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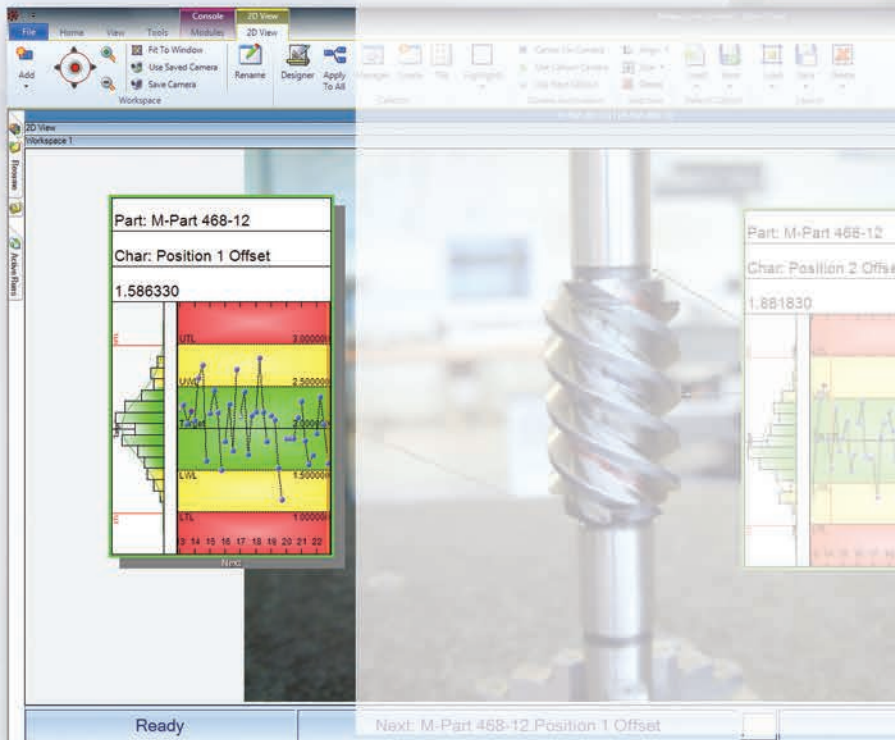
Small Tool Instruments and Data Management



Measurement Data Management

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MeasurLink®

An Integrated Solution for Quality Data Management

Most of Mitutoyo's electronic instruments can output data via optional connecting cables or wireless transmitters & receivers in the form of the Digimatic code. The Digimatic code can also be converted into RS-232C format by any of several available gage multiplexers. In this way, digital data can be sent to PCs for data acquisition and advanced statistical analysis.

As a client/server application, MeasurLink gives you the performance you need through distributed processing. Combined with a multi-user relational database, MeasurLink® delivers a safe and organized data warehousing system making quality data available for viewing and analysis by any member of the production,

engineering, and managerial staff throughout your company. Inspection in the factory produces data for analysis, corrective action, and various reporting needs. As the backbone of your quality efforts, MeasurLink® is guaranteed to reduce your production costs and increase your bottom line.

Scalable Network

MeasurLink® is capable of linking and managing multiple "islands" of inspection into a common database of part information, statistical data, gage information, processes, etc. Information is shared across an entire manufacturing facility.



MeasurLink 7 System Requirements

Database Management System (DBMS) Requirements

MeasurLink 7 ships with a copy of Microsoft® SQL Server Express Edition 2008 R2, this can be for a standalone or a workgroup installation. MeasurLink 7 also supports Microsoft® SQL Server 2005 all editions or newer.

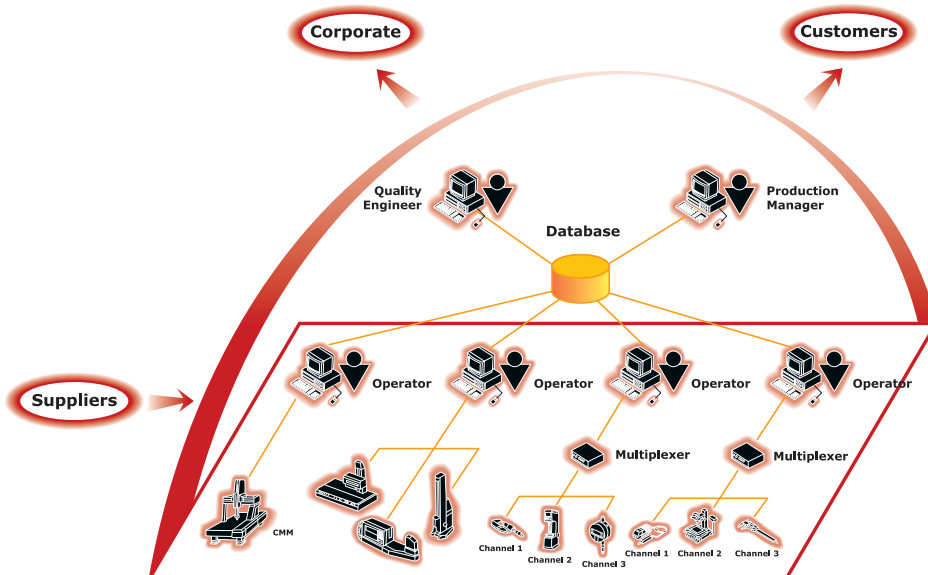
Operating System Requirements

All MeasurLink 7 products are supported on the following Microsoft® Windows Operating System versions:

- All Windows® XP SP3 versions
- All Windows® Vista SP2 versions
- All Windows® 7 versions
- Both 32bit and 64bit operating systems supported



Microsoft Partner



The Manufacturing Process with **MeasurLink®**

MeasurLink Suite of Software

MeasurLink is an easy-to use, Windows-based family of quality data management software applications. MeasurLink combines real-time data acquisition, on-line statistical analysis, integrated networking, and quality information sharing into a comprehensive data management solution.

- **Real-Time**
On-line real-time data collection
- **Process Analyzer**
Analysis of all data
- **Process Manager**
Network monitoring
- **Gage R&R**
Gage repeatability and reproducibility
- **Gage Management**
Gage inventory and calibration control

Note: Upgrade packages are also available. Please contact our sales department for details.

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MeasurLink®

An Integrated Solution for Quality Data Management

User-friendly

Click a gage button and watch the charts update in real-time. This helps the operator stay on top of the process. Begin collecting data in minutes with the newly designed Inspection Wizard.

Data acquisition

Collects data from digital micrometers, calipers, indicators, bore gages, etc. Keyboard entry is a snap. Collect data for one or a million parts.

Comprehensive SPC

Easy to use Control Charts, Histograms, Capability, Detailed statistics, Assignable Causes, Corrective Actions, and Traceability all make this software "best in class".

Variable data

Collect dimensional data (length, width, height, outside diameter, inside diameter weight, etc.). Supports derived features (calculations for run out, volume, true position, etc.)

Attribute data

Collect data from visual inspections (burrs, cracks, dents, missing holes, etc.) to determine the fitness of a part. Track failures using a go/no-go style or count the defects on a characteristic to determine if a part is defective. There is complete flexibility to study the individual characteristics and as a group of them, too.

Engineering specifications

Attach drawings to parts, routines or individual characteristics for viewing. Most file formats are supported as an attachment (e.g. Word, PDF, CAD).

Multimedia aids

Attach movies (AVI, MOV, MPG), sound (WAV) and images (BMP, JPG, TIF) to parts, routines or individual characteristics as instructional aids for an operator.

Revision history

Track specification adjustments and preserve historical data.

Mathematically derived features

Full functioning real-time calculator with standard math functions including square root, exponential, trigonometric, sum, average, max, min, calculations.

Part pictures

View scanned blueprints, digital photographs at a glance. On screen guided sequencing keeps the operator moving to the right feature.

Data tests

Full support of Western Electric and Nelson Tests for pattern recognition in control charts (e.g. extreme point, trend, stratification, oscillation, etc.) along with various alerts for each failed test.

Forced assignable cause

Force Assignable Cause Tags on Inspector during collection if process is out of control. Empower operator to build on existing pick list.

Corrective action plans

Operators choose corrective action as applied to the part or process. Multiple corrective actions can be applied to any subgroup. Empower operator to build on existing Corrective Action list.

Sequenced and random gage input

Flexible data input. Collect data by feature, by part or randomly. Guided sequencing minimizes inspection errors.

Time stamped data

All observation data is marked with the data and time from the computer clock.

Flexible reporting

Build report templates with company logos and free form text. Select and position chart types to customer specification.

Mixed variable/attribute data

Mix your dimensions and non-conformances in the same Inspection Routine. Track defects and defectives along with your dimensional data.

Crystal Reports

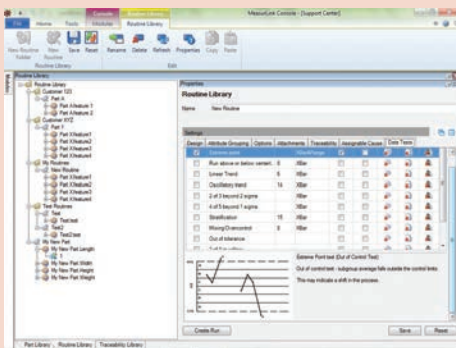
Create your own customized Crystal Reports for use with Part or Run data.

FDA 21CFR Part11 support

Provides support for medical and pharmaceutical manufacturers electronic records, including audit trails, e-signatures (Process Analyzer Professional only) and advanced security.

Inspection wizard

Begin collecting data in 60 seconds with a "Quick Run" by defining features, tolerances and input method.



Easy-to-use MeasurLink® provides to you the most intuitive interface with complete SPC functionality to help you monitor and manage your manufacturing processes. With MeasurLink®, you can easily manage the quality levels of your parts, identify problem areas and apply corrective action to areas in need of attention.

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MeasurLink® Real-Time

On-line Real-Time Data Collection

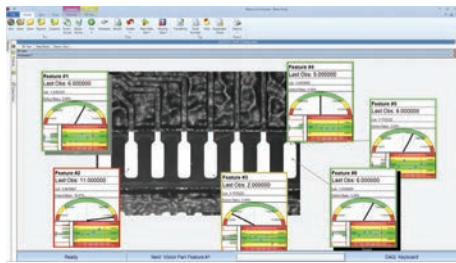
FEATURES

MeasurLink Real-Time performs as a data acquisition clearinghouse by enabling you to connect and acquire data from virtually any measuring device. It supports the full range of metrology technology, including calipers, micrometers, indicators, CMMs, vision systems and more. Select the edition to fit the device and the needs.

Real-Time Standard Edition

Designed for customers who want to acquire and analyze data in real-time and check variable and attribute inspection to maximize production and minimize defects. It has views to allow the user to create Parts, Characteristics with nominal and tolerance and Traceability lists. The data collection interface provides real-time graphics for Run charts, Control charts, Histograms and Statistics. Standard views include Datasheet (observations and charts), Classic View (chart windows), and 2D view (part images with callouts that include charts and statistical data) along with an especially customizable Info View and additional Manager views. Full reporting template functionality is also provided.

Supported data sources: keyboard, RS232 and USB devices.



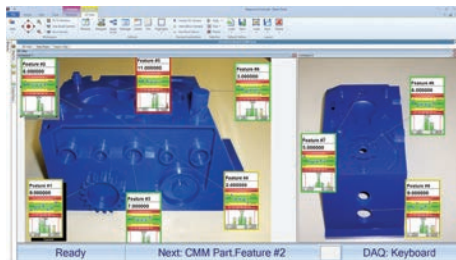
SPECIFICATIONS

Order No.	Description
64AAB177	MeasurLink 7 Real-Time Standard Edition

Real-Time Professional Edition

Enables customers to connect and acquire data from Mitutoyo Coordinate Measuring Machines, Vision and Form Measuring Systems via native integration (DDE). ASCII and QMD (xml-based) file import are also supported. In addition to all of the features supported by **MeasurLink 7 Real-Time Standard Edition**, this application also supports data filters. Full reporting functionality with templates is also provided

Supported data sources: keyboard, RS232 and USB devices, native Mitutoyo integration (DDE), ASCII and QMD (xml-based) file import.

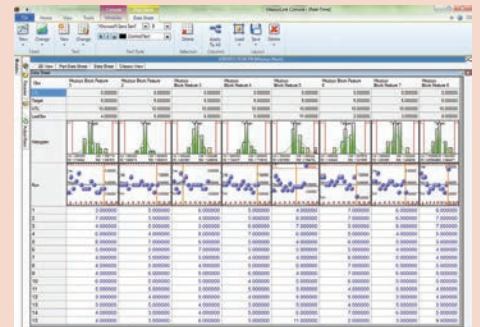


Import templates

Easily create an import template that maps data in a text file to MeasurLink information. Templates are saved to the database for everyone to use and can be added as data sources to data collection stations. An import template can be verified against the source file without adding data to the system.

SPECIFICATIONS

Order No.	Description
64AAB178	MeasurLink 7 Real-Time Professional Edition



MeasurLink is designed to detect and display patterns and provide additional statistical information. Many patterns can be seen appearing on SPC charts, including:

- Cycles
- Trends
- Freaks
- Mixtures
- Grouping or “bunching” of measurements
- Gradual change in level
- Sudden shift in level
- Instability (abnormally large fluctuations)
- Stratification (abnormally small fluctuations)
- Interactions (two or more variables acting together)
- Systematic variation
- Tendency of one chart to follow another

Direct data transfer

Collect data into MeasurLink from Mitutoyo capital equipment running Mitutoyo Software that is MeasurLink enabled. This provides a tighter and more robust interface than importing data from files.

Filter data

All data collected within a Real-Time run is related. Often, especially for runs containing a large volume of subgroups, requests are made for subsets of data that are further related from the entire run's population. MeasurLink provides robust filtering capabilities to comply with these requests.

Import data

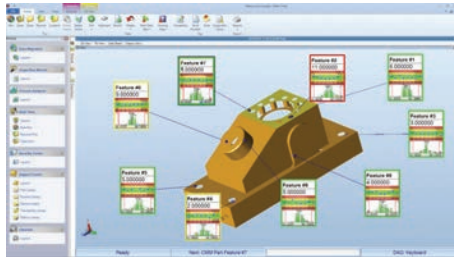
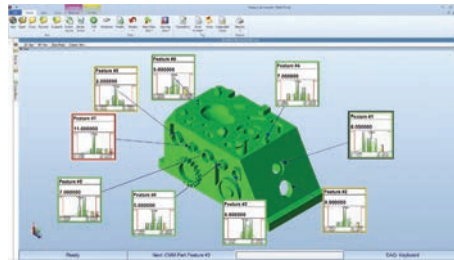
When set up as a data source, import templates are readily available to the operator, or periodic imports can be executed.

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Real-Time Professional 3D Edition

Designed for customers who wish to collect data using the Hoops 3D graphics view, in addition to all features offered by MeasurLink 7 Real-Time Professional Edition. Hoops 3D files can be exported from most CAD systems and provides the operator with a real view of the part. Camera angle and position can be saved for each characteristic providing for an intuitive prompted guided sequencing for the inspector.

Supported data sources: keyboard, RS232, and USB devices, native Mitutoyo integration (DDE), ASCII and QMD (xml-based) file import.



3D view

True three-dimensional model support with Hoops streaming files (*.HSF). Export your part's model from Catia, Solidworks or other CAD software and place callouts in the 3D space.

Flexible callout design

Callouts provide part acceptability at a glance. You can design them the same way as for the two-dimensional view to include charts or statistical information with the ability to size any element inside the callout.

Guided sequence

The display can automatically change during data collection to show the next or last observation point, providing a simple guided sequence for the inspection procedure. By saving a different view for each characteristic to be inspected, you can have the model rotate, pan or zoom to show the operator details of the part.

SPECIFICATIONS

Order No.	Description
64AAB179	MeasurLink 7 Real-Time Professional 3D Edition

Edition Definitions

Function	Real-Time Standard	Real-Time Professional	Real-Time Professional	Process Analyzer Lite	Process Analyzer Professional
	Edition	Edition	3D Edition	Edition	Edition
Classic SPC views	X	X	X	X	X
Datasheet	X	X	X	X	X
2D View	X	X	X	X	X
Manager Views	X	X	X		
Hoops 3D View			X		
Filter		X	X		X
CMM/Vision/Form connectivity		X	X		
Import (ASCII)		X	X		
Audit Trails	X	X	X	X	X
Merge, Copy and Edit Data					X
Scatter Chart					X
Archive Data					X
Electronic Signatures					X

MeasurLink® Process Analyzer

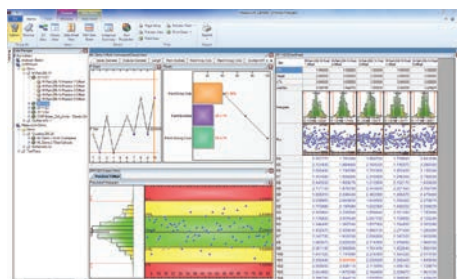
Data Analysis Software for Windows

FEATURES

Process Analyzer is an invaluable tool for your quality team. It gives you the flexibility to analyze your processes, identify problem areas and take corrective action to improve your product's quality. Inspection runs can be sorted by Inspection Station, Routine or Part, and are displayed with the look and feel of the Windows Explorer. Inspection data can be merged, filtered, grouped, charted and printed in the way you want it.

Process Analyzer Lite Edition

Designed for offline viewing of Real-Time data in a networked environment. All views that are available in Real-Time Standard Edition are supported, with the exception of the Manager Views. Full reporting template functionality is also provided.



Review inspection data

Analyze inspection data, view notes and traceability. Open data from different runs to compare the data and process behavior.

Switch between databases

For larger installations that use different databases, the ability to switch the connection

allows an engineer to analyze data from all sources.

Tree control navigation

Self organized inspection data provided in an easy to use "navigation tree". Sort data by Station or Inspection Routine, part, year, month or day.

Reporting

Reporting is made easy through the use of a "what you see is what you get" style of template creation that allows you to pick chart and data through drag and drop with resizing. Several standard report templates are provided out of the box.

SPECIFICATIONS

Order No.	Description
64AAB180	MeasurLink 7 Process Analyzer Lite Edition

Process Analyzer Professional Edition

Designed for more robust manipulation of Real-Time data in a networked environment using advanced features not available in MeasurLink Process Analyzer Lite Edition. It enables Quality Engineering to slice and dice data in meaningful ways that contribute to quality control initiatives.

For larger installations that use different databases, the ability to switch the connection allows an engineer to analyze data from all sources.



Group, Search and Sort data

View data by part, routine, station, year, month, day. Apply saved filters to data and search for specific traceability or serial number criteria.

Merge Data

Combine lot based or just in time collected data to get a bigger picture of process variation and production quality.

Scatter Plots

Perform correlation studies to identify process interactions.

Electronic Signatures

The e-signatures can be applied to runs only in Process Analyzer Professional. When combined with Audit Trails available in Real-Time, and security is implemented, then MeasurLink provides support for FDA requirements for the Medical and Pharmaceutical Manufacturers.

SPECIFICATIONS

Order No.	Description
64AAB181	MeasurLink 7 Process Analyzer Professional Edition

MeasurLink®

An Integrated Solution for Quality Data Management

MeasurLink Group Licensing

Order No.	Description
64AAB184	MeasurLink 7 Site License

MeasurLink 7 Site License is a bundle package that provides the customer with the ability to install up to and including 30 copies (mixed and matched) of any applications in the MeasurLink 7 suite.

Order No.	Description
64AAB185	MeasurLink 7 Workgroup License

MeasurLink 7 Workgroup License is a bundle package that provides the customer with the ability to install up to and including 15 copies (mixed and matched) of any applications in the MeasurLink 7 suite.

Order No.	Description
64AAB263	MeasurLink 7 Workgroup License – 10 Pack

MeasurLink 7 Workgroup License – 10 Pack is a bundle package that provides the customer with the ability to install up to and including 10 copies (mixed and matched) of any applications in the MeasurLink 7 suite.

Order No.	Description
64AAB264	MeasurLink 7 Workgroup License – 5Pack

MeasurLink 7 Workgroup License – 5 Pack is a bundle package that provides the customer with the ability to install up to and including 5 copies (mixed and matched) of any applications in the MeasurLink 7 suite.

Order No.	Description
64AAB265	MeasurLink 7 Academic License

MeasurLink 7 Academic License a bundle package that provides Universities and Technical Colleges with the ability to install up to and including 20 copies (mixed and matched) of any applications in the MeasurLink 7 suite for educational purposes.

Note: Upgrade packages are also available. Please contact our sales department for details.

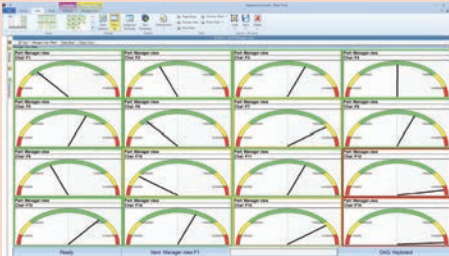
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MeasurLink® Process Manager

Network Monitoring Software for Windows

FEATURES

Real-time monitoring of data as it is collected. Provides the QC/Production Manager with the perfect tool to organize and maintain a shop-wide quality program at a glance.



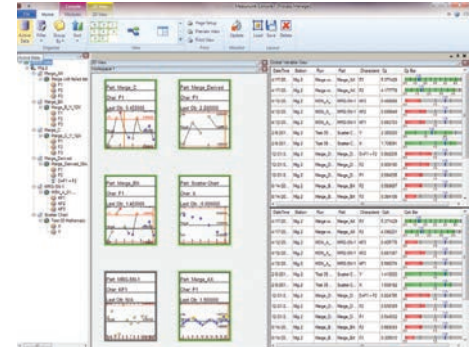
MeasurLink Process Manager displays snapshot windows of characteristics that are currently being collected in MeasurLink Real-Time. The data can be sorted by Station, Process, Capability or Timestamp.

Process Manager Standard Edition

Process Manager provides a method to audit the entire shop floor inspection activity from a single PC. Easily see process information without walking from one inspection area to another by viewing current production across all machines. Show clients your quality operation for the entire facility.

The Quality Control personnel can choose to display only specific stations, parts, routines or even critical characteristics that they are responsible for. Establish Cpk thresholds for acceptability. Drill down for details on certain traceability, assignable cause, failed tests or serial numbers.

Various alerts are provided to recognize and stay up to the minute on production problems. Display the easy to read charts and detailed statistics.



SPECIFICATIONS

Order No.	Description
64AAB182	MeasurLink 7 Process Manager Standard Edition

MeasurLink® Gage R&R

Measurement Systems Analysis

FEATURES

Determines the repeatability and reproducibility, linearity, bias, and stability of inspection systems allowing you to isolate gauging problems.

Gage R&R

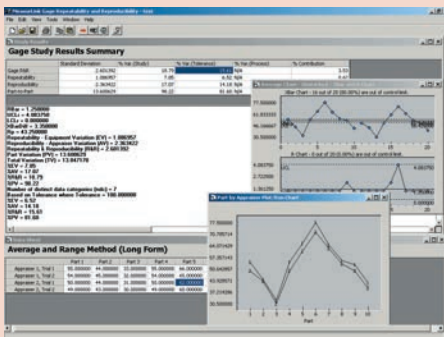
A Microsoft® Windows®-based Gage R&R software designed to the AIAG (Automotive Industry Action Group) Measurement System Analysis standard (MSA3) for ISO/ TS16949.

This software supports up to 25 appraisers per study, 25 trials per appraiser and 25 parts per trial. Each study supports a Gage ID, Gage type, Serial Number, Note, etc. A full search engine is available. This product is also integrated with MeasurLink Gage Management for recall and reporting purposes. MeasurLink Gage R&R works with virtually any gage or inspection system.

- Supports the following AIAG study methods:
 - 1) Range method.
 - 2) Average and range method.
 - 3) Average and range method including within part variation.
 - 4) Analysis of variance method.
 - 5) Short method for attribute gages.
 - 6) Bias study.
 - 7) Linearity study.
 - 8) Stability study.

- Input methods include: keyboard entry, direct gage input and text import.
- Builds a gage inventory and records your R&R study efforts.
- Generates reports that your customers will respect and value.

Provides graphical interpretation of appraiser consistency.



In addition to the standard calculations this software also provides graphical tools for analysis of the measurement system. The Xbar and R chart can show whether there is adequate gage discrimination to record part to part variation in production and if operators are self-consistent. The Part-by-Appraiser plot can show if there is a lack of consistency between operator inspection techniques.

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SPECIFICATIONS

Order No.	Description
64AAS941D	MeasurLink Gage R&R 6

MeasurLink® Gage Management

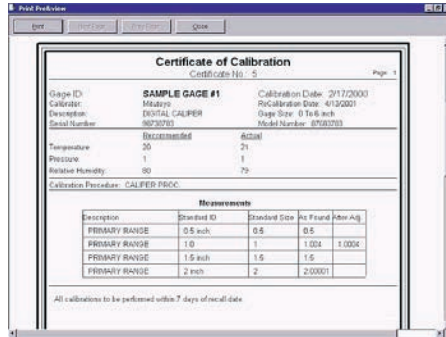
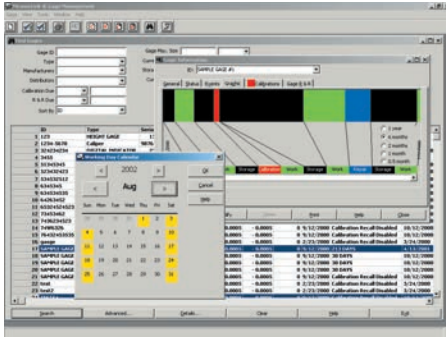
Gage Inventory and Calibration Control

FEATURES

Gage Management is essential for monitoring the calibration history of a gage. Periodic adjustments may be required to bring a gage into specification.

Gage Management

A Microsoft® Windows®-based gage calibration tracking software. It is networkable and shares the same database used by the rest of the MeasurLink® software family. This assists users in developing, maintaining, organizing, and managing information about their gages. Information such as gage in-service dates, calibration recall dates, gage R&R dates and general gage event history is provided in an intuitive interface with complete reporting abilities. MeasurLink® Gage Management also supports the creation of vendor contact and user lists. It comes equipped with a "smart" calendar that allows you to define working days. Calibration procedure setup is easy and incremental response methods help to achieve optimal calibration frequencies. Customized gage label printing is supported.



MeasurLink Gage Management allows customers to build a complete gage (and fixture) inventory. Calibration procedures are established using a sequence of Standards. These procedures are associated with Gage IDs and are used when performing "in-house" calibration.

Calibration is made simple by supporting digital gages. Attribute gage calibration can be performed using any digital gage. Certificates of calibration can be printed for archiving or for distribution by calibration labs.

SPECIFICATIONS

Order No.	Description
64AAS007D	MeasurLink Gage Management 6

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Input Tools

SERIES 264 — Digimatic Gage/PC Data Input Device

FEATURES

- The input tool is an interface enabling you to easily input measurement data from a Mitutoyo measuring instrument with the digimatic output feature to your PC.
- An USB keyboard signal conversion input tool, IT-012U converts measurement data to keyboard signals and directly inputs them to cells in off-the-shelf spreadsheet

software such as Excel. An RS-232C communication input tool, IT-007R is also available to input data through RS-232C communication.

- More accurate measurement is possible using an optional foot switch.

SPECIFICATIONS

Product Code No.	Input Tool for Keyboard 264-005	Input Tool for RS-232C 264-007	Input Tool for USB 264-012-10
Measuring Tools Required*1	Mitutoyo Digimatic measuring tools with SPC output		
PC Requirement	PC compatible, with PS/2 style keyboard interface*2 (Can be also connected to a laptop computer.) Connects to keyboard port on CPU	PC Compatible, (including laptops) with RS-232C Interface Connects to RS-232C port on CPU (D-sub 9-pin connector)	PC Compatible, (including laptops) with USB 2.0 or 1.1 port
Outside Dimensions HxWxD	2.8" x 1.7" x .9" (72 x 44 x 23.5 mm)		
Mass	2.5oz. (70g)(including cable and connector)	3.2oz. (91g)(including cable and connector)	2.6oz. (74g)

*1: Connecting cable (optional accessory) is required for a connection to a Digimatic measuring tool.

*2: Cannot be used for computers that use USB keyboard. When using a IBM Think Pad Series, a commercial keyboard adapter is required. When using AT style keyboard, adapter for conversion is required.



264-005



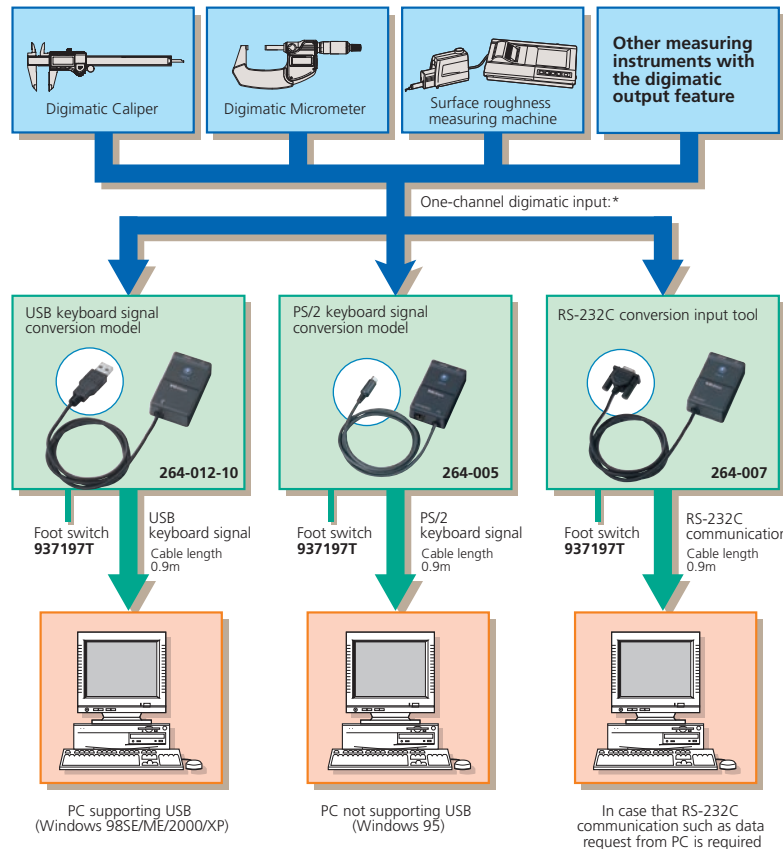
264-012-10



264-007

Optional Accessories

- 937197T: Foot switch
939039: Gage selector



* When you use an optional gage selector 3, you can connect up to three measuring gages and select an input by switching them. When using 264-012, you can connect multiple input tools at the same time with an off-the-shelf USB hub. Simultaneous input, however, is not supported. For cables used to connect each measuring gage and input tool, refer to page A-14.

USB Input Tool Direct: USB-ITN

Our USB Input Tool Direct has been streamlined into a range of dedicated models for each type of measuring instrument.

Data collection can start immediately after connecting the measuring instrument to a computer

Because the input tool is automatically recognized as an *HID keyboard device (a standard Windows driver) just by connecting it to a USB port, no special software is required.

Patent pending (Japan)

*HID (Human Interface Device)

The input tool directly connects the measuring instrument to a USB port on a computer

USB Input Tool Direct for micrometers: USB-ITN-B

The values displayed on the measuring instrument can be sent to the computer just by pressing the data switch.



This is the same result as that of typing numbers using the keyboard and then pressing Enter.

Note on using a foot switch with USB-ITN

The USB-ITPAK and USB-FSW options are required (see below).

If not using optional software the IT-012U input tool can be used with a foot switch.

Although measurement data can be simply loaded directly into an Excel spreadsheet by connecting the instrument and input tool to a computer, using the optional USB-ITPAK software enables time-saving operations and procedures that significantly improve reliability and efficiency.

Measurement data collection software: USB-ITPAK® Order No. 06ADV386

This setup and data collection software is used to input data from one or more measuring instruments (connected by way of USB-ITN) to any Excel sheet. (This software package cannot be used with IT-012U.)

USB-ITPAK



USB dongle



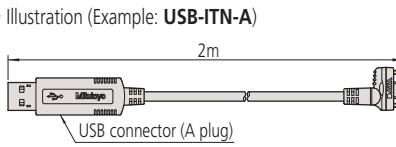
Software use requires USB dongle.

Major features

- Excel input settings: The input destination (a workbook, sheet, or cell), cell-fill direction (right or down), cell-fill interval, and other settings can be specified.
- Measurement method selection: Any of the following three methods can be selected: Sequential measurement, batch measurement, or individual measurement.
- Data input control: Data can be requested, canceled, or skipped by using mouse buttons, function keys, or foot switch.
- Character string input by the USB foot switch adapter, USB-FSW: Any previously specified character string can be input using the foot switch. Examples: *pass* or *fail*
- Number of units that can be connected (total number for both USB-ITN and USB-FSW): Up to 20 units can be connected for Windows Vista or Windows 7, and up to 100 units can be connected for Windows 2000 or Windows XP. However, the above numbers might be less depending on the system configuration.
- Data importation time: About 0.2 to 0.3 seconds per unit. However, this value differs depending on the connected measuring instruments and measurement environment.
- Driver software: The VCP (virtual COM port) drivers for USB-ITN and USB-FSW are individually recognized using a built-in COM number. • Patent pending (Japan)

Major specifications of USB Input Tool Direct

- Output specifications: USB 2.0 or 1.1
- Communication speed: 12 Mbps (full speed)
- Power supply: USB bus power
- Mass: 59 g
- USB 2.0 certification obtained
- Complies with the EMC Directive



Note: It is recommended to use a commercially available USB hub that has USB certification.

USB-ITPAK usage environment

Supported operating systems*	Windows 2000 SP4, Windows XP SP2 or later, Windows Vista, and Windows 7
Supported Excel versions	Excel 2000, 2002, 2003, and 2007
Hard disk	At least 20 MB of free space (required for installation)
CD-ROM drive	Required for installation
USB ports	At least two ports (for the USB dongle and USB-ITN)
Resolution	At least 800 x 600 pixels, and at least 256 displayable colors

- * 64-bit operating systems are not supported.
- The natural language selected in USB-ITPAK must be the same as that used in the operating system.

Codes for the main measuring instruments classified according to the USB Input Tool Direct code, part number, and plug type

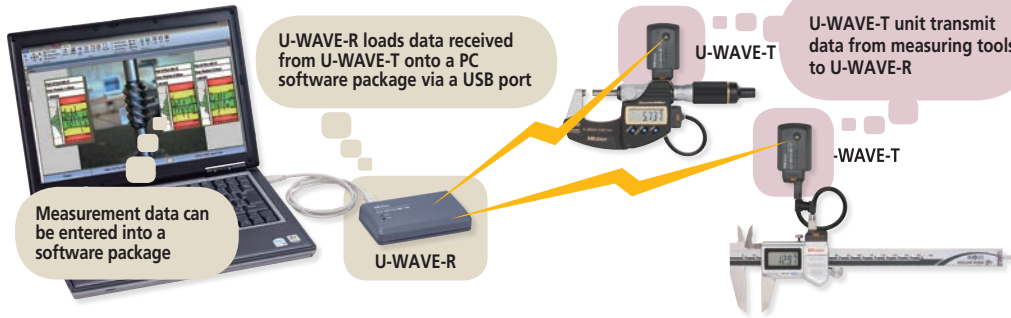
Determine the plug type suitable for your measuring instrument (one of the seven types from **A** to **G**) in the following table, and then select the corresponding USB Input Tool Direct.

Model	USB-ITN-A	USB-ITN-B	USB-ITN-C	USB-ITN-D	USB-ITN-E	USB-ITN-F	USB-ITN-G						
Order No.	06ADV380A	06ADV380B	06ADV380C	06ADV380D	06ADV380E	06ADV380F	06ADV380G						
Whether the existence of a data switch affects usability	Incorporates a data switch, so the tool is usable regardless of whether or not the measuring instrument has a switch.			Does not incorporate a data switch, so an instrument fitted with a switch is required in order to use the instrument alone. (However, the tool can be used with USB-ITPAK.)									
Cable type	A Water-proof with switch	B Water-proof with switch	C With switch	D 10-pin plain	E 6-pin round	F Straight type	G Water-proof straight type						
Illustration of the plug that connects to the measuring instrument													
Socket type on the measuring instrument													
Codes of major compatible measuring instruments	[Digimatic Caliper /Super Caliper] -500 series CD67-S_PM CD-PMX/PM/GM -550/551 series CDC-P_PMX CDN-P_PMX [Digimatic Carbon Fiber Caliper] -552 series CFC-G/GL/GC/GU [Digimatic Depth Gage] -571 series VDS-PMX [Digimatic Scale Unit] -572 series SD-G [Digimatic Exclusive Caliper] -573 series NTD-PMX/PM			[Digimatic Micrometer, QuantuMike] -293 series MDC-MJ/MJB/MJT MDE-MJ [Tubular Inside Micrometer] -337 series IMZ-MJ -339 series IMJ-MJ [Digimatic Micrometer Head] -350 series MHN-MB/MJB/MJNB [Digimatic Exclusive Micrometer] (The end of the mark is -MJ/MJB/M/MB/PM/PMB) [Digimatic Holtest] -468 series HTD-R			[Digimatic Micrometer Head] -164 series MHD-MB [Digimatic Caliper] -500 series CD-CX/C/S_C - 550/ 551 CDC-C/CX, CDN-C/CX [Digimatic Depth Gage] -571 series VDS-DCX/DC [Digimatic Scale Unit] -572 series SD-D/SDV-D [Digimatic Exclusive Caliper] -573 series The end of the mark is -CX/C			Measuring instrument models that incorporate a data switch			
	[Surface Roughness Tester] -178 series SJ-201/210/301/400/500 [Coating Thickness Gage] -179 series DGE-745/755 [Linear Height] -518 series QMH-S [Reference Gage] -515 series HMD-C [Digimatic Indicator] -543 series ID-H [Laser Scan Micrometer] -544 series LSM-9506/6100/6200/6900 [μ-checker] Digital μ-checker (Using the foot switch)				[Digimatic Micrometer] -121 series BD -164 series MHD-M -227 series CLM -293 series MDQ-M MDC-M [Tubular Inside Micrometer] -337 series IMZ-M [Tubular Inside Micrometer] -339 series IMJ-M [Digimatic Holtest] -468 series HTD [Reference Gage] -515 series HME-DM [Borematic] -568 series SBM-C [Hardness Testing Machines] -810 series HM-100/200 HV-100/HH-411 HR-500			[Digimatic Height Gage] -192/570/574 series HDM-A/AX, HD-A/AX HDS-H_C/C HDF-N [Digimatic Caliper] -500/550/551 series CD/CDC/CDN [Digimatic Bore Gage] -511 series CG-D [Digimatic Indicator] -543 series ID-C_X/_RB/_GB -339 series [Digimatic Depth Gage/ Digimatic Thickness Gage] -547 series Digimatic model (ID-CX) [Digimatic Carbon Fiber Caliper] -552 series CFC-P/-L/-C/-U [Digimatic Scale Unit] -572 series SD-E, SDV-E SD-F, SDV-F [Portable Hardness Testing Instruments] -811 series HH-300			[Digimatic Indicator] -543 series ID-N ID-B		
				Measuring instrument models that do not have a data switch									
				[Digimatic Indicator] -543 series ID-F [Linear Gage/Counter] -542 series EF-PRH/ZR, EH-P/Z/S/D EB-P/Z/D EC-D [Litematic] -318 series VL-A/AS/AH	No corresponding models	[Digimatic Indicator] -543 series ID-C/S/C_A [Digimatic Depth Gage/ Digimatic Thickness Gage] -547 series Digimatic model (ID-C) -575 series ID-U	No corresponding models						

U-WAVE

Measurement Data Wireless Communication System

MeasurLink ENABLED
Data Management Software by Mitutoyo

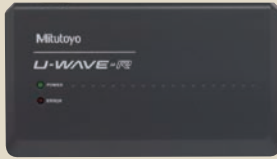


The **U-WAVE** system enables easy wireless data communication from a measuring tool to a PC using the Digimatic protocol. Measurement efficiency is improved by eliminating the long and cumbersome data cables. The user friendly interface allows data to be loaded into any software product that accepts keyboard input, such as Excel* or Notepad.

1 U-WAVE-R · Registered Design (Japan)

Major Specifications of U-WAVE-R

Model Order No.	U-WAVE-R 02AZD810D*
Power supply	USB bus power system
Number of U-WAVE-R units that can be connected to one PC	Up to 16
Number of U-WAVE-T units that can be connected	Up to 100
External dimensions	5.51" x 3.15" x 1.24" (140 x 80 x 31.6mm)
Mass	.29 lbs (130g)



*Detailed information on conformity standards of wireless communication specification is given below.

2 U-WAVE-T · Registered Design (Japan)

U-WAVE-T sends measurement data to U-WAVE-R.

Actual size



Standard accessory: driver

Major specifications of U-WAVE-T

Model Order No.	U-WAVE-T (IP67 model) 02AZD730D*	U-WAVE-T (Buzzer) 02AZD880D*
Protection Rating	IP67	-
Data reception indication	LEDs	LEDs and Buzzer
Power supply	Lithium battery CR2032★1	
Battery life	Approx. 400,000 transmissions	
External dimensions	1.73" x 1.17" x .73" (44 x 29.6 x 18.5 mm)	
Mass	.05 lbs (23g)	

*Detailed information on conformity standards of wireless communication specification is given below.

■ Installation Bracket Kit

Order No. 02AZE200



500 Series Caliper



293 Series Micrometer



543 Series Indicator

Specifications of wireless communication

Conformity standards	·European conformity standards* EN 50371:2002 EN 300 440-1 V1.3.1 EN 300 440-2 V1.1.2 EN 301 489-01 V1.6.1 EN 301 489-03 V1.4.1	Wireless standards	Conform to IEEE802.15.4
	·U.S.A. conformity standards 47 CFR Part 15.247:(Subpart :C) 47 CFR Part 15,(Subpart :B)	Wireless communication distance	Approx. 60ft (within visible range)
·Canada conformity standards RSS-210 (Issue 7) RSS-Gen (Issue 2) ICES 003 (Issue 4)	Wireless communication speed	250 kbps	
	Transmission output	1 mW (0 dBm) or less	
	Modulation method	DS-SS (direct sequence spread spectrum) Resistant to interfering signal or noise.	
	Communication frequency	2.4 GHz band (ISM band: universal frequency)	
	Used band	15 channels (2.405 to 2.475GHz at intervals of 5MHz) The noise search function can avoid interference with other communication devices.	

Note: In accordance with wireless regulations the use of this product is permitted in Japan, Europe (a total of 32 countries including 27 EU members, 4 EFTA members and Turkey), U.S.A., and Canada. This product must not be used in other countries or areas.
· This product is not compatible with the conventional Mu-WAVE, for which communication specifications are different.
* Japan conformity standards: ARIB STD-T66

U-WAVE

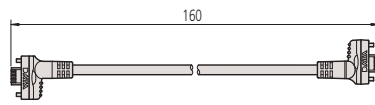
Measurement Data Wireless Communication System

List of U-WAVE-T Connecting Cables

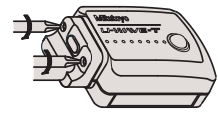
Select one from cables **A** to **G**, referring to the part number of connecting cable for wired connection in your measuring tool catalog or manual. If you are unsure which cable is appropriate, check the cable connectors, the shapes of terminal on the measuring tool side, or the codes of compatible measuring tool side for cables **A** to **G** below. It is not possible to connect to EF and EH counters.

From seven types of cables (**A** to **G**), select one compatible with your measuring tool.

Measuring tool

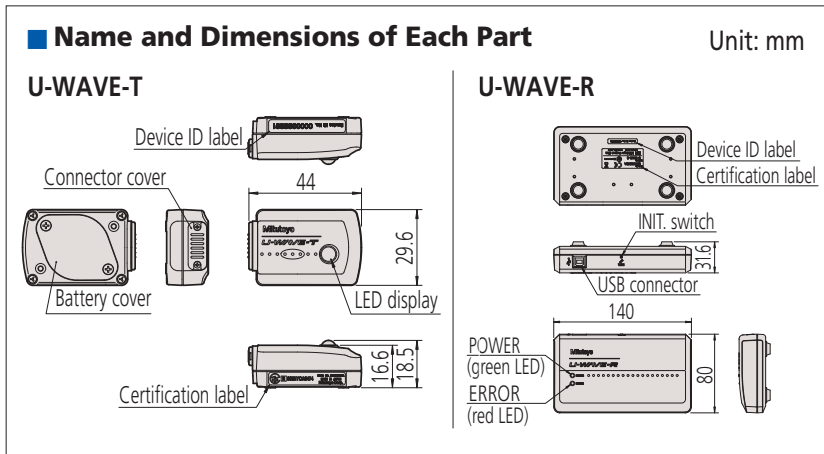


U-WAVE-T



Fasten the connector to **U-WAVE-T** with two screws.

Cable type	A water-proof model with output button	B water-proof model with output button	C With data-out button type	D 10-pin plain type	E 6-pin round	F Plain type straight	G Plain type straight water-proof model
Order No.	02AZD790A	02AZD790B	02AZD790C	02AZD790D	02AZD790E	02AZD790F	02AZD790G
Connector shape on the measuring tool side							
Socket shape on the measuring tool							
Codes of major compatible measuring tools and instruments	[Digimatic Caliper] CD67-S_PM CD-PMX CD-PM/GM CDC-P_PMX CDN-P_PMX CFC-G/GL/GC/GU [Digimatic Caliper] NTD-PMX [Digimatic Depth Gage] VDS-PMX [Digital Scale and DRO Systems] SD-G	[Digimatic Micrometer] MDE-MJ MDC-MJ/MJT [Digimatic Micrometer] The code suffix is -MJ. BLM-M OMV-M OMP-M PDM-M IMP-M VM-M [Digimatic Micrometer Heads] MHN-M/MJ/MJN [Digimatic Holtest] HTD-R [Digimatic Depth Gage] DMC-M	[Digimatic Caliper] CD-CX/-C CD-S_C CDC-CX/C CDN-CX/C [Digimatic Caliper] NTD-CX/C [Digimatic Depth Gage] VDS-DCX [Digital Scale and DRO Systems] SD-D, SDV-D	[Digimatic Indicator] ID-H/F [Linear Height] QMH-S [Linear Gage/Counter] EB,EC-D [μ-checker] Digital μ-checker [Laser Scan Micrometer] LSM-9506 [Reference Gage] HDM-C [Coating Thickness Gage] DGE-745/755 [Form Measurement] SJ-201/301/401	[Digimatic Micrometer] MDQ-M MDC-M CLM1-QM/DK PDM-QM PMU-DM BD-M [Digimatic Holtest] HTD [Reference Gage] HDM-DM [Hardness Testing Machines] HM-100/200 HV-100 HR-500 HH-411	[Digimatic Caliper] CD, CFC-P/-L/-C/-U [Digimatic Height Gages] HD-AX, HDM-AX HDS-H_C/-C HDM-A HDF-N [Digimatic Indicator] ID-C/_RB/_A/_GB ID-S/U [Digimatic Depth Gage] Digimatic model (ID-C) [Digital Scale and DRO Systems] SD-E, SDV-E SD-F, SDV-F [Portable Hardness Testing Instruments] HH-300	[Digimatic Indicator] ID-N ID-B
Reference Order No. of connecting cable	1m 05CZA624 2m 05CZA625	05CZA662 05CZA663	959149 959150	936937 965014	937387 965013	905338 905409	21EAA194 21EAA190



Note on Wireless Communication Environment

Although the communication range for **U-WAVE** is approximately 60ft line-of-sight, performance may be affected by obstacles or environmental factors.

Items that may cause communication errors

Item	Contents
Concrete wall	Communication is not possible into a room completely enclosed.
Metal partition	Communication speed may drop or communication may be interrupted.
Wireless LAN, communication device such as ZigBee Bluetooth, and microwave oven	Communication speed may drop or communication may be interrupted. Maintain the set frequency and installation distance if at all possible.
Medical instrument	Do not use this product near a medical instrument such as a laser knife or electronic scale.

Cautions · Safety Caution:

- Do not use this device near medical equipment that might malfunction due to radio interference.
- Caution on radio law:** This device is certified as a 2.4 GHz band wide-band low-power data communication system based on the Radio Regulations in Japan, Europe, U.S.A. and Canada. It is prohibited by law to disassemble or modify this device or peel off the certification label from it.

Multiplexers – MIG-2B, MIG-4A

SERIES 982 — Digimatic/RS-232C Interface Unit

FEATURES

- A measurement data transfer device, multiplexer MIG-2B and MIG-4A converts digimatic output measurement data to RS-232C and outputs it to an external device such as PC.
- Up to eight/four measuring instruments with the digimatic output feature can be connected.
- Units can be daisy-chained to meet any size needs.
- MIG-4A includes toggle switch for each input.

MIG-4A



982-548-10A
Front view



982-548-10A
Back view

MIG-2B



982-547-10A
Front view



982-547-10A
Back view

SPECIFICATIONS

Model No.	MIG-2B	MIG-4A
Order No.	982-547-10A	982-548-10A
Gage Capacity	8	4
Dimension (mm) W x D x H	146 x 150 x 45	146 x 150 x 70
Mass (g)	540	710

Technical Data

Data output: Via RS-232C interface

Default Configuration

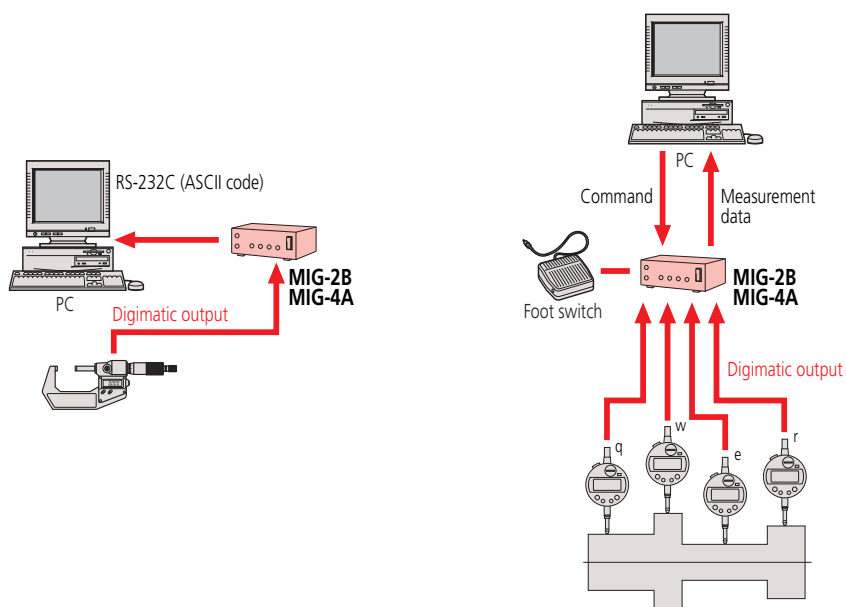
Data length: 8 bits
Start bit: 1 bit
Stop bit: 1 bit
Parity check: None
Baud rate: 4800

Standard Accessory

526688A: AC Adapter
RS232C: Cable (1.5m / 6Fz)

Optional Accessories

937179T: Foot switch

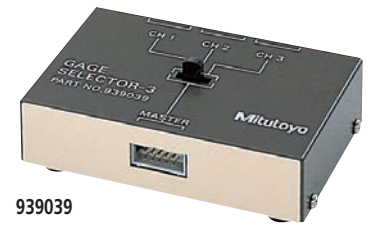


Gage Selector 3

3-channel Switching Box for Data Transmission

FEATURES

- 3 Digimatic gages can be connected.
- You can specify the gage which outputs the data with the channel switch.

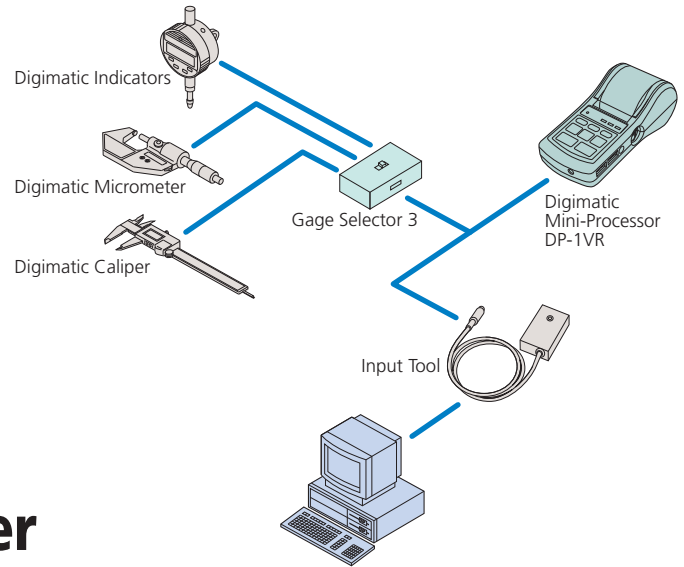


939039

SPECIFICATIONS

Order No.	Description
939039:	Gage Selector 3

Examples of Connections



EC Counter

SERIES 542 — Assembly Type Display Unit

FEATURES

- Compact panel mounting type and DIN size. It can be easily incorporated into each system.

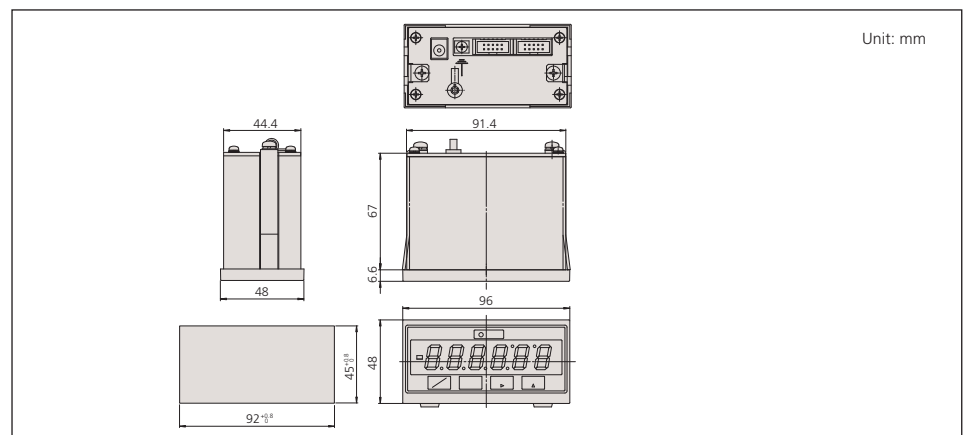


542-007A

SPECIFICATIONS

Order No.	Description
542-007A	EC Counter

DIMENSIONS



Technical Data

Connection: Up to three gages
 Signal: Digimatic code format
 Connection: Bidirectional
 External dimensions (W x D x H): 100 x 70 x 33mm

Technical Data

Applicable gage: LGD, LGS, All SPC output gages
 Resolution: .00005"/.0001"/0.001mm,
 .0005"/.001"/0.01mm
 No. of gage input: 1
 Display: 6-digit LED and a negative [-] sign
 Function: Preset
 GO/±NG judgment
 Output (open-collector): 3-step limit signal, Normal signal
 External control: Preset, Data hold
 Power supply: Via AC adaptor
 Dimensions (W x D x H): 96 x 48 x 84.6mm
 Mass: 50g

Standard Accessory

06AEG302JA: AC Adapter

DP-1VR

SERIES 264 — Digimatic Mini-Processor

FEATURES

- This is a palm-sized printer used to print measurement data from the digimatic gage or to perform statistical analysis.
- This printer offers excellent functionality. You can use it not only to print measurement data, perform a variety of statistical analyses, and draw a histogram or D chart but also to perform complicated operations for X-R control chart.

- Equipped with RS-232C output and GO/NG judgment output as standard functions, this processor ensures high reliability as an advanced quality inspection machine.
- The line thermal printer enables fast and quiet printing.

SPECIFICATIONS

Order No.	Description
264-504-5A	DP - 1VR



264-504-5A

Technical Data

Printing method: Thermal line printer
 Printing dot: 384dot (8dot/mm)
 Printing speed: 6.5mm/s (using AC adapter)
 Printing paper: 48mm
 Printing line: Approx. 6500 lines for large characters
 Approx. 12000 lines for normal characters
 Processing capacity: 9999 data (mode 1/2/3)
 100000 data (mode 0)
 Printing data: Measurement data, GO/±NG judgment, No. of data, Max/min value, Range, Average, Standard deviation, No. of defective, Fraction defective, Process capability index, Histogram, D-chart, Control chart generation for Xd-bar and control limit data, date and time
 Output function: Output the measuring data (RS232C) or GO/±NG judgment
 Input timer: 0.25s, 1s, 5s, 30s, 1min, 30min, 60min
 Power: AC adapter 6V
 Electric battery: LR6 (alkaline), Ni-Mh (AA size)
 Battery life: 10 years (clock battery), 10000 lines (1600mA 1time/5 sec. using the nickel hydrofluoric battery)
 Dimensions (W x D x H): 94 x 201 x 75.2mm
 Mass: 390g

Standard Accessory

06AEG302JA: AC Adapter

Optional Accessories

09EAA084*: RS-232C changing cable (1m, 9pin)

965516*: GO/±NG judgment cable

937179T: Foot switch

09EAA082: (10 rolls)

*It is impossible to use the both RS-232C cable and GO/±NG judgment cable at the same time.



Mode 0:
Record the measurement data and tolerance judgment.

Mode 1:
Record the measurement data, statistical analysis and histogram.

Mode 2:
A "D-chart" can be used to describe measurement data displacement visually. It's also possible to record the measurement data, statistical analysis and histogram at the same time.

Mode 3:
Automatically record the various calculation results to make a X-R control chart.

SPC Connecting Cables

- These cables are used to output measurement data from the digimatic gage with the output feature to the digimatic mini processor, digimatic display unit, multiplexer or other device.
- Cables of one or two meters are available.
- Note that the shape of connector differs depending on the model.

Input plug to Data Processor			
Order No.		Applicable gages	
Straight type		ALL CALIPERS WITHOUT ABSOLUTE ENCODER Height Gage 570-2XX, 192-6XX, 192-67X Indicators 575-XXX, 543-6XX, 543-2XX, 543-4XX Depth Gages 547-21X, 547-25X, 571-2XX Scale Unit 572-XXX Thickness Gages 547-3XX, 547-4XX	
905338: 1m (40") 905409: 2m (80") 64AAA016: 3m (120") 64AAA017: 5m (200")			
Back type			
905689: 1m (40") 905690: 2m (80")			
Right type			
905691: 1m (40") 905692: 2m (80")			
Left type			
905693: 1m (40") 905694: 2m (80")			
With data out switch type			ALL DIGIMATIC CALIPERS WITH ABSOLUTE ENCODER Height Gage 570-2XX Depth Gages 571-2XX Scale Unit 572-XXX
959149: 1m (40") 959150: 2m (80") 64AAA074: 3m (120") 64AAA075: 5m (200")			
With data out switch type		Coolant Proof Caliper 500-68X, 500-76X, 500-78X. Coolant Proof Digimatic scale units 572-61X.	
05CZA624: 1m (40") 05CZA625: 2m (80")			
With data out switch type		Digimatic Micrometer IP65	
05CZA662: 1m (40") 05CZA663: 2m (80")			
6 pins type		ALL MICROMETERS (not for IP65 mics) Indicators 543-11X, 543-13X, 543-14X, 543-18X, 543-17X Holtest 468-2XX, 468-9XX Micrometer Head 164-162, 164-172, 350-71X, 329-71X Boremetrics 568-XXX Others Mikematic, Quickmike Bench Mike 121-XXX	
937387: 1m (40") 965013: 2m (80") 64AAA026: 3m (120") 64AAA027: 5m (200")			
10 pins type		Indicators 543-5XX MU-Checkers 519-4XX, 519-621A MU-Gages 179-204, 179-205, 179-206 Display 542-022-5A, 542-032-5A, 542-036-5A Display 572-011A, 572-031A Linear Height 518-314A, 518-315A Litematic 318-202A, 318-204A Heightmatic 57X SERIES. Digi Derm 179-7XX Hardness Tester (Micro Hardness Type)	
936937: 1m (40") 965014: 2m (80") 64AAA020: 3m (120") 64AAA021: 5m (200")			
Digimatic cable extension adapter 02ADF640		DIGIMATIC CABLE EXTENSION ADAPTER Need 936937 or 965014 to the Data Processor	
			