DATASHEET

ACCELEROMETER WITH DIGITAL OUTPUT

MODEL EADA-350F

INTRODUCTION

Encardio-rite model EADA-350F digital force feedback accelerometer is based on a truly rectilinear suspension system. The internal 8 channel 24 bit high resolution digitizer utilizes the wide dynamic range of the feedback sensor. The unit is manufactured by Encardio-rite in India under license from Gaiacode, UK.

Three axis broad band sensor is housed in an 'O' ring sealed Hard Anodized water proof Aluminium case. The system is self-contained, except for the power source.

Three separate concurrent digital data outputs ports are provided, which are Ethernet, USB and serial RS-232 outputs. External GPS module time synchronizes the digital accelerometer. As a backup NTP time synchronization is available. An isolated dc-dc converter ensures galvanic isolation of the system and operates from 9 to 36 Volts.

The analogue feedback accelerometer has an extremely large dynamic range and 8 channel 24 bit acquisition system is incorporated to exploit the full dynamic range of the sensor as high gain and low gain digital outputs.

The low and high gain outputs are set digitally using the Programmable Gain Amplifiers (PGA) of the 8 channel Acquisition system. Nominally the high gain outputs are set to have a 12 times larger output than the low gain outputs.

The sensor's Analogue differential outputs are interfaced to the differential inputs of the digitizer. The digital part of the circuit is optically isolated from the front end ADC converter circuitry.

Description

Figure 1 shows the sensor connector turret. The connector turret allows easy connection to the sensor. All the connectors are water proof with O ring seals to a depth of 2 meters of water. The display provides state of health information of the feedback sensor and the digitizer.

Full-scale low and high gain sensitivity is digitally user-adjustable from ±4.0 g to ±0.33 g on individual channels of the digitizer.

The standard frequency pass band is flat to acceleration from DC to 350 Hz.

Detailed sensor calibration information is provided with every sensor, including sensor dc calibration levels, frequency response of the instrument and the transfer function in poles/zeroes notation. The digitizer calibration values are also provided and the calibration values are stored with in the digitizer.

It is extremely simple to install the digital sensor, Single point slotted base bolt point ensures that the sensor to be fixed firmly to the installation point. Three levelling feet ensure that the sensor to be levelled and locked to the installation bolt.

The North/South ordination pointes are machined on the sensor base and the sensor component fixing crews are fixed with dowel pins to achieve highest possible orientation accuracy. The errors in pointer to the sensor orientation is less than ± 0.1 degrees.

After installation the sensor output offsets are nulled electronically, without exposing the insides of the accelerometer.

The digital sensor noise performance is better than 0.15 μ $m/s^2/\sqrt{Hz}$. The sensor dynamic range exceeds 145 dB.

The digital accelerometer is provided with different connector options. Either with Encardio-rite D type water proof connectors or Mil-spec connectors as show in the following Figure 3 and 4.

Figure 1 Strong motion Accelerometer

Figure 2 Accelerometer base with fixing point and Orientation indicators machined to the base of the sensor

Figure 3 Feedback Accelerometer with Mil spec connectors

Figure 4 Feedback accelerometer with Encardio-rite D Type waterproof connectors

SPECIFICATIONS

Digital Accelerometer

Low gain output options	± 4 g (other output options are available)
Dynamic range for ±2 g F.S. 0.005 to 0.2 Hz 3 to 30 Hz	 <155 dB <160 dB
Standard frequency band	dc to 350 Hz (-3dB point)
Linearity	0.05% of full scale
Cross axis rejection	0.001 g/g
Self-noise, set by the gain of the accelerometer	0.15 μ $m/s^2/\sqrt{Hz}$

Digitizer Performance

Standard Output Format	24 Bits
Noise-free Resolution	Sample rate 1K Hz -122.2 dB Sample rate 100 Hz-134.3 dB Sample rate 10 Hz -144 dB
Absolute Accuracy	0.1 %
Differential inputs	All inputs are adjusted o the digitizer output voltage and impedance
Cross talk	<-110 dB @ 40 s/s
Total harmonic distortion	<-100 dB @ 40 sps
Digital Signal Processor	Multiple sample rates, with causal and a-causal filter selection and 4 concurrent sample rates for each channel
Maximum sample rate	1000 s/s
Trigger Modes	STA/LTA. Each Channel is programmable

Timing options

GPS Unit	External GPS Receiver with RS232 Interface
Time format	NMEA
Maximum Cable	15 meters

Calibration controls-remotely calibrated

Step function response	Digitally generated signal, from 24 bit DAC
Calibration inputs from 24 Bit DAC	Sine, step and pseudo-random inputs may be inserted

Physical

Lowest spurious resonance	500 Hz
Operating temperature range	-20 to +70°C
Pressure jacket material	Hard anodized aluminium
Power/signal connector	Gold plated water proof D Type connector.

Power

Current at 12 Vdc	197 milli amp with polarity protection. With TCP/IP communication and GPS included

All outputs and inputs are protected against transients

Made by Encardio-rite in India under license from Gaiacode, UK

**All specifications are subject to change without prior notice*

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