

# INSTRUCTION MANUAL



**Redwing105**  
**AirLink CDMA Modem C3111**

Revision: 7/06



Copyright © 2004-2006  
Campbell Scientific, Inc.

# ***Warranty and Assistance***

---

The **REDWING105 AIRLINK CDMA MODEM C3111** is warranted by CAMPBELL SCIENTIFIC, INC. to be free from defects in materials and workmanship under normal use and service for twelve (12) months from date of shipment unless specified otherwise. Batteries have no warranty. CAMPBELL SCIENTIFIC, INC.'s obligation under this warranty is limited to repairing or replacing (at CAMPBELL SCIENTIFIC, INC.'s option) defective products. The customer shall assume all costs of removing, reinstalling, and shipping defective products to CAMPBELL SCIENTIFIC, INC. CAMPBELL SCIENTIFIC, INC. will return such products by surface carrier prepaid. This warranty shall not apply to any CAMPBELL SCIENTIFIC, INC. products which have been subjected to modification, misuse, neglect, accidents of nature, or shipping damage. This warranty is in lieu of all other warranties, expressed or implied, including warranties of merchantability or fitness for a particular purpose. CAMPBELL SCIENTIFIC, INC. is not liable for special, indirect, incidental, or consequential damages.

Products may not be returned without prior authorization. The following contact information is for US and International customers residing in countries served by Campbell Scientific, Inc. directly. Affiliate companies handle repairs for customers within their territories. Please visit [www.campbellsci.com](http://www.campbellsci.com) to determine which Campbell Scientific company serves your country. To obtain a Returned Materials Authorization (RMA), contact CAMPBELL SCIENTIFIC, INC., phone (435) 753-2342. After an applications engineer determines the nature of the problem, an RMA number will be issued. Please write this number clearly on the outside of the shipping container. CAMPBELL SCIENTIFIC's shipping address is:

**CAMPBELL SCIENTIFIC, INC.**

RMA# \_\_\_\_\_

815 West 1800 North

Logan, Utah 84321-1784

CAMPBELL SCIENTIFIC, INC. does not accept collect calls.

# ***Redwing105 CDMA Table of Contents***

---

*PDF viewers note: These page numbers refer to the printed version of this document. Use the Adobe Acrobat® bookmarks tab for links to specific sections.*

<b>1. Introduction</b> .....	<b>1</b>
<b>2. Specifications</b> .....	<b>1</b>
2.1 Base Station Requirements .....	1
2.2 Datalogger Site Equipment .....	1
2.3 Power Considerations .....	2
<b>3. Configuration</b> .....	<b>2</b>
3.1 Establish Cellular Service .....	2
3.2 Program the Modem .....	2
3.3 Setup LoggerNet .....	3
 <b><i>Appendix</i></b>	
<b>A. Configuring Modem with a Terminal Emulator</b> .....	<b>A-1</b>
A.1 HyperTerminal Setup .....	A-1
A.2 Programming the Redwing's Phone Number .....	A-2
A.3 Programming the Redwing for Use with a Datalogger .....	A-3



# ***Redwing105 AirLink CDMA Modem***

---

## **1. Introduction**

Redwing modems are full-duplex, digital cellular modems that communicate with a base station PC via Code Division Multiple Access (CDMA) network and Public Switched Telephone Network (PSTN). Redwing105 modems are for use on the Alltel network only.

## **2. Specifications**

### **2.1 Base Station Requirements**

- PC with Hayes-compatible modem, running Campbell Scientific's LoggerNet or PC400 software.
- Subscription to the Alltel CDMA network with coverage at the datalogger site.

### **2.2 Datalogger Site Equipment**

- Redwing modem—includes power cable; the modem is configured using CellWizard.exe
- Datalogger—CR510, CR10(X), CR23X, CR7, CR5000, or CR2XX
- SC105 or SC932A Interface—connects the modem to the CR510, CR10(X), or CR7 dataloggers' CS I/O port
- 14392 Null Modem Cable—connects the modem to the CR23X, CR2XX, CR1000, or CR5000 RS-232 port
- 14394 Redwing Mounting Kit—includes mounting hardware for securing the modem to below referenced environmental enclosure and a 9-pin male to 9-pin female cable.
- Antenna—the following antennas are available from Campbell Scientific; sites near the edge of the CDMA coverage may require the Yagi antenna. Contact a CSI applications engineer for help in determining the best antenna for your application.
  - 14453 0 dBd ½ Wave Dipole Whip Cellular Antenna
  - 18285 1 dBd Omnidirectional Antenna with 10' Cable
  - 14454 9 dBd Yagi Cellular Antenna with 10' Cable
- Power Supply (see power considerations)
- Environmental Enclosure— ENC 10/12, ENC 12/14, or ENC 16/18

## 2.3 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 if desired.
- When using the switched 12 V terminal, the modem can be powered with a BP12 battery, CH100 charger/regulator, and MSX10 solar panel.

## 3. Configuration

### 3.1 Establish Cellular Service

Prior to contacting Alltel, have the following information on hand:

1. Electronic Serial Number (ESN). The ESN is found on the unit label.
2. Desired area code and local prefix. Normally, choose the same area code and prefix as the calling PC. These will ensure that calls are billed at local rates, even if the phone is used outside the local calling area.

Contact the provider, tell the account representative that you would like to open an account for a new voice phone. Request a voice plan and ask that voice mail NOT be activated. The Redwing may show up on Alltel's network as a MultiTech device; this is okay.

The provider will provide you with the following:

1. MDN (Mobile Directory Number). This is the number you dial.
2. MIN (Mobile Identification Number). This number identifies the Redwing on the cellular network. This may be the same number as the MDN.

### 3.2 Program the Modem

Program the modem with CellWizard.exe, available from Campbell Scientific, Inc. The appendix describes how to program the modem via a terminal emulator; however, programming via a terminal emulator is NOT the preferred method.

1. Connect the phone to your computer COM port.
2. Apply 12 volts to the phone. Red lead to +, black lead to -.
3. Start CellWizard.exe and select the COM port you will be using to program the Redwing.
4. Select desired datalogger baud rate. For the CR1000 or CR5000 dataloggers, set the baud rate to 115200. For the CR10(X), CR510, CR7, 21X, or CR200 dataloggers, set the baud rate to 9600. For the CR23X datalogger, set the baud rate to 38400.

5. Enter the MDN.
6. Enter the MIN.
7. Press the “Start” button to program the phone.

### 3.3 Setup LoggerNet

1. Select Add Root | TapiPort.
2. Add a TapiRemote to the TapiPort.
3. Add a datalogger to the TapiRemote.



4. On the TapiPort page, select your installed modem on the Tapi Line.
5. On the TapiRemote un-check “Use Tapi Dialing Properties.”
6. Enter the phone number of the CDMA phone.
7. Apply the changes and test.

---

**NOTE**

If you have a black SC12 cable, that is not Rev 1 or newer, it is a CS I/O cable only and will not work for RS-232. Connect the black SC12 cable between the datalogger and the SC932A. Use a 9-pin serial cable or a blue ribbon cable between the phone and the SC932A.

---





# Appendix A. Configuring Modem with a Terminal Emulator

---

**NOTE** Programming the modem with a terminal emulator is not recommended. Please first attempt programming with the CellWizard.exe program available from Campbell Scientific, Inc.

## Items needed:

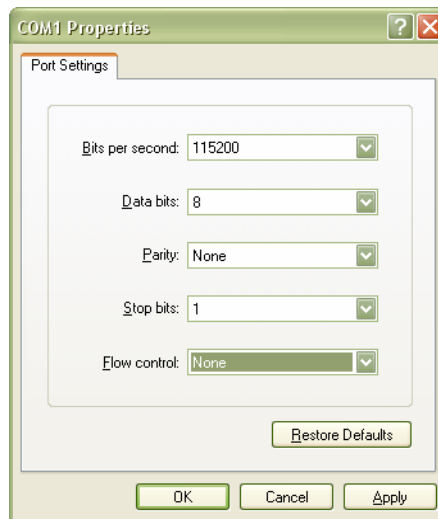
- Computer with a COM port.
- 9-pin cable to connect between the computer and the Redwing.
- A terminal program on the computer “HyperTerminal”.
- 12 volt DC applied to the Redwing.
- Antenna on the Redwing (for over-the-air updates).
- CDMA account.

## A.1 HyperTerminal Setup

Under “Connect using”, select the COM port you will be using.

Set COM Properties to:

Bits per second (baud) = 115200  
Data bits = 8  
Parity = None  
Stop bits = 1  
Flow control = None



Apply power to the modem and connect it to the computer via the 9-pin serial cable.

## A.2 Programming the Redwing's Phone Number

Your provider should give you two numbers to program into the Redwing, the MDN (Mobile Directory Number) and MIN (Mobile Identification Number).

Perform the following steps substituting the MDN and MIN with yours.

AT Commands to be typed are in **bold**. Follow each AT command string by pressing the Enter key and verify the response.

Step	AT Commands	Response	Description
1	<b>AT+WSPC=1,000000</b>	OK	Unlocks the module for service provisioning AT commands.
2	<b>AT+WMDN=[MDN]</b> Example: <b>AT+WMDN=4352551212</b>	OK	Enter the MDN here. The MDN is the number used to dial this device.
3	<b>AT+WIMI=31000[MIN]</b> Example: <b>AT+WIMI=310004352551234</b>	OK	Enter the MIN here. The <b>31000</b> must precede the MIN. The MIN is the number used to identify this device on the cellular provider's network. This number may be the same as the MDN.
4	<b>AT+WCMT=1</b>	OK	Commits the changes done during the service programming session.
		+WIND:8	Commission of these changes will force a software reset of the module.
5	<b>AT+CDV*22890</b>	+WORG:*22890 +WCNT:3 +WOT1:"Programming in progress" +WOTS:"SPL unlocked" +WOTP:"PRL Download OK" +WOTM:"MDM Download OK" +WOTC:"Commit Successful" +WOT2:"Programming Successful!"	Initiates over-the-air update. You must have cellular coverage with good signal strength for this to be successful.

**NOTE**

There are no O's in the above strings, they are Zero's.

## A.3 Programming the Redwing for Use with a Datalogger

The Redwing needs a few settings changed in it to power-up ready to work with the datalogger.

Step	AT Commands	Response	Description	
6	ATS0=1+CICB=0	OK	Sets auto answer in data mode.	
7	AT+IFC=0,0	OK	Disables local flow control.	
8	AT+IPR=[baud rate]; &W Example: AT+IPR=9600; &W	OK	Sets the Redwings RS232 baud rate and saves settings.  Use the following to determine baud rate:	
			CR1000	115200
			CR5000	38400
			CR10(X) CR510 CR200 CR7	9600

### NOTE

In the above strings, all "0" = zero.

Remove the power from the modem and power it up again. It should be ready to use at the baud rate set in Step 8. Test the communications before deploying the modem.





## **Campbell Scientific Companies**

---

### **Campbell Scientific, Inc. (CSI)**

815 West 1800 North  
Logan, Utah 84321  
UNITED STATES  
[www.campbellsci.com](http://www.campbellsci.com)  
[info@campbellsci.com](mailto:info@campbellsci.com)

### **Campbell Scientific Africa Pty. Ltd. (CSAf)**

PO Box 2450  
Somerset West 7129  
SOUTH AFRICA  
[www.csafrica.co.za](http://www.csafrica.co.za)  
[sales@csafrica.co.za](mailto:sales@csafrica.co.za)

### **Campbell Scientific Australia Pty. Ltd. (CSA)**

PO Box 444  
Thuringowa Central  
QLD 4812 AUSTRALIA  
[www.campbellsci.com.au](http://www.campbellsci.com.au)  
[info@campbellsci.com.au](mailto:info@campbellsci.com.au)

### **Campbell Scientific do Brazil Ltda. (CSB)**

Rua Luisa Crapsi Orsi, 15 Butantã  
CEP: 005543-000 São Paulo SP BRAZIL  
[www.campbellsci.com.br](http://www.campbellsci.com.br)  
[suporte@campbellsci.com.br](mailto:suporte@campbellsci.com.br)

### **Campbell Scientific Canada Corp. (CSC)**

11564 - 149th Street NW  
Edmonton, Alberta T5M 1W7  
CANADA  
[www.campbellsci.ca](http://www.campbellsci.ca)  
[dataloggers@campbellsci.ca](mailto:dataloggers@campbellsci.ca)

### **Campbell Scientific Ltd. (CSL)**

Campbell Park  
80 Hathern Road  
Shepshed, Loughborough LE12 9GX  
UNITED KINGDOM  
[www.campbellsci.co.uk](http://www.campbellsci.co.uk)  
[sales@campbellsci.co.uk](mailto:sales@campbellsci.co.uk)

### **Campbell Scientific Ltd. (France)**

Miniparc du Verger - Bat. H  
1, rue de Terre Neuve - Les Ulis  
91967 COURTABOEUF CEDEX  
FRANCE  
[www.campbellsci.fr](http://www.campbellsci.fr)  
[campbell.scientific@wanadoo.fr](mailto:campbell.scientific@wanadoo.fr)

### **Campbell Scientific Spain, S. L.**

Psg. Font 14, local 8  
08013 Barcelona  
SPAIN  
[www.campbellsci.es](http://www.campbellsci.es)  
[info@campbellsci.es](mailto:info@campbellsci.es)