

ACCELERATION MEASUREMENT - 3xMEMS-ACC AND NEMOSENSE

IOLITE 3xMEMS-ACC: LOW-NOISE TRIAXIAL MEMS ACCELEROMETER AND INCLINOMETER

IOLITEicw 3xMEMS-ACC is a data acquisition device with an embedded triaxial MEMS accelerometer, onboard analog-to-digital conversion, and an EtherCAT interface based on the IOLITE platform.

It is an ideal sensor for structural health monitoring, including permanent condition monitoring on bridges, buildings, antennas, and stadiums. Multiple sensors can be distributed and synchronized across large structures with a single cable that carries signal, power,

and synchronization over distances up to 100 meters between nodes. Because conversion happens inside the device, it avoids noise typical of long analog cable runs. It measures acceleration in the X, Y, and Z axes, and DewesoftX software allows easy calculation of velocity, displacement, and static pitch and roll from the DC acceleration values.

Although it measures acceleration, it also supports precise displacement measurement through double integration with appropriate filtering, handled directly in DewesoftX.

The "w" version comes in a waterproof aluminum enclosure with cable glands for outdoor mounting. The enclosure vents automatically to equalize internal and external pressure while preventing water ingress, which protects the seal and improves long-term durability.

IOLITEicw 3xMEMS-ACC

	3xMEMS-ACC-8g	3xMEMS-ACC-40g	3xMEMS-ACC-S	1xMEMS-ACC-Z
Nr. of axes	3	3	3	1
Measurement ranges	Min: ± 2 g Max: ± 8 g	Min: ± 10 g Max: ± 40 g	± 15 g	Min: ± 2 g Max: ± 8 g
-3 dB bandwidth	DC - 1000 Hz	DC - 1000 Hz	DC - 460 Hz	DC - 1000 Hz
Sample rate	4 kS/s	4 kS/s	1 kS/s	4 kS/s
Dynamic range	96 dB	96 dB	137 dB	96 dB
Noise density (lowest range)	25 $\mu\text{g}/\sqrt{\text{Hz}}$	75 $\mu\text{g}/\sqrt{\text{Hz}}$	0,7 $\mu\text{g}/\sqrt{\text{Hz}}$	25 $\mu\text{g}/\sqrt{\text{Hz}}$
Inclinometer option	✓	⊗	⊗	⊗
External Temperature sensor option	✓	⊗	⊗	✓
MEMS inclinometer				
Accuracy and resolution valid in range	$\pm 15^\circ$	/	/	/
Accuracy and resolution valid for bandwidth	< 0.1 Hz	/	/	/
Relative accuracy (23 °C)	0.01 °	/	/	/
Resolution	0.001 °	/	/	/
Dimensions	62 x 70.5 x 22.3 mm	62 x 70.5 x 22.3 mm	/	62 x 70.5 x 22.3 mm
Environmental	IP20/ IP67 available	IP20/ IP67 available	/	IP20/ IP67 available

NEMOSENSE: LOW- NOISE VIBRATION DATA LOGGER AND IOT DEVICE

NEMOSENSE is a tailor-made IoT device that combines a vibration data acquisition device, a data logger, and a low-noise triaxial MEMS accelerometer. All NEMOSENSE devices can connect to an existing Ethernet TCP/IP network or via mobile 4G/LTE networks (with the Mobile option) to send data to the Dewesoft Historian service, a time-series database for long-term data storage.

More information:

<https://dewesoft.com/products/iolitei-3xmems>

<https://dewesoft.com/products/nemosense>

NEMOSENSE 3xMEMS-ACC

	3xMEMS-ACC
Nr. of axes	3
Measurement ranges	Min: ± 2 g
-3 dB bandwidth	62 Hz
Sample rate	250 S/s
Dynamic range	96 dB
Noise density (lowest range)	25 $\mu\text{g}/\sqrt{\text{Hz}}$
Inclinometer option	✓
External Temperature sensor option	⊗
MEMS inclinometer	
Accuracy and resolution valid in range	$\pm 15^\circ$
Accuracy and resolution valid for bandwidth	< 0.1 Hz
Relative accuracy (23 °C)	0.01 °
Resolution	0.001 °
Battery power option	✓ (B VERSION)
Mobile 4G/LTE option	✓ (M VERSION)
GNSS option	✓ (G VERSION)
Dimensions	130 x 130 x 50 mm
Environmental	IP67



IOLITEicw 3xMEMS a low-noise triaxial MEMS accelerometer and Inclinometer



NEMOSENSE a low-noise vibration logger with a triaxial MEMS accelerometer.