TECHNICAL DATASHEET

RO4 V2

Relay Output Module (4 relay outputs)

Summary

The iMAC RO4 V2 Module provides four (4) general purpose relay outputs.

The relay outputs can be operated directly from the iMAC controller or by programming an input module such as a DI4 module to the same address as the RO4 module, in which case each relay output will respond to the respective input of the DI4 input module.

Multiple RO4 modules can be programmed to the same address, allowing distributed simultaneous control in multiple locations.

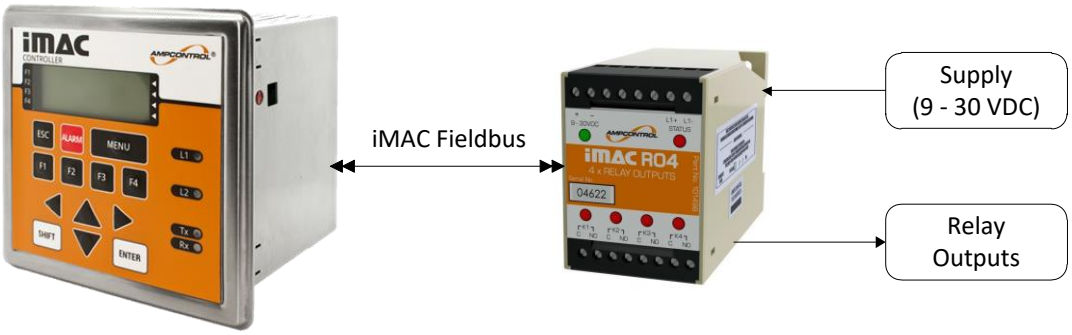
Data Register(s)

1 (Output)

Features

- 4 normally open relay outputs
- Standard DIN rail mounting
- iMAC Fieldbus electrically isolated
- Power healthy LED
- Multifunction diagnostic status LED
- Individual relay output LEDs
- Remotely configured via the iMAC Controller
- Configurable relay state on loss of fieldbus communications
- Wide power supply operating range

Minimum System



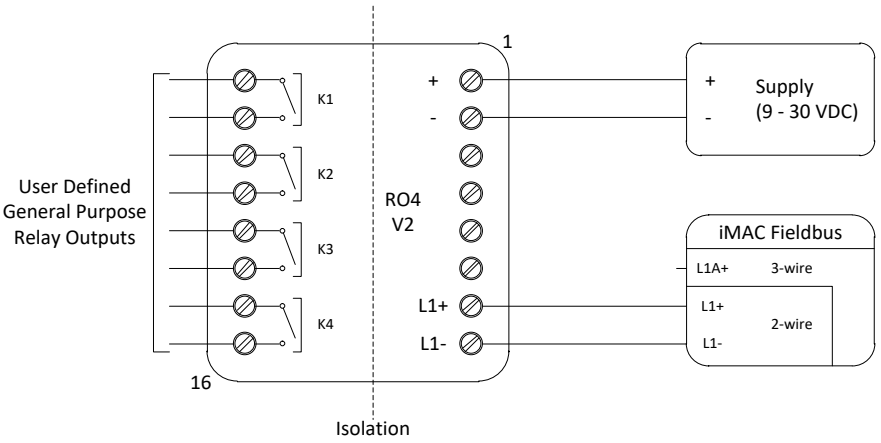
CAUTION!

The RO4 must NOT be installed in a hazardous area – module is NOT intrinsically safe.

All relays will open (de-energise) on failure of DC power supply, regardless of configuration parameters.

This datasheet revision (8) is relevant to RO4 V2 module, for superseded RO4 module versions V1 or V0 please refer to previous revision (5) of this datasheet.

Electrical Connections



Note: refer to iMACB094 – iMAC Installation Requirements

Terminal	Label	Description	
1	DC+	DC Power Supply Input (9 – 30VDC)	
2	DC-		
3, 4, 5, 6	-	-	
7	L1+	iMAC Fieldbus L1 connections (2-wire)	
8	L1-		
9	K1	Relay Output 1	Common
10			N/O
11	K2	Relay Output 2	Common
12			N/O
13	K3	Relay Output 3	Common
14			N/O
15	K4	Relay Output 4	Common
16			N/O

Data Register(s)

Output Register (Address: 1 - 255)				
Bit	**Description**	**Bit Value**	**R / W**	**Invert Bit**
15	-	X	w	-
14	-	X	w	-
13	-	X	w	-
12	-	X	w	-
11	-	X	w	-
10	-	X	w	-
9	-	X	w	-
8	-	X	w	-
7	-	X	w	-
6	-	X	w	-
5	-	X	w	-
4	-	X	w	-
3	K4 (Relay 4)	0 / 1	w	3 (0008h)
2	K3 (Relay 3)	0 / 1	w	2 (0004h)
1	K2 (Relay 2)	0 / 1	w	1 (0002h)
0	K1 (Relay 1)	0 / 1	w	0 (0001h)

Configuration Parameters

(Refer to document IMACB005 - iMAC module parameters programming procedure)

Output Register Parameters (roll-call name: RO4 Module)				
No	**Description**	**Range**	**Default**	**Notes**
1	Output register address	1 - 255	250	
2	Output register invert bits	0000h – 0008h	0000h	See below
3	De-energize relays on loss of iMAC Fieldbus comms	0000h – FF0Fh	0A0Fh	See below
4	Energize relays on loss of iMAC Fieldbus comms	0000h – FF0Fh	0000h	See below

Parameter Details…

Parameter 2: Invert bits - specify whether received output data bits energise or de-energise relay outputs. If invert bit is 0, then corresponding relay output energises when received data bit is a 1 and de-energises when a 0. If invert bit is 1, then corresponding relay output energises when received data bit is a 0 and de-energises when a 1.

Output Bits Kx (x = 1 to 4) Truth Table		
Output register – Kx bit value	**Output register parameter – Invert bit value**	**Relay output**
0	0 (N/O)	De-energised
1	0 (N/O)	Energised
0	1 (N/C)	Energised
1	1 (N/C)	De-energised

Parameters 3 & 4: specify the time delay and relay output state (energised or de-energised) on loss of iMAC Fieldbus comms.

The high byte of parameter's 3 & 4 specify the time delay following a loss of iMAC Fieldbus comms, from 0 to 51 seconds, in 0.2 second increments.

Parameter 3 and 4 high byte examples		
Hex	**Dec**	**Time Delay (s)**
00h	0	Instantaneous
01h	1	0.2 s
0Ah	10	2 s
32h	50	10 s
FFh	255	51 s

The low byte of parameter's 3 & 4 specify which relays will be affected following the time delay.

Parameter 3 and 4 low byte examples		
Hex	**Dec**	**Relays (s)**
00h	0	No effect (relays remain at last fieldbus communicated state)
01h	1	K1
02h	2	K2
03h	3	K2, K1
04h	4	K3
05h	5	K3, K1
06h	6	K3, K2
07h	7	K3, K2, K1
08h	8	K4
09h	9	K4, K1
0Ah	10	K4, K2
0Bh	11	K4, K2, K1
0Ch	12	K4, K3
0Dh	13	K4, K3, K1

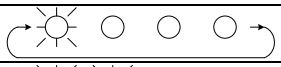
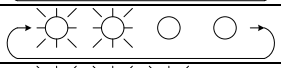
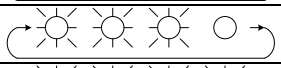
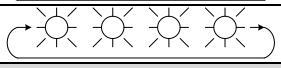
Parameter 3 and 4 low byte examples		
0Eh	14	K4, K3, K2
0Fh	15	K4, K3, K2, K1

Parameter 3 specifies which relays will de-energise (open contacts) while Parameter 4 specifies which relays will energise (close contacts).

Parameter 3 examples		
Hex	**Time Delay (s)**	**Relays open (De-energise)**
0A03h	2 s	K2, K1
3201h	10 s	K1
010Fh	0.2 s	K4, K3, K2, K1
Parameter 4 examples		
Hex	**Time Delay (s)**	**Relays close (Energise)**
0A01h	2 s	K1
320Ch	10 s	K4, K3
010Fh	0.2 s	K4, K3, K2, K1

If parameters 3 & 4 are both set to 0000h, then relay outputs will remain at last communicated state on loss of iMAC Fieldbus comms.

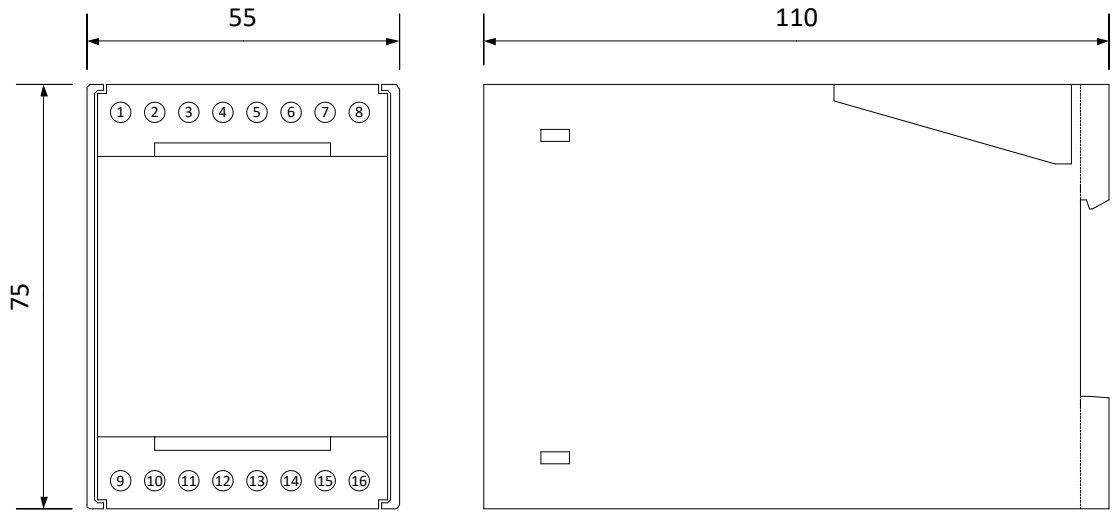
Note: All relays will open (de-energise) on failure of DC power supply, regardless of configuration parameters

LED Indicators		
Status LED (RED)		
Sequence		**Module – iMAC Comms Status**
Off		Unknown (check connections)
Slow Flash		Healthy
2 Flashes		Healthy (has been roll-called)
3 Flashes		Error (address clash)
Fast Flash		Error (general)
Power LED (GREEN)		
Off	Power Supply Off/Failure	
On	Power Supply On/Healthy	
Relay LED's (RED - K1, K2, K3, K4)		
Off	The corresponding relay output is de-energized	
On	The corresponding relay output is energized	

Certification / Approvals	
QPS	
File Number	LR1527
Model	101498 MODULE IMAC RO4 V2
Environment	Indoor use (or must be installed in a suitable outdoor enclosure with minimum IP54 rating) Altitude up to 2000m Mains supply fluctuations up to 15% of the nominal voltage Transient overvoltage's up to the levels of Overvoltage Category II Pollution Degree 2
Relay Output (1 C/O)	150VAC @ 8A or 30VDC @ 5A
The specified values approved by these standards may differ from the general specifications detailed elsewhere in this datasheet.	

Specifications	
Mechanical	
Dimensions (H x W x D)	110 mm x 55mm x 75mm (See diagram below)
Weight	230g
IP Rating	IP20
Mounting	Standard 35mm DIN rail (Top Hat Rail – EN50022)
Electrical Connections	ERNI screw terminals (maximum wire size of 4mm^2, maximum torque or 0.4 Nm)
Environmental	
Operating Temperature	-10°C to +60°C
Relative Humidity	<95% RH (non-condensing)
Power Supply (external)	
Relay Interface	External power supply required
Voltage	9 - 30VDC
Current (max)	90mA @ 9VDC - 35mA @ 30VDC
Relay Outputs	
Limits	110VAC @ 2A or 30VDC @ 2A (resistive)
Isolation	3kV RMS (coil – contacts)
Communications (iMAC L1)	
Hardware interface	2 wire (+/-18VDC or +/-21VDC iMAC Fieldbus)
Line Speed	300 – 1000 baud
Bit protocol	iMAC proprietary
L1 Isolation	5.3kV RMS
L1 Line Loading (baud)	1.32mA (300 – 1000 baud)
Find Out More	
For more information on this product, contact Ampcontrol Customer Service on +61 1300 267 373 or *customerservice@ampcontrolgroup.com* or visit the Ampcontrol website: www.ampcontrolgroup.com	

Dimensions



Equipment List	
Part Number	**Description**
101498	MODULE IMAC RO4 V2