


## MODEL IFMA - DIN-RAIL FREQUENCY TO ANALOG CONVERTER



- **SIMPLE ON-LINE RANGE SETTING**  
(Using Actual Input Signal or Signal Generator)
  - **USER SETTABLE FULL SCALE FREQUENCY FROM**  
1 Hz to 25 KHz
  - **FOUR OUTPUT OPERATING RANGES**  
(0 to 5 V, 0 to 10 V, 0 to 20 mA, and 4 to 20 mA)
  - **PROGRAMMABLE INPUT CIRCUIT ACCEPTS OUTPUTS FROM A VARIETY OF SENSORS**
  - **85 to 250 VAC and 9 to 32 VDC POWERED VERSIONS AVAILABLE**
  - **LOW FREQUENCY CUT-OUT AND OVERRANGE INDICATION**
  - **3-WAY ELECTRICAL ISOLATION (POWER/INPUT/OUTPUT)**
  - **INPUT AND OUTPUT INDICATION LED's**
- 



and



**UL Recognized Component,  
File #E137808**

**DESCRIPTION**

The Model IFMA accepts a frequency input, and outputs an analog voltage or current in proportion to the input frequency, with 0.1% accuracy. The full scale input frequency can be set to any value from 1 Hz to 25 KHz, either with a frequency source, or digitally with the on-board rotary switch and push-button.

The IFMA utilizes a seven position DIP switch, a rotary switch, a push button and two indication LED's to accomplish input circuit configuration, operational parameter set-up, and Input/Output indication. The input circuitry is DIP switch selectable for a variety of sources.

The indication LED's are used during normal operation to display the input and output status of the IFMA. These LED's are also used to provide visual feedback to the user of the existing parameter settings during parameter set-up.

The IFMA operates in one of four output modes. The programmable minimum and maximum response times provide optimal response at any input frequency.

The unit is equipped with a universal mounting foot for attachment to standard DIN style mounting rails, including top hat profile rail according to EN 50 022 - 35 x 7.5 and 35 x 15, and G profile rail according to EN 50 035 - G 32.

## SAFETY SUMMARY

All safety related regulations, local codes and instructions that appear in the manual or on equipment must be observed to ensure personal safety and to prevent damage to either the instrument or equipment connected to it. If equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

## SPECIFICATIONS

**1. POWER:**

**AC Operation:** 85 to 250 VAC, 48 to 62 Hz; 6.5 VA

**DC Operation:** 9 to 32 VDC; 2.5 W

**Power Up Current:**  $I_p = 600 \text{ mA}$  for 50 msec. max.

**2. SENSOR POWER:** (AC version only) +12 VDC  $\pm$ 25% @ 60 mA max.

**OPERATING FREQUENCY RANGE**  
From 0 Hz to 25 KHz; user selectable.

4. **SIGNAL INPUT:** DIP switch selectable to accept signals from a variety of sources, including switch contacts, outputs from CMOS or TTL circuits, magnetic pickups, and all standard RLC sensors.

**Current Sourcing:** Internal 1 K $\Omega$  pull-down resistor for sensors with current sourcing output. (*Max. sensor output current = 12 mA @ 12 V output.*)

**Current Sinking:** Internal 3.9 K $\Omega$  pull-up resistor for sensors with current sinking output. (*Max. sensor current = 3 mA.*)

**Low Bias:** Input trigger levels  $V_{IL} = 0.25$  V,  $V_{IH} = 0.75$  V; for increased sensitivity when used with magnetic pickups.

**Hi Bias:** Input trigger levels  $V_{\text{IL}} = 2.5 \text{ V}$ ,  $V_{\text{IH}} = 3.0 \text{ V}$ ; for logic level signals.

**Max. Input Signal:**  $\pm 90$  V; 2.75 mA max. (With both Current Sourcing and Current Sinking resistors switched off.)

### 5. SIGNAL VOLTAGE OUTPUT (Selectable):

0 to 5 VDC @ 10 mA max.

0 to 10 VDC @ 10 mA max.

**6. SIGNAL CURRENT OUTPUT (Selectable):**

0 to 20 mA @ 10 VDC min.

4 to 20 mA@ 10 VDC min.

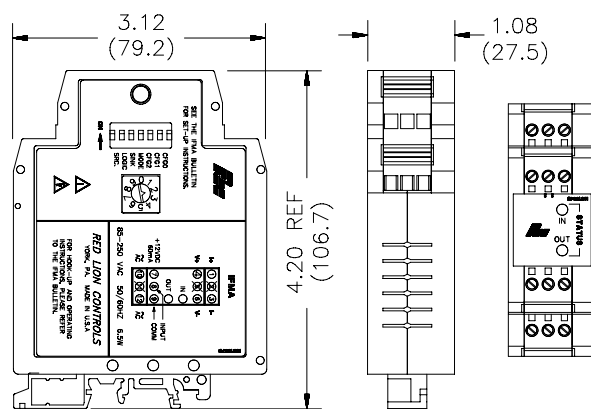
## 7. OUTPUT COMPLIANCE:

**Voltage:** 10 V across a min. 1K $\Omega$  load (10 mA). Factory calibrated for loads greater than 1 M $\Omega$ .

**Current:** 20 mA through a max. 500Ω load (10 VDC).

8. **ACCURACY:**  $\pm 0.1\%$  of full scale range ( $\pm 0.2\%$  for 0 to 5 VDC range).

***DIMENSIONS “In inches (mm)”***



## ORDERING INFORMATION

MODEL NO.	DESCRIPTION	PART NUMBERS FOR AVAILABLE SUPPLY VOLTAGES	
		9 to 32 VDC	85 to 250 VAC
IFMA	Pulse Rate to Analog Converter	IFMA0035	IFMA0065

For more information on Pricing, Enclosures & Panel Mount Kits refer to the RLC Catalog or contact your local RLC distributor.



**CAUTION:** Read complete instructions prior to installation and operation of the unit.



**CAUTION:** Risk of electric shock.

## SPECIFICATIONS (Cont'd)

### 9. RESOLUTION:

Voltage : 3.5 mV min.

Current: 5  $\mu$ A min.

10. **RESPONSE TIME:** 5 msec +1 period to 10 sec +1 period; user selectable

11. **INPUT IMPEDANCE:** 33 K $\Omega$  min. with the sink and source DIP switches in the OFF position (See Block Diagram).

12. **INPUT AND POWER CONNECTIONS:** Screw in terminal blocks.

13. **ISOLATION BREAKDOWN VOLTAGE (Dielectric Withstand):** 2200 V between power & input, and power & output; 500 V between input & output for 1 minute.

### 14. CERTIFICATIONS AND COMPLIANCES:

UL Recognized Component, File #E137808

Recognized to U.S. and Canadian requirements under the Component Recognition Program of Underwriters Laboratories, Inc.

### EMC EMISSIONS:

Meets EN 50081-2: Industrial Environment.

CISPR 11 Radiated and conducted emissions

### EMC IMMUNITY:

Meets EN 50082-2: Industrial Environment.

ENV 50140 - Radio-frequency radiated electromagnetic field <sup>1</sup>

ENV 50141 - Radio-frequency conducted electromagnetic field

EN 61000-4-2 - Electrostatic discharge (ESD) <sup>2</sup>

EN 61000-4-4 - Electrical fast transient/burst (EFT)

EN 61000-4-8 - Power frequency magnetic field

### Notes:

1. For operation without loss of performance:

Unit is mounted on a rail in a metal enclosure (Buckeye SM7013-0 or equivalent) and I/O cables are routed in metal conduit connected to earth ground.

2. This device was designed for installation in an enclosure. To avoid electrostatic discharge, precautions should be taken when the device is mounted outside an enclosure. When working in an enclosure (ex. making adjustments, setting switches, etc.) typical anti-static precautions should be observed before touching the unit.

Refer to the EMC Installation Guidelines section of this bulletin for additional information.

### 15. ENVIRONMENTAL CONDITIONS:

**Operating Temperature:** 0 to 50°C

**Storage Temperature:** -40 to 80°C

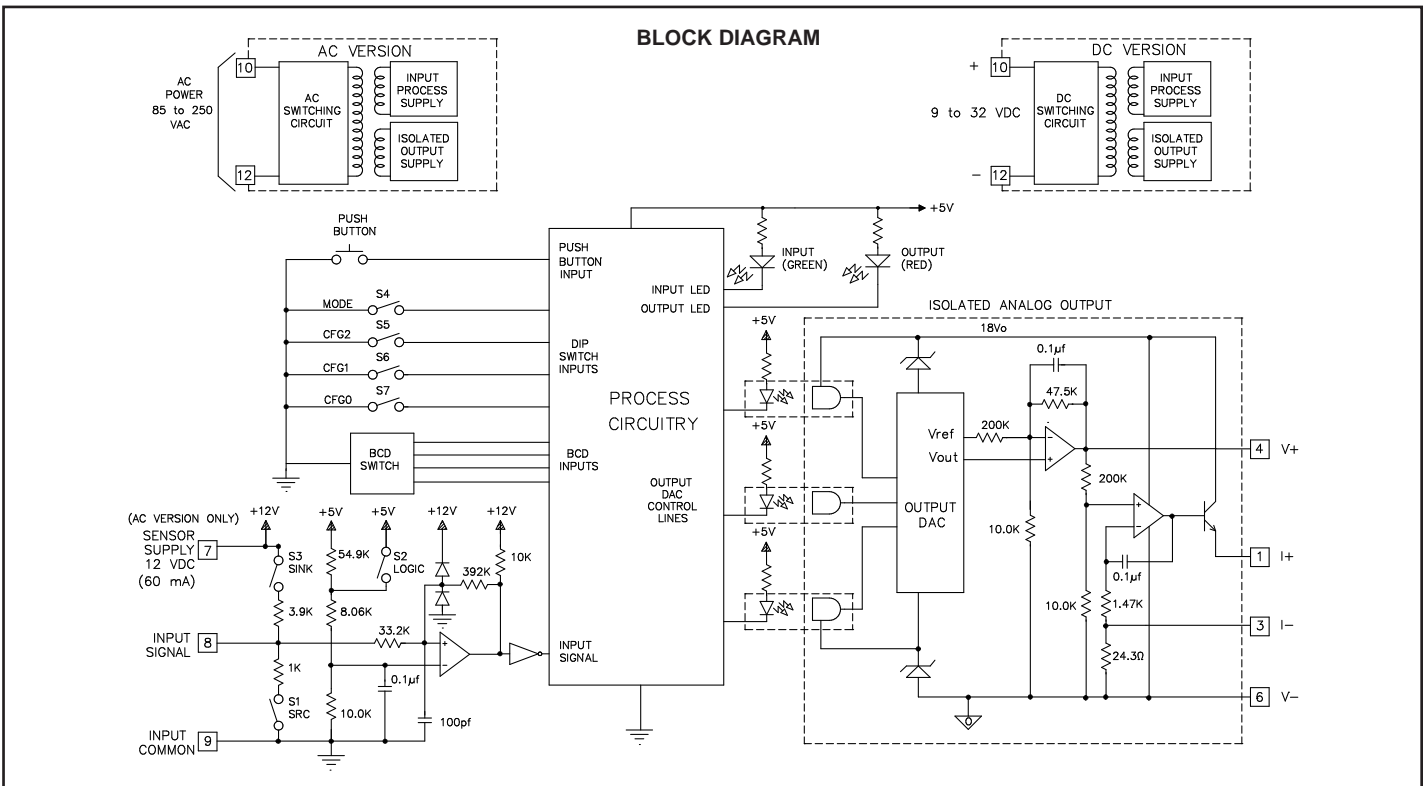
**Operating and Storage Humidity:** 85% max. (non-condensing) from 0°C to 50°C.

**Altitude:** Up to 2000 meters

### 16. CONSTRUCTION:

Case body is green, high impact plastic. Installation Category II, Pollution Degree 2

17. **WEIGHT:** 6 oz. (0.17 Kg)



## OVERVIEW

The Model IFMA continuously monitors a frequency input and outputs a voltage or current signal in proportion to the input signal. The output is accurate to  $\pm 0.1$  % of full scale for Operating Modes 2, 3, and 4. Operating Mode 1 is accurate to  $\pm 0.2$  % of full scale. The green Input LED blinks at the rate of the input frequency. At about 100 Hz, the Input LED will appear to be solid on. At very low frequencies, the Input LED blinks slowly and may also appear to be solid on. A loss of signal may also cause the Input LED to remain on, depending on the DIP switch set-up. In this case, the red LED also turns on.

The Minimum Response Time parameter sets the minimum update time of the output. The actual response time is the Minimum Response Time plus up to one full period of the input signal. The IFMA counts the negative edges occurring during the update time period, and computes the average frequency value for that time. This action filters out any high frequency jitter that may be present in the input signal. The longer the Minimum Response Time, the more filtering occurs.

The Maximum Response Time parameter sets the Low Frequency Cut-out response time for the unit. If a new edge is not detected within the time specified

by the Maximum Response Time setting, the unit sets the output to the existing Low Frequency Cut-out Value setting depending on the selected range and calibration setting.

The unit also indicates Low Frequency Cut-out by turning ON the output LED. The Maximum Response Time can be set shorter than the Minimum Response Time. In this case, as long as the input signal period is shorter than the Maximum Response Time, the unit continues to indicate the input frequency at its output. But, if the input period at any time exceeds the Maximum Response Time, the unit immediately takes the output to the Low Frequency Cut-out Value, regardless of the Minimum Response Time setting.

The IFMA is calibrated at the factory for all of the selected ranges. However, the user can adjust the minimum calibration to any value less than the Full Scale value, and the Full Scale value to any value greater than the minimum value. If the minimum and full scale values are brought closer together, the accuracy of the unit decreases proportionate to the decreased range of the unit (See Calibration).