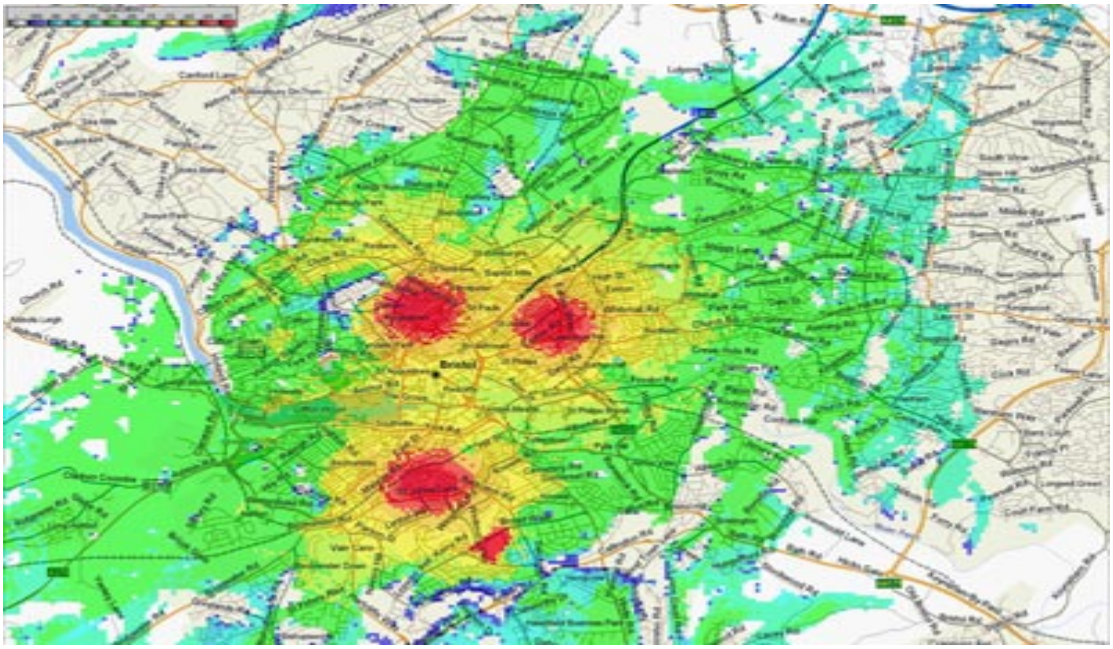
Expanding the Coverage

Terminals Servers in a *RavTrack*™ System



Document Version A1

April 2008

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1. Overview

There are a number of ways to expand the radio coverage of a RavTrack GPS tracking system. Any (or all) of the following methods will increase the coverage of a *RavTrack* GPS tracking system.

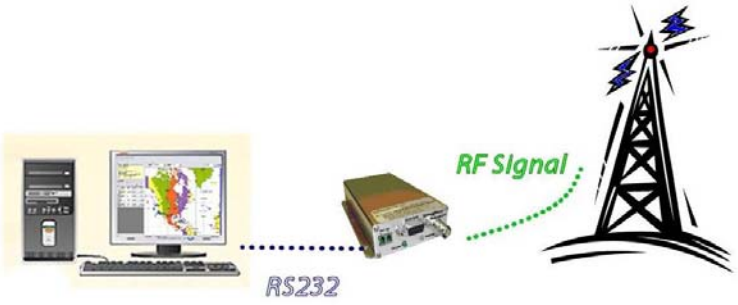
1) Increase the height of the receiving antenna. This may mean locating the base station on top of a tall building or even a mountain.
2) Add more base stations. *RavTrack PC* supports up to 6 base stations connected to it.
3) Install repeaters, and relay position reports.

A handy device that can be used with any of these methods is a “Terminal Server”, also called an IP Server, Telnet Server, or Serial IP converter. .

A terminal server delivers standard serial-to-Ethernet connectivity simply and reliably. It easily addresses the need to connect individual devices to a computer network over industry standard Ethernet.

Without a terminal server, the transceiver used to receive the position reports in a *RavTrack* system must be directly connected to the PC running the tracking software. An RS232 serial port (COM Port) on the PC will receive position reports directly from a *Raveon M7 GX* transceiver using one of its RS232 serial ports.

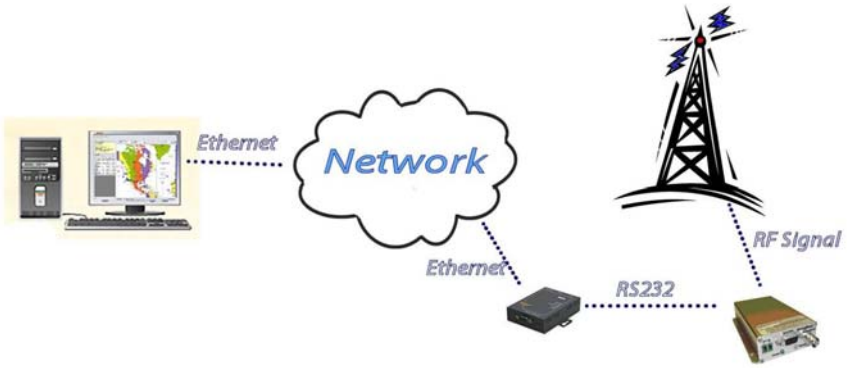
AVL System using only RS232



RS-232 serial cables are very limited on how long they may be run, so the RV-M7 transceiver must be physically close to the PC running the AVL software.

Using a terminal server, an *M7* GX transceiver may be located a long distance away from the PC that is processing the AVL data from it. It may easily be located across town or in another country.

Typical Terminal Server Setup

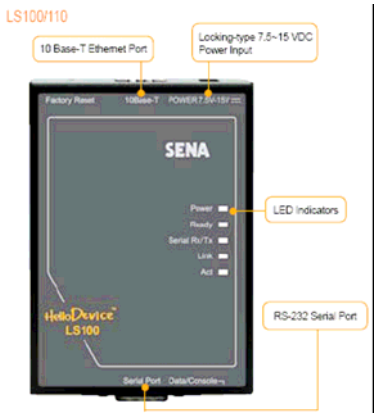


A terminal server converts the RS232 serial data to/from TCP/IP, the protocol used in most modern computer networks. A terminal server has two connections on it

1) An RS-232 serial port

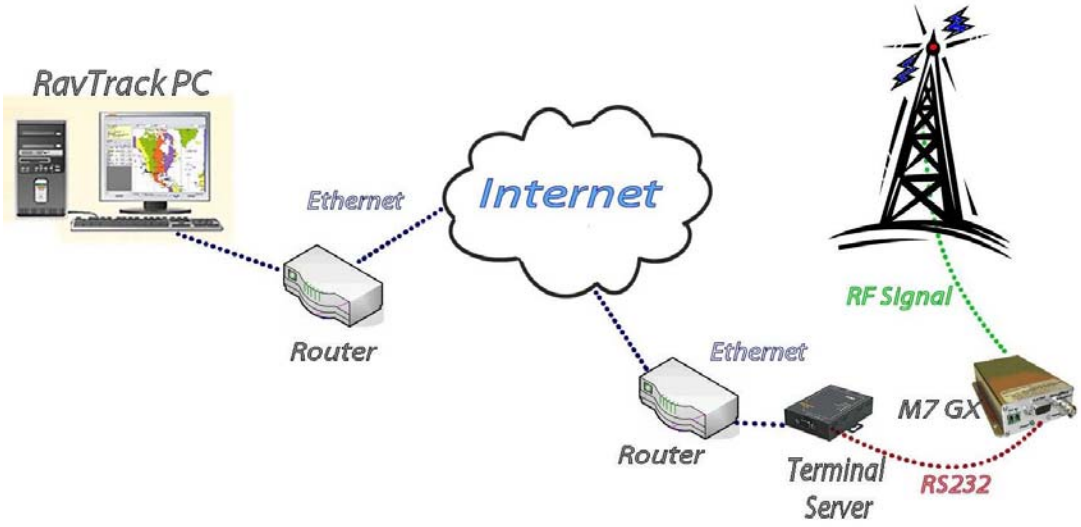
2) A network interface port, typically an Ethernet or WiFi.

A typical Terminal server is show below. It is a Sena LS100.



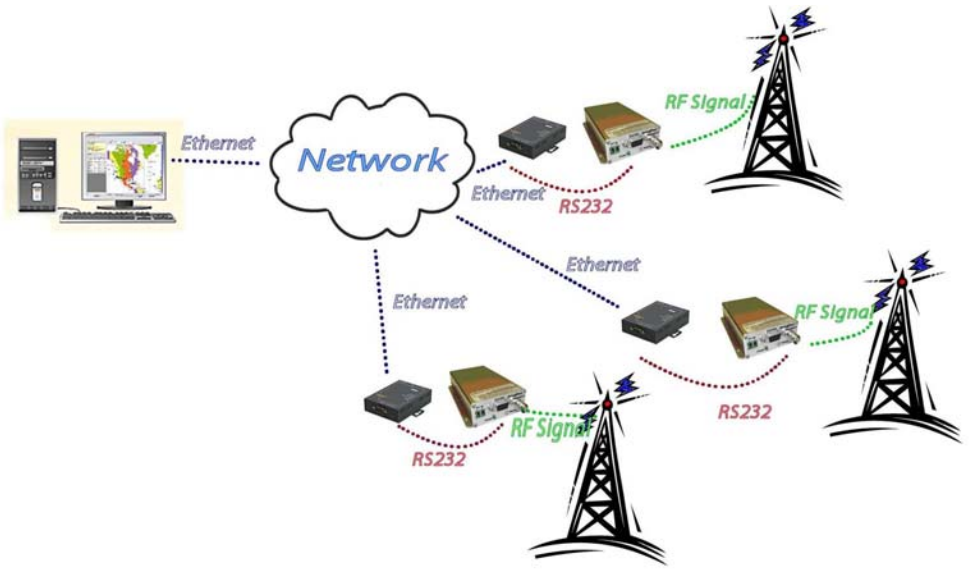
The RS232 serial port of the terminal server is connected to the RS232 serial port of the Raveon *M7 GX* transceiver. The network connection is connected to the computer network that the AVL PC is located on. This may be a corporate or private LAN, or to the Internet via a router – any network that supports TCP/IP.

When using a terminal server to connect to the RavTrack PC through the internet, Data from the *M7 GX* will pass through the terminal server and through a number of routers.



To create a wide-area RavTrack system, multiple terminal servers with multiple M7 GX transceivers may be used. RavTrack PC software version 1.4 and higher support up to 6 simultaneous connections, either RS232 or TCP/IP.

Wide-Area RavTrack System using Terminal Servers



2. Terminal Server Protocols

2.1. Configuration options

Terminal servers often support a large variety of protocols. For use with *RavTrack PC*, two of them are most appropriate.

1) *TCP Client using a Socket or IP Port.*
2) *Virtual COM port.*

Either method of utilizing a terminal server will work with RavTrack PC, and it is up to the system installer to choose the method most suitable for the installation.

2.2. TCP/IP Socket Services Control

TCP Socket communications can be used to enable a software application to communicate with a serial device that has been network-enabled using a terminal server, without installing a driver on the PC running *RavTrack PC*.

Socket communication is usually based on either TCP or UDP. TCP is the protocol of choice for applications where an end-to-end connection with guaranteed packet delivery is required. The client and server in a TCP based connection need to maintain an open and active link to exchange data. This provides a reliable connection between two endpoints, which is why RavTrack PC uses TCP sockets.

With TCP Sockets, one device is the “client” and one is the “Server”. RavTrack PC implements a TCP Socket server, so the terminal server must be configured to be as the TCP Client.

Important: The terminal server must be configured as the TCP Client.

When the terminal server is configured, the following parameters must be set:

Protocol ..... *TCP Client*

Serial Port Settings:..... *38400, 8 data, no parity, 1 stop*

IP address of the TCP Server ..... *The IP address of the PC running RavTrack PC*

Socket Number (also called TCP Port) .. *The TCP Port configured in RavTrack PC. Usually 53885 – 53890.*

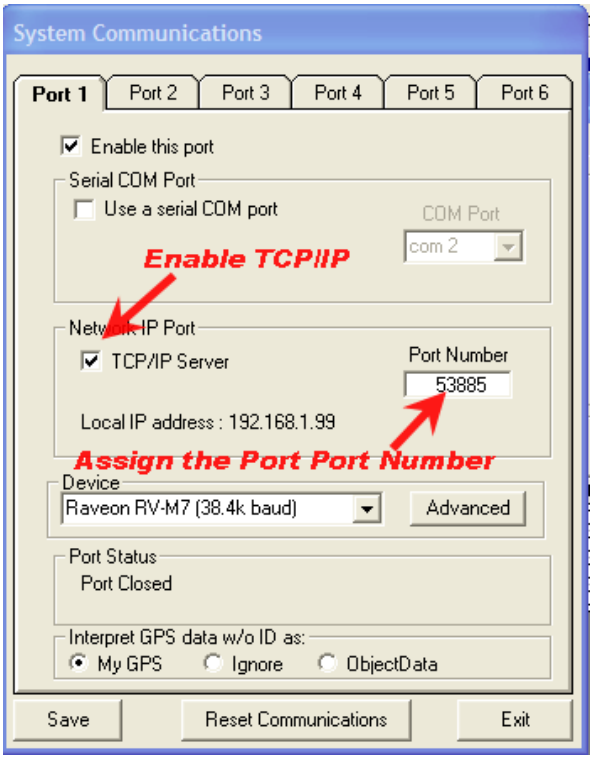
2.3. Virtual COM Port Driver-Based Control

“Virtual COM ports” allows applications to talk to devices across a network as though the devices were attached directly to the host server or PC, when in fact the devices are connected to a terminal server. They require a terminal server specific software driver to be installed on the PC running *RavTrack PC*. Once the driver is installed, the PC will have a virtual COM port connection to the terminal server. It will appear as another COM port on the PC.

All communications to/from the terminal server will take place through this virtual COM port. Virtual COM ports establish a connection between the PC and a networked terminal server device by creating a local COM or TTY port on the host, thereby delivering fully transparent and robust network connectivity for serial devices.

3. Configuring RavTrack PC

To configure RavTrack PC to work with a terminal server configured to use TCP Sockets, select ***Config IO*** from the main RavTrack PC screen. Select one of the 6 *RavTrack PC* "Ports" and enable it.



On the System Communication window, the operator is able to see the IP address of the PC that *RavTrack PC* is running on. In the example above, it is 192.168.1.99.

Each of RavTrack PC's 6 communication "Ports" may be configured to use either RS232 or TCP Sockets. When configuring for TCP sockets, a TCP Port Number must be assigned to the RavTrack PC port. The default TCP Port Number for RavTrack PC's port 1 is 53885. For #2, it is 53886, and so forth.

The user may configure *RavTrack PC* to use any valid TCP Port Number, but many TCP Ports are used by well-known applications. A quick internet search for *TCP "well known ports"* will find many lists of applications that use various TCP Ports.

4. Terminal Server Vendor Links:

Moxa NPort: http://www.moxa.com/product/NPort_6150.htm

Digi PortServer: http://www.digi.com/products/serialservers/portserverts.jsp

Lantronix: http://www.lantronix.com/device-networking/external-device-servers/intellibox-io.html

MRV: http://www.mrv.com/oobn/console-servers/

Patton: http://www.patton.com/products/pe_products.asp?category=156

Sena: http://www.sena-terminalservers.com/products/1-port_terminal_servers/