



**IRROmesh Node**

**Device Configuration –**

MATERIALS: Polycarbonate plastic, molded, vented, UV resistant housing

DIMENSIONS – HEIGHT: 5.05 in. (128mm)

WIDE: 2.5 x 2.25 in. (63.5 x 57.15mm)

WEIGHT: 1.53 lb. (.69 kg)

WIRE LEADS: 25 ft. (7.62 m) AWG 24, 12 leads

SENSOR COMPATIBILITY:

975NR & 975NE – WATERMARK soil moisture (3), temperature, tipping bucket rain gauge, switch closure

POWER: Two 5.5V, 55mA output solar panels. 2.67 x 1.57 in. (55 x 40mm)

FIELD MOUNTING: .75 in. male N.P.T. base.  
Adapter required for BSP pipe thread

**Radio Specifications –**

MODEL/TYPE: Microchip Model MRF89XAM9A 915 MHz or MRF89XAM8A 868 MHz Ultra Low Power Sub-GHz Transceiver module; integrated crystal, internal voltage regulator, matching circuitry and antenna.

RF/ANALOG FEATURES: ISM Band, 902-928 MHz operation; Data rate – FSK 20 kbps; Reception sensitivity: FSK 112 dBm (typical); + 10 dBm Typical Output Power; NZ 922-928 MHz; AU 916-927 MHz; ETSI 863-870 MHz

AIR TEMPERATURE: Internal temperature of the housing is detected for operational purposes. Can also indicate nighttime air temperature.

OPERATING TEMPERATURE: 14 – 149°F (-10 – +65°C).

STORAGE TEMPERATURE: -40 – 185°F (-40 – +85°C)

REGULATORY APPROVAL: IC for Canada; Regulatory approval for modular devices in the United States – FCC ID: OA3MRF89XAM9A and Canada – 7693A-89XAM9A. Radio regulation certified for Australia/New Zealand. CE marked for EN 55022 Class A, EN 55024/IEC 61000-4-2, EN 55024/IEC 61000-4-3. Conforms to the following ETSI standards: EN 300 220-2 V2.3.1 (2001-02), EN 301 489-3 V1.4.1 (2002-08).

RANGE: Up to 1000 ft. (305m) for Relay Nodes and 1200 ft. (366m) for End Nodes at +10dBm, clear line-of-sight, when mounted on level ground at least 10 ft. (3m) high and 5 ft. (1.5m) above crops, grass, brush or foliage (see manual for instructions and examples for optimizing installation).

MOISTURE PROTECTION: Acrylic conformal coating.

WARRANTY: One year

**ORDERING INFORMATION: Catalog Series #975 — IRROmesh System**

Available Components:

**#975B — Base Receiver Node**

**#975NR — Relay Node**

**#975NE — End Node**

**#975L — Logger**

**#975P — PC Link**

**#975G — Cellular Gateway**



**IRROmesh is a wireless solar powered data logging system. This system simplifies irrigation management using transmitter nodes that “talk” to each other along a network that relays site-specific data.**

- **No Batteries Required – Solar Panels on two sides – simplifies installation**
- **Self-Initializing – Nodes power up with initial sun exposure and associate themselves with the Base receiver**
- **Self-Routing – Nodes route communication for maximum efficiency**
- **Self-Healing – Nodes will re-route themselves in case of network obstruction or interference**
- **Automatically Manages Power – Unique sleep/wake cycling ensures continuous reliable data transfer during all light conditions**
- **In-Field Logging Capability**
- **Web Based Data Management – Store and analyze data through the Internet**
- **Small Size – Easy field installation**

OPERATING PRINCIPLE: The IRROmesh Data Logging System utilizes compact, solar powered wireless radio Nodes. This Node is a transceiver device for measurement of soil moisture, soil temperature and other environmental features. When deployed in an interactive mesh radio network, Nodes collect data that transmits to the Base Node where it can be transmitted to an external device or the Internet for compilation and viewing. Internet data service is available for management, storage and display in real-time.

Nodes connect with up to three WATERMARK Model 200SS Soil Moisture Sensors and one WATERMARK Model 200TS Soil Temperature Sensor, as well as switch closure devices and tipping bucket rain gauges. All sensor data and operating characteristics of the Node are recorded every 30 minutes and transmitted every few minutes during daylight and up to every 90 minutes during darkness.

SPECIFICATION INFORMATION: The soil moisture data collection system shall be capable of automatically recording soil water tension, soil temperature, ambient temperature, rainfall and switch closure devices. It shall wirelessly transmit sensor data from multiple sensing locations to a central collection location using a self-routing, self-initializing and self-healing mesh network structure that is FCC and IC approved or CE marked. Its soil moisture sensors shall require no site calibration or routine maintenance and the wireless radio transmission system shall require no batteries for operation. It shall be the IRROmesh system as manufactured by the IRROMETER Company, Inc. of Riverside, California.

**WATERMARK**

# IRROmesh SYSTEM — MODEL 975

## Base Receiver Node – 975B

IRROmesh Radio Node atop polycarbonate plastic housing containing three super capacitors. Used to receive and transmit all data from Field Nodes to user selected data collection device.

DIMENSIONS – HEIGHT: 9.25 in. (234.9 mm)  
 WIDTH: 4.5 in. (114.3 mm)  
 DEPTH: 3 in. (76.2 mm)  
 WEIGHT: 1.54 lb. (.70 kg)

COMMUNICATIONS: Radio to data collection device  
 POWER: Solar Charged Super Capacitors



## PC Link – 975P

IRROmesh Radio Node without solar panels, threaded into PVC stand for desktop placement. Used as a data collection device to stream data to the WEB using your computer's active Internet connection. Connects to your Windows® OS computer via USB cable and is required to be within close range of the Base.

DIMENSIONS – HEIGHT: 6 in. (152.4 mm)  
 DIAMETER: 3.25 in. (82.55 mm)  
 WEIGHT: 9.6 oz. (.272 kg)

COMMUNICATIONS: USB to Windows® computer  
 POWER: USB connection to a computer



## Logger – 975L

IRROmesh Radio Node atop polycarbonate plastic housing containing three super capacitors and a USB cable. Used as a manual data collection device to collect data from the Base and download to any full Windows® version device for display and graphing.

DIMENSIONS – HEIGHT: 14.75 in. (374.6 mm)  
 WIDTH: 4.5 in. (114.3 mm)  
 DEPTH: 3 in. (76.2 mm)  
 WEIGHT: 2.14 lb. (.97 kg)

COMMUNICATIONS: USB to Windows® computer  
 POWER: Solar Charged Super Capacitors



## Cellular Gateway – 975G

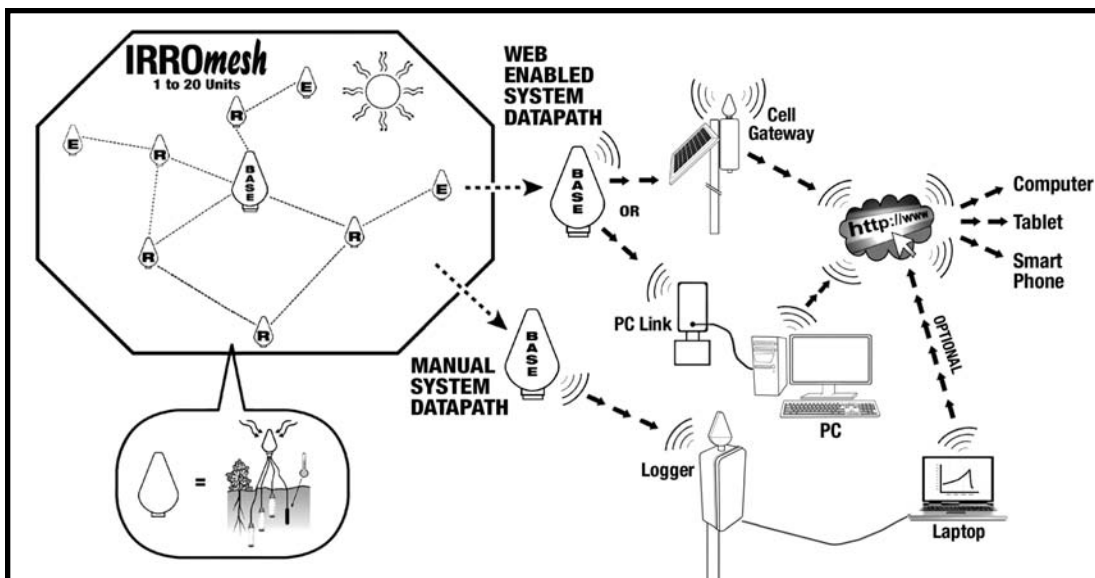
IRROmesh Radio Node without solar panels, atop polycarbonate plastic housing containing a cellular modem. (Solar battery pack required.) Used as a data collection device to automatically transfer data to the WEB through the cellular modem for viewing and storage. Cellular data coverage must be available at the gateway location.

DIMENSIONS – HEIGHT: 14.75 in. (374.6 mm)  
 WIDTH: 4.5 in. (114.3 mm)  
 DEPTH: 3 in. (76.2 mm)  
 WEIGHT: 2.01 lb. (.912 kg)

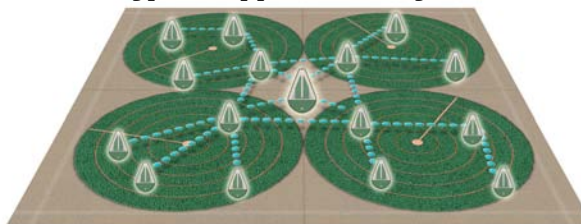
COMMUNICATIONS: GPRS 2G Data Service.  
 (others in development)  
 POWER: Solar Powered Battery Pack



## Communication Options



## Typical Application Layout



**IRROMETER®**

**THE IRROMETER COMPANY, INC.**

1425 Palmyrita Ave., Riverside, CA 92507

(951) 682-9505 PHONE

(951) 682-9501 FAX

www.IRROMETER.com

sales@IRROMETER.com

