

IRROMETER®

Monitoring soil moisture data from multiple sites or remote locations is now simpler with WATERMARK Remote Data Access equipment. Advances in communication technology provide cost effective and reliable methods of improving productivity and lowering operational costs by bringing the soil moisture data to you. The process begins when our WATERMARK Monitors (900M or 950R Models) collect the soil moisture data. The user can then manually download the collected data in the field or use our **Long Range Radio** system or **Cellular Gateway** system to view the data from a remote location.

The **Long Range Radio** typically has a range of several miles. These radios transmit a "line of sight" Radio Frequency (RF) signal. Its performance varies with site conditions such as antenna height, topography, structure interference, plant canopy and electrical interference.

Note: Ranges referenced are for equipment licensed for use in the USA. Similar equipment is available for use in many other countries, but frequency and output power vary and range will be different. Contact IRROMETER for country specific information.

The **Cellular Gateway** provides a dedicated cellular data connection for world wide access to data. When used in conjunction with our Cellular Data Service, this gateway allows viewing of the soil moisture data from any internet connected computer. Areas that have good cell phone coverage will have similar success with this technology.

The performance of these communication systems, like many other technologies, is influenced by site conditions, infrastructure limitations, and other factors. Please consult our technical support department for recommendation regarding your specific application.

Long Range Radios –

OPERATING PRINCIPLE: Long Range Radios transmit powerful point to point RF signals for remote access of data. The system consists of a Field Radio which transmits the information collected from a data logging device (monitor) when polled by a Base Radio. The Base Radio can then be connected directly to the user's computer or the Ethernet Radio Gateway can be substituted for the Base Radio when users want to view the data on the internet (using customer provided internet connection) – contact IRROMETER for details.

Features –

- 900 MHz Spread Spectrum radios offers long range performance
- Powerful 1 watt radio is FCC license free
- High sensitivity receiver provides improved signal performance
- Low power consumption requires little maintenance

Specifications –

RADIO TRANSMITTER:

POWER SUPPLY VOLTAGE: 12v

POWER OUTPUT: 1 watt

FREQUENCY: ISM 902-928 MHz

SPREAD SPECTRUM: Frequency Hopping Spread Spectrum (FHSS)

RECEIVER SENSITIVITY: 110 dBm

ANTENNA: Seven inch, half-wave dipole omni-directional antenna is standard. (Directional and high gain omni-directional antennas are available and can improve range and reliability, consult IRROMETER for details.)

TEMPERATURE RANGE: -40° to 185° F (-40° to 85° C)

OUTDOOR ENCLOSURE –

DIMENSIONS: 6.3 in. tall x 3 in. wide x 2.17 in. deep (160 mm x 75 mm x 55 mm). Antenna adds 6.5 in. (165 mm) to overall height.

WEIGHT: 1 lb.-13 oz. (.82 kg) (complete assembly)

Weather proof enclosure protects electronics from harsh environments.

SPECIFICATION INFORMATION: Radio equipment shall have 1 watt of output power, use 900 MHz frequency and be mounted in a heavy duty outdoor rated enclosure (where applicable). Radio shall use serial interface, Frequency Hopping Spread Spectrum (FHSS) and Frequency Shift Keying (FSK) modulation.

900M-FR — Field Radio transmitter module for mounting outdoors at monitor location. Mounted in a heavy duty watertight enclosure with aluminum mounting plate. Includes a 15 ft. (4.5 m) cable. (Requires power source – see Power Options)



900M-BR — Base Radio

receiver module for mounting indoors at the computer location.

Includes 100/240 VAC to 9-12 VDC plug-in style transformer and 6 ft. (1.8m) serial connection cable.

DIMENSIONS: 2.75 in. long x 5.5 in. wide x 1.13 in. deep (7 cm x 14 cm x 3 cm)

WEIGHT: 7.10 oz. (200 g)

900M-FR2BR — Field to Base converter adapts Field Radio to be used as a Base Radio and mounted outdoors for improved signal reception. Includes 100/240 VAC to 9-12 VDC plug-in style transformer and a 50 ft. (15m) connection cable.



900M-ER — Ethernet Radio Gateway

allows radio connection to customer supplied internet routing device with static IP. Includes a radio receiver in outdoor enclosure, 100/240 VAC to 9-12 VDC plug-in style transformer and 50 ft. (15 m) ethernet connection cable.

NOTE: 100 mW 900 MHz and 50 mW 2.4 GHz radios available for use internationally. Contact IRROMETER for details.

REMOTE DATA ACCESS OPTIONS

Cellular Gateway –

OPERATING PRINCIPLE: The Cellular Gateway provides high speed cellular connectivity for wireless transmission of data collected by Monitor (900M or 950R models). Uses General Packet Radio System (GPRS) technology which is well suited for data communications.



900M-CG – Cellular Gateway mounts outdoors at the Monitor location and provides a dedicated cellular connection.

User can also subscribe to our Cellular Data Service which allows viewing of soil moisture data on the internet. Includes gateway device mounted in an outdoor enclosure with aluminum mounting plate and a 15 ft. (4.5 m) cable for connecting to monitor. (Requires 20W Battery Pack or 100/240 VAC to 9-12 VDC plug-in style transformer for power source.)

Features –

- Uses reliable GPRS data network
- Simply connects directly to monitor in field
- Secure connection is accessible from any web enabled computer
- Durable outdoor enclosure is made of ABS material with silicone rubber seal

Specifications –

POWER SUPPLY VOLTAGE: 12v
 NETWORK: Quadband GPRS
 TEMPERATURE RANGE: -22° to 158 °F (-30° to 70° C)

OUTDOOR ENCLOSURE –

DIMENSIONS: 9 in. tall x 7.9 in. wide x 3.5 in. deep
 (197 mm x 229 mm x 89 mm)
 WEIGHT: 1 lb.- 13 oz. (.82 kg) (complete assembly)

SPECIFICATION INFORMATION: Cellular Gateway equipment shall use serial interface Quadband GPRS network to transmit data. Cellular Gateway device shall mount near the data logging device in a heavy duty outdoor rated enclosure.



Power Options –

900M-BP-5W — Battery Pack provides power source when line power is not available. Includes solar recharging panel, sealed maintenance free battery and outdoor enclosure, mounting kit and a 9 ft. (2.7 m) cable. Suitable for 900M-FR Field Radio.

900M-BP-10W — Battery Pack provides power source when line power is not available. Includes solar recharging panel with charge controller, sealed maintenance free battery and outdoor enclosure, mounting kit and a 9 ft. (2.7 m) cable. Suitable for 900M-FR radio transmitter when used in conjunction with 950R-O Receiver Module.

900M-BP-20W — Battery Pack provides power source when line power is not available. Includes solar recharging panel with charge controller, sealed maintenance free battery and outdoor enclosure, mounting kit and 9 ft. (2.7 m) cable. Suitable for 900M-CG Cellular Gateway.

900AC – Transformer 100/240 VAC to 9-12 VDC plug-in style transformer.

MODEL	BP (5W)	BP-10W	BP-20W
POWER OUTPUT	12v	12v	12v
BATTERY RATING	5Ah	5Ah	7Ah
TEMPERATURE RANGE	4° to 122° F (-20° to 50° C)	4° to 122° F (-20° to 50° C)	4° to 122° F (-20° to 50° C)
SOLAR PANEL DIMENSIONS	12 in. tall x 8.6 in. wide x .75 in. deep (305 mm x 216 mm x 19 mm)	12 in. tall x 14 in. wide x .75 in. deep (305 mm x 368 mm x 19 mm)	12 in. tall x 26 in. wide x .75 in. deep (305 mm x 660 mm x 19 mm)
BATTERY BOX DIMENSIONS	9 in. tall x 7.9 in. wide x 3.5 in. deep (197 mm x 229 mm x 89 mm)	9 in. tall x 7.9 in. wide x 3.5 in. deep (197 mm x 229 mm x 89 mm)	9.4 in. tall x 7.2 in. wide x 6.2 in. deep (239 mm x 183 mm x 158 mm)
WEIGHT (COMPLETE)	8.5 lbs. (3.8 kg)	10 lbs. (4.5 kg)	15 lbs. (6.8 kg)

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THE IRROMETER COMPANY, INC.

P.O. Box 2424, Riverside, CA 92516

(951) 689-1701 PHONE

(951) 689-3706 FAX

www.IRROMETER.com

sales@IRROMETER.com

