 2 W, 10 W, 25 W

Wireless Data Rate 4800 bps, 9600 bps, 19200 bps

Frequency Bands 410–420 MHz, 430–450 MHz, or 450–470 MHz
(Only one band per radio modem)

Channel Spacing 12.5 kHz or 25 kHz
(Only one spacing per radio modem)

Number of Channels² Can be ordered with up to 20 programmed frequencies, internally stored

RF Modulation Format Gaussian Minimum Shift Keying (GMSK)

Range (typical)³

25 W Base 10 km to 12 km (6 miles to 7 miles)

2 W Repeater 5 km to 8 km (3 miles to 5 miles)

Power Consumption⁴

2 W mode 12.6 V

Voltage

Current

Nominal Load

10 W mode

12.6 V

0.8 A

~10 W

25 W mode

12.6 V

3.6 A

~45 W

8.0 A

~75 W

Serial Port One set of RS-232 signals available.

Data is 8 bits with selectable parity and 1 stop bit.

Supported data rates are 9600 bps, 19200 bps, and 38400 bps⁵

ANTENNA PHYSICAL SPECIFICATIONS

LENGTH (TYPICAL)

WEIGHT

Standard antenna

0 dB UHF omni whip

47 cm (18.5 in)

0.5 kg (1.1 lb)

5 dB UHF omni whip

99 cm (39 in)

0.5 kg (1.1 lb)

1. Radios are configured as 25-W units at the factory.

2. Use the same frequency for all radio modems in the same wireless data network.

3. Varies with terrain and operational conditions. Up to 2 repeaters can be used to extend range.

4. Power consumption and battery life depend on the broadcast information content and wireless data rate (e.g., CMR versus RTCM SC-104 Ver 2.x packets at 1-Hz epoch rates).

5. Communications rate between the radio and GPS receiver; not wireless rate.

Specifications subject to change without notice.

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DATASHEET

TRIMBLE HPB450 RADIO

KEY FEATURES

The surveying industry's most powerful radio for GPS base stations

Rugged and reliable whatever the conditions

Intelligent and easy to use

Compatible with any GPS surveying system



The Trimble® HPB450 radio modem is a powerful and rugged 450 MHz radio specifically designed for GPS surveying systems.

EXTREMELY LONG RANGE AND HIGH POWER

The HPB450 offers high or low power broadcast of GPS correction data. With its high power output of 35 W, the HPB450 is the most powerful radio of its type available, maximizing the achievable range. With a fast over-the-air data rate, the HPB450 also offers reduced latency for improved GPS positioning information.

INTELLIGENT PROTOCOLS AND AUTOBASE TECHNOLOGY

Unique AutoBase™ technology in the HPB450 radio offers the convenience of automatic channel scanning; the radio scans through all available channels and then returns to the best one for transmission.

Broadcast range and noise immunity are also significantly enhanced via the HPB450 radio's forward error correction (FEC).

SEAMLESS INTEGRATION WITH TRIMBLE GPS SYSTEMS

The HPB450 radio is designed to compliment and fit seamlessly into new and existing Trimble GPS surveying systems. As such, it is built to the same standards of ruggedness, reliability, and suitability for the field as other Trimble products. It is lightweight and consumes minimal power for longer field operation, and you can rely on the radio to perform in the field day after day, whatever the conditions. With its built-in mounts the radio can be mounted on any tripod.

The HPB450 is also easy to use, with a user interface that includes a channel display, LEDs to indicate system status, and on/off control. Configuring the radio is also possible using your Trimble field software or supplied PC software.

TRIMBLE HPB450 RADIO

TRIMBLE HPB450 BENEFITS

- "Auto Power On" feature
- Rugged construction withstands harsh job site conditions
- Designed for use with Trimble internal 450 MHz radios
- Built-in channel selector
- 4800, 9600, 19,200¹ over-the-air baud rates
- 20 MHz splits

TRIMBLE HPB450 GENERAL SPECIFICATIONS

DTE-DCE interface 3-wire, RS-232, 38,400 baud maximum
User interface Auto Power On, on/off button,
channel button with AutoBase and AutoRover™,
digital display, modem/power status indicators,
RF power select toggle switch

POWER

External 9–16 V DC
Internal battery NA
During TX (nominal) 110 W (35 W)
During RX (nominal) 1.9 W

ANTENNA

External 50 Ω, BNC

MODEM SPECIFICATIONS

Link rate/modulation 19,200 bps/4 level FSK (25 kHz)¹
9600 bps/4 level FSK (12.5 kHz)¹
9600 bps/GMSK (25 kHz)
4800 bps/GMSK (12.5 kHz)
Link protocols Transparent, packet switched,
digipeater, TRIMTALK™
Forward error correction (FEC) Hamming code (12, 8)
with data interleaving¹

RADIO SPECIFICATIONS

Frequency bands 410–430 MHz, 430–450 MHz or 450–470 MHz
(only one band per radio)
Frequency controls Synthesized 12.5 kHz resolution,
±2.5 ppm stability
RF power select Low/high
RF transmitter output 3/35 W
Sensitivity –110 dBm BER 10–5
Adjacent channel selectivity >60 dB (25 kHz), >50 dB (12.5 kHz)
Type certification All models are type accepted and certified for
operation in the U.S.A. and Canada.
For detailed information concerning your
country's type certification, please contact
your local Trimble Authorized Distribution Partner.

ENVIRONMENTAL SPECIFICATIONS

Operating temperature –30 °C to +60 °C (–22 °F to +140 °F)
Storage temperature –55 °C to +85 °C (–67 °F to +185 °F)
Vibration/shock ANSI/ASAE EP455
Enclosure IEC 144/855420 IP66 watertight and dustproof

MECHANICAL SPECIFICATIONS

Dimensions (WxHxL) 15.8 cm x 7.0 cm x 16.7 cm
(6.23 in x 2.77 in x 6.58 in)
Weight 1.34 kg (2.96 lb)
Data/power connector 5-pin LEMO #1 shell
Mount Tripod bracket

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¹ Requires HPB450 or PDL450 at both base and rover.

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