RavenXTA & RavenXTV

Airlink CDMA Digital Cellular Modems

CAMPBELL SCIENTIFIC®

WHEN MEASUREMENTS MATTER

The RavenXTA and RavenXTV are full-duplex Airlink modems that transmit data to the local cellular tower using a Code Division Multiple Access (CDMA) network. A PC typically retrieves the data from the cellular tower via the Internet (1xRTT/EVDO). Internet communications provide faster communication rates and eliminate dialing delays and long distance fees.

The RavenXTA and RavenXTV differ in the CDMA network used. The RavenXTA uses the Alltel network, and the RavenXTV uses the Verizon Wireless network.
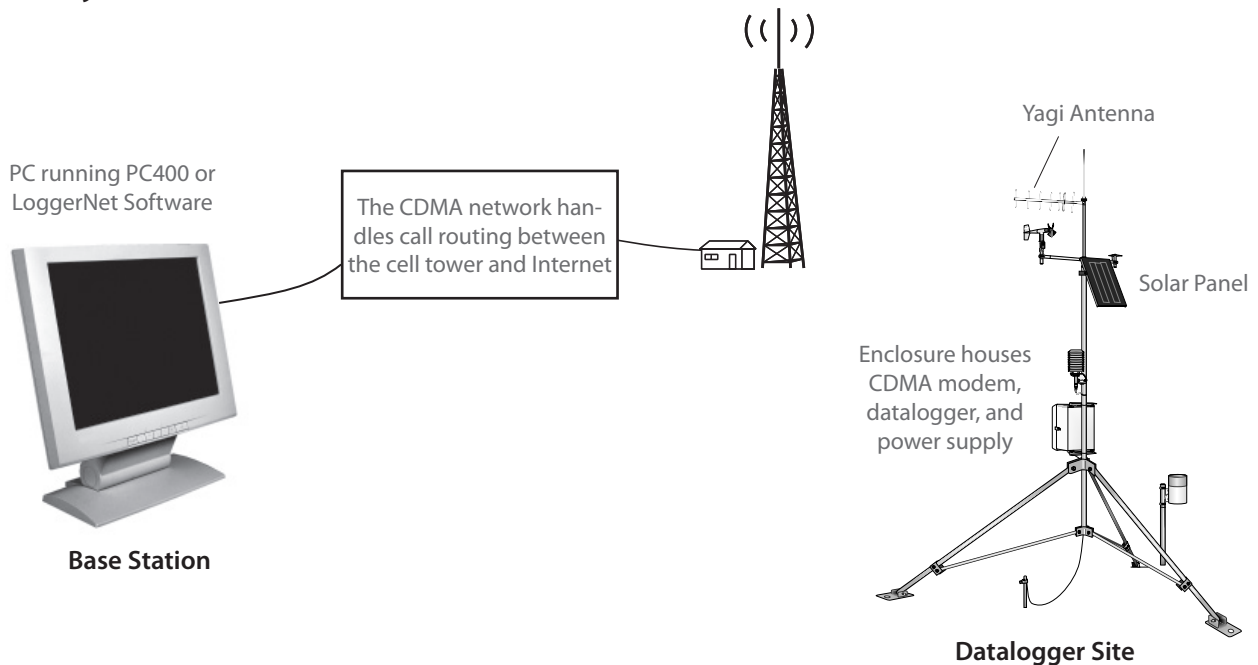
Features

- Supports CDMA digital cellular networks

- Eliminates the dialing delays and long distance fees that land-line phone modems experience

- Allows simultaneous communications with multiple dataloggers in the network

- Housed in a rugged aluminum case

- Operates over a wide operating temperature range of -30° to +70°C

Cellular Coverage

Prior to purchase, contact Alltel or Verizon to ensure that there is a CDMA network with coverage at the datalogger site.

Typical System[1] (1xRTT/EVDO)

PC running PC400 or LoggerNet Software

The CDMA network handles call routing between the cell tower and Internet

Base Station

Yagi Antenna

Solar Panel

Enclosure houses CDMA modem, datalogger, and power supply

Datalogger Site

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[1] Contact Campbell Scientific for system requirements if using IS-95 to communicate over standard telephone lines.

Establishing Cellular Service

Contact Alltel or Verizon (1-888-384-1775) and setup an account. When setting up the account, you will need the ESN number, which is listed on the modem's label.

To use 1xRTT/EVDO, you should ask for the Broadband Plan, and either a static or a dynamic IP account. A static IP account eliminates the need for a third party Dynamic Domain Name System (DDNS) such as IP manager. The DDNS translates the domain name to a dynamic IP address so that the modem can be contacted as if it had a static IP address.

When using the RavenXTA, you will also need to ask for the Mobile Directory Number (MDN), Mobile Identification Number (MIN), and SID. If you do not ask, Alltel may only give you the MDN. You need to know these numbers to program your RavenXTA.

Base Station Requirements

- PC running PC400 or LoggerNet Datalogger Support Software.

- Access to the Internet.

Enclosures and Mounting Bracket

An ENC12/14, ENC14/16, or ENC16/18 environmental enclosure can house the modem, datalogger, and power supply. The modem is secured to the enclosure's backplate via the 14394 Mounting Bracket.

RavenXTA and RavenXTV Modems

The RavenXTA and RavenXTV are shipped with a power cable, our Resource CD, and a CD containing the Airlink software and the Airlink manual. The modems are configured using the following software:

- Airlink AceManager software—activates the modem and configures the generic parameters of the modem.

- Campbell Scientific's Raven CDMA Template—used with Airlink AceManager software to configure the modem. This template sets up the Raven serial interface, which is specific to our systems. The Raven CDMA Template is available, at no charge, from: www.campbellsci.com/downloads

Network connection information can be viewed using the Airlink AceManger or Airlink AceView software.

Datalogger Connections

All of our contemporary and many of our retired dataloggers are compatible. The datalogger connects using one of the following options:

- 18663 Null Modem Cable—connects the modem to the datalogger's RS-232 port.
- SC105 DCE Interface—connects the modem to the CS I/O port via an SC12 cable.
- SC932A DCE Interface—connects the modem to the CS I/O port via an SC12 cable.

The 18663 null modem cable connects directly to the datalogger's RS-232 port. This cable is the only option available for connecting a RavenXTA or RavenXTV to a CR200-series datalogger.

The SC105 interface connects the modem to the datalogger's CS I/O port, and is recommended when using a PAKBUS® datalogger.

The SC932A interface connects the modem to the datalogger's CS I/O port, and is recommended when using a mixed-array datalogger.

Antennas and Antenna Accessories

Antennas

A choice of four antennas is offered for the modems. Contact an Applications Engineer for help in determining the best antenna for your application.

- 21831 0 dBd, ½ Wave Dipole Whip Antenna— supports the 800 MHz band. It is intended for locations that have strong cellular coverage. This antenna attaches directly to the modem's SMA connector and must reside in an environmental enclosure or building.

- 18285 1 dBd, Omnidirectional Antenna—covers both the 800 MHz and 1.9 GHz bands. It includes a mounting bracket for attaching the antenna to a crossarm, tripod, tower, or pole. Connection to the modem requires either a 21847 12-foot cable or a COAXSMA-L cable (see *Antenna Cables*).

- 20679 800 MHz/0 dBd & 1.9 GHz/3 dBd Omni-directional Antenna—includes a mounting bracket for attaching the antenna to a crossarm, tripod, tower, or pole. Connection to the modem requires either a 21847 12-foot cable or a COAXSMA-L cable (see *Antenna Cables*).

- 10530 9 dBd, Yagi Antenna—supports the 800 MHz band and is intended for sites near the edge of the cellular coverage. It includes a bracket for attachment to a mast or pole (outer diameter of up to 1.5" (3.8 cm)). Some sites may require the CM230 mount (see *Adjustable Angle Mounting Kit*). The antenna connects with the modem using either the 21847 12-foot cable or the COAXSMA-L cable (see *Antenna Cables*).

Antenna Cables

One of the following cables must be ordered when using a 18285, 20679, or 10530 antenna. Both cables have a type N male connector on the "antenna end" and an SMA connector on the "transceiver end." They differ in their length:

- 21847 Antenna Cable with 12-foot Length

- COAXSMA-L Antenna Cable with User-specified Length—enter cable length, in feet, after the L. Length should not exceed 20 ft (6 m).

Adjustable Angle Mounting Kit

The CM230 Adjustable Angle Mounting Kit allows the 10530 Yagi antenna to be aimed at the service provider's antenna.
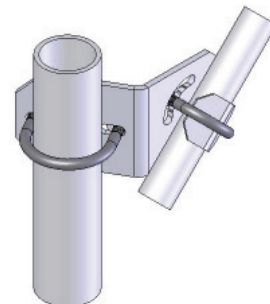

The 21831 antenna has an articulating knuckle joint that can be oriented vertically or at right angles.
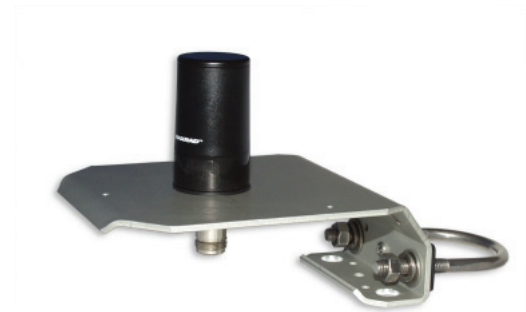
The 18285 antenna can be used for many of our applications.

The 10530 Yagi antenna is intended for longer transmission distances.

When using the CM230, fix the declination of the antenna by tightening the u-bolt that mounts on the mast. The inclination is then adjusted with the other set of u-bolts and nuts.

Power Considerations

A power cable included with the modem connects to the datalogger's 12 V or switched 12 V terminal. Connection to the switched 12 V terminal allows the datalogger to switch power to the modem during scheduled transmission intervals, thereby conserving power. When using the switched 12 V terminal, the modem can be powered with a BP12 battery, CH100 regulator, and SP10 solar panel. For help on analyzing your system's power requirements, refer to our Power Supply product literature or application note.
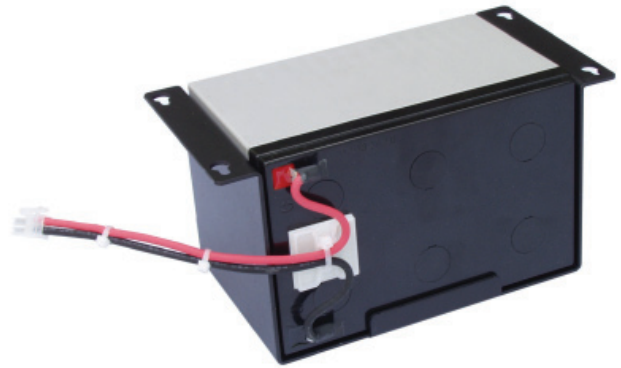
The BP12 includes lead wires terminating in connectors that attach to the CH100, and hardware for mounting the BP12 to an enclosures backplate.

Specifications

Technology:
CDMA 1xRTT, EVDO Rev. A, CDMA IS-95

Bands:
800 MHz Cellular,
1900 MHz PCS

Transmit Frequency:
1850 to 1910 MHz and 824 to 849 MHz

Transmit Power:
1.0 W for 1900 MHz; 0.8 W for 850 MHz

Receiver Frequency:
1930 to 1990 MHz and 869 to 894 MHz

CDMA Throughput:
up to 80 kbps

RS-232 Data Rates:
1200 bps to 115.2 kbps

Serial Interface:
RS-232, DB9-F

Serial Protocols:
AT Commands, PPP, SLIP, UDP/IP, TCP/IP

RF Antenna Connector:
50 Ohm SMA

Input Current Range:
40 to 120 mA

Typical Current Drain (at 12 Vdc):
50 mA dormant (idle for 10 to 20 seconds),
120 mA transmit/receive

Input Voltage Range:
6 to 28 Vdc

Operating Temperature Range:
-30° to +70°C

Operating Humidity Range:
5% to 95% RH non-condensing

Status LEDs:
Power, Network, Signal, Activity

Dimensions:
3"W x 1"D x 3.6"L (7.6 x 2.5 x 9.2 cm)

Weight:
5.6 oz (160 g)