V3DX3-010BR21A

Ruler3000

3D MACHINE VISION

SICK
Sensor Intelligence.

V3DX3-010BR21A | Ruler3000

3D MACHINE VISION

Ordering information

Type	part no.
V3DX3-010BR21A	1126983

Other models and accessories ➜ www.sick.com/Ruler3000

Detailed technical data

Features

Technology	3D triangulation
Streaming	✓
Pre-calibrated	✓
Shutter technology	Global-Shutter
Working range	99 mm … 149 mm
Example field of view	85 mm x 30 mm
Exposure mode	Linear HDR
Illumination	Integrated
Illumination color	Blue, laser, Visible, 450 nm, ± 10 nm
Laser class	3R (EN 60825-1:2014+A11:2021; IEC 60825-1:2014, Complies with the FDA performance requirements for laser products except for conformance with IEC 60825-1 Ed.3., as described in Laser Notice 56 dated May 8, 2019.)
Data synchronization	Free running, encoder triggered, external triggering
3D measurement	✓
Scatter measurement	✓
Reflectance measurement	✓
Ambient light suppression	✓ [1]
Scheimpflug adapter, integrated	✓
Width at minimum operating distance	77 mm
Width at maximum operating distance	105 mm
Maximum height range	50 mm

[1] Blue bandpass filter.

Task	Detecting - Standard objects Detecting - Level Measuring - Dimension, contour and volume Monitoring and controlling - Quality Determining position - 3D position determination

[1] Blue bandpass filter.

Mechanics/electronics

Connection type	Voltage – I/O: M12, 17-pin male connector Gigabit Ethernet: M12, 8-pin socket, X-coded
Connector material	M12: Nickel-coated brass
Supply voltage	24 V DC, ± 10 %
Ripple	< 5 V_{pp}
Power consumption	≤ 12 W
Current consumption	≤ 1.5 A
Enclosure rating	IP65 IP67
Protection class	III
Housing material	Aluminum
Housing color	Blue
Window material	Float glass, anti-reflective coated
Weight	1.2 kg
Dimensions (L x W x H)	151.5 mm x 60.3 mm x 100 mm

Performance

Image sensor	CMOS sensor from SICK with ROCC technology, M30
Scan/frame rate	46,000 3D profiles/s, In reduced ROI 7,000 3D profiles/s, full format
Data points/profile	3,200
Repeatability	0.8 µm [1]
Typical resolution	Z resolution (height): 3 µm … 6 µm, X resolution (width): 32 µm … 45 µm

[1] Height values measured for different positions in the field of view. 20 measurements are performed at each position. The repeatability value is the 3-fold of the standard deviation (3 σ) for all measurements at all positions.

Interfaces

Ethernet	✓ , UDP/IP
Remark	GigE Vision Standard
Data transmission rate	≤ 1 Gbit/s
Configuration software	Stream Setup
Operating system	Windows 10
Application programming interface (API)	GenAPI, GenTL, Proprietary SICK GenIStream
Inputs/outputs	4 x HIGH = 10 V … 28.8 V, configurable
Encoder interface	RS-422 5 V, 2 x HTL single-ended

Ambient data

Shock load	15 g, 3 cycles per axis

[1] Non-condensing.

Vibration load	5 g, 10 Hz ... 150 Hz (EN 60068-2-6)
Ambient operating temperature	0 °C ... +40 °C [1]
Storage temperature	–30 °C ... +70 °C [1]

[1] Non-condensing.

Classifications

ECLASS 5.0	27310205
ECLASS 5.1.4	27310205
ECLASS 6.0	27310205
ECLASS 6.2	27310205
ECLASS 7.0	27310205
ECLASS 8.0	27310205
ECLASS 8.1	27310205
ECLASS 9.0	27310205
ECLASS 10.0	27310205
ECLASS 11.0	27310205
ECLASS 12.0	27310205
ETIM 5.0	EC001820
ETIM 6.0	EC001820
ETIM 7.0	EC001820
ETIM 8.0	EC001820
UNSPSC 16.0901	43211731

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)	✓
GigE Vision	✓
GenICam	✓

Dimensional drawing
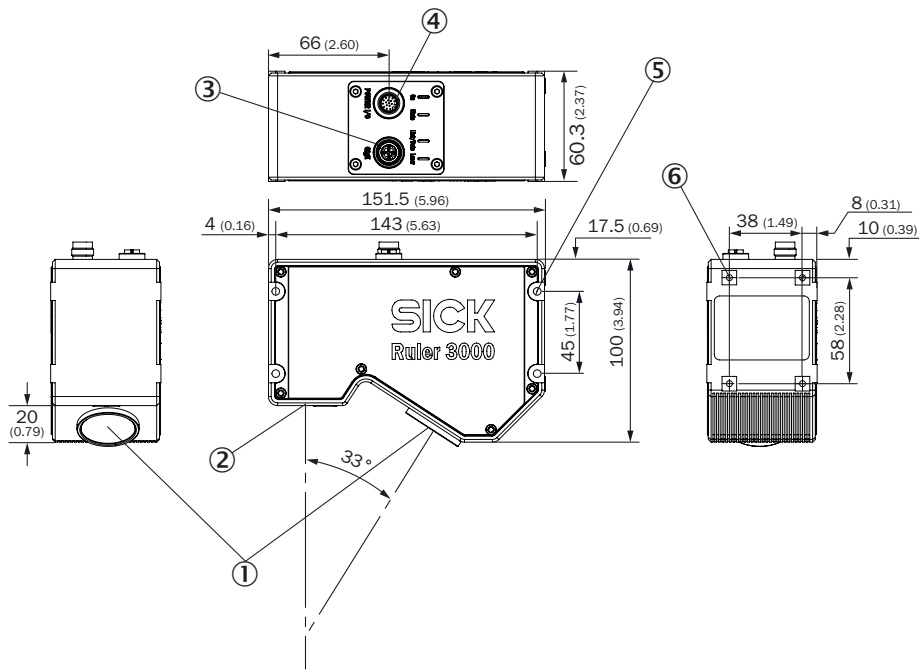
Dimensions in mm (inch)
① Optical receiver (center)
② Optical sender (center)
③ Gigabit Ethernet connection (GbE)
④ Power/I/O connection
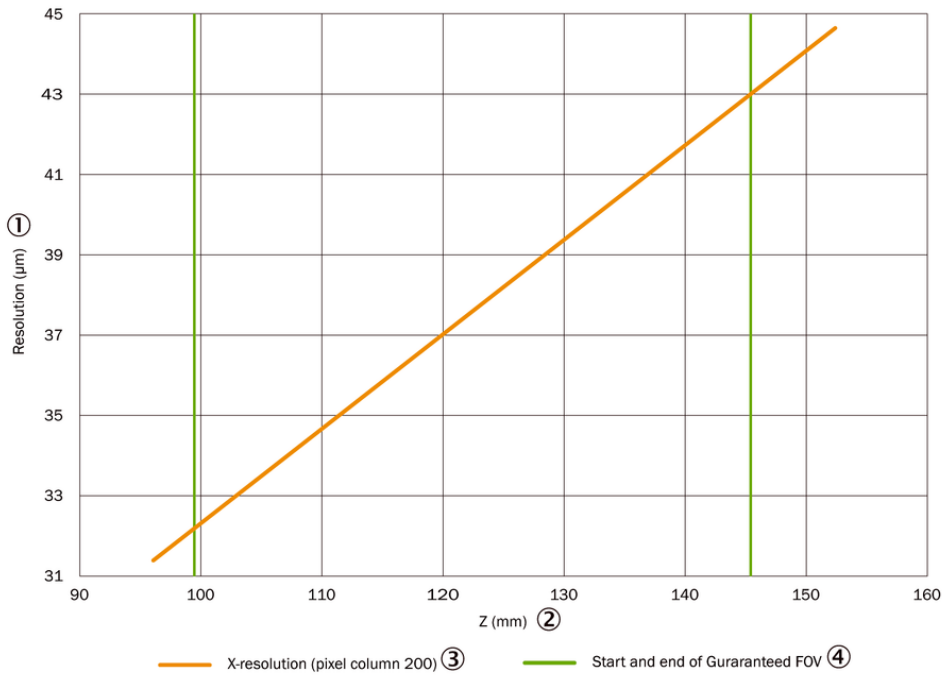⑤ Threaded mounting hole M5
⑥ M5 threaded mounting hole, 10 mm deep
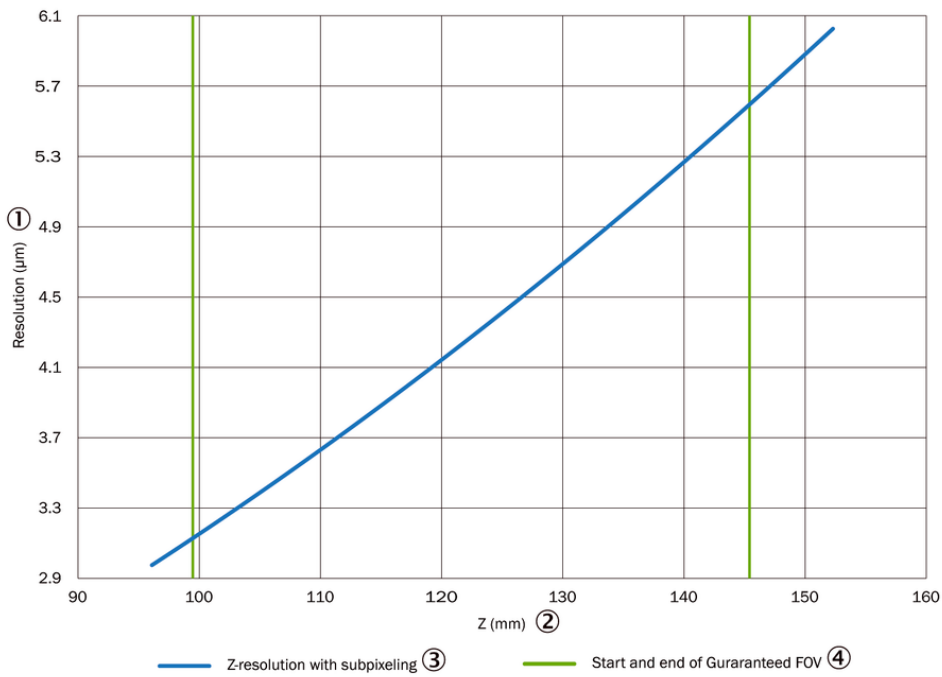
Field of view

Ruler3010
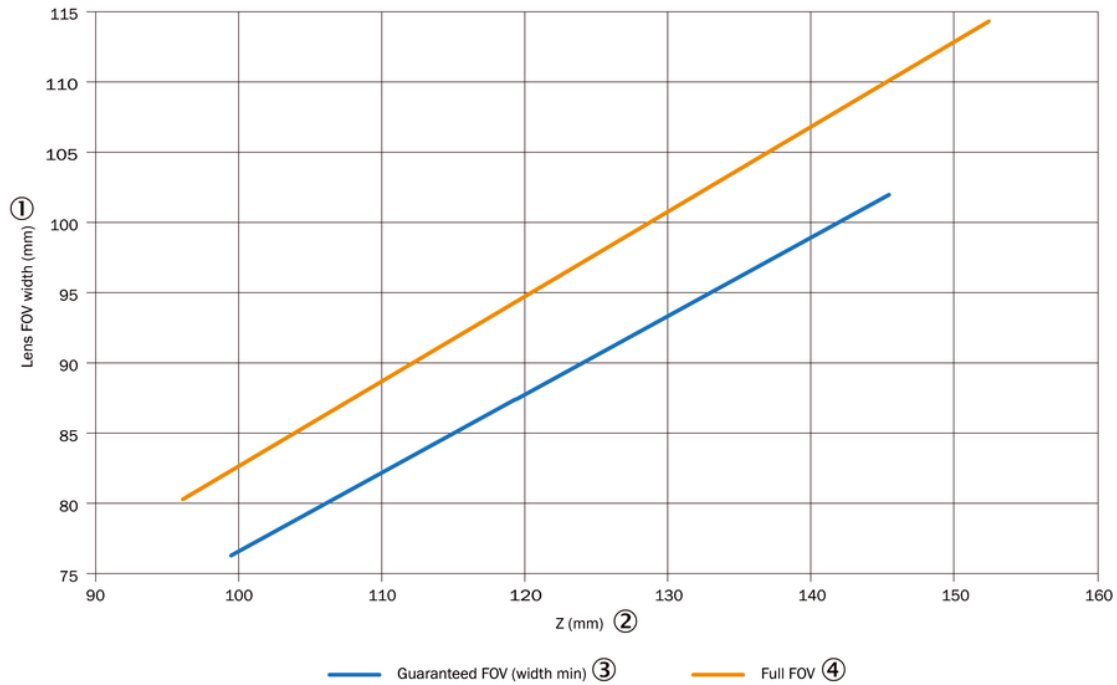Guaranteed field of view in mm

H

99

50

77
(Z res 3 µm)

85 x 30

W

105
(Z res 6 µm)
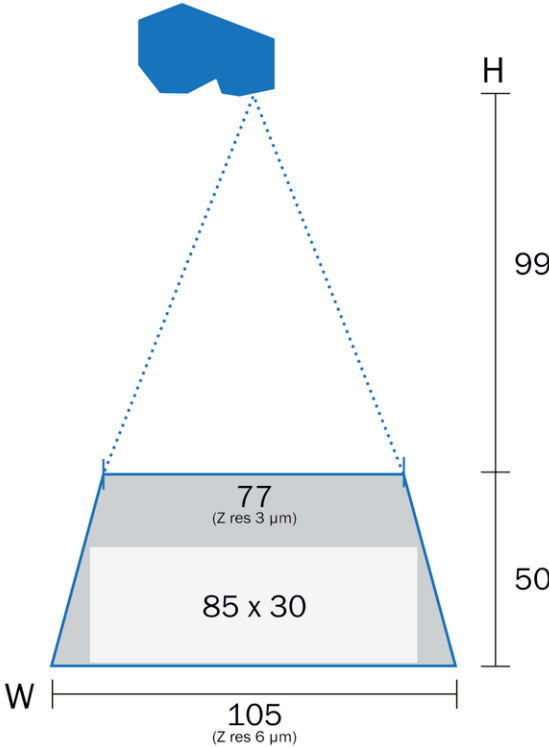
Characteristic curve X resolution via Z position

X-resolution (pixel column 200) ③   Start and end of Guraranteed FOV ④

Characteristic curve Z resolution via Z position

Z-resolution with subpixeling ③   Start and end of Guraranteed FOV ④

Characteristic curve Width of the field of view via the Z position

Guaranteed FOV (width min) ③   Full FOV ④

Characteristic curve

Line rate (kHz) ①

Number of rows ②
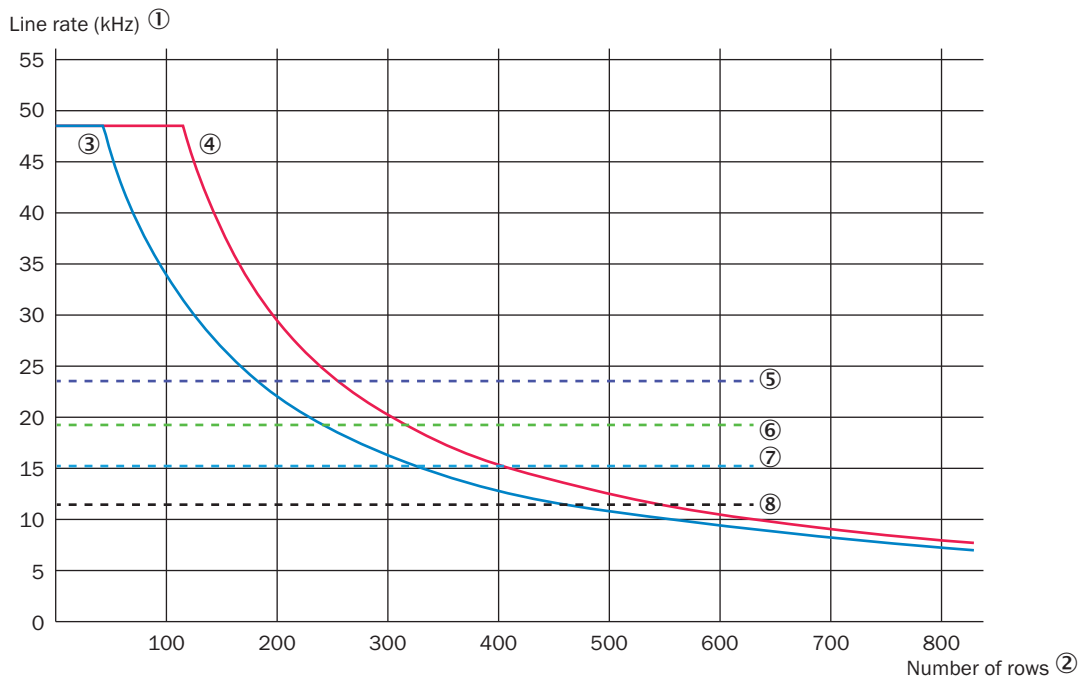
The maximum line rate is based on the number of sensor lines used
① Line rate (kHz)
② Number of lines
③ Ruler3000 with activated HDR

④ Ruler3000 without activated HDR
⑤ Bandwidth limit for image width 2,560, height range only
⑥ Bandwidth limit for image width 3,072, height range only
⑦ Bandwidth limit for image width 2,560, height range and reflectance
⑧ Bandwidth limit for image width 3,072, height range and reflectance

Recommended accessories

Other models and accessories ➜ www.sick.com/Ruler3000

	Brief description	Type	part no.
connectors and cables			
	• **Connection type head A:** Female connector, M12, 17-pin, straight, A-coded • **Connection type head B:** Flying leads • **Signal type:** Sensor/actuator cable • **Cable:** 3 m, 17-wire, PUR • **Description:** Sensor/actuator cable, twisted pair, shielded • **Application:** Uncontaminated zones, Zones with oils and lubricants, Robot, Drag chain operation	YF2A2D-030U-V1XLEAX	6042772
	• **Connection type head A:** Male connector, M12, 8-pin, straight, X-coded • **Connection type head B:** Male connector, RJ45, 8-pin, straight • **Signal type:** Ethernet, Gigabit Ethernet • **Cable:** 2 m, 8-wire, PUR, halogen-free • **Description:** Ethernet, shielded, Gigabit Ethernet • **Application:** Zones with oils and lubricants	YM2X18-020EG1M-RJA8	2106258
	• **Connection type head A:** Male connector, M12, 8-pin, straight, X-coded • **Connection type head B:** Male connector, RJ45, 8-pin, straight • **Signal type:** Ethernet, Gigabit Ethernet • **Cable:** 3 m, 8-wire, PUR, halogen-free • **Description:** Ethernet, shielded, Gigabit Ethernet • **Application:** Zones with oils and lubricants	YM2X18-030EG1M-RJA8	2145693

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."

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