Measurement Data Input Unit

USB Input Tool Series
Still entering measurement results manually into a check sheet?

- Read scale
- Enter values into check sheet
- Use the keyboard to create inspection certificate

Misreadings may occur
Wrong values may be entered
Typing mistakes may occur

Using digital measuring tools together with the USB Input Tool makes recording measurement results more efficient and improves data reliability.

Digimatic micrometer
USB Input Tool IT-016U (Requires separate connecting cable)

Send to computer at the push of a button

Same result as when typing numbers with the keyboard and then pressing Enter.

Connecting cable (optional)
Refer to page 4, 9, and 10 for details.
The USB Input Tool lets you send measurement data to a computer at the simple push of a button! No need for initial setup, and cost is eminently affordable!

Simply connect to the USB port of a computer

Without needing special software or initial setup, the data can be used in any general-purpose software application that accepts numeric input from a keyboard, such as Excel, Word, Notepad, etc. The USB Input Tool will be recognized as a USB numeric keypad. When connected, the USB Input Tool is recognized automatically as an HID (Human Interface Device) keyboard (using the standard Windows driver).

The USB Input Tool requires no setup and is very reasonably priced. It is ideal for moving away from manual recording and for maintaining quality records in electronic form, which are vital first steps towards higher inspection efficiency and reliability. An existing measuring tool with digimatic output can be used. Simply purchase the USB Input Tool and use it to send measurement data to a personal computer (a connecting cable is required depending on the models). Two different series are available in various configurations to fit different application scenarios.

Use your existing measuring tool equipped with a data output

You may already own a measuring tool that can be used. See the photographs below to check whether it has a Digimatic output connector. The connector type may be different, depending on the measuring tool model. See the list showing measuring tool compatibility on pages 10-11.
Merely connecting this tool to a PC allows measurement data to be input to Excel, Memo Pad, etc.
Two types of USB input tools are available depending on your purpose.

(1) USB Input Tool IT-016U Released in Jan. 2015

Box type equipped with a built-in data switch and an add-on foot switch terminal
This interface box is provided with a larger data input switch compared with the old type (from ø4mm to ø18mm), improving operability.
The switch has also widely increased in durability. (From million times to ten million times)

Easy data input is enabled by connecting the foot switch (optional). (The foot switch terminal comes standard.)

NOTE:
If your tool is renewed from IT-012U, note that some instrument models may not be connected.
Please refer to Note 2 in the List of Compatible Instruments on page 11.

(2) USB Input Tool Direct USB-ITN (7 Models) Released in Jun. 2010

Slimline, cable-integrated type
This tool is a cable-integrated type slimmed down by eliminating the interface box. It provides simple connecting to a PC and smooth cable routing, thus improving workability.

<Caution in combining with an instrument>
USB-ITN-D/E/F/G type which has no data switch on the connector part of the input tool cannot be used depending on the instrument to be combined.* In this case, use box type IT-016U with a data switch.
* Please refer to Note 1 in the List of Compatible Instruments on page 11.

Combination of IT-016U and Dedicated Option of USB-ITN

The efficiency of recording inspection results in Excel has improved.
For the clients who feel that it is not enough to merely load numeric data into Excel, Mitutoyo has increased the efficiency of inspection task including repeated operations through the combination of optional software USB-ITPAK V2.0 that enables creation of inputting procedure to any Excel sheet.

Usage example in combination with USB-ITPAK V2.0: Efficiency improvement in inspection tasks to be daily performed in the same repeated procedure such as sampling or 100% inspection of mass-produced products
IT-016U/USB-ITN Connection Configuration and main specifications

**Digimatic gages**

- Foot Switch (optional)
- Connecting cable (optional)

**USB Input Tool IT-016U**

**PC**

- USB Input Tool Direct USB-ITN
- USB-ITPAK V2.0 (optional)

**Digimatic caliper**

- Digimatic indicator
- Digimatic micrometer

**External view of IT-016U**

- Terminal for foot switch
- Ø3.5 dipole jack US type (input)
- USB connector
- Micro B receptacle (output)

**USB Input Tool Direct USB-ITN**

- Cable length: 2m, mass: 50g

**USB keyboard signal conversion model**

- Model: IT-016U
- Order No. 264-016

**System Environment**

- Supporting model: PC with USB socket (Type A)
- Software (when single HD is connected): Programs supporting keyboard input (Excel, Word, memo pad, etc.)

**Common specifications**

- Output compatibility: USB2.0 or USB1.0
- Supporting driver software:
  1. When using standalone: HID keyboard device
  2. When using with USB-ITPAK V2.0: Communication speed: 12Mbps (Full Speed)
- Power supply: USB bus power
- USB2.0 certificate
- Conforms to EU EMC Directives.

**Measurement Data Collection Software**

- USB-ITPAK V2.0 (optional)
- No. 06AEN846

**Gage selector 3** (optional)

- This selector can connect up to 3 measuring gages and switching is available with the slide switches without changing connecting cables.
- Connecting cable (length 1m) between two input tools is a standard accessory (No. 936937).

**Foot switch** (optional)

- Resin type: No. 937179T
- Cable length: 2m

- Mold type: No. 12AAJ088
- Available for both USB-FSW and IT-007R. DP-1VR is not connectable.

Refer to pages 7 to 9 for details.
Input tool for RS-232C communication best suited for communication control of the software!
Control is available by transmitting data request commands via RS-232C communication.

For example, production engineers can create communication programs to load the measurement data by transmitting a command from the PC.

This product is a compact and low-cost RS-232C communication interface, which is convenient when it is installed in a machine tool or dedicated device to feed back measurement data (for connection other than to a PC, a separate power supply is required).

IT-007R Connection Configuration and main specification

### Specifications of IT-007R

- **RS-232C Communication**
  - Output specification: RS-232C compliant
  - Communication method: Full duplex
  - Communication speed: 2400bps (fixed)
  - Bit configuration: Start bit 1
  - Data length 8
  - Stop bit 1
  - Parity: None
  - Flow control: None
  - Home position: DCE (modem definition)
  - Data format: DCE (modem definition)

- **Data format**
  - (1) When data output: DCE
  - (2) Error code output: DCE

- **Foot switch**
  - (optional) resin type
  - No. 937179

- **Gage selector 3**
  - (optional)
  - No. 939039

- **System Environment**
  - Supporting model: PC or sequencer with a serial port (D-sub 9 pin)
  - Note: When connecting to a sequencer, a power supply is required. Due to the restriction of power supply (storage), a second or more input interval is required.

- **Software**
  - A program compatible with the RS-232C communication (such as a hyper terminal) is required. Note: Connecting with USB-ITPAK V2.0 is not available.

- **IT-007R Connection port**
  - D-SUB 9pin female

- **External view of IT-007R**
  - Cable length: 0.9m
  - Mass: 91g (including a cable)

### Foot switch specification and power supply from the PC

<table>
<thead>
<tr>
<th>Pin No.</th>
<th>Symbol</th>
<th>In/out</th>
<th>Description of functions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>N.C.</td>
<td>–</td>
<td>No connecting</td>
</tr>
<tr>
<td>2</td>
<td>RXD</td>
<td>OUT</td>
<td>Data output from the PC</td>
</tr>
<tr>
<td>3</td>
<td>TxD</td>
<td>IN</td>
<td>Data input from the PC</td>
</tr>
<tr>
<td>4</td>
<td>DTR</td>
<td>IN</td>
<td>Data input from the PC to this product</td>
</tr>
<tr>
<td>5</td>
<td>GND</td>
<td>–</td>
<td>Ground</td>
</tr>
<tr>
<td>6</td>
<td>DSR</td>
<td>OUT</td>
<td>+12 V power supply from the PC*</td>
</tr>
<tr>
<td>7</td>
<td>RTS</td>
<td>IN</td>
<td>+12 V power supply from the PC*</td>
</tr>
<tr>
<td>8</td>
<td>CTS</td>
<td>OUT</td>
<td>Not used</td>
</tr>
<tr>
<td>9</td>
<td>N.C.</td>
<td>–</td>
<td>Not used</td>
</tr>
</tbody>
</table>

Note: Connecting with USB-ITPAK V2.0 is not available.

* “4” and “6”, “7” and “8” are short-circuited with each other inside this product.
  * When connecting to a sequencer, a power supply is required. Input voltage: Supplied in the range 6 V - 16 V
  * Power supply terminal: Supplied to pins 4 and 7
  * If the power supply is difficult, please consider to purchase MUX-10F (power supply by AC adapter and connectable with 4 units of Digimatic gages).
Optional

Note: These options are common for IT-016U, USB-ITN, and U-WAVE. They cannot be used with the IT-007R. U-WAVE is measurement data wireless communication system. For the system summary, refer to the U-Wave leaflet.

Measurement data collection software

USB-ITPAK V2.0

Upgraded USB-ITPAK V2.0 now supports U-WAVE, a wireless communication system. Both wired connecting (USB-ITN) and wireless system (U-WAVE) are supported.

New functions of USB-ITPAK V2.0

• Supports the U-WAVE wireless communication system
• Timer input function

Measurement date/time display

• Others: Compatible with Windows 8, 64-bit OS, and Russian included in the operating language selection

USB-ITPAK V2.0 creates a procedure to input data from gages equipped with Digi-matic output to Excel sheets via IT-016U or USB-ITN or U-WAVE. Using together with USB-ITPAK V2.0 will further improve the operational efficiency of repetition inspection work. Best suited for keeping track of inspection data of mass-produced products.

Main features of USB-ITPAK V2.0

• Setting of Microsoft Excel input:
  Designation of where to input (workbook, worksheet, cell range), cursor move (right, down), and others.
• Selection of measuring method (3 modes available)
  (1) Sequential measurement (2) Simultaneous measurement (3) Individual measurement (refer to page 11 for details).
• Data handling
  Commands available: "Data Output Request", "Data Cancel", "Data Skip", "Arbitrary Character Input" (available only after prior registration and with a foot switch)
Command input methods: Pressing a mouse, function key, foot switch, etc. (available only with a foot switch in the discrete measurement mode)
• Number of connectable devices and others
  Connectable devices: (1) IT-016U, (2) USB-ITN, (3) USB-FSW, (4) U-WAVE-R (Each U-WAVE-R can accept measurement data from up to 100 registered instruments)

Order No. Price

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Order No.</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>USB-FSW</td>
<td>06ADV384</td>
<td></td>
</tr>
</tbody>
</table>

A USB dongle must be connected to the PC running the software.

Order No. USB-ITPAK V2.0

USB-ITPAK V2.0 USB dongle

Order No. 06AEN846
Upgrade pricing from V1.0 is not available. Please purchase V2.0.

Order No. Excel versions

- Excel 2000
- Excel 2002
- Excel 2003
- Excel 2007
- Excel 2010
- Excel 2013

Supported Excel


CD-ROM drive

For program installation

Monitor resolution

800x600, 256 colors or more

USB port

2 ports or more for USB dongle and USB-ITN

Compatible OS

Windows 2000 SP4, Windows XP SP2 or later, Windows Vista, Windows7, Windows8, Windows8.1

Simplified Chinese

• Others: Compatible with Windows 8, 64-bit OS, and Russian included in the operating language selection

Language support

• Operation language (15 languages)
  Japanese, English, German, French, Spanish, Italian, Czech, Swedish, Turkish, Polish, Hungarian, Russian, Korean, Chinese (traditional/simplified), and Simplified Chinese

• Operation manual (PDF file)
  Japanese, English, German

• USB ITPAK V2.0 and the PC Operating System must use the same natural language.

This USB adapter for connecting a PC is required when using the Foot Switch (No. 937179T) in USB-ITN.

A dedicated VCP driver* for this adapter is included in USB-ITPAK V2.0.

Order No. Price

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Order No.</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>USB-FSW</td>
<td>06ADV384</td>
<td></td>
</tr>
</tbody>
</table>

Foot Switch Adapter USB-FSW

Overall length: 160mm

Foot switch (No. 937179T)

External view

Unit:mm

MONO(Ø3.5)2-CON.MINIATURE PLUG US Type

Output data by causing a contact signal from the Foot Switch.

<Tip> Refer to the USB-ITPAK V2.0 user’s manual on the Mitutoyo website. http://www.mitutoyo.co.jp/eng/
Optional

Note: These options are common for IT-016U, SB-ITN and U-WAVE. They cannot be used with the IT-007R.

USB-ITPAK V2.0

Measurement examples: 3 measurement methods by USB-ITPAK V2.0 are explained with example below.

<TIP> User’s manual for USB-ITPAK V2.0 is posted on our website with details of setting procedures, etc.
http://www.mitutoyo.co.jp/eng/

Sequential measurement

Measurement values are input one by one according to a procedure previously defined by using one or more Digimatic gages (via IT-016U or USB-ITN or U-WAVE).

<Measurement examples>
Outside diameter in X and Y directions and length H for the workpiece below are measured in order for 5 pieces and finally perform OK/NG judgement for external view by visual check (scratches, color unevenness, etc.).

1. Measure outside diameter at X and Y of 5 workpieces with a micrometer.
2. Measure length H of 5 workpieces.
3. Inspect external view to check if there are any scratches or color shading and input “OK” or “NG”.

When a measuring procedure is executed, a window (as below) is displayed. “Data request*”, “Data cancel*”, “Data skip*”, “Aborting”, “Complete” can be specified.
* These operations can be allocated to the function key or foot switch (via USB-FSW).

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Setting</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>2</td>
<td>Dimension X</td>
<td>10.025</td>
<td>10.033</td>
<td>9.964</td>
<td>10.031</td>
</tr>
<tr>
<td>3</td>
<td>Dimension Y</td>
<td>9.982</td>
<td>10.017</td>
<td>10.008</td>
<td>9.996</td>
</tr>
<tr>
<td>4</td>
<td>Dimension H</td>
<td>29.97</td>
<td>30.02</td>
<td>30.07</td>
<td>29.96</td>
</tr>
<tr>
<td>5</td>
<td>External Appearance</td>
<td>OK</td>
<td>OK</td>
<td>NG</td>
<td></td>
</tr>
</tbody>
</table>

Cell movement direction after inputting data (down and right)

Carriage return (Low, column)

Microsoft Excel sheet previously specified

Input range of micrometer (B2 to F3)

Input range of caliper (B4 to F4)

Input range of visual judgment (B5 to F5)

Cell that will receive next input is highlighted in green
Several operators input measurement data asynchronously according to individually defined procedures (where to input, move direction, etc.) from each Digimatic gage via IT-016U or USB-ITN or U-WAVE.

**Notes on using USB-ITPAK V2.0:**
Do not merge the cells in the specified range as a measurement data input. During measurement, the Microsoft Excel worksheet cannot be modified in any way apart from entering data. If you need to modify the sheet, it is necessary to abort or finish the measurement.
# Measuring Tool Compatibility List

## Compatibility of USB-ITN and connecting cables with measuring tools

### USB Input Tool Direct

<table>
<thead>
<tr>
<th>USB-ITN</th>
<th>Connector type</th>
<th>(A) Water-proof type with output button</th>
<th>(B) Water-proof type with output button</th>
<th>(C) Straight type with output button</th>
<th>(CR) L type with output switch (cable outlet is right)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Model No. Order No.</td>
<td>USB-ITN-A 06ADV380A</td>
<td>USB-ITN-B 06ADV380B</td>
<td>USB-ITN-C 06ADV380C</td>
<td>No applicable models USB-ITN-C is available Refer to the following figure.</td>
</tr>
</tbody>
</table>

### IT-016U/IT-007R/DP-1VR/MUX-10F/EC Counter

Select a cable whose gage connector fits the Digimatic port on your gage.

<table>
<thead>
<tr>
<th>Connector type</th>
<th>(A) Water-proof type with output button</th>
<th>(B) Water-proof type with output button</th>
<th>(C) Straight type with output button</th>
<th>(CR) L type with output switch (cable outlet is right)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Order No. 1m</td>
<td>05CZA624</td>
<td>05CZA662</td>
<td>959149</td>
<td>04AZB512</td>
</tr>
<tr>
<td>Order No. 2m</td>
<td>05CZA625</td>
<td>05CZA663</td>
<td>959150</td>
<td>04AZB513</td>
</tr>
</tbody>
</table>

### Gage connectors on data cable

- **Water-proof** type with output button
- **Water-proof** type with output button
- **Straight** type with output button
- **L type with output switch (cable outlet is right)**

### Digimatic ports on gage

Please note that some high-precision Digimatic gages are capable of displaying the measurement result to more than 6 digits. However, according to the Digimatic output specification, the result may be output in 6 digits only.

- **Digimatic caliper**
  - 500-776/500-777, etc.
  - 500-712/500-713, etc.
  - 500-712/500-714, etc.
  - 550-301-10/550-311-10, etc.
  - 551-301-10/551-311-10, etc.
  - 552-302-10/552-303-10, etc.
  - 552-150-10/552-151-10, etc.
  - 552-155-10/552-156-10, etc.
  - 552-181-10/552-182-10, etc.

- **Digimatic special application caliper**
  - 573-401/573-402, etc.

- **Digimatic depth gage**
  - 571-251-10/571-252-10, etc.

- **Digimatic scale unit**
  - 572-400, 572-601, etc.

- **Digimatic micrometer**
  - 293-100/293-130
  - 293-140/293-141, etc.
  - 293-250-30/293-251-30, etc.
  - 340-251-10/340-252-10
  - 340-252-30/340-253-30, etc.

- **Dedicated micrometers for Digimatic**
  - 422-230-30/422-231-30, etc.
  - 406-250-30/406-251-30, etc.
  - 343-250-30/343-251-30, etc.
  - 309-250-30/309-251-30, etc.

- **Digimatic special application caliper**
  - 573-302-10/573-303-10, etc.
  - 573-181-30/573-182-30, etc.

- **Digimatic micrometer head**
  - 350-251-30/350-261-30, etc.
  - 350-252-30/350-262-30, etc.

- **Digimatic micrometer**
  - 293-582/293-583, etc.
  - 389-514/389-714

- **Digimatic special application caliper**
  - 573-118-10/573-119-10, etc.
  - 573-116-10/573-117-10, etc.
  - 573-195-10/573-196-30, etc.
  - 573-181-30/573-182-30, etc.

- **Digimatic depth gage**
  - 571-203-30/571-204-30, etc.
  - 571-201-30/571-202-30, etc.

- **Digimatic special application caliper**
  - 164-163/164-164

- **Digimatic scale unit**
  - 572-200-30/572-201-30, etc.
  - 572-300-30/572-301-30, etc.

- **Digimatic micrometer head**
  - 164-163/164-164

- **Digimatic caliper**
  - 500-150-30/500-151-30, etc.

- **Digimatic special application caliper**
  - 573-118-10/573-119-10, etc.

- **Digimatic depth gage**
  - 571-203-30/571-204-30, etc.

- **Digimatic scale unit**
  - 572-200-30/572-201-30, etc.

- **Digimatic micrometer head**
  - 164-163/164-164
<table>
<thead>
<tr>
<th>(D) Flat 10-pin type</th>
<th>(E) Flat 10-pin type</th>
<th>(F) Flat 10-pin type</th>
<th>(FB) Flat L-shape (cable outlet is back)</th>
<th>(FR) Flat L-shape (cable outlet is right)</th>
<th>(FL) Flat L-shape (cable outlet is left)</th>
<th>(G) Flat straight waterproof type</th>
</tr>
</thead>
<tbody>
<tr>
<td>USB-ITN-D 06ADV380D</td>
<td>USB-ITN-E 06ADV380E</td>
<td>USB-ITN-F 06ADV380F</td>
<td>No applicable models USB-ITN-F is available</td>
<td>USB-ITN-G 06ADV380G</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(D) Flat 10-pin type</td>
<td>(E) Round 6-pin type</td>
<td>(F) Flat straight type</td>
<td>(FB) Flat L-shape (cable outlet is back)</td>
<td>(FR) Flat L-shape (cable outlet is right)</td>
<td>(FL) Flat L-shape (cable outlet is left)</td>
<td>(G) Flat straight waterproof type</td>
</tr>
<tr>
<td>936937</td>
<td>937387</td>
<td>905338</td>
<td>905689</td>
<td>905691</td>
<td>905693</td>
<td>21EAA194</td>
</tr>
<tr>
<td>965014</td>
<td>965013</td>
<td>905409</td>
<td>905690</td>
<td>905692</td>
<td>905694</td>
<td>21EAA190</td>
</tr>
</tbody>
</table>

(Note 1) When using ID-F, EB, EC-101D, ID-C112A, ID-U, ID-SS, ID-SX with USB-ITN, it is required to use together with USB-ITPAK.

(Note 2) USB-ITN and IT-016U cannot be used with EF/EH, VL-50-B/505-B, and SJ-500/SV-2100.

- Digimatic indicator ID-H ID-F (Note 1)
- High-precision height gage QM-Height
- Mu-checker Digital Mu-checker (using a foot switch)
- Laser scan micrometer LSM-9506
- Digital height master 515-341/515-342
- Linear gage counter EF/EH (Note 2) EB (Note 1), EC-101D (Note 1)
- Linear micrometer VL-300-B/505-B (Note 2)
- Contour measuring system SJ-210/310/410 SJ-500/SV-2100 (Note 2)
- Hardness testing machines HM-210/220

- Digimatic indicator ID-CX, ID-C (Peak-Value Hold Type) (Note1), ID-C (Calculation type), ID-C (Bore Gage Type), ID-U (Note2), ID-SS (Note1), ID-SX (Note1)
- Digimatic height gage 192-663-10/192-613-10/570-322/570-227/574-112-1, etc. (Flat L-shape, cable outlet is right)
- ABS borescope 568-361/568-362, etc.
- Digimatic bore gage 511-501/511-502, etc.
- Hardness testing machines HH-300
- Hardness testing machines 572-460/572-560/572-480-10/572-580-10, etc.
- Digimatic depth gage
- Digimatic type (ID-CX)

- Scale unit

- Digimatic indicator ID-N ID-B
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 up 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 bespoke measuring solutions and even, if deemed cost-effective, take your critical measurement challenges in-house on a sub-contract basis.

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