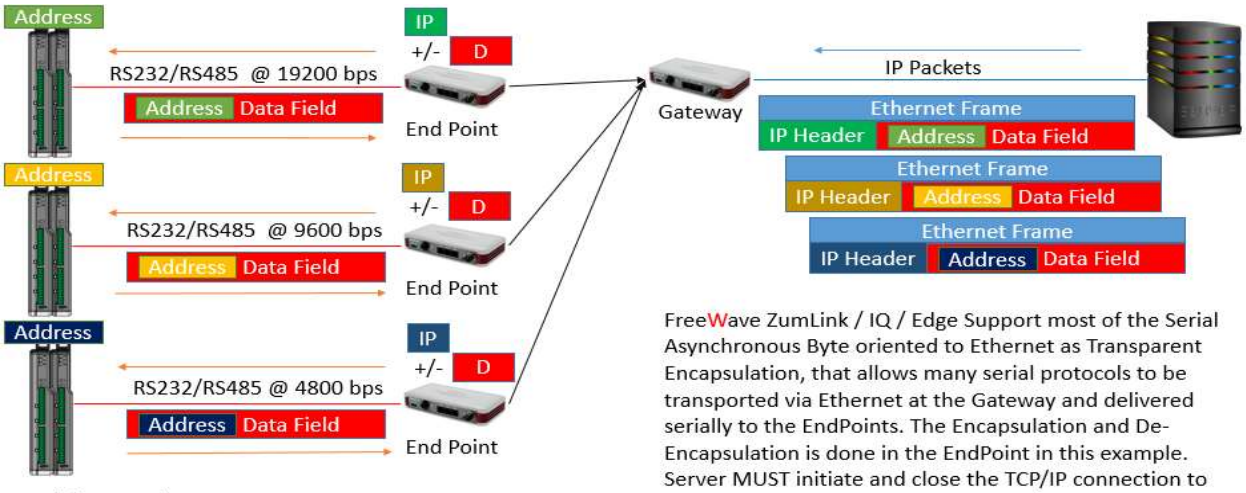
Terminal Server & Serial Protocol Set up

ZumLink, ZumIQ and ZumEdge (referred to below as just "Zumlink") have a feature to Encapsulate and De-Encapsulate a message (PAYLOAD DATA) on serial ports COM1 and COM2 coming from an IP Device/Host that is sending a TCP IP Packet. This TCP IP Packet Data Field has the PAYLOAD DATA which has the Serial Protocol Address and the Commands / Data that are to be passed to serial devices. It is important that the Protocol Address of the unique device is in the PAYLOAD DATA.

Some of the Serial Protocols that have been used with FreeWave Terminal server are DNP3.0, DF1, Modbus RTU, BSAP and many more as long as the protocols are *Asynchronous Byte oriented*.



Serial Protocols Customer uses:
DNP3.0 , DF1, Modbus RTU
Modbus TCP, BSAP, and more

FreeWave ZumLink / IQ / Edge Support most of the Serial Asynchronous Byte oriented to Ethernet as Transparent Encapsulation, that allows many serial protocols to be transported via Ethernet at the Gateway and delivered serially to the EndPoints. The Encapsulation and De-Encapsulation is done in the EndPoint in this example.
Server MUST initiate and close the TCP/IP connection to each EndPoint IP:Port
Gateway is Transparent and just passes the TCP/IP packet

Detailed Setup & Operations:

- The Host/Server will establish all individual TCP connections to each End Device. Each ZumLink Endpoint / COM port will need one connection.
- The Targeted IP address should be the IP address of the ZumLink EndPoint on port 5041 for COM1 or 5042 for COM2.
- For each ZumLink EndPoint, the Handler in the COM1/COM2 should be configured as **Terminal Server**, this way when the TCP request connection arrives at the ZumLink EndPoint, if the TCP Port matches the configuration in the COM port, a connection will be established. The ZumLink EndPoint keeps the connection open (unless the Host closes it) and keeps in it's table the Source IP:Port that it is connected to. At which point the PAYLOAD DATA in the IP Packet will be sent out of the serial COM port to the PLC/RTU/Device.

- While the connection is established, the PLC/RTU/device serial information/response is sent back thru the ZumLink COM port which will then be encapsulated and sent to the Source IP address:Port (Host/Server).

Note: *Set the Baud Rate, Parity, Stop Bits to match locally to the COM port and the PLC/RTU/Device it is attached to.*

Examples:

Server --- (Ethernet) --- Gateway --- (RF) --- EndPoint 1 (Com1) --- (Serial) --- PLC/RTU
192.168.1.100 192.168.1.200 192.168.1.201:5041 19200bps (DNP3.0/Modbus/DF1)
Server will need to make a TCP connection to 192.168.1.201:5041 to talk to the COM1 at 19200bps

Server --- (Ethernet) --- Gateway --- (RF) --- EndPoint 1 (Com2) --- (Serial) --- PLC/RTU
192.168.1.100 192.168.1.200 192.168.1.201:5042 38400bps (DNP3.0/Modbus/DF1)
Server will need to make a TCP connection to 192.168.1.201:5042 to talk to the COM2 at 38400bps

Server --- (Ethernet) --- Gateway --- (RF) --- EndPoint 2 (Com1) --- (Serial) --- PLC/RTU
192.168.1.100 192.168.1.200 192.168.1.202:5041 9600bps (DNP3.0/Modbus/DF1)
Server will need to make a TCP connection to 192.168.1.202:5041 to talk to the COM1 at 9600bps

Server --- (Ethernet) --- Gateway --- (RF) --- EndPoint 2 (Com2) --- (Serial) --- PLC/RTU
192.168.1.100 192.168.1.200 192.168.1.202:5042 115200bps (DNP3.0/Modbus/DF1)
Server will need to make a TCP connection to 192.168.1.202:5042 to talk to the COM1 at 115200bps

The Default TCP ports used on the ZumLink are the following and each can be modified or changed as needed:

TCP Port	Function
502	Modbus RTU to ZumLink
5021	Modbus RTU over TCP to ZumLink
5041	COM1 on ZumLink

5042	COM2 on ZumLink

Note: *The TCP Port 5041 for COM1 and 5042 for COM2 can be modified if needed to serve specific TCP port assignments needed by the Serial Protocol. Special care in the use of TCP Port numbering is needed to prevent duplication. The ZumLink must be restarted if any of the TCP Port number are modified before that TCP Port becomes usable.*

Special consideration: ZumLink has Read Only Modbus Registers to see statistics and values like Signal Strength, Noise Level etc., of the units. See manual for additional Modbus Configuration.