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.

8 Port DI and 8 Port DO 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	12 Pin 5.08 mm and 2 Pin 5.08 mm pitch pluggable screw Terminal Block
Dimensions	110 mm L x 110 mm B x 50mm H
Power	Input Power – 15-40V DC or 24 V AC/DC

	Typical – 12V DC @ 150mA
Operating Temperature	0 – 60° C (32 ~ 140°F)
Storage Temperature	-20 - 70° C (-4 ~ 158°F)
Storage Humidity	5 ~ 95 % RH, non – Condensing
Certifications	

Relay Output –

Channels	8
Contact Form	1A, 1C
Contact Material	Ag Alloy
Contact Capacity	10A @ 240VAC, 10A @ 28VDC
Coil Voltage	5 – 48 VDC
Coil Power	0.36 W
Insulation Resistance	250MΩ
Electrical Life	1 x 10^5
Mechanical Life	1 x 10^7
Operating Time	7 msec, Max 15 msec
Release Time	2 msec, Max 6 msec

DI Inputs –

Channels	8
Sense Voltage	3.3 – 30 VDC
Sense Logic	Logic ‘0’ = <1 VDC, Logic ‘1’ = >3.3 VDC
Isolation	Optically isolated
Response Time	2 msec, Max 6 msec

Additional Features -

All inputs and communication port isolated
Input power reverse polarity safety
ESD Safety IEC 61000-4-2, ± 30KV contact, ± 30KV air
EFT IEC 61000-4-4, 50A (5/50ms)
400V isolation.
CRC Error check.
No configuration needed on the IO board

Configuration Settings -

Communication Speed	9600 - 115200(DIP SW selectable)
Data Bits	8
Parity	None
Stop bit	1
CRC	Yes
Slave ID	1 – 15 (DIP SW selectable)
Function code DO	0x05 and 0x0F (5 Single coil & 15 multiple coil)
DO Register Address	0,1,2,3,4,5,6,7.
Function code DI	0x02 Read Discrete Input
DI Register Address	8,9,10,11,12,13,14,15.

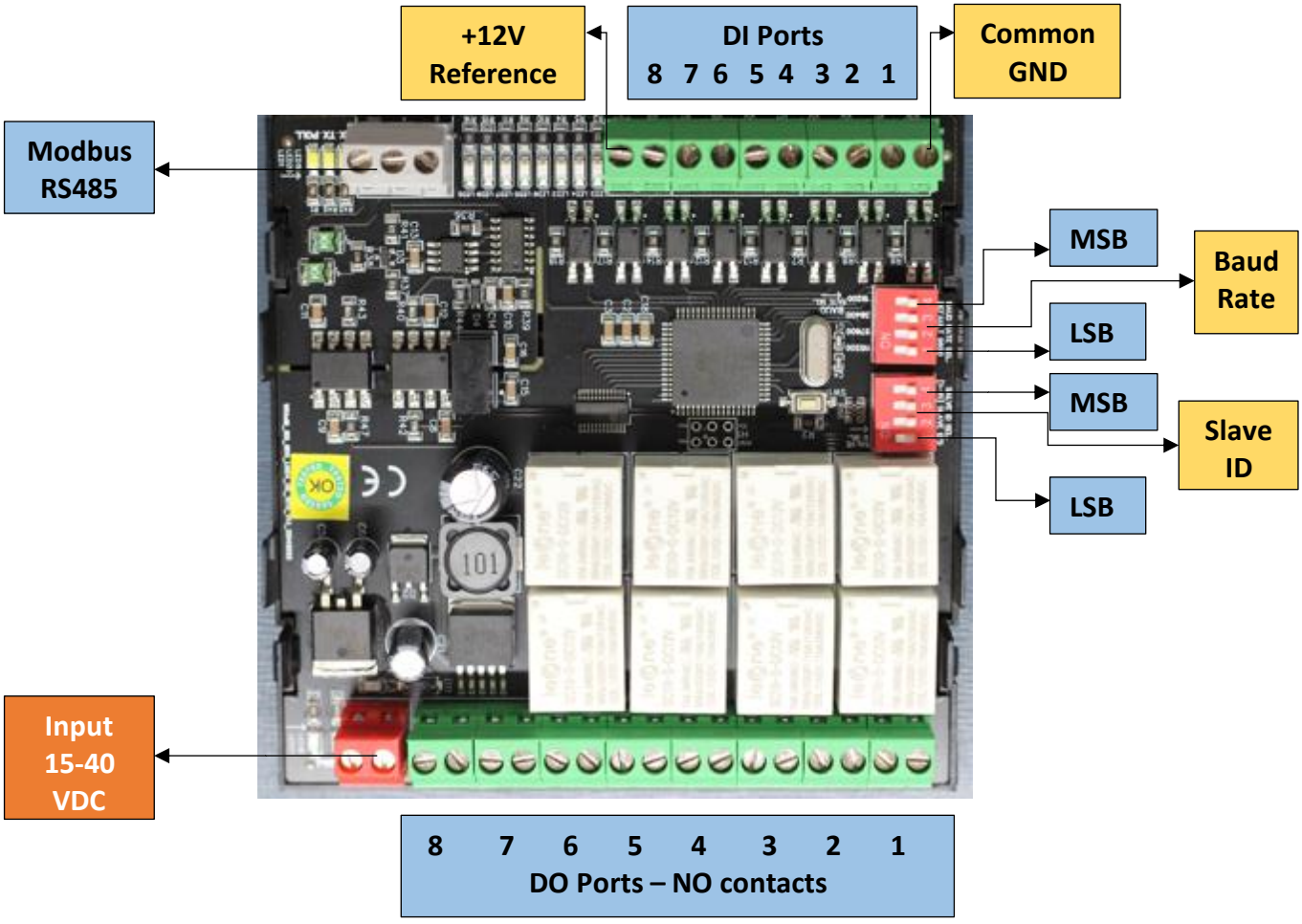
ID	Function Description	Register Description	Modbus Function Code	Protocol	Data Type
1	**DO 1**	00000	0X05,0X0F	RS485	1 Bit Boolean
2	**DO 2**	00001	0X05,0X0F	RS485	1 Bit Boolean
3	**DO 3**	00002	0X05,0X0F	RS485	1 Bit Boolean
4	**DO 4**	00003	0X05,0X0F	RS485	1 Bit Boolean
5	**DO 5**	00004	0X05,0X0F	RS485	1 Bit Boolean
6	**DO 6**	00005	0X05,0X0F	RS485	1 Bit Boolean
7	**DO 7**	00006	0X05,0X0F	RS485	1 Bit Boolean
8	**DO 8**	00007	0X05,0X0F	RS485	1 Bit Boolean
9	**DI 1(With & Without Potential)**	00008	0X02	RS485	1 Bit Boolean
10	**DI 2(With & Without Potential)**	00009	0X02	RS485	1 Bit Boolean
11	**DI 3(With & Without Potential)**	00010	0X02	RS485	1 Bit Boolean
12	**DI 4(With & Without Potential)**	00011	0X02	RS485	1 Bit Boolean
13	**DI 5(With & Without Potential)**	00012	0X02	RS485	1 Bit Boolean
14	**DI 6(With & Without Potential)**	00013	0X02	RS485	1 Bit Boolean
15	**DI 7(With & Without Potential)**	00014	0X02	RS485	1 Bit Boolean
16	**DI 8(With & Without Potential)**	00015	0X02	RS485	1 Bit Boolean

Note: -

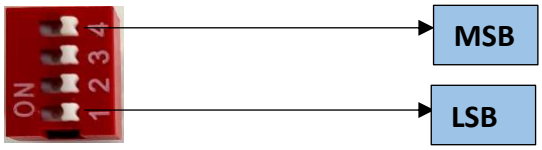
For MODBUS communications, **a shielded and twisted pair cable** is used. One example of such cable is Belden 3105A.

Recommended Cable Electrical Characteristics: -

22 AWG Cable	Shielded and twisted pair
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



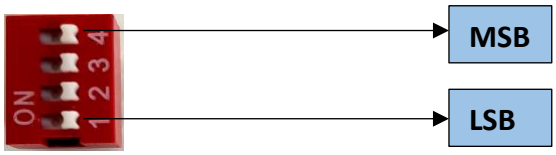
BAUD RATE DESCRIPTION



- 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

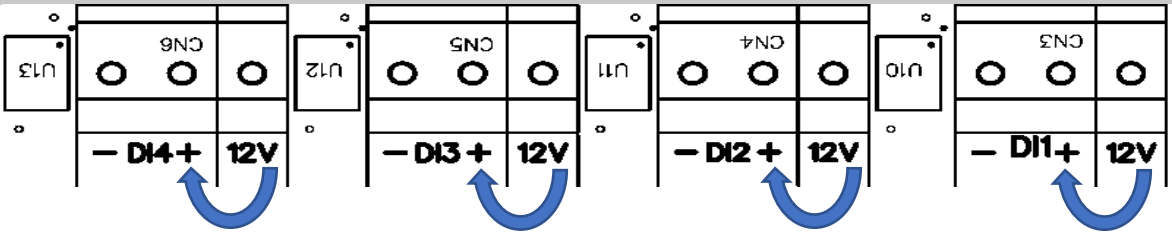


For Slave ID Selection SW is used to Set The SLAVE ID .
For Slave ID DIP Switch LSB is "1" follow through "4" is MSB.
Slave ID Confirmed through below Device ID table .
IF Eg. Slave ID 1 is Needed to be selected Switch number 1 should pulled up other three should be selected down side. So"1 0 0 0" will be selected as Slave ID 1.

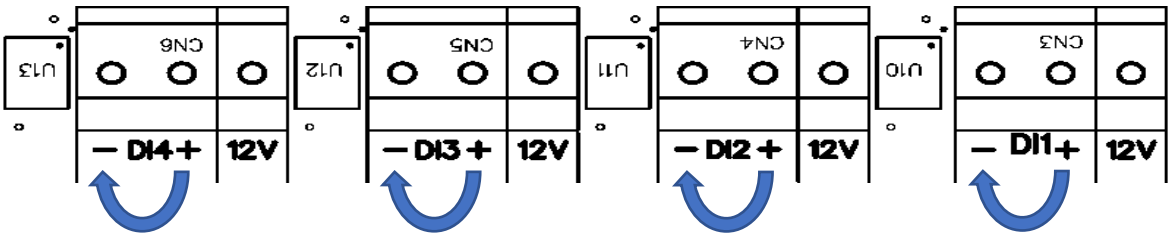
Slave ID	DIP SWITCH				OUTPUT (Binary)	OUTPUT (Decimal)
	1	2	3	4		
0	OFF(0)	OFF(0)	OFF(0)	OFF(0)	1 0 0 0	1
1	ON(1)	OFF(0)	OFF(0)	OFF(0)	1 0 0 0	1
2	OFF(0)	ON(1)	OFF(0)	OFF(0)	0 1 0 0	2
3	ON(1)	ON(1)	OFF(0)	OFF(0)	1 1 0 0	3
4	OFF(0)	OFF(0)	ON(1)	OFF(0)	0 0 1 0	4
5	ON(1)	OFF(0)	ON(1)	OFF(0)	1 0 1 0	5
6	OFF(0)	ON(1)	ON(1)	OFF(0)	0 1 1 0	6

7	ON(1)	ON(1)	ON(1)	OFF(0)	1 1 1 0	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)	OFF(0)	ON(1)	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

Connection Instruction FOR DI



For Digital Input Potential Free Contact Detection 12V & + terminals should be connected, e.g. 12v & DI1+ve terminal.



For Digital Input with Potential (3V to 30V) Contact + Common GND terminal should be connected on the Board, e.g DI1 +ve terminal and GND pin.

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