Cathodic Protection Remote Monitoring
Model 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 CP 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 board-level radio (shown below) is also available in a preassembled FGRCP LineMarker Test Station complete with solar power system, antenna and conduit mounting bracket.

**Affordable Radio-Based Cathodic Protection Remote Monitoring**

**FreeWave Model FGRCP Remote Monitoring Unit Features:**
- Refreshingly easy to buy with the best return on investment available.
- Multi-Purpose, All-in-One: CP RMU for remotely monitoring:
  - Rectifier Input Power Status
  - Rectifier Power Interruption
  - Rectifier Output Voltage
  - Rectifier Output Amperage
  - Pipe-to-Soil Test Points,
  - Critical Bonds
  - Interference Points
- No Recurring Monthly Fees or Costs
- No Licensing Fees or Costs
- Open Protocol Communications
- Maximum Network Security behind the Company Firewall
- Easily integrates into existing radio networks
- Long Range: up to 60 miles line of sight,
- Infinite Communication Repeater Capability
- Advanced Lightening Surge Isolation
- Industrial Grade temperature tested: -40°F to +165°F.
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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)
12 or 24 VDC, up to 50 Watt

Integrated Solar Charging:
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 1x10⁻⁶
-110 dBm for BER 1x10⁻⁴

Selectivity:
20 dB at fc± 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:

<table>
<thead>
<tr>
<th></th>
<th>12vdc</th>
<th>30vdc</th>
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</thead>
<tbody>
<tr>
<td>Transmit</td>
<td>500mA</td>
<td>200mA</td>
</tr>
<tr>
<td>Receive</td>
<td>60mA</td>
<td>30mA</td>
</tr>
<tr>
<td>Idle</td>
<td>9mA</td>
<td>6mA</td>
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</table>

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

FreeWave Radios Require Professional Installation
Specifications may change without notice. 2008 FreeWave Technologies, Inc.

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