

# CDMA Digital Cellular Modem

## Models Redwing100, Redwing105

The Redwing100 and Redwing105 are full-duplex, digital cellular modems that communicate with the base station computer via a Code Division Multiple Access (CDMA) network and the standard telephone land-lines. Our CR800, CR1000, and CR3000 dataloggers contain an internal IP stack, enabling IP communications. IP communications use the Internet instead of standard telephone land-lines, which allows faster communications rates and simultaneous communications with multiple dataloggers in the network.

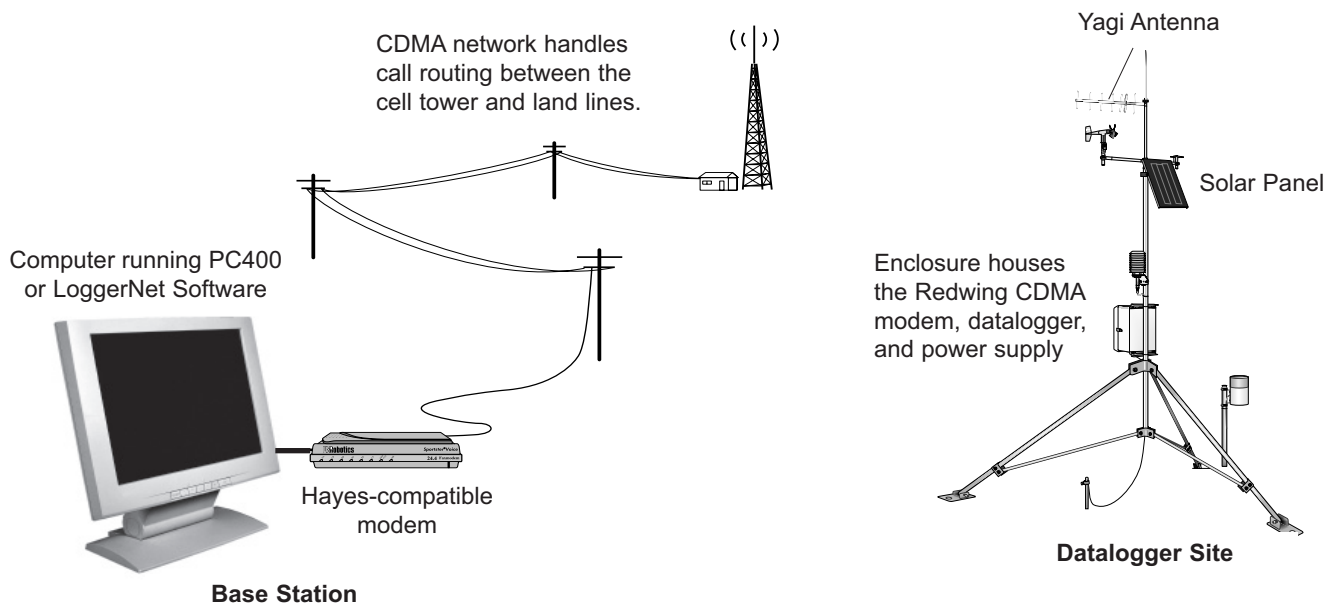


The Redwing100 and Redwing105 differ in the CDMA network used. The Redwing100 uses the Verizon Wireless network, and the Redwing105 uses the Alltel network. Both modems are manufactured by AirLink.

### Features

- Supports mobile applications and datalogger sites where phone lines have not been established and cellular coverage is available
- Uses IS-95 Circuit Switched CDMA for communications via standard telephone land-lines
- With a CR800, CR1000, or CR3000 datalogger, uses 1xRTT for IP communications
- Housed in a rugged aluminum case
- Operates over a wide temperature range of -30° to +75°C

### Typical System



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## Cellular Coverage/Service Requirements

- Subscription to a CDMA network with coverage at the datalogger site. Prior to purchase, contact Verizon Wireless (Redwing100) or Alltel (Redwing105) to ensure that they provide CDMA coverage for your site.
- Redwing communications using IS-95 over the standard telephone land-lines require the account to be set up as a Voice Account even though you are transmitting data.
- CR800, CR1000, or CR3000 customers using 1xRTT for IP communications must establish at Verizon or Alltel a static IP account (not dynamic). There is a charge to activate accounts of this type.
- While setting up your account, ask Verizon or Alltel for both the Mobile Directory Number (MDN) and Mobile Identification Number (MIN). If you do not ask, they may only give you the MDN. You need to know both of these numbers to program your Redwing100 or Redwing105.



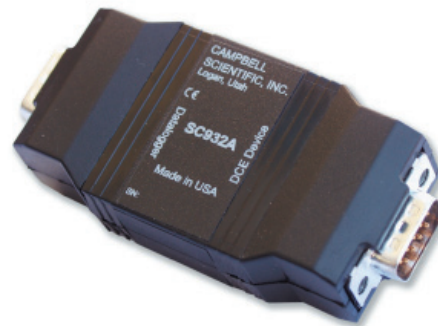
*The #18663 null modem cable connects directly to the datalogger's RS-232 port. This cable is the only option available for connecting a Redwing modem to a CR200-series datalogger.*

## Datalogger Site Equipment

- Redwing100 or Redwing105 Modem—includes a power cable. Depending on your modem and application, the modem is programmed using:
  - CellWizard—configures newer modems (labeled C3111) that are using IS-95 over the standard telephone land-lines. CellWizard is available, at no charge, from: [www.campbellsci.com/downloads](http://www.campbellsci.com/downloads)
  - CellSet—configures older modems (labeled C3110) that are using IS-95 over the standard telephone land-lines. CellSet is available, at no charge, from: [www.campbellsci.com/downloads](http://www.campbellsci.com/downloads)
  - Airlink's Setup Wizard and Wireless Ace—program modems that are using 1xRTT IP communications with a CR800, CR1000, or CR3000. The software is available, at no charge, from: [www.airlink.com](http://www.airlink.com)
- Campbell Scientific Datalogger—all of our contemporary dataloggers are compatible when using IS-95 over the standard telephone land-lines. Our CR800, CR1000, and CR3000 dataloggers also support 1xRTT IP communications.
- Datalogger connection options:
  - The #18663 null modem cable connects the modem to the datalogger's RS-232 port (not compatible with the CR510, CR10X, or CR7 dataloggers).
  - An SC105 or SC932A interface connects the modem to the CS I/O port (not compatible with the CR200-series dataloggers).
- Mounting Kit—includes mounting hardware for securing the modem to an environmental enclosure.



*For connecting the modem to the datalogger's CS I/O port, the SC105 interface is recommended when the datalogger uses the PAKBus<sup>®</sup> communication protocol.*

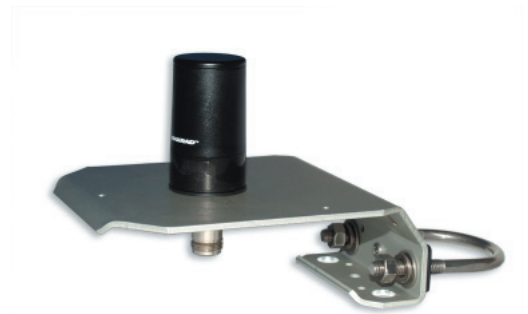


*For connecting the modem to the datalogger's CS I/O port, the SC932A interface is recommended when using a mixed-array datalogger.*

- Antenna—Campbell Scientific offers the following antennas for use with our cellular modems. Contact an Applications Engineer for help in determining the best antenna for your application.
  - 14453—0 dBd, ½ Wave Dipole Whip Cellular Antenna. It supports the 800 MHz band and is intended for locations that have strong cellular coverage. The antenna attaches directly to the Redwing modem and should reside in an environmental enclosure.
  - 18285—1 dBd, Omnidirectional Antenna. This antenna is dual band, covering both the 800 MHz and 1.9 GHz bands. The 18285 includes a 10 ft cable for attaching to the modem and a mounting bracket for attaching the antenna to a crossarm, tripod, tower, or pole.
  - 14454—9 dBd, Yagi Antenna. This antenna supports the 800 MHz band and is intended for sites near the edge of the the cellular coverage. The antenna must be aimed at the service providers's antenna. The 14454 includes 10 ft of cable for attaching the antenna to the modem and a bracket for attaching the antenna to a mast or post up to 1.5" (3.8 cm) in diameter. Often the CM230 Adjustable Inclination Mount is used with the 14454.
- CM230 Adjustable Inclination Mount—allows the 14454 Yagi antenna to be aimed at the service provider's antenna.
- Power Supply (see power considerations)
- Environmental Enclosure—typically an ENC12/14 or ENC16/18 is used to house the Redwing100 or Redwing105, datalogger, and power supply.



*The 14453 antenna has an articulating knuckle joint that can be oriented vertically or at right angles.*



*The 18285 antenna is recommended for many of our applications. It is the only cellular antenna offered that supports the 1.9 Ghz band.*



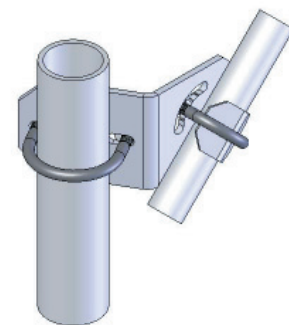
*The 14454 Yagi antenna is intended for longer transmission distances.*

## Base Station Requirements

- PC running PC400 or LoggerNet Datalogger Support Software.
- Hayes-compatible modem when using IS-95 over standard phone land-lines.

## 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 charger/regulator, and SP10 solar panel. For help on analyzing your system's power requirements, refer to our Power Supply product literature or application note.



*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.*

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## Specifications

RF Output:	224 mW (+23.5 dBm)
Dual-band support:	800 MHz cellular, 1.9 GHz PCS bands
Data Rate:	9600 bps (CR200-series, CR510, CR10X, CR7), up to 14.4 kbps (CR800, CR1000, CR3000, CR5000)
IS-95B Circuit-Switched Mode:	G3 facsimile receive and transmit, Quick Net Connect (QNC) support
Short Message Service:	Send and receive, notification of new messages
Input Voltage:	10 to 28 Vdc
Input Current:	20 to 350 mA
Typical Current Drain at 12 Vdc:	20 mA dormant connection (idle for 10 to 20 seconds), 120 mA while receiving, 120 mA during transmission
Operating Temperature Range:	-30° to 75°C with transmissions limited to a 10% duty cycle above 60°C
Humidity:	5% to 95% non-condensing
Serial Interface:	RS-232, DB-9F
RF Antenna Connector:	50 Ohm TNC female
Dimensions:	3"W x 1"D x 5.1"L (5.8" w/connector), 7.6 x 2.5 x 13 cm (14.7 cm w/connector)
Weight:	<1 lb (<0.5 kg)



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