







# XK20 alignment laser system

## Build to international standards

The XK20 system is our second generation alignment laser system designed specifically to make machine build easier, faster and in conformance to the latest ISO standards. Using a laser alignment system helps to ensure high machine accuracy and durability while reducing operator error.


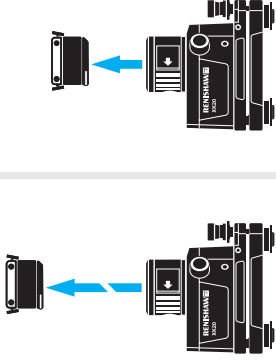

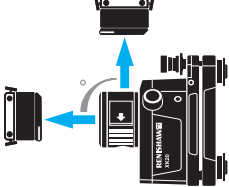

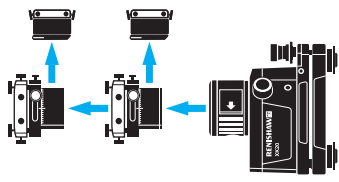

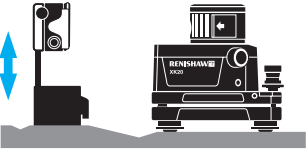

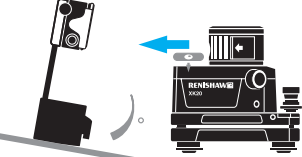
<input checked="" type="checkbox"/>	Build	
<input type="checkbox"/>	Verify	
<input type="checkbox"/>	Compensate	
<input type="checkbox"/>	Diagnose	

## A foundation for precision


At Renishaw, we design and develop industrial products that enable manufacturers to build high accuracy machines and parts. Our innovative solutions help quantify process capability to reduce costs and improve efficiency. As market leaders, our laser systems have been the foundation for precision, quality and reliability for over 35 years.




# XK20 measurements

	<p><b>Straightness</b></p> <p>Measures both horizontal and vertical straightness simultaneously. Essential for all machine builds to ensure accuracy when mounting and aligning stages and guideways.</p> <p><b>Long range straightness</b></p> <p>Measure straightness over distances up to 40 m with our advanced long range feature. This ensures repeatable results while minimising measurement time.</p>	
	<p><b>Squareness</b></p> <p>Measures the orthogonality of two machine axes. This would typically be used to ensure that machine axes and beds are at 90° angles, to align machine rails, or when squaring separate machine assemblies.</p>	
	<p><b>Parallelism</b></p> <p>Measures the straightness deviation or overall misalignment angle between two nominally parallel axes. It is typically used during the manufacture of machine tool structures.</p>	
	<p><b>Flatness</b></p> <p>Measures vertical deviation along a machine bed, rails, or other machine planes.</p>	
	<p><b>Level</b></p> <p>Measures machine level with respect to gravity, or to a separate machine surface.</p>	

**Coming soon**

 **Coaxiality**  
 Measures the deviation of one rotating centre from another.

 **Spindle direction**  
 Measures the angle at which a spindle or chuck is pointing.

# System overview

## Launch unit

The launch unit is the laser reference of the XK20 system. It has a built-in calibrated pentaprism, precision rotating head, and digital levels. This provides a stable reference for straightness, parallelism, squareness and flatness measurements. It can also be used for leveling machines and castings.

### Key features

- Digital precision levels
- 360° laser head rotation
- Rechargeable battery
- Over 12 hours of continuous use



## M unit (moving) and S unit (static)

The M unit is the primary sensor for the majority of XK20 system measurements. Similar to traditional dial indicators, when mounted on the axes or carriages being measured, the S unit and M unit detect deviations from the laser source and sends a digital record to the CARTO XK20 app for analysis. The S unit is used in conjunction with the M unit for coaxiality measurement.

### Key features

- 2 axis PSD sensor
- Wireless connectivity to CARTO XK20 app
- Rechargeable battery
- Over 12 hours of continuous use



# Software overview

The Renishaw CARTO XK20 app provides an intuitive and simple interface with easy navigation.

## Mobile app

Developed specifically for machine builders, CARTO XK20 is an app-based software ideal for factory environments. Operators can use various Android™ devices or Renishaw XK20 display unit to streamline their measurement and assembly processes.



## Easy set-up

Aligning the laser to the workpiece or machine is crucial before taking measurements. However, this can be time-consuming, especially over long distances. The CARTO XK20 app simplifies this task, making it faster and easier to use.



## Data analysis

Data analysis can be tailored to user needs, for example:

- view error graphs quickly with custom tolerances
- report results in relevant ISO standard formats
- download raw data for research and development analysis.



## Built-in user guide

Most laser systems require extensive training for effective operation and reliable results. The XK20 system requires minimal user training. The built-in guide provides step-by-step instructions, with images and illustrations, designed for both skilled and unskilled operators.

# Accessories

When combined with additional accessories, the XK20 system measures a wide variety of machine types and configurations.

## Mounting accessories

Renishaw has designed a selection of mounting accessories that enable versatile mounting of the system on a variety of machine configurations.

- 1 Reference mount
- 2 Launch L bracket
- 3 Pillars
- 4 Low profile magnetic base

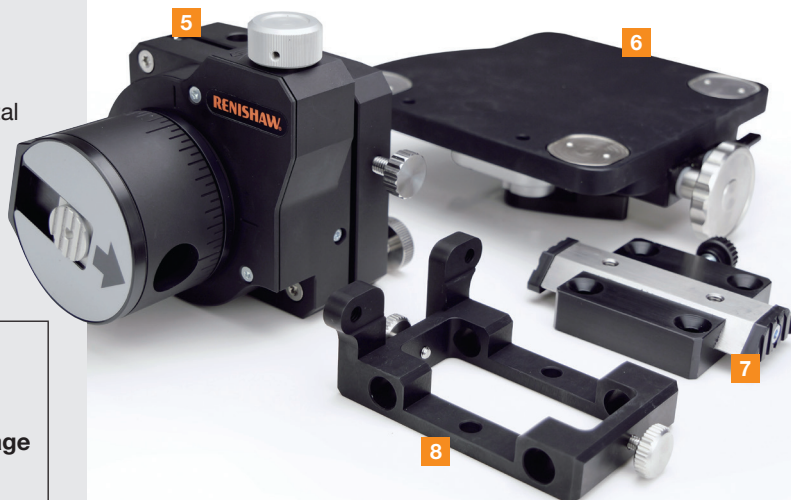


## Squareness and parallelism accessories

The XK20 pentaprism optic is calibrated. The pentaprism enables squareness and horizontal parallelism measurements.

This can be used to measure squareness of 'T' shaped castings, gantry and moving bed machines.

- 5 Pentaprism optic
- 6 Tripod translation stage
- 7 Pentaprism translation stage
- 8 90° transceiver bracket



## Fixturing kit

The versatile fixturing kit contains aluminium extrusions and fastenings for mounting the launch unit across a range of complex applications.

- 1 Extrusions**  
(350 mm, 250 mm, 200 mm)
- 2 Extrusion connectors**
- 3 Position discs**
- 4 Magnets**
- 5 Launch unit extrusion mount**
- 6 Hex drivers**



## XK20 display unit

The display unit is used for live feedback of alignment and to capture results.

- **Wireless communication**  
Communicates with the M unit and S unit via wireless connection.
- **Portable**  
Powered by a rechargeable battery, allowing portable operation up to 16 hours.
- **Robust design**  
Durable device designed to withstand industrial environments.



CHINESE VERSION WILL NOT INCLUDE IMAGE OF THE DISPLAY UNIT SO WILL NEED TO ADD A STOCK IMAGE TO FILL THE GAP.

# Hardware combinations

The following components are recommended for each measurement.



## Straightness/ long range straightness

- Launch unit
- M unit
- Launch L bracket
- Low profile magnetic base
- Pillar kit



## Squareness

- Launch unit
- M unit
- Launch L bracket
- Low profile magnetic base
- Pillar kit



## Horizontal parallelism

- |  |   |
|--|---|
| <ul style="list-style-type: none"> <li>• Launch unit</li> <li>• M unit</li> <li>• Pentaprism optic</li> <li>• Launch L bracket</li> <li>• Low profile magnetic base</li> </ul> | <ul style="list-style-type: none"> <li>• Pillar kit</li> <li>• Pentaprism translation stage</li> <li>• 90° transceiver bracket</li> </ul> |
|--|---|



## Flatness

- |  |  |
|--|--|
| <ul style="list-style-type: none"> <li>• Launch unit</li> <li>• M unit</li> <li>• Launch L bracket</li> <li>• Low profile magnetic base</li> </ul> | <ul style="list-style-type: none"> <li>• Pillar kit</li> <li>• Rotary magnetic base</li> </ul> |
|--|--|

# XK20 system specifications


## Launch and M unit

System performance	Launch unit	M unit
Beam measurement range	40 m radius	20 m
Laser output	Class 2	Class 2
Power	Heavy duty Li-Ion chargeable	Heavy duty Li-Ion chargeable
Operating time	Over 12 hours continuous use	Over 12 hours continuous use
Precision level	20 µm/m	Not applicable
Specified accuracy range	-10 °C to 50 °C	-20 °C to 50 °C
Recommended recalibration period	2 years	2 years
IP rating	Not applicable	IP 66/67 (IEC 60529)


## Display unit

Power	Fixed heavy duty Li-Ion (chargeable)
Operating time	Up to 16 hours continuous use
Screen size	8" LCD capacitive multi-touch colour display
IP rating	IP 66/67 (IEC 60529)


# Performance specifications

Straightness (Launch and M unit)		
	Range	±5 mm
	Accuracy	±0.008A ±0.8 µm
	Resolution	0.1 µm

A = displayed straightness reading (µm)

Squareness		
	Range	±5 mm
	Accuracy*	±0.008A/M ±1.4/M ±4 µm/m
	Resolution	0.1 µm


A = straightness reading of the furthest point (µm)  
M = length of the (shortest) axis (m)  
\* with squareness calibration factor

Parallelism		
	Range	±5 mm
	Accuracy (i)	±0.008A/M ±1.4/M ±2 µm/m*
	Accuracy (ii)	±0.008A ±1.4 ±2M µm*
	Resolution	0.1 µm

\* laser to pentaprism distance > 0.2 m

A = (largest) straightness reading (µm)  
M = length of the axis (m)

i. parallel angle  
ii. parallel straightness (point to point variation)

Flatness		
	Range	±5 mm
	Accuracy*	±0.01A ±1 ±(1 + 1.1M) µm
	Resolution	0.1 µm

A = displayed straightness reading (µm)  
M = distance to the furthest point (m)  
\*over a 90° sweep

# Comparison chart

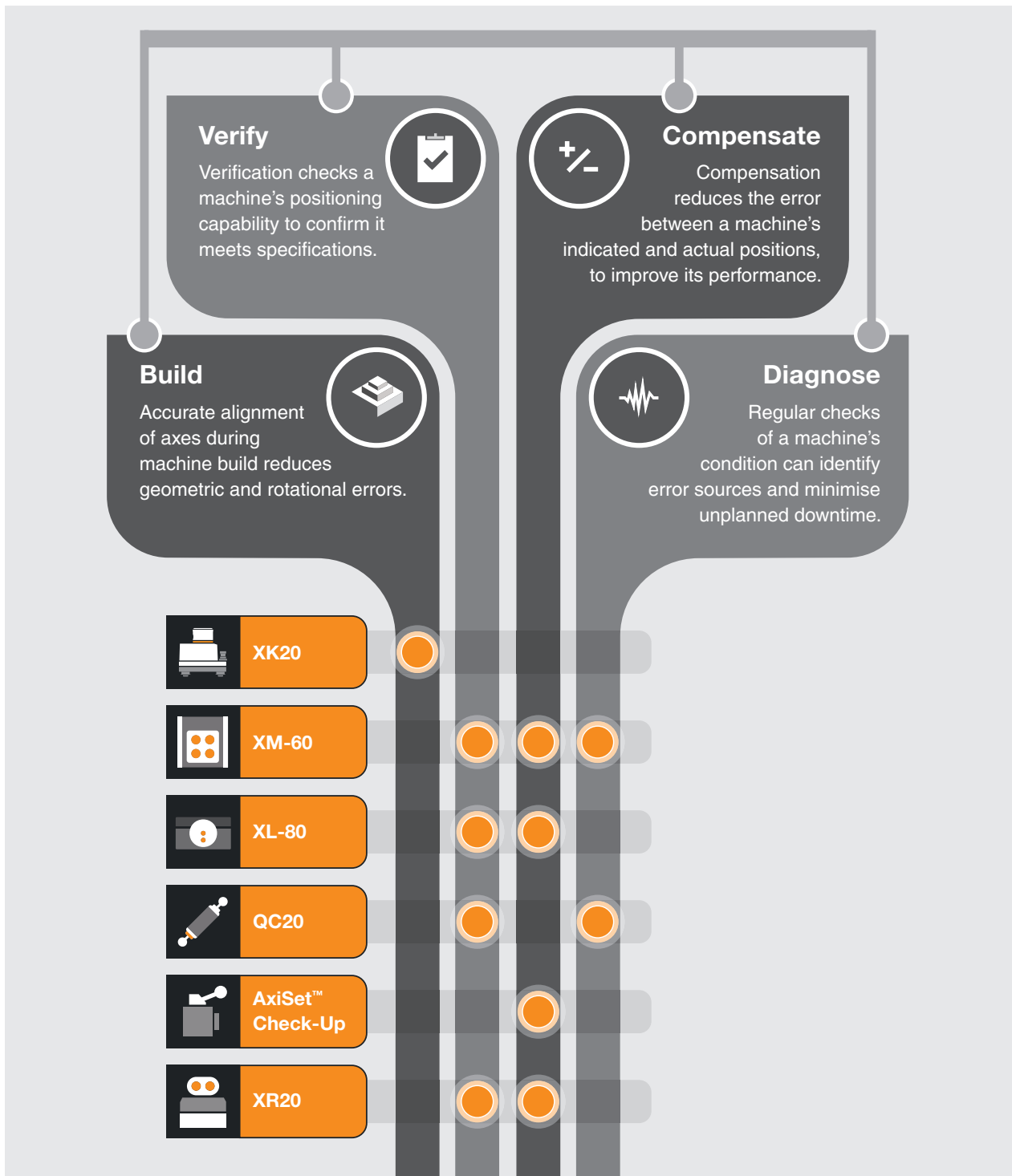
Measurements	XK10	XK20
Straightness	Y	Y
Squareness	Y	Y
Parallelism (horizontal)	Y	Y
Parallelism (vertical)	Y	Y
Parallelism (combined)	Y	Y
Long range straightness	N	Y
Flatness	Y	Y
Level	N	Y
Coaxiality	Y	Coming soon
Spindle direction	Y	Coming soon

System	XK10	XK20
Battery life	Up to 4 hours continuous operation	Over 12 hours continuous operation*
Mobile device capable	XK10 display unit	Android™ devices
Data transfer	USB	USB-C and wireless
Recalibration period	2 years	2 years

\* Depends on mobile device used

# Renishaw's machine measurement solutions

Renishaw offers a range of calibration solutions for improved machine performance, increased machine up-time and preventative maintenance schedules.



# Renishaw's innovation has transformed industrial metrology

Renishaw offers a range of calibration solutions for machine tools, CMMs and other applications:



## XL-80 laser measurement system

- The ultimate in traceable, versatile motion system analysis
- $\pm 0.5$  ppm certified linear measurement accuracy



## XR20 rotary axis calibrator

- Measurement accuracy of up to  $\pm 1$  arc second
- Totally wireless operation for quick and easy set up



## XM-60 multi-axis calibrator system

- Measure six degrees of freedom in any orientation from a single set-up
- Unique technology, optical roll measurement and fibre optic launch



## QC20 ballbar system

- The most widely used system for machine tool performance verification
- Reduces machine down-time, scrap and inspection costs



## AxiSet™ Check-Up for machine tools

- Rapid on-machine measurement of rotary axis performance
- Accurate detection and reporting of errors in rotary axis pivot points

# Service and quality

Our ongoing commitment to service and quality provides our customers with the complete solution



## Training

Renishaw offers an established range of comprehensive operator training courses either on-site or at a Renishaw training centre.

Our experience in metrology allows us to teach not just about our products, but also underlying scientific principles and methods of best practice. This enables our customers to get the most out of their manufacturing processes.

## Support

Our products enhance quality and productivity, and we strive for total customer satisfaction through superior customer service and expert knowledge of potential product applications.

When you purchase a laser or ballbar system from Renishaw, you are buying into a worldwide support network that understands machine metrology and the service of production equipment.

## Certification

Renishaw plc is certified and audited regularly to the latest ISO 9001 quality assurance standard. This ensures all aspects of design, manufacture, sales, after sales support, and recalibration remain at the highest standards.

The certificate is issued by BSI Management Systems, an internationally recognised certification body, accredited by UKAS.

**bsi.**

[www.renishaw.com/xk20](http://www.renishaw.com/xk20)



#renishaw



+44 (0) 1453 524524



[uk@renishaw.com](mailto:uk@renishaw.com)

© 2025–2026 Renishaw plc. All rights reserved. RENISHAW® and the probe symbol are registered trade marks of Renishaw plc. Renishaw product names, designations and the mark 'apply innovation' are trade marks of Renishaw plc or its subsidiaries. Other brand, product or company names are trade marks of their respective owners. Renishaw plc. Registered in England and Wales. Company no: 1106260. Registered office: New Mills, Wotton-under-Edge, Glos, GL12 8JR, UK.

WHILE CONSIDERABLE EFFORT WAS MADE TO VERIFY THE ACCURACY OF THIS DOCUMENT AT PUBLICATION, ALL WARRANTIES, CONDITIONS, REPRESENTATIONS AND LIABILITY, HOWSOEVER ARISING, ARE EXCLUDED TO THE EXTENT PERMITTED BY LAW.



Part no.: L-9971-9031-02-A