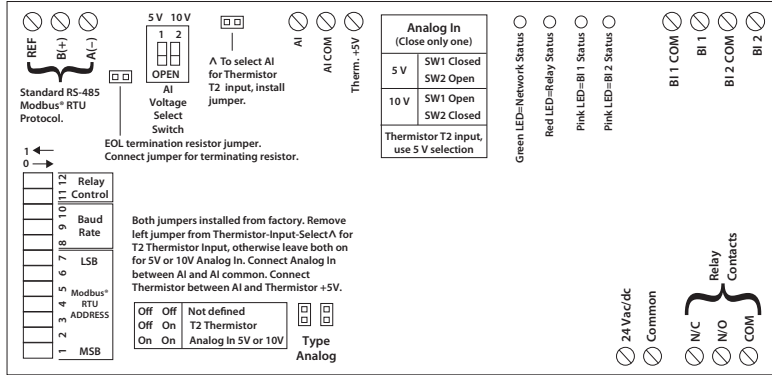


**RIBMNW24B-MBAI**

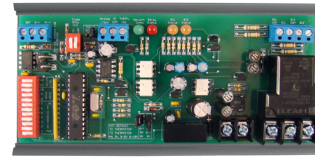
2.75" Track Mount Modbus® RTU Network Relay Device; One Binary Output (20 Amp Relay SPDT + Override); Two Binary Inputs (Dry Contact, Class 2); One Analog Input (T2 Thermistor / 0-5 Vdc / 0-10 Vdc); 24 Vac/dc Power Input; Optional End of Line Resistor (EOL) Included.

**RIBTW24B-MBAI**

Enclosed Modbus® RTU Network Relay Device; One Binary Output (20 Amp Relay SPDT + Override); Two Binary Inputs (Dry Contact, Class 2); One Analog Input (T2 Thermistor / 0-5 Vdc / 0-10 Vdc); 24 Vac/dc Power Input; Optional End of Line Resistor (EOL) Included.



Network Compatible Relays



Code Version 1.1

**Specifications**

- # Relays & Contact Type: One (1) SPDT Continuous Duty Coil
- Expected Relay Life: 10 million cycles minimum mechanical
- Operating Temperature: -30 to 140° F
- Humidity Range: 5 to 95% (noncondensing)
- Operate Time: 18ms
- Green LED: Network Communication
- Red LED: Relay Status
- Pink LED: BI 1 Status
- Pink LED: BI 2 Status
- Dimensions: 6.25" x 2.75" x 1.75" (RIBMNW24B-MBAI) 4.28" x 7.00" x 2.00" with .75" NPT Nipple (RIBTW24B-MBAI)
- Track Mount: MT212-6 Mounting Track Provided
- Approvals: CE, UL Listed, UL916, C-UL, RoHS
- Housing Rating: UL Listed, NEMA 1, C-UL, CE Approved, UL Accepted for Use in Plenum, Also available NEMA 4 / 4X
- Gold Flash: No
- Relay Override Switch: DIP Switch Control

- Contact Ratings:
  - 20 Amp Resistive @ 277 Vac
  - 20 Amp Ballast @ 277 Vac
  - 16 Amp Electronic Ballast @ 277 Vac (N/O)
  - 10 Amp Tungsten @ 120 Vac (N/O)
  - 1110 VA Pilot Duty @ 277 Vac
  - 770 VA Pilot Duty @ 120 Vac
  - 2 HP @ 277 Vac
  - 1 HP @ 120 Vac
- Power Input Ratings:
  - 81 mA @ 24 Vdc
  - 111 mA @ 24 Vac

- Notes:**
- Modbus® Address & Baud Rate must be set prior to power up via DIP switches.
  - Order NEMA 4 housing by adding "-N4" to end of model number. (RIBTW24B-MBAI-N4)
  - Order with grey lid by adding "-GY" to end of model number. (RIBTW24B-MBAI-GY)
  - Order NEMA 4 housing with grey lid by adding "-N4-GY" to end of model number. (RIBTW24B-MBAI-N4-GY)
  - This model utilizes:
    - Physical coil 1 (Relay output)
    - Physical binary input 1 (Dry contact binary input)
    - Physical binary input 2 (Dry contact binary input)
    - Physical input register AI 1 (Analog input)
  - Thermistor Type 2 (T2) Precon 10 K @ 77°F (25°C) PN ST-R24, Model 24, (or equivalent.) Thermistor not included. (Range -39 to 187°F)
  - For all versions, raw analog default settings are 0 and 1023 (real), respectively.
  - When connecting 24 Vac to both this device and a half-wave device, damage to device can occur.
    - Option 1: Use separate transformers for each device.
    - Option 2: Add diode between devices, see Option 2 note below.^^

- Network Media: Twisted Pair 22-24AWG, shielded recommended, EIA/TIA-485 (standard RS485)
- Terminations: Functional Devices product installed at both ends of the standard RS485 Modbus® RTU network - Use 120 Ω end of line resistors. All other cases - Follow instructions from the device installed at the end of the Modbus® network.
- Polarity: Network is polarity sensitive
- Baud Rate: 9600, 19200, 38400, 57600 (DIP Switch Selectable)

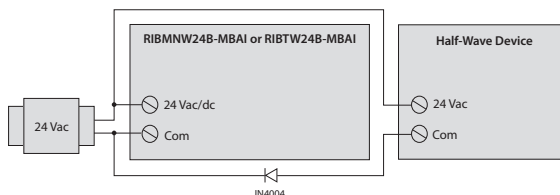
DIP Switches*			Baud Rate
8	9	10	
0	0	0	9600
0	0	1	19200
0	1	0	38400
0	1	1	57600

All other combinations=9600 baud

DIP Switches*		Relay State**
11	12	
1	0	Auto
X	1	Override on
0	0	Override off

\* 0 = Open ; 1 = Closed  
 \*\* Device must be powered for override

• Dry contact binary input is a general purpose input that is not tied to the relay internally. Can be used with any dry contact switching device, such as a current sensor, to feed back to the network.



^^ Option 2:  
 Add diode on 24 Vac power (Com) interconnection between devices. Band on diode faces towards -MBAI.

**Bulletin B1676**  
393208D

ENERGY MANAGEMENT EQUIPMENT

**CAUTION:** RISK OF ELECTRIC SHOCK - MORE THAN ONE DISCONNECT MAY BE REQUIRED TO DEENERGIZE THE DEVICE BEFORE SERVICING.

FOR SUPPLY CONNECTIONS USE #12AWG WIRES OR LARGER RATED FOR AT LEAST 75°C(167°F).

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# Modbus® RTU Address Setting

Modbus® RTU Address	DIP Switch						
	1	2	3	4	5	6	7
0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	1
2	0	0	0	0	0	1	0
3	0	0	0	0	0	1	1
4	0	0	0	0	1	0	0
5	0	0	0	0	1	0	1
6	0	0	0	0	1	1	0
7	0	0	0	0	1	1	1
8	0	0	0	1	0	0	0
9	0	0	0	1	0	0	1
10	0	0	0	1	0	1	0
11	0	0	0	1	0	1	1
12	0	0	0	1	1	0	0
13	0	0	0	1	1	0	1
14	0	0	0	1	1	1	0
15	0	0	0	1	1	1	1
16	0	0	1	0	0	0	0
17	0	0	1	0	0	0	1
18	0	0	1	0	0	1	0
19	0	0	1	0	0	1	1
20	0	0	1	0	1	0	0
21	0	0	1	0	1	0	1
22	0	0	1	0	1	1	0
23	0	0	1	0	1	1	1
24	0	0	1	1	0	0	0
25	0	0	1	1	0	0	1
26	0	0	1	1	0	1	0

Modbus® RTU Address	DIP Switch						
	1	2	3	4	5	6	7
27	0	0	1	1	0	1	1
28	0	0	1	1	1	0	0
29	0	0	1	1	1	0	1
30	0	0	1	1	1	1	0
31	0	0	1	1	1	1	1
32	0	1	0	0	0	0	0
33	0	1	0	0	0	0	1
34	0	1	0	0	0	1	0
35	0	1	0	0	0	1	1
36	0	1	0	0	1	0	0
37	0	1	0	0	1	0	1
38	0	1	0	0	1	1	0
39	0	1	0	0	1	1	1
40	0	1	0	1	0	0	0
41	0	1	0	1	0	0	1
42	0	1	0	1	0	1	0
43	0	1	0	1	0	1	1
44	0	1	0	1	1	0	0
45	0	1	0	1	1	0	1
46	0	1	0	1	1	1	0
47	0	1	0	1	1	1	1
48	0	1	1	0	0	0	0
49	0	1	1	0	0	0	1
50	0	1	1	0	0	1	0
51	0	1	1	0	0	1	1
52	0	1	1	0	1	0	0
53	0	1	1	0	1	0	1

Modbus® RTU Address	DIP Switch						
	1	2	3	4	5	6	7
54	0	1	1	0	1	1	0
55	0	1	1	0	1	1	1
56	0	1	1	1	0	0	0
57	0	1	1	1	0	0	1
58	0	1	1	1	0	1	0
59	0	1	1	1	0	1	1
60	0	1	1	1	1	0	0
61	0	1	1	1	1	0	1
62	0	1	1	1	1	1	0
63	0	1	1	1	1	1	1
64	1	0	0	0	0	0	0
65	1	0	0	0	0	0	1
66	1	0	0	0	0	1	0
67	1	0	0	0	0	1	1
68	1	0	0	0	1	0	0
69	1	0	0	0	1	0	1
70	1	0	0	0	1	1	0
71	1	0	0	0	1	1	1
72	1	0	0	1	0	0	0
73	1	0	0	1	0	0	1
74	1	0	0	1	0	1	0
75	1	0	0	1	0	1	1
76	1	0	0	1	1	0	0
77	1	0	0	1	1	0	1
78	1	0	0	1	1	1	0
79	1	0	0	1	1	1	1
80	1	0	1	0	0	0	0

Modbus® RTU Address	DIP Switch						
	1	2	3	4	5	6	7
81	1	0	1	0	0	0	1
82	1	0	1	0	0	1	0
83	1	0	1	0	0	1	1
84	1	0	1	0	1	0	0
85	1	0	1	0	1	0	1
86	1	0	1	0	1	1	0
87	1	0	1	0	1	1	1
88	1	0	1	1	0	0	0
89	1	0	1	1	0	0	1
90	1	0	1	1	0	1	0
91	1	0	1	1	0	1	1
92	1	0	1	1	1	0	0
93	1	0	1	1	1	0	1
94	1	0	1	1	1	1	0
95	1	0	1	1	1	1	1
96	1	1	0	0	0	0	0
97	1	1	0	0	0	0	1
98	1	1	0	0	0	1	0
99	1	1	0	0	0	1	1
100	1	1	0	0	1	0	0
101	1	1	0	0	1	0	1
102	1	1	0	0	1	1	0
103	1	1	0	0	1	1	1
104	1	1	0	0	1	0	0
105	1	1	0	1	0	0	1
106	1	1	0	1	0	1	0
107	1	1	0	1	0	1	1

Modbus® RTU Address	DIP Switch						
	1	2	3	4	5	6	7
108	1	1	0	1	1	0	0
109	1	1	0	1	1	0	1
110	1	1	0	1	1	1	0
111	1	1	0	1	1	1	1
112	1	1	1	0	0	0	0
113	1	1	1	0	0	0	1
114	1	1	1	0	0	1	0
115	1	1	1	0	0	1	1
116	1	1	1	0	1	0	0
117	1	1	1	0	1	0	1
118	1	1	1	0	1	1	0
119	1	1	1	0	1	1	1
120	1	1	1	1	0	0	0
121	1	1	1	1	0	0	1
122	1	1	1	1	0	1	0
123	1	1	1	1	0	1	1
124	1	1	1	1	1	0	0
125	1	1	1	1	1	0	1
126	1	1	1	1	1	1	0
127	1	1	1	1	1	1	1

Baud Rate	DIP Switch		
	8	9	10
9600	0	0	0
19200	0	0	1
38400	0	1	0
57600	0	1	1

Function Code							
DI's	Physical Discrete Inputs	Code	HEX	Address	Data	Type	DESCRIPTION
1	Read Discrete Input 1	02	0x02	10001	1 - ON 0 - OFF	BIT	Discrete input 1 current state/value
2	Read Discrete Input 2	02	0x02	10002	1 - ON 0 - OFF	BIT	Discrete input 2 current state/value

Function Code							
Relay	Physical Coils	Code	HEX	Address	Data	Type	DESCRIPTION
1	Read Coil 1	01	0x01	00001	1 - ON 0 - OFF	BIT	Get current value/state of RELAY 1
1	Write Single Coil 1	05	0x05	00001	1 - ON 0 - OFF	BIT	Set current value/state of RELAY 1
1	Read Coil 2	01	0x01	00002	1 - ON 0 - OFF	BIT	Get default relay start up state
1	Write Single Coil 2	05	0x05	00002	1 - ON 0 - OFF	BIT	Set default relay start up state

Function Code							
AIN	Physical Input Register	Code	HEX	Address	Data	Type	DESCRIPTION
1	Read Input Register 1	04	0x04	30001	-39 °F 187 °F	INT16	Thermister Temperature °F
1	Read Input Register 1	04	0x04	30001	0 1023	UINT16	Raw Analog Input Value 0-5V or 0-10V Range
1	Read Input Register 3	04	0x04	30003		Float 32 LSB	
	Read Input Register 4			30004	0 5.000	Float 32 MSB	Real Voltage Value Input 0-5V Range
1	Read Input Register 3	04	0x04	30003		Float 32 LSB	
	Read Input Register 4			30004	0 5.000	Float 32 MSB	Real Voltage Value Input 0-10V Range
1	Read Input Register 5	04	0x04	30005		Float 32 LSB	
	Read Input Register 6			30006	1.100	Float 32 MSB	Software Revision

2 Exception Codes Supported		
02	ILLEGAL_DATA_ADDRESS	
03	ILLEGAL_DATA_VALUE	

Baud Rates Supported			
9600	Data Bits	Parity	
19200	8	None	
38400			
57600			

**INPUTS Function Code 2 - Read Physical Discrete Inputs**  
 WORD Register1 - 10001 - Digital Input Status 1 - Read (BIT)  
 WORD Register2 - 10002 - Digital Input Status 2 Read (BIT)

**INPUTS Function Code 4 - Read Physical Input Registers**  
 WORD Register1 - 30001 - Temperature Read (Thermister Mode) -39 °F thru 187 °F (INT16)  
 WORD Register1 - 30001 - Analog Input Read (Analog Input Mode) 0 thru 1023 (UINT16)  
 DWORD Register3 - 30003 and Register4 - 30004 - Analog Input Read (Analog Input Mode) 0.00 thru 5.00 Vdc (FLOAT32)  
 Real (FLOAT32) voltage will read 0.00-5.00V when AI switch selection is in 5V or 10V mode.

**INPUTS Function Code 1 - Read Physical Coils**  
 WORD Register1 - 00001 - Get Relay State (BIT)  
 WORD Register2 - 00002 - Get Default Relay Power on State (BIT)

**OUTPUTS Function Code 5 - Write Physical Coils**  
 WORD Register1 - 00001 - Set Relay State (BIT)  
 WORD Register1 - 00002 - Set Value for Default Relay State on power up (BIT)