

Willrich Precision  
Ph 866-945-5742  
sales@willrich.com



## Manual Coordinate Measuring Machine CRYSTA-PLUS M SERIES

COORDINATE  
MEASURING MACHINES



# Crysta-Plus M: Quality down to the smallest detail



# Crystal Plus M



# High operability, environmental stability and performance

## Maintains High Accuracy for Long Periods

The Crysta-Plus M series features the world's highest measuring accuracy in manual coordinate measuring machines. The main unit base is manufactured from highly reliable Graplate (precision granite surface plate), which provides high-rigidity construction with extremely small secular change by integrating the Y-axis guide rail with the measuring table. X-, Y- and Z-axis guides are equipped with high-accuracy air bearings to provide excellent linearity and sliding smoothness so that the operator can move the stylus around the workpiece with minimal effort. The length measuring system of each axis employs high-accuracy glass scales and linear encoders to enable long-term accuracy stability, combined with negligible maintenance requirements apart from normal servicing.

## Axis Clamp Switch and X/Y Fine-Feed Knob

The X, Y and Z axes can be individually clamped with a one-touch air clamp. Each axis can be finely adjusted over the entire measuring range when in the clamped state.

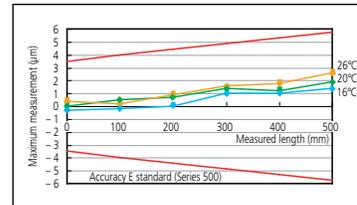
In the Crysta-Plus M443/M500 series, the X- and Y-axis fine-feed knobs are grouped together on the front of the main unit for convenience. When centering microscope CF20 is installed, for example, these knobs allow easy and precise positioning without causing operator fatigue.

The Crysta-Plus M700 series is provided with a coarse-feed knob for each axis (18.85mm/revolution), as well as fine feed (0.99mm/revolution), to enable easy handling of this larger machine. Additionally, adoption of the Mobile Clamp Box allows the operator to perform clamping operations on each axis from just one location.

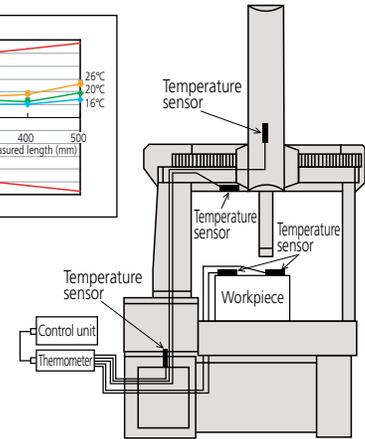


## Temperature Compensation Function

The Crysta-Plus M series is equipped with the temperature compensation function. This function uses multiple sensors to ensure maintenance of the specified accuracy over the operating temperature range of 15 to 30°C.

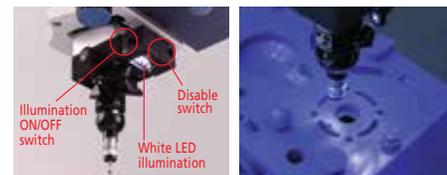


Temperature sensors



## Illuminator and Disable Switch

- In order to greatly improve workability during measurement of fine geometry or a deep hole, an optional white LED illuminator can be installed.
- In order to prevent unintentional triggering of the probe when changing the probe orientation or replacing a stylus, an ON/OFF switch (Disable switch) is provided on the probe holder.



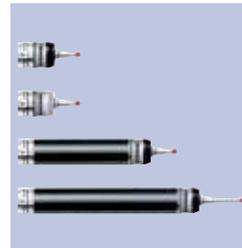
## Probes



Touch-trigger Probe MH20



Touch-trigger Probe MH20i



Probe modules



Centering Microscope CF20

Repeatability	$2\sigma \leq 0.35\mu\text{m}$ (When using standard stylus)
Trigger force	XY: 0.08N Z: 0.75N

The centering microscope is best suited to measure a small hole into which a stylus cannot be inserted, plastic or rubber items, or a thin workpiece which would be deformed by contact with a touch-trigger probe stylus.  
 Note: The auxiliary weight set is required if the CF20 is installed.

# Crysta-Plus M

## Series M443/M500

- Standard
- Optional



**Clamp switch and fine-feed knob on each axis**  
(Continuous fine feed operates over the entire range)

Crysta-Plus M443

**Continuous fine feed over the entire Z-axis measuring range**



**Machine stand / Accessory storage**

**Interchangeable probe, probe disable button and white LED illuminator**

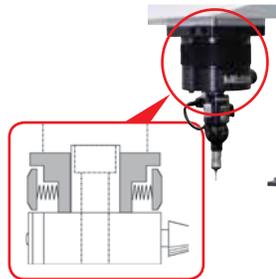
## Series M700

**Fine/Coarse feed knob on each axis**  
(Continuous fine/coarse feed operates over the entire measuring range)

**Interchangeable probe, probe disable button and white LED illuminator**

### Constant grip

A constant-force handgrip is installed at the lower end of the ram to limit the force applied by the operator during operation, thus improving repeatability of measurement.



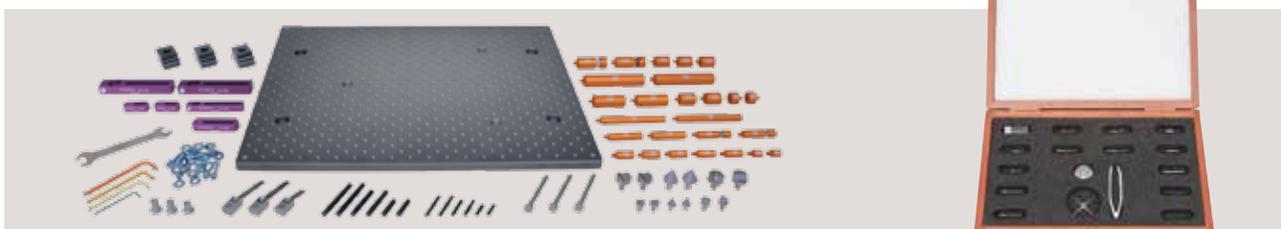
Constant-force handgrip



Crysta-Plus M7106

**Mobile clamp switch box**

## Accessories



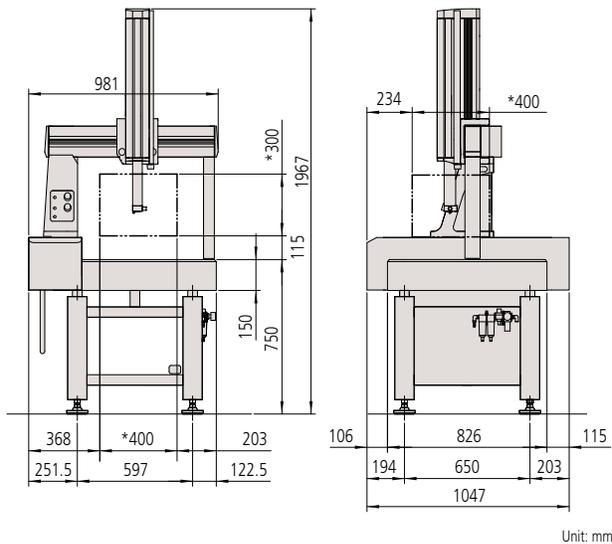
Clamping kit

Stylus kit

# Crysta-Plus M443

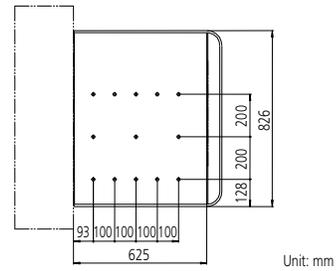


## Dimensions (Main Unit)

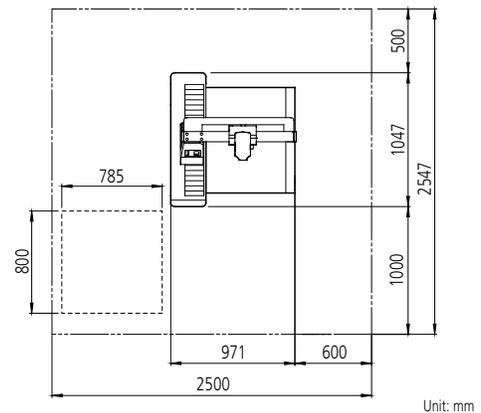


	Crysta-Plus M443
Mass of main unit	360kg
Mass of machine stand	50kg

## Dimensions (Measuring Table)



## Installation Floor Space



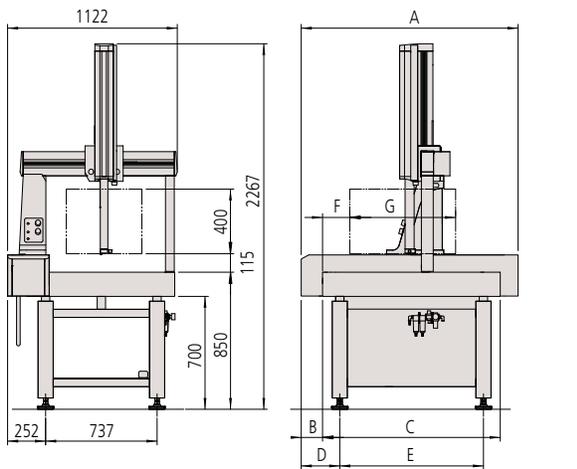
\*Pictures and dimensions shown in this page are an example of system configuration.  
Contact your Mitutoyo representative or the nearest Mitutoyo sales office for details of the system configuration.

# Crysta-Plus M574



Crysta-Plus M574

## Dimensions (Main Unit) Crysta-Plus M574

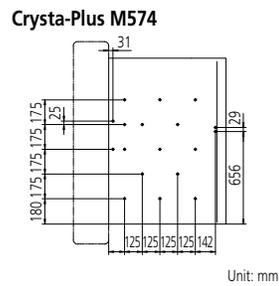


Unit: mm

	Crysta-Plus M574
Mass of main unit	575kg
Mass of machine stand	71kg

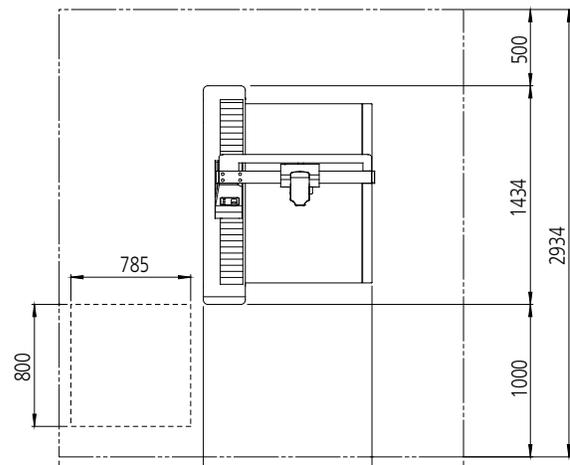
	Crysta-Plus M574
A	1434mm
B	141mm
C	1175mm
D	255mm
E	950mm
F	180mm
G	700mm

## Dimensions (Measuring Table) Crysta-Plus M574



Unit: mm

## Installation Floor Space Crysta-Plus M574



Unit: mm

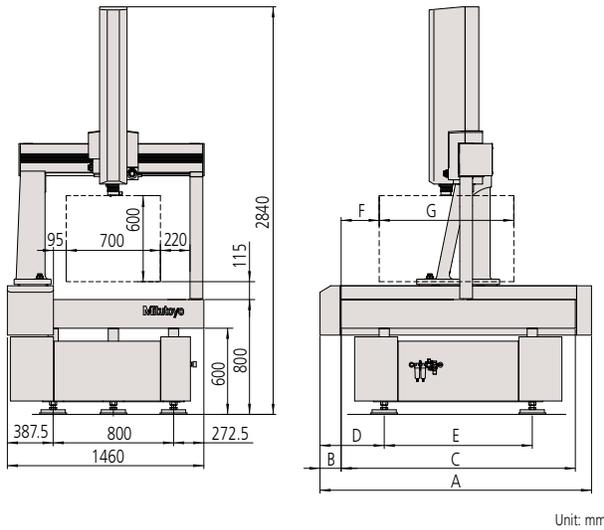
\*Pictures and dimensions shown in this page are an example of system configuration. Contact your Mitutoyo representative or the nearest Mitutoyo sales office for details of the system configuration.

# Crysta-Plus M7106



Crysta-Plus M7106

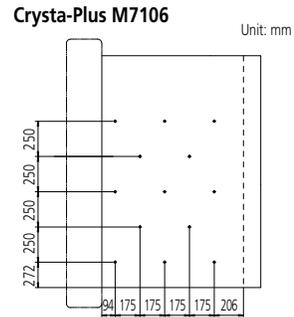
## Dimensions (Main Unit) Crysta-Plus M7106



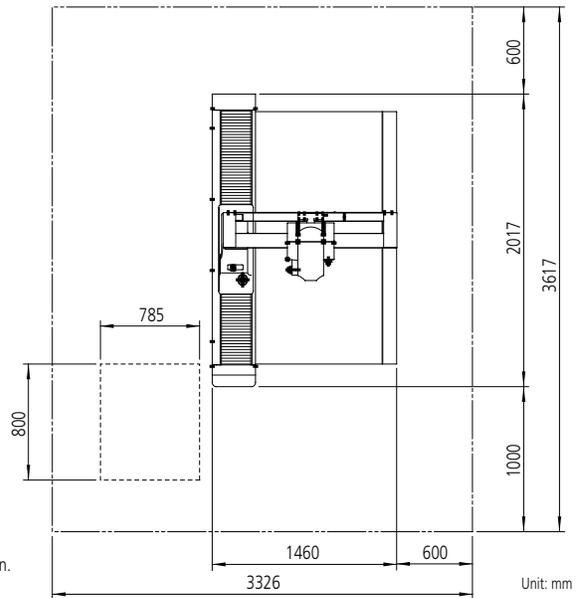
	Crysta-Plus M7106
Mass of main unit (including machine stand)	1800kg

	Crysta-Plus M7106
A	2017mm
B	157mm
C	1740mm
D	370mm
E	1000mm
F	283mm
G	1000mm

## Dimensions (Measuring Table) Crysta-Plus M7106



## Installation Floor Space Crysta-Plus M7106



\*Pictures and dimensions shown in this page are an example of system configuration. Contact your Mitutoyo representative or the nearest Mitutoyo sales office for details of the system configuration.

# Crysta-Plus M443 / M500 / M700 Series Specifications

## Specifications

Item		Model	Crysta-Plus M443
Measuring range	X axis		400mm
	Y axis		400mm
	Z axis		300mm
Resolution			0.0005mm
Accuracy (20°C)	Measuring error (E)		$(3.0+4L/1000)\mu\text{m}^{*3}$
ISO 10360-2 <sup>*1,*2</sup>	Probing error (R)		4.0 $\mu\text{m}$
Temperature compensation function			Standard
Length standard			Linear encoder
Guide method			Air bearing on each axis
Clamping on each axis			One-touch air clamp
Fine feed of each axis			Continuous fine feed over the entire measuring range on each axis
Measuring table	Effective size		624mmx805mm
	Material		Granite
Workpiece	Maximum height		480mm
	Maximum mass		180kg
Z-axis balancing method			Counterweight (adjustable by 1.5kg)
Machine dimensions	Width		981mm
	Depth		1047mm
	Height		1967mm
Mass of main unit (including machine stand)			410kg
Air supply	Pressure		0.35MPa (air source: 0.5-0.9MPa)
	Consumption (Under normal conditions)		50L/min (air source: 100L/min)

## Specifications

Item		Model	Crysta-Plus M574
Measuring range	X axis		500mm
	Y axis		700mm
	Z axis		400mm
Resolution			0.0005mm
Accuracy (20°C)	Measuring error (E)		$E = (3.5+4L/1000)\mu\text{m}^{*3}$
ISO 10360-2 <sup>*1,*2</sup>	Probing error (R)		4.0 $\mu\text{m}$
Temperature compensation function			Standard
Length standard			Linear encoder
Guide method			Air bearing on each axis
Clamping on each axis			One-touch air clamp
Fine feed of each axis			Continuous fine feed over the entire measuring range on each axis
Measuring table	Effective size		764mmx1175mm
	Material		Granite
Workpiece	Maximum height		595mm
	Maximum mass		180kg
Z-axis balancing method			Counterweight (adjustable by 1.5kg)
Machine dimensions	Width		1122mm
	Depth		1434mm
	Height		2267mm
Mass of main unit (including machine stand)			646kg
Air supply	Pressure		0.35MPa (air source: 0.5-0.9MPa)
	Consumption (Under normal conditions)		50L/min (air source: 100L/min)

## Specifications

Item		Model	Crysta-Plus M7106
Measuring range	X axis		700mm
	Y axis		1000mm
	Z axis		600mm
Resolution			0.0005mm
Accuracy (20°C)	Measuring error (E)		$E = (4.5+4.5L/1000)\mu\text{m}^{*3}$
ISO 10360-2 <sup>*1,*2</sup>	Probing error (R)		5.0 $\mu\text{m}$
Temperature compensation function			Standard
Length standard			Linear encoder
Guide method			Air bearing on each axis
Clamping on each axis			One-touch air clamp (mobile clamp switch box)
Fine feed of each axis			Continuous fine/coarse feed over the entire measuring range on each axis
Measuring table	Effective size		900mmx1740mm
	Material		Granite
Workpiece	Maximum height		800mm
	Maximum mass		800kg
Z-axis balancing method			Counterweight (adjustable by 1.7kg)
Machine dimensions	Width		1460mm
	Depth		2017mm
	Height		2840mm
Mass of main unit (including machine stand)			1800kg
Air supply	Pressure		0.4MPa (air source: 0.5-0.9MPa)
	Consumption (Under normal conditions)		50L/min (air source: 100L/min)

## Guaranteed Accuracy Temperature Limits

Range	15 to 30 °C
Rate of change	2°C per hour or less, 5°C in 24 hours or less
Gradient	1°C or less per meter (both horizontal and vertical direction)

\*1: According to ISO 10360-2 methods

\*2: When using the touch-trigger probe MH20i/MH20/TP20 and stylus (L10mm)

\*3: L=Measured length (mm)

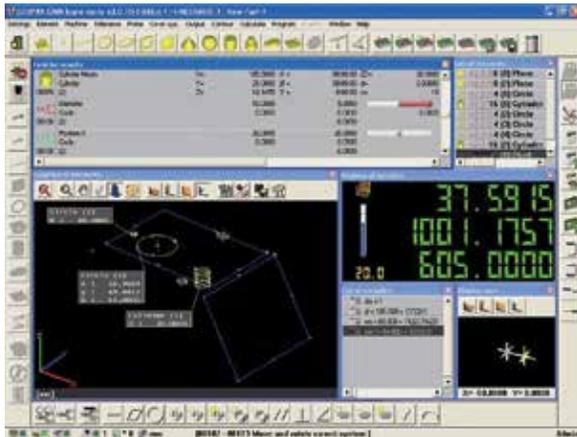
Note: When the appearance of the natural stone measuring table varies according to the source, the high stability for which this material is known, can always be relied on.

# Software to Support Your Measurement Tasks

## MCOSMOS

### GEOPAK (High Performance General-Purpose Measurement Program)

This module is the heart of the MCOSMOS software system and is used to measure and analyze geometric elements. All the functions are provided by icons or pull-down menus, freeing users from the need to memorize complex code numbers. It is unnecessary to switch windows for operations, so even novices can promptly select desired functions. Its main features include easier viewing of measuring procedures and results, such as real-time graphic display of measurement results and a function for direct callup of elements from results graphics, which were not previously available.

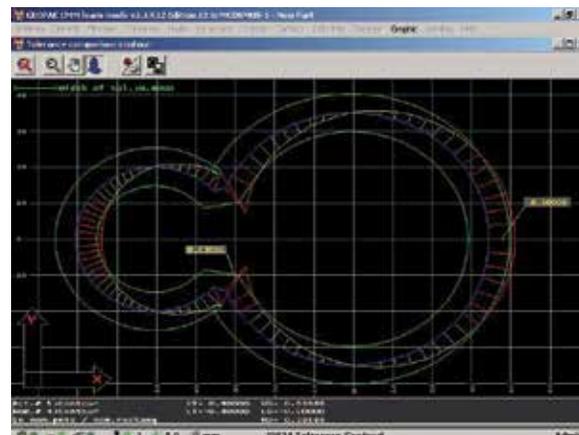


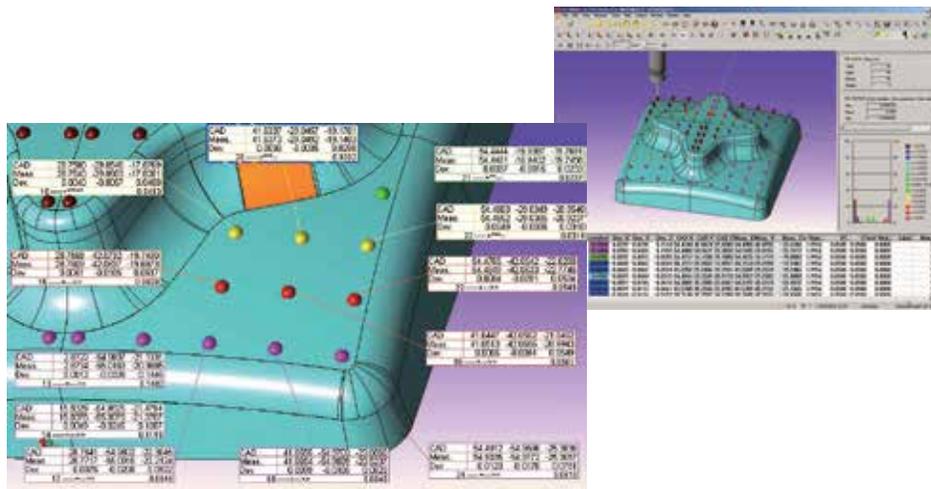
### Cutting finished products



### SCANPAK (Optional Contour Measurement Program)

Measures two-dimensional unfiltered profiles and performs various evaluations. It can evaluate profile measurement data, based on design data, and calculate various elements and inter-elements by specifying a range from the measurement data.





Resin molded or plastic formed products

**CAT1000S**  
(Optional Free Curved Surface Evaluation Program)

Checks and compares the workpiece with the CAD data and directly outputs the results in the form of CAD data in various formats. It supports SAT/STEP CAD data as standard, and software to directly convert from/ to various types of CAD data is available as an option.

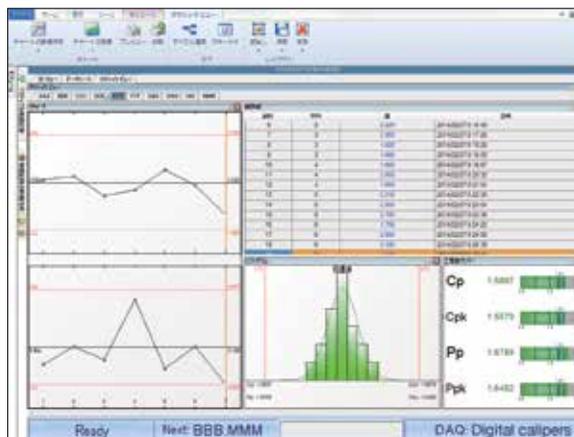


Small parts

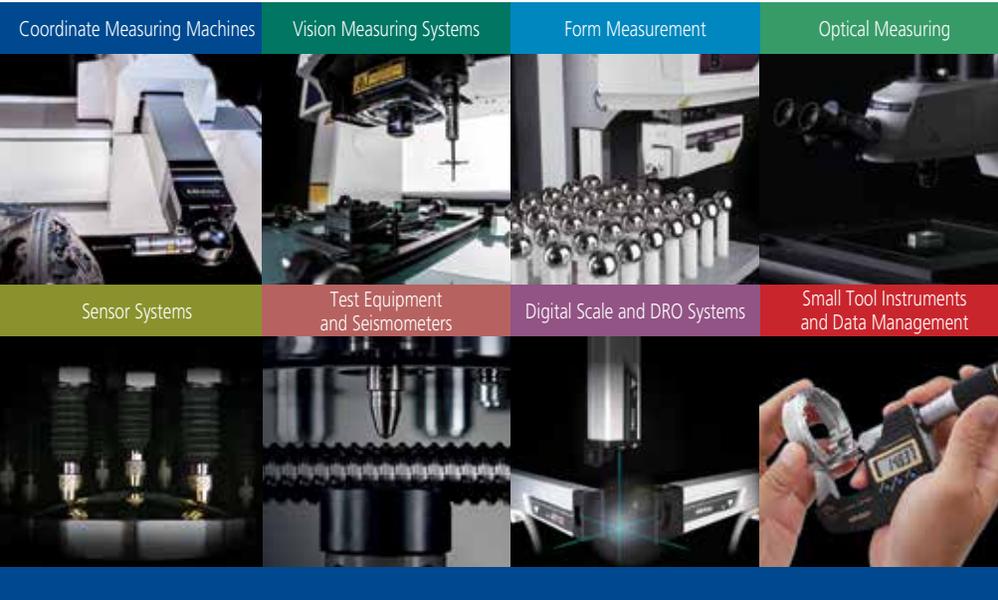


**MeasurLink**  
(Optional Statistical Process Control Program)

This program can process various statistical analyses based on the measurement results. A real-time display of a control chart allows earlier detection of potential defects, such as wear or damage to cutting tools. This allows implementation of effective countermeasures, including changes in cutting depth and working conditions. Using this program as a terminal, it is also possible to connect to a higher network environment for integrated control.



Willrich Precision  
 Ph 866-945-5742  
 sales@willrich.com



**Whatever your challenges are, Mitutoyo supports you from start to finish.**

Mitutoyo is not only a manufacturer of top quality measuring products but one that also offers qualified support for the lifetime of the equipment, backed by comprehensive services that ensure your staff can make the very best use of the investment.

Apart from the basics of calibration and repair, Mitutoyo offers product and metrology training, as well as IT support for the sophisticated software used in modern measuring technology. We can also design, build, test and deliver measuring solutions and even, if deemed cost-effective, take your critical measurement challenges in-house on a sub-contract basis.



**Find additional product literature and our product catalog**

[www.mitutoyo.com](http://www.mitutoyo.com)

**Note:** All information regarding our products, and in particular the illustrations, drawings, dimensional and performance data contained in this printed matter as well as other technical data are to be regarded as approximate average values. We therefore reserve the right to make changes to the corresponding designs. The stated standards, similar technical regulations, descriptions and illustrations of the products were valid at the time of printing. In addition, the latest applicable version of our General Trading Conditions will apply. Only quotations submitted by ourselves may be regarded as definitive. Specifications are subject to change without notice.

Mitutoyo products are subject to US Export Administration Regulations (EAR). Re-export or relocation of our products may require prior approval by an appropriate governing authority.

**Trademarks and Registrations**

Designations used by companies to distinguish their products are often claimed as trademarks. In all instances where Mitutoyo America Corporation is aware of a claim, the product names appear in initial capital or all capital letters. The appropriate companies should be contacted for more complete trademark and registration information.

**Mitutoyo**

**Mitutoyo America Corporation**

[www.mitutoyo.com](http://www.mitutoyo.com)

One Number to Serve You Better

1-888-MITUTOYO (1-888-648-8869)

**M<sup>3</sup> Solution Centers:**

Aurora, Illinois (Headquarters)

Boston, Massachusetts

Huntersville, North Carolina

Mason, Ohio

Plymouth, Michigan

City of Industry, California

Birmingham, Alabama

Renton, Washington

Houston, Texas