

SI-535D Vibration Module Operating Notes

1. Description. The SI-535D Vibration Module operates with a 100mV/g constant current type accelerometer to provide two DC outputs, one proportional to rms velocity and another proportional to peak-to-peak displacement. These outputs can be set for 4-20mA or 0-10V by internal links as shown in Fig.1 and are set at the factory for 4-20mA. A buffered AC output is provided, via a BNC connector to, allow vibration frequency analysis. The unit is housed in a compact DIN-Rail mounting plastic case and operates from a 24VDC supply. Terminal connections are shown in Fig.2 overleaf.

2. Accelerometer Power. The SI-535D provides a 3.6mA constant current supply to a Spectrum sensors SI-100 series accelerometer which connects directly to the module input terminals.

3. TDX OK LED. A green LED on the front of the unit indicates proper connection of the accelerometer. The LED will not light if there are input wiring short-circuits or open- circuits. Under fault conditions 0-10V output is clamped to 0V, and the 4-20mA output clamped to 2mA.

4. AC Output. A buffered AC output, proportional to acceleration, is provided via a BNC connector mounted on the front panel. The 100mV/g signal is DC coupled to the accelerometer output and thus swings about the accelerometer bias voltage level (12VDC nominal). If a data-collector is used to monitor this signal for vibration analysis, it must have the sensor power function turned off.

5. Velocity Output. This output is proportional to rms velocity in mm/s. The output can be selected for 4-20mA or 0-10V and the output range selected for 10, 25, 50 or 100mm/s by internal links. The SI-535D velocity circuit incorporates high and low pass filters to limit the measurement bandwidth at 10Hz to 1kHz, The output range is set at the factory for 4-20mA = 0-100mm/s.

6. Displacement Output. This output is proportional to peak to peak displacement in mm pk-pk. The output can also be selected for 4-20mA or 0-10V and the output range selected for 5, 10, 25 or 50 mm pk-pk via internal links. The displacement circuit has a fixed high pass filter at 10Hz and a low pass filter of 1.5 kHz, 3.5 kHz or 5 kHz which is user selectable. The default factory setting is 4-20mA = 0-25 mm pk-pk

7. Connections. The power supply and the accelerometer connections are duplicated, as shown in the drawing below, to enable wire looping to other signal conditioning modules if required.

6. System Grounding. To avoid spurious 50Hz pick-up from surrounding equipment, it is advisable for both the case of the accelerometer and the SI-535D power supply 0V to be grounded. This is achieved normally by the accelerometer being fitted to a grounded machine

casing, and the SI-535D power supply 0V being grounded locally. In this instance the screen wire of the accelerometer should not be grounded at the measurement end in order to avoid ground loop currents. For this reason, the SI-535D accelerometer screen terminals are not internally connected to the power supply 0V.

In some applications the machine ground is sufficiently noisy to inject spurious signals into the measurement system. In this instance, the case of the accelerometer should be isolated from the machine casing using an isolating stud, and the screen wire connected, via wire links, from the SI-535D accelerometer screen terminals to the power supply 0V terminals and to ground.

8. Specifications

Power Input	+24 VDC \pm 10%, 80mA max.
Accelerometer Power	3.5mA \pm 20% constant current, 23VDC driving voltage
Accel. Input Sensitivity	100mV/g
Filters	Velocity - 2 pole Butterworth 5Hz – 1 kHz (-3db) Displacement - 2 pole Butterworth 5Hz – 1.5 kHz (selectable)
Detection	Velocity - True RMS (10% error for crest factor >6) Displacement mm pk-pk – True peak detector
Velocity Ranges	10, 25, 50 or 100 mm/s set by internal link
mm pk-pk Ranges	5, 10, 25 or 50 mm pk-pk set by internal link
4-20 mA Outputs	Max. Load resistance - 450 Ω Max. Output current (input overload) - 22mA
0-10V Outputs	Output Impedance – <200 Ω Max. Output voltage (input overload) – 12V
AC Output	Sensitivity 100mV/g (as accelerometer) Output resistance - <200 Ω DC level +12V nominal (as accelerometer) Connector - BNC (50 Ω)
Dimensions	134mm x 99mm x 22.5 mm (H x D x W) including BNC
Weight	0.11Kg

HS-535D
INTERNAL LINK POSITIONS

LINK 1 VELOCITY RANGE

- 1 - 100mm/s
- 2 - 50mm/s
- 3 - 25mm/s
- 4 - 10mm/s

LINK 2 & 3 g pk-pk LP FILTER

- 1 - 5kHz
- 2 - 3.5kHz
- 3 - 1.5kHz

Note: Links 2 & 3 must be in the same position.

LINK 4 pk-pk RANGE

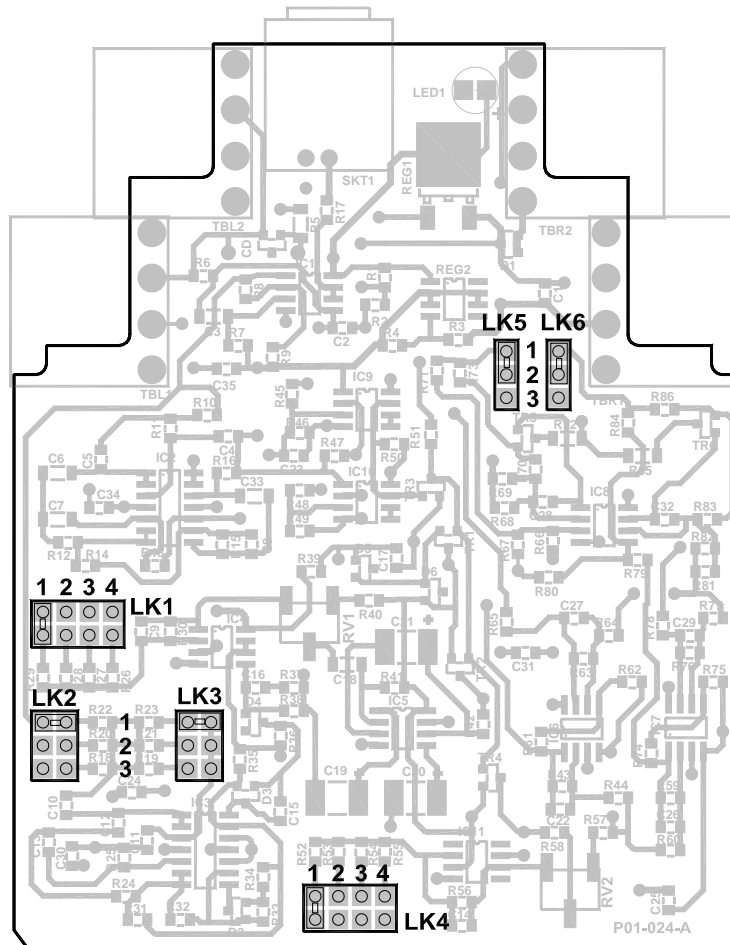
- 1 - 50 mm pk-pk
- 2 - 25 mm pk-pk
- 3 - 10 mm pk-pk
- 4 - 5 mm pk-pk

LINK 5 VELOCITY OUTPUT

- 1 & 2 - 4-20mA
- 2 & 3 - 0-10V

LINK 6 Displacement pk-pk OUTPUT

- 1 & 2 - 4-20mA
- 2 & 3 - 0-10V



SI-535D and HS-535D models are synonymous.

HS-535D Terminal Connections

- 13 - 0V Power In
- 14 - 0V Power Out
- 15 - 0V (mm pk-pk Output)
- 16 - 0V (Vel. rms Output)

- 9 - +24V In
- 10 - +24 V Out
- 11 - mm pk-pk Output +
- 12 - Vel. rms Output +

- 5 - As 1
- 6 - As 2
- 7 - As 3
- 8 - No Connection

- 1 - Accel. + IN
- 2 - Accel. 0V IN
- 3 - Accel. Screen
- 4 - No Connection

