

VLM502

Velocity and length measurement gauge

The optical non-contact operating VLM502 is a modern velocity and length measurement gauge with a small separated head unit. The speed acquisition is realized using the spatial filter principle. It bases 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 over the time. The object is illuminated by an integrated strong LED light source. 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. The head unit (VLM502 – O) is connected to the evaluation unit (VLM502 – E) with a wiring harness. According to the customer requirement the VLM502 can be equipped with several different industry interfaces or pulse outputs. The small gauge head allows a space-saving installation in compact facilities in various fields of the industry.



Key Features

- Contactless optical
- Velocity up to 50 m/s
- Measuring uncertainty $\pm 0.025\%$
- Working distance: 85 mm
- Slip free
- Nonwearing
- Nearly material independent
- High-Power illumination-LED
- No harmful LASER-light
- Robust and precise
- Insensitive against impurity
- Various interfaces
- Easy installation
- Nearly maintain free at a lifetime of > 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, 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

Nominal distance and working range	85 ± 15 mm
- extended working range	85 ± 15 mm
Measuring range	0,60 ... 1500 m/min
- in extended working range	1,20 ... 3000 m/min
- with special filter board FB2V	0,36 ... 210 m/min
- in ext. working range and FB2V	0,72 ... 420 m/min
Measuring uncertainty ¹⁾	< 0,025 % at nominal working distance < 0,05 % in working range and < 0,2 % in extended working range
Reproducibility ²⁾	< 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 ³⁾
State indicator (VLM502 - E)	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	VLM502 – E: IP 65, VLM502 – O: IP65
EMC	Industrial standard in compliance with CE
Weight, Housing dimension	VLM502 – O: 1,7 kg, 163 mm x 137 mm x 67 mm VLM502 – E: 2,2 kg, 140 mm x 140 mm x 91 mm Connection between VLM502 – O and VLM502 – E: 3 m
Interfaces	
Programming interface (max. 2)	for parameter setting, data output and firmware update USB (IUSB), RS-232 (I232), RS-422 (I4U4), isolated
Outputs ⁴⁾	2x (Error signal, Signal status)
Inputs ⁴⁾	3x (External trigger signal, Standby ⁵⁾ , Direction)
Pulse-output (Encoder)	A/B, 2 phases 90°, resolution 8 ns, 0,2 Hz ... 50 kHz Optionally as Open Collector, 5V active ⁶⁾ or Push Pull ⁶⁾
Analog output	Current output, adjustable as 0 ... 20 / 0 ... 24 / 4 ... 20 mA
Fieldbus interface	Profibus DP (IFPB), Ethernet (IFFE), Profinet IO (IFPN), EtherNet/IP (IFEI)

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

²⁾ Simple replacement by user. The LED has still 70 % of brightness after 50.000 working hours.

³⁾ Open Collector interface card (IOPL). Connections are isolated and short circuit proof.

⁴⁾ Opto isolated, short circuit proof, max. Voltage 50 VDC, 36 VAC

⁵⁾ The standby input can be uses as a second trigger input.

⁶⁾ IP5V and IPPP provide output frequencies up to 1 MHz.