




FLEX-RP Solar Repeater

The Sensys Networks Solar Repeater offers a power pack delivering a 15 year life that virtually eliminates the ongoing maintenance cost for the effective life of the wireless sensor networking system. The solar repeater utilizes a hybrid power source: solar power which feeds into a super capacitor as its primary power source and lithium batteries to provide backup power if required. The repeater and power pack are individually aimed to provide optimal RF and solar power performance. The solar repeater eliminates repeater battery replacement and saves time and resources.

The FLEX-RP Solar Repeater includes the enhanced RF chipsets and external antenna options of the FLEX family of second generation repeaters. The enhanced RF chipsets improve the RF robustness and reduce the energy consumption. The FLEX-RP Solar Repeater has an internal antenna and connects with the FLEX External Antenna.

Antenna options. The FLEX External Antenna connects to the FLEX-RP Solar Repeater via a coaxial cable. The antenna allows the repeater to be aimed in two directions simultaneously utilizing a pole located between the sensor and access point.

Two types of FLEX External Antenna are supported: (i) the FLEX-ANT-1 with the same RF coverage as the internal antenna and (ii) the FLEX-ANT-2 with Long Range RF coverage. The FLEX-RP Solar Repeater can also operate without an external antenna.

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| FLEX Repeater and FLEX Solar | FLEX Repeater, FLEX Solar, and Long Range External Antenna | FLEX Repeater, FLEX Solar, and Standard External Antenna |

FLEX Solar Repeater Configurations



Functions / Features

Relay of radio communications

- To/from wireless sensors
- To/from access point
- To/from another repeater (FLEX or RP240)

Extension of range and coverage of the access point

- Can be operated in tandem – one repeater and its supported sensors can communicate with another repeater and then to the access point
- Maximum single-hop range of ~2000 feet (610 meters) from supporting access point or repeater
- Maximum single-hop range of ~300 feet (91 meters) from sensors with Long Range External Antenna

Fully wireless operation – no cable connections

Radio signal quality measurements (of each link to wireless sensor or tandem repeater)

- Receive Signal Strength Indicator (RSSI, in dBm)
- Link Quality Index (LQI, figure of merit 40-99)

Firmware upgrades over-the-air from access point

Simple installation

- Any roadside location that provides adequate signal coverage to sensors and the access point or repeater
- No special requirements regarding setback, relative angle of the sun or mounting stability

No calibration or adjustment required

No battery replacement

Functional Specifications

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| interfaces | <ul style="list-style-type: none"> • to/from sensors via 802.15.4 PHY radio • to/from repeaters via 802.15.4 PHY radio • to/from access point via 802.15.4 PHY radio |
| over-the-air protocol | Sensys Networks NanoPower (SNP) protocol (TDMA) |
| physical layer protocol | IEEE 802.15.4 PHY |
| modulation | Direct Sequence Spread Spectrum Offset Quadrature Phase-Shift Keying (DSSS O-QPSK) |
| transmit/receive bit rate | 250 kbps |
| frequency band | 2400 to 2483.5 MHz (ISM unlicensed band) |
| frequency channels | 16 |
| channel bandwidth | 2 MHz |
| antenna type | microstrip patch antenna (behind front face panel) |
| antenna field of view | ±60° (azimuth & elevation) |
| nominal output power | 3 dBm |
| spurious emissions | <ul style="list-style-type: none"> • 30 - 1000 MHz: < -36 dBm • 1 - 12.75 GHz: < -30 dBm • 1.8 - 1.9 GHz: < -44 dBm • 5.15 - 5.3 GHz: < -47 dBm |
| typical receive sensitivity | -101 dBm (PER ≤ 1%) |
| saturation (max input level) | ≥ 10 dBm |

Compliance

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| safety | 2006/95/EC |
| EMC | <ul style="list-style-type: none"> • FCC: This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. • 2004/108/EC |

Power, Physical, & Environmental

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|-------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| power supply | <ul style="list-style-type: none"> • the power supply is rechargeable super capacitor with primary battery back up – primary battery back up is lithium iron phosphate |
| recommended unit replacement | every 15 years |
| dimensions | <ul style="list-style-type: none"> • FLEX-RP: 6.5" x 6.55" x 6" (16.5 cm x 16.6 cm x 15.2 cm) • FLEX-Solar: 6.25" x 6.25" x 3.5" (15.9 cm x 15.9 cm x 8.9 cm) • FLEX-ANT-1: 5.65" x 3.54" x 4.80" (14.4 cm x 9 cm x 12.2 cm) • FLEX-ANT-2: 9.5" x 9.5" x 4.38" (24.10 cm x 24.10 cm x 11.10 cm) |
| weight | <ul style="list-style-type: none"> • FLEX-RP: 1.01 lb (0.46 kg) • FLEX-Solar: 4.44 lb (2.01 kg) • FLEX-ANT-1: 0.94 lb (0.43 kg) • FLEX-ANT 2: 2.2 lb (1 kg) |
| environmental | <ul style="list-style-type: none"> • designed for weatherproof, outdoor operation • NEMA Type 4x enclosure • IP65 ingress protection |
| operating temp | -40°F to 176°F / -40°C to +80°C |

Available Products

| Product | Description |
|-------------------|---------------------------------------------|
| FLEX-RP | FLEX Repeater for use with FLEX-Solar |
| FLEX-Solar | Solar Powered Hybrid Power Pack for FLEX-RP |
| FLEX-ANT-1 | FLEX Standard External Antenna |
| FLEX-ANT-2 | FLEX Long Range External Antenna |

Local Distributor