

# VLM500

## Velocity and length measurement gauge

The optical non-contact operating VLM500 is a modern velocity and length measurement gauge in a compact housing.

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. The frequency is proportional to the velocity of the object being measured. The length can be obtained by integration. The object is illuminated by an integrated strong 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. A fast adaption to the surface condition of the object is guaranteed by built-in control loops adjusting the exposure time and the brightness. According to the customer requirement the VLM500 can be equipped with several different industry interfaces or pulse outputs. The compactness and robustness of the gauge allows a space-saving and secure installation in facilities in various fields of the industry (metal, paper, wood, ceramic).



### Key Features

- **Contactless optical measurement principle**
- **Velocity up to 50 m/s**
- **Measuring uncertainty < 0.025 %**
- **Working distance:**  
**185 mm / 240 mm / 330 mm**
- **Measurement without slip**
- **Nonwearing and maintenance free**
- **Nearly material independent**
- **High-Power illumination-LED**
- **No harmful LASER-light**
- **Robust construction**
- **Insensitive against impurity**
- **Various interfaces**
- **Easy installation**  
**Expected lifetime > 15 years**
- **PC-Software for parameterization**
- **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)
- Suitable for various cases of applications (e.g. cutting, positioning, regulation, inspection, quality control)
- 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, slitting lines, coating and inspection lines
- Velocity measurement in paper machines for example at paper pulp, web and paper
- Tube and profile length inspection and provision of velocity signals for testing purposes
- Velocity and cutting control for extruders

### Options and accessory

- Add-on cards for digital interfaces (RS232, RS485/RS422, Fast Ethernet, PROFIBUS DP, Profinet IO, EtherNet/IP, USB), for pulse output and analog output
- Delivery on demand with mounting accessory, linear guide, protection case, air purge nozzles, external counters and displays, light barriers, etc.

## Technical Data

	VLM500A	VLM500D	VLM500L	VLM500E
Nominal distance and working range <sup>1)</sup>	185 ± 15 mm	240 ± 15 mm	185 ± 10 mm	330 ± 30 mm
- extended working range <sup>1)</sup>	185 ± 15 mm	240 ± 30 mm	185 ± 15 mm	330 ± 30 mm
Measuring range	0.6 ... 2200 m/min	0.18 ... 1200 m/min	0.12 ... 250 m/min	0.60 ... 2000 m/min
- in extended working range	1.2 ... 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 <sup>2)</sup>	< 0.025 % at nominal working distance < 0.05 % in working range and < 0.2 % in extended working range			
Reproducibility <sup>2)</sup>	< 0.025 %			
Averaging-/Update-Time	> 0.2 ms with additional 1 ... 32 times sliding average			
Length measuring range	Internal length range up to 2,000,000 km			
Detector / principle	CCD sensor / spatial filter with semiconductor grid as reference			
Illumination	White light LED (expected life span: > 5 years <sup>3)</sup> )			
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	Industrial standard in compliance with CE			
Weight, Housing dimensions	approx. 3.6 kg, 260 mm x 160 mm x 90 mm (without connections)			
Programming interface (max. 2)	for parameter setting, data output and firmware update: USB (IUSB), RS-232 (I232), RS-422/RS-485 (I4UN), isolated			
Opto-isolated outputs <sup>4)</sup>	2x (Error, Signal status)			
Opto-isolated inputs <sup>5)</sup>	3x (External trigger signal, Idle mode / Lock <sup>6)</sup> , Definition of the directional of the movement)			
Pulse output (Encoder)	A/B, 2 phases 90°, resolution 8 ns, 0.2 Hz ... 25 kHz Optionally as Open Collector (IPPL), 5V active (IP5V) <sup>7)</sup> or Push Pull (IPPP) <sup>7)</sup>			
Analog output	Current output, adjustable as 0 ... 20 mA, 0 ... 24 mA, 4 ... 20 mA (IAUN)			
Fieldbus interface	Profibus DP (IFPB), Telnet via FastEthernet (IFFE), Profinet IO (IFPN), EtherNet/IP (IFFE)			
Standard scope of delivery	VLM500, Programming interface on customer request, Power supply cable, Connection cable, positioning aid, USB memory with documentation and software, printed manual			

## Accessory (extract)

Cooling and Protective CPC1



Mounting plate MPL1



Cooling air supply AC5



- <sup>1)</sup> Larger working ranges can be offered according to customer demands
- <sup>2)</sup> DIN 1319 / ISO 3534, of measured length, test conditions: measuring length 10 m, active tracking, constant conditions in: temperature (20 °C), distance, velocity, illumination.
- <sup>3)</sup> Simple replacement by user.
- <sup>4)</sup> OpenCollector interface card (IOPL). Connections are isolated and short circuit proof.
- <sup>5)</sup> Opto isolated, short circuit proof, max. voltage 50 VDC, 36 VAC
- <sup>6)</sup> The idle mode input can be used as a second trigger input. From firmware version 1.10 and higher.
- <sup>7)</sup> IP5V and IPPP provide output frequencies up to 4 MHz.

Vers. 2.1 (2018-10-23), 18-1100-02, Datasheet\_VLM500\_EN\_V2.1.docx