

4899 Addendum

B.1 INTRODUCTION

Watlow has recently introduced new Modbus Temperature Controllers with 32 bit command and data registers. This Addendum describes how to read and write to Watlow's 32-bit Modbus registers using the 4899/4809/4819 Interfaces.

B.2 32-BIT CONCEPT

Watlow's original Modbus temperature controllers used 16-bit wide registers to set a parameter and to read back data. Some of Watlow's new Temperature Controllers like the Series SD and Series PD have 32-bit registers which are accessed as two 16-bit registers. The value is assumed to have three decimal places.

B.3 WRITE EXAMPLE

To write a set point of 1250 degrees (which is really 1250.000) to Registers 27 and 28, multiply the setpoint value (SP) by 1000 to get 1,250,000. Add 65536 to negative numbers. This produces the setpoint (SP) we want to send.

To determine the most significant word (MSW) for Register 27, divide the SP by 2^{16} or 65536. To determine the least significant word (LSW) for Register 28, subtract from the SP the result of

Rev 07/15/2003

multiplying the MSW by 2^{16} or 65536. i.e.

$$\text{SP} = 1250 * 1000 = 1250000$$

$$\text{MSW} = 1250000 / 65536 = 19$$

$$\text{LSW} = 1250000 - (19 * 65536) = 4816$$

Register 27 is written with MSW of 19

Register 28 is written with LSW of 4816

The 4899 can write each register separately with standard write commands or both registers together with write block command. Examples are:

W 27,19 and W 28,4816 or

WB 27,2,19,4816

B.3 READ EXAMPLE

To read a 32-bit value, two successive 16-bit registers are read and the user's program then puts the values together to form the 32-bit result. An example is reading a process variable from Registers 20 (MSW) and 21 (LSW). The 4899 can be used to read each register individually or to read two successive registers. The commands are:

R? 20,1 and R? 21,1 or

R? 20,2

Both sequences return two numbers to the user. The MSW is returned from Register 20, the LSW from Register 21. Multiply the MSW by 2^{16} or 65536 and add it to the LSW. Divide the result by 1000 to scale it to three decimal places.

$$\text{Reading} = ((\text{MSW} * 65536) + \text{LSW})/1000$$

B