Mark VIeS Functional Safety Vibration Input Module Summary Sheet*

The Mark* VIeS Functional Safety Vibration Input module provides an interface between eddy-current (position, velocity, and key-phasor), seismic (velocity), velometer (velocity), accelerometer with integrated output (velocity), and charge amplifier (dynamic pressure probe interface for acoustics) sensors, and Mark VIeS Safety certified vibration algorithms. The Vibration Input module consists of two orderable parts: the Vibration Input IS420YVIBS1B I/O pack and the Vibration Input IS410TVBAS2B terminal board. The Vibration Input module is available in both Simplex and Triple Modular Redundant (TMR) configurations.

TMR Vibration Input Module

The IS420YVIBS1B I/O pack provides the following IEC61508 certified algorithms:

- Configurable gain and sensor bias nulling to maximize the resolution of the time series AC content
- Gap measurement between eddy-current sensor head and rotating member of machine for channels 1 through 13
- RPM and position information relative to rotor's key-phasor for channels 12 and 13
- Vibration displacement using peak-to-peak and true RMS calculations of passband filtered, broadband time-series sampled inputs for channels 1 through 8
- Vibration magnitude and phase from tracking filters using a rotor's key-phasor input for channels 1 through 8
- Magnitude only from tracking filters using speed inputs from the Safety controller
- Configurable limit checks on all algorithm results

The IS410TVBAS2B terminal board provides buffered outputs through BNC connectors or four D-shell connectors to some third-party devices. The following table provides the specifications for the IS410TVBAS2B terminal board.

For more information on the YVIB I/O pack and the TVBA terminal board, refer to the *Mark VIeS Functional Safety Systems for General Market Volume II System Guide for General-purpose Applications* (GEH-6855_Vol_II), the chapter *YVIB Vibration Monitor Modules*.

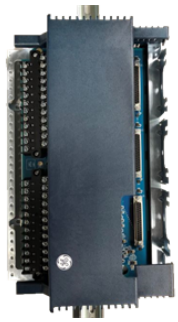
TVBA Terminal Board with YVIB I/O Pack Specifications

Item	IS410TVBAS2B Terminal Board
Product Name	Mark VIeS Vibration Input
Life-cycle Status	Active
I/O Pack Redundancy	Simplex or TMR
I/O Pack	IS420YVIBS2B (qty 3 or 1) (order separately)
Number of Channels	13 channels per module
Common Mode Voltage	-13.5 V dc min, +13.5 V dc max
CMRR at 50/60 Hz	-50 dB
Input passband frequency	4300 Hz
Sample Frequency	10,000 Hz
Eddy-current Displacement Measurement Accuracy	± 0.02 Vpp at 10 Hz ± 0.023 Vpp at 200 Hz ± 0.056 Vpp at 700 Hz
Seismic Velocity Measurement Accuracy	± 0.01 Vp at 10 Hz ± 0.012 Vp at 200 Hz ± 0.034 Vp at 700 Hz

TVBA Terminal Board with YVIB I/O Pack Specifications (continued)

Item	IS410TVBAS2B Terminal Board
Dynamic Pressure Measurement Accuracy	± 0.01 Vp at 10 Hz ± 0.132 Vp at 1000 Hz
Key-phasor RPM	0.1% of reading Range: 2 to 20,000 Hz
Phase	± 0.5 degrees at 333 Hz ± 1 degree at 667 Hz
Sensor Power	-24 V dc at 12 mA per transducer
Buffered Outputs	0.1% of full scale
Field Wiring Terminal Block	Barrier-type terminal blocks
Field Wiring	22 AWG min, 12 AWG max
I/O Scan Time	Supported controller I/O scan rates: 10 ms, 40 ms, 80 ms, 160 ms
Diagnostic Fault Detection	Power-up self test, continuous monitoring of power supplies, both configurable sensor limit and system function limit checks, and incorrect terminal board check
Sensor Input Line Monitoring	Open/Short circuit detection for sensor outputs with DC bias, but not for zero bias signals
I/O Pack DC Control Power	28 V dc, 12 W max per YVIB
I/O Pack DC Power Connector	Micro Mate-N-Lok receptacle (AMP 1445022-3)
I/O Pack Construction	Aluminum case
I/O Pack Health	Visual status LEDs, circuit health variables available to control logic
Termination Module Dimensions (includes cover and I/O pack) (H x W x D)	34.0 x 24.9 x 15.3 cm (13.4 x 9.4 x 6.0 in)
Safety Rated	Yes, compliant with IEC 61508
Hazardous Locations Capability	Class 1, Div 2 / Class 2, Zone 2 / ATEX For ratings and further details, refer to the *Mark VIeS Functional Safety System Equipment in Hazardous Locations (HazLoc) Instruction Guide* (GEH-6861).
G3 Compliant	Yes
Ambient Operational Temperature	-40 to 70°C (-40 to 158 °F)
Storage Temperature	-40 to 85°C (-40 to 185 °F)
Mounting Method	DIN-rail mounted
I/O Pack Replacement Part Number	IS420YVIBS1B
Terminal Board Part Number	IS410TVBAS2B
Module Cover Replacement Part Number	151X1202YE08PP14BL

IS420YVIBS1B I/O Pack



IS410TVBAS2B Terminal Board

Issued: Sept 2018 Revised: July 2019

Please send comments or suggestions to controls.doc@ge.com
For further assistance or technical information, contact the nearest GE Sales or Service Office, or an authorized GE Sales Representative.

Public Information