VLM500-MID

Velocity and length measurement gauge

The optical non-contact operating VLM500-MID is a modern velocity and length measurement device, that complies with the software guidelines of the european measurement instrument directive *MID 2014/32/EC*. The gauge, considered as a counter in the sense of a type approval, is pre-tested by the German Physikalisch Technische Bundesanstalt (*PTB*) and is ready for the implementation in length measuring machines (*MI-009*). The VLM500-MID consists of two units, the measuring device VLM500 and the display and storage unit CDB. Based on the spatial filter principle the velocity is acquired continuously. The spatial filter is based on the filtering effect of grid-like structures (grid modulation) implemented by a CCD-Sensor. The resulting frequency is detected by the device. It is proportional to the velocity of the object being measured. The length can be otained by integration. The object is illuminated by the integrated light source (LED). The light is reflected to the CCD-Sensor according to the surface morphology (granularity). Almost every surface can be measured that way. The aquired length values are displayed on the screen of the CDB. When a measurement is finished, the length data set is stored MID compliant for at least 90 days. In addition to that, the values ca be printed directly or can be shared to typical industrial interfaces (serial or field bus). According to the customers needs the gauge can be equipped with pulse outputs.

Key Features

- **Contactless optical measurement principle**
- **Measurement without slip**
- **Insensitive against impurity**
- **No harmful LASER-light**
- **Robust construction**
- **Non-wearing and maintenance free**
- **Velocity range 0.08 m/min up to 3,000.00 m/min**
- **Working distance: 185 mm / 240 mm / 330 mm**
- **PTB Pre-Tested for the integration in machines with obligatory calibration**
- **Accuracy class III according to MID 2014/32/EC, approved for lengths ≥ 10 m**
- **PC-Software for parameterization**
- **Expected lifetime > 15 years**
- **60 months warranty**
- **Made in Germany**

Applications

- Able to measure on almost all surfaces and materials (e.g. metal, paper, textiles, plastics, ceramic, wood, rubber)
- Applicable for a wide range of product profiles (e.g. strips, rails, plates, foils, tubes, cables, wires, robes, etc.)
- Length and speed measurement at winders
- Manual or automated cutting to length of goods
- External triggered length measurement (Trigger)

Options and accessory

- Add-on cards for digital interfaces (USB, RS232, RS485/RS422, Profinet IO, EtherNet/IP, Ethernet)
- Add-on cards for pulse output for motor control (TTL, Open Collector)
- Add-on card for analog output for velocity monitoring (4…20 mA)
- Delivery on demand with mounting accessory, swinging arm, linear guide, protective housing, air purge nozzles, light barriers, printer etc.

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Technical Data: VLM500 - gauge

	VLM500A	VLM500D	VLM500L	VLM500E
Nominal distance and working range	185 ± 15 mm	240 ± 15 mm	185 ± 10 mm	330 ± 30 mm
- extended working range [1]	185 ± 15 mm	240 ± 30 mm	185 ± 15 mm	330 ± 30 mm
Measuring range	0.60 … 2200 m/min	0.18 … 1200 m/min	0.12 … 250 m/min	0.60 … 2000 m/min
- in extended working range	1.20 … 3000 m/min	0.72 … 2400 m/min	0.30 … 600 m/min	1.00 … 2700 m/min
- with special filter FB2V	0.35 … 280 m/min	0.18 … 150 m/min	0.08 … 100 m/min	0.41 … 270 m/min
- in extended working range and FB2V	0.75 … 570 m/min	0.42 … 330 m/min	0.25 … 200 m/min	0.82 … 540 m/min
Measuring uncertainty [1]	< 0.025 % at nominal working distance < 0.05 % in working range and < 0.2 % in extended working range			
Reproducibility [1]	< 0.025 %			
Detector / principle	CCD sensor / spatial filter with semiconductor grid as reference			
Illumination	White light LED (expected life span: > 5 years)			
State indicator (LED in cover plate)	Signal (green), Error signal (red), Communication (yellow), Forward(green), Backward (green)			
Power supply, consumption	24 VDC, max. 25 W			
Temperature range	0 °C … 50 °C			
Protection class	IP 65			
EMC	compliance with EN 61326-1 (group 1, class A) Emission: CISPR 11, Susceptibility: IEC 61000-4-2, -3, -4, -5, -6			
Weight, Housing dimensions	approx. 3.6 kg, 260 mm x 160 mm x 90 mm (without connections)			
Pulse output / Encoder (optional)	A/B, 2 phases 90°, resolution 8 ns, 0.2 Hz … 25 kHz or 0.2 Hz … 1 MHz Optionally as Open Collector (IPPL), 5V [2] active (IP5V) or Push Pull (IPPP) [2]			
Analog output (optional)	Current output, adjustable as 0 … 20 mA, 0 … 24 mA, 4 … 20 mA (IAUN)			
Process data interface (optional)	Field bus: Profinet IO (IFPN), EtherNet/IP (IFEI), Ethernet (IFFE)			
Standard scope of delivery	VLM500, Power supply cable, Connection cable, positioning aid			

Technical Data: CDB – Display and storage unit

Display	240 x 128 Pixel, background illuminated
Keys	4x, soft keys
Memory capacity	3,938,304 (overwritable after 90 days)
Storable length	0 m < … < 100,000.00 m or 0.01 km < … < 500,000.00 km (legally valid from 10 m)
Print output	Brother TD-4000 (EPSON ESC/POS® protocol)
Length measurement	Auto trigger, manual via key, cut to length according preset length
Programming decontrol	Dongle
State indicator	Signal (green) or Error signal (red)
Power supply, consumption	24 VDC, max. 5 W, power supply via cable from VLM500
Temperature range	0 °C … 50 °C
Protection class	IP 64
EMC	compliance with EN 61326-1 (group 1, class A) Emission: CISPR 11, Susceptibility: IEC 61000-4-2, -3, -4, -5, -6
Weight, Housing dimensions	approx. 1,8 kg, 160 mm x 160 mm x 91 mm (without connections)
Programming interface	for parameter setting and firmware update: USB as virtual COM-Port, isolated
Data output (optional) (protocol interface)	Field bus: Profinet IO (IFPN), EtherNet/IP (IFEI), Ethernet (IFFE) Serial: USB (IUSB), RS-232 (I232), RS-422/RS-485 (I4UN), isolated
Signal Input	External trigger, external direction (Open collector, isolated and short circuit proof)
Signal output	Error, Status, 2x preset length (Open collector, isolated and short circuit proof)
Standard scope of delivery	CDB, cable for programming interface (USB), connection cable to VLM500, programming adapter, USB memory with documentation and software, printed manual

[1] DIN 1319 / ISO 3534, of measured length, test conditions: measuring length 10 m, active tracking, constant conditions in: temperature (20 °C), distance, velocity, illumination.

[2] IP5V and IPPP provide output frequencies up to 1 MHz.