Powerohm Resistors Digital HRG Pulser

Modbus Setup Instructions

This manual provides general information, installation, and configuration information for Modbus communications for Power Resistors Digital HRG Pulser controllers.

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History of Changes

Rev. No.	Date	Description of Changes
A	August 01 2017	Initial Release
B	May 2020	Update tech support phone number

Introduction

Modbus is a simple and open serial communication protocol that enables communication between a master device and one or more slave devices all connected to the same network. The Digital HRG Pulser operates as a slave device.

For more information about Modbus, refer to www.modbus.org.

NOTICE	Read these instructions thoroughly before installing and operating the controller. If there are still questions, contact your Powerohm Resistors factory representative for assistance.

Hardware Setup

Precautions

CAUTION To avoid risk of **SERIOUS INJURY or DEATH,** and to avoid damage to the system, READ THIS SECTION CAREFULLY. If questions or concerns still exist, contact the Powerohm Resistors factory for further clarification.

RS-485 Connections

The Modbus option uses a 2-wire (half-duplex) RS-485 port, which is located on the backside of the OID stack up. The OID has a panel covering the CPU board, but the RS-485 port is accessible. Figure 2 below shows the location of the port, which is labeled J9.

Figure 1 below shows the wiring diagram for the RS-485 port.

Pin 1 is the A pin, also known as '+', 'D+', and 'TxD+/RxD+'

Pin 2 is the Ground pin

Pin 3 is the B pin, also known as '-', 'D-', and 'TxD-/RxD-'

The voltage tolerance for Pin 1 and Pin 3 is -9V to +14V

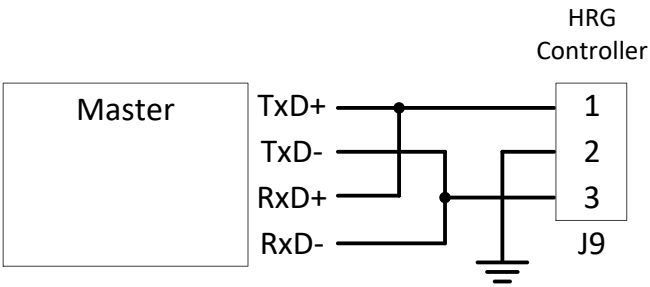

Figure 1: RS-485 Wiring Diagram

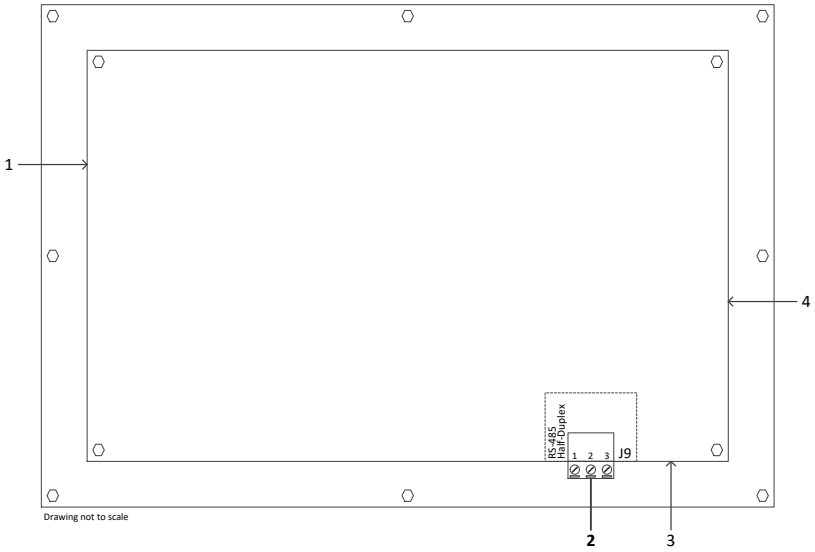

Figure 2: Back view of the OID (located on the enclosure door)

Item	Description
1	USB Port
2	**RS-485 Port and Connector**
3	Horn cable
4	Power cable

Set Point Configurations

To configure the Modbus set points: press the MENU button on the OID, then touch the *Devices* icon, and then touch the *Modbus* icon. The Modbus configuration screen will be displayed, listing the set points on the right-hand side and the Modbus enable/disable button on the lower left.

The Modbus option must be disabled in order to modify settings. Refer to Publication 247 (Setup and Operating Instructions for Powerohm Resistors Digital HRG Pulser controllers) for general instructions on navigating the menu system and configuring set points.

The Address set point configures the Modbus address for the Digital HRG Pulser. All Modbus devices on a network must have a unique address.

The Protocol, Baud Rate, and Parity set points must be configured to match the settings of all other Modbus devices on the network.

Modbus Registers

All registers are 16-bit word. Maps of registers are summarized in Table 1 and Table 2.

Input Register (Function Code 4)

Register	Name	Value
40001	Phase A Voltage	Voltage on Phase A
40002	Phase B Voltage	Voltage on Phase B
40003	Phase C Voltage	Voltage on Phase C
40004	Neutral Voltage	The neutral voltage
40005	Neutral Current	The neutral current
40006	System Status	Bit 0 Pulser On Bit 1 Test Relay On Bit 2 System Fault Bit 3 System Idle
40007	Alarms	Bit 0 Ground Fault Bit 1 Low Voltage Bit 3 Resistor Fault
40008	Diagnostics	Bit 0 Low Clock Battery Bit 1 Clock not set Bit 2 12-Channel I/O PCB Fault Bit 3 Power Monitor PCB Fault
40009	12-Channel I/O PCB Input	Bit 0 Input 1 Closed (40/41) … Bit 11 Input 11 Closed (62/63)
40010	12-Channel I/O PCB Outputs	Bit 0 Relay K1 Energized … Bit 11 Relay K12 Energized

40011	Power Monitor PCB I/O	Bit 0	Relay K1 Energized
		Bit 1	Relay K2 Energized
		Bit 2	Relay K3 Energized
		Bit 3	Relay K4 Energized
		Bit 4	Relay K5 Energized
		Bit 5	Relay K6 Energized
		Bit 6	Relay K7 Energized
		Bit 7-15	RESERVED
40012	Aux Program 1–16	Bit 0	Aux Program 1 running
		…	
		Bit 15	Aux Program 16 running
40013	Aux Program 17–32	Bit 0	Aux Program 17 running
		…	
		Bit 15	Aux Program 32 running
40014	Aux Program 33–48	Bit 0	Aux Program 33 running
		…	
		Bit 15	Aux Program 48 running
40015	RESERVED	0	
40016	RESERVED	0	
40017	RESERVED	0	
40018	RESERVED	0	
40019	RESERVED	0	
40020	RESERVED	0	
40021	RESERVED	0	
40022	RESERVED	0	
40023	RESERVED	0	
40024	RESERVED	0	
40025	RESERVED	0	
40026	RESERVED	0	
40027	RESERVED	0	

40028	RESERVED	0
40029	RESERVED	0
40030	RESERVED	0
40031	RESERVED	0
40032	RESERVED	0

Table 1: Input Registers

Read Device ID Register (Function Code 43)

The controller supports only Read Device ID code 4, individual access.

Objects 0x00–0x02 (basic identification) and 0x80–0x82 (extended identification) are supported.

Object ID	Object Name	Type	Value
0x00	Vendor Name	ASCII String	“Powerohm”
0x01	Product Code	ASCII String	“Digital HRG”
0x02	MajorMinorRevision	ASCII String	Major.Minor e.g. “V1.000”
0x80	Memory Map Version	ASCII String	“01”
0x81	Firmware Version	ASCII String	Major.Revision e.g., “1.000”
0x82	Controller Serial Number	ASCII String	e.g. “12345678”

Table 2: Read Device ID Registers

Replacement Parts

For replacement parts, contact your local Powerohm Resistors office or the Powerohm Resistors factory at:

Telephone: (800) 838-4694
Email: sales@powerohm.com

Technical Support

Telephone: (336) 434-2800 ext. 2803
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