

Data Bulletin

Using POWERLINK® G3 Controllers in Pass-Through Mode with ModBus® TCP Ethernet Communications Protocol Class 1210

Retain for future use.

ABOUT THIS BULLETIN

This bulletin provides technical data and information about using POWERLINK® G3 Controllers in pass-through mode with Modbus® TCP Ethernet communications protocol. Pass-through mode is only supported by POWERLINK G3 Controller version 5.

Pass-through mode allows Modbus Serial devices to be addressed through the POWERLINK G3 Controller. Up to 8 devices are supported on the serial chain. The pass-through device (POWERLINK G3 Controller) will pass through all Modbus TCP requests that are not the controller's serial ID or device ID 0. All requests that are passed through are converted to Modbus RTU packets and transmitted out the RS485 serial port. Replies from the serial device are converted back to a Modbus TCP packet and transmitted out to the network.

The front panel or wiring compartment RS232 port is not available when the serial port is in the pass-through mode.

NOTE: Modbus Serial Broadcast and Modbus Tunneling (more than one message in a Modbus TCP packet) are not supported in Pass-Through mode. There is no error checking performed on the packets that are passed through the device.

CONFIGURATION PARAMETERS

By default the POWERLINK G3 device is not configured for pass-through mode. To enable pass-through mode coil 2006 must be set. The device will reset when pass-through mode is enabled or disabled.

Enabling Coil 2006

Follow steps 1–3 to enable coil 2006:

1. Write 0x2222 to register 48200 to enable the command interface.
2. Write 0xEA60 to register 48020 to enable configuration mode.
3. Enable coil 2006 (set the bit to 1).

The controller will reset after enabling coil 2006. The device is now in pass-through mode.

Disabling Coil 2006

Follow steps 1–3 to disable coil 2006:

1. Write 0x2222 to register 48200 to enable the command interface.
2. Write 0xEA60 to register 48020 to enable configuration mode.
3. Disable coil 2006 (set the bit to 0).

The controller will reset after enabling coil 2006. The device is now in stand alone mode.

Adjusting Parameters

If needed, adjust any parameters listed below depending on the devices on the serial chain:

- **Serial Communications Time-out** – device ID on serial chain did not return a reply in specified time - default 1 second (range 1- 120 sec.) – Register 44452. (note: for 2400 baud this parameter must be changed to a minimum of 3 seconds, for 1200 baud this parameter must be changed to a minimum of 4 seconds).

NOTE: The G3 controller does not support sub-second time-outs.

- **Time Between Serial Requests** – time from last packet on serial chain until a new packet will be sent - default 5 (50 milliseconds) (range 1- 100 (10msec to 1 sec.)) – Register 44453.

- **Modbus Serial RTU Packet Time-out** – calculated time which determines the end of a RTU packet (based on baud rate character time) – default 4 characters (range 4-65535 char) – Register 44454.
- **Ethernet Connection Time-out** – closes TCP connection when idle for specified time – default 300 seconds (range 1- 65535) – Register 44210.

ERROR MESSAGES

Table 1: Error Messages

Error Message	Cause
Exception Error 0x0A	Gateway time-out, returned when the requested device does not respond on the serial chain
Exception Error 0x06	Slave device busy, returned when more than eight messages are waiting to be sent out the serial port

DIAGNOSTICS

Table 2: Diagnostic Addresses

Diagnostics web page	http://device IP/PassThru_Status.htm
Ethernet diagnostics	http://device IP/Ethernet_Status.htm

HARDWARE

Table 3: Hardware Specifications

Baud Rates Supported	1200, 2400, 4800, 9600, 19200, 38400
Serial Connection	RS485 – 2 wire
Biasing	10k ohms
Termination	none
Isolation	none

RS485 2-Wire Communications Daisy Chain Parameters

Use Belden® Cable 8723 CN2P22 Shielded E108998 or equivalent.

Table 4: RS485 2-Wire Communications Daisy Chain Parameters

Baud Rate	Distance (1- 8 Devices)	Serial Communications Time-out (Register 44452) RTU
1200	10,000 ft. (3048 m)	4 seconds minimum
2400	10,000 ft. (3048 m)	3 seconds minimum
4800	10,000 ft. (3048 m)	2 seconds minimum
9600	8,000 ft. (24408 m)	1 second minimum
19200	4,000 ft. (1220 m)	1 second minimum
38400	2,000 ft. 610 m)	1 second minimum

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