

3D Accelerometer

ACC-2x series

User Manual

SUPERTECH Instruments

General Description

ACC-2x is a complete 3-axis accelerometer. It measures acceleration with a nominal full-scale range of +/- 2 g. It can measure the static acceleration of gravity in tilt-sensing applications, as well as dynamic acceleration, resulting from motion, shock, or vibration. It can measure the acceleration in three dimensions (3 axes) independently of each other. It is compatible with any PC-based data acquisition (DAQ) systems due to its analog voltage outputs.

In this description, in connection with the 3D Accelerometer, unit of measure **g** means the standard gravitational acceleration (9.80665 m/s²)

The sensor of the ACC-2x Accelerometer is extremely small. This advantageous feature allows you to connect it to any target to be measured without disturbing the original vibration situation. Despite the high sensitivity of the sensor (0.001 g of resolution), it can survive 10,000 g of shock overload.

ACC-2x Accelerometer has:

- Extremely high sensitivity
- Excellent linearity
- Superb temperature stability
- Wide bandwidth (fast recording speed)
- Very good long-term stability

There are several typical application fields of ACC-2x Accelerometer:

- The measurable acceleration range is wide enough to cover every biological research and diagnostic application
- It is an ideal tool for measuring of vibration in general
- A unique application field is the high-end microscopy and evaluation of the vibration isolation attempts and solutions

The most important biological applications of ACC-2x Accelerometer are:

- Research of neurodegenerative diseases
- Diagnostic measurements of neurodegenerative diseases, such as Parkinson's disease and Huntington's disease
- Quantitative evaluation of cognitive functions

Specifications

Full-scale range of measurement: +/- 2 g

Resolution: 0.001 g

Worst-case error of the full scale value: < 5 %

Linearity error maximum: < 5 %

Scale factor choice:

420 mV / g

840 mV / g

2.0 V / g

Bandwidth choice:

10 Hz

50 Hz

100 Hz

200 Hz

500 Hz

Analog output impedance: 300 Ohms

Dimensions of the sensor: 8 x 8 x 3 mm

Dimensions of the ACC-2x equipment: 160 x 200 x 65 (Width x Depth x Height)

Weight: 1 kg

Supply voltage: 15 to 24 V DC with any polarity

DC Supply current: 500 mA

Accessories

3D acceleration sensor assembled with Precidip 853 connector

1.5 meter long sensor extension cable

Wall plug power supply

“Medically certified” power supply according to EN60601 (optional)

BNC cables to the PC-based DAQ system (optional)

Security Rules

Most of the measuring equipments manufactured by Supertech Instruments are for experimental and/or lab animal purposes only and are not intended for human use.

ACC-2x Accelerometer is an exception, because it can be used in human biological research or diagnostic applications, if you order an optional “Medically certified” power supply unit for it.

In many of the biological measurement situations you should establish an invasive connection between the subject (animal) and the acceleration sensor. To do this you must strictly follow the legal animal protection rules.

Electrical safety measurements of proper operation of the 115/230 VAC mains electric system (from the equipments have been supplied) is the sole responsibility of the user.

The external wall plug power supply must have a valid CE identifier and certificate. Supertech Instruments provides such certified power supply units.

First Time Installation and Setup

In switched off state of the ACC-2x Accelerometer please connect all the cables: the output jack of the wall plug power supply (or the optional "Medically certified" power supply), the 10-pin IDC plug of the sensor extension cable and the BNC cables to your PC-based DAQ system. Connect the acceleration sensor to the Precidip socket at the far end of the sensor extension cable. Plug in the external power supply to the power point. Establish the appropriate mechanical connection of the acceleration sensor to the target. Switch on the ACC-2x Accelerometer and the system is ready to use.

Front Panel Controls

Analogue Outputs: BNC connectors to the PC-based DAQ system. There are 3 independent outputs for the 3 axes, respectively (Out Z, Out Y and Out X). The scale factor and the bandwidth are the same for all the axes.

Power On LED: it indicates the proper supply voltage condition

Mains switch

Connectors at the Back Side

External DC Power Supply: 2.1 mm coaxial connector

Sensor Input: 10-pin IDC socket to connect the sensor extension cable

The actual parameter setup is indicated at the back side by tiny colored circles. Any combination of the scale factor and the bandwidth can be set. These parameters can be changed only by the factory. If you need any modification, you should send the equipment back to our workshop. According to the featured application fields of the ACC-2x Accelerometer, there are two different factory default setting pairs:

For biological research and diagnostic application:

- Scale factor is 420 mV / g
- Bandwidth is 100 Hz

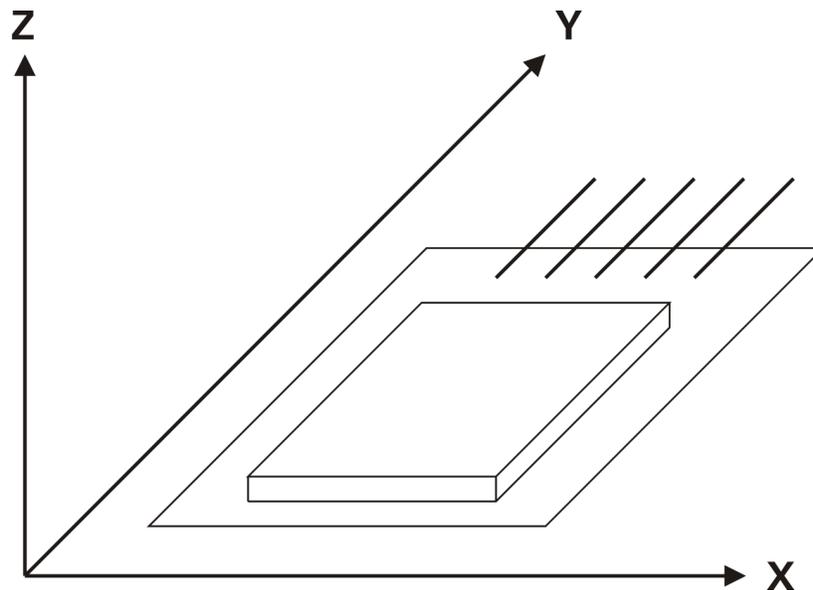
For general vibration recording and/or vibration isolation measurements:

- Scale factor is 2.0 V / g
- Bandwidth is 500 Hz

Calibration

ACC-2x Accelerometer equipment is calibrated by the factory. You can check its calibration easily, because the gravitational acceleration is always given anywhere. You can calibrate one axis of three at a time. You should connect a precise voltmeter to the output BNC connector of the measured axis. Turn the sensor by 180 degrees along the measured axis clockwise and counterclockwise. At the output you can see 1 g in the first position and -1 g if you turn the sensor by 180 degrees.

You can see the three axes of the acceleration sensitivity in the following drawing:



Warranty

Supertech Instruments gives you 5 years of full warranty for electronic products and 3 years of full warranty for mechanical products by default. Longer warranty periods can also be defined and agreed (the actual conditions should be discussed before placing the order).

Supertech Instruments gives you full warranty for its products against defects in materials or workmanship as long as the equipment has been subjected to normal and proper use. During the warranty period, faulty products will be repaired or replaced free of charge provided they are returned to our workshop. Postage of the warranty repair actions is paid by the Customer. The exceptions are the Vibration Isolation Tables. There are special conditions introduced for repairing of Vibration Isolation Tables (see the appropriate User Manual). Supertech Instruments will undertake the servicing and calibration after the expiration of the warranty period for a nominal fee.

The warranty does not cover the faults made by the user.

Supertech Instruments provides 5 years of warranty for the PRM-4x Precision Biological Pressure Meter only in that case if it is supplied from a wall plug power supply approved in advance by Supertech Instruments.

Further information sources

Technical hotline via email (all of them work):

office@superte.ch

office@supertechinstruments.co.uk

office@super-tech.eu

International technical hotline on the phone: +36 20 9234 386

For further technical information please visit our websites. Supertech Instruments continuously uses several websites with the same content. Please use that one, which is the easiest for you to remember:

www.superte.ch

www.supertechinstruments.co.uk

www.supertech-instruments.co.uk

www.supertech-instruments.com

www.super-tech.eu