Sierra Wireless Airlink Raven XE H2225E Router

Description
The target of the Airlink Raven XE is the Alarming Module. Its purpose is to Send and Receive SMS messages. Essentially, it is going to be utilized as an SMS gateway. As an example, Ignition picks up information from a PLC that the water temperature is too hot. Ignition send an SMS message via the Raven XE to contacts assigned to that alarm. It is received by a contact, which is then acknowledged via SMS by the contact. This SMS message is sent back and received by Ignition via the Raven XE.

Raven XE and Network Security
The security settings covered here are basic steps to secure the Raven XE. Inductive Automation is not responsible for the security of your Raven XE. You should take the time to configure and test the current and other security measures as appropriate to your network.

Inductive Automation tested this router as a device that sits inside a network. Therefore, it needs to be configured to act simply as another device on the network, not as a router or DHCP Server etc. Its sole purpose is to handle SMS traffic. The setup steps below cover these. If you wish to utilize its other features, bear in mind that you will need to ensure it works properly on your network and is secure.

Configuration and ACEManager
To access and change the modem’s configuration information, you will be accessing what is called the ACEManager. This can be accessed via Ethernet, USB or Serial. This document will only cover Ethernet access. The recommended browser to use is IE or Firefox. ACEManager run poorly under Safari and Chrome.

Setup Steps

The sections below should be followed in the order given to setup the Raven XE H2225E. Note that any change that is made usually requires a reboot of the modem, which can be done through the ACEManager. Follow these instructions and reboot at the end.

Default Ethernet Connection
First connect the Raven XE directly to your computer and follow the manual’s instructions to connect to it.

Default Ethernet settings for access is:
Device IP Address: 192.168.13.31
Port: 9191
Username: user
Password: 12345
It should be as simple as changing your computer’s LAN settings to DHCP. Then connect to it via a browser with [http://192.168.13.31:9191/index.htm](http://192.168.13.31:9191/index.htm).

**Password**  
The first thing you need to do is change the password. From the Admin Tab of ACEManager, change it.

**Firmware**  
The first thing to check is if the router’s firmware is up-to-date. Go to the Status Tab. If the router’s ALEOS Software Version is H2225E_4.0.10.001 Jul 21 2011 or earlier, it should be updated. As of this writing, the latest firmware version is H2225E_4.0.11. This can be found on the Sierra Wireless website at [http://www.sierrawireless.com/en/Support/Downloads/AirLink/Configurable_Intelligent_Gateways/AirLink_Raven_XE_HSPA_for_ATT_H2225E-C.aspx](http://www.sierrawireless.com/en/Support/Downloads/AirLink/Configurable_Intelligent_Gateways/AirLink_Raven_XE_HSPA_for_ATT_H2225E-C.aspx). The executable file is RvnXE_90_H2225E_4.0.11.003.exe.

With the firmware downloaded, follow these instructions to install it:

1) Simply connect the Ethernet cable from your laptop to the router;
2) Set your computer to DHCP;
3) Double-click on the file to execute the firmware upgrade program.
4) You will be entering the IP address of 192.168.13.31 with the default username and the appropriate password.
5) Follow the instructions on the upgrade program.

The Raven XE’s manual also covers how to upgrade the firmware easily.

**Setting up the Raven to be on a network**  
The ACEManager will be accessed to change the LAN and other setting to enable it to be accessed via an existing network. After the firmware upgrade, you should still be able to access it via the default Ethernet settings.

Go to the LAN – Ethernet Tab and enter the following:  
**DHCP Server Mode: Disable**  
The Raven XE has a built-in DHCP Server. This must be disabled. If not it may cause network issues, creating conflicts on existing IP addresses already assigned.

**Host Routing Mask:** 255.255.5.0

The following is a screen shot of the default LAN settings Inductive Automation is using – you should adjust these as appropriate to you network:
After the above has been done, go to the LAN – Host Port Routing Tab. The router must be set to NOT act as the gateway on the network.

Primary Gateway: Disabled

Failure to make the above setting may cause devices on the network to cease functioning.

Below is a screen shot of the change:
ACEManager “Over-The-Air”
By default the ACE Manager can be accessed “over-the-air”. If you load the Inductive Automation default configuration, it is disabled. This will add security to the device to prevent access from outside the network.
SSH Interface to the Router

If you load the Inductive Automation default configuration, SSH is used in preference to Telnet. To SSH into the router, use Putty or some other SSH Client. See Ethernet section for IP and login credentials. The SSH Port number to use is 2332 by default. The following is the SSH setup page in ACEManager:
Configuring SMS
In order to send SMS it must be enabled. Go to the Services – SMS tab. The following changes are made:

- SMS Send Enabled is Enabled
- Non-Trusted Read Security is Allow Access
- Non-Trusted Write Security is Allow Access

There are other security features you may wish to utilize here, such as Trusted Phone numbers.
Port Filtering and Outbound Ports
To prevent outbound http and https traffic over the air from the Raven XE, I have utilized Port Filtering. Under Security – Port Filtering Outbound, enter ports 80 and 443 to be blocked.
Trusted Inbound/Outbound IP Address
Using the ACEManager, you can set certain Static IP addresses as trusted for both Inbound and outbound traffic for the router. If this router will be put inside a network, this option should be looked at.

Per the manual, Trusted IPs Inbound restrict access to the router and all LAN connected devices. You would use the Public IP Address that someone would be accessing the Raven XE over the air.

Per the manual, Trusted IPs Outbound restrict access to external networks to IPs in the list.

Reboot the Raven XE
At this point in the setup, you should reboot the Raven XE.

Using the Raven and Additional Information

Sending & Receiving SMS Messages
To send SMS messages, login to the Raven XE via SSH. The following are basic commands to send the message:

```
at*smsm2m="1XXXXXXXXXX This is SMS test message."
```
To send a test message to itself:

```plaintext
at*phonehome=1XXXXXXXXXX
```

1XXXXXXXXXX is the number for the Raven XE.

To see if the Raven XE is receiving text messages, send one to it. Then from the ACEManager, go to Services – SMS – SMS Security. There are 2 fields called Last Incoming Phone Number and Last Incoming Message you can see if it came in. Press **Refresh** if you do not see it immediately.

**Over The Air Access**

To utilize Over the Air access, you must have a data plan. If you do not, you will not be able to access the ACEManager remotely over the air; additionally, you will not be able to access the internet utilizing the Raven XE. From a security point of view, this is a good thing. If the Raven XE is only to be used as an SMS gateway, simply get a SIM card with Text and Minutes only. Inductive Automation tested with a T-Mobile SIM card with only text and minutes; we were unable to access the ACEManager over the air and when the Raven XE was acting as the Primary Gateway, we were unable to get http traffic out.

**Troubleshooting Notes:**

1. To reset your device back to factory defaults, you must hold down the reset button between 45 and 60 seconds. At that point you will see the lights flash from left-to-right and right-to-left. Do not be fooled by the flashing lights after 5 seconds of holding down the reset button. It is a flashing pattern of lights, left-to-right.

2. If you are putting the Raven XE on your network and you discover certain computers on your network start behaving incorrectly (intermittent connection drops, packet routing problems to name a couple), this is because the Raven XE is also a router and it is attempting to act as such. What is happening is that it is conflicting with the primary router you already have on the network. To solve this problem, go in your ACEManager under LAN – Host Port Routing Tab and disable the Primary Gateway.