

Application Note

Topic: Modbus TCP/IP Access of Redundant CPUs via MB+
Product: MEB-TCP
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Abstract

The MEB-TCP may be used to connect Hot Standby Quantum PLCs using Modbus Plus (MB+) to a single Modbus TCP/IP Ethernet address for SCADA access.

Introduction

Connecting SCADA systems to redundant "Hot Standby" Quantum PLCs through MB+ is a simple task if the SCADA has a MB+ interface. The Primary and Standby Quantum PLCs exchange MB+ addresses on switch-over so the SCADA system always communicates with a single MB+ target. If the SCADA system uses Modbus TCP/IP Ethernet instead of MB+, the application becomes more complicated.

When Quantum NOE TCP/IP Ethernet Modules are used in both the Primary and Standby PLCs, each NOE must have a unique IP address. These IP addresses are not exchanged during the switch-over from Standby to Primary. The SCADA system would need to communicate to both NOEs to determine which PLC was the Primary (which is difficult and wasteful of bandwidth).

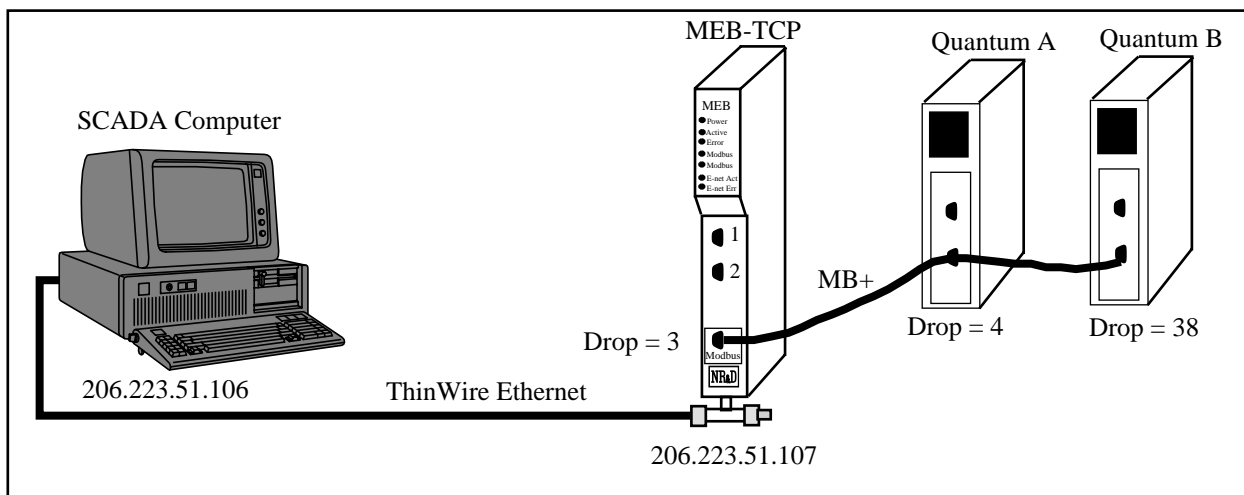
An easy solution is to use an NR&D MEB-TCP to route/translate the Modbus TCP/IP messages from the SCADA system to the Primary using MB+. This setup only requires one target IP address for the SCADA system.

Setup

The figure below shows a SCADA computer with an IP address of 206.223.51.106. On the same subnet is an MEB-TCP with an IP address of 206.223.51.107. The Subnet Mask is set to 255.255.255.0 and the Default Gate is set to 0.0.0.0 since they are on the same subnet. (These settings would be modified for a particular network configuration.)

The MB+ port of the MEB-TCP is connected to the two Quantum PLCs. The MEB's port is set for MB+ drop number 03 while PLC A is set for drop 04 and PLC B is set for drop 38 (04 + 32).

The MEB-TCP is mounted in an NR&D **NRK2** single slot rack with built-in power supply. The MEB-TCP is configured using the MEBSW.EXE application through one of its serial ports with an **SC902** RS-232<>RS-422 converter cable.



Modbus Routing

This application makes use of the MEB-TCP as a Server with the SCADA system being the Client. The Modbus Server Routing Table for the MEB's Ethernet port must be configured to translate the Destination Index from the Modbus TCP/IP messages into downstream MB+ routes. For this example, only a single entry is required as shown below:

Index	Route
0	3,4
1	NONE
2	NONE
3	NONE
etc.	

The first drop in the Route is the drop number of the MEB's MB+ port. The second drop is the target device on the MB+ network. Additional drops may be added to the route to pass through Bridge Plus, Bridge Mux, MEBs, or other MB+ routers. A maximum of 6 drops may be placed in this route when pointing to the MB+ port

The SCADA System will be configured to send Modbus TCP/IP messages to the MEB-TCP's IP address with a Destination Index of 0. These messages will be sent out the MB+ port of the MEB to the Primary Quantum PLC.

Other MB+ devices could be added to the MEB's network and their routes would be placed in the above table. For instance, if a Compact 984 PLC were also placed on the network at drop 05, the route for Index 1 could be set to 3,5. SCADA messages to the MEB with Destination Index 5 would be sent to the Compact 984.

Summary

The Niobrara MEB-TCP provides a simple interface to allow SCADA Systems using Modbus TCP/IP Ethernet to access devices on a MB+ network. In the case of a Hot Standby System, the MEB-TCP is able to provide a single destination for the SCADA system that always points to the Primary CPU.

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