Digital Input Output Card Manual

1. Introduction

DIO-0804 Digital Input Output card is a microcontroller-based 8 Input & 4 Output DIO Instrument available with Din rail mounting. It is used for external IO expansion for PLC's HMI's, PC's etc. The IO's can be operated on Modbus RS485 Communication.

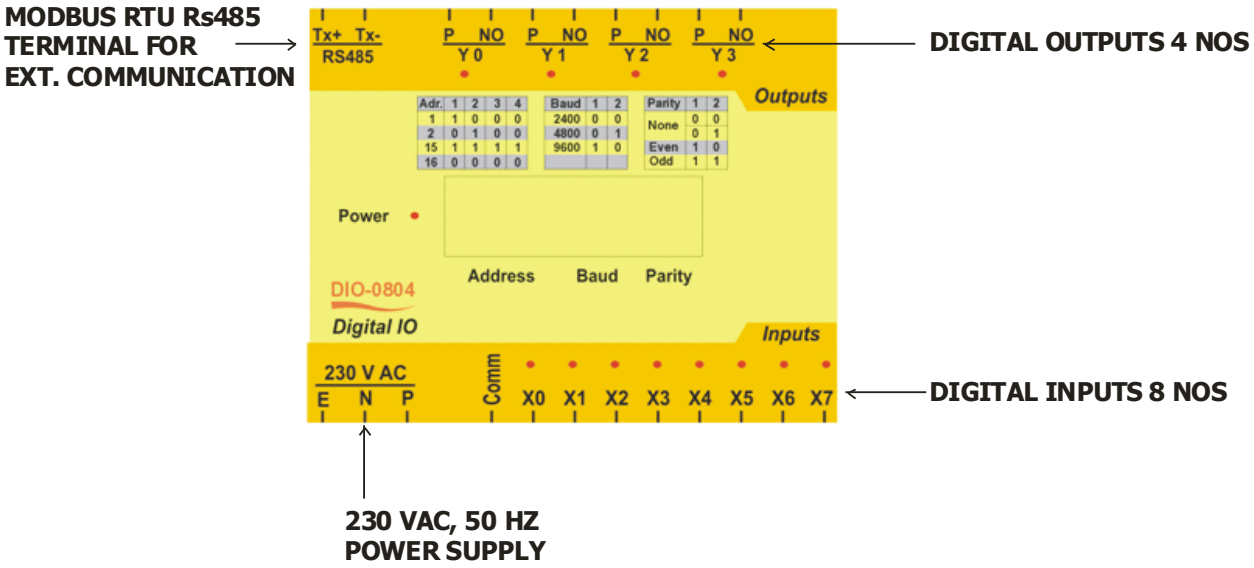
The Input Status Registers can be read via communication and output can be controlled. Once particular output is set HIGH it will retain its state until a command LOW is given to it.

Product photo

2. Specifications

Model	: DIO-0804
No. of Inputs	: 8 (Optically isolated)
No. of Outputs	: 4 Relays with potential free Pole & NO Contact
Power Supply	: 230 V AC, 50 Hz
Operating Temperature	: 0 to 55 °C
Relative Humidity	: 0-90% RH (Less than 55 °C) Non-condensive
Communication	: RS485 2 wire, Isolated
Protocol	: Modbus RTU
Slave Address Selection	: 1 to 16 (Using DIP)
Baud Rate Selection	: 2400, 4800, 9600
Parity Selection	: Odd, even & none
Weight	: 400 grams approx.
Mounting	: Din Rail
Dimensions	: 70 (W) x 75 (H) x 110 (D) mm

3. Illustrations



4. Communication protocol and its information

Communication interface : RS485 (2 wire)
Protocol : Modbus RTU
Baud Rate : Selectable between 2400, 4800, 9600 bps
Parity : Odd, Even & None
Data byte : 8 bit
Stop bit : 1
Device Address : Programmable from 1 to 16
Function supported : Read Coil = 01
Write Single Coil = 05
Write Multiple Coils = 15
Response Timeout (By master**):** 500 msec minimum

FUNCTION: Message Formats
Message Format: (Request initiated by Master)

Slave Address	Function Code	Start Address (Hi)	Start Address (Lo)	Data High (Hi) byte	Data Low (Lo) byte	CRC Check (Lo)	CRC Check (Hi)
0F	01	00	00	00	08	3C	E2

Message Formats:
(Response by the slave for the request initiated by the master)

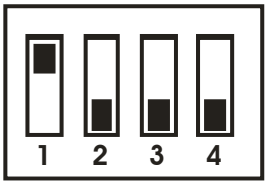
Slave Address	Function Code	Byte Count	Data	CRC Check (Lo)	CRC Check (Hi)
0F	01	01	00	53	60

4.1 Address selection procedure

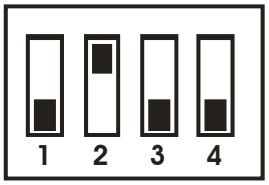
Modbus is "Master/Slave" communication protocol. Usually, there is one master & multiple slave devices on one multi-drop RS-485 serial bus. Each slave is assigned a unique slave address. The address is determined by the DIP switch setting. DIP switch position 1 to 4 set the slave address from 1 to 16. Whenever user changes the device address, baud rate & Parity settings, the unit needs to be restarted. First 4 way DIP on the instruments decides the address of the slave device.

ON: Shift DIP to ON side
OFF: Shift DIP to numerical side

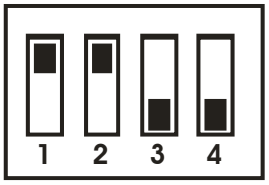
e.g. 1) To set Slave Address 1, position 1 = ON & position 2,3,4 = OFF



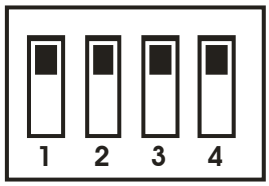
2) To set slave address 2, position 1,3,4 = OFF & position 2 = ON



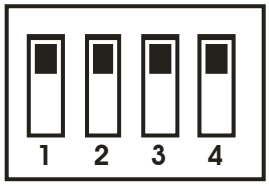
3) To set slave address 3, position 1, 2 = ON & position 3,4 = OFF



4) To set slave address 15 (1111 bin), position 1, 2, 3,4 = ON

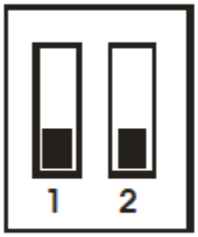


5) To set slave address 16 (0000 bin), position 1, 2, 3,4 = OFF



4.2 Baud rate selection procedure

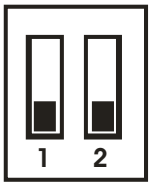
2-way middle DIP on the instruments decides the baud rate for slave device. Switch position 1 & 2 can be used to set the baud rate. DIO-0804 can support 4 different types of baud rate. i.e. 2400, 4800, 9600 bps.



SW1	SW2	BAUD
OFF	OFF	2400
OFF	ON	4800
ON	OFF	9600

4.3 Parity selection procedure.

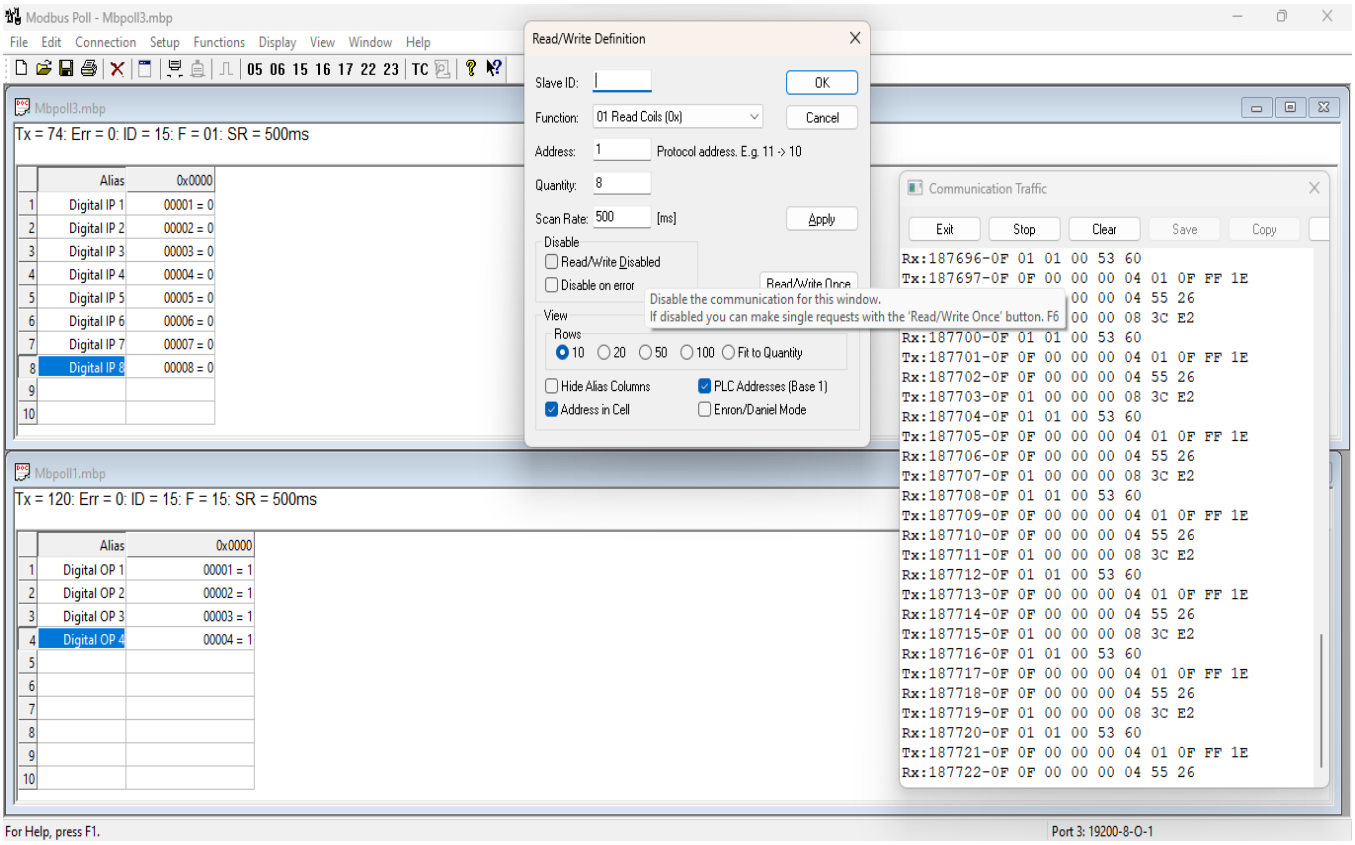
Last 2- way DIP on instruments decides the Parity selection for communication.



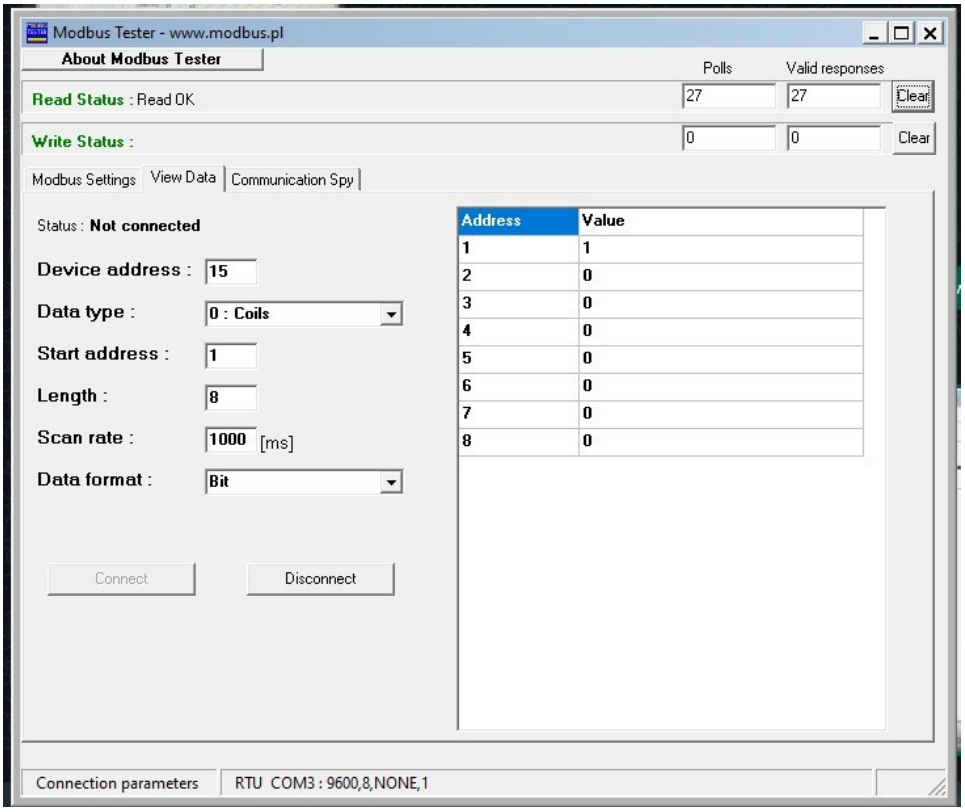
SW1	SW2	PARITY
OFF	OFF	NONE
OFF	ON	
ON	OFF	EVEN
ON	ON	ODD

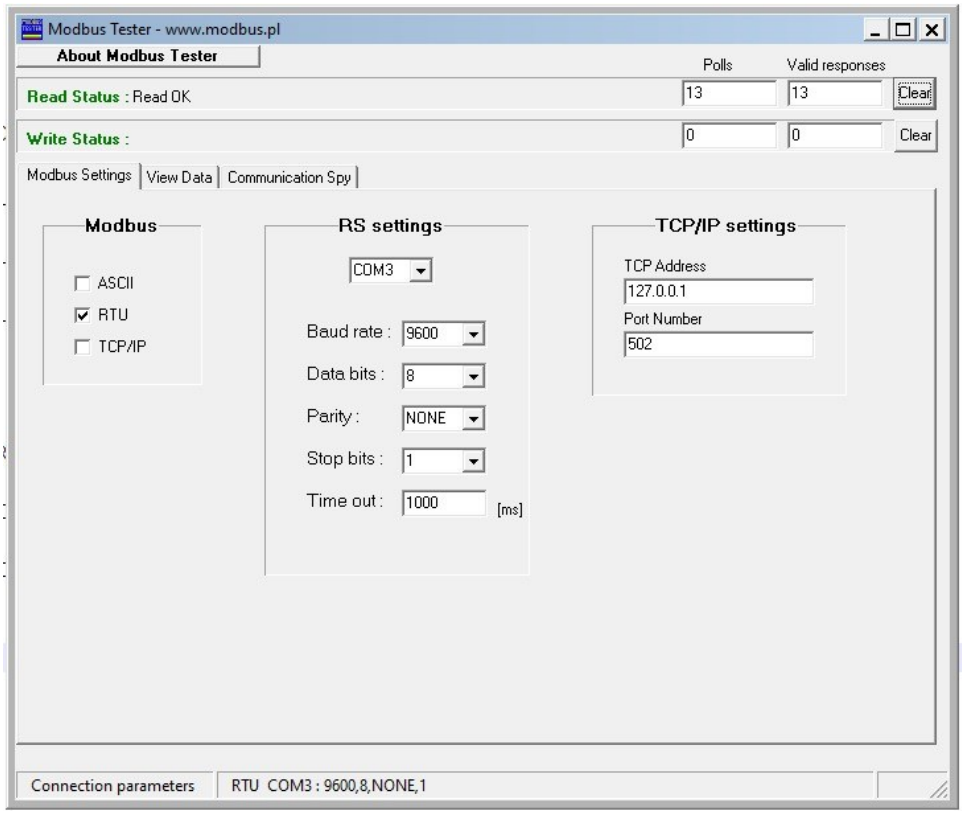
5. Modbus Poll tester communication screen shots

5.1 Read Multiple Coils (Modbus Poll)

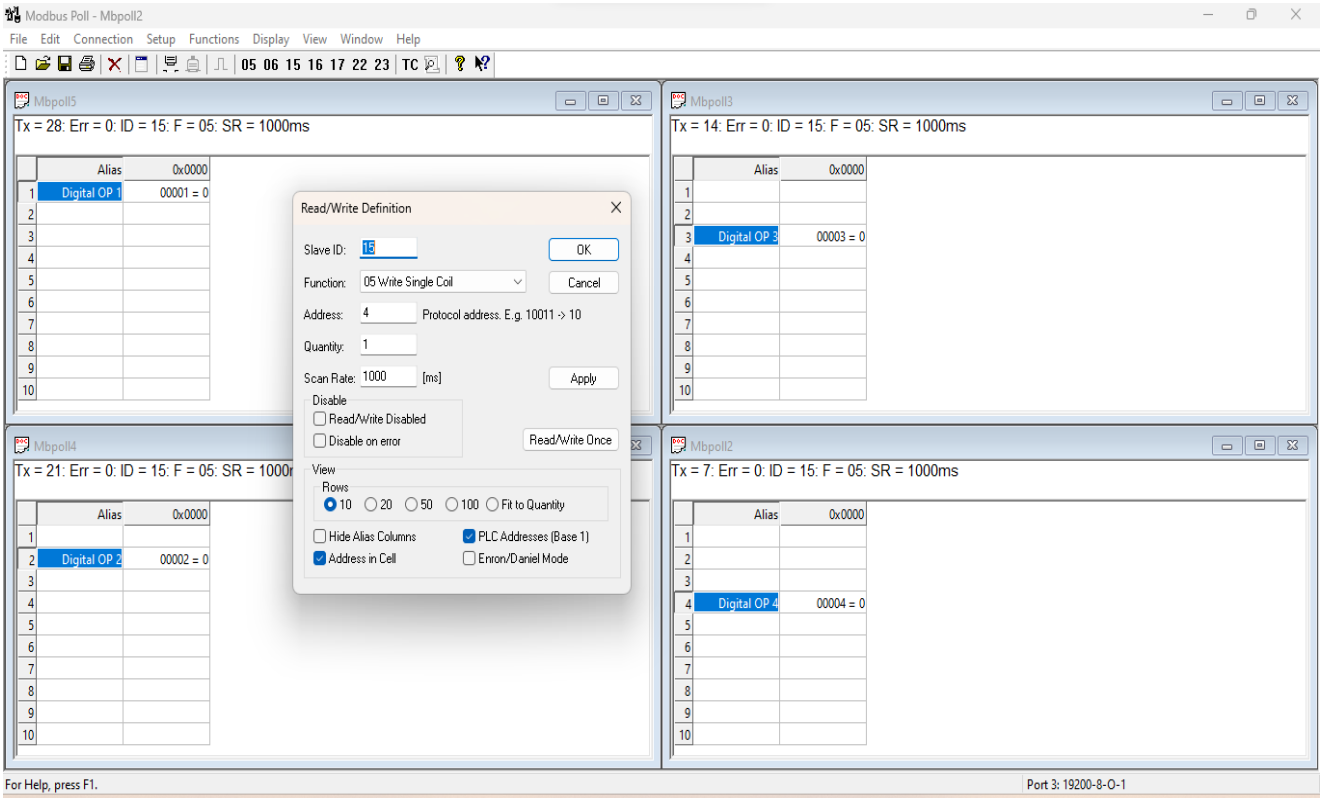


5.2 Read Multiple Coils (Modbus Tester)

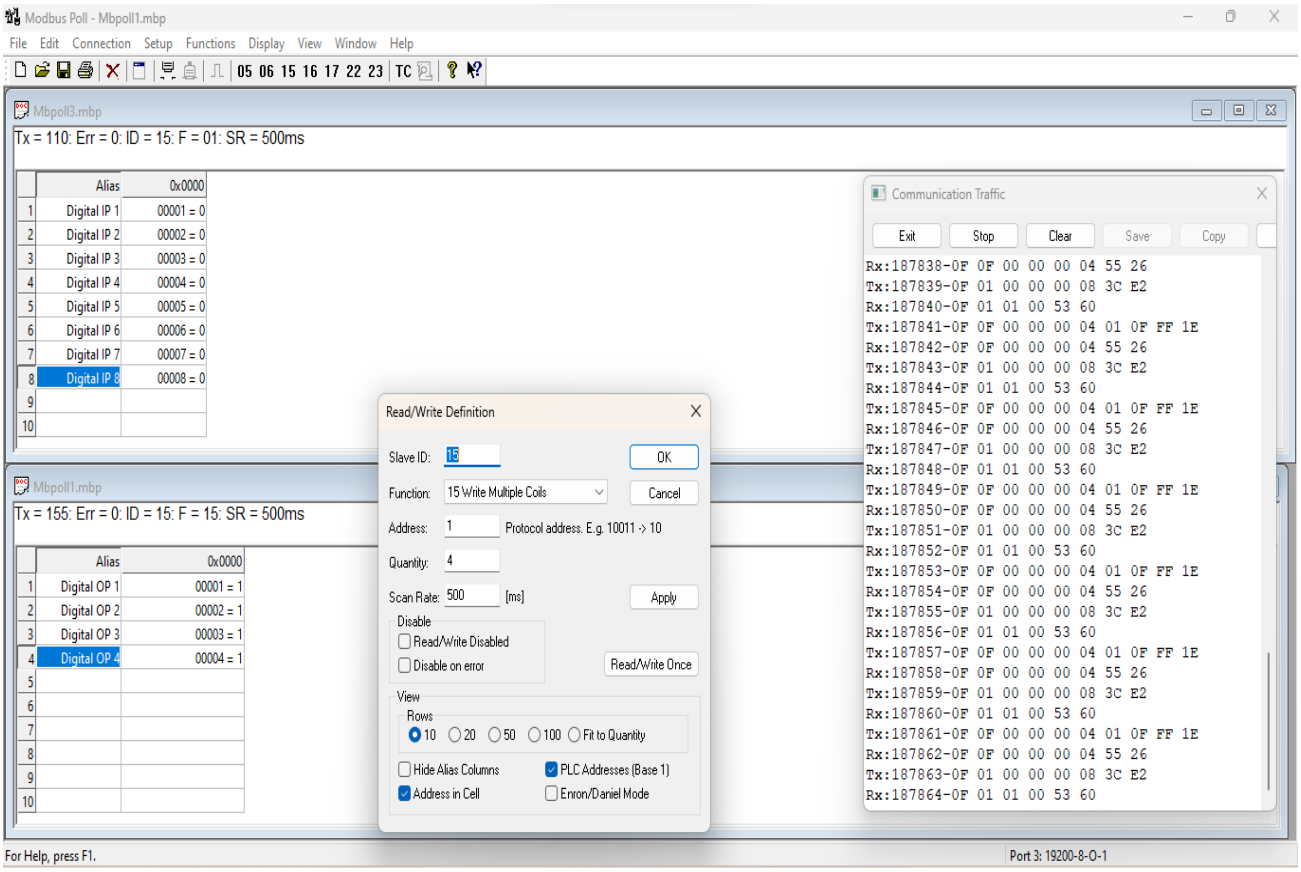




5.3 Write Single Coil (Modbus Poll)



5.4 Write Multiple Coils (Modbus Poll)



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