

Radios
communication without barriers

IM-Series 2.4 GHz

Spread Spectrum OEM Modules European Union and Region 1 Approved

Features:

Freewave® Technologies provides wireless data solutions for applications around the world ranging from mission critical to recreational. All radios are built and tested in our world class manufacturing facility in Boulder, Colorado to operate over the temperature range of -40° to +75°C. The quality and versatility of our radios has led to their use in locations ranging from Mount Everest and Antarctica to the Amazon rainforest.

- **Frequency Hopping**
- **High Speed** –115.2 Kbps true throughput.
- **Long Range** – 20 mile range
- **Error Free Communications** – 32 bit CRC with automatic retransmission.
- **Industrial Grade Specifications** – 100% tested for full performance from -40°C to +75°C.
- **Repeater** and simultaneous Slave and Repeater function all in a single radio.
- **Improved supply voltage range and power consumption.** Input voltage range is now 9.5-30 VDC at full RF output power. Receive current is less than 100 mA @ 12 VDC. A new sleep mode consumes only 5 mA. A unit in sleep mode will wake up, synchronize with the network, and accept data in less than 150 *microseconds*.
- **Separate diagnostic serial connector** allows real time local diagnostics and setup menu access.
- **Better diagnostics**, including signal level in dBm and transmit current.
- **RS232 Interface**
- **Noise Immunity** – Superior performance in noise congested environments.
- **Secure** – proprietary spread spectrum technology prevents detection and unauthorized access.
- **100% backward compatible** with every 2.4 GHz FreeWave radio ever shipped.
- **European Union Standards**—programmable to comply with either the EN 300 328-2 or EN 300 440-2 standards.





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IM-Series 2.4 GHz Spread Spectrum Radios

Technical Specifications

Transmitter & Receiver	Transmitter	
	Frequency Range	2.400 - 2.483 GHz
	Output Power	100 mW to 500 mW
	Range, Line of Sight	20 miles with clear line of sight
	Modulation	Spread Spectrum GFSK
	Occupied Bandwidth	230 kHz
	Spreading Method	Frequency Hopping
	Hopping Patterns	15 per band, 105 total, user selectable
	Hopping Channels	75 to 80, user selectable
	Hopping Bands	3, user selectable
	Receiver	
	Sensitivity	-105 dBm for 10 ⁻⁶ BER -107 dBm for 10 ⁻⁴ BER
	Selectivity	20 dB at fc ± 115 kHz 60 dB at fc ± 145 kHz
System Gain	137 dB	

Data Transmission & Power	Data Transmission																					
	Error Detection	32 bit CRC, Retransmit on Error																				
	Data Encryption	Substitution, Dynamic Key																				
	Maximum Throughput	115.2 Kbps																				
	Data Interface	RS232/485/422																				
	Data Connector	Standard DB9 connector (IM-820X009)																				
	Power Requirement																					
	Operating Voltage	9.5-30 VDC																				
	Current Drain	<table border="1"> <thead> <tr> <th>Mode</th> <th>9.5VDC</th> <th>12 VDC</th> <th>30 VDC</th> </tr> </thead> <tbody> <tr> <td>Transmit</td> <td>400 mA</td> <td>325 mA</td> <td>150 mA</td> </tr> <tr> <td>Receive</td> <td>130 mA</td> <td>115mA</td> <td>60 mA</td> </tr> <tr> <td>Idle</td> <td>37 mA</td> <td>30 mA</td> <td>13 mA</td> </tr> <tr> <td>Sleep</td> <td>8 mA</td> <td>5 mA</td> <td>2 mA</td> </tr> </tbody> </table>	Mode	9.5VDC	12 VDC	30 VDC	Transmit	400 mA	325 mA	150 mA	Receive	130 mA	115mA	60 mA	Idle	37 mA	30 mA	13 mA	Sleep	8 mA	5 mA	2 mA
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General	General Information	
	Operating Temperature Range	-40°C to +75°C 100% full performance tested
	Dimension	165.1 mm L x 74.42 mm W x 58.64 mm H (IM-820X009)
	Weight	441 grams (IM-820X009)
	External Antenna Connector	Type N female. Professional installation only.
	Humidity	0 to 95% non-condensing

Specifications may change at any time without notice
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