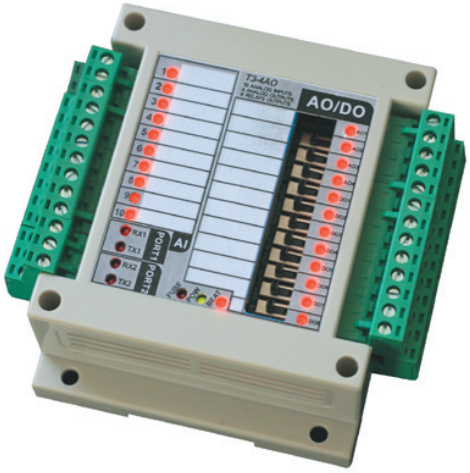
T3-4AO

Descriptions

The T3 Series are general purpose input / output modules for building integrators. Available in several input/output configurations, the T3 Series modules provide convenient termination for field devices and interfacing to your HVAC, lighting, temperature sensors, and other typical building automation applications. Each of the analog inputs can be jumper configured for signals of either 0-5V, 0-20mA, or dry contact.The outputs are available in dry contacts 2amp/output, 0-10V analog, and PNP sinking. The modules are slave devices that can be easily controlled via the RS485 serial inter face using the industry standard Modbus Protocol.



Highlights:

- Surge-protected analog inputs with 10-bit resolution.
- Outputs can individually be switched to ON, OFF, AUTO.
- High impact plastic enclosure provides durability in com-mercial environments.
- Standard modbus protocol allows for up to 254 unique devices on one RS485 network.

Special Features

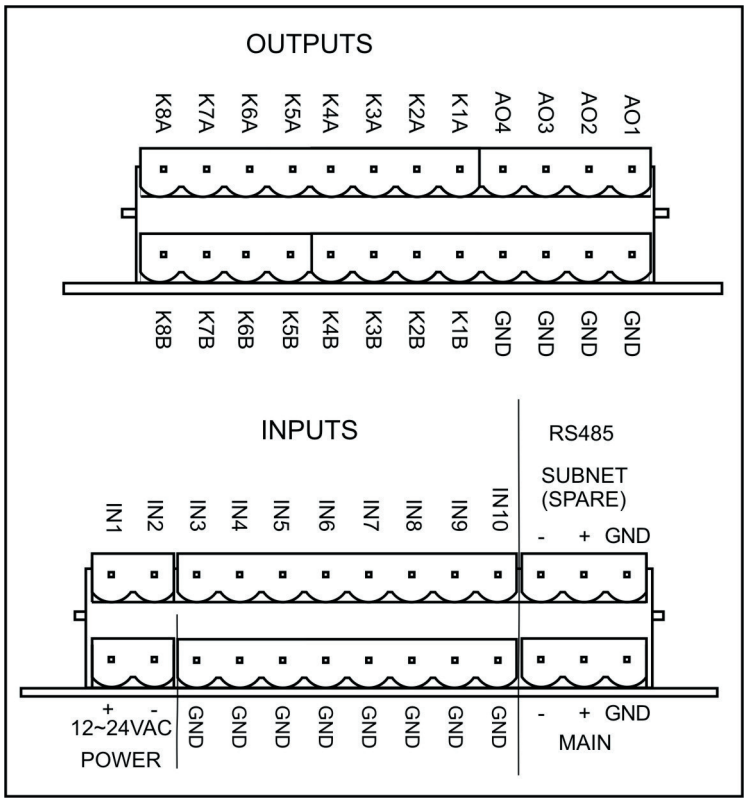
The T3-4AO has a few special features which the other T3 series do not have due to a more advanced CPU. For example the faster scan rates for the inputs, In on/off mode, inputs 1 through 8 can count pulses up to 1 khz on each channel. In analog mode, inputs 1 thru 8 are 12 bits compared to the previous 10 bits, inputs 9 and 10 remain as 10 bits and slower at pulse counting.

For developers there is a significant improvement with the larger rom and ram space: 128k versus 64k for the flash space and 3k ram versus 1k of ram space compared to the earlier models. This gives more room for developers to add features such as Bacnet, PLC type logic, logging, etc. Secondly there's an additional serial port, currently the port is unused but developers will be able to use the second port to manage a subnet of local sensors, keypads and displays for example, or use it in repeater mode to extend and isolate the RS485 main network.

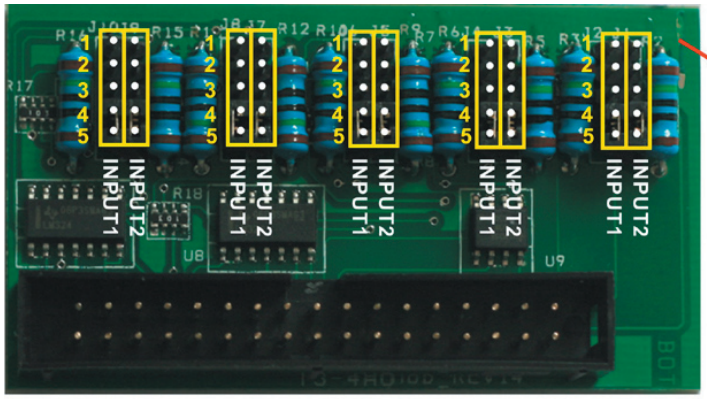
Technical Data

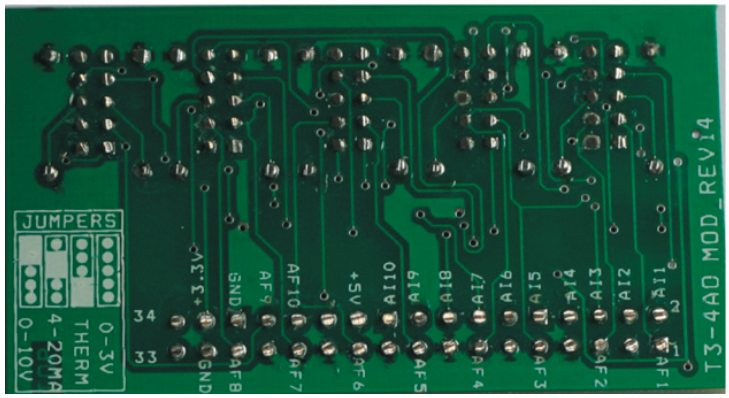
T3-4AO ..... 8 dry-contact relay outputs x2amps @120V, 4 analog outputs @0-10V, 10 analog input @ 0-3.3V, 0-10V, 0-20mA, dry
Operating temperature ..... -30~70°C (-22~158°F)
Supply voltage ..... 12~24VAC/DC ±10%, 50-60Hz
Power consumption ..... 100mA at 12VDC
Relay contacts rating ..... max 2A
Ambient humidity..... 10-90 %Rh
Plastic housing..... Flammability rating UL 94V0 file E194560
Enclosure rating..... IP31
Temperature sensor..... 10K thermistor ±0.5°C
Colour..... White/Off-white
Dimensions..... 115 x 90 x 40mm

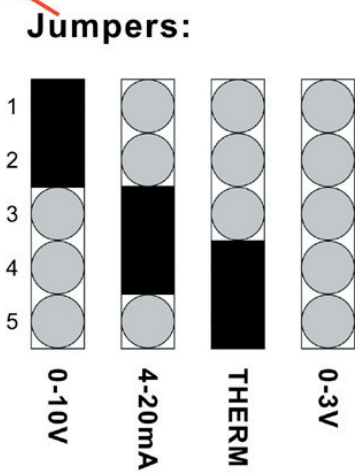
Terminal Block Connections



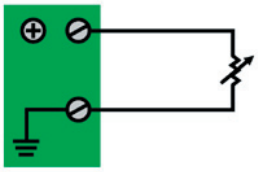
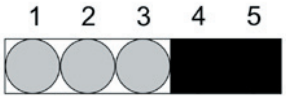
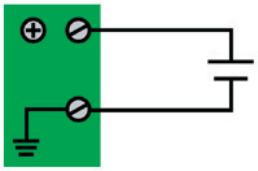
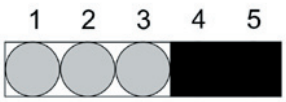
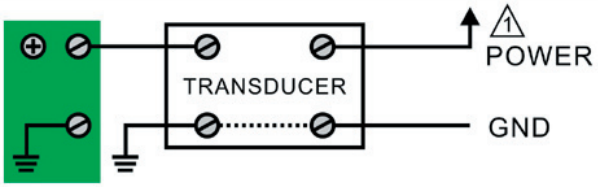
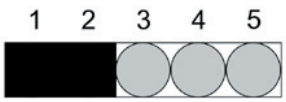
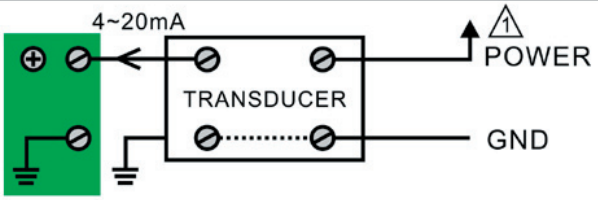
Jumper Settings



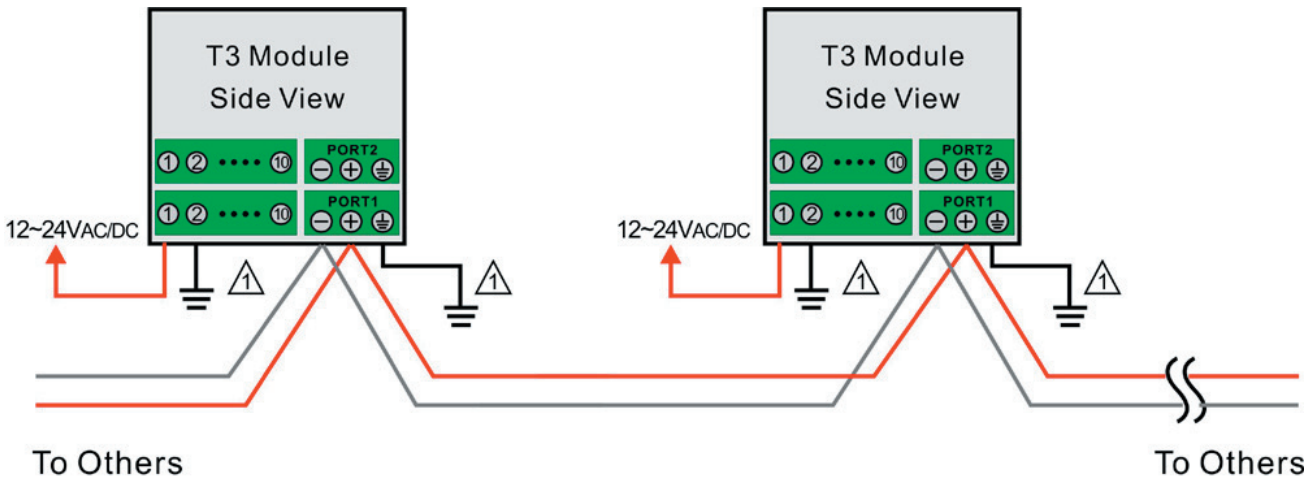




Typical Sensor Inputs

Title	Typical Wiring Diagram	Jumper
Thermistors		
Dry Contacts		
Transducer Signal 0-10V 0-5V	 ⚠1 T3 module and transducer power share GND. Transducer shall be half wave rectified.	
Transducer 4-20mA	 ⚠1 T3 module and transducer power share GND. Transducer shall be half wave rectified.	

Network Diagram



⚠1 Tie GNDs to earth at each cabinet.

List of Registers in the T3-4AO

Address	Bytes	Register and Description
0 - 3	4	Serial Number 4 Bytes value
4	1	Firmware Version , low byte
5	1	Firmware Version, hi byte
6	1	Modbus device address
7	1	Product Model
8	1	Hardware Revision
9	1	PIC Version Number
10-12		Reserved
13	1	Calibration Register-Used to calibrate the outputs
14		Reserved
15	1	Baudrate Setting: 0 = 9600bps, 1 = 19200bps
16	1	Firmware Update Register, used to show the status of firmware updates
17-99		Reserved
100	2	Output 1 Register
101	2	Output 2 Register
102	2	Output 3 Register
103	2	Output 4 Register
104	2	Output 5 Register
105	2	Output 6 Register
106	2	Output 7 Register
107	2	Output 8 Register
108	2	Output 9 Register
109	2	Output 10 Register
110	2	Output 11 Register
111	2	Output 12 Register
112	0	Reserved
113	0	Reserved
114	0	Reserved
115	0	Reserved
116	2	Register 116 , 117 and 118 hold the position information on each of the hand-off-auto switches on the T3 modules Each switch has three positions and therefore each switch requires 2 bits to hold the state. Modbus registers are 16 bits wide so we can hold the status of 8 switches in register 116, the next 8 are held in register 117 and so on, up to the number of switches on the particular T3 module. The switch states are as follows: 00= off , the switch is in the center position 10=auto, the switch is positioned towards the terminal block 01= hand, manually on. The switch is positioned towards the center of the module (away from the terminal block).
117	2	
118	2	
119	2	Input 1 register, high word
120	2	Input 1 register, low word
121	2	Input 2 register, high word
122	2	Input 2 register, low word

Address	Bytes	Register and Description
123	2	Input 3 register, high word
124	2	Input 3 register, low word
125	2	Input 4 register, high word
126	2	Input 4 register, low word
127	2	Input 5 register, high word
128	2	Input 5 register, low word
129	2	Input 6 register, high word
130	2	Input 6 register, low word
131	2	Input 7 register, high word
132	2	Input 7 register, low word
133	2	Input 8 register, high word
134	2	Input 8 register, low word
135	2	Input 9 register, high word
136	2	Input 9 register, low word
137	2	Input 10 register, high word
138	2	Input 10 register, low word
139-143	5	Date Stamp of Input 1, YEAR, MONTH, DAY, HOUR, MINUTE respectively
144-148	5	Date Stamp of Input 2, YEAR, MONTH, DAY, HOUR, MINUTE respectively
149-153	5	Date Stamp of Input 3, YEAR, MONTH, DAY, HOUR, MINUTE respectively
154-158	5	Date Stamp of Input 4, YEAR, MONTH, DAY, HOUR, MINUTE respectively
159-163	5	Date Stamp of Input 5, YEAR, MONTH, DAY, HOUR, MINUTE respectively
164-168	5	Date Stamp of Input 6, YEAR, MONTH, DAY, HOUR, MINUTE respectively
169-173	5	Date Stamp of Input 7, YEAR, MONTH, DAY, HOUR, MINUTE respectively
174-178	5	Date Stamp of Input 8, YEAR, MONTH, DAY, HOUR, MINUTE respectively
179-183	5	Date Stamp of Input 9, YEAR, MONTH, DAY, HOUR, MINUTE respectively
184-188	5	Date Stamp of Input 10, YEAR, MONTH, DAY, HOUR, MINUTE respectively
189	1	Assign each input sample type. 0 = analog; 1 = pulse. Input 1; correspond to Bit0, input 2; correspond to bit1 and so on.
190	2	Analog input1 original data
191	2	Analog input2 original data
192	2	Analog input3 original data
193	2	Analog input4 original data
194	2	Analog input5 original data
195	2	Analog input6 original data
196	2	Analog input7 original data
197	2	Analog input8 original data
198	2	Analog input9 original data
199	2	Analog input10 original data
200	1	Range Setting for each input.
201	1	183 correspond to input1
202	1	184 correspond to input2, etc.
203	1	0 = raw data
204	1	1 = 10K Celsius
205	1	2 = 10K Fahrenheit
206	1	3 = 0-100%
207	1	4 = ON/OFF

Address	Bytes	Register and Description
208	1	5 = OFF/ON
209	1	6 = Pulse Input, 7 = Lighting Control
210	1	Filter coefficient for input 1, 0 through 100, default is 20.
211	1	Filter coefficient for input 2, 0 through 100, default is 20.
212	1	Filter coefficient for input 3, 0 through 100, default is 20.
213	1	Filter coefficient for input 4, 0 through 100, default is 20.
214	1	Filter coefficient for input 5, 0 through 100, default is 20.
215	1	Filter coefficient for input 6, 0 through 100, default is 20.
216	1	Filter coefficient for input 7, 0 through 100, default is 20.
217	1	Filter coefficient for input 8, 0 through 100, default is 20.
218	1	Filter coefficient for input 9, 0 through 100, default is 20.
219	1	Filter coefficient for input 10, 0 through 100, default is 20.
220	1	Timer for input 1, how long time the lighting control take over the outputs
221	1	Timer for input 2, how long time the lighting control take over the outputs
222	1	Timer for input 3, how long time the lighting control take over the outputs
223	1	Timer for input 4, how long time the lighting control take over the outputs
224	1	Timer for input 5, how long time the lighting control take over the outputs
225	1	Timer for input 6, how long time the lighting control take over the outputs
226	1	Timer for input 7, how long time the lighting control take over the outputs
227	1	Timer for input 8, how long time the lighting control take over the outputs
228	1	Timer for input 9, how long time the lighting control take over the outputs
229	1	Timer for input 10, how long time the lighting control take over the outputs
230	1	Input 1 timer Left, how much time left for the lighting control
231	1	Input 2 timer Left, how much time left for the lighting control
232	1	Input 3 timer Left, how much time left for the lighting control
233	1	Input 4 timer Left, how much time left for the lighting control
234	1	Input 5 timer Left, how much time left for the lighting control
235	1	Input 6 timer Left, how much time left for the lighting control
236	1	Input 7 timer Left, how much time left for the lighting control
237	1	Input 8 timer Left, how much time left for the lighting control
238	1	Input 9 timer Left, how much time left for the lighting control
239	1	Input 10 timer Left, how much time left for the lighting control
240	2	light control disable/enable ,each bit correspond to one output, output1 correspond to least significant bit, 0 = disable, 1 = enable
241	1	Select which input as lighting control trigger, 0 = disable lighting control, 1= input1, 2=input2
242	1	Select which input as lighting control trigger,0 = disable lighting control, 1= input1, 2=input2
243	1	Select which input as lighting control trigger, 0 = disable lighting control, 1= input1, 2=input2
244	1	Select which input as lighting control trigger, 0 = disable lighting control, 1= input1, 2=input2
245	1	Select which input as lighting control trigger, 0 = disable lighting control, 1= input1, 2=input2
246	1	Select which input as lighting control trigger, 0 = disable lighting control, 1= input1, 2=input2
247	1	Select which input as lighting control trigger, 0 = disable lighting control, 1= input1, 2=input2
248	1	Select which input as lighting control trigger, 0 = disable lighting control, 1= input1, 2=input2