



analytical



Multicon and Monocon Controller MODBUS Reference Guide

1. Modbus Characteristics

Controller is a Modbus Server.

Controller has the default Modbus Node ID 11.

Frame Format is RTU.

Baud rate is 9600

Data bits: 8

Half-duplex

No parity

1 stop bit

Response timeout set to 5000 [ms] minimum

Delay between polls set to 20 [ms] minimum

Note: Establishing MODBUS connection disables touchscreen functionality. **Caution:** Users will not see accurate and dynamic temperature readouts displayed on the touchscreen while a MODBUS connection is established. Please see register 124 for reactivating touchscreen functionality.

Note: READ Registers 201-449 only apply to the MULTICON controller and are inactive in the MONOCON

Note: WRITE Registers 250-454 only apply to the MULTICON controller and are inactive in the MONOCON

Note: If you are consistently encountering Timeout errors, the MODBUS termination switch may need to be toggled to the opposite of it's current position.

Note: Consider your system's data format (binary, dec., etc.) when reading/writing registers.

2. Modbus Functions Supported

MODBUS READ INPUT REGISTERS 0x04

MODBUS WRITE REGISTER 0x06

3. Registers Characteristics

16 bits

Big Endian

Address Base is 1

4. (Read) Input Registers Tables

Register Data	Address	Data Definition High Byte Low Byte	Example (if applicable)
CH1 Device Model Number Characters 1 to 16	1 to 16	From 0 to 255 (ASCII format, DEC value)	0000 0000 0110 0001 = a
CH1 Actual Temperature in UNIT Integer Part	17	From 0 to 200	0000 0000 0010 1101 = 45 UNIT
CH1 Actual Temperature in UNIT Fractional Part	18	From 0 to 9	0000 0000 0000 0010 = 0.2 UNIT
CH1 Timer Value Seconds	19	From 0 to 59	0000 0000 0010 1101 = 45 seconds
CH1 Timer Value Minutes	20	From 0 to 59	0000 0000 0010 1101 = 45 minutes
CH1 Timer Value Hours	21	From 0 to 999	0000 0000 0010 1101 = 45 hours
CH1 Working P Integer Part	22	From 0 to 65535	0000 0000 0000 1010 = 10
CH1 Working P Fractional Part	23	From 0 to 65535	0000 0000 0000 1010 = 0.10
CH1 Working I Integer Part	24	From 0 to 65535	0000 0000 0000 1010 = 0.10
CH1 Working I Fractional Part	25	From 0 to 65535	0000 0000 0000 1010 = 0.10
CH1 Working D Integer Part	26	From 0 to 65535	0000 0000 0000 1010 = 0.10
CH1 Working D Fractional Part	27	From 0 to 65535	0000 0000 0000 1010 = 0.10
CH1 Device Serial Number Characters 1 to 20	28 to 47	From 0 to 255 (ASCII format, DEC value)	0000 0000 0110 0001 = a
Heater Controller Model # Characters 1 to 16	48 to 63	From 0 to 255 (ASCII format, DEC value)	0000 0000 0110 0001 = a
Heater Controller Serial # Characters 1 to 28	64 to 91	From 0 to 255 (ASCII format, DEC value)	0000 0000 0110 0001 = a
CH1 Temperature High Limit in UNIT Integer Part	92	From 0 to 392	0000 0000 0010 1101 = 45 UNIT
CH1 Temperature High Limit in UNIT Fractional Part	93	From 0 to 9	0000 0000 0000 0010 = 0.2 UNIT
CH2 Device Model Number Characters 1 to 16	201 to 216	From 0 to 255 (ASCII format, DEC value)	0000 0000 0110 0001 = a
CH2 Actual Temperature in UNIT Integer Part	217	From 0 to 200	0000 0000 0010 1101 = 45 UNIT
CH2 Actual Temperature in UNIT Fractional Part	218	From 0 to 9	0000 0000 0000 0010 = 0.2 UNIT
CH2 Timer Value Seconds	219	From 0 to 59	0000 0000 0010 1101 = 45 seconds
CH2 Timer Value Minutes	220	From 0 to 59	0000 0000 0010 1101 = 45 minutes
CH2 Timer Value Hours	221	From 0 to 999	0000 0000 0010 1101 = 45 hours
CH2 Working P Integer Part	222	From 0 to 65535	0000 0000 0000 1010 = 10
CH2 Working P Fractional Part	223	From 0 to 65535	0000 0000 0000 1010 = 0.10
CH2 Working I Integer Part	224	From 0 to 65535	0000 0000 0000 1010 = 0.10
CH2 Working I Fractional Part	225	From 0 to 65535	0000 0000 0000 1010 = 0.10
CH2 Working D Integer Part	226	From 0 to 65535	0000 0000 0000 1010 = 0.10
CH2 Working D Fractional Part	227	From 0 to 65535	0000 0000 0000 1010 = 0.10
CH2 Device Serial Number Characters 1 to 20	228 to 247	From 0 to 255 (ASCII format, DEC value)	0000 0000 0110 0001 = a
CH2 Temperature High Limit in UNIT Integer Part	248	From 0 to 392	0000 0000 0010 1101 = 45 UNIT
CH2 Temperature High Limit in UNIT Fractional Part	249	From 0 to 9	0000 0000 0000 0010 = 0.2 UNIT
CH3 Device Model Number Character 1 to 16	301 to 316	From 0 to 255 (ASCII format, DEC value)	0000 0000 0110 0001 = a
CH3 Actual Temperature in UNIT Integer Part	317	From 0 to 200	0000 0000 0010 1101 = 45 UNIT
CH3 Actual Temperature in UNIT Fractional Part	318	From 0 to 9	0000 0000 0000 0010 = 0.2 UNIT
CH3 Timer Value Seconds	319	From 0 to 59	0000 0000 0010 1101 = 45 seconds
CH3 Timer Value Minutes	320	From 0 to 59	0000 0000 0010 1101 = 45 minutes
CH3 Timer Value Hours	321	From 0 to 999	0000 0000 0010 1101 = 45 hours
CH3 Working P Integer Part	322	From 0 to 65535	0000 0000 0000 1010 = 10
CH3 Working P Fractional Part	323	From 0 to 65535	0000 0000 0000 1010 = 0.10
CH3 Working I Integer Part	324	From 0 to 65535	0000 0000 0000 1010 = 0.10
CH3 Working I Fractional Part	325	From 0 to 65535	0000 0000 0000 1010 = 0.10
CH3 Working D Integer Part	326	From 0 to 65535	0000 0000 0000 1010 = 0.10
CH3 Working D Fractional Part	327	From 0 to 65535	0000 0000 0000 1010 = 0.10
CH3 Device Serial Number Characters 1 to 20	328 to 347	From 0 to 255 (ASCII format, DEC value)	0000 0000 0110 0001 = a
CH3 Temperature High Limit in UNIT Integer Part	348	From 0 to 392	0000 0000 0010 1101 = 45 UNIT
CH3 Temperature High Limit in UNIT Fractional Part	349	From 0 to 9	0000 0000 0000 0010 = 0.2 UNIT
CH4 Device Model Number Characters 1 to 16	401 to 416	From 0 to 255 (ASCII format, DEC value)	0000 0000 0110 0001 = a
CH4 Actual Temperature in UNIT Integer Part	417	From 0 to 200	0000 0000 0010 1101 = 45 UNIT
CH4 Actual Temperature in UNIT Fractional Part	418	From 0 to 9	0000 0000 0000 0010 = 0.2 UNIT
CH4 Timer Value Seconds	419	From 0 to 59	0000 0000 0010 1101 = 45 seconds
CH4 Timer Value Minutes	420	From 0 to 59	0000 0000 0010 1101 = 45 minutes
CH4 Timer Value Hours	421	From 0 to 999	0000 0000 0010 1101 = 45 hours
CH4 Working P Integer Part	422	From 0 to 65535	0000 0000 0000 1010 = 10
CH4 Working P Fractional Part	423	From 0 to 65535	0000 0000 0000 1010 = 0.10
CH4 Working I Integer Part	424	From 0 to 65535	0000 0000 0000 1010 = 0.10
CH4 Working I Fractional Part	425	From 0 to 65535	0000 0000 0000 1010 = 0.10
CH4 Working D Integer Part	426	From 0 to 65535	0000 0000 0000 1010 = 0.10
CH4 Working D Fractional Part	427	From 0 to 65535	0000 0000 0000 1010 = 0.10
CH4 Device Serial Number Characters 1 to 20	428 to 447	From 0 to 255 (ASCII format, DEC value)	0000 0000 0110 0001 = a
CH4 Temperature High Limit in UNIT Integer Part	448	From 0 to 392	0000 0000 0010 1101 = 45 UNIT
CH4 Temperature High Limit in UNIT Fractional Part	249	From 0 to 9	0000 0000 0000 0010 = 0.2 UNIT

5. (Write) Registers Table

Register Data	Address	Data Definition High Byte Low Byte (X = not mapped)	Example (examples given in BINARY. Please see conversion chart on next page if your system only accepts DECIMAL)
Channels Enable Status (see Binary-to-Decimal conversion chart on last page)	94	XXXXXXXX XXXX CH4 CH3 CH2 CH1	0000 0000 0000 0110: CH1, CH4 = DISABLED CH2, CH3 = ENABLED
CH1 Set Temperature in UNIT Integer Part	95	From 0 to 200 (MUST ENTER Integer and Fractional each time)	0000 0000 0010 1101 = 45 UNIT
CH1 Set Temperature in UNIT Fractional Part	96	From 0 to 9 (MUST ENTER Integer and Fractional each time)	0000 0000 0000 0010 = 0.2 UNIT
UNITS	97	1 = C, 2 = F, 3 = K	0000 0000 0000 0001 = C
CH1 Set Timer Value Seconds	98	From 0 to 59	0000 0000 0010 1101 = 45 seconds
CH1 Set Timer Value Minutes	99	From 0 to 59	0000 0000 0010 1101 = 45 minutes
CH1 Set Timer Value Hours	100	From 0 to 999	0000 0000 0010 1101 = 45 hours
Input Relay 1 Channel	101	From 1 to 4	0000 0000 0000 0010 = Channel 2
Input Relay 2 Channel	102	From 1 to 4	
Input Relay 3 Channel	103	From 1 to 4	
Input Relay 4 Channel	104	From 1 to 4	
Input Relays Enable Status	105	XXXXXXXX XXXX IR4 IR3 IR2 IR1	0000 0000 0000 0110: RLYH1, RLY4 = DISABLED RLY2, RLY3 = ENABLED
Output Relay 1 Channel	106	From 1 to 8	0000 0000 0000 0010 = Channel 2
Output Relay 2 Channel	107	From 1 to 8	
Output Relay 3 Channel	108	From 1 to 8	
Output Relay 4 Channel	109	From 1 to 8	
Output Relay 5 Channel	110	From 1 to 8	
Output Relay 6 Channel	111	From 1 to 8	
Output Relay 7 Channel	112	From 1 to 8	
Output Relay 8 Channel	113	From 1 to 8	
Output Relay 1 Condition	114	From 1 to 6	0000 0000 0000 0010 = Condition 2
Output Relay 2 Condition	115	From 1 to 6	
Output Relay 3 Condition	116	From 1 to 6	
Output Relay 4 Condition	117	From 1 to 6	
Output Relay 5 Condition	118	From 1 to 6	
Output Relay 6 Condition	119	From 1 to 6	
Output Relay 7 Condition	120	From 1 to 6	
Output Relay 8 Condition	121	From 1 to 6	
Output Relays Enable Status	122	XXXXXXXX OR8 OR7 OR6 OR5 OR4 OR3 OR2 OR1	OR1 = 0 = OR1 is disabled OR1 = 1 = OR1 is enabled
Output Relays Mode	123	XXXXXXXX OR8 OR7 OR6 OR5 OR4 OR3 OR2 OR1	OR1 = 0 = OR1 is LATCH OR1 = 1 = OR1 is PULSE
Give up Modbus Control (this reactivates screen functionality)	124	1 or 0 (XXXXXXXX0/1)	1 = Give Up Modbus Control 0 = Modbus Control Not Given Up
CH2 Set Temperature in UNIT Integer Part	250	From 0 to 200 (MUST ENTER Integer and Fractional each time)	0000 0000 0010 1101 = 45 UNIT
CH2 Set Temperature in UNIT Fractional Part	251	From 0 to 9 (MUST ENTER Integer and Fractional each time)	0000 0000 0000 0010 = 0.2 UNIT
CH2 Timer Value Seconds	252	From 0 to 59	0000 0000 0010 1101 = 45 seconds
CH2 Timer Value Minutes	253	From 0 to 59	0000 0000 0010 1101 = 45 minutes
CH2 Timer Value Hours	254	From 0 to 999	0000 0000 0010 1101 = 45 hours
CH3 Set Temperature in UNIT Integer Part	350	From 0 to 200 (MUST ENTER Integer and Fractional each time)	0000 0000 0010 1101 = 45 UNIT
CH3 Set Temperature in UNIT Fractional Part	351	From 0 to 9 (MUST ENTER Integer and Fractional each time)	0000 0000 0000 0010 = 0.2 UNIT
CH3 Timer Value Seconds	352	From 0 to 59	0000 0000 0010 1101 = 45 seconds
CH3 Timer Value Minutes	353	From 0 to 59	0000 0000 0010 1101 = 45 minutes
CH3 Timer Value Hours	354	From 0 to 999	0000 0000 0010 1101 = 45 hours
CH4 Set Temperature in UNIT Integer Part	450	From 0 to 200 (MUST ENTER Integer and Fractional each time)	0000 0000 0010 1101 = 45 UNIT
CH4 Set Temperature in UNIT Fractional Part	451	From 0 to 9 (MUST ENTER Integer and Fractional each time)	0000 0000 0000 0010 = 0.2 UNIT
CH4 Timer Value Seconds	452	From 0 to 59	0000 0000 0010 1101 = 45 seconds
CH4 Timer Value Minutes	453	From 0 to 59	0000 0000 0010 1101 = 45 minutes
CH4 Timer Value Hours	454	From 0 to 999	0000 0000 0010 1101 = 45 hours

Binary to Decimal Conversion Chart

16 Bit				Channel 4	Channel 3	Channel 2	Channel 1	Decimal	Note
0000	0000	0000	0000	Off	Off	Off	Off	0	Turn all channels off
0000	0000	0000	0001	Off	Off	Off	On	1	Turns on only channel 1
0000	0000	0000	0010	Off	Off	On	Off	2	Turns on only channel 2
0000	0000	0000	0011	Off	Off	On	On	3	Turns on channels 1 and 2
0000	0000	0000	0100	Off	On	Off	Off	4	Turns on only channel 3
0000	0000	0000	0101	Off	On	Off	On	5	Turns on channels 1 and 3
0000	0000	0000	0110	Off	On	On	Off	6	Turns on channels 2 and 3
0000	0000	0000	0111	Off	On	On	On	7	Turns on channels 1, 2 and 3
0000	0000	0000	1000	On	Off	Off	Off	8	Turns on only channel 4
0000	0000	0000	1001	On	Off	Off	On	9	Turns on channels 1 and 4
0000	0000	0000	1010	On	Off	On	Off	10	Turns on channels 2 and 4
0000	0000	0000	1011	On	Off	On	On	11	Turns on channels 1, 2 and 4
0000	0000	0000	1100	On	On	Off	Off	12	Turns on channels 2 and 4
0000	0000	0000	1101	On	On	Off	On	13	Turns on channels 1, 3 and 4
0000	0000	0000	1110	On	On	On	Off	14	Turns on channels 2, 3 and 4
0000	0000	0000	1111	On	On	On	On	15	Turn all channels on



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