MiCAT
Mitutoyo Intelligent Computer Aided Technology
the standard in world
metrology software
MeasurLink

No. 99MAM021A1

USB-ITPAK

User's Manual

Read this User's Manual thoroughly before using the instrument.
After reading, retain it close at hand for future reference.

Mitutoyo

Second Edition October, 2011 Ver 1.001A
First Edition March 2010 Ver 1.000

This manual is subject to change without notice for improvement and other purposes.

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CONVENTIONS USED IN THIS MANUAL

Types of Notes

The following types of **notes** are used in this manual to help the operator obtain reliable measurement data through correct instrument operation.

IMPORTANT

- An *important note* provides information essential to the completion of a task. You cannot disregard this note to complete the task.
- An *important note* is a type of precaution, which if neglected could result in a loss of data, decreased accuracy or instrument malfunction/failure.

NOTE A *note* emphasizes or supplements important points of the main text. It also supplies information about specific situations (e.g., memory limitations, equipment configurations, or details that apply to specific versions of a program).

TIP A *tip* is a type of note that helps the user apply the techniques and procedures described in the text to his or her specific needs.

It also provides reference information associated with the topic being discussed.

Conventions for Describing Software Operation

This software runs on Windows operating systems.

This manual assumes that the reader is familiar with the operation of Windows-based software. If you are not familiar with the operation of Windows, refer to a Windows operation manual such as the ‘Microsoft Windows First Step Guide’.

This manual features screen displays and operation explanations for when the software is used on Windows XP, but the functions and operation method of the software are the same regardless of the Windows platform.

Microsoft, Windows, Windows Vista and Excel are registered trademarks and/or trademarks of Microsoft Corporation in the United States and/or other countries.

Warranty

In the event that the Mitutoyo product, except software product, should prove defective in workmanship or material, within one year from the date of original purchase for use, it will be repaired or replaced, at our option, free of charge upon its prepaid return to us.

If the product fails or is damaged for any of the following reasons, it will be subject to a repair charge, even if it is still under warranty.

1 Failure or damage owing to inappropriate handling or unauthorized modification.

2 Failure or damage owing to transport, dropping, or relocation of the instrument after purchase.

3 Failure or damage owing to fire, salt, gas, abnormal voltage, or natural disaster.

This warranty is effective only where the instrument is properly installed and operated in conformance with the instructions in this manual.

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This Product falls into the Catch-All-Controlled Goods or Program under the Category 16 of the Separate Table 1 of the Export Trade Control Order or the Category 16 of the Separate Table of the Foreign Exchange Control Order, based on the Foreign Exchange and Foreign Trade Law of Japan.

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This system conforms to the following standard.

• EMC directive
EC Directive:2004 / 108 / EC
Standard: EN61326-1:2006
Immunity test requirement : Clause 6.2 Table 2
Emission limit : Class B

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Contents

SERVICE NETWORK

MEMO

1 BASIC KNOWLEDGE

1.1 Overview

USB-ITPAK is software for inputting measurement data of measuring tools connected to the USB Input Tool Direct (hereafter referred to as USB-ITN) (option) to Microsoft Excel (hereafter referred to as Excel).

Users can create their own software that captures measurement data via virtual RS-232C interface using a dedicated VCP driver provided with USB-ITPAK.

TIP ・For the specifications of the virtual RS-232C interface of USB-ITN, refer to 'CHAPTER **7** COMMUNICATION COMMAND SPECIFICATIONS'.

USB-ITPAK supports the following functions to input data to Excel.

1) Inputting measurement data directly to inspection table sheets on Excel

   Input cells can be specified for respective measuring tools when multiple measuring tools are connected using USB-ITN, such as '1st measuring tool data input to cells of column A, 2nd measuring tool data input to cells of column B'.

   Further, when measuring three dimensions using one measuring tool, the location of the input cells for the dimension can be specified, such as 'length data input to cell A, width data to cell B, height data to cell C'.

   By specifying the location of the input cells according to the measurement procedure of the user, inspection certificates can easily be created with Excel, and inspection data for manufacturing processes can easily be managed.

2) Inputting multi-point measurement data using measurement jigs at a time

   USB-ITPAK allows the user to issue a request from a PC for the output of measurement data from a measuring tool connected to USB-ITN.

   Optional USB Foot Switch Adapter (hereafter referred to as USB-FSW) and foot switch allows acquiring measurement data of a measuring tool in batch by simply pressing a foot switch.

3) Randomly inputting measurement data from multiple measuring tools to worksheets

   USB-ITPAK allows you to individually set the worksheets and cells to which measurement data is to be input for each measuring tool. This allows multiple operators to randomly perform measurements and input the measurement data from each measuring tool to the respectively specified cells.

4) Request for data output to measuring tool using foot switch

   With the USB-FSW and a foot switch, USB-ITPAK allows you to instruct a measuring tool to output measurement data without having to operate the PC, by using the foot switch.

   Measurement data output can also be requested from the PC if there is no foot switch.

5) Data cancellation using foot switch

   With the USB-FSW and a foot switch, USB-ITPAK allows you to cancel measurement data without having to operate the PC, by using the foot switch, in order to restore the state before measurement.

   Measurement data can also be canceled via the PC if there is no foot switch.

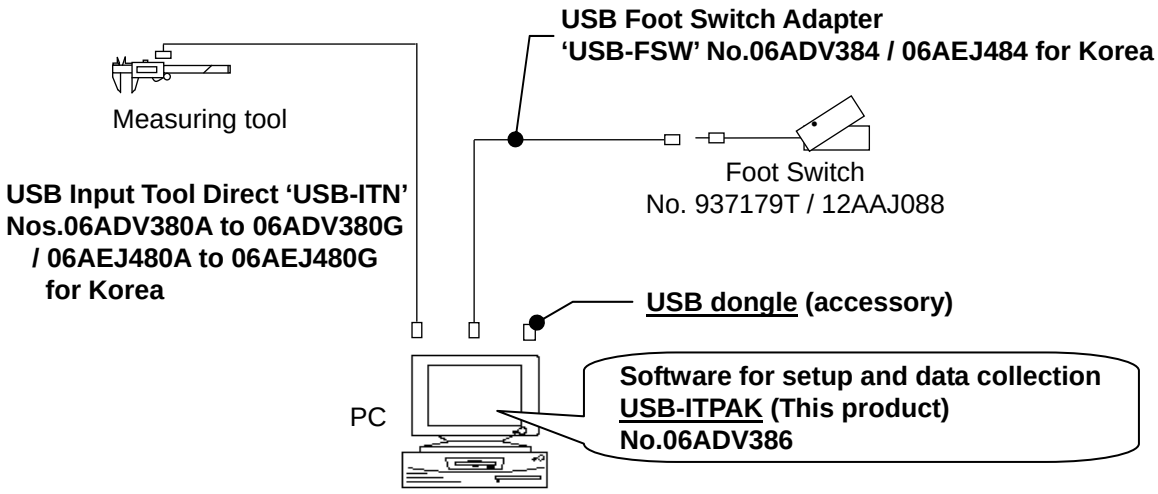
6) Inputting character string such as “PASS” or “FAIL” using foot switch

   When preparing inspection certificates, there are items such as visual inspection results that need character input. However, inputting character strings such as “PASS” and “FAIL” from the keyboard at each inspection takes time and effort. Also, it may not be possible to operate the keyboard in some work environments.

   With USB-ITPAK, character strings such as “PASS” and “FAIL” can be registered in advance and input to the specified cells by simply pressing a foot switch, when the USB-FSW and a foot switch are used.

1.2 System Configuration

An example of the system configuration of USB Input Tool Direct is shown in the figure below.



- Provide the measuring tool(s) and PC according to the system to be used.
- If multiple USB-ITN and USB-FSW units are used, a corresponding number of USB ports are required. If the PC does not have the required number of USB ports, use a USB hub (commercially available).
- Select a USB-ITN that is suitable for the connector of the measuring tool to be used. Supported connectors can be identified by suffixes A to G. Choose an appropriate device.
  For details about the USB-ITN, see '1.4 Tools that work with USB-ITPAK' or the user's manual of the USB-ITN.
- Provide USB-FSW and foot switch units only if required.
- USB-ITPAK operates only when the provided USB dongle is connected to the PC. Connect the USB dongle to the PC before using USB-ITPAK.

1.3 PC Specification Requirements

The following specifications are required of the PC on which USB-ITPAK is used.

<Hardware Specifications>

- Monitor (800 x 600 or higher resolution, 256 or more colors)
- 5 MB or more hard disk space
  (5 MB is the minimum required amount for installation.)
- CD-ROM drive
  (required to install USB-ITPAK)
- 2 or more USB ports
  (required to connect the USB dongle and USB-ITN / USB-FSW)

NOTE
- Other hardware specifications must meet those required by the OS on which USB-ITPAK runs.

<Software Specifications>

- OS:

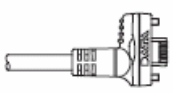
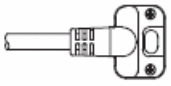
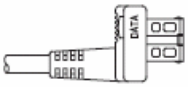
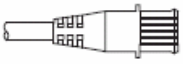
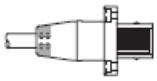
Microsoft Windows 2000	Professional	SP4
Microsoft Windows XP	Professional	SP2 or higher
Microsoft Windows XP	Home Edition	SP2 or higher
Microsoft Windows Vista	Ultimate	
Microsoft Windows Vista	Enterprise	
Microsoft Windows Vista	Business	
Microsoft Windows Vista	Home Premium	
Microsoft Windows Vista	Home Basic	
Microsoft Windows 7	Ultimate	
Microsoft Windows 7	Enterprise	
Microsoft Windows 7	Professional	
Microsoft Windows 7	Home Premium	
Microsoft Windows 7	Home Basic	
Microsoft Windows 7	Starter	

IMPORTANT
- USB-ITPAK does not support 64-bit OSs.
- Use the same OS language as the USB-ITPAK language. The operation on an OS with a different language is not guaranteed.
- To input measurement data to Excel using USB-ITPAK, Excel 2000 or higher is required.

1.4 Tools that work with USB-ITPAK

USB-ITPAK supports the following.

1) USB Input Tool Direct

Model	Code No.	Connector type on measuring tool side
USB-ITN-A	06ADV380A / 06AEJ480A for Korea	 Equipped with the output switch Waterproof type
USB-ITN-B	06ADV380B / 06AEJ480B for Korea	 Equipped with the output switch Waterproof type
USB-ITN-C	06ADV380C / 06AEJ480C for Korea	 Equipped with the output switch
USB-ITN-D	06ADV380D / 06AEJ480D for Korea	 Flat (10-pin)
USB-ITN-E	06ADV380E / 06AEJ480E for Korea	 Round (6-pin)
USB-ITN-F	06ADV380F / 06AEJ480F for Korea	 Flat straight
USB-ITN-G	06ADV380G / 06AEJ480G for Korea	 Flat straight Waterproof type

IMPORTANT

- Select the USB-ITN model according to the shape of the connector of the measuring tool to be connected.
- Mitutoyo products other than the above (such as IT-005D, IT-006N, IT-007R, IT-008Z, IT-012U, IT-013UD, IT-014UT, and MUX-10F) employ different communication methods and thus cannot be used for USB-ITPAK.

2) USB Foot Switch Adapter

Model	Code No.	Compatible foot switch
USB-FSW	06ADV384 / 06AEJ484 for Korea	937179T / 12AAJ088

1.5 Technical Terms

1.5.1 Device No.

The device No. displayed on each the USB connector (“A” plug) of the USB-ITN unit, USB-FSW unit and USB dongle is individual identification information. These devices Nos. are fixed and cannot be changed.

USB-ITPAK displays the device No. of the USB-ITN and USB-FSW units as the default.

The device Nos. displayed by USB-ITPAK can be changed.

TIP • For how to change device Nos., see ‘CHAPTER 4 MEASUREMENT DATA COLLECTION (BASICS)’.

1.5.2 Dedicated VCP driver

USB-ITN operates in either the Human Interface Device (HID) or Virtual COM Port (VCP) mode.

USB-ITPAK uses USB-ITN in the VCP mode to achieve various functions.

The dedicated VCP driver is required to use USB-ITN in the VCP mode, and is included on the CD provided with USB-ITPAK.

TIP • For how to install the dedicated VCP driver, see ‘2.2 Installing and Uninstalling the VCP driver’.

1.5.3 Procedure

The procedure consists of information that specifies the data collection method in USB-ITPAK. This information includes the Excel file that is the output destination, the USB-ITN unit to be used, the input method (“sequential”, “batch”, etc.), the cell movement direction following input (“down”, “right”, etc.).

The procedure is saved as a “setting file” by USB-ITPAK.

Inspections can be performed efficiently by preparing in-process inspection and acceptance inspection procedures in advance.

1.5.4 Setting files

These are the files for saving the ‘procedures’ used in USB-ITPAK (file extension: itp).

1.5.5 Sequential measurement

Sequential measurement is a measurement method that can be selected in the ‘procedure’ used by USB-ITPAK.

During sequential measurement, one or more measuring tools are used and the measurement data is input from the measuring tool(s) registered beforehand in the procedure to an Excel inspection table sheet.

Example: Measurements in a pre-set sequence using one measuring tool, such as measuring the length and then the width

Example: Measurements using multiple measuring tools, such as measuring the length with a caliper and then the diameter using a micrometer

1.5.6 Batch measurement

Batch measurement is a measurement method that can be selected in the ‘procedure’ used by USB-ITPAK.

During batch measurement, measurement data is acquired in batch from multiple measuring tools.

Example: Batch collection of measurement data from all measuring tools registered in the procedure by attaching multiple measuring tools to measurement jigs, setting workpieces to these tools, and operating a foot switch

1.5.7 Individual measurement

Individual measurement is a measurement method that can be selected in the ‘procedure’ used in USB-ITPAK.

For individual measurement, the worksheet and cells to which the measurement data is input are set for each measuring tool. This method allows multiple operators to randomly perform measurement, and the measurement data from each measuring tool is input to the respectively specified cells.

Example: Data collection from three measuring tools operated by respective operators

MEMO

2 INSTALLATION AND UNINSTALLATION

2.1 Installing and Uninstalling USB-ITPAK

2.1.1 Installing USB-ITPAK

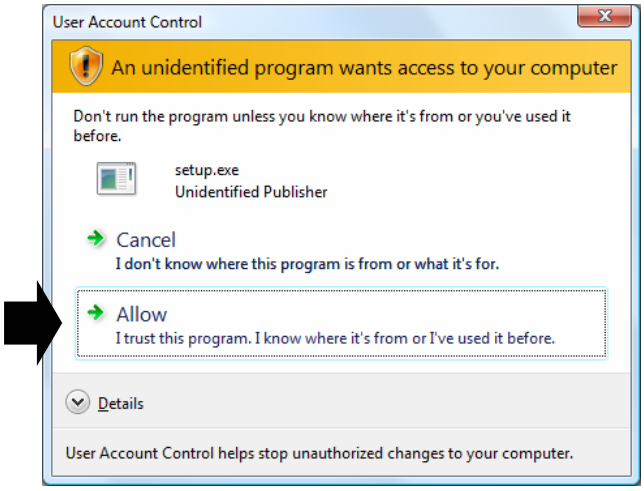
NOTE
- To install USB-ITPAK, log in to Windows with ‘Administrator’ authority.
- Do not connect USB-ITN or USB-FSW to the PC before USB-ITPAK has been installed.
- To use USB-ITN or USB-FSW with USB-ITPAK, a dedicated VCP driver must be installed for each USB-ITN or USB-FSW unit.
  For how to install the dedicated VCP driver, see ‘2.2 Installing and Uninstalling the VCP driver’.

1) Start the PC and insert the supplied CD in the CD drive.

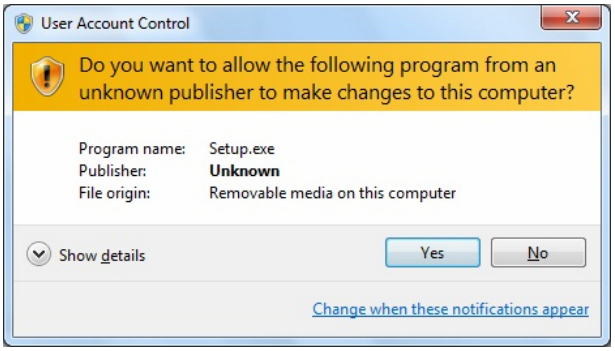
2) From Windows Explorer, execute ‘Setup.exe’ in the ‘Setup’ folder of the supplied CD.

If the [User Account Control] warning is displayed in Windows Vista / Windows 7, perform as follows.

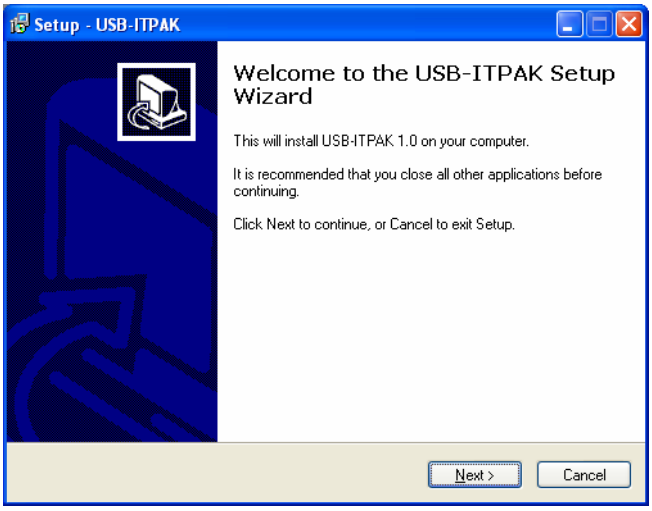
Windows Vista: Select [Allow].



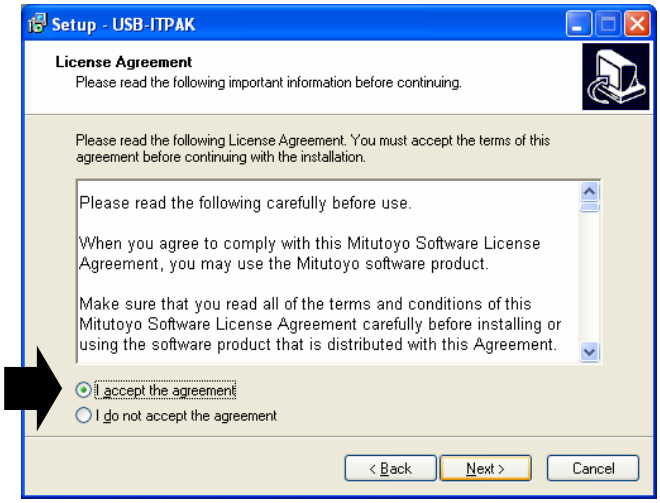
Windows 7: Click the [Yes] button.



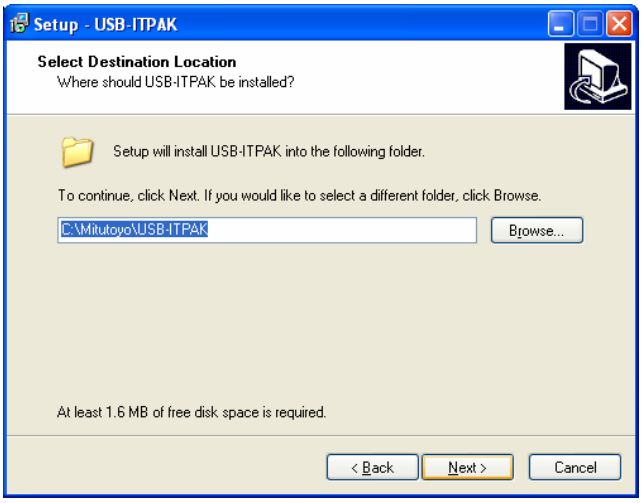
3) When the [Welcome to the USB-ITPAK Setup Wizard] dialog box is displayed, click the [Next] button.



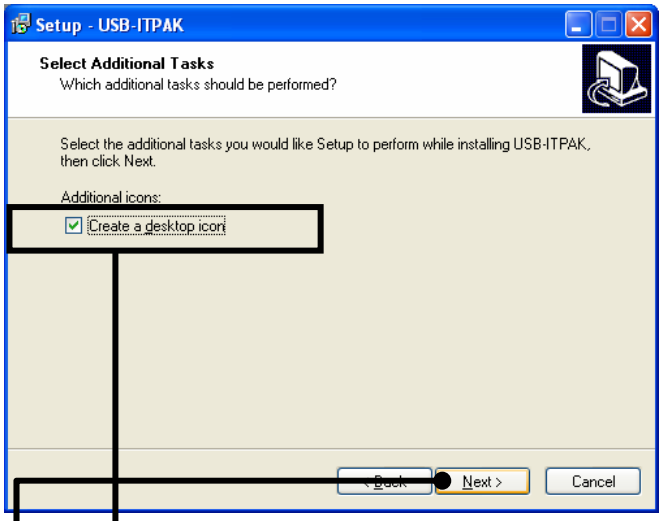
4) Read the [License Agreement] and if you accept this agreement, select [I accept the agreement] and then click the [Next] button.



5) When the [Select Destination Location] dialog box is displayed, click the [Next] button.



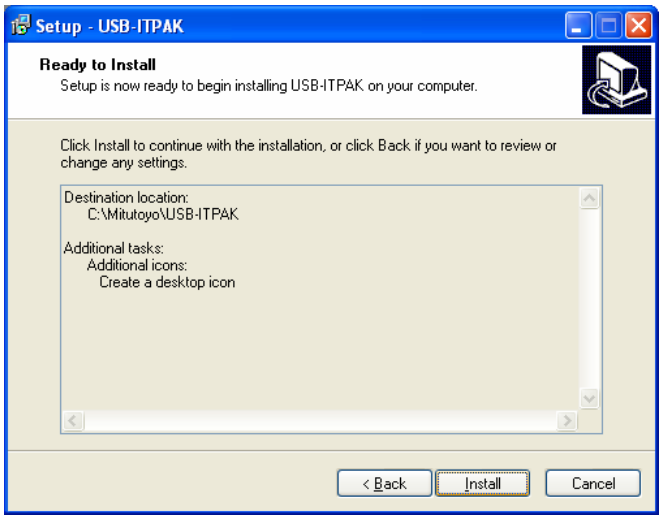
6) When the [Select Additional Tasks] dialog box is displayed, click the [Next] button. To create an icon on the desktop, follow steps a) and b), in this sequence.



a) Select [Create a desktop icon].

b) Click the [Next] button.

7) When the [Ready to Install] dialog box is displayed, click the [Install] button.

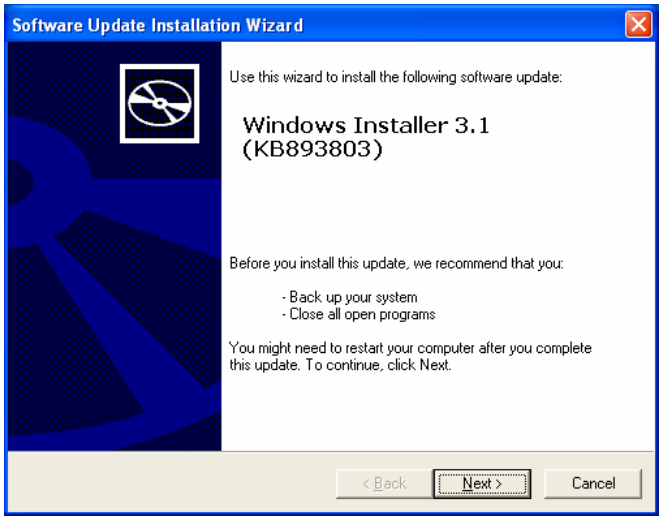


NOTE • When USB-ITPAK has been installed, a ‘Sample Inspection Table File’ is installed in the “Sample” folder in the install destination folder.

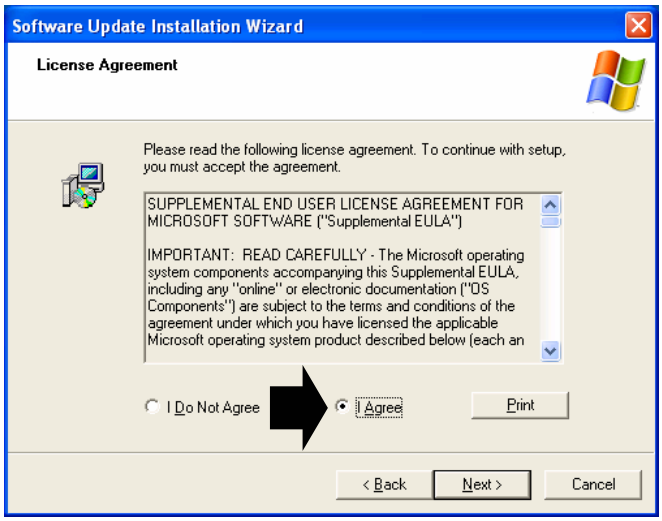
If a ‘Sample Inspection Table File’ already exists in the “Sample” folder, back up this file to a different folder if it will be needed later before installing USB-ITPAK.

8) If Windows Installer 3.1 is not yet installed, the [Windows Installer 3.1 (KB893803)] dialog box is displayed. Click the [Next] button.

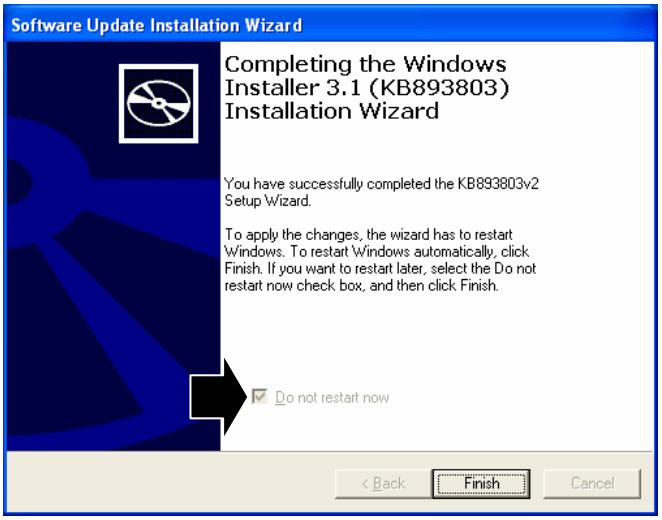
NOTE • If Windows Installer 3.1 is already installed, step 8) is skipped.



Read the [License Agreement] and if you accept this agreement, select [I Agree] and then click the [Next] button.

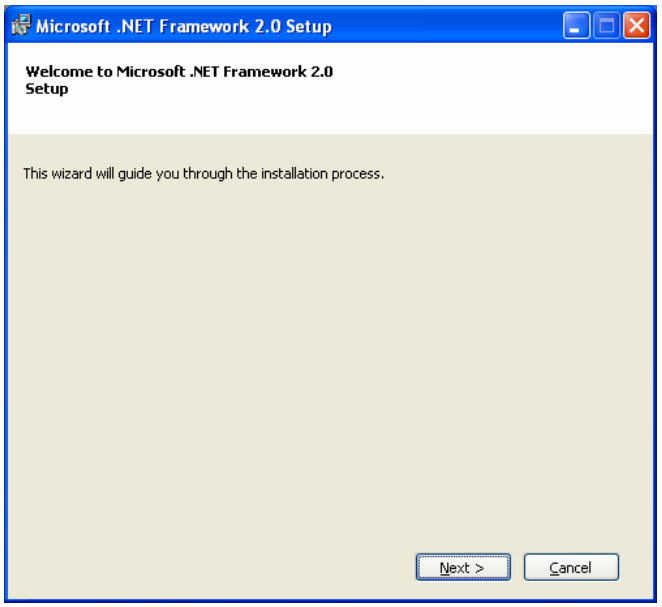


When the [Completing the Windows Installer 3.1 (KB893803) Installation Wizard] dialog box is displayed, select [Do not restart now] and click the [Finish] button.

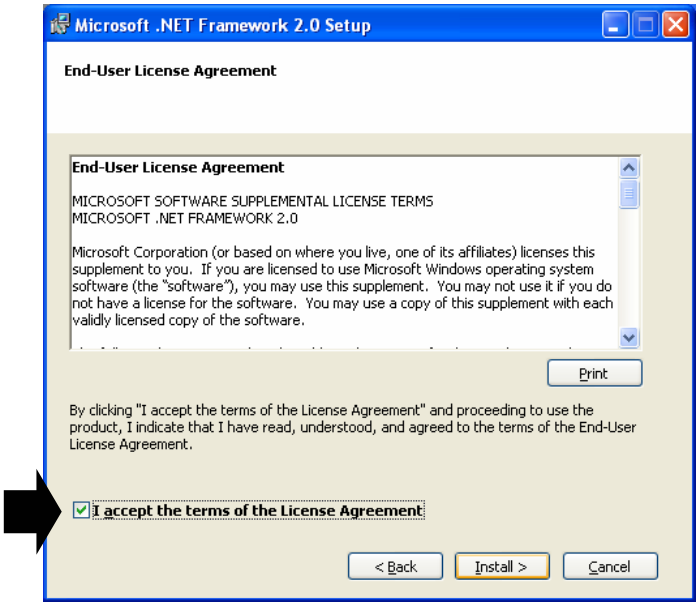


9) If Microsoft .NET Framework 2.0 is not yet installed, the [Welcome to Microsoft .NET Framework 2.0 Setup] dialog box is displayed. Click the [Next] button.

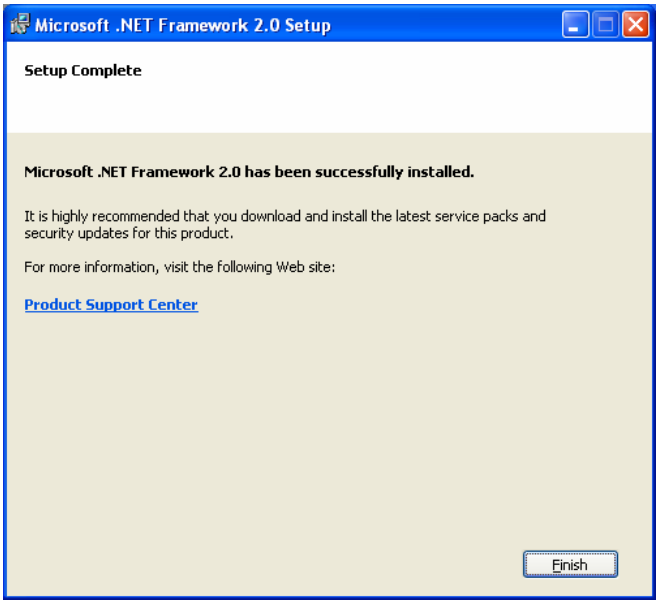
NOTE • If Microsoft .NET Framework 2.0 is already installed, step 9) is skipped.



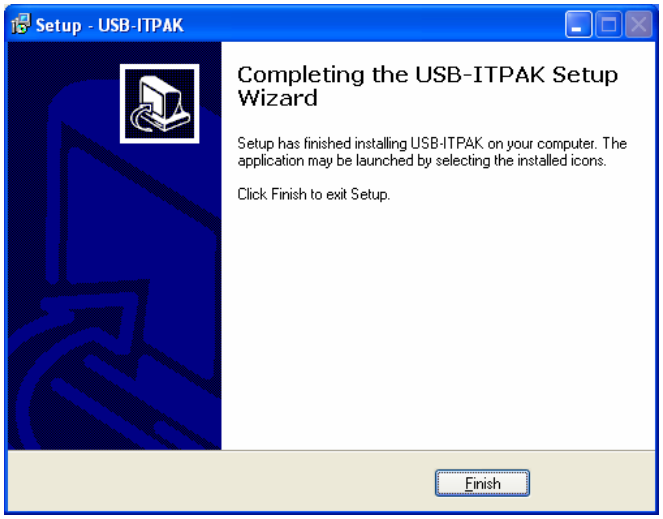
Read the [License Agreement] and if you accept this agreement, select [I accept the terms of the License Agreement] and click the [Install] button.



When the [Setup Complete] dialog box is displayed, click the [Finish] button.



10) When the following dialog box is displayed, click the [Finish] button to complete the installation procedure.



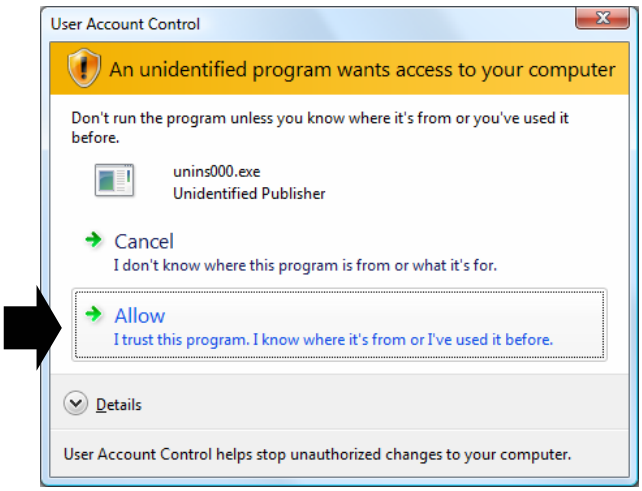
2.1.2 Uninstalling USB-ITPAK

NOTE • To uninstall USB-ITPAK, log in to Windows with 'Administrator' authority.

1) Click the Start button of Windows and select [All Programs] - [USB-ITPAK], and then [Uninstall USB-ITPAK].

If the [User Account Control] warning is displayed in Windows Vista / Windows 7, perform as follows.

Windows Vista: Select [Allow].



Windows 7: Click the [Yes] button.

2) When [Are you sure you want to completely remove USB-ITPAK and all of its components?] is displayed, click the [Yes] button.

3) When [USB-ITPAK was successfully removed from your computer.] is displayed, uninstallation is successful. Click the [OK] button.

2.2 Installing and Uninstalling the VCP Driver

2.2.1 Installing the VCP driver (Windows XP)

NOTE • To install the VCP driver, log in to Windows with 'Administrator' authority.

To use USB-ITN or USB-FSW with USB-ITPAK, a dedicated VCP driver must be installed for each USB-ITN or USB-FSW unit.

1) Connect USB-ITN or USB-FSW to the PC.

   When USB-ITN or USB-FSW is connected to a PC for the first time, the PC recognizes it as a USB human interface device and the HID driver is automatically installed.

2) Check whether USB-ITN or USB-FSW is correctly connected as the USB human interface device.

   Click the Start button of Windows and open [Control Panel].

   From [Performance and Maintenance], open [System].

   Select the [Hardware] tab and open [Device Manager].

   When the following is displayed, open [Human Interface Devices].

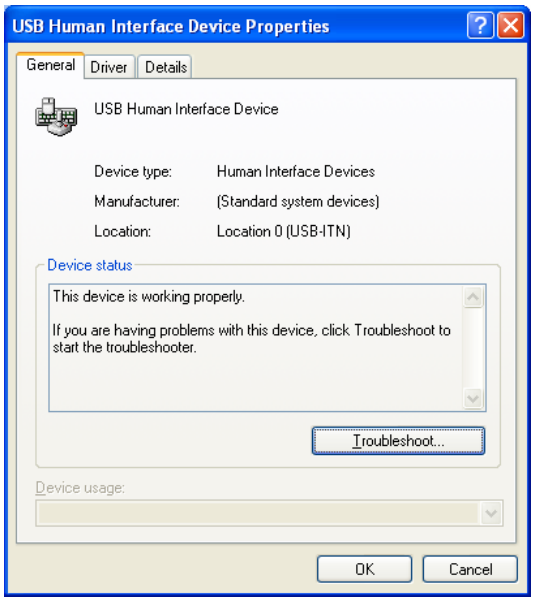
   When USB-ITN or USB-FSW is connected to the USB connector, one [USB Human Interface Device] is added.

   Connect or disconnect USB-ITN or USB-FSW and check whether the number of displayed [USB Human Interface Device] increases or decreases as a result.

NOTE • To identify the connected device, follow the steps below.

Right-click the desired [USB Human Interface Device] and click [Properties] in the menu.

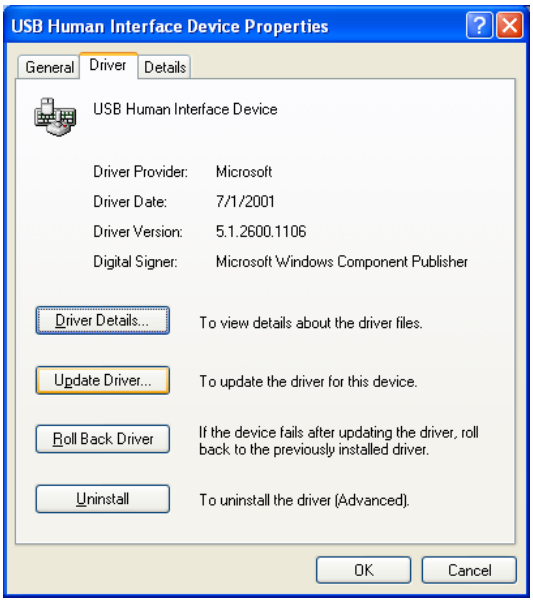
Check if USB-ITN or USB-FSW is displayed in the Location field of the [General] tab.



3) Install the dedicated VCP driver.

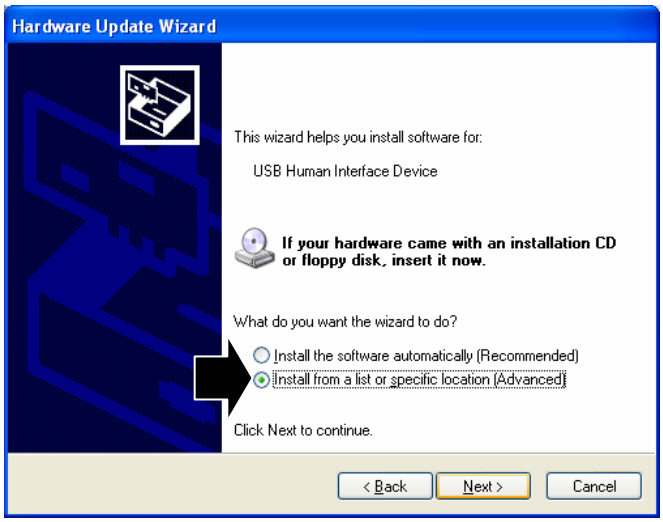
Right-click the added [USB Human Interface Device] and click [Properties] in the menu.

Click the [Update Driver] button in the [Driver] tab, and install the dedicated VCP driver following the procedure below.

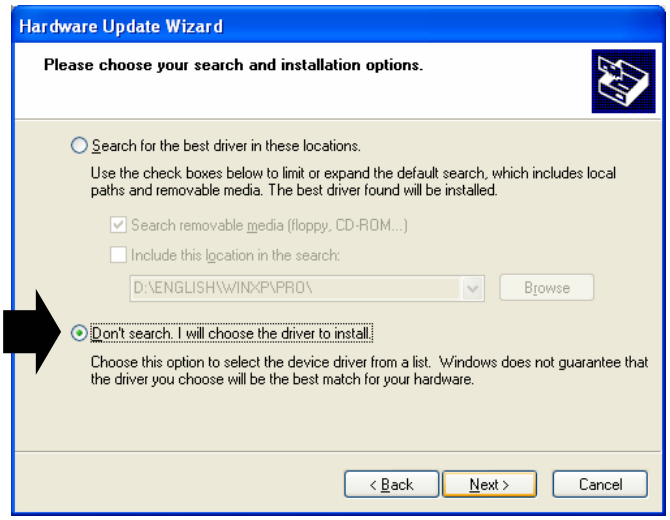


Select [No, not this time] and click the [Next] button.

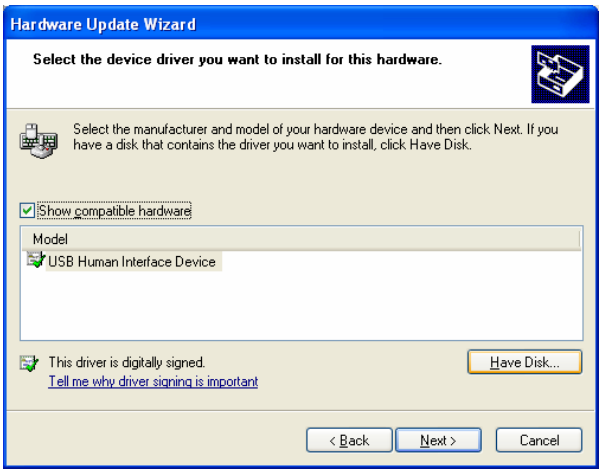
Select [Install from a list or specific location] and click the [Next] button.



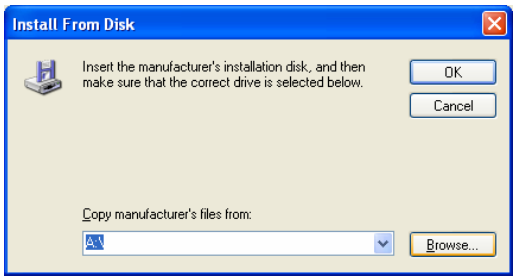
Select [Don't search. I will choose the driver to install.] and click the [Next] button.



Click the [Have Disk…] button.



Click the [Browse…] button.



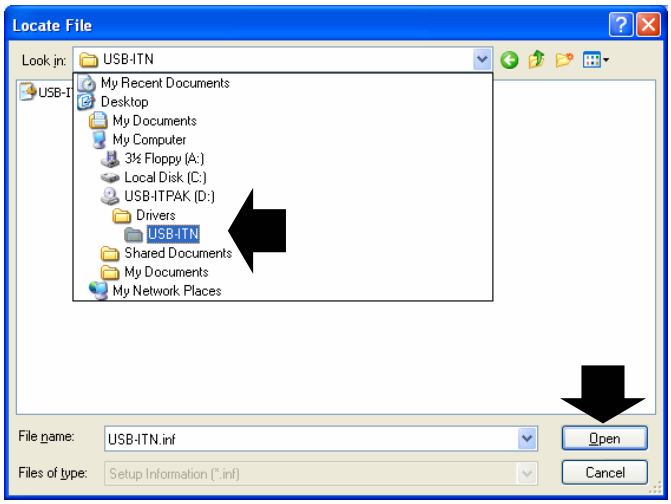
Insert the supplied CD in the PC and select the folder according to the device in the 'Drivers' folder.

To install USB-ITN, select the 'USB-ITN' folder.

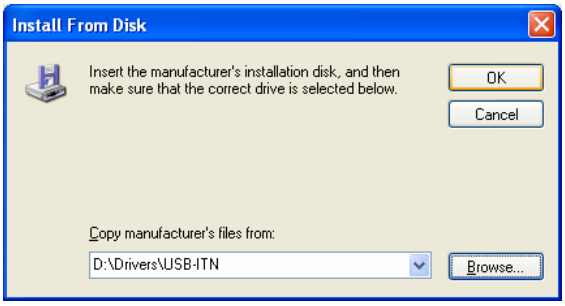
To install USB-FSW, select the 'USB-FSW' folder.

Select any one of the files in the folder and click the [Open] button.

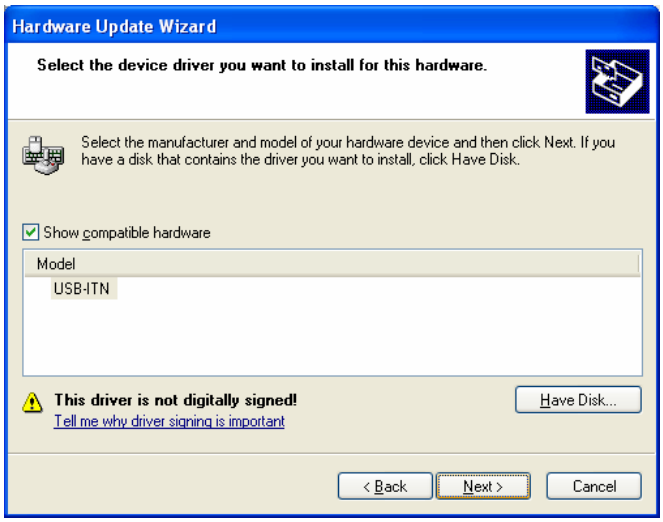
NOTE • Regardless of the file selected by the user, the installer selects the appropriate file from the specified folder according to the connected device.



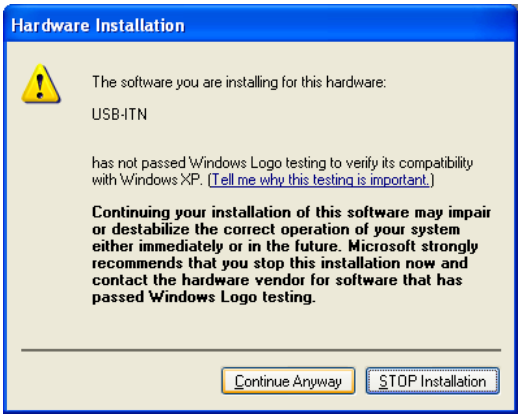
Click the [OK] button.



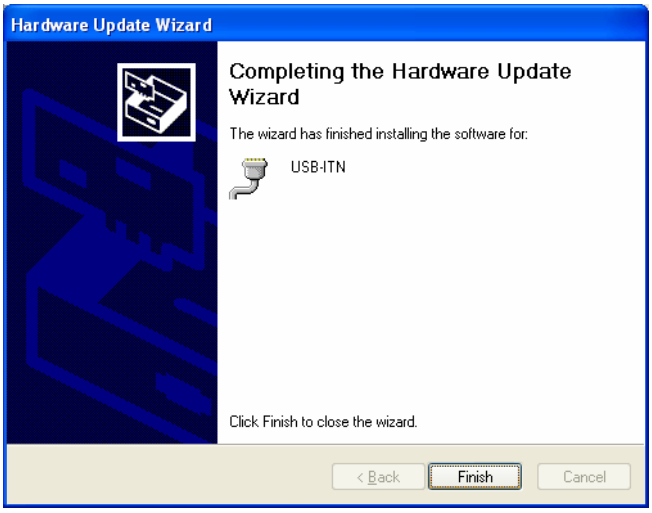
Check that USB-ITN or USB-FSW is selected in the Model field, and then click the [Next] button.



A warning about Windows XP logo authentication is displayed. Click the [Continue Anyway] button.

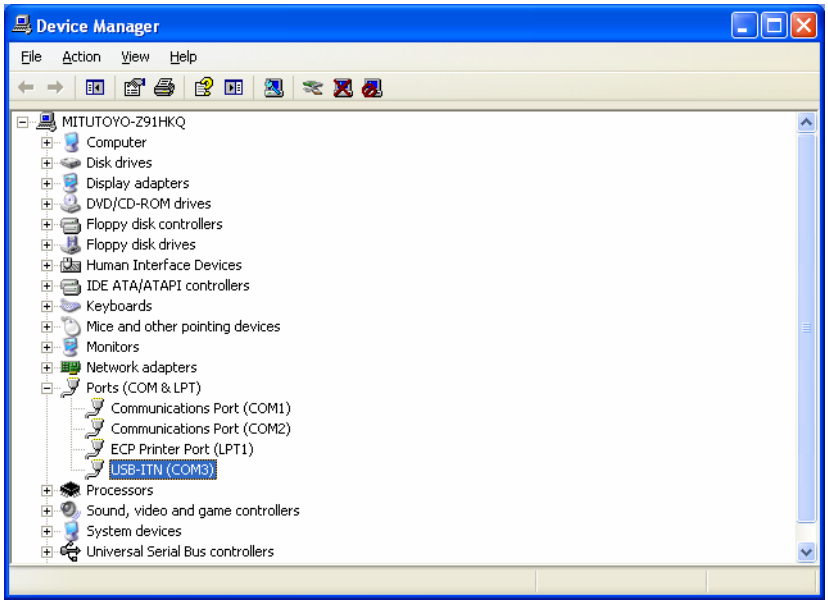


When the [Completing the Hardware Update Wizard] dialog box is displayed, click the [Finish] button.



4) If the hardware has been correctly updated, the item of the device that has been installed moves from [Human Interface Device] to USB-ITN (COMx) or USB-FSW (COMx) under [Ports (COM & LPT)] in the [Device Manager] dialog box.

NOTE
- The 'x' in COMx is the COM port number; the installer automatically assigns an available number. In the following example, this number is '3'.
- When the VCP driver is installed, USB-ITN and USB-FSW are recognized as ports (COM & LPT), not human interface devices.



5) If multiple USB-ITN or USB-FSW units are to be connected, repeat steps 1) to 4).

NOTE
- When installing multiple USB-ITN or USB-FSW units, the above procedure is required for each unit.

2.2.2 Installing the VCP driver (Windows 7 / Windows Vista)

NOTE
- To install the VCP driver, log in to Windows with 'PC administrator' authority.
- If the OS is Windows Vista, [USB Human Interface Device] corresponds to [USB Input Device].

To use USB-ITN or USB-FSW with USB-ITPAK, a dedicated VCP driver must be installed for each USB-ITN or USB-FSW unit.

1) Connect USB-ITN or USB-FSW to the PC.

   When USB-ITN or USB-FSW is connected to a PC for the first time, the PC recognizes it as a USB human interface device and the HID driver is automatically installed.

2) Check whether USB-ITN or USB-FSW is correctly connected as the USB human interface device.

   Click the Windows Start button, and perform the following in [Control Panel].

   Windows 7: Open [System and Security], and open [Device Manager] in [System].

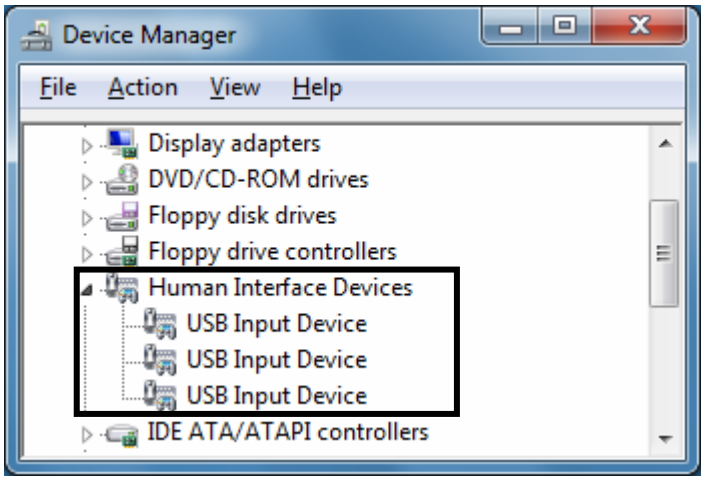
   Windows Vista: From [System and Maintenance], open [Device Manager].

   If the [User Account Control] warning is displayed, perform as follows.

   Windows 7: click [Yes].

   Windows Vista: click [Continue].

   When the following is displayed, open [Human Interface Devices].



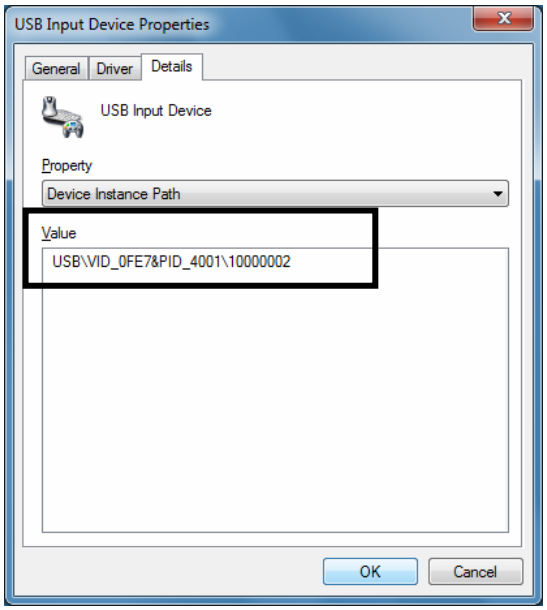
   When USB-ITN or USB-FSW is connected to the USB connector, one [USB Input Device] is added.

   Connect or disconnect USB-ITN or USB-FSW and check whether the number of displayed [USB Input Device] increases or decreases as a result.

NOTE • To identify the connected device, follow the steps below.

Right-click the desired [USB Input Device] and click [Properties] in the menu.

Select the [Details] tab and select [Device Instance Path] in Property.



Devices can be identified depending on the contents of [Value] as follows.

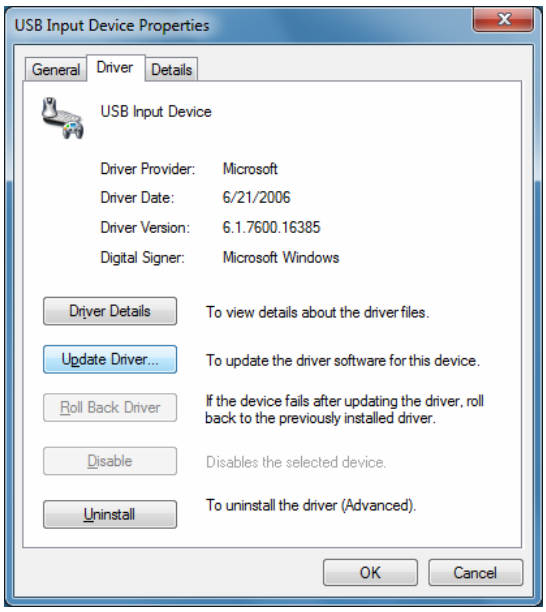
- USB-ITN ：USB\VID_0FE7&PID_4001\ ********
- USB-FSW：USB\VID_0FE7&PID_4002\ ********

******** indicates an 8-digit serial number.

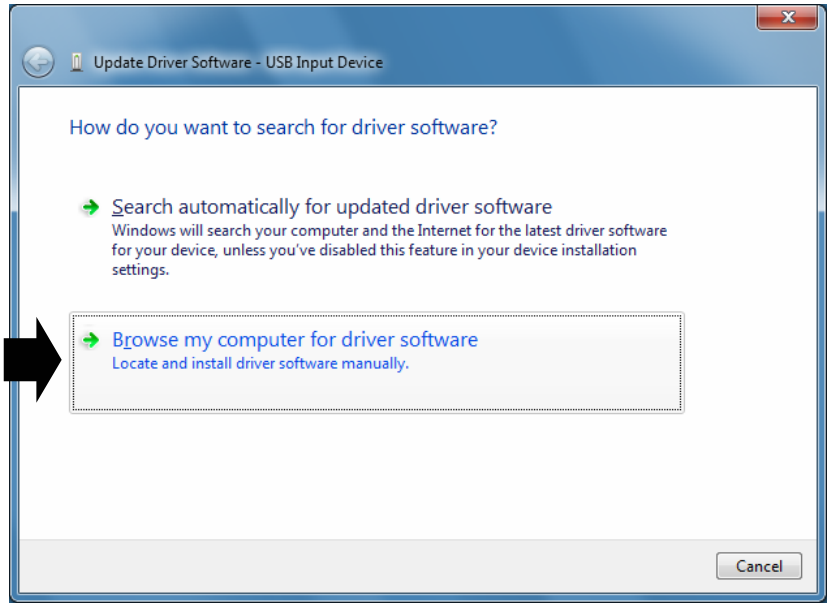
3) Install the dedicated VCP driver.

Right-click the added [USB Input Device] and click [Properties] in the menu.

Click the [Update Driver] button in the [Driver] tab, and install the dedicated VCP driver following the procedure below.

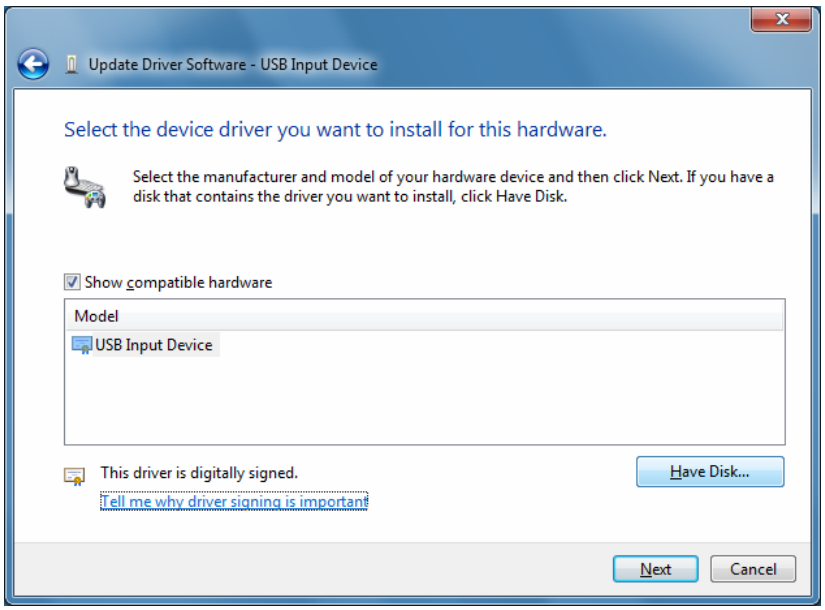


Select [Browse my computer for driver software].

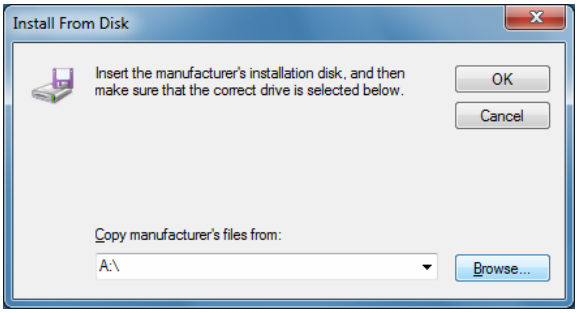


Select [Let me pick from a list of device drivers on my computer].

Click the [Have Disk…] button.



Click the [Browse…] button.



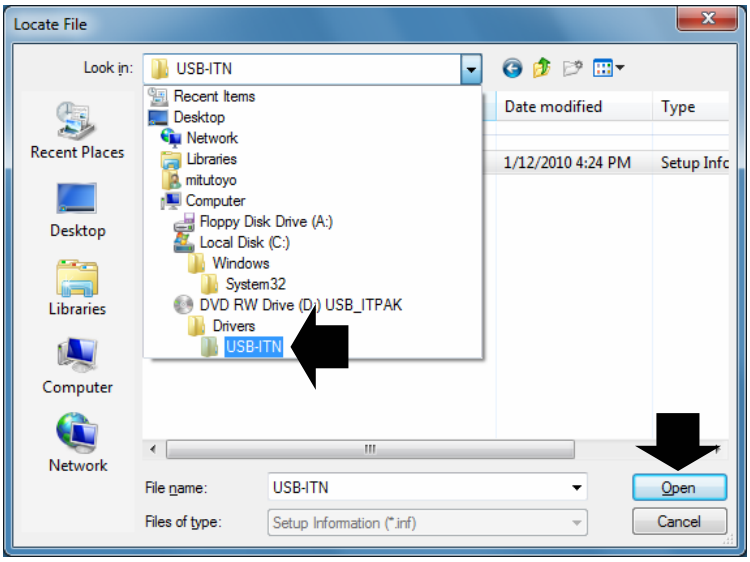
Insert the supplied CD in the PC and select the folder according to the device in the 'Drivers' folder.

To install USB-ITN, select the 'USB-ITN' folder.

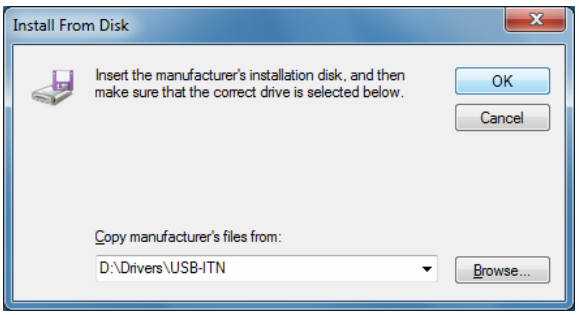
To install USB-FSW, select the 'USB-FSW' folder.

Select any one of the files in the folder and click the [Open] button.

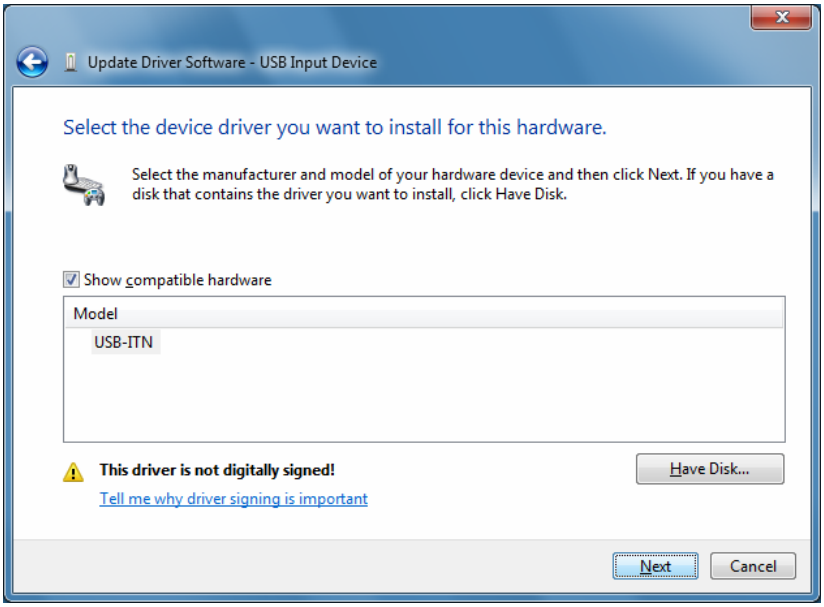
NOTE • Regardless of the file selected by the user, the installer selects the appropriate file from the specified folder according to the connected device.



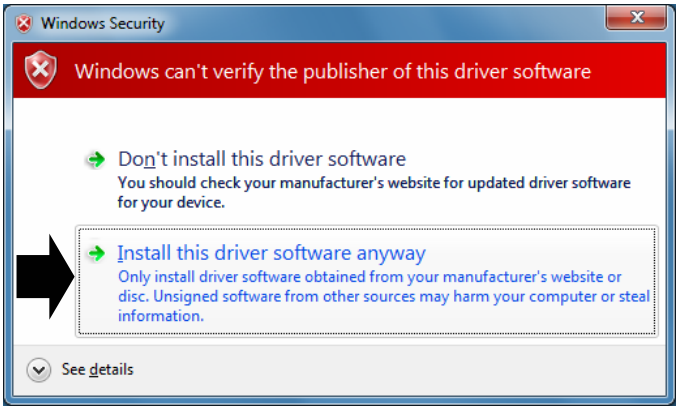
Click the [OK] button.



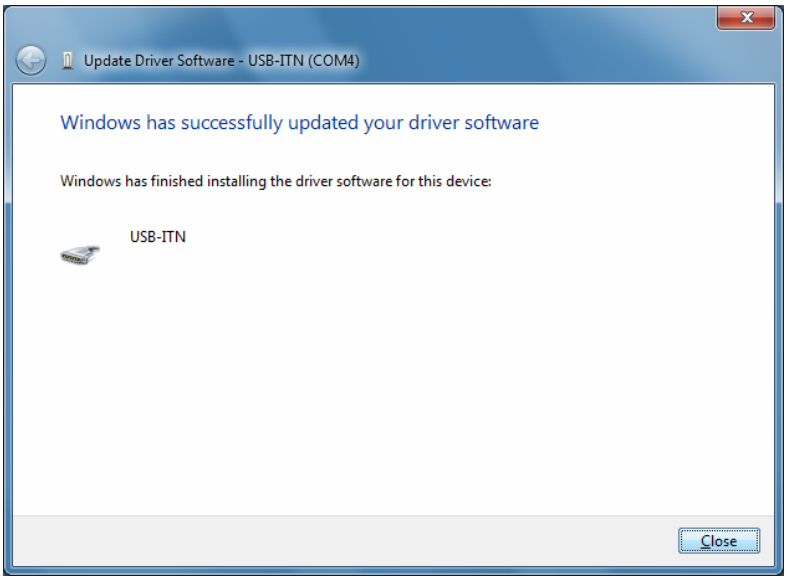
Check that USB-ITN or USB-FSW is selected in the Model field, and then click the [Next] button.



A warning about the driver software is displayed. Select [Install this driver software anyway].



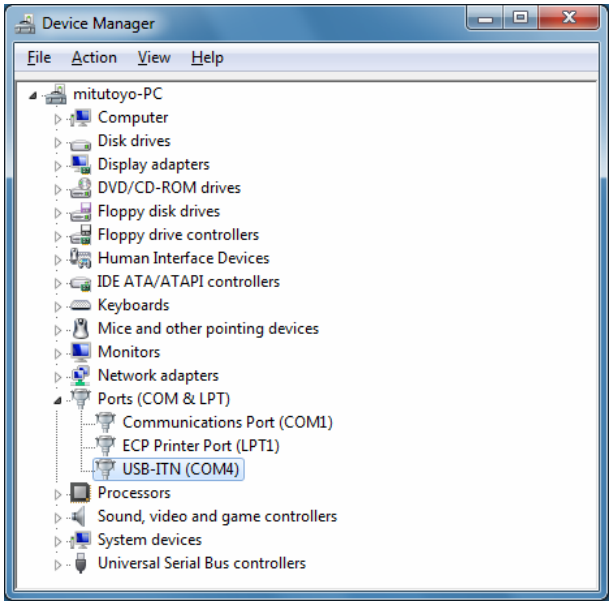
When the message [Windows has successfully updated your driver software] is displayed, the installation is completed. Click the [Close] button.



4) If the hardware has been correctly updated, the item of the device that has been installed moves from [Human Interface Device] to USB-ITN (COMx) or USB-FSW (COMx) under [Ports (COM & LPT)] in the [Device Manager] dialog box.

NOTE

- The 'x' in COMx is the COM port number; the installer automatically assigns an available number. In the following example, this number is '4'.
- When the VCP driver is installed, USB-ITN and USB-FSW are recognized as ports (COM & LPT), not human interface devices.



5) If multiple USB-ITN or USB-FSW units are to be connected, repeat steps 1) to 4).

NOTE

- When installing multiple USB-ITN or USB-FSW units, the above procedure is required for each unit.

2.2.3 Installing the VCP driver (Windows 2000)

NOTE • To install the VCP driver, log in to Windows with 'Administrator' authority.

To use USB-ITN or USB-FSW with USB-ITPAK, a dedicated VCP driver must be installed for each USB-ITN or USB-FSW unit.

1) Connect USB-ITN or USB-FSW to the PC.

   When USB-ITN or USB-FSW is connected to a PC for the first time, the PC recognizes it as a USB human interface device and the HID driver is automatically installed.

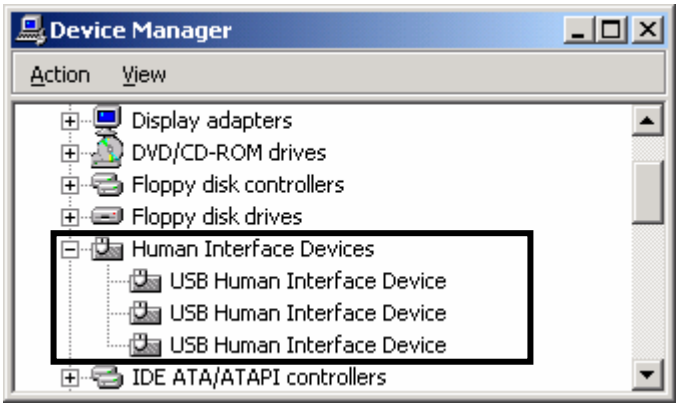
2) Check whether USB-ITN or USB-FSW is correctly connected as the USB human interface device.

   Click the Start button of Windows and open [Control Panel] from the [Settings] menu.

   Open [System].

   Select the [Hardware] tab and open [Device Manager].

   When the following is displayed, open [Human Interface Devices].



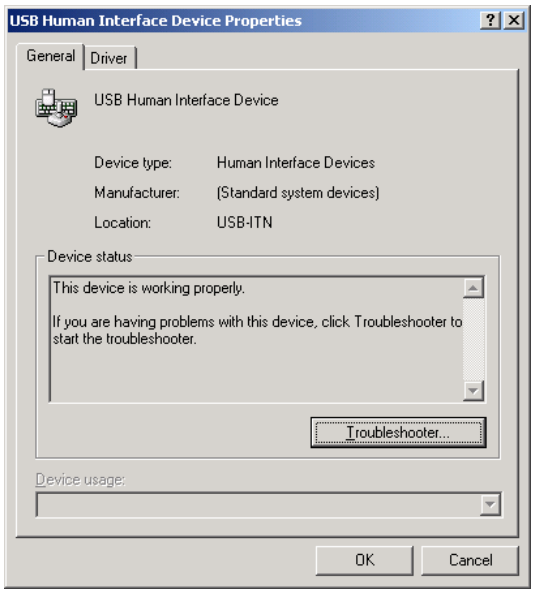
   When USB-ITN or USB-FSW is connected to the USB connector, one [USB Human Interface Device] is added.

   Connect or disconnect USB-ITN or USB-FSW and check whether the number of displayed [USB Human Interface Device] increases or decreases as a result.

NOTE • To identify the connected device, follow the steps below.

Right-click the desired [USB Human Interface Device] and click [Properties] in the menu.

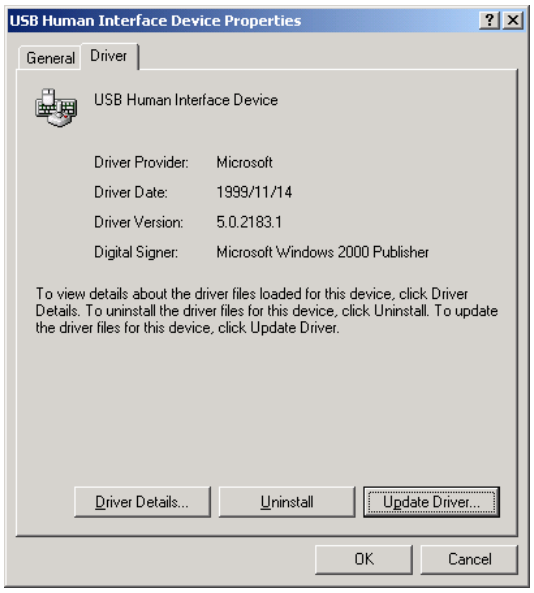
Check if USB-ITN or USB-FSW is displayed in the Location field of the [General] tab.



3) Install the dedicated VCP driver.

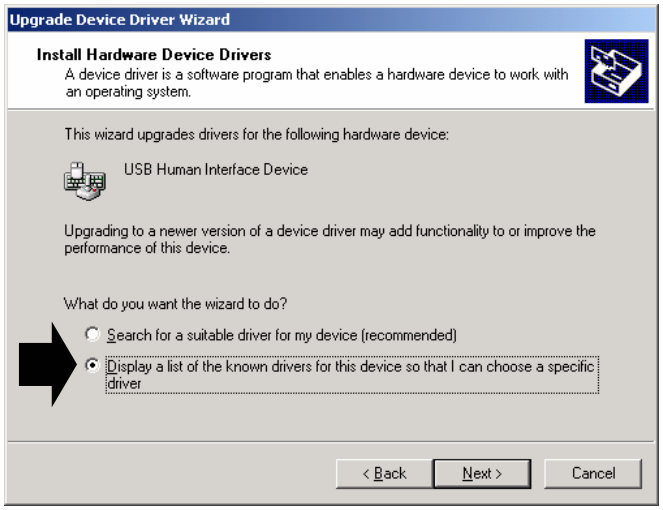
Right-click the added [USB Human Interface Device] and click [Properties] in the menu.

Click the [Update Driver] button in the [Driver] tab, and install the dedicated VCP driver following the procedure below.

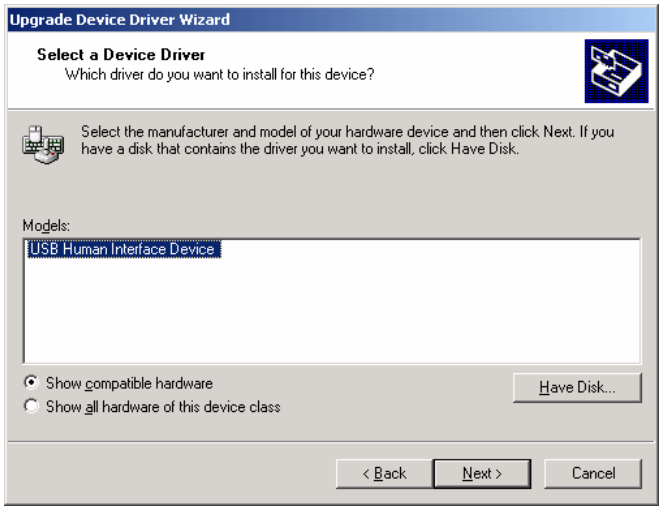


Click the [Next] button.

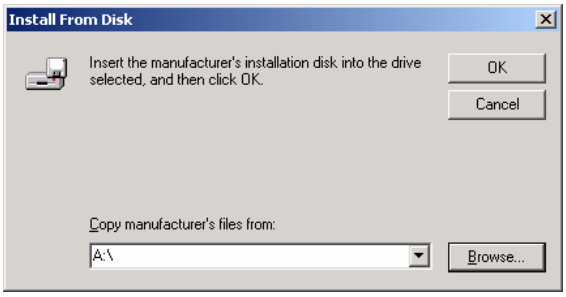
Select [Display a list of the known drivers for this device so that I can choose a specific driver] and click the [Next] button.



Click the [Have Disk...] button.



Click the [Browse…] button.



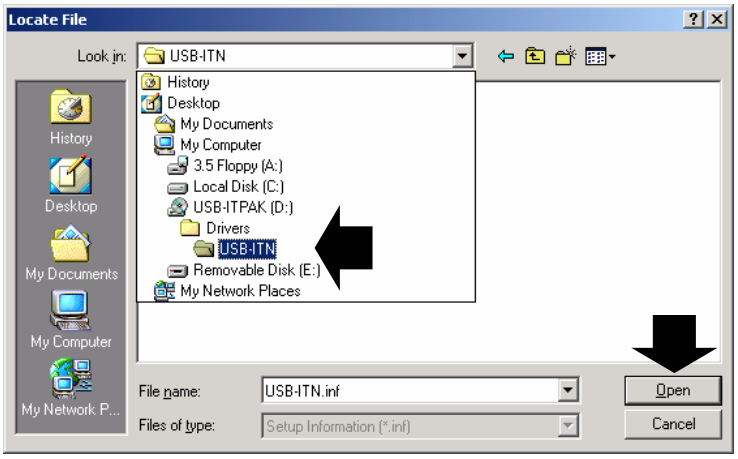
Insert the supplied CD in the PC and select the folder according to the device in the 'Drivers' folder.

To install USB-ITN, select the 'USB-ITN' folder.

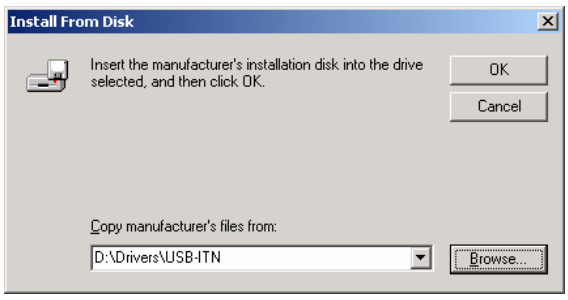
To install USB-FSW, select the 'USB-FSW' folder.

Select any one of the files in the folder and click the [Open] button.

NOTE • Regardless of the file selected by the user, the installer selects the appropriate file from the specified folder according to the connected device.

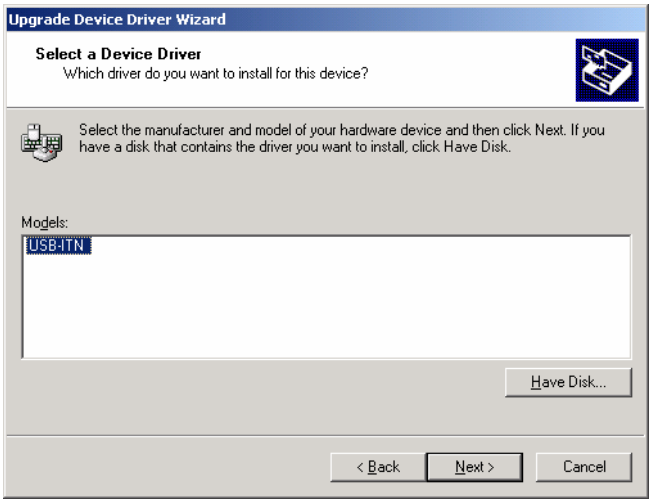


Click the [OK] button.

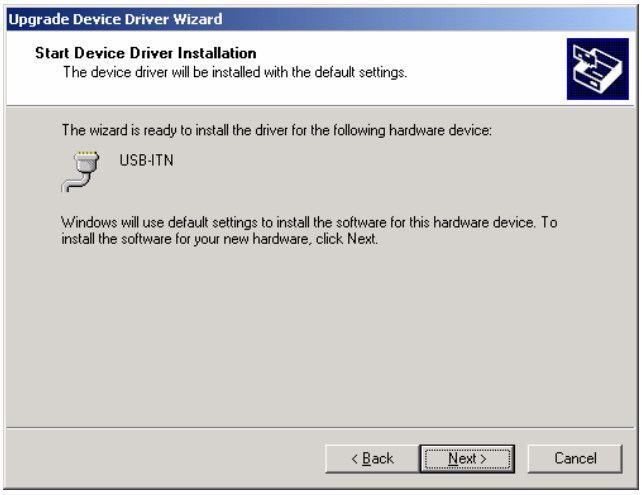


NOTE • When the [OK] button on the above dialog box is clicked, the 'The specified location does not contain information about your hardware.' message may be displayed and the VCP driver may not be recognized. In this case, select again the folder according to the model in the 'Drivers' folder on the supplied CD. For details, see '8.3.1 Problems related to installing VCP driver'.

Check that USB-ITN or USB-FSW is selected in the Model field, and then click the [Next] button.



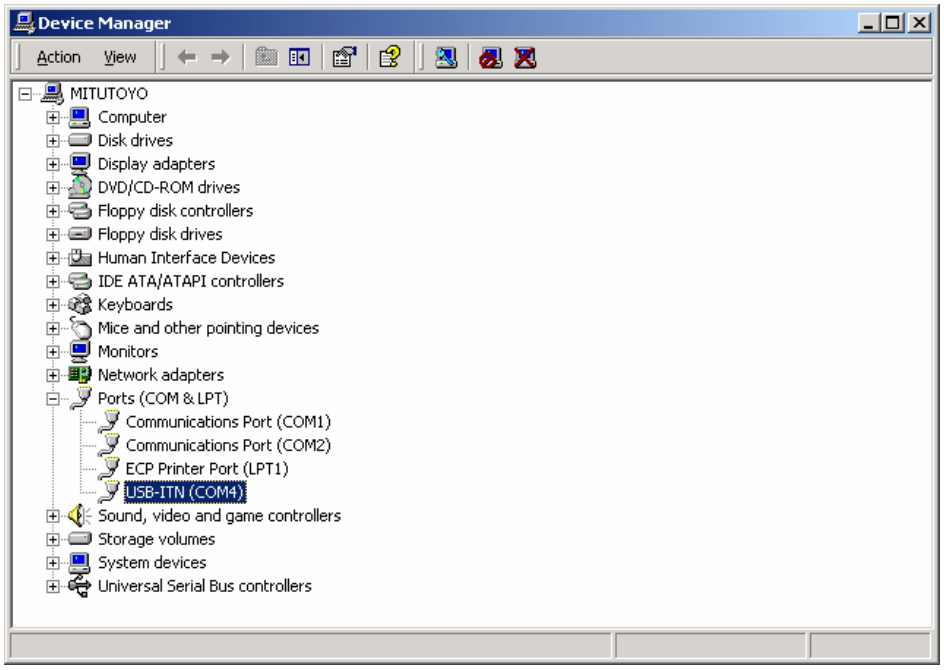
When the [Start Device Driver Installation] dialog box is displayed, click the [Next] button.



When the [Completing the Upgrade Device Driver Wizard] dialog box is displayed, click the [Finish] button.

4) If the hardware has been correctly updated, the item of the device that has been installed moves from [Human Interface Device] to USB-ITN (COMx) or USB-FSW (COMx) under [Ports (COM & LPT)] in the [Device Manager] dialog box.

NOTE
- The 'x' in COMx is the COM port number; the installer automatically assigns an available number. In the following example, this number is '4'.
- When the VCP driver is installed, USB-ITN and USB-FSW are recognized as ports (COM & LPT), not human interface devices.



5) If multiple USB-ITN or USB-FSW units are to be connected, repeat steps 1) to 4).

NOTE
- When installing multiple USB-ITN or USB-FSW units, the above procedure is required for each unit.

2.2.4 Uninstalling the VCP driver (Windows XP)

NOTE • To uninstall the VCP driver, log in to Windows with 'Administrator' authority.

Connect the USB-ITN or USB-FSW unit whose VCP driver is to be removed.

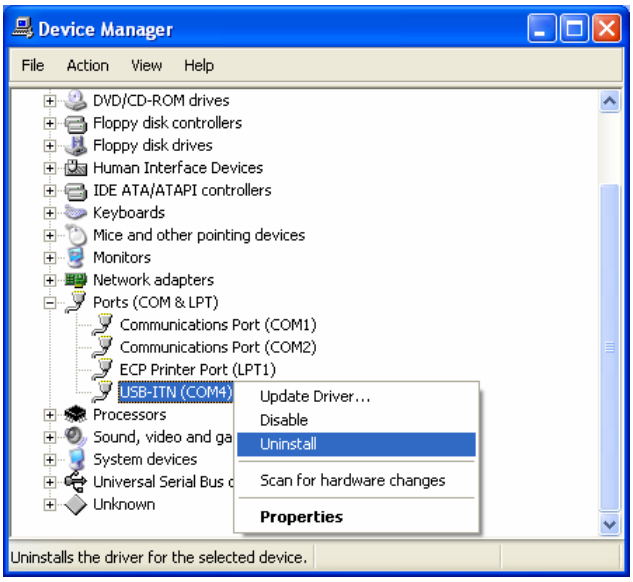
Click the Start button of Windows and open [Control Panel].

Open [System] from [Performance and Maintenance].

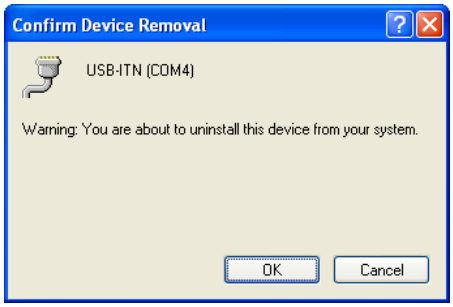
Select the [Hardware] tab and open [Device Manager].

When the [Device Manager] dialog box is displayed, right-click the USB-ITN (COMx) or USB-FSW (COMx) in [Ports (COM & LPT)] whose VCP driver is to be deleted, and select [Uninstall].

NOTE • The 'x' in COMx is the COM port number. This number is automatically assigned by the installer. In the following example, this number is '4'.



When the [Confirm Device Removal] dialog box is displayed, click the [OK] button.



This completes uninstallation.

If the OS is restarted or USB-ITN or USB-FSW is disconnected and then reconnected, the PC recognizes USB-ITN or USB-FSW as a USB human interface device similarly to when it is connected to the PC for the first time and the HID driver is automatically installed.

2.2.5 Uninstalling the VCP driver (Windows 7 / Windows Vista)

NOTE • To uninstall the VCP driver, log in to Windows with 'PC administrator' authority.

Connect the USB-ITN or USB-FSW unit whose VCP driver is to be removed.

Click the Windows Start button, and perform the following in [Control Panel].

Windows 7: Open [System and Security], and open [Device Manager] in [System].

Windows Vista: From [System and Maintenance], open [Device Manager].

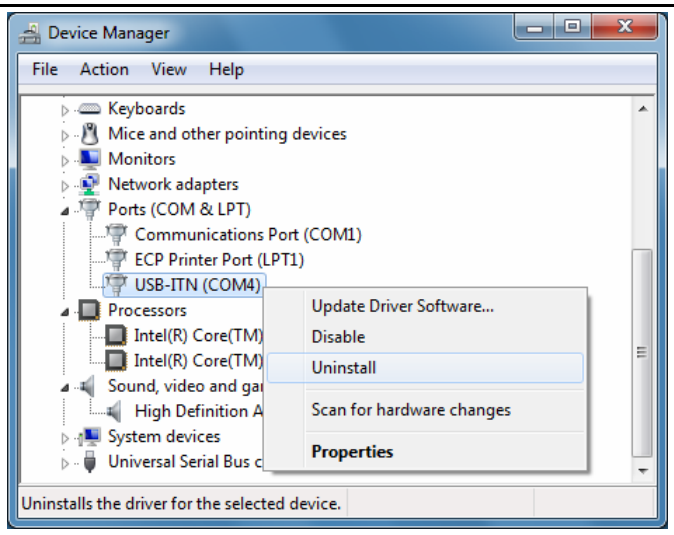
If the [User Account Control] warning is displayed, perform as follows.

Windows 7: click [Yes].

Windows Vista: click [Continue].

When the [Device Manager] dialog box is displayed, right-click the USB-ITN (COMx) or USB-FSW (COMx) in [Ports (COM & LPT)] whose VCP driver is to be deleted, and select [Uninstall].

NOTE • The 'x' in COMx is the COM port number. This number is automatically assigned by the installer. In the following example, this number is '4'.



When the [Confirm Device Uninstall] dialog box is displayed, click the [OK] button.

Do not select [Delete the driver software for this device.].

This completes uninstallation.

If the OS is restarted or USB-ITN or USB-FSW is disconnected and then reconnected, the PC recognizes USB-ITN or USB-FSW as a USB human interface device similarly to when it is connected to the PC for the first time and the HID driver is automatically installed.

2.2.6 Uninstalling the VCP driver (Windows 2000)

NOTE • To uninstall the VCP driver, log in to Windows with 'Administrator' authority.

Connect the USB-ITN or USB-FSW unit whose VCP driver is to be deleted.

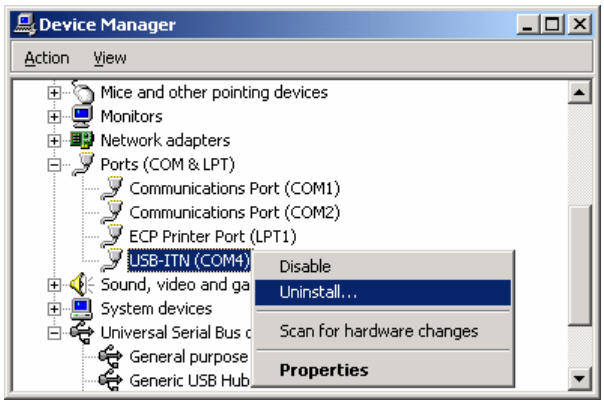
Click the Start button of Windows and open [Control Panel] from the [Settings] menu.

Open [System].

Select the [Hardware] tab and open [Device Manager].

When the [Device Manager] dialog box is displayed, right-click the USB-ITN (COMx) or USB-FSW (COMx) in [Ports (COM & LPT)] whose VCP driver is to be deleted, and select [Uninstall].

NOTE • The 'x' in COMx is the COM port number. This number is automatically assigned by the installer. In the following example, this number is '4'.



When the [Confirm Device Removal] dialog box is displayed, click the [OK] button.

This completes uninstallation.

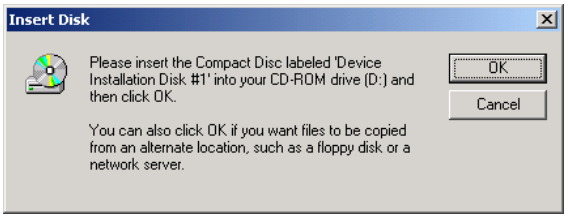
To return USB-ITN or USB-FSW to the USB human interface device, the HID driver must be installed. In this case, follow the procedure below.

1) Remove the CD supplied with USB-ITPAK from the PC.

IMPORTANT · If the supplied CD is inserted in the PC, the VCP driver will automatically be installed and USB-ITN or USB-FSW cannot be returned to the USB human interface device.

2) Restart the OS or disconnect and connect back again the USB-ITN or USB-FSW unit whose HID driver is to be installed.

When the [New Hardware Detected] dialog box is displayed followed by the [Insert Disk] dialog box, click the [Cancel] button.

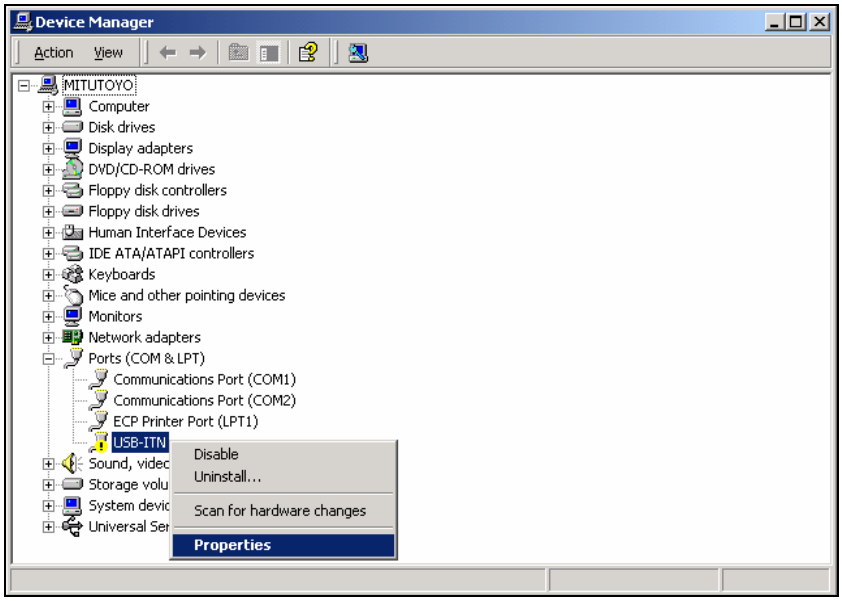


3) Click the Start button of Windows and open [Control Panel] from the [Settings] menu.

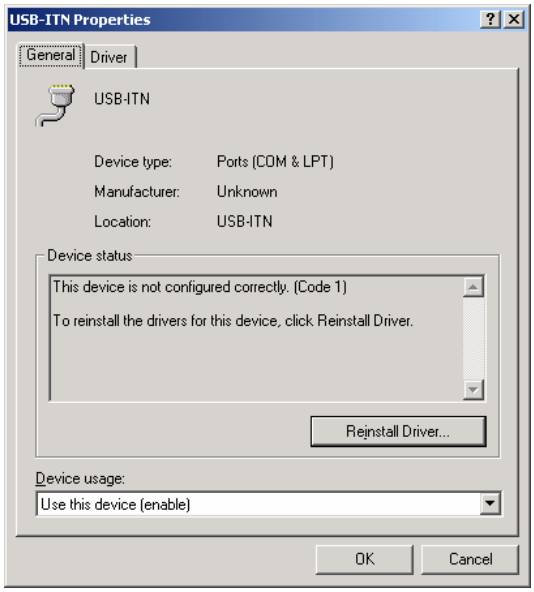
Open [System].

Select the [Hardware] tab and open [Device Manager].

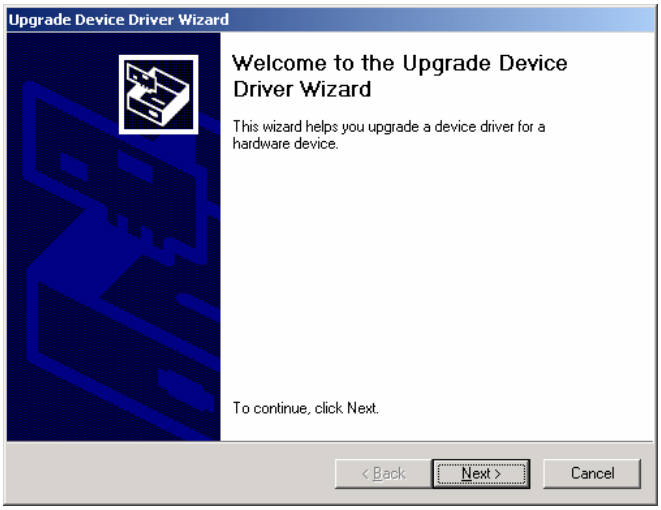
The USB-ITN or USB-FSW is recognized as [Port (COM & LPT)]. Right-click the USB-ITN or USB-FSW with the [!] mark, and select [Properties].



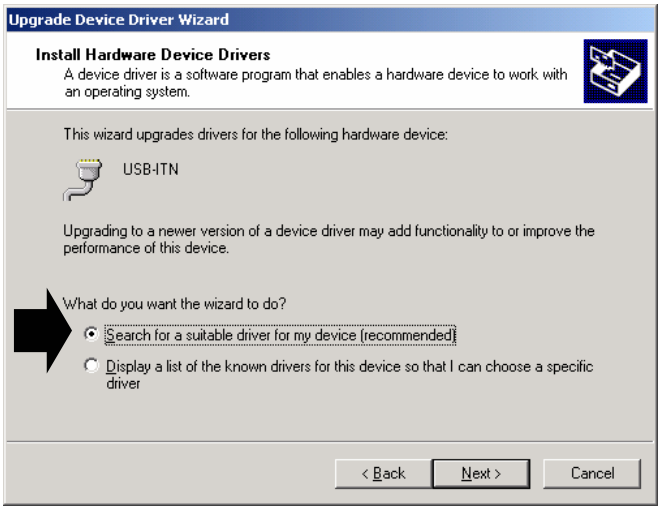
Click the [Reinstall Driver…] button.



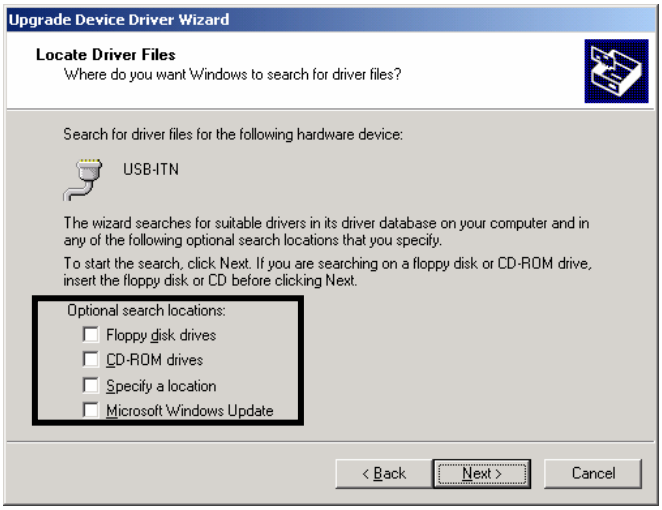
Click the [Next] button.



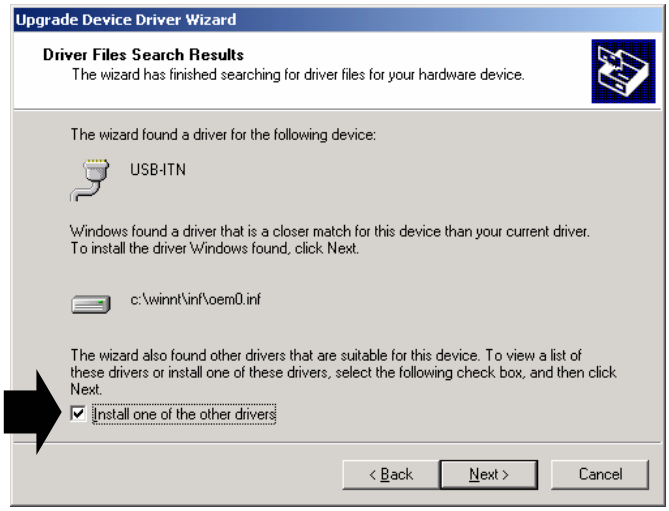
Select [Search for a suitable driver for my device] and click the [Next] button.



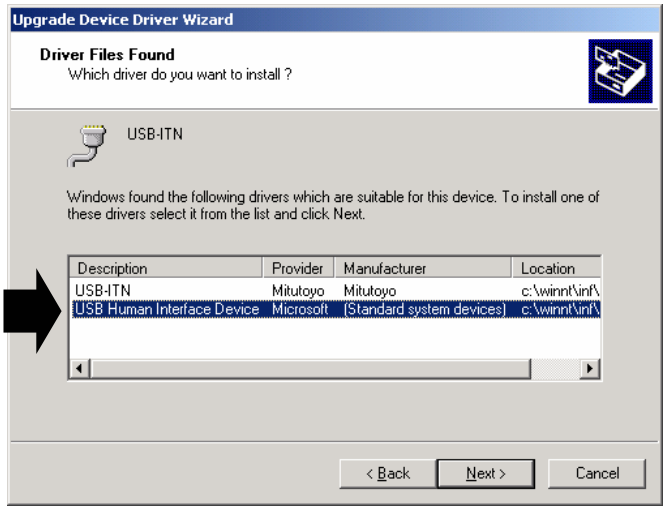
Clear all the check box for [Option search locations] and then click the [Next] button.



Select [Install one of the other drivers] and click the [Next] button.



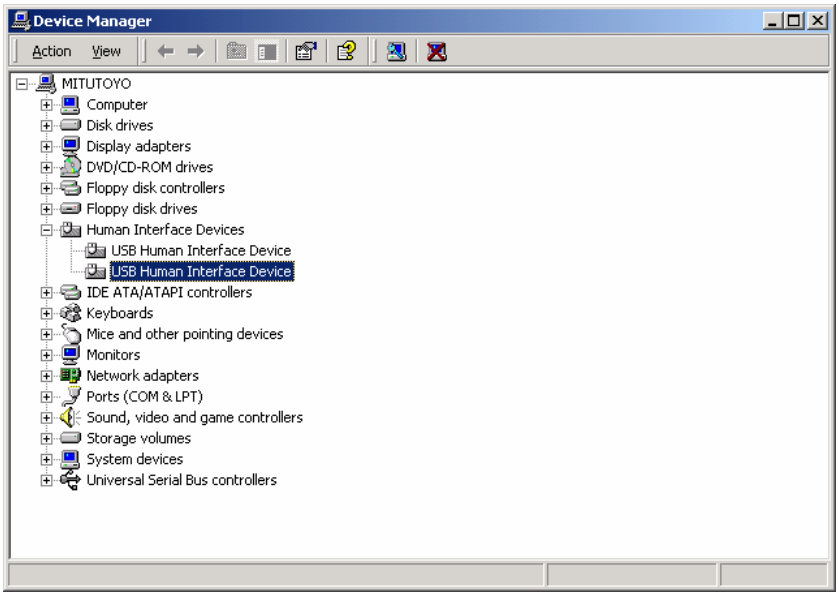
Select [USB Human Interface Device] and then click the [Next] button.



If a warning about digital signature is displayed, click the [Yes] button.

When the [Completing the Upgrade Device Driver Wizard] dialog box is displayed, click the [Finish] button.

This completes the HID driver installation procedure. From Device Manager, check that USB-ITN or USB-FSW is connected as a USB human interface device.



MEMO

3 STARTUP AND TERMINATION OF USB-ITPAK

3.1 Starting up USB-ITPAK

3.1.1 Connecting the measuring tool and foot switch to the PC

1) Connect the measuring tool to USB-ITN and connect USB-ITN to a USB port of the PC.

2) Connect the foot switch to USB-FSW and connect USB-FSW to a USB port of the PC.

IMPORTANT

- Select the USB-ITN appropriate for the measuring tool to be used.

  For details, see ‘1.4 Tools that work with USB-ITPAK’.

- If multiple USB-ITN and USB-FSW units are used, a corresponding number of USB ports is required. If the PC does not have the required number of USB ports, use a USB hub (commercially available).

- To use USB-ITN or USB-FSW with USB-ITPAK, a dedicated VCP driver must be installed for each USB-ITN or USB-FSW unit.
  For how to install the dedicated VCP driver, see ‘2.2 Installing and Uninstalling the VCP driver’.

3.1.2 Connecting the USB dongle to the PC

Connect the supplied USB dongle to a USB port on the PC to be used.

IMPORTANT

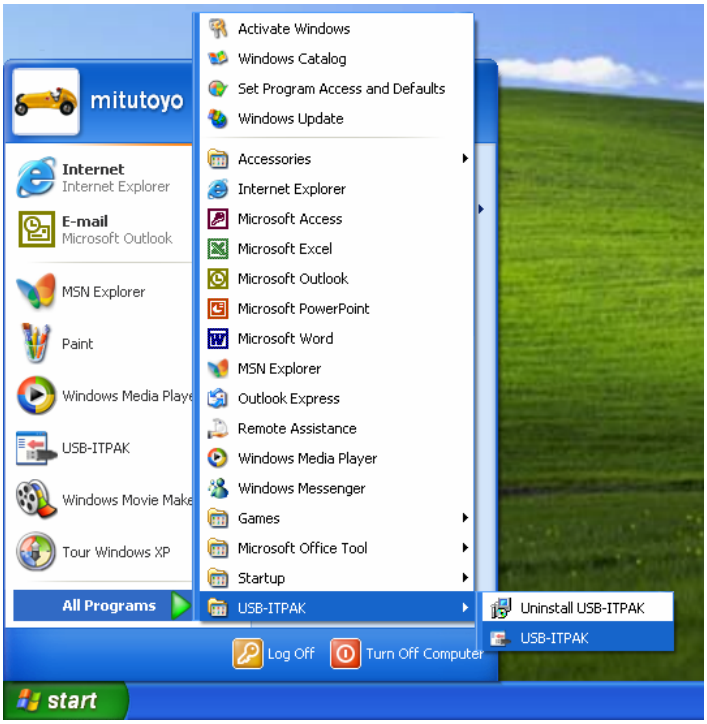
- USB-ITPAK can be installed even if the USB dongle is not inserted, but the USB dongle is required to start up USB-ITPAK.

3.1.3 Starting up USB-ITPAK

IMPORTANT

- To use USB-ITPAK, Microsoft Excel (Excel 2000 or higher) is required. Install Excel on the same PC as USB-ITPAK.

Click the Start button of Windows and select [All Programs] - [USB-ITPAK], and then [USB-ITPAK].



If a shortcut icon is created on the desktop, USB-ITPAK can be started up by double-clicking this icon.

IMPORTANT

- If USB-ITN or USB-FSW is connected after USB-ITPAK is started up, the device is not recognized. In this case, exit USB-ITPAK and then restart it.

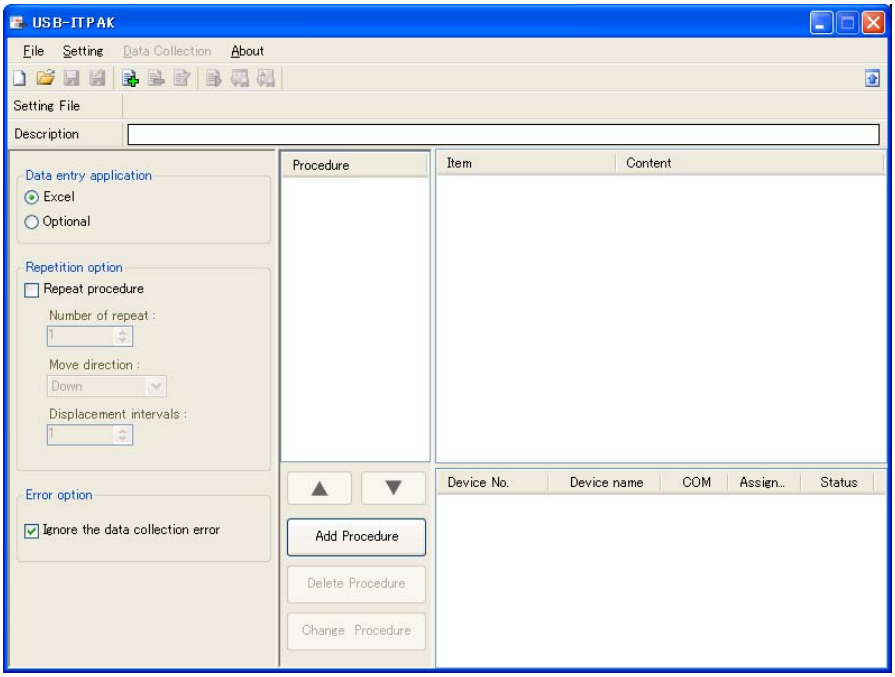
When USB-ITPAK is started up, either of the following two dialog boxes is displayed, depending on the setting.

IMPORTANT • For details about setting whether to select Quick Menu as the initial dialog box after USB-ITPAK startup, see '6.5 Options'.

1) Main dialog box

The main dialog box is displayed for operators who create the setting file.

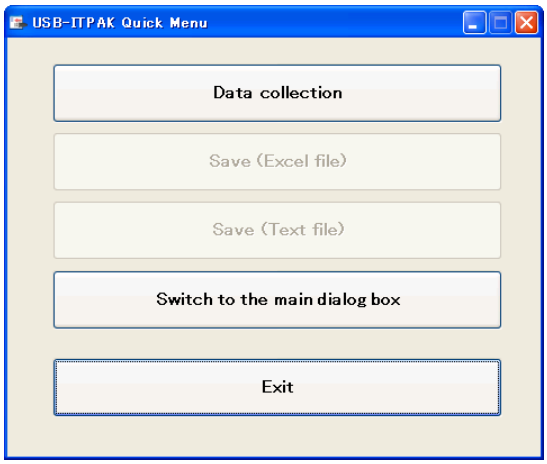
All the functions of USB-ITPAK, from setting of the procedure to data collection, can be used from this dialog box.



2) Quick Menu

Quick Menu is displayed for operators who collect data.

Operators can start measurement by clicking the [Data collection] button to open an already set procedure (setting file). Quick Menu is very useful for performing actual measurement work.



3.1.4 Exiting USB-ITPAK

IMPORTANT • Save data if it is not saved, before exiting USB-ITPAK.

Perform one of the two following ways to exit USB-ITPAK.

1: Click [Exit] button in Quick Menu.

2: Select [File] and then [Exit] on the main dialog box.

3.1.5 Disconnecting the USB dongle from the PC

Exit USB-ITPAK before disconnecting the USB dongle from the PC.

NOTE • To continuously use USB-ITPAK, keep the USB dongle connected.

3.1.6 Disconnecting the measuring tool and foot switch from the PC

Exit USB-ITPAK before disconnecting USB-ITN and USB-FSW from the USB ports of the PC.

NOTE • To continuously use USB-ITPAK, keep USB-ITN and USB-FSW connected.

4 MEASUREMENT DATA COLLECTION (BASICS)

This chapter explains the basic use of USB-ITPAK.

'CHAPTER 5 MEASUREMENT DATA COLLECTION (ADVANCED)' explains the advanced use of USB-ITPAK, such as collecting data by using the foot switch and combining multiple procedures.

'CHAPTER 6 DIALOG BOX CONFIGURATIONS OF USB-ITPAK' describes the menus and dialog box configuration for all the functions of USB-ITPAK.

4.1 General Cautions Regarding Use

Carefully read the following cautions before using USB-ITPAK.

1. Handling Excel files registered in USB-ITPAK procedures
   USB-ITPAK manages Excel files by using the Excel workbook and worksheet names registered to procedures.

   Therefore, do not make the following changes to Excel files registered to procedures in Excel:

   - Deleting or changing workbook and worksheet names
   - Saving a workbook in a different folder

2. Handling Excel files currently used for data collection
   Do not perform the following manipulations in Excel while collecting data by executing a procedure in USB-ITPAK:

   - Exiting Excel
   - Closing an Excel file registered to a procedure
   - Changing the contents of an Excel file registered to a procedure.

3. Executing procedure test (recommended)
   Multiple procedures can be registered to the setting file of USB-ITPAK to provide a complex procedure that can be run as a whole. Before running procedures, it is recommended to check their operation by testing them beforehand.

4.2 Sequential Measurement (Basics)

4.2.1 Overview

Sequential measurement is one of the measurement methods that can be selected in the procedures used in USB-ITPAK.

During sequential measurement, one or more measuring tools are used and measurement data is input from the tools to cells specified in advance in an inspection table worksheet in Excel or other applications.

Example: Measurement in a pre-set sequence such as measuring the length, and then the width by using one measuring tool

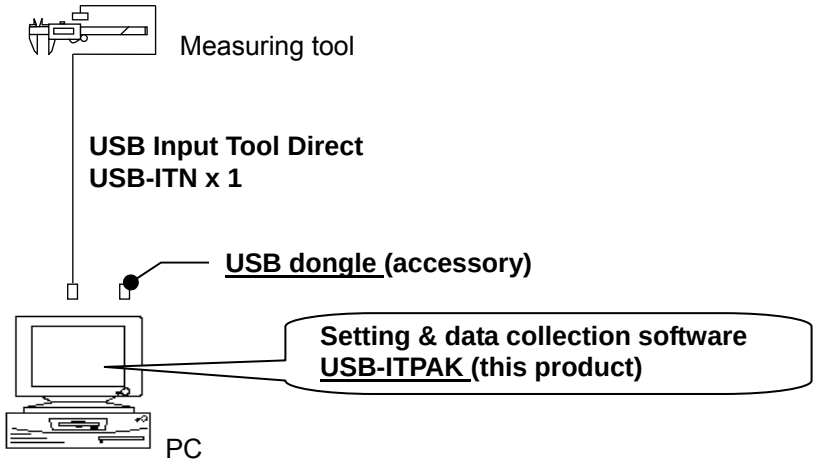
Example: Sequential measurement of measurement locations on a workpiece using multiple measuring tools, such as measuring the length by using a caliper and measuring the diameter by using a micrometer

[Data request] button of USB-ITPAK, function keys of a PC, the DATA switch of the measuring tools, and the foot switch can be used when collecting measurement data.

This section explains the basic use of sequential measurement.

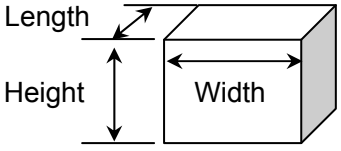
1) Connection

In the example used in this section, one measuring tool is connected to USB-ITN. The connection diagram is shown below.



2) Workpiece for measurement

The following workpiece is used in the explanation. The measurement locations are the length, width, and height of the rectangular parallelepiped.



3) Measurement

The image of the inspection table upon completion of data collection is shown below.

No.	Inspection item	Permissible value		Unit	Measuring item	X1	X2	X3	X4	X5
1	Length	13.60	13.40	mm	CD	13.49	13.51	13.52	13.53	13.50
2	Width	12.20	12.00	mm	CD	12.12	12.15	12.13	12.15	12.14
3	Height	10.60	10.50	mm	CD	10.58	10.58	10.55	10.57	10.56

In this measurement procedure, the length, width, and height of the first workpiece are measured and the input data is output to the first row (Length), the second row (Width), and the third row (Height), respectively, of the X1 column on the Excel worksheet.

Next, the second workpiece is similarly measured, and so on, until all five workpieces have been measured.

X1	X2	X3	X4	X5
Length (1) ↓ Width (1) ↓ Height (1)				
				Height (5)

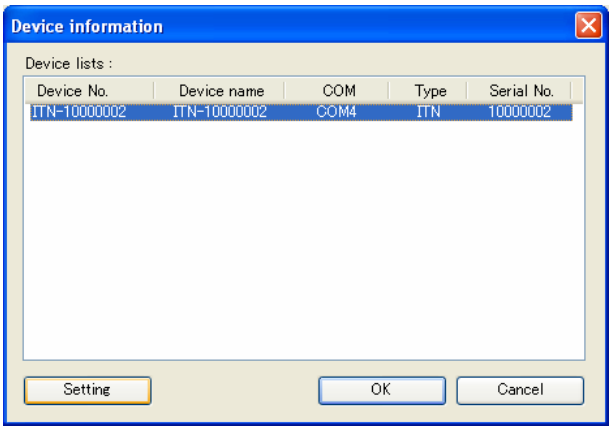
The following describes how to set up the measurement procedure, perform measurement, and save the results.

4.2.2 Setting

1) Check the device information.

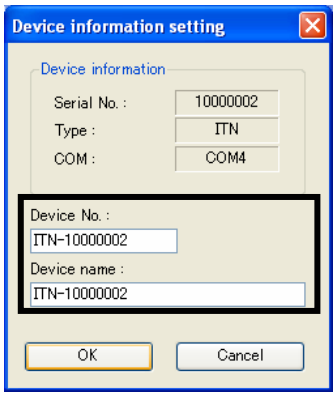
NOTE • USB-ITPAK loads the information of connected devices at startup. Therefore, connect all the devices to be used before starting up USB-ITPAK.

From the menu of the main dialog box, select [Settings] and then [Device information]. This opens the [Device information] dialog box, which allows you to check the devices that are connected to the PC.



If you do not want to change the device number or device name, click the [Cancel] button to return to the main dialog box.

If you want to change the device number or device name, click the [Setting] button.



Click the [OK] button if you change any settings.

NOTE • In the procedure created from step '2)', the device number is used to specify the device to be used. If you change the number, revise all the setting files that use it.

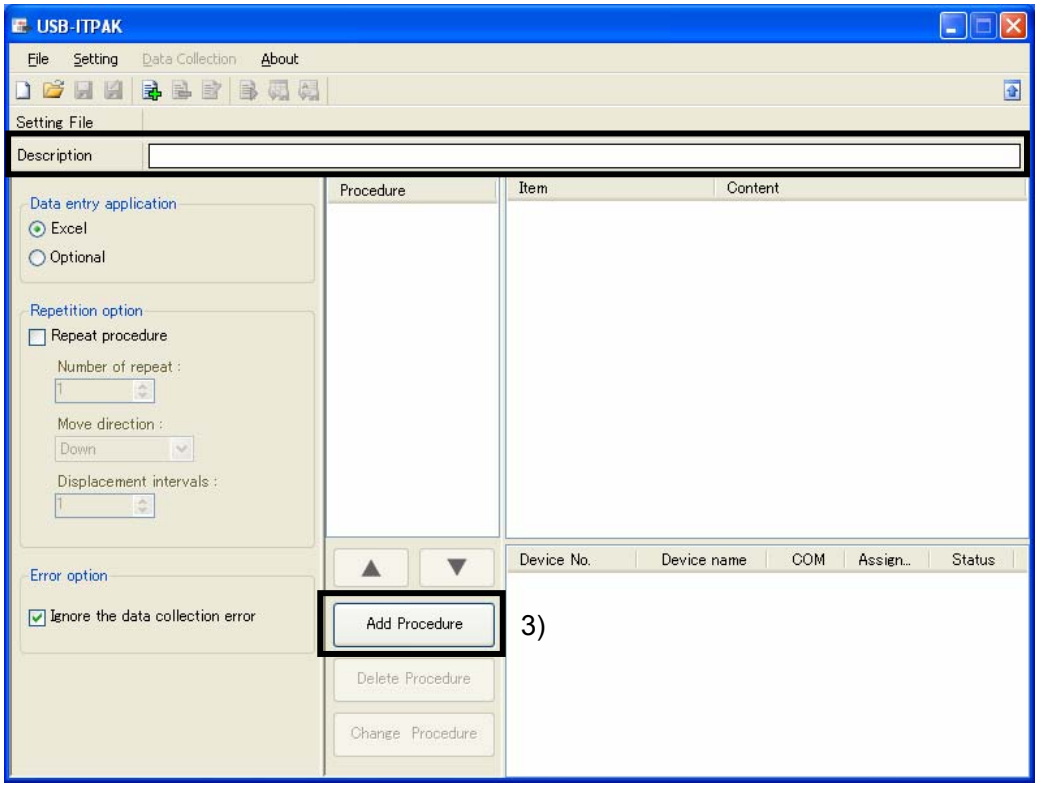
TIP • If multiple units are connected, specify settings for each.

TIP • If performing measurement using existing setting files, skip this section and see '4.2.3 Measurement'.

2) Enter information about the setting file in the [Description] field.

Enter a description of the setting file. This field may be left blank.

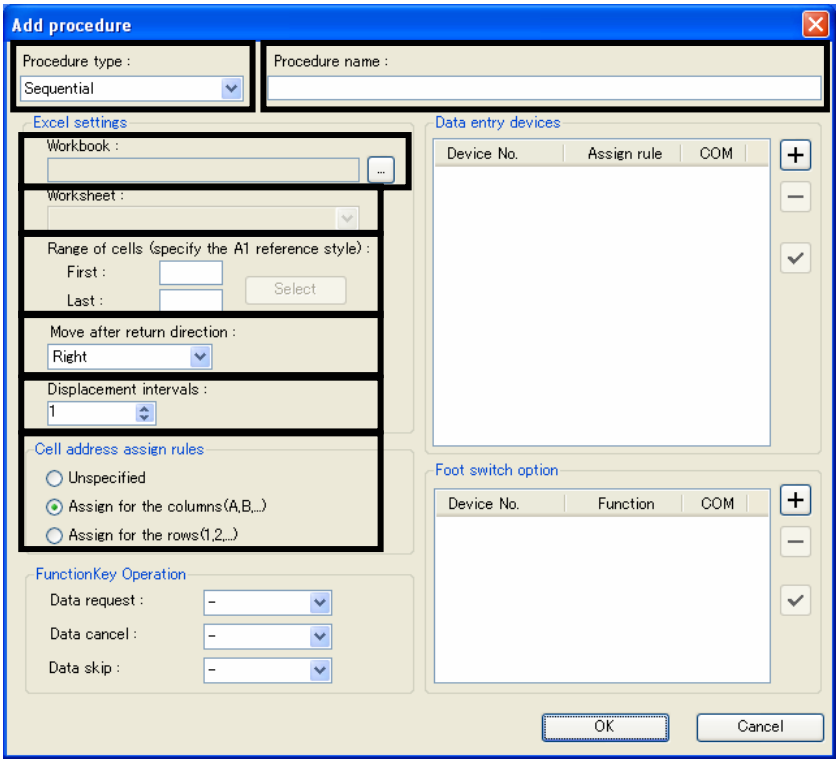
2)



3) Add a procedure to the setting file.

Click the [Add Procedure] button on the main dialog box.

4) Select a procedure type for the [Procedure type] field.



Check that [Sequential] is selected as the procedure type, and if not, select [Sequential] from the drop-down list.

5) Enter a name in the [Procedure name] field.

Entering the procedure name is required.

TIP • Since the procedure name will be displayed in the [Procedure] field at the center of the main dialog box, enter an easily identifiable name.

Here, enter [3 side measurement].

6) Specify an Excel file in the [Workbook] field under [Excel settings].

Enter the workbook name of the Excel file to which the measured data is to be input.

The file can be selected from the [Open] dialog box by clicking the […] button.

Here, select the following file.

C:\Mitutoyo\USB-ITPAK\Sample\ITPAK_Sample_Form_1_GB.xls

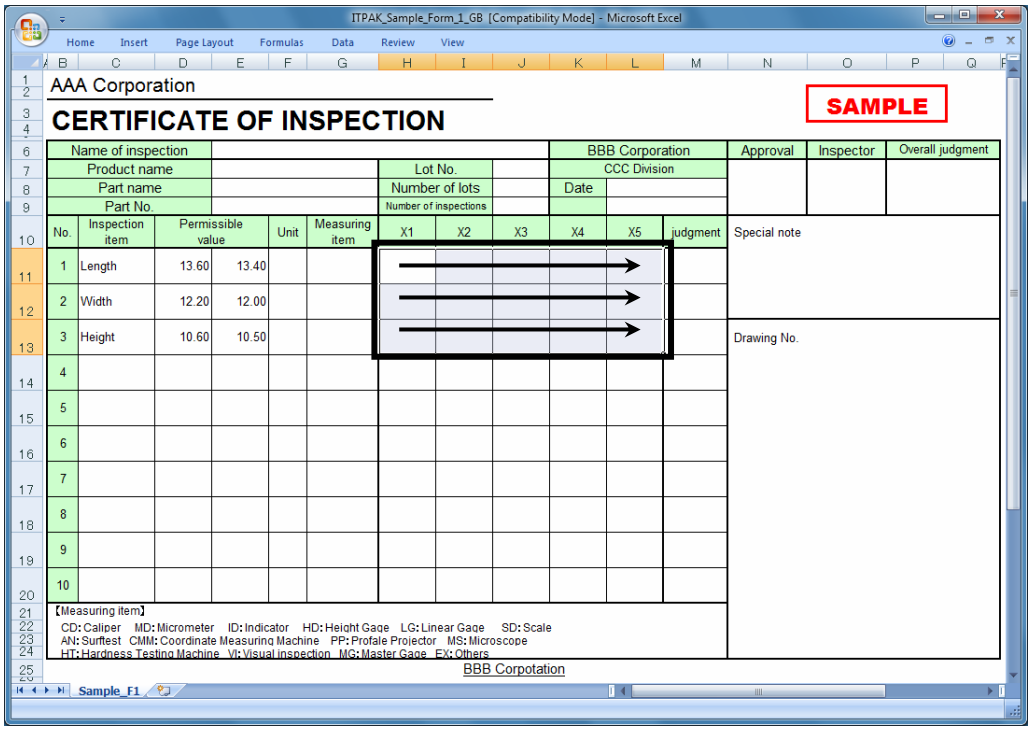
IMPORTANT • If you want to use a file other than the sample inspection table file, create an inspection file using Excel before starting up USB-ITPAK. Inspection table files can be saved to any folder. Save the inspection table file to a folder location that will be easy to manage.

7) Select a worksheet for the [Worksheet] field under [Excel settings].

Select the worksheet name to be included in the workbook of step '6)' from the drop-down list.

Here, select [Sample_F1].

8) Enter the input range in the [Range of cells] fields under [Excel settings].



To specify the area indicated by the bold lines in the above inspection table as the input cell range, enter:

First: H11

Last: L13

TIP • The inspection table above is shown with the [Inspection item] and [Permissible value] cells filled.

9) Select the desired direction for the [Move after return direction] field under [Excel settings].

During measurement using USB-ITPAK, once data is input from the measuring tools, the measurement data is input to the current cell and then the entry point (cell) automatically moves to the next cell.

In the inspection table example shown above, select [Down].

10) Specify the [Displacement intervals] under [Excel settings].

Specify the interval for the cell movement specified in step 9). Specifying "1" results in movement to the next cell. Specifying "2" results in movement to the cell after the next.

In the inspection table example above, specify "1".

11) Select an option under [Cell address assign rules].

In USB-ITPAK, the measuring items can be assigned to columns (vertical) or rows (horizontal) of the inspection table worksheet.

In the inspection table example above, the measuring items are assigned to respective rows, so select [Assign for the rows (1, 2…)].

TIP • Data can be collected even if the device is not assigned to columns (A, B, ...) or rows (1, 2, ...). In this case, select [Unspecified].

When data is input from the device registered in the procedure during data collection, the data is written to the cell that is currently active in the order of input, regardless of the cell position.

For details, refer to '6.6.3 Cell address assign rules'.

12) Specify the [Data entry devices] settings.

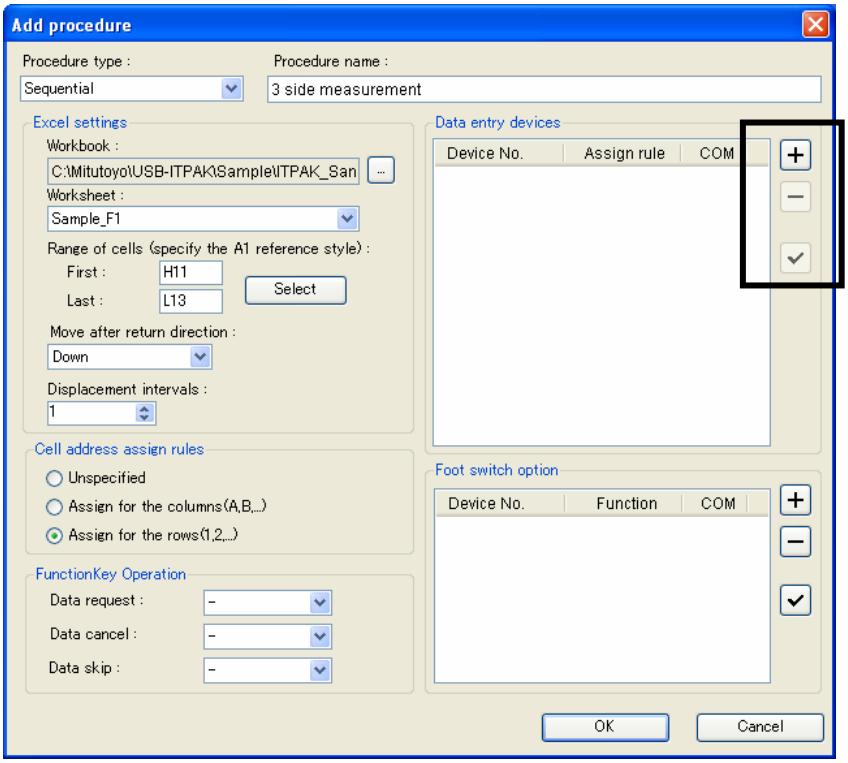
The functions of the buttons for the [Data entry devices] field are as follows:

[+]: Adds device settings.

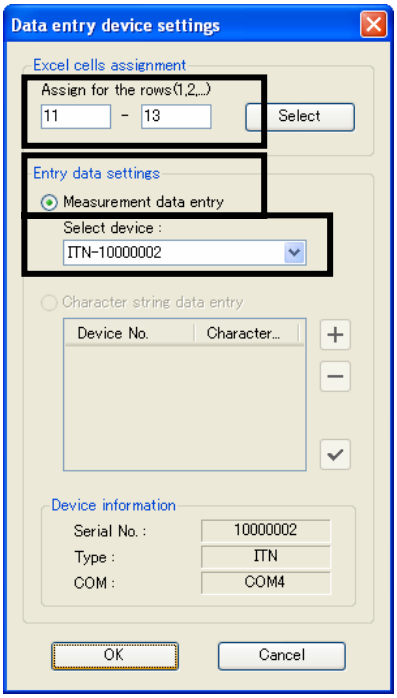
[–]: Deletes the device setting selected from the list.

[√]: Changes the device setting selected from the list.

Here, click the [+] button to switch to the [Data entry device settings] dialog box.



13) Specify the settings in the [Excel cells assignment] field on the [Data entry device settings] dialog box.



In the [Excel cells assignment] field, specify columns (vertical) or rows (horizontal) according to the specification in step 11). Specify the rows here.

There are three input areas in the previously described inspection table. Here, one device is assigned on all the rows, so enter start row number “11” in the input field on the left, and input “13” in the input field on the right.

14) In the [Entry data settings] field, select the entry data type.

The entry data types consist of measurement data input from the measuring tools (numeric data), and character string data input by pressing the foot switch.

TIP • For details about the method for inputting character string data using a foot switch, refer to ‘CHAPTER 5 MEASUREMENT DATA COLLECTION (ADVANCED)’.

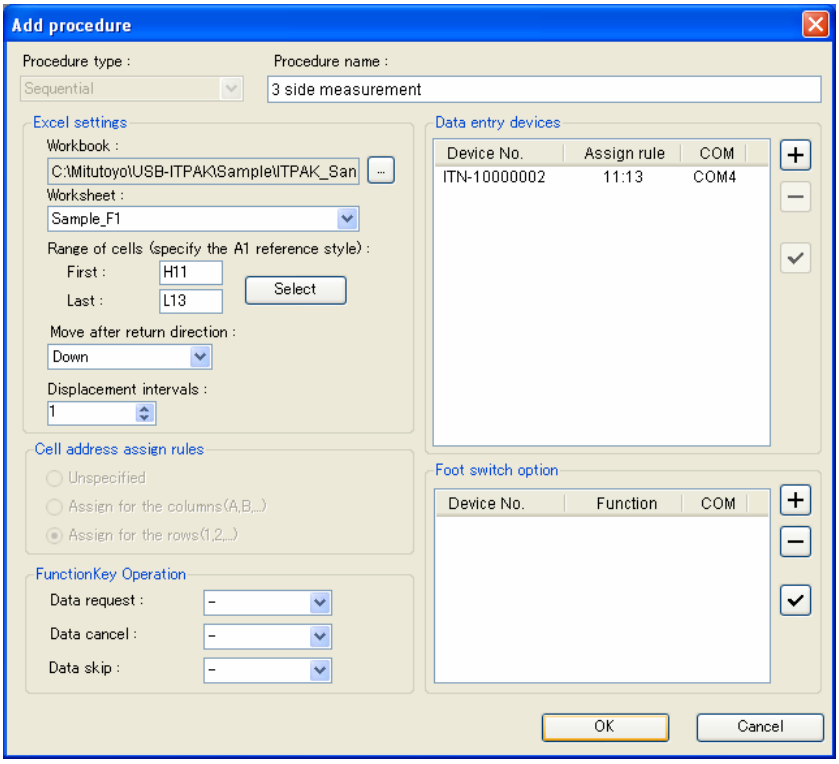
Here, select the [Measurement data entry] radio button.

15) In the [Select device] field, select the device to be assigned.

From the drop-down list, select the device to be assigned.

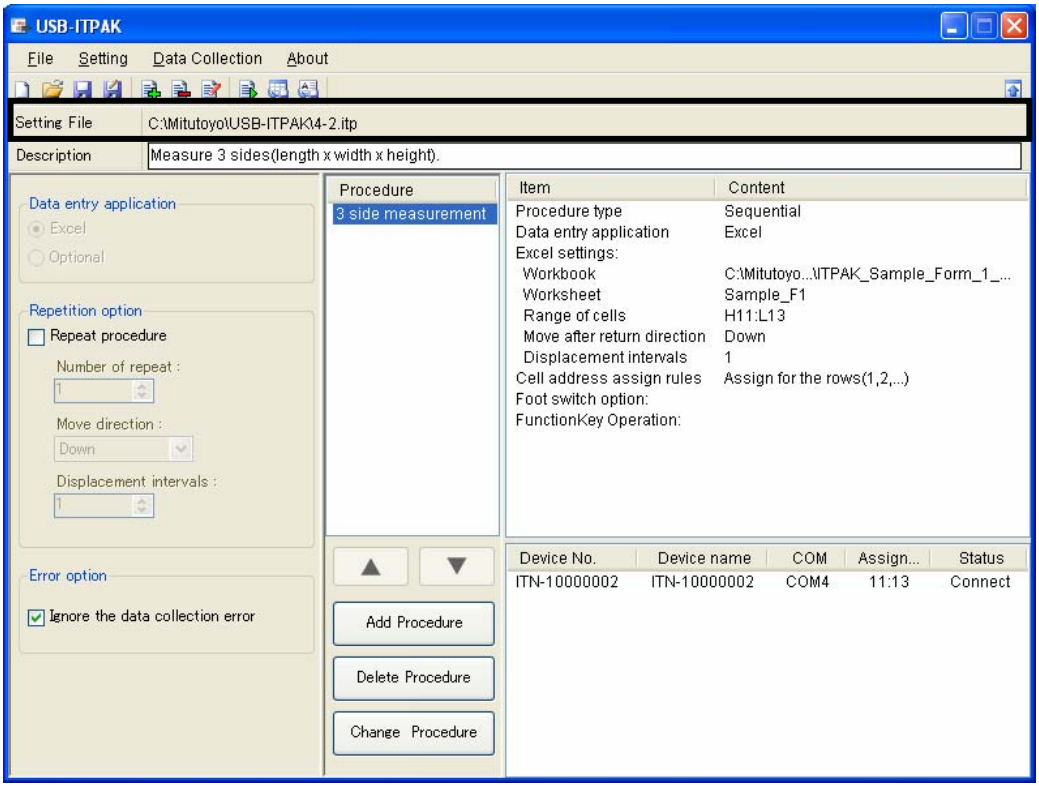
This completes the settings on the [Data entry device settings] dialog box, so click the [OK] button.

16) Close [Add procedure].



This completes the settings on the [Add procedure] dialog box, so click the [OK] button.

17) Save the created setting file.



From the menu of the main dialog box, select [File], [Save As], and then save the file by giving it a name. When the file has been saved, the file name is displayed as a full path in the [Setting File] field.

4.2.3 Measurement

1) Open [Setting File].

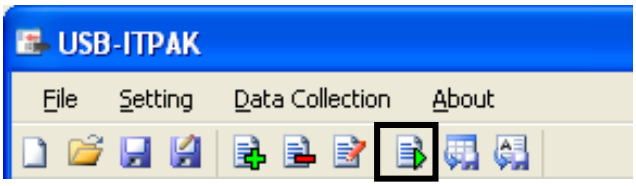
TIP
- If starting measurement immediately after specifying the settings in '4.2.2 Setting', the setting file is already opened. In this case, skip step '1)'.

From the menu of the main dialog box, select [File] and then [Open], or open [Setting file] from [Recent files].

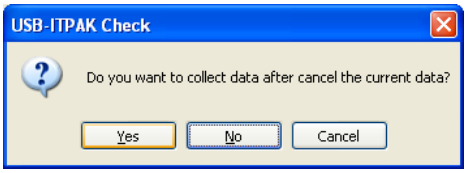
2) Open the data collection dialog box.

IMPORTANT
- In USB-ITPAK, following data collection, the Excel file to which the data was input is saved through overwriting under the existing file name. To use the original Excel file later, back it up beforehand.

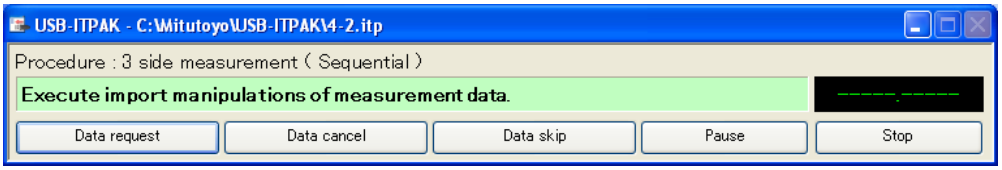
From the menu of the main dialog box, select [Data Collection] and then [Start], or click the icon shown below.



When data collection starts, the message [Do you want to collect data after cancel the current data?] is displayed. Click [Yes] to clear the existing data or [No] not to.

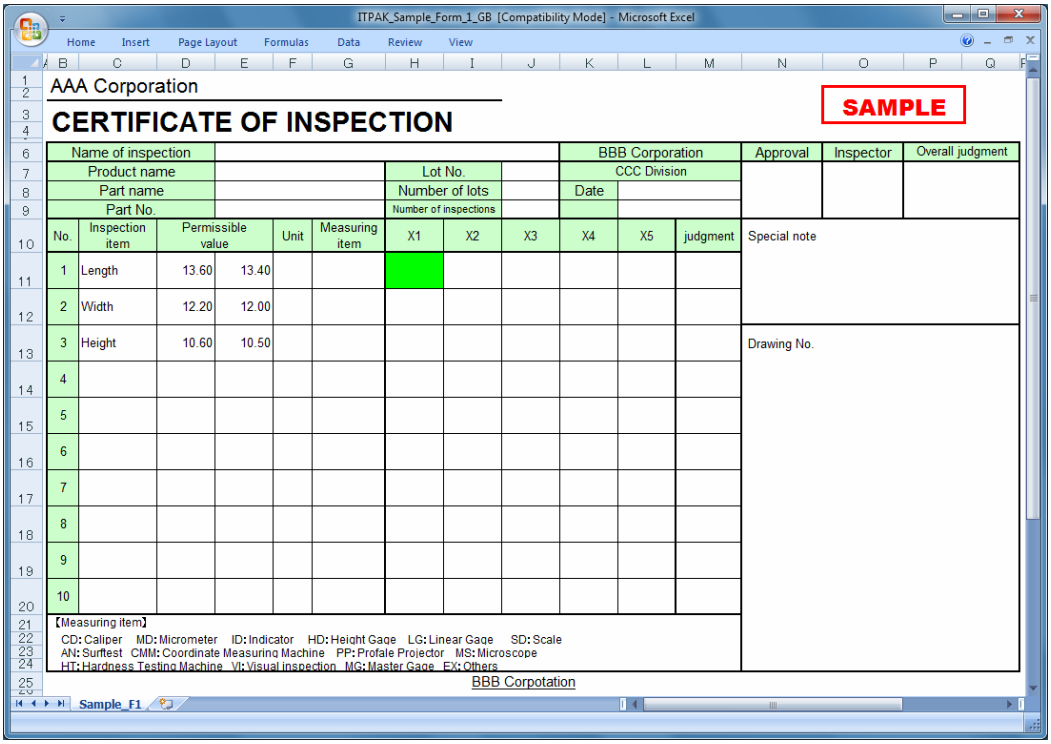


The data collection dialog box is displayed and data collection can now be performed.



3) Perform data collection.

During data collection, the cell to which data will be input next is highlighted in green.



Input data from the measuring tools through one of the following operations:

(1) Pressing the DATA switch on the measuring tool.

(2) Pressing the output switch if USB-ITN has one.

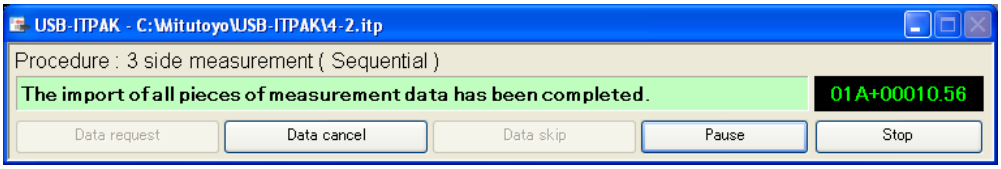
(3) Clicking the [Data request] button on the data collection dialog box.

To cancel data that has been input, click the [Data cancel] button on the data collection dialog box. The data in the entry cell is canceled and the previous cell is highlighted.

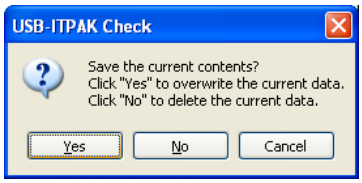
To skip the current data entry cell without inputting data, click the [Data skip] button on the data collection dialog box. The next cell is highlighted.

4) End data collection and save the results.

Once all the data has been input, a completion message is displayed on the data collection dialog box.



Click the [Stop] button on the data collection dialog box. The following message is displayed.



[Yes]: The Excel file to which data was input is saved through overwriting under the existing file name.

[No]: The Excel file is not overwritten and the data that was input is deleted.

[Cancel]: The message dialog box is closed and the data collection dialog box is displayed.

Click the [Yes] button. The Excel file is saved through overwriting and the dialog box switches to the main dialog box.

This completes basic data collection for sequential measurement.

4.3 Batch Measurement (Basics)

4.3.1 Overview

Batch measurement is one of the measurement methods that can be selected in the procedures used in USB-ITPAK.

During batch measurement, multiple measuring tools are used to acquire measurement data in batch.

Example: Multiple measuring tools are attached to measuring jigs and workpieces are set to these jigs, and then measurement data is collected from all the connected measuring tools by using a foot switch, etc.

The [Data request] button of USB-ITPAK, function keys of a PC, and the foot switch can be used when collecting measurement data.

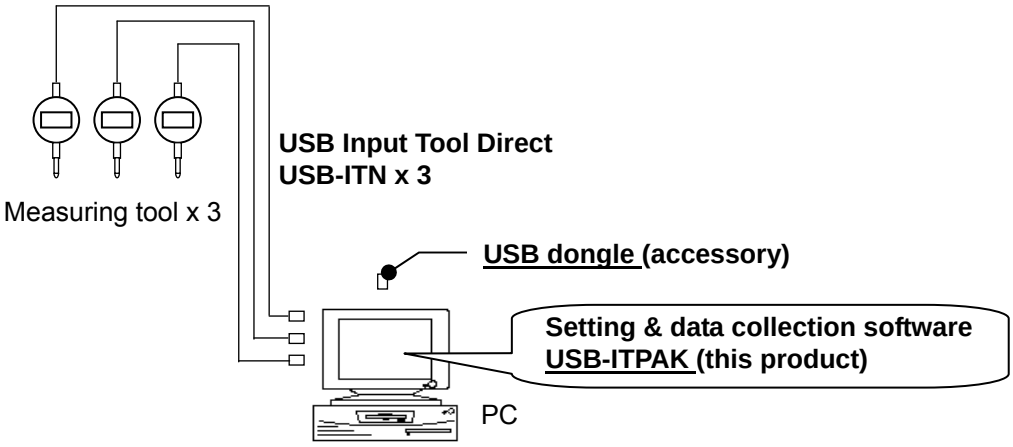
IMPORTANT

- During batch measurement, a data output request is sent to all the measuring tools through a single operation, but some differences arise among the measurement times of the measuring tools. Therefore, it is not possible to perform measurement while moving measuring jigs or workpieces. Be sure to fix jigs and workpieces in place during measurement.

This section explains the basic use of batch measurement.

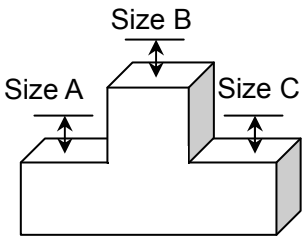
1) Connection

In the example used in this section, three indicators are connected to USB-ITN. The connection diagram is shown below.



2) Workpiece for measurement

The following workpiece is used in the explanation. Three indicators are used and measurement is done with measuring jigs. ‘Size A’, ‘Size B’, and ‘Size C’, which are shown in the figure below, are measured.

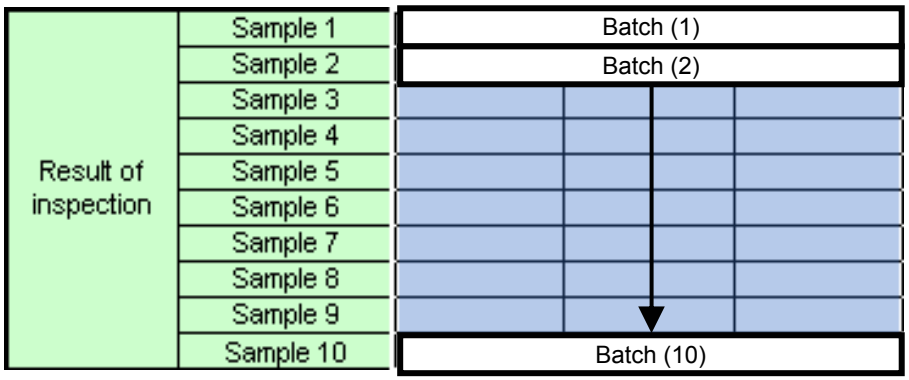


3) Measurement

The image of the inspection table upon completion of data collection is shown below.

Inspection item		Size A	Size B	Size C
Measuring item				
Tolerance	Upper limit	0.15	0.10	0.15
	Lower limit	-0.15	-0.10	0.00
Result of inspection	Sample 1	0.05	0.02	0.07
	Sample 2	0.08	0.01	0.06
	Sample 3	0.09	0.00	0.05
	Sample 4	0.07	0.03	0.06
	Sample 5	0.08	-0.01	0.04
	Sample 6	0.08	0.02	0.06
	Sample 7	0.06	-0.01	0.05
	Sample 8	0.07	-0.02	0.05
	Sample 9	0.07	0.01	0.04
	Sample 10	0.08	0.00	0.06

The measurement procedure is as follows. The three locations of the first workpiece are measured, and the input data is output to the ‘Size A’, ‘Size B’, and ‘Size C’ columns.
Next, the three locations of the second workpiece are measured, and the input data is output to the ‘Size A’, ‘Size B’, and ‘Size C’ columns in the ‘Sample 2’ row of the Excel worksheet.
The remaining workpieces up to the tenth one are measured in the same manner.



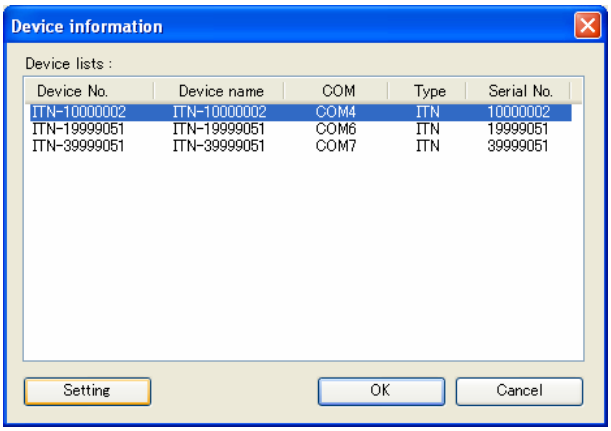
The following describes how to set up the measurement procedure, perform measurement, and save the results.

4.3.2 Setting

1) Check the device information.

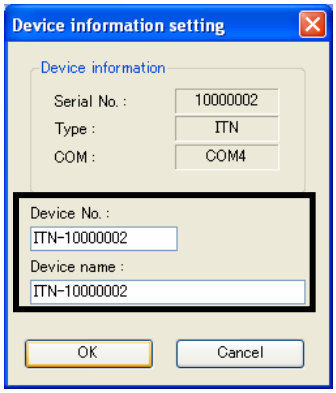
TIP • USB-ITPAK loads the information of connected devices at startup. Therefore, connect all the devices to be used before starting up USB-ITPAK.

From the menu of the main dialog box, select [Settings] and then [Device information]. This opens the [Device information] dialog box, which allows you to check the devices that are connected to the PC.



If you do not want to change the device number or device name, click the [Cancel] button to return to the main dialog box.

If you want to change a device number or device name, select the device, and then click the [Setting] button.



Click the [OK] button if you change any settings.

NOTE • In the procedure created from step '2)', the device number is used to specify the device to be used. If you change the number, revise all the setting files that use it.

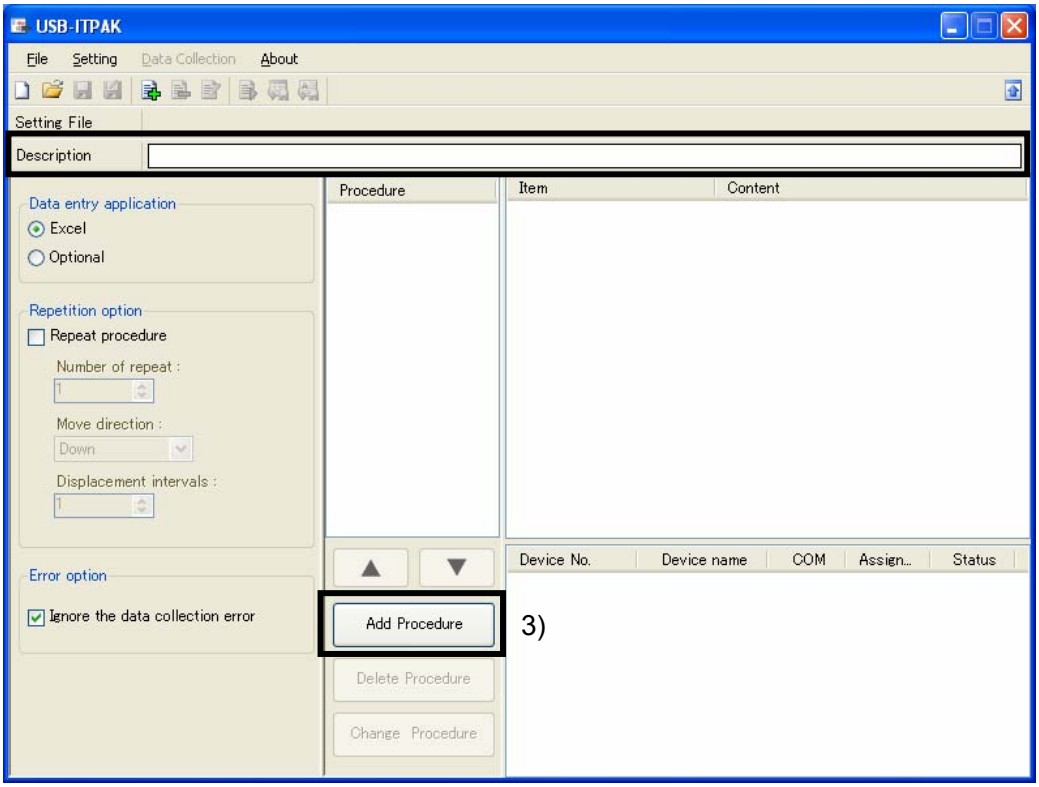
TIP • If multiple units are connected, specify settings for each.

TIP • If performing measurement using existing setting files, skip this section and see '4.3.3 Measurement'.

2) Enter information about the setting file in the [Description] field.

Enter a description of the setting file. This field may be left blank.

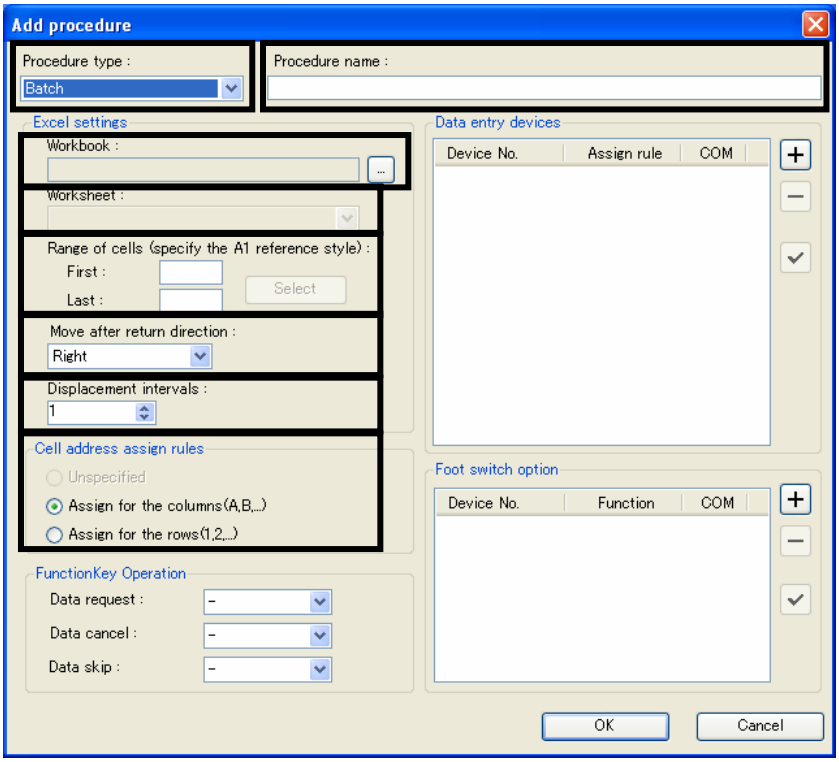
2)



3) Add a procedure to the setting file.

Click the [Add Procedure] button on the main dialog box.

4) Select a procedure type for the [Procedure type] field.



Check that [Batch] is selected as the procedure type, and if not, select [Batch] from the drop-down list.

5) Enter a name in the [Procedure name] field.

Entering the procedure name is required.

TIP

- Since the procedure name will be displayed in the [Procedure] field at the center of the main dialog box, enter an easily identifiable name.

Here, enter [3 position batch measurement].

6) Specify an Excel file in the [Workbook] field under [Excel settings].

Enter the workbook name of the Excel file to which the measured data is to be input.

The file can be selected from the [Open] dialog box by clicking the […] button.

Here, select the following file.

C:\Mitutoyo\USB-ITPAK\Sample\ITPAK_Sample_Form_3_GB.xls

IMPORTANT

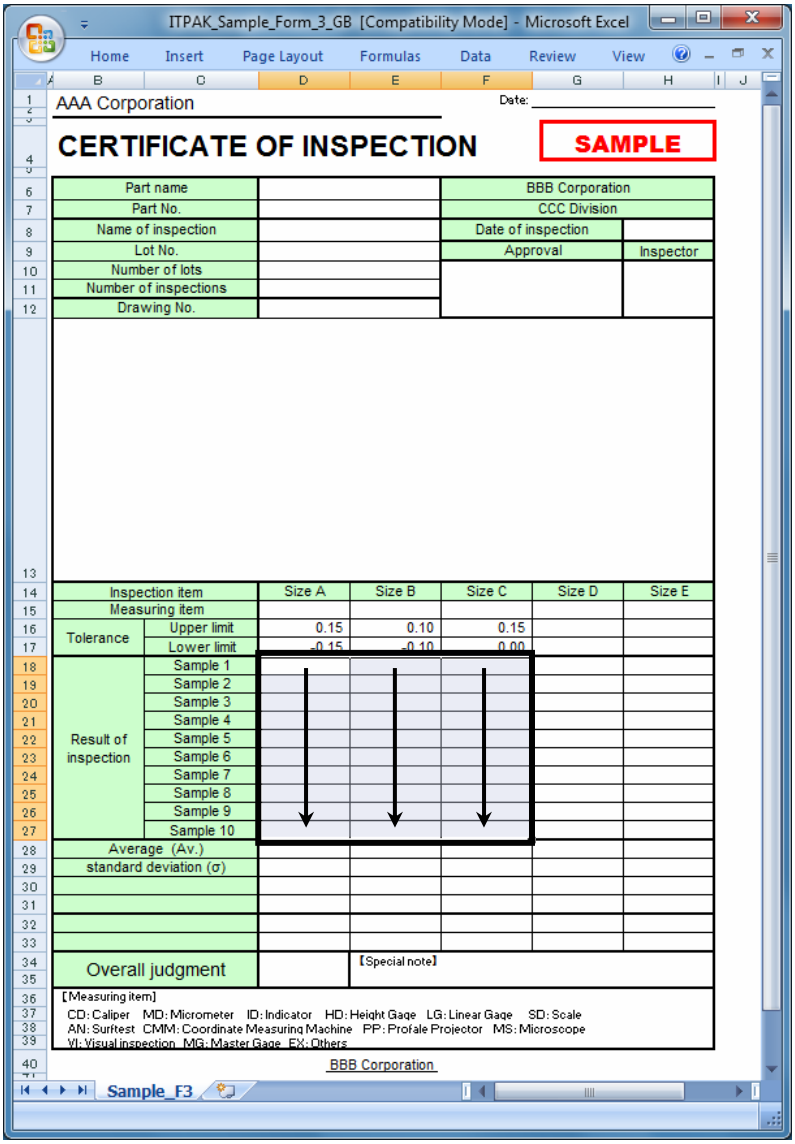
- If you want to use a file other than the sample inspection table file, create an inspection file using Excel before starting up USB-ITPAK. Inspection table files can be saved to any folder. Save the inspection table file to a folder location that will be easy to manage.

7) Select a worksheet for the [Worksheet] field under [Excel settings].

Select the worksheet name to be included in the workbook of step '6)' from the drop-down list.

Here, select [Sample_F3].

8) Enter the input range in the [Range of cells] fields under [Excel settings].



To specify the area indicated by the bold lines in the above inspection table as the input cell range, enter:

First: D18

Last: F27

TIP • The inspection table above is shown with the [Upper limit] and [Lower limit] cells filled.

9) Select the desired direction for the [Move after return direction] field under [Excel settings].

During measurement using USB-ITPAK, once data is input from the measuring tools, the measurement data is input to the current cell and then the entry point (cell) automatically moves to the next cell.

In the inspection table example shown above, select [Down].

10) Specify the [Displacement intervals] under [Excel settings].

Specify the interval for the cell movement specified in step 9). Specifying “1” results in movement to the next cell. Specifying “2” results in movement to the cell after the next.

In the inspection table example above, specify “1”.

11) Select an option under [Cell address assign rules].

In USB-ITPAK, the measuring items can be assigned to columns (vertical) or rows (horizontal) of the inspection table worksheet.

In the inspection table example above, the measuring items are assigned to respective columns, so select [Assign for the columns (A, B…)].

12) Specify the [Data entry devices] settings for the first device.

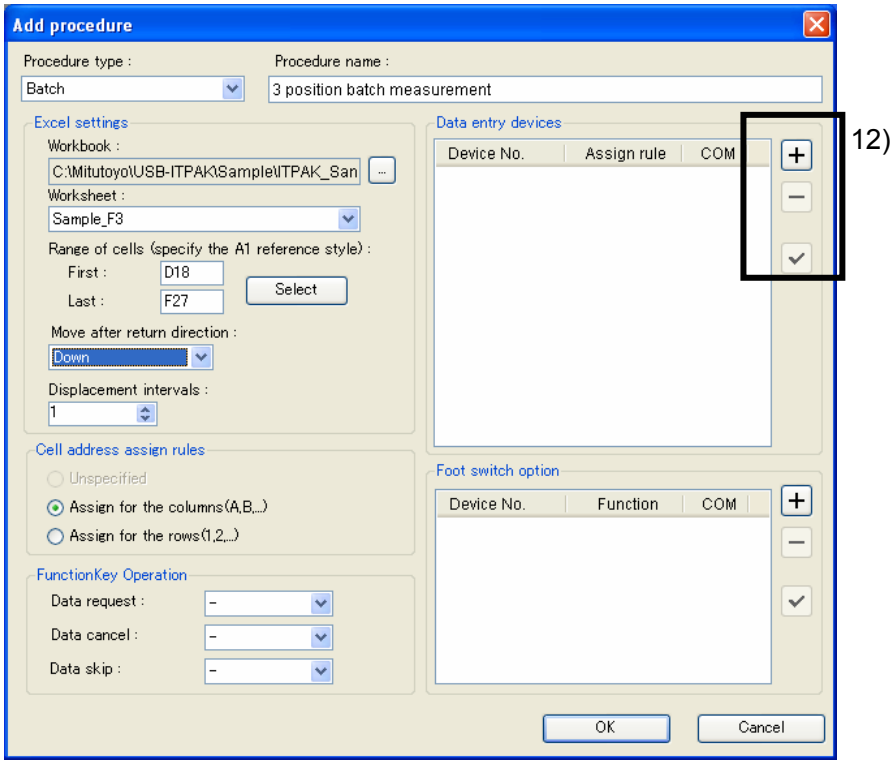
The functions of the buttons for the [Data entry devices] field are as follows:

[+]: Adds device settings.

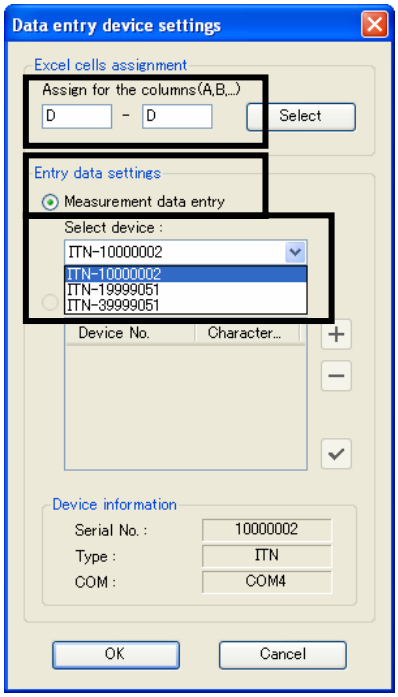
[–]: Deletes the device setting selected from the list.

[√]: Changes the device setting selected from the list.

Here, click the [+] button to switch to the [Data entry device settings] dialog box.



13) Specify the settings in the [Excel cells assignment] field on the [Data entry device settings] dialog box.



In the [Excel cells assignment] field, specify columns (vertical) or rows (horizontal) according to the specification in step 11). Specify the columns here.

There are three input areas in the previously described inspection table. Here, the first device is assigned to the D column, which is the first column, so enter “D” in both fields.

14) In the [Entry data settings] field, select the entry data type.

The entry data types consist of measurement data input from the measuring tools (numeric data), and character string data input by pressing the foot switch.

TIP • For details about the method for inputting character string data using a foot switch, refer to ‘CHAPTER 5 MEASUREMENT DATA COLLECTION (ADVANCED)’.

Here, select the [Measurement data entry] radio button.

15) In the [Select device] field, select the device to be assigned.

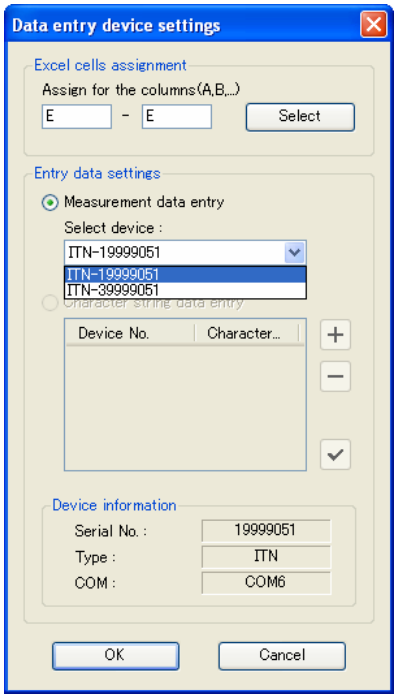
From the drop-down list, select the device to be assigned.

Here, select the first device.

This completes the settings on the [Data entry device settings] dialog box for the first device, so click the [OK] button.

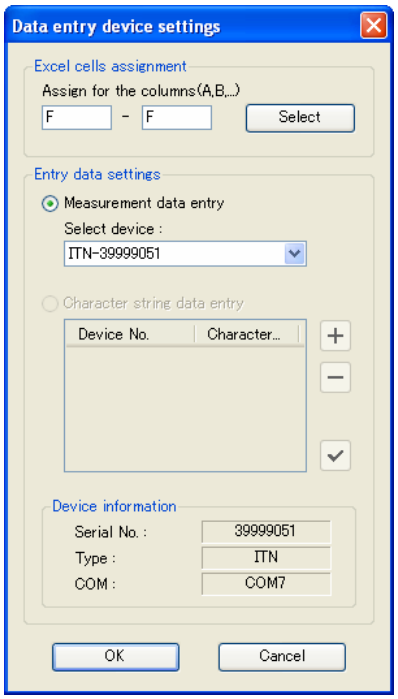
16) Repeat steps '12) to 15)' to specify the [Data entry device] settings for the second device.

Here, assign the second device to the E column.

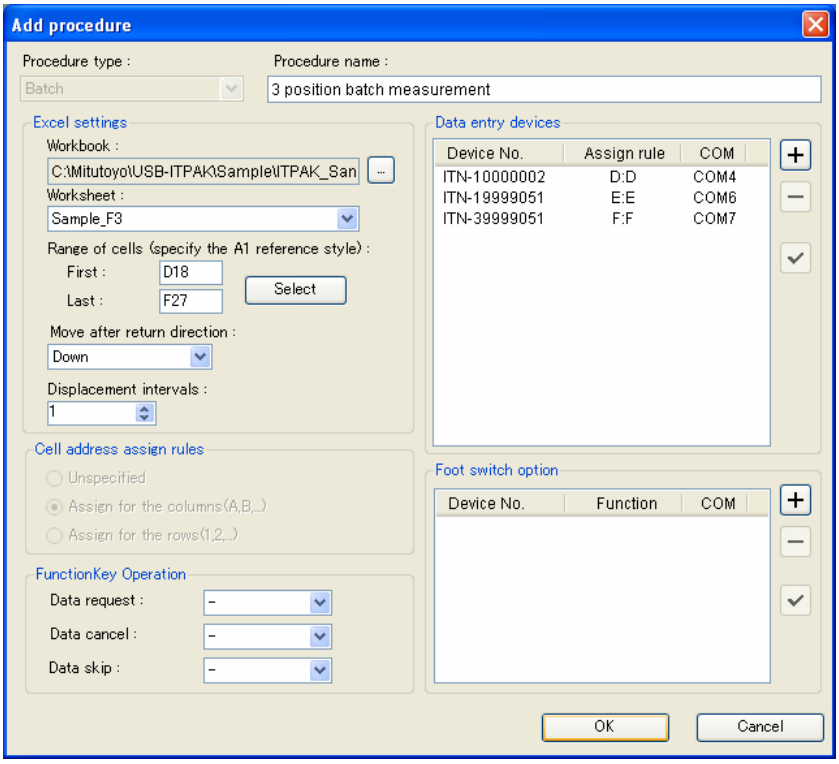


17) Repeat steps '12) to 15)' to specify the [Data entry device] settings for the third device.

Here, assign the third device to the F column.

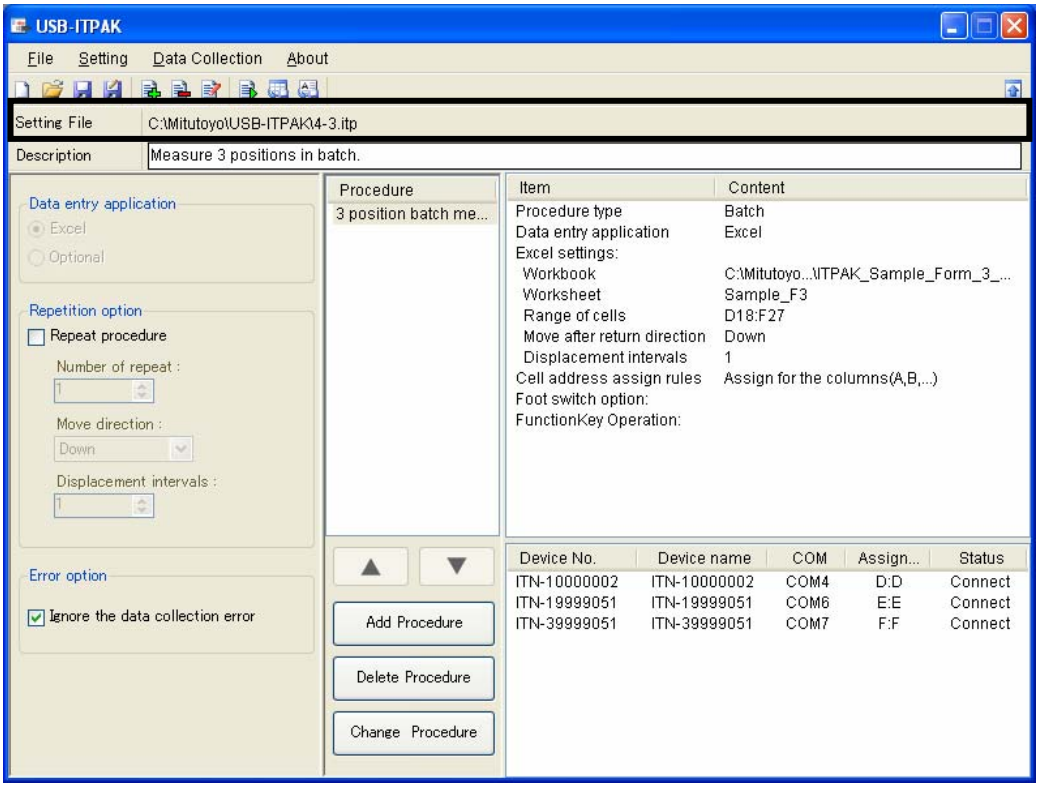


18) Close [Add procedure].



This completes the settings on the [Add procedure] dialog box, so click the [OK] button.

19) Save the created setting file.



From the menu of the main dialog box, select [File], [Save As], and then save the file by giving it a name. When the file has been saved, the file name is displayed as a full path in the [Setting File] field.

4.3.3 Measurement

1) Open [Setting File].

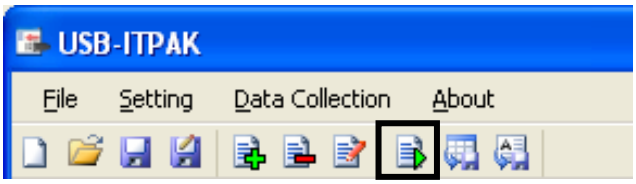
TIP
- If starting measurement immediately after specifying the settings in '4.3.2 Setting', the setting file is already opened. In this case, skip step '1)'.

From the menu of the main dialog box, select [File] and then [Open], or open [Setting file] from [Recent files].

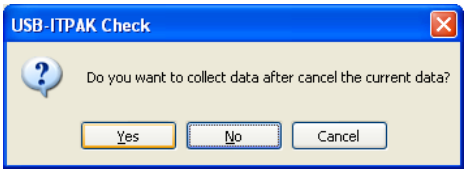
2) Open the data collection dialog box.

IMPORTANT
- In USB-ITPAK, following data collection, the Excel file to which the data was input is saved through overwriting under the existing file name. To use the original Excel file later, back it up beforehand.

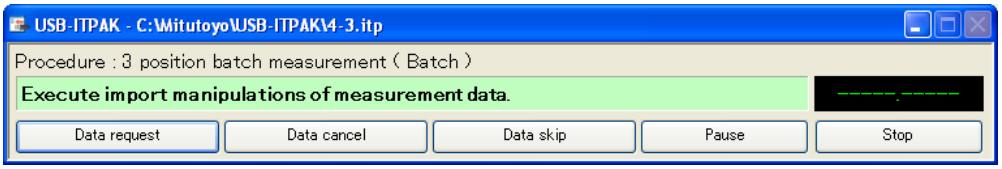
From the menu of the main dialog box, select [Data Collection] and then [Start], or click the icon shown below.



When data collection starts, the message [Do you want to collect data after cancel the current data?] is displayed. Click [Yes] to clear the existing data or [No] not to.

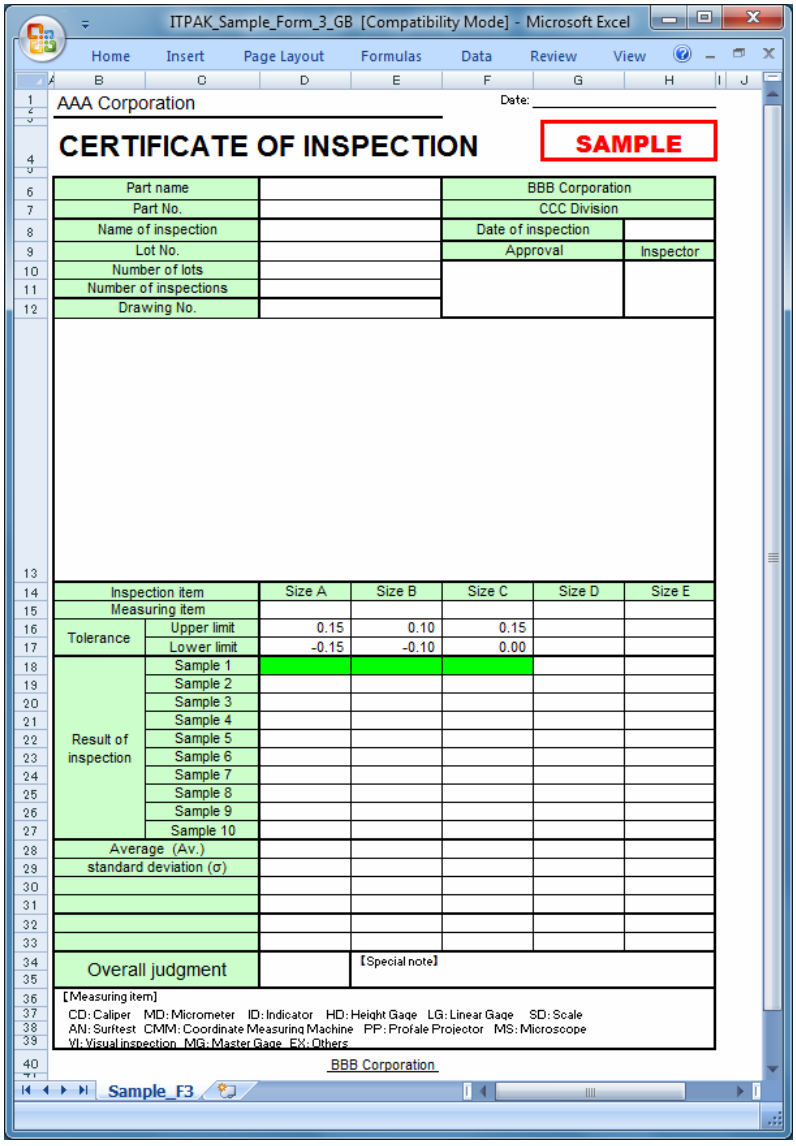


The data collection dialog box is displayed and data collection can now be performed.



3) Perform data collection.

During data collection, the cell to which data will be input next is highlighted in green.



Click the [Data request] button on the data collection dialog box and perform data input from the measuring tools.

To cancel data that has been input, click the [Data cancel] button on the data collection dialog box. The data in the entry cell is canceled and the previous cell is highlighted.

To skip the current data entry cell without inputting data, click the [Data skip] button on the data collection dialog box. The next cell is highlighted.

IMPORTANT

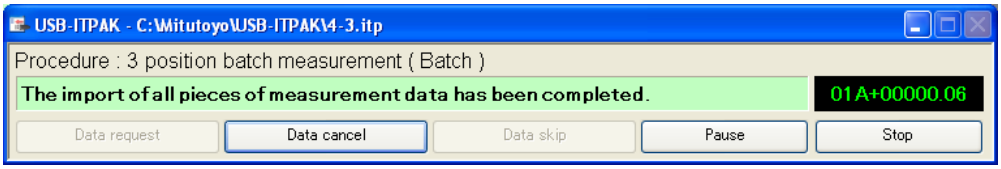
- During batch measurement, data is collected all at once, so data cannot be collected through the following operations:

(1) Pressing the DATA switch on the measuring tool

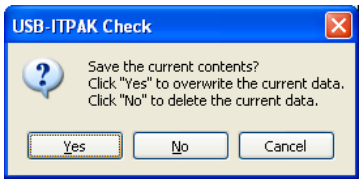
(2) Pressing the output switch if USB-ITN has one

4) End data collection and save the results.

Once all the data has been input, a completion message is displayed on the data collection dialog box.



Click the [Stop] button on the data collection dialog box. The following message is displayed.



[Yes]: The Excel file to which data was input is saved through overwriting under the existing file name.

[No]: The Excel file is not overwritten and the data that was input is deleted.

[Cancel]: The message dialog box is closed and the data collection dialog box is displayed.

Click the [Yes] button. The Excel file is saved through overwriting and the dialog box switches to the main dialog box.

This completes basic data collection for batch measurement.

4.4 Individual Measurement (Basics)

4.4.1 Overview

Individual measurement is one of the measurement methods that can be selected in the procedures used in USB-ITPAK.

During individual measurement, measurement data from multiple operators can be input to the respectively assigned cells in the specified Excel worksheet.

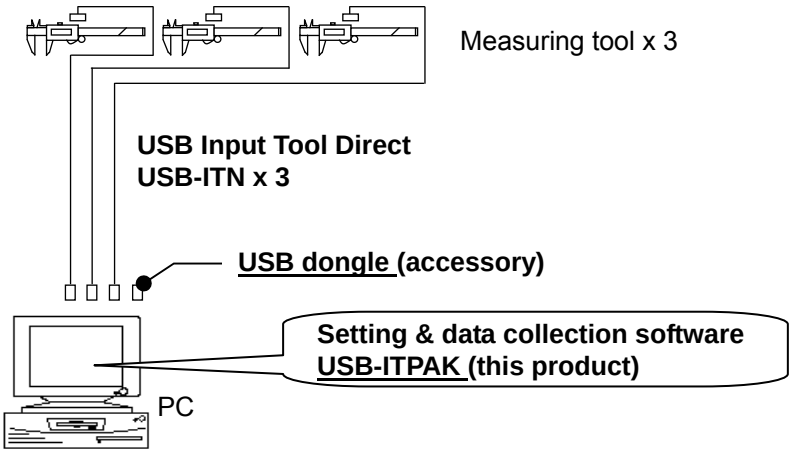
Example: Collection of data while three operators perform measurements with their respective measuring tools.

The DATA switch of the measuring tool and the foot switch can be used when collecting measurement data.

This section explains the basic use of individual measurement.

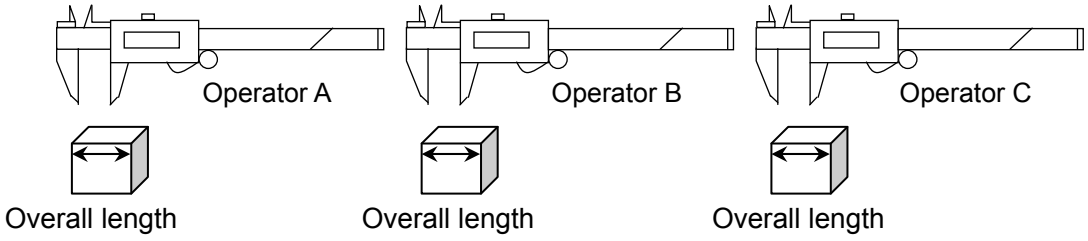
1) Connection

In the example used in this section, three measuring tools are connected to USB-ITN. The connection diagram is shown below.



2) Workpieces for measurement

The following workpieces are used in the explanation. The measurement location is the overall length of the same workpiece for all three operators (designated as A, B, and C).

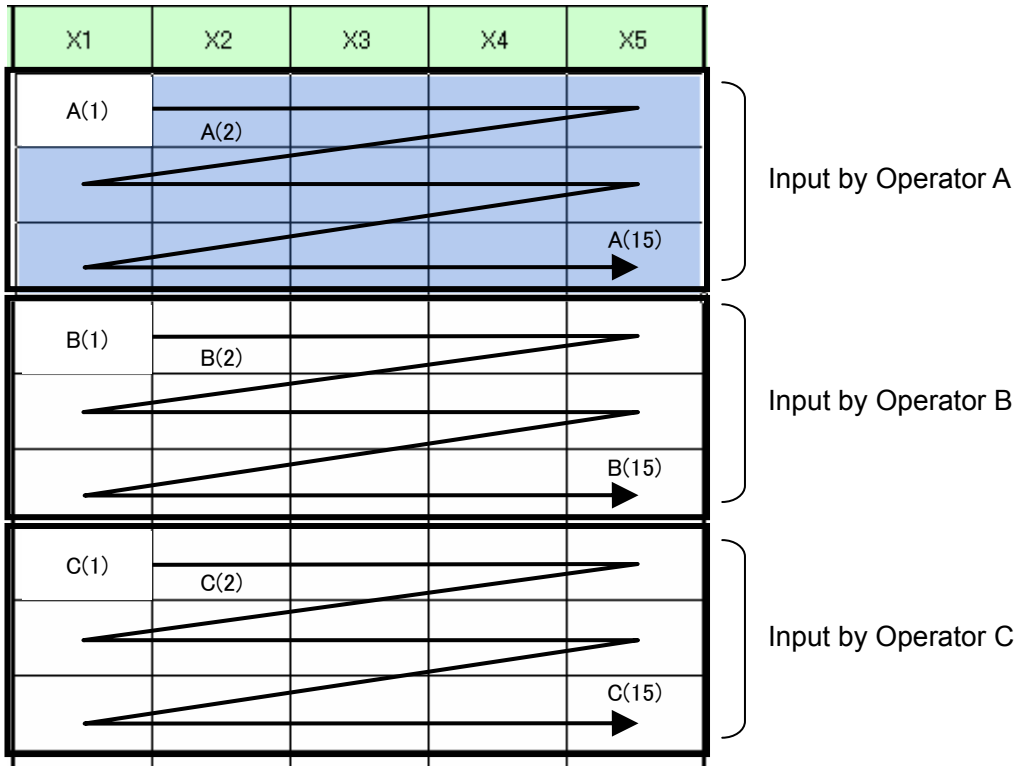


3) Measurement

The image of the inspection table upon completion of data collection is shown below.

No.	Inspection item	Permissible value		Unit	Measuring item	X1	X2	X3	X4	X5
1	Overall Length	10.05	9.95	mm	CD	10.02	10.01	10.01	10.03	10.03
2	Operator A					10.01	10.02	10.02	10.03	10.01
3						10	10.03	10.03	10.02	10.01
4	Overall Length	10.05	9.95	mm	CD	10.02	10.02	10	10.01	10.01
5	Operator B					10.02	10.01	10.01	9.99	10.01
6						10.01	10	9.99	10	10.01
7	Overall Length	10.05	9.95	mm	CD	10.01	10.03	10.02	10	10.02
8	Operator C					10.03	10.02	10.02	10.01	10.03
9						10.03	10.02	10.02	10.01	10.01

The measurement procedure is as follows. Operator A, Operator B, and Operator C each measure the width of the first workpiece, and the input data is output to the first row (for Operator A), fourth row (for Operator B), and seventh row (for Operator C) of the X1 column on the Excel worksheet. Next, the second workpiece is measured in the same manner, with each operator measuring 15 workpieces in all.



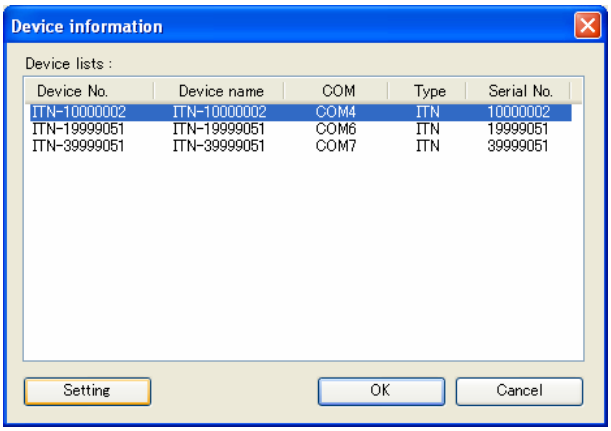
The following describes how to set up the measurement procedure, perform measurement, and save the results.

4.4.2 Setting

1) Check the device information.

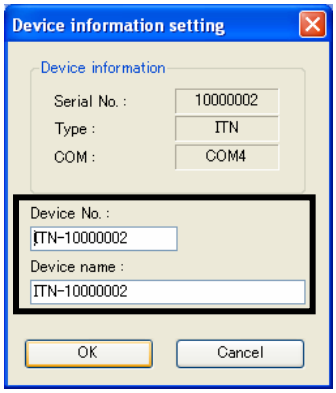
NOTE • USB-ITPAK loads the information of connected devices at startup. Therefore, connect all the devices to be used before starting up USB-ITPAK.

From the menu of the main dialog box, select [Settings] and then [Device information]. This opens the [Device information] dialog box, which allows you to check the devices that are connected to the PC.



If you do not want to change the device number or device name, click the [Cancel] button to return to the main dialog box.

If you want to change a device number or device name, select the device, and then click the [Setting] button.



Click the [OK] button if you change any settings.

NOTE • In the procedure created from step '2)', the device number is used to specify the device to be used. If you change the number, revise all the setting files that use it.

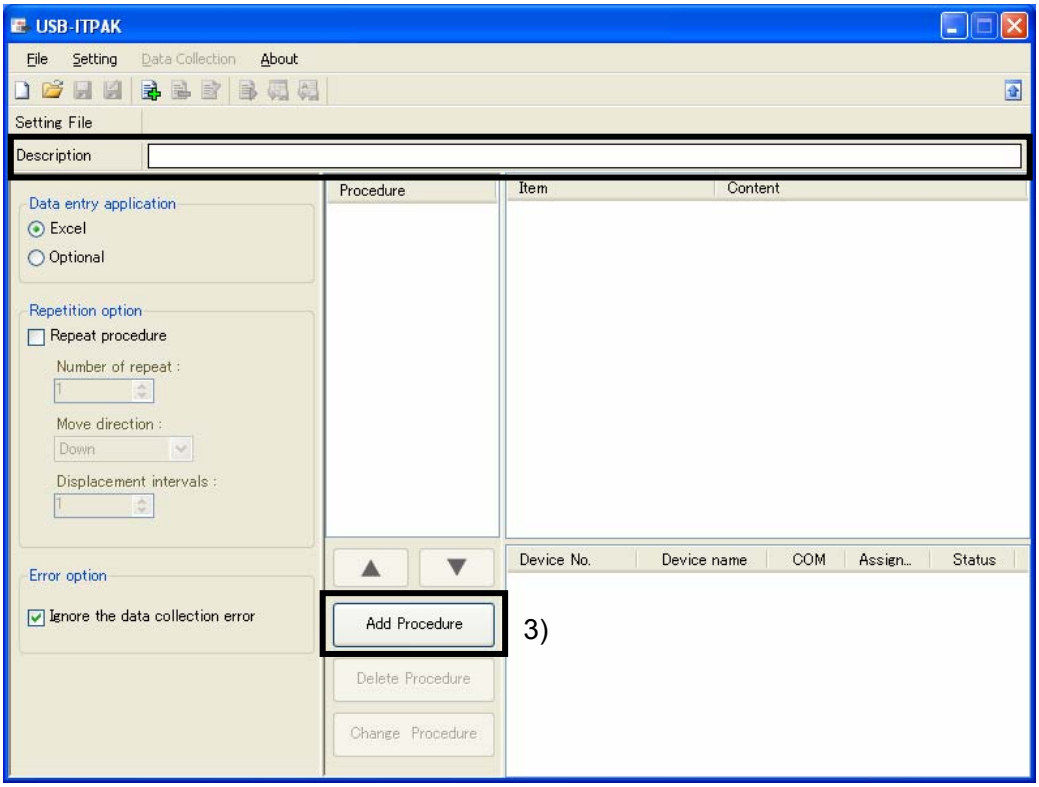
TIP • If multiple units are connected, specify settings for each.

TIP • If performing measurement using existing setting files, skip this section and see '4.4.3 Measurement'.

2) Enter information about the setting file in the [Description] field.

Enter a description of the setting file. This field may be left blank.

2)



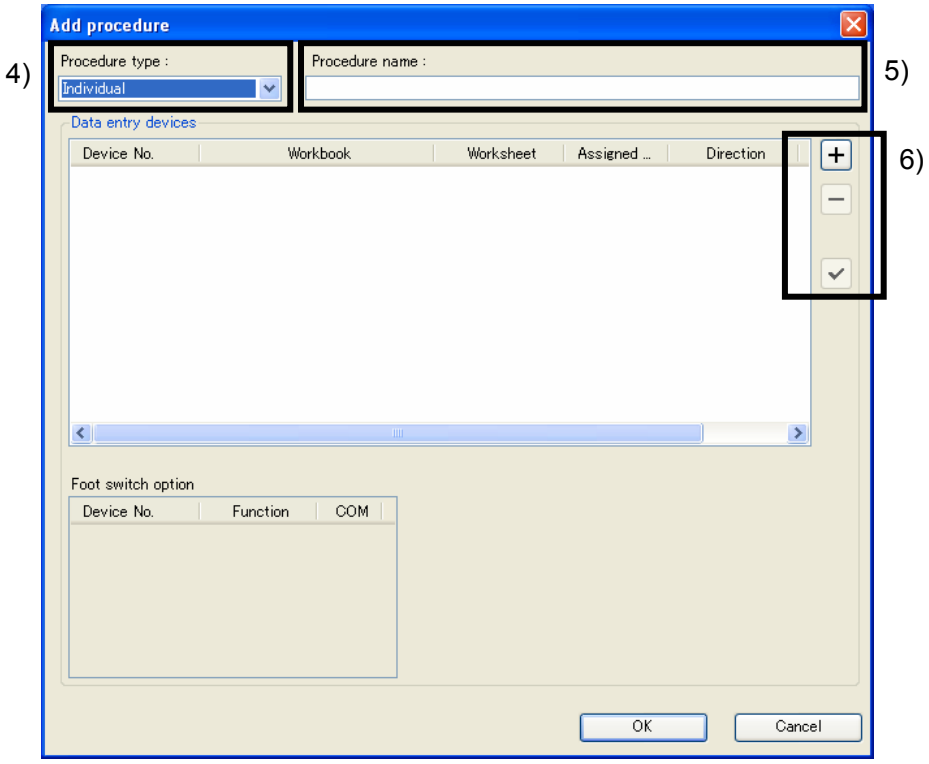
3)

3) Add a procedure to the setting file.

Click the [Add Procedure] button on the main dialog box.

4) Select a procedure type for the [Procedure type] field.

If [Individual] is selected, the dialog box switches to the following dialog box.



If a different dialog box is displayed, select [Individual] from the drop-down list.

5) Enter a name in the [Procedure name] field.

Entering the procedure name is required.

TIP • Since the procedure name will be displayed in the [Procedure] field at the center of the main dialog box, enter an easily identifiable name.

Here, enter [3 posi. individual measurement].

6) Specify the [Data entry devices] settings for the first device.

The functions of the buttons for the [Data entry devices] field are as follows:

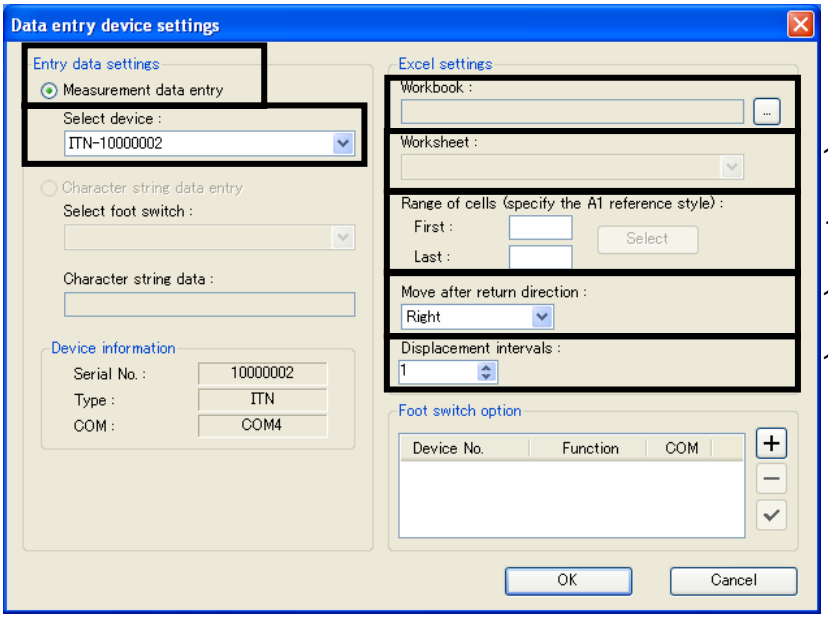
[+]: Adds device settings.

[–]: Deletes the device setting selected from the list.

[√]: Changes the device setting selected from the list.

Here, click the [+] button to switch to the [Data entry device settings] dialog box.

7) In the [Entry data settings] field, select the entry data type.



The entry data types consist of measurement data input from the measuring tools (numeric data), and character string data input by pressing the foot switch.

TIP • For details about the method for inputting character string data using a foot switch, refer to 'CHAPTER 5 MEASUREMENT DATA COLLECTION (ADVANCED)'.

Here, select the [Measurement data entry] radio button.

8) In the [Select device] field, select the device to be assigned.

From the drop-down list, select the device to be assigned.

Here, select the first device.

9) Specify an Excel file in the [Workbook] field under [Excel settings]

Enter the workbook name of the Excel file to which the measured data is to be input.

The file can be selected from the [Open] dialog box by clicking the […] button.

Here, select the following file.

C:\Mitutoyo\USB-ITPAK\Sample\ITPAK_Sample_Form_4_GB.xls

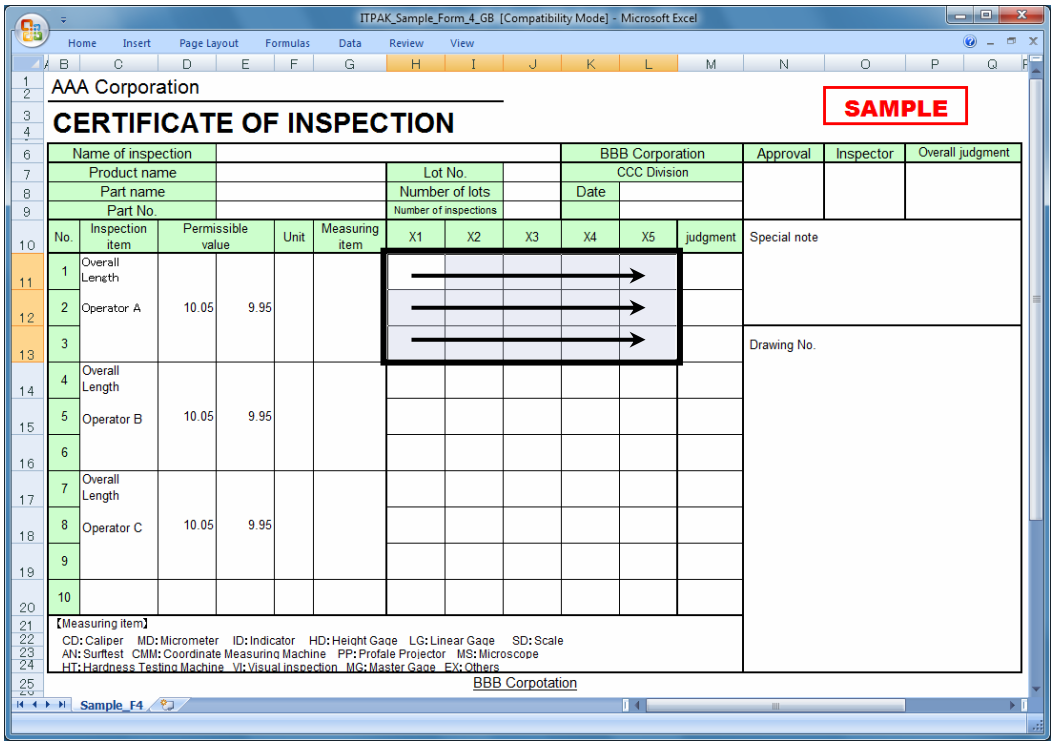
IMPORTANT • If you want to use a file other than the sample inspection table file, create an inspection file using Excel before starting up USB-ITPAK. Inspection table files can be saved to any folder. Save the inspection table file to a folder location that will be easy to manage.

10) Select a worksheet for the [Worksheet] field under [Excel settings].

Select the worksheet name to be included in the workbook of step '9)' from the drop-down list.

Here, select [Sample_F4].

11) Enter the input range in the [Range of cells] fields under [Excel settings].



To specify the area indicated by the bold lines in the above inspection table as the input cell range, enter:

First: H11
Last: L13

TIP • The inspection table above shows the [Inspection item] and [Permissible value] cells filled, and the three rows provided respectively for operators A, B, and C.

12) Select the desired direction for the [Move after return direction] field under [Excel settings].

During measurement using USB-ITPAK, once data is input from the measuring tools, the measurement data is input to the current cell and then the entry point (cell) automatically moves to the next cell.

In the inspection table example shown above, select [Right].

13) Specify the [Displacement intervals] under [Excel settings].

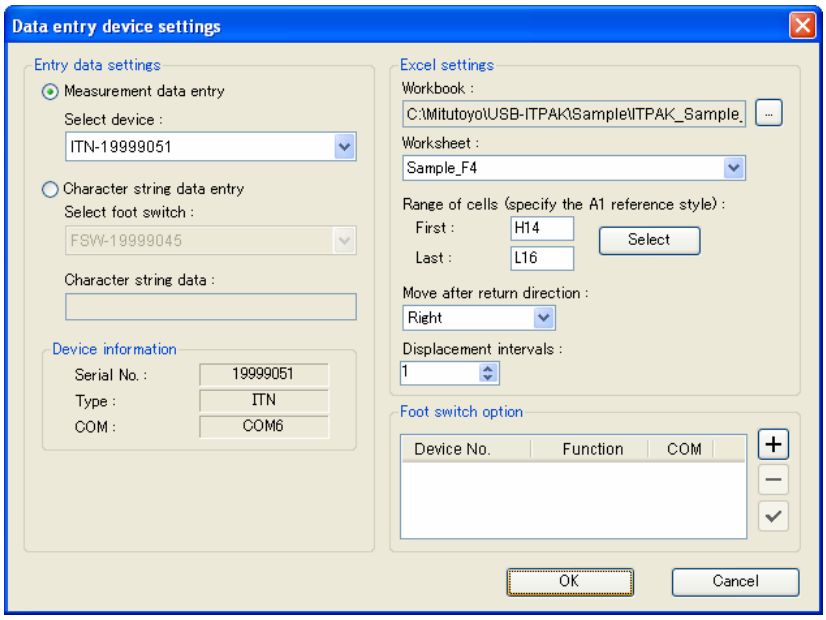
Specify the interval for the cell movement specified in step 12). Specifying "1" results in movement to the next cell. Specifying "2" results in movement to the cell after the next.

In the inspection table example above, specify "1".

This completes the settings on the [Data entry device settings] dialog box for the first device, so click the [OK] button.

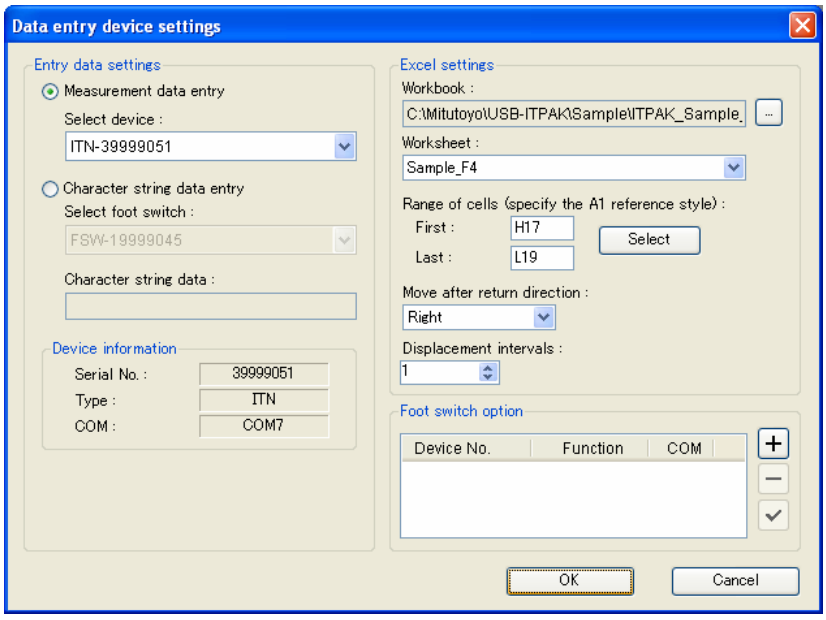
14) Repeat steps ‘6) to 13)’ to specify the [Data entry device] settings for the second device.

Here, assign the second device to the [H14:L16].

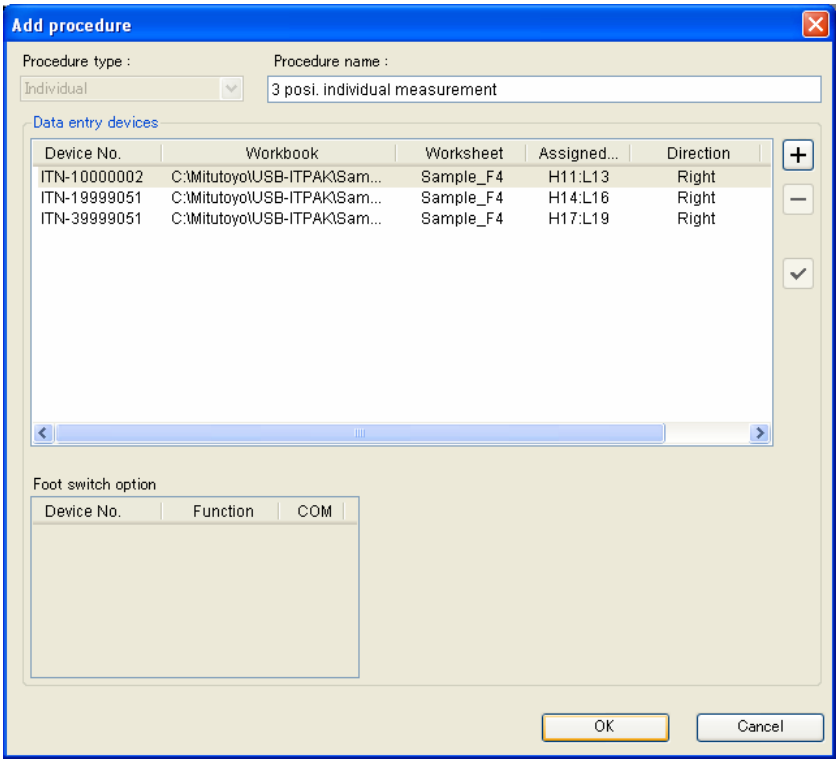


15) Repeat steps ‘6) to 13)’ to specify the [Data entry device] settings for the third device.

Here, assign the third device to the [H17:L19].

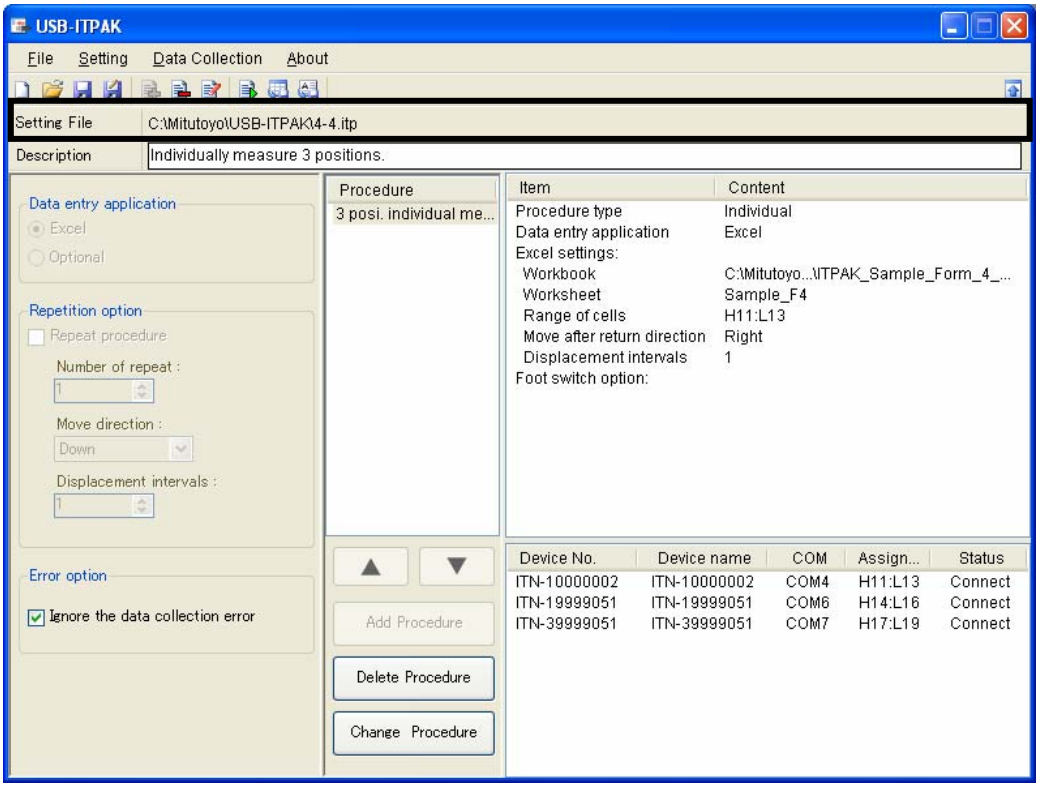


16) Close [Add procedure].



This completes the settings on the [Add procedure] dialog box, so click the [OK] button.

17) Save the created setting file.



From the menu of the main dialog box, select [File], [Save As], and then save the file by giving it a name. When the file has been saved, the file name is displayed as a full path in the [Setting File] field.

4.4.3 Measurement

1) Open [Setting File].

TIP

- If starting measurement immediately after specifying the settings in '4.4.2 Setting', the setting file is already opened. In this case, skip step '1)'.

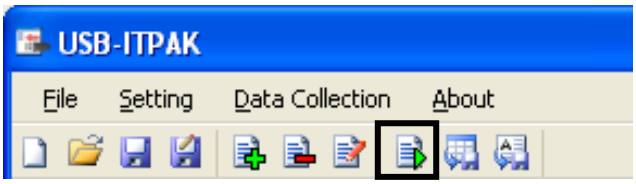
From the menu of the main dialog box, select [File] and then [Open], or open [Setting file] from [Recent files].

2) Open the data collection dialog box.

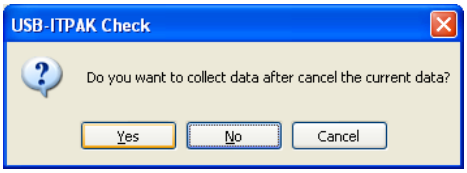
IMPORTANT

- In USB-ITPAK, following data collection, the Excel file to which the data was input is saved through overwriting under the existing file name. To use the original Excel file later, back it up beforehand.

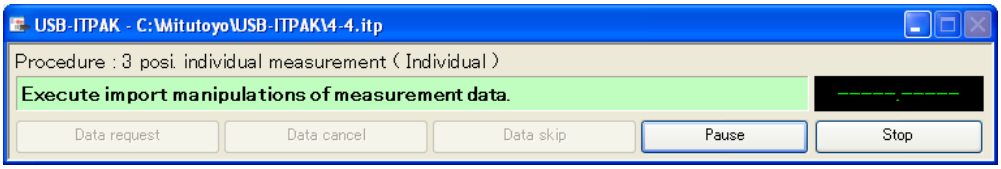
From the menu of the main dialog box, select [Data Collection] and then [Start], or click the icon shown below.



When data collection starts, the message [Do you want to collect data after cancel the current data?] is displayed. Click [Yes] to clear the existing data or [No] not to.

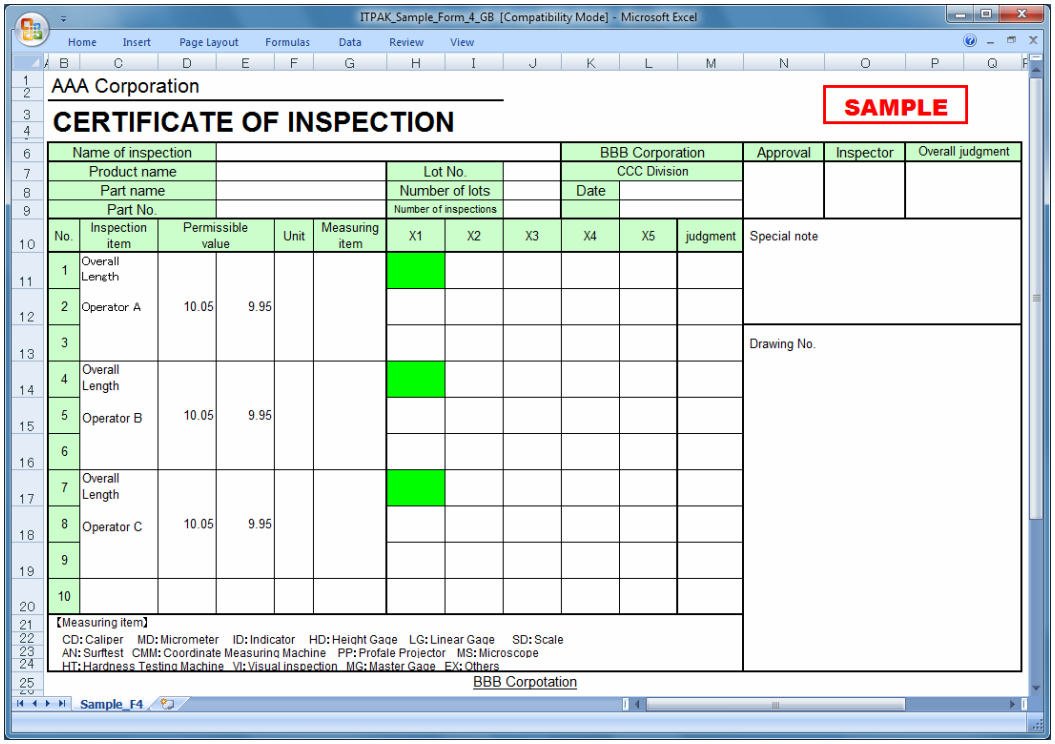


The data collection dialog box is displayed and data collection can now be performed.



3) Perform data collection.

During data collection, the cell to which data will be input next is highlighted in green.



Input data from the measuring tools through one of the following operations:

(1) Pressing the DATA switch on the measuring tool.

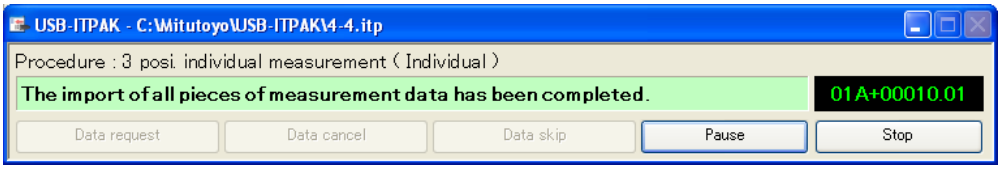
(2) Pressing the output switch if USB-ITN has one.

IMPORTANT

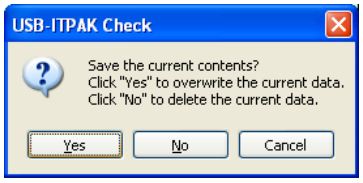
- During individual measurement, data is collected separately for each measuring tool, so data cannot be collected by clicking the [Data request] button on the data collection dialog box.

4) End data collection and save the results.

Once all the data has been input, a completion message is displayed on the data collection dialog box.



Click the [Stop] button on the data collection dialog box. The following message is displayed.



[Yes]: The Excel file to which data was input is saved through overwriting under the existing file name.

[No]: The Excel file is not overwritten and the data that was input is deleted.

[Cancel]: The message dialog box is closed and the data collection dialog box is displayed.

Click the [Yes] button. The Excel file is saved through overwriting and the dialog box switches to the main dialog box.

This completes basic data collection for individual measurement.

MEMO

5 MEASUREMENT DATA COLLECTION (ADVANCED)

This chapter explains the advanced use of USB-ITPAK, such as the data collection using the foot switch and the combination of multiple procedures. This chapter covers the following contents.

5.1 Data Input Request Using Foot Switch
5.2 Setting File That Includes Two Procedures
5.3 Measurement by Repeating Procedure
5.4 Character Input Using Foot Switch
5.5 Data Input to an Optional Application

'CHAPTER 4 MEASUREMENT DATA COLLECTION (BASICS)' explains the basic use of USB-ITPAK.

'CHAPTER 6 DIALOG BOX CONFIGURATIONS OF USB-ITPAK' describes the menus and dialog box configuration for all the functions of USB-ITPAK.

5.1 Data Input Request Using Foot Switch

5.1.1 Overview

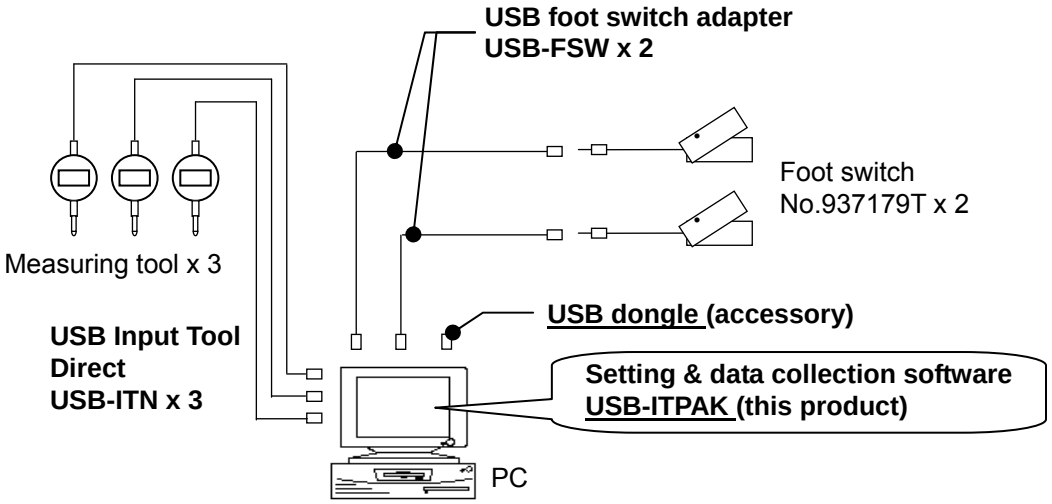
This section explains how to issue data input requests and how to cancel data by using the foot switch.

TIP
- The procedure used in the explanation in this section is based on the batch measurement method described in 'CHAPTER 4 MEASUREMENT DATA COLLECTION (BASICS)'. The setting file created in 'CHAPTER 4 MEASUREMENT DATA COLLECTION (BASICS)' is used with some modifications.

NOTE
- The foot switch can be used to issue data input requests or cancel data for all measurement methods, i.e. sequential, batch, and individual measurement.

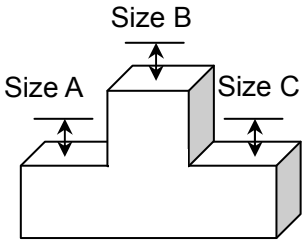
1) Connection

In the explanation in this section, three indicators are connected to USB-ITN, and two foot switches are connected to USB-FSW. The connection diagram is shown below.



2) Workpiece for measurement

The following workpiece is used in the explanation. Three indicators are used and measurement is done with measuring jigs. 'Size A', 'Size B', and 'Size C', which are shown in the figure below, are measured.

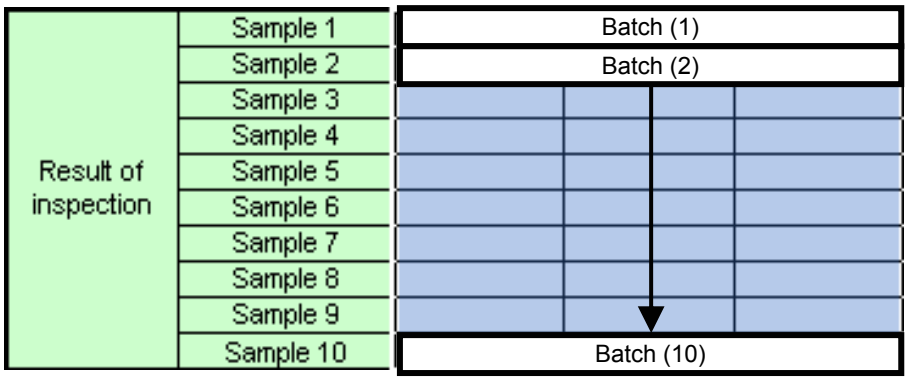


3) Measurement

The image of the inspection table upon completion of data collection is shown below.

Inspection item		Size A	Size B	Size C
Measuring item				
Tolerance	Upper limit	0.15	0.10	0.15
	Lower limit	-0.15	-0.10	0.00
Result of inspection	Sample 1	0.05	0.02	0.07
	Sample 2	0.08	0.01	0.06
	Sample 3	0.09	0.00	0.05
	Sample 4	0.07	0.03	0.06
	Sample 5	0.08	-0.01	0.04
	Sample 6	0.08	0.02	0.06
	Sample 7	0.06	-0.01	0.05
	Sample 8	0.07	-0.02	0.05
	Sample 9	0.07	0.01	0.04
	Sample 10	0.08	0.00	0.06

The measurement procedure is as follows. The three locations of the first workpiece are measured, and the input data is output to the ‘Size A’, ‘Size B’, and ‘Size C’ columns.
Next, the three locations of the second workpiece are measured, and the input data is output to the ‘Size A’, ‘Size B’, and ‘Size C’ columns in the ‘Sample 2’ row of the Excel worksheet.
The remaining workpieces up to the tenth one are measured in the same manner.



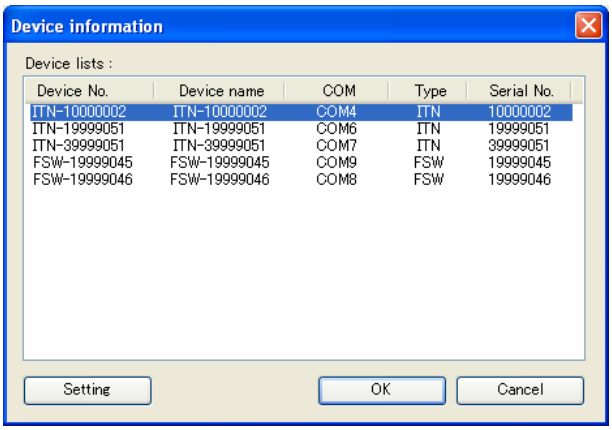
The following describes how to set up the measurement procedure, perform measurement, and save the results.

5.1.2 Setting

1) Check the device information.

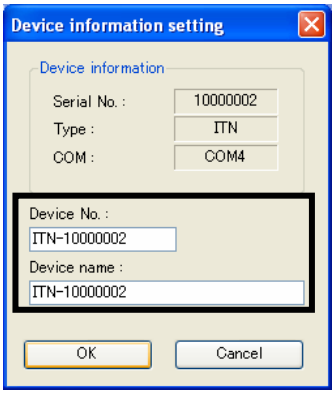
NOTE • USB-ITPAK loads the information of connected devices at startup. Therefore, connect all the devices to be used before starting up USB-ITPAK.

From the menu of the main dialog box, select [Settings] and then [Device information]. This opens the [Device information] dialog box, which allows you to check the devices that are connected to the PC.



If you do not want to change the device number or device name, click the [Cancel] button to return to the main dialog box.

If you want to change a device number or device name, select the device, and then click the [Setting] button.



Click the [OK] button if you change any settings.

NOTE • In the procedure created from step '2)', the device number is used to specify the device to be used. If you change the number, revise all the setting files that use it.

TIP • If multiple units are connected, specify settings for each.

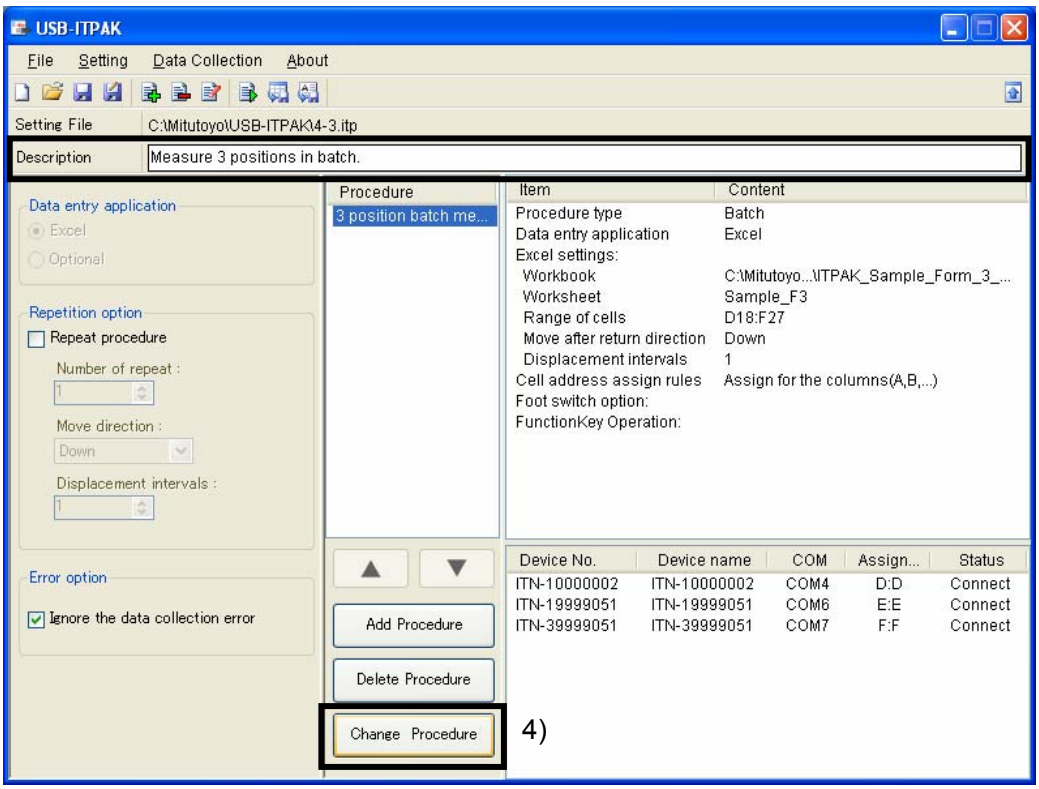
TIP • If performing measurement using existing setting files, skip this section and see '5.1.3 Measurement'.

2) Open the setting file created in '4.3 Batch Measurement (Basics)'.

From the menu of the main dialog box, select [File] and then [Open], or open [Setting file] from [Recent files].

3) Enter information about the setting file in the [Description] field.

Enter a description of the setting file. This field may be left blank.



4) Start the procedure change.

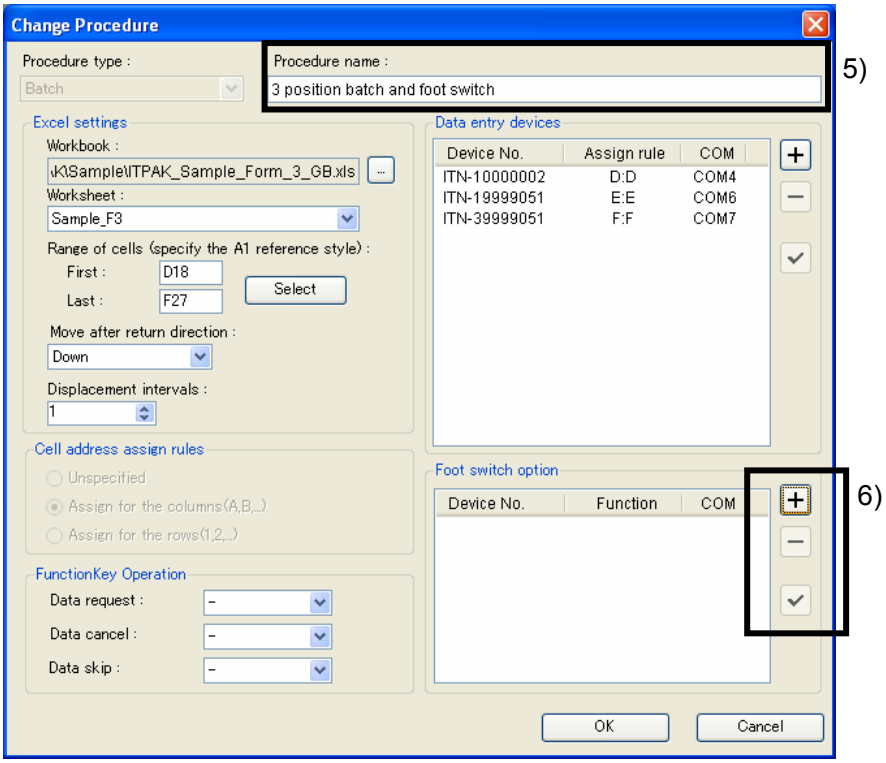
Click the [Change Procedure] button on the main dialog box.

5) Enter a name in the [Procedure name] field.

Entering the procedure name is required.

TIP • Since the procedure name will be displayed in the [Procedure] field at the center of the main dialog box, enter an easily identifiable name.

Here, enter [3 position batch and foot switch].



6) Specify the [Foot switch option] settings for the first device.

The functions of the buttons for the [Foot switch option] field are as follows:

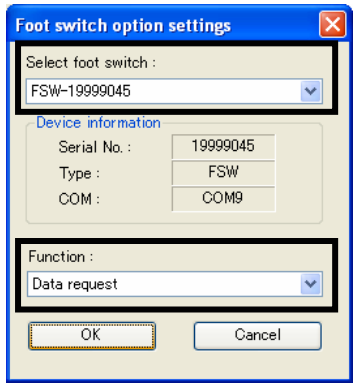
[+]: Adds device settings.

[–]: Deletes the device setting selected from the list.

[√]: Changes the device setting selected from the list.

Here, click the [+] button to switch to the [Data entry device settings] dialog box.

7) In the [Select foot switch] field on the [Foot switch option settings] dialog box, select the device to be assigned.



From the drop-down list, select the device to be assigned.

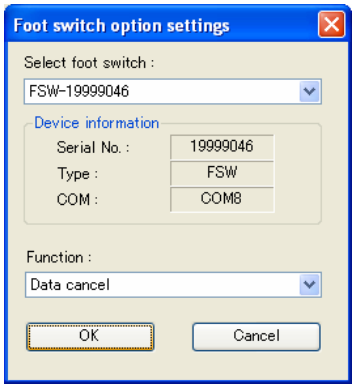
Here, select the first device.

8) In the [Function] field, select the function to be assigned.

Here, select [Data request].

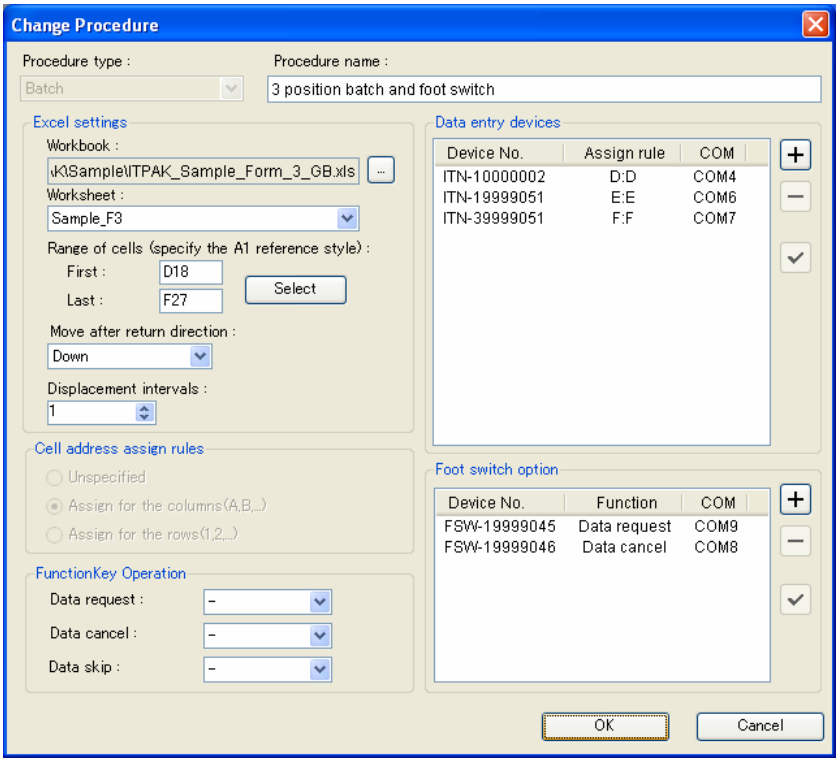
This completes the setting on the [Foot switch option settings] dialog box for the first device, so click the [OK] button.

9) Repeat steps ‘6) to 8)’ to specify the [Foot switch option] settings for the second device.



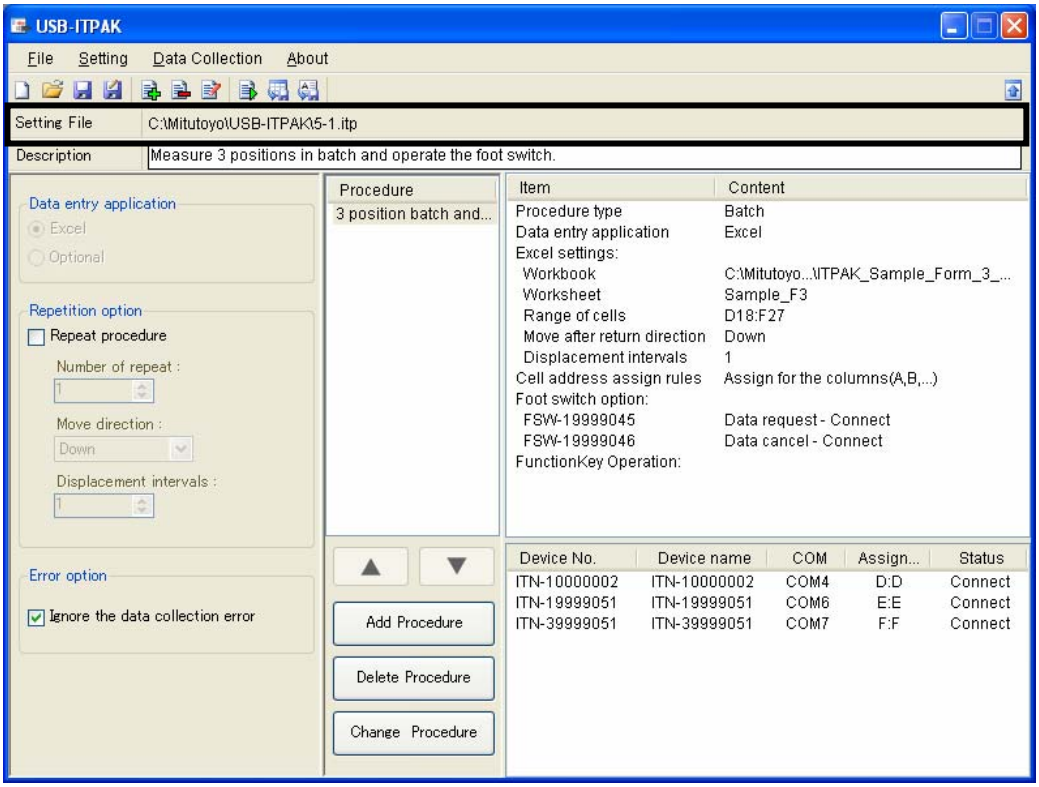
Here, assign the [Data cancel] function to the second device.

10) Close [Change Procedure].



This completes the settings on the [Change Procedure] dialog box, so click the [OK] button.

11) Save the created setting file.



From the menu of the main dialog box, select [File], [Save As], and then save the file by giving it a name. When the file has been saved, the file name is displayed as a full path in the [Setting File] field.

5.1.3 Measurement

1) Open [Setting File].

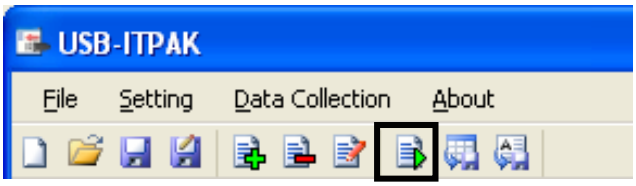
TIP
- If starting measurement immediately after specifying the settings in '5.1.2 Setting', the setting file is already opened. In this case, skip step '1)'.

From the menu of the main dialog box, select [File] and then [Open], or open [Setting file] from [Recent files].

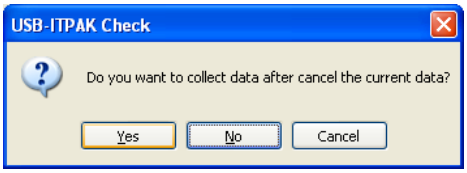
2) Open the data collection dialog box.

IMPORTANT
- In USB-ITPAK, following data collection, the Excel file to which the data was input is saved through overwriting under the existing file name. To use the original Excel file later, back it up beforehand.

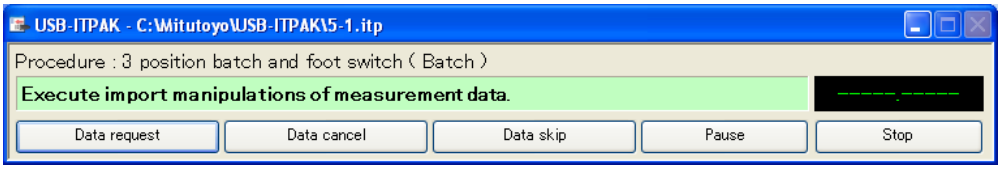
From the menu of the main dialog box, select [Data Collection] and then [Start], or click the icon shown below.



When data collection starts, the message [Do you want to collect data after cancel the current data?] is displayed. Click [Yes] to clear the existing data or [No] not to.

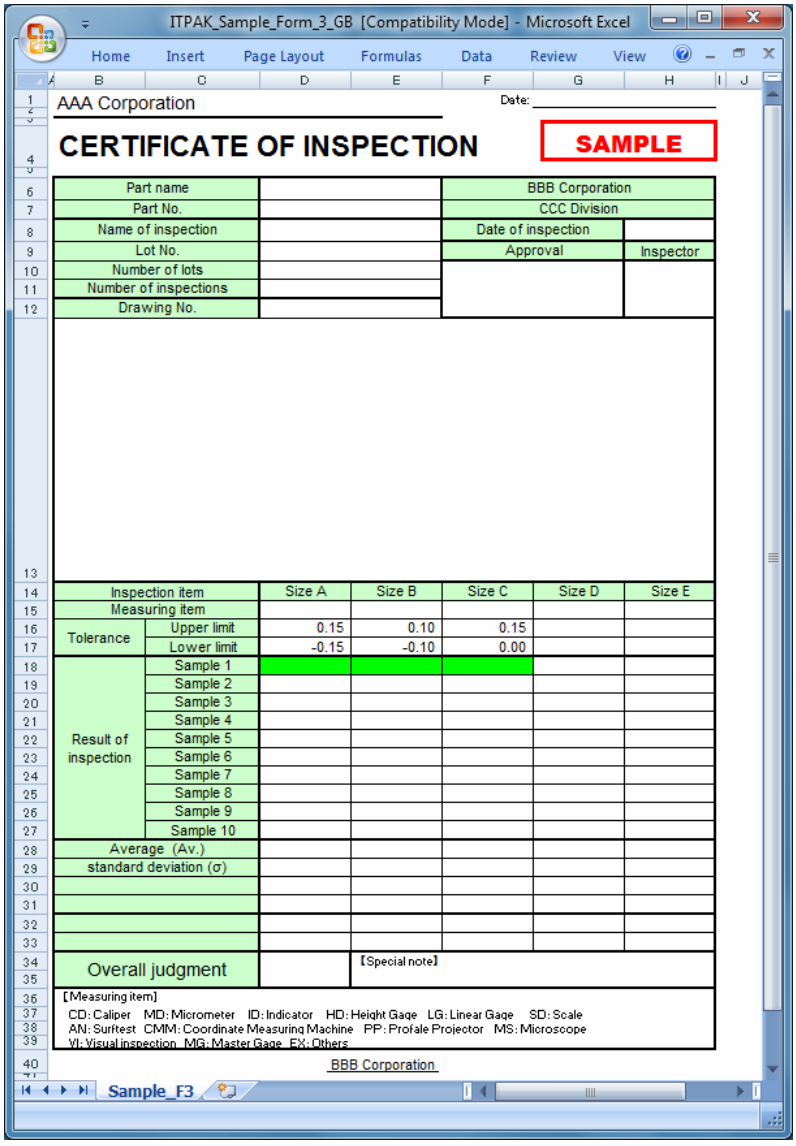


The data collection dialog box is displayed and data collection can now be performed.



3) Perform data collection.

During data collection, the cell to which data will be input next is highlighted in green.



TIP

- The inspection table above is shown with the [Upper limit] and [Lower limit] cells filled for explanatory purposes.

In the foot switch option settings, press the foot switch to which the [Data request] function has been assigned to input data.

To cancel the data that was input, in the foot switch option settings, press the foot switch to which the [Data cancel] function was assigned. This cancels the data of the input cell and the green highlight moves to the previous cell.

To skip the current data entry cell without inputting data, click the [Data skip] button on the data collection dialog box. The next cell is highlighted.

IMPORTANT

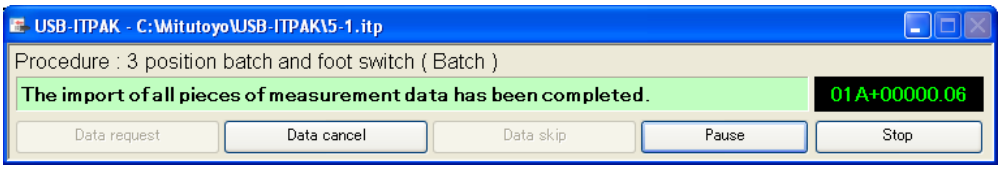
- During batch measurement, data is collected all at once, so data cannot be collected through the following operations:

  (1) Pressing the DATA switch on the measuring tool

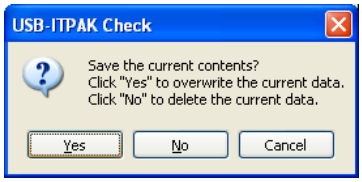
  (2) Pressing the output switch if USB-ITN has one

4) End data collection and save the results.

Once all the data has been input, a completion message is displayed on the data collection dialog box.



Click the [Stop] button on the data collection dialog box. The following message is displayed.



[Yes]: The Excel file to which data was input is saved through overwriting under the existing file name.

[No]: The Excel file is not overwritten and the data that was input is deleted.

[Cancel]: The message dialog box is closed and the data collection dialog box is displayed.

Click the [Yes] button. The Excel file is saved through overwriting and the dialog box switches to the main dialog box.

This completes data collection for batch measurement using a foot switch.

5.2 Setting File That Includes Two Procedures

5.2.1 Overview

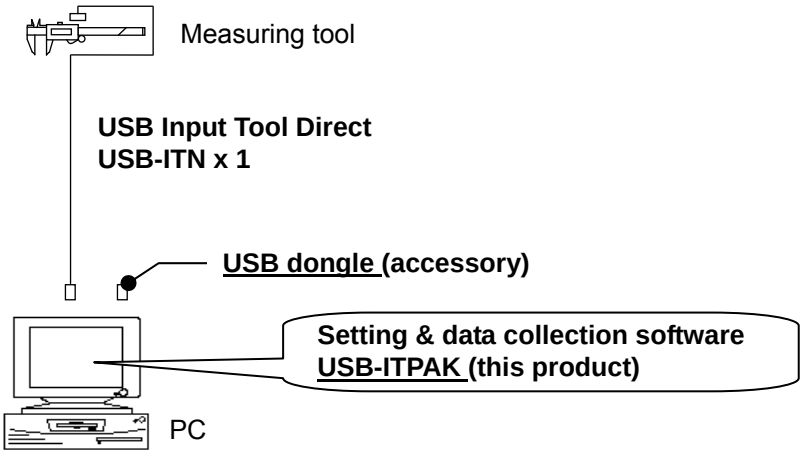
This section explains how to register two procedures to a single setting file.

TIP • The procedure used in the explanation in this section is based on the sequential measurement method described in 'CHAPTER 4 MEASUREMENT DATA COLLECTION (BASICS)'. Since the setting file requires many changes, a new setting file is created.

NOTE • Setting files that include two procedures can be used for sequential measurement and batch measurement. Procedures can be combined and registered regardless of whether they are of the same type. Only one procedure can be registered to one setting file for individual measurement.

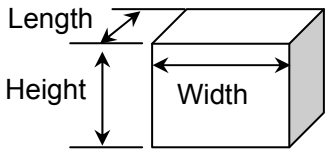
1) Connection

In the explanation in this section, one caliper is connected to USB-ITN for use. The connection diagram is shown below.



2) Workpiece for measurement

The following workpiece is used in the explanation. The measurement locations are the length, width, and height of the rectangular parallelepiped.



3) Measurement

The image of the inspection table upon completion of data collection is shown below.

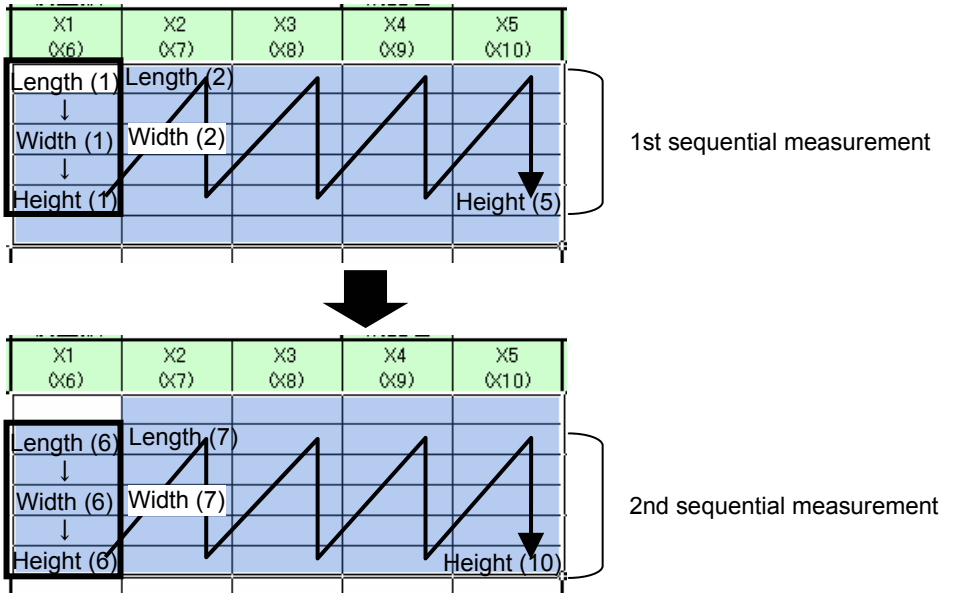
No.	Inspection item	Permissible value	Unit	Measuring item	X1 (X6)	X2 (X7)	X3 (X8)	X4 (X9)	X5 (X10)
1	Length	13.60	mm	CD	13.49	13.51	13.52	13.53	13.50
		13.40			13.53	13.49	13.53	13.52	13.53
2	Width	12.20	mm	CD	12.12	12.15	12.13	12.15	12.14
		12.00			12.15	12.12	12.14	12.15	12.13
3	Height	10.60	mm	CD	10.58	10.58	10.55	10.57	10.56
		10.50			10.57	10.56	10.56	10.57	10.55

This inspection table includes the measurement data of 10 workpieces, and the measurement data of each measurement item consists of 2 rows.

The measurement procedure consists in the following:

(1) In this measurement procedure, the length, width, and height of the first workpiece are measured and the input data is output to the first row (Length), third row (Width), and fifth row (Height) of the X1 column on the Excel worksheet.
Next, the length, width, and height of the second workpiece are measured and the input data is output to the first row (Length), third row (Width), and fifth row (Height) of the X2 column.
The remaining workpieces are similarly measured, until 5 workpieces have been measured.

(2) Next, the length, width, and height of the sixth workpiece are measured and the input data is output to the second row (Length), fourth row (Width), and sixth row (Height) of the X1 (X6) column on the Excel worksheet.
Then, the length, width, and height of the seventh workpiece are measured and the input data is output to the second row (Length), fourth row (Width), and sixth row (Height) of the X2 (X7) column.
The remaining workpieces are similarly measured, until all 10 workpieces have been measured.



The above measurement procedure flow is performed by creating (1) and (2) above as separate procedures and executing the two procedures one after the next.

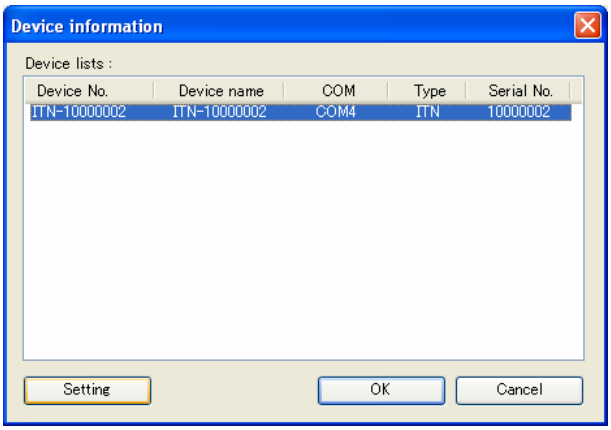
The following describes hot to set up the measurement procedure, perform measurement, and save the results.

5.2.2 Setting

1) Check the device information.

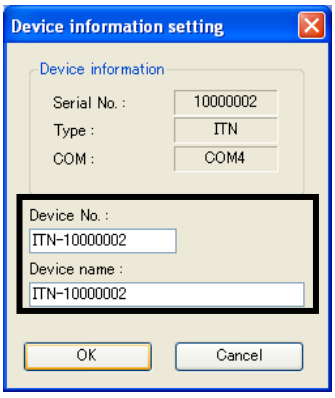
NOTE • USB-ITPAK loads the information of connected devices at startup. Therefore, connect all the devices to be used before starting up USB-ITPAK.

From the menu of the main dialog box, select [Settings] and then [Device information]. This opens the [Device information] dialog box, which allows you to check the devices that are connected to the PC.



If you do not wish to change the device number or device name, click the [Cancel] button to return to the main dialog box.

If you want to change the device number or device name, click the [Setting] button.



Click the [OK] button if you change any settings.

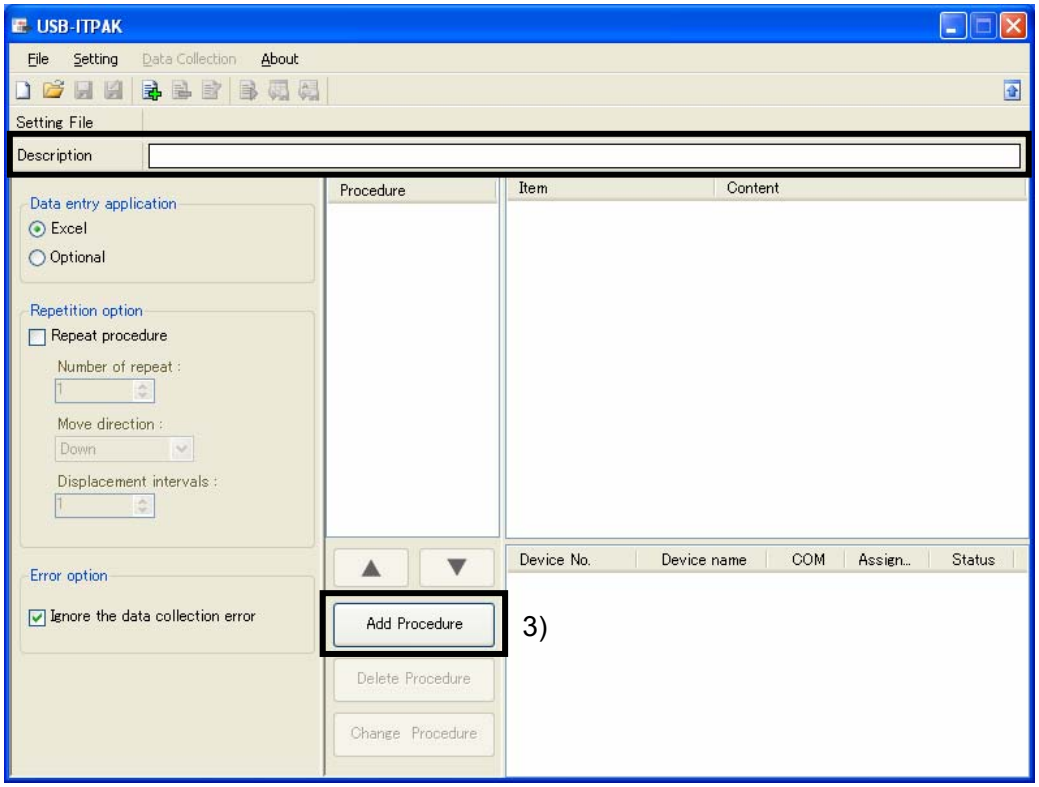
NOTE • In the procedure created from step '2)', the device number is used to specify the device to be used. If you change the number, revise all the setting files that use it.

TIP • If multiple units are connected, specify settings for each.

TIP • If performing measurement using existing setting files, skip this section and see '5.2.3 Measurement'.

2) Enter information about the setting file in the [Description] field.

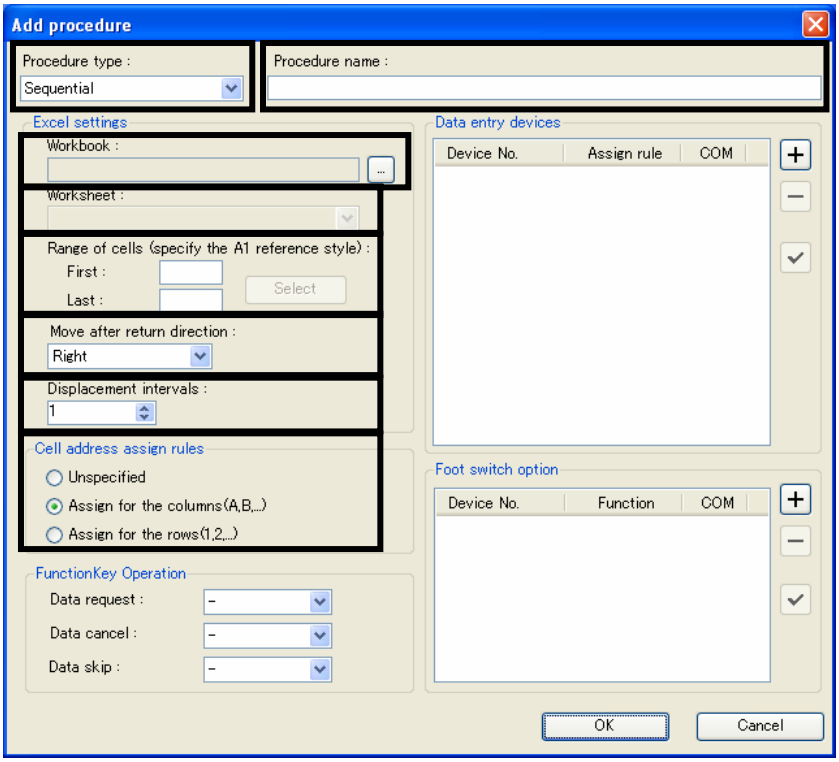
Enter a description of the setting file. This field may be left blank.



3) Add the first procedure to the setting file.

Click the [Add Procedure] button on the main dialog box.

4) Select a procedure type for the [Procedure type] field.



Check that [Sequential] is selected as the procedure type, and if not, select [Sequential] from the drop-down list.

5) Enter a name in the [Procedure name] field.

Entering the procedure name is required.

TIP

- Since the procedure name will be displayed in the [Procedure] field at the center of the main dialog box, enter an easily identifiable name.

Here, enter [3 side measurement_1].

6) Specify an Excel file in the [Workbook] field under [Excel settings].

Enter the workbook name of the Excel file to which the measured data is to be input.

The file can be selected from the [Open] dialog box by clicking the […] button.

Here, select the following file.

C:\Mitutoyo\USB-ITPAK\Sample\ ITPAK_Sample_Form_2_GB.xls

IMPORTANT

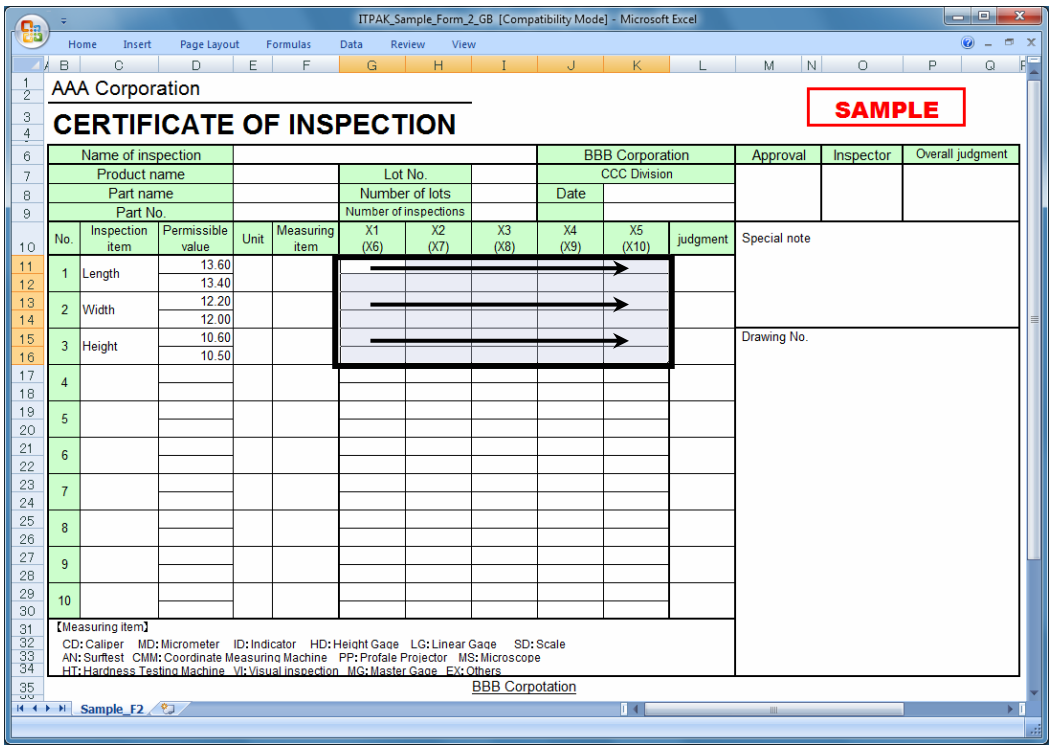
- If you want to use a file other than the sample inspection table file, create an inspection file using Excel before starting up USB-ITPAK. Inspection table files can be saved to any folder. Save the inspection table file to a folder location that will be easy to manage.

7) Select a worksheet for the [Worksheet] field under [Excel settings].

Select the worksheet name to be included in the workbook of step ‘6)’ from the drop-down list.

Here, select [Sample_F2].

8) Enter the input range in the [Range of cells] fields under [Excel settings].



To specify the area indicated by the bold lines in the above inspection table as the input cell range, enter:

First: G11

Last: K16

TIP • The inspection table above is shown with the [Inspection item] and [Permissible value] cells filled.

9) Select the desired direction for the [Move after return direction] field under [Excel settings].

During measurement using USB-ITPAK, once data is input from the measuring tools, the measurement data is input to the current cell and then the entry point (cell) automatically moves to the next cell.

In the inspection table example shown above, select [Down].

10) Specify the [Displacement intervals] under [Excel settings].

Specify the interval for the cell movement specified in step ‘9)’. Specifying “1” results in movement to the next cell. Specifying “2” results in movement to the cell after the next.

In the inspection table example above, specify “2”.

11) Select an option under [Cell address assign rules].

In USB-ITPAK, the measuring items can be assigned to columns (vertical) or rows (horizontal) of the inspection table worksheet.

In the inspection table example above, the measuring items are assigned to respective rows, so select [Assign for the rows (1, 2…)].

12) Specify the [Data entry devices] settings.

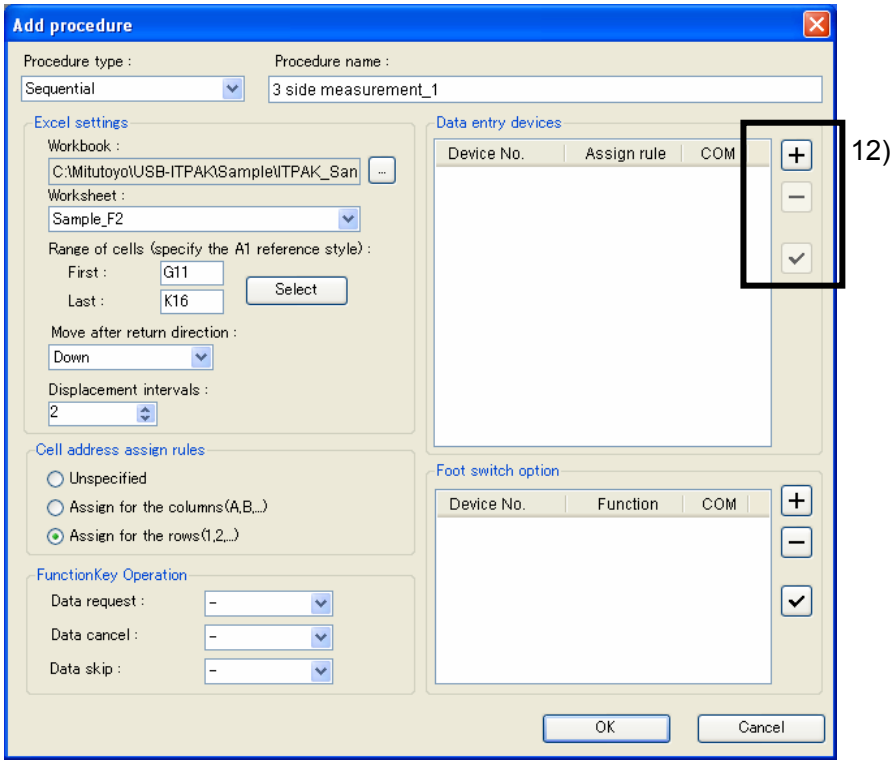
The functions of the buttons for the [Data entry devices] field are as follows:

[+]: Adds device settings.

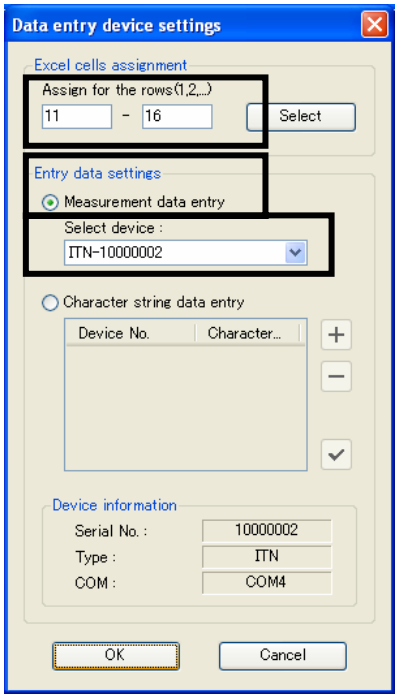
[–]: Deletes the device setting selected from the list.

[√]: Changes the device setting selected from the list.

Here, click the [+] button to switch to the [Data entry device settings] dialog box.



13) Specify the settings in the [Excel cells assignment] field on the [Data entry device settings] dialog box.



In the [Excel cells assignment] field, specify columns (vertical) or rows (horizontal) according to the specification in step 11). Specify the rows here.

There are three input areas in the previously described inspection table. Here, one device is assigned on all the rows, so enter start row number “11” in the input field on the left, and input “16” in the input field on the right.

14) In the [Entry data settings] field, select the entry data type.

The entry data types consist of measurement data input from the measuring tools (numeric data), and character string data input by pressing the foot switch.

TIP • For details about the method for inputting character string data using a foot switch, refer to ‘5.4 Character Input Using Foot Switch’.

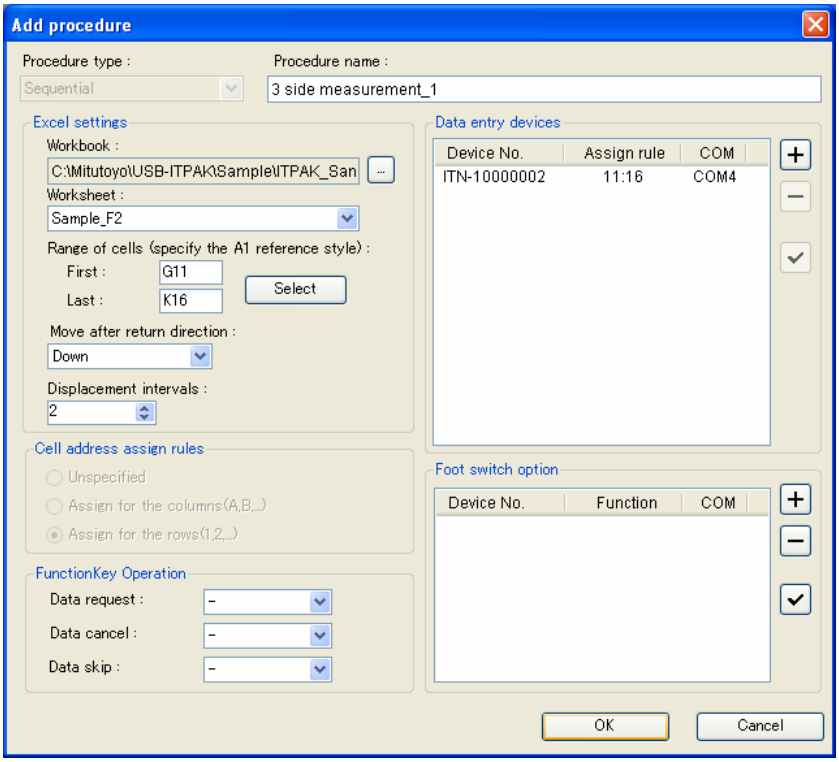
Here, select the [Measurement data entry] radio button.

15) In the [Select device] field, select the device to be assigned.

From the drop-down list, select the device to be assigned.

This completes the settings on the [Data entry device settings] dialog box, so click the [OK] button.

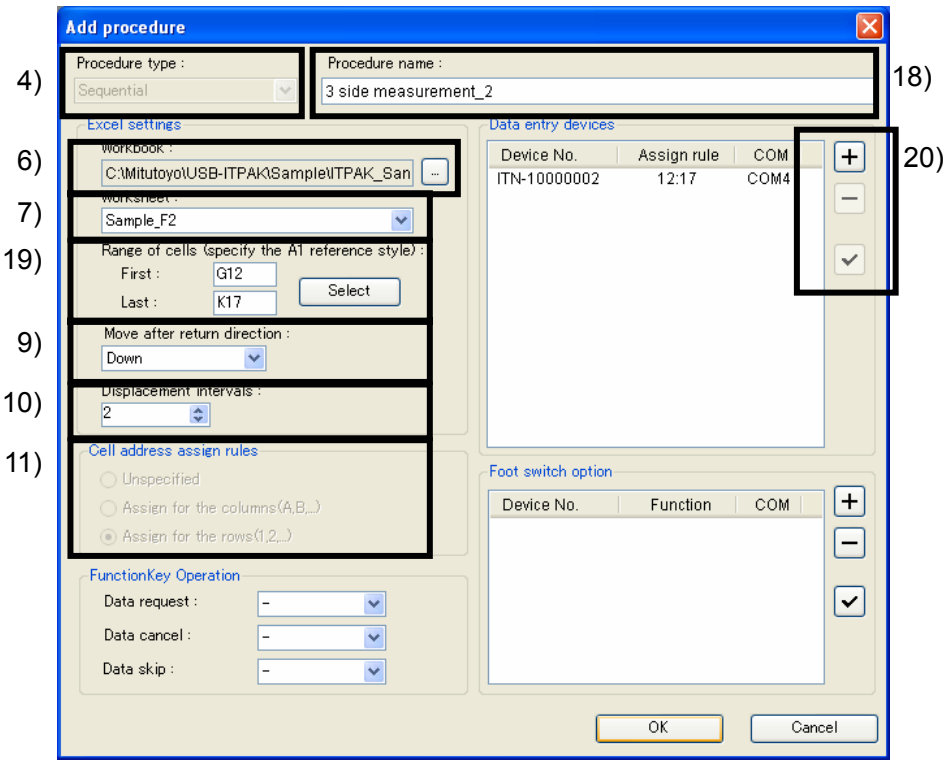
16) Close [Add procedure].



This completes the settings on the [Add procedure] dialog box for the first procedure, so click the [OK] button.

17) Repeat steps '3) to 16)' to create the second procedure.

How to perform steps 18) and subsequent steps in the figure below is described below.



18) Enter a name in the [Procedure name] field.

Here, enter [3 side measurement_2].

19) Enter the input range in the [Range of cells] fields under [Excel settings].

Here, enter:

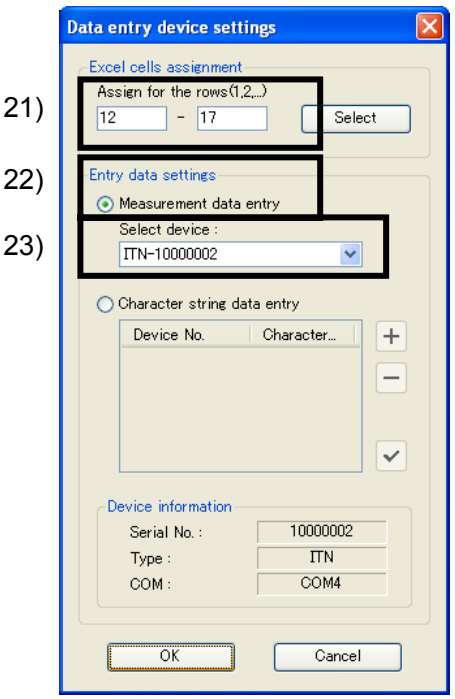
First: G12

Last: K17

20) Specify the [Data entry devices] settings.

Here, click the [+] button to switch to the [Data entry device settings] dialog box.

21) Specify the settings in the [Excel cells assignment] field on the [Data entry device settings] dialog box.



In the [Excel cells assignment] field, specify columns (vertical) or rows (horizontal) according to the specification in step 11). Specify the rows here.

There are three input areas in the previously described inspection table. Here, one device is assigned on all the rows, so enter start row number “12” in the input field on the left, and input “17” in the input field on the right.

22) In the [Entry data settings] field, select the entry data type.

The entry data types consist of measurement data input from the measuring tools (numeric data), and character string data input by pressing the foot switch.

TIP • For details about the method for inputting character string data using a foot switch, refer to ‘5.4 Character Input Using Foot Switch’.

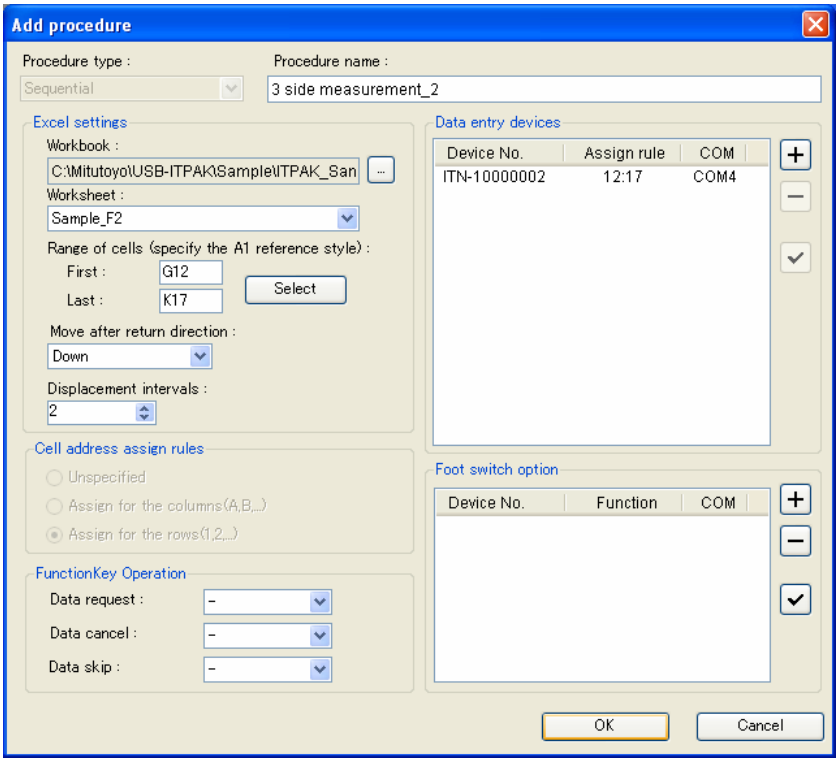
Here, select the [Measurement data entry] radio button.

23) In the [Select device] field, select the device to be assigned.

From the drop-down list, select the device to be assigned.

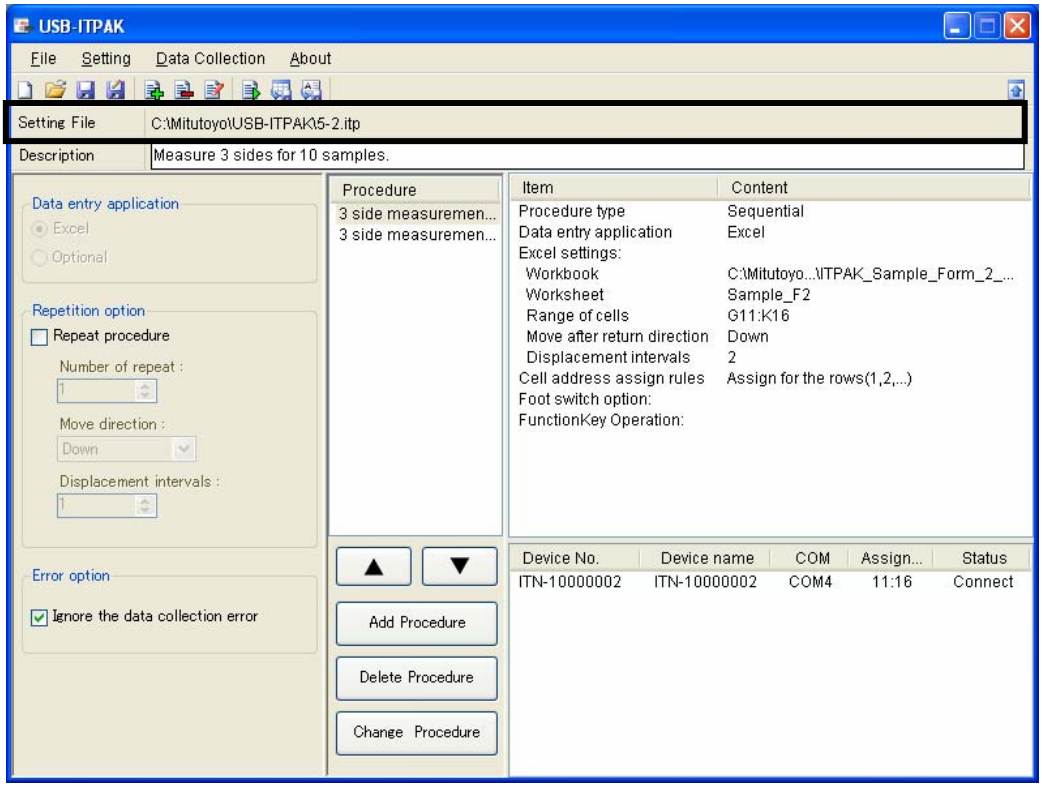
This completes the settings on the [Data entry device settings] dialog box, so click the [OK] button.

24) Close [Add procedure].



This completes the settings on the [Add procedure] dialog box, so click the [OK] button.

25) Save the created setting file.



From the menu of the main dialog box, select [File], [Save As], and then save the file by giving it a name. When the file has been saved, the file name is displayed as a full path in the [Setting File] field.

5.2.3 Measurement

1) Open [Setting File].

TIP

- If starting measurement immediately after specifying the settings in '5.2.2 Setting', the setting file is already opened. In this case, skip step '1)'.

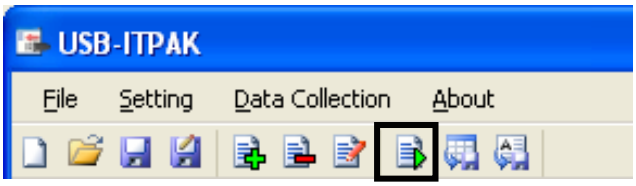
From the menu of the main dialog box, select [File] and then [Open], or open [Setting file] from [Recent files].

2) Open the data collection dialog box.

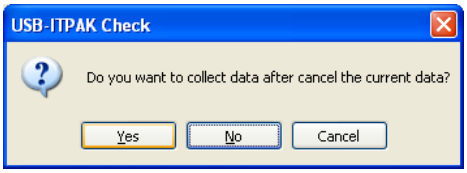
IMPORTANT

- In USB-ITPAK, following data collection, the Excel file to which the data was input is saved through overwriting under the existing file name. To use the original Excel file later, back it up beforehand.

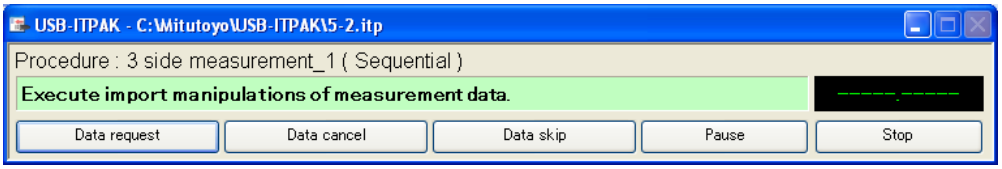
From the menu of the main dialog box, select [Data Collection] and then [Start], or click the icon shown below.



When data collection starts, the message [Do you want to collect data after cancel the current data?] is displayed. Click [Yes] to clear the existing data or [No] not to.

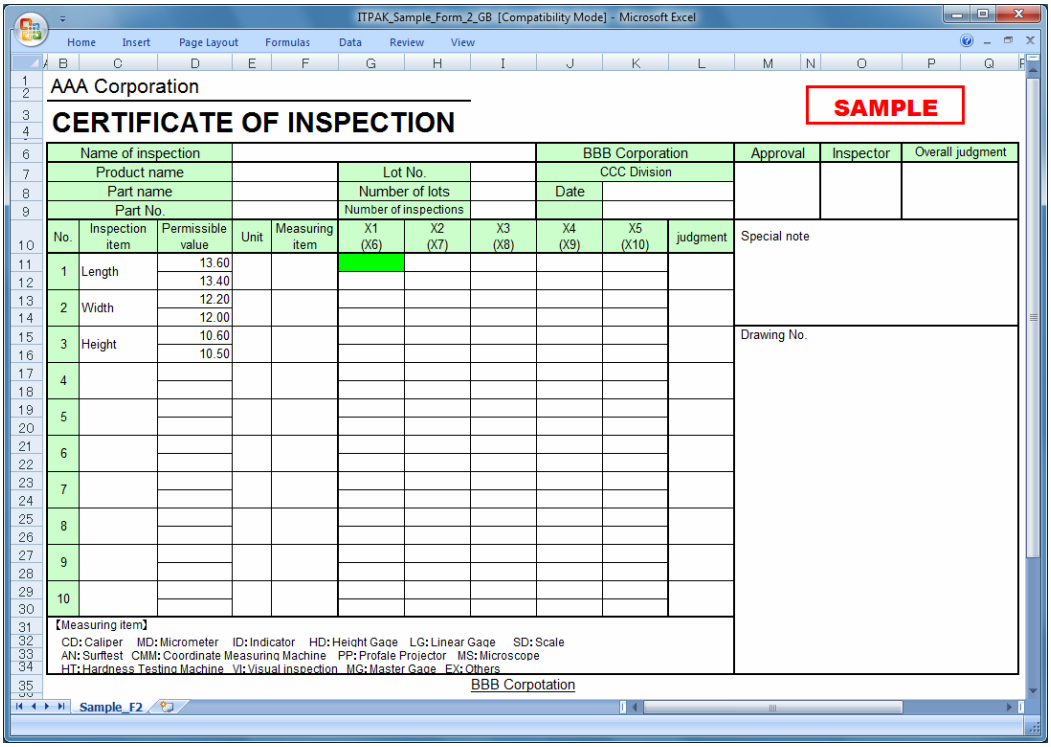


The data collection dialog box is displayed and data collection can now be performed.



3) Perform data collection.

During data collection, the cell to which data will be input next is highlighted in green.



Input data from the measuring tools through one of the following operations:

(1) Pressing the DATA switch on the measuring tool.

(2) Pressing the output switch if USB-ITN has one.

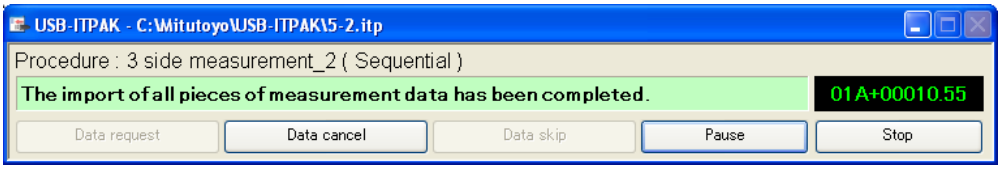
(3) Clicking the [Data request] button on the data collection dialog box.

To cancel data that has been input, click the [Data cancel] button on the data collection dialog box. The data in the entry cell is canceled and the previous cell is highlighted.

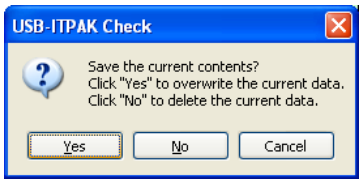
To skip the current data entry cell without inputting data, click the [Data skip] button on the data collection dialog box. The next cell is highlighted.

4) End data collection and save the results.

Once all the data has been input, a completion message is displayed on the data collection dialog box.



Click the [Stop] button on the data collection dialog box. The following message is displayed.



[Yes]: The Excel file to which data was input is saved through overwriting under the existing file name.

[No]: The Excel file is not overwritten and the data that was input is deleted.

[Cancel]: The message dialog box is closed and the data collection dialog box is displayed.

Click the [Yes] button. The Excel file is saved through overwriting and the dialog box switches to the main dialog box.

This completes data collection for measurement that includes two procedures.

5.3 Measurement by Repeating Procedure

5.3.1 Overview

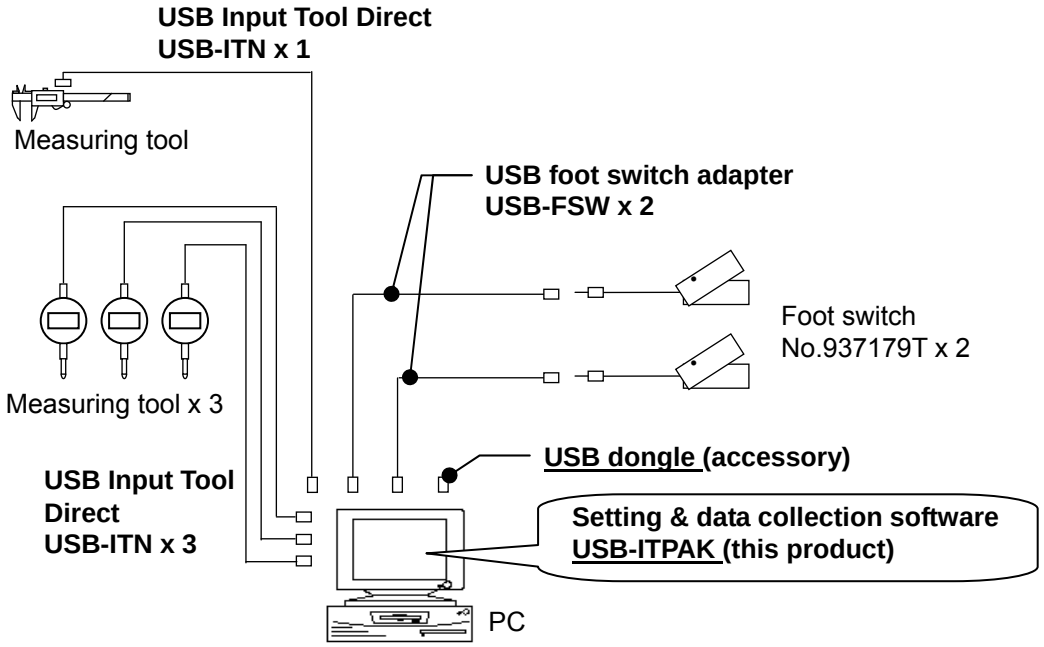
This section explains how to register two procedures to a single setting file and execute these two procedures repeatedly.

TIP
- The procedure used in the explanation in this section is based on the batch measurement method described in '5.1 Data Input Request Using Foot Switch'. The setting file created in '5.1 Data Input Request Using Foot Switch' is used with some modifications.

NOTE
- Measurement by repeating the procedure can be used for both sequential measurement and batch measurement. This function cannot be used for individual measurement.

1) Connection

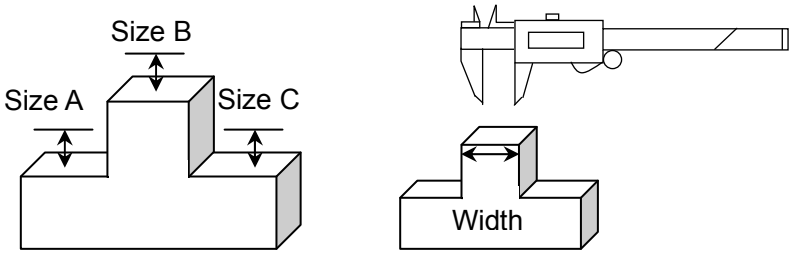
In the explanation in this section, measurement is done with three indicators connected, along with one caliper connected to USB-ITN, and two foot switches connected to USB-FSW. The connection diagram is shown below.



2) Workpiece for measurement

The following workpiece is used in the explanation. Three indicators are used and measurement is done with the measuring jigs. ‘Size A’, ‘Size B’, and ‘Size C’, which are shown in the figure below, are measured.

A caliper is then used to measure the width at the top of the work.



3) Measurement

The image of the inspection table upon completion of data collection is shown below.

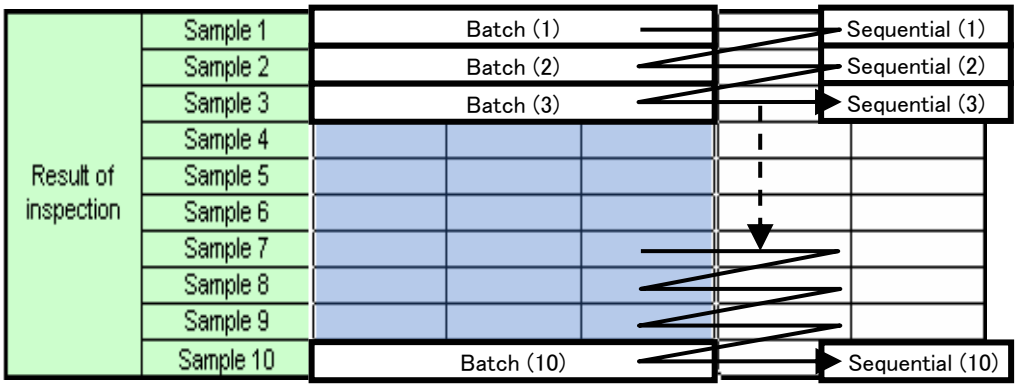
Inspection item		Size A	Size B	Size C	Size D	Size E
Measuring item						
Tolerance	Upper limit	0.15	0.10	0.15		13.55
	Lower limit	-0.15	-0.10	0.00		13.45
Result of inspection	Sample 1	0.05	0.02	0.07		13.50
	Sample 2	0.08	0.01	0.06		13.50
	Sample 3	0.09	0.00	0.05		13.51
	Sample 4	0.07	0.03	0.06		13.52
	Sample 5	0.08	-0.01	0.04		13.51
	Sample 6	0.08	0.02	0.06		13.51
	Sample 7	0.06	-0.01	0.05		13.50
	Sample 8	0.07	-0.02	0.05		13.52
	Sample 9	0.07	0.01	0.04		13.50
	Sample 10	0.08	0.00	0.06		13.51

The measurement procedure consists of the measurement of ten workpieces using the following procedure.

(1) 'Size A', 'Size B', and 'Size C' of the first workpiece are measured in batch by using the measuring jigs, and the input data is output to the respective columns of the Sample 1 row on the Excel worksheet.

(2) Next, 'Size E' is measured using the caliper and the input data is output to the 'Size E' column of the Sample 1 row on the Excel worksheet.

The above steps are performed for the second to tenth workpieces, and the input data is output to the Sample 2 row to the Sample 10 row on the Excel worksheet.



To perform such procedures, create (1) and (2) above as separate procedures, and set up the procedures so they are repeated a total of 10 times. By executing these procedures, the measurements for one workpiece are performed by executing procedures (1) and (2) in series one time, and the measurements for all workpieces are done by doing this total of 10 times.

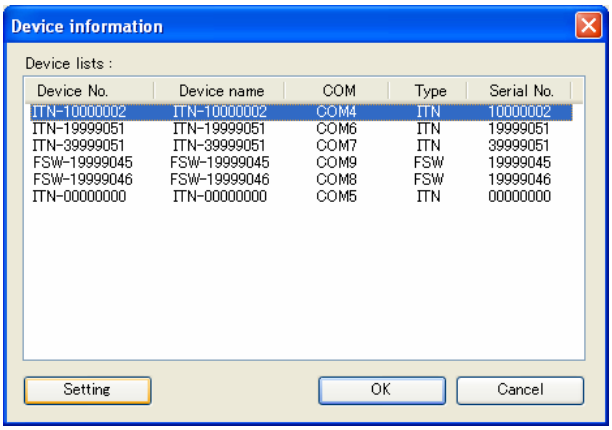
The following describes how to set up the measurement procedure, perform measurement, and save the results.

5.3.2 Setting

1) Check the device information.

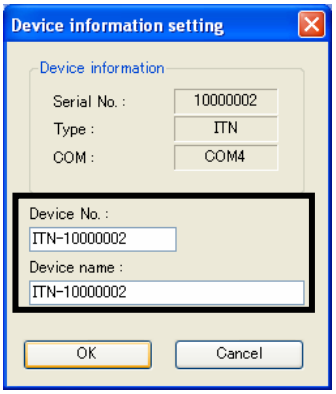
NOTE • USB-ITPAK loads the information of connected devices at startup. Therefore, connect all the devices to be used before starting up USB-ITPAK.

From the menu of the main dialog box, select [Settings] and then [Device information]. This opens the [Device information] dialog box, which allows you to check the devices that are connected to the PC.



If you do not want to change the device number or device name, click the [Cancel] button to return to the main dialog box.

If you want to change a device number or device name, select the device, and then click the [Setting] button.



Click the [OK] button if you change any settings.

NOTE • In the procedure created from step '2)', the device number is used to specify the device to be used. If you change the number, revise all the setting files that use it.

TIP • If multiple units are connected, specify settings for each.

TIP • If performing measurement using existing setting files, skip this section and see '5.3.3 Measurement'.

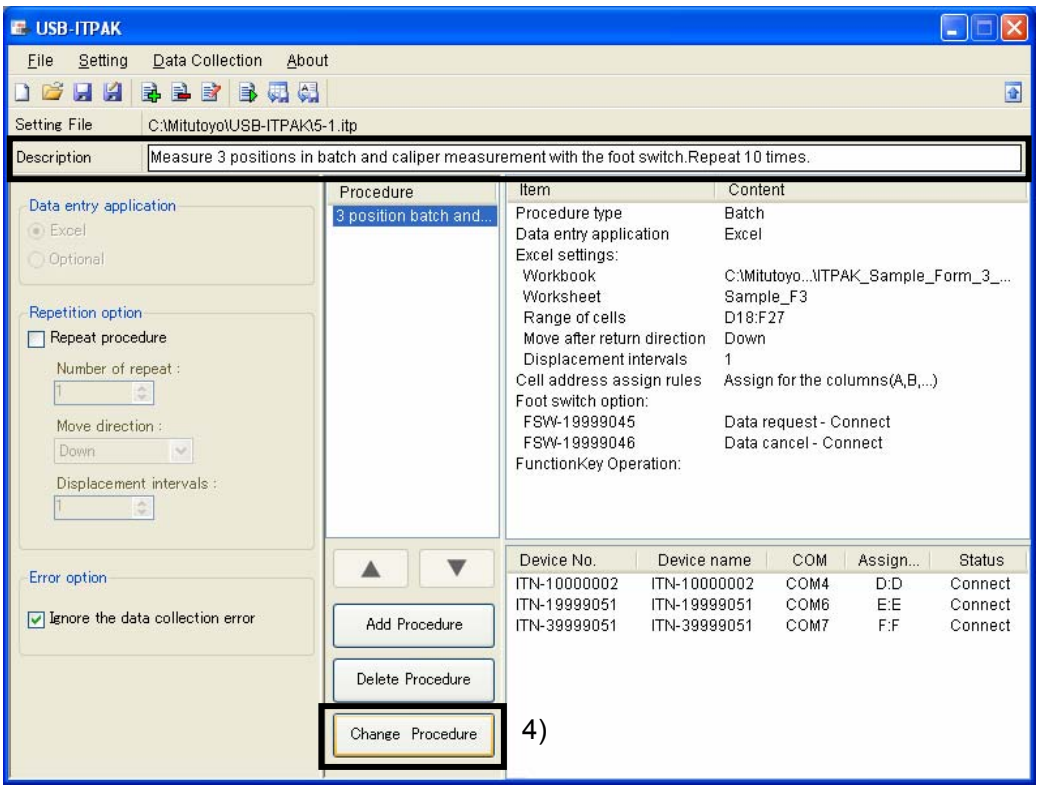
2) Open the setting file created in '5.1 Data Input Request Using Foot Switch'.

From the menu of the main dialog box, select [File] and then [Open], or open [Setting file] from [Recent files].

3) Enter information about the setting file in the [Description] field.

Enter a description of the setting file. This field may be left blank.

3)



4)

4) Start the procedure change.

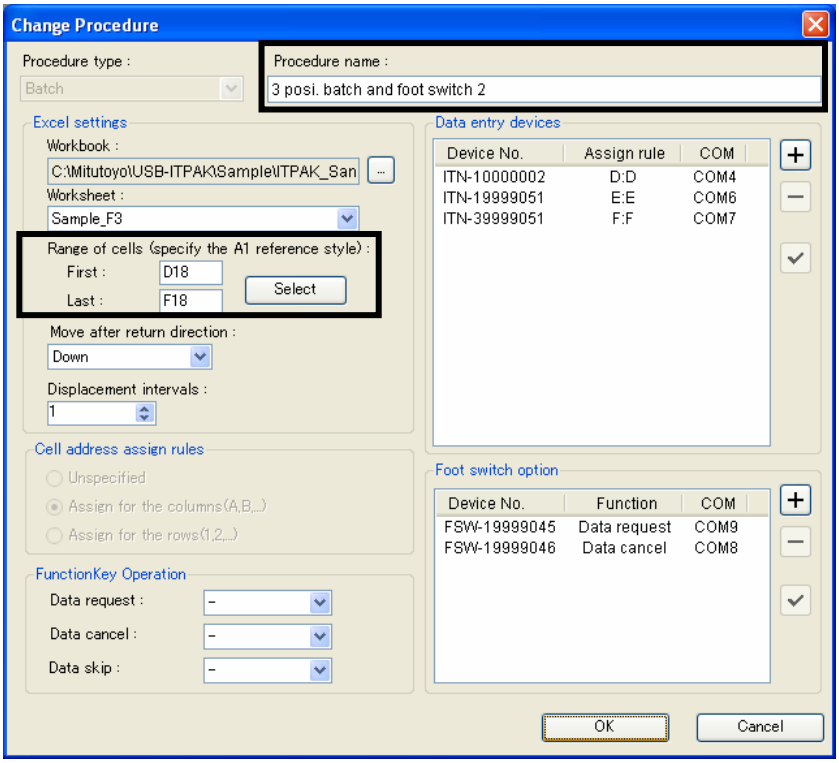
Click the [Change Procedure] button on the main dialog box.

5) Enter a name in the [Procedure name] field.

Entering the procedure name is required.

TIP • Since the procedure name will be displayed in the [Procedure] field at the center of the main dialog box, enter an easily identifiable name.

Here, enter [3 posi. batch and foot switch 2].



6) Change the input range in the [Range of cells] fields under [Excel settings].

Here, enter:

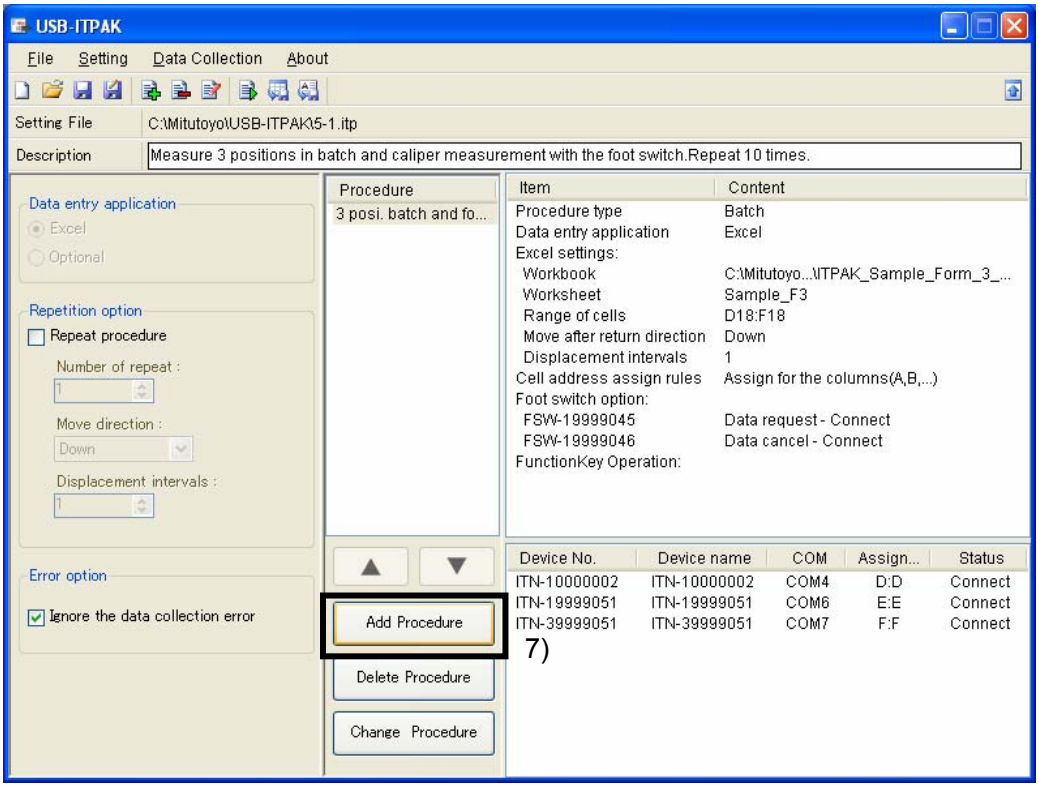
First: D18

Last: F18

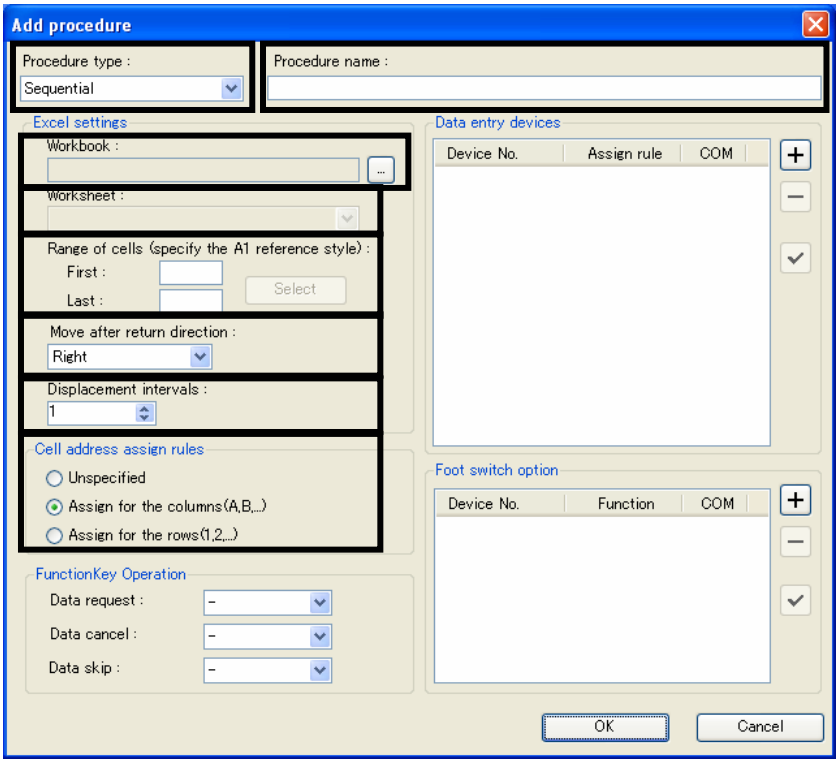
This completes the settings on the [Change Procedure] dialog box, so click the [OK] button.

7) Add the second procedure to the setting file.

Click the [Add Procedure] button on the main dialog box.



8) Select a procedure type for the [Procedure type] field.



Check that [Sequential] is selected as the procedure type, and if not, select [Sequential] from the drop-down list.

9) Enter a name in the [Procedure name] field.

Entering the procedure name is required.

TIP

- Since the procedure name will be displayed in the [Procedure] field at the center of the main dialog box, enter an easily identifiable name.

Here, enter [Caliper measurement].

10) Specify an Excel file in the [Workbook] field under [Excel settings].

Enter the workbook name of the Excel file to which the measured data is to be input.

The file can be selected from the [Open] dialog box by clicking the […] button.

Here, select the following file.

C:\Mitutoyo\USB-ITPAK\Sample\ ITPAK_Sample_Form_3_GB.xls

IMPORTANT

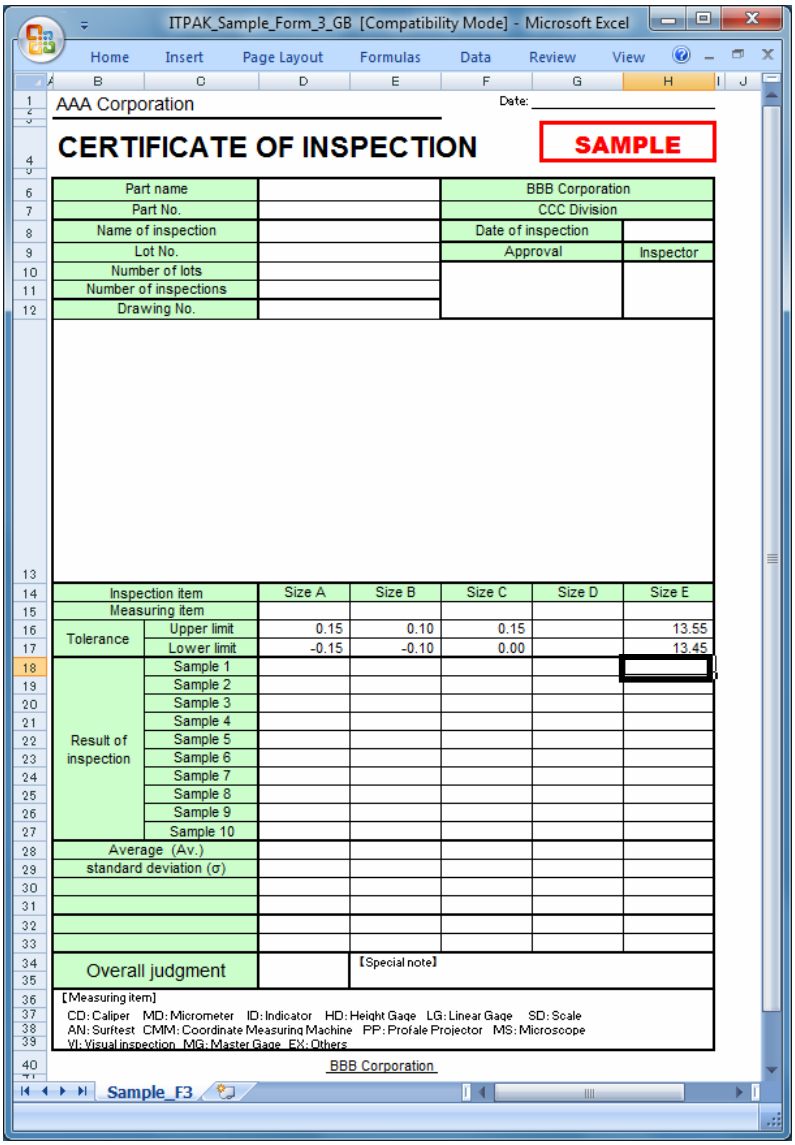
- If you want to use a file other than the sample inspection table file, create an inspection file using Excel before starting up USB-ITPAK. Inspection table files can be saved to any folder. Save the inspection table file to a folder location that will be easy to manage.

11) Select a worksheet for the [Worksheet] field under [Excel settings].

Select the worksheet name to be included in the workbook of step '10)' from the drop-down list.

Here, select [Sample_F3].

12) Enter the input range in the [Range of cells] fields under [Excel settings].



To specify the area indicated by the bold lines in the above inspection table as the input cell range, enter:

First: H18

Last: H18

13) Select the desired direction for the [Move after return direction] field under [Excel settings].

During measurement using USB-ITPAK, once data is input from the measuring tools, the measurement data is input to the current cell and then the entry point (cell) automatically moves to the next cell.

In the inspection table example shown above, select [Down].

14) Specify the [Displacement intervals] under [Excel settings].

Specify the interval for the cell movement specified in step 13). Specifying “1” results in movement to the next cell. Specifying “2” results in movement to the cell after the next.

In the inspection table example above, specify “1”.

15) Select an option under [Cell address assign rules].

In USB-ITPAK, the measuring items can be assigned to columns (vertical) or rows (horizontal) of the inspection table worksheet.

In the inspection table example above, the measurement items are assigned to respective columns, so select [Assign for the columns (A,B,…)].

16) Specify the [Data entry devices] settings.

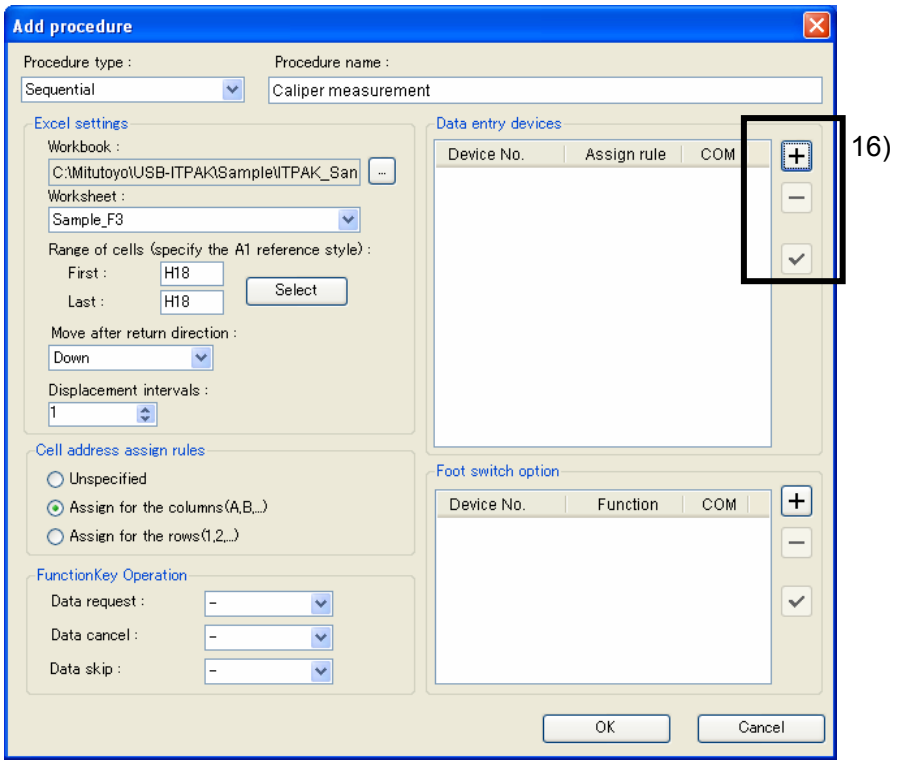
The functions of the buttons for the [Data entry devices] field are as follows:

[+]: Adds device settings.

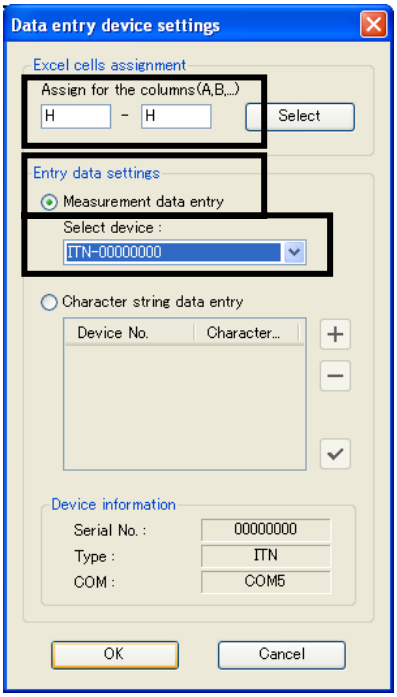
[–]: Deletes the device setting selected from the list.

[√]: Changes the device setting selected from the list.

Here, click the [+] button to switch to the [Data entry device settings] dialog box.



17) Specify the settings in the [Excel cells assignment] field on the [Data entry device settings] dialog box.



In the [Excel cells assignment] field, specify columns (vertical) or rows (horizontal) according to the specification in step 11). Specify the columns here.

Here, the device is assigned to one column, the H column, so enter “H” in both input fields.

18) In the [Entry data settings] field, select the entry data type.

The entry data types consist of measurement data input from the measuring tools (numeric data), and character string data input by pressing the foot switch.

TIP • For details about the method for inputting character string data using a foot switch, refer to ‘5.4 Character Input Using Foot Switch’.

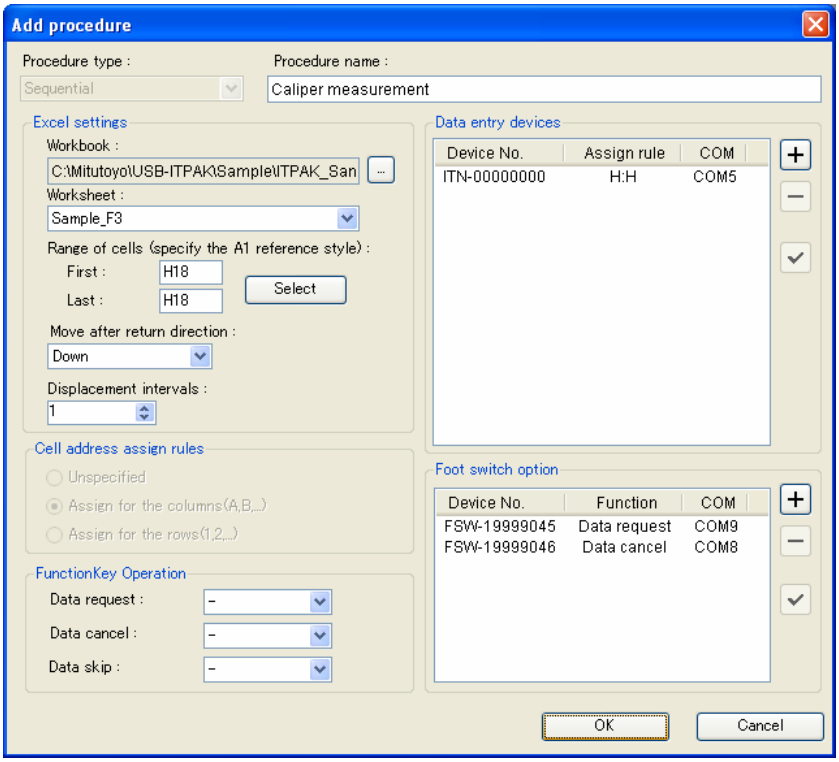
Here, select the [Measurement data entry] radio button.

19) In the [Select device] field, select the device to be assigned.

From the drop-down list, select the device to be assigned.

This completes the settings on the [Data entry device settings] dialog box, so click the [OK] button.

20) Close [Add procedure].

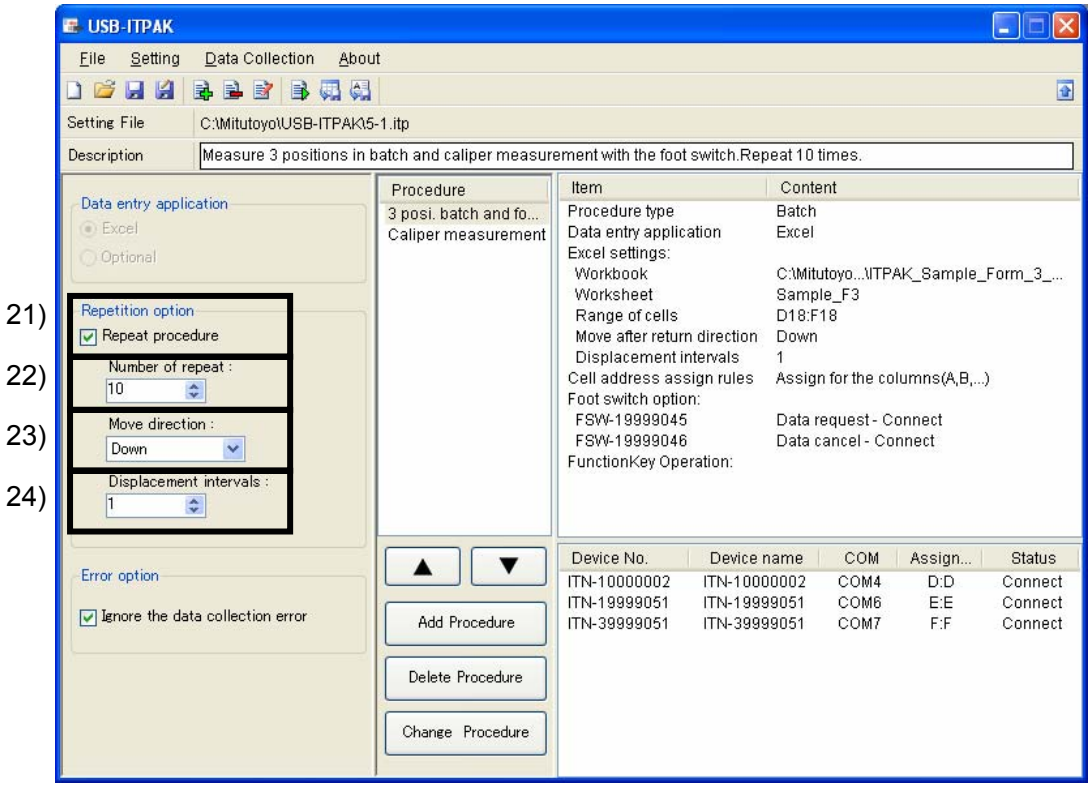


This completes the settings on the [Add procedure] dialog box, so click the [OK] button.

21) Specify the repetition settings.

Select [Repeat procedure] in the [Repetition option] field.

The ‘22) to 24)’ fields shown below activate.



21)

22)

23)

24)

22) Specify [Number of repeat] in the [Repetition option] field.

Specify the number of times the created procedure is to be repeated.

Here, specify “10”.

23) Specify [Move direction] in the [Repetition option] field.

After the created procedure has been performed, the entry point (cell) automatically moves to the next position.

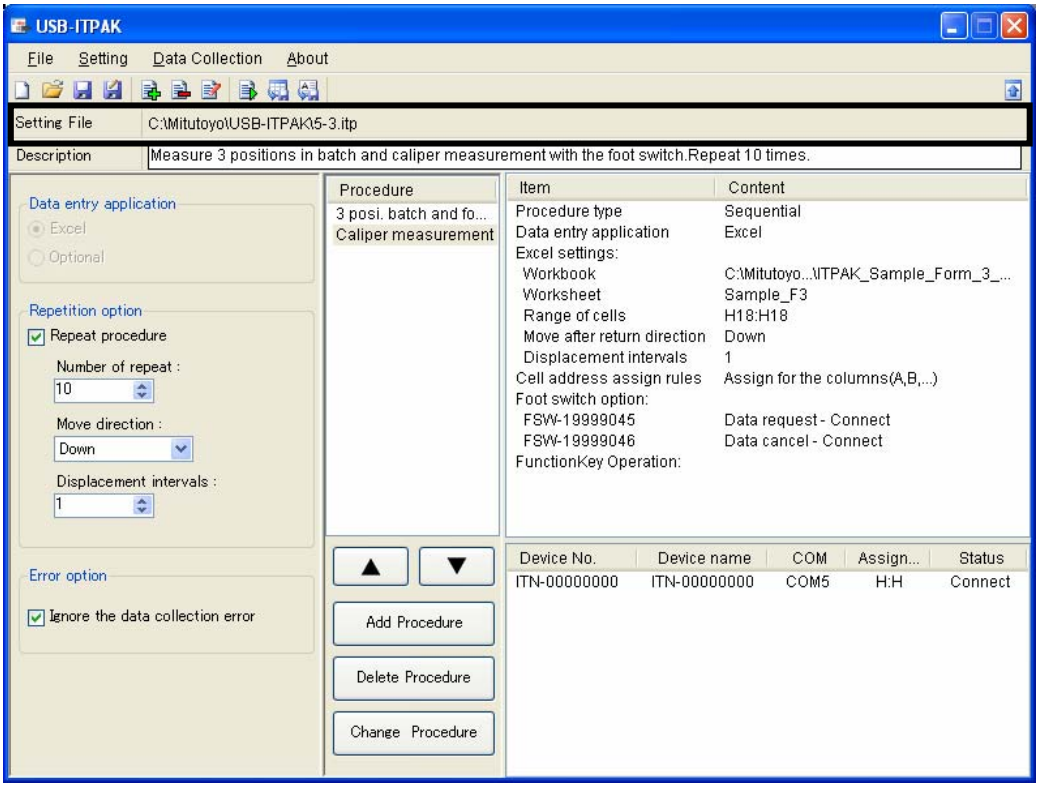
Here, select [Down].

24) Specify [Displacement intervals] in the [Repetition option] field.

Specify the interval for the cell movement specified in step ‘23)’. Specifying “1” results in movement to the next cell. Specifying “2” results in movement to the cell after the next.

Here, specify “1”.

25) Save the created setting file.



From the menu of the main dialog box, select [File], [Save As], and then save the file by giving it a name. When the file has been saved, the file name is displayed as a full path in the [Setting File] field.

5.3.3 Measurement

1) Open [Setting File].

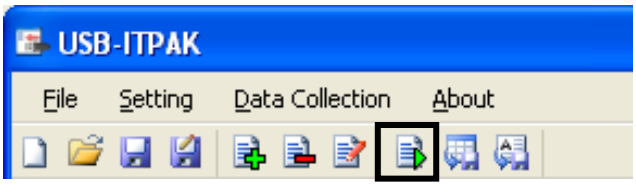
TIP
- If starting measurement immediately after specifying the settings in '5.3.2 Setting', the setting file is already opened. In this case, skip step '1)'.

From the menu of the main dialog box, select [File] and then [Open], or open [Setting file] from [Recent files].

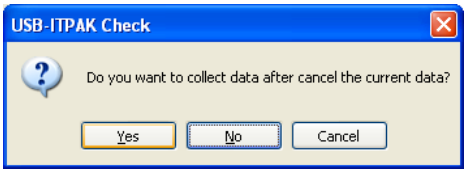
2) Open the data collection dialog box.

IMPORTANT
- In USB-ITPAK, following data collection, the Excel file to which the data was input is saved through overwriting under the existing file name. To use the original Excel file later, back it up beforehand.

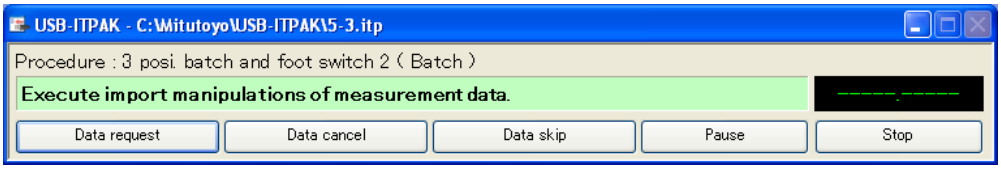
From the menu of the main dialog box, select [Data Collection] and then [Start], or click the icon shown below.



When data collection starts, the message [Do you want to collect data after cancel the current data?] is displayed. Click [Yes] to clear the existing data or [No] not to.

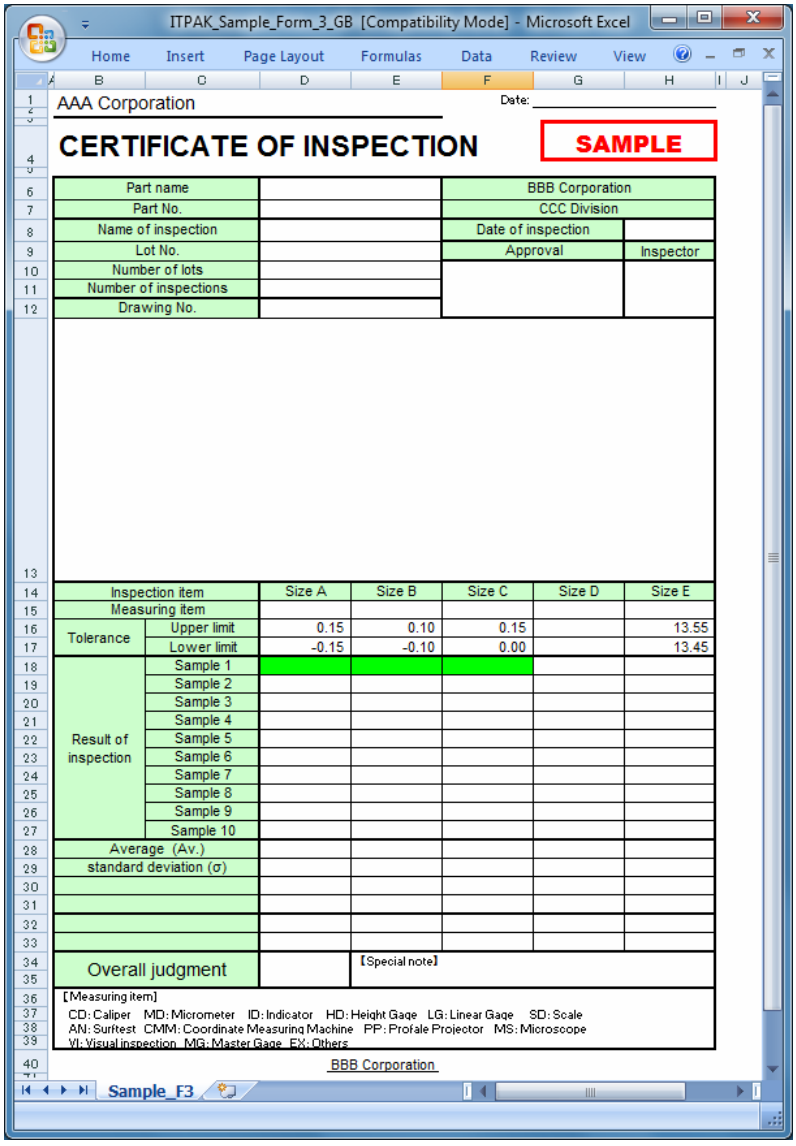


The data collection dialog box is displayed and data collection can now be performed.



3) Perform data collection.

During data collection, the cell to which data will be input next is highlighted in green.



Input data from the measuring tools through one of the following operations:

(1) Press the foot switch to which the [Data request] function was assigned in the foot switch option setting.

(2) Click the [Data request] button on the data collection dialog box.

To cancel the data that was input, do either of the following. The data in the entry cell is canceled and the previous cell is highlighted.

(1) Press the foot switch to which the [Data cancel] function was assigned in the foot switch option setting.

(2) Click the [Data cancel] button on the data collection dialog box.

To skip the current data entry cell without inputting data, click the [Data skip] button on the data collection dialog box. The next cell is highlighted.

IMPORTANT

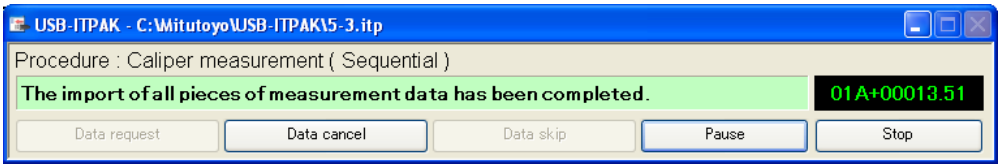
- During batch measurement, data is collected all at once, so data cannot be collected through the following operations:

(1) Pressing the DATA switch on the measuring tool

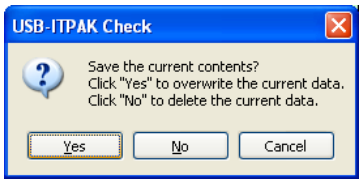
(2) Pressing the output switch if USB-ITN has one

4) End data collection and save the results.

Once all the data has been input, a completion message is displayed on the data collection dialog box.



Click the [Stop] button on the data collection dialog box. The following message is displayed.



[Yes]: The Excel file to which data was input is saved through overwriting under the existing file name.

[No]: The Excel file is not overwritten and the data that was input is deleted.

[Cancel]: The message dialog box is closed and the data collection dialog box is displayed.

Click the [Yes] button. The Excel file is saved through overwriting and the dialog box switches to the main dialog box.

This completes the data collection for measurement by repeating procedure.

5.4 Character Input Using Foot Switch

5.4.1 Overview

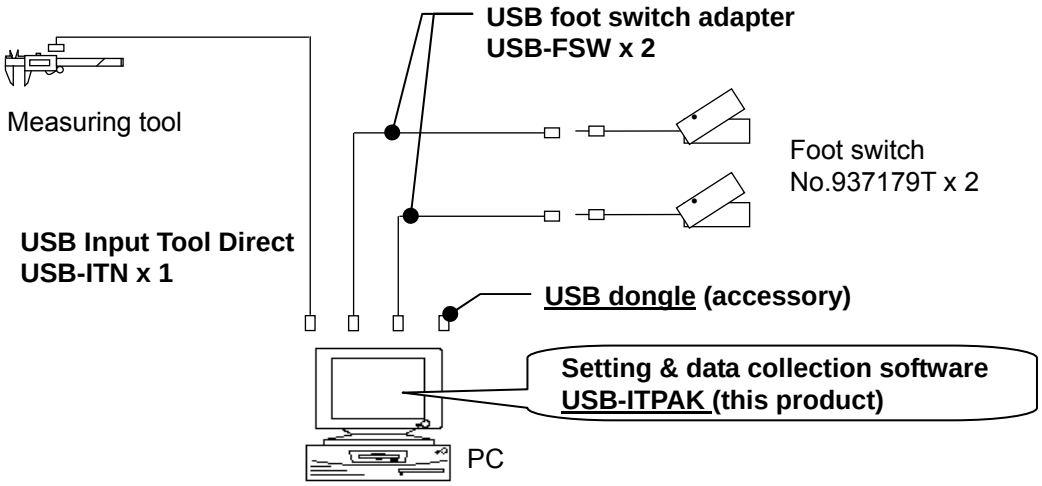
This section explains how to input pre-registered characters in the inspection table using the foot switch. This function is used for inputting sensory inspection results (PASS/FAIL), etc.

TIP • The procedure used in the explanation in this section is based on the sequential measurement method described in 'CHAPTER 4 MEASUREMENT DATA COLLECTION (BASICS)'. The setting file created in 'CHAPTER 4 MEASUREMENT DATA COLLECTION (BASICS)' is used with some modifications.

NOTE • Character input using the foot switch can be used for both sequential measurement and individual measurement. This function cannot be used for batch measurement.

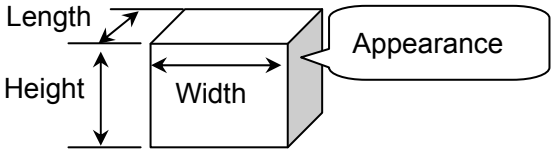
1) Connection

In the explanation in this section, one caliper is connected to USB-ITN and two foot switches are connected to USB-FSW. The connection diagram is shown below.



2) Workpieces for measurement

The following workpiece is used in the explanation. The measurement locations are the length, width, height, and appearance (visual) of the rectangular parallelepiped.



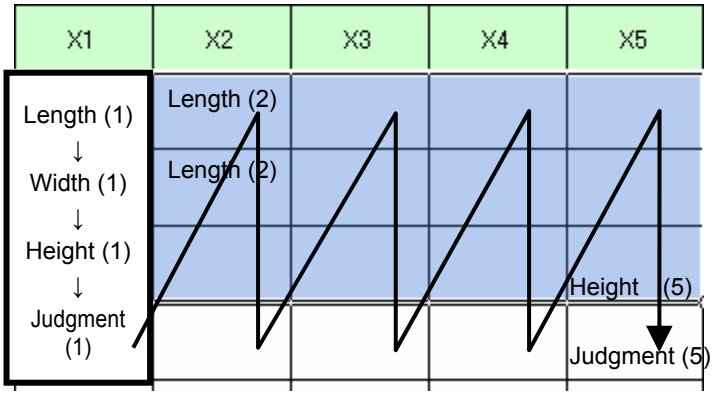
3) Measurement

The image of the inspection table upon completion of data collection is shown below.

No.	Inspection item	Permissible value		Unit	Measuring item	X1	X2	X3	X4	X5
1	Length	13.60	13.40	mm	CD	13.49	13.51	13.52	13.53	13.50
2	Width	12.20	12.00	mm	CD	12.12	12.15	12.13	12.15	12.14
3	Height	10.60	10.50	mm	CD	10.58	10.58	10.55	10.57	10.56
4	Visual	-	-	-	-	OK	OK	OK	OK	OK

In this measurement procedure, the length, width, and height of the first workpiece are measured and the input data is output to the first row (Length), the second row (Width), and the third row (Height), respectively, of the X1 column on the Excel worksheet. Next, the first workpiece is visually inspected and the result is output to the fourth row (Visual) of the X1 column.

Next, the second workpiece is similarly measured, and so on, until all five workpieces have been measured.



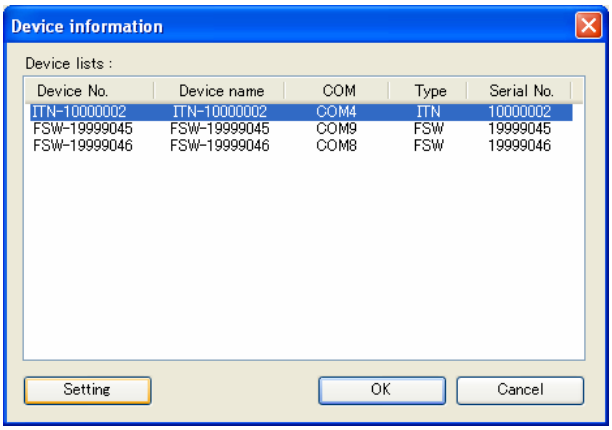
The following describes how to set up the measurement procedure, perform measurement, and save the results.

5.4.2 Setting

1) Check the device information.

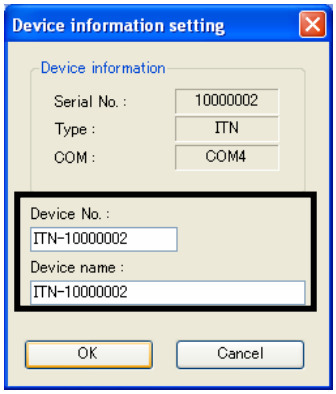
NOTE • USB-ITPAK loads the information of connected devices at startup. Therefore, connect all the devices to be used before starting up USB-ITPAK.

From the menu of the main dialog box, select [Settings] and then [Device information]. This opens the [Device information] dialog box, which allows you to check the devices that are connected to the PC.



If you do not want to change the device number or device name, click the [Cancel] button to return to the main dialog box.

If you want to change a device number or device name, select the device, and then click the [Setting] button.



Click the [OK] button if you change any settings.

NOTE • In the procedure created from step '2)', the device number is used to specify the device to be used. If you change the number, revise all the setting files that use it.

TIP • If multiple units are connected, specify settings for each.

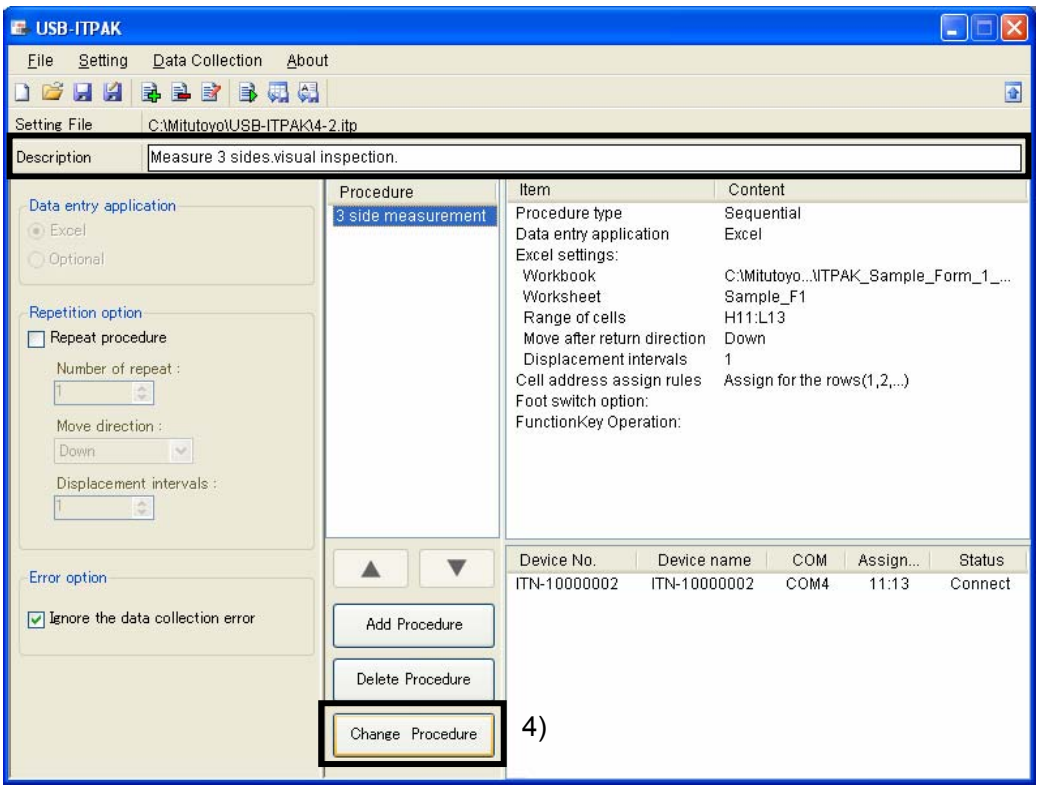
TIP • If performing measurement using existing setting files, skip this section and see '5.4.3 Measurement'.

2) Open the setting file created in '4.2 Sequential Measurement (Basics)'.

From the menu of the main dialog box, select [File] and then [Open], or open [Setting file] from [Recent files].

3) Enter information about the setting file in the [Description] field.

Enter a description of the setting file. This field may be left blank.



4) Start the procedure change.

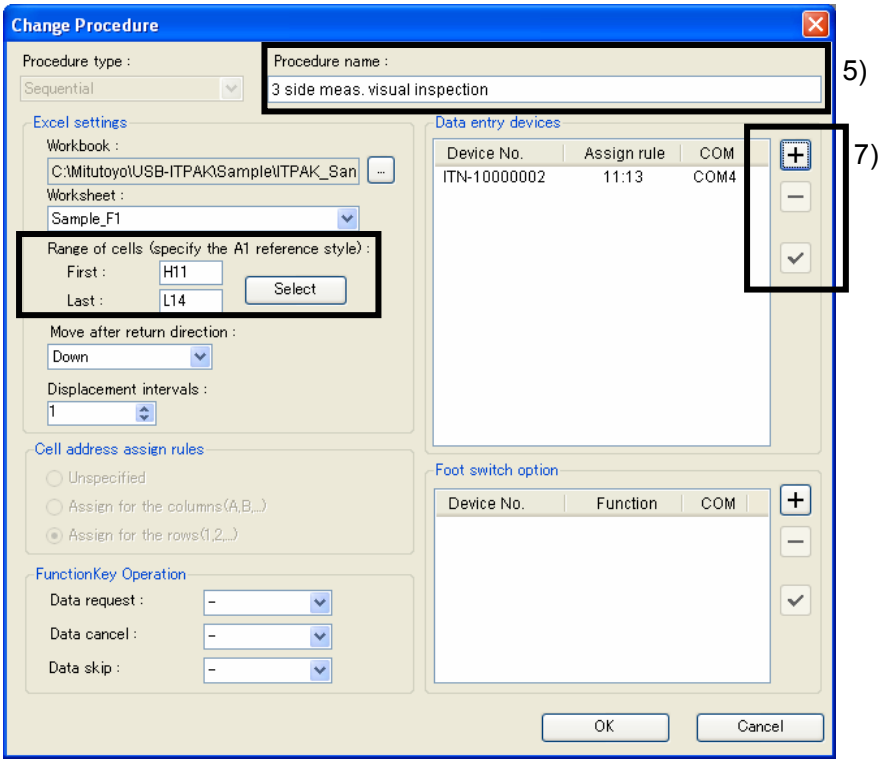
Click the [Change Procedure] button on the main dialog box.

5) Enter a name in the [Procedure name] field.

Entering the procedure name is required.

TIP • Since the procedure name will be displayed in the [Procedure] field at the center of the main dialog box, enter an easily identifiable name.

Here, enter [3 side meas. visual inspection].



6) Change the input range in the [Range of cells] fields under [Excel settings].

Here, enter:

First: H11

Last: L14

7) Specify the [Data entry devices] settings.

The functions of the buttons for the [Data entry devices] field are as follows:

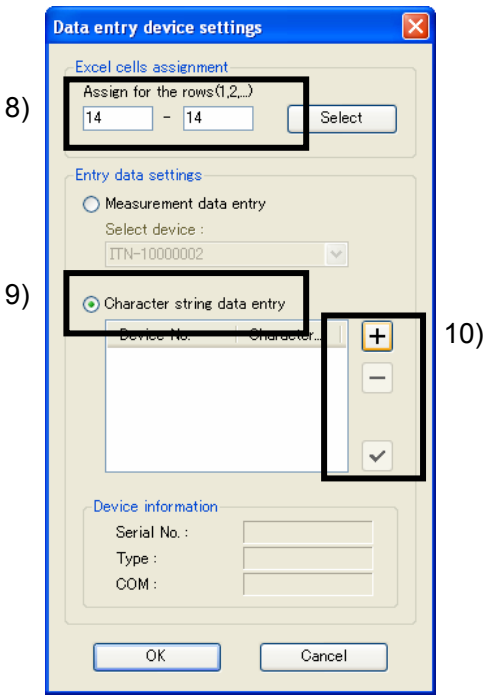
[+]: Adds device settings.

[–]: Deletes the device setting selected from the list.

[√]: Changes the device setting selected from the list.

Here, click the [+] button to switch to the [Data entry device settings] dialog box.

8) Specify the settings in the [Excel cells assignment] field on the [Data entry device settings] dialog box.



In the [Excel cells assignment] field, specify columns (vertical) or rows (horizontal) according to the specification in the [Cell address assign rules] field on the main dialog box. Specify the rows here.

Here, enter “14” in both input fields to assign the device to one row, [Row 14].

9) In the [Entry data settings] field, select the entry data type.

The entry data types consist of measurement data input from the measuring tools (numeric data), and character string data input by pressing the foot switch.

Here, select [Character string data entry].

10) Specify the settings of the first device for inputting character strings.

The functions of the buttons for the [Entry data settings] field are as follows:

[+]: Adds device settings.

[–]: Deletes the device setting selected from the list.

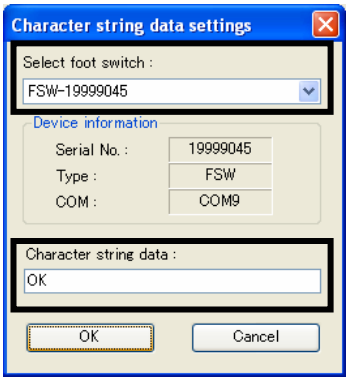
[√]: Changes the device setting selected from the list.

Here, click the [+] button to switch to the [Character string data settings] dialog box.

11) Select the device to be assigned in the [Select foot switch] field of the [Character string data settings] dialog box.

11)

12)



Select the device to be assigned from the drop-down list.

Here, select the first device.

12) In the [Character string data] field, enter the character string to be input in the Excel cell.

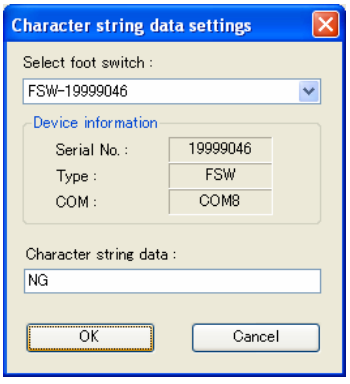
Here, enter [OK].

NOTE • If [Optional] was selected in the [Data entry application] field on the main dialog box, only ASCII code character strings (strings consisting of alphanumeric characters and some symbols that can be entered directly from the keyboard) can be input.

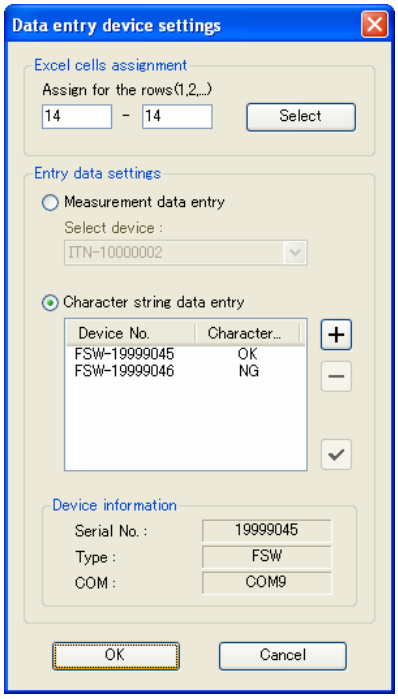
This completes the settings on the [Character string data settings] dialog box for the first device, so click the [OK] button.

13) Repeat steps '10) to 12)' to specify the settings of the second device for inputting character strings.

Here, specify settings so that [NG] is input from the second device.

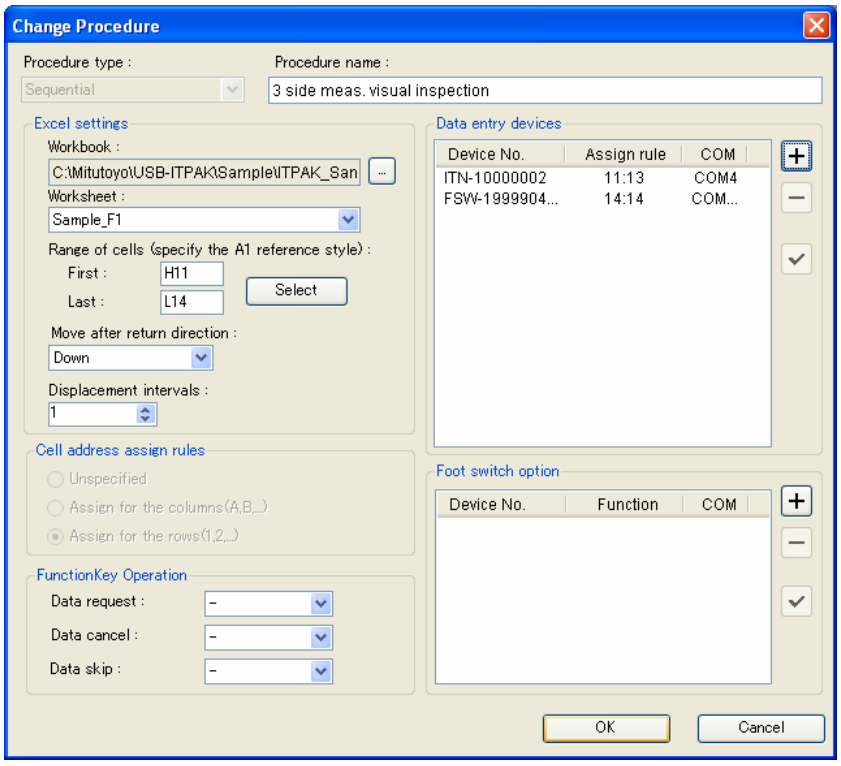


14) Close [Data entry device settings].



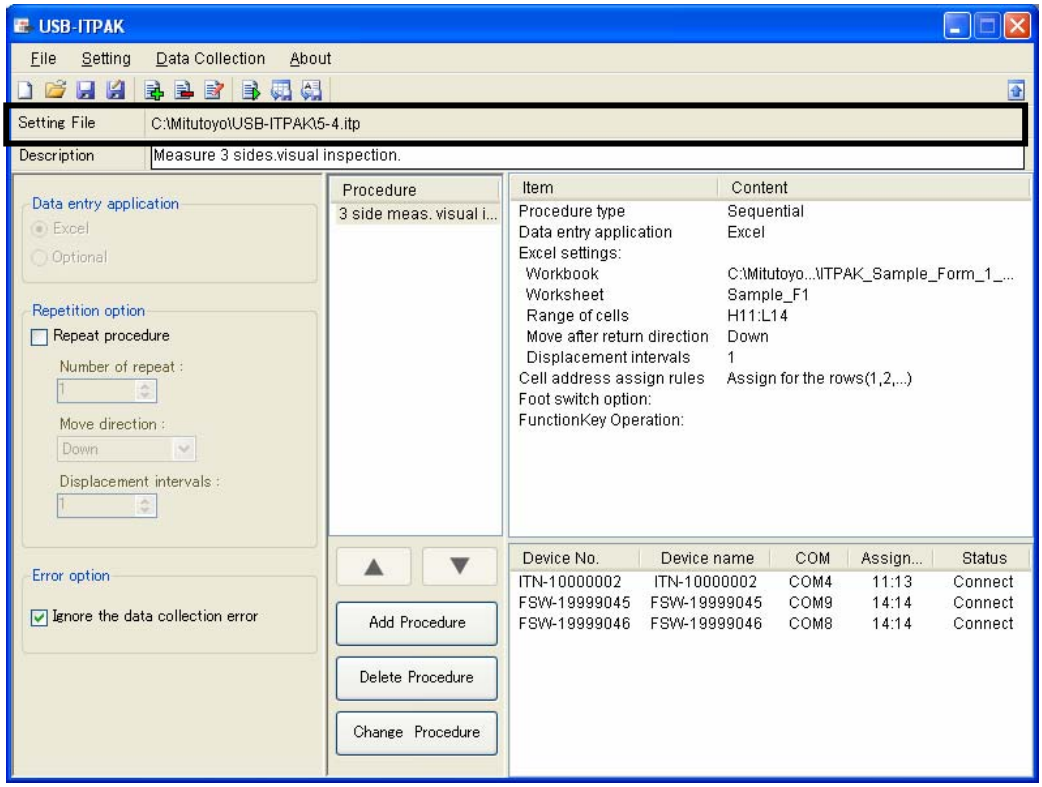
This completes the settings on the [Data entry device settings] dialog box, so click the [OK] button.

15) Close [Change Procedure].



This completes the settings on the [Change Procedure] dialog box, so click the [OK] button.

16) Save the created setting file.



From the menu of the main dialog box, select [File], [Save As], and then save the file by giving it a name. When the file has been saved, the file name is displayed as a full path in the [Setting File] field.

5.4.3 Measurement

1) Open [Setting File].

TIP

- If starting measurement immediately after specifying the settings in '5.4.2 Setting', the setting file is already opened. In this case, skip step '1)'.

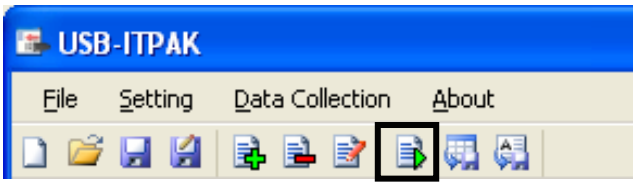
From the menu of the main dialog box, select [File] and then [Open], or open [Setting file] from [Recent files].

2) Open the data collection dialog box.

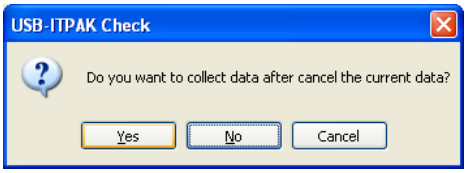
IMPORTANT

- In USB-ITPAK, following data collection, the Excel file to which the data was input is saved through overwriting under the existing file name. To use the original Excel file later, back it up beforehand.

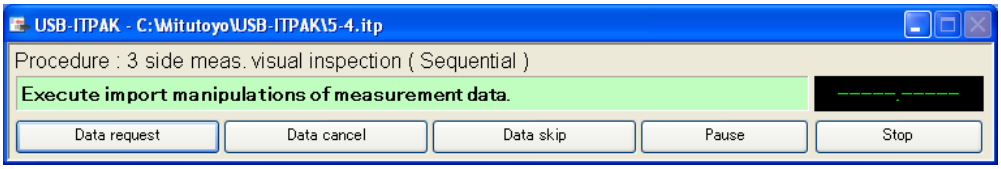
From the menu of the main dialog box, select [Data Collection] and then [Start], or click the icon shown below.



When data collection starts, the message [Do you want to collect data after cancel the current data?] is displayed. Click [Yes] to clear the existing data or [No] not to.

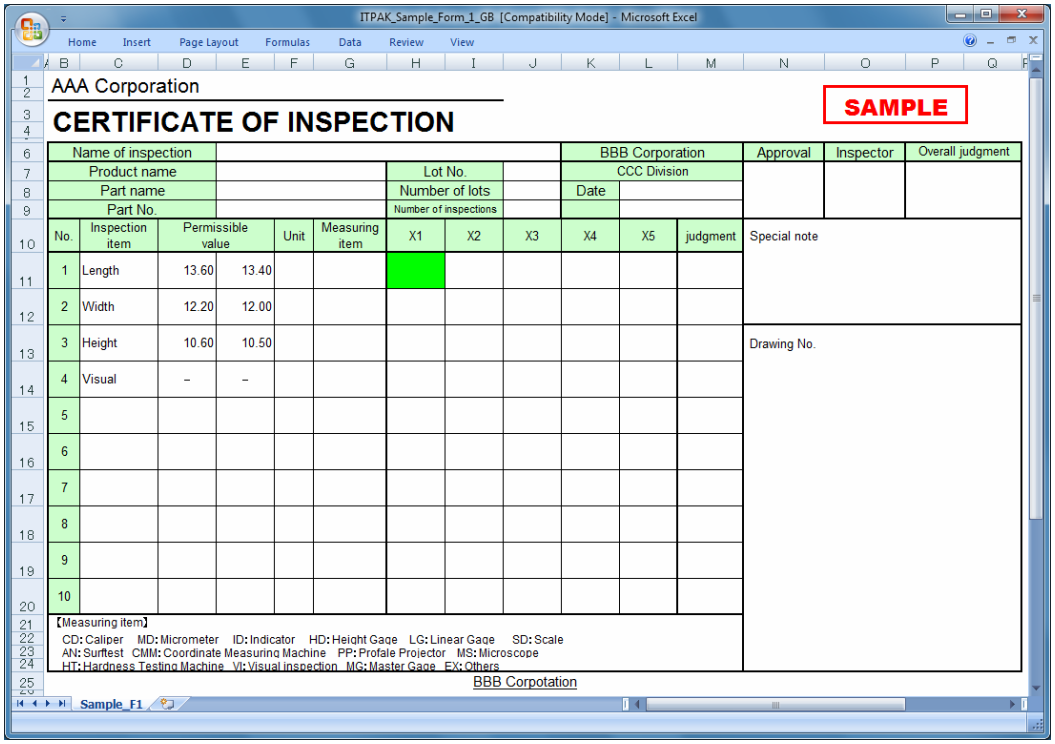


The data collection dialog box is displayed and data collection can now be performed.



3) Perform data collection.

During data collection, the cell to which data will be input next is highlighted in green.



TIP • The inspection table above is shown with the [Inspection item] and [Permissible value] cells filled.

The cells from [row 11] to [row 13] in the above inspection table are those input from the measurement data input device. Input data from the measuring tools through one of the following operations:

(1) Pressing the DATA switch on the measuring tool.

(2) Pressing the output switch if USB-ITN has one.

(3) Clicking the [Data request] button on the data collection dialog box.

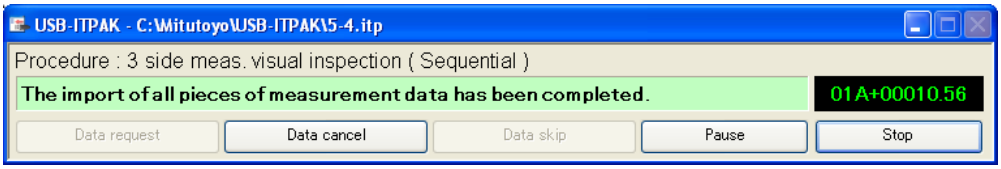
The cells of [row 14] in the above inspection table are those input from the character string data input device. Press the foot switch to which the characters to be input are assigned.

To cancel data that has been input, click the [Data cancel] button on the data collection dialog box. The data in the entry cell is canceled and the previous cell is highlighted.

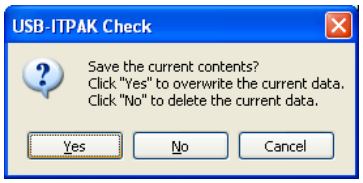
To skip the current data entry cell without inputting data, click the [Data skip] button on the data collection dialog box. The next cell is highlighted.

4) End data collection and save the results.

Once all the data has been input, a completion message is displayed on the data collection dialog box.



Click the [Stop] button on the data collection dialog box. The following message is displayed.



[Yes]: The Excel file to which data was input is saved through overwriting under the existing file name.

[No]: The Excel file is not overwritten and the data that was input is deleted.

[Cancel]: The message dialog box is closed and the data collection dialog box is displayed.

Click the [Yes] button. The Excel file is saved through overwriting and the dialog box switches to the main dialog box.

This completes data collection for sequential measurement using a foot switch for character input.

5.5 Data Input to an Optional Application

5.5.1 Overview

This section explains how to input measurement data to an optional application.

By using this function, it is possible to input measurement data to an optional application in the same way as through regular keyboard input.

NOTE
- Data input to an optional application is possible for all measurement methods, i.e., sequential, batch, and individual measurement.

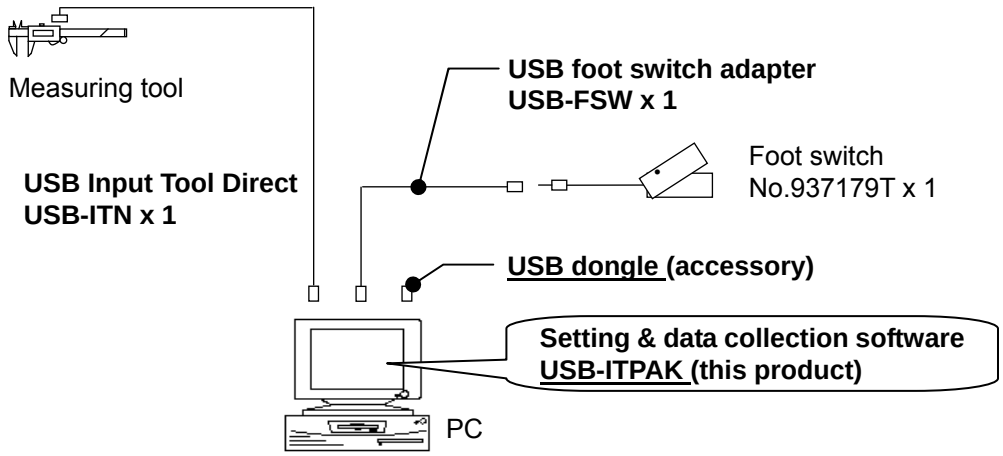
NOTE
- During data input to an optional application, the measurement data is input to the current position of the cursor in the currently active application. Unlike the case when Excel is selected as the data input application, the input position cannot be specified in the setting file.

The DATA switch of the measuring tools, the [Data request] button of USB-ITPAK, and the foot switch can be used when collecting measurement data.

NOTE
- A foot switch can be used only to request data, not to cancel or skip data.

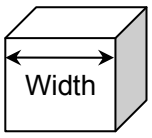
1) Connection

In the explanation in this section, one caliper is connected to USB-ITN and one foot switch is connected to USB-FSW. The connection diagram is shown below.



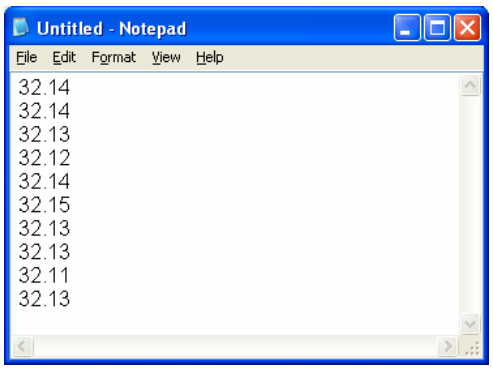
2) Workpiece for measurement

The following workpiece is used in the explanation. The measurement location is the width of a cube.



3) Measurement

In the explanation in this section, 'Notepad', which is provided as standard with Windows XP, is used as the optional application. The following shows the appearance during data collection.



The workpieces are sequentially measured in this procedure.

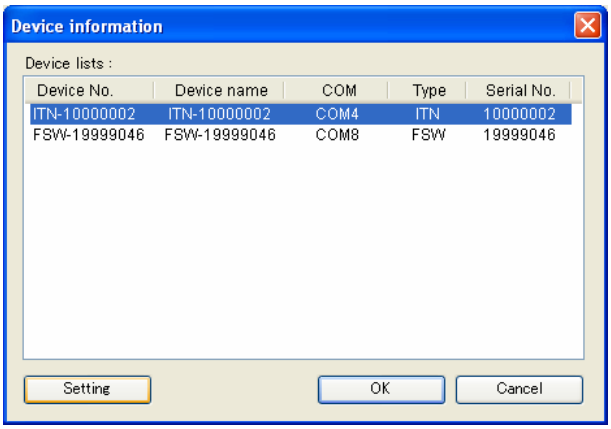
The following describes how to set up the measurement procedure, perform measurement, and save the results.

5.5.2 Setting

1) Check the device information.

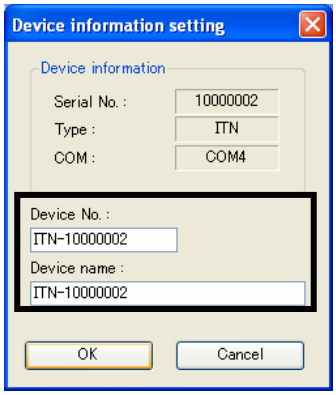
NOTE • USB-ITPAK loads the information of connected devices at startup. Therefore, connect all the devices to be used before starting up USB-ITPAK.

From the menu of the main dialog box, select [Settings] and then [Device information]. This opens the [Device information] dialog box, which allows you to check the devices that are connected to the PC.



If you do not want to change the device number or device name, click the [Cancel] button to return to the main dialog box.

If you want to change a device number or device name, select the device, and then click the [Setting] button.



Click the [OK] button if you change any settings.

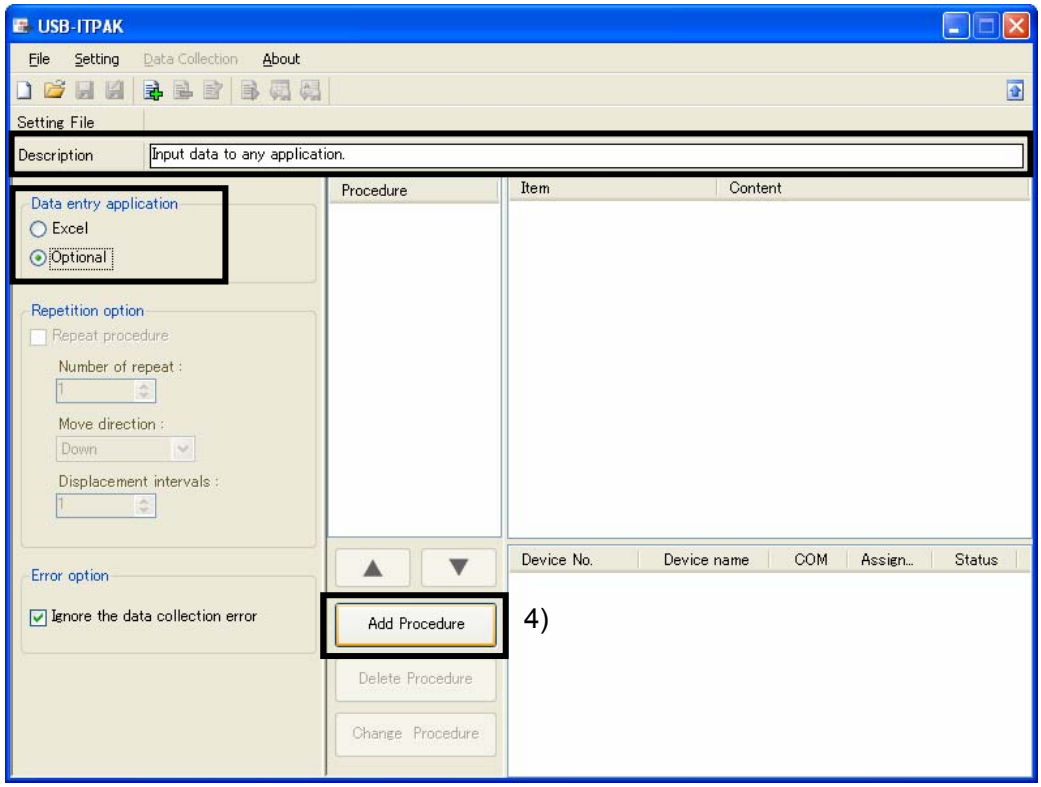
NOTE • In the procedure created from step '2)', the device number is used to specify the device to be used. If you change the number, revise all the setting files that use it.

TIP • If multiple units are connected, specify settings for each.

TIP • If performing measurement using existing setting files, skip this section and see '5.5.3 Measurement'.

2) Enter information about the setting file in the [Description] field.

Enter a description of the setting file. This field may be left blank.



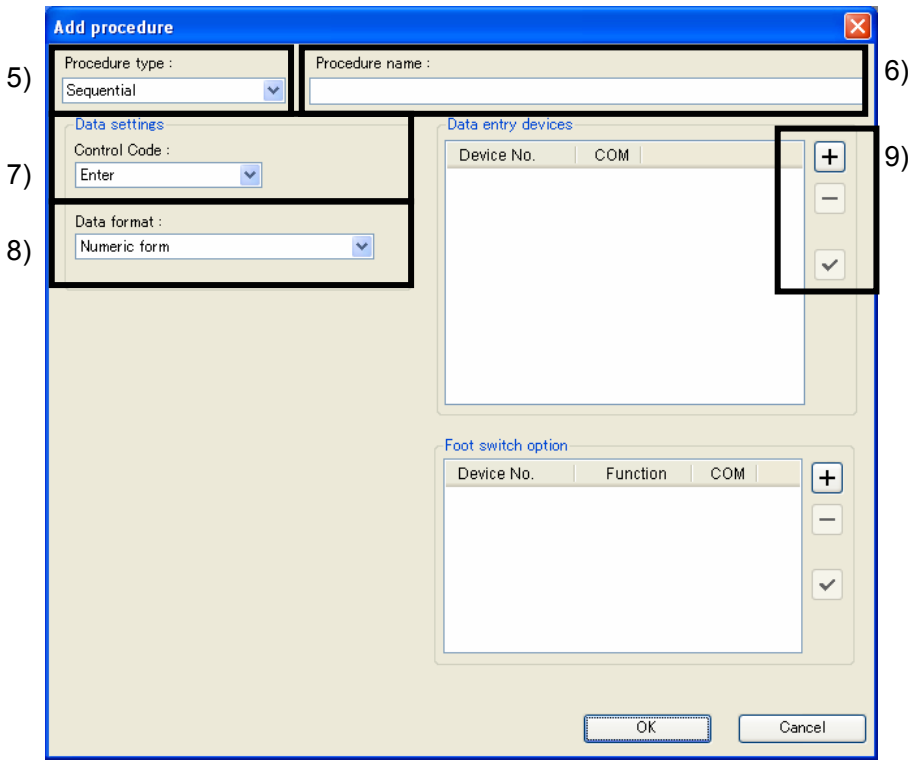
3) Select [Data entry application].

Select [Optional] in the [Data entry application] field on the main dialog box.

4) Add a procedure to the setting file.

Click the [Add Procedure] button on the main dialog box.

5) Select a procedure type for the [Procedure type] field.



Check that [Sequential] is selected for the procedure type, and if not, select [Sequential] from the drop-down list.

6) Enter a name in the [Procedure name] field.

Entering the procedure name is required.

TIP • Since the procedure name will be displayed in the [Procedure] field at the center of the main dialog box, enter an easily identifiable name.

Here, enter [Optional data input].

7) Select [Control Code] in the [Data settings] field.

Select the code to be added after data input from [Unspecified], [Enter], [Up], [Down], [Right], [Left], and [Tab].

Here, select [Enter].

8) Select [Data format] in the [Data settings] field.

Select the format of the data to be input to the application.

The data formats below can be selected. In the example used in this explanation, 32.14 mm was measured using a measuring tool on channel 1 and with COM number 13.

- [Numeric form]:

  Only the measurement data is input.

  Example: “32.14”

- [Command form]:

  The channel No. and measurement data are input.

  Example: “01A+00032.14”

- [COM No. + Command form]:

  The COM number (3 digits), channel number and measurement data are input.

  Example: ”01301A+00032.14”

Here, select [Numeric form].

9) Specify the [Data entry devices] settings.

The functions of the buttons for the [Data entry devices] field are as follows:

[+]: Adds device settings.

[–]: Deletes the device setting selected from the list.

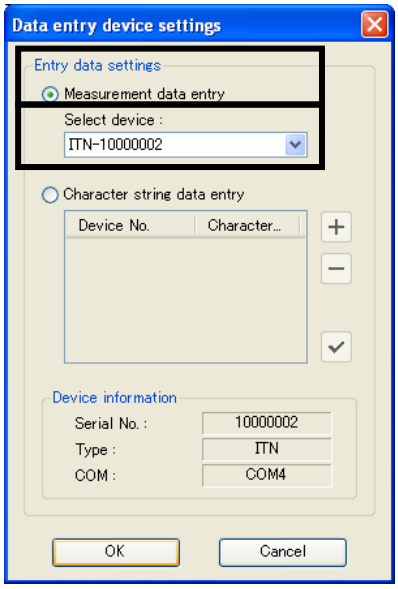
[√]: Changes the device setting selected from the list.

Here, click the [+] button to switch to the [Data entry device settings] dialog box.

10) In the [Entry data settings] field, select the entry data type.

10)

11)



The entry data types consist of measurement data input from the measuring tools (numeric data), and character string data input by pressing the foot switch.

TIP • For details about the method for inputting character string data using a foot switch, refer to '5.4 Character Input Using Foot Switch'.

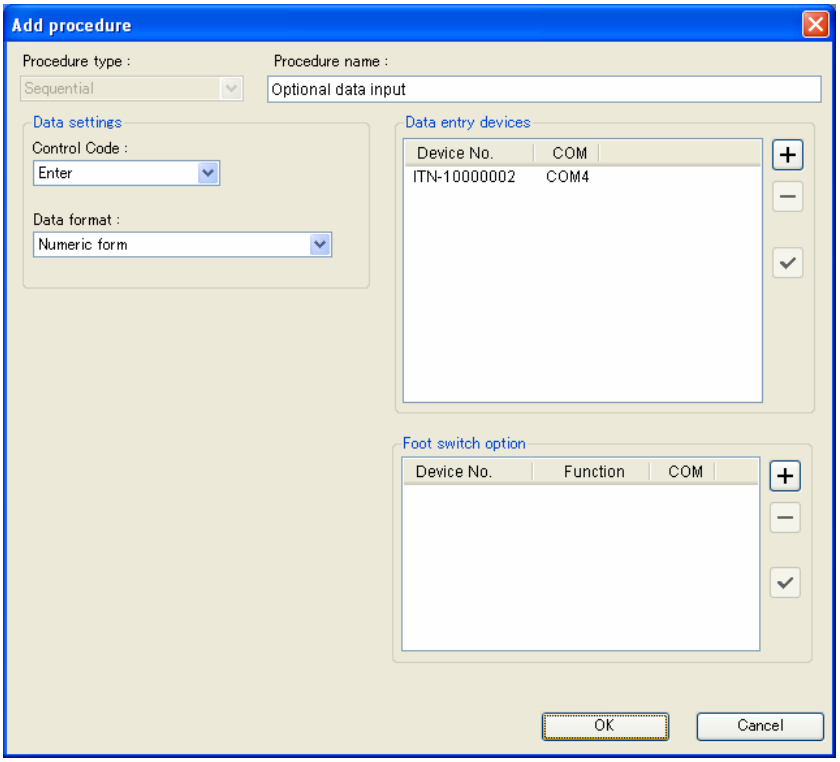
Here, select the [Measurement data entry] radio button.

11) In the [Select device] field, select the device to be assigned.

From the drop-down list, select the device to be assigned.

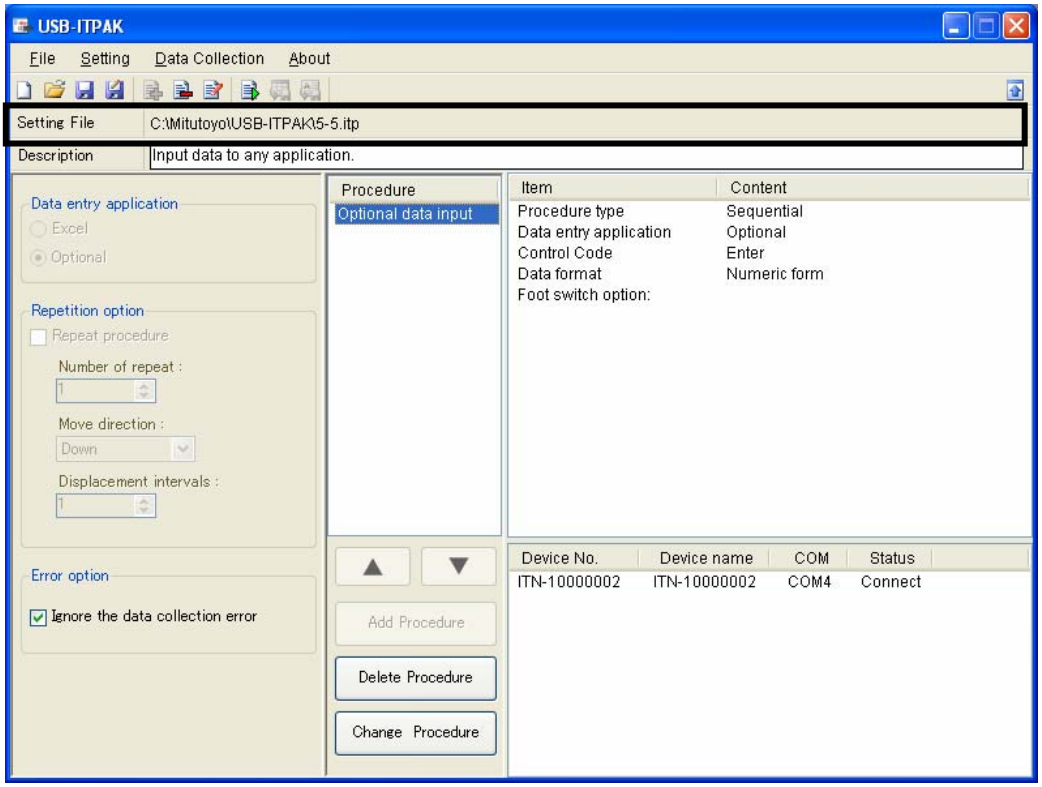
This completes the settings on the [Data entry device settings] dialog box, so click the [OK] button.

12) Close [Add procedure].



This completes the settings on the [Add procedure] dialog box, so click the [OK] button.

13) Save the created setting file.



From the menu of the main dialog box, select [File], [Save As], and then save the file by giving it a name. When the file has been saved, the file name is displayed as a full path in the [Setting File] field.

5.5.3 Measurement

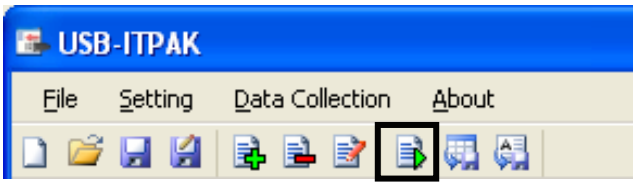
1) Open [Setting File].

TIP • If starting measurement immediately after specifying the settings in '5.5.2 Setting', the setting file is already opened. In this case, skip step '1)'.

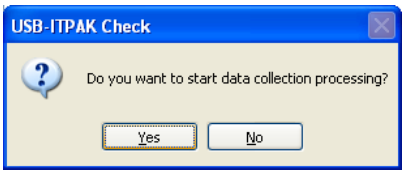
From the menu of the main dialog box, select [File] and then [Open], or open [Setting file] from [Recent files].

2) Open the data collection dialog box.

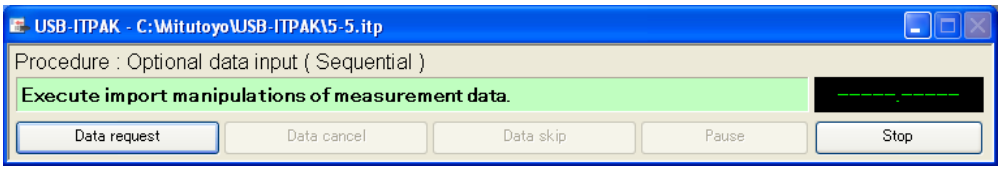
From the menu of the main dialog box, select [Data Collection] and then [Start], or click the icon shown below.



When the [Do you want to start data collection processing?] message is displayed, click [Yes].

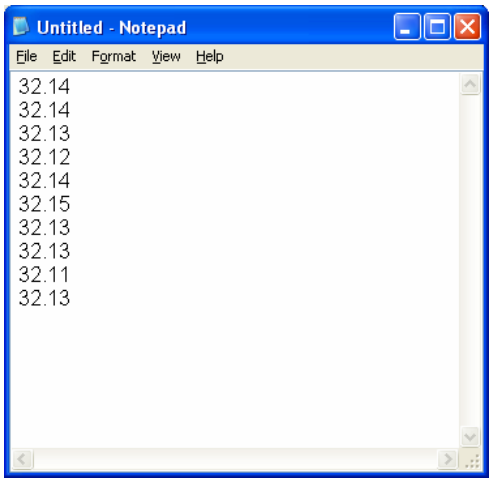


The data collection dialog box is displayed and data collection can now be performed.



3) Open the application to which the measurement data is to be input and start data collection.

Open ‘Notepad’, which is provided as standard with Windows XP, and make it the active (currently selected) application.



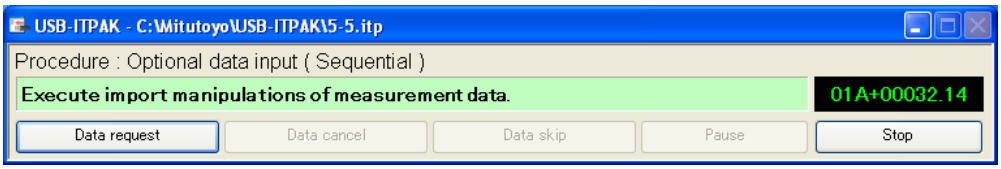
Input data from the measuring tool through one of the following operations:

(1) Pressing the DATA switch on the measuring tool.

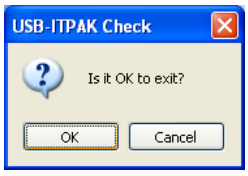
(2) Pressing the output switch if USB-ITN has one.

(3) Clicking the [Data request] button on the data collection dialog box.

4) End data collection.



Click the [Stop] button on the data collection dialog box.



Click the [OK] button. The dialog box switches to the main dialog box.

NOTE •The function to input data to an optional application does not allow saving the result. Save the measurement data using the save function of the application.

This completes data collection to an optional application.

6 DIALOG BOX CONFIGURATIONS OF USB-ITPAK

‘CHAPTER 4 MEASUREMENT DATA COLNDLECTION (BASICS)’ explains the basic use of USB-ITPAK.

‘CHAPTER 5 MEASUREMENT DATA COLLECTION (ADVANCED)’ explains the applied use of USB-ITPAK, such as data collection using the foot switch and the combination of multiple procedures.

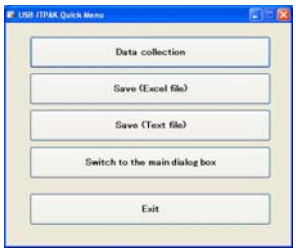
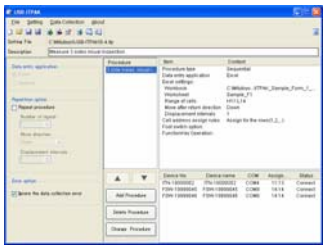
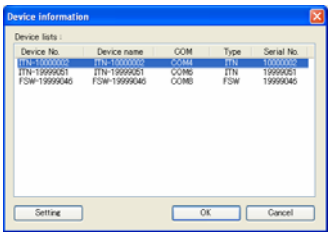
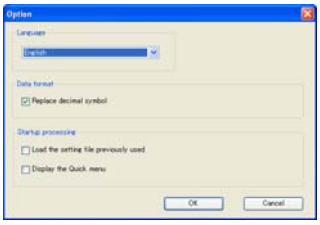
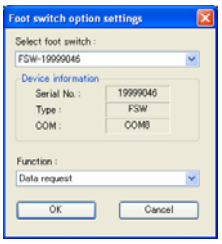
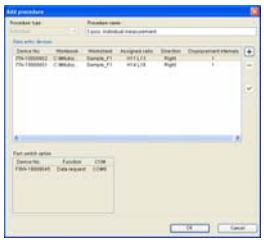
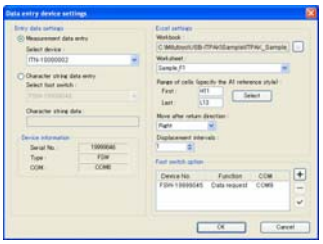
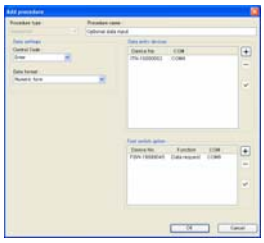
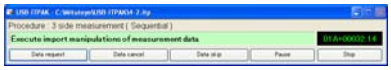
‘CHAPTER 6 DIALOG BOX CONFIGURATIONS OF USB-ITPAK’ explains the configuration and contents of all the dialog boxes of USB-ITPAK. This chapter also explains functions not described in ‘CHAPTER 4 MEASUREMENT DATA COLLECTION (BASICS)’ and ‘CHAPTER 5 MEASUREMENT DATA COLLECTION (ADVANCED)’.

The hierarchy of the dialog boxes of USB-ITPAK is shown below. The numbers in parentheses are the numbers of the sections explaining the corresponding dialog boxes.

1. Quick Menu (6.1)

2. Main Dialog Box (6.2)
    - 2.1 Device Information (6.3)
        - 2.1.1 Device Information Setting (6.4)
    - 2.2 Options (6.5)
    - 2.3 Adding and Changing Procedures (Excel/Sequential or Batch) (6.6)
        - 2.3.1 Data Entry Device Settings (Excel/Sequential or Batch) (6.7)
        - 2.3.2 Character String Data Settings (6.8)
        - 2.3.4 Foot Switch Option Settings (6.9)
    - 2.3 Adding and Changing Procedures (Excel/Individual) (6.10)
        - 2.3.1 Data Entry Device Settings (Excel/Individual) (6.11)
    - 2.4 Adding and Changing Procedures (Optional) (6.12)
        - 2.4.1 Data Entry Device Settings (Optional) (6.13)
        - 2.4.2 Character String Data Settings (6.8)
        - 2.4.3 Foot Switch Option Settings (6.9)

3. Data Collection (6.14)

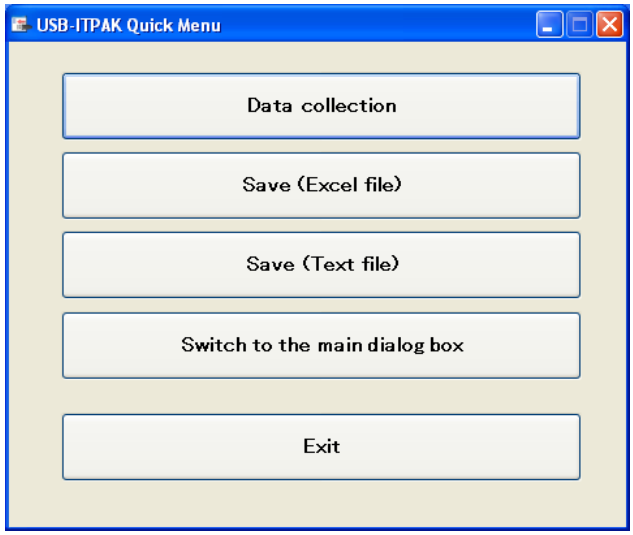
1. Quick Menu (6.1)	2. Main Dialog Box (6.2)	2.1 Device Information (6.3)
		
2.1.1 Device Information Setting (6.4)	2.2 Options (6.5)	2.3 Adding and Changing Procedures (Excel/Sequential or Batch) (6.6)
		
2.3.1 Data Entry Device Settings (Excel/Sequential or Batch) (6.7)	2.3.2 Character String Data Settings (6.8)	2.3.4 Foot Switch Option Settings (6.9)
		
2.3 Adding and Changing Procedures (Excel/Individual) (6.10)	2.3.1 Data Entry Device Settings (Excel/Individual) (6.11)	2.4 Adding and Changing Procedures (Optional) (6.12)
		
2.4.1 Data Entry Device Settings (Optional) (6.13)	3. Data Collection (6.14)	
		

6.1 Quick Menu

If the [Display the Quick menu] option is enabled, Quick Menu is displayed when USB-ITPAK starts up.

Quick Menu is a dialog box for operators who collect data. By clicking the [Data collection] button to open the setting file, measurement can be started quickly, making Quick Menu a useful feature for the execution of actual measurement work.

TIP • For the [Display the Quick menu] options, refer to '6.5 Options'.



1) [Data collection] button

Opens an already created setting file and executes data collection according to that procedure.
For the operation method, refer to '6.1.1 [Data collection] button'.

2) [Save (Excel file)] button

Saves the Excel file to which measurement data is input, after data collection.
For the operation method, refer to '6.1.2 [Save (Excel file)] button'.

3) [Save (Text file)] button

Saves the measurement data as a text file, after data collection.
For the operation method, refer to '6.1.3 [Save (Text file)] button'.

4) [Switch to the main dialog box] button

Switches the dialog box to the main dialog box.

5) [Exit] button

Exits USB-ITPAK.

6.1.1 [Data collection] button

An already created setting file is opened and data is collected according to the procedure in the file.

1) Select the setting file to be executed on the [Open] dialog box.

   Select the setting file (extension: itp) from the list of files, and then click the [Open] button.

NOTE
- If [Load the setting file previously used] was selected in the [Startup processing] field in '6.5 Options', the setting file that was used last is loaded when USB-ITPAK starts up, so step '1)' is skipped in this case.

2) Collect data.

   When the [Do you want to collect data after cancel the current data?] message is displayed, click either the [Yes] or [No] button.

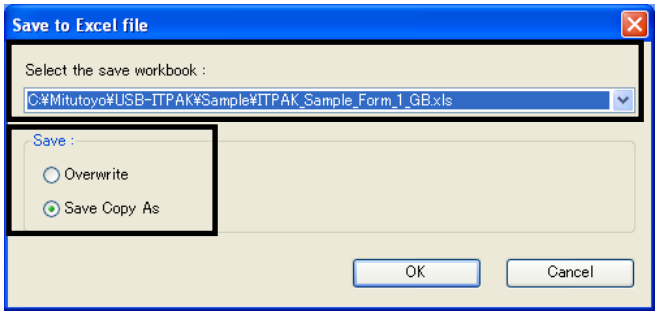
   The data collection dialog box is displayed and the Excel inspection table file specified in the setting file is opened, so data collection starts.

TIP
- For details about the data collection dialog box, refer to '6.14 Data Collection'.

6.1.2 [Save (Excel file)] button

After data has been collected, the Excel file to which measurement data is input is saved.

NOTE
- The [Save (Excel file)] button can be used only after data has been collected.



1) In the [Select the save workbook] field, select the file that is to be saved.

   Select the file to be saved from the drop-down list.

2) Select the method for saving the file.

   In the [Save] field, select either [Overwrite] or [Save Copy As].

3) Click the [OK] button to save the file.

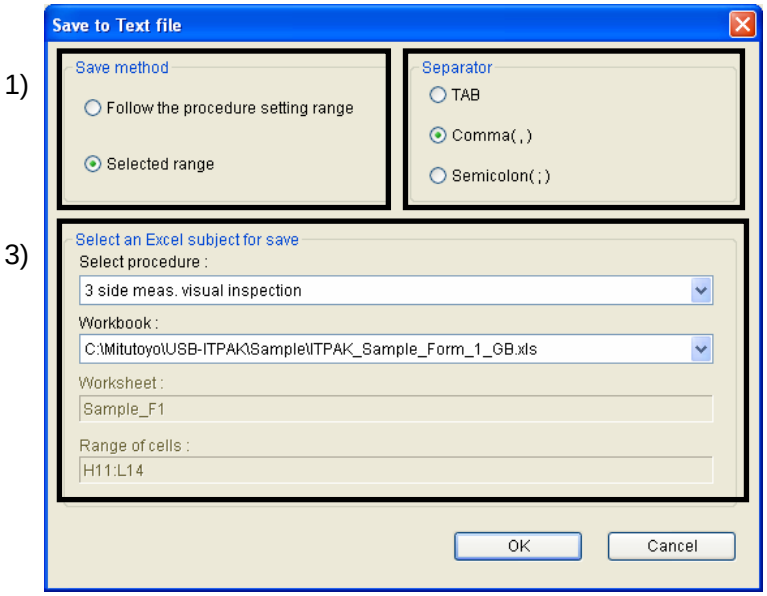
   When [Save Copy As] is selected in the [Save] field, the [Save As] dialog box is displayed, so enter the file name and save the Excel file.

If multiple Excel workbooks are used in the setting file, perform steps 1) to 3) above for each file to be saved.

6.1.3 [Save (Text file)] button

The measurement data is saved to a text file after data has been collected.

NOTE • The [Save (Text file)] button can be used only after data has been collected.



1) Select the desired method in the [Save method] field.

   Select the method for specifying the range of data to be saved from the measurement data on the Excel worksheet.

   - [Follow the procedure setting range]

     The range specified for [Range of cells (specify the A1 reference style)] on the [Add procedure] dialog box for the setting file is selected.

   - [Selected range]

     Directly select the cell range on the displayed Excel worksheet.

2) Select the separator in the [Separator] field.

   Select the character for separating Excel columns when saving Excel worksheet data to a text file. Select either [TAB], [Comma], or [Semicolon].

3) Specify the settings in the [Select an Excel subject for save] field.

   - Select the procedure to save in the [Select procedure] field.
   - Select the Excel workbook registered to the procedure to be saved, in the [Workbook] field.

4) Click the [OK] button to save the file.

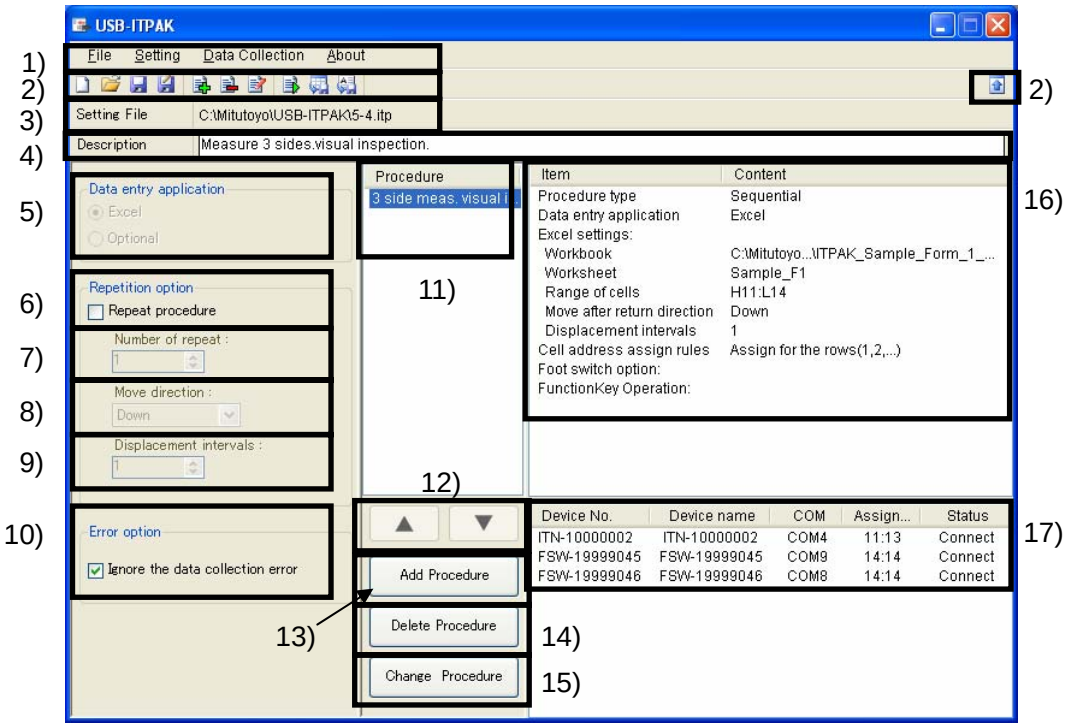
   The [Save As] dialog box is displayed, so enter the file name and click the [Save] button.

6.2 Main Dialog Box

If the [Display the Quick menu] option is disabled, the main dialog box is displayed when USB-ITPAK starts up.

The main dialog box is a window for operators creating setting files. All the functions of USB-ITPAK, from procedure setting to data collection, can be used from this dialog box.

TIP • For details on the [Display the Quick menu] option, refer to '6.5 Options'.



1) Menu bar

The functions of USB-ITPAK can be accessed using the menu bar.
For details about how to use the menu bar, refer to '6.2.1 [File] menu' and subsequent sections.

2) Tool bar

The functions of USB-ITPAK can also be accessed using the tool bar.
For details about how to use the tool bar, refer to '6.2.1 [File] menu' and subsequent sections.

3) [Setting file] field

Displays the path name of the setting file that is currently opened.

4) [Description] field

Enter a description of the setting file in this field. This field can be left blank.

NOTE • Up to one hundred 1-byte or 2-byte characters can be entered in the [Description] field.

5) [Data entry application] field

Select the application to which data is input in this field.

- [Excel]

  Data is input to Excel.

- [Optional]

  Data is input to an optional application (such as the Notepad or Word) that is active during data collection.

6) [Repetition option] field

If [Repeat procedure] is selected in this field, the procedure registered in step '11)' is performed multiple times during data collection.

7) [Number of repeat] field

This field can be specified only if [Repeat procedure] is selected.
Enter how many times to repeat the procedure.

8) [Move direction] field

This field can be specified only if [Repeat procedure] is selected.
When the procedure is repeated during data collection, the data entry cell is shifted at each execution. The cell movement direction at such time is selected in this field. Either [Right] or [Down] can be selected.

9) [Displacement intervals] field

This field can be specified only if [Repeat procedure] is selected.
When the procedure is repeated during data collection, the data entry cell is shifted at each execution. The cell displacement interval is selected in this field.

10) [Error option] field

If the following errors occur during data collection, select whether to ignore them.

	Error Message
1	The used device is wrong.
2	An error occurred during data reception. Device No. = [Device] Click Ignore to proceed anyway or Retry to try again.

TIP • For details about the error messages, refer to '8.4.7 Error messages of data collection dialog box' in '8.4 USB-ITPAK Error Messages'.

11) [Procedure] field

This field lists the names of the procedures that have been created.

Multiple procedures can be registered in the setting file.

12) [▲][▼] field

The sequence of procedures can be changed by clicking these buttons after selecting procedures in the [Procedure] field.

13) [Add Procedure] button

This button is used to add a new procedure.
For the operation method, refer to '6.2.2 [Setting] menu'.

14) [Delete Procedure] button

This button is used to delete the procedure selected in the [Procedure] field.
For the operation method, refer to '6.2.2 [Setting] menu'.

15) [Change Procedure] button

This button is used to change the procedure selected in the [Procedure] field.
For the operation method, refer to '6.2.2 [Setting] menu'.

16) Procedure details display field

This field displays the information of the procedure selected in the [Procedure] field.

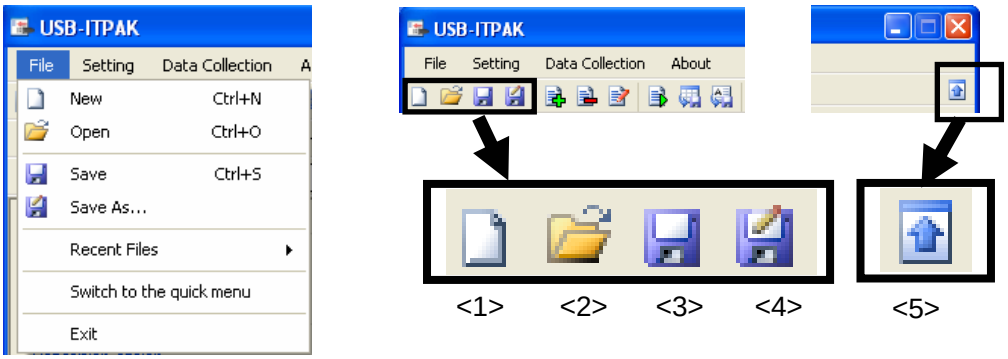
17) Field for displaying detailed information of device used for data collection

This field displays the information of the device (USB-ITN, USB-FSW) used for data collection in the procedure selected in the [Procedure] field.

NOTE
- If USB-FSW is used for character string data input, this is displayed in '17)'.
- If USB-FSW is used for data requests or data cancellation, this is displayed in the [Foot switch option] of the '16)' field.

6.2.1 [File] menu

The [File] menu is used to load and save setting files.



1) [New]

Creates a new setting file.
This operation can also be performed by clicking icon <1> on the tool bar.

2) [Open]

Loads a setting file that was saved.
This operation can also be performed by clicking <2> on the tool bar.

3) [Save]

Overwrite and saves the setting file.
This operation can also be performed by clicking icon <3> on the tool bar.

4) [Save As...]

Saves the setting file with a different name.
This operation can also be performed by clicking icon <4> on the tool bar.

5) [Recent Files]

When the setting file displayed in the sub-menu of this menu is selected, that setting file is loaded. The five files that have been loaded or saved the most recently are registered to the sub-menu.

6) [Switch to the quick menu]

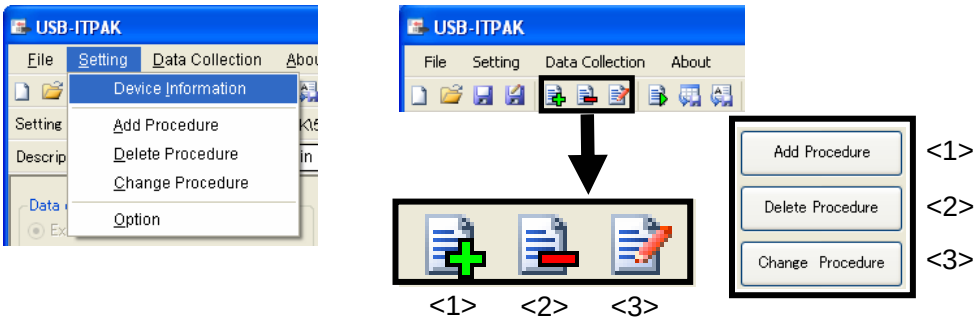
Switches the dialog box to the Quick Menu.
This operation can also be performed by clicking icon <5> on the tool bar.

7) [Exit]

Exits USB-ITPAK.

6.2.2 [Setting] menu

The [Setting] menu is used to display device information, add, delete, and change procedures, and also specify option settings related to the operation of USB-ITPAK.



1) [Device Information]

Displays the [Device information] dialog box.

TIP • For details about the [Device information] dialog box, refer to '6.3 Device information'.

2) [Add Procedure]

Adds a new procedure to the setting file that is opened.

This operation can also be performed by clicking icon <1> on the tool bar or button <1> on the main dialog box.

3) [Delete Procedure]

Deletes the procedure selected in the [Procedure] field on the main dialog box.
This operation can also be performed by clicking icon <2> on the tool bar or button <2> on the main dialog box.

4) [Change Procedure]

Changes the procedure that is selected in the [Procedure] field on the main dialog box.

This operation can also be performed by clicking icon <3> on the tool bar or button <3> on the main dialog box.

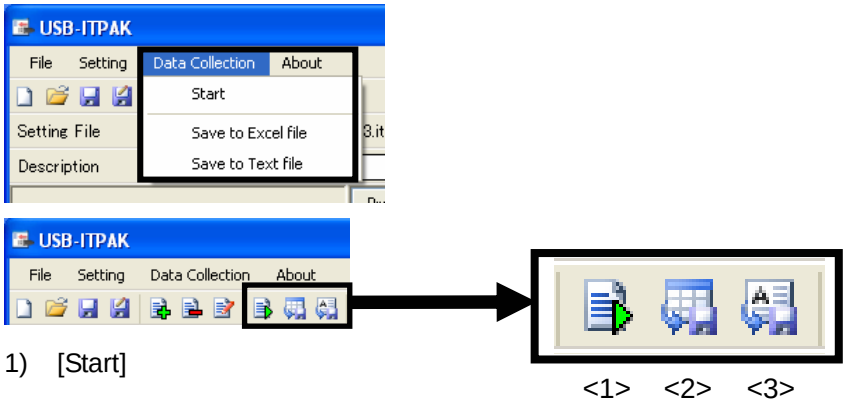
5) [Option]

Displays the [Option] dialog box.

TIP • For the option functions, refer to '6.5 Options'.

6.2.3 Data Collection menu

The Data Collection menu on the menu bar is used to start data collection and save data after data collection.



1) [Start]

Collects data according to the setting file.

This operation can also be performed by clicking icon <1> on the tool bar.

2) [Save to Excel file]

Saves the Excel file to which the collected data was input.

This operation can also be performed by clicking icon <2> on the tool bar.

TIP • For how to save an Excel file, refer to '6.1.2 [Save (Excel file)] button]'.

3) [Save to Text file]

Saves the collected data as a text file.

This operation can also be performed by clicking icon <3> on the tool bar.

TIP • For how to save a text file, refer to '6.1.3 [Save (Text file)] button]'.

6.2.4 [About] menu

Displays the version information of USB-ITPAK.

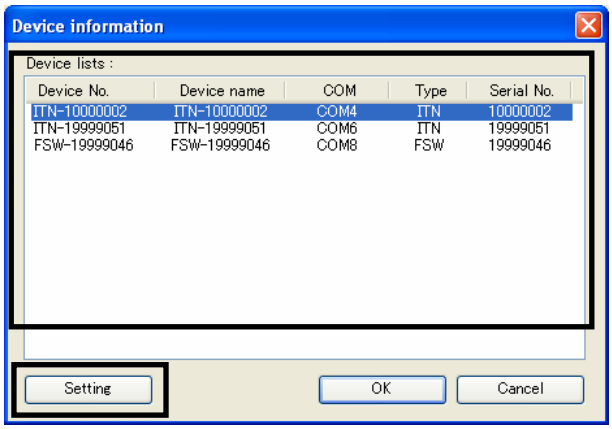
6.3 Device Information

The [Device information] dialog box is displayed by selecting [Setting] and then [Device information] from the menu described in '6.2 Main Dialog Box'.

This dialog box displays the USB-ITN and USB-FSW connected to the PC.

1)

2)



1) [Device lists] field

Displays all the USB-ITN and USB-FSW units connected to the PC and to which the dedicated VCP driver has been installed.

2) [Setting] button

When a device is selected in the [Device lists] field and then the [Setting] button is clicked, the [Device information setting] dialog box is displayed.

TIP • For details about the [Device information setting] dialog box, refer to '6.4 Device Information Setting'.

3) [OK] button

Applies the changes on the [Device information setting] dialog box and returns to the main dialog box.

4) [Cancel] button

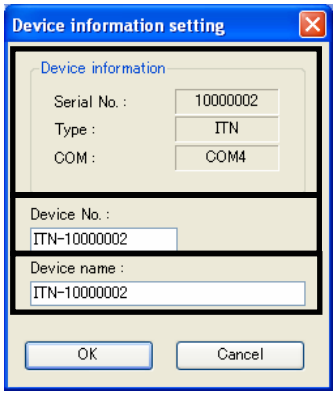
Clears the changes on the [Device information setting] dialog box and returns to the main dialog box.

6.4 Device Information Setting

Clicking the [Setting] button on the dialog box described in '6.3 Device Information' displays the [Device information setting] dialog box for the device that was selected in the [Device lists] field on the [Device information] dialog box.

The device information settings are specified on this dialog box.

1)
2)
3)



1) [Device information] field

Displays the information of the device that was selected. The setting cannot be changed.

- [Serial No.]

  Displays the lower 8 digits of the device number of the selected device.

- [Type]

  Displays the upper 3 alphabetic characters of the device No. of the selected device. [ITN] stands for USB-ITN, and [FSW] stands for USB-FSW.

- [COM]

  Displays the COM port number assigned to the device.

NOTE

- The COM port number in the [COM] field is automatically assigned when the dedicated VCP driver is installed. The COM port number cannot be changed.

2) [Device No.] field

The device No. is information that identifies the USB-ITN or USB-FSW unit. This information is registered to the procedure.

In the initial state, the device number recorded on the USB-ITN or USB-FSW unit is displayed.

NOTE
- Up to twenty 1-byte characters can be input.

NOTE
- The device No. can be changed only when no procedures are registered in the [Procedure] field on the main dialog box.

IMPORTANT
- When the device No. used in an existing setting file is changed, that setting file may become unusable, so be careful when changing the device No.

3) [Device name] field

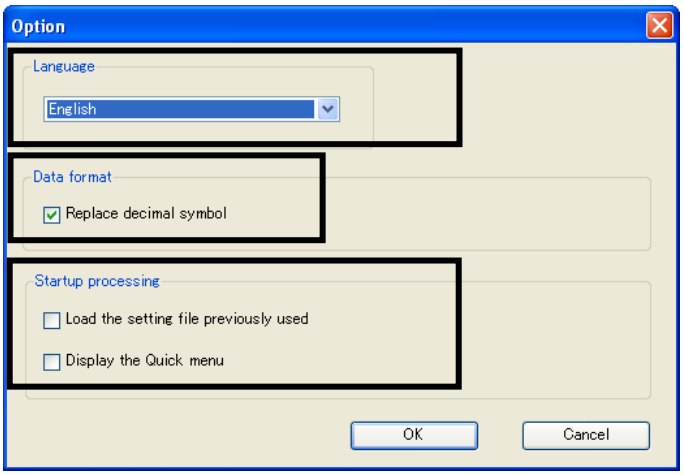
Inputting the name of the measuring tool that is connected to USB-ITN as the device name makes it easy to check the procedure settings.

NOTE
- Up to thirty-two 1-byte and 2-byte characters can be input.

6.5 Options

The [Option] dialog box is displayed by selecting [Setting] and then [Options] on the dialog box described in '6.2 Main Dialog Box'.

Various settings related to USB-ITPAK operations are specified on this dialog box.



1) [Language] field

This field is used to select the language to be used in USB-ITPAK.

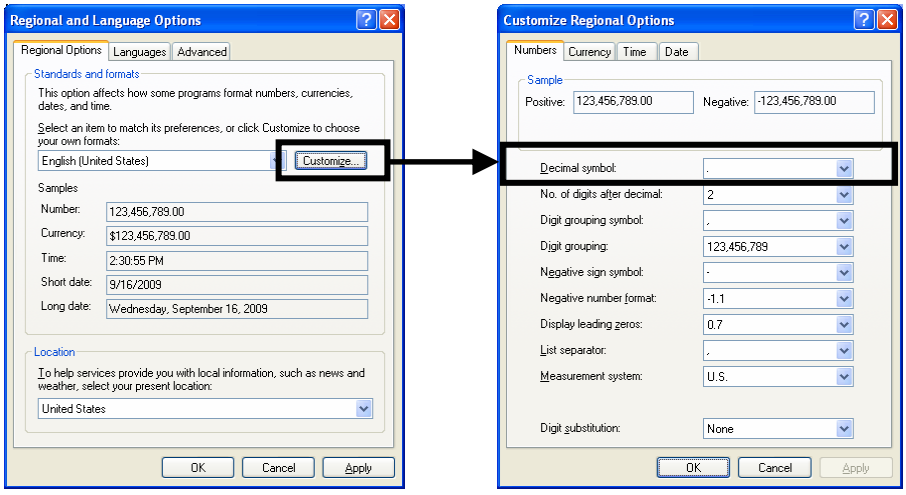
2) [Data format] field

If [Replace decimal symbol] is selected, USB-ITPAK uses the decimal symbol specified in Windows as the decimal symbol for measurement data.

If [Replace decimal symbol] is not selected, USB-ITPAK uses "." (period) as the decimal symbol for measurement data.

TIP

- To check the decimal point symbol that is specified in Windows, select [Control Panel], [Regional and Language Options], and then [Customize Regional Options], and look at the [Decimal symbol] field.



3) [Startup processing] field

This field is used to specify the settings for how USB-ITPAK behaves after it starts up.

- [Load the setting file previously used]

  When [Load the setting file previously used] is selected, the setting file that was used last is automatically loaded when USB-ITPAK starts up.

  - If the Quick Menu is set to be displayed, the setting file that was used last is used for data collection.
  - If the main dialog box is set to be displayed, the main dialog box is displayed with the setting file that was used last open when USB-ITPAK starts up.

- [Display the Quick menu]

  If [Display the Quick menu] is selected, the Quick Menu is displayed when USB-ITPAK starts up.

  If it is not selected, the main dialog box is displayed when USB-ITPAK starts up.

6.6 Adding and Changing Procedures (Excel/Sequential or Batch)

Clicking the [Add procedure] button on the main dialog box described in '6.2 Main Dialog Box' displays the [Add procedure] dialog box. Selecting a procedure in the [Procedure] filed and then clicking the [Change procedure] button displays the [Change procedure] dialog box.

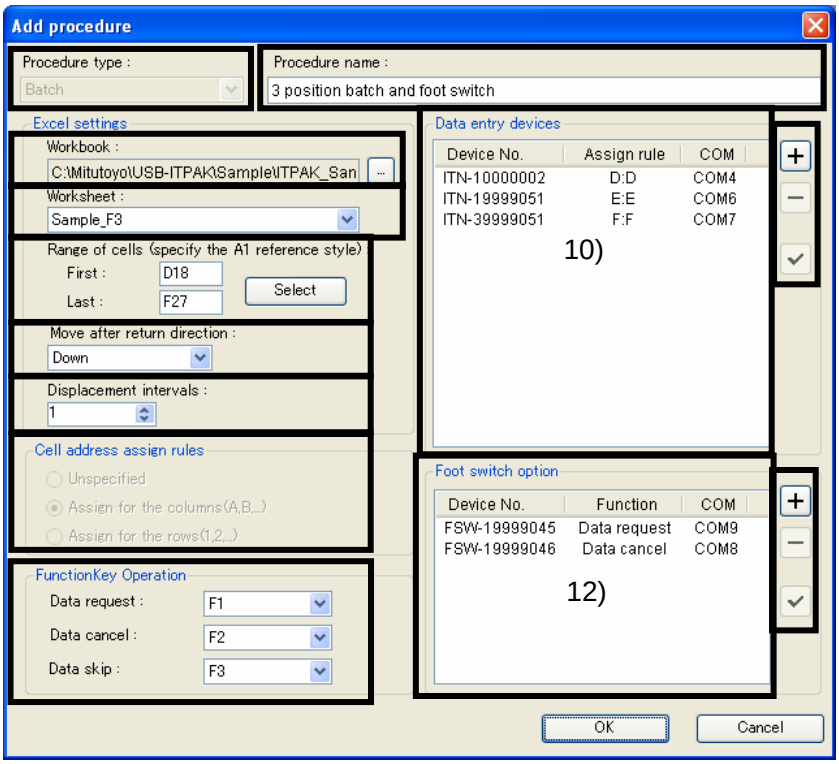
On the [Add procedure] dialog box, new procedures can be created and added to the setting file. On the [Change procedure] dialog box, existing procedures can be changed.

The operation of the [Change procedure] dialog box is similar to the operation of the [Add procedure] dialog box.

This section explains the case when [Excel] is selected in the [Data entry application] field on the main dialog box described in '6.2 Main Dialog Box' and that [Sequential] or [Batch] is selected in the [Procedure type] field on that dialog box.

TIP

- If [Excel] is selected in the [Data entry application] field on the main dialog box described in '6.2 Main Dialog Box' and [Individual] is selected in the [Procedure type] field on that dialog box, refer to '6.10 Adding and Changing Procedures (Excel/Individual)'.
- If [Optional] is selected in the [Data entry application] field on the main dialog box described in '6.2 Main Dialog Box', refer to '6.12 Adding and Changing Procedures (Optional)'.



1) [Procedure type] field

Select either [Sequential], [Batch], or [Individual] as the type of data collection procedure.

NOTE
- If [Individual] is selected, the [Add procedure] dialog box switches to a dialog box dedicated to individual measurement.

TIP
- For details about the procedure types, refer to 'CHAPTER 1 BASIC KNOWLEDGE'.

2) [Procedure name] field

Enter the name of the procedure to be created. Entering the procedure name is required.

NOTE
- Up to thirty-two 1-byte and 2-byte characters can be input.

3) [Workbook] field

Enter the workbook name of the Excel file to which the measured data is to be input. The file can be selected from the [Open] dialog box by clicking the […] button.

4) [Worksheet] field

Select the name of the sheet to which data is to be input from the drop-down list.

5) [Range of cells (specify the A1 reference style)] field

Specify the range of cells in Excel to which the collected data is to be input, in the A1 format.
Besides directly entering the cell numbers, the cell range can also be selected by using the [Select] button and inputting data on the Excel dialog box. This operation is explained in '6.6.1 Selection of data entry cell range in Excel'.

IMPORTANT
- When using the repeat function on the main dialog box, specify the cell range to be input at the first execution.

6) [Move after return direction] field

Specify the movement direction of the Excel cell after data input ([Right] or [Down]). This operation is explained in '6.6.2 Cell movement direction & displacement interval'.

7) [Displacement intervals] field

Specify the interval of Excel cell movement after data input. This operation is explained in '6.6.2 Cell movement direction & displacement interval'.

NOTE
- A value between 1 and 100 can be specified for [Displacement intervals].

8) [Cell address assign rules] field

Assign the cells to which data is to be input from the device to columns (vertical) or rows (horizontal) on the Excel worksheet. Select according to the position of the measurement item. This operation is explained in '6.6.3 Cell address assign rules'.

9) [FunctionKey Operation] field

The [Data request], [Data cancel], and [Data skip] functions can be assigned to the function keys (F1 to F8) of the PC.
Select the function key to which a function is to be assigned from the drop-down list.

IMPORTANT

- The function key operation cannot be set if [Unspecified] is selected for the [Cell address assign rules] field.
- The [Data request], [Data cancel], and [Data skip] functions cannot be set in combination to the same function key.

10) [Data entry devices] field

Displays the information of the data entry device assigned in Excel.

11) Buttons in [Data entry device] field

- [+] button: Adds a data entry device in the [Data entry devices] field.
- [–] button: Deletes the data entry device selected in the [Data entry devices] field.
- [✓] button: Changes the settings of the data entry device selected in the [Data entry devices] field.

TIP

- For details about the data entry device settings, refer to ‘6.7 Data Entry Device Settings (Excel/Sequential or Batch)’.

12) [Foot switch option] field

Displays the information of the USB-FSW unit registered in the foot switch option.

NOTE

- If the USB-FSW unit is to be used for inputting character string data, it is handled as a data entry device. For details, refer to ‘6.8 Character String Data Settings’.

13) Buttons in [Foot switch option] field

- [+] button: Adds a USB-FSW unit in the [Foot switch option] field.
- [–] button: Deletes the USB-FSW unit selected in the [Foot switch option] field.
- [✓] button: Changes the settings of the USB-FSW unit selected in the [Foot switch option] field.

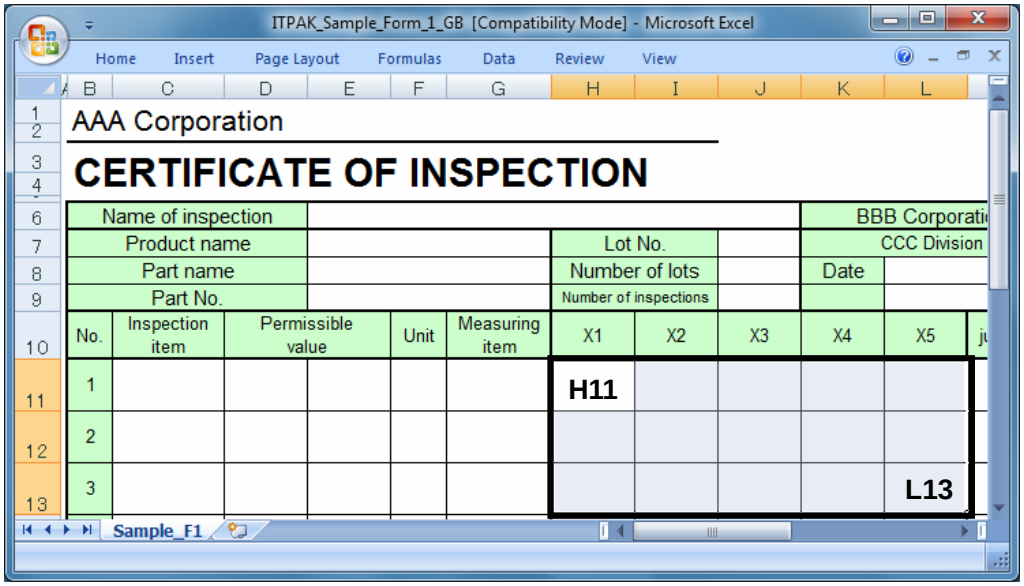
TIP

- For details about the foot switch option settings, refer to ‘6.9 Foot switch option settings’.

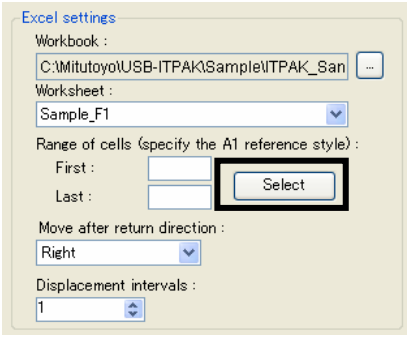
6.6.1 Selection of data entry cell range in Excel

Regarding the input method for the [Range of cells (specify the A1 reference style)] field, besides direct input, the range of data entry cells using the [Select] button and the Excel dialog box can be selected.

1) On the Excel dialog box, specify the range of cells to which data is to be input.



2) Click the [Select] button on the [Add procedure] dialog box.



To specify the area indicated by the bold lines in the above inspection table as the input cell range, enter:

First: H11
Last: L13

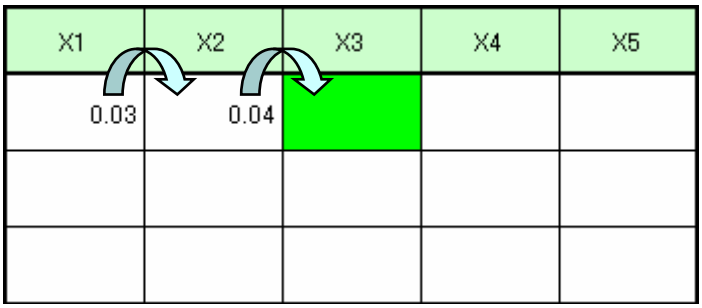
6.6.2 Cell movement direction & cell displacement interval

This section explains how to specify the cell movement direction and cell displacement interval, and the operation during data collection.

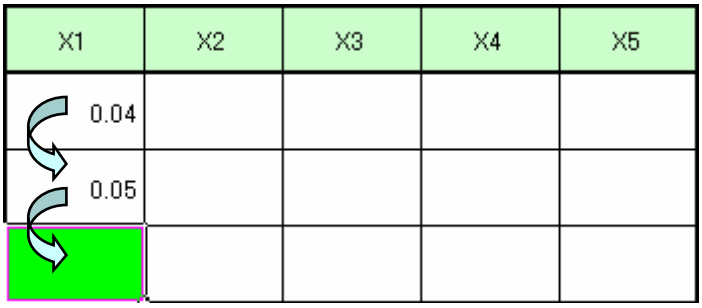
1) Cell movement direction

Select the direction in which the Excel data entry cell moves after data input in the [Move after return direction] field.

- If [Right] is selected:



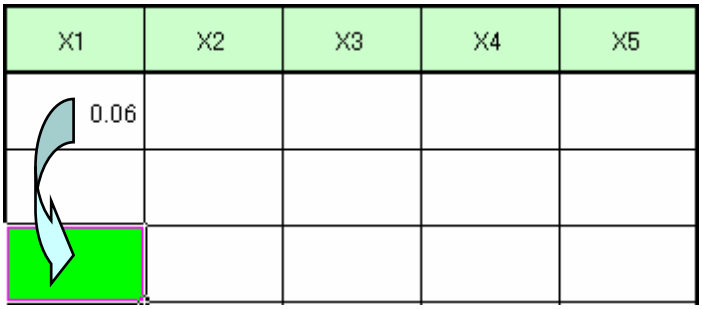
- If [Down] is selected:



2) Cell displacement interval

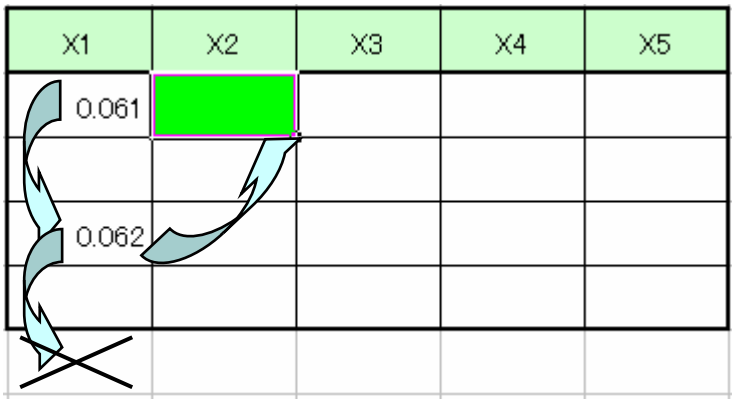
- Select the displacement interval of the Excel data entry cell after data input in the [Cell displacement interval] field.

Example: If [Down] is selected in the [Move after return direction] field and “2” is specified in the [Displacement intervals] field, the cell for the next data entry moves two cells down.



- During sequential measurement, if the cells in the current row or column are filled in the specified range, data input to the current row or column ends and the data entry cell moves to the next row or column.

  Example: If a cell range of 4 rows x 5 columns is selected in the [Range of cells (specify the A1 reference style)] field, [Down] is selected in the [Move after return direction] field, and “2” is specified in the [Displacement intervals] field, data entry in the first column ends when the third row has been input, and the cell for the next data entry moves to the second column.



6.6.3 Cell address assign rules

The cells to which data is to be input from a device are assigned to columns (vertical) or rows (horizontal) on the Excel worksheet. Select according to the position of the measurement item.

1) [Unspecified]

No device is assigned to Excel cells.

When data is input from the device registered in the procedure during data collection, the data is written to the cell that is currently active in the order of input, regardless of the cell position.

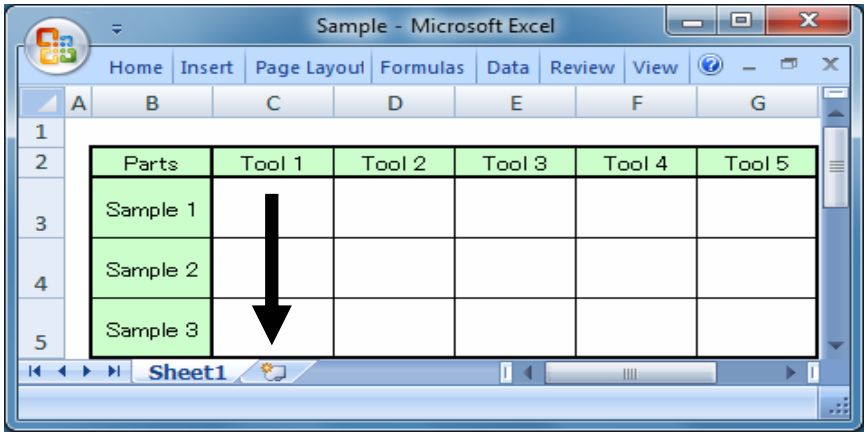
NOTE

- If [Batch] is selected in the [Procedure type] field, [Unspecified] cannot be selected.
- If [Unspecified] is selected, the sequence of data input from the data input device cannot be specified, so function key operation and foot switch option cannot be used.

2) [Assign for the columns (A,B,…)]

Assigns one device per column of a worksheet.

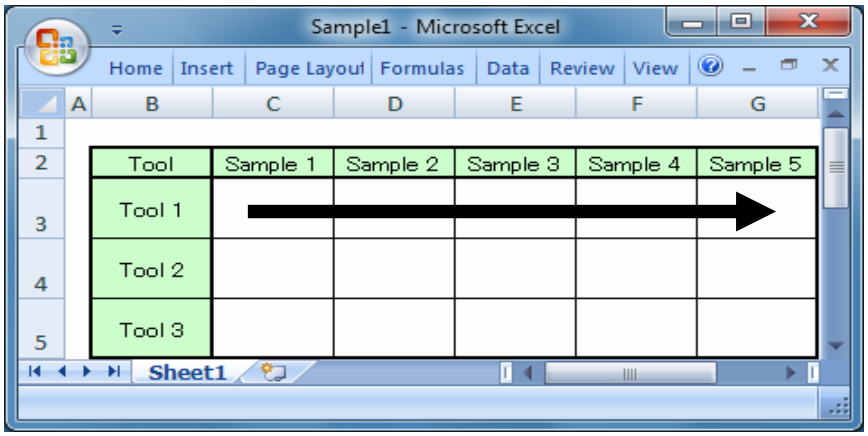
Example: The following figure shows the case when Tool 1 is assigned to [Column C], Tool 2 to [Column D], Tool 3 to [Column E], Tool 4 to [Column F], and Tool 5 to [Column G]. The data input from Tool 1 is input to cells C3, C4, and C5.



3) [Assign for the rows (1, 2…)]

Assigns one device per row of a worksheet.

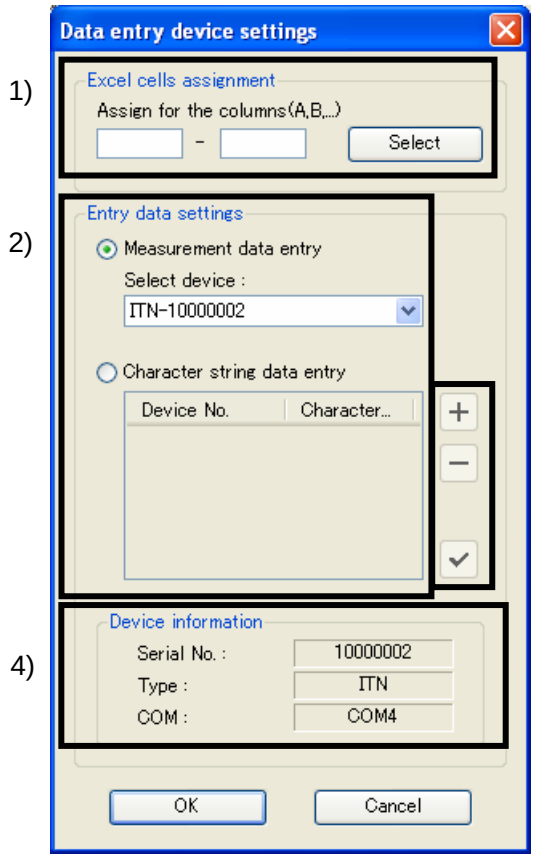
Example: The following figure shows the case when Tool 1 is assigned to [Row 3], Tool 2 to [Row 4], and Tool 3 to [Row 5]. The data input from Tool 1 is written to cells C3, D3, E3, F3, and G3.



6.7 Data Entry Device Settings (Excel/Sequential or Batch)

Clicking the [+] button in the [Data entry devices] field on the dialog box described in '6.6 Adding and Changing Procedures (Excel/Sequential or Batch)' displays the [Data entry device settings (Excel/Sequential or Batch)] dialog box.

On this dialog box, the Excel range to be assigned as the data entry destination and the device whose data is to be input can be selected.



1) [Excel cells assignment] field

Input the row numbers or column numbers of the Excel cells to which the data entry device is to be assigned.

This operation is explained in '6.7.1 [Excel cells assignment] field input'.

2) [Entry data settings] field

Select the device whose data is to be input in the range specified in the [Excel cells assignment] field.

Select either [Measurement data entry] or [Character string data entry].

- [Measurement data entry]

  Input the measurement data from USB-ITN. Select the device from the drop-down list in the [Select device] field.

- [Character string data entry]

  Input the character string data from USB-FSW. Click the [+] button in the [Character string data entry] field and specify the character string data.

3) Buttons in [Character string data entry] field

- [+] button: Adds a USB-FSW unit in the [Character string data entry] field.
- [–] button: Deletes the USB-FSW unit selected in the [Character string data entry] field.
- [✓] button: Changes the settings of the USB-FSW unit selected in the [Character string data entry] field.

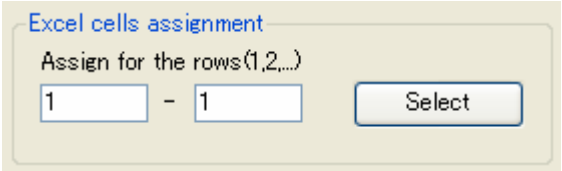
TIP • For the character string data settings, refer to '6.8 Character String Data Settings'.

4) [Device information] field

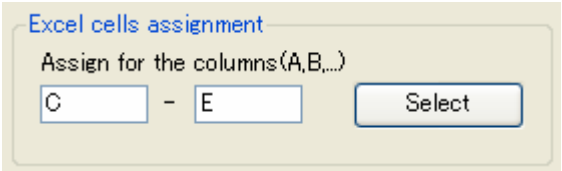
The [Device information] field displays the information of the device selected in the [Entry data settings] field.

6.7.1 [Excel cells assignment] field input

1) If the [Excel cells assignment] field displays [Assign for the rows (1, 2,...)], input the row numbers (1, 2,…) in Excel in the A1 format.

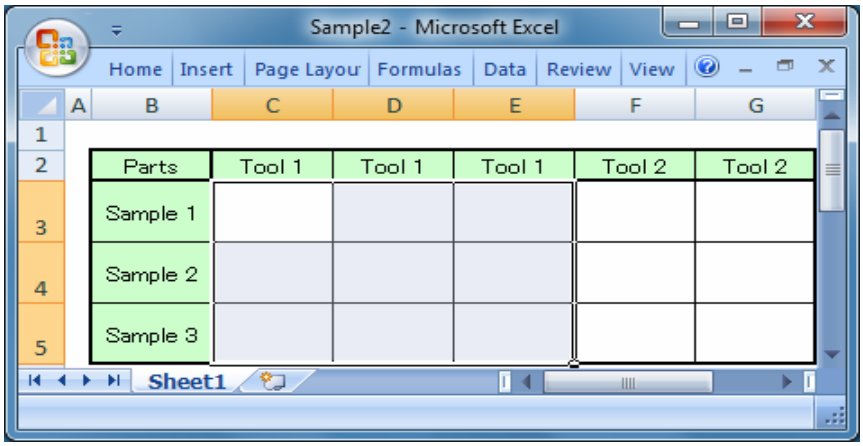


2) If the [Excel cells assignment] field displays [Assign for the columns (A,B,...)], input the column numbers (A, B,…) in Excel in the A1 format.



You can also perform input by specifying the range in Excel and clicking the [Select] button in the [Excel cells assignment] field. This operation is explained below.

If you want to specify Tool 1 from [Column C] (or [Row 3]) to [Column E] (or [Row 5]), specify the range as shown in the figure below and then click the [Select] button on the [Data entry device settings] dialog box. As a result, "C" (or "3") is input in the left side of the [Excel cells assignment] field and "E" (or "5") is input in the right side of this field.



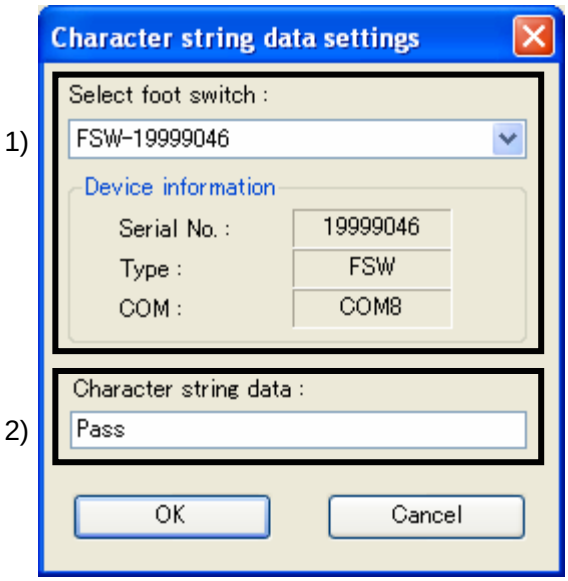
IMPORTANT

- When the [Data entry device settings] dialog box is displayed, the Excel range specification used in the procedure is changed once to the range that was input in [Range of cells (specify the A1 reference style)] in the [Excel settings] field of the [Add/change procedure] dialog box. For Excel cell assignment, be sure to specify the range in Excel after the [Data entry device settings] dialog box is displayed.

6.8 Character String Data Settings

Selecting [Character string data entry] in the [Entry data settings] field on the dialog box shown in '6.7 Data Entry Device Settings (Excel/Sequential or Batch)' and clicking the [+] button displays the [Character string data settings] dialog box.

On this dialog box, the USB-FSW unit used for inputting character string data can be selected and the character string to be input can be input.



1)

2)

1) [Select foot switch] field

Select the USB-FSW unit used for inputting character string data from the drop-down list. The information of the selected device is displayed in the [Device information] field.

2) [Character string data] field

Input the character string to be input to Excel when the foot switch is pressed.

NOTE

- Up to thirty-two 1-byte and 2-byte characters can be input.

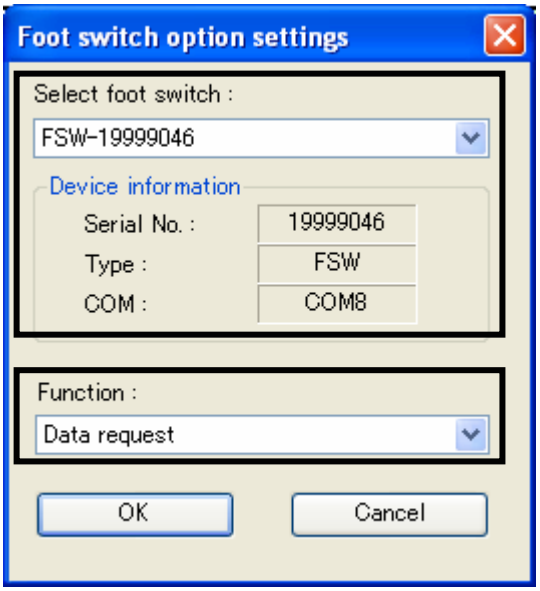
IMPORTANT

- Only 1-byte characters can be input to an optional application (other than Excel).

6.9 Foot Switch Option Settings

Clicking the [+] button in the [Foot switch option] field on the dialog box described in '6.6 Adding and Changing Procedures (Excel/Sequential or Batch)' displays the [Foot switch options settings] dialog box.

On this dialog box, the USB-FSW unit for which the foot switch option is to be set and the function to be set can be selected.



1) [Select foot switch] field

Select the USB-FSW unit to which a function is to be assigned from the drop-down list. The information of the selected device is displayed in the [Device information] field.

2) [Function] field

Select the function to be executed when the foot switch is pressed from the drop-down list.

The [Data request], [Data cancel], or [Data skip] function can be assigned.

IMPORTANT

- If data is input to an optional application (other than Excel), only the [Data request] function can be assigned to the USB-FSW unit, not the [Data cancel] and [Data skip] functions.

6.10 Adding and Changing Procedures (Excel/Individual)

Clicking the [Add procedure] button on the main dialog box described in '6.2 Main Dialog Box' displays the [Add procedure] dialog box. Selecting a procedure in the [Procedure] filed and then clicking the [Change procedure] button displays the [Change procedure] dialog box.

On the [Add procedure] dialog box, new procedures can be created and added to the setting file. On the [Change procedure] dialog box, existing procedures can be changed.

The operation of the [Change procedure] dialog box is similar to the operation of the [Add procedure] dialog box.

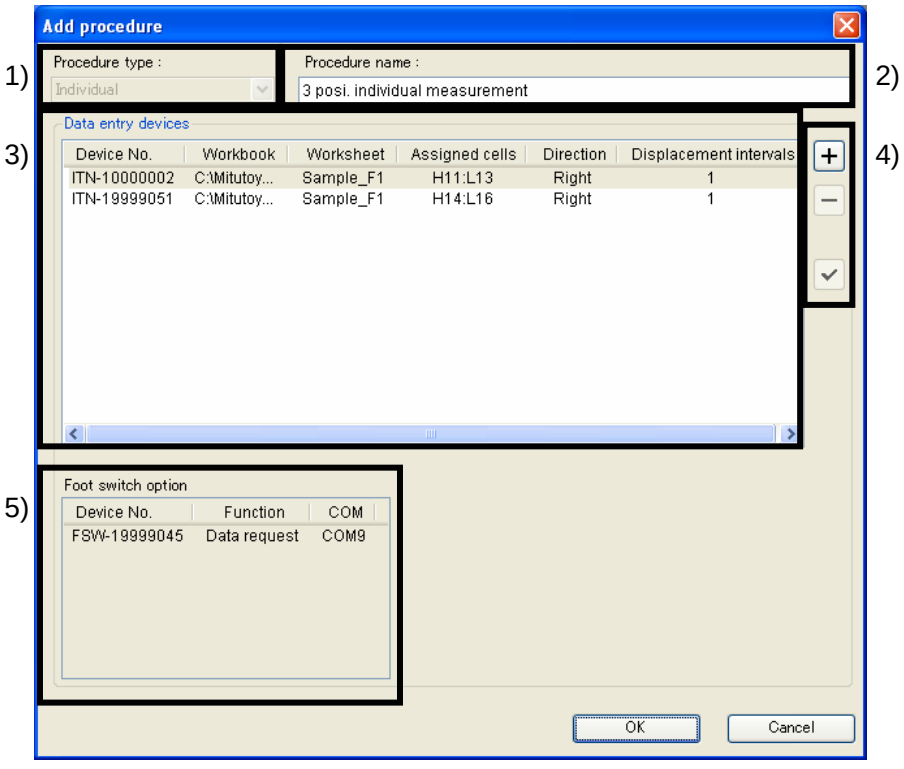
This section explains the case when [Excel] is selected in the [Data entry application] field on the main dialog box in '6.2 Main Dialog Box' and [Individual] is selected in the [Procedure type] field on that dialog box.

IMPORTANT

- In the case of individual measurement, multiple procedures cannot be added.

TIP

- If [Excel] is selected in the [Data entry application] field on the main dialog box described in '6.2 Main Dialog Box' and [Sequential] or [Batch] is selected in the [Procedure type] field on that dialog box, refer to '6.6 Adding and Changing Procedures (Excel/Sequential or Batch)'.
- If [Optional] is selected in the [Data entry application] field on the main dialog box described in '6.2 Main Dialog Box', refer to '6.12 Adding and Changing Procedures (Optional)'.



1) [Procedure type] field

Select either [Sequential], [Batch], or [Individual] as the type of data collection procedure.

NOTE
- If [Sequential] or [Batch] is selected, the [Add procedure] dialog box switches to the dedicated dialog box for the sequential or batch type.

TIP
- For the [Add/change procedure] dialog box for sequential measurement or batch measurement, refer to '6.6 Adding and Changing Procedures (Excel/Sequential or Batch)'.
- For details about the procedure types, refer to 'CHAPTER 1 BASIC KNOWLEDGE'.

2) [Procedure name] field

Enter the name of the procedure to be created. Entering the procedure name is required.

NOTE
- Up to 32 1-byte and 2-byte characters can be input.

3) [Data entry devices] field

This field displays the information of the registered data entry device.

4) Buttons in [Data entry devices] field

- [+] button: Adds a data entry device in the [Data entry devices] field.
- [–] button: Deletes the data entry device selected in the [Data entry devices] field.
- [✓] button: Changes the settings of the data entry device selected in the [Data entry devices] field.

TIP
- For details about the data entry device settings, refer to '6.11 Data Entry Device Settings (Excel/Individual)'.

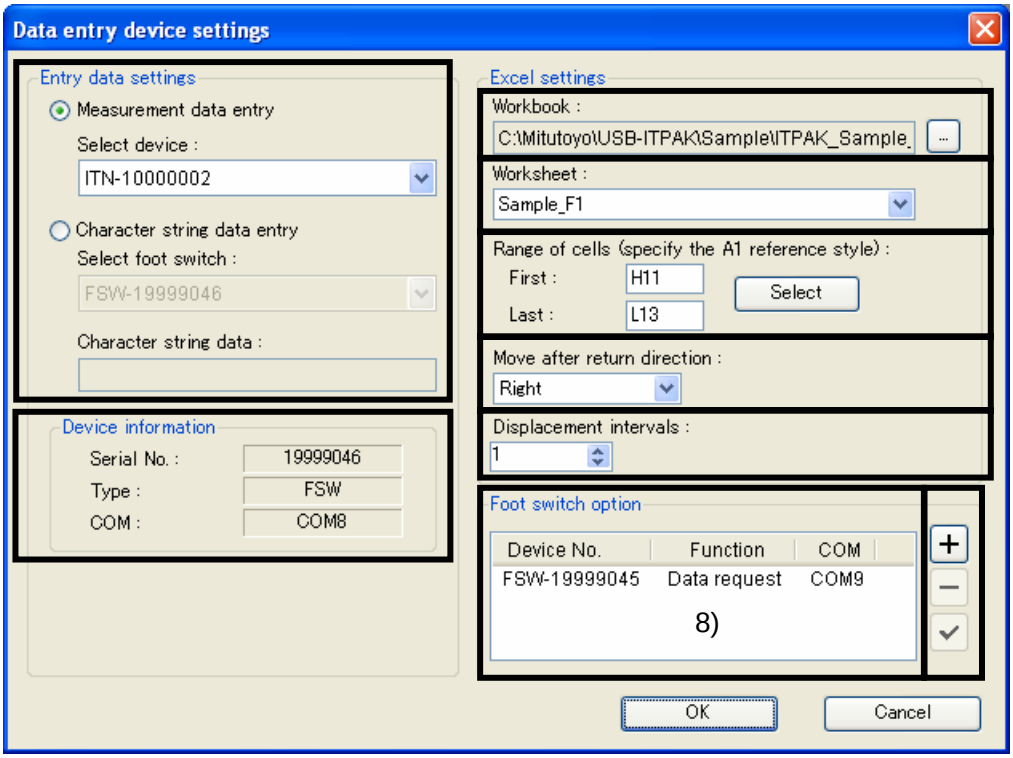
5) [Foot switch option] field

This field displays the information of the USB-FSW unit assigned to the USB-ITN unit selected in the [Data entry devices] field in step '3)'.

6.11 Data Entry Device Settings (Excel/Individual)

Clicking the [+] button in the [Data entry devices] field on the dialog box described in '6.10 Adding and Changing Procedures (Excel/Individual)' displays the [Data entry device settings (Excel/Individual)] dialog box.

On this dialog box, the device used for inputting data can be selected, and the settings for the Excel file that will serve as the data input destination can be specified.



1) [Entry data settings] field

Select the device used for inputting data.

Select either [Measurement data entry] or [Character string data entry].

- If [Measurement data entry] is selected:

  Measurement data will be input from USB-ITN. Select the device from the drop-down list in the [Select device] field.

- If [Character string data entry] is selected:

  Character string data will be input from the USB-FSW unit. Select the device from the drop-down list in the [Select foot switch] field. Also input in the [Character string data] field the character string to be input to Excel when the foot switch is pressed.

NOTE • Up to thirty-two 1-byte and 2-byte characters can be input.

2) [Device information] field

This field displays the information of the device selected in the [Entry data settings] field.

3) [Workbook] field

Enter the workbook of the Excel file to which the measured data is to be input. Clicking the [...] button allows you to select a file from the [Open] dialog box.

4) [Worksheet] field

Select the name of the worksheet to which data is to be input from the drop-down list.

5) [Range of cells (specify the A1 reference style)] field

Input the range of cells in Excel to which the collected data is to be input, in the A1 format.

Besides directly inputting the cell numbers, the cell range can also be selected by using the [Select] button and specifying the range on the Excel dialog box.

TIP • For the operation to select the cell range to which data is to be input by using the [Select] button and using the Excel dialog box, refer to '6.6.1 Selection of data entry cell range on Excel'.

6) [Move after return direction] field

Specify the movement direction of the Excel cell after data input ([right] or [down]).

7) [Displacement intervals] field

Specify the interval of Excel cell movement after data input.

NOTE • A value between 1 and 100 can be specified for [Displacement intervals].

TIP • For details about the relationship between the settings for the cell movement direction and displacement interval and the operation during data collection, refer to '6.6.2 Cell movement direction & cell displacement interval'.

8) [Foot switch option] field

This field displays the information of the USB-FSW unit registered to foot switch option.

NOTE • If the USB-FSW unit is used for inputting character string data, it is handled as a data entry device.

9) Buttons in [Foot switch option] field

- [+] button: Adds a USB-FSW unit in the [Foot switch option] field.
- [–] button: Deletes the USB-FSW unit selected in the [Foot switch option] field.
- [✓] button: Changes the settings of the USB-FSW unit selected in the [Foot switch option] field.

TIP • For details about the foot switch option settings, refer to '6.9 Foot Switch Option Settings'.

6.12 Adding and Changing Procedures (Optional)

Clicking the [Add procedure] button on the main dialog box described in '6.2 Main Dialog Box' displays the [Add procedure] dialog box. Selecting a procedure in the [Procedure] field and then clicking the [Change Procedure] button displays the [Change procedure] dialog box.

On the [Add procedure] dialog box, new procedures can be created and added to the setting file. On the [Change procedure] dialog box, existing procedures can be changed.

The operation of the [Change procedure] dialog box is similar to the operation of the [Add procedure] dialog box.

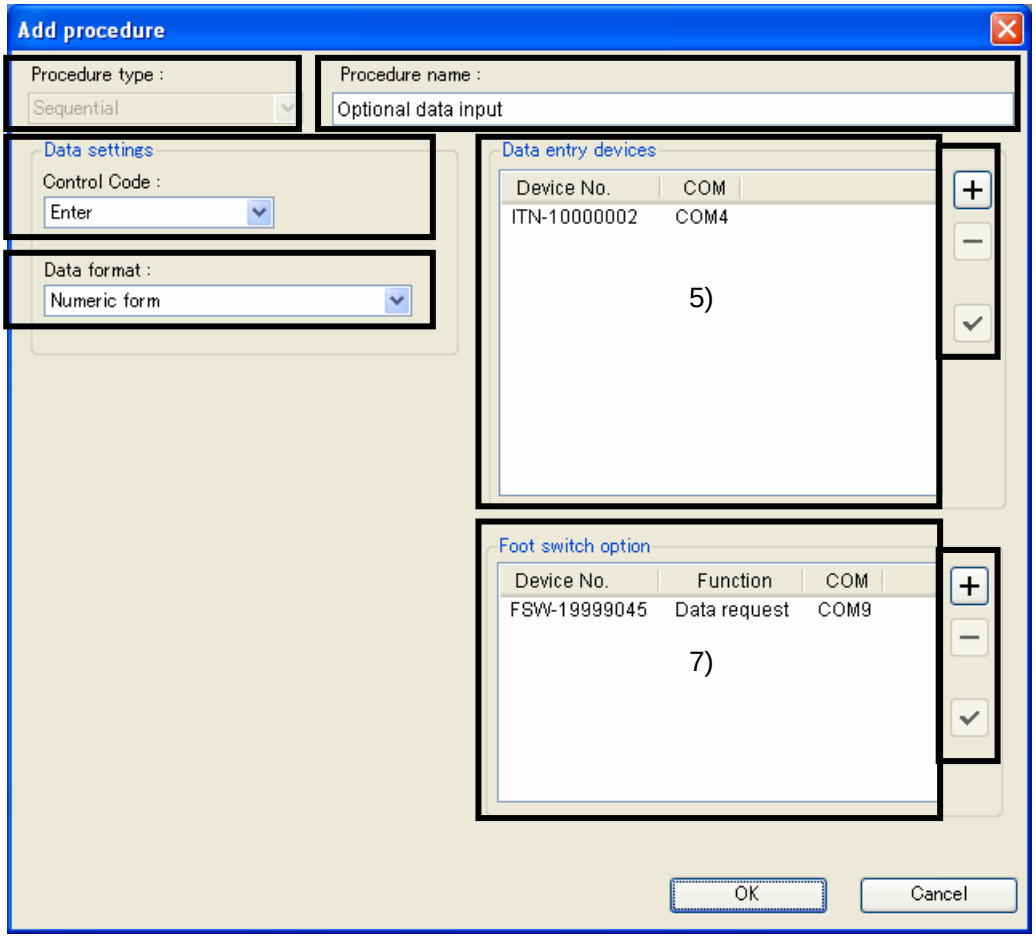
This section explains the case when [Optional] is selected in the [Data entry application] field on the main dialog box described in '6.2 Main Dialog Box'.

IMPORTANT

- In the case of input to an optional application, multiple procedures cannot be added.

TIP

- If [Excel] is selected in the [Data entry application] field on the main dialog box in '6.2 Main Dialog Box', refer to '6.6 Adding and Changing Procedures (Excel/Sequential or Batch)' and '6.10 Adding and Changing Procedures (Excel/Individual)'.



1) [Procedure type] field

Select either [Sequential], [Batch], or [Individual] as the type of data collection procedure.

IMPORTANT
- If [Individual] is selected, the foot switch option cannot be used.

TIP
- For details about the procedure types, refer to 'CHAPTER 1 BASIC KNOWLEDGE'.

2) [Procedure name] field

Enter the name of the procedure to be created. Entering the procedure name is required.

NOTE
- Up to thirty-two 1-byte and 2-byte characters can be input.

3) [Control Code] in [Data settings] field

Select the control code to be added after numeric data input.

Select the control code from [Unspecified], [Enter], [Up], [Down], [Right], [Left], or [Tab].

TIP
- If using 'Notepad' as the optional application, line return can be effected after numeric data input by selecting [Enter] as the control code.

IMPORTANT
- The function of the control code differs according to the application to be used. Select the control code after checking the functions of the various control codes in the application to be used.

4) [Data format] in [Data settings] field

Select the format of the data to be input to the application.

Select the data format from among [Numeric form], [Command form], and [COM +Command form].

Example: If the COM number is 13 and the measurement data is 32.14 mm, the value input to the optional application is as follows.

- [Numeric form]

  Only the measurement data is input.
  Example: "32.14"

- [Command form]

  The channel number and measurement data are input.
  Example: "01A+00032.14"

- [COM+Command form]

  The COM number (3 digits), channel number (fixed to 1), and measurement data are input.
  Example: " 01301A+00032.14"

5) [Data entry devices] field

This field displays the information of the registered data entry device.

6) Buttons in [Data entry devices] field

- [+] button: Adds a data entry device in the [Data entry devices] field.
- [–] button: Deletes the data entry device selected in the [Data entry devices] field.
- [✓] button: Changes the settings of the data entry device selected in the [Data entry devices] field.

TIP • For details about the data entry device settings, refer to '6.13 Data Entry Device Settings (Optional)'.

7) [Foot switch option] field

This field displays the information of the USB-FSW unit registered to foot switch option.

8) Buttons in [Foot switch option] field

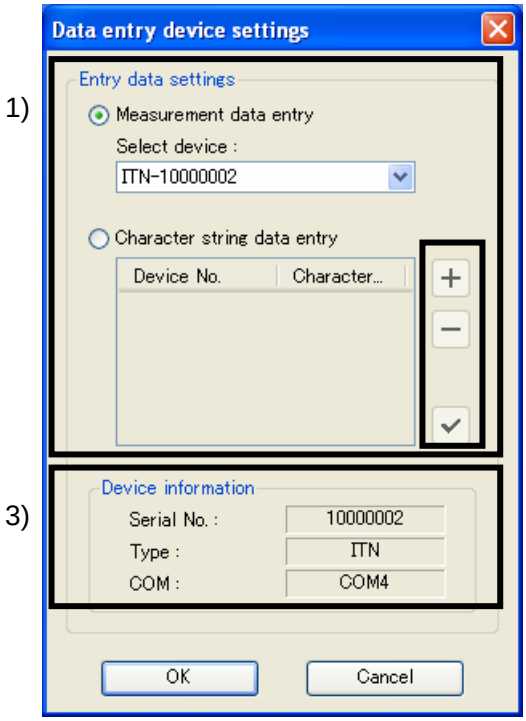
- [+] button: Adds a USB-FSW unit in the [Foot switch option] field.
- [–] button: Deletes the USB-FSW unit selected in the [Foot switch option] field.
- [✓] button: Changes the settings of the USB-FSW unit selected in the [Foot switch option] field.

TIP • For details about the foot switch option settings, refer to '6.9 Foot Switch Option Settings'.

6.13 Data Entry Device Settings (Optional)

Clicking the [+] button in the [Data entry devices] field of the dialog box described in '6.12 Adding and Changing Procedures (Optional)' displays the [Data entry device settings] dialog box.

On this dialog box, the device used for inputting data can be selected.



1) [Entry data settings] field

Select the device used for inputting data to the optional application.

Select either [Measurement data entry] or [Character string data entry].

- [Measurement data entry]

  The measurement data is input from USB-ITN. Select the device from the drop-down list in the [Select device] field.

- [Character string data entry]

  The character string data is input from USB-FSW. Click the [+] button in the [Character string data entry] field and specify the character string data.

2) Buttons in [Character string data entry] field

- [+] button: Adds a USB-FSW unit in the [Character string data entry] field.
- [–] button: Deletes the USB-FSW unit selected in the [Character string data entry] field.
- [✓] button: Changes the settings of the USB-FSW unit selected in the [Character string data entry] field.

TIP • For the character string data settings, refer to '6.8 Character String Data Settings'.

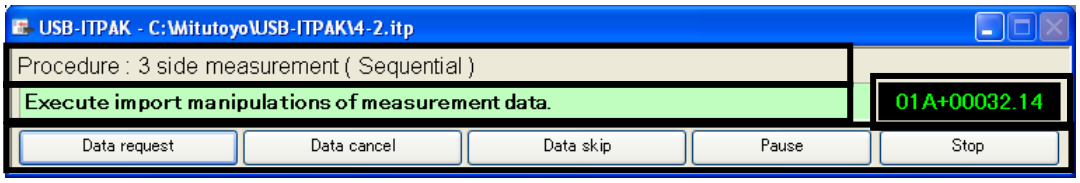
3) [Device information] field

The [Device information] field displays the information of the device selected in the [Entry data settings] field.

6.14 Data Collection

Clicking the [Data collection] button on the Quick Menu described in '6.1 Quick Menu' displays the data collection dialog box. Alternatively, selecting the Data Collection menu and then [Start] from the dialog box described in '6.2 Main Dialog Box', or clicking the [Data collection] button on the tool bar also displays the data collection dialog box.

This dialog box is used to input data from a measuring tool to an application.



1) [Procedure] field

This field displays the procedure currently used to collect data.

2) [Guidance message] field

Displays the following guidance messages for the operator.

- [Execute import manipulations of measurement data]

  Input measurement data in one of the following ways.

  (1) Press the DATA switch on the measuring tool.

  (2) In the case of a USB-ITN unit that has an output switch, press the output switch.

  (3) Click the [Data request] button on the data collection dialog box.

  (4) If the [Data request] function is assigned to the foot switch, press the foot switch.

  (5) If the [Data request] function is assigned to a function key, press that function key.

- [Please execute the foot switch operation.]

  Input the character string data by pressing the foot switch connected to the USB-FSW unit to which character string data input has been assigned.

- [Execute data entry operation.]

  Input measurement data or character string data by using the USB-ITN or USB-FSW unit.

- [The import of all pieces of measurement data has been completed.]

  Data collection has been completed. Click the [Exit] button and save the measurement data.

3) [Data display] field

This field displays the data input from the device in the transmission command format.

4) [Data request] button

Collects data.

NOTE
- The [Data request] button does not support data input for individual measurement.

5) [Data cancel] button

Cancels the data that was input.

NOTE
- The [Data cancel] button does not support data input for individual measurement.

6) [Data skip] button

Skips to the next data without inputting the current data.

NOTE
- The [Data skip] button does not support data input for individual measurement.

7) [Pause] button

Pauses data collection.

For the operation of this button, refer to ‘6.14.1 [Pause/Resume] button’.

8) [Resume] button

Resumes data collection that had been paused.

For the operation of this button, refer to ‘6.14.1 [Pause/Resume] button’.

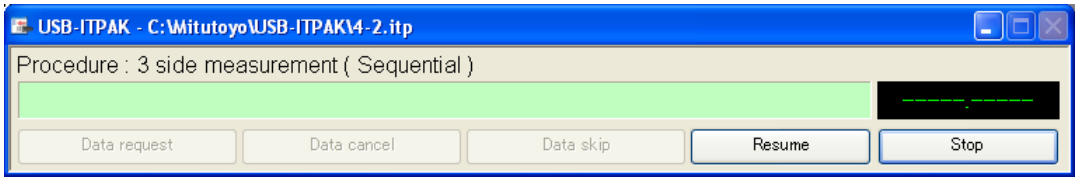
9) [Exit] button

Exits data collection.

6.14.1 [Pause/Resume] button

1) Clicking the [Pause] button pauses data collection.

When the [Pause] button is displayed as the [Resume] button, as shown below, data collection is paused.



In the paused state, the following operations are possible.

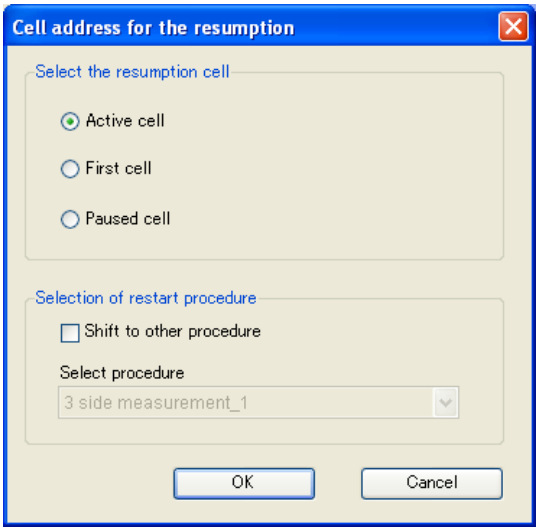
- Specify the start cell from which to resume data collection.
- Perform worksheet editing, such as character string input.

2) To resume data collection, click the [Resume] button.

IMPORTANT

- Before returning to data collection with USB-ITPAK by clicking the [Resume] button, be sure to thoroughly complete operations in Excel. If data collection with USB-ITPAK is resumed while operations in Excel remain uncompleted, such as input to a cell being in progress or a message being displayed, USB-ITPAK may not operate normally.

Click the [Resume] button to display the [Cell address for the resumption] dialog box as shown below. Next, select either one from the [Select the resumption cell] field, and click the [OK] button.



If the paused setting file consists of multiple procedures, the [Selection of restart procedure] field on the [Cell address for the resumption] dialog box is active, so it is possible to resume from another procedure.

To resume from another procedure, select [Shift to other procedure] and from the drop-down list in the [Select procedure] field, select the procedure for data collection resumption.

The resumption cell position is the first cell if collection is resumed from another procedure.

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7 COMMUNICATION COMMAND SPECIFICATIONS

7.1 Overview

This chapter explains the VCP communication command interface between USB-ITN or USB-FSW and the application software for the input and output of measurement data.

7.1.1 API of VCP communication

When using USB-ITN or USB-FSW with application software other than USB-ITPAK, communication can be done with the same operation (API function calls) as the serial communication ports (COM) operating with the Windows standard driver.
Generally, to communicate by using a serial communication port (COM), the RS-232C communication parameters (communication speed, flow control, etc.) must be set, but, for the virtual serial port (VCP) communication used by USB-ITN and USB-FSW, the communication protocol does not use RS-232C communication parameters, and therefore communication is possible without any RS-232C communication parameter settings (or with arbitrary values).

7.1.2 Common specifications of communication commands

All commands use the ASCII code.

7.1.3 Types of communication commands

The types of communication commands are listed in the table below.

(Term)

Device: USB-ITN or USB-FSW

(Legend)

Direction: Down: Command transmitted from the software to the device

Up: Command transmitted from the device to the software

ITN: Y: Command used by USB-ITN

N: Command not used by USB-ITN

FSW: Y: Command used by USB-FSW

N: Command not used by USB-FSW

No.	Direction	Code	Command Name	ITN	FSW
1	Down	V	Device information request command	Y	Y
2	Up	1	Device information command	Y	Y
3	Down	1	Measurement data request command	Y	N
4	Up	0	Measurement data command	Y	N
5	Up	8	Foot switch signal command	N	Y
6	Up	9	Status command	Y	N

7.2 Format of Communication Commands

The following tables list the types of communication commands.

7.2.1 Device information request command (V) (down)

This command is valid for both USB-ITN and USB-FSW.
This request command is for the software to read the information of the device.
When the software sends this command to the device, the device returns the 'device information command' (1).

Item	Value ASCII [Hex]	Bytes	Description
Command code	V	1	Device information request command
Terminator	CR [0x0D]	1	CR (carriage return)
Total		2	

7.2.2 Device information command (1) (up)

This command is valid for both USB-ITN and USB-FSW.
This response command is for the software to read the information of the device.
When the software sends the 'device information request command (V)' to the device, the device returns this command.

Item	Value ASCII [Hex]	Bytes	Description
Command code	1	1	Device information command
Type	ITN FSW	3	Device types ITN = USB-ITN FSW = USB-FSW
Serial No.	00000000 to 99999999	8	Serial No. of device
Terminator	CR [0x0D]	1	CR (carriage return)
Total		13	

7.2.3 Measurement data request command (1) (down)

This command is valid for USB-ITN.
This request command is for the software to read the measurement data from USB-ITN.
When the software sends this command to USB-ITN, USB-ITN inputs the measurement data from a measuring tool with Digimatic output and returns 'measurement data command' (0).

Item	Value ASCII [Hex]	Bytes	Description
Command code	1	1	Measurement data request command
Terminator	CR [0x0D]	1	CR (carriage return)
Total		2	

7.2.4 Measurement data command (0) (up)

This command is valid for USB-ITN.
This command is used by USB-ITN to notify the software of measurement data.
When the software sends 'measurement data request command (1)' to USB-ITN, USB-ITN inputs the measurement data from a measuring tool with Digimatic output and returns this command.
Also, when the measuring tool makes a request, such as when the DATA button of the measuring tool is pressed, measurement data is input from the measuring tool and this command is sent to the software.

NOTE • If an error occurs when the measurement data is being input from a measuring tool that has Digimatic output, the USB-ITN unit sends the 'status command' (9) instead of the 'measurement data command' (0).

Item	Value ASCII [Hex]	Bytes	Description
Command code	0	1	Measurement data command
Channel	1	1	Channel (fixed to 1)
Measurement data type	A	1	Normal data (fixed to A)
Sign	+/-	1	'+' if the measurement data is 0
Measurement data	.0000000 to 99999999	8	A period (.) is used as the decimal point character. Values are zero-supplied (displayed right-aligned, and padded with 0s if there are unused leading digits). If there are no digits past the decimal point, no decimal point character is used in the right-most digit.
Terminator	CR [0x0D]	1	CR (carriage return)
Total		13	

7.2.5 Foot switch signal command (8) (up)

This command is valid for USB-FSW.
This command is for the USB-FSW unit to notify the software of the foot switch signal.
Upon detecting that the foot switch signal is ON, the USB-FSW unit sends this command to the software.

Item	Value ASCII [Hex]	Bytes	Description
Command code	8	1	Foot switch signal command
Trigger type	0	1	0 = Unspecified
Terminator	CR [0x0D]	1	CR (carriage return)
Total		3	

7.2.6 Status command (9) (up)

This command is valid for USB-ITN.
This command is for the USB-ITN unit to notify the software of its state.
Upon detecting the occurrence of a status to be reported, the USB-ITN unit sends this command to the software.

Item	Value ASCII [Hex]	Bytes	Description
Command code	9	1	Status command
Channel	1	1	Channel (fixed to 1)
Status	(See table below.)	1	(See table below.)
Terminator	CR [0x0D]	1	CR (carriage return)
Total		4	

The following table lists the status values.

Value ASCII	Explanation
1	The measurement data could not be received within the stipulated time (2 s) from the measuring tool with Digimatic output. Examples of possible causes: • The measuring tool is turned off. • The cable of the USB-ITN unit is not connected to the measuring tool.
2	The Digimatic communication data loaded from the measuring tool with Digimatic output was data not matching the Digimatic communication specifications. Examples of possible causes: • Influence of noise • Fault in the communication circuits of the measuring tool or the USB-ITN unit
3	The Digimatic communication clock (CK) signal loaded from the measuring tool with Digimatic output was data not matching the Digimatic communication specifications. Examples of possible causes: • Disconnected CK signal of Digimatic communication cable • Fault in the communication circuits of the measuring tool or the USB-ITN unit
4	The Digimatic communication data (DATA) signal loaded from the measuring tool with Digimatic output was data not matching the Digimatic communication specifications. Examples of possible causes: • Disconnected DATA signal of Digimatic communication cable • Fault in the communication circuits of the measuring tool or the USB-ITN unit
8	During reception of a measurement data request command from the software, the USB-ITN unit that received the request was in a busy state. Examples of possible causes: • A measurement data request command was received during Digimatic communication processing.
9	The device detected an error other than those defined above.

NOTE • If a command received from the software is illegal, the USB-ITN unit ignores that command and does not send a response command.

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8 APPENDIX

8.1 Product Specifications

8.1.1 Configuration of USB-ITPAK

	Name	Q'ty	Remarks
1	USB-ITPAK V1.0 Program Disk	1 set	• Provided on CD • Includes dedicated VCP driver • Includes USB-ITPAK User's Manual
2	USB Dongle	1	• For program protection • Connect to USB port of PC when using software • Supported USB versions are USB 2.0 full speed and USB 1.1
3	USB-ITPAK Installation Manual	1 set	• Provided in paper form

8.1.2 Main specifications of USB-ITPAK

Item	Specifications
Maximum number of USB-ITN or USB-FSW units that can be connected *1	Windows 2000 / Windows XP : Within 100. Windows Vista / Windows 7 : Within 20.
Number of data input devices that can be registered to USB-ITPAK (USB-ITN or USB-FSW)	Within 200.
Data request (sequential)	Data request to 1 USB-ITN unit
Data request (batch)	Batch data request to multiple USB-ITN units
Data cancel (sequential, batch)	Cancellation of measurement data that was input
Data skip (sequential, batch)	Skipping of data input that was to be executed next and movement to the next data
Character string input through USB-FSW	Input of arbitrary character string set beforehand, through USB-FSW operation

*1: The maximum number of units that can be connected may be lower depending on the PC or USB hub that is used.
When using a USB hub, using a hub that has USB authentication is recommended.
The loading time per unit is 0.2 to 0.3 seconds. However, this varies according to the measuring tool that is connected and the measuring environment.

8.2 Supplementary Explanation of Use

8.2.1 Using setting files on another PC

1) Moving a device and setting file

When copying a setting file of USB-ITPAK (extension: itp) to another PC for use on that PC, also copy the Excel file to which that setting file is registered to the PC at the same time.
Since the setting file is registered including the folder name of the Excel file, copy the Excel file using the same path name (drive name + folder name) that was saved on the copy source PC.

2) Moving the setting file only for use with another device

When using another device (USB-ITN or USB-FSW) on the copy destination PC, the setting file cannot be used as is by performing only operation 1) above.

This is because the device No. registered to the procedure in the setting file differs between the copy source PC and the copy destination PC.

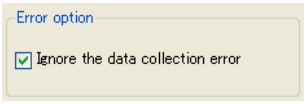
In this case, the solution is to make the device No. of the copy destination PC the same as the device No. of the copy source PC. When this is done, the setting file that was copied can be used as is.

TIP • For how to change the device No., refer to '6.3 Device Information' and section '6.4 Device Information Setting'.

8.2.2 Operation when data request to measuring tool times out

If the measuring tool to which USB-ITPAK has sent a data request does not respond within about 2 seconds, USB-ITPAK stops data input from the measuring tool.

The following operations are performed according to the setting of [Ignore the data collection error] in the [Error option] field on the main dialog box.



1) If selected:

No error message is displayed when a data collection error occurs.
If the data input application is Excel, the active cell changes to the next cell.

2) If not selected:

The following error message is displayed when a data collection error occurs.

Check the measuring tool connected to the USB-ITN unit with the [Device No.] shown in the error message.

Click the [Ignore] button:

If the data input application is Excel, the active cell changes to the next cell.

Click the [Retry] button:

No processing is done for the application and a data request is sent to the measuring tool again.

8.2.3 Sound output during data input

A sound can be output during data input by creating an Excel macro.

TIP • For details about macros, refer to the Excel user's manual.

8.3 Troubleshooting

Countermeasures for USB-ITN, USB-FSW, and USB-ITPAK are explained below. If the implementation of these countermeasures does not result in normal operation, report the following information to the distributor or the sales office where the unit was purchased.

1) Serial number of USB-ITN, USB-FSW, and USB dongle
2) Version of USB-ITPAK
3) Name and model number of PC
4) Version of used OS and Excel
5) If using USB hub, name and model number of USB hub
6) Device information and connection configuration of other USB devices connected to PC

8.3.1 Problems related to installing VCP driver

The [The specified location does not contain information about your hardware.] message is displayed.

Two drivers can be used with USB-ITN and USB-FSW: the HID driver and VCP driver.

If the HID driver is selected due to a problem with the plug & play facility of the OS, the VCP driver is not recognized. In this case, select again the folder according to the device in the 'Drivers' folder on the supplied CD. The VCP driver can be selected and installed.

8.3.2 Problems related to starting up USB-ITPAK

1. A security warning message is displayed at USB-ITPAK startup.

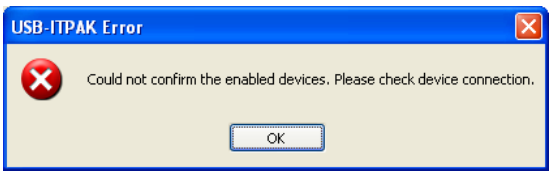
To avoid this warning message, enable the operation of 'itpak.exe' of USB-ITPAK in the security software.

2. At USB-ITPAK startup, the [Failed to identify the USB dongle.] message is displayed.

The supplied USB dongle must be connected to the PC in order to start up USB-ITPAK.

Connect the USB dongle, and then restart USB-ITPAK.

3. At USB-ITPAK startup, the message [Could not confirm the enabled devices.] is displayed.



If USB-ITPAK does not recognize any connected USB-ITN or USB-FSW, it displays this error message.

USB-ITPAK also does not recognize USB-ITN or USB-FSW units connected to the PC if no VCP driver has been installed.

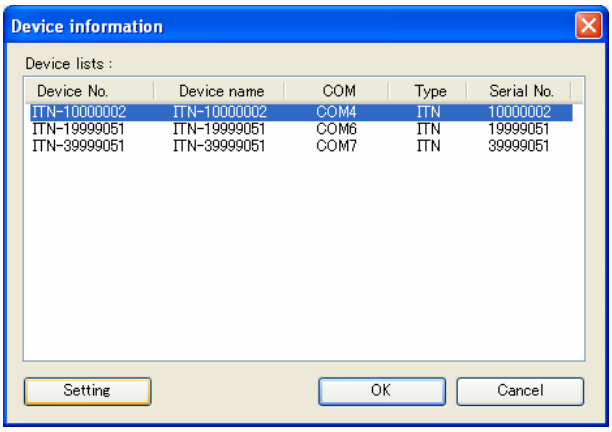
TIP
- For details about installing the VCP driver, refer to '2.2 Installing and Uninstalling the VCP Driver'.
- If this error message is displayed even though the VCP driver has been installed, refer to '8.3.3 Problems related to connecting USB-ITN or USB-FSW'.

8.3.3 Problems related to connecting USB-ITN or USB-FSW

1. The connected USB-ITN or USB-FSW cannot be correctly recognized.

1) Check the device connections in USB-ITPAK.

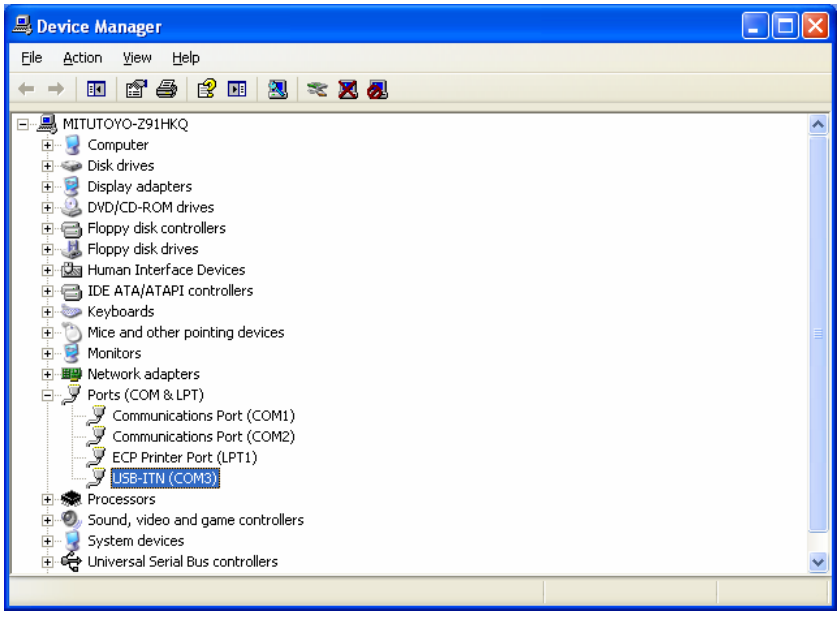
The connection status of the devices recognized by USB-ITPAK can be checked on the [Device information] dialog box displayed by selecting [Setting] and then [Device Information] from the menu on the main dialog box.



If the device is correctly recognized, review the procedure settings.

2) Check the USB devices in Windows Device Manager.

If the connected device is not displayed on the [Device information] dialog box shown in '1)' above, start up the Windows Device Manager to display the connection status of the USB devices.



- If USB-ITN or USB-FSW is not recognized, disconnect the device from the PC and then reconnect it, and check whether the device connection is recognized.

  Once the device connection is recovered, start up USB-ITPAK and proceed with the operation.

- If the USB hub to which the device is connected is not recognized, disconnect the USB hub from the PC and then reconnect it, and check whether the USB hub connection is recognized.

  Once the USB hub connection is recovered, check the connection of the USB-ITN or USB-FSW unit.

NOTE
- If multiple USB hubs are connected, Windows might not recognize the USB hub. Using a USB hub that has USB authentication is recommended.

2. When Windows returns from standby or hibernation, USB-ITN or USB-FSW is not recognized.

USB-ITN, USB-FSW, and the USB dongle support the suspend (sleep mode, standby mode) function. However, the operation is not guaranteed for all PCs and USB hubs.

If the operation of the suspend function encounters a problem in the environment that is used, set the power management of the PC so that the PC does not enter the suspended mode during operation.

TIP
- For the power management settings, refer to the user's manual of Windows.

8.3.4 Problems related to data collection

1. Data cannot be input from the measuring tool.

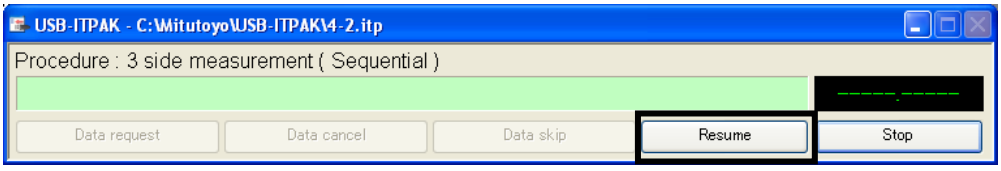
1) Check if the power of the measuring tool is not off.

If the power of the measuring tool is off, resume work after switching it on.

2) Check the connection status of the measuring tool used for data collection.

Check the connection status of the device in accordance with '8.3.3 Problems related to connecting USB-ITN or USB-FSW'.

3) Check the data collection dialog box to confirm that collection is not paused.



If this button displays [Resume], collection is paused. In this case, click the [Resume] button to resume collection.

4) If the [Data entry application] setting is [Optional], check whether the application to which the measurement data is to be input on the PC screen is active.

If the data entry application is not active, select that application and make it active.

5) If the [Data entry application] setting is [Optional], check the Japanese kana-kanji conversion mode.

If the Japanese kana-kanji conversion mode is not [Direct Input], select [Direct Input].

2. Data is not input to the specified cell.

Return to the main dialog box and check the data entry cell settings.

3. The processing speed declines as the number of connected units increases.

Processing takes longer as the number of connected units increases.

Examples:

- PC and Windows startup time
- USB-ITPAK startup time
- USB-ITPAK's batch measurement data collection time
- USB-ITPAK's switching time from the main dialog box to the data collection dialog box

Use of 20 units or less is recommended.

8.4 USB-ITPAK Error Messages

The contents of the main error messages of USB-ITPAK and their solutions are described below.

8.4.1 Error messages common to all dialog boxes

	Error Message	Error Timing	Error Contents	Solution
1	Failed to identify the USB dongle. Check for proper connection of the USB dongle.	At USB-ITPAK startup	The USB dongle is not connected to the USB port of the PC.	After connecting the USB dongle, restart USB-ITPAK.
2		Throughout USB-ITPAK execution	The USB dongle might be disconnected.	Check if the USB dongle is correctly connected, and resume operation.
3	Could not confirm the enabled devices. Please check device connection.	At USB-ITPAK startup	No USB-ITN or USB-FSW unit is connected.	After connecting the USB device to be used, restart USB-ITPAK.

8.4.2 Error message of main dialog box

	Error Message	Error Timing	Error Contents	Solution
1	File [file.itp] does not exist. Verify that the correct file name was given.	When a setting file is opened by selecting [File] and then [Open]	The selected setting file cannot be found.	Check whether the setting file to be used does exist.
2	Failed to find the setting file.	When a setting file is opened by selecting [File] and then [Recent Files]		
3	Could not control Excel. Please check Excel condition.	When a setting file is opened by selecting [File] and then [Open] or [File] and then [Recent Files]	This error occurs when Excel cannot be controlled from USB-ITPAK.	Check the status of Excel displayed on the error dialog box. Example: • If the cursor on the Excel worksheet to be used is in the edit state, release it. • If the Excel setting dialog box is open, close it.

	Error Message	Error Timing	Error Contents	Solution
4	Failed to find the specified Excel file. Workbook = [Workbook]	When a setting file is opened by selecting [File] and then [Open] or [File] and then [Recent Files]	The Excel file registered to the setting file is not found.	Check whether the Excel file does exist.
5	Failed to find the specified Worksheet. Workbook = [Workbook] Worksheet = [Worksheet]	When a setting file is opened by selecting [File] and then [Open] or [File] and then [Recent Files]	The worksheet registered to the setting file is not found.	Check whether the worksheet does exist.
6	Device used in the procedure is not connected. Connect the device to restart the USB-ITPAK or change the device to use.	When a setting file is opened by selecting [File] and then [Open] or [File] and then [Recent Files]	The device to be used in the procedure is not connected. Among the procedures displayed at the center of the main dialog box, the device of the procedure displayed in red characters is not connected.	Apply one of the following actions. • After connecting the unconnected device, restart USB-ITPAK. • Select the procedure displayed in red characters on the main dialog box, click the [Change procedure] button, and change the assignment of the device.
7	Device used in the procedure is not connected. Connect the device to restart the USB-ITPAK.	When data collection is started by selecting [Data collection] and then [Start]		
8	An invalid procedure has been set.	When a setting file is opened by selecting [File] and then [Open] or [File] and then [Recent Files]	The information registered to the setting file might have been damaged.	Newly create a procedure.

8.4.3 Error messages of [Device information setting] dialog box

	Error Message	Error Timing	Error Contents	Solution
1	The specified device No. has already been used.	When the [OK] button is clicked	The specified device No. has already been used for another device.	Enter a device No. that has not been used.

8.4.4 Error messages of [Add/change procedure] dialog box

	Error Message	Error Timing	Error Contents	Solution
1	Could not control Excel. Please check Excel condition. Workbook = [Workbook] Worksheet = [Worksheet]	When [Workbook] is selected by clicking the […] button in the [Excel settings] field	This error occurs when Excel cannot be controlled from USB-ITPAK.	Check the Excel status displayed on the error dialog box. Example: • If the cursor on the Excel sheet to be used is in the edit state, release it. • If the Excel setting dialog box is open, close it.
		When the [Select] button in the [Excel settings] field is clicked		
		When the [+] button in the [Data entry device settings] field is clicked		
2	The specified Key has already been used.	When a function key in the [Function key operation] field is selected	The selected function key has already been assigned to another function.	Change the function key selection for function assignment.
3	Device can not be registered anymore.	When the [+] button in the [Data entry devices] field is clicked	The maximum number of devices that can be registered has been exceeded.	Make the number of registered devices 200 or less.
4	No configurable USB-IT is connected. When the USB-IT is added, connect the device to restart the USB-ITPAK.	When the [+] button in the [Data entry devices] field is clicked	A configurable USB-ITN is not connected, or all USB-ITN units are already registered.	When adding a USB-ITN or USB-FSW unit, after saving the created setting file, connect the device and restart USB-ITPAK.
5	Selected device is not connected. Connect the device to restart the USB-ITPAK or change the device to use.	When the [√] button in the [Data entry devices] field is clicked	The selected device is not connected.	Execute one of the following. • Connect the selected device and restart USB-ITPAK. • Delete the unconnected device by clicking the [-] button, and assign another device by clicking the [+] button.
6	No configurable foot-switch device is connected. When the footswitch device is added, connect the device to restart the USB-ITPAK.	When the [+] button in the [Foot switch option] field is clicked	A configurable USB-FSW is not connected, or all USB-FSW units are already registered.	To add a USB-FSW unit, after saving the created setting file, connect the device and restart USB-ITPAK.

	Error Message	Error Timing	Error Contents	Solution
7	Specify the Excel file.	When the [OK] button is clicked	No Excel file has been specified in [Workbook] in the [Excel settings] field.	Click the […] button and select the Excel file.
8	Specify the data entry cell range.	When the [OK] button is clicked	The [Range of cells] has not been specified.	In the [Start] and [Last] fields in [Range of cells], enter the cell range in the A1 format.
9	Set USB-IT devices.	When the [OK] button is clicked	The [Data entry device] field has not been set.	Click the [+] button in the [Data entry devices] field and set the data entry device.
10	Set the procedure name.	When the [OK] button is clicked	The [Procedure name] field has not been set.	Enter the procedure name in the [Procedure name] field.
11	The entered procedure name has already been registered.	When the [OK] button is clicked	The entered procedure name is used by another procedure.	Enter another procedure name.
12	First cell address is illegal. Check the entered cell address.	When the [OK] button is clicked	The address entered in [Start] in the [Range of cells] field is incorrect.	Enter the correct cell address in the A1 format.
13	Last cell address is illegal. Check the entered cell address.	When the [OK] button is clicked	The address entered in [Last] in the [Range of cells] field is incorrect.	Enter the correct cell address in the A1 format.
14	Cell range provided is illegal. Check the entered cell address.	When the [OK] button is clicked	The data entry device assignment is not included in [Range of cells] in the [Excel settings] field.	Execute one of the following. • Change the assignment of data entry device. • Change [Displacement intervals] in the [Excel settings] field.

8.4.5 Error messages of [Data entry device settings] dialog box

	Error Message	Error Timing	Error Contents	Solution
1	No configurable foot-switch device is connected. When the footswitch device is added, connect the device to restart the USB-ITPAK.	When the [+] button of [Character string data entry] in the [Entry device settings] field is clicked	A configurable USB-FSW is not connected, or all USB-FSW units are already registered.	To add a USB-FSW unit, after saving the created setting file, connect the device and restart USB-ITPAK.
2	Specify the data entry cell range.	When the [OK] button is clicked	The [Excel cells assignment] field has not been entered.	Enter the [Excel cells assignment] field in the A1 format.
3	Beyond the data entry cell range is assigned. Perform setting again.	When the [OK] button is clicked	A value that is outside the data entry range was entered in the [Excel cells assignment] field.	Enter the row numbers or column numbers that are within the cell range specified for [Range of cells] in the [Excel settings] field on the [Add procedure] dialog box into the [Excel cells assignment] field.
4	Specify the character string data entry device.	When the [OK] button is clicked	While [Character string data entry] in the [Entry data settings] field is in a selected state, the character string data entry device has not been set.	Click the [+] button in the [Entry data settings] field and set the character string data entry device.

8.4.6 Error messages of [Character string data settings] dialog box

	Error Message	Error Timing	Error Contents	Solution
1	Specify the character string data.	When the [OK] button is clicked	Data is not entered in the [Character string data] field.	Enter the desired character string in the [Character string data] field.

8.4.7 Error messages of data collection dialog box

	Error Message	Error Timing	Error Contents	Solution
1	The used device is wrong.	When data is input from a device	Data was input from a device that differs from the device set in the procedure of the setting file.	Input data from the correct device.
2	An error occurred during data reception. Device No. = [Device] Click Ignore to proceed anyway or Retry to try again.	Refer to '8.2.2 Operation when data request to measuring tool times out'.		
3	Could not confirm the enabled devices. [COM No.] Please check device connection.	When a data request is issued from the PC	Communication with USB-ITN or USB-FSW is not possible.	Check the connection status of the USB-ITN or USB-FSW unit corresponding to [COM No.].
4	The selected cell is not a target cell to enter data. Select the cell again.	When the [Resume] button is clicked when data collection is paused, and [Active cell] in the [Select the resumption cell] field on the next dialog box is selected	The selected cell is not within the range of data entry cells.	Select cells in the cell range for data input.
5	Failed to character string data entry. Check the character string data.	When character string data is input	If the selection in the [Data entry application] is [Optional], character string data cannot be input.	Check the character string data that has been set.
6	Failed to character string data entry. Check the excel condition and character string data.	When character string data is input	Character string data input to Excel is not possible.	Check the Excel status and the character string data that has been set.
7	Could not control Excel. Please check Excel condition. Workbook = [Workbook] Worksheet = [Worksheet]	Throughout data collection	This error occurs when Excel cannot be controlled from USB-ITPAK.	Check the Excel status displayed on the error dialog box. Example: • If the cursor on the Excel sheet to be used is in the edit state, release it. • If the Excel setting dialog box is open, close it.

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