Raven CDMA

AirLink Cellular Modem

Instruction Manual:

PassThru mode configuration

02/Jan/2006

WARRANTY AND ASSISTANCE

The **RAVEN CDMA AIRLINK CELLULAR MODEM** is warranted by CAMPBELL SCIENTIFIC (CANADA) CORP. ("CSC") 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 are not warranted.** ***** CSC's obligation under this warranty is limited to repairing or replacing (at CSC's option) defective products. The customer shall assume all costs of removing, reinstalling, and shipping defective products to CSC. CSC will return such products by surface carrier prepaid. This warranty shall not apply to any CSC 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. CSC is not liable for special, indirect, incidental, or consequential damages.

Products may not be returned without prior authorization. To obtain a Return Merchandise Authorization (RMA), contact CAMPBELL SCIENTIFIC (CANADA) CORP., at (780) 454-2505. An RMA number will be issued in order to facilitate Repair Personnel in identifying an instrument upon arrival. Please write this number clearly on the outside of the shipping container. Include description of symptoms and all pertinent details.

CAMPBELL SCIENTIFIC (CANADA) CORP. does not accept collect calls.

Non-warranty products returned for repair should be accompanied by a purchase order to cover repair costs.

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1 Introduction

The Raven CDMA modem is a full-duplex, 1xRTT cellular modem that communicates with a base station PC via Code Division Multiple Access (CDMA) network and Public Switched Telephone Network (PSTN). The Raven CDMA modem is for use on Bell, Alliant, ManitobaTel, and SaskTel networks only.

The AirLink Raven CDMA is a rugged, intelligent wireless data platform designed to enable real-time, two-way communications with remote assets. The AirLink Embedded Operating System (ALEOS) is the power inside the Raven. ALEOS has its own embedded TCP/IP stack which enables transmission of serial data from non-IP devices. ALEOS enables several functions including remote configuration and diagnostics, packet assembly and disassembly (PAD) for UDP or TCP, and telemetry protocol spoofing and conversion.

2 Specifications

2.1 Base Station Requirements

- PC with Hayes-compatible modem, running Campbell Scientific's LoggerNet or PC400 software.
- Subscription to Bell, Alliant, ManitobaTel, or SaskTel CDMA networks with coverage at the datalogger site.

2.2 Datalogger Site Equipment

- Raven CDMA modem—includes power cable; the modem is configured using the Wireless Ace 3G program prior to installation. Wireless Ace 3G can be downloaded from www.Airlink.com
- Datalogger—CR510, CR10(X), CR23X, CR7, CR1000,CR5000, or CR2XX
- SC105 or SC932A Interface—connects the modem to the CR510, CR10(X), or CR7 dataloggers' CS I/O port

NOTE: If you have a black SC12 cable that is not Rev 1 or newer (as indicated on cable), 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.

- L14392 Null Modem Cable—connects the modem to the CR23X, CR2XX, CR1000 or CR5000 RS-232 port

- L14394 Raven 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 CSC Applications Technician for help in determining the best antenna for your application.

    - L14453 Omni 0 dBd ½ Wave Dipole Whip Cellular Antenna (800 MHz)

    - L14454 Yagi 8 dBd Cellular Antenna with 10' Cable (800 MHz)

    - L18285 Omni 1 dBd Cellular Antenna (800 MHz & 1.9 GHz)

- 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 typically be powered with a BP12 battery, CH100 charger/regulator, and MSX10 solar panel.

3 Configuration

3.1 Establish Cellular Service

Prior to contacting the cellular service provider*, 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. Choose the same area code and prefix as the calling PC to ensure that calls are billed at local rates, even if the phone is used outside the local calling area.

*For modem activation, further information, and assistance in selecting the most suitable cellular plan, please call 1-866-928-4465 or email info@thinktel.ca

NOTE: The service provider does not need the Raven modem to activate the account.

3.2 Program the Modem

For the following steps you will need to download a Wireless Ace 3G Modem Doctor and an Activation Wizard that is matched to your selected carrier provider from the Utilities page at http://www.airlink.com/support/modems/modem_utils.asp

Make note of the program's location on your hard drive.

NOTE: Each provider has a specific Wizard. Please ensure you have downloaded the Wizard that corresponds to your provider. XP users can use the smaller version of Wireless Ace 3G which does not include the .Net framework.

1. Connect the modem to a com port on the PC using a direct RS232 connection. Also attach a dual band antenna to the Raven.

2. Start Wireless Ace, apply power to the modem, and select the Connect tab in the upper left corner of the menu selection bar, as shown in Figure 1 –Wireless Ace Connection Screen.

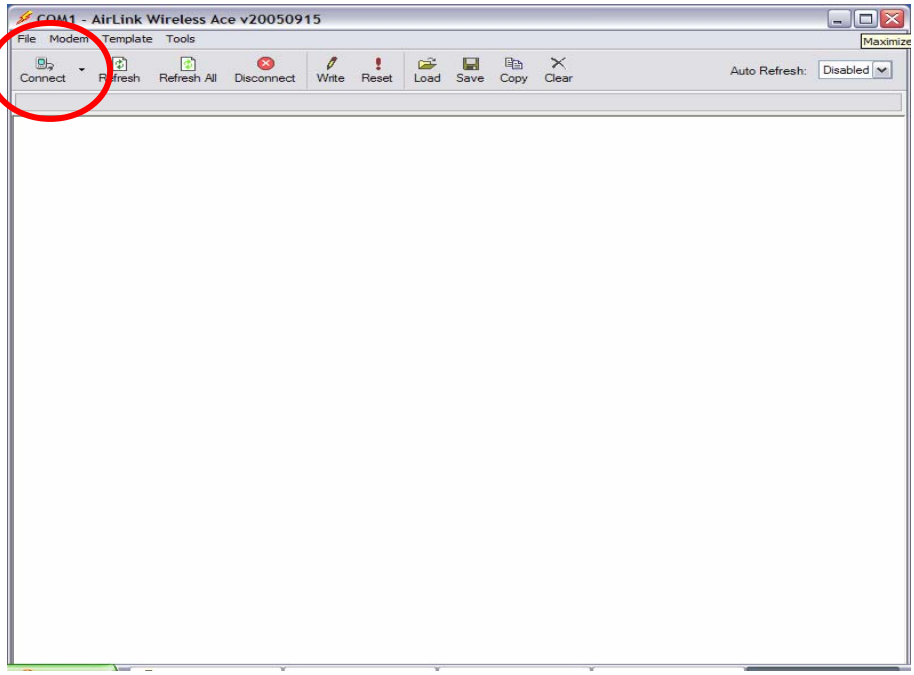


Figure 1 – Wireless Ace Connection Screen

3. The connection screen will appear with a default password, as shown in Figure 2 – Connect to Modem. *Do not change this password.* Press OK to continue.

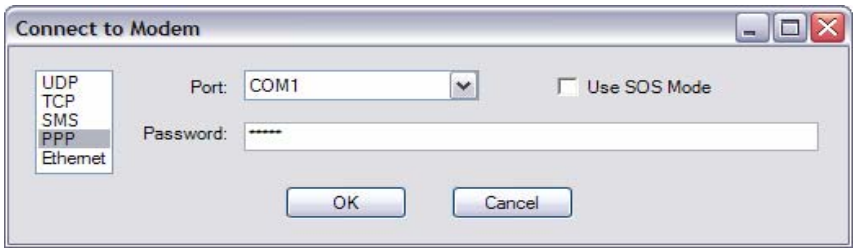
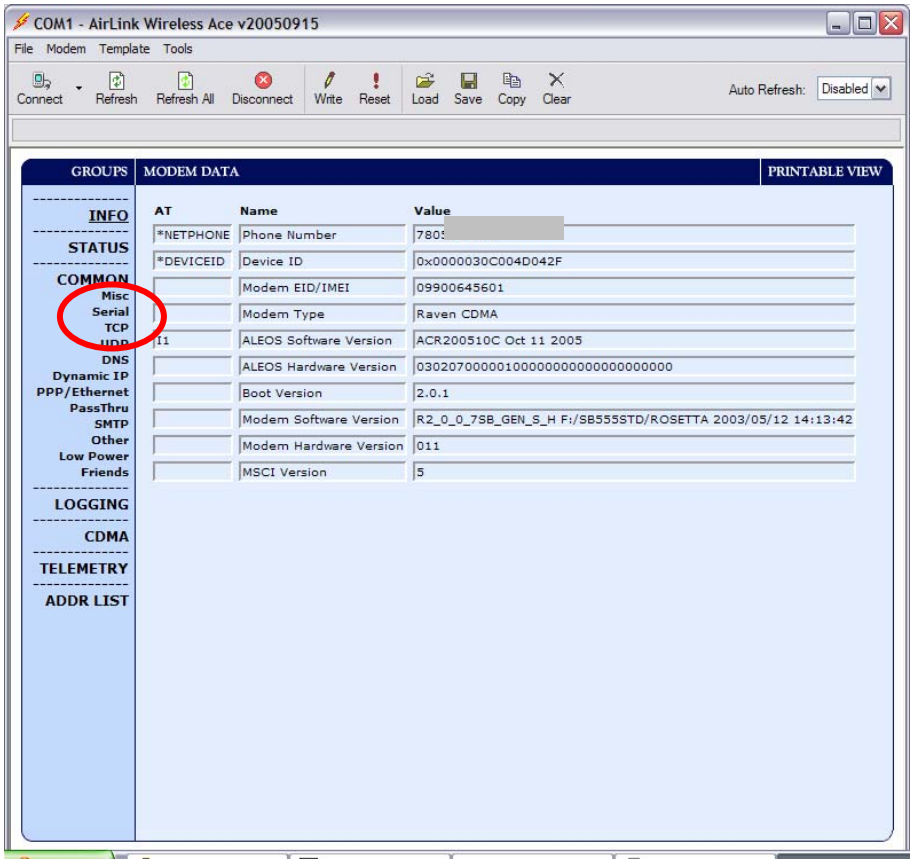


Figure 2 – Connect to Modem

4. Select the Serial option from the left side menu as shown below. This will take you to the Modem Data screen as shown in Figure 3 – Modem Data.



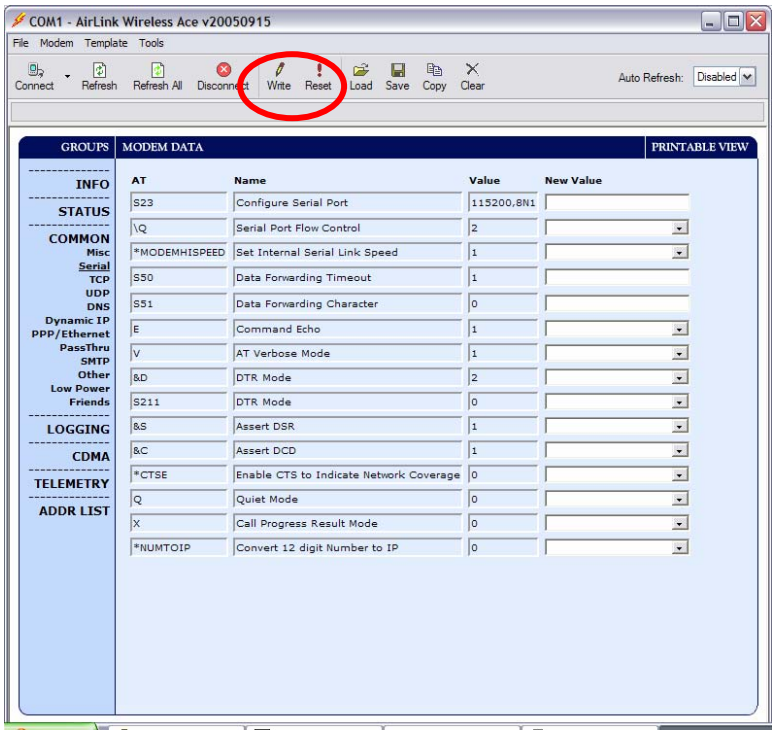


Figure 3 – Modem Data

5. Ensure the *MODEMHISPEED field is set to “0” by using the New Value pull down menu and then selecting the Write option in the top tool bar. Within 5 seconds the modem will update and you will see “Write successful” in the address bar.

6. Select the Reset modem option from the top tool bar. The modem will respond with a “Reset successful” message. Leave the modem powered up and connected to your PC.

7. Close down Wireless Ace and start the Activation Wizard.

4 Activation Wizard

The Activation Wizard will start and test your modem while performing firmware updates where necessary. Follow these instructions carefully to ensure a successful set-up.

1. From the Airlink Setup Wizard screen (as shown in Figure 4), uncheck “Update PRL List” and “Setup a DUN connection” and click next to proceed.

Figure 4 – Airlink Setup Wizard

2. Enter the COM port you are using, as shown in Figure 5 – Connection Settings, and click next to proceed.

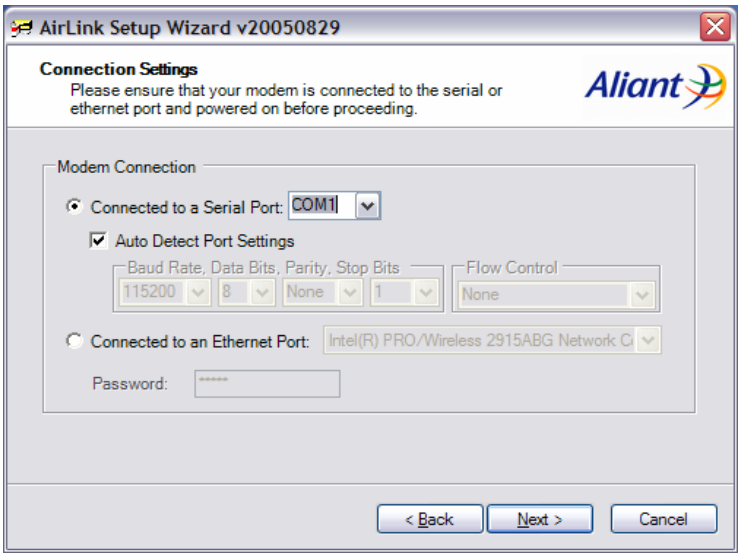
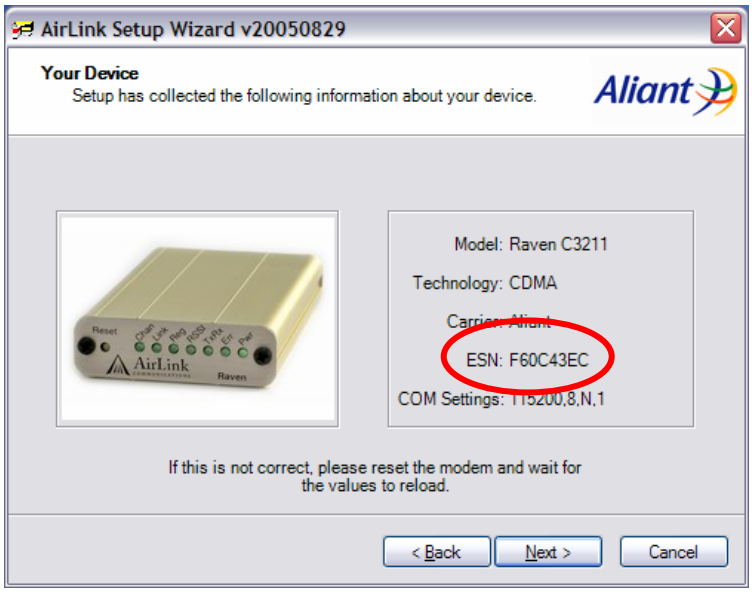


Figure 5 – Connection Settings

3. Wait until the ESN number field has updated before clicking next to proceed.



4. Follow the instructions as indicated on the Update Modem Firmware screen (Figure 6). If no updates are required, the "Update Now" button will not be activated. Click next to continue.

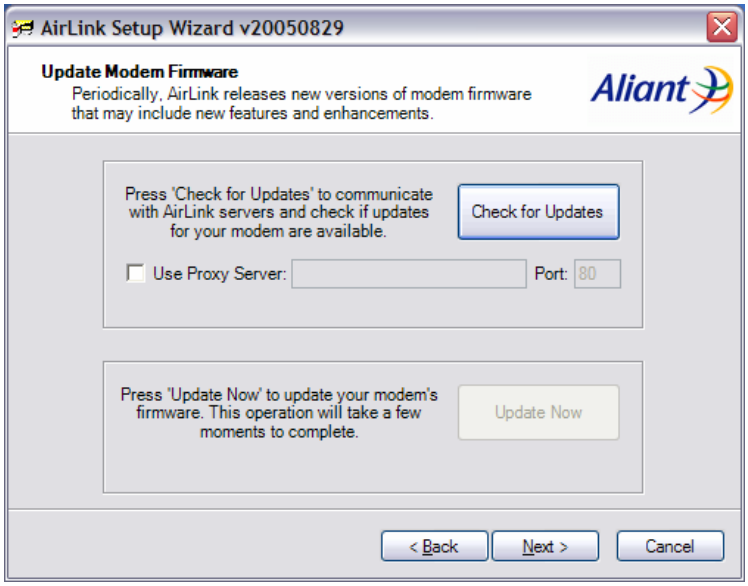


Figure 6 – Update Modem Firmware

5. A 6-digit Program Lock Code is written on the box the Raven CDMA modem was shipped in. Enter this code in the MSL area, as shown in Figure 7 – Device Activation, and click next to continue.

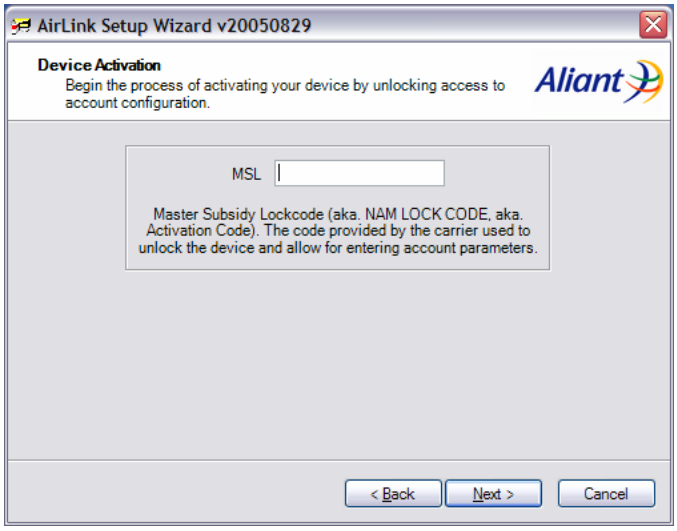


Figure 7 – Device Activation

6. Enter the 10 digit phone number provided by the carrier in the MDN field, shown in Figure 8 – MDN Field. The number will be echoed in the lower field.

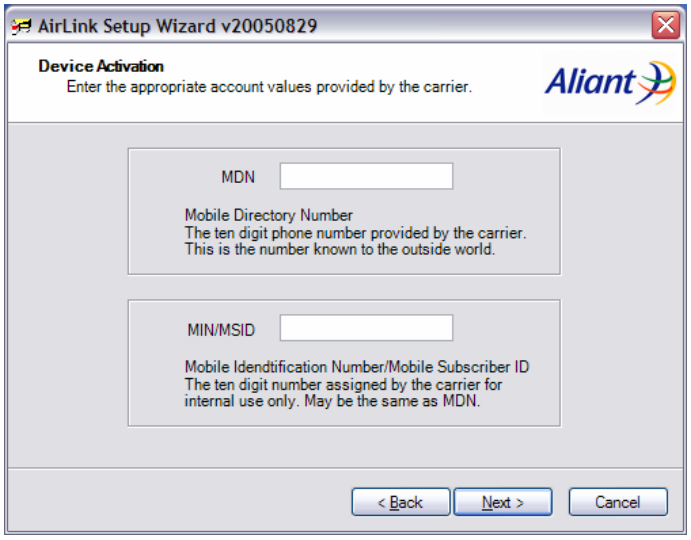


Figure 8 – MDN Field

7. Figure 9 – Confirmation Screen shows input settings to this point. The password is the default network password and is different for each carrier Wizard. *Do not change this password.* Click next to continue.

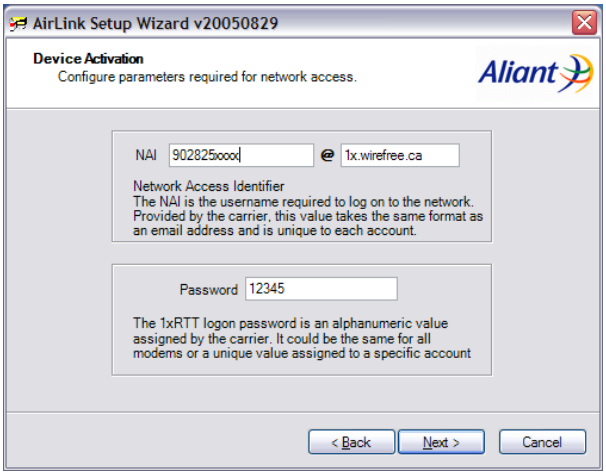


Figure 9 – Confirmation Screen

8. The next step will test the modem, authenticate it on the carrier network and register it as an active device, as shown in Figure 10 – Provisioning the Modem.

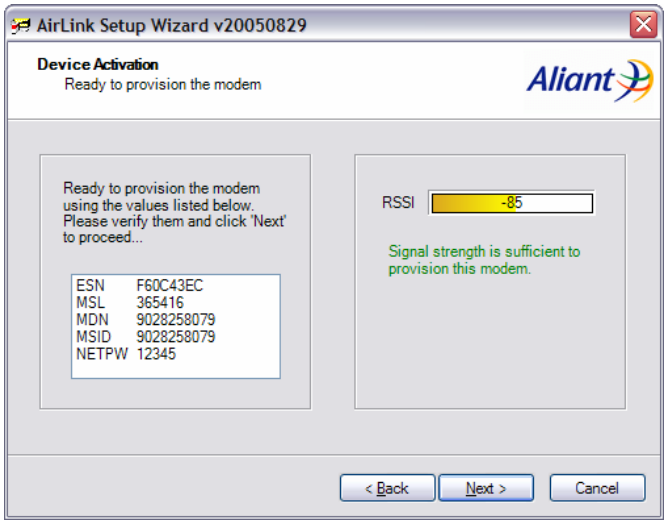


Figure 10 – Provisioning the Modem

9. Upon successful completion of the provisioning process, all of the boxes will have a green check mark. Click next to proceed to the “Setup Complete” screen.

10. Click “Finish” - the modem is now ready for advanced programming using Wireless Ace 3G.

5 Setup Modem using Wireless Ace 3G

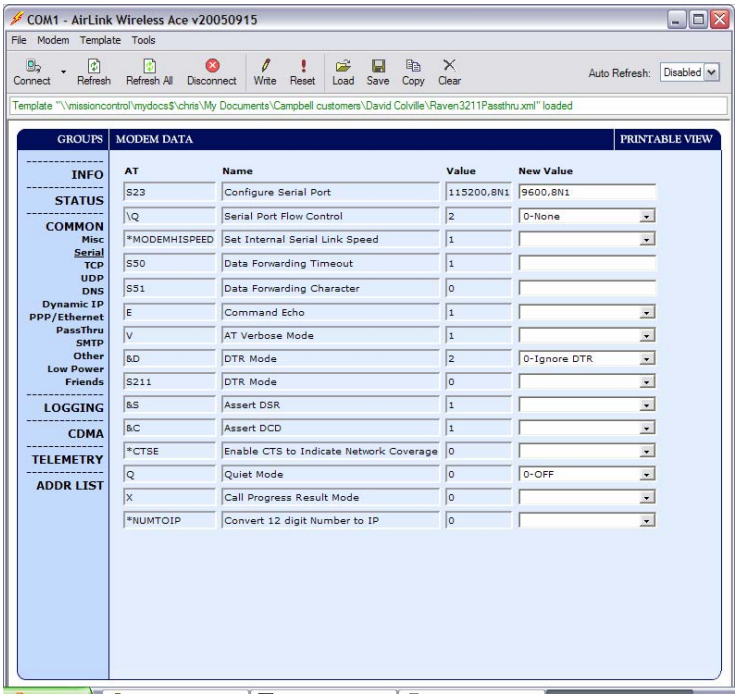
1. Start Wireless Ace, apply power to the modem, and select the Connect tab in the upper left corner of the menu selection bar, as shown on Page 5 in Figure 1 – Wireless Ace Connection Screen.

2. At the Connect to Modem screen, click OK *without changing the default password.*

3. Select the Serial option from the right side menu, as shown on Page 7 in Figure 3 – Modem Data.

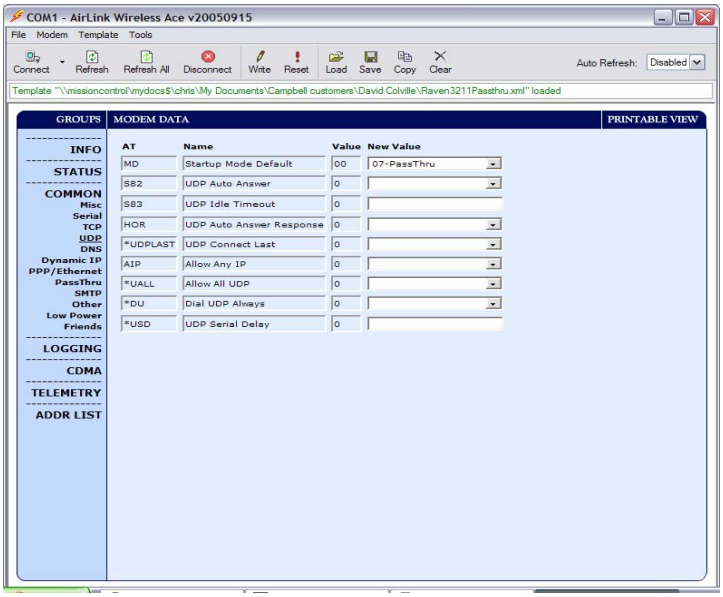
4. Enter the following information (as shown in the screen shot below) in the New Value fields:

Configure Serial Port	9600,8N1
Serial Port Flow Control	0-None
Quiet Mode	0-OFF
DTR Mode	0 Ignore DTR



5. Select the UDP menu option and enter the following information in the New Value fields:

   Startup Mode Default = 07-Passthru

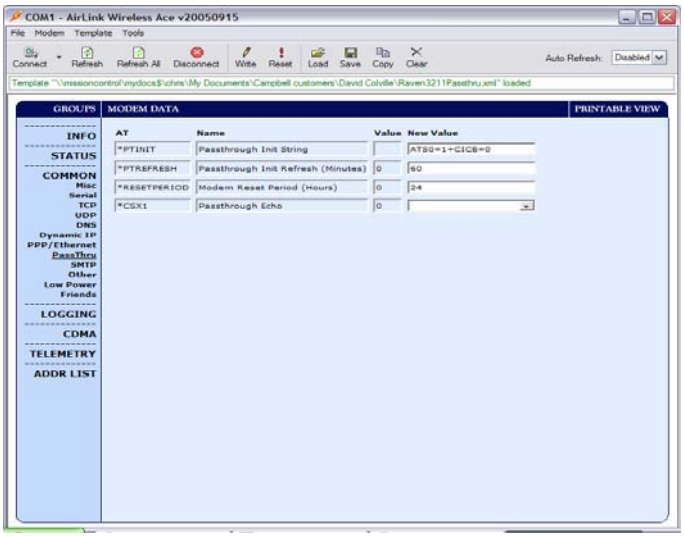


6. Select the PassThru menu option and enter the following information in the New Value fields:

   Passthrough Init String = ATS0=1+CICB=0

   Passthrough Init Refresh (Minutes) = 60

   Modem Reset Period (Hours) = 24



7. Select the Write option in the top tool bar. Within 5 seconds the modem will update and you will see a “Write successful” message in the address bar.

8. Next select the Reset modem option from the top tool bar. The modem will respond with a “Reset successful” message. Turn off the power to the modem.

From this point on the modem is in PassThru mode and further attempts to communicate with it using Wireless Ace 3G is not advisable. If the modem needs reprogramming, it is best to use Modem Doctor and reset the modem. Then reprogram starting at section 3.2 of this manual.

6 Testing the Modem in Pass Thru Mode

1. Open Hyper Terminal and create a 9600 N 8 1 Hardware session using the PC com port that the modem is still attached to.

2. Apply power to the modem and if the modem is working in PassThru mode the PassThru string ATS0=1+CICB=0 will display on the terminal screen.

3. Check to make sure the Channel, Link, and Reg lights are all flashing once per second in unison. This is confirmation that the modem is in PassThru mode.

4. Next call the number assigned to the modem from a regular phone set. The terminal session should show the Ring command and the modem will pickup within 5 rings.

5. Power down the modem, close Hyper Terminal and disconnect the modem from the PC. The modem is now ready to connect to a data logger.

7 Setup LoggerNet (Option A)

1. Select Add Root | TapiPort.

2. Add a TapiRemote to the TapiPort.

3. Add a datalogger to the TapiRemote.

4. On the TapiPort page:
    a. Select Communications Enabled.
    b. If you are using the Call-back feature of the datalogger on any of your stations, select Call-Back Enabled.
    c. Select your installed modem on the Tapi Line.
    d. Extra Response Time can remain as 0 seconds.
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.

8 Setup LoggerNet (Option B)

1. Select Add Root | ComPort.
2. Add a PhoneBase to the ComPort.
3. Add a PhoneRemote to the Phone Base.
4. Add a datalogger to the Phone Remote.

5. On the ComPort page:
    a. Select Communications Enabled.
    b. If you are using the Call-back feature of the datalogger on any of your stations, select Call-Back Enabled.
    c. Select the ComPort that is connected to your modem from the drop-down menu.
    d. Extra Response Time can remain as 0 seconds.
6. On the PhoneBase page:

a. Select Communications Enabled.

b. Select the modem that you are using from the Modem Type list.

c. For CR10(X), CR510, CR7, 21X, or CR200 dataloggers, set the baud rate to 9600. For CR23X, CR1000 or CR5000 dataloggers, set the baud rate to 38400 (when using the RS232 port).

d. Extra Response Time can remain at 0 seconds.

7. On the PhoneRemote page:

a. Select Communications Enabled.

b. The Delay can remain at 0 milliseconds.

c. Enter the Phone Number.

8. Apply the changes and test.