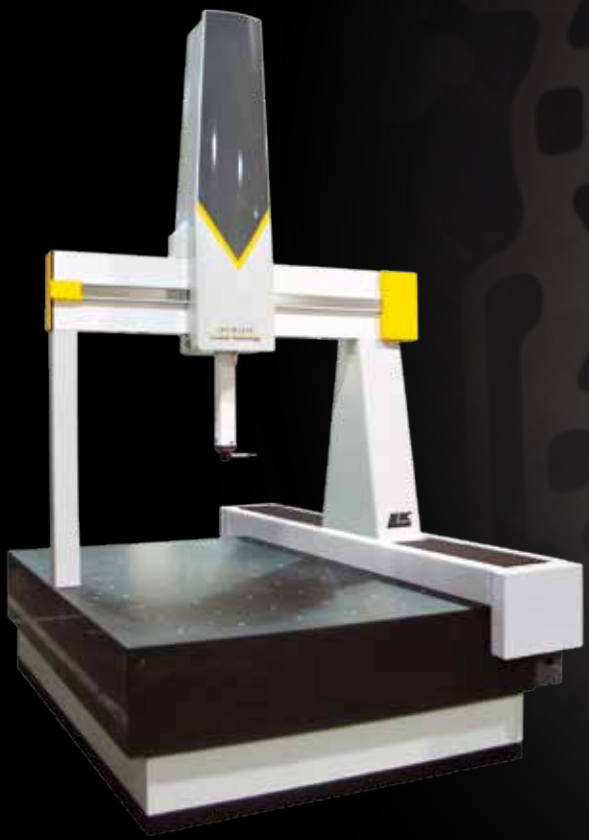
LK CMM

Coordinate Measuring Machines



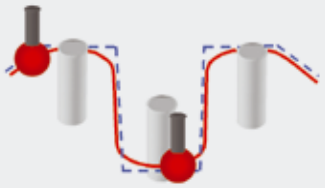
So much more than precision

The Nikon Metrology LK 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 45 years experience and expertise.
LK 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.

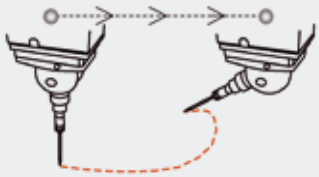
Key design features

- 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



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



PH Fast
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 support - Measurement for everyone

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) 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 world leading Nikon Metrology LC and unique patented XC (Cross-Scanner) technology, 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 ever to be ordered with a measuring length and width of 6 meter.

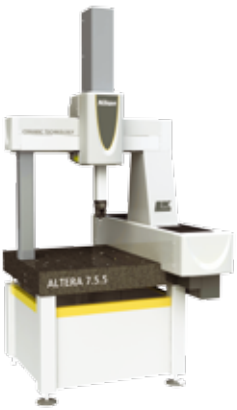
Whether it is a large bridge or a horizontal arm configuration you require, the Nikon Metrology LK range has a standard solution ready for you. Based on the same ceramic and granite construction, the large bridge and horizontal arm CMM range offers market leading accuracy and performance characteristics.

ALTERA and LK V Bridge CMM and LK V HA High Accuracy Bridge CMM

High-performance ceramic bridge CMMs

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

ALTERA 12.10.8



ALTERA 7.5.5 (box stand)


LK V 15.12.10

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

- Volumetric accuracy
  - from 1.8µm + L/400 (ALTERA)
  - from 2.1µm + L/375 (LK V)
  - from 1.5µm + L/350 (LK V HA)
- Repeatability
  - from 1.8µm (ALTERA)
  - from 2.1µm (LK V)
  - from 1.5µm (LK V HA)
- Velocity
  - up to 43m/min (ALTERA)
  - up to 37m/min (LK V)
  - up to 50m/min (LK V HA)
- Acceleration
  - up to 6824m/min^2 (ALTERA)
  - up to 5900m/min^2 (LK V)
  - up to 5400m/min^2 (LK V HA)

ALTERA - Small bridge general-purpose CMM

Sizes (box stand)	Sizes [1]	Probe head	Sensors
7.5.5	15.7.6	MH20i	TP20
8.7.6	10.10.8	PH10T PLUS	TP200
10.7.6	12.10.8	PH10M PLUS	SP25M
	15.10.8	PH20	LC series laser scanners
	20.10.8		XC series laser scanners

LK V - Medium to large bridge general-purpose CMM

Sizes [1]				Probe head	Sensors
15.12.10	20.15.12	25.15.15	20.20.15	PH10MQ PLUS	TP20
20.12.10	25.15.12	30.15.15	30.20.15	PH20	TP200
25.12.12	30.15.12	35.15.15	35.20.15	SP80	SP25M
30.12.10	35.15.12	40.15.15	40.20.15	REVO	LC series laser scanners
					XC series laser scanners

LK V HA - Small to medium bridge high accuracy CMM

Sizes [1]				Probe head	Sensors
8.7.6	10.10.8			PH10MQ PLUS	TP20
10.7.6	15.10.8			PH20	TP200
	20.10.8			SP80	SP25M
	25.10.8			REVO	LC series laser scanners
					XC series laser scanners

[1] (other sizes available on request)

LK High-speed scanning bridge CMM

LK V-SL and LK V-SL HA offering 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 1.1µm+L/400 (LK V-SL)
  - from 0.7µm+L/600 (LK V-SL HA)
- Repeatability
  - from 0.7µm (LK V-SL)
  - from 0.5µm (LK V-SL HA)
- Velocity
  - up to 51m/min (LK V-SL)
  - 20m/min (LK V-SL HA)
- Acceleration
  - up to 5065m/min^2 (LK V-SL)
  - 722m/min^2 (LK V-SL HA)

LK V 10.10.8 SL equipped with an LC60Dx laser scanner

LK V-SL (HA) metrology lab reference CMM

Ceramics for LK 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.

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

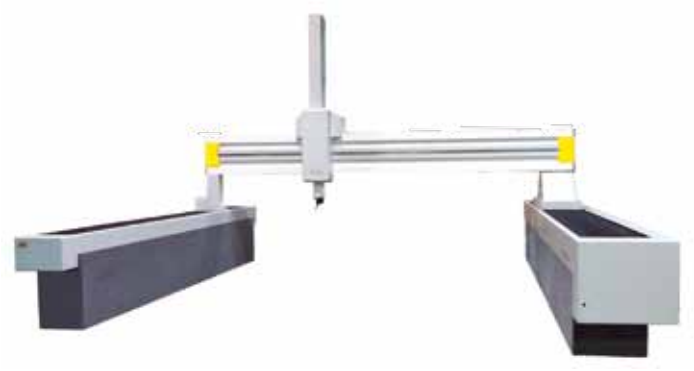
Preferred sizes[1]			Probe Head	Probes
8.7.6	10.10.8	20.12.10	PH10MQ PLUS	TP200
10.7.6	15.10.8			SP25M
15.7.6				LC15, LC50Cx, LC60Dx, XC65Dx (-LS)

[1] (other sizes available on request)

LK V Large scale twin-rail mounted 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 4.5µm + L/200 (LK V-R)
  - from 3.5µm + L/250 (LK V-G(P))
- Repeatability
  - from 4.5µm (LK V-R)
  - from 3.5µm (LK V-G(P))
- Velocity
  - up to 32m/min (LK V-R)
  - up to 27m/min (LK V-G(P))
- Acceleration
  - up to 2270m/min^2 (LK V-R)
  - up to 2070m/min^2 (LK V-G(P))

LK V-R and LK V R-SL - Twin-rail mounted bridge style CMM
(short-leg models available)

Sizes[1]	Probe Head	Probes
Rail lengths from 3m to 10m+ Bridge sizes from 2m to 4m Spindle lengths from 1.2m to 3m *(short-leg model with steel legs or concrete riser foundation)*	PH10MQ PLUIS	TP20 TP200 SP25M LC15, LC50Cx, LC60Dx, XC65Dx (-LS)

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

Sizes[1]	Probe Head	Probes
Rail lengths from 2m to 10m+ Bridge sizes from 4m to 7m Spindle lengths from 3m to 4m *(available with steel legs or concrete riser foundation)*	PH10MQ PLUS	TP20 TP200 SP25M LC15, LC50Cx, LC60Dx, XC65Dx (-LS)

[1] (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 1.9µm + L/250 (LK H-T)
  - from 10µm + L/200 (LK H-R)
- Repeatability
  - from 1.9µm (LK H-T)
  - 6.0µm (LK H-R)
- Velocity
  - up to 51m/min (LK H-T)
  - up to 40m/min (LK H-R)
- Acceleration
  - up to 10830m/min^2 (LK H-T)
  - up to 7580m/min^2 (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)

Sizes[1]	Probe Head	Probes
Rail lengths from 4m to 10m+	PH10MQ PLUS	TP7M
Spindle lengths from 0.4m to 1.6m		TP20
Column heights from 2m to 3m		TP200B
(available with walk-on or bellow covers for rails)		SP25M
		LC15, LC50Cx, LC60Dx, XC65Dx (-LS)

LK H-T - high accuracy table mounted horizontal arm style CMM

Sizes[1]	Probe Head	Probes
Rail lengths from 1m to 5m	PH10MQ PLUS	TP20
Spindle lengths from 0.4m to 1.6m		TP200B
Column heights from 0.6m to 2m		SP25M
		LC15, LC50Cx, LC60Dx, XC65Dx (-LS)

[1] (other sizes available on request)

LK H-R dual column horizontal arm CMM

LK H-T high accuracy table mounted horizontal arm CMM

LK H-T featuring rotating table

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

Manual probe heads with integral TP20 probe systems

MH20i

MH20

PH6M

PH6M

Manual probe head with autojoint connection

MIH

TP20

TP200

SP25M

Fixed position with autojoint

PH6M

TP20

TP200

MCR20

MCR20/SCR200/FCR25

Motorized

Motorized probe heads with 720 positions available

PH10T PLUS

PH10M PLUS

PH10MQ PLUS

TP20

TP20

SP25M

TP200

TP200

TP7M

MCR20/SCR200/FCR25/ MRS-ACR3

Dynamic

Infinite positioning probe head for 5 axis point collection

PH20

MCR20

Infinite positioning probe head for 5 axis multi-point measurement

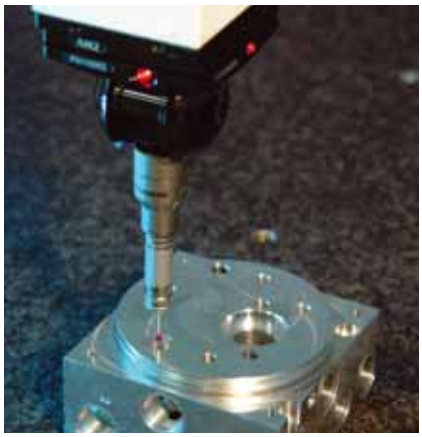
REVO

RSP2

RSP3

Fixed probe head with long stylus capability

SP80



High accuracy TP200 touch trigger probe

High speed SP25 scanning probe

REVO

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

LC15Dx

LC50Cx

LC60Dx

XC65Dx / XC65Dx-LS

MCR20

Scanning of medical implant

Scanning of casting

Feature inspection

Digital CMM scanners

Digital scanning boosts inspection performance

The all-digital Nikon LC15Dx scanner brings 3D digitizing in the accuracy range of tactile measurement, while offering the advantage of capturing a multitude of inspection points. With its smaller field of view, it perfectly suits digitizing small or detailed objects with higher point density and tighter tolerances

The LC60Dx is an all-purpose scanner that can be used both on CMM and portable arms. The LC50Cx laser scanner offers an adequate productivity with its 50mm stripe width and scanning rate of 45 stripes per second.

Incorporating 3 lasers in a cross pattern, the XC65Dx captures all full 3D details of features, edges, pockets, ribs and freeform surfaces in a single scan. The XC65Dx-LS version with a longer stand-off distance (170mm) facilitates scanning of complex forms.

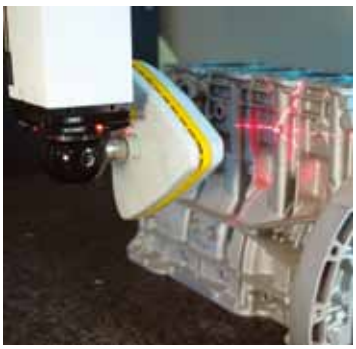
To effectively scan surfaces with varying color or high reflectivity, LC/XC scanners provide automatic real-time adjustment (ESP3) of sensor settings for each individual point of the laser stripe.

Features

- Fully compatible with Renishaw PH10M(Q) PLUS and automatic change racks (ACR)
- Data collection over multi-wire is integrated into most CMM brands and types
- Designed for minimum warm-up time and maximum operational stability and robustness

Applications

Inspection and reverse engineering of mobile phones, turbine blades, tools, castings, dies, sheet metal parts, plastics, etc.



XC65Dx

LC60Dx

Specifications

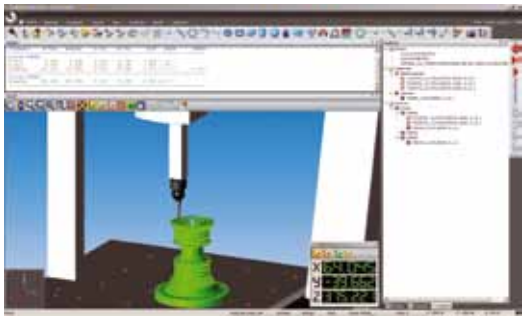
	LC15Dx	LC60Dx	LC50Cx	XC65Dx	XC65Dx-LS
Field of View	18x15mm	60x60mm	50x60mm	65x65mm (3x)	65x65mm (3x)
Probing error (MPE_P) [1]	2.5µm	9µm	20µm	12µm	15µm
Data acquisition (approx. pts/sec)	70,000	77,000	37,500	3x 25.000	3x 25.000
Enhanced Scanner Performance (ESP3)	√	√	√	√	√

[1] *Nikon Metrology test comparable to EN/ISO 10360-2*

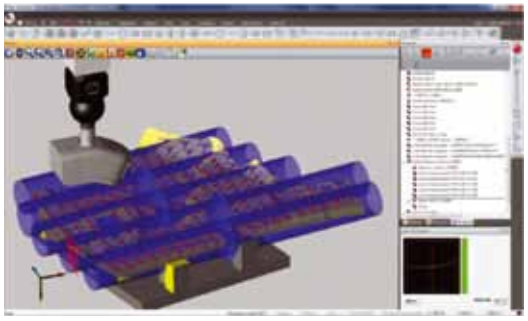
CAMIO7 multi-sensor CMM metrology software

The standard for DMIS co-ordinate measuring machine programming

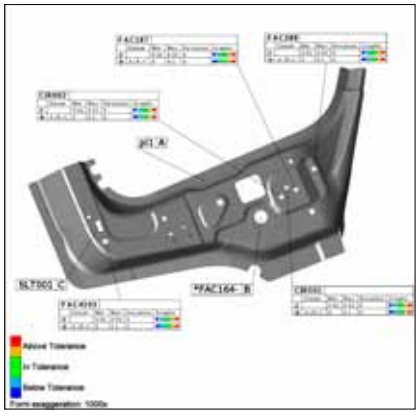
CAMIO7 is the world's leading multi-sensor CMM programming software supporting traditional touch-trigger probes, continuous contact scanning probes and the full range of Nikon laser scanning probes.
Regardless of whether inspecting stamped, moulded, fabricated or machined parts CAMIO7 drives accurate and efficient inspection programs for geometric features or full surface analysis with CAD compare.



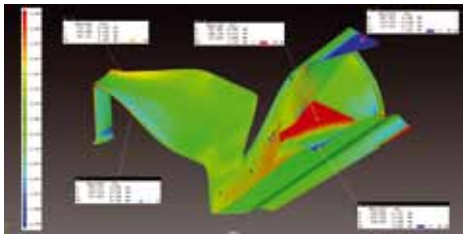
Straightforward scanner path definition based on CAD data



Laser scanner paths can be programmed based on CAD data or taught from the hand-box



Comprehensive graphical reporting



Graphical reporting can combine GD&T tolerances and full part to CAD comparison

Features

- An interface reflecting the latest Microsoft® Windows© standard with ribbon style toolbars providing instant access to all programming functions.
- A NEW simplified programming environment with fewer mouse-clicks.
- A NEW faster workflow to program multiple features of multiple types (ie points, circles etc.) in a single operation.
- Simplified probe management.
- Probe check function to verify the probe path before committing to the program or CMM operation.
- Flexible reporting options with multiple outputs including full colour graphics, ASCII text, excel or internet browser compatible formats.
- Support for the latest versions of CAD data: IGES, VDA-FS, STEP, ACIS®, CATIA® v4 and v5, Pro/ENGINEER®, Unigraphics®, Solidworks® and Parasolids®.
- Fully I++ compliant.

Benefits

- The ability to create CMM programs using multiple probe types to achieve the best CMM inspection routine for your application.
- Easy to use programming functions to suit all levels of user.
- Reduced programming time.

Comprehensive off-line programming capability

- CAMIO7 planning provides the capability create new or open existing inspection plans direct from CAD data including the import of part axis and GD&T tolerance data.
- Full machine simulation and collision avoidance.
- Creates CMM programs in true DMIS output without translation.
- CAMIO7 can be used as a stand-alone solution to create programs to run in compatible 3rd party DMIS software* including PC-DMIS® and Metrolog XG®.

* compatibility check to the DMIS standard is advised

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