



# *JNIOR Series 3*

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A Network I/O Resource  
Utilizing the JAVA™ Platform

## Serial-to-Ethernet Manual Release 3.0

NOTE: JNIOR OS 3.1 or greater required

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# 1 What is the Serial-to-Ethernet Function?

The Serial-to-Ethernet function for the JNIOR is a software application that runs on the JNIOR and allows the JNIOR to act as a converter between a serial device connected to the JNIOR and a remote application communicating to the JNIOR via the Ethernet network using TCP/IP. The serial to Ethernet conversion is bi-directional meaning that the serial device can communicate to the PC and the PC can communicate to the serial device. The JNIOR acts as a converter in between the serial device and the PC sending and receiving packets of information between the two devices.

## 2 The Purpose of the Serial-to-Ethernet Function

The Serial-to-Ethernet function can be used for a variety of applications and adds value to these applications when compared to standalone serial converters because of the digital and analog I/O available with the JNIOR. The user can integrate new and legacy serial devices into their application as well as utilize the JNIOR I/O.

## 3 Connecting the Serial Device

The default port for connecting the serial device is the Auxiliary Serial port located along the top edge of the JNIOR. (Please see “Section 7 – Options” of this manual for using the “RS-232 only” serial port located along the lower edge of the JNIOR.) There are two different physical connection types available for the Auxiliary Serial port. JNIOR model number JNR-100-003A has a 5-pin connector and JNIOR model number JNR-100-003B has a DB9 connector. For both models, the auxiliary serial port can communicate via RS232, RS422 or RS485. The mode is configured via jumpers internal to the JNIOR.

**The default jumper setting is RS232.**

The following information is from the drawing titled – JNIOR Model 310 Connections & Mounting – on the CD supplied with your JNIOR. To modify the communication mode, you must remove the four screws on the JNIOR and remove the lid. The jumpers are located in the upper right corner. Pin number 1 is closest to the outside of the box. The internal jumper settings are as follows:

Mode	J15	J16	J17
RS-485 2-Wire Half Duplex – Terminated	1 – 2	1 – 2	1 – 2
RS-485 2-Wire Half Duplex – Not Terminated	1 – 2	1 – 2	2 – 3
RS-422/RS-485 4-Wire Terminated	2 – 3	2 – 3	1 – 2
RS-422/RS-485 4-Wire Not Terminated	2 – 3	2 – 3	2 – 3
<b>RS-232 (default setting since January 1, 2008)</b>	2 – 3	2 – 3	2 – 3

### **Auxiliary Serial Port DB9 Connector**

For JNIOR model number JNR-100-003B, the serial device is connected to the DB9 connector using a standard, **straight through serial cable**. The pin connections are as follows:

- Pin 1 – No connection
- Pin 2 – RS232 (TX) / RS485 (TX-)
- Pin 3 – RS232 (RX) / RS485 (RX-)
- Pin 4 – No connection
- Pin 5 – Ground
- Pin 6 – No connection
- Pin 7 – RS232 (RTS) / RS485 (RX+)
- Pin 8 – RS232 (CTS) / RS485 (TX+)
- Pin 9 – No connection

### **Auxiliary Serial Port 5-Pin Connector**

For JNIOR model number JNR-100-003A, the serial device is connected to the 5-pin connector as follows, where pin 1 is closest to the center of the JNIOR box:

- Pin 1 – Ground
- Pin 2 – RS232 (TX) / RS485 (TX-)
- Pin 3 – RS232 (RTS) / RS485 (TX+)
- Pin 4 – RS232 (RX) / RS485 (RX-)
- Pin 5 – RS232 (CTS) / RS485 (RX+)

## 4 Activating the Serial-to-Ethernet Software

The Serial-to-Ethernet software is pre-installed on all JNIORs. A back-up copy is provided on the JNIOR CD. To activate the software so that it runs on boot up, please launch the main JNIOR web page, go to the Applications tab and check the Serial-to-Ethernet Converter box. When finished, click the Save button and you will be asked if you want to reboot the JNIOR now. Please click “Yes” (if you are ready) and the JNIOR will reboot. After the reboot, the Serial-to-Ethernet software will be running.

The screenshot shows a web interface with a tabbed menu at the top: I/O Control, Configuration, Registry Editor, Command Line, Applications (selected), and About. The main content area contains three configuration items:

- Serial Control**  
The Serial Control software application provides the user with a way to monitor and control the internal JNIOR I/O and external 4 Relay Out expansion modules through an RS-232 connection using the Auxiliary Serial port or the RS-232 port. The AUX serial port is the default port. Please consult the Serial Control Manual on how to change to the RS-232 port.
- Serial to Ethernet Converter**  
The Serial to Ethernet Converter software application provides the user with the ability to use the JNIOR as a bridge connecting serial devices to the Ethernet via the Auxiliary Serial port or the RS-232 port. The AUX serial port is the default port. Please consult the Serial To Ethernet Manual on how to change to the RS-232 port.
- Task Manager**  
The Task Manager software application provides the user with the ability to configure tasks on the JNIOR for output control, data logging, resetting data and/or sending emails. These tasks can be defined as recurring based on time or interrupt driven.

At the bottom of the configuration area are two buttons: **Save** and **Cancel**.

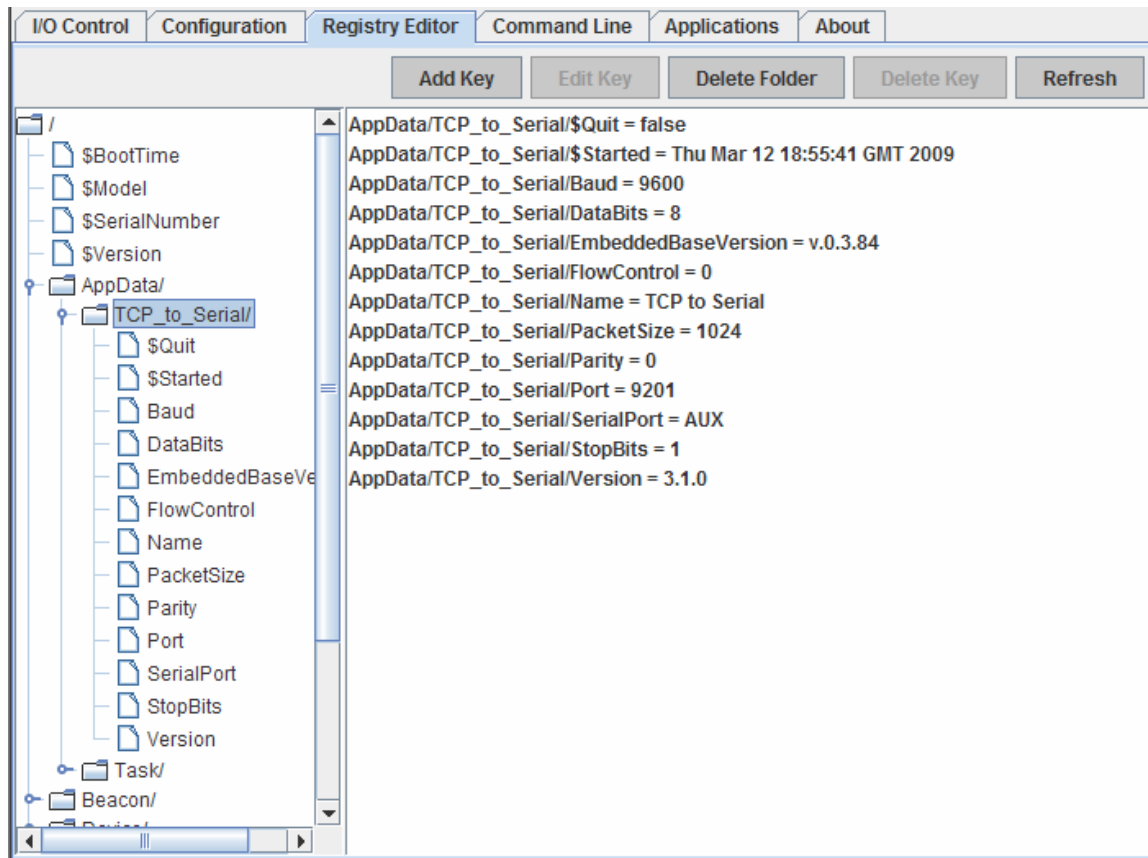
**NOTES:**

1. In order to run the Serial Control and Serial to Ethernet Converter applications at the same time you must make the necessary configuration changes to use different serial ports and start the programs one at a time via the Command Line tab or a telnet session.
2. Please see the manuals for each application on the JNIOR CD for more details.

## 5 Configuring the Serial-to-Ethernet Software

Once the Serial-to-Ethernet program is running, it will be ready to accept clients on the default Ethernet TCP/IP port of 9201. The default setting for the serial port is 9600 baud, 8 data bits, 1 stop bit, no parity and flow control set to none. What this means is that the serial device connected to the JNIO serial port must work with the above serial settings otherwise you will have to change the settings on either the JNIO or your device. Any application running on a PC or other remote device that wants to interact with the serial device connected to the JNIO via the Ethernet using TCP/IP will need to make a connection to the JNIO using port 9201. This port can also be changed.

The Registry Editor tab on the JNIO Main Web page can be used to change any settings for the Serial-to-Ethernet software program. After you enable the Serial-to-Ethernet program and it is running after a reboot, the default settings are displayed in the Registry Editor and are as shown below:



The Registry Keys with their full name and default settings that you can edit are as follows (please ignore any other registry keys as they are for system operation):

**AppData/TCP\_to\_Serial/Baud** = 9600  
**AppData/TCP\_to\_Serial/DataBits** = 8  
**AppData/TCP\_to\_Serial/FlowControl** = 0  
**AppData/TCP\_to\_Serial/PacketSize** = 1024  
**AppData/TCP\_to\_Serial/Parity** = 0  
**AppData/TCP\_to\_Serial/Port** = 9201  
**AppData/TCP\_to\_Serial/SerialPort** = AUX  
**AppData/TCP\_to\_Serial/StopBits** = 1

To modify any of the above keys, click on the appropriate key in the Registry Editor window and then the Edit Key button. Make any changes and click the Save button.

The valid settings are as follows:

Key Name	Default	Valid Settings	Comments
Baud	9600	300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200	No reboot required
DataBits	8	7 or 8	No reboot required
Flow Control	0	0, 1, or 2 where: 0 = none 1 = CTS/RTS (hardware) 2 = XON/OFF (software)	No reboot required
Packet Size	1024	From 1 to 1024 bytes	No reboot required
Parity	0	0, 1, or 2 where: 0 = no parity 1 = odd parity 2 = even parity	No reboot required Supports: 8 databits, 1 stop bit 7 databits, 2 stop, no parity 7 databits, 1 stop, with parity
Port	9201	Any valid TCP port not already used	The JNIO must be rebooted for this change to take effect.
Serial Port	AUX	AUX or RS232	Reboot required – defines the serial port on the JNIO that the serial device is connected to. (Please see Section 7 of this manual for important information.)
StopBits	1	1 or 2	No reboot required

## 6 How to Test and Use the Serial-to-Ethernet Software

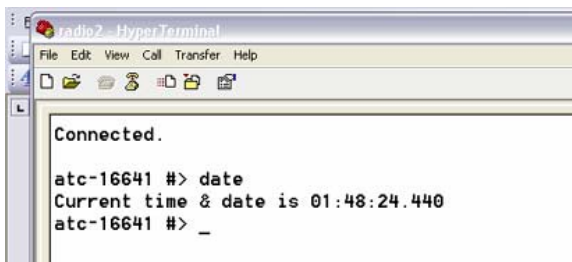
After the Serial-to-Ethernet software is running and properly configured, you may be able to test the connection to your serial device using a program such as HyperTerminal. The test will only work if your serial device either puts out serial packets unsolicited or can receive commands from a program such as HyperTerminal.

To connect to the Serial-to-Ethernet application via the Ethernet (TCP/IP) using HyperTerminal, set it up using a TCP/IP (Winsock) connection and enter port 9201 and your JNIOR IP Address. The screen shot below shows the HyperTerminal set-up.



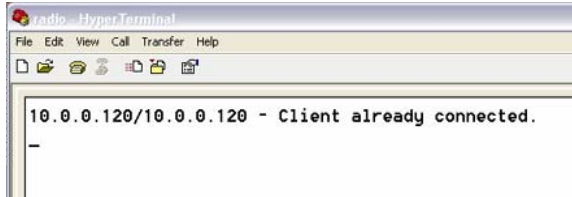
Once connected, you will see the word **Connected** appear on the Hyper Terminal screen followed by any prompt or data coming from your serial device. You can now interact with your serial device as if it were connected via the serial cable directly to your PC.

An example of a good connection as viewed from Hyper Terminal is as follows:



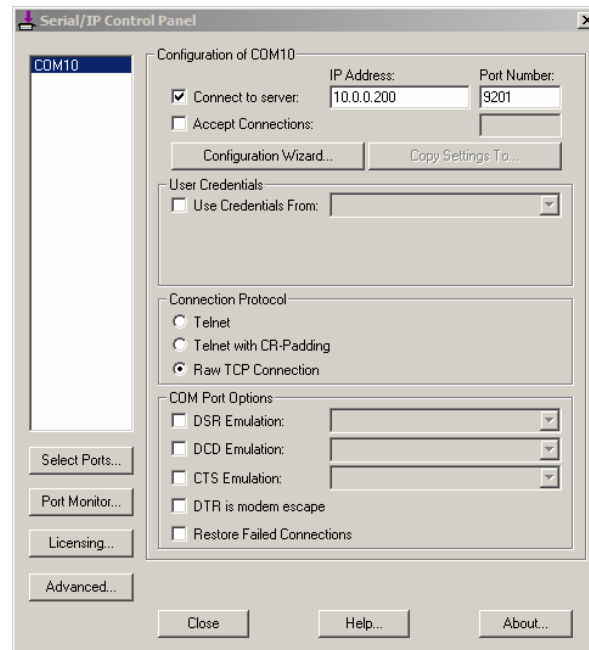


**NOTE:** Only one client (PC application or other service coming in through the Ethernet port) can be connected to the Serial-to-Ethernet application at a time. When a connection is attempted while another client is already connected, a string is returned telling you the IP Address of the client already connected. An example of a connection attempt when someone else is already connected and the message displayed in HyperTerminal is as follows:



### Third Party Packages

Third party packages, such as Serial/IP Redirector from Tactical Software can be used between your program running on a PC and the JNIOR serial server running on the JNIOR. The set-up screen for Serial/IP Redirector would look as shown below where the server IP address is your JNIOR IP Address and the port is the port you are using with 9201 being the default.



## 7 Options

The default setting for the Serial-to-Ethernet software is to utilize the Auxiliary Serial port located along the top edge of the JNIOR. However, it is possible to change this setting to utilize the RS-232 serial port located along the bottom edge of the JNIOR. It is important to understand that the primary purpose of the RS-232 port is to act as the command console for the JNIOR. The command console allows the user to connect to the JNIOR via a program such as HyperTerminal for configuration purposes. And although they are not visible to the user unless connected, the JNIOR will write certain system messages to this port.

If you desire to use this port for your serial device, then you must start the Serial-to-Ethernet software as described above so that the Registry Keys are displayed. Using the main JNIOR web page, edit the SerialPort key and change the value to RS232. You must reboot the JNIOR (a soft reboot via the About tab or a Telnet window is preferred) and when it finishes, the Serial-to-Ethernet software will now use the RS-232 port.

**IMPORTANT:** Every time the JNIOR reboots, it waits 1 minute before taking over the RS-232 port for the Serial-to-Ethernet application. This would allow you some time to connect to the JNIOR via HyperTerminal for an emergency where you no longer knew the JNIOR IP address and had no other way to connect to the JNIOR. You would have 1 minute to log in and type 'ps' at the prompt to list all the running processes and then type 'kill X' where X is the process number for the serial ethernet.jnior program.

The program will stop immediately and you will have time to change your ipconfig or go to the Command Line registry editor and delete the Run key for the Serial-to-Ethernet software program. When the Run key is deleted, the program will no longer automatically run after boot.

**NOTE:** You can have both Serial-to-Ethernet and Serial Control (see the Serial Control Manual) running on the same JNIOR at the same time as long as they are using different serial ports. You must start the application first that will be using the RS232 port and change its default setting from AUX to RS232. Then you can start the other application because it will now be able to run and use the Auxiliary Serial port. Having both programs running at the same time with both of them configured for the Auxiliary Serial port could cause unexpected operation of your JNIOR.

## Summary

Thank you for purchasing the **JNIOR**. Hopefully this manual made the getting-to-know process of your new **JNIOR** very quick and easy. The **JNIOR** has many more wonderful tools and features available, and are explained in detail in the supplied documents.

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