

MonoDAQ-E-gMeter

A data acquisition device with embedded triaxial MEMS accelerometer, analog-to-digital conversion and EtherCAT interface based on the MonoDAQ EtherCAT platform (www.monodaq.com).

Key features:

- 25 $\mu\text{g}/\sqrt{\text{Hz}}$ noise density
- EtherCAT bus, daisy-chaining with single cable up to 50 m device-device
- DEWESoft X3 software support

Typical applications:

- Bridge structural monitoring
- Seismic measurements
- Mobile network antenna structural monitoring



MonoDAQ-E-gMeter is an integrated sensing device. Acceleration is measured by a triaxial MEMS accelerometer inside the device that is tightly attached to the mechanical chassis. Analog to digital conversion is done inside the device, eliminating any noise pick up in analog cabling. Microprocessor inside the device transmits the acceleration samples over EtherCAT protocol into DEWESoft software running on a Windows PC, or alternatively to any controller running EtherCAT master on any platform. Scaling is automatic in DEWESoft software, therefore the data in g or m/s^2 is easily available to the user. MEMS sensor internal temperature is also available as a data channel in DEWESoft software under System monitor channels.

Specifications of the MEMS accelerometer:

	Min.	Typ.	Max.	Unit
Measurement ranges	+2		+8	g
-3 dB bandwidth		1000		Hz
Sample rate			4	kHz
Noise density (+2 g)		25		$\mu\text{g}/\sqrt{\text{Hz}}$
Residual noise (+2 g @50 Hz bandwidth)		100		μg RMS
Residual noise (+2 g @125 Hz bandwidth)		150		μg RMS
Offser error	-75	+25	+75	mg
Offset temp. drift (-40...125 degC)	-0.15	+0.02	0.15	mg/degC
Sensitivity temp. drift (-40...125 degC)		+0.01		%/degC
Linearity error -1g ... +1g range		0.1		% FS
Crossaxis sensitivity	-1		+1	%

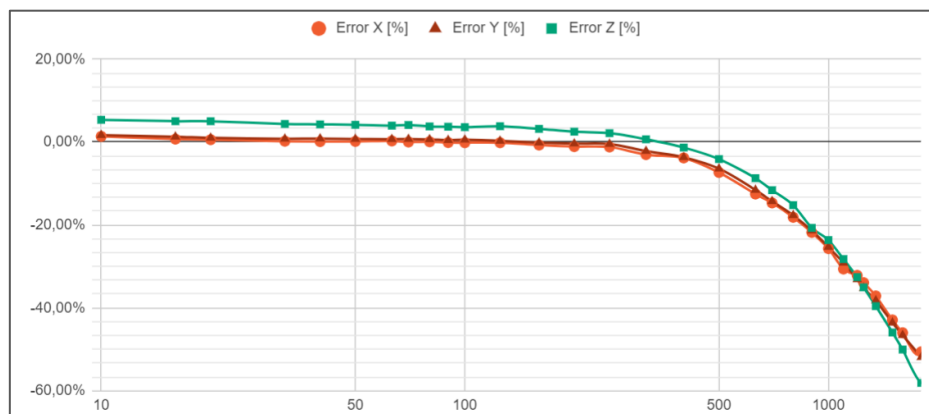


Figure 1 - MonoDAQ-E-gMeter frequency response (Range: 2g, SR: 4kS/s)

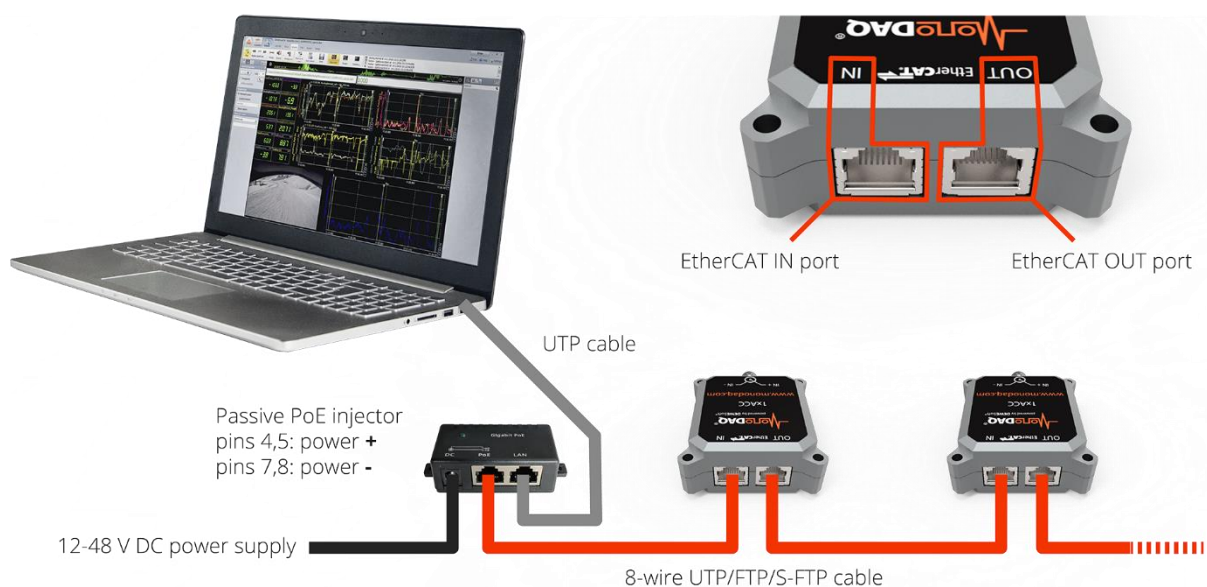
General specifications of the MonoDAQ-E-gMeter device:

Digital interface	EtherCAT
Interface connectors	RJ45
Power consumption	1300 mW
Supply voltage	12-48 V
Operating temperature	-20 ... 60 degC
IP rating	IP20
Weight	105 g
Housing material	Aluminium
Tariff number (HTS)	8471.90.0000

Software support: DEWEsoft X3, any standard EtherCAT master

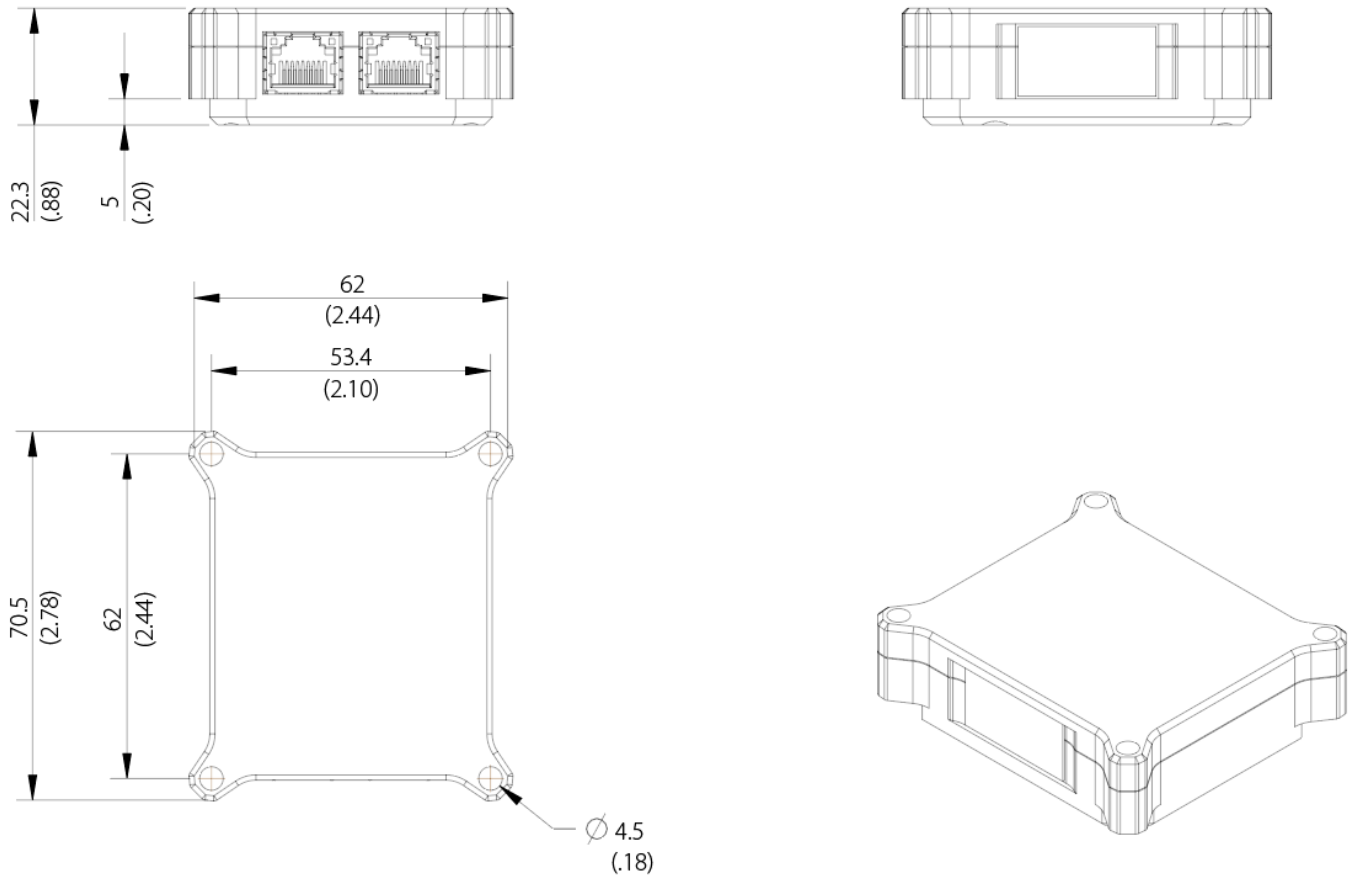
Installation: Devices are daisy chained with a standard network cable. It is recommended that the cable is shielded (SFTP, CAT5e) and has a minimum 24 AWG wire thickness. The cable must have 4 wire pairs. The maximum distance node-to-node is 50 m.

Power supply: Passive PoE power injector is necessary for merging the EtherCAT signal and power into a single cable.



Power supply voltage	Cable length device-to-device	Cable size	Max. number of devices from a single power supply
24 V	1 m	AWG 24	8
24 V	50 m	AWG 24	4
48 V	1 m	AWG 24	12
48 V	50 m	AWG 24	10

Mechanical drawing



Preferred mounting: M4 screws in each of the four $\varnothing 4.5$ mm corner holes.