

# MM2 Series

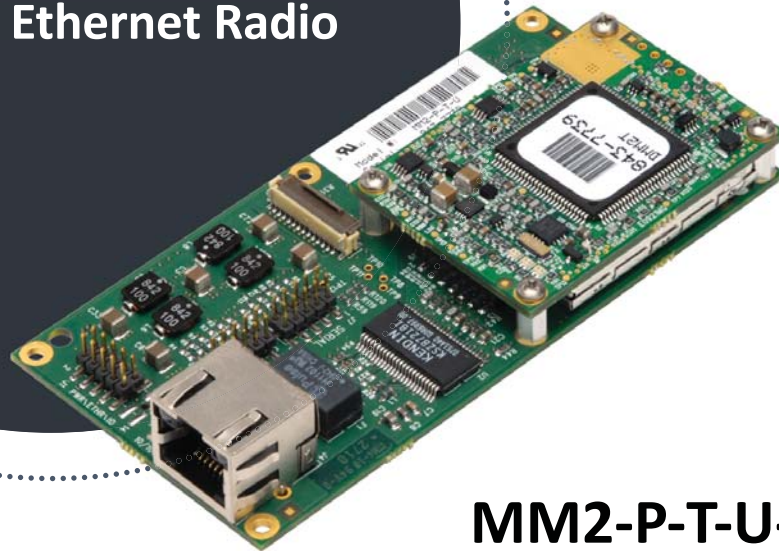
## 900MHz OEM Ethernet Radio

**FREEWAVE**

Contact us for product details and pricing

**NavtechGPS**

+1-703-256-8900 or 800-628-0885  
info@NavtechGPS.com  
www.NavtechGPS.com



## MM2-P-T-U-SR001

### KEY FEATURES

**Versatility:** Gateway, Endpoint, Repeater or simultaneous Endpoint and Repeater function in a single radio.

**Long Range:** 60 miles with clear line of sight with the ability to extend through Repeaters.

**Noise Immunity:** Superior performance in noise congested environments.

**Secure:** Frequency Hopping Spread Spectrum technology prevents detection and unauthorized access. 128-bit AES encryption standard.

**Error Free Communications:** 32-bit CRC with automatic retransmissions.

**Industrial Grade:** 100% tested for RF performance from -40°C to +85°C.

### OVERVIEW

Combining the FreeWave MM2 OEM Radio with an interface module running and IP stack allows FreeWave to offer a MM2 OEM Ethernet Radio. The MM2 OEM Ethernet Radio has been designed to provide the performance, reliability, and quality that our customers have come to know and expect.

The MM2 OEM Ethernet Radio provides all of the same functionality that can be found in the FGR2 Ethernet Radio but in a smaller footprint with a wider operating temperature. The smaller footprint makes it attractive for embedded applications where space is at a premium.

All radios are designed, manufactured and tested in Boulder, CO.



Contact NavtechGPS for product details. [www.NavtechGPS.com](http://www.NavtechGPS.com)  
+1-703-256-8900 • 800-628-0885 • [info@navtechgps.com](mailto:info@navtechgps.com)

### SOLUTIONS



DRONES & ROBOTICS



EARTH MONITORING



GOV & DEFENSE



IRRIGATION & PRECISION AGRICULTURE



ASSET TRACKING



OIL & GAS



WATER & WASTEWATER



SMART CITIES



UTILITIES

# TECHNICAL SPECIFICATIONS

## TRANSMITTER

<b>Frequency Range</b>	902 to 928 MHz
<b>Output Power</b>	Up to 1 W
<b>Range</b>	Up to 97 km (60 mi.), clear line of sight
<b>Channel Spacing</b>	230.4 kHz
<b>RF Data Rate</b>	115.2 or 153.6 kbps, user-selectable

## RECEIVER

<b>Sensitivity</b>	-108 dBm @ 115.2 kbps for BER 10 <sup>-4</sup> -103 dBm @ 153.6 kbps for BER 10 <sup>-4</sup>
<b>IF Selectivity</b>	-40 dB at fc +/- 230 kHz
<b>RF Selectivity</b>	50 dB at 896 MHz, 935 MHz
<b>Dynamic Range</b>	+10 dBm 3rd order intercept point

## DATA TRANSMISSION

<b>Type</b>	Frequency Hopping Spread Spectrum
<b>Modulation</b>	2 level GFSK
<b>Data Throughput</b>	80 or 115.2 kbps, user selectable
<b>Error Detection</b>	32-bit CRC, retransmit on error
<b>Data Encryption</b>	AES 128-bit encryption standard
<b>Hopping Zones</b>	16 zones, user-selectable
<b>Hopping Bands</b>	7, user-selectable
<b>Hopping Channels</b>	50 to 112, user-selectable
<b>Hopping Patterns</b>	15 per band, 105 total, user-selectable
<b>Protocol</b>	Ethernet: IEEE 802.3 CPIP, DHCP, ICMP, UDP, ARP multicast TFTP
<b>Authentication</b>	RADIUS

## POWER REQUIREMENTS

<b>Operating Voltage</b>	+5 VDC (+/- 5%)		
<b>Current Consumption</b>			
<b>Voltage</b>	<b>Transmit</b>	<b>Receive</b>	<b>Idle</b>
+5 VDC	850 A	205 mA	125 mA

## INTERFACES

<b>Data Interface</b>	1 straight 10-pin dual row header for power and Ethernet 2 serial straight 10-pin dual row headers 2mm pin spacing RS232 or TTL Options: 1 RJ45 Ethernet connector
<b>Diagnostics Interface</b>	Ethernet
<b>RF Connector</b>	MMCX

## GENERAL INFORMATION

<b>Operating Temperature</b>	-40°C to +85°C (-40°F to +185°F)
<b>Humidity</b>	0 to 95%, non-condensing
<b>Dimensions</b>	
MM2-P-T	101 L x 51 W 13 H (mm) 3.98 L x 2.00 W x 0.51 H (in.)
MM2-P-T-U	101 L x 51 W 13 H (mm) 3.98 L x 2.00 W x 0.51 H (in.)
MM2-P-T-SR001	101 L x 51 W x 16.8 H (mm) 3.98 L x 2.00 W x 0.66 H (in.)
MM2-P-T-U-SR001	101 L x 51 W 13 H (mm) 3.98 L x 2.00 W x 0.51 H (in.)
<b>Weight</b>	42g (0.9 lbs.)

## INFORMATION TO ORDER

Model Number	Description
MM2-P-T	Board level, Ethernet, RS232
MM2-P-T-SR007	Board level, Ethernet, TTL
MM2-P-T-U	Board level, Ethernet, RS232, UL Class 1 Div 2
MM2-P-T-U-SR001	Board level, Ethernet, RS232 with RJ45, UL Class 1 Div 2



Contact NavtechGPS for product details. [www.NavtechGPS.com](http://www.NavtechGPS.com)  
+1-703-256-8900 • 800-628-0885 • [info@navtechgps.com](mailto:info@navtechgps.com)

5395 Pearl Parkway, Boulder, CO 80301  
TF: 866-923-6168 T: (303) 381-9200  
For more information, visit [www.freewave.com](http://www.freewave.com)