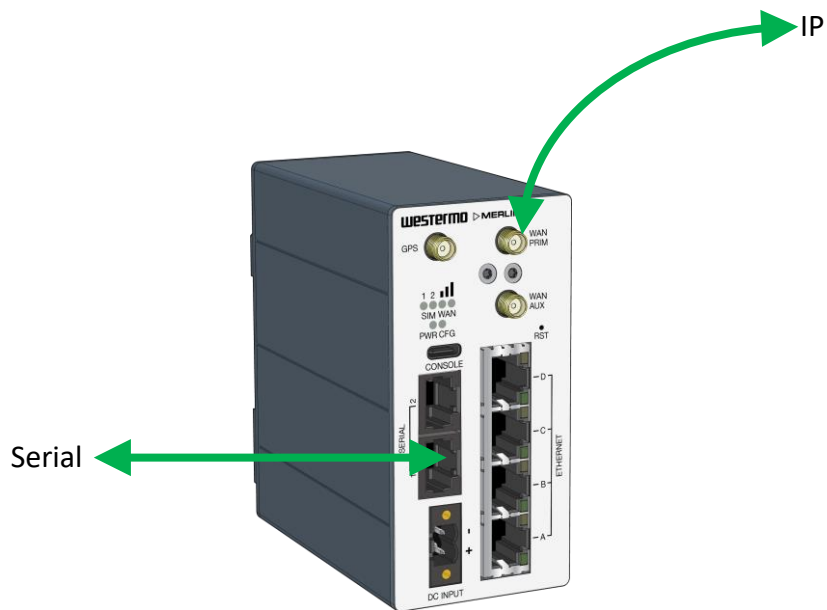


Merlin Serial over IP

Using Terminal Server



Overview

This application note shows how to configure some of the Serial over IP functions within a Westermo Merlin 4407 router. However, it is applicable to all routers in the Merlin range.

Firmware version used: SXL-25.04.16.000

Assumptions

This application note shows the Merlin-4407 router and assumes the router has a factory default configuration.

This application note can be applied to the other routers in the Merlin range.

Corrections

Requests for corrections or amendments to this application note are welcome and should be addressed to support.uk@westermo.com

Requests for new Application Notes and Quick Notes can be sent to the same address.

Introduction

The Merlin routers with serial ports offer a highly configurable Terminal Server and related SCADA protocol functions.

This application note aims to introduce the basic serial over IP functionality typically used in legacy Westermo products but using the Terminal Server functionality of the Merlin.

The TSERVD package is used to provide the Terminal Server with this application note covering the basic webUI configuration for TCP Server, UDP mode and UDP Multi Point sometimes also known as UDP MUX.

It is possible to fine tune many other settings than what is covered in this note and those details are covered in the Merlin management guide. This note will cover getting a connection which can be tested using the usual methods such as PCs with serial ports and terminal software such as Teraterm or PUTTY to pass characters over the link.

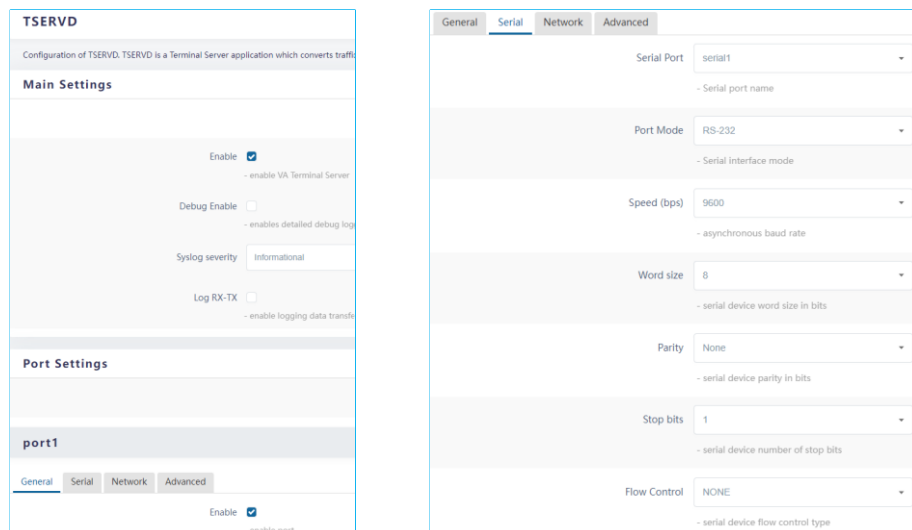
General Settings

In the webUI go to **SCADA->Terminal Server** and enable the **Terminal Server (TSERVD)** and then enable the port to be used.

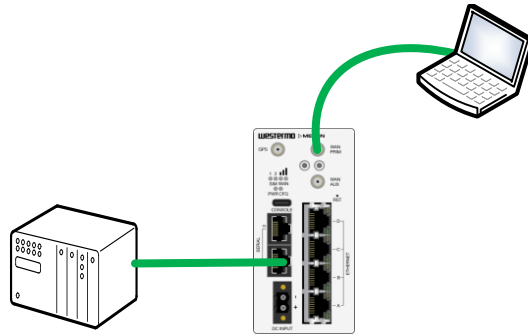
For this application note, serial port 1 is being used on a Merlin-4407 but the principle is the same for all ports and models.

At this stage the port 1 reference is an internal label, so in port 1 settings select the Serial 1 for the physical port. On a Merlin with only 1 serial port this will already be selected.

Select the Serial tab and set the serial parameters to match the connected device, in this example 9600, 8, N, 1 was used.



TCP Server



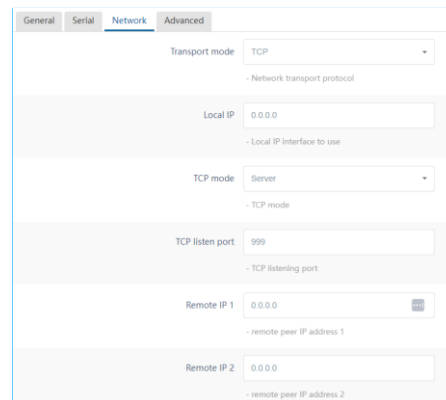
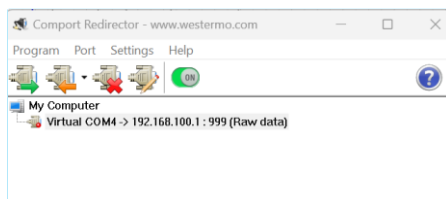
This example connects a PC using Comport Redirector to port 1 on a Merlin.

Go to **SCADA->Terminal Server** then enable the **Terminal Server (TSERVD)** and the serial port being used. For this example port 1 is used.

Setup the **Serial** tab as described in the general settings section of this application note and then select the **Network** tab.

Set the **transport** mode, **interface** to listen on (LocalIP), **mode** and listening **port**. For this example we will allow it to listen on any IP so 0.0.0.0 is used and it will be a TCP Server listening on the default port 999. This can be locked to a particular interface IP address later as part of security improvements.

Click **Save and Apply**.



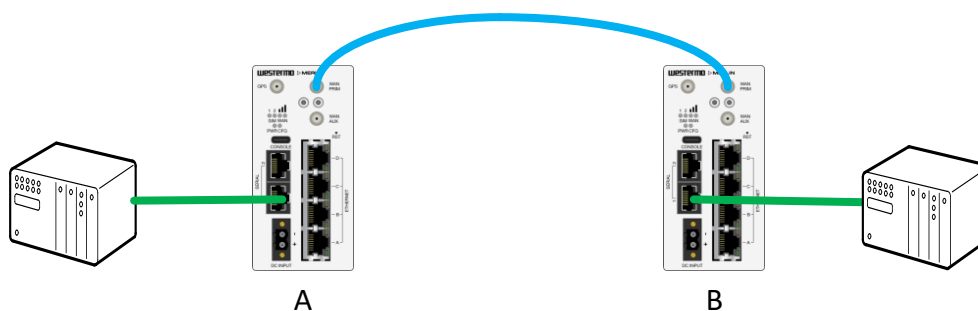
Connect a virtual comm port software to the Merlin IP and port number. In this example Westermo Comport Redirector was used with the default LAN IP and TSERVD TCP port 999 were used.

The principle is the same if the Merlin was remote and the PC and Merlin had a routed path between them such as using a VPN. As long as the traffic type can pass over the connection and is allowed through any firewalls in the path.

Test with a terminal package and connect to the virtual comm port on one PC and the serial port on the Merlin and pass data.

The connection status can be seen under **Status->Terminal Server** on the Merlin.

UDP point to point



The UDP mode allows for a simple method to connect two Merlin serial ports. This method was often used to replace legacy leased line type links with a VPN used between the Merlin to securely carry the data between the two sites

It is also possible to configure a point to point link using TCP Client and Server mode in a similar way.

Setup the **Serial** tab as described in the general setting section of this application note and then select the **Network** tab.

Set the **transport mode** to **UDP** and then configure the local **listen IP** and **port**. In this example the default listen on 0.0.0.0 will listen on all interfaces but this can be changed to a specific interface IP later as part of security improvements. The port 9000 is just an example port number and other spare UDP port numbers could be used.

In Merlin A set the remote IP to be that of Merlin B and vice versa so the serial setups are sending to their remote counterpart. In this example LAN ports are used but these connections can be direct to WAN address or over a VPN depending on the network requirements.

Click **Save and Apply**.

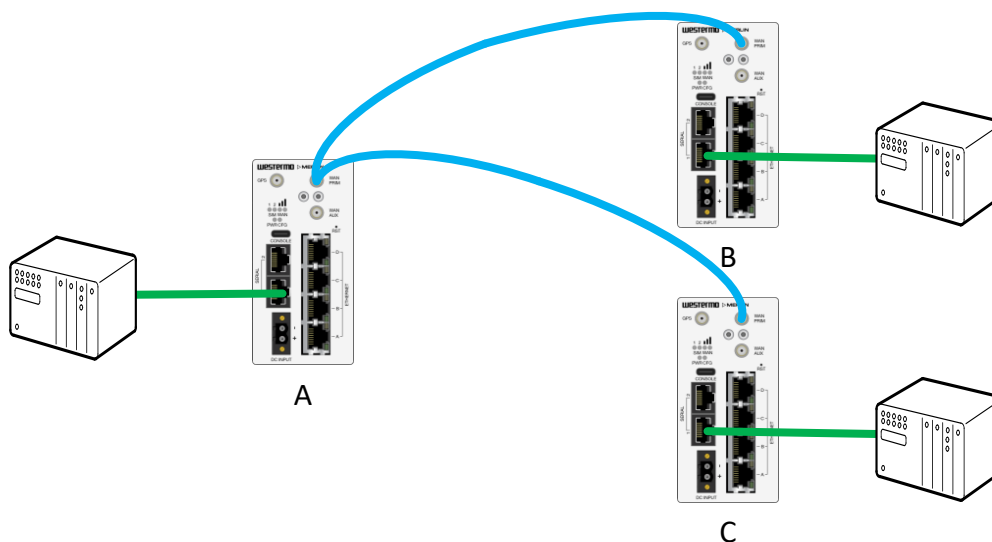
The screenshot shows the configuration interface for Merlin A, port1, Network tab. The Transport mode is set to UDP. The Local IP is 0.0.0.0. The Local UDP Port is 9000. The Remote IP 1 is 192.168.100.2. The Remote UDP Port is 9000.

A

The screenshot shows the configuration interface for Merlin B, port1, Network tab. The Transport mode is set to UDP. The Local IP is 0.0.0.0. The Local UDP Port is 9000. The Remote IP 1 is 192.168.100.1. The Remote UDP Port is 9000.

B

UDP Multi Point (UDPMUX)

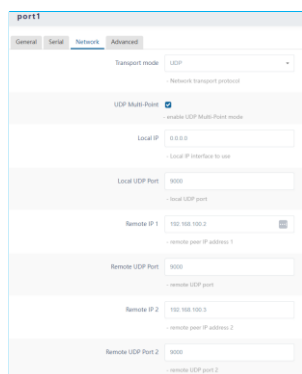


The UDP Multi Point setup expands on the UDP to allow the central Merlin to communicate to up to 8 remotes.

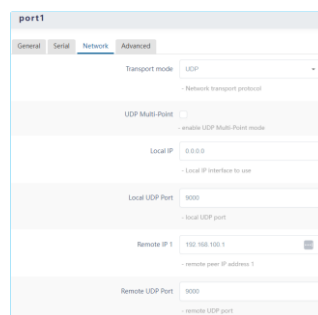
The remote sites are configured the same as UDP to communicate only with the central site, in this example Merlin A.

In the central Merlin typically the one where the SCADA would be polling out towards the remote sites, select the **UDP Multi Point** option and enter the **remote IP** and **port** number for the remote sites. In this example the LAN IP addresses for sites B and C have been entered. As for all serial over IP functions, these IP addresses could be remote WAN IP or over VPNs.

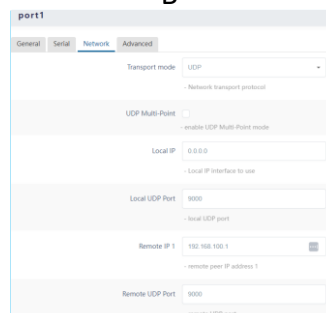
Click **Save and Apply**.



A



B



C

Routing and VPNs

The examples shown in this application note have all used local LAN connections to help focus on the serial over IP functions.

This is always a useful place to start when performing initial setup and testing of serial over IP functionality. Doing this helps ensure the serial traffic is passed and a baseline set so the only difference when adding additional network media and routing will be factors such as a firewall blocking the traffic or additional latency affecting the overall poll and response time.

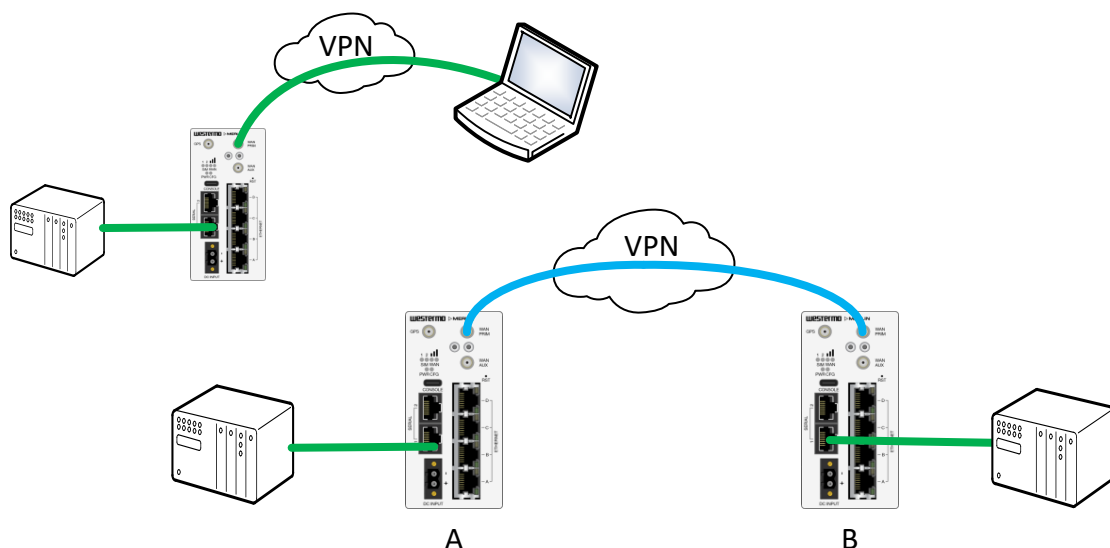
Once the serial data is packetised then it be be carried and routed over all sorts of media. Depending on requirements, the traffic can then be securely encrypted end to end between the routers by using a Virtual Private Network (VPN).

The most common methods of VPN used with the Merlin routers are IPSec and WeConnect but other VPN methods are available. See the product datasheet for further information.

There is an IPSec VPN application note available for Merlin to Merlin connections. Whether the IPSec VPN is to another Merlin or to another vendor VPN concentrator, the serial over IP data can be passed encrypted between the routers using a VPN.

WeConnect is a hosted service using SSL VPNs to simply and securely connect Westermo routed devices such as the Merlin with each other and/or with PCs, tablets and similar devices using OpenVPN. More information about WeConnect is available on www.westermo.com

Routed Serial over IP examples



Revision history for version 1.0

Revision	Rev by	Revision note	Date
00	VC	Release version	27/11/24
01			
02			
03			
04			
05			
06			
07			