ARM

Auxiliary Relay Module

Summary

The iMAC ARM Module is an Intrinsically Safe Auxiliary Relay output module for the iMAC System. The iMAC ARM provides remote mirroring of the iMAC Controller's Auxiliary Relay (AR). There are three ARM variants to suit 24 VDC, 110 VAC, or 240 VAC power supplies.

The ARM can be used with 2-wire or 3-wire iMAC fieldbus systems and does not require EOL module data to operate.

The ARM module AR relay output can be wired in series with the iMAC Controller AR relay to provide a 1oo2 SIL rated safety system output.

Provides redundancy for AR relay output logic.
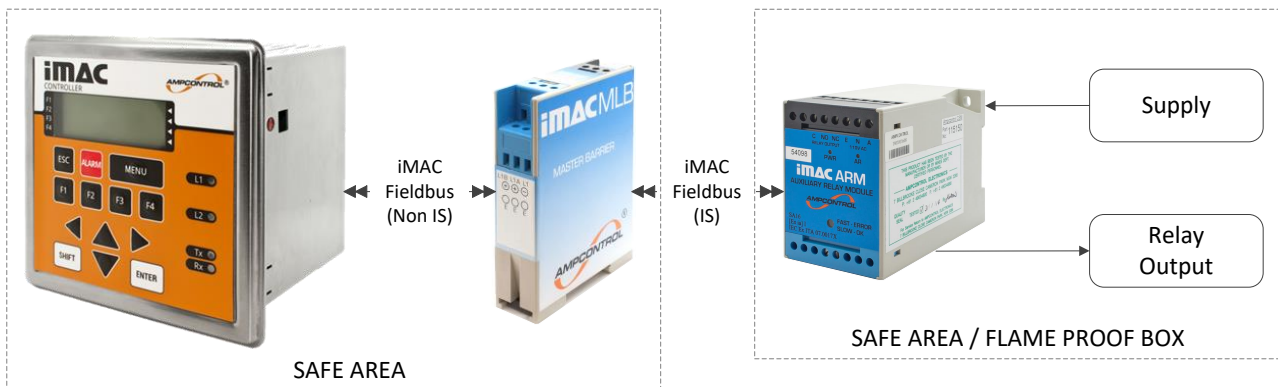
Data Register(s)

1 (Output)

Features

- Intrinsically Safe IECEx [Ex ia] Group I Ma
- Mirrors the iMAC Controller's Auxiliary Relay
- iMAC Fieldbus electrically isolated
- Variety of power supply options
- Power healthy LED indicator
- AR energised LED indicator
- Multifunction diagnostic status LED
- Standard DIN rail or foot mounting

Minimum System

SAFE AREA

SAFE AREA / FLAME PROOF BOX

iMAC ARM Technical Datasheet
IMACB141 Version 4
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| **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 ARM Relay must be installed in a safe area or a flameproof enclosure.

Electrical Connections

24 VDC Model
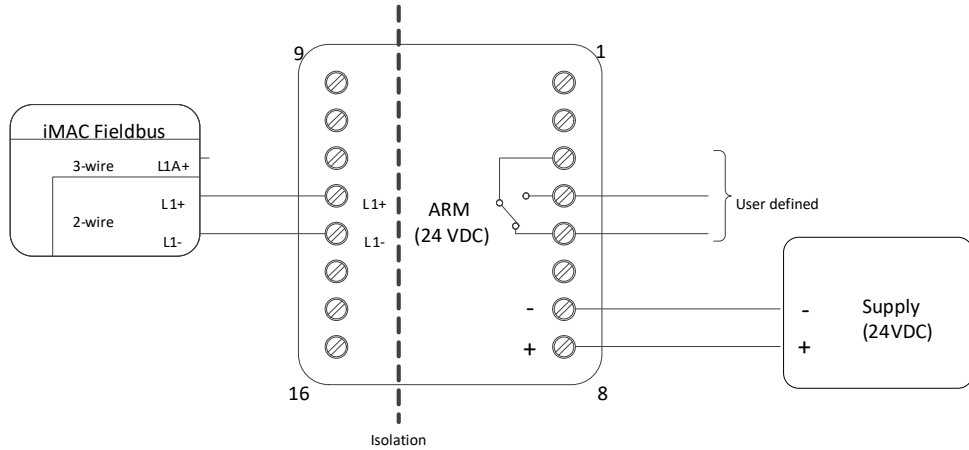
110 VAC Model
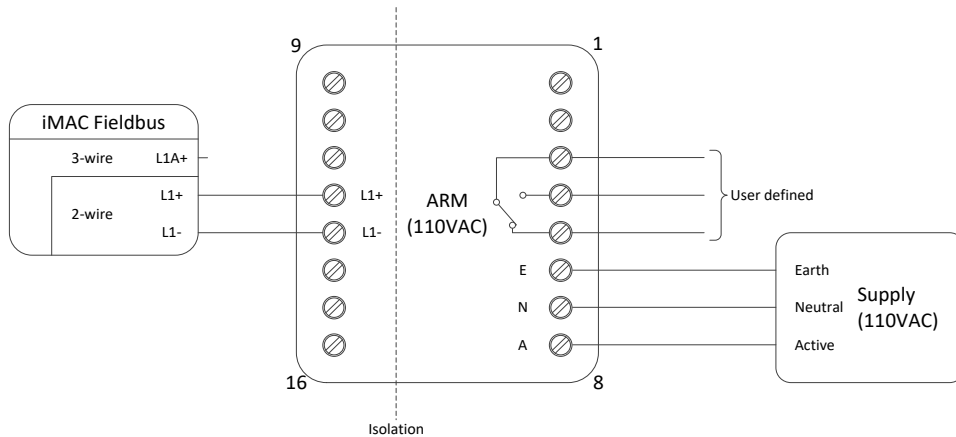
240 VAC Model
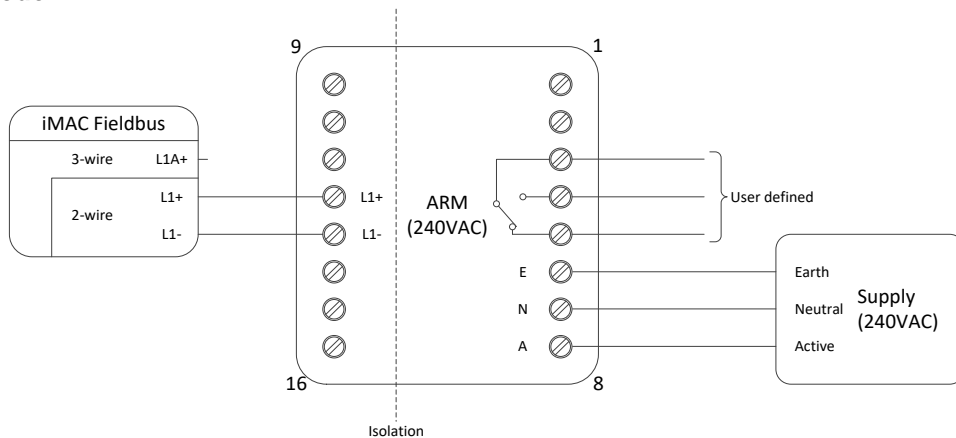
Note: refer to iMACB094 – iMAC Installation Requirements

Terminal	Label	Type	Description
1, 2	-	-	-
3	C		
4	NO	Relay output	Duplicates the iMAC controller auxiliary relay
5	NC		
6	E	Power supply input	AC / DC – model dependent (E connection required for AC models only)
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
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	-	X	W
2	-	X	W
1	Auxiliary Relay	1 = energised	W
0	-	X	W

Configuration Parameters

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

Output Register Parameters (roll-call name: ARM 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

Functional Logic

The iMAC ARM Module address is fixed at 0. Custom iMAC Controller application software (SLP) code is required to assert address 0 bit 1 when the iMAC controllers AR relay is energised.

The ARM relay output energises (closes) if address 0, bit 1 is asserted from the iMAC Controller and will tolerate 1 bit of data corruption in 2 scans of address 0, bit 1. The ARM relay output de-energises (opens) immediately if these conditions are not maintained.

ARM Output Relay Status

iMAC Controller AR	Output Register – Auxiliary Relay Bit	ARM Output Relay
Energised	1	Energised
De-Energised	0	De-Energised

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

Auxiliary Relay LED (AR)

Off	Relay is de-energised
On	Relay is energised

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	115149 MODULE IMAC ARM 24VDC 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 @ 5 A

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
Relative Humidity	<95 % RH (non-condensing)

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 (100 VA 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

FRONT VIEW   SIDE VIEW
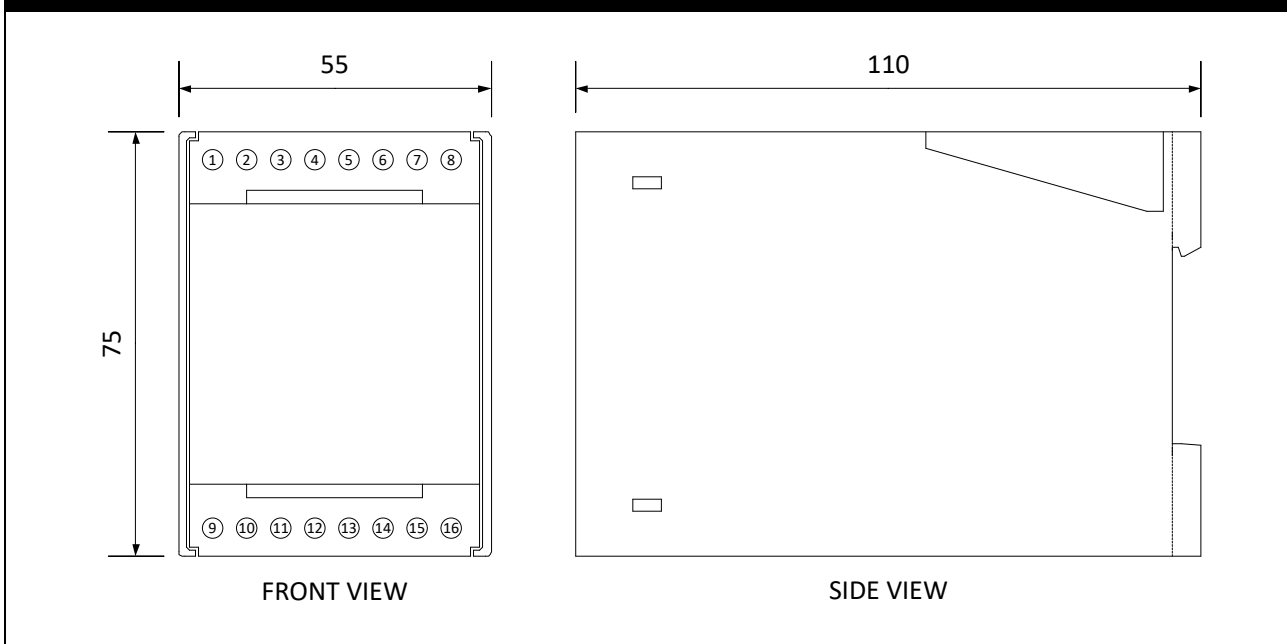
Equipment List

Part Number	Description
115149	MODULE IMAC ARM 24VDC IECEx
115150	MODULE IMAC ARM 110V IECEx
144327	MODULE IMAC ARM 240V IECEx

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