WIRELESS LAN TRANSCEIVER
EZCom® Modbus

FEATURES

- 900 MHz Spread Spectrum-Direct Sequence
- High Immunity to Interference and Jamming
- Modbus ASCII & RTU, DF1, Optomux or transparent mode
- Store and Forward Repeater Capability
- High Speed 115 KB Data Rate
- Attached or Remote Antenna
- Industrial Temperature Range
- Exceptionally High Processing Gain
- EZ-Setup Software
- Two Year Warranty

APPLICATIONS

- Stand Alone Control
- Local Control & I/O
- **Central Processing: Remote I/O**
- **Distributed Processing: Remote I/O**
- **SCADA**
- **RTU**

DESCRIPTION

The Grayhill EZCom® radio is a complete 900 MHz Direct Sequence, Spread Spectrum (DSSS) Industrial Transceiver that can be used for point to point or point to multi-point data communications. These rugged radios are based on spread spectrum technology with direct sequence spreading for enhanced interference immunity, reliability and extended range.

The EZCom® radio can establish a good quality, point to point link at up to 15 miles unobstructed line of site. Since these radios operate in the ISM band, no FCC license is required. They are designed for industrial environments and are backed by Grayhill's two year warranty.

EZCom's network controller will packetize the data prior to transmission which provides communication handshaking, error detection, packet sequencing and supports up to 255-2 endpoints store and forward repeaters to extend the communication range. EZCom's data port uses a standard RS-232 serial interface that can be driven asynchronously at rates up to 115 KBps. The EZCom® data port can be configured for protocol specific operation which supports several standard industrial protocols. When your application calls for minimal setup or involves a proprietary protocol, the EZCom® radio can be configured for fully transparent operation.

A development kit is also available that contains everything to develop and test an application including: 2 EZCom® radios, 2 power supplies, 2 antennas, 2 data cables, 1 programming cable and a resource CD all packaged in a rugged carry case.

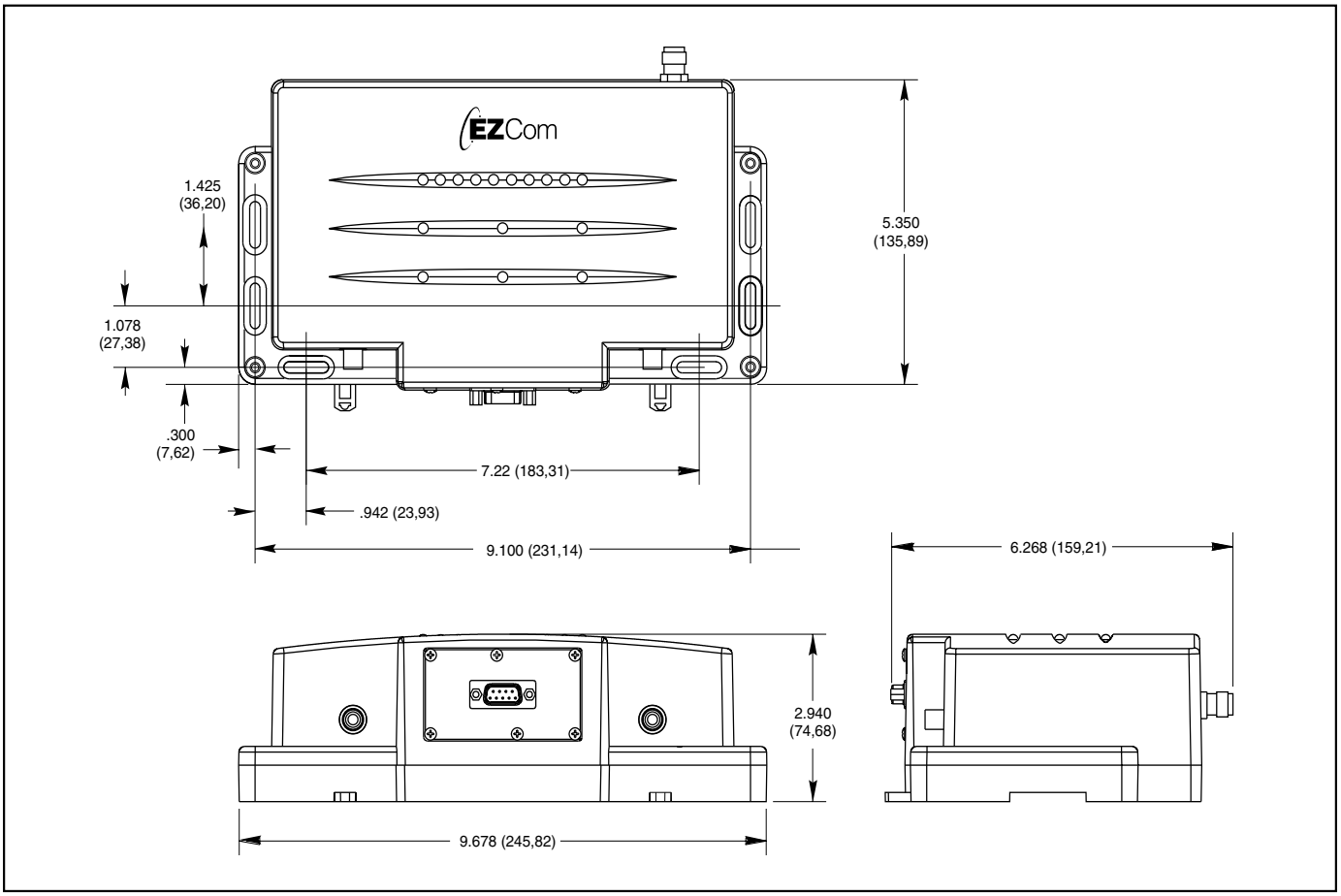
CONFIGURATION OPTIONS

The Grayhill EZCom® network is easy to setup and configure using our Windows based setup software called EZ-Setup. The Grayhill EZ-Setup software allows system-wide configuration and monitoring of every radio on the network including store and forward links. This allows operators to gather field diagnostics and monitor daily radio traffic from a central location.

EZ-Setup allows the operator to graphically set parameters such as Protocol, Data Routing, Center Frequency, Data Baud Rate, and Modulation. Data traffic statistics are kept in each radio and are available from EZ-Setup as well.

Grayhill EZ-Setup

DIMENSIONS In inches (and millimeters)



SPECIFICATIONS

Transceiver

Waveform: Direct sequence spread spectrum
RF Frequency Band: 902 to 928 MHz
Frequency Channel Spacing: 1 MHz
Modulation Type: Differential BPSK or QPSK
Communication Mode: Half duplex
Chip Rate: 3.275 Mcps
Channel Burst Data Rate: 101.6 or 211.3 KBps
Processing Gain: 16.5 dBm minimum
Receiver Sensitivity at 10^{-6} BER: -103 dBm
Maximum Transmitter Output Power: 500mW
Maximum Effective Radiated Power: 4.0W with Yagi or high gain Omni Antenna
Spurious Output: Compliant to FCC Part 1
LED Indicators: Power, multi-color signal strength, local error, remote error & test

Connectors

Antenna Port: Reverse polarity TNC jack.
Data Interface Connector: Standard RS-232 9-pin D-subminiature plug. Use Grayhill cable WL-CDAT-6.
Power Connector: Lemo receptacle, 3-pin, connects directly to Grayhill power supply p/n WL-PWR-AC1.
Monitor Port: Lemo receptacle, 4-pin, connects directly to Grayhill cable asm p/n WL-CPRG-8.

Data Interface

Interface Type: RS-232 (EIA/TIA-232-E)
Lines Supported: TXD, RXD, RTS, CTS, DSR, DTR, CD, GND
Asynchronous Baud Rates: 1200 Baud to 115.2 Kbaud

Power Requirements

Supply Voltage: +10 to +28 Vdc
Maximum Power Consumption: 16.8W
Tx Supply Current: 1400 mA at +12 Vdc
Rx Supply Current: 800 mA at +12 Vdc

Environmental Rating

Operating Temperature Range: -40°C to +70°C
Storage Temperature Range: -40°C to +85°C
Humidity: 0 to 90%, non-condensing

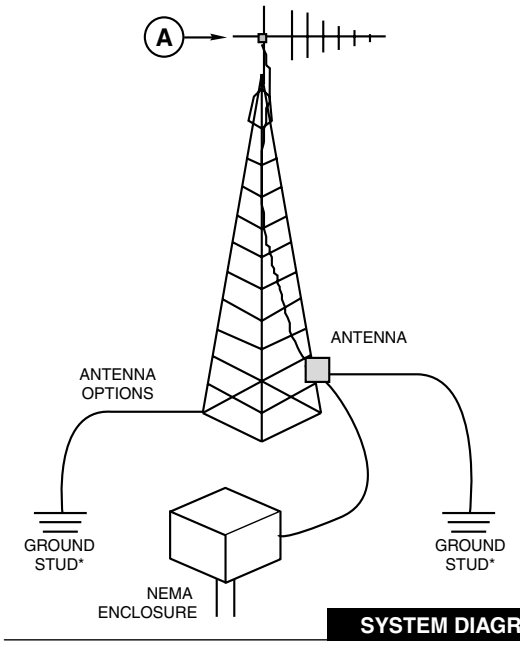
Mechanical Rating

Dimensions: 9.7" x 5.4" x 2.9" (24.7 cm x 13.9 cm x 7.4 cm)
Weight: 4.4 lbs. (2.0 kg)
Case Material: Diecast aluminum

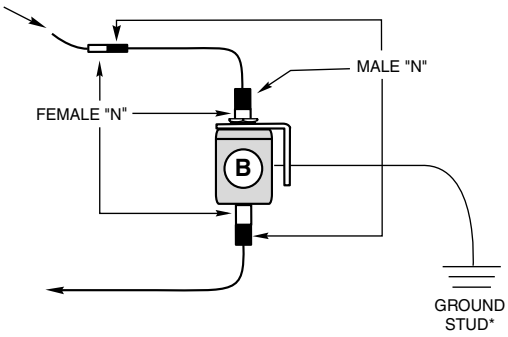
Approvals

FCC: Part 15 FCC approved
Industry Canada: RSS 210 approved
Warranty: 2 year

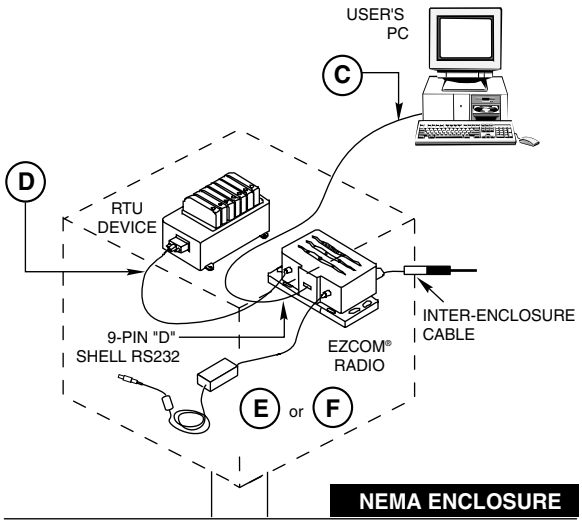
900 MHZ MODBUS EZCOM® OUTDOOR EXAMPLE SITE



SYSTEM DIAGRAM



LIGHTNING ARRESTOR



NEMA ENCLOSURE

*CONSULT LOCAL ELECTRICAL CODES.

EZCOM® MODBUS ACCESSORIES

A

Whip Antenna
This antenna is used for general purpose wireless LAN applications an is intended to be attached directly to the EZCom® RF connector and provides unity gain. It has a mechanical hinge to allow it to adjust from 0 to 90°.

Omni Antenna
The 6 dBd omni antenna is ideal for remote sites in a master/slave configuration such as base stations. It includes mounting brackets for remote mounting from the radio and requires low loss RF extender cable to connect to the EZCom® radio.

Yagi Antenna
The 9 dBd yagi antenna is ideal for point-to-point transmit and receive applications that require high gain. The Yagi antenna includes mounting brackets for remote mounting from the radio and requires the low loss RF extender cable to connect to the EZCom® radio.

B

Lightning Arrestor
A flange mount broadband coaxial protector for general radio use. It uses frequencies from 1.5 Mhz to 1000 MHz with multi-strike capability.

C

Programming Cable
The programming cable allows the user to configure or monitor the EZCom® radio network from a local computer. The programming cable is 8 feet long, plugs directly into the EZCom® monitor port and an RS-232 port on a local computer.

D

Data Cable
The data cable connects the data port of the radio to the host computer or end device. The data cable is a standard RS-232, female to female, cable assembly and is 6 foot long.

E

Mini Power Supply with Power Cord
The power supply offers a reliable, compact unit for powering the EZCom® radio with 120 or 240 Vac. The power connector plugs directly into the EZCom® transceiver.

F

DC Cable Power Supply
The DC cable provides flying leads to be terminated on a terminal block when using existing power supplies.

ORDERING INFORMATION: Radio and Radio Kits

Part Number	Description
WL9D-MOD	**EZCom® Modbus Radio only**
WL9D-MOD-DEV	**EZCom® Modbus Development Kit** (2 radios, 2 power supplies, 2 antennas, 2 data cables, resource CD)
WL9D-MOD-EVK	**EZCom® Modbus Evaluation Kit** (2 radios, 2 power supplies, 2 antennas, 2 data cables, resource CD, carrying case)
WL-WRD	**Wireless Resource CD** (includes user's manual, software, demo tools)

ORDERING INFORMATION: Accessories

Part Number	Description
WL-ANT-MNUA	Whip Antenna
WL-ANT-Y9A	9 dBd Yagi Antenna
WL-ANT-MN6A	6 dBd Omni Antenna
WL-PWR-AC1	Mini Power Supply with Power Cord
WL-CPRG-8	Programming Cable
WL-CDAT-6	Data Cable
WL-CPWR-6	DC Cable Power Supply
WL-ARST-1	Lightning Arrestor

ORDERING INFORMATION: Low Loss RF Extender Cable Examples

Part Number	Connector 1	Connector 2	Length
WL-CAEX-BS-001	Bulkhead N	Straight female TNC	1 foot
WL-CAEX-FS-001	Female N	Straight female TNC	1 foot
FR-R06	Female N	Right angle female TNC	6 inches
WL-CAEX-MR-025	Male N	Right angle female TNC	25 feet
WL-CAEX-MR-100	Male N	Right angle female TNC	100 feet

Low Loss RF Extender Cables
The RF Extender cables provide a low loss way to connect an externally mounted antenna to the EZCom® Modbus radio. The RF extender cables are made with LMR-400, a low loss and very flexible communications cable. Grayhill can provide custom lengths and configurations. For indoor usage only.

ORDERING INFORMATION: Custom Cables

WL-CAEX-MR-100

Series
Cable Extenders
Cable Length: in feet (from 1 to 100 feet)
Connector 2: B = Bulkhead N; S = Straight TNC; M = Male N; F = Female N; R = Right Angle TNC
Connector 1: B = Bulkhead N; S = Straight TNC; M = Male N; F = Female N; R = Right Angle TNC

Available from your local Grayhill Distributor. For prices and discounts, contact a local Sales Office, an authorized Distributor or Grayhill.