

# AccuSense Repeat

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▷ ▷ The AccuSense Repeat and AccuSense Repeat Flex is positioned so that both the sensors and the tandem repeater or access point are within view and within range.

## About AccuSense Repeat and AccuSense Repeat Flex

In cases where installed wireless sensors are out of range of the nearest access point, one or more repeaters can be used to provide a two-way relay between the out-of-range sensors and the access point. A repeater is mounted by the roadside on a pole or other structure.

Flex Repeaters are second generation repeaters that provide antenna options that extends the range of the repeaters and eliminates the need for additional repeaters operating in tandem. The AccuSense Repeat Flex are powered with a replaceable battery pack located within the unit; however the AccuSense Repeat does not have a replaceable battery. Both Flex Repeaters utilize enhanced RF chipsets and circuitry that improves RF robustness and reduces energy consumption. Flex Repeaters have an internal antenna and connect with the Flex External Antenna.

The Flex External Antenna connects to Flex Repeaters via a coaxial cable. The antenna, which works in conjunction with a repeater, 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 Antennas are supported: (i) the ASENSE-FLX-ANT1 with the same RF coverage as the internal antenna and (ii) the ASENSE-FLX-ANT2 with Long Range RF coverage. The Flex family of repeaters work with the standard repeaters.

### At A Glance

- ▷ To/from wireless sensors
- ▷ To/from access points
- ▷ Supports operating in two directions with one repeater; its supported sensors communicate with 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
- ▷ No calibration or adjustment required



## Functional Specifications - ASENSE-RPT

Interfaces	<ul style="list-style-type: none"> <li>To/from sensors via 802.15.4 PHY radio</li> <li>To/from repeaters via 802.15.4 PHY radio</li> <li>To/from access point via 802.15.4 PHY radio</li> </ul>
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
Internal antenna type	Microstrip patch antenna (behind front face panel)
Antenna field of view	±60° (azimuth & elevation)
Nominal output power	0 dBm
Spurious emissions	<ul style="list-style-type: none"> <li>30 - 1000 MHz: &lt; -56 dBm</li> <li>1 - 12.75 GHz: &lt; -44 dBm</li> <li>1.8 - 1.9 GHz: &lt; -56 dBm</li> <li>5.15 - 5.3 GHz: &lt; -51 dBm</li> </ul>
Typical receive sensitivity	-95 dBm (PER ≤ 1%)
Saturation (max input level)	≥ 10 dBm

### Power, Physical, & Environmental

Power supply	<ul style="list-style-type: none"> <li>ASENSE-RPT: <ul style="list-style-type: none"> <li>Li-SOCI2 3.6V battery pack</li> <li>Nominal capacity: 171 Ah</li> </ul> </li> </ul>
Recommended battery/unit replacement	<ul style="list-style-type: none"> <li>ASENSE-RPT: unit replacement every 7 years</li> </ul>
Dimensions	<ul style="list-style-type: none"> <li>ASENSE-RPT: <ul style="list-style-type: none"> <li>7.75" x 6.5" x 5.37"</li> <li>(19.68cm x 16.51cm x 13.65cm)</li> </ul> </li> </ul>
Weight	<ul style="list-style-type: none"> <li>ASENSE-RPT: <ul style="list-style-type: none"> <li>3.87 lbs (1.75kg)</li> <li>Mounting kit: add'l 1.2 lbs (0.5kg)</li> </ul> </li> </ul>
Environmental	<ul style="list-style-type: none"> <li>Designed for weatherproof, outdoor operation</li> <li>NEMA Type 4x enclosure</li> <li>IP65 ingress protection</li> </ul>
Operating temp	-40°F to 176°F / -40°C to +80°C

### Available Products

Products	Descriptions
ASENSE-RPT	AccuSense Repeater with long-life battery pack

### Compliance

Safety	2006/95/EC
EMC	<ul style="list-style-type: none"> <li>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.</li> <li>2004/108/EC</li> </ul>



## Functional Specifications - ASENSE-RPT-FLX

Interfaces	<ul style="list-style-type: none"> <li>To/from sensors via 802.15.4 PHY radio</li> <li>To/from repeaters via 802.15.4 PHY radio</li> <li>To/from access point via 802.15.4 PHY radio</li> </ul>
Over-the-air protocol	Sensys Networks NanoPower (SNP) proprietary 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	2405 to 2480 MHz (ISM unlicensed band)
Frequency channels	16
Channel bandwidth	2 MHz
Internal 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"> <li>30 - 1000 MHz: &lt; -36 dBm</li> <li>1 - 12.75 GHz: &lt; -30 dBm</li> <li>1.8 - 1.9 GHz: &lt; -44 dBm</li> <li>5.15 - 5.3 GHz: &lt; -47 dBm</li> </ul>
Typical receive sensitivity	-101 dBm (PER ≤ 1%)
Saturation (max input level)	≥ 10 dBm

### Power, Physical, & Environmental

Power supply	<ul style="list-style-type: none"> <li>ASENSE-RPT-FLX: <ul style="list-style-type: none"> <li>Li-SOCl<sub>2</sub> 3.6V battery pack</li> <li>Nominal capacity: 171 Ah</li> </ul> </li> </ul>
Recommended battery/unit replacement	<ul style="list-style-type: none"> <li>ASENSE-RPT-FLEX: battery replacement every 7 years</li> </ul>
Dimensions	<ul style="list-style-type: none"> <li>ASENSE-RPT: <ul style="list-style-type: none"> <li>7.75" x 6.5" x 5.37"</li> <li>(19.68 cm x 16.51 cm x 13.65 cm)</li> </ul> </li> <li>ASENSE-FLX-ANT1: 5.65" x 3.54" x 4.80" (14.4 cm x 9 cm x 12.2 cm)</li> <li>ASENSE-FLX-ANT2: 9.5" x 9.5" x 4.38" (24.10 cm x 24.10 cm x 11.10 cm)</li> </ul>
Weight	<ul style="list-style-type: none"> <li>ASENSE-RPT: <ul style="list-style-type: none"> <li>ASENSE-RPT-FLX: 3.93 lb (1.78 kg)</li> </ul> </li> <li>ASENSE-FLX-ANT1: 0.94 lb (0.43 kg)</li> <li>ASENSE-FLX-ANT2: 2.2 lb (1 kg)</li> </ul>
Environmental	<ul style="list-style-type: none"> <li>Designed for weatherproof, outdoor operation</li> <li>NEMA Type 4x enclosure</li> <li>IP65 ingress protection</li> </ul>
Operating temp	-40°F to 176°F / -40°C to +80°C

### Available Products

Products	Descriptions
ASENSE-RPT-FLX	AccuSense Flex Repeater with long-life battery pack
ASENSE-FLX-ANT1	AccuSense Flex Standard External Antenna
ASENSE-FLX-ANT2	AccuSense Flex Long Range External Antenna

### Compliance

Safety	2006/95/EC
EMC	<ul style="list-style-type: none"> <li>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. Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.</li> <li>CE0678</li> <li>2004/108/EC</li> </ul>

