DMM – Deflection Multi Meter

(FEB 2025)

The DMM system measures vertical deflection from many locations, in real-time, utilizing optical reference level created by a rotary laser level. The multipoint measurement capability with a 10 Hz sampling rate of a normal rotary laser level makes it unique compared to other measurement equipment, such as a total station theodolite. The DMM system can be applied for measuring bending of main girders during a bridge loading test or for long-term monitoring of various structures, for example.

Serially connected DMM units send measurement results to computer using a RS-485 data bus cable, which also serves power for the system. Communication between a DMM and a computer utilizes the MODBUS protocol which enables an easy connection to existing measurement systems.

In many applications it is possible to utilize super magnets or clamps for fixing, which makes the DMM system very flexible and easy to assemble.

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DMM products

DMM ER160 unit

Adjustable fixing bracket with clamps

DMM cable

Adjustable fixing bracket with magnets

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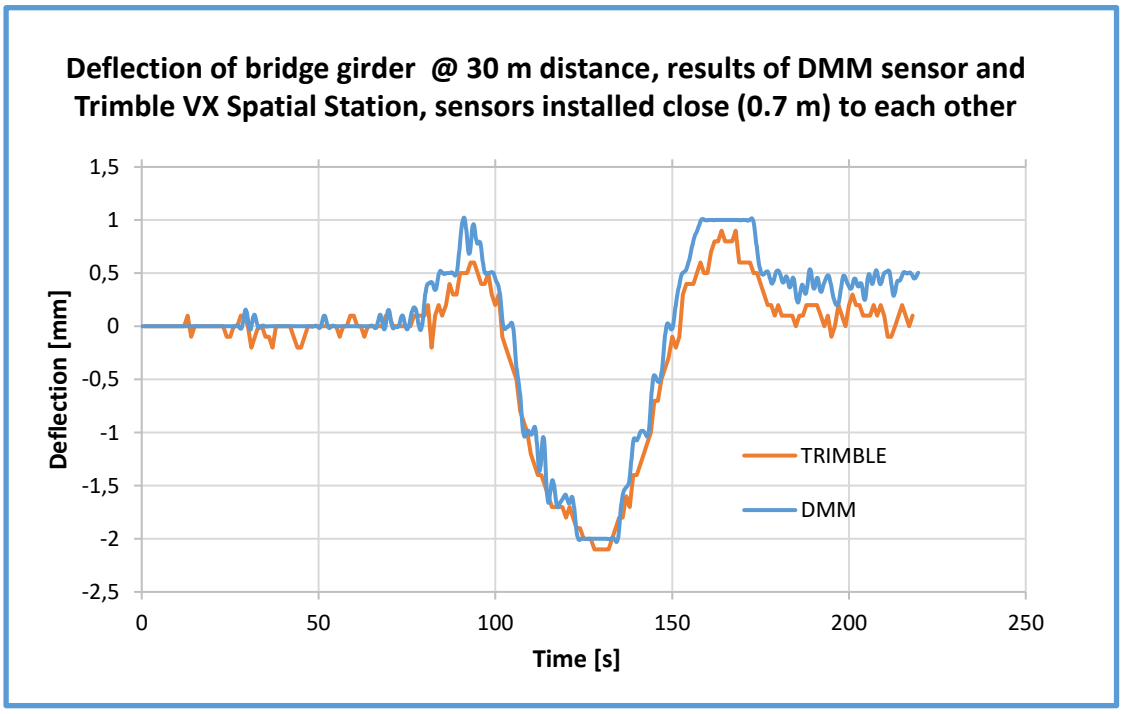
Application photographs

Four DMM sensors measuring deflection of main girders.



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Technical performance

Deflection sensor DMM ER160 and DMM ER320:

Resolution	0.5 mm (single shot)
Nonlinearity	+/- 0.25 mm
Sampling rate	1-10 Hz
Measurement range	160 mm , 320 mm with DMM ER320
Measurement distance	350 m (DMM ER160 and DMM ER320, with GL700-series laser, 600 rpm/10 Hz), 100 m (with HV302 laser, 600 rpm/10 Hz)
Number of DMM units in one data bus	1 – 20
Operating voltage	7.5 – 36 V measured at the input connector
Current consumption	250 mA
Data bus	RS-485 (MODBUS)
Dimensions and weight	120 x 128 x 260 mm (D x W x H), 4.5 kg (DMM ER160) 120 x 180 x 420 mm (D x W x H), 9.5 kg (DMM ER320)
Enclosure material	Aluminum, EN AW 6082, window PMMA 3 mm
Connector type	MIL-5015
Operating temperature	- 20 °C … +50 °C

Rotary laser level:

Rotating speed	60-600 rpm (pulse frequency 1 Hz – 10 Hz)
Laser type	Class 2/3A/3R, 620 nm-850 nm, 1 mW – 5 mW

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