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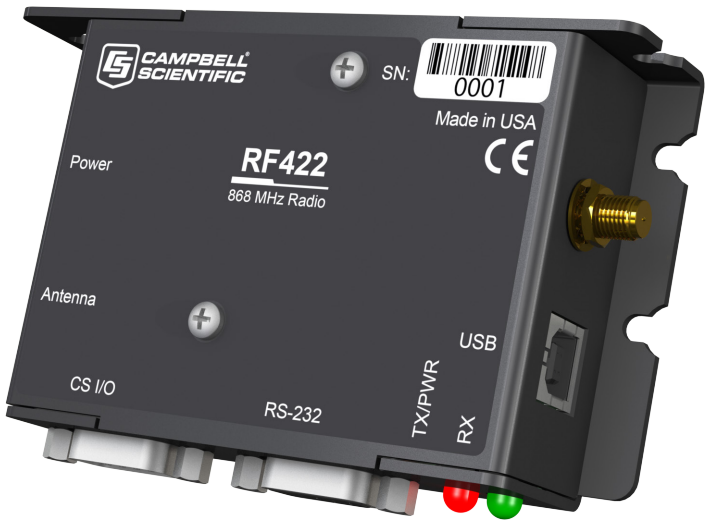
WHEN MEASUREMENTS MATTER

RF422

868 MHz Radio



Overview

The RF422[a] is an 868 MHz SRD860 radio designed to provide license-free operation for wireless serial communications in Europe. The RF422 transmits data at 10 kbps with a maximum power of 25 mW, and it employs listen-before-talk (LBT) and adaptive-frequency-agility (AFA) to provide a robust link of up to 100 m within buildings and 5 km with full line-of-sight. The RF422 supports point-to-point and point-to-multipoint datalogger communications and PakBus repeater operation.

Benefits and Features

- Does not require individual operational license in Europe
- Robust serial communication, optimized for PakBus networks
- Low power (<2 mA idle) during periods of inactivity
- Supports point-to-point with RF retries and point-to-multi-point operations
- Remote diagnostics using PakBus node operations
- Operational power can be supplied over USB when attached to PC

System Components

An RF422 radio needs to be at both the base station and field site. Each radio requires an antenna that does not exceed 2.1 dBi in gain over the 863 to 870 MHz frequency range, such as the 009964 whip antenna offered by Campbell Scientific. The RF422 has a reverse polarity SMA (RPSMA) connector for attaching the antenna or antenna cable.

Powering the Radio

At the base station, the radio typically uses ac power that is either supplied by the 004202 (Euro)/004248 (UK) AC/12V power supply or through the PC via the USB port and cable. At the field site, the radio is typically powered by the datalogger through the CS I/O port. The 006725 Field Cable can also be used to connect the radio to an appropriate 12 Vdc power supply. This field cable is required when the radio is connected to the datalogger's RS-232 port instead of the CS I/O port.

[a]Campbell Scientific also offers the RF407 and RF412 900 MHz spread spectrum radios. These radios are used in North America (RF407) or Australia/New Zealand (RF412). For more information, see the RF407 and RF412 product brochure.

Specifications

- Type: SRD860, LBT+AFA
- Restrictions: These radios can be used throughout Europe, although there are some restrictions in some countries. See REC70-03E, CEPT recommendation on the use of SRD in the h1.3 waveband[a]
- Listen before talk (LBT) and automatic frequency agility (AFA) to comply with ETSI duty cycle requirements. Radio communication effective duty cycle = (number of channels * 100) / 3600.
- Channel Capacity: 30 channels (default), software configurable for the purpose of meeting local regulations; 10 sequences for reducing interference through channel hop.
- LBT+AFA performance
  - Channel spacing: 100 kHz
  - Receiver bandwidth: 150 kHz
  - Modulation bandwidth: < 300 kHz
  - LBT threshold: < -88 dBm
  - TX on time: < 1 s
- Frequency Range: 863 to 870 MHz
- Transmitter Power Output: 2 to 25 mW, software selectable, assuming 2 Bi antenna gain
- Receiver Sensitivity: -106 dBm
- RF Data Rate: 10 kbps
- Antenna Connector: Reverse Polarity SMA (RPSMA) jack
- LEDs: Power/Tx, Rx
- RS-232 Connector: 9-pin D female
- RS-232 Baud Rate: 1200 to 115200 bps
- CS I/O Connector: 9-pin D male
- CS I/O Modes: SDC 7, 8, 10, 11, and ME master
- USB: USB Type B jack
- Dimensions[b]: 11.1 x 6.9 x 2.7 cm (4.4 x 2.7 x 1.1 in)
- Power: 9 to 16 Vdc
- Power Connector: 2.5 mm dc power jack
- Operating Temperature Range: -40° to 70°C

Weight

- Without "Ships With" Items: 136 g (4.8 oz)
- With "Ships With" Items: 283.5 g (10 oz)

Average Current Drain

- Transmit: < 25 mA (25 mW TX Power)
- Receive: 15 mA
- Stand-by: < 0.5 mA (depending on power saving mode)

Certifications

- CE
- ETSI EN 306 220-2 V2.3.1

[a]Currently Sweden, Norway and Greece do not allow full use of the 863-870 MHz band. The wavebands used can easily be limited to suit the country requirements by setting a mask in the radio settings. The restrictions in those countries will not limit the general performance of the radios.

[b]Dimensions are from the tip of the antenna connector to the other side of the case, and from the bottom of the case to the top of the DB9 connector jack screw. The width includes the thickness of the screw heads on the screws that hold the case together. Please contact Campbell Scientific for further details.

Antenna:

009964: Whip antenna for use on the desktop and indoor networks (2.1 dBi).

009962: Enclosure mount, wide-band antenna, mounts through the top of an enclosure with 0.4 m cable. Gain ~ 2 dBi.

009965: Wall/Pole mount antenna, with 5 m of cable. Gain: ~ 2 dBi (incl. cable losses). Suitable for use at the base or at a station where the antenna needs to be raised. Fits poles 30-54 mm in diameter.

Other higher gain pole mount antenna are available, but the gain must not exceed 2.1 dBi, after allowing for losses in the cable. Note: raising the antenna is generally beneficial when trying to achieve maximum range.

Lightning protectors are available to special order and are recommended for installations where lightning is common.