

# Condor Series Serial Communication Options

The document illustrates how to setup a transparent serial communications link in a point to point application. This setup will use the Serial Gateway TCP Server and Client configuration options on the module's serial web page. This document shows web page configuration only.

Configuration software has very similar selections, you should just need to choose the appropriate serial port and select configuration parameters as per below web page selections.

There are other possible configuration options for serial communications which will also be briefly explained at the end of the document.

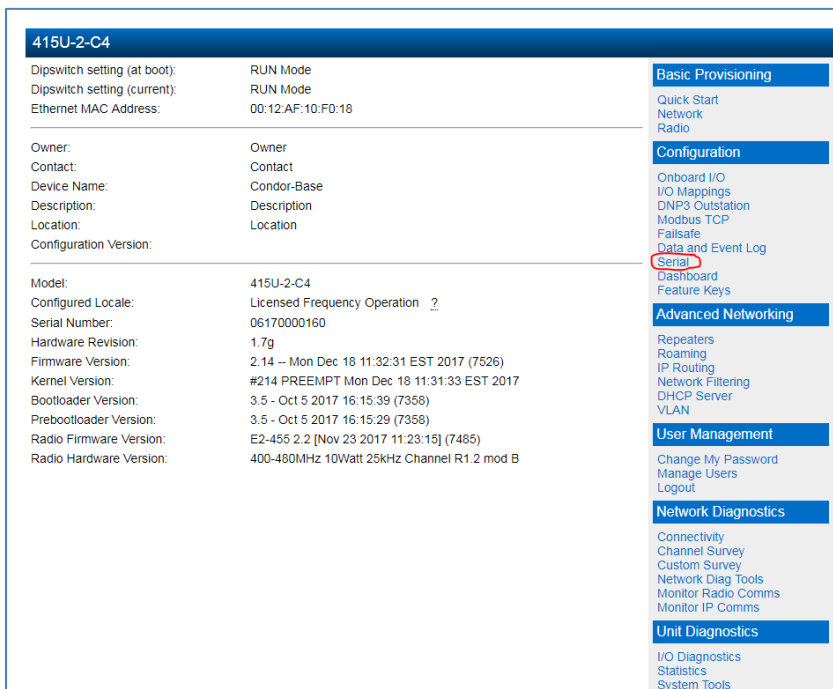
## Application

This application should be read in conjunction with the Condor Series Radio, i.e. 415U-2,415-U-E, 215U-2 & 925U-2 User Manuals, these provides extensive details on hardware setup and configuration of the Radio's. It is expected the reader has a firm understanding of Ethernet devices and how they communicate over a TCP/IP network.

It is also expected that Condor series modems are already setup to communicate with each other. Check "Connectivity" link on the module web page for status and if not connected or not setup then see the User Manual for the setup procedure.

Connectivity							
Connected Wireless Devices:							
Current Frequency: Tx 444.425000MHz, Rx 444.425000MHz; Current Bandwidth: 25.000kHz							
Device Name	IP Address	Interface	Tx Rate	RSSI	Compress	Link Uptime	Link Count
Condor-Remote1	192.168.17.81	radio0	96k	-42dBm	Yes	0000:00:53:38	6

When the Condor modem can be accessed via Windows internet Explorer select the "Serial" configuration from the right-hand menu (Menus may vary slightly with different Condor models).



**415U-2-C4**

Dipswitch setting (at boot): RUN Mode  
 Dipswitch setting (current): RUN Mode  
 Ethernet MAC Address: 00:12:AF:10:F0:18

Owner: Owner  
 Contact: Contact  
 Device Name: Condor-Base  
 Description: Description  
 Location: Location  
 Configuration Version:

Model: 415U-2-C4  
 Configured Locale: Licensed Frequency Operation ?  
 Serial Number: 06170000160  
 Hardware Revision: 1.7g  
 Firmware Version: 2.14 -- Mon Dec 18 11:32:31 EST 2017 (7526)  
 Kernel Version: #214 PREEMPT Mon Dec 18 11:31:33 EST 2017  
 Bootloader Version: 3.5 - Oct 5 2017 16:15:39 (7356)  
 Prebootloader Version: 3.5 - Oct 5 2017 16:15:29 (7356)  
 Radio Firmware Version: E2-455 2.2 [Nov 23 2017 11:23:15] (7485)  
 Radio Hardware Version: 400-480MHz 10Watt 25kHz Channel R1.2 mod B

**Basic Provisioning**  
 Quick Start  
 Network  
 Radio

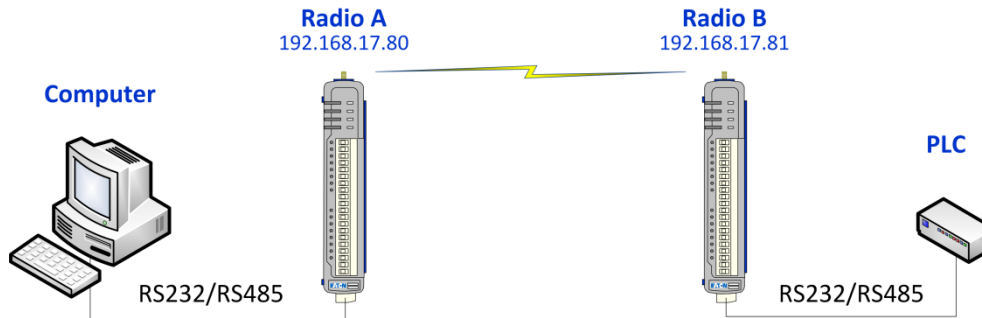
**Configuration**  
 Onboard I/O  
 I/O Mappings  
 DNP3 Outstation  
 Modbus TCP  
 Failsafe  
 Data and Event Log  
 Serial

**Advanced Networking**  
 Repeater  
 Roaming  
 IP Routing  
 Network Filtering  
 DHCP Server  
 VLAN

**User Management**  
 Change My Password  
 Manage Users  
 Logout

**Network Diagnostics**  
 Connectivity  
 Channel Survey  
 Custom Survey  
 Network Diag Tools  
 Monitor Radio Comms  
 Monitor IP Comms

**Unit Diagnostics**  
 I/O Diagnostics  
 Statistics  
 System Tools



## Configuration

To demonstrate the setup, I am connecting a computer RS232 port through radio “A” to a PLC connected to the RS232 port of Radio “B” (see diagram above)

The example is showing RS232, but it could be RS485 at either end or RS232 to RS485, it does not matter as long as the configuration is setup correctly.

### Radio “A” TCP Server/Client Setup

(Example: IP address 192.168.17.80)

Serial parameters need to be setup to match the serial device, i.e. baud rate, parity, stop bits, flow control, etc.

On the Serial Gateway Mode, configure one radio to be a “TCP Server” and the other end to be a Client (In this case Radio “A” is the Server). Note: In a point to point Setup it does not matter which end is the Server or the Client just that there is one of each.

Change the Character Timeout to 5mSec and leave the Packet size to 500 bytes for the moment, these can be adjusted later if need be.

Character Timeout is the maximum delay between the received serial characters before the packet is sent via the network and the Packet Size is the number of received bytes that will be buffered before a packet is sent. Most applications will work fine with these default settings but in special applications they may need to be adjusted.

Next select a Listening port in this case “24” is the default. It does not matter what this is just that it is the same at both ends of the serial link.

When completed, press “Save and Activate Changes”

RS-232 Serial Port Configuration:

RS-232 Port Type:

Data Rate:

Data Format:

Flow Control:

RS-232 Serial Gateway:

Serial Gateway Mode:

Character Timeout (msec):

Packet Size (bytes):

Listen Port:

### Radio “B” TCP Server/Client Setup (Example: IP address 192.168.17.81)

Now connect to the second modem and again navigate to the “Serial” page.

Set the serial parameters appropriately to match the application, then set the Serial Gateway Mode to be “TCP Client”

Again, change the Character Timeout to 5mSec and leave the Packet size at 500 bytes for the moment, they can be adjusted later if need be.

Make the “Remote Device Port” the same port number that was used on the first mode, i.e. 24.

Next enter the IP address of the first modem in to the “Remote Device IP Address”

When completed, press “Save and Activate Changes” Modems should now be able to communicate serial data from the one modem serial port to the other.

To test this, connect a terminal (Windows HyperTerminal, Putty, etc) to the serial port of each modem, and type characters into one terminal and you should see them appear on the other terminal, you could also connect the serial ports to a Modbus Master at one end and poll a Modbus slave connected to the other.

**RS-232 Serial Port Configuration:**

RS-232 Port Type

Data Rate

Data Format

Flow Control

**RS-232 Serial Gateway:**

Serial Gateway Mode

Character Timeout (msec)

Packet Size (bytes)

Remote Device Port

Remote Device IP Address

### Other Serial options

For Point to Point applications you can use TCP Server & Client (explained above) however there is another selection in the Serial Gateway Mode of “UDP Point to Point”

#### “UDP Point to Point”

This option is similar to the TCP Server/Client but uses UDP rather than TCP communications. What this means is that the serial communication us broadcast messages which do not send receive acknowledgements and therefore mean no message retries. This can improve busy systems because it reduces the number of messages being sent but also means there are no retries if the message fails to be received at the destination. Depending on the serial protocol, polling speeds and frequency this may not be a major issue, it’s just another communication option that can be explored if need be.

Configuration is very similar in that all radios have a Remote Device Port number (24) which needs to be the same on both radios and the Remote Device IP address needs to point to the other radio, similar to TCP client configuration.

#### “UDP Multicast”

The UDP Multicast option in the serial menu is used for Point to Multipoint serial communications, similar to what RS485 is to on wired connections but over wireless.

Configuration is done by selecting “UDP Multicast” from the dropdown “Serial Gateway Mode” list and as it’s a UDP broadcast communication it requires **all** communicating radios to have the **same** Multicast Group Port number and Multicast Group IP Address.

**RS-485 Serial Gateway:**

Serial Gateway Mode

Character Timeout (msec)

Packet Size (bytes)

Multicast Group Port

Multicast Group IP Address  (range 224.0.1.0 to 238.255.255.255)

When a serial packet is sent all radios will receive the message and only output to the serial port if the Multicast Group Port and IP address are the same.

### Amendment Register:

Issue No.	Date	Details of Amendment
1.0	19/04/18	Draft Issue
1.1	16/10/18	Elpro Brand
1.2	22/7/24	Added 215, 925 and made generic