

This Version of the RN700 (Build 1100, Tue Mar 14, 2006 or later) supports a simple method to create multiple Wireless Serial links to Bluetooth Serial Adapters (Roving Networks FireFly, BlueportXP, RNXX embedded modules, or any other device supporting Bluetooth Serial Port Profile) These connections are bi-directional, and the data stream has no modifications; it is a raw data stream. Up to 7 simultaneous connections are supported.

Usage Model

The SPP Server is configured using a webpage. The user enters the Bluetooth addresses of the devices to be connected, and the Base TCP start port of the Ethernet ports that will be offered (default = port 6000). The AP will automatically attempt to connect to the remote Serial Device over Bluetooth when the host connects to the TCP port via Ethernet. To access these devices, Ethernet connected servers and PCs simply open the TCP port associated with the device. For example, by default, device 1 is set to communicate on port 6001. If the remote device is not connected (not in range or powered down) the AP will close the TCP port. Device 2 will connect at port 6002, etc.

Configuration – IP Address

DHCP

The RN-700 defaults to using a dynamic IP address on the Ethernet (using DHCP). You should be able to check with your DHCP server to find out the address that was given. Another way to determine what address it acquires is to connect an ASCII terminal or terminal emulator (e.g. Hyperterm on Windows) through a null-modem cable to the console DB9 port on the RN-700 (comm. Parameters are 115200 baud, 8N1). When booting the RN-700, look for a line that reads something like this:

```
eth0:DHCP set address 10.20.20.127, netmask 255.255.255.0, router  
10.20.20.20 In this case, the unit has acquired address 10.20.20.127.
```

You may also browse the device through Bluetooth, and the name will include the IP address. For example, If you search for Bluetooth devices, you will see **RN_020320[10.20.20.127]**, where in this case 020320 is the last 3 bytes of the units BT address, and 10.20.20.127 is the IP address that was assigned by DHCP.

If you need to set a static IP address, the easiest way to configure this is to browse to the IP address of the unit. On the main page, click LAN and on the next page, click CHANGE. Enter the values and click UPDATE. You need to reboot the RN-700 to have the changes take effect.

NO DHCP - FIXED ADDRESS (using cross over cable)

If DHCP service cannot be found, and no IP address is set, The RN-700 defaults to using the fixed address of 192.168.2.253. You can set a fixed address on your PC or workstation to the same subnet, for example, 192.168.2.250, and then browse this URL: <http://192.168.2.253> . Access the main web page on the RN700, and then configure the settings just as you would in the DHCP case above.

USING the Serial Console

Connect an ASCII terminal or terminal emulator (e.g. Hyperterm on Windows or teraterm, provided on roving networks support page, (<http://www.rovingnetworks.com/support/teraterm.zip>) through a null-modem cable to the console DB9 port on the RN-700 (comm. Parameters are 115200 baud, 8N1).

Here are the commands used to configure the IP settings:

IP address	<i>setbox ip N.N.N.N</i>
Netmask	<i>setbox netmask N.N.N.N</i>
Router	<i>setbox router N.N.N.N</i>
Primary DNS	<i>setbox dns1 N.N.N.N</i>
Secondary DNS	<i>setbox dns2 N.N.N.N</i>
Hostname	<i>setbox hostname name</i>

In all of the above cases, make your changes and then reboot or power cycle the unit.

Configuration – Bluetooth Serial Port Profile Devices

To configure the SPP server, Browse the IP address of the unit. The main web page should show the link **SPP-Server** Click on this link. You will see a page offering **Configure SPP Server**. Click on this link. Enter the Bluetooth Address(s) of the Serial adapters you would like to connect to. Most Serial adapters use RFCOMM Channel 1, but this can be changed if necessary here. Once configuration is complete, reboot or power cycle the unit, and the new connections will take effect.

Status

You can check the status of devices to see whether or not they are connected using the status page. It can be found by clicking on the **SPP-Server** page , and then **SHOW STATUS** page . For more advanced status and control, see below.

Advanced Real-time control, and searching for Bluetooth Devices

This release of RN700 adds a control port to allow the host system to dynamically configure the Bluetooth address associated with each data port, as well as to retrieve port status, scan for Bluetooth devices within range and to retrieve the device name associated with a BT address. Changes made through the control port take effect immediately but do not persist through a reboot. On reboot, the unit reverts to the configuration in flash memory. The control port is the configured “base port”. Thus, if the base port is configured to 6000, then the control port is 6000 and the data ports are 6001 through 6007.

The control port takes commands, terminated by CR (0x0D) or NL/LF (0x0A). Blank lines are ignored. Each command consists of a command word, followed by zero or more parameters, separated by spaces. Each command causes the RN700 to respond with a response line (or, with one command, several response lines) terminated by a NL/LF (0x0A).

Where a command refers to a “slot number”, this is a number from 0 through 6 corresponding to the data ports (slot-number = data-port – base-port – 1).

The following is the list of valid commands:

- “numslot” responds with simply the number of available slots. In the current code, the response is always “7”.
- “assign <slot> <btaddress>” associates the specified BT address with the slot. The BT address must be specified as “xx:xx:xx:xx:xx:xx” where “x” is a hex digit. To disable a port use address “00:00:00:00:00:00”. If this command is sent while the data port is connected, it will be automatically disconnected. For example: Assign 3 00:4C:2F:99:10:C0
- “getstat <slot>” returns the status of the specified slot. The return is of the form: “status:<state> <port> <btaddr>”. Where <state> is the state keyword (one of “disabled”, “waiting”, “connecting” and “connected”), <port> is the data port number and <btaddr> is the associated BT address (or “none” if state is “disabled”).
- “abort <slot>” disconnects the port associated with this slot. A new connection can then be made.
- “scan” performs a BT inquiry to scan for devices in range. There is an optional argument of the number of time units (1.28 seconds), in the range of 1 – 10 (we do not recommend less than 3). The default is 6 time units. This returns one line for each detected device, followed by an “ok”

after the last. Each device response is of the form “<btaddress> <cod>” where <cod> is the BT class-of-device as a C hex integer (e.g. “0x12345678”).

- “name <btaddress>” requests the BT “friendly name” associated with a device. The response is of the form “name:<name>”. If the name cannot be read, the response is “name:”.
- “reboot” Response is “ok” before closing the connection and rebooting.

In order to respond quickly to network failures and prevent the control port from hanging on, for example, a host crash, there is a 60-second timeout. If the control port has not received any characters from the host in this time, it closes the connection to allow another connection. The host may simply send blank lines to keep the connection alive. If the host wants to get responses to know that the access point is still alive, it can send “numslot” commands.

The control port only supports one connection at a time. If a second connection is attempted, that host will receive a “connection refused” error. When the connection is closed, the control port quickly listens for a new connection. Except as noted above, successful commands receive a response of “ok”. Any error in a command will generate as response of “error”. There are a few cases where failure conditions will create a response of “error-internal”. (In this case, reboot the access point. Please report these occurrences to roving networks.)

Enhancements, other versions

Other versions of the code are available which add the ability to automatically search and connect to Bluetooth devices (including using wildcarding for address matching/filtering) and the ability to stream multiple devices over a single TCP port, with a defined protocol and control channel. Contact Roving Networks for more information.