

VLM320 VELOCITY AND LENGTH SENSOR

White Light Velocity Sensor Providing Length & Velocity



- **Mounting options -170, 185 & 240 mms**
- **Pulse output for encoder emulation.**
- **Multiple programmable outputs.**
- **Compact rugged construction.**
- **Assimilates direction & encoder inputs**
- **Velocity determined to 0.1% accuracy**
- **Optional analogue 4-20mA output**
- **Measures off all surfaces**

General Description

The VLM320 operates optically without contact, and implements the principle of the spatial filter by means of the use of a CCD sensor. Spatial filter is the generic term used to describe a measuring principle for the non-contact determination of the velocity and length of moving materials. The spatial filter is based on the filtering effect of grid-like structures (grid modulation).

The function of the VLM320 can be described as follows: The object to be measured is reproduced through the objective onto the CCD sensor.

The CCD sensor is operated as an optical grid (no image pickup). The object to be measured is illuminated by an integrated light source (LED). External light disruptions are effectively suppressed with this method. When the object is moved, a signal frequency is generated due to grid modulation. This frequency is proportional to the velocity at which the object is moving. The device measures the signal frequency and converts it to a velocity value.

There are several control circuits that enable automatic adjustment to the most varied of materials (material surface structure and brightness).

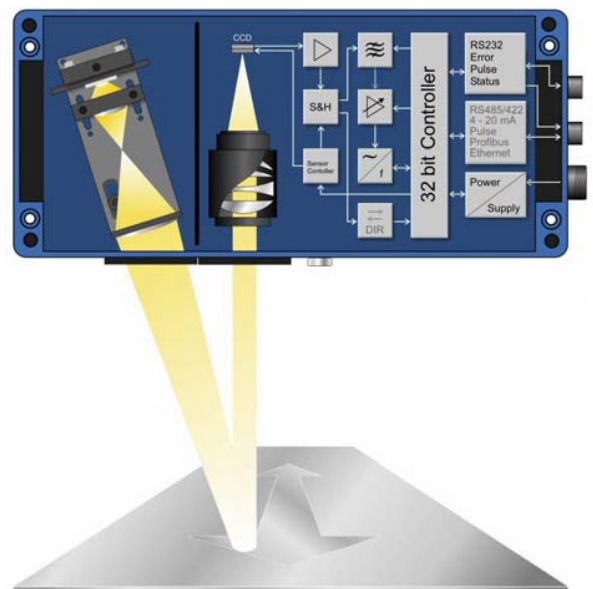
Applications

Suitable for nearly all materials, such as metal, paper, textiles, plastics, rubber, ceramics and timber.

Suitable for a wide range of products, including strips, rails, plates, foils, tubes, profiles, cables, wires, ropes, etc.

Caters for various processes such as cutting, positioning, regulation, inspection, quality control.

Examples: 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 of testing purposes; velocity regulation and cutting control for extruders.



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VLM320 Technical Data

Non-contact velocity and length measurement for nearly all materials				
Technical Data	VLM320A	VLM320D	VLM320L	VLM320V
Measuring Distance	185 ± 7.5 mm	240 ± 15 mm	170 ± 7.5 mm	170 ± 7.5 mm
Extended Measuring Distance	185 ± 15 mm	240 ± 30 mm	170 ± 10 mm	170 ± 10 mm
Measuring Range	0.01 ... 25 m/s	0.008 ... 15 m/s	0.004 ... 3,0 m/s	0.001 ... 1,5 m/s
Extended Measuring Range	0.12 ... 50 m/s	0.016 ... 30 m/s	0.008 ... 6,0 m/s	0.002 ... 3,0 m/s
Max. Acceleration = $K_i \cdot v^2$	$K_i = 200 \text{ m}^{-1}$	$K_i = 290 \text{ m}^{-1}$	$K_i = 450 \text{ m}^{-1}$	$K_i = 900 \text{ m}^{-1}$

Measuring Uncertainty¹⁾

Reproducibility¹⁾

Average-/Update-Time
Length Measuring Range

better than 0.1% (0.2% in extended range)

better than 0.05%

from 0.2 ms with additional 1 - 32 times sliding averaging
internal length range up to 400 km

Detector / measurement Principle

Illumination

Programming Interface³⁾

CCD sensor/spatial filter with semiconductor grid as reference

white light LED (recommended maintenance interval: 24 months, expected life span: 70% brightness after 50,000 hours of operation)
internal length range up to 400 km

Opto-isolated Outputs³⁾

Function

Frequency for pulse output

Type.max. output current

OUT0, OUT1, OUT2, OUT3

OUT0: **VLM Error** (Hardware Error)

OUT1, OUT2 **Pulse output with 2 phase shaft encoder emulation (a and B)**

OUT3 **Signal Status**

0,2 Hz—25 kHz (A/B 2 phases 90°; resolution 5 ns)

(2 optional high resolution pulse outputs available, see below)

NPN open emitter/40 mA with AB3, optional with AB4 active push/pull

Opto-isolated Inputs³⁾

Function

Voltage Level

Input Current

IN0, IN1, IN2

IN0: **Standby**

IN2: **External directional signal**

IN3: **Trigger signal**

(for signals 0/24 V, 0/20 mA or ±20 mA, Ri approx. 1 kOhm)

> 8 V for HIGH (switchable to > 3 V for IN1 and IN2)

approx. 20 mA at 24 V

Power supply

Power consumption

230 V / 50 Hz optional 115 V / 60 Hz or 24 V / DC

< 20 W

Protection Class

Weight²⁾

EMC⁴⁾

IP 65

approx. 5.8 kg (12.8 LBS)

Industrial standard corresponding to CE

Temperature range

0 to 50 °C (32 to 122 °F)

Housing Dimensions²⁾

360 mm x 160 mm x 90 mm (14.17" x 6.3" x 3.5")

Options

Additional analogue output IF1 (4 to 20 mA or 0 to 20 mA, 16-bit, opto-isolated); various digital interfaces IF1 (RS485/RS422, RS232, opto-isolated, bus-compatible, usable like programming interface); 2 additional pulse outputs up to 25 kHz: IF3 (passive) and IF3/PP (active); 2 high-resolution pulse outputs: IF3/5V (0,2 Hz up to 2 MHz); interface board for Ethernet or ProfiBus DP; automatic direction detection, light barriers, various counter and displays, mounting accessories, linear moving units, air purge nozzles, protection cases, etc.

¹⁾ DIN 1319 / ISO 3534, from the measured length value, test conditions: measuring length 10 m, with active tracking

²⁾ Standard model without connection: L and V series without objective window; other models available on request

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We reserve the right to alter specifications without prior notice. Specifications without tolerances are typical values.



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