

FlexNode Line Powered Radio (NA)

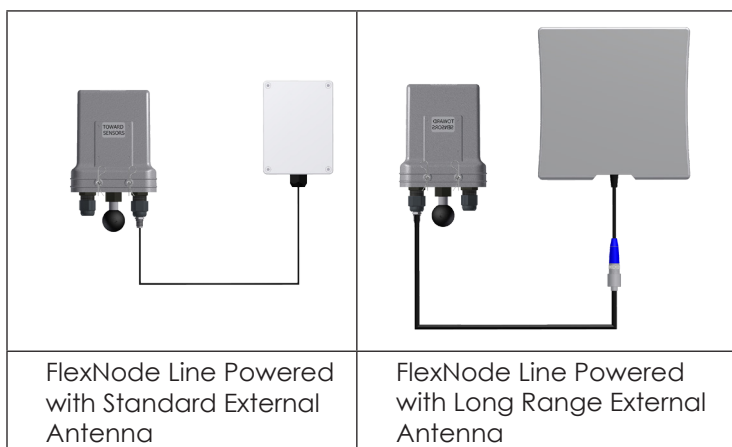
The Sensys Networks Repeater. In cases where installed Sensys Networks wireless sensors are out of range of the nearest access point, one or more Sensys Networks repeaters can be used to provide a two-way relay between the out of range sensors and the access point. A repeater is pole mounted by the roadside and is positioned so that both the sensors and the tandem repeater or access point are within view and within range.

The Sensys Networks FlexNode Line Powered Radio is a single pole-mounted unit. The FlexNode Line Powered Radio includes no battery and is powered by a continuous 12-24 VDC power source. The FlexNode Line Powered Radio is housed in a robust enclosure that provides excellent protection against outside environment.

The FlexNode Line Powered Radio has a connector for an external antenna to provide for greater flexibility in providing a two-way relay between sensors and the access point.

Antenna options. The optional external antenna connects to the FlexNode Line Powered Radio via a coaxial cable. The external antenna allows the repeater to be aimed in two directions simultaneously utilizing a pole located between the sensor and access point.

Two types of external antenna are supported: (i) the FLEX-ANT-1 with the same RF range as the internal antenna and (ii) the FLEX-ANT-2 with Long Range RF range. The FlexNode Line Powered Radio can also operate without an external antenna.



Features and Functions

Relay of radio communications

- To/from wireless sensors (downlink)
- To/from access point (uplink)
- To/from another repeater (uplink or downlink)

Extension of range and coverage of the access point

- Tandem operation – 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 with the Long Range External Antenna
- Maximum single-hop range of ~300 feet (91 meters) from sensors with Long Range External Antenna

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

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

Enclosure

- Robust protection against the environment

Simple installation

- Any roadside location that provides adequate height and line of sight to sensors and the access point or repeater
- Direct connection to the power source

No calibration or adjustment required

Firmware upgrades over-the-air from access point

Functional Specifications

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
internal antenna type	ceramic patch antenna (behind front face panel)
internal 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: < -47 dBm 5.15 - 5.3 GHz: < -47 dBm
typical receive sensitivity	-101 dBm (PER ≤ 1%)
saturation (max input level)	≥ 10 dBm

Compliance

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. FCC: This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20cm between the radiator and any part of your body. IC: This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device. IC: This equipment complies with IC RSS-102 radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20cm between the radiator and any part of your body. IC : Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement. IC: Pour se conformer aux exigences de conformité CNR 102 RF exposition, une distance de séparation d'au moins 20 cm doit être maintenue entre l'antenne de cet appareil et toutes les personnes.
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Power, Physical, & Environmental

power supply	<ul style="list-style-type: none"> 12- 24 VDC line powered (wire 24-12 stranded/solid AWG)
power consumption	<ul style="list-style-type: none"> 0.5 W
dimensions	<ul style="list-style-type: none"> FLEX-NODE-LPDC: 9.5" x 5.59" x 4.32" (24.13 cm x 14.19 cm x 10.97 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-NODE-LPDC: 1.25 lbs (0.56 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
operating temp	-40°F to +176°F / -40°C to +80°C

Available Products

Order Codes	Description
FLEX-NODE-LPDC	FFlexNode Line Powered Radio (NA)
FLEX-ANT-1	Standard External Antenna
FLEX-ANT-2	Long Range External Antenna

Local Distributor

EMC

- Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning
- the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:
 - –Reorient or relocate the receiving antenna.
 - –Increase the separation between the equipment and receiver.
 - –Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
 - –Consult the dealer or an experienced radio/TV technician for help.

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