



Dynamic Transducers and Systems

21592 Marilla St. • Chatsworth, CA 91311 • Phone 818-700-7818
www.dytran.com • e-mail: info@dytran.com

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OPERATING GUIDE

SERIES 7506A

**Variable Capacitance Accelerometer with
CVLD (Constant Voltage Line Driver) Interface**





OPERATING GUIDE SERIES 7506A ACCELEROMETER

INTRODUCTION

Dytran Series 7506A is a family of high-performance, wide temperature range, variable capacitance (VC) accelerometers intended to directly replace CVLD units for existing or new applications. This accelerometer utilizes a capacitive sensing element and an advanced electrical circuitry to simulate the operation of a CVLD sensor. It combines an integrated VC accelerometer chip with high-drive, low-impedance buffering for measuring acceleration in commercial and industrial environments. It is tailored for zero-to-medium frequency instrumentation applications. This module contains a hermetically sealed micromachined capacitive sensing element, a custom integrated circuit amplifier, and current output stages. The hermetically sealed titanium case has a Glenair Series 805 Mighty-Mouse, 3-pin receptacle, and is easily mounted via two 4-40 screws. It is relatively insensitive to temperature changes and thermal gradients. The power signal and ground wires are isolated from the case. An initial calibration sheet is included and periodic calibration checking is available.

OPERATION

Series 7506A accelerometer modules produce an analog current output which varies with acceleration. The sensitive axis is perpendicular to the bottom of the package, with positive acceleration defined as a force pushing on the bottom of the package. The signal output current oscillates about a bias current (14-15 mA) which provides dynamic acceleration information. The output scale factor and the bias current are independent from the supply voltage of 10 to 36 volts. At zero acceleration, the output current is nominally 14-15 mA. At \pm full scale acceleration, the output current is ± 5 mA from the bias current stated on the calibration certificate.

NOTE: After powering the unit, allow 3-5 minutes for the unit to stabilize before taking readings.

CABLE LENGTH CONSIDERATIONS

Cable lengths of up to 15 meters (50 feet) can be used with the 7506A accelerometer. For lengths longer than 15 meters, we recommend you check each individual installation for oscillation by tapping

the accelerometer and watching the current output for oscillation in the 20kHz to 50kHz region. If no oscillation is present, then the cable length being used is acceptable. From the standpoint of output current drive and slew rate limitations, the 7506A series is capable of driving over 600 meters (2000 feet) of its cable type, but at some length between 15 and 600 meters, each device will likely begin to exhibit oscillation.

ABOUT CVLD INTERFACE

The basic idea of the CVLD (Constant Voltage Line Driver) interface is accomplished by changing the signal carrier from voltage to current. The CVLD is similar to IEPE in regard that CVLD is also a two wire sensor, meaning that the sensor is powered and the signal is extracted through the same wire. Unlike IEPE, no current limitation is required, as the sensor regulates the current internally and is changing it in accordance with applied acceleration. Therefore, by monitoring the current, one can always receive the acceleration information.

The CVLD sensor is compatible with 4-20mA signal loops. When using the CVLD sensor with a standard 4-20mA loop equipment the signal must be interpreted differently. A 4-20mA interface is designed such that 4mA current designates zero measurand and when used with accelerometers, the increase in current shows the increase in RMS or peak acceleration. In other words, a typical 4-20mA loop accelerometer does not provide dynamic acceleration, but rather its RMS or peak representation. In case of CVLD sensor, the bias current (14-15mA, the exact value can be found on the calibration certificate) designates zero measurand which allows for dynamic signal representation.

The advantages of using the CVLD accelerometers are lower noise, high immunity to EMI/EMC interference, simplified wiring (only two wires: power and ground are required), and long cable runs.



MAINTENANCE AND REPAIR

Should you experience a problem with your system, contact the Dytran factory for technical assistance with analysis and troubleshooting. If the product must be returned for evaluation and/or repair, you will be given an RMA (returned materials authorization) number and instructions for returning the instrument to the factory. Do not return the instrument without first obtaining this authorization to return.

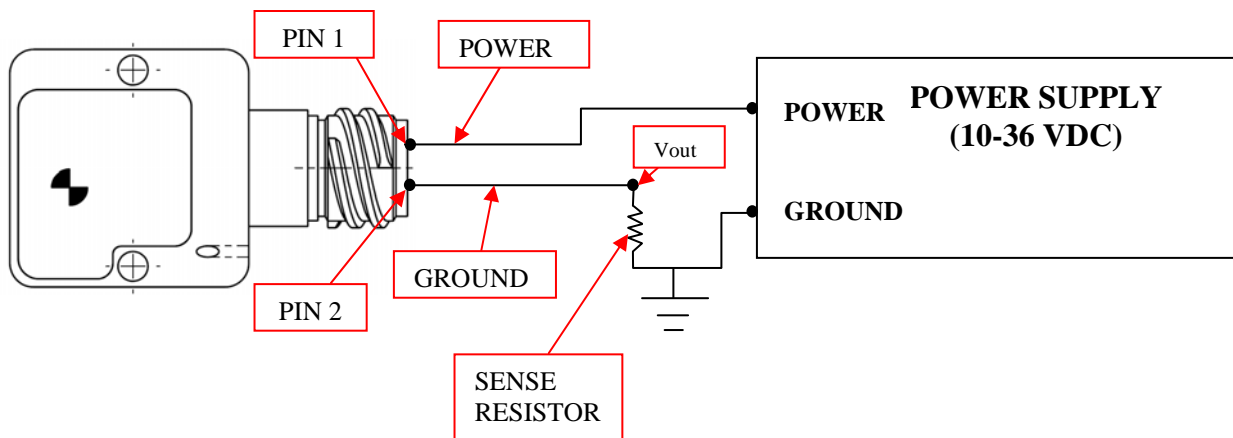


Figure 2: Connection Diagram