

# IIM

## Input and Indication Module

IECEx ITA 07.0017x

### Description

The iMAC IIM Module is an intrinsically safe contact input and LED output module. The IIM monitors 5 voltage free contacts, provides 4 user LED outputs in addition to 3 status LEDs and monitors the status of the L1A+ communication line in 3-wire remote isolation systems.

Typical applications include remote isolation control and display, status and control of conveyor signal lines, remote indication and secure monitoring in a hazardous location.

### Features

- One 16 bit input data word (Addressable 1..255)
- The Low Byte of the data word contains the 5 x Voltage Free input bits and the Line-A Monitor status.
- One 16 bit output data word (Fixed at Address 100)
- The bottom 4 bits of Address 100 control 4 of the 6 LED outputs.
- Down Line powered - over communication pair.
- High whetting current - contact sensing, typically 15 volts and 5 milliampere.
- Encapsulated, robust, reliable electronics.
- Compact design fits anywhere.
- The Module has been approved to IECEx Intrinsically Safe Standards for use Zone 0 hazardous locations.

### LED Status Indication

- LED1 to LED4 – are controlled from Address 100 data.  
Slow Flash when data is 1.  
No flash when data is a 0.
- LED5 – is Address 100 status.  
Slow Flash when address 100 data is received.
- LED6 - A-Line Monitor input status.  
Slow Flash when A-Line monitor input detects a valid LA+ connection.
- LED7 – External OK LED mimics IIM status LED.  
Slow flash if the module is communicating to the Controller over the L1 line and there are no trip conditions on this module.  
Two flashes when module is being roll called.  
Three flashes if there is an Address Clash  
Fast flash if any of the complimentary pairs are not in the healthy condition.  
Intermittent flash indicates a checksum error or an intermittent short or open circuit.

### Data Mapping

The input data word is addressable from 1..255 except 100. The high byte is not used. The low byte bits are defined as follows:



Bit	15	8	7	6	5	4	3	2	1	0
X	X	X	X	X	X	S	X	M	I5	I4

IIM 16-Bit Input Data Word (A1..255, excluding 100)

- Bits 0 to 4 - 5 Voltage free inputs (I1 - I5). For N/C switch inputs, data will be 0 for a closed input and 1 for an open input. For N/O switch inputs, data will be 1 for a closed input and 0 for an open input. See programmable settings for configuring inputs as N/C or N/O.
- Bit 5 - A-Line Monitor input (M). When a valid LA+ line connection is detected this bit will be a 0 otherwise it will be 1.
- Bit 7 - Random data bit (S). The random data bit was introduced in the IIM data word to ensure a high Clash indication when two IIM modules are connected to an iMAC system with the same addresses. iMAC does not generate clash indication for two modules programmed with the same address that are transmitting the same data. The random bit improves clash detection as two modules with the same address will eventually have a data miss-match due to a difference in random bit state even though they may be transmitting identical input data. This allows addressing mistakes to be quickly identified.
- Bits 6 and 8 to 15 – Not used (X).

The output data word is fixed at address 100. The high byte is not used. The low byte bits are defined as follows:

Bit	15	8	7	6	5	4	3	2	1	0
X	X	X	X	X	X	X	X	L4	L3	L2

IIM 16-Bit Output Data Word (A100)

- Bits 0 to 3 - LED1 to LED4 (L1 – L4). The IIM reads Address 100 data from the communication line. The LEDs Slow Flash (1 flash/sec) when data is 1, no flash if data is 0.
- Bits 4 to 15 – Not used (X).

## Programming Procedures

The IIM is programmed from the Controller using the following procedure.

Select the Rollcall and Program page from the Controller menu.

- Press <F2> to rollcall each module. The modules are rollcalled in address order. Keep pressing <F2> until the correct module with the correct serial number is displayed.

```
MAIN ROLLCALL PAGE
IIM Module next>
Serial number: 1111
Address: 101, read>
```

The rollcall page displays the type of module, the module's serial number and the module's address.

- Pressing <F4> will cause the Controller to read the programming parameters from the module and display the parameters on the "Programming Page"

Parameter	Meaning	Range
Parameter 1	iMAC IIM Input Address	1..255d
Parameter 2	Input Invert Bits	0..1Fh
Parameter 3	LED Output Address	64h
Parameter 4	Not Used	

**Parameter 1:** IIM Input Address. Selecting 0 will put IIM offline. Since address 100 is used for the LED output data the IIM address should not be programmed to 100.

**Parameter 2:** Invert bits for selecting N/O or N/C inputs. Bits 0 to 4 correspond to Inputs 1 to 5 respectively, set bits to 0 for N/C and 1 for N/O.

**Parameter 3:** IIM Output Address. Fixed at address 100.

**Parameter 4:** Not used

- Edit the parameters by pressing the function key corresponding to parameter for editing. Use the arrow keys to edit the value. Save edits by re-pressing the corresponding function key. To cancel edits press the <ESC> key.
- Write the edited parameters to the module by pressing the function key corresponding to the "Write Parameters?" message. Note the down arrow may have to be used to locate this message. This writes the parameter values into the module non-volatile memory.

## Specifications

### Power Supply:

Powered from iMAC Communication Line.

### Inputs:

5 x Voltage free contact inputs sharing single common.

Nominal Sensing Current: 5mA.

Nominal Sensing Voltage: 15V.

Note: maximum length of lead between switch inputs and voltage free contacts should not exceed 10 metres.

### Outputs:

7 x LED outputs sharing single common.

### Communication:

iMAC 2/3 Wire Line.

500 to 1000 baud

### Operating Environment:

0 to 50°C.

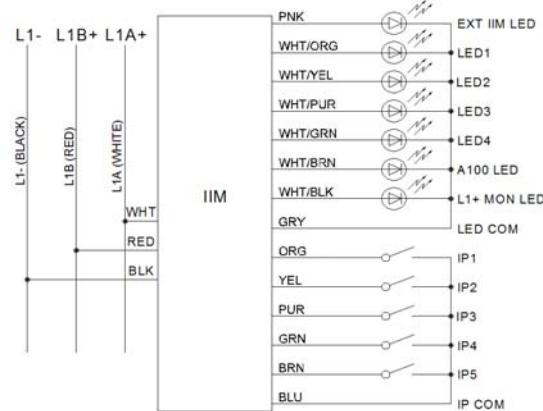
### Overall Dimensions:

70L x 31W x 24H mm

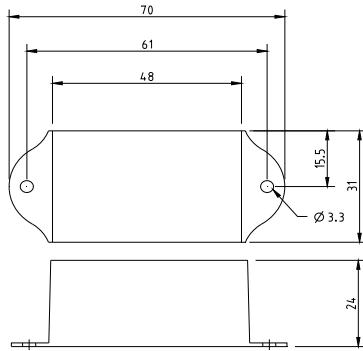
## Equipment List

121891	iMAC IIM I.S.
142323	Kit iMAC Din Rail Mount

## Connection Diagram



## General Arrangement



## Technical Support

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