Raven X 1x/EV-DO

Quick Start

20080620
Rev 1.0C

SIERRA WIRELESS
HEART OF THE WIRELESS MACHINE®

≫ Activating your Raven X on your cellular provider Network

- Activating Using AT Commands
- Hardware Installation
- Indicator Lights
- Mounting

This Quick Start guide provides step-by-step directions for activating your Raven X on your cellular provider's network.

Tip: *For additional configuration options, refer to the User Guide for your Raven X.*

"

Activating Using AT Commands

An alternate method to configure and activate your Raven X is by using AT commands sent directly to the modem with a terminal application.

Caution: *It is not possible to activate the Raven X using either Aceweb or AceNet.*

---

1. Set telnet timeout in to 20 minutes.
2. Save the telnet setting.
3. Enter the user name of your account (NAI). The user name is usually expressed as an email address with phone number of the account (example, 1234567@carrier.com). This information should be provided by your carrier. You may not need this step.

   `AT*NETUID=[NAI]`
4. Enter the password of your account. This information should be provided by your carrier. You may not need this step.

   `AT*NETPW=[password]`
5. Verify ALEOS has established communication to the internal hardware.
6. Enter the activation command appropriate for your type of account. The SID and NID are optional and only required if your account type uses them.

- If you have the same number for the MIN and MDN or MSID:

`AT*PROVISION=MSL,MDN[,SID,NID]`

- If you have the different numbers for the MIN and MDN or MSID:

`AT*PROVISION2=MSL,MDN,MIN/MSID[,SID,NID]`

Using Direct Commands to the Internal Hardware

Use only if the ALEOS method is unsuccessful.

Activating the Modem

1. Set telnet timeout in to 20 minutes.

   `AT*TELNETTIMEOUT=20`

2. Save the telnet setting.

   `AT&W`

3. Verify ALEOS has established communication to the internal hardware.

   `ATI3`

4. Enter the user name of your account (NAI). The user name is usually expressed as an email address with phone number of the account (example, 1234567@carrier.com). This information should be provided by your carrier. You may not need this step.

   `AT*NETUID=[NAI]`

5. Enter the password of your account. This information should be provided by your carrier. You may not need this step.

   `AT*NETPW=[password]`

6. Put modem into passthru mode to by-pass ALEOS. This will allow direct communication with the wireless module for programming. Entering passthru will take 10-15 seconds and will return an 'OK' when it is complete.

   `AT\APASSTHRU`

7. Verify you are in Passthru mode.

   `AT!STATUS`

8. Unlock the module.

   `AT~NAMLCK=MSL`

9. Set the MDN and MSID.

   `AT~NAMVAL=0,MDN,MSID,0,65535`

10. Verify the settings are what you intended to enter.

    `AT~NAMVAL?0`

11. Start the IOTA session.

AT!IOTASTART

Status will be output until IOTA completes with 'IOTA Successful' or ' 1012 ERROR'.

12. Reset the module.

AT!RESET

13. Press the reset button on the front of the modem. When the modem restarts, it should register on the network.

Private Networking

1. Put modem into passthru mode.

AT\APASSTHRU

2. Verify you are in Passthru mode.

AT!STATUS

3. Set the NAI.

AT$QCMIPNAI=[NAI],1

4. Set the IP address of the primary home agent.

AT$QCMIPPHA=[PHA_IP],1

5. Set the IP address of the secondary home agent.

AT$QCMIPSHA=[SHA_IP],1

6. Set the home agent shared secret key.

AT$QCMIPMHSS=oursecretmnhakey,1

7. Set the AAA shared secret key.

AT$QCMIPMASS=[AAA_Key],1

8. Enable reverse tunneling.

AT$QCMIPRT=1,1

9. Enter the SPI to authenticate on the primary and secondary Home Agents. This is provided by your carrier or HA administrator.

AT$QCMIPMHSPI

10. Enter the SPI required by the Authentication, Authorization and Accounting server. This is provided by your carrier or AAA administrator.

AT$QCMIPMASPI

Hardware Installation

Your Raven X should be mounted in a position that allows
easy access for the cables so they are not bent, constricted, in
close proximity to high amperage, or exposed to extreme
temperatures. The LEDs on the front panel should be visible
for ease of operational verification. You should ensure that
there is adequate airflow around the modem but that it is kept
free from direct exposure to the elements, such as sun, rain,
dust, etc.

Caution: *The Raven X is in a hardened case and designed for use in
industrial and extreme environments. However, unless you are using
cables expressly designed for such environments, they can fail if
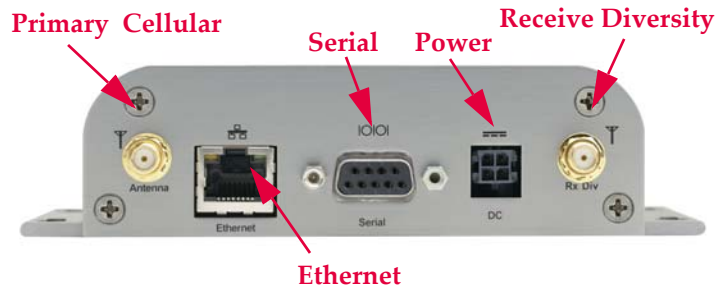exposed to the same conditions the Raven X can withstand.*

Figure 1-1: Raven X Connectors

Cellular

Antennas selected should not exceed a maximum gain of 5 dBi
under standard installation configuration. In more complex
installations (such as those requiring long lengths of cable and/
or multiple connections), it's imperative that the installer
follow maximum dBi gain guidelines in accordance with the
radio communications regulations of the Federal Communica-
tions Commission (FCC), Industry Canada, or your country's
regulatory body (if used outside the US).

Your Raven X will work with most cellular antennas with a
SMA connector. Connect the primary antenna or primary RF
cable directly to the antenna connector on the back of the
Raven X.

To provide for diversity in the signal reception, connect the second antenna to the second antenna port (SMA, labeled Rx Div) on the back of the Raven X.

Power

Your Raven X can be used with either DC or AC, with the appropriate power adapter. DC cables and AC adapters are available as optional accessories in addition to the one included with your Raven X.

The DC power cable positive lead should be connected to the battery or power source positive terminal. The power cable negative lead should be connected to the battery or power source negative terminal.

Connecting to a Computer or other Device

Figure 1-2: Ethernet

The Ethernet port of your Raven X can be connected directly to a computer or other Ethernet device with either a cross-over cable or a straight-through cable. The Ethernet port on the Raven X is auto-sensing and will auto-detect the speed of the connecting device for 100baseTX or 10baseT. If you are connecting the modem to a hub or switch you should use a straight through cable or use the uplink port on the hub or switch with a cross-over cable.

Figure 1-3: Serial

The serial port of your Raven X can be connected directly to most computers or other devices using a standard straight through cable. If you have a DCE device, you will need a null modem or null modem cable.

Indicator Lights

When your Raven X is connected to power and an antenna, there is a specific pattern to the lights to indicate its operation mode.

Figure 1-4: Raven X Indicator lights

- **Network** - Indicates a successful connection to the cellular network with an IP address given and a channel acquired.
- **Signal** - Light shows the strength of the signal and may be nearly solid (strong signal) or flashing (weaker signal). A slow flash indicates a very weak signal.

RSSI LED Ranges

RSSI/Signal LED Status	Ranges of RSSI (dBm)
On Solid	Equal to or stronger than -69
Fast Blink	-70 to -79
Normal blink	-80 to -89
Slow Blink	-90 to -99
Extinguished	Equal to or weaker than -100

- **Activity** - Lights will flash as data is transferred to and from the PinPoint modem on the remote network.
- **Service** - Indicates when the connection is EV-DO. Unlit indicates 1x.
- **Power** - Indicates the power adapter is connected and there is power getting to the Raven X.
- The **Reset button** (on the left side of the Raven X) has two functions. If it is quickly depressed and released, the modem will simply power cycle the internal hardware. If, however, the reset is depressed and held for several seconds (count 10 slowly, and wait for the power light to go off after the light pattern stops), the ALEOS configuration settings will return to the factory defaults.

Caution: *If you reset the modem configuration using the reset button, you may need to reactivate your Raven X with your cellular provider.*

Light Patterns

The LEDs on the front of the modem will respond in different patterns to indicate modem states.

- **Normal** - Each LED, mentioned above, is lit as applicable.
- **Start up** - The LEDs will cycle from left to right.
- **PassThru mode** - Network and Signal LEDs will blink in tandem. The Activity LED will blink when transmitting or receiving data.
- **SOS** - The Network and Service Err or Service LEDs will blink alternate to each other.

- **Configuration Reset** - The LEDs will cycle left to right and then right to left 4 times.
- **Authentication Failure** - The Network, Signal, and Activity LEDs blink every 2 seconds.
- **Data Retry** - The Network, Signal, and Activity LEDs blink every 3 seconds.
- **Invalid MAC Address or Ethernet Initiation Fail** - The Service LED will blink.

Mounting

The integrated mounting with keyhole screw mounts on the Raven X will allow you to secure your modem nearly anywhere, quickly and easily, without the need for a separate bracket.

A radius: 0.14" (2.5mm)
B radius: 0.075" (1.9mm)
C to C: 0.565" (14mm)
D to D: 0.315" (8mm)
E to E: 0.132" (3.3mm)

F to F: 0.315"(8mm)
G to G: 2.145" (54.48mm)
H to H: 1.895"(48.13mm)
I to I: 0.565" (14.35mm)
K to K: 0.665"(16.89mm)
L to L: 0.257" (6.53mm)
M to M: 5.385"(136.7mm)
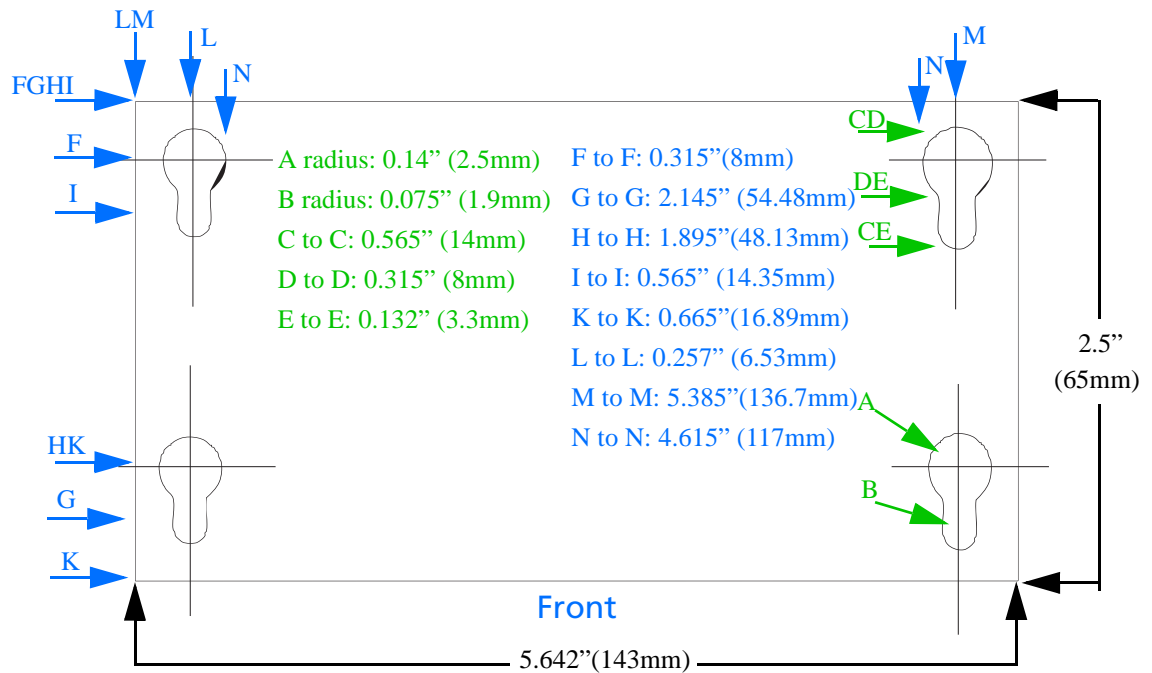N to N: 4.615" (117mm)

2.5" (65mm)

Front

5.642"(143mm)

Figure 1-5: Diagram of the Raven X base

Important Notice

Due to the nature of wireless communications, transmission and reception of data can never be guaranteed. Data may be delayed, corrupted (i.e., have errors) or be totally lost. Although significant delays or losses of data are rare when wireless devices such as the Sierra Wireless AirLink Raven X are used in a normal manner with a well-constructed network, the Sierra Wireless AirLink Raven X should not be used in situations where failure to transmit or receive data could result in damage of any kind to the user or any other party, including but not limited to personal injury, death, or loss of property. Sierra Wireless accepts no responsibility for damages of any kind resulting from delays or errors in data transmitted or received using the Sierra Wireless AirLink Raven X, or for failure of the Sierra Wireless AirLink Raven X to transmit or receive such data.

Safety and Hazards

Do not operate the Sierra Wireless AirLink Raven X in areas where blasting is in progress, where explosive atmospheres may be present, near medical equipment, near life support equipment, or any equipment which may be susceptible to any form of radio interference. In such areas, the Sierra Wireless AirLink Raven X **MUST BE POWERED OFF**. The Sierra Wireless AirLink Raven X can transmit signals that could interfere with this equipment.

Do not operate the Sierra Wireless AirLink Raven X in any aircraft, whether the aircraft is on the ground or in flight. In aircraft, the Sierra Wireless AirLink Raven X **MUST BE POWERED OFF**. When operating, the Sierra Wireless AirLink Raven X can transmit signals that could interfere with various onboard systems.

Note: Some airlines may permit the use of cellular phones while the aircraft is on the ground and the door is open. Sierra Wireless AirLink Raven X may be used at this time.

The driver or operator of any vehicle should not operate the Sierra Wireless AirLink Raven X while in control of a vehicle. Doing so will detract from the driver or operator's control and operation of that vehicle. In some states and provinces, operating such communications devices while in control of a vehicle is an offence.

Limitation of Liability

The information in this manual is subject to change without notice and does not represent a commitment on the part of Sierra Wireless. SIERRA WIRELESS AND ITS AFFILIATES SPECIFICALLY DISCLAIM LIABILITY FOR ANY AND ALL

DIRECT, INDIRECT, SPECIAL, GENERAL, INCIDENTAL, CONSEQUENTIAL, PUNITIVE OR EXEMPLARY DAMAGES INCLUDING, BUT NOT LIMITED TO, LOSS OF PROFITS OR REVENUE OR ANTICIPATED PROFITS OR REVENUE ARISING OUT OF THE USE OR INABILITY TO USE ANY SIERRA WIRELESS PRODUCT, EVEN IF SIERRA WIRELESS AND/OR ITS AFFILIATES HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES OR THEY ARE FORESEEABLE OR FOR CLAIMS BY ANY THIRD PARTY.

Notwithstanding the foregoing, in no event shall Sierra Wireless and/or its affiliates aggregate liability arising under or in connection with the Sierra Wireless product, regardless of the number of events, occurrences, or claims giving rise to liability, be in excess of the price paid by the purchaser for the Sierra Wireless product.

Patents

Portions of this product may be covered by some or all of the following US patents:

5,515,013	5,629,960	5,845,216	5,847,553	5,878,234
5,890,057	5,929,815	6,169,884	6,191,741	6,199,168
6,339,405	6,359,591	6,400,336	6,516,204	6,561,851
6,643,501	6,653,979	6,697,030	6,785,830	6,845,249
6,847,830	6,876,697	6,879,585	6,886,049	6,968,171
6,985,757	7,023,878	7,053,843	7,106,569	7,145,267
7,200,512	D442,170	D459,303		

and other patents pending.
This product includes
technology licensed from: QUALCOMM® 3G

Licensed by QUALCOMM Incorporated under one or more of the following United States patents and/or their counterparts in other nations:

4,901,307	5,056,109	5,101,501	5,109,390	5,228,054
5,267,261	5,267,262	5,337,338	5,414,796	5,416,797
5,490,165	5,504,773	5,506,865	5,511,073	5,535,239
5,544,196	5,568,483	5,600,754	5,657,420	5,659,569
5,710,784	5,778,338			

Manufactured or sold by Sierra Wireless or its licensees under one or more patents licensed from InterDigital Group.

Copyright

© 2009 Sierra Wireless. All rights reserved.

Trademarks

AirCard® and "Heart of the Wireless Machine®" are registered trademarks of Sierra Wireless. Watcher® is a trademark of Sierra Wireless, registered in the European Community.

Contact Information

Support Desk:	Phone:	1-877-231-1144
	Hours:	5:00 AM to 5:00 PM Pacific Time, Monday to Friday, except US Holidays
	E-mail:	support@sierrawireless.com
Sales Desk:	Phone:	1-510-624-4200 1-604-232-1488
	Hours:	8:00 AM to 5:00 PM Pacific Time
	E-mail:	MobileandM2Msales@sierrawireless.com
	Post:	Sierra Wireless America 39677 Eureka Drive Newark, CA USA 94560 Sierra Wireless 13811 Wireless Way Richmond, BC Canada V6V 3A4
	Fax:	1-510-624-4299 1-604-231-1109
	Web:	www.sierrawireless.com

Consult our website for up-to-date product descriptions, documentation, application notes, firmware upgrades, trouble-shooting tips, and press releases:

www.sierrawireless.com

Revision History

Revision number	Release date	Changes
1.x	2003-2005	AirLink Communications documentation - CDPD, CDMA, and GPRS.
2.x	Q2: 2005-Q2: 2007	AirLink Communications documentation - CDMA, EV-DO, EDGE, and HSUPA/HSDPA.
3.0	Q2: 2008	Converted documentation from AirLink Communications documentation format into Sierra Wireless documentation format. Phase II of the conversion completed. Raven modem line documentation is revised.