

# **RDAc - II**

## **I/O PROCESSOR**



## **REMOTE DATA ACQUISITION & CONTROL**



Cybernetic Software  
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# RDAc – II I/O

## MODEL: P01003A1

Semi universal low cost 16 channel I/O processor. Part of the series – II RDAc family.

## FEATURES

- ◆ 8 Bit CPU
- ◆ Combination of I/O for the 16 channels with max of:
  1. 8 – Digital Inputs
  2. 8 - Analog Inputs ( 0-5V )
  3. 8 - Relay Outputs ( 1A@30Vdc)
  4. Counters :
    - a) High Speed Counters Channel 1 – 8  
Pulse Rate : 200Hz  
Pulse width : 2ms
    - b) Slow Speed Counters Channel 9 – 16  
Pulse Rate : 50Hz  
Pulse Width : 20ms
- ◆ RS485 or RS232
- ◆ Channel Led indicators
- ◆ Communications indicators
- ◆ Panel mounted module
- ◆ Standard modbus RTU communications Protocol
- ◆ All I/O functions available in 4000X registers
- ◆ Multi address support for 485 multi drop



## SPECIFICATIONS

Supply	- 15 to 30VDC
Power	- 2,5 Watt
RS232	- Standard D-Sub, 9 Pin
RS485	- Convenient Screw terminal
Temp	- 0°C to 50°C
Storage	- 10°C to 70°C

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P01003A1.DOC

## RDAC II I/O

### Memory map:

The first 30 registers from 40001 to 40030 are internal RAM registers and contain the I/O map for the device as the following table indicates.

ADDRESS	FUNCTION	RANGE	MODE
40001	Digital outputs	0-255	W
40002	Analogue out 1 (CH15)	0-4095	W
40003	Analogue out 2 (CH16)	0-4095	W
40004	Write Command	0-65535	W
40005	Write Info 1	0-65535	W
40006	Write Info 2	0-65535	W
40007	Write Info 3	0-65535	W
40008	Write Info 4	0-65535	W
40009	Digital Inputs	0-65535	R
40010	Counter 1 (CH 01)	0-65535	R
40011	Counter 2 (CH 02)	0-65535	R
40012	Counter 3 (CH 03)	0-65535	R
40013	Counter 4 (CH 04)	0-65535	R
40014	Counter 5 (CH 05)	0-65535	R
40015	Counter 6 (CH 06)	0-65535	R
40016	Counter 7 (CH 07)	0-65535	R
40017	Counter 8 (CH 08)	0-65535	R
40018	Analogue 1 (CH 09)	0-4095	R
40019	Analogue 2 (CH 10)	0-4095	R
40020	Analogue 3 (CH 11)	0-4095	R
40021	Analogue 4 (CH 12)	0-4095	R
40022	Analogue 5 (CH 13)	0-4095	R
40023	Analogue 6 (CH 14)	0-4095	R
40024	Analogue 7 (CH 15)	0-4095	R
40025	Analogue 8 (CH 16)	0-4095	R
40026	Read Command	0-65535	R
40027	Read Info 1	0-65535	R
40028	Read Info 2	0-65535	R
40029	Read Info 3	0-65535	R
40030	Read Info 4	0-65535	R

There is then a gap to make up 128 registers, and then from register 40129 the EEPROM is mapped for 180 registers.

## RDAc II I/O

**NOTE!** The internal EEPROM is read and written directly using these registers so it is advisable not to use the registers as storage for continually updated parameters.

ADDRESS	FUNCTION	RANGE	MODE
40129	RDAC signature	0x2BAD	R
40130	Hardware Type	0-65535	R
40131	Software version	0-65535	R
40132	Reserved	0-65535	R
40133	Reserved	0-65535	R
40134	Reserved	0-65535	R
40135	Reserved	0-65535	R
40136	Reserved	0-65535	R
40137	Signature	0xABCD	R/W
40138	Port mode	1-RS232, 0-RS485	R/W
40139	Device address	1-254	R/W
40140	Baud-rate	300-19200	R/W
40141	Response Time	0-100ms	R/W
40142	Reserved	0-65535	R/W
40143	Reserved	0-65535	R/W
40144	Configuration	0-65535	R/W
40145	ADC Offset	1-16383	R/W
40146	ADC Span	1-16383	R/W
40147	Reserved	0-65535	R/W
40148	Reserved	0-65535	R/W
40149	Reserved	0-65535	R/W
40150	Reserved	0-65535	R/W
40151	Reserved	0-65535	R/W
40152	Reserved	0-65535	R/W
40153	Reserved	0-65535	R/W
40154	Reserved	0-65535	R/W
40155	Reserved	0-65535	R/W
40156	Reserved	0-65535	R/W
40157	Reserved	0-65535	R/W
40158	Reserved	0-65535	R/W
40159	Reserved	0-65535	R/W
40160	Reserved	0-65535	R/W
40161	Reserved	0-65535	R/W
40162	Reserved	0-65535	R/W
40163	Reserved	0-65535	R/W
40164	Reserved	0-65535	R/W
40165	Reserved	0-65535	R/W
40166	Reserved	0-65535	R/W
40167	Reserved	0-65535	R/W
40168	Reserved	0-65535	R/W
40169	Reserved	0-65535	R/W
40170	Reserved	0-65535	R/W
40171	Reserved	0-65535	R/W
40172	Reserved	0-65535	R/W
40173	Reserved	0-65535	R/W
40174	Reserved	0-65535	R/W
40175	Reserved	0-65535	R/W

The default configuration for the I/O is 8 counters and 8 analogue channels.

### Extra counters

From software version 1.02, the ability was added to select the 8 channels, CH9 to CH16 to be either analogue inputs or slow speed counters.

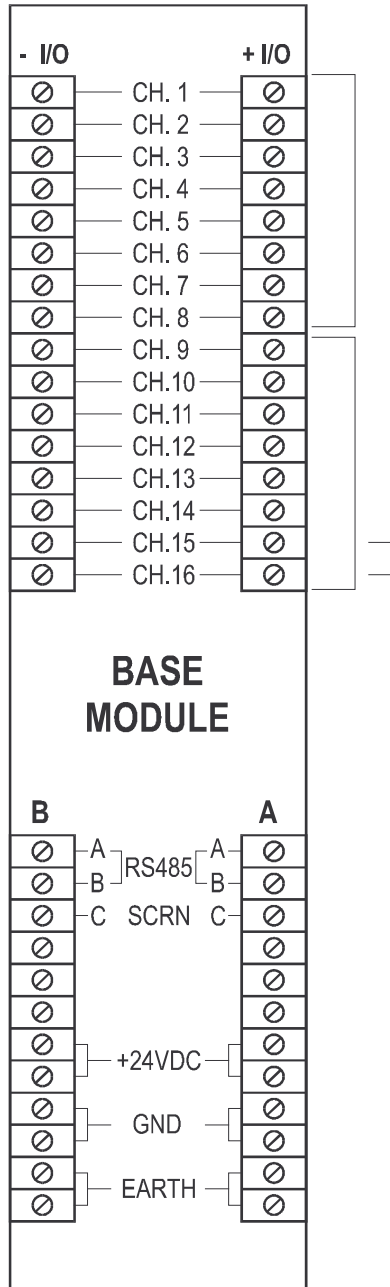
The configuration register at 40144 controls this action.

40144 Value	Function
0	CH9 to CH16 are Analogue inputs.
1	CH9 to CH16 are digital counters.

**NOTE1:** You can either have analogue inputs or slow-speed counter inputs, not a combination of both.

**NOTE2:** The inputs on channel 9 to channel 16 are non-isolated.

# RDAc I/O SERIES & I/O LAYOUT

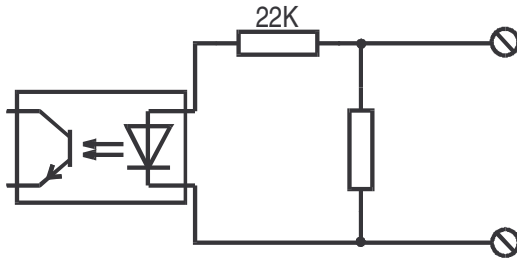


- High Speed Digital Inputs    1 - 8 (Isolated)
- High Speed Digital Counters    1 - 8 (Isolated)
- Relay Digital Outputs    1 - 8 (Isolated)
- Slow Speed Digital Counters    9 - 16 (Non - Isolated)
- Slow Speed Digital Inputs    9 - 16 (Non - Isolated)
- Analog Inputs    1 - 18 (Single ended  
non - isolated)
- Open collector unprotected  
Digital Outputs    9 - 16 (Non - Isolated)
- Analog Outputs    (1 - 2)    0 - 5v

(SEEN FROM THE TOP)

**DIGITAL INPUT: OPTO ISOLATED**

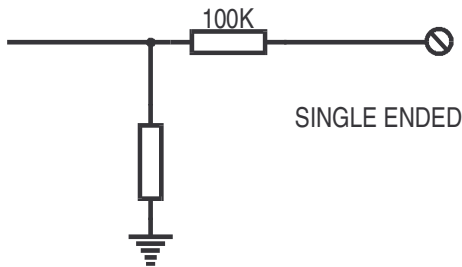
- ◆ 8 – Channels : Channel 1 to 8
- ◆ Logic Change : 0 – 1 at 3.5V
- ◆ Input loading : 1 mA at 24V
- ◆ Sense Speed : 500hz
- ◆ Input Circuitry :



Inputs are Opto – Isolated which can either be sinked or sourced, depending on wiring configuration.

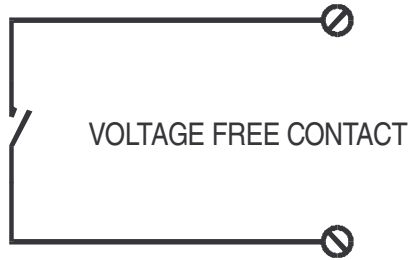
**DIGITAL INPUTS : NON – ISOLATED**

- ◆ 8 – Channels : Channel 9 to 16
- ◆ Logic Change : 0 < 2.5V  
1 > 3.7V
- ◆ Conversion Speed : 100hz
- ◆ Loading Input : 0.3mA at 24V



### DIGITAL OUTPUTS - RELAY VOLTAGE FREE CONTACT

- ◆ 8 – Channels : Channels 1 to 8
- ◆ Driving Capacity sink or source : 1 amp at 24VDC
- ◆ Relay contacts : N/O for “0”  
N/C for “1”
- ◆ Output Speed : 2hz (2 / sec)



### DIGITAL OUTPUTS – OPEN COLLECTOR

- ◆ 8 – Channels : Channel 9 to 16
- ◆ Open Collector type : Sink - No current protection
- ◆ Driving Capacity : 200mA at 24VDC
- ◆ Output Speed : 1ms internal update rate

### ANALOG INPUT

- ◆ 8 – Channels : Channel 9 to 16
- ◆ Resolution : 12 bits
- ◆ Conversion Time : 40 uS for all 8 channels
- ◆ Input Range : Single ended 0 – 5VDC only
- ◆ Accuracy : 0.1% ± 1bit
- ◆ Input Independence : 100K
- ◆ Over voltage : ± 30V continuous

## **ANALOG OUTPUTS**

- ◆ 2 – Channels : Channel 15 and 16
- ◆ Resolution : 12 Bits
- ◆ Single ended : 0 – 5V
- ◆ Drive capacity : 10mA max
- ◆ Settling Time : 1 ms internal update rate
- ◆ Linearity :  $\pm 1$ Bit

**NOTE:** Will lose AI channel 7 and 8 if allocated as AQ channels

## **COUNTERS - HIGH SPEED**

- ◆ 8 – Channels : Channel 1 to 8
- ◆ Counting Speed : 500hz

**NOTE:** Same spec as DI channels 1 to 8

## **COUNTERS – SLOW SPEED**

- ◆ 8 – Channels : Channel 9 to 16
- ◆ Counting Speed : 50hz

**NOTE:** Same spec as DI channels 9 to 16

## **GENERAL**

- ◆ Power consumption : 5W  
+ 12V at 400mA  
+ 24V at 200mA
- ◆ Operating temperature : 0 – 50C
- ◆ Storage temperature : 10 – 70C

## **SOFTWARE PARAMETERS**

- ◆ Base Address : 1 – 255
- ◆ Serial Protocol : Modbus RTU
- ◆ Serial Port : RS485 - Lightning Protected / Galvanically Isolated  
RS232
- ◆ Baud rate : 1200  
2400  
4800  
9600  
19200
- ◆ Response Time : 0 – 100 m/s