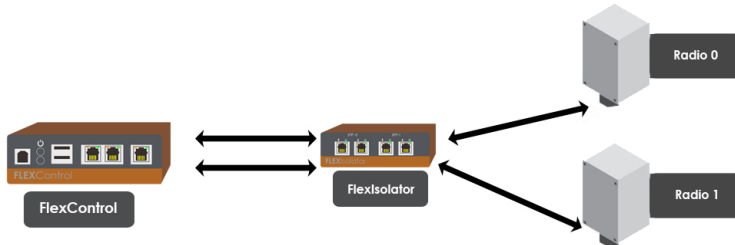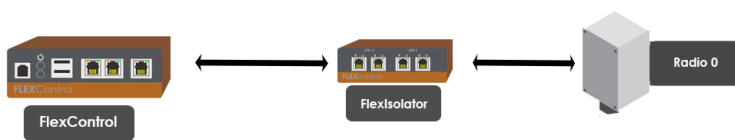# Radio

The Sensys Networks Serial Port Protocol (SPP) Radio is a low powered radio that maintains two-way wireless links to an installation's sensors and repeaters. The Radio establishes overall time synchronization, transmits configuration commands and message acknowledgements, and receives data from the sensors. The Radio then relays the sensor detection data to the FlexControl† over a CAT5 cable.

FlexControl with Two Radios Configuration

FlexControl with One Radio Configuration

A typical FlexControl system consists of one FlexControl and two Radios with one FlexIsolator. The system can also consist of a FlexIsolator and a Radio.

Functions / Features

Sensys Networks radio communications

- To/from Sensys Networks sensors
- To/from Sensys Networks repeaters

Radio signal quality measurements

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

Simple installation

- Any roadside location that provides adequate signal coverage to sensors/repeaters
- No special requirements regarding setback, relative angle of the sun, or mounting stability
- Mounted on pole using a Sensys Networks mounting kit

Low power consumption

- Receives power through the FlexControl in the traffic cabinet

No calibration or adjustment required

† Applicable also to the Access Point Controller Card (APCC)

Functional Specifications

interfaces	RS-422 full duplex to FlexControl via RJ45 connector
over-the-air protocol	Sensys 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	2405 to 2483.5 MHz (ISM unlicensed band)
frequency channels	16
channel bandwidth	2.8 MHz (20 dB)
antenna type	ceramic patch antenna (+5 dBi)
antenna field of view	±60° (azimuth & elevation)
nominal output power	+3 dBm
spurious emissions	• 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

Power, Physical, & Environmental

power consumption	less than 150 mW
input voltage	4.5 V up to 28 V
dimensions	4.7" x 3.5" x 2.4" (12 cm x 9 cm x 6 cm)
weight	14.1 oz (400 g)
operating temp	industrial -40°C to 85°C
enclosure rating	NEMA 4X

Available Product

Order Code	Description
APCC-SPP	Radio (SPP Digital Radio)
KIT-MTG	Mounting kit

Compliance

safety	2006/95/EC
EMC	• 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 • 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 : 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.