

Description of Equipment

PRODUCT DESCRIPTION

The equipment that is being submitted to the FCC due to a change in identification is known as the UtiliNet Series II Integrated WanGate Radio, Models 20043 (12 VDC) and 20044 (120 VAC). The following information was provided by Schlumberger Resource Management Services (RMS), Inc.

SERIES II INTEGRATED WANGate RADIO (IWR)

The Metricom UtiliNet Series II Integrated WanGate Radio (IWR) communicates via RS-232 to end devices and is designed for internal mounting (e.g., inside a remote terminal unit enclosure). It is commonly interfaced with such devices as remote terminal units (RTUs), programmable logic controllers (PLCs), and other intelligent end devices (IEDs). The Integrated WanGate has two RS-232 serial ports - a LAN Packet Protocol Port and a Transparent Port. The LAN Packet Protocol Port is used to communicate to devices which use UtiliNet LAN Packet Protocol (ULPP), such as a PC with configuration or diagnostic software, or an end device which has implemented ULPP. The Transparent Port is a general data port and used to transport byte-oriented data, such as that generated by industry standard protocols.

The Integrated WanGate Radio comes in a 12 VDC version and an AC version which combines the DC radio with a 120 VAC power supply.

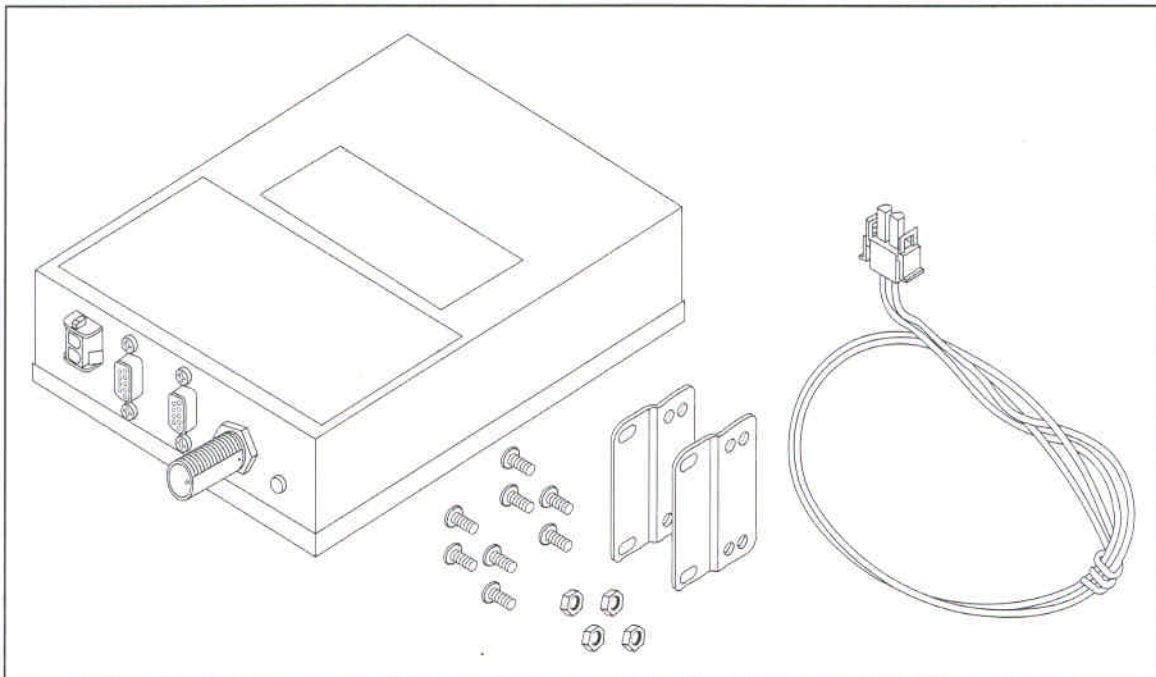


CAT# 20043 SERIES II INTEGRATED WANGATE RADIO

The Series II IWR, DC version, comes in a metal enclosure and is designed to be placed inside an RTU or like enclosure. The radio has a two-pin Molex connector for 12 VDC input. It has one DB-9 RS-232 connector for transparent data and one DB-9 connector for ULPP operations. The radio comes with a standard N-Female antenna connector mount and mounting hardware.

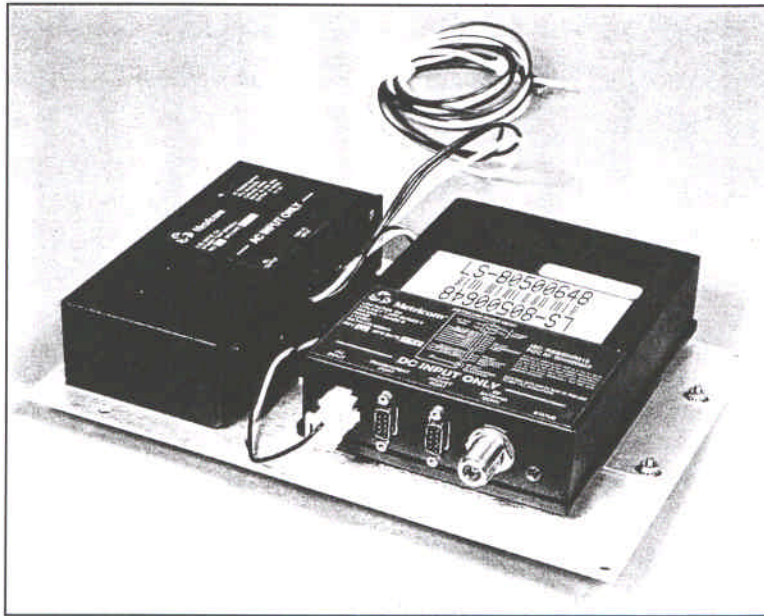
Included are the following:

- Series II Integrated WanGate Radio
- Two mounting brackets
- Four 6-32 screws
- Four 10-32 screws
- Four 10-32 hex nuts
- DC power connector with 48" cable
- Reference mounting drawing



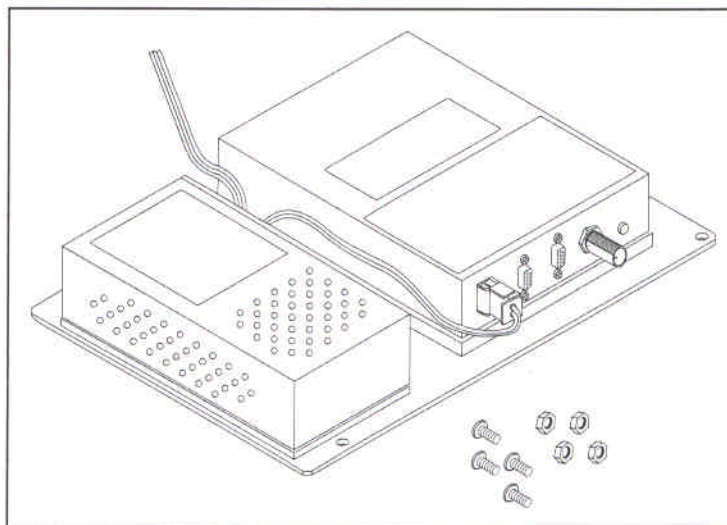
CAT# 20044 SERIES II INTEGRATED WANGATE RADIO (W/AC POWER SUPPLY)

The Series II IWR, AC version, is the DC version of the IWR with a rugged AC power supply, both mounted together on a plate. It is designed to be placed inside an RTU or like enclosure. The radio has an unterminated 3-wire pigtail for 120 VAC input. It has one DB-9 RS-232 connector for transparent data and one DB-9 connector for ULPP operations. The radio comes with a standard N-Female antenna connector mount and mounting hardware.



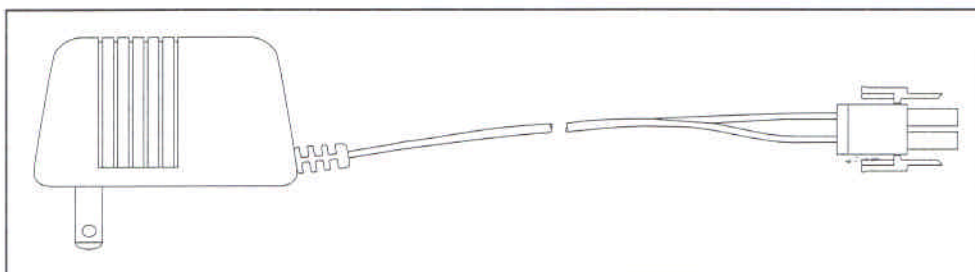
Included are the following:

- Series II Integrated WanGate Radio (w/AC power supply)
- Four 10-32 screws
- Four 10-32 hex nuts
- Reference mounting drawing



CAT# 80032 120 VAC TO 12 VDC POWER ADAPTOR CUBE

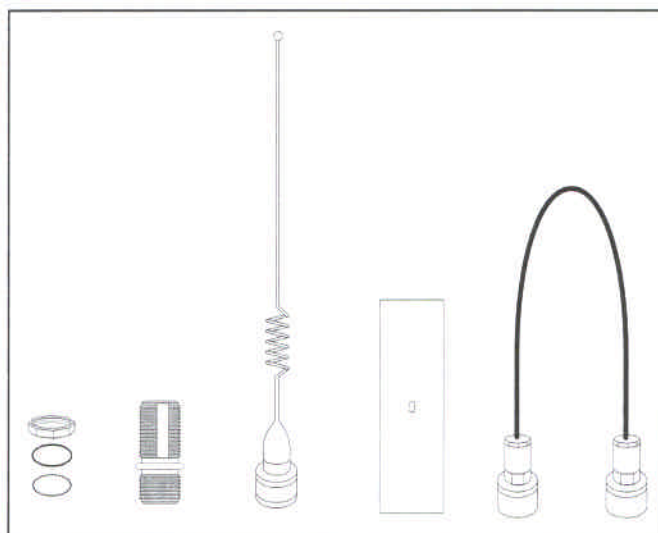
This Power Adaptor Cube plugs into a 120 VAC outlet and provides 12 VDC to the Series II IWR, DC version. Since the DC version of the Series II IWR is intended to be wired directly to 12 VDC in a final installation, this is typically only used for demonstration and test purposes.

**CAT# 81001 ANTENNA KIT**

The antenna kit provides a simple 3 dB gain whip antenna and extends the IWR antenna connection to an adaptor on the enclosure in which it is installed.

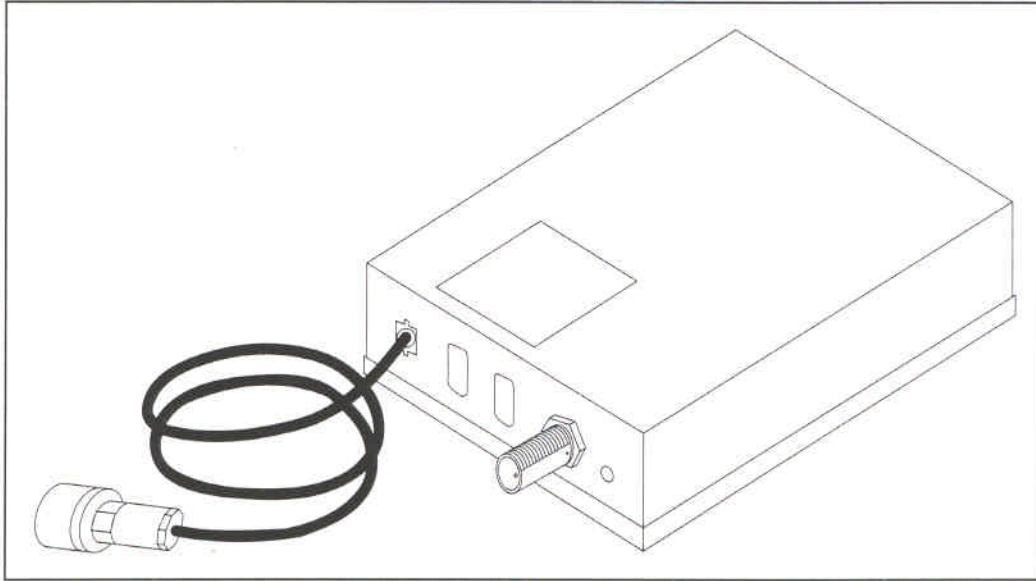
Included are the following:

- Antenna, 3 dB gain whip, 915 MHz, N-Male
- Coax jumper cable, RG 58, 18" N-Male to N-Male
- Antenna mounting plate
- Bulkhead connector w/O-ring gasket, lock washer, and nut
- Reference drawing

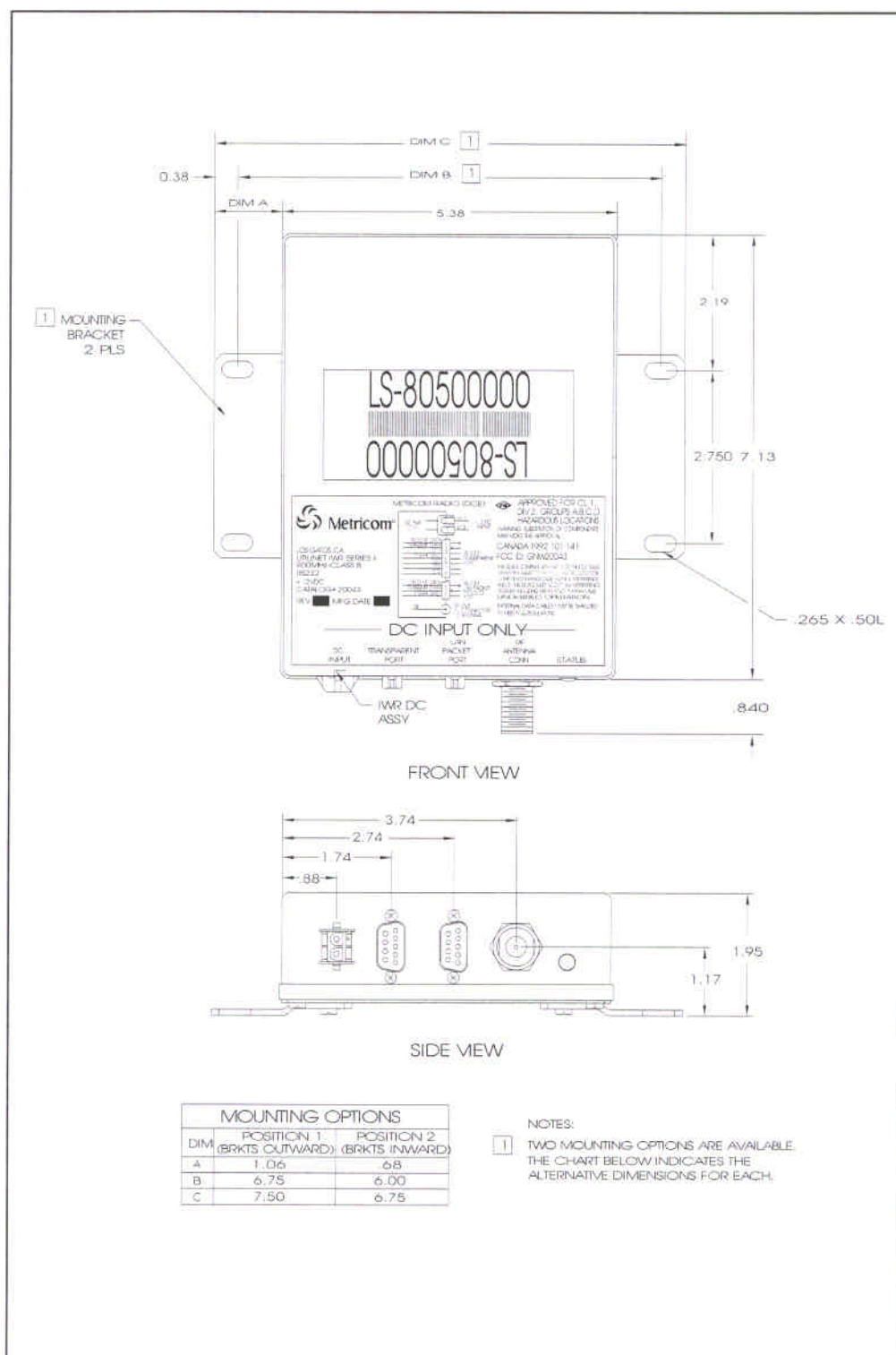


CAT# 81002 FILTER

This band-pass filter attenuates out-of-band signals and is used to reject interference from sources such as paging and cellular phone. It is designed to be used with the Series II IWR (both DC and AC) and be placed inside an RTU or like enclosure. It is a passive filter and connects in-line with the antenna coaxial cable. Only sites that exhibit interference from out-of-band sources require this filter. As a side note, UtiliNet radios are designed to be in-band interference tolerant and in-band interference has rarely been a problem.



UTILINET SERIES II INTEGRATED WANGATE RADIO



UTILINET SERIES II INTEGRATED WANGATE SPECIFICATIONS

Data Ports/Formats

UtiliNet LAN Packet Port	
Serial Interface	RS-232C
Data Rate	1200 or 9600 bps (N, 8, 1, FDX)
Protocol	UtiliNet LAN Packet Protocol
Transparent Port	
Serial Interface	RS-232C
Data Rate	300, 600, 1200, 2400, 4800, or 9600 bps
Parity	Odd, Even, or None
Data Bits	7 or 8
Stop Bits	1 or 2
Duplex	FDX
Protocol	Any Asynchronous Byte-Oriented Protocol

Power

12 VDC Operation	
Input Voltage Range	10.5 - 16.0 VDC
Input Current	100 mA
Input Current (RF transmit max)*	260 mA
Noise & Ripple allowed @ 12 VDC (max)	200 mV p-p

Agency Approvals

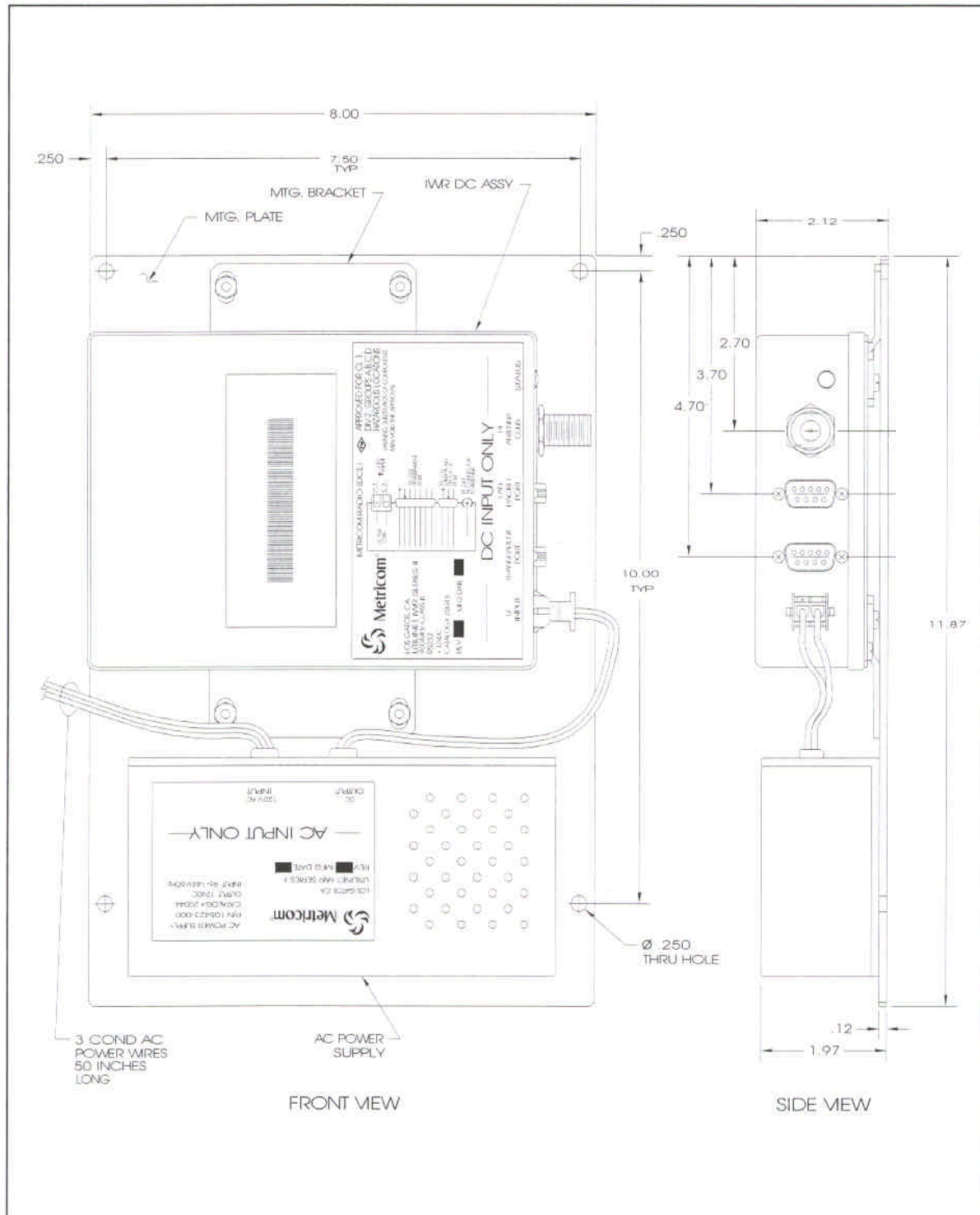
FCC	Certified Part 15.247
Factory Mutual	Class I, Div 2, Groups A,B,C&D
	Hazardous Locations

Mechanical

Interface Connections	
Power	Amp Mate-N-Lock
Data Ports	DB-9
Antenna	"N" Type, Female
Enclosure (indoor)	Sheet Metal
Weight	1 lb. 6 oz.
Size	5.38"W x 7.97"D x 1.95"H (8.25"W w/mounting brackets)

* Maximum transmit duty cycle is estimated to be 15%

UTILINET SERIES II INTEGRATED WAN GATE (w/AC POWER SUPPLY)



UTILINET SERIES II INTEGRATED WANGATE (W/AC POWER SUPPLY) SPECIFICATIONS

Data Ports/Formats

UtiliNet LAN Packet Port	
Serial Interface	RS-232C
Data Rate	1200 or 9600 bps (N, 8, 1, FDX)
Protocol	UtiliNet LAN Packet Protocol
Transparent Port	
Serial Interface	RS-232C
Data Rate	300, 600, 1200, 2400, 4800, or 9600 bps
Parity	Odd, Even, or None
Data Bits	7 or 8
Stop Bits	1 or 2
Duplex	FDX
Protocol	Any Asynchronous Byte-Oriented Protocol

Power

120 VAC Operation	
Input Voltage Range	96 - 144 VAC
Input Current (receive avg)	40 mA
Input Current (RF transmit max)*	70 mA

Agency Approvals

FCC	Certified Part 15.247
Factory Mutual	Class I, Div 2, Groups A,B,C&D
	Hazardous Locations

Mechanical

Interface Connections	
Power	3-wire pigtail, 18 AWG, 600 V
Data Ports	DB-9
Antenna	"N" Type, Female
Enclosure (indoor)	Sheet Metal
Weight	4 lb. 12 oz.
Size	8.00"W x 10.00"D x 2.12"H

* Maximum transmit duty cycle is estimated to be 15%

UTILINET SERIES II RADIO GENERAL SPECIFICATIONS

General

Frequency Range	902 - 928 MHz
Channels	240, 25 kHz wide
Channel Spacing	100 kHz
Raw RF Data Rate	9600 bps
Spreading Technique	Frequency Hopping
Hopping Technique	Pseudo Random, Asynchronous
Hopping Patterns	65,536 (Unique per Network)
Network Address	Latitude/Longitude Coordinates

Receiver

Type	Double Conversion Superheterodyne; 1st IF 45 MHz, 2nd IF 455 kHz
Dynamic Range	-104 to -20 dBm
Packet Error Rate	1×10^{-2} (1×10^{-6} BER)
IF Selectivity	6 dB down @ 30 kHz
45 MHz IF Rejection	< 90 dB
Frequency Stability	2.5 ppm (0.00025%) @ -30 to +75 degrees C 5 ppm (0.0005%) @ -40 to +85 degrees C

Transmitter

RF Output Min (at antenna connection)	+17 dBm (50 mW)
RF Output Typical	+20 dBm (100 mW)
Out-of-Band Spurious Radiation	< -55 dBc (1 kHz bandwidth)
Deviation	± 5.5 kHz $\pm 10\%$
Modulation Bandwidth	25 kHz
Modulation	Standard FSK
Output Impedence	50 Ohms
Frequency Stability	2.5 ppm (0.00025%) @ -30 to +75 degrees C 5 ppm (0.0005%) @ -40 to +85 degrees C

Processing

CPU	NEC V25
Clock Speed	8 MHz
Memory	
ROM	256 KBytes
DRAM	128 KBytes
EEPROM	512 Bytes
FLASH RAM	512 KBytes
Programming Language	Mettricom Device Control Word (MDCW)

Environmental

Operating Temperature Range	-40 to +60 degrees Celcius
Storage Temperature Range	-40 to +85 degrees Celcius
Operating Vibration	FCC Part 68D, Paragraph 302 Modified
Operating Shock	20 g, 11 ms, Half Sine per Mil Std. 802
Humidity	Mil Std. 202F, Method 106 Modified, 10 Days

EMI & Power/Control Susceptibility

Electromagnetic Radiation	FCC Class B, Part 15.247
Electromagnetic Susceptibility	ANSI C37.90.2 Modified
Surge Withstanding Capability	ANSI C37.90.1 and ANSI C62.41
Electrostatic Discharge	MIL Handbook 263 and IEC 801.2