



# FGR2 Series

## FGR2-T9 Industrial 900 MHz Series

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### Overview:

FreeWave Technologies Inc's products are legendary for their ability to deliver reliable, error free data in extreme climatic conditions and in noisy, congested RF environment. Our products have been installed on top of Mt. Everest, in the Amazon Rain Forest, in the Permian Basin and in major urban sites including New York City and in Los Angeles. Our installed base of more than 300,000 units are in use in a multitude of applications including oil and natural gas collection/transmission, traffic signal control, vehicle monitoring, electric power transmission/distribution and SCADA.

The T-Series products combine FreeWave's performance and reliability in a convenient low cost package designed specifically for traffic signal control applications. The T-Series is compatible with standard loop detector card cages and can be used in systems with 170, 2070 or NEMA controllers. All radios are designed, manufactured and tested at FreeWave's in Boulder, Colorado.

### Features:

- Secure Frequency Hopping Spread Spectrum Technology provides superior performance in noise congested environments.
- License Free: No need to wait for licensing approval to install networks.
- High Speed: 115.2 Kbaud true throughput.
- Long Range: 60 mile range with clear line of sight; ability to extend through Repeaters.
- Error Free Communications: With 32 bit CRC the best available, your data integrity is guaranteed.
- Industrial Grade Specification: 100% tested for RF performance from -40° C to +75° C.
- Scalable Network: The maximum number of radios in a network is unlimited. The number of repeaters in a network or any individual link is also unlimited.
- Diagnostic: Real time system diagnostics both for local site and the entire network.
- Interface Options: RS232 / 485 / 422 user selected.
- Detector Rack Compatible: Plugs into and is powered from standard loop detector rack.
- FreeWave Network Compatible: Full network compatible with standard FreeWave 900 MHz.
- Flexible Configuration: Any radio may be programmed to be a master, slave or repeater. Repeater can function as a simultaneous slave and repeater.



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Transmitter				
Frequency Range	902-928 MHz (FHSS)			
Output Power	5 mW to 1 Watt			
Range, Line of Sight	60 miles			
Modulation	2 level GFSK, 115.2 Kbps or 153.6 Kbps			
Occupied Bandwidth	230 kHz			
Hopping Patterns	15 per Band, 105 total, user selectable			
Hopping Channels	50 to 112, user selectable			
Hopping Bands	7, user selectable			
Frequency Zones	16 Zones, 7 channels per zone			
RF Connector	Type SMA			
Receiver				
Sensitivity	107 dBm for BER $1 \times 10^{-6}$ , -109 dBm for BER $1 \times 10^{-4}$			
Selectivity	40 dB at fc +/- 230 kHz 3rd Order Intercept Point at Input Connector			
System Gain	140 dB exclusive of antennas			
Data Transmission				
Error Detection	32 bit CRC, Retransmit on error			
Data Encryption	AES 128 bit encryption* and Proprietary Spread Spectrum Technology			
Link Throughput**	115.2 Kbps standard speed, 80 Kbps low speed <i>**Uncompressed, measured assuming 75% frequency availability</i>			
Data Interface	Serial			
Protocol	RS232 / 485 / 422, 1200 Baud to 230.4 KBaud, DCE			
Data Connector	DB9			
Power Requirements				
Operating Voltage	+6.5 to +30 VDC			
Current [mA]	Mode	+6.5 VDC	+12 VDC	+30 VDC
	Transmit	800	380	170
	Receive	90	55	40
	Idle	24	16	8
	Sleep	8	6	3
General Information				
Operating Temperature Range	-40° C to +75° C (-40° F to +167° F)			
Dimensions	1 slot width, standard loop detector rack			
Weight	206 g			
Humidity	0 to 95% non-condensing			

\*Contact your FreeWave reseller or sales rep for implementation details.

FreeWave Radios Require Professional Installation. Specifications may change at any time without notice. ©2012 FreeWave Technologies, Inc.

