PENTAIR

ACUPORT™
COMMUNICATION CONTROLLER

INSTALLATION AND USER'S GUIDE

IMPORTANT SAFETY INSTRUCTIONS
READ AND FOLLOW ALL INSTRUCTIONS
SAVE THESE INSTRUCTIONS

Table of Contents

Safety

PLEASE READ THIS USERS MANUAL
completely before installing or operating the equipment.

Be sure to observe the following safety precautions:

- Never service the Acu-Trol controller or AcuPort device with power applied. Always turn OFF the main circuit breaker to the units and all equipment when servicing.

- Be careful not to damage the control wires or the power cord insulation. Should these become damaged, contact your dealer for a replacement. Continued use may result in fire or electric shock.

- To reduce the risk of electric shock, do not use an extension cord to connect the AcuPort power adapter to the electrical source, provide a properly located GFCI receptacle.

SAVE THIS INSTRUCTION GUIDE

Warranty

Acu-Trol, Inc. warrants the AcuPort to be free from defects in manufacturing and workmanship for a period of thirty (30) days from the date of manufacture for the electronic module. Other equipment is covered by manufacturer's own warranty. During the warranty period, any defective parts will be repaired or replaced as necessary by Pentair Acu-Trol, LLC.

This warranty does not cover: (a) the buyers' labor or any servicing fees related to replacement of the Product; (b) damage resulting from the use of this Product in other than its normal manner; (c) damage from misuse, accident or neglect; (d) damage from improper testing, operation, or installation; (e) not operating the Product under conditions other than those recommended or at voltages other than the voltage indicated on the Product; and (f) acts of Mother Nature (i.e. lightning, electrical storms, floods, etc.). In addition, attempting to service or modify the Product will render this warranty void. Defective parts should be returned immediately to the local Pentair Acu-Trol dealer, any parts returned to the factory require a return of material authorization code to subsequently generate an RMA (Return Material Authorization form). A Pentair Acu-Trol Technician will analyze the returned part and determine the cause of failure and process accordingly.

A WARRANTY CARD MUST BE COMPLETED AND RETURNED AT ONCE TO BE KEPT ON FILE

AcuPort Specifications

- Power Source — 120 VAC, 60 Hz, 10 watts maximum, North American standard outlet. Contact the factory for 220V/60Hz and International Voltages.
- Safety Approval — Fiberglass Enclosure Rating: UL/cUL Listed, Type 4x, CSA IP66
Serial Device Server: UL/cUL Listed, CE, FCC Class A
- Dimensions — 6.5" x 6.5" x 4.5" (165mm x 165mm x 114mm)
- Weight — 2.8 lbs (1.28kg)
- Operating Environment — 32°F to 118°F (0°C to +48°C)
5 to 95% RH non-condensing
Shaded from direct sunlight
- Serial Port — RS-232, DB9 Male (to Acu-Trol Programmable Controller)
57600 baud, 8 data bits, No parity, 1 Stop bit, No flow control

Network Configurations Available

Model 1000, Serial RS-232 to Ethernet

- Ethernet Port — 10/100 Mbps, RJ45, 802.3 with built-in 1.5kV magnetic isolation
Connection through weatherproof bulkhead RJ45 receptacle.

Model 1100, Serial RS-232 to WiFi or Ethernet

- Ethernet Port — 10/100 Mbps, RJ45, 802.3 with built-in 1.5kV magnetic isolation
Connection through weatherproof bulkhead RJ45 receptacle.
- WiFi Port — 802.11 a/b/g, DSSS/OFDM modulation
Network Modes: Infrastructure, Ad-Hoc
Optional remote antenna with 6 foot long cable provides range up to 100 meters
Wireless Security: WEP 64-bit/128-bit data encryption, WPA, WPA2, 802.11i

Model 500, Serial RS-232 to RS-422/485

- RS-422/485 Port — RS-422 or RS-485 2/4-wire with RTS/CTS support.
Connections: Terminal block through weatherproof strain-relief.

Introduction

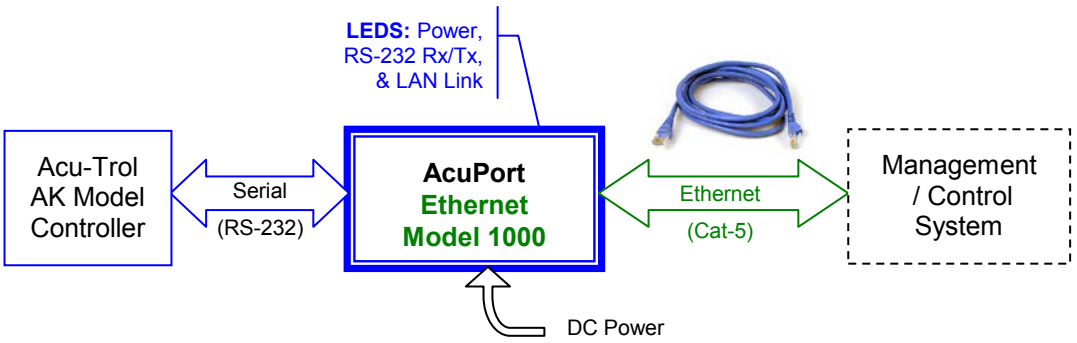
The AcuPort is a general-purpose connectivity solution to provide communication with an Acu-Trol controller via an Ethernet, WiFi, or RS-422/485 connection. It serves to extend the reach of the controller's standard RS-232 serial communication interface beyond the inherent limit of 50 feet (15 meters). An RS-422/485 interface can reach as far as 4,000 feet (1,220 meters). Ethernet can extend without limitation, including connection to the internet.

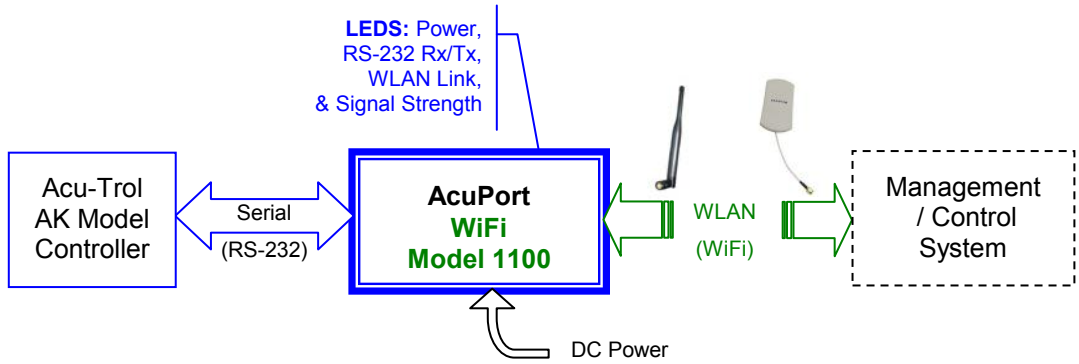
Navigating firewalls and TCP/IP port settings requires extensive expertise that must be provided by the network administrator or IT professional at the installation site. Pentair Acu-Trol, the manufacturer, will provide technical assistance for setting up a connection with a LAN (local area network) only if the network administrator is present. Due to the technical complexity of internet security, the manufacturer does not offer assistance for connections through a firewall.

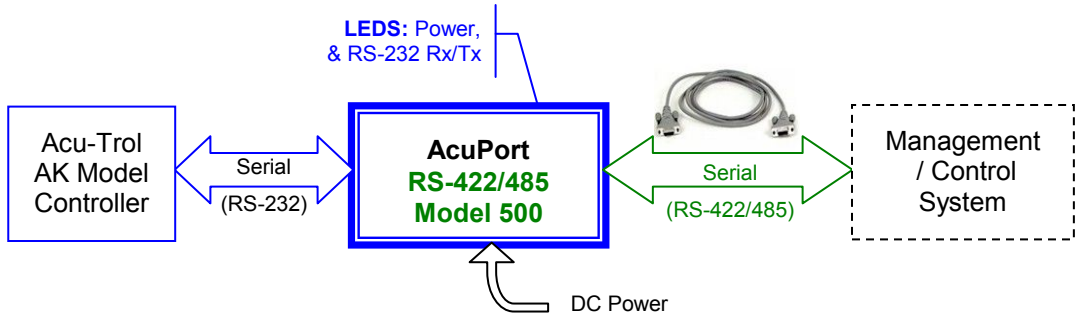
Each AcuPort is dedicated to communicating with a single controller; specifically commercial products such as the Acu-Trol AK110, AK400, and AK600. Mounted in its own enclosure, the AcuPort interfaces the RS-232 serial communication port with an alternate industrial standard communications port such as Ethernet or RS-422/485. The latest version of AcuCom (08) Windows™ software application offers

new connection features that allow direct connection to a TCP/IP device at a specified Static IP address and TCP port number.

The following block diagrams depict connectivity for the AcuPort series of products.





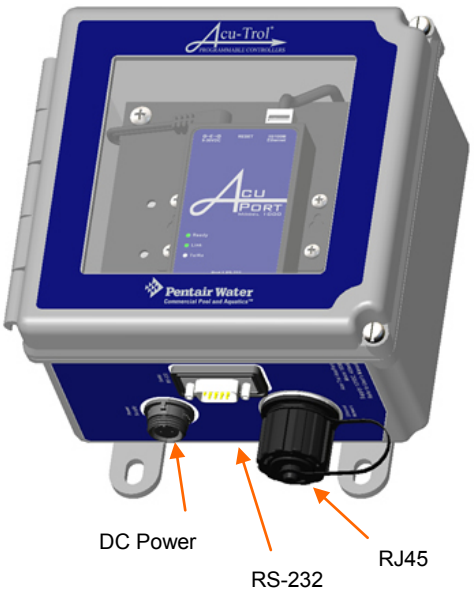


This manual describes the construction and features of the AcuPort product. It serves as a guide for installing the unit and configuring the ports for the desired operation. The following sections provide detail of the enclosure, the serial and network ports, and the power supply requirements.

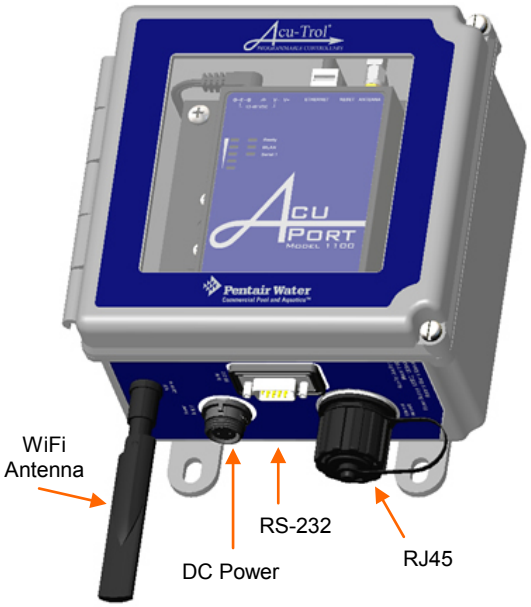
Enclosure

The enclosure is rated NEMA 4X, UL 508A Type 4, 4X, 12, and 13 with an ingress rating (IEC 60529) of IP66 which provides for total protection against dust and strong jets of water. Connectors are UL recognized and meet or exceed the same ingress rating to maintain the integrity of the enclosure. The front cover is not lockable; however, screws provide tamper-resistant access.

CAUTION: Warranty is void if cover is not securely fastened.
Once installed, the enclosure must remain sealed in order to prevent moisture and corrosive fumes, common in a pump room, from deteriorating the electronic equipment inside.



Model 1000: RS-232 to Ethernet



Model 1100: RS-232 to WiFi

RS-232/Serial Port

All three AcuPort models are designed for connecting Acu-Trol AK-series programmable controllers to other networks via the versatile embedded RS-232 serial port. The six-foot (6') long serial cable is provided with a weatherproof DB9F plug on one end for connection to the RS-232 weatherproof DB9M bulkhead receptacle connector on the AcuPort. The opposite end of the cable must be routed to the AK-series Acu-Trol controller and connected to the RS-232 terminal block inside the unit.

Two RS-232 adapter circuit boards are provided with the AcuPort. One is suited for adapting to the AK110, the other is suited to adapting to the AK600. The AK400 uses the existing screw terminals and does not require an adapter board. Refer to the wiring directions in Section 5.3. Custom cable lengths shall not exceed the 20 ft (6 m) allowed by the standard RS-232 port specifications.

Network Ports

Each AcuPort model serves to connect to one of the following network configurations. Port specifications are listed in section 3.1.

- **Model 1000, Ethernet RJ45**

  This is the standard interconnection module used to hook an Acu-Trol controller to a hard-wired Ethernet network. At the installation site, the network administrator will need to provide assistance to determine the network parameters including the subnet mask, an available IP address and a TCP port number. The gateway address is required if access will be provided through a router. *Although the units can be configured for DHCP (dynamically assigned IP address), the method described in this installation manual are for a static IP address assigned by the network administrator*.

- **Model 1100, WiFi Antenna**

  This is similar to the Model 1000, above, with the addition of the WiFi port allowing 802.11 wireless connectivity to a network. A shared wireless access-point must be provided at the installation site. Configuration parameters include those listed above with the additional requirements of the WLAN address and wireless security settings. Installation of this product requires an experienced IT professional onsite.

- **Model 500, RS-422/485**

  The RS-422/485 network is a long-distance serial interface capable of ranges up to 4000 feet (1220 meters). Many configurations allow for various degrees of signal conditioning to accommodate long cabling and electrically noisy environments. Rather than providing a limited DB9 connector for the RS-422/485 port, a strain-relief cable gland is provided in a ½" hole in the bottom of the unit. A 9-pin terminal block on the module inside the AcuPort allows for custom signal configurations.

NOTICE

The methods described in this installation manual are for static IP address assigned by the network administrator.

INSTALLATION OF THIS PRODUCT REQUIRES AN EXPERIENCED IT PROFESSIONAL ONSITE.

DC power from AC power adapter

Each of these units requires a 12VDC input from a wall-mount power adapter. Power consumption is as follows:

AcuPort Model	12 VDC **
Model 1000, Ethernet	260 mA
Model 1100, WiFi	560 mA
Model 500, RS-422/485	300 mA

** All units accept an input voltage range of 12-48VDC

Each AcuPort is supplied with an AC power adapter. Various styles are available including 115VAC and 230VAC; international wall plugs are also available. The standard configuration is North American, 115VAC/60 Hz. Adapters are modified for the AcuPort by adding a weatherproof 2-pin connector that mates to the NEMA 4X enclosure's bulkhead fitting.

There is no ON|OFF power switch. Power is established by connecting the 2-pin weatherproof connector to the AcuPort and plugging the DC power adapter into an energized wall receptacle.

INSTALLATION

Required Tools and Information

The installation of the AcuPort will require the following tools and supplies:

- Mounting screws for securing AcuPort to the appropriate wall surface
- Slot-head screwdrivers, 1/8" and 1/4"
- Phillips-head screwdriver, #1
- 3/16" hex nut driver (AK600 only) for jack screws on DB9 connector of the RS-232 board
- Cat.5e cable, crossover if connecting direct to a computer, straight-through if connecting to a hub/switch
- RJ45 plug connector crimp tool
- Ethernet network cable tester
- Two ¾" open-end wrenches or similar sized adjustable wrenches for tightening strain-relief and RJ45 plug
- Paper Clip to reset the module
- Small cable zip tie

The following network information will be required from the IT administrator:

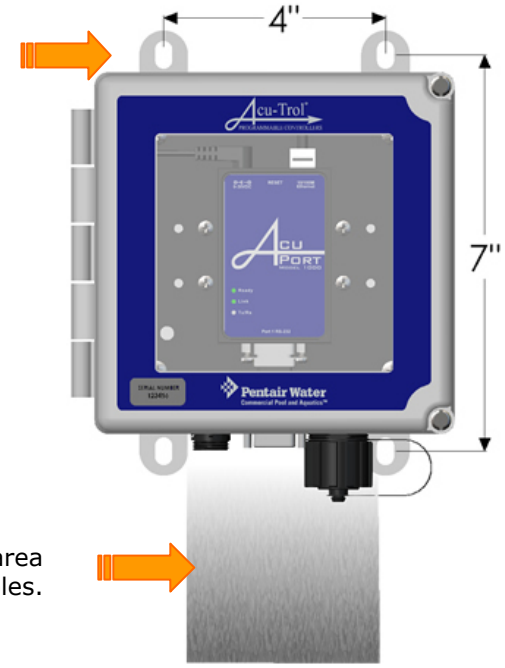
- Ethernet MAC address of AcuPort device (see label inside front hinged cover)
- Ethernet port:
  - Static IP address
  - Network Mask
  - Gateway address (if communicating beyond the local network or through firewall)
- Model 1100 only, WiFi port:
  - WiFi Static IP address
  - WiFi Network Mask
  - WiFi Gateway address (if communicating beyond the local network or through firewall)
  - SSID
  - Network Type, Infrastructure or Ad-hoc
  - Authentication and encryption security settings

AcuPort dimensions and mounting

The AcuPort requires a mounting area of 6.5" x 6.5", with a 6" area below the unit reserved for routing cables to the environmentally-sealed bulkhead connectors. In order to use the provided serial cable, locate the AcuPort within five (5) feet of the Acu-Trol controller.

(4) Mounting tabs

Four (4) mounting screws should be used to mount the device at the desired location as indicated in the figure to the right.

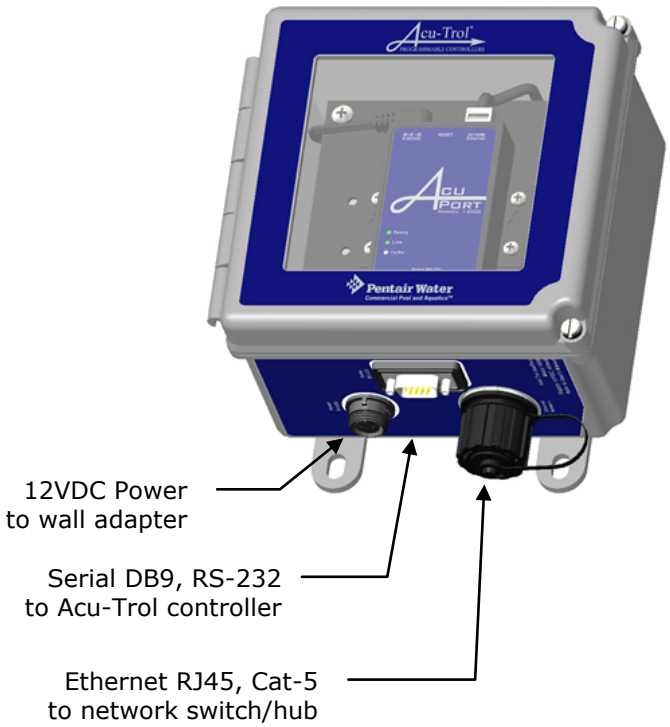


Reserve 6" area below for cables.

Cable installation

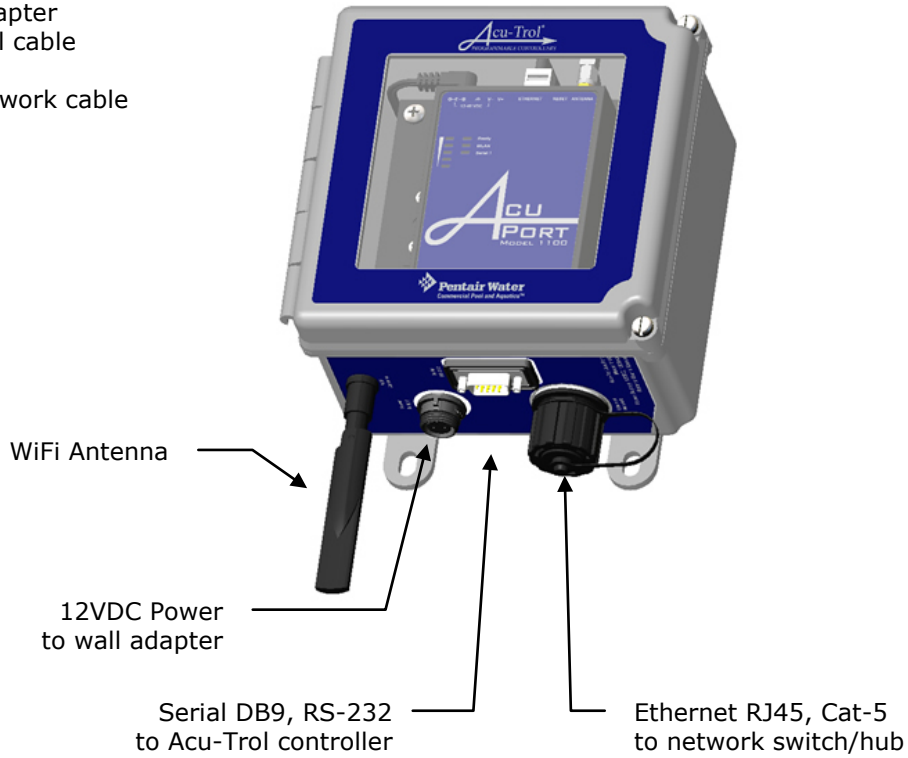
The AcuPort 1000 requires:

- 12V DC power adapter
- DB9 RS-232 serial cable
- RJ-45 Cat-5 network cable



The AcuPort 1100 requires:

- 12V DC power adapter
- DB9 RS-232 serial cable
- Choice of either:
  - RJ-45 Cat-5 network cable
  - WiFi Antenna



Steps **A** through **E** that follow, outline the procedure of installing these cables on the AcuPort, the Acu-Trol controller, and the network.

A. Connect the RS-232 cable to the Acu-Trol controller's serial port.

Follow the appropriate instructions below with regard to the model of controller to which the AcuPort is being connected.

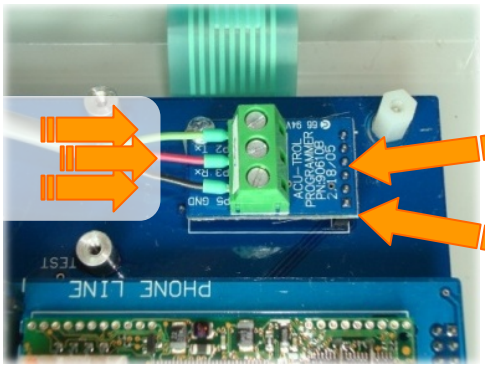
AK110 Controller

First, turn the controller power switch off and remove the power source to the AK110 by unplugging the power cord or turning off the supply circuit breaker. Open the AK110 by removing the two upper screws and loosening the two lower screws so that the front cover hinges downward.

Inside the enclosure, locate the terminal block circuit board labeled "Acu-Trol Programmer PN:90610B". If the terminal block circuit board is not already installed in the 6-pin socket labeled "RS-232 MODULE", carefully plug a new assembly (Acu-Trol part number 890610005) into the 6-pin header socket. Ensure that all 6 pins seat securely in the header socket. Fasten the board securely with the supplied 5/16" long, #4-40 screw.

Route the 3-wire end of the RS-232 cable into the AK110 through an unoccupied strain relief. Insert the wire ends into the green terminal strip as follows:

Green wire to Tx
Red wire to Rx
Black wire to GND



6-pin header socket labeled: RS232 MODULE

Assy # 890610005

Tighten the terminal block screws using a 1/8" slot-head screwdriver. Secure the cable inside the AK110 and tighten the cable strain relief. Replace the enclosure front cover and tighten the four (4) front panel screws. Plug in the controller power cord, apply power and turn on the controller power switch.

AK400 Controller

First, turn the controller power switch off and remove the power source to the AK400 by unplugging the power cord or turning off the supply circuit breaker.

Open the AK400 front access panel by removing the two lower-front screws and removing the front cover. Inside the left-side of the enclosure, locate the terminals labeled "Serial DB9".

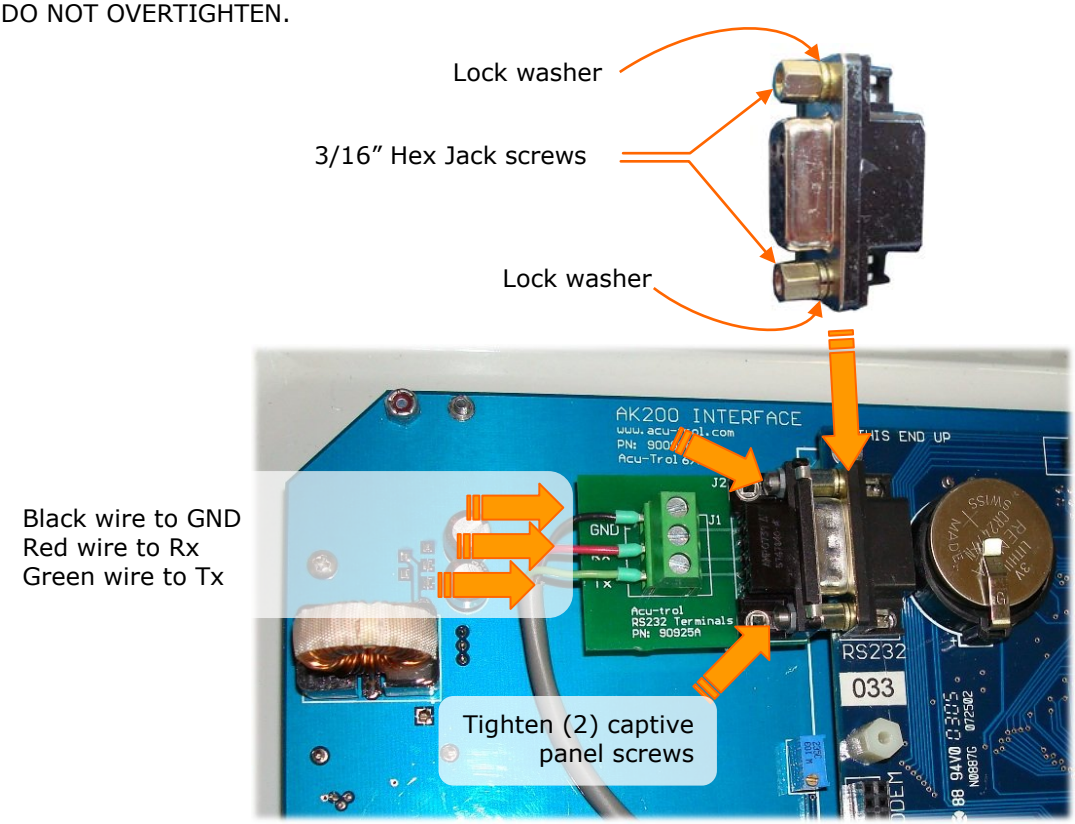
Route the 3-wire end of the RS-232 cable into the AK400 through an unoccupied strain relief. Insert the wire ends into the "Serial DB9" terminals as follows:
Red wire to PC3RXD, Green wire to PC2RXD, Black wire to PC5GND

Tighten the terminal block screws using a 1/8" slot-head screwdriver. Secure the cable inside the unit and tighten the cable strain relief. Replace the enclosure front cover and tighten the two (2) front panel screws. Plug in the controller power cord, apply power and turn on the controller power switch.

AK600 Controller

First, remove power to the controller by unplugging the power cord or turning off the supply circuit breaker. Unlatch and open the controller's hinged front door.

Inside the enclosure, locate the DB9F connector labeled "RS232". Install a lock-washer over the threads of each jack screw. Install two (2) jack screws into the RS232 connector housing as shown in the following diagram; tighten with a 3/16" hex nut driver.
DO NOT OVERTIGHTEN.



Install the RS232 Terminal board labeled "PN: 90925A". Tighten the two (2) captive panel screws into the RS-232 connector jack screws.

Route the 3-wire end of the RS-232 cable into the AK600 through an unoccupied strain relief. Insert the wire ends into the green terminal block as shown above. Tighten the terminal block screws using a 1/8" slot-head screwdriver and attach a tie-wrap to fasten the cable to a nearby standoff.

Secure the cable inside the enclosure and be sure that it will not become pinched in the hinged door. Tighten the strain relief around the cable to ensure an adequate environmental seal. Close and latch the enclosure front cover. Plug in the controller power cord, apply power and turn on the controller power switch.

B. Connect the RS-232 cable to the AcuPort.

Once the above procedure is complete, attach the DB9M weatherproof connector to the bottom of the AcuPort enclosure at the connector labeled "Serial RS-232". Tighten the screws sufficiently to slightly compress the rubber seal ring.

C. Connect a Cat-5e network cable to the AcuPort 1000.

A Cat-5e network cable must be provided by the customer and routed from a nearby network hub or switch. Before assembling the RJ45 plug onto the end of the network cable which connects to the AcuPort, first refer to the assembly instructions in Appendix A for the *Conec* brand, sealed Ethernet RJ45 connector system.

IMPORTANT

It is essential to install this sealed housing over the cable before crimping the RJ45 plug. Refer to Acu-Trol p/n 734-000-110, Conec p/n 17-10001

NOTE

If the AcuPort is to be connected directly to a computer without routing through a hub or switch, the Ethernet cable must be prepared as a crossover cable.

Insert the Cat-5e cable end through the plastic waterproof plug housing assembly. Prepare the individual wires, and crimp the modular RJ45 plug in place. To ensure a reliable long-life seal, be sure to tighten the strain relief (cable fitting) such that the rubber seal seats well against the cable jacket to prevent moisture and corrosive fumes from entering the connector.

Test the new cable with an appropriate network cable tester. If the cable test passes, attach the sealed RJ45 plug to the bulkhead connector labeled "Ethernet Network". Align the plug and insert it into the receptacle housing. Secure with a short clockwise twist until it clicks in place.

If the network cable is disconnected for any length of time, install the protective cap over the receptacle to prevent corrosion of the connector.

D. Connect a Cat-5e network cable to the AcuPort 1100.

Whether or not the AcuPort is to be used with the antenna in a WiFi application, the initial configuration of the AcuPort 1100 must be performed using the hard-wired Ethernet network connection.

Follow the instructions above in section C if the AcuPort is to be hard-wired to a LAN (local area network). If the AcuPort 1100 is to be installed in a WiFi network, the AcuPort must first be connected to a computer to configure the network settings as described in section 6.2 and 6.4. A standard Ethernet Cat.5e patch cable may be used for this purpose.

Note: If connecting directly to a computer without being routed through a hub or switch, the Ethernet patch cable must be a crossover cable.

Subsequent to the setup procedure, the Cat.5e cable may be removed and the unit rebooted to switch over to the antenna WiFi connection.

IMPORTANT FOR WiFi APPLICATIONS

The AcuPort 1100 will use the Ethernet RJ45 port if the Cat5 cable is plugged in during boot-up. To use the WiFi port, disconnect the RJ45 Cat5 cable and reboot the device by disconnecting the power supply for five seconds and reapplying power.

E. Connect the 12VDC power adapter.

The Class II power adapter provides 12 VDC output power for the AcuPort device. Each AcuPort model uses a unique module and power supply with its own power ratings. Refer to section 4.4 for further details.

The wall power adapter is rated only for an indoor installation. If the GFCI electrical outlet is located outdoors or in a wet location, use a suitable weatherproof while-in-use receptacle cover, compliant with NEC 406.8(B), such as the Acu-Trol p/n 735-000-310 (for model 1000) or p/n 735-000-320 (for model 1100).

DANGER

To reduce the risk of electrical shock, do not connect this unit to an extension cord.

Provide a properly located receptacle rated for the existing environmental conditions.

Connect the 2-pin circular connector to the AcuPort bulkhead connector labeled "Power Supply". Tighten the outer ring sufficiently to ensure a watertight and reliable seal.

Plug the power adapter into a wall outlet. The AcuPort module's "Ready" light will briefly illuminate red for one second, will flash off, and then will turn green. This indicates proper power to the device. The "Link" light will illuminate green if the network is found. The "TxRx" or "Serial 1" light will only illuminate once a serial communication to the AK controller is established.

Proceed with the following steps to configure the AcuPort module for your application. Both the serial port and the network port require special configuration before a reliable connection can be established.

Software

The Acu-Trol RS-422/485 AcuPort 500 product requires only hardware jumper configurations and has no software application associated with its setup. It is compatible with all prior versions of the AcuCom program. Please proceed to the next chapter if installing the AcuPort 500.

Ethernet products such as the AcuPort 1000 and 1100 require settings to be programmed in order to function on a network. To use the Ethernet or WiFi products, install AcuCom version '08. Previous versions are not compatible with the AcuPort. In addition, install the AcuPort Configuration Utility program.

The following procedure outlines the steps required to install the necessary programs.

Install the AcuPort Configuration Utility

Load the AcuPort CD into the computer CD/DVD drive. If the drive's auto-run feature is enabled, it will begin the installation process automatically. Otherwise, open *My Computer*, browse to the CD drive, and double-click on the *Setup.exe* file. This will install the AcuPort configuration utility to the local drive. The AcuPort application software will now be accessible by clicking on the "AcuPort" icon within the Pentair Acu-Trol folder on the Windows™ *Start* menu.

The installation program installs Microsoft .NET Framework 2.0 which is compatible with Windows 95, 98, ME, and XP.

System Requirements:

- **Supported Operating Systems:** Windows 2000 Service Pack 3; Windows 98; Windows 98 Second Edition; Windows ME; Windows Server 2003; Windows Vista Business; Windows Vista Business 64-bit edition; Windows Vista Enterprise; Windows Vista Enterprise 64-bit edition; Windows Vista Home Basic; Windows Vista Home Basic 64-bit edition; Windows Vista Home Premium; Windows Vista Home Premium 64-bit edition; Windows Vista Starter; Windows Vista Ultimate; Windows Vista Ultimate 64-bit edition; Windows XP Service Pack 2

- **Required Software:**
  Windows Installer 3.0 (except for Windows 98/ME, which require Windows Installer 2.0 or later).
  Windows Installer 3.1 or later is recommended.
  Microsoft Internet Explorer 5.01 or later for all installations of the .NET Framework.

- **Disk Space Requirements:** 280 MB (x86), 610 MB (x64)

Important: Make sure Windows is up to date with the latest service pack and critical updates. To find recent security updates, visit Windows Update.

Important: If previous pre-release versions of .NET Framework v2.0 are installed such as Beta 1, Beta 2 or Community Technical Preview (CTP) builds, uninstall these versions via the Add/Remove Programs feature in the Control Panel before installing this final release version.

WINDOWS VISTA USERS

The AcuPort Configuration Utility requires the use of the Telnet application. Windows Vista™ computers require Telnet to be installed or enabled. To enable this application, click the Start button, click Control Panel, select Programs, and then click Turn Windows Features On or Off. If prompted for an administrator password or confirmation, type the password or provide confirmation. In the Windows Features dialog box, select the Telnet Client check box. Click OK. The installation may take several minutes.

Configure the AcuPort 1000 Network IP Address

Run the AcuPort Configuration Utility program from the Start-Menu as described above. This product shall be configured with a dedicated static IP address. Once the network administrator has provided an IP address, it must be programmed into the AcuPort module.

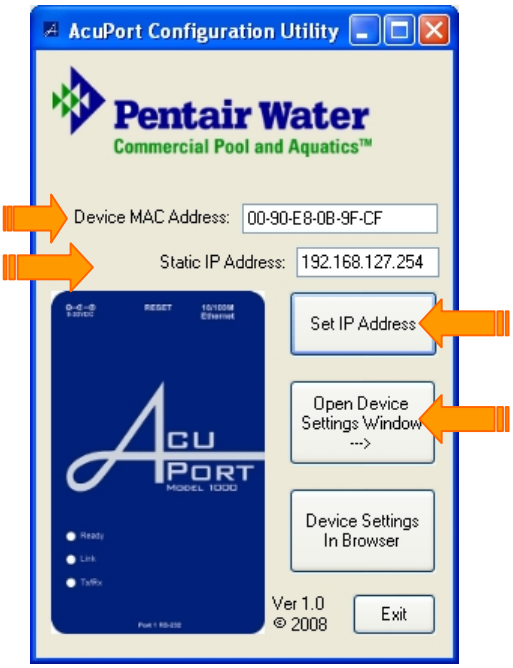
For instructions to configure the AcuPort 1100, skip ahead to section 6.4.

The first step is to enter the device's hardware MAC Address. This is a hexadecimal (0-9, A-F) address assigned by the manufacturer to each device. It is a unique identifier used to locate the device on a network. This number is written on a label inside the AcuPort. Note the MAC address is entered with dashes "-" between each numeric pair.

Next, enter the static IP Address assigned by the network administrator. This also is a unique number, but must match specific codes for the computer network system. Note, the IP address is entered with dots "." between the numbers.

Ensure the AcuPort device is powered-up and shows lights for both the **Ready** and **Link** LEDs.

Click the ***Set IP Address*** button. This will prompt for resetting the device, a necessary step before re-programming the IP Address.



Open the Acu-Port front panel and locate the RESET button on the top of the Acu-Port Ethernet device inside. Use a narrow tool (such as a straightened paper clip) to press and hold down the RESET button. The "Ready" LED will blink for five (5) seconds. When the all the LEDs turn off and cease to blink, release the RESET button.

Once the RESET button has been released, the "Ready" LED will turn on to indicate factory defaults have been restored and the device is ready to be assigned an IP address. Click the OK button to program the assigned IP address, or the CANCEL button to abort the procedure.

Within the Acuport configuration utiltiy, click on the ***Open Device Settings Window*** button.

Note: If, for reasons of screen resolution or other computer variations, the Device Settings Window does not appear clearly, click on the ***Device Settings in Browser*** button. This will provide access to the device settings through the Microsoft Internet Explorer™ web browser.

Configure the AcuPort 1000 Programmable Settings

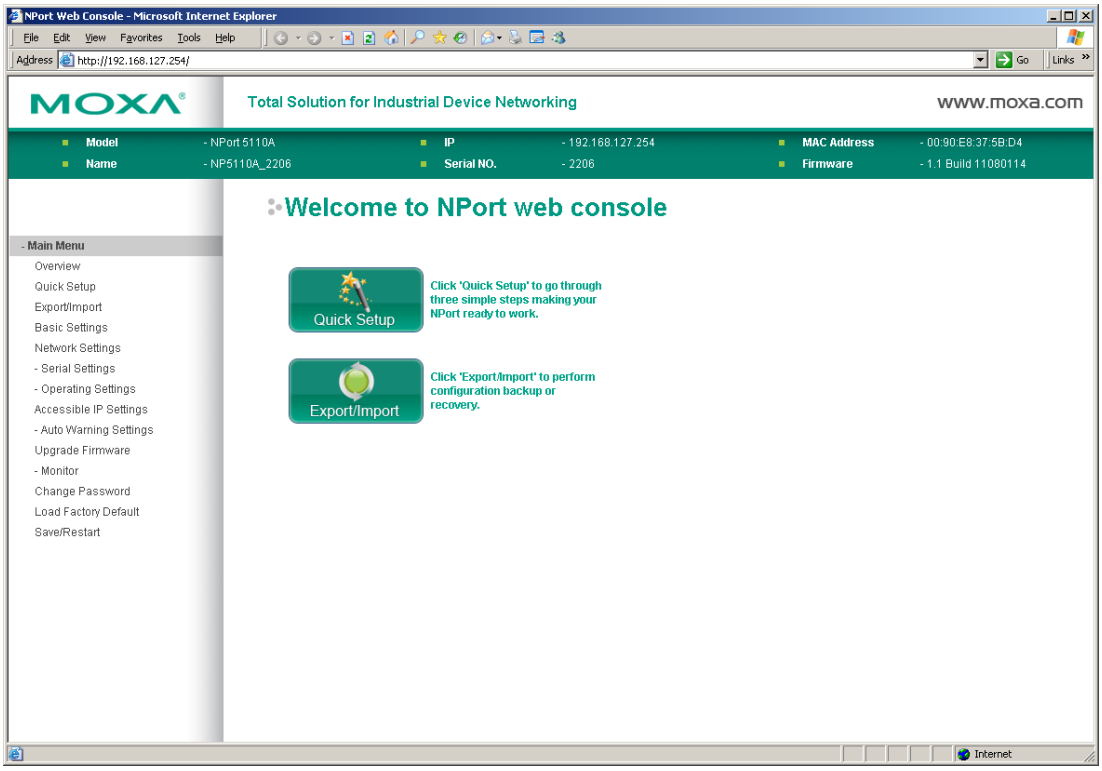
Once the preceding steps have been successfully completed, the Acuport Configuration utility provides access to the device settings through the Microsoft Internet Explorer web browser. The default IP Address for the MOXA device is 192.168.127.254.

Input the password if prompted. The password will be transmitted with MD5 encryption over the Ethernet. Note that you will not be prompted to enter the password if the NPort 5110A is not currently password protected.

Click the Login button.

The NPort 5150A homepage will open next.

Once the procedure has been successfully completed, the NPORT Web Console Configuration utility window displays the "**Welcome to NPort web console**" page for the AcuPort device.



Should the procedure fail to be successfully completed, an error message will appear following a 30-45 second timeout.

If this occurs close the NPort Web Console Configuration utility and repeat the configuration procedure from the beginning, making sure the following steps have been properly executed:

- Enter a valid network **IP address**; if necessary, try a different valid IP address
- Perform a complete **RESET**

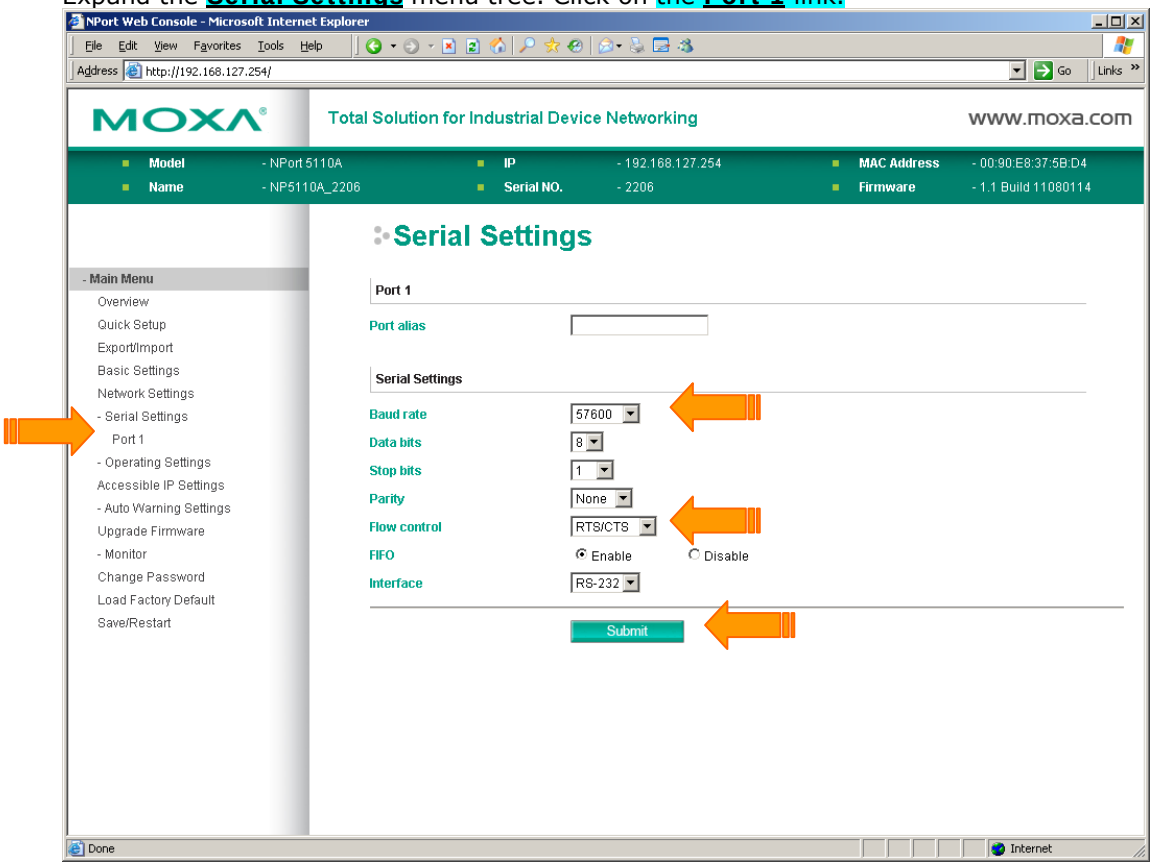
Also, ensure that the network cable is connected and the device ***Link*** LED is lit (orange = 10 Mbps, green =100 Mbps).

If the ***Ready*** LED is red in color, this may indicate an IP conflict.

TROUBLESHOOTING TIP
The AcuPort 1000 device has a factory default static IP address of 192.168.127.254.

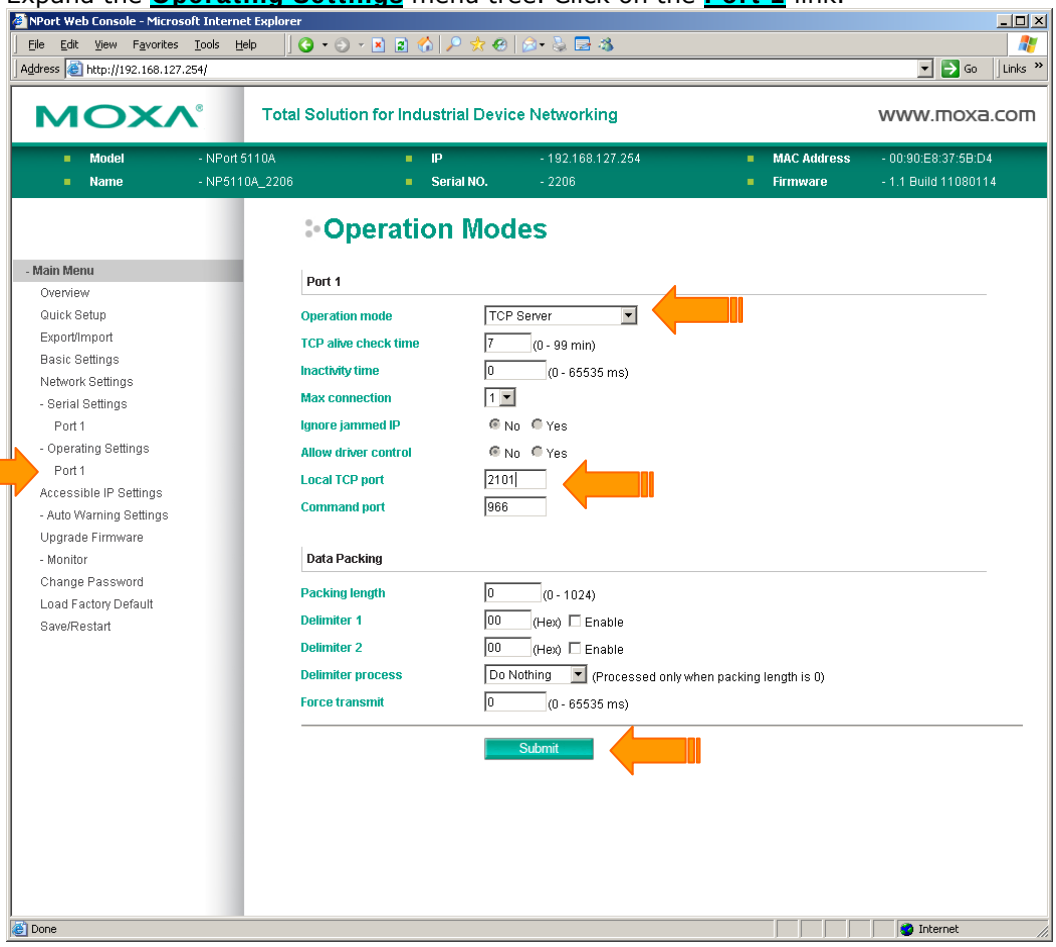
Four (4) special settings will properly configure the AcuPort to work with Acu-Trol controllers. These settings are different than the "factory defaults" and must be reprogrammed once the device has been reset.

Expand the **Serial Settings** menu tree. Click on the **Port 1** link.



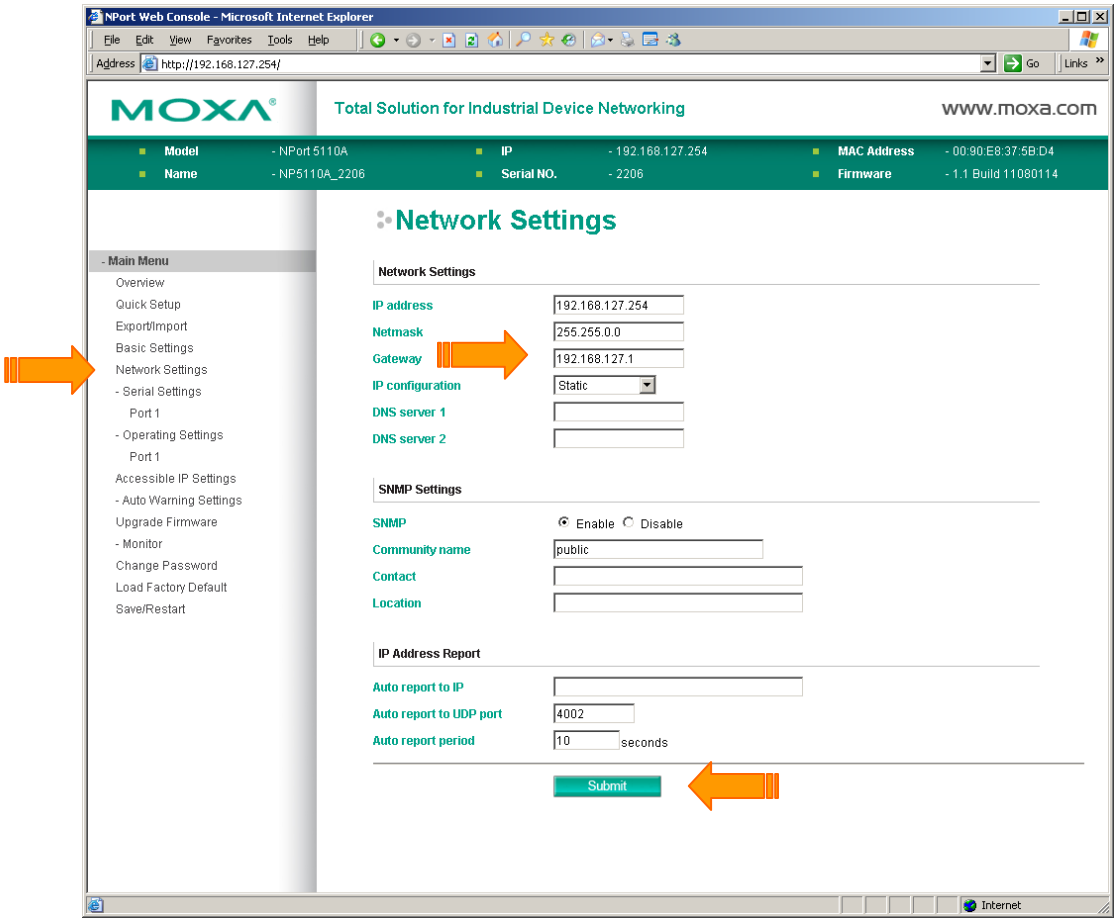
Set the Baud rate to **57600**.
Set the Flow Control to **None**.
Click the **Submit** button.
At the next prompt, click the **Back** or **Home** buttons; do not *Save/Restart* at this time.

Expand the **Operating Settings** menu tree. Click on the **Port 1** link.



Set the Operation Mode to **TCP Server**.
Set the Local TCP Port to **2101** or to that designated by the network administrator.
Click the **Submit** button.
At the next prompt, click the **Back** or **Home** buttons; do not *Save/Restart* at this time.

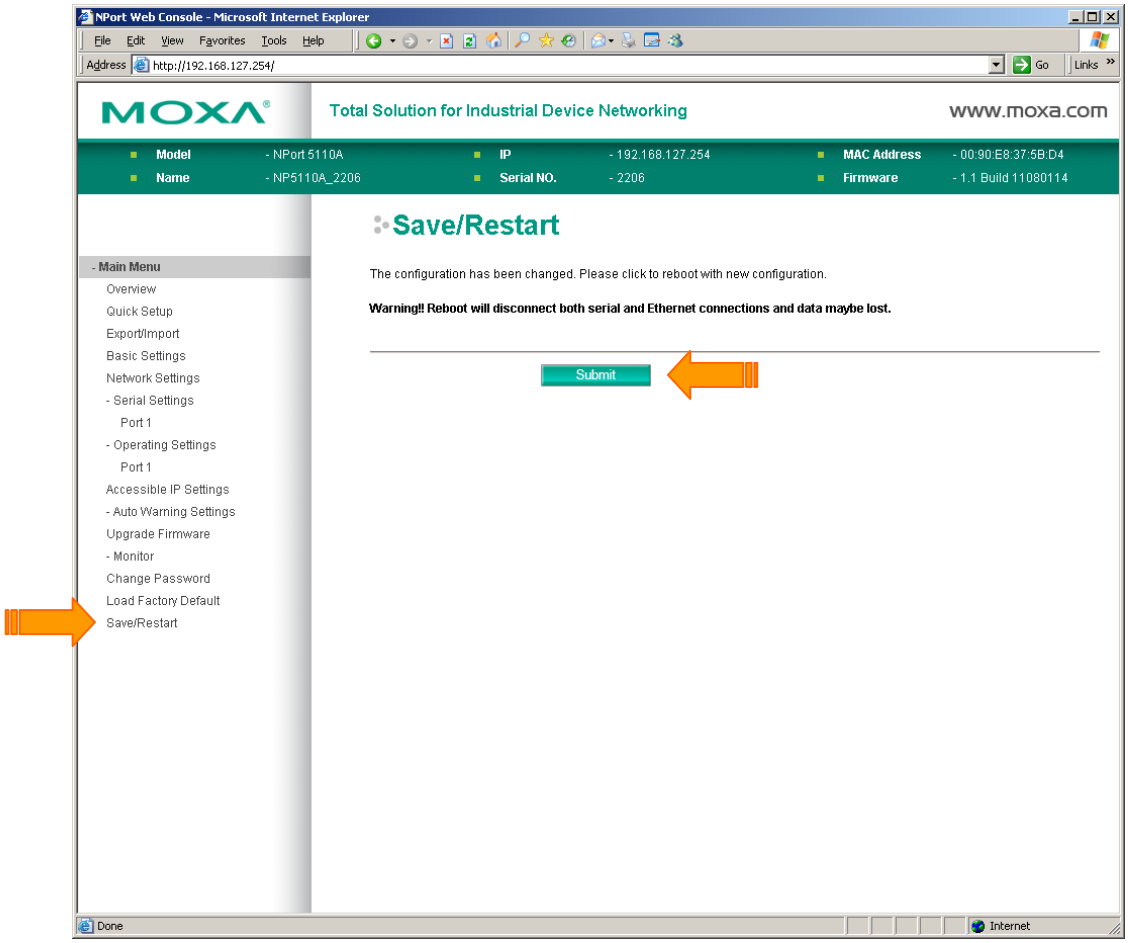
Click the **Network Settings** link.



If the AcuPort will be accessed from outside the local area network, enter the **Gateway** address.
Scroll down to click the **Submit** button.
At the next prompt, click the **Back** or **Home** buttons; do not *Save/Restart* at this time.

Now, re-verify that these settings are correct. Catching mistakes at this point may avert frustration later.

Click on the **Save / Restart** link.



Click the **Submit** button to save the settings and reboot the AcuPort device.

After the device restarts, within a few seconds, click the back button to verify the serial settings and operating settings have been properly retained.

Once satisfied with the configuration settings exit the AcuPort Configuration Utility and proceed with installing the AcuCom08 program.

IMPORTANT NOTE

When using the AcuCom08 software to connect to the Acu-Trol controller, it is necessary to know both the IP Address and the TCP Port number.

All Acu-Trol controllers require the serial port settings to be:
Baud rate = 57600, Data bits = 8, Stop bits = 1, Flow control = none, Parity = none

WARNING

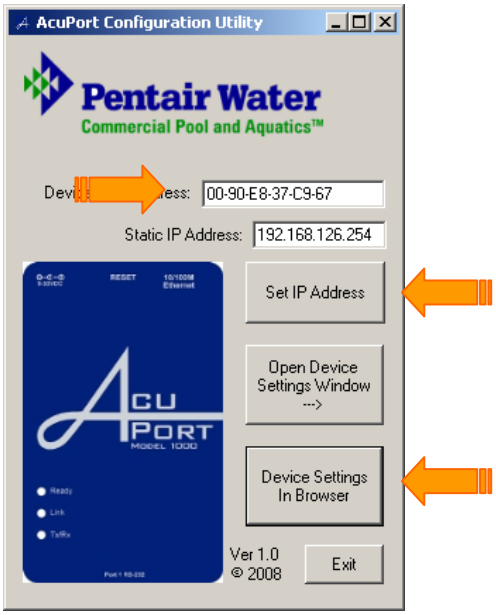
The *Local TCP* port should be chosen carefully. The module defaults to port 4001; however, the proper port should be determined by the IT administrator. Verify the port availability and avoid conflicts with existing devices. Avoid commonly used ports between 0 and 1024. Refer to RFC 1700 or consult www.iana.org for Well Known Ports, Registered Ports, and Dynamic and/or Private Ports.

Configure the AcuPort 1100 Network IP Address

The setup procedure for this product is slightly different than that of the AcuPort 1000 and requires additional wireless network parameters and associated security settings. Be sure to use only the hard-wired Ethernet MAC address and IP address during the first part of this configuration step.

Run the Acuport Configuration Utility program as described in the procedure below. This product shall be configured with a dedicated static IP address. The network administrator must provide two (2) IP addresses, one for the hard-wired Ethernet address and one for the WiFi address. In this first step, program the Ethernet address of the AcuPort module.

Enter the device's Ethernet MAC Address. This is a hexadecimal (0-9, A-F) address assigned by the manufacturer to each device. It is a unique identifier used to locate the device on a network. This number is written on a label inside the AcuPort. Note the MAC address is entered with dashes "-" between each numeric pair.



Next, enter the static Ethernet IP Address assigned by the network administrator. This also is a unique number, but must match specific codes for the computer network system. Note, the IP address is entered with dots "." between the numbers.

Ensure the AcuPort device is wired to the Ethernet port, powered-up, the green **Ready** LED is lit, and the **WLAN** LED is not lit.

Click the ***Set IP Address*** button. This will prompt for resetting the device, a necessary step before re-programming the IP Address.

Open the Acu-Port front panel and locate the RESET button on the top of the Acu-Port Ethernet device inside. Use a narrow tool (such as a straightened paper clip) to press and hold down the RESET button. The "Ready" LED will blink for five (5) seconds. When the "Ready" LED turns red and ceases to blink, release the RESET button.

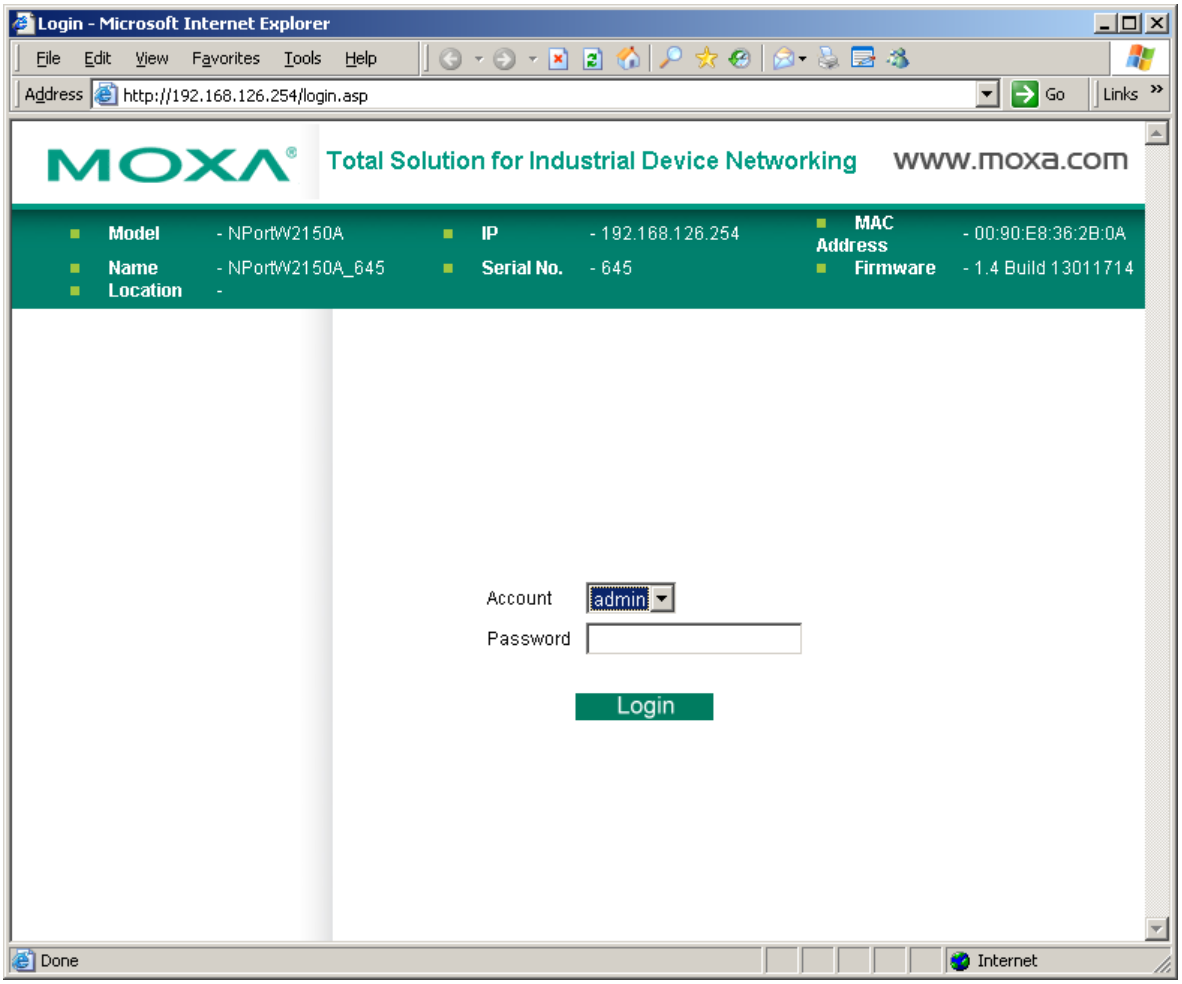
Twelve (12) seconds after the RESET button has been released, the "Ready" LED will turn green to indicate factory defaults have been restored and the device is ready to be assigned an IP address. Click the OK button to program the assigned IP address.

The device will again reboot. After 10-15 seconds the Ready LED will turn from red to green indicating it is back online.

Within the Acuport configuration utility, click the ***Device Settings In Browser*** button. This provides a full view of the Serial Device's web server interface.

Configure the AcuPort 1100 Programmable Settings

Once the preceding steps have been successfully completed, the Acuport Configuration Utility provides access to the device settings through the Microsoft Internet Explorer™ web browser.



Click the Login button.

If the preceding steps failed to complete successfully, an error message will appear following a 30-45 seconds timeout.

Should this occur, close the Acuport Configuration utility and repeat the configuration procedure from the beginning, making sure the following steps have been properly executed:

- Enter a valid network **IP address**; if necessary, try a different valid IP address
- Enter the **Netmask**

- Perform a complete **RESET**

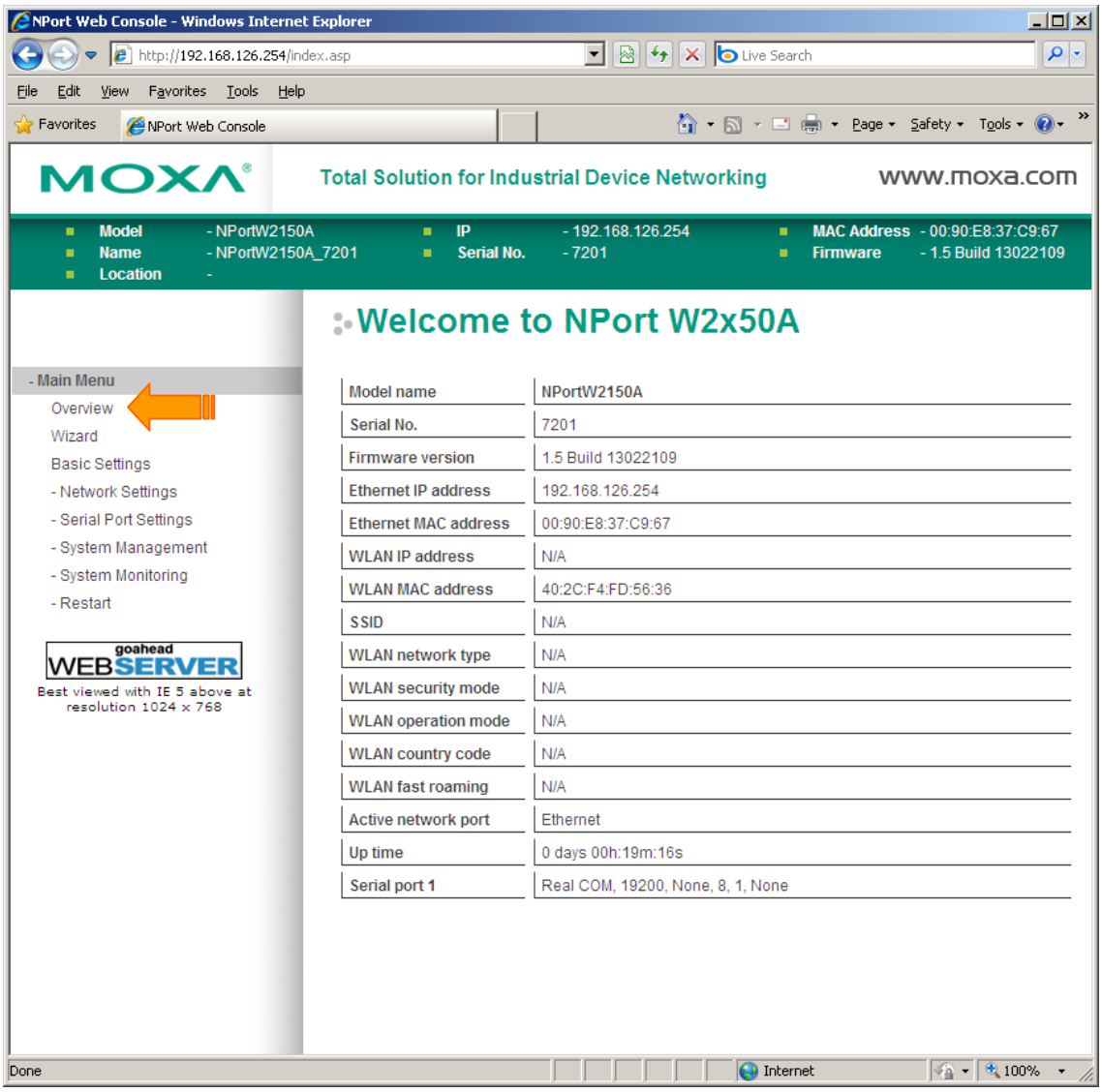
Also, ensure that the network cable is connected and the device's ***Ready*** LED is illuminated green.

If the ***Ready*** LED is red in color, this indicates the module is rebooting. Flashing red may indicate an IP conflict.

TROUBLESHOOTING TIP

The AcuPort 1100 device has a factory default static IP address of 192.168.126.254.

The default configuration settings for the AcuPort 1100 are displayed on the **Overview** screen.

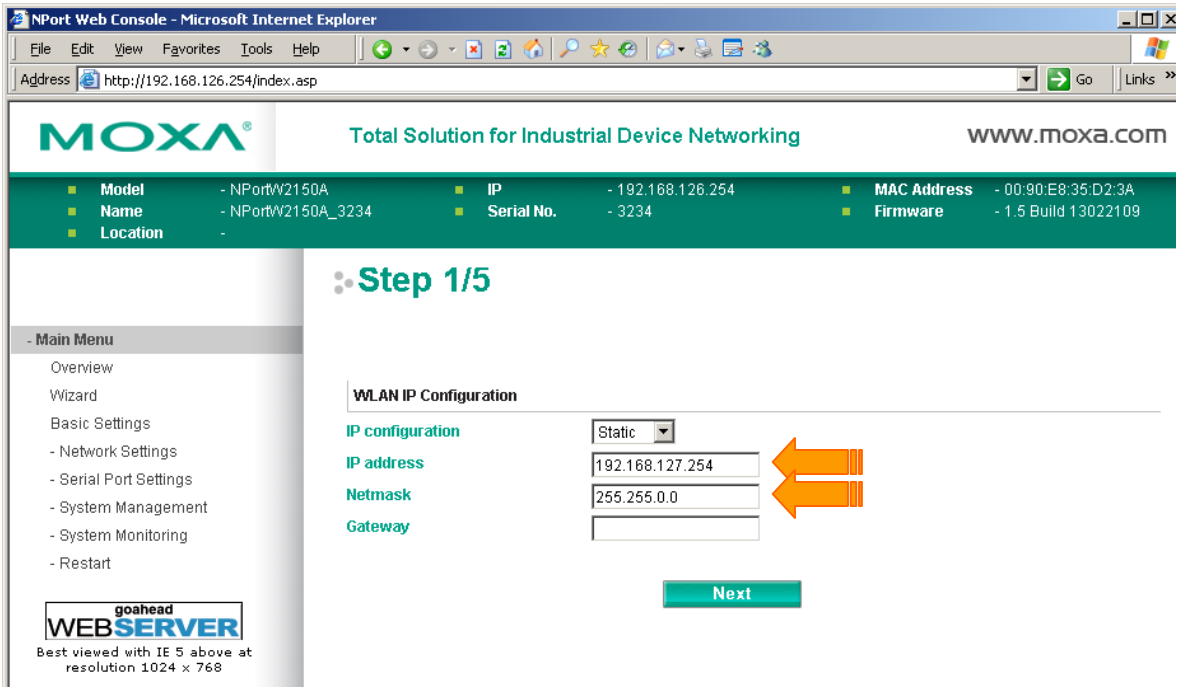


These special settings will properly configure the AcuPort to work with Acu-Trol controllers and the network. They are different than the "factory defaults" and must be reprogrammed once the device has been reset.

On the next screen, select the **Wizard** button which will then guide you through the rest of the setup procedure.

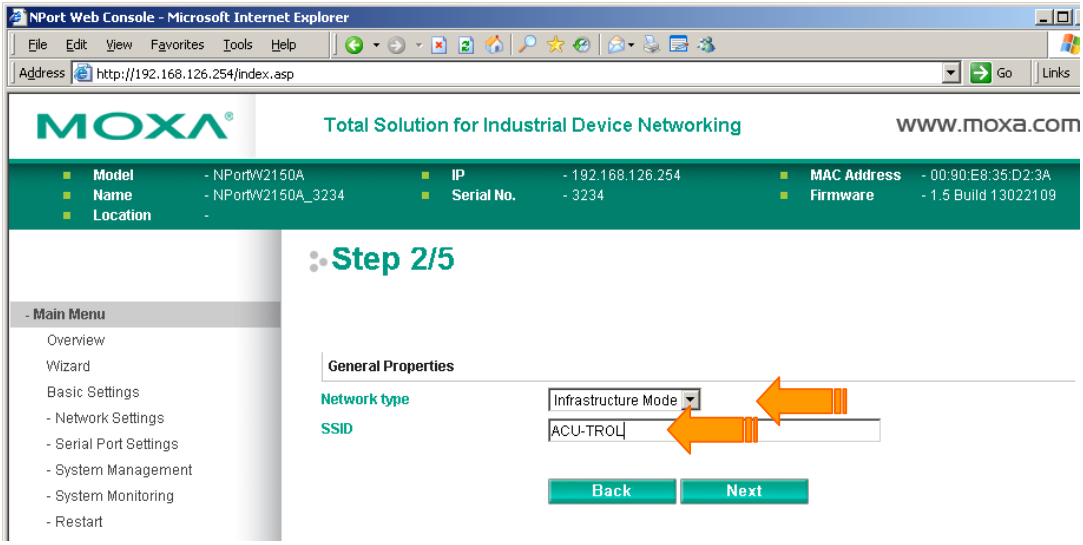
Next, enter the static Ethernet IP Address assigned by the network administrator. This also is a unique number, but must match specific codes for the computer network system. Note, the IP address is entered with dots "." between the numbers.

Set the **IP Address**, **Netmask**, and **Gateway** parameters as assigned by the IT Administrator. The Gateway address is necessary if access is allowed outside the local area network.



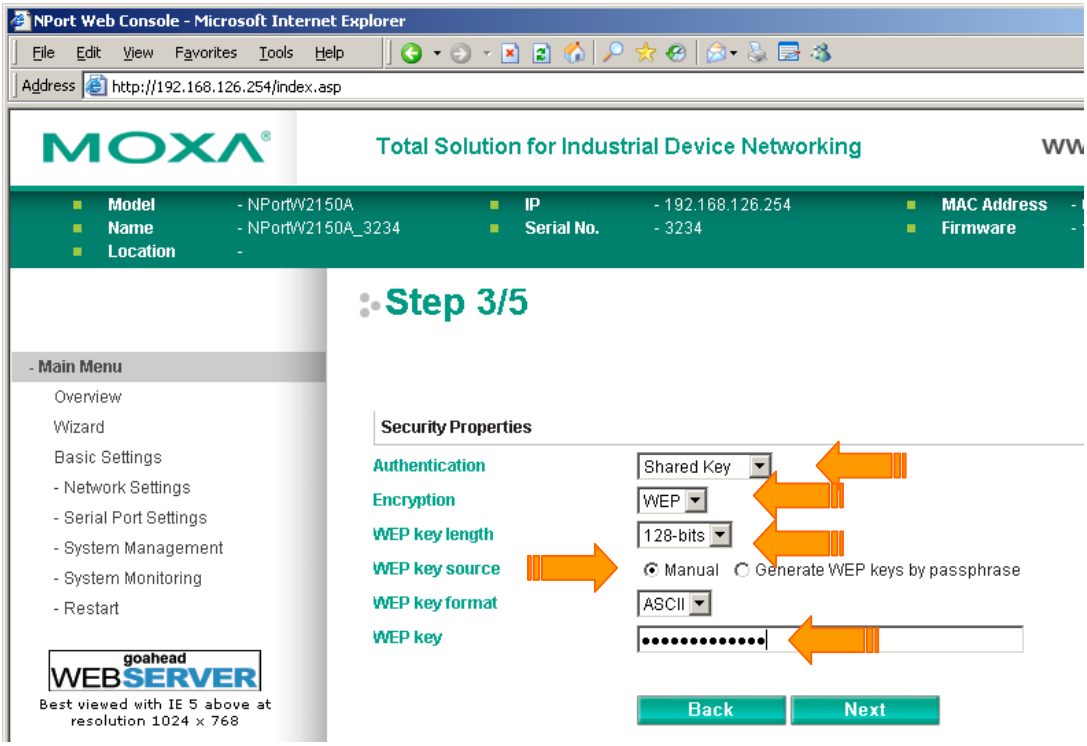
Select the **Next** button.

Set the **Network Type** item to **Infrastructure Mode.** Enter the WiFi network's name in the **SSID** field.



Click the **Next** button.

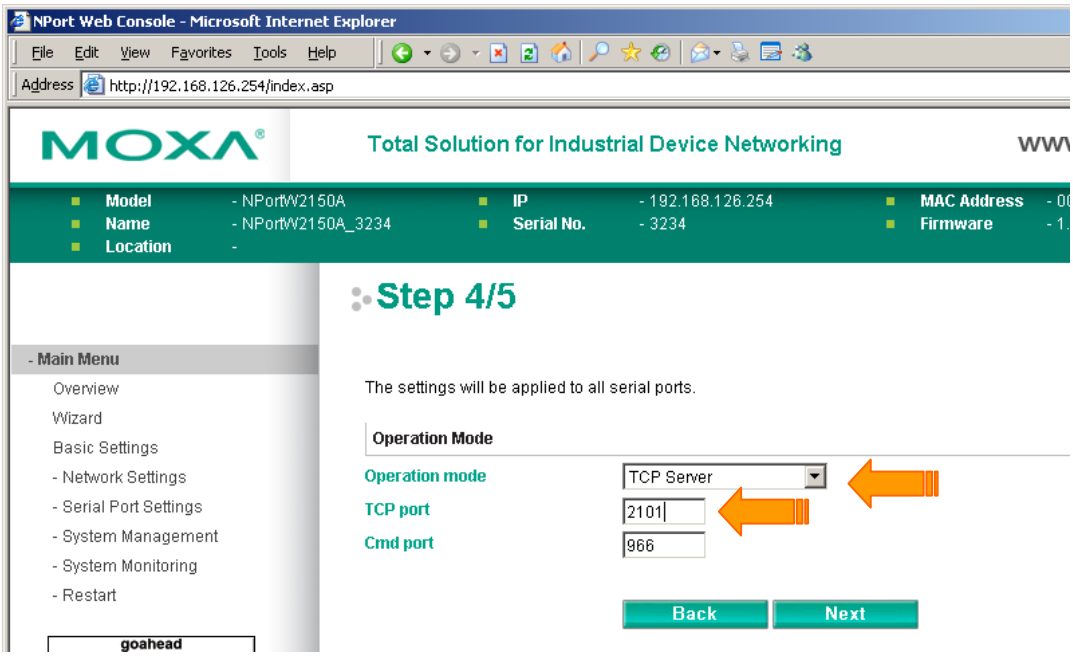
Select the **Authentication** type. Depending on the selection, the Encryption menu will change to offer appropriate choices. Select and enter the appropriate encryption information.



Click the **Next** button.

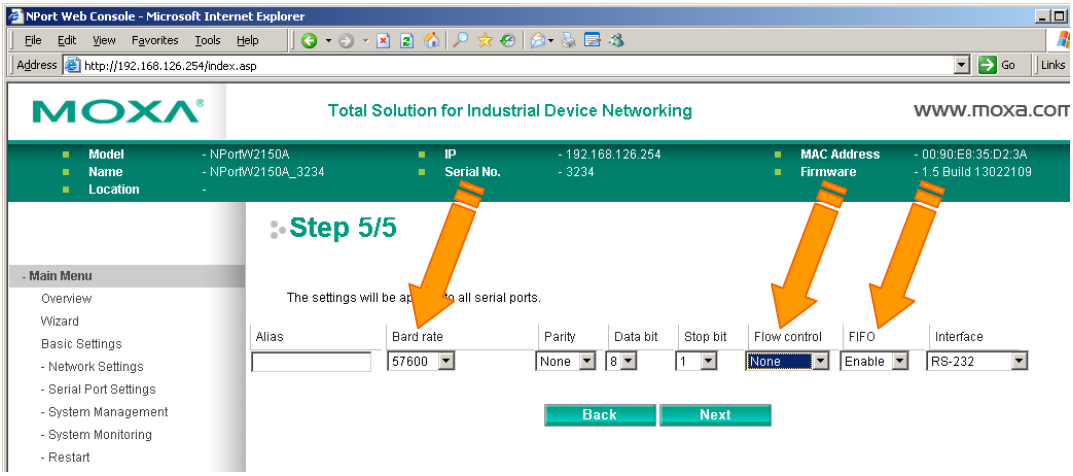
Select the **Operation Mode** pull-down menu to select **TCP Server**.
Set the TCP Port to **2101** or to that designated by the network administrator

Operation mode: **TCP Server**
TCP port: **2101**



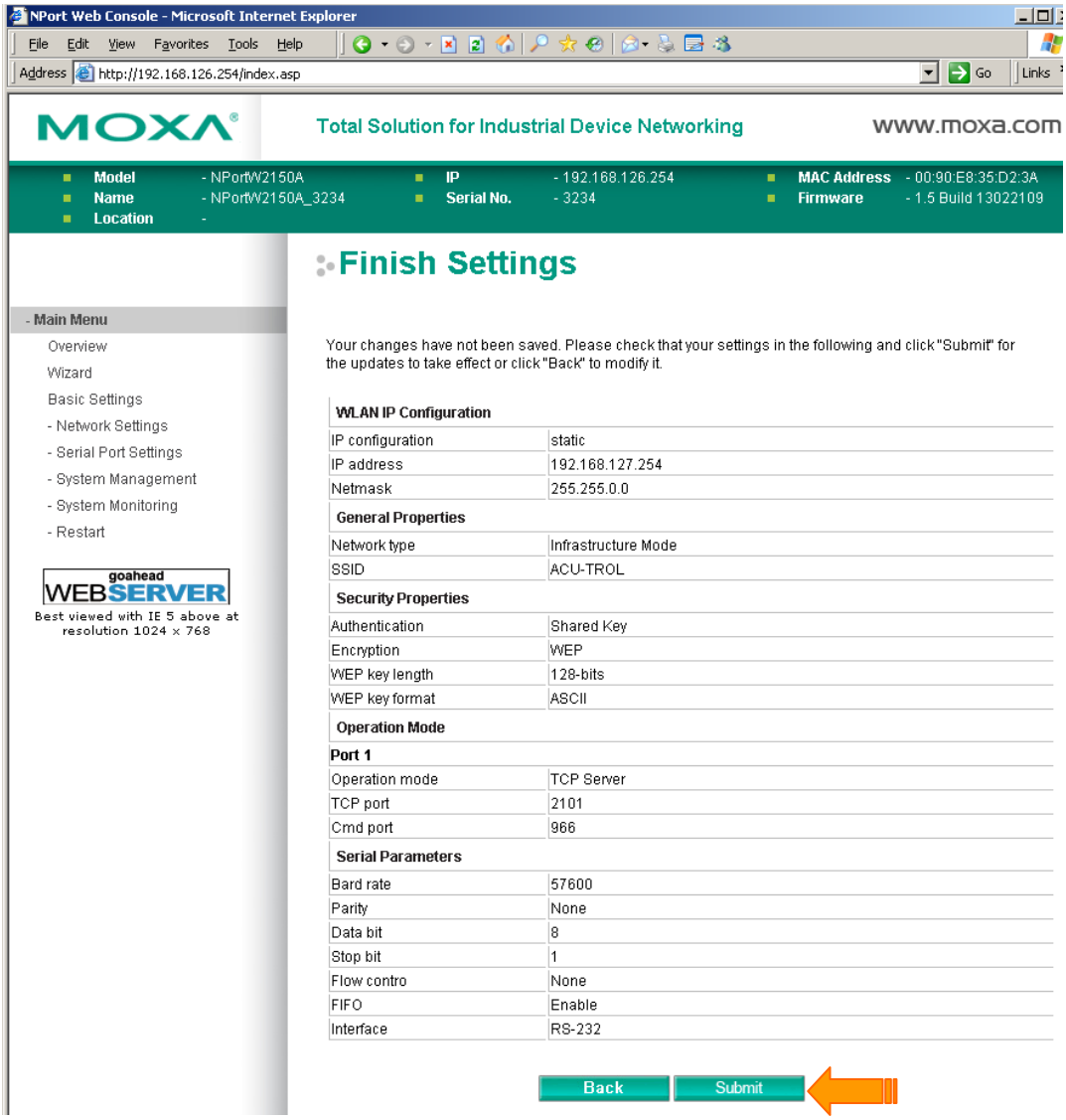
Click the **Next** button.

Select the menu selections for **Baud Rate, Flow Control,** and **FIFO** as shown below.
Set the **Baud rate** to **57600**.
Set the **Flow Control** to **None**.
Set the **FIFO** to Enable.



Click the **Next** button.

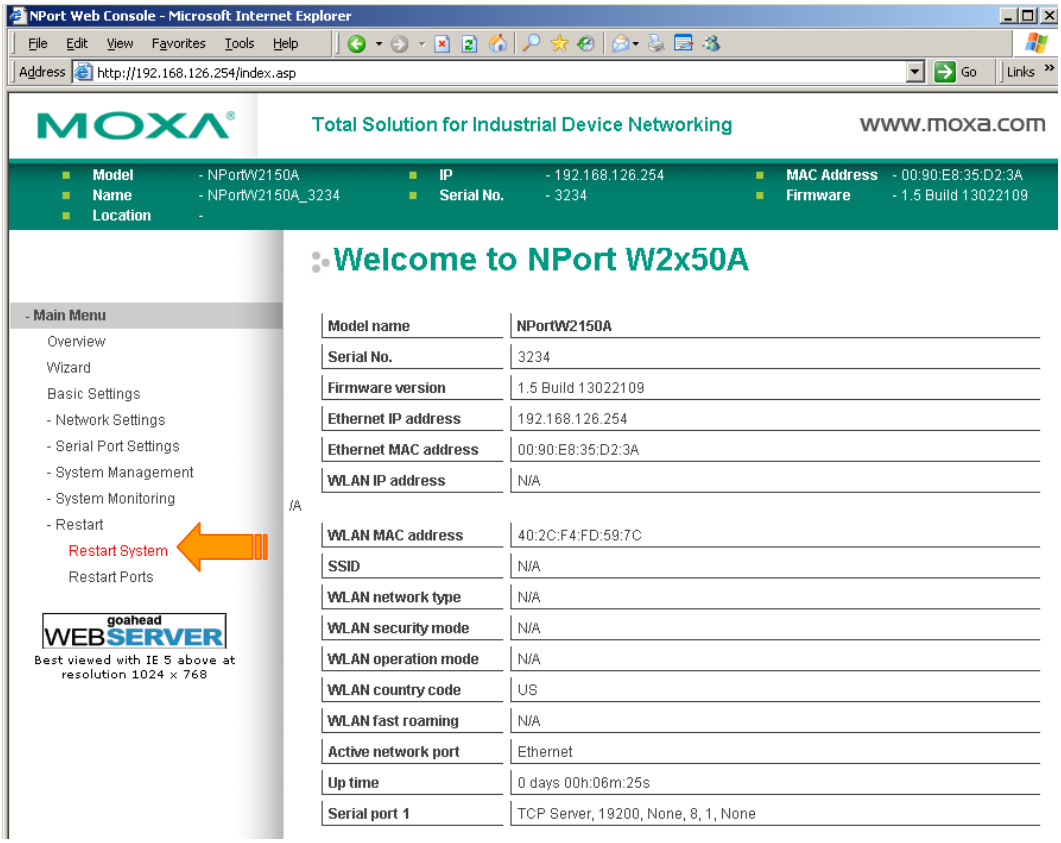
Verify the information on the displayed screen is correct on the **Finish Settings** screen. Catching mistakes at this point may avert frustration later. Remember to press the Submit button on each page to store settings when changes are made.



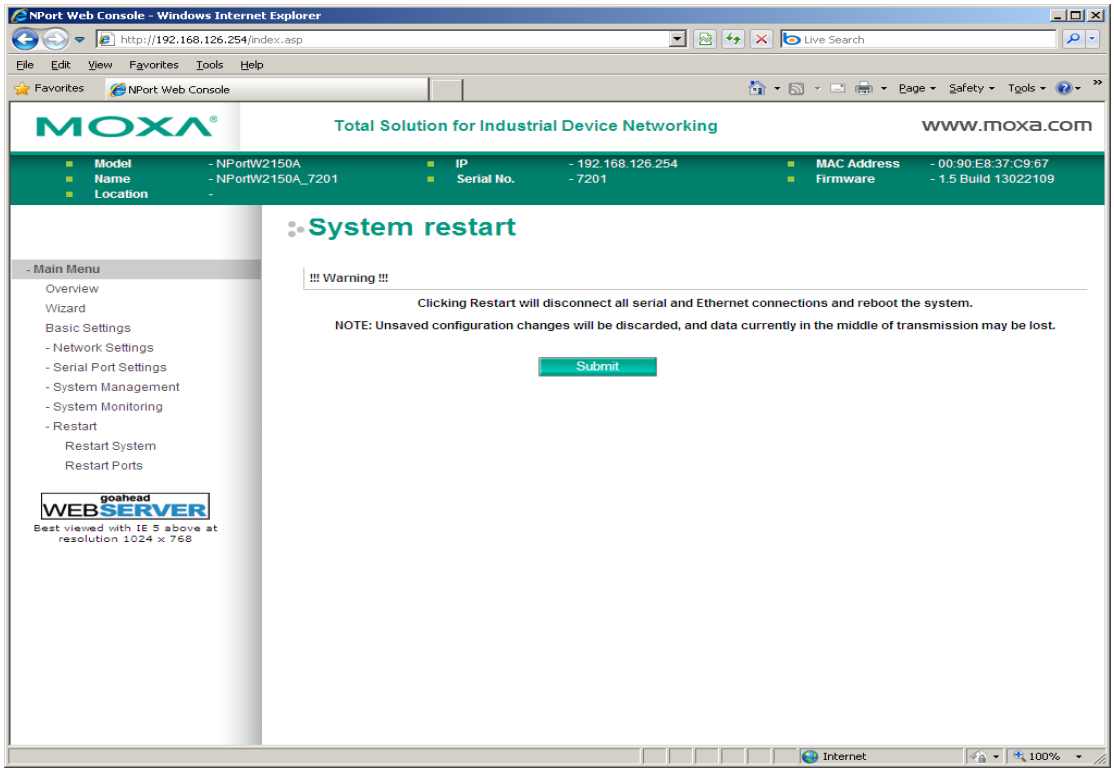
Select the **SUBMIT** button to save the settings.

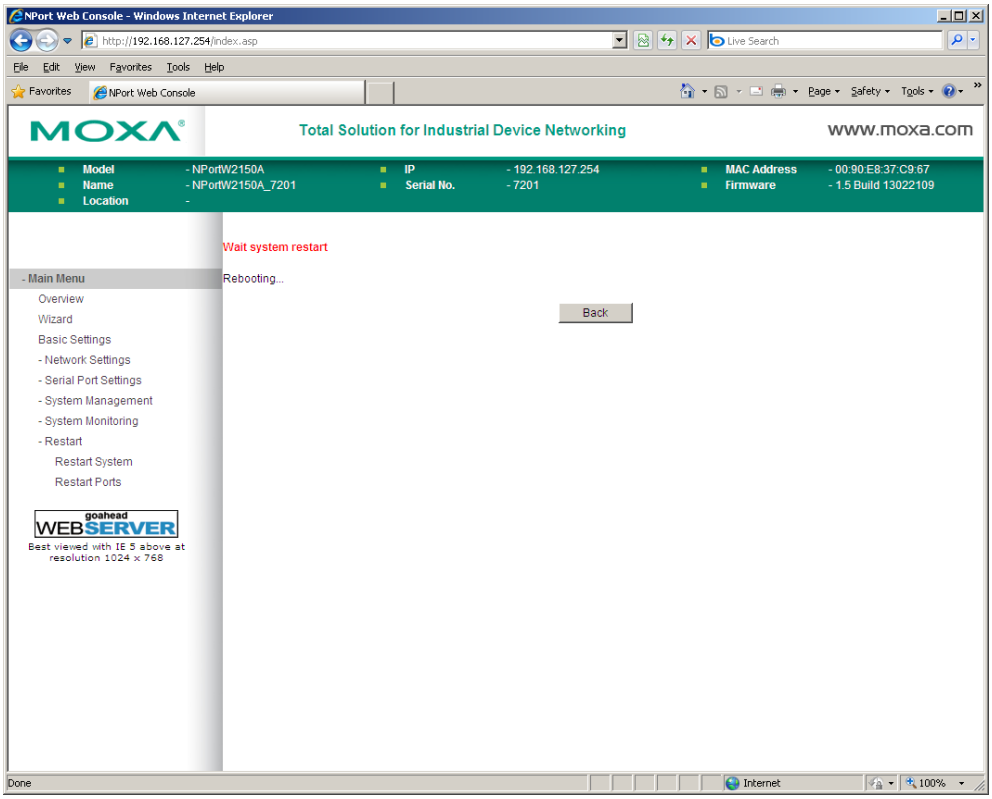
A temporary screend displays “Wizard Setting OK” with BACK button before returning to the main menu.

Expand the **Restart** menu tree. Click the **Restart System** menu option.



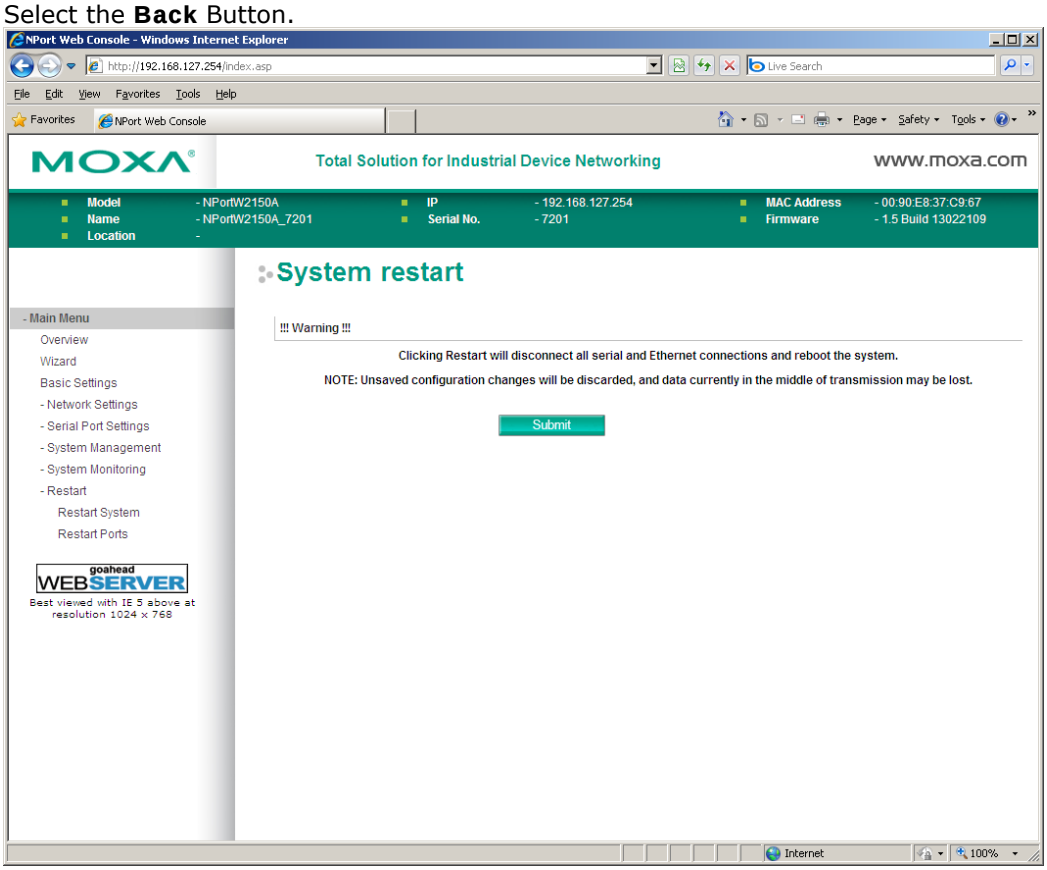
Click the **SUBMIT** button and reboot the AcuPort device by disconnecting the power supply for five seconds and reapplying power to the MOXA unit.





Disconnect power. Wait for green “Ready” LED.

Select the **Back** Button.



Select the SUMBIT button.

After the device restarts, the green **Ready** LED illuminates within 10-15 seconds. Click the **Overview** button and again verify that all of the settings have been properly retained.

Close the Acuport Configuration Utility Window, if satisfied with the configuration settings. Proceed with installing and/or executing the AcuCom08 program.

IMPORTANT FOR WiFi APPLICATIONS

The AcuPort 1100 will use the Ethernet RJ45 port if the Cat5 cable is plugged in during boot-up. To use the WiFi port, disconnect the RJ45 Cat5 cable and reboot the device by disconnecting the power supply for five seconds and reapplying power.

IMPORTANT NOTE

When using the AcuCom08 software to connect to the Acu-Trol controller, it is necessary to know both the IP Address and the TCP Port number.

All Acu-Trol controllers require the serial port settings to be the following:
Baud rate = 57600, **Data bits** = 8, **Stop bits** = 1, **Flow control** = none, **Parity** = none

WARNING

The *Local TCP* port should be chosen carefully. The module defaults to port 4001; however, the proper port should be determined by the IT administrator. Verify the port availability and avoid conflicts with existing devices. Avoid commonly used ports between 0 and 1024. Refer to RFC 1700 or consult www.iana.org for Well Known Ports, Registered Ports, and Dynamic and/or Private Ports.

Install the AcuCom08 Program

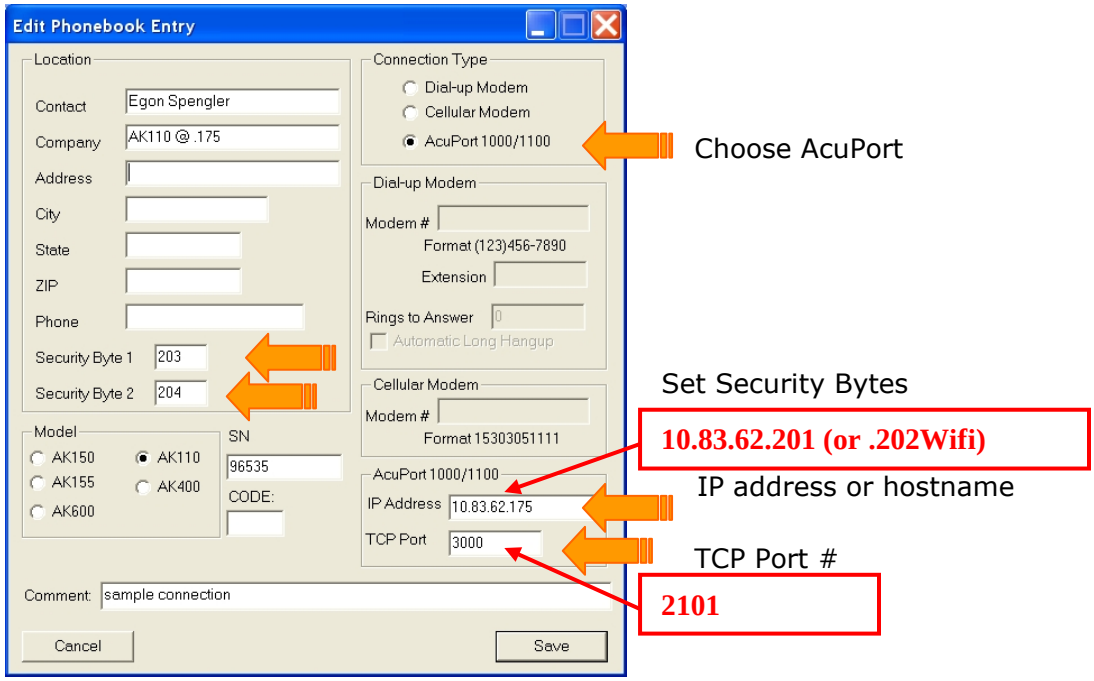
The AcuCom08 program must be used to access an Acu-Trol controller over a network. The following steps outline the procedure to install and run AcuCom08.

1. Load the AcuCom installation CD.
2. Open the ACUCOM08 folder.
3. Double-click on the file AcuCom08_Setup_xxxxxxx.EXE.
4. Select the desired folder in which to install the program and click OK. *Make note of this folder for the following step.*
5. To run the AcuCom08 program, open the folder selected in the previous step.
6. With the mouse, right-click the AcuCOM08.exe file.
7. From the menu, select "Send To…." "Desktop (create shortcut)".
8. Run the AcuCom08 program by double-clicking the shortcut on the desktop.

Connecting to the Acu-Trol Controller with AcuCom 08

AcuCom supports various connection methods, namely: Com ports 1-4, Dial-Up Modem, and Cellular Modem. AcuCom version 08, in conjunction with the AcuPort Ethernet products (1000 and 1100), introduces connection through a LAN (local area network) via an Ethernet connection (a TCP/IP socket) using the AcuCom phonebook.

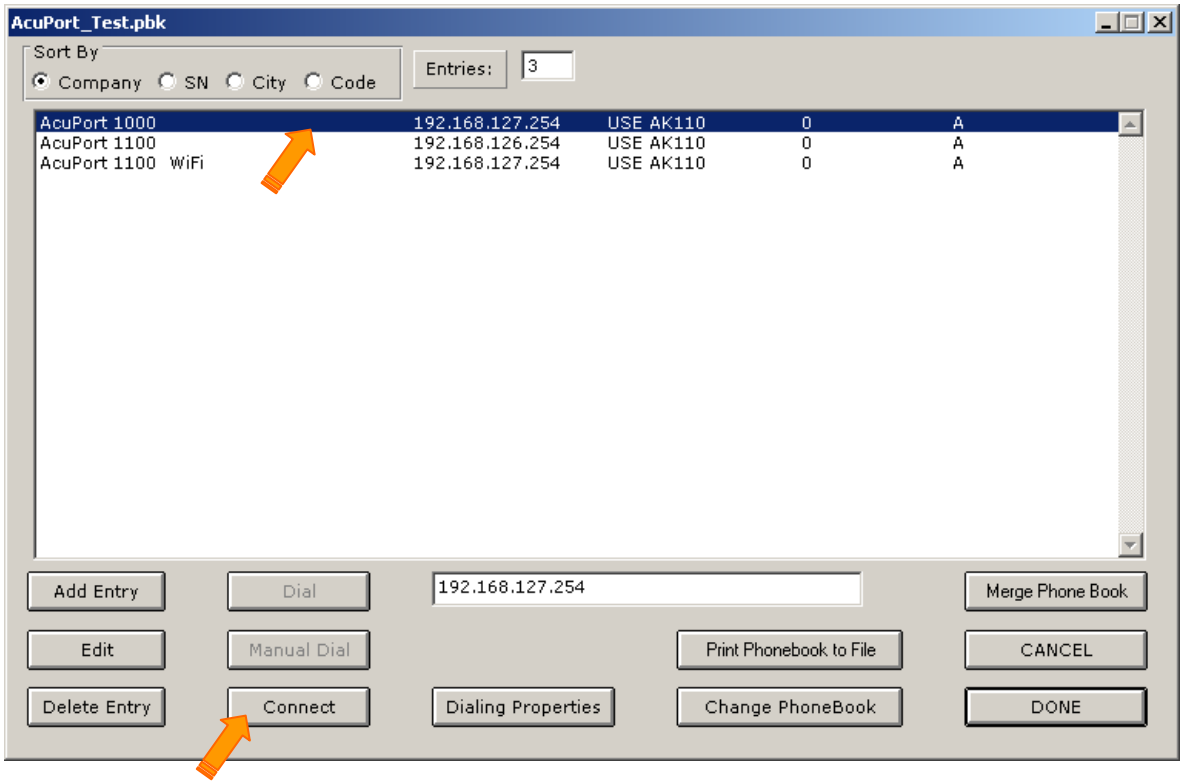
Once the AcuPort device has been properly configured as indicated above, AcuCom08 has the capability of specifying a network IP address in the phonebook as follows:



The **Controller Communications** window appears. Select the Icon of the telephone.

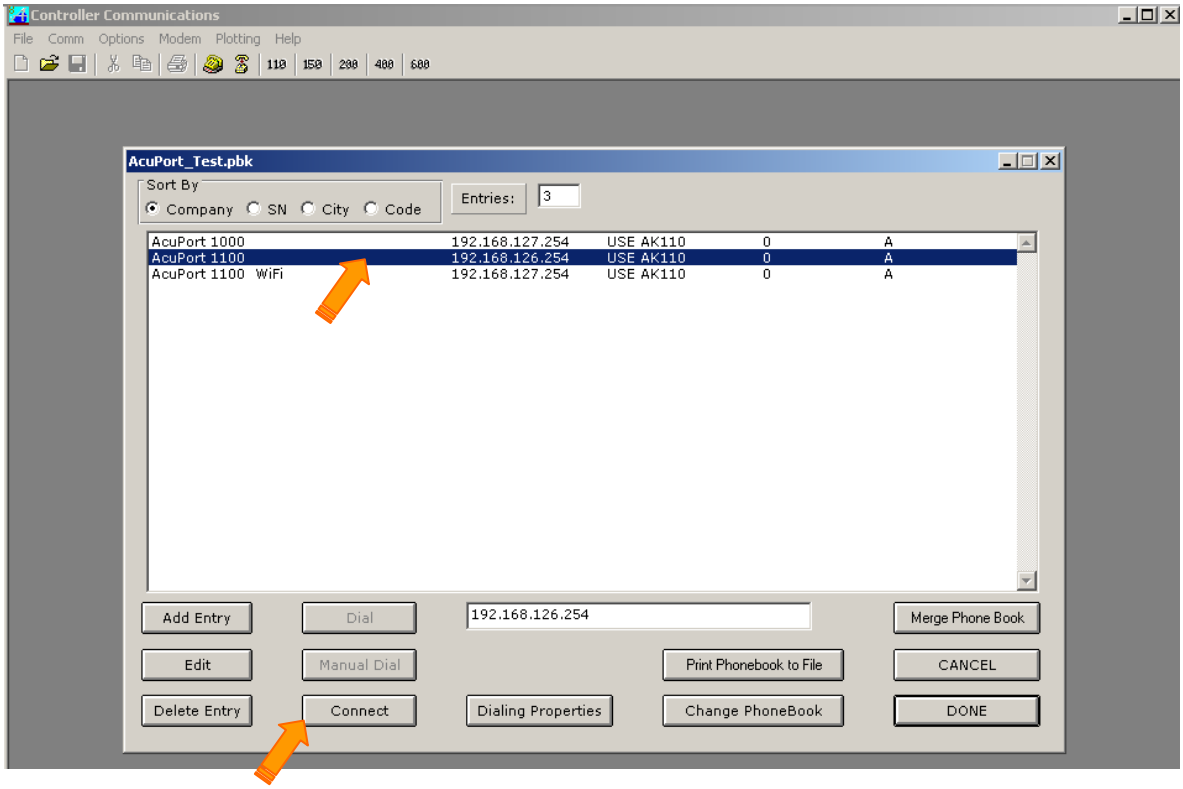
If the AcuPort 1000 is used, perform this step.

Select the **AcuPort 1000** entry as shown below and then click the **Connect** button.

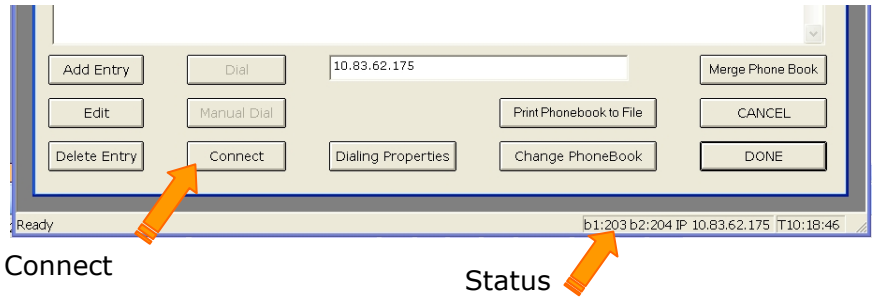


If the AcuPort 1100 is used, perform this step.

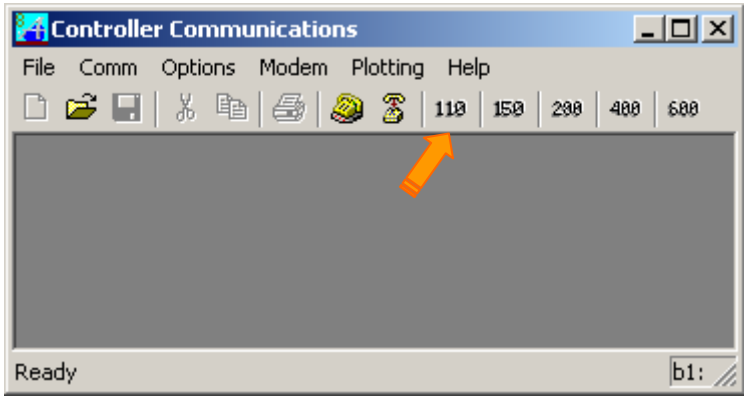
Select the **AcuPort 1100** entry as shown below and then click the **Connect** button.



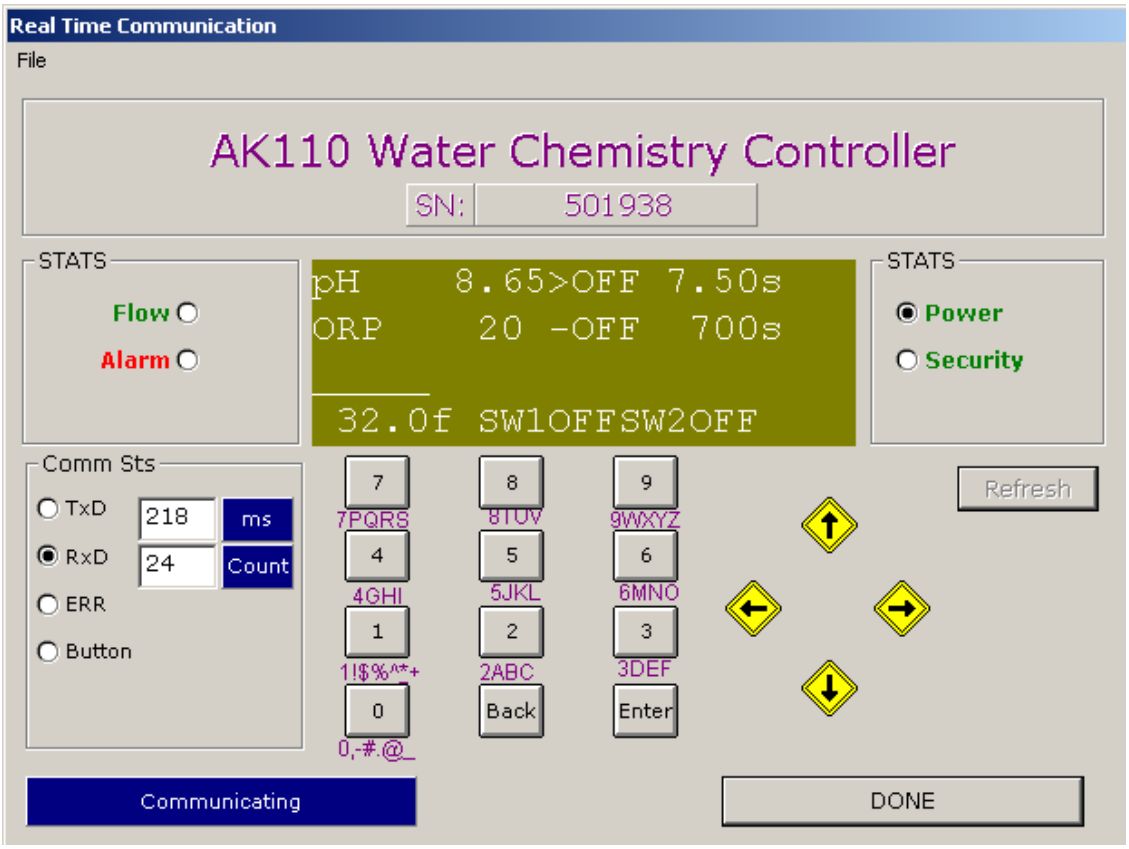
When clicking the **Connect** button and serial communication is established, then serial communication information appears in the bottom-right portion of the status bar.



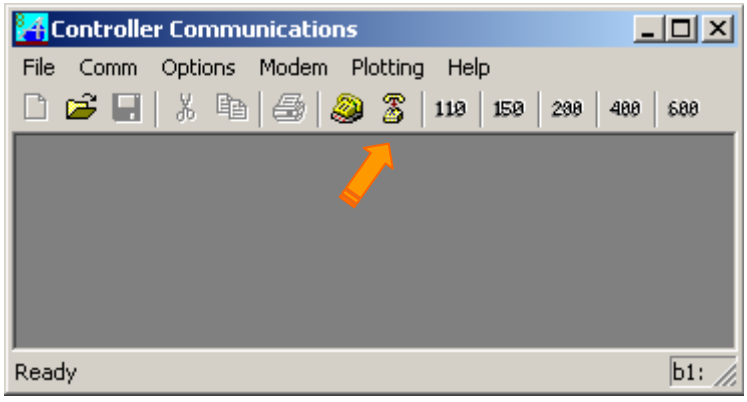
The **AcuPort_Test** window will close and the **Controller Communications** window will be clear. Click on the **110** icon.



The Real Time Communication window appears. Verify the serial communication is established with the AK Model Tester.



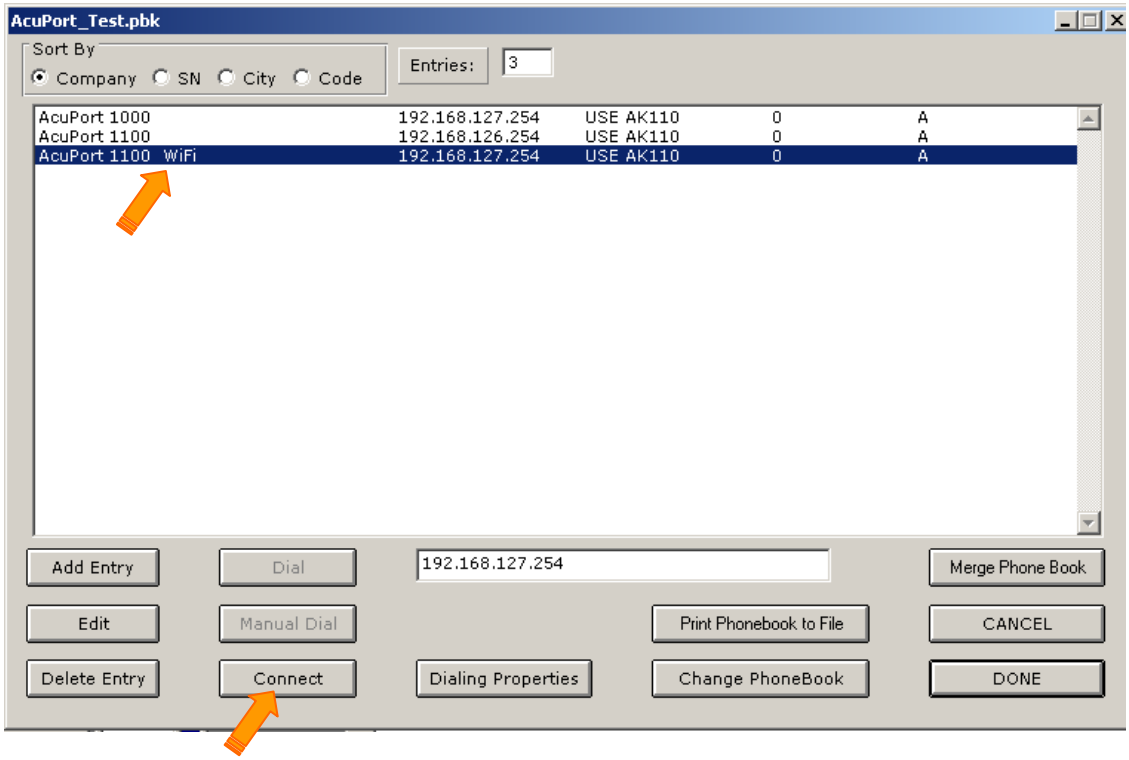
Click **DONE** to return to the **Controller Communications** window to click the Icon of the hung-telephone.



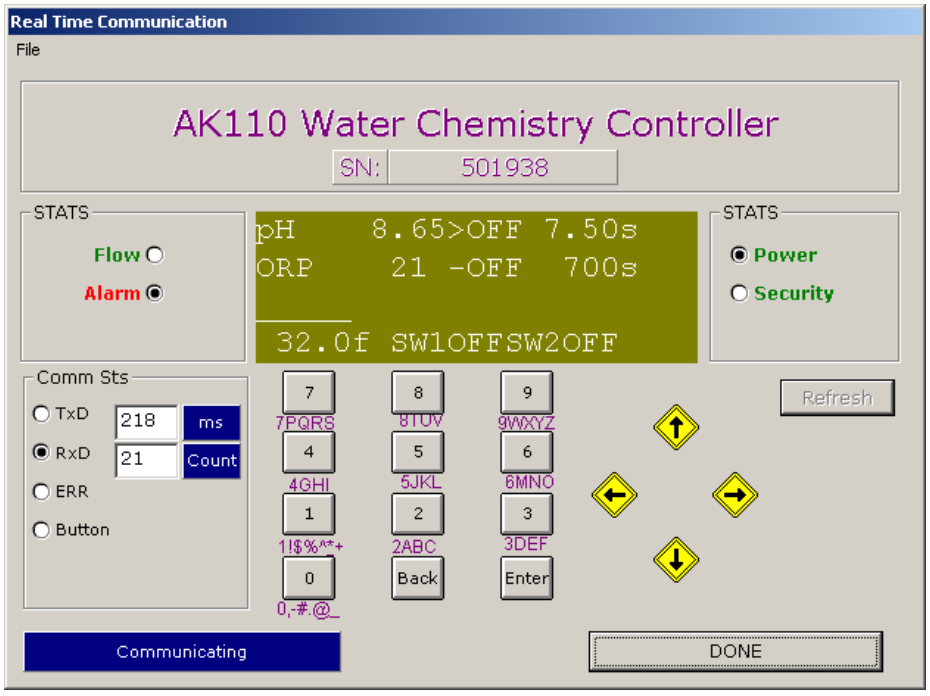
For AcuPort 1100 Wireless Test Only:
Wireless Communication Test for the AcuPort 1100 Wireless:

To test the wireless communication, unplug the Acuport from its power source and disconnect the network communication cable. Plug the power source to the Acuport and wait for the indicator lights on the cover of the MOXA to turn green. The Ready, WLAN, and the five left-positioned LEDs are lit green.

Return to the **Controller Communications** window. Press the icon of the telephone again. At the **AcuPort_Test** window, highlight the AcuPort 1100 WiFi entry. Click the **Connect** button.

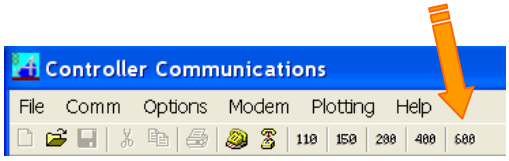


The **Real Time Communication** window appears as shown below. The "Communicating" button verifies the wireless connection.



Return to the **Controller Communications** window to select the icon of the hung-telephone.

From the AcuCom Comm menu, select the device to connect or press the appropriate controller icon (e.g. 110, 150, 200, 400, 600) to launch the controller's virtual front panel.



NOTE
The AcuPort 500 (RS-422/485) connects just like any other serial COM port.
It does not have an address and does not use the phonebook.

Quick Start Checklist

Once familiar with the setup procedure for the AcuPort product, use the following checklist as a guide to ensure a complete and trouble-free installation.

AcuPort 1000, 1100

- ☐ Mount AcuPort to wall.
- ☐ Connect AcuPort RS-232 port to Acu-Trol controller with supplied cable.
- ☐ Install the RJ45 weatherproof hood. Refer to Appendix A.
- ☐ Connect AcuPort Ethernet RJ45 port to the network.
- ☐ Connect AcuPort Power to the wall power outlet.
- ☐ Install AcuCom08 software from the CD.
- ☐ Install AcuPort Configuration Utility from the CD.
- ☐ Obtain an available static IP address and TCP port number from the network administrator.
- ☐ Run the AcuPort utility to configure IP address, RS232 settings, and Operation settings.
- ☐ Run AcuCom08.

  Use the 'Modem' phonebook.
  Add a new entry.
  Enter the proper Security Bytes.
  Choose the proper model number.
  Check the "AcuPort 1000/1100" box.
  Enter an IP address or hostname. ,Enter the appropriate TCP Port number
  Click Save.
  Click "Connect". Check the status bar for an indication of connection.
  View controller's virtual front panel by selecting the appropriate icon or Comm menu item.

Packing List

AcuPort 1000, 1100

- ☐ Operation and Installation Manual with Quick Start Checklist
- ☐ Installation CD(s) with AcuCom08 and AcuPort Configuration Utility
- ☐ AcuPort NEMA4X Enclosure including device module, internal wiring, and RJ45 cap
- ☐ RJ45 Weatherproof Plug hood
- ☐ 110V to 12VDC Wall Power Adapter
- ☐ RS232 Cable to connect to an AK110, AK400, or AK600 controller
  (AK110 kit circuit board and #4-40 x 5/16" screw)
  (AK600 kit circuit board and #4-40 jack screw)
- ☐ Model 1100 only: Antenna

Accessories

The following replacement parts and accessories are available from your distributor.

Replacement Parts:

734-000-080	AcuPort 1000 Power Adapter, 120VAC to 12VDC, 5Ft.
734-000-090	AcuPort 1100 Power Adapter, 100-240VAC to 12VDC, 5Ft.
734-000-100	AcuPort 6ft RS232 Cable and Adapters for AK110 and AK600/2100
734-000-110	AcuPort RJ45 Waterproof Plug Connector Kit
734-000-120	AcuPort Duckbill Antenna, 2dB, Outdoor

Accessories:

735-000-310	AcuPort 1000 Waterproof Single-Gang Receptacle Cover
735-000-320	AcuPort 1100 Waterproof 2-Gang Receptacle Cover
735-000-330	Antenna, WiFi 2.4GHz, Outdoor Omnidirectional, Kit
735-000-340	Antenna, WiFi 2.4GHz, Outdoor Directional, Kit

AcuPort Transporter II Program Instructions

Introduction

Transporter II program is a Windows™ application designed to run on a desktop PC that resides on the same network as the AcuPort which is in turn connected to the Acu-Trol water chemistry controller. Transporter II reads the AK110, AK600, and AK2100 and sends the data to the AcuManage server. Users log in to www.AcuManage.net to view daily or monthly graphs of the pH, ORP/ppm and temperature readings. AcuManage can also be configured to email alarms and periodic data readings to its users. Transporter II can access up to four (4) AK-series controllers at once. For example if a property has two 3-pool AK600's and two single-pool AK110 controllers, data from all eight bodies of water could be transferred from this one application.

Install the AcuPort Transporter II Program

Install the Transporter II application from the Pentair website or otherwise provided setup file. To avoid port-forwarding setup issues dealing with the router's firewall, choose a Windows™ computer that is:

1. Located on the same internal network as the AcuPort.
2. Has internet access
3. Is on continuously 24 hours a day and has sleep/hibernate power-modes disabled
4. It is okay if the monitor's energy mode allows the monitor to sleep, and okay to have a screen-saver enabled. It is okay if you use the computer for other purposes as well.

When the Transporter II program window is minimized, it will show in the task bar. While on screen, the progress of the data transfers can be monitored.

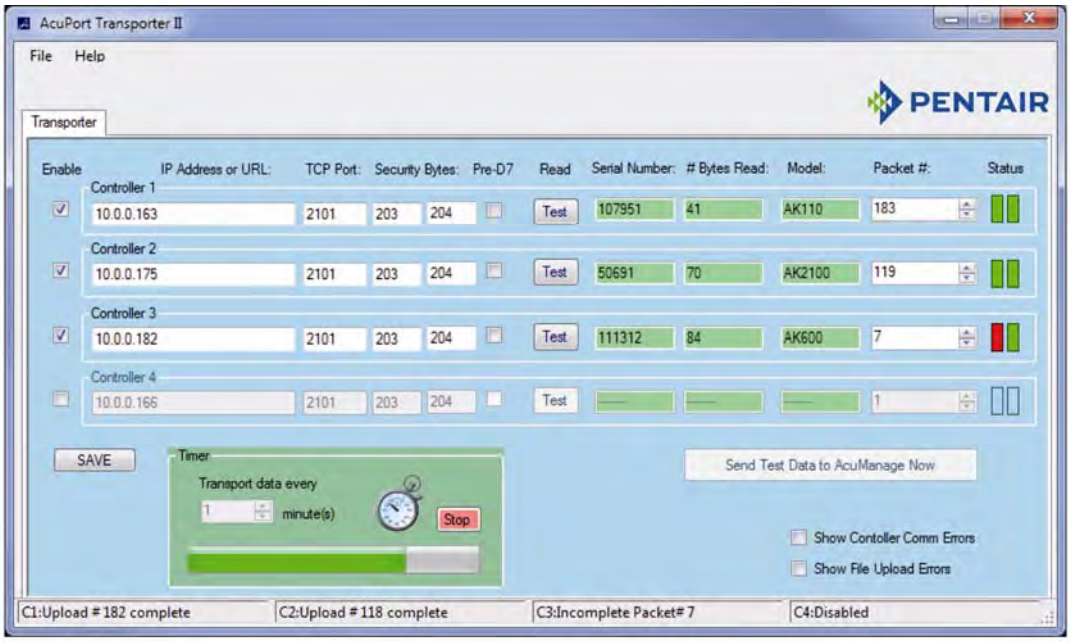
Refer to Pentair AcuPort application note on port-forwarding to take advantage of other networking schemes that allow AcuPorts to be accessed through firewalls with the assistance of the IT administrator.

As part of the standard AcuPort installation procedure, an IP address and TCP Port number are assigned to the AcuPort. Those two values, along with the controller's two Security Bytes are required to gain secure access to the controller.

Setup and Start using the Transporter II Program

Transporter II is extremely easy to use. With the five access parameters (IP Address, TCP Port, Security Bytes 1 & 2, and the firmware version) connection to the AcuPort and AK-series controller can be tested immediately. As shown below, Transporter II can access up to four (4) controllers at once, each with its own unique identifiers.

1. Check the first Enable checkbox.
2. Enter the AcuPort IP Address and TCP control port number. The IP address can be an IP address or URL.
3. Enter the AK-series controller's Security Bytes.
4. If the controller's firmware predates version D7 dated 7/7/08, check the Pre-D7 checkbox.
5. Transporter II User Guide v1.0a February 25, 2012 p 2 of 3
6. Click the "Test" button.



If the network and security settings are correct, the serial number, model number, and number of data bytes read will be displayed in the adjoining boxes. The status box at the bottom of the screen will show status such as number of bytes read. If incorrect, the program will try to help. By knowing whether the network communication failed or the RS232 communication to the controller failed, it may suggest checking the appropriate settings. Green 'Status' lights indicate that communication to each controller and file uploads are successful. If any of these are red, enable the checkbox below to show the error messages on the next cycle.

Select the SAVE button to store the existing settings. Saved settings will be automatically restored when the program is restarted. Settings are also automatically saved in timer mode, each time a data packet is successfully uploaded to the server. Repeat the setup for up to three more controllers. Leave unused controllers disabled and they will not be included in the automatic monitoring and data sets.

Once a sample data packet is read from each enabled controller, verify data can be uploaded to the AcuManage server by selecting the "Send Test Data to AcuManage now" button. The status box at the bottom of the screen will indicate the result of the process. If the "Send…" button is pressed prior to successful test readings for each enabled controller, a message will be displayed indicating the model number is invalid.

The Packet # box shows the current file iteration number used in transferring data to AcuManage. Although less important, this value, incrementing for each data packet, is a good indication that files continue to transfer properly throughout time.

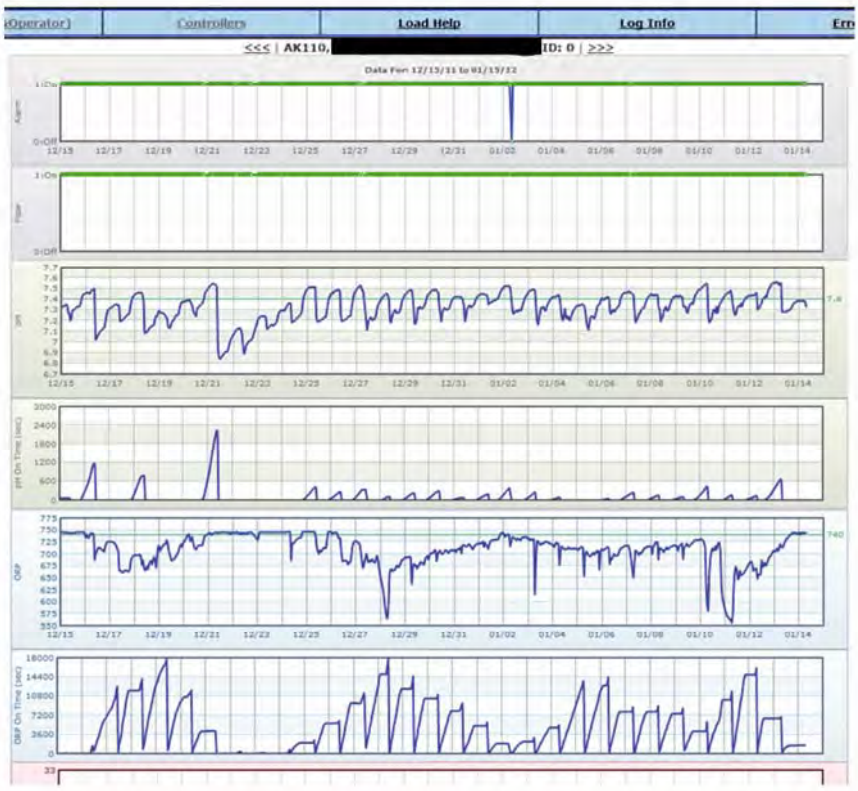
Timer Mode

Once it has been verified that a reliable connection is established to the AcuPort, the AK-series controller, and the AcuManage server, the automated monitoring and uploading can be initiated. Select the desired timer interval and click the "Start" button. The timer loop will immediately retrieve fresh data from each of the enabled controllers and upload the packets to AcuManage. If desired, or if problems are encountered during operation, check the boxes "Show… Errors" to display network messages caught by the program.

View Data

Contact Pentair Water Sales or Tech Support to establish an account on ww.AcuManage.net. Log on with your username and password, locate your controller, and view the data in table or graphs formats.

For support contact Technical Support at (800) 831-7133.



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