# MULS1AA-112211 multiScan136
multiScan100

**3D LIDAR SENSORS**

**SICK**
Sensor Intelligence.

# MULS1AA-112211 multiScan136 | multiScan100
## 3D LIDAR SENSORS

## Ordering information

| Type | part no. |
|------|----------|
| MULS1AA-112211 multiScan136 | 1140134 |

Other models and accessories ➔ www.sick.com/multiScan100

## Detailed technical data

### Features

| Application | Indoor, Outdoor |
|---|---|
| Variant | Standard (not pre-configured) |
| Measurement principle | Statistical measurement procedure |
| Light source | Infrared (850 nm) |
| Laser class | 1 (IEC 60825-1:2014, EN 60825-1:2014+A11:2021) |
| **Aperture angle** | |
| Horizontal | 360° |
| Vertical | 65°, 22.5° ... -42.5°, DIN ISO 8855 |
| Scanning frequency | 20 Hz |
| **Angular resolution** | |
| Horizontal | 0.125°, 2 high-resolution scan layers |
| | 1°, 14 scan layers |
| | 0.5°, 14 scan layers, interlaced |
| | 0.125°, 14 scan layers, interlaced |
| Vertical | Approx. 2.5° [1] |
| | Approx. 5° [1] |
| Working range | 0.05 m ... 60 m |
| **Scanning range** | |
| At 10% reflection factor and 100 klx | 10 m [2] |
| At 10% reflection factor and 10 klx | 12 m [2] |
| At 90% reflection factor and 100 klx | 15 m [2] |
| At 90% reflection factor and 10 klx | 30 m [2] |

[1] For details see operating instructions.
[2] Detection probability > 99%.
[3] In the scan direction.

| Spot size | 5.3 mrad (0,3 °) <br> 7.5 mrad (0,3 ° + 0,125 °) [3] |
|---|---|
| Amount of evaluated echoes | 3 |

[1] For details see operating instructions.

[2] Detection probability > 99%.

[3] In the scan direction.

## Mechanics/electronics

| Connection type | 1 x "Ethernet" connection, 4-pin M12 female connector, D-coded <br> 1 x "POWER" connection, 5-pin M12 plug, A-coded |
|---|---|
| System plug | See system plug 2116047 <br> Assembled to the rear |
| Supply voltage | 9 V DC … 30 V DC |
| Power consumption | Typ. 10 W, 22 W, Power-up max. 35 W for 5 s |
| Housing material | AlSi12, Optics cover: polycarbonate |
| Housing color | Anthracite gray (RAL 7016) |
| Enclosure rating | IP65 (IEC 60529:1989+AMD1:1999+AMD2:2013) <br> IP67 (IEC 60529:1989+AMD1:1999+AMD2:2013) <br> IP69 (IEC 60529:1989+AMD1:1999+AMD2:2013) <br> IPX9K (ISO 20653) |
| Protection class | III (IEC 61140:2016-11) |
| Electrical safety | IEC 61010-1:2010-06 |
| Weight | 0.7 kg |
| Dimensions (L x W x H) | 100.3 mm x 100.3 mm x 98.5 mm |
| MTBF | 50 years |
| MTTFd | > 100 years (at 25 °C ambient temperature), EN ISO 13849-1:2015 |

## Safety-related parameters

| $MTTF_D$ | > 100 years, at 25 °C ambient temperature (EN ISO 13849-1:2015) |
|---|---|

## Functions

| Digital add-ons | Data Reduction & Data Preparation package <br> Reliability package <br> Multi-echo technology <br> Reflector detection <br> Interlaced mode <br> IMU (Inertial Measurement Unit) <br> PTP |
|---|---|

## Performance

| Scan/frame rate | 216,000 measurement point/s … 648,000 measurement point/s |
|---|---|
| Systematic error | ± 50 mm |
| Statistical error | ≤ 15 mm |
| Integrated application | Output of measurement data |

## Interfaces

| Ethernet | ✓ , TCP/IP, UDP/IP |
|---|---|
| Function | Data interface (read result output), NTP, Measured data output (distance, RSSI) |
| Data transmission rate | 100 Mbit/s |
| Digital inputs/outputs | 3, customizable, see system plug 2116047 |
| Optical indicators | 4 LEDs |

| Configuration software | SOPAS Air (browser based)<br>SOPAS ET |
|---|---|

## Ambient data

| Remission factor | 2 % ... > 1,000 % (Reflector) |
|---|---|
| **Electromagnetic compatibility (EMC)** | |
| Emitted radiation | Emissions in residential, commercial and light industrial environments<br>(EN 61000-6-3:2007+A1:2011) |
| Electromagnetic immunity | Industrial environment (EN 61000-6-2:2005) |
| Application areas | Automotive (UN ECE R10) [1] |
| Application areas | Agricultural and forestry machinery (ISO 14982-1, ISO 14982-2) [1] |
| Application areas | Earthmoving and construction machinery (ISO 13766-1) [1] |
| **Vibration resistance** | |
| Sine resonance scan | 10 Hz ... 1,000 Hz [2] |
| Sine test | 10 Hz ... 500 Hz, 5 g, 10 frequency cycles [2] |
| Noise test | 10 Hz ... 250 Hz, 4.24 g RMS, 5 h [3] |
| **Shock resistance** | 50 g, 11 ms, ± 3 single shocks/axis [4]<br>25 g, 6 ms, ± 1,000 continuous shocks/axis [4]<br>50 g, 3 ms, ± 5,000 continuous shocks/axis [4] |
| **Ambient operating temperature** | –40 °C ... +60 °C [5] |
| **Storage temperature** | –40 °C ... +75 °C |
| **Relative humidity** | ≤ 90 % RH, Non-condensing |
| **Ambient light immunity** | 100 klx |

[1] Load dump: from ISO 16750-2 Test B Severity Level 4 passed for 12 V systems. Required in case of transient disturbances on the input filtering signal lines (de-bounce > 10 ms).
[2] IEC 60068-2-6:2007.
[3] IEC 60068-2-64:2008.
[4] IEC 60068-2-27:2008.
[5] At operating temperatures above +50 °C, mechanical mounting of the device is required, preferably using the mounting accessories provided. Minimum switch-on temperature: –30 °C.

## General notes

| Items supplied | Hardware, software, Software license |
|---|---|
| Note on use | The sensor does not constitute a safety component as defined by relevant legislation on machine safety. |

## Certificates

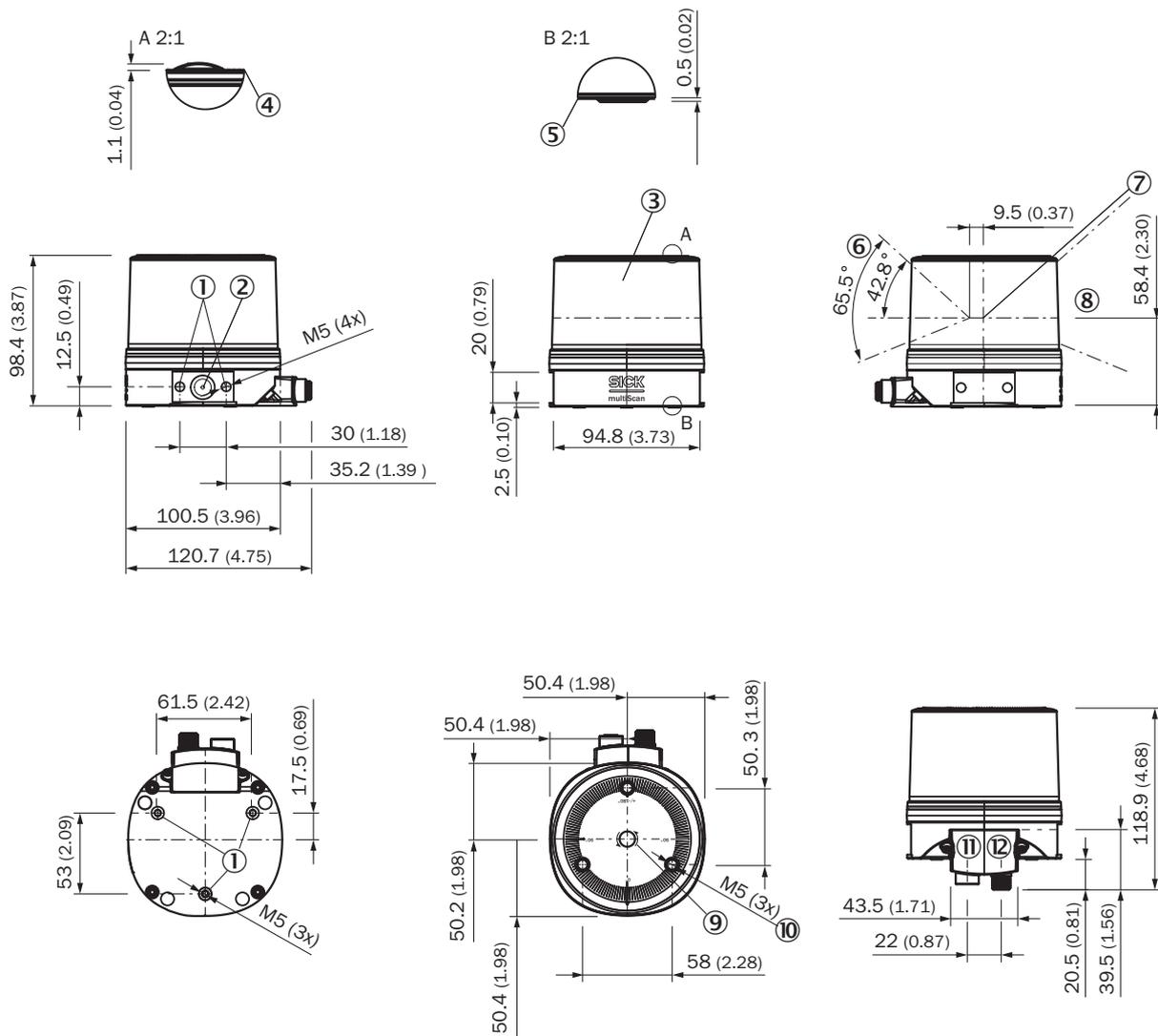| EU declaration of conformity | ✓ |
|---|---|
| UK declaration of conformity | ✓ |
| ACMA declaration of conformity | ✓ |
| China RoHS | ✓ |
| cTUVus certificate | ✓ |
| Information according to Art. 3 of Data Act (Regulation EU 2023/2854) | ✓ |

## Classifications

| ECLASS 5.0 | 27270990 |
|---|---|
| ECLASS 5.1.4 | 27270990 |

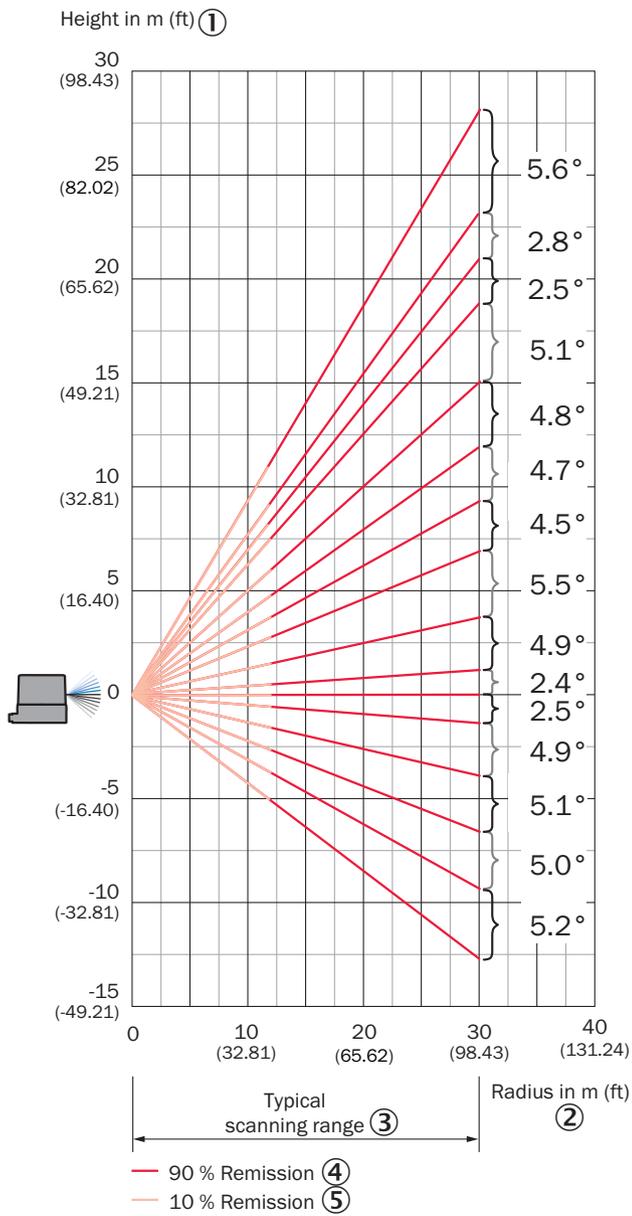| ECLASS 6.0 | 27270913 |
|---|---|
| ECLASS 6.2 | 27270913 |
| ECLASS 7.0 | 27270913 |
| ECLASS 8.0 | 27270913 |
| ECLASS 8.1 | 27270913 |
| ECLASS 9.0 | 27270913 |
| ECLASS 10.0 | 27270913 |
| ECLASS 11.0 | 27270913 |
| ECLASS 12.0 | 27270913 |
| ETIM 5.0 | EC002550 |
| ETIM 6.0 | EC002550 |
| ETIM 7.0 | EC002550 |
| ETIM 8.0 | EC002550 |
| UNSPSC 16.0901 | 41111615 |

## Dimensional drawing
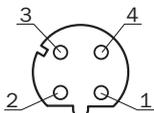
Dimensions in mm (inch)
① M5 threaded mounting hole, 6.4 mm deep; tightening torque ≤ 3 Nm; for mounting the device
② Ventilation element (membrane)
③ Optical hood
④ Top edge of the optics cover
⑤ Base of housing
⑥ Aperture angle (vertical viewing range)
⑦ Defined device origin
⑧ Visual zero position with maximum viewing range
⑨ direction of rotation
⑩ M5 threaded mounting hole; 6.4 mm deep; for accessories only
⑪ supply voltage connection
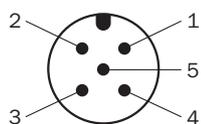⑫ Ethernet connection

## Working range diagram

Height in m (ft) ①

| | |
|---|---|
| 30 (98.43) | |
| 25 (82.02) | 5.6° |
| 20 (65.62) | 2.8° |
| | 2.5° |
| 15 (49.21) | 5.1° |
| | 4.8° |
| 10 (32.81) | 4.7° |
| | 4.5° |
| 5 (16.40) | 5.5° |
| | 4.9° |
| 0 | 2.4° |
| | 2.5° |
| | 4.9° |
| -5 (-16.40) | 5.1° |
| | 5.0° |
| -10 (-32.81) | 5.2° |
| -15 (-49.21) | |

| 0 | 10 (32.81) | 20 (65.62) | 30 (98.43) | 40 (131.24) |

Typical scanning range ③

Radius in m (ft) ②

— 90 % Remission ④
— 10 % Remission ⑤

## Connection type Ethernet

M12 female connector, 4-pin, D-coded
① TX+
② RX+
③ TX-
④ RX-

## PIN assignment



① $V_s$
② I/O 2
③ GND
④ I/O 1
⑤ I/O 3

## Recommended accessories

Other models and accessories ➜ www.sick.com/multiScan100

| Brief description | | Type | part no. |
|---|---|---|---|
| **system plugs and extension modules** | | | |
|  | • **Description:** System plug spare part kit. For use with multiScan100 and picoScan150. The warranty is retained when the system plug is replaced. The system plug can be replaced and reinstalled by following the mounting instructions.⌕1 x "Ethernet" connection, 4-pin M12 female connector, D-coded⌕1 x "Power" connection, 5-pin M12 male connector, A-coded | SYSPLG DCT M12-5 3IO DCT M12D ETH | 2116047 |
| **Mounting systems** | | | |
|  | • **Description:** Simple mounting bracket for multiScan100 with alignment function<br>• **Dimensions (W x H x L):** 78 mm x 42 mm x 134 mm<br>• **Material:** Stainless steel<br>• **Details:** Stainless steel 1.4547<br>• **Items supplied:** Simple bracket, 4 x M5 x 8 countersunk screws, stainless steel<br>• **Suitable for:** multiScan100 | Simple bracket | 2128226 |
|  | • **Description:** Fine adjustment bracket for multiScan100 with tilt and pitch function<br>• **Dimensions (W x H x L):** 85 mm x 42 mm x 134 mm<br>• **Material:** Stainless steel<br>• **Details:** Stainless steel 1.4547<br>• **Items supplied:** Fine adjustment bracket, 4 x M5 x 12 countersunk screws, stainless steel<br>• **Suitable for:** multiScan100 | Mounting bracket alignment | 2124591 |
| **connectors and cables** | | | |
|  | • **Connection type head A:** Male connector, M12, 4-pin, straight, D-coded<br>• **Connection type head B:** Male connector, RJ45, 4-pin, straight<br>• **Signal type:** Ethernet, PROFINET<br>• **Cable:** 2 m, 4-wire, PUR, halogen-free<br>• **Description:** Ethernet, shielded, PROFINET<br>• **Application:** Drag chain operation, Zones with oils and lubricants | YM2D24-020P-N1MRJA4 | 2106182 |
|  | • **Connection type head A:** Male connector, M12, 4-pin, straight, D-coded<br>• **Connection type head B:** Male connector, RJ45, 4-pin, straight<br>• **Signal type:** Ethernet, PROFINET<br>• **Cable:** 3 m, 4-wire, PUR, halogen-free<br>• **Description:** Ethernet, shielded, PROFINET<br>• **Application:** Drag chain operation, Zones with oils and lubricants | YM2D24-030P-N1MRJA4 | 2106183 |

## SICK AT A GLANCE

SICK is one of the leading manufacturers of intelligent sensors and sensor solutions for industrial applications. A unique range of products and services creates the perfect basis for controlling processes securely and efficiently, protecting individuals from accidents and preventing damage to the environment.

We have extensive experience in a wide range of industries and understand their processes and requirements. With intelligent sensors, we can deliver exactly what our customers need. In application centers in Europe, Asia and North America, system solutions are tested and optimized in accordance with customer specifications. All this makes us a reliable supplier and development partner.

Comprehensive services complete our offering: SICK LifeTime Services provide support throughout the machine life cycle and ensure safety and productivity.

**For us, that is "Sensor Intelligence."**

## WORLDWIDE PRESENCE:

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