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Connecting. Converting. Leading !

Document Name: USER MANUAL for RIO.

INTRODUCTION

RIO is used to monitor field inputs and control outputs through Modbus interface It acts as a Modbus RTU slave and updates status of analog and digital inputs in predefined Modbus registers. Digital Outputs of RIO can be controlled through Modbus registers Unit is designed to be used in industrial panels and operates on 18V-36V DC, 1A power supply.

FEATURES

- Supports up to 8 Analog Inputs (4-20mA,0-10V.0-5V), 8 Digital Inputs (Potential Free) and 4 Digital Outputs
- Modbus RTU Slave interface for SCADA
- Configuration through Modbus registers
- Configurable Modbus Device ID and RTU Interface settings.
- Robust design with DIN rail mounting and wall mounting
- Industrial screw type Power terminal block for 18 ~ 36 V DC operation

OPERATION

RIO is Modbus slave device. It is configured using Modbus predefined registers. Device ID baud rate, parity and stop bits can be configured .
After configuration, status of Analog inputs, Digital inputs and Digital outputs is shown in predefined Modbus registers which can be observed in Modscan software.
Digital outputs can be controlled by updating the value in predefined Modbus registers of digital outputs.

CONFIGURATION DETAILS

1) Configuration through Modbus registers:

a. Connect unit's D+ and D- to PC using RS485 to USB converter to PC

b. Open Modscan Software on PC. Select ID as 1, Serial parameters as 9600,8,N,1 address 5001 length 4

Modbus protocol address map

Modbus Register	Function	Description	Action
5000	Read/write Modbus device address	Modbus device Address The rage is 1 to 247	R/W
5001	Read/write baud rate	Baud Rate Setting 1-2400 2-4800 3-9600 4-19200 5-38400 6-57600 7-115200	R/W
5002	Read/Write Parity	0-None 1-Even 2-Odd	R/W
5003	Read/write stop bits	0-1 Stop bit 1-2 Stop bits	R/W

Modbus memory map of RIO

Digital Inputs
Function code -02: Input status

Digital Input	Modbus Address	Actual address
DI1	0001	0000
DI2	0002	0001
DI3	0003	0002
DI4	0004	0003
DI5	0005	0004
DI6	0006	0005
DI7	0007	0006
DI8	0008	0007

To observe digital input status open Modscan with device address, Function code 02 and length 4 or 8 as per RIO241/RIO884 model resp.

Analog Inputs
Function code -03: Holding register

Digital Input	Modbus Address	Actual address
AI1	0001	0000
AI2	0002	0001
AI3	0003	0002
AI4	0004	0003
AI5	0005	0004
AI6	0006	0005
AI7	0007	0006
AI8	0008	0007

To observe analog input value, open Modscan with device address, Function code 03 and length 2 or 8 as per RIO241/RIO884 model resp.

Actual mA current for 4 to 20mA = Value shown in decimal in Modscan /100

Actual voltage for(0-10/0-5V) = Value shown in decimal in Modscan /100

Digital outputs
Function code -01: Coil Status

Digital Input	Modbus Address	Actual address
DO1	0001	0000
DO2	0002	0001
DO3	0003	0002
DO4	0004	0003

To observe digital output status, open Modscan with device address, Function code 01 and length 1 or 4 as per RIO241/RIO884 model resp.

To change the digital output value, change it through Modscan by updating Coil Status.

CONNECTOR DETAILS

RTU interface:

RIO 884 models -RTU has RS485 interface using 3 Pin Houder.

PIN no.	PIN details
1	D+ (RS485)
2	D- (RS485)
3	GND

RIO241 Models – RTU has RS485 interface using 2 pin Houder

PIN No	PIN Details
1	D+ (RS485)
2	D- (RS485)

Power connector:

RIO models work on +24V DC supply using 3 Pin Houder.

PIN no.	PIN details
1	+24 V DC IN
2	GND
3	E

LED INDICATIONS

LED Name	Details	
Power	ON	Unit is powered on
RTU LEDS	Blinking	When RS485 Communication takes place