



**PROCESS CONTROL**  
**REMOTE MONITORING**  
**HVAC CONTROL**  
**WATER & WASTEWATER**  
**OIL & GAS**

*A long-range 900MHz spread spectrum **Ethernet Radio** designed for reliable high-speed operation in harsh environments and extremely wide temperature ranges.*



## **FREEWAVE LONG RANGE WIRELESS ETHERNET BRIDGE**

- **License Free**
- **>60+ mile range in one hop**
- **Very High Noise Immunity**
- **Enhanced Security Features**
- **Built-in repeater functions**
- **Up to 170kbps "over-the-air"**
- **32-bit CRC error checking**
- **Automatic Error Correction**
- **On-line radio net diagnostics**
- **Very Low Power Operation**
- **Wide Power Voltage Range**
- **Wide Temperature Operation**
- **Standard 10Base-T interface**
- **3 Year Factory Warranty**

**Freewave long-range Wireless Ethernet Bridges** offer a unique wireless solution that combines the connectivity features of Ethernet with the long distance communications capabilities of the Freewave spread spectrum SCADA radios. Unlike competing 802.11 wireless Ethernet solutions, the Freewave radios operate at 900MHz, reaching much further and penetrating obstacles better. The Wireless Ethernet Bridges use the same SCADA radio technology as their field-proven, time-tested serial data counterparts, with the same extremely wide operating temperature range and high noise immunity, ideal for harsh environments.

### **Open Architecture**

Freewave long-range Wireless Ethernet Bridges provide a transparent wireless link between two or more points regardless of the message protocol; "like a wire through the sky".

### **Performance Plus**

Freewave long-range Wireless Ethernet Bridges operate up to the maximum legal output power, combined with a superior front-end design that "digs-out" weak received signals. Built-in 32-bit error detection AND correction ensures high throughput even in noisy environments. A built-in repeater capability transparently extends the effective reach of a system well beyond the 60+ mile range of a single radio "hop".

### **Support Tools**

Using a laptop or desktop PC, Freewave's support software provides real-time access to operating status information ANYWHERE IN THE RADIO NETWORK. Look at signal quality, error rates; even voltages and temperatures at any site in the network. Long-term trending tools and powerful spectrum analyzer software simplify troubleshooting if required. Even configuration and firmware updates can be done remotely "over the air", protecting your investment over time.



**Industrial Control Links**  
**(800) 888-1893 [www.iclinks.com](http://www.iclinks.com)**

# FREEWAVE LONG RANGE WIRELESS ETHERNET BRIDGE

## TRANSMITTER

<b>Frequency Range</b>	902 to 928 MHz
<b>RF Output Power</b>	User programmable 0.1 watt to 1.0 watt / +30dBm
<b>Range, Line of Sight</b>	60+ miles
<b>Modulation</b>	Spread Spectrum GFSK 120 Kbps to 170 Kbps
<b>Occupied Bandwidth</b>	230KHz
<b>Spreading Method</b>	Frequency Hopping
<b>Hopping Patterns</b>	15 (user selectable)
<b>Hopping Channels</b>	50 to 112 (user selectable)
<b>Hopping Bands</b>	7 (user selectable)

## RECEIVER

<b>Sensitivity</b>	-108dBm for $10^{-6}$ BER
<b>Selectivity</b>	20dB at $fc \pm 230$ KHz 60dB at $fc \pm 290$ KHz

## DATA TRANSMISSION

<b>Error Detection</b>	32-bit CRC
<b>Error Recovery</b>	Retransmit on Error (automatic, transparent to user)
<b>Data Encryption</b>	Substitution, Dynamic Key
<b>Maximum Throughput</b>	100Kbps
<b>Data Interface</b>	10Base-T UTP (Unshielded Twisted Pair) Crossover Switch built-in

## GENERAL SPECIFICATIONS

<b>Dimensions</b>	3.0" W x 6.5" L x 2.3" D (75mm x 165mm x 59mm)
<b>Power</b>	6 to 30Vdc
<b>Operating Current</b>	
<b>Transmit</b>	550mA at 12Vdc, 225mA at 24Vdc
<b>Receive</b>	125mA at 12Vdc, 63mA at 24Vdc
<b>Idle Current</b>	70mA at 12Vdc, 35mA at 24Vdc
<b>Sleep</b>	55mA at 12Vdc, 28mA at 24Vdc
<b>Wiring Terminations</b>	
<b>Ethernet</b>	RJ-45 (10Base-T)
<b>Serial Diagnostic Port</b>	9-pin "D" Female w/supplied cable
<b>Power</b>	2.1mm "Barrel" Connector center pin positive
<b>Antenna</b>	Type N Female

## Status LEDs

### Ethernet Modem Section

<b>LINK</b>	Modem connected to LAN
<b>TX</b>	Radio Link Transmit Data
<b>RX</b>	Radio Link Receive Data
<b>LTX</b>	LAN Transmit Data
<b>LRX</b>	LAN Receive Data
<b>COL</b>	LAN Data Collision
<b>ERR</b>	LAN Data Error

### Radio Section

<b>CD *</b>	Radio Carrier Detect
<b>TX *</b>	Radio Transmit Data
<b>CTS*</b>	Radio Clear to Send

\* These LEDs have multiple functions in combination with each other to provide detailed status information. See manual for details.

<b>Operating Temperature</b>	-40°C to 75°C (-40°F to 167°F)
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<b>Weight</b>	441 grams
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## SOFTWARE TOOLS

### Wireless Ethernet Starter Kit

<b>consisting of:</b>	Network Diagnostic Software Ethernet Patch Cable Documentation on CD
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## ORDER PART NUMBERS:

### HARDWARE

**98-1101** Freewave 900MHz Long-range Wireless Ethernet Bridge

### SOFTWARE

**98-5002** Wireless Ethernet Starter Kit Radio network diagnostic, installation and test tools, Ethernet cable, and documentation on CD.