TN-W0034
MicroStrain Technical Note

Cellular Data Service for WSDA®

Introduction

The WSDA®-1000 Wireless Sensor Data Aggregator may be deployed where a LAN does not exist by use of a wireless Ethernet modem. MicroStrain recommends using the Sierra Wireless AirLink™ Raven X 3G Gateway. The Raven X is a powerful wireless networking device designed to leverage today's 3G networks. Its high-speed Ethernet port makes the Raven X ideal for use with WSDA®-1000 and allows deployment in remote locations such as vineyards, over-the-road trucks, boats, highway bridges and the like.

When purchasing your Raven X, you will specify the cellular service carrier from whom you will be purchasing service. The Raven X supports many worldwide carriers including (but not limited to):

- AT&T
- Sprint
- Verizon Wireless
- Bell Mobility
- Rogers
- Telus

MicroStrain recommends doing a quality of cellular service test before proceeding with a particular carrier in any given location, and we also note that *any modem ordered for a specific carrier can not be used on another carrier's network.*

This technical note discusses configuration and operation of your modem with the WSDA®-1000.

Establish Cellular Service

Once you have acquired your modem, you will need to contact your service provider. Here are some general tips:

- Have the following information in hand, i.e., the IMEI (AT&T) or ESN (Verizon and Sprint) of the modem, usually found on the label of the device.
- If your organization already has an account with the carrier, you will need a person authorized on the account to assist setting up a new line. For Sprint users, only the account number and PIN of the existing account are required.
- Contact the provider and ask to set up a data plan for a data modem. They will give you a phone number for the device. **It is important to keep track of this number;** it may be necessary for certain modem functionality, and will also be the best way of identifying the device with the provider in the future.

Provisioning the Modem

AT&T modems

AT&T is a CDMA cellular service provider that requires the use of SIM cards in devices that communicate with their network. Once a cellular account and data plan have been established with AT&T, and the device IMEI is registered, AT&T will mail you a SIM card. Insert the SIM card into the data modem's SIM card tray. To provision the modem on AT&T's network, attach the antenna and simply power up the modem. Provisioning will take about 2 minutes. Do not turn off or move the modem until provisioning is complete. You will know provisioning is complete when the following status LEDs are illuminated: Power, Service, Network, Signal (Signal will either be solid or flashing depending on the strength of the modem's connection signal).

Verizon modems

Verizon is a CDMA service provider, but does not require the use of SIM cards in devices that communicate with its network. Once a cellular account and data plan have been established with Verizon and the device ESN is registered, attach the antenna and simply power up the modem. Provisioning takes about 2 minutes. When activating a new device on Verizon's network, it may take a few hours or even an entire day for device registration to occur. Until your device is actually registered by Verizon, automatic provisioning will not be successful. Power the modem down between automatic provisioning attempts.

Sprint modems

The Sprint Raven X does not support automatic provisioning. To provision the modem, see the Sierra Wireless Quick Start manual at: http://www.sierrawireless.com/support.

Connecting the Modem to a WSDA®-1000

Once a cellular account has been established and the modem is provisioned on the cellular network, power down the modem. Connect the modem to the WSDA®-1000 with the Ethernet cable. This is a standard, straight-through Ethernet cable, as opposed to a crossover cable. Next, power up the modem and wait for it to establish a connection to the cellular network by observing its status LEDs. When the modem has connected, power up the WSDA®-1000 and follow the step-by-step in the WSDA®-1000 quick start guide.

Appendix

Raven X LED Status

LED Label	Function ('normal' indication)
Network	On = Network is Ready Blinking = Roaming
Signal	This *LED* 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.
Activity	The *LED* will flash as data is transferred to and from the modem on the remote network.
Service	For EV-DO modems: lit indicates EV-DO, unlit indicates 1x. For HSDPA modems: lit indicates HSDPA or UMTS, unlit indicates EDGE or GPRS.
Power	Indicates the power adapter is connected and there is power getting to the modem.

Modem State	Light Pattern
Start Up	*LEDs* cycle from left to right.
Activation Process (Provisioning)	*LEDs* cycle left to right.
Configuration Reset	*LEDs* cycle left to right then right to left four times.
Pass-through	Network and Signal *LED* will blink in tandem. The Activity *LED* will blink when transmitting or receiving data.
SOS	The Network and Service *LED* will blink alternately.
Activation Failure	Network, Signal, and Activity *LEDs* will blink every 2 seconds.
Data Retry	Network, Signal, and Activity *LEDs* will blink every 3 seconds.
Invalid MAC Ethernet Initialization Failure	Service *LED* will blink (can be present with any other state).

Support

MicroStrain support engineers are always available to expand on this subject and support you in any way we can.

MicroStrain®
MicroStrain, Inc.
459 Hurricane Lane, Unit 102
Williston, VT 05495 USA
ph: 800-449-3878
fax: 802-863-4093
www.microstrain.com
support@microstrain.com