Scadaflex LPR

Wireless Ultra Low Power Remote I/O

Scadaflex LPR modules are ultra low power wireless remote I/O devices pre-packaged in polycarbonate enclosures. They extend the I/O capacity of Scadaflex II and Modulus SCADA controllers via a license-free mesh radio network. The radios form a wide network of up to 64 sites (per master controller) to cover a large area with minimum power consumption. Each mesh radio module automatically serves as a repeater for any other modules that cannot get through directly. Mesh radio systems are “self healing”; if a node drops out, others take over the message repeater functions.

LPR modules are supplied with a “D” cell lithium battery that can power them for up to several years, eliminating the need for solar equipment or external power wiring. They can also except external DC power, in which case, the battery can serve as a backup power source. Scadaflex LPR modules utilize conventional sensors and can supply 12Vdc power for them.

A low-power ultrasonic level sensor is available as an option.

LPR modules achieve their extremely low power operation by “sleeping” most of the time until an I/O sample must be taken. They wake up synchronized with the other modules in the system, sample their Inputs, exchange I/O information over the mesh network (always or on change), and then return to a low-power sleep state.

ULTRA LOW POWER BATTERY OPERATION
Scadaflex LPR modules can operate for several years from just a single “D” cell lithium battery. The battery is a non-proprietary type readily available worldwide. External DC power may also be used.

WIDE-AREA COVERAGE
Scadaflex LPR modules use 900MHz Spread Spectrum technology for license free operation that has superior range and penetration compared to higher frequency competitive offerings.

Scadaflex LPR modules have a wireless range of 0.5 miles to about 2 miles with the supplied antenna, or much farther with elevated higher gain antennas. With their mesh repeating capability, their effective coverage range is many square miles.

STANDARD SENSOR SUPPORT
LPR modules have 8 analog inputs; 4 for process sensors and 4 for resistive type sensors.

LPR modules support low-cost industry-standard 20mA or 5Vdc sensors. Power for the sensors can be provided by the module, boosted from its low-voltage internal battery or power supply. To minimize power consumption, the sensor power is switched ON just long enough to take readings from the sensors and shut off during the modules sleep periods.

The LPR module supports resistive sensors for temperature, position and soil moisture measurement, as well as high-speed pulse type devices such as flow meters, with calculated rate and totalization.

OPTIONAL ULTRASONIC LEVEL SENSOR
A low-power ultrasonic level sensor is available as an option. Powered from the LPR module battery or power supply, the sensor can measure distances up to 10 meters (32.8 feet) with a resolution of 1mm (0.04 inches)

LATCHING RELAY OUTPUTS
LPR modules have a pair of mechanical latching relays to provide “dry” contact outputs while consuming power only when switching. The relays only consume power when switching their on/off state.

AUTOMATIC FIRMWARE UPDATES
If new firmware becomes available, the Scadaflex II or Modulus master controller automatically updates all of the LPR modules in the field “over-the-air”. No manual intervention or technical expertise is required.

EXTENDED TEMPERATURE OPERATION
LPR modules operate from –40°C to +70°C.
Scadaflex LPR Ultra Low Power Wireless Remote I/O  SPECIFICATIONS

FIELD I/O
Discrete Inputs: 4  Contact closure or DC voltages up to 30Vdc
  Two of the inputs support high-speed pulse totalization up to 10KHz.
  Wetting Current: Approximately 0.2 mA
Discrete Outputs: 2  Latching Relays  Contact rating: 30Vdc / 250Vac, 1A/60W/120VA max.
Analog Inputs: 4  16-bit, Delta Sigma
  Input Ranges:
    [29-1001] 4 x 5V, 4 x 65,000 ohms
    [29-1002] 4 x 20mA, 4 x 65,000 ohms
  Resistance inputs support 2250 ohm thermistors and Irrometer Watermark 200SS soil moisture sensors
  Maximum signal level: 35Vdc on any range
  Sensor Power Output: 12Vdc, 50mA maximum

Ultrasonic Level Sensor Option: 50mm (1.97") to 9999mm (32.8 feet), 1mm res

COMMUNICATIONS
Radio: 1  900MHz 1/4W (24dBm) Meshing radio
  -101 dBm sensitivity @ 200kbps
  Ultra low-power protocol (optimized power-down/sleep)
  Approximate Range:
    0.5 miles w/ supplied 2dB whip ant., 6' elev., flat terrain
    2 miles w/ supplied 2dB whip ant., 12' elev., flat terrain
    Up to 9 miles w/ 9dB Yagi ant., >=12' elev.

GENERAL
Battery Power: 19AH Lithium Battery (supplied)
External Input Power (optional): 10Vdc to 30Vdc
  Sleeping: 1mA @ 10Vdc or 12Vdc, 0.5mA @ 24Vdc
  Idle, Sensor Power OFF: 17mA @ 10Vdc, 15mA @ 12Vdc, 7mA @ 24Vdc (depending on sensor power consumption)
  Idle, Sensor Power ON: 96mA @ 10Vdc, 78mA @ 12Vdc, 41mA @ 24Vdc max
  Transmitting: 25mA @ 10Vdc, 24mA @ 12Vdc, 12mA @ 24Vdc (short bursts—sensor power turned off while transmitting)
Field Wiring Termination: Screw terminal blocks, 3.5mm, 22 to 14GA wires
Antenna Connector: RPSMA female (male pin center conductor)
Temperature: -40°C to 70°C (operating), -40°C to 85°C (storage)
Humidity: <95% RH (non-condensing)
Enclosure: 8"(H) x 4"(W) x 3"(D), NEMA 4X, Polycarbonate
Wiring Entrance/Exit: Pre-drilled for 3/4" conduit fitting on bottom of enclosure

⚠️ Refer to the installation manual for additional installation details and precautions.
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Inductive loads, regardless of their size, must have transient suppression (diodes or snubbers).

Optional external ultrasonic level sensor

Optional only required if battery power is not used.

External Ultrasonic Sensor Wiring

<table>
<thead>
<tr>
<th>Pin</th>
<th>Color</th>
<th>Signal</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Brown</td>
<td>+VS (3.6V Sensor Power)</td>
</tr>
<tr>
<td>2</td>
<td>White</td>
<td>not used</td>
</tr>
<tr>
<td>3</td>
<td>Blue</td>
<td>Ground</td>
</tr>
<tr>
<td>4</td>
<td>Black</td>
<td>Data (SDI)</td>
</tr>
</tbody>
</table>

INTERNAL SENSOR OPTION

Follow the same color coded wiring as the external sensor option.

Be careful to wire the sensor as shown to avoid damage to the sensor and/or LPR module.