



Sample Series 96 16-bit Modbus Packet

Sent to Read (16-bit) Process Value

| Binary | Hex | Decimal | Purpose |
|----------|-----|---------|--|
| 00000001 | 01 | 1 | Address of Controller |
| 00000011 | 03 | 3 | Function Read |
| 00000000 | 00 | 0 | High Byte of Register 100 decimal (Process Temp) |
| 01100100 | 64 | 100 | Low Byte of Register 100 decimal (Process Temp) |
| 00000000 | 00 | 0 | High Byte of Number of register to Read (Always 0) |
| 00000001 | 01 | 1 | Low Byte of Number of registers to Read (Always 1 to 32) |
| 11000101 | C5 | 197 | Low byte of CRC |
| 11010101 | D5 | 213 | High byte of CRC |

The CRC (also a 16 bit wide value) is sent in reverse order, low byte then high byte.

Received from Controller (16-bit) Process Value 74 °F

| Binary | Hex | Decimal | Purpose |
|----------|-----|---------|--|
| 00000001 | 01 | 1 | Address of Controller |
| 00000011 | 03 | 3 | Function Read |
| 00000010 | 02 | 2 | Number of data bytes returned |
| 00000000 | 00 | 0 | High Byte Data of register Read |
| 01001010 | 4A | 74 | Low Byte Data of register Read |
| | | | High Byte Data of register Read (more than one register is requested) |
| | | | Low Byte Data of register Read (more than one register is requested) |
| 00111001 | 39 | 57 | Low byte of CRC |
| 10110011 | B3 | 179 | High byte of CRC |

Example- To read a 16-bit value in decimal format;

Note: The process value of the Series 96 is contained in a 16-bit register. Each register, a 16-bit value, contains a most significant byte, MSB and a least significant byte, LSB. Negative numbers are sent in two's complement format.

In this example, Register 100 MSB = 0 and Register 100 LSB = 74.

| 16-bit Process Value | |
|--|--------------------|
| MSB, a 8-bit value | LSB, a 8-bit value |
| 0 | 74 |
| $(\text{MSB} \times 256) + \text{LSB} = \text{Answer}$ | |
| $(0 \times 256) + 74 = 74$ | |

The answer is 74 degrees.



Sample Series 96 16-bit Modbus Packet

Sent to Write (16-bit) Set Point of 1,250 °F

| Binary | Hex | Decimal | Purpose |
|----------|-----|---------|---|
| 00000001 | 01 | 1 | Controller Address |
| 00000110 | 06 | 6 | Function Write |
| 00000001 | 01 | 1 | High Byte of Set Point Register 300 decimal |
| 00101100 | 2C | 44 | Low Byte of Set Point Register 300 decimal |
| 00000100 | 04 | 4 | High Byte of Data to write in Register (New Temp of 80 degrees) |
| 11100010 | E2 | 226 | Low Byte of Data to write in Register (New Temp of 80 degrees) |
| 11001011 | CB | 203 | Low byte of CRC |
| 01110110 | 76 | 118 | High byte of CRC |

The CRC (also a 16 bit wide value) is sent in reverse order, low byte then high byte.

Received from Writing to Controller (16-bit) Set Point of 1,250 °F

| Binary | Hex | Decimal | Purpose |
|----------|-----|---------|--|
| 00000001 | 01 | 1 | Controller Address |
| 00000110 | 06 | 6 | Function Write |
| 00000001 | 01 | 1 | High Byte of Set Point Register 300 decimal |
| 00101100 | 2C | 44 | Low Byte of Set Point Register 300 decimal |
| 00000100 | 04 | 4 | High Byte of Data to write in Register (New Temp of 134 degrees) |
| 11100010 | E2 | 226 | Low Byte of Data to write in Register (New Temp of 134 degrees) |
| 11001011 | CB | 203 | Low byte of CRC |
| 01110110 | 76 | 118 | High byte of CRC |

Example- To write a 16-bit value in decimal format;

The set point value of the Series 96 is contained in register 300. To determine the most significant byte (MSB), divide the set point (SP) by 256. To determine the least significant byte (LSB), subtract from the SP the integer results of multiplying the MSB by 256.

SP = 1,250

Register 300 is written with a value of 1,250

| Set Point Value is a 16-bit value | |
|-----------------------------------|--|
| Integer of $1250/256 = 4$ | Remainder is $1250 - (4 \times 256) = 226$ |
| MSB, a 8-bit value | LSB, a 8-bit value |
| 4 | 226 |
| (MSB x 256) + LSB = Answer | $(4 \times 256) + 226 = 1250$ |

If the controller displays with a decimal point, then the Modbus value has an assumed decimal point. As an example, a set point of 125.0 is sent as 1250 when the decimal register 606 is set to a value of 1. When register 606 has a value of 0, then a value of 1250 means one thousand two hundred and fifty degrees.