Technical Datasheet Input / Output Modules with Modbus RTU Protocol with RS485 Interface

The IO modules communicate via RS485. The port can drive distances up to max 700 meters without the use of any repeater (*this feature however also depends on the signal strength of the Modbus Master Device).*
The RS485 Digital IO module is sturdy, low power usage and easy to use.

4 Port AO Module: -

The IO modules are mounted on DIN rail mountable casing and with exposed connectors and LED indicators. The DIP switch for Slave ID and Baud rate are placed inside the enclosure.

The design of the modules incorporates '**resettable Fuses**' to safeguard against reverse polarity connection both for **Power** and **Communication** port.

Specifications

General –

I/O Connectors	2 Pin 5.08 mm pitch pluggable screw terminals.
Dimensions	60 mm L x 110 mm B x 50 mm H
Power	Input Power – 12 – 24 VDC or 24 V AC/DC
	Typical – 12V DC @ 80mA
Operating Temperature	0 – 60° C (32 ~ 140°F)
Storage Temperature	-20 - 70° C (-4 ~ 158°F)

Storage Humidity	5 ~ 95 % RH, non – Condensing

Certifications

AO Outputs –

| Channels	4
Inputs Resolution	10 Bit (12 bit optional)
Signal Range	4 – 20 mA
Accuracy	$\pm$ 2 % of Full scale
Linearity Error	0.1 %
Conversion Time	20 msec

Additional Features: -
Communication Port isolated
Input power reverse polarity safety
ESD Safety IEC 61000-4-2, $\pm$ 30KV contact, $\pm$ 30KV air
EFT IEC 61000-4-4, 50A (5/50ms)
750V isolation.
CRC Error check.
No configuration needed on the IO board

Configuration Settings: -

Communication Speed	9600 – 115200 bps (DIP SW selectable)
Data Bits	8
Parity	None
Stop bit	1
CRC	Yes
Slave ID	1 – 15 (DIP SW selectable)
Function code AO	0x10 Write Multiple registers
AO Register Address	10 Bit - 8,9,10,11 / 12 bit – 12,13,14,15

ID	Function Description	Register Description	Modbus Function Code	Protocol	Data Type
1	AO 1 – 10 Bit	40008	0X10	RS485	16 Bit Unsigned int
2	AO 2 – 10 Bit	40009	0X10	RS485	16 Bit Unsigned int
3	AO 3 – 10 Bit	40010	0X10	RS485	16 Bit Unsigned int
4	AO 4 – 10 Bit	40011	0X10	RS485	16 Bit Unsigned int
5	AO 1 - 12 Bit	40012	0x10	RS485	16 Bit Unsigned int
6	AO 2 - 12 Bit	40013	0x10	RS485	16 Bit Unsigned int
7	AO 3 - 12 Bit	40014	0x10	RS485	16 Bit Unsigned int
8	AO 4 - 12 Bit	40015	0x10	RS485	16 Bit Unsigned int

BAUD RATE DESCRIPTION

MSB

LSB
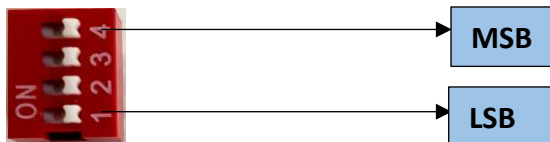
- For Baud rate Selection, DIP SW is used as per the diagram.
- Pulling up the switch will make Baud rate active.
- If no selection is made 9600 will be default Baud rate.
- When u change the Baud rate in the Module power 'ON' condition, pls press the reset button to get Change to affect.

Baud Rate	DIP SWITCH			
	1	2	3	4
9600	OFF	OFF	OFF	OFF
19200	ON	OFF	OFF	OFF
38400	OFF	ON	OFF	OFF
57600	OFF	OFF	ON	OFF
115200	OFF	OFF	OFF	ON

SLAVE ID DESCRIPTION

MSB

LSB
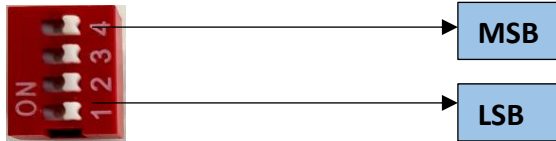
For Slave ID Selection SW is used to Set The SLAVE ID .

For Slave ID DIP Switch LSB is "1" follow through "4" is MSB.

Slave ID Confirmed through below Device ID table .

IF Eg. Slave ID 1 is Needed to be selected Switch number 1 should pulled up other three should be selected down side. So"1 0 0 0" will be selected as Slave ID 1.

Slave ID	DIP SWITCH				OUTPUT (Binary)	OUTPUT (Decimal)
	1	**2**	**3**	**4**		
0	OFF(0)	OFF(0)	OFF(0)	OFF(0)	0 0 0 1	1
1	ON(1)	OFF(0)	OFF(0)	OFF(0)	0 0 0 1	1
2	OFF(0)	ON(1)	OFF(0)	OFF(0)	0 0 1 0	2
3	ON(1)	ON(1)	OFF(0)	OFF(0)	0 0 1 1	3
4	OFF(0)	OFF(0)	ON(1)	OFF(0)	0 1 0 0	4
5	ON(1)	OFF(0)	ON(1)	OFF(0)	0 1 0 1	5
6	OFF(0)	ON(1)	ON(1)	OFF(0)	0 1 1 0	6
7	ON(1)	ON(1)	ON(1)	OFF(0)	0 1 1 1	7
8	OFF(0)	OFF(0)	OFF(0)	ON(1)	1 0 0 0	8
9	ON(1)	OFF(0)	OFF(0)	ON(1)	1 0 0 1	9
10	OFF(0)	ON(1)	OFF(0)	ON(1)	1 0 1 0	10
11	ON(1)	ON(1)	OFF(0)	ON(1)	1 0 1 1	11
12	OFF(0)	OFF(0)	ON(1)	ON(1)	1 1 0 0	12
13	ON(1)	OFF(0)	ON(1)	ON(1)	1 1 0 1	13
14	OFF(0)	ON(1)	ON(1)	ON(1)	1 1 1 0	14
15	ON(1)	ON(1)	ON(1)	ON(1)	1 1 1 1	15

Note: -

For MODBUS communications, **a shielded and twisted pair cable** is used. One example of such cable is Belden 3105A.

Recommended Cable Electrical Characteristics: -

22 AWG Cable	Shielded and twisted pair should be used.
Tinned Copper	Recommended
Nominal Conductor DCR	14.7 ohm / 1000 ft
Nominal Capacitance	11 pf / feet (conductor to conductor)
High Frequency Non-Insertion Loss	0.5db / 100ft

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