# Networking Multiple Controllers Using Modbus RTU Ext V3 Protocol

**Article Number:** TN1070
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## Information in this article applies to:

EZware-500

| HMI Product(s) | Controller (PLC) Product(s) |
|---|---|
| HMI500 Series | All |

## Summary

The HMI500 Series of graphic operator interface touch panels from Maple Systems provides the capability of accessing data in multiple controllers from a single master station. The HMI500 series can address each object to its respective controller node, giving operators the ability to seamlessly interact with an entire multi-drop network without changing either screen or station numbers. This allows the information to be organized in the most logical way rather than being clumped by controller address, which may not be anywhere near ideal for the operator. In addition, directly accessing the necessary data from each controller eliminates the need to use a "data concentrator" PLC to present a single point of access. With the inherent noise immunity and line-length capability of RS-485, you can view information and control equipment from anywhere in the plant at one convenient location.

Operators can access up to 16 slave controllers using the Modbus RTU Ext V3 protocol in the EZware-500 configuration software, by setting the 'Address Mode' in the System Parameters->{EDITOR} dialog box to 'Extended'. Each object on the HMI is given a Slave address, delineated by a # sign, followed by the register address.

**NOTE**: In this Technical Note, fields requiring action or entry are *italicized*.

## Solution

The system may be wired with either a 2-wire or 4-wire cabling scheme, with a single signal return wire in either case. This is selected in the **Set System Parameters** dialog on the **General** tab.

In general, a 4-wire system is preferred, since it prevents the possibility of the Master (HMI) and Slave (controller) units interfering with each other's transmissions. There is a user-adjustable polling delay.

1. To set the user-adjustable polling delay:
   - Select Edit-System Parameters from the main menu. The **Set System Parameters** dialog box appears.
   - Select the PLC tab.
   - *Parameter 1*-- Enter a value between 1-999 (mSec)
   - It is best to start with a large delay until communication is established with all of the Slave controllers, then decrease it until a minimum reliable setting is reached. This is especially true of 2-wire configurations, as the HMI may reissue a command if the reply is not processed quickly enough.
   - *Send Port 1/F*-- select RS485 4W or RS485 2W.

**Managing Communication Failures**

When communicating with multiple devices over a network, it is possible that one or more of the devices may fail without affecting other devices on the network. When this happens, plant personnel may need to be notified of the failure, while still maintaining communications with the rest of the network.

Starting in EasyBuilder v2.60, communications failures to any node can be managed by the HMI. A series of local bits monitor and control communications failures on both the main and auxiliary communications ports.

| Bits | PLC Node |
|---|---|
| LB9100-9227 | Main port nodes 0 - 127 |
| LB9228-9355 | Aux port nodes 0 - 127 |

When a communications failure is detected on a particular PLC node address, the corresponding local bit will be turned off, and communication to that node address is suspended. To restart communications to that node, the bit must be turned back on.

## More Information

For more information on

Additional query words: 2-wire network, 4-wire network, multi-drop

Keywords: Networking, Modbus RTU

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|---|---|---|
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