



**LC15Dx** Laser scanner  
High accuracy with high resolution



# New possibilities

without compromise





**Nikon**

HENSHEL ACR3

WITTE AG 23174

# LC15Dx

## Closing the gap with tactile probe accuracy

The LC15Dx is a viable alternative to a tactile probe for an increasing number of high precision CMM applications. Manufacturers gain a better appreciation of the dimensional quality of their products without compromising on cycle times. A wider variety of parts, geometry and materials can be measured more effectively, including many parts too small or fragile for a touch probe.

## BENEFITS

### Closing the accuracy gap

Thanks to the latest laser scanner technology the LC15Dx is closing the gap between laser scanner and tactile probe accuracy. In tests comparable to ISO 10360-2 MPE<sub>P</sub> and ISO 10360-5 MPE<sub>AL</sub> the LC15Dx achieved the accuracy associated with using a CMM and tactile probe. However, unlike a tactile probe, the LC15Dx uses non-contact 3D laser triangulation to measure the surface directly and eliminate probe compensation errors. The uncertainty and delay caused when a laser scanner is used before it has reached operating temperature, has been eliminated by a thermal stabilizer mounted inside the scanner body.

### Versatile scanning without the hassle

Nikon's unique ESP3 technology intelligently adapts the laser settings for each measured point in real-time. A wider range and mix of surface materials, finishes, colors and transitions can be measured more efficiently without user interaction, manual tuning and part spraying, including small and fragile parts. Unwanted reflections are neutralised by an advanced software filter while changes in ambient light are absorbed by a high grade daylight filter.

### Better appreciation of product quality

Global Compare provides a complete 3D visualization of dimensional quality. The entire part is checked to the CAD model and any areas of concern are immediately highlighted using Color Mapping. Further investigation and analysis is possible using fly-outs, sections and a library of Geometric Dimensioning and Tolerancing (GD&T). Inspection reports can be as simple or complex as required with follow-on reports fully automated.

#### PH10M/MQ autojoint

Automatic scanner and probe change

#### ESP3

Automatic laser settings

#### Thermal stabilizer

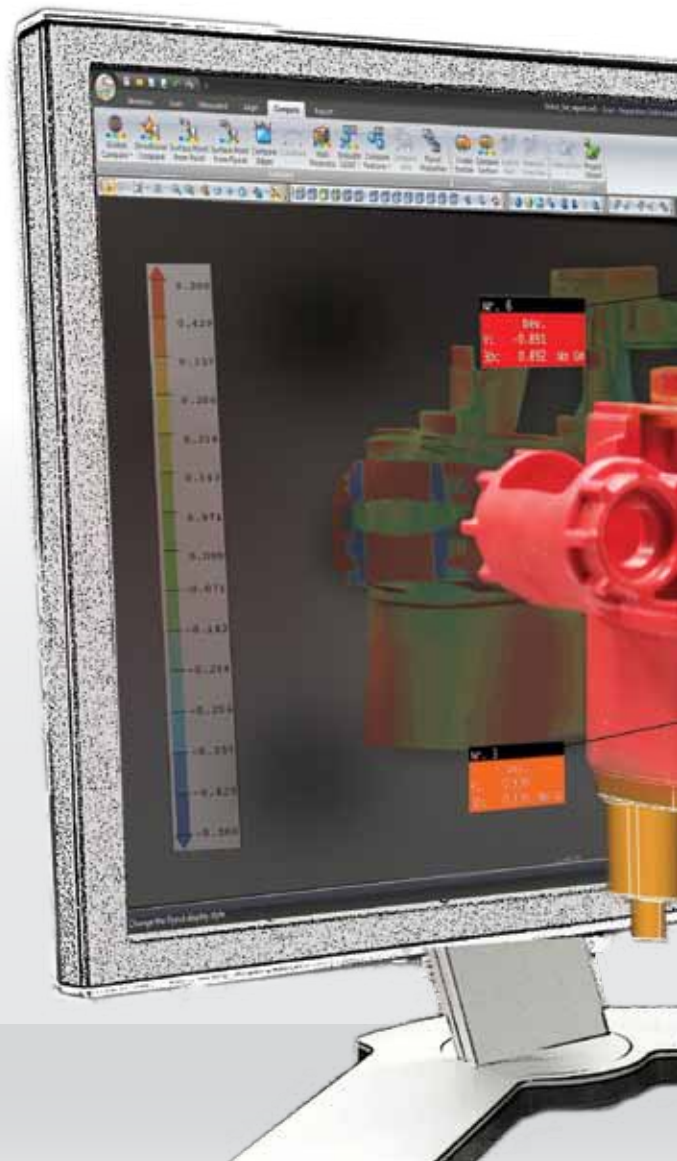
Zero warm-up

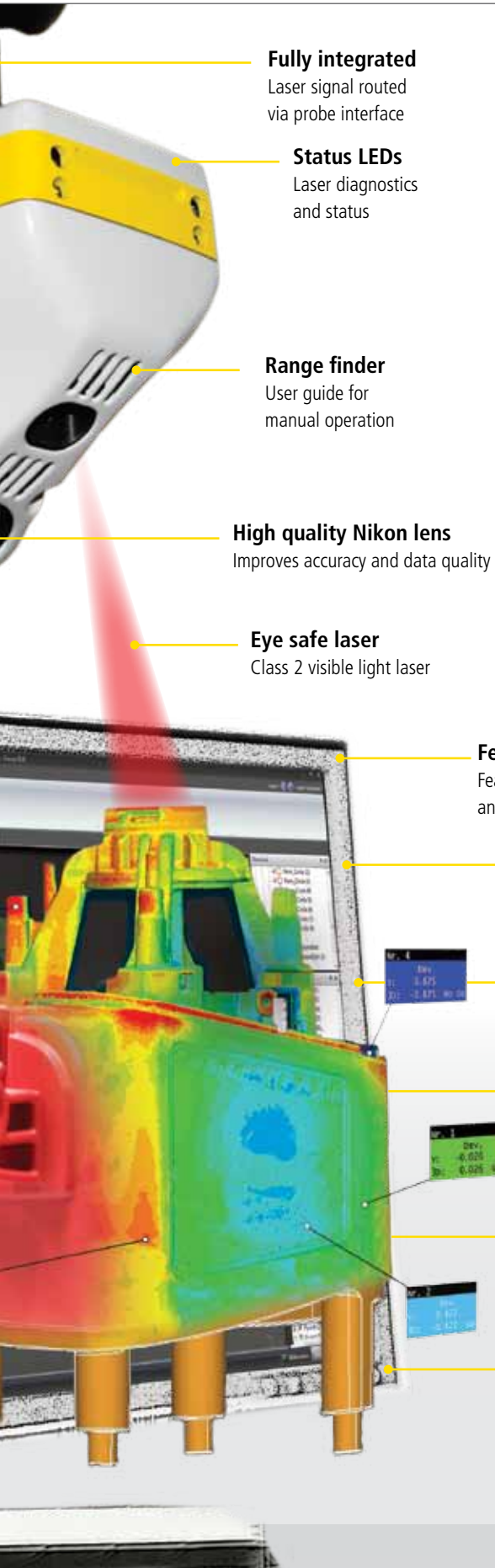
#### Reflection filter

Neutralizes unwanted reflections

#### Daylight filter

Absorbs ambient light





**Fully integrated**

Laser signal routed via probe interface

**Status LEDs**

Laser diagnostics and status

**Range finder**

User guide for manual operation

**High quality Nikon lens**

Improves accuracy and data quality

**Eye safe laser**

Class 2 visible light laser

**Feature inspection**

Feature measurement and GD&T library

**Sections and profiles**

2D section and profile analysis

**CAD comparison**

Direct comparison of measured part to CAD

**Best-fit alignment**

Best-Fit alignment of measured part to CAD

**Point cloud management**

Trim and filter point clouds

**CAD export**

Reverse Engineering and data storage

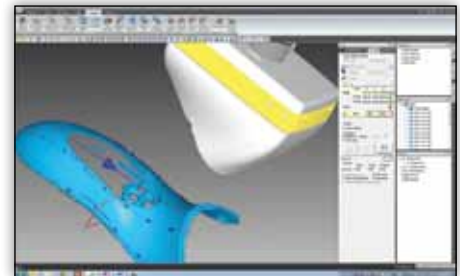
## SOFTWARE

### Intuitive software for every application

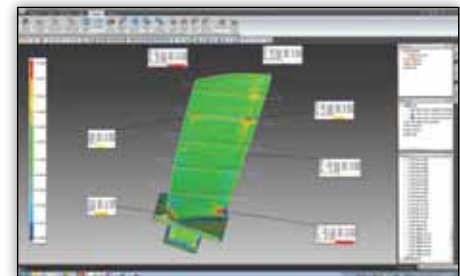
A selection of popular software packages for part-to-CAD and feature inspection are available for the LC15Dx, including FOCUS and CAMIO.

Key features include:

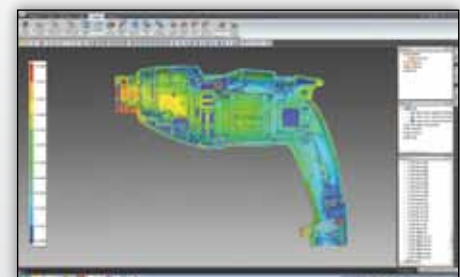
- CAD programming
- Best-fit alignment
- Part to CAD comparison
- Feature inspection
- Blade analysis
- Color reporting
- Multi-sensor CMM
- Offline programming
- Point cloud management
- GD&T library
- Teach & Learn programming
- Full simulation



Intuitive programming and offline simulation reduces preparation time



Blade section analysis combined with full 3D comparison



3D visualization of dimensional quality

## APPLICATIONS

### High precision parts and small geometry

The LC15Dx provides significant benefits for a wide variety of high precision parts and geometry, including small details, semi-rigid parts and the more demanding materials:

<b>PROCESS</b>	PRODUCTION - R&D - REVERSE ENGINEERING
<b>METHOD</b>	MACHINED - MOULDED - STAMPED - CAST - FORGED
<b>MATERIAL</b>	METAL - PLASTIC - RUBBER - CLAY - CERAMIC - COMPOSITES
<b>FINISH</b>	MACHINE - POLISHED - PLATED - PAINT - MIXED COLORS
<b>STRUCTURE</b>	RIDGED - SOFT - FLEXIBLE - FRAGILE
<b>FEATURE</b>	SURFACE - GEOMETRIC FEATURE - PROFILE - SECTION



Precision moulding  
Measure small, soft and fragile parts



Medical implants  
Inspect complex freeform geometry



Turbine blades  
Eliminate probe tip compensation errors

## MULTI-SENSOR CMM

### Combine laser scanning with a tactile probe

In some cases a single sensor technology is insufficient for measuring all of the features. The LC15Dx can be combined with an optional tactile probe to create a versatile multi-sensor CMM. Depending on the application both technologies can be used independently or together in the same inspection program. Fully automatic sensor changing is possible with the addition of an optional change and storage rack which is mounted on the table of the CMM.



## RETROFITS

### Enhance the capability of your current CMM

Retrofitting your current CMM with an LC15Dx is a cost effective solution. The retrofit integrates with the existing CMM controller hardware and compatible probe system to provide a versatile multi-sensor CMM offering both non-contact and touch probe inspection.

LC15Dx retrofit kits are available for the follow CMM controller systems.

- Aberlink
- Deva
- Coord3
- Dukin
- LK
- Hexagon DEA
- Hexagon Brown & Sharpe
- Hexagon Sheffield
- Mitutoyo
- Mora
- Renishaw
- Wenzel
- Werth
- Zeiss



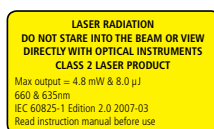
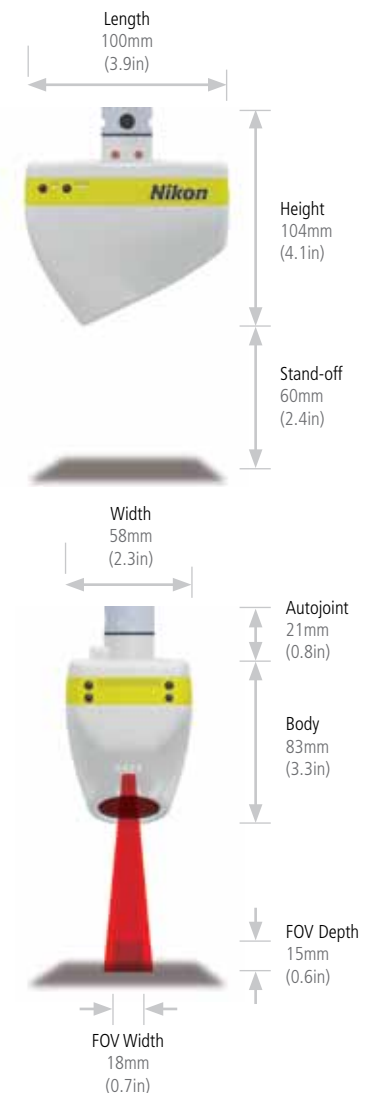
## SPECIFICATIONS

Probing error (MPE <sub>p</sub> ) <sup>1</sup>	2.5µm (0.0001in)
Multi-stylus test (MPE <sub>AL</sub> ) <sup>2</sup>	6µm (0.00024in)
Resolution (point spacing)	22µm (0.00087in)
Data acquisition (approx.)	70,000 points/sec
Points per line (approx.)	900
Measuring temperature range	18-22°C (64.4-71.6°F)
Operating temperature range	10-40°C (50-104°F)
Warm-up time	0 (zero) seconds
Weight	370g (13oz)
Ingress Protection	IP30
Power	110/240VAC, 50/60Hz 5A
Enhanced Scanner Performance (ESP3)	√
Daylight filter	√
Probe head compatibility <sup>3</sup>	PH10M, PH10MQ, CW43, PHS
Laser type	Class 2 (660nm)

<sup>1</sup> Nikon Metrology test comparable to EN/ISO 10360-2

<sup>2</sup> Nikon Metrology test comparable to EN/ISO 10360-5, for CMM with accuracy of 2µm+L/350 or better

<sup>3</sup> For CMM controller and probe head compatibility see LC15Dx datasheet.



Complies with 21 CFR 1040.10 and 1040.11, Laser Notice No. 50, dated June 24, 2007  
 Due to the diverging beam, viewing the laser output with optical instruments (for example, eye loupes, magnifiers and microscopes) within a distance of 100 mm may pose an eye hazard.

# LC15Dx

Closing the gap with touch probe accuracy



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