

### Wireless Solution

ESTeem® wireless modem products provide a "Wireless Solution" by eliminating conventional hard wiring, leased phone lines, or cellular costs.

The ESTeem Model 192M comes with the industry standard RS-232C, RS-422, and RS-485 asynchronous communications ports to give the user a new dimension to "Wireless Networking".

Our narrow band, packet burst, frequency agile, radios allow the user to create a "Radio Area Network" of up to 255 users on a single frequency. The packet burst communications technique was chosen to give the system very high data integrity in high noise industrial environments. The ESTeem incorporates forward error correction and CRC error checking that provides received data accuracy of greater than one part in 100 million.



Model	Frequency (MHz)	RF Power (W)
192M	150 to 174	2 to 5

### Packet Protocols

By using a Carrier-Sensed-Multiple-Access (CSMA) communication protocol, no polling station or token is required in the ESTeem network. When an ESTeem has information to send, it will check to see if the channel is clear, transmit its packet, then wait for the acknowledge packet. ESTeem radios are a Master/Master system, meaning any ESTeem of the same model type can communicate with each other using a User Definable Radio Address.

### Data Privacy

Transmitted data privacy is insured by the use of an interleaving technique of the modulated data, user definable radio addressing, network addressing, and security lock-out of software programming.

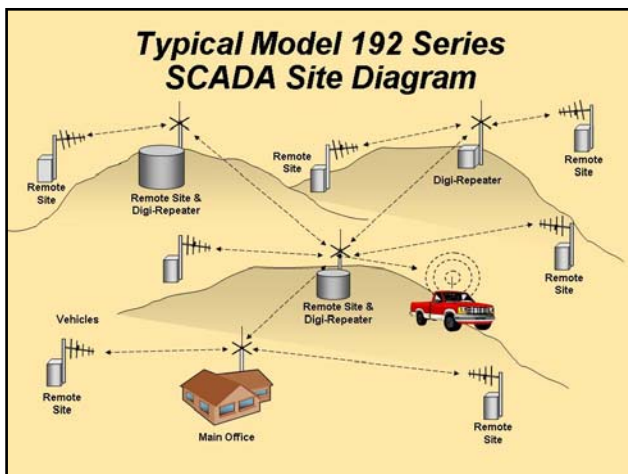
### Increased Operating Range

The internal Digi-Repeater feature allows the user to increase operating range by relaying transmissions through a maximum of three ESTeems to reach the destination ESTeem. The ESTeem can function as a Master, Remote, Repeater, or Remote/Repeater node for added flexibility.

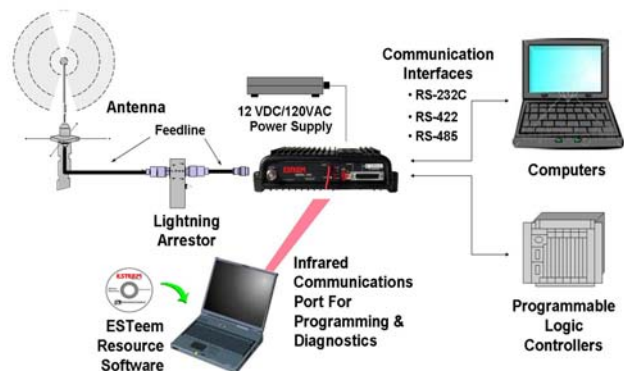
### User Friendly

The ESTeem has user programmable software to allow the configuration of the unit for any application. These commands are saved in the ESTeem's internal non-volatile memory.

ESTeem 192 Software Features
User Definable Radio Modes of Operation
Digi-Repeater Feature, Maximum 3 Hops
Remote Programmability
Programmable Auto-Connect
Radio Self Test
Packet Monitor
Received Signal to Noise Ratio Output
Received Signal Strength Output
Point to Point Protocol
Point to Multi-Point Protocol
Polled with Report-By-Exception Protocol
Multi-Connect
Global Broadcast
Transparent Mode
Semi-Transparent Mode
Contention Protocol
DNP Protocol
PLC/RTU Protocol Drivers
Security Code (user programmable)



Typical 192 Series Outdoor Hardware Block Diagram



# Technical Specifications

# Model 192M

ESTeem 192M Specifications	
<b>Transceiver</b>	
Frequency of Operation (Software Selectable)	150 to 174 MHz
Frequency Selectability	6.25 KHz
Frequency Stability	± 1.5 ppm
RF Data Rate @ 25 KHz Channel Spacing	19200 bps
RF Data Rate @ 12.5 KHz Channel Spacing	9600 bps
RF Output Power @ 50 ohms (Z)	2 to 4 Watts
TX Duty Cycle	100%
Transmitter Spurious & Harmonics	> 55 dB down from carrier
Transmitter Rise Time	1 mSec
TX Modulation	DC to 4800 Hz @ 19,200 bps DC to 2400 Hz @ 9600 bps
TX Deviation	4000 Hz @ 19,200 bps 3000 Hz @ 9,600 bps
Minimum Radio Turn Around Time	<30 mSec + Data (with Acknowledge) <15 mSec + Data (without Acknowledge)
Transmit/Receive Switch	Integral to Unit
RX Sensitivity	-110 dBm @12 dB Sinad
Receiver Spurious & Image Rejection	> 50 dB
Receiver Squelch Sensitivity	Software Adjustable
Receiver Adjacent Channel Rejection	> 70 dB
Receiver Modulation Acceptance:	25 KHz @ 19,200 bps 12.5 KHz @ 9,600 bps
Receiver Base Bandwidth:	4.8 KHz @ 19,200 bps 2.4 KHz @ 9,600 bps
<b>Data Packet Information</b>	
Radio Addressing (Programmable)	1 to 255
Data Packet Size (Programmable)	1 to 2000 bytes
Data Buffers	Transmit 4000 bytes/Receive 4000 bytes
Data Transmission Protocol	Carrier Sensed Multiple Access w/Collision Detection (CSMA-CD)
Data Error Checking	Forward Error Correction, 32 bit Cyclic Redundancy Check (CRC) with Packet Acknowledge and Retry
Data Retry (programmable)	1-255
<b>LED Indicators</b>	
Front Panel	Power (On/Off) - Rx Carrier Detect (On/Off) - Transmitter (On/Off) - Auto Connect (On/Off) - Link Connect (On/Off) - Serial Port Error (On/Off)
<b>Input/Output Interfaces</b>	
RF Input/Output	TNC Female Connector
Input Power	2 Pin Molex (male) Connector
Asynchronous RS-232C/422/485	25 Pin Sub Minatue D Connector 600 to 19,200 baud (software selectable), 7 to 8 data bits, Even/Odd/No Parity, 1 or 2 stop bits Hardware or Software Flow Control
Infrared Programming Port	Dongle, Infrared Communications Device, AA300 (optional)
<b>Switches</b>	
CPU Reset	Front Panel (push button)
RS-232C/422/485	Dip Switch (on rear of unit)
<b>Power Requirements</b>	
Power Supply Voltage	10.8 to 16 VDC
Power Supply Current	400 mA Receive 1.5 A Transmit (2 W) 2.0 A Transmit (4 W)
<b>Case</b>	
Temperature Range	-30 to +60 degrees C.
Humidity	95% Non Condensing
Dimensions	2.45 in. (H) x 8.16 in. (W) x 9.37 in. (L)
Weight	5 lbs.
Product Warranty	1 Year
<b>Type Acceptance</b>	
FCC (USA) @ 25 KHz Channel Spacing	ENPESTEEM192M
FCC (USA) 25 KHz Emission Designator	17K6F2D
FCC (USA) @ 12.5 KHz Channel Spacing	ENPESTEEM192M
FCC (USA) 12.5 KHz Emission Designator	10K8F2D
Industry Canada @ 25 KHz Channel Spacing	2163 195 385A
Industry Canada 25 KHz Emission Designator	17K6F2D
Industry Canada @ 12.5 KHz Channel Spacing	2163 195 385A
Industry Canada 12.5 KHz Emission Designator	10K8F2D



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