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Cathodic Protection Remote Monitoring

FGRCP Industrial 900 MHz Radio

Overview:

The FreeWave Technologies Model FGRCP cathodic protection remote monitoring radio is a multi-purpose, spread spectrum, board level product with specific inputs and outputs for monitoring and reporting operational values on pipelines, tanks, structures, and other underground facilities subject to environmental corrosion. Designed to be compatible with other FreeWave radio products, the FGRCP is ideal for pipeline and tank companies wishing to extend their investment in telemetry automation to cathodic protection structures as well.

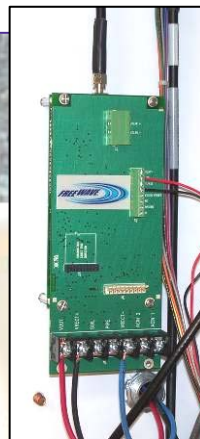
The FGRCP cathodic protection remote monitoring radio products monitor pipe-to-soil test stations, rectifier stations, pipeline pressure stations and pipeline scrubbing stations. The FGRCP board level radio, shown below, is available in a preassembled LineMarker Test Station complete with solar power system, antenna and conduit mounting bracket. The FGRCP has no recurring monthly costs or fees.

Features:

- Multi-Purpose, All-in-One: radio modem for monitoring rectifiers, pipe-to-soil test stations, pressure monitoring, and pipeline scrubbing operations.
- Enhanced lightning surge isolation: Full CP isolation protection from field structures.
- Open Protocol Communications: the FGRCP uses open Modbus and Extended Modbus.
- No Obsolescence: 100% backwards compatibility with all FreeWave 900 MHz products.
- No Recurring Monthly Costs: by owning your own communication network.
- Enhanced Security: retains all data within company firewall protection.
- Easily Integrates: into existing radio networks leveraging existing investments in supervisory control and data acquisition systems using open extended Modbus network addressing.
- Frequency Hopping Spread Spectrum: invented for military use in 1940's.
- High Speed Communications: 115.2 Kbps true data throughput
- Long Range: up to 60 miles line of sight, ability to extend range by repeating from station to station to station or to existing FreeWave radio products.
- Error Free Communications: 32 bit CRC with automatic retransmission.
- Industrial Grade Specifications: Every FGRCP is 100% factory tested for full range performance and temperature cycle tested from -40°C to +75°C.
- Repeater Capabilities: Each FGRCP can perform as a Slave Radio, a Repeater and simultaneous Slave/Repeater.
- Wide Supply Voltage Range: Supply voltage 10 to 30 VDC.
- Ultra Low Power Consumption: Current draw is less than 8 mA, 12 vdc in linked idle mode, and less than 60 mA in receiving mode.
- Separate Diagnostics Serial Port: Allows real time simultaneous diagnostics and setup without tying up the FGRCP main communication port.
- Separate RS232 Serial Port: allows the FGRCP radio to simultaneously communicate to the CP monitoring points and to auxiliary PLC's, EFM's, RTU's, etc.
- Enhanced Diagnostics: including signal level in dBm and transmit current.
- RS232/RS485/RS422 Interface available with user programmability.
- Noise Immunity: Robust communication performance in noisy, congested areas.
- Secure: Proprietary spread spectrum technology and user programmable security features prevent detection or unauthorized access.



FGRCP LineMarker
Test Station



FGRCP Board Level Radio



Specifications

FGRCP - Cathodic Protection Remote Monitoring Radio

Cathodic Protection Remote Monitoring

FGRCP Industrial 900 MHz Radio

Model FGRCP Specifications:

Rectifier Output Monitoring:

Voltage: -12 to +112 VDC,

Current Sense: -0.156 to +0.156 VDC

Rectifier Status Monitoring:

Inlet power status monitoring: 13 VAC or VDC

Rectifier Interruption:

12 vdc, DO relay output, user selectable

Pipe-to-Soil Monitoring:

Potential: -8 to +8 volt VDC

Auxiliary Discrete Output:

Used for rectifier interruption or remote control of field equipment.

Auxiliary Analog Input:

1 to 5 VDC or 4 to 20 milli-amp (250 ohm)

Integrated Solar Charging:

12 or 24 VDC, up to 50 Watt

Charging circuit and regulator, controller

Frequency Range:

902-928 MHz

Output Power:

100mW to 1 Watt

Range, Line of Sight:

60 Miles with line of sight

Modulation:

Spread Spectrum GFSK

Data Throughput:

115.2 Kbps

Occupied Bandwidth:

230 kHz

Spreading Method:

Frequency Hopping

Hopping Pattern:

15 per Band, 105 Total, User Selectable

Hopping Channels:

50 to 112, User Selectable

Hopping Bands:

7, User Selectable

Sensitivity:

-108 dBm for BER 1×10^{-6}

-110 dBm for BER 1×10^{-4}

Selectivity:

20 dB at $f_c \pm 460$ kHz (2nd IF)

System Gain:

140 dB

Error Detection:

32 bit CRC, Retransmit on error

Data Encryption:

Substitution, Dynamic Key

Data Interface:

RS232/RS485/RS422 or TTL

Data Connector:

10 pin, locking data and power connector

Diagnostics Connector:

20 pin header connector

Antenna Connector:

Board-Level Radio: SMA, threaded

LineMarker Test Station: Antenna included

Power Requirements:

12vdc

30vdc

Transmit:

500mA

200mA

Receive:

60mA

30mA

Idle:

9mA

6mA

Solar Autonomy:

LineMarker Test Station: fully loaded I/O, 18 days with 1.25 safety factor

Electrical Classification:

None, Class 1, Division 2 (pending)

Operating Temperature:

Range: -40°C to +75°C, fully tested

Humidity:

0-95% non-condensing

Dimensions:

Board-Level Radio: h 5", w 3.5", d 2"

LineMarker Test Station: h 30", w 4", d 4"

Weight:

Board-Level Radio: 160 grams

LineMarker Test Station: 12 pounds

Mounting:

Board-Level Radio: Standoffs available or FGRCP bracket mount

LineMarker Test Station: 3 inch conduit riser pipe or

8x8 surface mount, flat adapter bracket



**Model FGRCP
LineMarker
Test Station on
3 inch conduit
pipe.**

