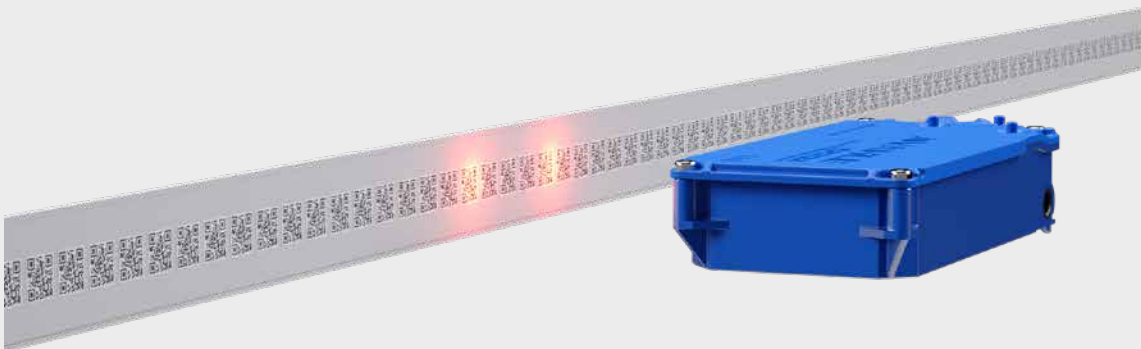
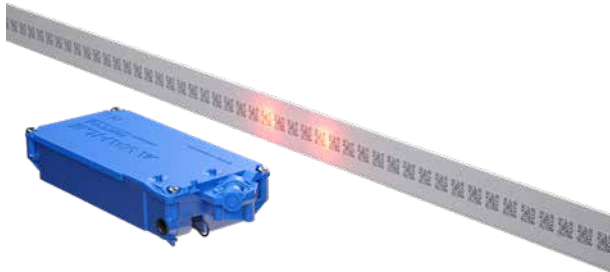




vPOS – POSITIONING SYSTEMS
APOS OPTIC

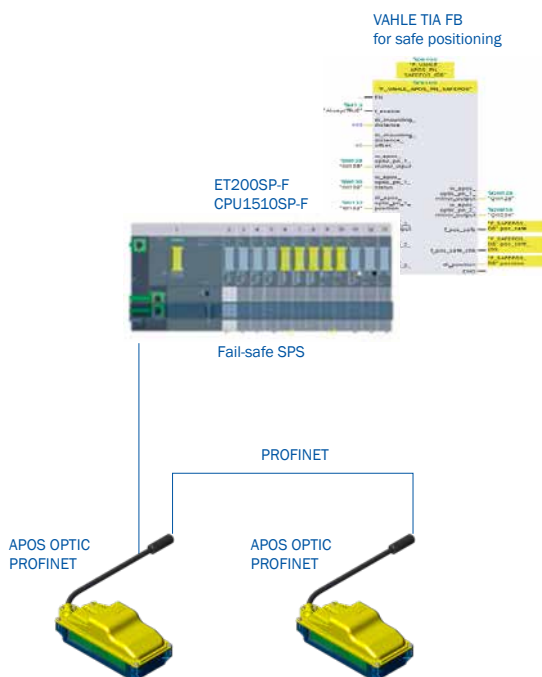


APOS OPTIC – KEY HIGHLIGHTS



COMPLETE SOLUTIONS

APOS Optic offers simple and easy assembly and integration with other VAHLE systems to provide compact and efficient solutions in onepack-age.

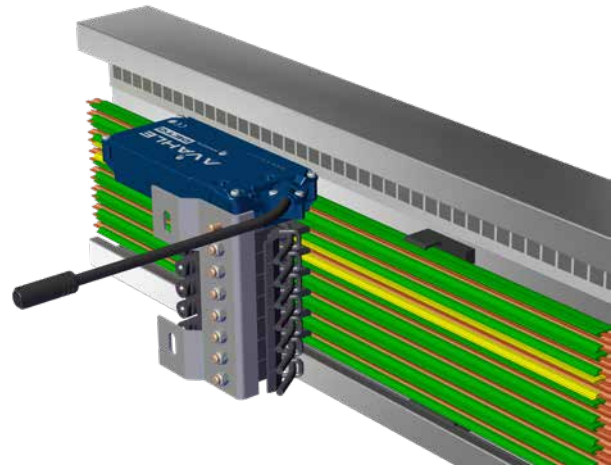


QUICK COMMISSIONING AND MAINTENANCE

With the help of the APOS Optic Diagnosis Kit and the APOS ServiceTool software the data of the reading heads can be read, updates can be carried out, the code strip inspected and errors of the reading head can be analysed.

RELIABLE POSITIONING SYSTEM

Dual integrated cameras ensure high reliability in critical functions. Instant and accurate positioning is available after system interruptions or restarts.



SAFE POSITION

For safety-related applications a security function referred to as „Safe Position“ with **Performance Level d, Cat. 3**, in accordance with DIN EN ISO 13849-1, can be realised in conjunction with TÜV-certified TIA system modules.

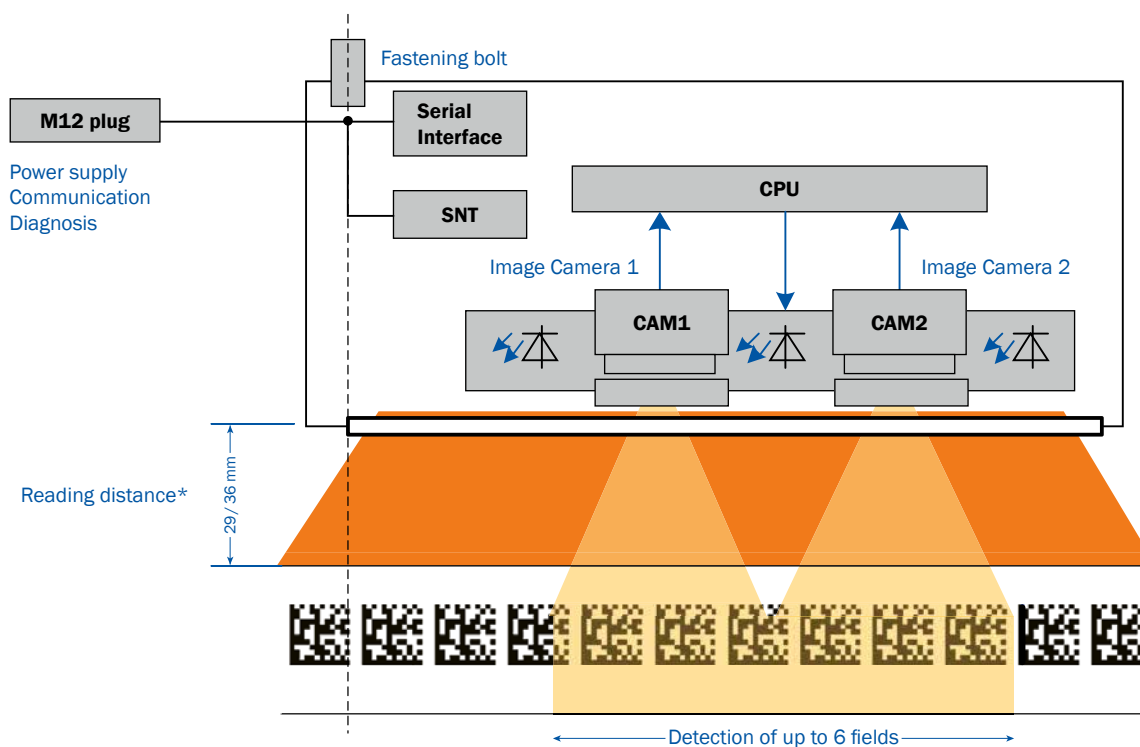


APOS OPTIC – FUNCTION

Modern material handling applications such as automobile production, assembly lines and storage and retrieval systems require gapless and exact positioning of the mobile equipment throughout the entire processing cycle. APOS Optic - of the product range vPOS - achieves this task by providing optical reading of the DataMatrix code strip.

OPERATION

VAHLE APOS Optic reading heads come equipped with dual cameras and integrated LED lighting. The dual cameras allow the reading head to detect up to six DataMatrix code fields at one time. Only one code field is required to determine positioning. This redundancy allows the reading head to bridge small gaps or damages to the codetape without error. The integrated LED lighting is another factor that ensures process reliable detection.



The positioning system operates with the simple and efficient Data Matrix code strip. This permits absolute position detection up to a maximum travel range of 10,000 meters. Instant positioning is available after interruptions and the LED light source is unaffected by ambient lighting conditions.

* The reading distance of 29 mm is only applicable in conjunction with code strip carriers and assembly on the current collector package.

APOS OPTIC – SERIAL READING HEADS

TECHNICAL DATA

ELECTRICAL DATA

| | |
|-------------------------|------------------------|
| Voltage | 24 VDC (20 ... 30 VDC) |
| Power consumption | Max. 130 mA |
| Power input..... | <3 W |
| Start-up time | <2 sec |

MEASUREMENT ELECTRONICS

| | |
|--------------------|------------------------------------|
| Accuracy..... | ±1 mm |
| Reading rate | ≤3 m/s (180 m/min) |
| Lighting | Integrated LED code strip lighting |

M-12 CONNECTIONS

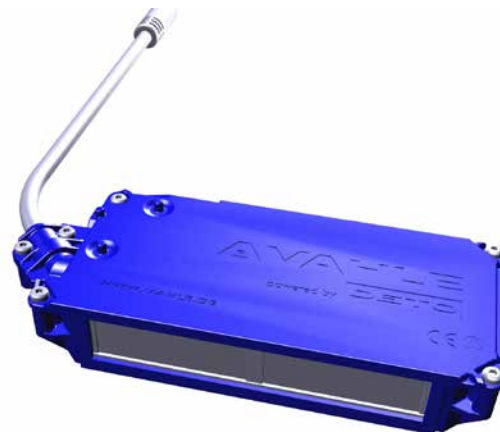
| | |
|-------------------|------------------------|
| Plug coding | 4-pole A-coded (RS485) |
| | 8-pole A-coded (SSI) |

AMBIENT CONDITIONS

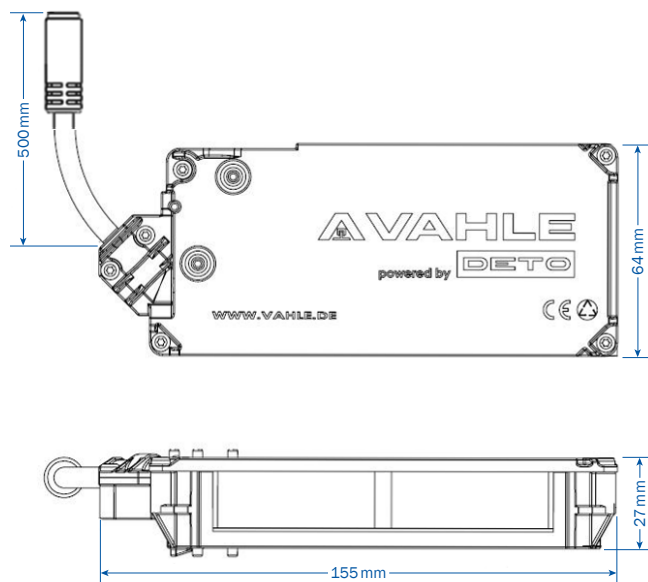
| | |
|-----------------------------|-----------------|
| Operating temperature | 0 °C... 60 °C |
| Storage temperature..... | -15 °C... 60 °C |

MECHANICAL DATA

| | |
|------------------------|-------------------------|
| Protection Type..... | IP54 |
| Depth of field..... | ±14 mm |
| Inclination | ±1,5 ° |
| Dimensions..... | 155 x 64 x 27 mm |
| Weight..... | approx. 200 g |
| Tolerances height..... | 4 mm / 6 mm |
| Reading distance | 29 or 36 mm (see below) |



DIMENSIONS



RANGE OF PRODUCTS

| Description | Protocol* | Data Rate [kBit/s] | Order No. |
|-----------------------------------|------------------------|--------------------|-----------|
| Reading distance O3: 29 mm | | | |
| LK-03-RS485-D-576-D1-54 | DETO | 57,6 | 10011578 |
| Reading distance O2: 36 mm | | | |
| LK-02-RS485-D-1152-D1-54 | DETO | 115,2 | 10010601 |
| LK-02-RS485-D-625-D1-54 | DETO | 62,5 | 10004141 |
| LK-02-RS485-D-576-D1-54 | DETO | 57,6 | 10004140 |
| LK-02-RS485-S-625-D1-54 | Binary protocol type 2 | 62,5 | 10005457 |
| LK-02-RS485-S-576-D1-54 | Binary protocol type 2 | 57,6 | 10005456 |
| LK-02-SSI-4-D1-54 | Siemens | - | 10014882 |
| LK-02-RS485-D-576-DX-54 | DETO | 57,6 | 10013786 |
| LK-02-SSI-2-D1-54 | Binary protocol | - | 10013467 |
| LK-02-SSI-3-D1-54 | SEW | - | 10022006 |

* More protocol types are available on request. Please contact our Techsales in case of need.

APOS OPTIC – PROFINET READING HEADS

TECHNICAL DATA

ELECTRICAL DATA

| | |
|-------------------------|------------------------|
| Voltage | 24 VDC (20 ... 30 VDC) |
| Power consumption | Max. 600 mA |
| Power input..... | <13 W |
| Start-up time | <2 sec |

MEASUREMENT ELECTRONICS

| | |
|--------------------|------------------------------------|
| Accuracy..... | ±1 mm |
| Reading rate | ≤3 m/s (180 m/min) |
| Lighting | Integrated LED code strip lighting |

M-12 CONNECTIONS

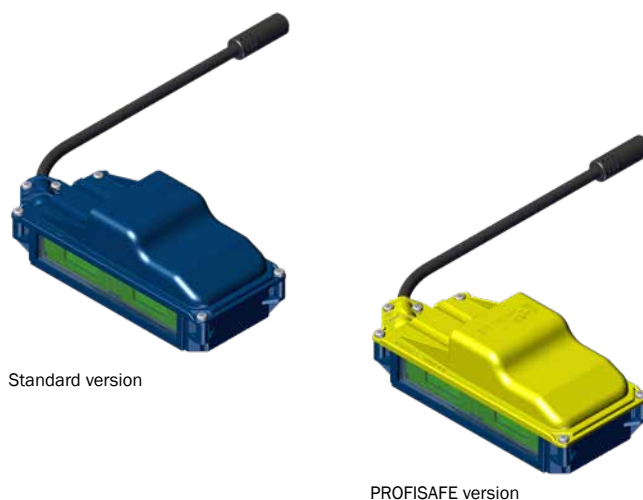
| | |
|------------------|----------------|
| Plug coding..... | 4-pole A-coded |
| | 4-pole D-coded |

AMBIENT CONDITIONS

| | |
|-----------------------------|------------------|
| Operating temperature | 0 °C ... 60 °C |
| Storage temperature..... | -15 °C ... 60 °C |

MECHANICAL DATA

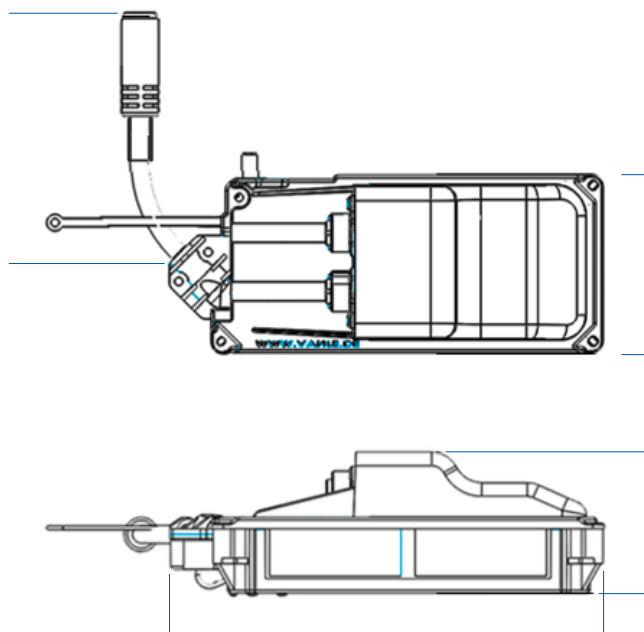
| | |
|------------------------|------------------|
| Protection Type..... | IP54 |
| Depth of field | ±14 mm |
| Inclination | ±1,5° |
| Dimensions..... | 155 x 64 x 50 mm |
| Weight..... | approx. 260 g |
| Tolerances height..... | 4 mm / 6 mm |
| Reading distance | 36 mm |



Standard version

PROFISAFE version

DIMENSIONS



RANGE OF PRODUCTS

| Description | Protocol* | Data Rate [MBit/s] | Order No. |
|--|------------------|--------------------|-----------|
| Reading distance O2: 36 mm | | | |
| LK-02-PNIO2-S-D1-54 | PROFINET-IO CC-B | 100 | 10011072 |
| LK-02-PNIO2-SAFE-DX-54 Incl. VAHLE TIA PROFINET component, Safe Position* | PROFINET-IO CC-B | 100 | 10013679 |

* Always assemble two reading heads (LK-02-PNIO2-SAFE) for the APOS optic System „Safe Position.“ With the SPS either use CPU 1510SP F-1 PN or CPU 1512SP F-1 PN (both Siemens, product family ET200-SP). The version Standard PROFINET only requires one reading head (LK-02-PNIO2-S).

APOS OPTIC – DIAGNOSIS

APOS OPTIC DIAGNOSIS KIT

The APOS Optic Diagnosis Kit enables a complete diagnosis and trouble shooting.

The APOS optic ServiceTool allows for:

- Firmware updates and restarting the reading heads
- Display of the current position values of each camera
- Graphic presentation of the position progression
- Display of camera images



With the help of the APOS Code Generator, defective code strip segments can quickly be reprinted and replaced.

Please contact our Techsales in case of need.

RANGE OF PRODUCTS

| Description | | Order No. |
|--------------------------|--|-----------|
| APOS Optic Diagnosis Kit | Diagnosis interface, PC APOS optic Service Tool-Lite, APOS optic Code Generator USB/RS485 adapter, USB/RS422 adapter, power adapter and case | 10014747 |

APOS OPTIC – DATA MATRIX CODE STRIP



RANGE OF PRODUCTS

| Description | Coding | Order No. |
|---------------------------------|-------------------|-----------|
| Code strip : 100 m drum* | | |
| Code Strip CB25 | 0 - 100.000 | 10004169 |
| Code Strip CB25 | 100.001 - 200.000 | 10005781 |
| Code Strip CB25 | 200.001 - 300.000 | 10005782 |
| Code Strip CB25 | 300.001 - 400.000 | 10005784 |
| Code Strip CB25 | 400.001 - 500.000 | 10005786 |
| Code strip : 50 m drum* | | |
| Code Strip CB25 | 0 - 50.000 | 10010849 |
| Code Strip CB25 | 100.001 - 150.000 | 10012051 |
| Code Strip CB25 | 200.001 - 250.000 | 10012610 |

* More code strip lengths are available on request. Please contact our Techsales in case of need.

APOS OPTIC – FIXING MATERIAL



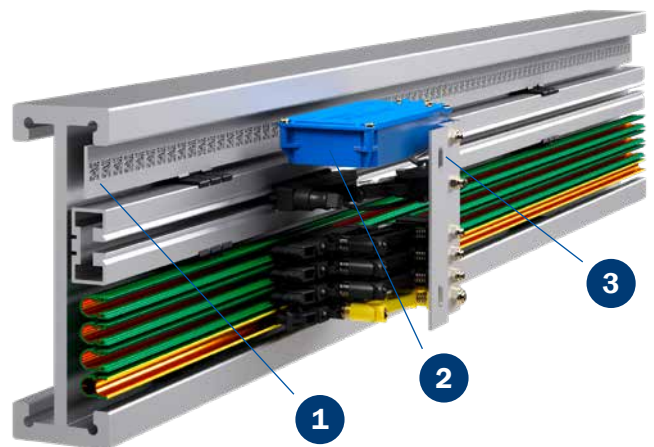
RANGE OF PRODUCTS

| Description | | Dimensions | Order No. |
|--|------------------------|-------------------|-------------------------|
| Support profile for data matrix code strip | VTS-TP-28 x 2 x 6000-S | 28 x 2 x 6000 mm | P9999996 ⁽¹⁾ |
| Universal bracket for reading head | VTS-HLK-SHE-SB | 71,5 x 3 x 120 mm | 0144509 |

APOS OPTIC – SYSTEM INTEGRATION

EXAMPLE: EMS APPLICATION⁽²⁾

- 1 The APOS Optic code strip is mounted in the EMS profile by using an aluminum bar.
- 2 In this application, the APOS Optic reading head is integrated above the mobile SMGM coupler and the U10 current collector.
- 3 A special bracket provides a common mounting plate for the APOS Optic reading head, the U10 current collector and also for the mobile SMGM coupler.



(1) It is a matter of a pseudo order number. Our Techsales will check the profile components in detail by ordering.

(2) More system combinations are available on request. Please contact our Techsales in case of need. Please take into account that the EMS components are not part of VAHLE delivery scope.



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