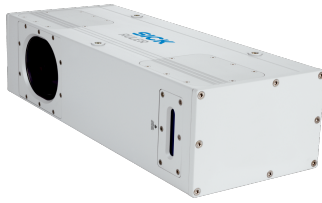


# Ruler-E2421

Ruler

3D MACHINE VISION

**SICK**  
Sensor Intelligence.



## Ordering information

Type	part no.
Ruler-E2421	1096641

Other models and accessories → [www.sick.com/Ruler](http://www.sick.com/Ruler)



## Detailed technical data

### Features

<b>Technology</b>	3D triangulation
<b>Pre-calibrated</b>	✓
<b>Product category</b>	Streaming, pre-calibrated
<b>Working distance</b>	415 mm ... 865 mm
<b>Example field of view</b>	250 mm x 600 mm
<b>Field of view width</b>	450 mm ... 820 mm
<b>Illumination</b>	Integrated
<b>Illumination color</b>	Red, laser, Visible, 660 nm, ± 15 nm
<b>Laser class</b>	3B (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.)
<b>Data synchronization</b>	Free running, encoder triggered, external triggering
<b>Grayscale measurements</b>	✓
<b>Spectral range</b>	Approx. 630 nm ... 690 nm
<b>Maximum height range</b>	450 mm
<b>Heating element</b>	Without heating
<b>Description</b>	Ruler E600 B - 3B laser, up to 10 k profiles/second. Gigabit Ethernet interface 1,536 px x 512 px.

### Mechanics/electronics

<b>Connection type</b>	Harting Push Pull (Ethernet) M12, 8-pin male connector, A-coded (voltage supply, I/O) M12, 8-pin socket (encoder)
<b>Connector material</b>	M12: nickel-plated brass, Ethernet: thermoplast/anodized aluminum
<b>Ripple</b>	< 5 V <sub>pp</sub>
<b>Power consumption</b>	7 W
<b>Current consumption</b>	< 1 A
<b>Enclosure rating</b>	IP65
<b>Housing material</b>	Aluminum
<b>Housing color</b>	Gray, varnished
<b>Window material</b>	PMMA
<b>Weight</b>	7 kg
<b>Dimensions (L x W x H)</b>	420 mm x 107 mm x 163 mm

## Performance

<b>Sensor properties</b>	
Sensor resolution	1,536 px x 512 px
<b>Image sensor</b>	CMOS
<b>Scan/frame rate</b>	10,000 3D profiles/s
<b>Typical height resolution</b>	0.2 mm <sup>1)</sup>
<b>Sensor resolution</b>	1,536 px x 512 px
<b>3D profile resolution</b>	1,536 px
<b>Gray-scale resolution</b>	1,536 px

<sup>1)</sup> Object distance.

## Interfaces

<b>Ethernet</b>	✓ , UDP/IP
Data transmission rate	1,000 Mbit/s
<b>Serial</b>	✓ , RS-422
Function	Encoder
Data transmission rate	Maximum encoder frequency: 2 MHz
<b>Configuration software</b>	Ranger Studio
<b>Operating system</b>	Windows 7, Windows XP Pro, Windows 10
<b>Development environment</b>	C++ (VS 2005/2008/2010) / C
<b>Application programming interface (API)</b>	iCon API
<b>Digital input</b>	3 x HIGH = 10 V ... 28.8 V
<b>Encoder interface</b>	RS-422
<b>Maximum encoder frequency</b>	Max. 2 MHz

## Ambient data

<b>Shock load</b>	15 g, 3 x 6 directions
<b>Vibration load</b>	5 g, 58 Hz ... 150 Hz
<b>Ambient operating temperature</b>	0 °C ... +40 °C <sup>1)</sup>
<b>Storage temperature</b>	-30 °C ... +70 °C <sup>1)</sup>

<sup>1)</sup> Non-condensing.

## Certificates

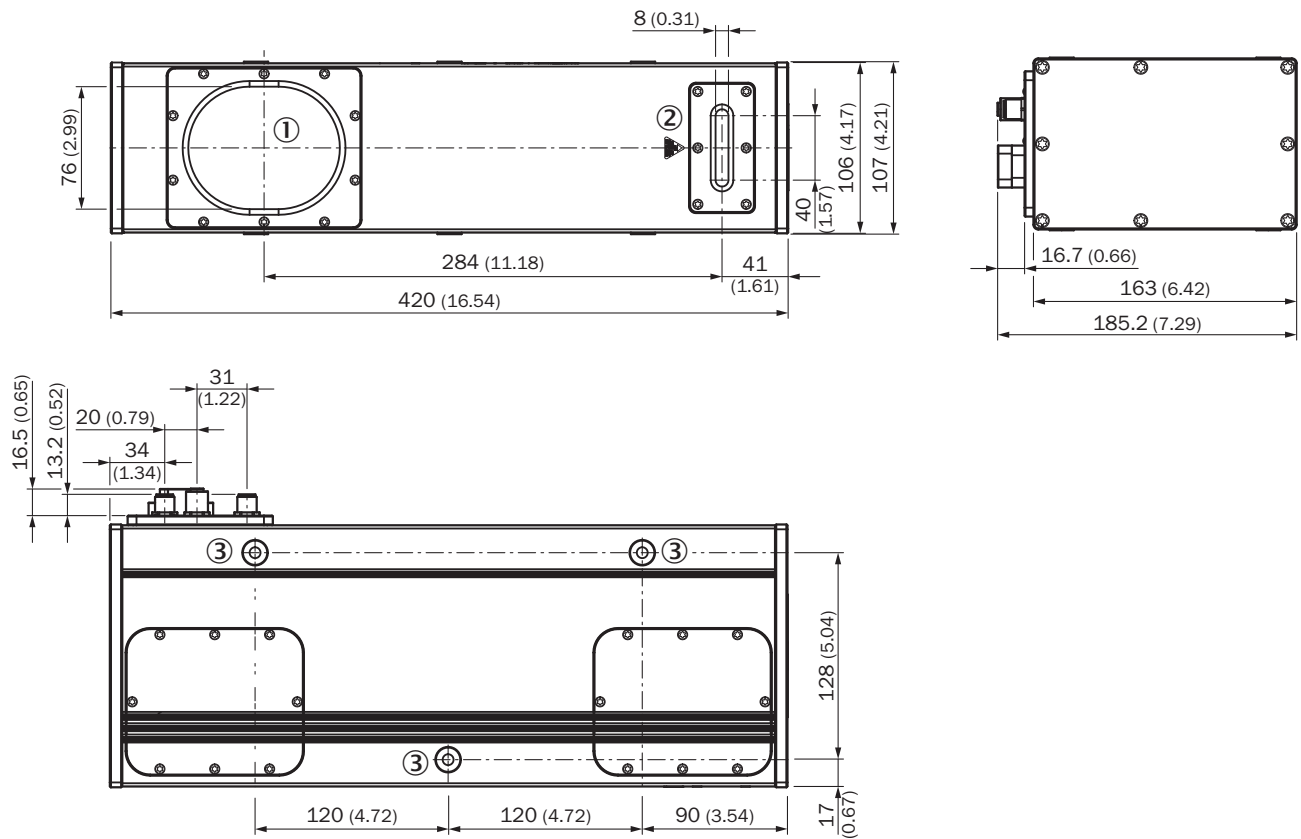
<b>EU declaration of conformity</b>	✓
<b>ACMA declaration of conformity</b>	✓
<b>China RoHS</b>	✓

## Classifications

<b>ECLASS 5.0</b>	27310205
<b>ECLASS 5.1.4</b>	27310205
<b>ECLASS 6.0</b>	27310205
<b>ECLASS 6.2</b>	27310205
<b>ECLASS 7.0</b>	27310205

<b>ECLASS 8.0</b>	27310205
<b>ECLASS 8.1</b>	27310205
<b>ECLASS 9.0</b>	27310205
<b>ECLASS 10.0</b>	27310205
<b>ECLASS 11.0</b>	27310205
<b>ECLASS 12.0</b>	27310205
<b>ETIM 5.0</b>	EC001820
<b>ETIM 6.0</b>	EC001820
<b>ETIM 7.0</b>	EC001820
<b>ETIM 8.0</b>	EC001820
<b>UNSPSC 16.0901</b>	43211731

### Dimensional drawing

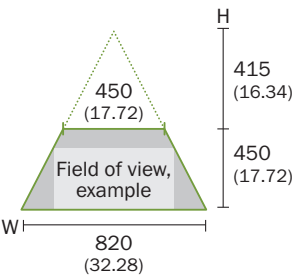


Dimensions in mm (inch)

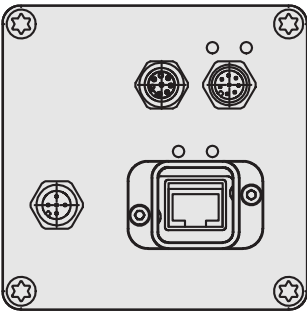
- ① Image sensor
- ② Laser unit
- ③ Fastening threads (M8 x 15 mm)

Field of view

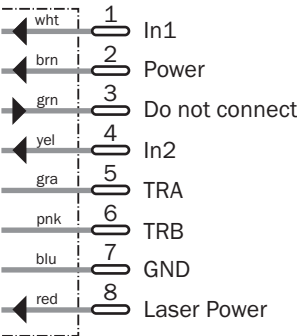
**Ruler E600**  
**Typ. field of view in mm (inch)**



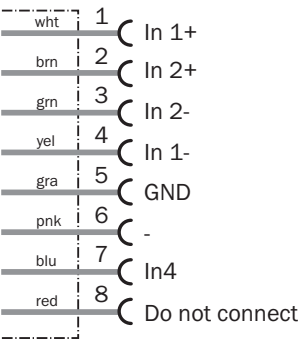
Connection type



Connection diagram, voltage I/O













Connection diagram, encoder connection



Recommended accessories

Other models and accessories → [www.sick.com/Ruler](http://www.sick.com/Ruler)

	Brief description	Type	part no.
integration modules and adapters			
	<ul style="list-style-type: none"><li><b>Description:</b> Single port PCI board for connection to Gigabit Ethernet high-end camera</li></ul>	Gigabit Ethernet Board Single	6032329
Power supply units and power supply cables			
	<ul style="list-style-type: none"><li><b>Input voltage:</b> 90 V AC ... 264 V AC</li><li><b>Output voltage:</b> 24 V DC</li><li><b>Output current:</b> 1.14 A</li><li><b>Description:</b> 24 V DC power supply with 8-pin M 12 connector, 90 ... 264 V AC, 1.14 A / 24 W, including two line cords (European and US)</li></ul>	Power supply (Ruler E/S)	1014242
reflectors and optics			
	<ul style="list-style-type: none"><li><b>Description:</b> The ICT-R terminal box with key-operated pushbutton is used to switch the power to the internal laser on and off. The ICT-R is intended for devices with class IIIb/3B lasers to achieve compliance with laser safety regulations. The ICT-R has a removable key, switch-on delay (&lt; 5 s), M12 plug connectors, and LEDs to indicate the operational status.</li><li><b>Connection types:</b> Plug, M12, 8-pin for camera, connection cable glands and terminals for laser connection</li><li><b>Ambient operating temperature:</b> -10 °C ... +48 °C</li></ul>	ICT-R	1029242

	Brief description	Type	part no.
connectors and cables			
	<ul style="list-style-type: none"> <li><b>Connection type head A:</b> Male connector, RJ45, 8-pin, straight</li> <li><b>Connection type head B:</b> Male connector, RJ45, 8-pin, straight</li> <li><b>Signal type:</b> Ethernet, Gigabit Ethernet</li> <li><b>Cable:</b> 10 m, PVC</li> <li><b>Description:</b> Ethernet, Push-pull male connector, unshielded, Gigabit Ethernet</li> </ul>	SSL-0J08-G10ME	6032322
	<ul style="list-style-type: none"> <li><b>Connection type head A:</b> Male connector, M12, 8-pin, A-coded</li> <li><b>Connection type head B:</b> Female connector, M12, 8-pin, A-coded</li> <li><b>Connection type head C:</b> Male connector, M12, 8-pin, A-coded</li> <li><b>Note:</b> Parallel connected</li> </ul>	SB0-02F12-SF	6026503
	<ul style="list-style-type: none"> <li><b>Connection type head A:</b> Female connector, M12, 8-pin, straight, A-coded</li> <li><b>Connection type head B:</b> Male connector, M12, 8-pin, straight, A-coded</li> <li><b>Signal type:</b> Sensor/actuator cable</li> <li><b>Cable:</b> 2 m, 8-wire, PUR, halogen-free</li> <li><b>Description:</b> Sensor/actuator cable, shielded</li> <li><b>Application:</b> Uncontaminated zones, Zones with oils and lubricants, Robot, Drag chain operation</li> </ul>	YF2A28-020UA6M2A28	2096105
	<ul style="list-style-type: none"> <li><b>Connection type head A:</b> Male connector, M12, 8-pin, straight, A-coded</li> <li><b>Connection type head B:</b> Flying leads</li> <li><b>Signal type:</b> Sensor/actuator cable</li> <li><b>Cable:</b> 2 m, 8-wire, PVC</li> <li><b>Description:</b> Sensor/actuator cable, shielded</li> <li><b>Application:</b> Zones with chemicals, Uncontaminated zones</li> </ul>	YM2A28-020VA6XLEAX	2096232
	<ul style="list-style-type: none"> <li><b>Connection type head A:</b> Male connector, M12, 8-pin, straight, A-coded</li> <li><b>Connection type head B:</b> Flying leads</li> <li><b>Signal type:</b> Sensor/actuator cable</li> <li><b>Cable:</b> 0.6 m, 8-wire, PVC</li> <li><b>Description:</b> Sensor/actuator cable, shielded</li> <li><b>Application:</b> Zones with chemicals, Uncontaminated zones</li> </ul>	YM2A28-C60VA6XLEAX	2145392
	<ul style="list-style-type: none"> <li><b>Connection type head A:</b> Male connector, M12, 8-pin, straight, A-coded</li> <li><b>Connection type head B:</b> Flying leads</li> <li><b>Signal type:</b> Sensor/actuator cable</li> <li><b>Cable:</b> 1 m, 8-wire, PVC</li> <li><b>Description:</b> Sensor/actuator cable, shielded</li> <li><b>Application:</b> Zones with chemicals, Uncontaminated zones</li> </ul>	YM2A28-010VA6XLEAX	2145393
	<ul style="list-style-type: none"> <li><b>Connection type head A:</b> Male connector, M12, 8-pin, straight, A-coded</li> <li><b>Connection type head B:</b> Flying leads</li> <li><b>Signal type:</b> Sensor/actuator cable</li> <li><b>Cable:</b> 3 m, 8-wire, PVC</li> <li><b>Description:</b> Sensor/actuator cable, shielded</li> <li><b>Application:</b> Zones with chemicals, Uncontaminated zones</li> </ul>	YM2A28-030VA6XLEAX	2145394

## 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:

Contacts and other locations –[www.sick.com](http://www.sick.com)