

DTI-M60-3K

Type DTI-M60-3K

Acceleration measurement unit

The acceleration unit Type DTI-M60-3K of the DTI technology is designed to measure linear acceleration in all three orthogonal directions. The unit consists of 3 accelerometers and one DiMod Type DTI307.03. All components are combined in one housing and only one 4 wire cable leads to the connector. All sensor data are transferred to the data recorder via one RS-485 bus line.

- 3-axis sensor (acceleration in the three coordinate directions)
- 4-pole anti-aliasing filter, 4 kHz cut-off frequency
- Sampling rate 20 kHz
- Sampling ADC with 16 bits resolution
- Shunt stimulation of all axes
- DTI bus connection
- Dimensions 22x22x21 mm

Description

The functionality of the sensor Type DTI-M60-3K is to measure three linear accelerations at one position. The sensor is designed for crash test applications and can be mounted in crash test dummies, vehicles or similar "short duration" applications.

The calculation of the stored data will be done by postprocessing after the crash test by the customer itself. The range of each axis will be fixed during manufacturing. Therefore contact our sales experts for help to define the measurement range in front of an order.

The sensors are calibrated together with the DiMods as measuring chain. For quick checking of the measuring chain a shunt stimulation is present. The DiMods behave to the bus lines like six parallel connected uniaxial DiMods.



Technical data

Dynamic

Measuring range	g	±2 000
SAE J211-1 specification	CFC	1 000
FS output signal, typ.	LSB	±27 000
Sensitivity	mV/g	0.15
Frequency response		
±2 %	Hz	0 ... 2 000
±5 %	Hz	0 ... 5 000
±1 dB	Hz	0 ... 7 000
Resonance frequency, typ.	Hz	20 000
Amplitude nonlinearity	%FSO	<1
Damping ratio		0.05
Cross sensitivity, typ.	%	<3
Shock border	g	5 000

Electronics

ZMO, typ.	LSB	±1 000
Excitement	VDC	2 ... 10
Input impedance	Ω	3 500 ... 4 800
Output impedance	Ω	2 700 ... 4 800
Insulation resistance (@50 VDC)	MΩ	100

Environment

Thermal zero point drift, 0 ... 50 °C	%FSO/°C	±0.04
Thermal sensitivity drift, 0 ... 50 °C	%/°C	±0.1 (±0.06)
Operating temperature range	°C	-40 ... 125
Storing temperature range	°C	-40 ... 125
Humidity		not sealed

Mechanics

Housing material		Alu alloy
Weight, typ.	grams	25
Dimensions (HxWxD)	mm	22x22x21
Mounting screws	metric	2xM2.5x25
Torque	N·m	1.2

Application

Due to the steady increase of the measuring locations in crash testing and the associated additional wires in the conventional measurement technology where the sensor signals are transmitted in an analog way to a central data acquisition unit, the handling of the test dummies is quite cumbersome.

Using the DiMod technology, a significant simplification and improvement can be achieved both in the dummy and on-board instrumentation by shifting the signal processing and digitization to the sensors. Due to their small size, one DiMod of the Type series DTI307.03 is installed in this case directly into the sensor. Wiring complexity is drastically reduced by using bus lines for digital signal transmission.

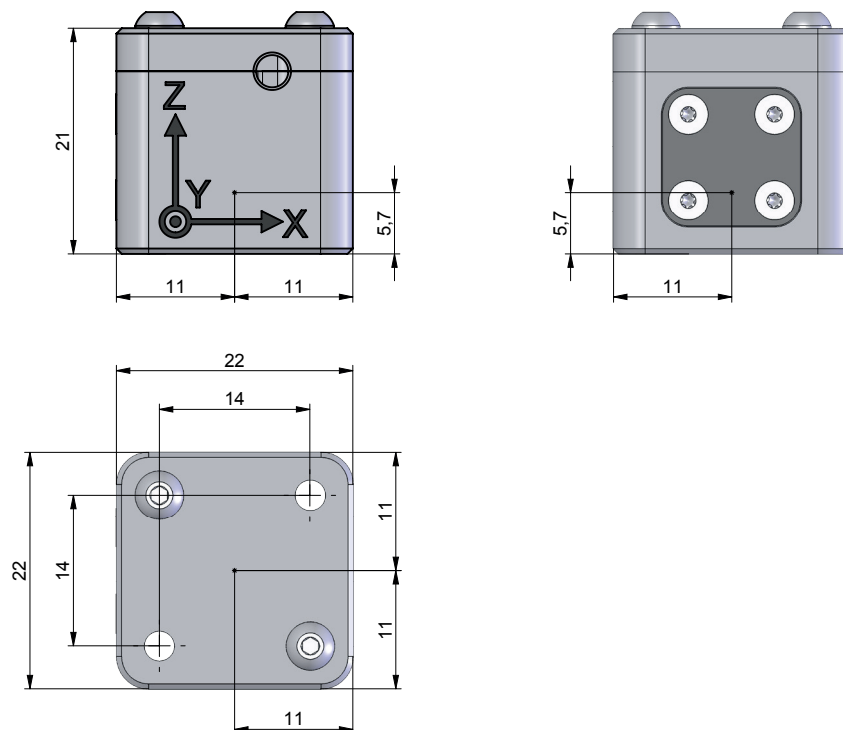
The DiMod technology concept at the sensor in combination with the bus connection to a central data recorder (Type DTI304.xy) in the dummy or a rack in the vehicle is designed for minimal space requirements at minimal power loss.

Up to 12 sensor channels are connected to one bus line thus leading to a simple and well-arranged wiring in the vehicle or in the dummy. As mentioned before, the measuring data are centrally stored in a data recorder and read out after the crash.

Ordering code

- Acceleration measurement unit

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Fig. 1: Dimensions in mm

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