

MDA-8000 DIO

User Manual

Warranty

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Warning

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Introduction

The MDA-8000 series is a family of network data acquisition and control modules, providing analog-to-digital, digital-to-analog, digital input/output and other functions. The modules can be remotely controlled using a set of commands, which we call the MODBUS protocol. Communication between the module and the host is in RTU format via an RS-485 bi-directional serial bus standard. Baud Rates are software programmable and transmission speeds of up to 115.2 Kbps can be selected.

The MDA-8000 DIO modules support photo-isolated digital input, photo-isolated digital input and relay contact output.

© For details of INIT mode operation, please refer to Section A.1 INIT Mode.

1.1 Pin Assignment

MDA-8316:		MDA-8416:	
<p>1 DI COM</p> <p>2 DI 11</p> <p>3 DI 12</p> <p>4 DI 13</p> <p>5 DI 14</p> <p>6 DI 15</p> <p>7 DI COM</p> <p>8</p> <p>9 INIT</p> <p>10 (Y)DATA+</p> <p>11 (G)DATA-</p> <p>12 (R)+24V</p> <p>13 (B)GND</p>	<p>DI COM 26</p> <p>DI 10 25</p> <p>DI 9 24</p> <p>DI 8 23</p> <p>DI 7 22</p> <p>DI 6 21</p> <p>DI COM 20</p> <p>DI 5 19</p> <p>DI 4 18</p> <p>DI 3 17</p> <p>DI 2 16</p> <p>DI 1 15</p> <p>DI 0 14</p>	<p>1 DO 11</p> <p>2 DO 12</p> <p>3 DO 13</p> <p>4 DO 14</p> <p>5 DO 15</p> <p>6 EXT GND2</p> <p>7 EXT PWR2</p> <p>8</p> <p>9 INIT</p> <p>10 (Y)DATA+</p> <p>11 (G)DATA-</p> <p>12 (R)+24V</p> <p>13 (B)GND</p>	<p>DO 10 26</p> <p>DO 9 25</p> <p>DO 8 24</p> <p>EXT GND1 23</p> <p>EXT PWR1 22</p> <p>DO 7 21</p> <p>DO 6 20</p> <p>DO 5 19</p> <p>DO 4 18</p> <p>DO 3 17</p> <p>DO 2 16</p> <p>DO 1 15</p> <p>DO 0 14</p>
MDA-8508:		MDA-8708:	
<p>1 DI COM</p> <p>2 DI 3</p> <p>3 DI 4</p> <p>4 DI 5</p> <p>5 DI 6</p> <p>6 DI 7</p> <p>7 DI COM</p> <p>8</p> <p>9 INIT</p> <p>10 (Y)DATA+</p> <p>11 (G)DATA-</p> <p>12 (R)+24V</p> <p>13 (B)GND</p>	<p>DI 2 26</p> <p>DI 1 25</p> <p>DI 0 24</p> <p>DO GND 23</p> <p>DO 7 22</p> <p>DO 6 21</p> <p>DO 5 20</p> <p>DO 4 19</p> <p>DO 3 18</p> <p>DO 2 17</p> <p>DO 1 16</p> <p>DO 0 15</p> <p>EXT PWR 14</p>	<p>1 RL5 COM</p> <p>2 RL5 NO</p> <p>3 RL6 COM</p> <p>4 RL6 NO</p> <p>5 RL7 COM</p> <p>6 RL7 NO</p> <p>7</p> <p>8</p> <p>9 INIT</p> <p>10 (Y)DATA+</p> <p>11 (G)DATA-</p> <p>12 (R)+24V</p> <p>13 (B)GND</p>	<p>RL4 COM 26</p> <p>RL4 NO 25</p> <p>RL3 COM 24</p> <p>RL3 NO 23</p> <p>RL2 NC 22</p> <p>RL2 COM 21</p> <p>RL2 NO 20</p> <p>RL1 NC 19</p> <p>RL1 COM 18</p> <p>RL1 NO 17</p> <p>RL0 NC 16</p> <p>RL0 COM 15</p> <p>RL0 NO 14</p>

1.2 Specifications

System Specification:

Model	MDA-8316	MDA-8416	MDA-8508	MDA-8708
Communication				
Interface	RS-485			
Format	N, 8, 1			
Baud Rate	9600~115200 bps			
Protocol	Modbus RTU			
LED Indicator				
Power Indicator	1			
Communication Indicator	1			
I/O Indicator	16			8
Isolation				
Voltage	3000V DC			
Power				
Input Range	24V DC $\pm 10\%$			
Consumption	Approx. 1W			
Reverse Polarity Protection	With			
Environment				
Operating Temperature	-25~+75°C			
Storage Temperature	-40~+85°C			
Humidity	10~95% RH, Non-condensing			

I/O Specification:

Model	MDA-8316
Digital Input	
Channels	16 (Sink / Source)
Input Type	Isolated with Common Power or Ground
Off Voltage Level	+1V Max.
On Voltage Level	+4V to +30V
Input Impedance	3K Ω

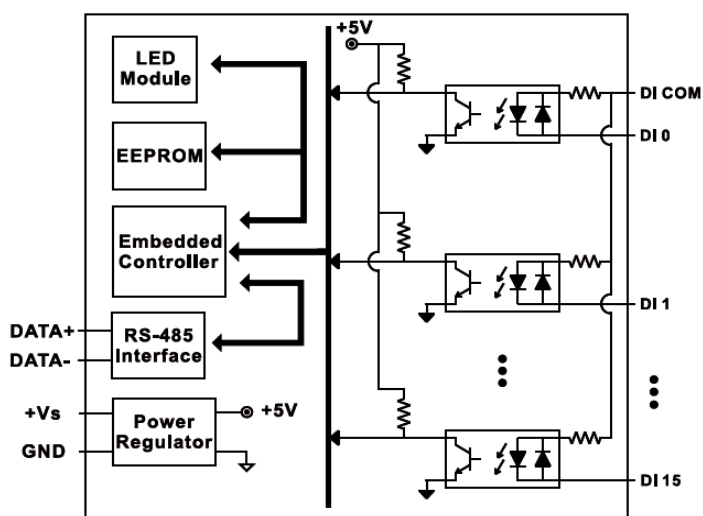
Model	MDA-8416
Digital Output	
Channels	16 (Sink)
Output Type	Open Collector (NPN)
Load Voltage	+3.5V to +50V
Max Load Current	100mA per Channel
Surge Protection	$\pm 3K\Omega$ for Power Input

Model	MDA-8508
Digital Input	
Channels	8 (Sink / Source)
Input Type	Isolated with Common Power or Ground
Off Voltage Level	+1V Max.
On Voltage Level	+4V to +30V
Input Impedance	3K Ω
Digital Output	
Channels	8 (Sink)
Output Type	Open Collector (NPN)
Load Voltage	+3.5V to +50V
Max Load Current	100mA per Channel
Surge Protection	\pm 3K Ω for Power Input

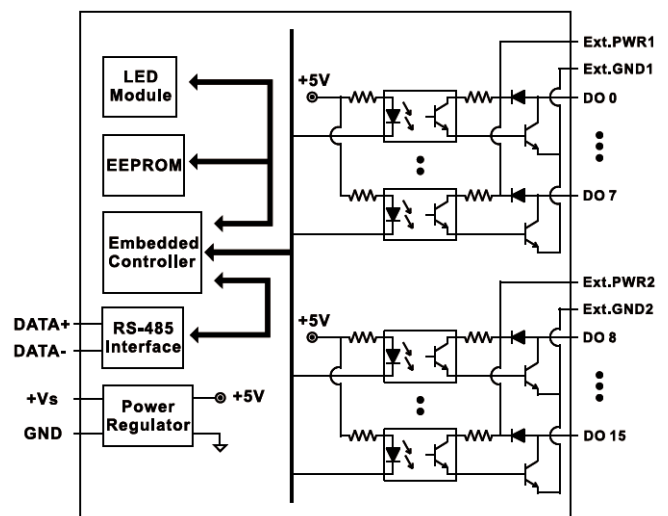
Model	MDA-8708	
Relay Output		
Channels	RL0~RL2	RL3~RL7
Contact Type	1 Form C	1 Form A
Rated Voltage	250V AC	250V AC
Rated Current	5A	3A
Mechanical Endurance	15 x 10 ⁶ ops.	10 x 10 ⁶ ops.
Electrical Endurance	10 ⁵ ops.	10 ⁵ ops.

1.3 Internal I/O Struction

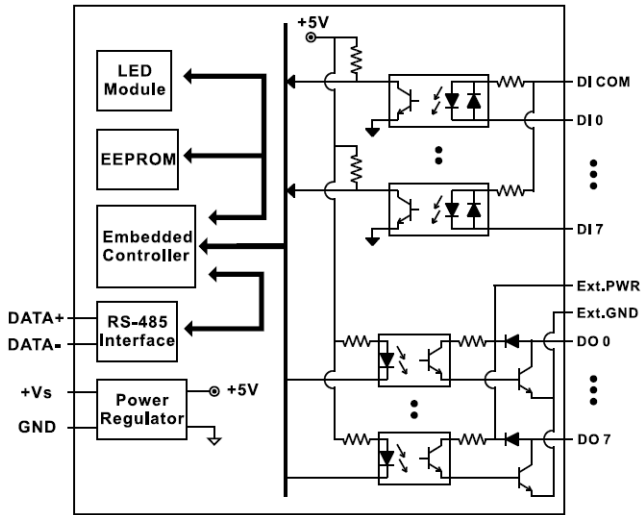
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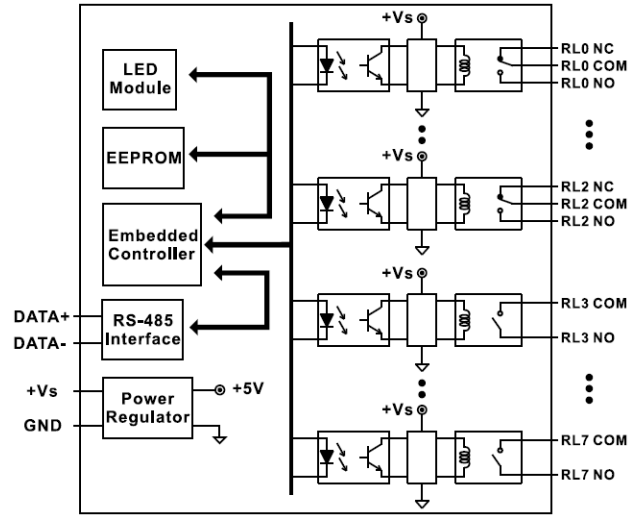
MDA-8416:



MDA-8508:



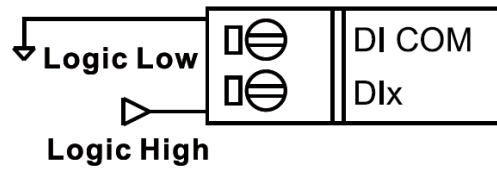
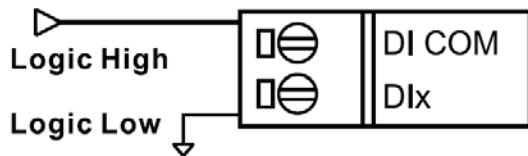
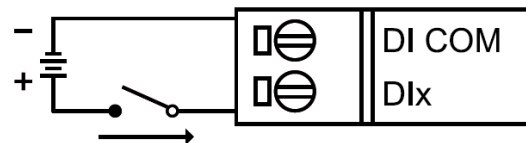
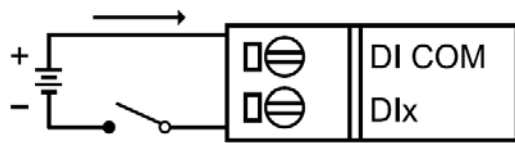
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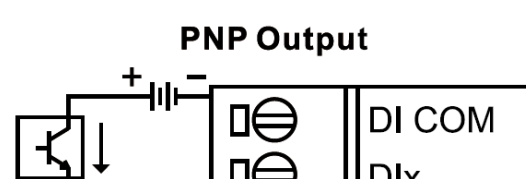
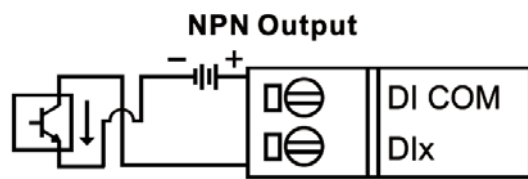
1.4 Wire Connections

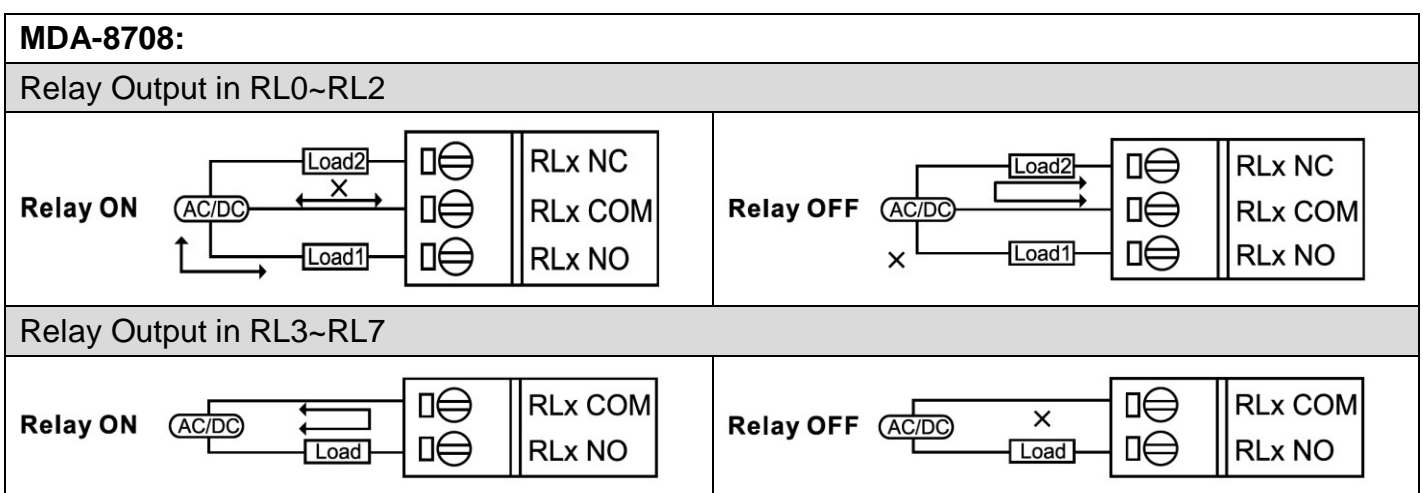
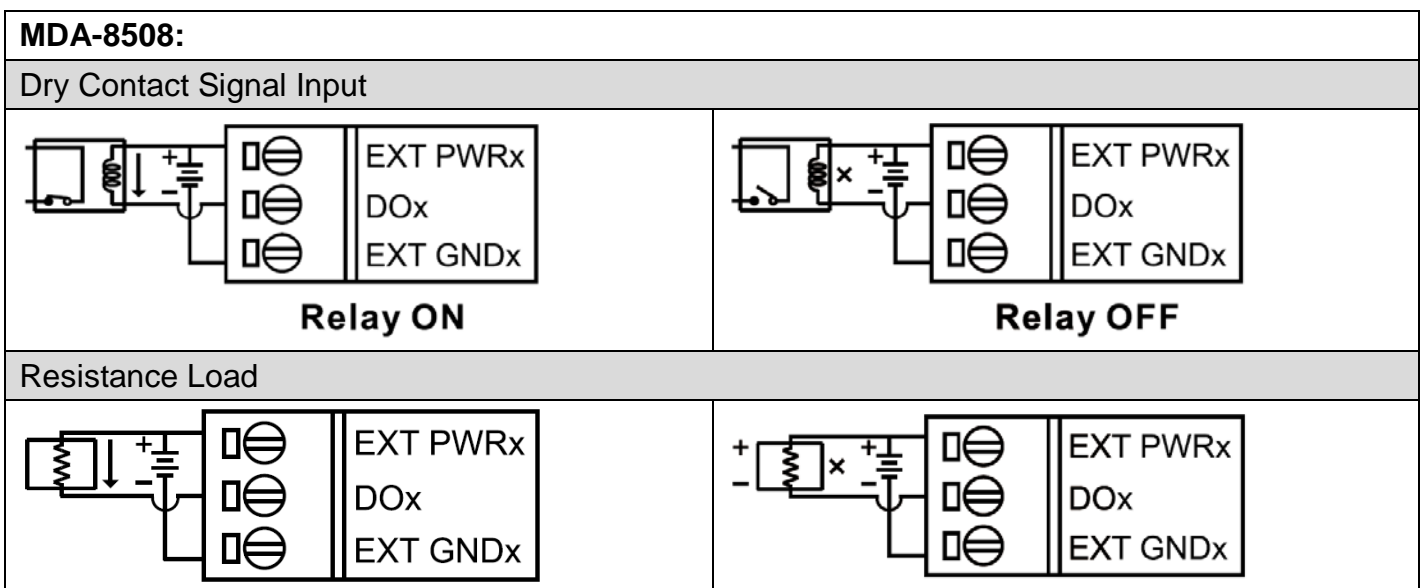
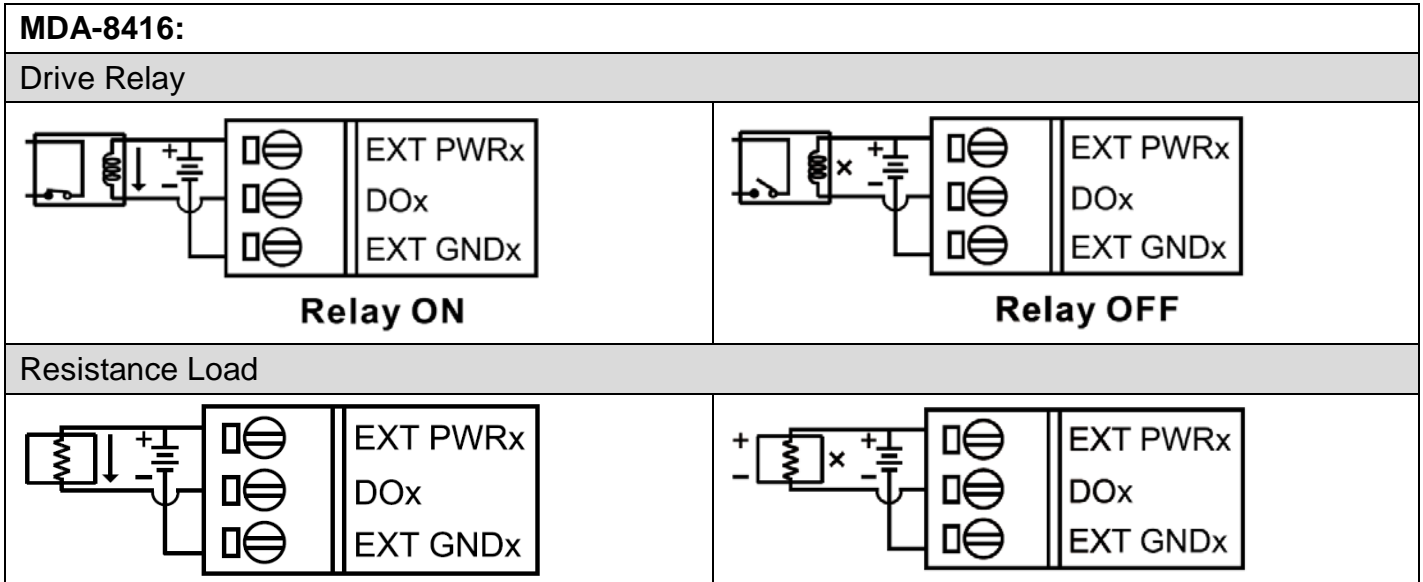
MDA-8316:

Dry Contact



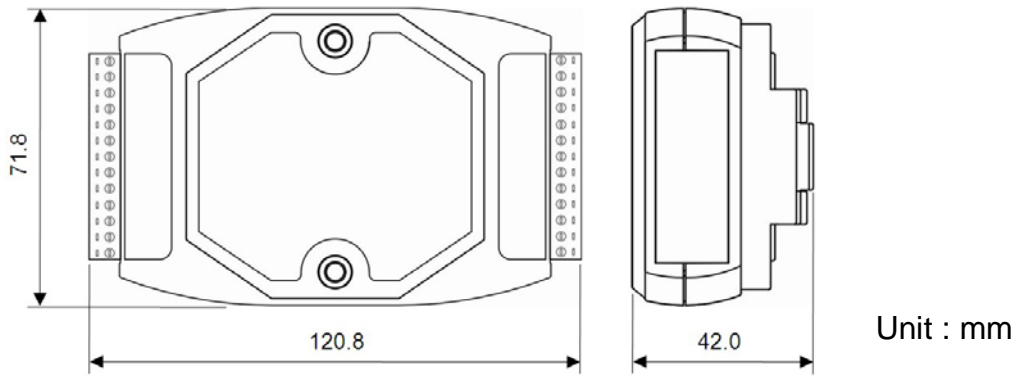
TTL / CMOS





1.5 Dimensions

The dimensions of the MDA-8316 / MDA-8416 / MDA-8508 / MDA-8708 are as shown below.



2. Communication Protocol

Interface

RS-485

Baud Rate

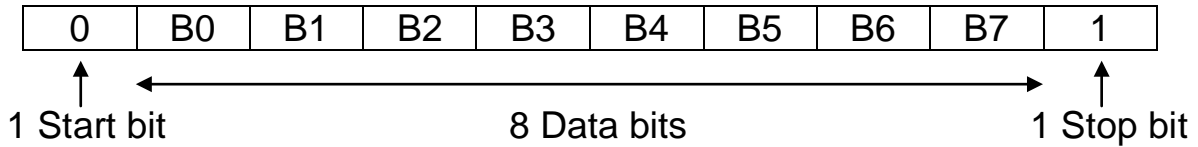
9600 57600
19200 115200
38400

Data Frame

Data bits = 8
Parity = None
Start bit = 1
Stop bit = 1

Data Format

MODBUS RTU Protocol



PARA	INDEX	Description	Attribute
Address	00	Range : 1~255	R/W
Baud Rate	01	0: 9600 / 1: 19200 / 2: 38400 / 3: 57600 / 4: 115200	R/W
DI0~DI15	02	MDA-8316	R
DO0~DO15	03	MDA-8416	R/W
RL0~RL7	04	MDA-8708	R/W
		MDA-8508 (DI0~DI7 / DO0~DO7)	

MDA-8316:

PARA	INDEX	Description	Attribute
TIMER01	0005	Delay timer for DI0 , Range : 0.0~10.0 seconds	R/W
TIMER02	0006	Delay timer for DI1 , Range : 0.0~10.0 seconds	R/W
TIMER03	0007	Delay timer for DI2 , Range : 0.0~10.0 seconds	R/W
TIMER04	0008	Delay timer for DI3 , Range : 0.0~10.0 seconds	R/W
TIMER05	0009	Delay timer for DI4 , Range : 0.0~10.0 seconds	R/W
TIMER06	000A	Delay timer for DI5 , Range : 0.0~10.0 seconds	R/W
TIMER07	000B	Delay timer for DI6 , Range : 0.0~10.0 seconds	R/W
TIMER08	000C	Delay timer for DI7 , Range : 0.0~10.0 seconds	R/W
TIMER09	000D	Delay timer for DI8 , Range : 0.0~10.0 seconds	R/W
TIMER10	000E	Delay timer for DI9 , Range : 0.0~10.0 seconds	R/W
TIMER11	000F	Delay timer for DI10 , Range : 0.0~10.0 seconds	R/W
TIMER12	0010	Delay timer for DI11 , Range : 0.0~10.0 seconds	R/W
TIMER13	0011	Delay timer for DI12 , Range : 0.0~10.0 seconds	R/W
TIMER14	0012	Delay timer for DI13 , Range : 0.0~10.0 seconds	R/W
TIMER15	0013	Delay timer for DI14 , Range : 0.0~10.0 seconds	R/W
TIMER16	0014	Delay timer for DI15 , Range : 0.0~10.0 seconds	R/W

MDA-8508:

PARA	INDEX	Description	Attribute
TIMER01	0005	Delay timer for DI0 , Range : 0.0~10.0 seconds	R/W
TIMER02	0006	Delay timer for DI1 , Range : 0.0~10.0 seconds	R/W
TIMER03	0007	Delay timer for DI2 , Range : 0.0~10.0 seconds	R/W
TIMER04	0008	Delay timer for DI3 , Range : 0.0~10.0 seconds	R/W
TIMER05	0009	Delay timer for DI4 , Range : 0.0~10.0 seconds	R/W
TIMER06	000A	Delay timer for DI5 , Range : 0.0~10.0 seconds	R/W
TIMER07	000B	Delay timer for DI6 , Range : 0.0~10.0 seconds	R/W
TIMER08	000C	Delay timer for DI7 , Range : 0.0~10.0 seconds	R/W

A.1 INIT Mode

INIT mode: To return to the ex-factory parameters.

When users forgot the previous settings and is unable to use the module, it is able to use this mode to return to the initial setting.

Ex-factory settings as below:

Address: 1 / Baud Rate: 9600

Operation: When the module is powered on, please short "13 (B)GND pin" and " 9 INIT pin" then power off the module. When the module is powered on again, it will return to the ex-factory setting.