E

Electronic Indicators, Dial Indicators, Digital Probes, Digital Readouts
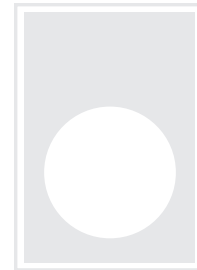
TABLE OF CONTENTS

visit our searchable web site and find Dyer's interactive catalog, gaging solutions by application and industry!

The Dyer Company ~ phone: 717.569.3223 ~ gage hotline: 800.631.3333 ~ fax: 717.569.6721 ~ www.dyergage.com ~ e-mail: Dyer@dyergage.com

900-301

Notable Features
- Resolution 0.0005"/0.01 mm
- Range 0–0.500"/12.7 mm
- Preset, zero, ± direction Go/± NG functions
- Preset/recall absolute number. Encoder maintains settings and readings for life of battery, (even when power is off)
- SPC output
- Battery Power 5000 hours
- Face rotates 330º
- Stem Ø 0.375", contacts 4-48 UNF

900-305

Notable Features
- Resolution 0.00005"/0.001 mm
- Range 0–0.500"/12.7 mm
- Preset, zero, ± direction Go/± NG functions
- Preset/recall absolute number. Encoder maintains settings and readings for life of battery, (even when power is off)
- SPC output
- Battery Power 5000 hours
- Face rotates 330º
- Stem Ø 0.375", contacts 4-48 UNF

900-114

Notable Features
- Resolution 0.0001"/0.001 mm
- Range 0–0.500"/12.7 mm
- Holds min value/tolerance
- Preset up to 3 values
- Analog bar
- Preset, zero, ± direction Go/± NG functions
- Preset/recall absolute number. Encoder maintains settings and readings for life of battery, (even when power is off)
- SPC output
- Battery Power 5000 hours
- Face rotates 330º
- Stem Ø 0.375", contacts 4-48 UNF

900-315

Notable Features
- Resolution 0.0005"/0.01mm
- Range 0–0.500"/0-12.7mm
- Zero, ± direction
- No preset to absolute
- SPC output
- Battery power 20,000 hours
- Low Cost
- Face rotates 330º
- Stem Ø 0.375", contacts 4-48 UNF

900-200

Notable Features
Any ratio calculation can be programmed
Resolution adjustable from 0.000010"–0.050" (0.002 mm–1 mm)
Range 0–0.500"/12.7 mm
Preset, zero, ± direction Go/± NG functions
Preset/recall absolute number. Encoder maintains settings and readings for life of battery, (even when power is off)
SPC output
Battery Power 5000 hours
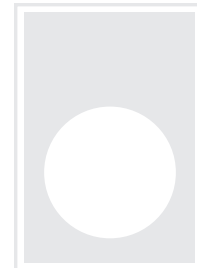Face rotates 330º
Stem Ø 8 mm, contacts 2.5 mm

900-325

Notable Features
- Resolution 0.000050"/0.0001mm
- Range 0–0.500"/0-12.7mm
- Zero, ± direction
- No preset to absolute
- SPC output
- Battery power 20,000 hours
- Low Cost
- Face rotates 330º
- Stem Ø 0.375", contacts 4-48 UNF

901, 903 SERIES
ELECTRONIC INDICATORS

901-100

Notable Features
- Resolution 0.000050"/0.001 mm
- Range 0–1.0"/25 mm
- Zero, preset/recall absolute number
- Battery Power, face rotates 270º
- RS232, SPC output, bi-directional
- Stem Ø 0.375", contacts 4-48 UNF

901-101

Notable Features
- Resolution 0.0005"/0.01 mm
- Range 0–1.0"/25 mm
- Zero, preset/recall absolute number
- Battery Power, face rotates 270º
- RS232, SPC output, bi-directional
- Stem Ø 0.375", contacts 4-48 UNF

903-115

Notable Features
- Range ± 0.040"/1 mm
- Fan display
- Battery Power
- Stem Ø 0.375", contacts 4-48 UNF
- Switchable resolution
  0.000020"/0.0005 mm
  0.000050"/0.001 mm
  0.0001"/0.001 mm
  0.0005"/0.005 mm

903-118

Notable Features
- Resolution 0.000050",
  0.00020", 0.000010"/0.001 mm,
  0.0005 mm, 0.0002 mm
- Range
  ± 0.0015"/0.030 mm
  ± 0.0006"/0.015 mm
  ± 0.0003"/0.006 mm
- Preset/recall absolute number
- SPC output
- Battery Power
- Stem Ø 0.375", contacts 4-48 UNF

903-120
Remote Indicator
Notable Features
- Range ± 0.040"/1 mm
- Fan display
- Battery Power
- Switchable resolution
  0.000020"/0.0005 mm
  0.000050"/0.001 mm
  0.0001"/0.001 mm
  0.0005"/0.005 mm

901-201

Notable Features
- Resolution 0.00050"/0.01 mm
- Range 0-1"/0-25.4 mm
- Button Function: ON/OFF, ZERO, in/mm
- Auto power off
- SPC output/USB
- CR2032 Battery, Battery life > 1 year
- Stem 0.375", contacts 4-48 UNF

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SECTION E
INDICATION, DIGITAL ELECTRONICS

451-001 Inch

Notable Features
- Graduation 0.000050"
- Range 0.004" (± 0.002")
- Dial face 20-0-20
- Range per revolution ± 0.002"
- Stem Ø 8 mm, spindle lapped
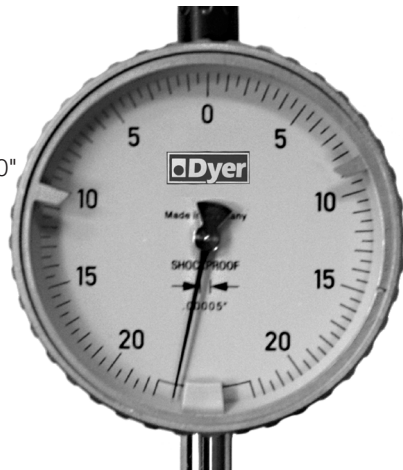- Fine adjustment at top of case

451-011 Metric

Notable Features
- Graduation 0.001 mm
- Range 0.1 mm (± 0.050 mm)
- Dial face 50-0-50
- Range per revolution ± 0.050 mm
- Stem Ø 8 mm, spindle lapped
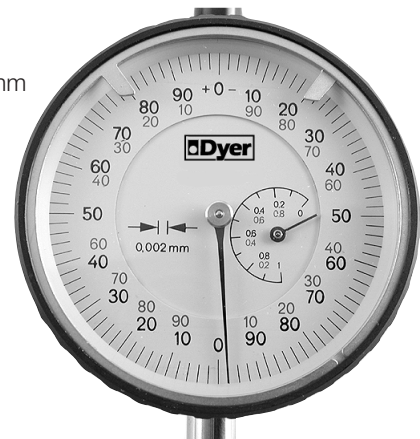- Fine adjustment at top of case

450-000 Inch

Notable Features
- Graduation 0.000050"
- Range 0.004" (± 0.002")
- Dial face 20-0-20
- Range per revolution ± 0.002"
- Stem Ø 8 mm, spindle lapped

458-003 Metric

Notable Features
- Resolution 0.002 mm
- Range 1 mm
- Dial face 0-100-0
- Range per revolution 0.2 mm
- Stem Ø 8 mm, spindle lapped

458-001 Inch

Notable Features
- Graduation 0.0001"
- Range 0.200"
- Dial face 0-5-0
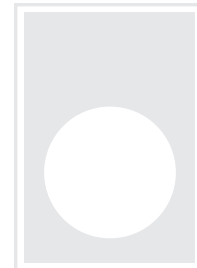- Range per revolution 0.010"
- Stem Ø 3/8", spindle lapped

458-002 Inch

Notable Features
- Graduation 0.0005"
- Range 0.500"
- Dial face 0-25-0
- Range per revolution 0.010"
- Stem Ø 3/8", spindle lapped

450, 451, 458 SERIES
DIAL INDICATORS

450-001 Inch

Notable Features
- Resolution 0.0001"
- Range 0.040"
- Dial face 0-10
- Range per revolution 0.010"
- Stem Ø 8 mm, spindle lapped

450-002 Inch

Notable Features
- Resolution 0.0005"
- Range 0.500"
- Dial face 0-50
- Range per revolution 0.050"
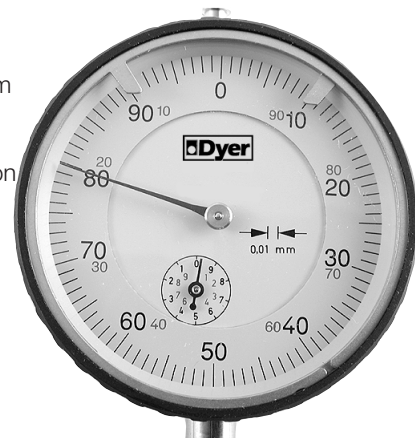- Stem Ø 8 mm, spindle lapped

458-004 Metric

Notable Features
- Resolution 0.01 mm
- Range 10 mm
- Dial face 0-50-0
- Range per revolution 1.0 mm
- Stem Ø 8 mm, spindle lapped

450-012 Metric

Notable Features
- Resolution 0.01 mm
- Range 10 mm
- Dial face 0-100
- Range per revolution 1.0 mm
- Stem Ø 8 mm, spindle lapped

458-015 Inch

Notable Features
- Resolution 0.001"
- Range 0.080"
- Dial face 40-0-40
- Stem Ø 8 mm, spindle lapped

458-020 Metric

Notable Features
- Resolution 0.010 mm
- Range 0.80 mm
- Dial face 40-0-40
- Stem Ø 8 mm, spindle lapped
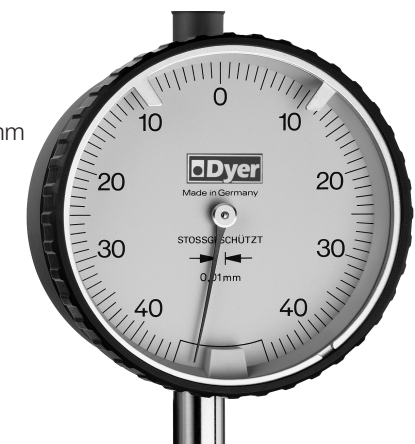
971 SERIES
TRANSDUCER PROBES

971-100 STANDARD Digital Probe Features

- The 971-100 transducer probe has a measuring range of 0.089"-2 (2mm)
- Accuracy of ± 0.000004"-2 (0.0001mm)
- Built for the shop floor. Robust design.
- High thermal stability translates to high accuracies even when used 24-7.

Model	971-100
Measuring Range	0.080"-2 (2mm)
Accuracy	± 0.000004"-2 (± 0.0001mm)
Temperature Range	32° to 140° F (0° to 60° C)
Stem Diameter	8mm
Contact Tip	3mm diameter carbide ball, with M2.5 thread
Cable Length	6.55 feet (2M) – Axial Cable Outlet
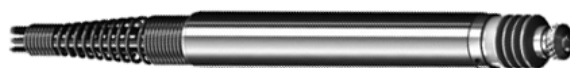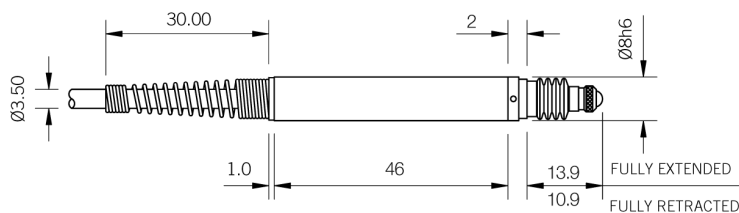
971-100 Probe

971-200 EXTENDED Range Digital Probe Features

- The 971-200 transducer probe has a large measuring range of 0.472"-2 (12mm)
- Accuracy of ± 0.000040"-2 (0.001mm) applies for the entire travel of the measuring probe. Nothing is lost as the travel increases.
- Built for the shop floor. Robust design.
- High thermal stability translates to high accuracies even when used 24-7.

| Model	971-200
Measuring Range	0.472"-2 (12mm)
Accuracy	± 0.000040"-2 (± 0.001mm)
Temperature Range	50° to 104° F (10° to 40° C)
Stem Diameter	8mm
Contact Tip	3mm diameter carbide ball, with M2.5 thread
Cable Length	5 feet (1.5M) – Axial Cable Outlet
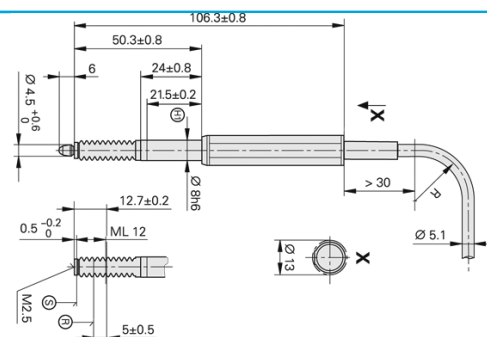
971-200 Probe

971-300 REMOTE Digital Probe Features

- The 971-300 remote transducer probe has a measuring range of 0.080"-2 (2mm)
- Accuracy of ± 0.000040"-2 (0.001mm)
- Built for the shop floor. Robust design.
- High thermal stability translates to high accuracies even when used 24-7.

903-120 Indicator Offered separately

Model	971-300
Measuring Range	0.080"-2 (2mm)
Accuracy	± 0.000040"-2 (± 0.001mm)
Temperature Range	50° to 130° F (10° to 55° C)
Stem Diameter	0.375"-2
Contact Tip	hardened radius tip with 4-48 thread
Cable Length	4 feet (1.2M) – Axial Cable Outlet
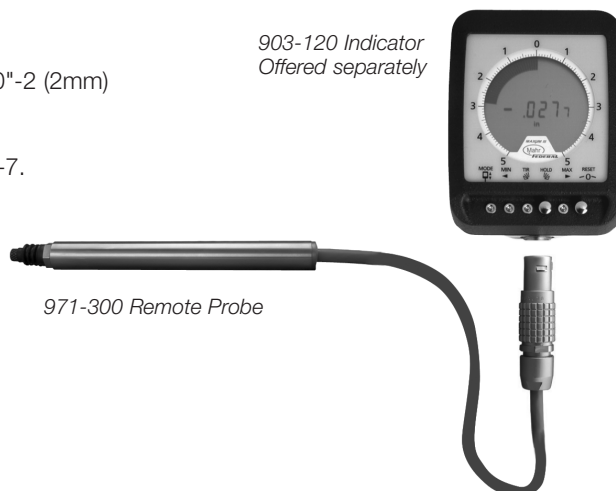
971-300 Remote Probe

981 SERIES
DISPLAY BOX
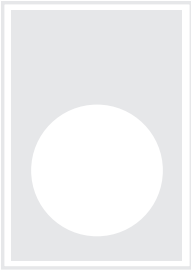
981-200 Digital Readout for one axis measurements

Notable Features
- ⊙ The 981-200 has selectable resolution as low as 0.000020" (0.0005mm)
- ⊙ Can store up to 1000 measured values
- ⊙ Minimum/Maximum value storage
- ⊙ Can calculate mean value and standard deviations
- ⊙ Creates histograms and control charts
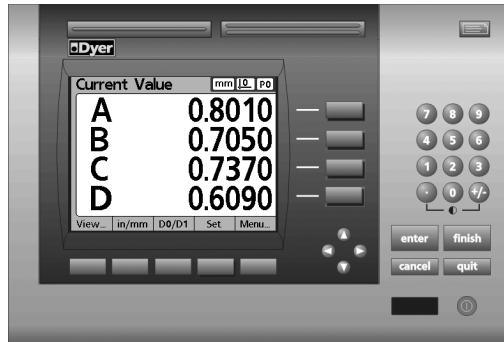- ⊙ Various other statistical functions

*981-200 Box shown
with motorized control device for transducer probe*

Specifications	
Data Interface	Two serial interfaces: **RS-232-C/V.24** 110 to 115 200 baud **USB Type B** (UART)
Operating temperature	0°C–50°C (32°F–122°F)
Storage temperature	-40°C–85°C (-40°F–185°F)
Relative air humidity	Annual mean: < 75% In exceptional cases: <90%
Protection (IEC 60529)	IP 40 rear panel; IP 54 front panel
Weight	Approximately 2.5 kg (5.5 lb)
Housing	Benchtop Design, cast metal housing
Housing dimensions	Width 211 mm Height 112 mm (including feet) Depth 251 mm (including connector)

*981-200 Box shown
with various transducer stands*

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E.7

SECTION E
INDICATION, DIGITAL ELECTRONICS

981 SERIES
DIGITAL READOUTS
VISUAL FEEDBACK

Overview
◉ Up to 8 Encoder or LVDT inputs.
◉ LVDT Signal Conditioning.
◉ Color LCD Display.
◉ Custom Formula.
◉ Data Charts & Graphs.
◉ SPC Database & Calculations.
◉ Assignable dimension tolerances.

Input/Output
◉ Up to eight encoder or full bridge LVDTs.
◉ Provides LVDT signal conditioning.
◉ Encoder inputs; Heidenhain, Mitutoyo, Nikon.
◉ LVDT inputs; Solartron, Marposs, Tesa.
◉ Display up to 16 dimensions.
◉ Parallel/serial port for printing/communications.
◉ Two programmable relay outputs.
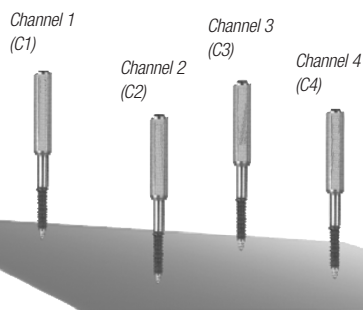
Advanced Calculations
◉ Create custom formulas to track critical dimensions.
◉ Assign formulas to determine max and min dimensions.
◉ Unique "trip function" automates data entry.
◉ Determine run-out of a rotating shaft.
◉ Encoders can be combined algebraically to calculate thickness, flatness and volume.

F = max (C1, C2, C3, ...Cn) - min (C1, C2, C3, ... Cn)

DIGITAL READOUTS 981 SERIES
A GAGING BREAKTHROUGH FOR THE FACTORY FLOOR
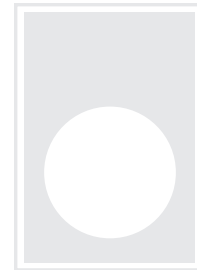
This DRO is a multi-axis metrology display that accepts up to eight discrete inputs. It features intuitive visual displays, helpful audio cues and user-defined formulas. It also reports dynamic Min/Max measurements, provides SPC analysis from an integrated database and includes connectivity to PCs and other peripherals.
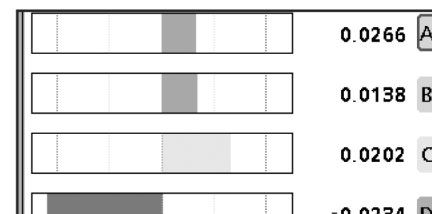
Visual feedback
A highly visible, intuitive and familiar interface with standard color cues. Instantly informs operators of pass/fail performance details for critical part dimensions.
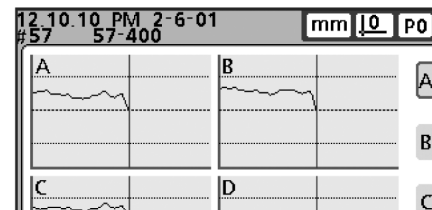
Integrated SPC database
Store, retrieve and manage enormous amounts of measurement data on the shop floor. Check quality control of each gage. Share information locally and globally.
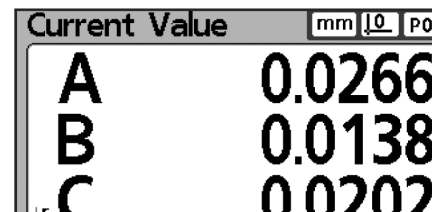
Formulas
Up to 16 output channels apply mathematical formulas to measurement data for on-the-spot part analysis.

981 Series Specifications		Inputs
LCD	6" color	4 and 8-axis input available
Display digit size	.45"	External connections:
Resolution down to	.000004" or .0001 mm	Footswitch
Operating temperature	0°C–45°C	Remote keypad
Enclosure (W × H × D)	11.5" × 7.5" × 2.75"	Touch probe
Base (W × H × D)	10" × 2" × 7.5"	RS-232C serial port
Enclosure weight	5.4 lbs	Parallel port – 16 pin
Base weight	6.2 lbs	**Outputs**
Input voltage range	85 VAC–264 VAC	Parallel port – 16 pin /
Input frequency	43 Hz–63 Hz	Data output to USB stick

Ordering Information

Analog	Order No.
4 Gage Input	**981-004**
8 Gage Inputs	**981-008**

Digital	Order No.
up to 16 Gage Inputs	**981-000**

Standard boxes configured for Heidenhain probes.

SECTION E
INDICATION, DIGITAL ELECTRONICS
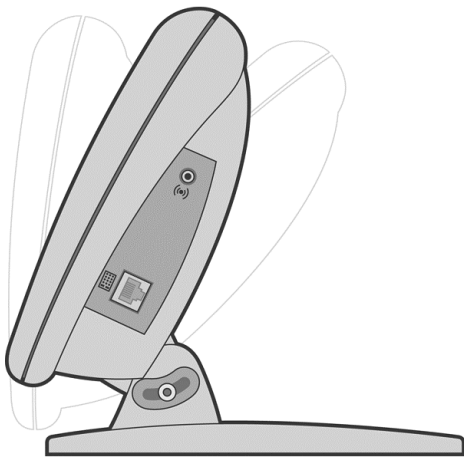
981 SERIES
DIGITAL READOUTS
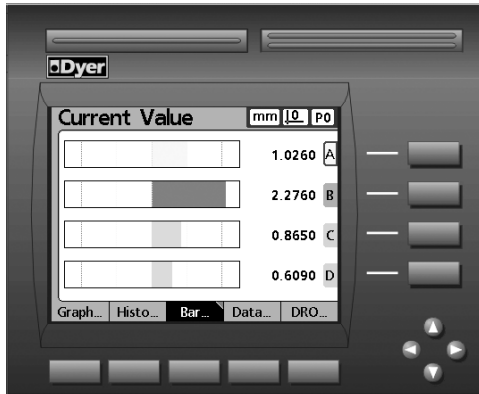
View as Column Gages

Color-coded vertical or horizontal bar graphs
User selectable high/low tolerance limits
User-settable audio warning limits
Display one, four or eight bar graphs for quick
pass/fail notification
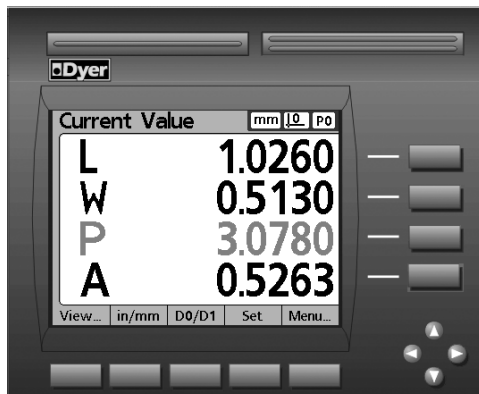
Easy to view DRO

Customizable display to reflect part dimension
Large, easy to read numerical display
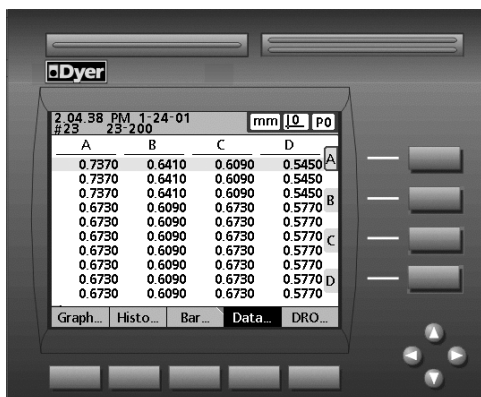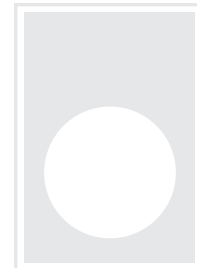Color coded pass/fail with audio alert
Inch/mm toggle

Digital Readouts

◉ Ergonomic design
◉ Intuitive user interface
◉ Familiar, powerful measurement tools
◉ Single- and multi-sensor environments

981 SERIES
DIGITAL READOUTS
DATA VIEWING AND COLLECTION

Data Output

◉ RS232 interface to computer.
◉ Customizable color report print-outs using standard HP ink jet printers.
◉ 2 switching outputs.
◉ Output single record measurement or an entire data report.
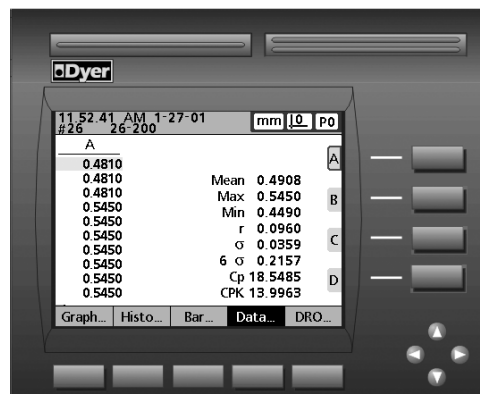
Historical Data Views

◉ Display single or multiple dimensions.
◉ Display SPC statistics.
◉ Each dimension is time and date stamped.
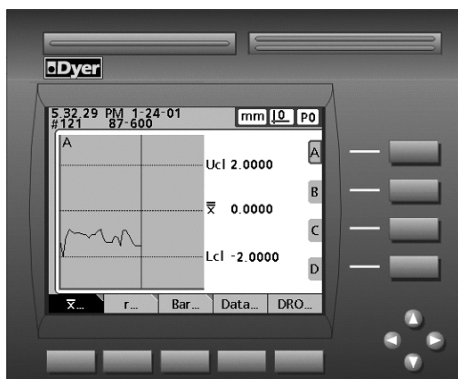
SPC Charts

X-Bar and range charts.
Assign subgroup size.
Set visual warning limits.
Display charts for one, four or eight dimensions on screen.

SPC Charts

◉ Display process capability charts.
◉ Display charts for one, four or eight dimensions on screen.

SECTION E INDICATION, DIGITAL ELECTRONICS

Description	Order No.
2-function footswitch w/ 8' cable	**981-501**
8-function remote keypad w/ 15' cable	**981-502**
8-function remote keypad w/ 25' cable	**981-503**
Dot-matrix 40-column printer w/ RS-232 cables	**981-504**
Dot-matrix 80-column printer w/ RS-232 cables	**981-505**
Printer paper for 40-column printer	**981-506**
9-pin serial cable	**981-507**
Serial printer cable	**981-508**
QC tray stand	**981-509**
Swivel arm-mounting bracket for QC tray stand	**981-510**
QC arm-mounting bracket adapter	**981-511**
Arm-mounting bracket	**981-512**
Fowler's 16-bit Software Wedge	**981-513**
GC-100 instruction manual	**981-514**

Dot-matrix printers
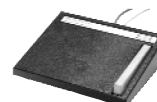
Two-function footswitch

Eight-function remote keypad
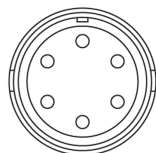
MLG Mitytoyo linear gage		Order No.
6-pin round connector for Mitutoyo linear gages	1-axis	**981-601**
	4-axis	**981-602**
	8-axis	**981-603**
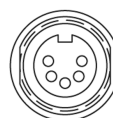
SL-F Solartron		Order No.
Full-bridge LVDT probe interface	1-axis	**981-616**
	4-axis	**981-617**
	8-axis	**981-618**
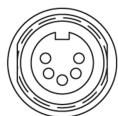
MP-F Marposs		Order No.
Full-bridge LVDT probe interface	1-axis	**981-604**
	4-axis	**981-605**
	8-axis	**981-606**
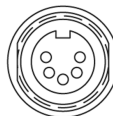
SL-H Solartron		Order No.
Half-bridge HBT probe interface	1-axis	**981-619**
	4-axis	**981-620**
	8-axis	**981-621**
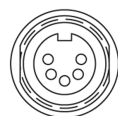
MP-H Marposs		Order No.
Half-bridge HBT probe interface	1-axis	**981-607**
	4-axis	**981-608**
	8-axis	**981-609**
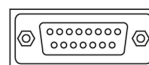
SP Heidenhain Specto		Order No.
15-pin D-sub female connector for 1vp-p Specto gages	1-axis	**n/a**
	2-axis	**n/c**
	3-axis	**n/c**
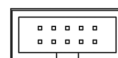
MSR Mitutoyo		Order No.
10-pin rectangular connector for Mitutoyo serial gages	1-axis	**981-610**
	4-axis	**981-611**
	8-axis	**981-612**

TS-F Tesa		Order No.
Full-bridge LVDT probe interface	1-axis	**981-622**
	4-axis	**981-623**
	8-axis	**981-624**
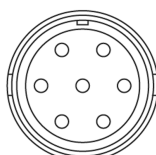
NL Nikon linear scales or Digi-Micro		Order No.
7-pin round female connector; .001mm, .002mm, .004mm, .005mm resolutions	1-axis	**981-613**
	4-axis	**981-614**
	8-axis	**981-615**
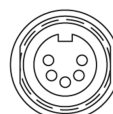
TS-H Tesa		Order No.
Half-bridge HBT probe interface	1-axis	**981-625**
	4-axis	**981-626**
	8-axis	**981-627**

Note: Digi-Micro requires 11B11219 cable

n/c - no charge
n/a - not available

MEASURING APPLICATION SOLUTIONS
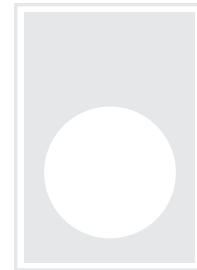
Build Your Own Gage
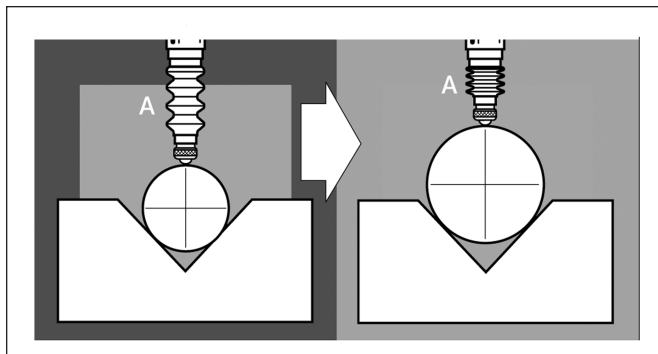Using Dyer Digital Probes, linear encoders and digital readout, you can easily build your own tabletop gage.
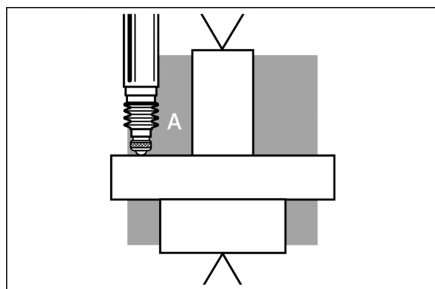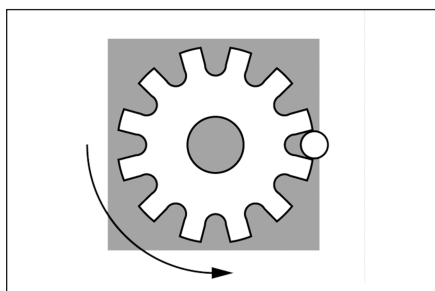
Digital Readout
This is Dyer's most advanced, yet easy-to-use, Digital Readout. "Auto custom" display guides the operator through the setup or Dyer will set up a system for you.
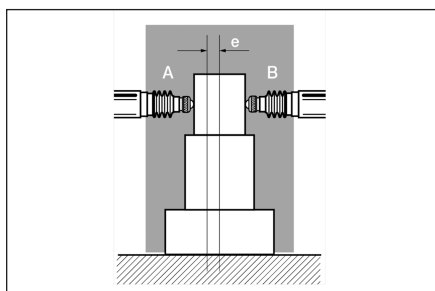
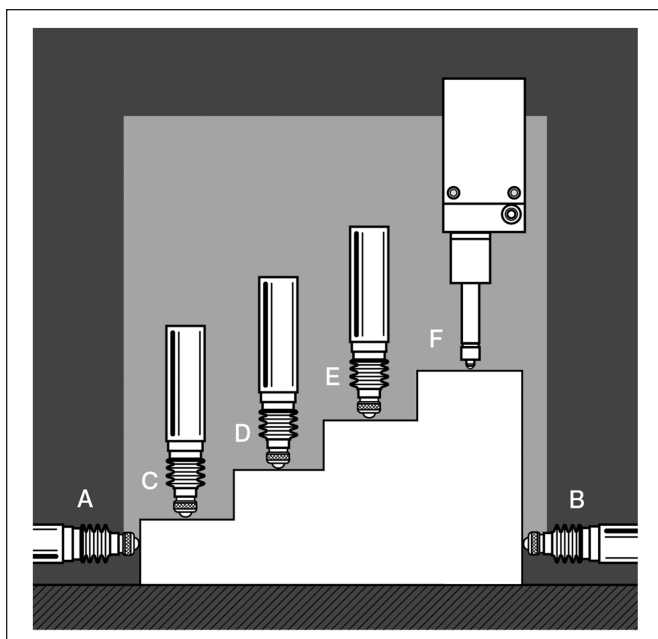### Network Systems
Easily sets up for SPC Data Collection.

TIR max - min measuring

Scaling factor measuring

TIR of gears

Scaling mode

$$e = \frac{A - B}{2}$$

$$\overline{Max - min}$$

Global pass/fail measuring of up to 30 scan channels (up to 30 probes). Each channel can be either an individual probe A + B or A - B and have its own set of limit and preset values.

SECTION E
INDICATION, DIGITAL ELECTRONICS

Build Your Own System

Dyer's Digital Probes and Readouts along with our component fixturing will make the high accuracy measurements you require. Just contact Dyer's office with your measuring applications.
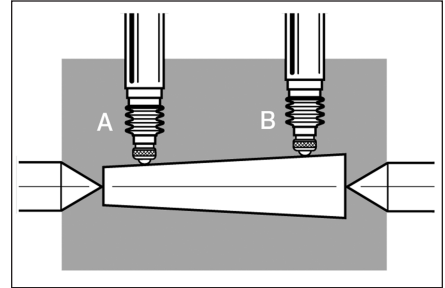
Absolute Measurements

The Dyer Digital Probe is an absolute measuring device, which means when you switch it on it returns to the correct output regardless of movements during the off periods.
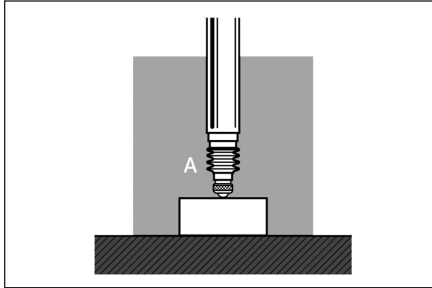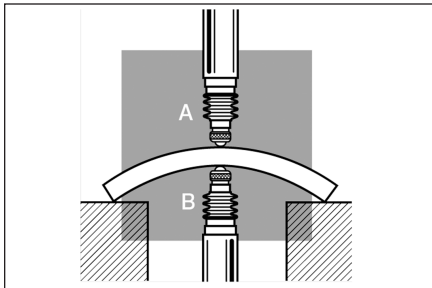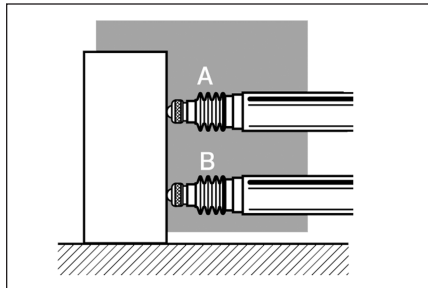

Height or gage block measuring
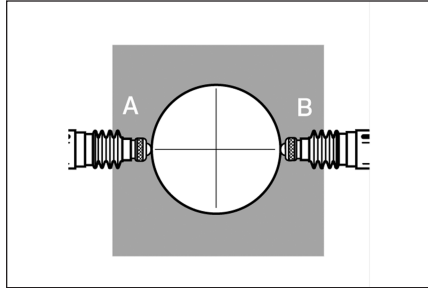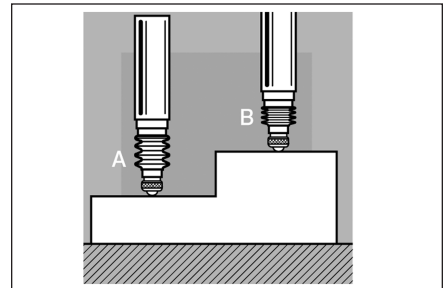

Diameter measuring independent of eccentricity

Taper measuring independent of component dimensions
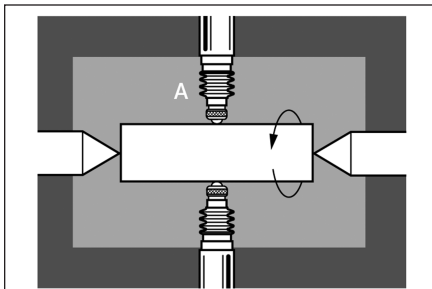

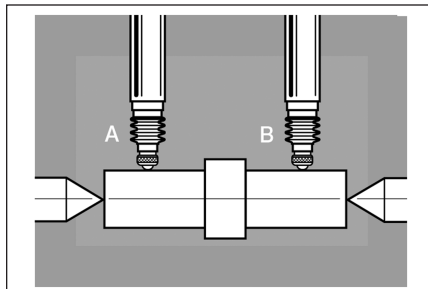*Thickness measuring independent of component shape or location*
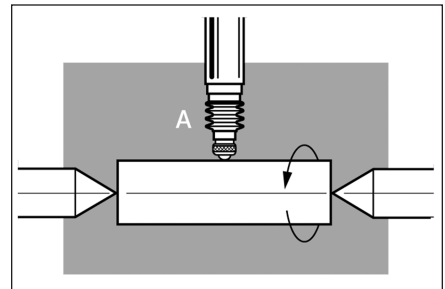

Squareness measuring independent of position

Step height measuring

Max - min or max + min

Measuring alignment of two shafts

Out-of-roundness measuring independent of eccentricity with sum of measurement