Trimble TMR1 All Weather

SOFTWARE-DEFINED HIGH-SPEED DATA RADIO FOR WATER MANAGEMENT COMMUNICATIONS

WORLD LEADER IN INDUSTRIAL TECHNOLOGY

Trimble® is the world leader in a wide range of positioning technologies including GPS, laser, optical and inertial technologies with application software and information services to provide complete industrial solutions. None of this would have been possible without the support of Trimble's wireless communications technology, from mobile radios for RTK surveying to satellite networks for world-wide data communications.

LONG-RANGE, HIGH-SPEED COMMUNICATIONS

The Trimble TMR1 is a dual ISM band (865-870 and 902-928 MHz) networked transceiver supporting license-free wireless communications around the world. With available throughput up 2.6 Mbps, the TMR1 allows you to seamlessly integrate both serial and Ethernet traffic as well as having the throughput available for video. Range as high as 70 miles has been demonstrated in low noise environments. The TMR1's high performance and versatility make it ideal for water and wastewater treatment data networks.

DUAL DATA PORTS FOR BOTH SERIAL AND IP COMMUNICATION

The Trimble TMR1 is equipped with two data connectors: one for serial/power and one for Ethernet. This allows you to attach sensors to the TMR1 in the field and to communicate with any TMR1 via Ethernet cables, a LAN/WAN or the Internet. All links can be protected by AES 128- and 256-bit data encryption and VLAN segregation, so only you are allowed to communicate with your network.

Key Features

- Software-defined dual-band (865-870 and 902-928 MHz) link using Frequency Hopping Spread Spectrum (FHSS) technology
- Waterproof, high-vibration housing withstands harsh industrial conditions
- Supports up to 2.6 Mbps throughput
- Dual data ports for simultaneous communication with both TCP/IP and serial devices
- Secure, AES 128- and 256-bit encryption, VLAN network segregation, password authentication
- Upload configurations and firmware upgrades over the air or over the Internet
- OEM modules also available for system integrators

RUGGED, WATERPROOF, MADE FOR THE REAL WORLD

The Trimble TMR1 is built to survive in real-world water treatment plants - outside at the ponds and tanks as well as inside to monitor pumps, filters and other processes. The rugged aluminum housing and connectors are certified to withstand submersion in 1 meter of water and are chemically treated to withstand corrosion.

DATASHEET

TRIMBLE TMR1 ALL WEATHER radio

Transmitter	900 ISM Band	868 ISM Band
Frequency	902-928 MHz	864.9-870 MHz
Output Power	1 mW to 1W	3 mW to 500 mW
Range – LOS	70+ miles	50+ km
Modulation	MSK, 2FSK, BPSK, QPSK, 8PSK	MSK, QPSK, 8PSK, 16QAM, 32QAM
RF Data Rate	57 kbps to 2.6 Mbps	10 kbps to 736 kbps
Occupied Bandwidth	6.25 kHz to 1.5 MHz	50 kHz, 100 kHz, 250 kHz
Frequency Stability	1.0 ppm	1.0 ppm
Duty Cycle	Continuous	50% (10% in 250 kHz channels)
Output Impedance	50 Ohms	

Receiver sensitivity	900 ISM Band	868 ISM Band
@ BER = $1x10^{-6}$	-114 @ 57 kbps MSK	-110 @ 38 kbps MSK
	-112 @ 114 kbps MSK	-108 @ 74 kbps MSK
	-111 @ 153 kbps MSK	-107 @ 76 kbps QPSK
	-107 @ 229 kbps MSK	-104 @ 120 kbps QPSK
	-104 @ 663 kbps 2FSK	-103 @ 177 kbps MSK
	-105 @ 884 kbps BPSK	-100 @ 280 kbps QPSK
	-101 @ 1768 kbps QPSK	-94 @ 420 kbps 8PSK
	-95 @ 2651 kbps 8PSK	-86 @ 736 kbps 32QAM
RF Selectivity	50 dB	50 dB

CONNECTIVITY

- Ethernet
  - Waterproof, locking rotary connector
  - IEEE 802.3, TCP/IP, UDP, Modbus, Profibus DP, DNP3 & IEC-61850 and many more industrial protocols due to fully transparent communication
- Serial/Power
  - Waterproof, locking rotary connector
  - RS-232/422/485
  - Up to 230.4 kbps

ERROR DETECTION

- Error detection: up to 32-bit CRC with retransmit on error

SECURITY

- AES 128- and 256-bit encryption
- VLAN network segregation
- Password authentication
- FHSS technology

OPERATING MODES

- Point to Point
- Point to Multipoint
- Adaptive Speed/Modulation
- Repeater

CONFIGURATION SOFTWARE

- Web-based configuration and diagnostics software application

ANTENNA CONNECTION

- TNC female
- Works with all 50 Ohm antennas

ELECTRICAL

- Input voltage range: 10-32 VDC +/- 1%
- Input current
  - 902-928 MHz: 430 mA @ 12 V, 1W RF output
  - 869.4-869.65 MHz: 860 mA @ 12V, 500 mW RF output

PHYSICAL

- Dimensions: 175 x 98 x 36 mm (7 x 4 x 1.5")
- Weight: 705 g (1.55 lb)
- Compatible with standard 35 mm DIN rail mounts (EN 50022)

ENVIRONMENTAL

- Water/dust: IP67
- Vibration/Shock: 9.8 gRMS, 2000 Hz
- Temperature range:
  - Operating: -50 to +65°C
  - Storage: -50 to +85°C

COMPLIANCE

- FCC, ETSI, IC, Australia

APPLICATIONS

- Marine construction
- SCADA communications
- Ethernet bridge to remote sites
- Remote sensing
- Video surveillance
- RTK corrections for precise positioning

ORDERING INFORMATION

- TMR1 All Weather, 902-928 MHz 102500-11
- TMR1 All Weather, 865-870 MHz 102500-21

TRIMBLE
Worldwide
Integrated Technologies
510 DeGuigne Drive
Sunnyvale, CA 94085

Email: sales-intech@trimble.com

Specifications subject to change without notice.