



DATA SHEET

V3DX3-004BR21A

Ruler3000
3D machine vision

SICK Sensor Intelligence



3D MACHINE VISION

V3DX3-004BR21A

ORDERING INFORMATION

Type	part no.
V3DX3-004BR21A	1126984

Further device versions and accessories at www.sick.com/Ruler3000



DETAILED TECHNICAL DATA

FEATURES

Technology	3D laser triangulation
Streaming	✓
Pre-calibrated	✓
Shutter technology	Global-Shutter
Working range	54.2 mm ... 71.8 mm
Example field of view	40 mm x 12 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	38 mm
Width at maximum operating distance	45 mm

¹⁾ Blue bandpass filter.

Maximum height range	17.6 mm
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

Connector material	M12: Nickel-coated brass
Supply voltage	24 V DC, $\pm 10\%$
Ripple	$< 5\text{ V}_{pp}$
Power consumption	$\leq 12\text{ W}$
Enclosure rating	IP65 IP67
Protection class	III
Housing material	Aluminum
Housing color	Blue
Window material	Float glass, anti-reflective coated
Weight	0.99 kg
Dimensions (L x W x H)	129.5 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	0.5 μm ¹⁾
Typical resolution	Z resolution (height): 1.5 μm ... 2 μm , X resolution (width): 17 μm ... 20 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	$\leq 1\text{ Gbit/s}$
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

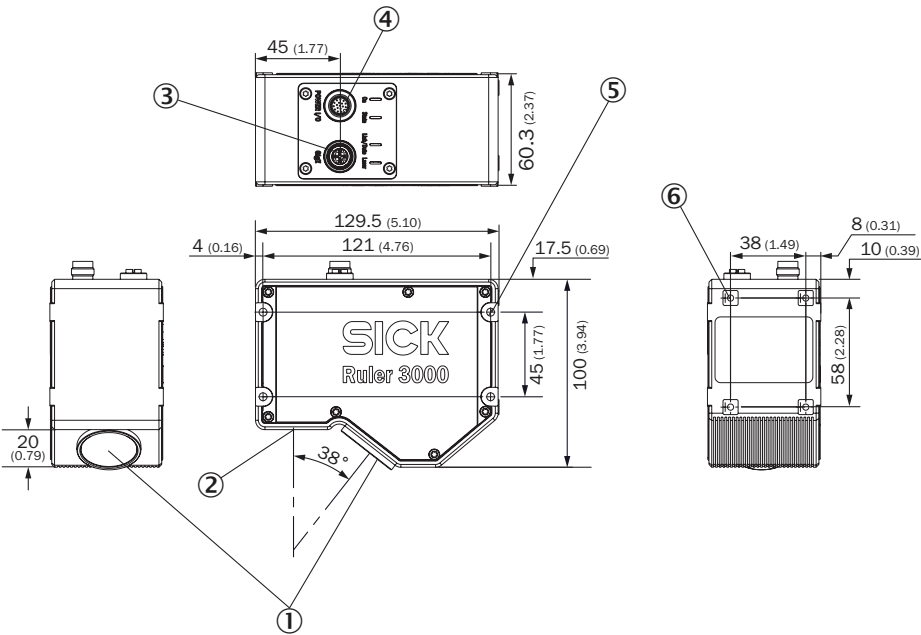
Shock load	15 g, 3 cycles per axis
Vibration load	5 g, 10 Hz ... 150 Hz (EN 60068-2-6)
Ambient operating temperature	0 °C ... +40 °C ¹⁾
Storage temperature	-30 °C ... +70 °C ¹⁾

¹⁾ Non-condensing.

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

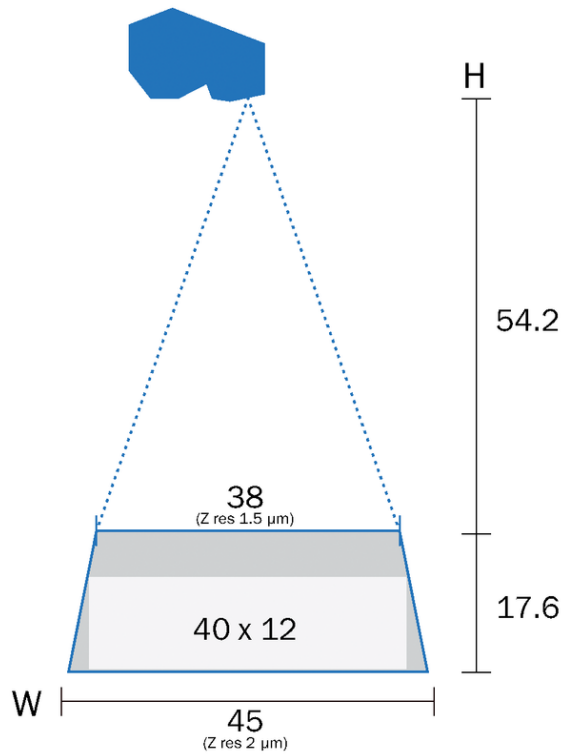


- Dimensions in mm (inch)
- ① Optical receiver (center)
 - ② Optical sender (center)
 - ③ Gigabit Ethernet connection (GbE)
 - ④ Power/I/O connection
 - ⑤ Threaded mounting hole M5
 - ⑥ M5 threaded mounting hole, 10 mm deep

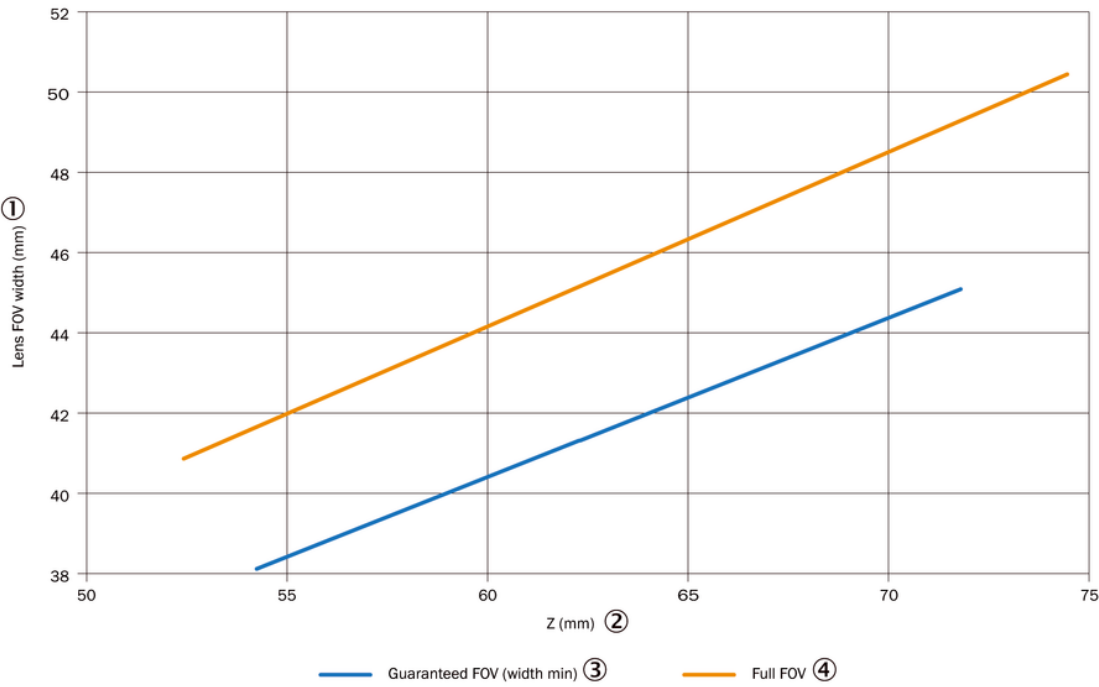
FIELD OF VIEW

Ruler3004

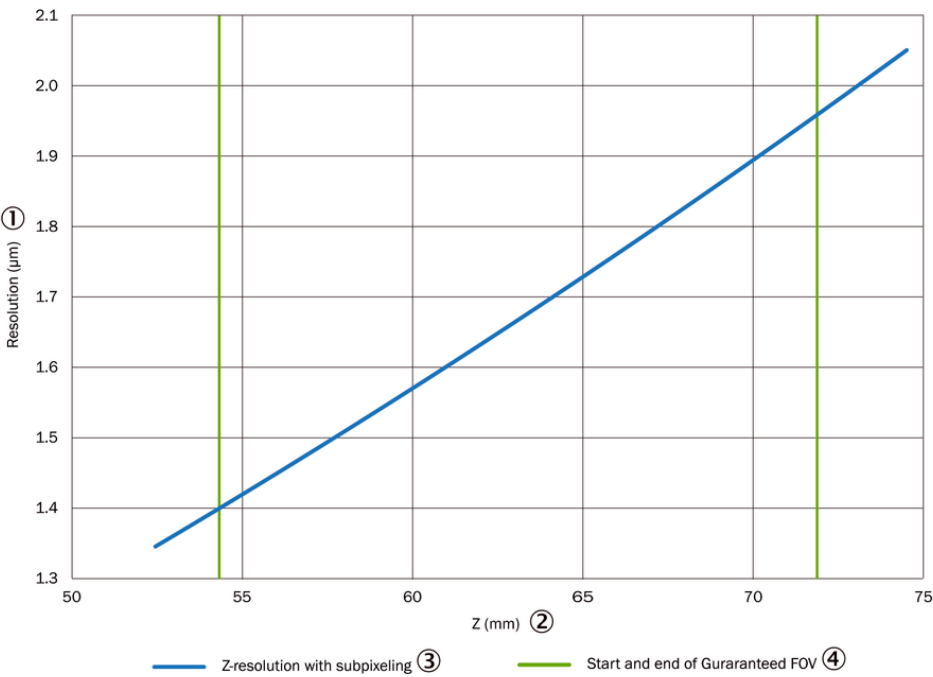
Guaranteed field of view in mm



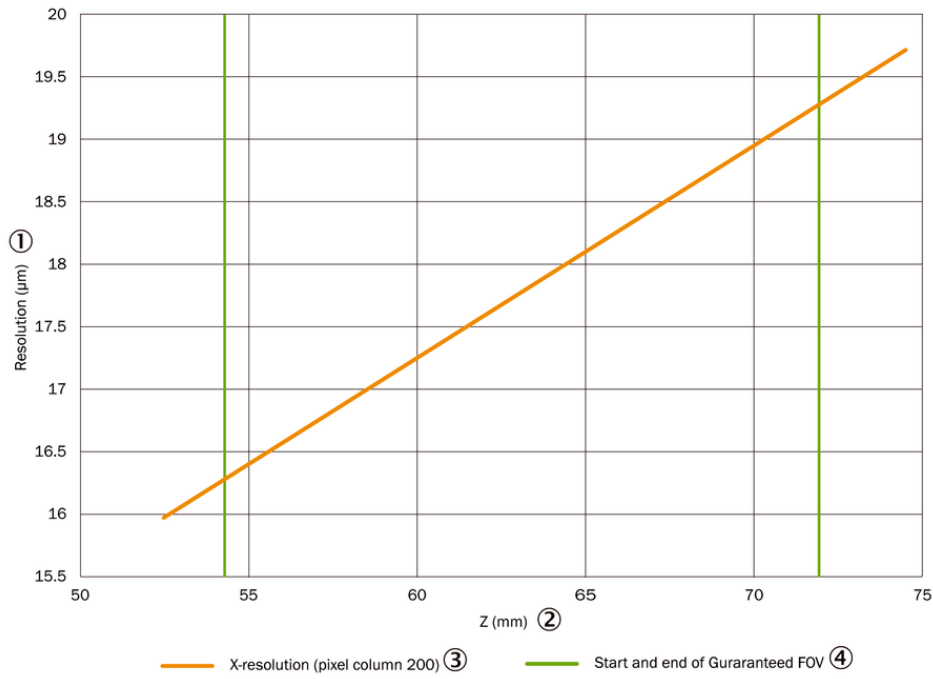
CHARACTERISTIC CURVE WIDTH OF THE FIELD OF VIEW VIA THE Z POSITION



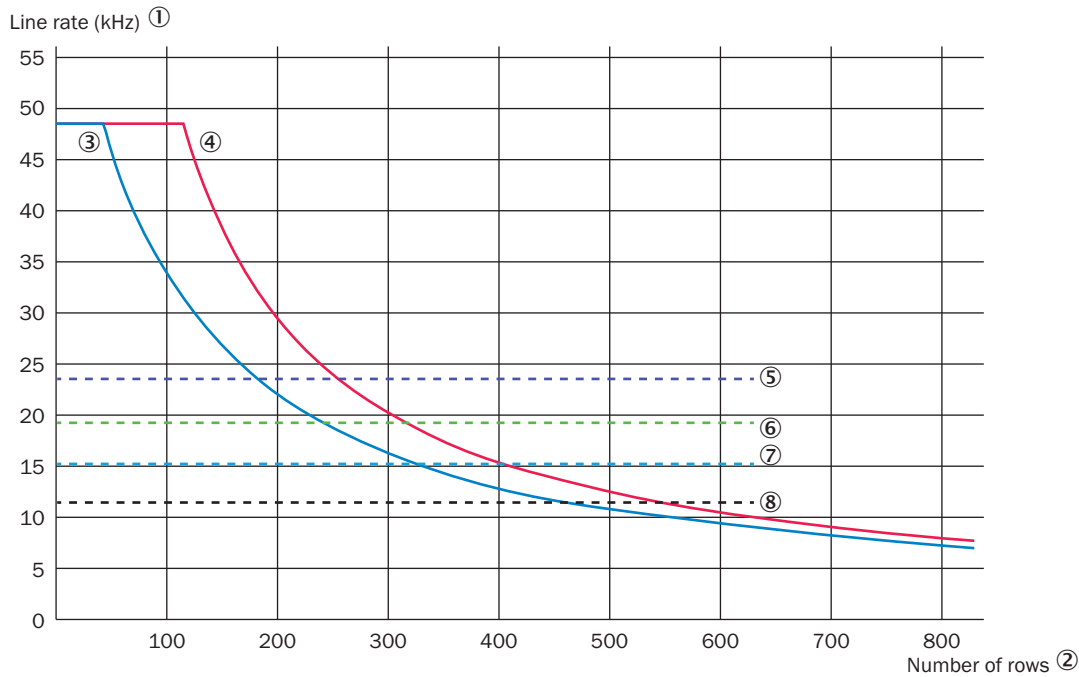
CHARACTERISTIC CURVE Z RESOLUTION VIA Z POSITION



CHARACTERISTIC CURVE X RESOLUTION VIA Z POSITION



CHARACTERISTIC CURVE



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

Further information as well as suitable accessories, example applications and downloads such as CAD dimensional models, operating instructions and software can be found at www.sick.com/1126984



SICK AG
WALDKIRCH
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SICK AT A GLANCE

SICK is a leading global technology company for intelligent sensors and integrated solutions in industrial automation. Our technologies set benchmarks, making your industrial processes more efficient, safer and more sustainable – both in logistics and manufacturing operations.

SICK combines sensor intelligence with industry expertise and certified consulting services. We provide the ideal foundation for scalable as well as tailor-made automation solutions and create added value along the entire value chain. Our close partnerships with our customers are more than just a promise: Together, we optimize productivity, improve quality, protect health and safety, and help build a sustainable future. All with empathy and trust.

Since 1946, we have been developing innovative technologies with passion and a pioneering spirit. With a global network in around 40 countries, SICK has a global presence and is always close by. The company's headquarters are located in Waldkirch near Freiburg, Germany. Our customers benefit from our understanding of both local and global requirements, which enables us to deliver tailor-made solutions

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