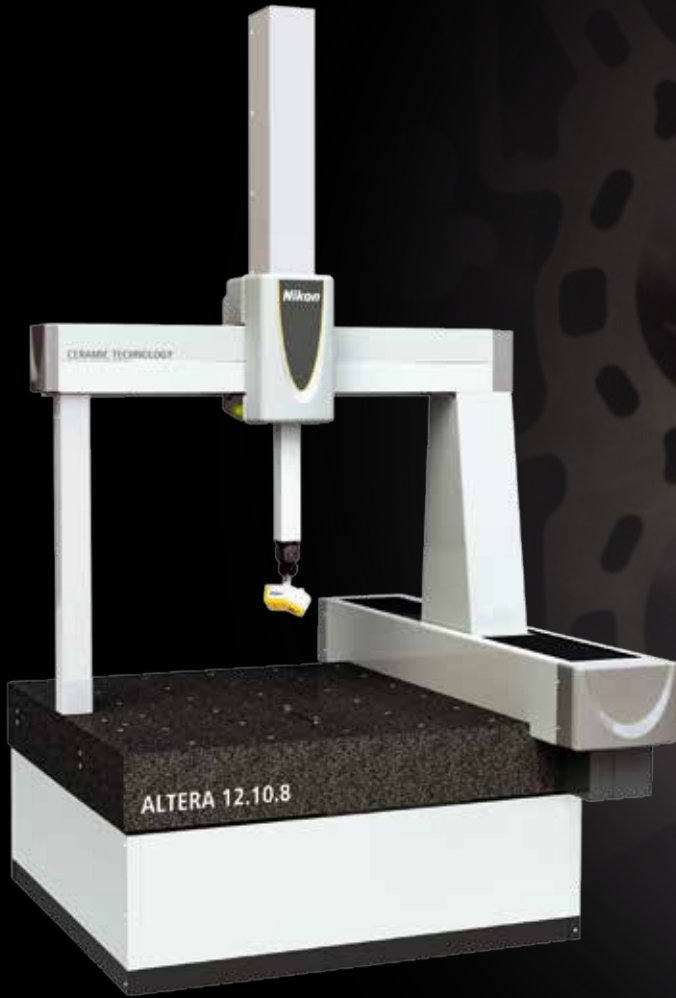




# NIKON CMM

## Coordinate Measuring Machines



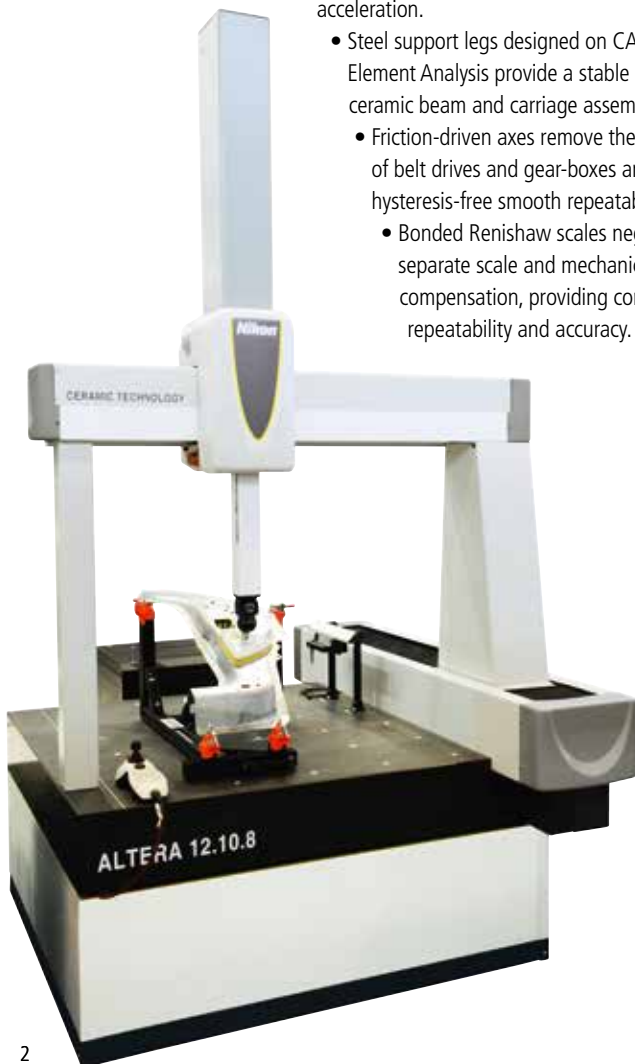
# SO MUCH MORE THAN PRECISION

The Nikon Metrology range of Coordinate Measuring Machines represent the ultimate in CMM technology. Designed and manufactured using only the highest quality materials, they carry a heritage of over 50 years experience and expertise.

Nikon Metrology CMMs deliver the ability to perform dimensional, positional and surface measurement in a single system. Combined with a complete range of contact and non-contact sensors, Nikon Metrology CMMs provide true multi-sensor capability. Sensors can be quickly changed to combine geometric and surface measurement into a single inspection routine.

## Key design features

- Ceramic bridge and spindle provide a thermally stable and ultra-stiff frame for long lasting accuracy.
- Nikon Metrology unique LK air bearings provide a smaller air gap with greater stiffness than standard air bearings to enhance the rigidity of the frame.
- Granite table with integral dovetail guideway (10.10.8 and bigger) provides the smoothest of drives with high velocity and acceleration.
  - Steel support legs designed on CAD with Finite Element Analysis provide a stable mounting for the ceramic beam and carriage assembly.
  - Friction-driven axes remove the uncertainty of belt drives and gear-boxes and provide a hysteresis-free smooth repeatable motion.
    - Bonded Renishaw scales negate the need for separate scale and mechanical frame thermal compensation, providing confidence in repeatability and accuracy.



## Key performance features

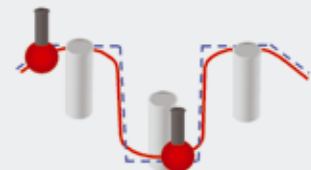
### Ceramics for premium performance

Stress-free ceramic guideways are most dimensionally stable, provide high and long-lasting measurement accuracy, and require minimum machine verification, saving both time and money.



### Fly mode

Provides optimized motion control for more efficient machine movement and faster throughput.



### PH fast probe motion

Further optimize the machine throughput by moving the probe head simultaneously with machine motion.



### CMM hand-box

Multi-function hand-box provides access to programming tools without returning to the computer.



# MULTI-SENSOR PRODUCTIVITY



## Scanning made easy

**Regardless whether contact or non-contact scanning is required, Nikon Metrology has a solution designed that provides highly repeatable and accurate scanning results for geometric feature and free-form surface inspection.**

Unique and unequalled, digital scanning is delivered as standard on every Nikon Metrology LK CMM equipped with either TP20 or TP200 probes. This cost-effective scanning solution enhances traditional CMM inspection to increase productivity.

When accuracy and high speed are expected, LK CMMs' ultra-stiff ceramic frame guarantees that continuous contact scanning (SP25M or REVO-2) will provide you feature, form and free-form surface data that is equal to any 'fixed-head' probe system.

Non-contact laser scanning, with the Nikon Metrology InSight L100, LC15Dx, LC60Dx line scanners or XC Cross Scanners, allow you to scan virtually any component with unequalled levels of performance. Suitable for geometric inspection, free-form surface inspection or reverse engineering, laser scanning is available for everyone.

## When size truly matters

**Nikon Metrology recently manufactured one of the largest CMM bridge sizes with a measuring length and width of 6 meter.**

Whether it is a large bridge or a horizontal arm configuration you require, the Nikon Metrology LK range has a standard solution ready for you. Based on the same ceramic and granite construction, the large bridge and horizontal arm CMM range offers market leading accuracy and performance characteristics.



# ALTERA BRIDGE CMM

## High performance ceramic bridge CMMs

ALTERA's ceramic bridge and spindle components coupled with proven air-bearing design provide the ultimate in stiffness and stability, altogether delivering significantly improved repeatability.

### Benefits

- Premium performance
- High velocities/accelerations for low cycle times
- Excellent accuracy and repeatability
- Total solution for probing, scanning and digital inspection

### Features

- Flexible multi-sensor platform: touch probes, analog scanning and laser scanning
- High capacity (loads) table

### Applications

- Machined and pressed parts
- Plastic moldings
- Casting and forgings
- Touch trigger and non-contact inspection
- Digitizing, scanning and reverse engineering

### Specifications

	ALTERA	ALTERA+
Volumetric accuracy	from 1.8 $\mu\text{m} + L/400$	from 1.5 $\mu\text{m} + L/375$
Repeatability	from 1.7 $\mu\text{m}$	from 1.5 $\mu\text{m}$
Velocity	up to 762 mm/s	up to 833 mm/s
Acceleration	up to 2,303 mm/s <sup>2</sup>	up to 2,514 mm/s <sup>2</sup>

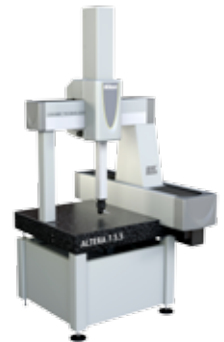
Full CMM specifications available on request, contact Nikon Metrology for more information.

ALTERA								ALTERA+	
7.5.5	8.7.6	10.10.8	<i>10.12.10</i>	<i>15.15.10</i>	20.15.12	20.15.15	25.20.15	8.7.6	10.10.8
	<b>10.7.6</b>	<b>12.10.8</b>	<b>15.12.10</b>	<b>20.15.10</b>	<b>25.15.12</b>	<b>25.15.15</b>	<b>30.20.15</b>	<b>10.7.6</b>	<b>15.10.8</b>
	<b>15.7.6</b>	<b>15.10.8</b>	<b>20.12.10</b>	<b>25.15.10</b>	<b>30.15.12</b>	<b>30.15.15</b>	<b>35.20.15</b>	<i>15.7.6</i>	<b>20.10.8</b>
	<i>20.7.6</i>	<b>20.10.8</b>	<b>25.12.10</b>	<b>30.15.10</b>	<b>35.15.12</b>	<b>35.15.15</b>	<b>40.20.15</b>		<b>25.10.8</b>
	<i>25.7.6</i>	<i>25.10.8</i>	<b>30.12.10</b>	<b>35.15.10</b>	<i>40.15.12</i>	<b>40.15.15</b>	<i>45.20.15</i>		<i>30.10.8</i>
			<i>35.12.10</i>	<i>40.15.10</i>	<i>45.15.12</i>	<i>45.15.15</i>	<b>50.20.15</b>		<i>35.10.8</i>
			<i>40.12.10</i>	<i>45.15.10</i>	<i>50.15.12</i>	<i>50.15.15</i>	<b>60.20.15</b>		<i>40.10.8</i>
			<i>50.12.10</i>	<i>50.15.10</i>	<i>60.15.12</i>	<i>60.15.15</i>	<i>65.20.15</i>		<i>45.10.8</i>
			<i>60.12.10</i>	<i>60.15.10</i>	<i>70.15.12</i>	<i>70.15.15</i>	<i>70.20.15</i>		
			<i>70.12.10</i>	<i>70.15.10</i>					

Full CMM specifications available on request, contact Nikon Metrology for more information. CMM sizes printed in bold font are standard sizes. CMM sizes in italics are available on request.



ALTERA+ 10.10.8



ALTERA 7.5.5 (box stand)



ALTERA 20.10.12

# LK V-SL HIGH-SPEED SCANNING BRIDGE CMM

## Ultimate scanning and inspection performance

The LK V-SL features a revolutionary design that delivers the best scanning and inspection performance currently available in the marketplace. Particularly suited to meet the demands of automotive and aerospace applications, the LK V-SL is a unique and distinctive multi-sensor CMM. With the HA option, such a system becomes a metrology lab reference CMM featuring submicron accuracy for applications requiring highest precision.

### Benefits

- Increased scanning performance delivering high accuracy and throughput
- Increased stiffness and stability of the metrology frame
- Ready for shop floor and metrology lab

### Features

- Granite table with ceramic Y & Z guideways
- Raised X-axis guideway provides ultrafast dynamics
- S-axis 0.1 micron scale
- Multi-sensor capability
- Pneumatic anti-vibration mounts
- Temperature compensation as standard

### Applications

- Analog, digital or laser scanning
- Automotive, engine and transmission components
- Aerospace blade, engine and aircraft components
- General precision engineering
- Medical instruments

### Specifications

- Volumetric accuracy
  - from 1.1  $\mu\text{m} + L/400$  (LK V-SL)
  - from 0.7  $\mu\text{m} + L/600$  (LK V-SL HA)
- Repeatability
  - from 0.7  $\mu\text{m}$  (LK V-SL)
  - from 0.5  $\mu\text{m}$  (LK V-SL HA)
- Velocity
  - up to 850 mm/s (LK V-SL)
  - up to 317 mm/s (LK V-SL HA)
- Acceleration
  - up to 1407 mm/s<sup>2</sup> (LK V-SL)
  - up to 566 mm/s<sup>2</sup> (LK V-SL HA)



LK V 20.12.10 SL

#### LK V-SL and LK V-SL HA - High accuracy bridge style CMM

Preferred sizes <sup>1</sup>			Probe head	Probes
8.7.6	10.10.8	20.12.10	PH10MQ PLUS	TP200
10.7.6	15.10.8		REVO-2	SP25M
15.7.6				InSight L100, LC15Dx, LC60Dx, XC65Dx (-LS)

<sup>1</sup> (other sizes available on request)

# LK V LARGE BRIDGE AND GANTRY CMMS

## A new breed of large scale CMMs

Nikon Metrology offers large scale gantry and twin-rail mounted bridge style CMMs when size really matters. In addition to high accuracy with maximum volume, these large scale CMMs support a variety of probing solutions, including touch-trigger digital, analogue and laser options. Nikon Metrology also provides customized gantry CMM projects that meet customers' exacting requirements. LK large scale CMMs are constructed using materials with high thermal stability to guarantee optimum accuracy.



LK V 50.40.12 R

### Benefits

- Ceramic material offering 300% more stiffness over aluminium allows for ultra large machine sizes with premium accuracy
- Floor-mounted or raised gantry versions to suit all environments and component handling situations
- Twin drive systems valued for smooth motion
- Available with separate measuring plate if required

### Features

- High-performance air bearings
- LK CMMs feature granite rails with ceramic Y and Z guideways
- Supports tactile styli, analogue scanning and laser scanners



LK V-R twin-rail mounted bridge style CMM

### Applications

- Automotive and commercial vehicles
- Aerospace components and structures
- Marine and locomotive engine components
- Telecommunications and satellite equipment

### Specifications

- Volumetric accuracy
  - from 4.5  $\mu\text{m} + L/200$  (LK V-R)
  - from 3.5  $\mu\text{m} + L/250$  (LK V-G(P))
- Repeatability
  - from 4.5  $\mu\text{m}$  (LK V-R)
  - from 3.5  $\mu\text{m}$  (LK V-G(P))
- Velocity
  - up to 533 mm/s (LK V-R)
  - up to 467 mm/s (LK V-G(P))
- Acceleration
  - up to 631 mm/s<sup>2</sup> (LK V-R)
  - up to 581 mm/s<sup>2</sup> (LK V-G(P))

### LK V-R and LK V R-SL - Twin-rail mounted bridge style CMM

(short-leg models available)

Sizes <sup>1</sup>	Probe head	Probes
Rail lengths from 3m to 10m+	PH10MQ PLUS	TP20
Bridge sizes from 2m to 4m	REVO-2	TP200
Spindle lengths from 1.2m to 3m		SP25M
<i>(short-leg model with steel legs or concrete riser foundation)</i>		InSight L100, LC15Dx, LC60Dx, XC65Dx (-LS)

### LK V-G(P) - High accuracy and ultra high accuracy bridge style CMM

Sizes <sup>1</sup>	Probe head	Probes
Rail lengths from 2m to 10m+	PH10MQ PLUS	TP20
Bridge sizes from 4m to 7m	REVO-2	TP200
Spindle lengths from 3m to 4m		SP25M
<i>(available with steel legs or concrete riser foundation)</i>		InSight L100, LC15Dx, LC60Dx, XC65Dx (-LS)

<sup>1</sup> (other sizes available on request)

# LK H HORIZONTAL ARM CMM

## The fastest high accuracy horizontal arm CMMs on the market

Nikon Metrology's complete range of horizontal arm CMMs provides unequalled performance in speed, accuracy and repeatability. Ceramic guideways and air bearings used in the construction of LK H CMMs, offer stability at high velocity and acceleration. LK horizontal arm CMMs provide unique access to the measuring envelope and can be supplied as subfloor or floor level installations, or as part of fully-automated measurement cells.

### Benefits

- High velocities/acceleration for low cycle times
- Excellent accuracy and repeatability
- Flexible multi-sensor platform: touch probes, analog scanning, laser scanning

### Features

- Multiple CMM configurations available: table, rail, twin, etc.
- Supports laser scanners and touch sensors
- Can be supplied with cast-iron measuring plate if required

### Applications

- Automotive full body and panels inspection
- Inspection of large parts such as mold tools, housings, castings, etc.
- Integrated in-line inspection
- Touch trigger and non-contact inspection
- Digitizing, scanning and reverse engineering

### Specifications

- Volumetric accuracy
  - from 1.9  $\mu\text{m} + L/250$  (LK H-T)
  - from 10  $\mu\text{m} + L/200$  (LK H-R)
- Repeatability
  - from 1.9  $\mu\text{m}$  (LK H-T)
  - 6.0  $\mu\text{m}$  (LK H-R)
- Velocity
  - up to 850 mm/s (LK H-T)
  - up to 667 mm/s (LK H-R)
- Acceleration
  - up to 3008 mm/s<sup>2</sup> (LK H-T)
  - up to 2106 mm/s<sup>2</sup> (LK H-R)



LK H-R premium series twin-rail mounted horizontal arm CMM with walk-on covers

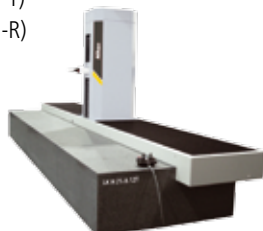
### LK H-R - high accuracy rail mounted horizontal arm style CMM (single or twin column)

<b>Sizes<sup>1</sup></b> Rail lengths from 4m to 10m+ Spindle lengths from 0.4m to 1.6m Column heights from 2m to 3m <i>(available with walk-on or bellow covers for rails)</i>	<b>Probe head</b> PH10MQ PLUS	<b>Probes</b> TP7M TP20 TP200B SP25M InSight L100, LC15Dx, LC60Dx, XC65Dx (-LS)
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### LK H-T - high accuracy table mounted horizontal arm style CMM

<b>Sizes<sup>1</sup></b> Rail lengths from 1m to 5m Spindle lengths from 0.4m to 1.6m Column heights from 0.6m to 2m	<b>Probe head</b> PH10MQ PLUS	<b>Probes</b> TP20 TP200B SP25M InSight L100, LC15Dx, LC60Dx, XC65Dx (-LS)
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<sup>1</sup> (other sizes available on request)



LK H-T high accuracy table mounted horizontal arm CMM
















LK H-T featuring rotating table

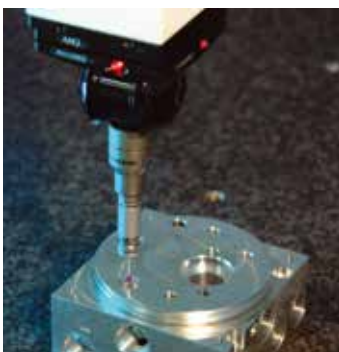


LK H-R dual column horizontal arm CMM

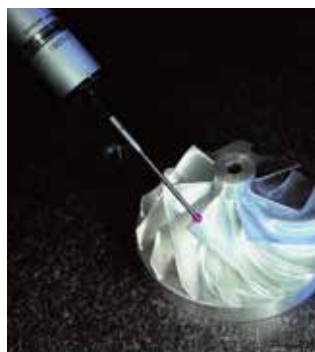
# SUPPORTED PROBE SYSTEMS

From traditional single point data collection to state-of-the-art 5 axis measurement incorporating probe head touches, Nikon Metrology supports many different configurations of probe system.

Contact measuring systems										
Manually indexing			Motorized			Dynamic				
Manual probe heads with integral TP20 probe systems		Manual probe head with autojoint connection	Fixed position with autojoint		Motorized probe heads with 720 positions available		Infinite positioning probe head for 5 axis point collection	Infinite positioning probe head for 5 axis multi-point measurement	Fixed probe head with long stylus capability	
MH20i    MH20 		MIH 	PH6M 		PH10T PLUS    PH10M PLUS    PH10MQ PLUS 			PH20 	REVO-2 	SP80 
PH6M    PH6M 		TP20    TP200 		TP20    TP200 		TP20    TP20    SP25M 				
		SP25M 		TP200    TP200    TP7M 						
MCR20		MCR20/SCR200/FCR25		MCR20/SCR200/FCR25/MRS-ACR3			MCR20			



High accuracy TP200 touch trigger probe



High speed SP25 scanning probe



REVO-2 5-axis measurement system

Contact Nikon Metrology to check availability of the probe system to each machine model





**Non-contact measuring systems**

**Single and multi-stripe laser**

Laser data collection for inspection of features, comparison to nominal CAD data or reverse engineering

PH10M PLUS PH10MQ PLUS



InSight L100



LC15Dx



LC60Dx



XC65Dx / XC65Dx-LS



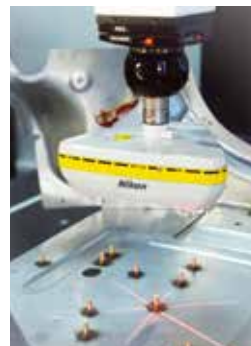
**MCR20**



Scanning of medical implant



Sheet metal inspection



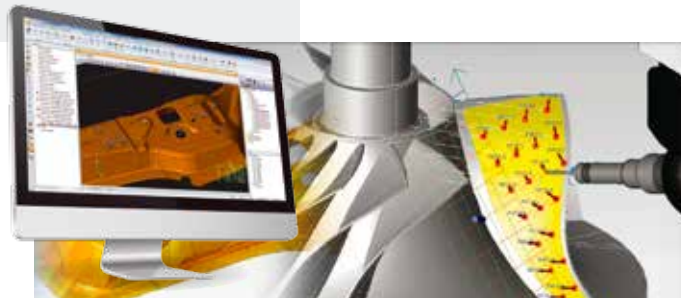
Feature inspection

# ALTERA SOFTWARE

Two software options, CMM-MANAGER or CAMIO, lets you choose the software package which best suits your needs. CMM-MANAGER is an easy to use software package with productivity focused intelligence and CAMIO is a powerful multi-sensor software package with advanced capability.

## Advanced multi-sensor

### **CAMIO8** Multi-sensor metrology software



CAMIO is a comprehensive CMM software package, with advanced integrated multi-sensor capability for touch probes, scanning probes and laser scanning. Inspection programs and reports can be created for a wide range of common or specialist applications, both online or offline, using any popular CAD format.

- Industry standard DMIS inspection programs
- Inspect geometric features and full freeform surfaces
- Supports popular CMMs and probe systems via I++ protocol
- Intuitive workflows and powerful ribbon-style interface
- Touch probe, scanning probe and laser scanner integration
- Graphical reporting with SPC and Q-DAS link
- Gear and blade application software
- Production line automation

## Easy to use productivity

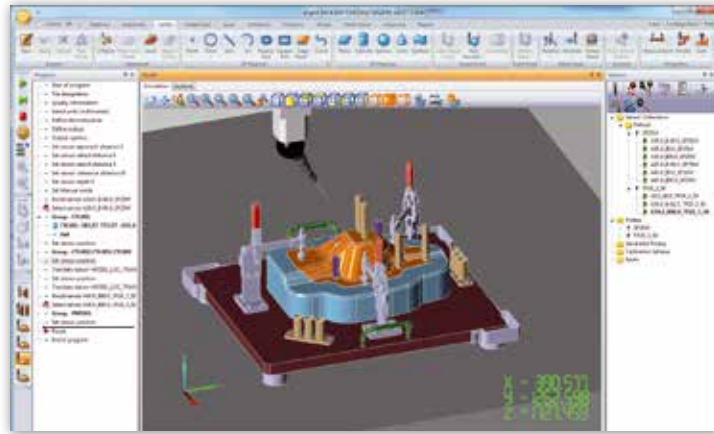
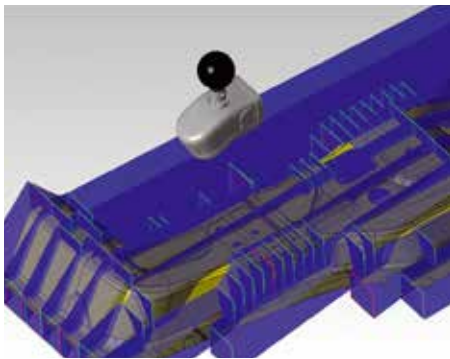
### **CMM-MANAGER** Metrology software for CNC, manual and portable CMM



CMM-MANAGER has been developed to make every step of CMM measurement and reporting as streamlined as possible.

- Walk in, measure and report quick start dimensional checks
- Optimized measurement and probe selection using a single click
- Intelligent graphical reporting with easy-to-understand output formats
- Real-time work piece and probe simulation with smart collision avoidance
- Web-ready reporting for convenient report distribution to a wider audience

# CMM software

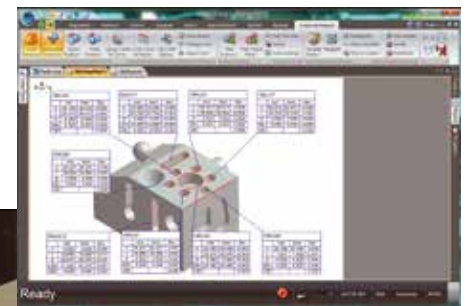
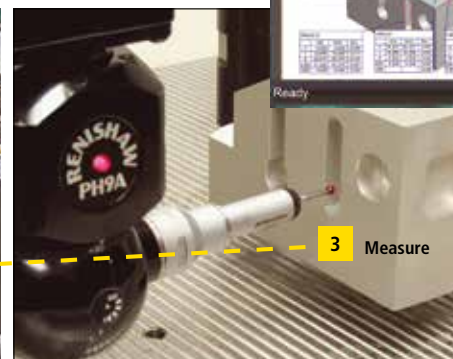
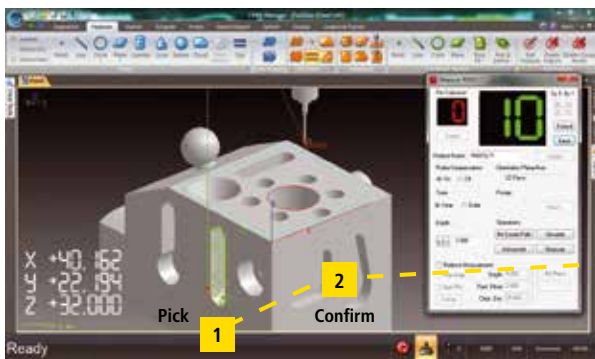


## Virtual simulation

CAMIO's powerful CMM programming environment provides full simulation for CMM, work piece and sensor. CMM programs can be optimized and verified for maximum efficiency before the arrival of work piece samples. Reports can be prepared and customized to meet customer specific formats ahead of time for maximum CMM uptime.



# focused CMM software



## Click-and-measure

Using CMM-Manager's click-and-measure capability, the operator is able to pick any feature on the CAD model.. The software automatically selects the proper probing angle and generates a collision-free path. After the operator confirms the selection, the CMM automatically measures the feature.

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