PPS33LR RemoteWatcher
Multi-Sensor Wireless Monitoring System

www.pioneerps.com
PPS33LR RemoteWatcher is a low-power multi-sensor monitoring system designed for applications that require simultaneous multipoint pressure, differential pressure, temperature and/or flow monitoring. The system is highly adaptive and cost effective. Customers can choose from multiple sensor and surface unit configurations based on the number of sensors needed and the transmission distance required.

Wireless Systems

The Gateway–sensor configuration allows customers to use the PPS Gateway and up to 16 sensors as a network. The Gateway is capable of transferring data to a computer and other devices, through USB and RS232/485 communication. The Gateway also has a 2 GB (15,000,000 samples at 60 sec/sample) SD memory card as backup in the unlikely event of a power interruption.

The Gateway Surface Unit System also allows customers to use the PPS Gateway and up to 16 sensors as a network, with the key difference being the LCD display with keypad and 16 real time status indicators. This allows customer to easily monitor sensor readings from the display panel, as well as check each sensor’s signal strength and battery remaining. The status indicators clearly show which sensors are online or offline.

Data Transmission

Any of the PPS33LR RemoteWatcher configurations can work with customer SCADA or satellite and cellular phone transmission systems to offer real-time information to clients working off site. PPS has also designed its own proprietary data transmission service, which transmits data to a secure server via a GSM network. Clients can now view, download and chart their data 24 hours a day, seven days a week.

900 MHz Frequency Protocol

The PPS Gateway is typically tuned to operate using 900 MHz (902-928MHz) radio frequency. However alternative frequency bands are available upon

System Applications

- Wellhead Stimulation Monitoring
- Wellhead Pressure Buildup and Production Monitoring
- Injection Pressure Monitoring
- Well Testing Monitoring
- Perforation Monitoring
- Pipeline Monitoring
- Plant Monitoring
request making PPS33 RemoteWatcher globally compatible. Usually the distance over which data can be transmitted depends significantly on things such as transmitter power, receiver quality, type, size, and height of antenna, mode of transmission, noise, and interfering signals.

With PPS’s high performance design for the wireless transceiver and antenna, there is a reduction in noise and interference allowing for greater distances to be achieved. With an unobstructed line of sight data can be received up to seven kilometers (4.4 miles) away, and by adding a high gain antenna the distance can be increased up to 15 km (9.3 miles). Gateway provides reliable, long range, wireless data transmission.

* Range up to and over one km requires an unobstructed line of sight

- Maximize return on investment with the option to expand the PPS33 system as requirements change
- Designed for multiple types of applications
- Highly accurate sensors to ensure precise measurements
- ZigBee is compliant in the 2.4GHz ISM band for global application
- 902-928 MHz ISM band and other band frequencies available
- Integrated antenna and battery

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System Components:

1. Temperature Sensor
2. Pressure Sensor
3. Differential Sensor
4. PPS Gateway
5. Flow Sensor (Not Shown)
6. PPS Gateway System (Not Shown)
# PPS33LR Wireless Sensors

## Metrology

<table>
<thead>
<tr>
<th>Sensor Type</th>
<th>Pressure (P+T) Sensor</th>
<th>Temperature Sensor</th>
<th>Turbine Flow Sensor**</th>
<th>Differential Pressure Sensor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>Silicon-Sapphire</td>
<td>RTD</td>
<td>Turbine</td>
<td>Silicon-Sapphire</td>
</tr>
<tr>
<td></td>
<td>Quartz (Optional)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Range</td>
<td>3K</td>
<td>6K</td>
<td>10K</td>
<td>15K</td>
</tr>
<tr>
<td>Accuracy</td>
<td>±0.03% full scale</td>
<td>±1 °C</td>
<td>±1%</td>
<td>N/A</td>
</tr>
<tr>
<td>Resolution</td>
<td>0.0003%FS</td>
<td>0.01°C</td>
<td>One Pulse</td>
<td>0.01 psi @ 1sec</td>
</tr>
<tr>
<td>Drift-psi/yr</td>
<td>&lt;±3 psi/year</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## Characteristics

<table>
<thead>
<tr>
<th>Service</th>
<th>H₂S/CO₂ Services</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental Temperature</td>
<td>-40 °C (-40 °F) to 100 °C (212 °F)</td>
</tr>
<tr>
<td>Humidity</td>
<td>0-100%</td>
</tr>
<tr>
<td>Memory</td>
<td>4 million data sets</td>
</tr>
<tr>
<td>Battery Type</td>
<td>Lithium Size D 3.6V</td>
</tr>
<tr>
<td>Battery Life</td>
<td>Up to 1.4 years @ 25 °C</td>
</tr>
<tr>
<td>External Power</td>
<td>9-28VDC (Optional)</td>
</tr>
<tr>
<td>Sample Rate</td>
<td>1 sec to 60 sec/sample</td>
</tr>
<tr>
<td>Dimension–inch</td>
<td>15 x 4 x 3.75</td>
</tr>
<tr>
<td>Weight</td>
<td>3.3 lbs (1.5 kg)</td>
</tr>
<tr>
<td>Housing Material</td>
<td>Aluminum (copper free) or SS316</td>
</tr>
<tr>
<td>Other Material</td>
<td>SS17-4</td>
</tr>
<tr>
<td>Transducer Material</td>
<td>Hastelloy</td>
</tr>
<tr>
<td>Safety Rating Classification</td>
<td>Ex ia IIB T4 Ga; IS CI, DIV 1, GRP C and D T4 Class I, Zone 0, AEx ia IIB T4 Ga</td>
</tr>
<tr>
<td>Classification</td>
<td>IP56 classification</td>
</tr>
<tr>
<td>Connection</td>
<td>1/2” NPT (others by request)</td>
</tr>
</tbody>
</table>

## Communication

<table>
<thead>
<tr>
<th>Method</th>
<th>Time / Pressure Method</th>
<th>Time / Temperature Method</th>
<th>Time / Flow Rate Method</th>
<th>Time / Differential Pressure Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wireless Transmission Distance</td>
<td>902-928MHz (Other frequency available upon request)</td>
<td>7 km Line of Sight, further w/high gain antenna</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Antenna</td>
<td>2.5dB Whip (Standard), other options available upon request</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transmission Power</td>
<td>+24dBm (250mW) Software selectable</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Other pressure ranges available upon request
**Transmitter limits only

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## PPS33LR Gateway

### Characteristics
- **Environmental Temperature**: -40 °C (-40 °F) to 80 °C (176 °F)
- **Humidity**: 0-100%
- **Power Source**: 5V(USB) or 9-28VDC
- **Enclosure Dimension**:
  - Inch: 6.3 x 6.3 x 3.19 (160 mm x 160 mm x 81 mm)
- **Material**: Powder Coated Aluminum, EN 1706 ENAC-AlSi12(Fe)
- **Ingression Protection**: NEMA4 | IP-66 construction
- **Safety Rating**: Designed for Class I Division 2
- **Classification**: IP56 Classification

### Communication
- **Sensors Supported**: Connect up to 16 Sensors
- **Sample Rate**: 1 to 60 sec/sample
- **Data Set Method**: 902-928MHz (Other frequencies available upon request)
- **Wireless Transmission Distance**: 7 km Line of Sight
- **Antenna**: 2.5dB Whip(Standard), other options available upon request
- **Transmission Power**: +24dBm (250 mW) Software selectable

### Other
- **Interface**: RS485 / RS232 | USB
- **Interface Protocol**: MODBUS / Push | USB
- **Diagnostics / Configuration**: By Software or MODBUS
- **Data Storage**: SD Card 2GB (15,000,000 samples)

## PP33LR Gateway System

### Characteristics
- **Environmental Temperature**: -20 °C (-4 °F) to 80 °C (176 °F) for LCD Display
- **Humidity**: 0-100%
- **Power Source**: 9-28VDC, 90-260VAC
- **Enclosure Dimension**:
  - Inch: 16.1 x 14.3 x 8.1 (409 mm x 363 mm x 206 mm)
- **Material**: Polyester (SS316 Ex Enclosure available upon request)
- **Ingression Protection**: IP66 construction
- **Safety Rating**: Designed for Class I Division 2
- **Classification**: IP56 Classification

### Communication
- **Sensors Supported**: Connect up to 16 Sensors
- **Sample Rate**: 1 to 60 sec/sample
- **Data Set Method**: 902-928MHz (Other frequencies available upon request)
- **Wireless Transmission Distance**: 7 km Line of Sight
- **Antenna**: 3dB Omni (Standard), other options available upon request
- **Transmission Power**: +24dBm (250 mW) Software selectable

### Other
- **Interface**: MODBUS TCP/IP | PPS Remote Data Access | Wireless Repeater
- **Interface Protocol**: MODBUS / Push | PPS Remote Data Access | USB
- **Diagnostics / Configuration**: By Software / MODBUS / Remote Data Access
- **Data Storage**: SD Card 2GB (15,000,000 samples)
## Choose a Wellhead Monitoring System

<table>
<thead>
<tr>
<th></th>
<th>Temperature Max.</th>
<th>Pressure Max.</th>
<th>Power Source</th>
<th>Wireless Transmission</th>
<th>Work Mode</th>
<th>Memory Capacity</th>
<th>Safety Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PPS31</strong></td>
<td>-20 (-4°F) to 70 (158°F)</td>
<td>up to 15k</td>
<td>Lithium</td>
<td>328' (100m) (Optional)</td>
<td>MRO/ SRO</td>
<td>2,000,000</td>
<td>Class I, Division 1, Exia IIC T4, E Marking (-40 °C to 55 °C)</td>
</tr>
<tr>
<td><strong>PPS31M-Sapphire</strong></td>
<td>-50 (-58°F) to 200 (392°F)</td>
<td>up to 20k</td>
<td>Lithium</td>
<td>328' (100m)</td>
<td>MRO/ SRO</td>
<td>16,000,000</td>
<td>Class I Division 1 Group A, B, C &amp; D, T4 Ex ia IIC T4 (-40 °C–55 °C)</td>
</tr>
<tr>
<td><strong>PPS31M-Quartz</strong></td>
<td>-50 (-58°F) to 200 (392°F)</td>
<td>up to 20k</td>
<td>Lithium</td>
<td>328' (100m)</td>
<td>MRO/ SRO</td>
<td>16,000,000</td>
<td>Class I Division 1 Group A, B, C &amp; D, T4 Ex ia IIC T4 (-40 °C–55 °C)</td>
</tr>
<tr>
<td><strong>PPS33LR</strong></td>
<td>-50 (-58°F) to 200 (392°F)</td>
<td>up to 20k</td>
<td>Lithium</td>
<td>up to 7 km</td>
<td>MRO/ SRO</td>
<td>4,000,000</td>
<td>Ex ia IIB T4 Ga; IS CL I, DIV 1, GRP C &amp; D T4 Class I, Zone 0, AEx ia IIB T4 Ga</td>
</tr>
</tbody>
</table>
Smart Gauges and Simple Software

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