TECHNICAL DATASHEET

GRM

General Relay Module

Summary

The iMAC GRM Module is an Intrinsically Safe General Relay output module for the iMAC System. The module responds to iMAC Address 0 data and can be configured to operate off any bit (0-7) via a rotary switch located under the front fascia. There are three GRM variants to suit 24 VDC, 110 VAC, or 240 VAC power supplies.

Specific user functionality can be programmed into the iMAC controller to operate the desired bit in Address 0 to operate the GRM relay output.

Provides a general-purpose relay output.

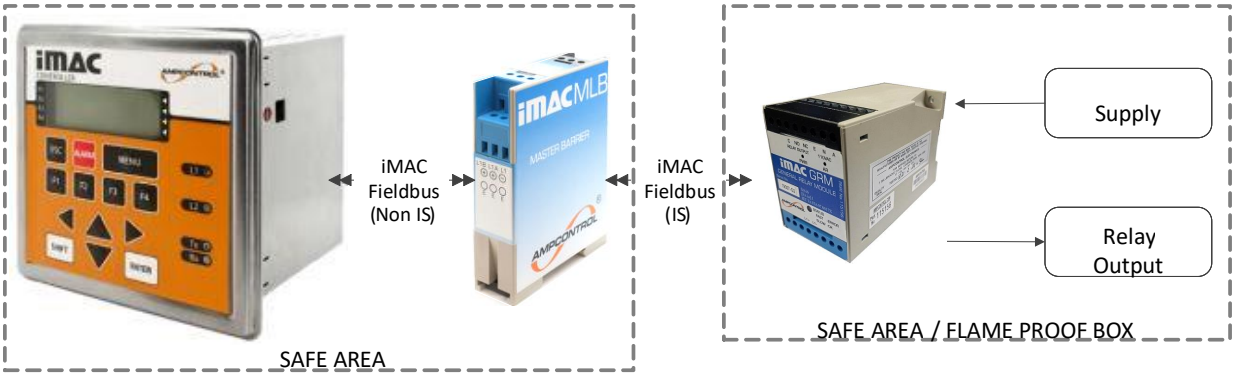
Data Register(s)

1 (Output)

Features

- Intrinsically Safe IECEx [Ex ia] Group I Ma
- Provides 1 general purpose relay output
- iMAC Fieldbus electrically isolated
- Variety of power supply options
- Power healthy LED indication
- Relay energised LED indicator
- Multifunction diagnostic status LED
- Remotely controlled via the iMAC Controller
- Standard DIN rail or foot mounting

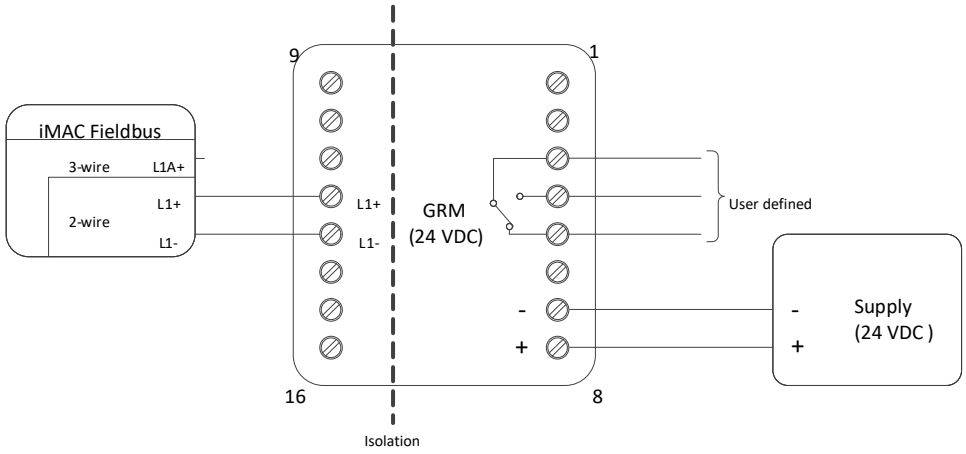
Minimum System



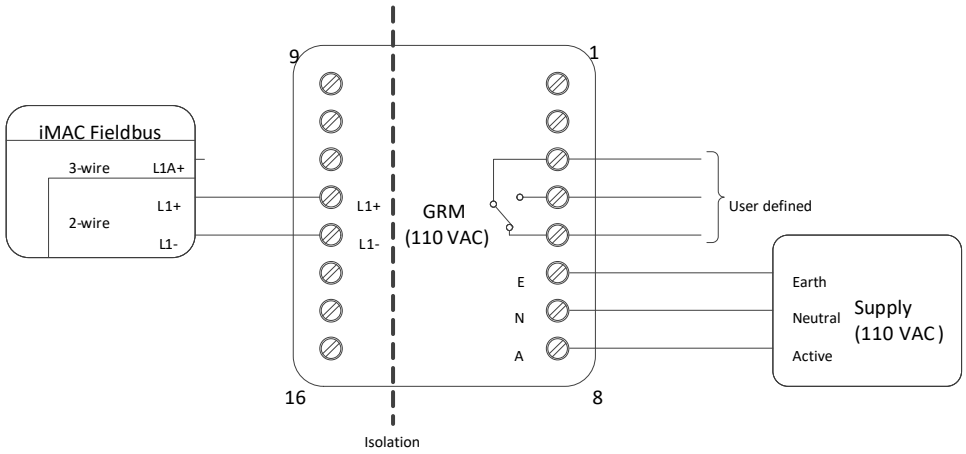
CAUTION! 	Modules used in non-I.S. systems shall not be re-used in I.S. systems (as the integrity of internal components upon which intrinsic safety depends may have been compromised). Inductive loads must include transient suppression (snubber) to prevent output relay contact damage (refer to output relay ratings). Custom iMAC Controller application software (SLP code) is required to operate this module. When connected to an iMAC intrinsically safe communication line, the iMAC GRM Relay must be installed in a safe area or a flameproof enclosure.

Electrical Connections

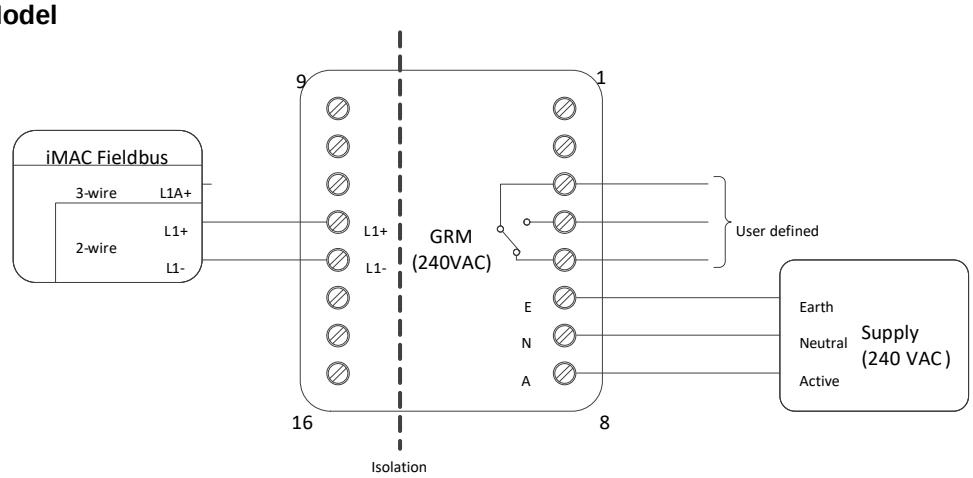
24 VDC Model



110 VAC Model



240 VAC Model



Note: refer to iMACB094 – iMAC Installation Requirements

Terminal	Label	Type	Description
1, 2	-	-	-
3	C	Relay output	General purpose (user defined)
4	NO		
5	NC		
6	E	Power supply input	AC / DC – model dependent (E connection required only for AC models)
7	N / (-)		
8	A / (+)		
9, 10, 11	-	-	-
12	L1+	L1 Comms	iMAC Fieldbus (2 wire)
13	L1-		
14, 15, 16	-	-	-

Data Register(s)				
Output Register (Address: Fixed at 0)				
Bit	**Description**	**Bit Value**	**R / W**	**Rotary Switch**
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	Output Relay or	1 = energised	W	7
6	Output Relay or	1 = energised	W	6
5	Output Relay or	1 = energised	W	5
4	Output Relay or	1 = energised	W	4
3	Output Relay or	1 = energised	W	3
2	Output Relay or	1 = energised	W	2
1	Output Relay or	1 = energised	W	1
0	Output Relay	1 = energised	W	0

Configuration Parameters

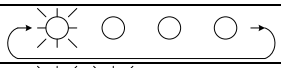
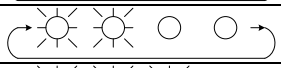
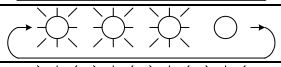
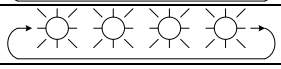
(Refer to document IMACB005 - iMAC module parameters programming procedure)

Output Register Parameters (roll-call name: GRM Module)					
No	**Description**	**Range**	**Default**	**Units**	**R/W**
1	Output register address	0	0	-	R
2	L1 comms – Invalid symbol counter	0 - 65535	0	-	R
3	L1 comms – Checksum error counter	0 - 65535	0	-	R
4	Not used (Factory use)	-	-	-	R

Output Register Control Bit Selection
A rotary switch (behind the module's front fascia cover) selects which bit (0 to 7) of the output register (fixed at address 0) controls the output relay. Rotary position 0 = bit 0, 1 = bit 1 … 7 = bit 7; positions 8 to F are invalid.

Functional Logic

The iMAC GRM Module address is fixed at 0. Custom iMAC Controller application software (SLP) code is required to assert address 0 bit 0-7 when required. The rotary switch in the GRM must be set to the corresponding bit of address 0.

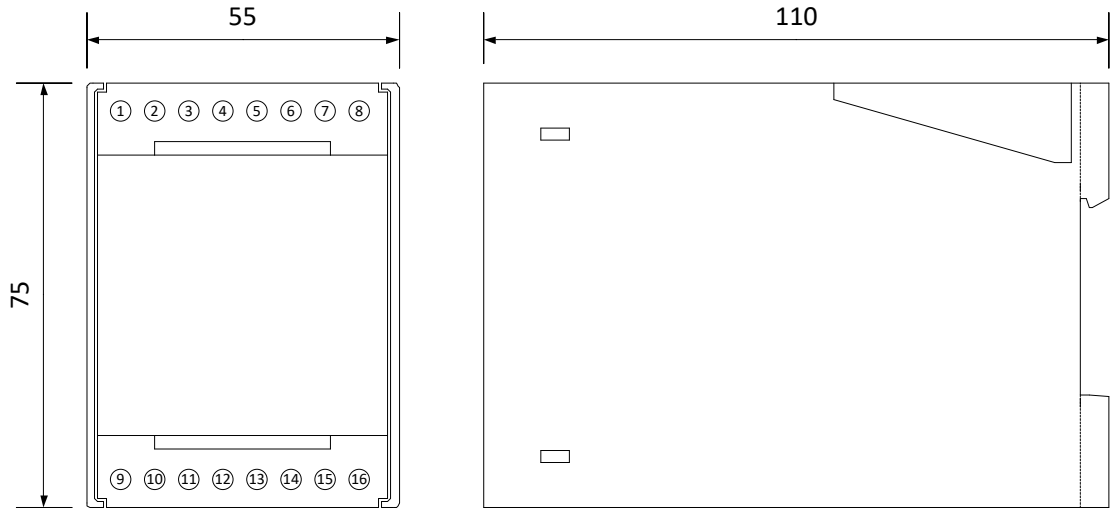
LED Indicators			
Status LED (RED)			
Flash Sequence		**Module - iMAC Comms Status**	**Module - Function Status**
Off		Unknown (check connections)	Unknown (check connections)
Slow Flash		Healthy	-
2 Flashes		Healthy (has been roll-called)	-
3 Flashes		Error (address clash)	-
Fast Flash		Warn (general)	-

Power LED (PWR)	
Off	The module is not powered
On	The module is powered
Control Relay LED (GR / AR)	
Off	Relay is de-energized
On	Relay is energized

Certification / Approvals		
Intrinsic Safety		
Type	[Ex ia] I Ma	
Certificate number	IECEx ITA 07.0017X	
Module type	SA16	
IP rating	Must be installed in an enclosure not less than IP20 (IP54 recommended)	
Other	Must be installed in safe area or flame proof box Must be connected in accordance with iMAC system drawing IMACZ032. L1+ L1- terminals must only connect to a single MLB (Master Line Barrier).	
I/O parameters	Terminals 1 - 8	Um = 250 V
	Terminals 12 wrt 13 (L1+ wrt L1-)	Ui = 21.5 V (44.65 R source resistor) Ci = Negligible Li = Negligible Uo = 0 V Io = 0 A
Ambient temperature (Ta)	-20 °C to +40 °C (refer to operating environment specifications)	
This table is provided for quick reference purposes only: refer to latest issue of the Certificate of Conformity for all system designs.		
QPS		
File Number	LR1527	
Model	115155 MOD IMAC GRM 24VDC IS IECEx	
Environment	Indoor use (or must be installed in a suitable outdoor enclosure with minimum IP54 rating) Altitude up to 2000 m 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)	150 VAC @ 8 A or 30 VDC @ 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)	75 x 55 x 110 mm		
Weight	230 g		
IP Rating	IP20		
Mounting	Standard 35 mm DIN rail (Top Hat Rail – EN50022)		
Electrical Connections	ERNI screw terminals (maximum wire size of 4 mm^2, maximum torque or 0.4 Nm)		
Environmental			
Operating Temperature	0 °C to +50 °C		
Power Supply (external)			
Voltage	24 VDC (±15 %)	110 VAC (±15 %)	240 VAC (±15 %)
Current (qty relays on)	7 mA (0) / 26 mA (1)	36.4 mA (4 W max)	16.7 mA (4 W max)
Relay Outputs (1 C/O)			
Limits	240 VAC @ 8 A (100VA max) or 30 VDC @ 5 A (resistive) (100 VA max)		
Communications (iMAC L1)			
Hardware interface	2 wire (+/-18 VDC I.S. via MLB barrier or +/-21 VDC non I.S. iMAC Fieldbus)		
Line Speed	300 - 1000 baud		
Bit protocol	iMAC proprietary		
L1 Isolation	3.5 kV AC		
L1 Line Loading (baud)	Relay energised: 0.80 mA (300) / 1.32 mA (500) / 3.56 mA (1000)		
	Relay de-energised: 0.52 mA (300) / 0.82 mA (500) / 2.16 mA (1000)		
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**
115155	MODULE IMAC GRM 24VDC IECEx
115156	MODULE IMAC GRM 110V IECEx
115146	MODULE IMAC GRM 240V IECEx