# Mitutoyo U-WAVE Navi

## Measurement navigation APP
## for Smartphones

# User's Manual

Please read this "User's Manual" before use to ensure correct use.
After reading, be sure to keep it in a place where you can read it any time.

# Mitutoyo

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- ・ When using the Bluetooth $^{®}$function, the Android$^{TM}$ device needs the access right of the location information.
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- ・Please disconnect the Bluetooth$^{®}$ communication of this application when you do not use it for a long time. Otherwise, your device and U-WAVE-TCB/TMB battery may be depleted.

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# **1.** Overview

This application is an application for smartphone (Android™) that assists the measurement work by MITUTOYO's "Digimatic measuring instruments connected U-WAVE-TCB/TMB wireless communication system". Use photos to navigate "in what order", "where", "what" and "how" to measure.
The measured value is passed or rejected according to the set tolerance value.
It is also possible to record "who" worked with an NFC card used for employee ID cards and others.

# **2.** About installation

Please install this application from Google Play ™ Store.

## **2.1.** Settings after installation

Please set "Camera", "Storage", "Location" in "App permissions" and "Allow" from "Settings" of Android™ device. Location information authority is required for Bluetooth® communication. This app does not collect location information.
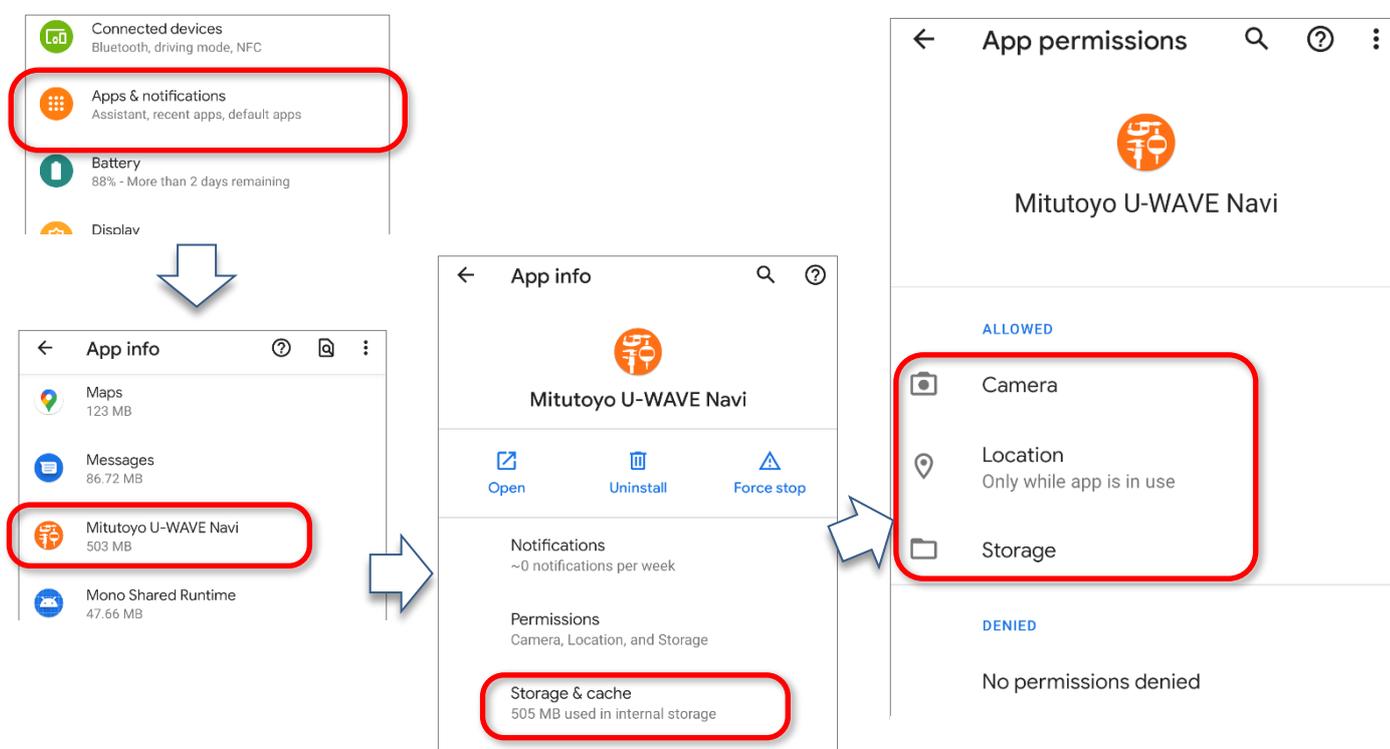


Caution!  Please do not execute "Clear stragea" or "Clear cache" (may be displayed differently) from "Apps" in "Settings" . The measurement navigation files and measurement results may be erased.

# **3.** Operating instructions

## **3.1.** Register the ID

The "ID" is "who", which is one of the measurement results recorded by this application.

① First, launch the app.
② Tap the "Sign up " button at the bottom of the screen to create a new account.（screen 3.1(A)）
③ Enter your ID and Choose a secure Password(which may even be empty).（screen 3.1(B)）
④ Select permission. Note.2
　　※ "Administrator" has the authority to clear the registration of other "measurers" and to enable the function
　　　　to display the cancel data.（see "4. Settings"）
⑤ Bring the NFC card close to the NFC reading section of the smartphone.（Only when using NFC） Note.3



screen3.1(A)



screen 3.1(B)

Tip. If you want to login automatically, check the "Auto-login".

Tip. The logged-in ID is displayed in the sidebar menu (「≡」 button after login, or the menu that appears when you swipe from the left side of the screen).

Tip. If the IDs or NFC cards are duplicated, you cannot register.

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Note.2 "One or more 「administrator」 registration" is recommended(All can be 「administrators」)
Note.3 One NFC card per measurer.

## **3.2.** log in

① First, launch the app.

② Enter your ID and password and tap the "Login" button.
If you registered an NFC card, bring the NFC card close to the NFC reading section of your smartphone.
　　>> The screen switches and a list of measurement navigation files is displayed.

## **3.3.** Create a measurement navigation file

① If you are not logged in, follow "3.2 log in" to log in.

② Tap 「＋」button.
　　>> Icons 🗂🗐 are additionally displayed on the left side of the + button.（screen 3.4(A))

③ Tap「Add 🗐 」button.
　　>> The screen switches to "Navigation Edit".

④ Create a cover sheet for the measurement navigation file.（screen 3.4(B))
　(1) Enter "Part name" and "Name of the measurement navigation".
　　If necessary, enter the external photo of the part from the "camera" or "Select a Photo".
　(2) After entering the required items, tap the "Create navigation(s)" button.
　　>> Switch to the screen for creating the content(page) for each measurement point.
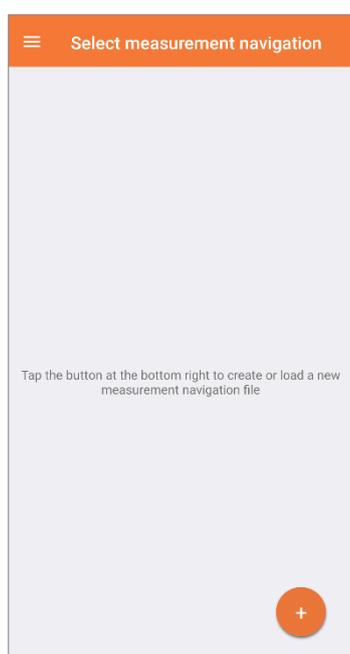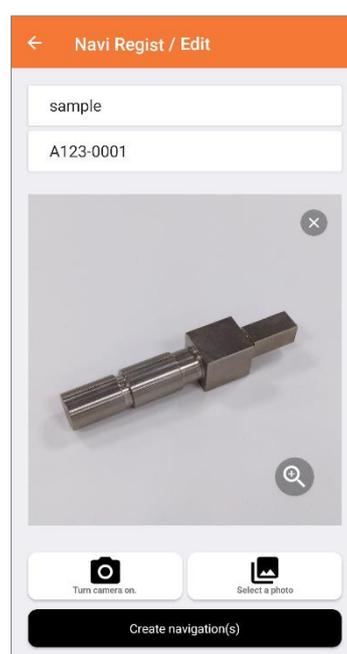
|  |  |
|:---:|:---:|
| screen 3.4(A) | screen 3.4(B) |

⑤ Create the content (page) of "Each measurement point" in the measurement navigation file.（screen 3.4(C)）
　(1) Enter the "Nominal size". （required）
　(2) Enter the "upper limit of size" and "lower limit of size". （not required）
　(3) Enter "Comment". （not required）
　(4) Enter the "Name of the measuring instruments" and "serial number" to be used at that page. （not required）
　(5) From the "camera" or "Select a photo", register the photo of the measurement point. （and how to measure）
　　　（not required）
　　　　※ The number of U-WAVE-TCB / TMB that can be connected per measurement procedure depends on the Android device.

⑥　Tap the 「 ➔ 」 button to set the next measurement page.
　　　＞＞ The next measurement point can be created and the "No." counts up.

⑦ Tap the「✔」button to reach the last measurement page.
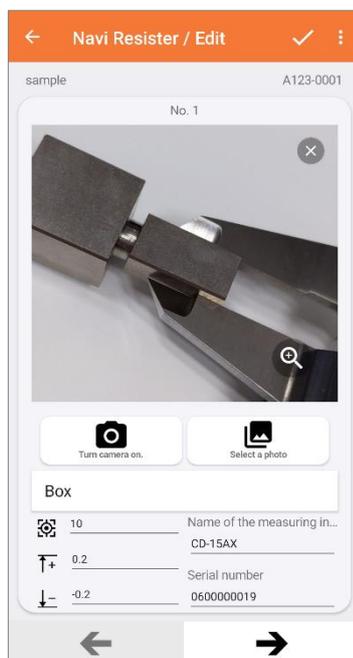


screen 3.4(C)

　　Tip. As an application example of "photograph of measurement point", "photograph of drawing"
　　　　can be inserted.

　　Tip. If you want to add or delete pages, please use the "：" menu at the top

# 3.4. Measure using "registered measurement navigation file"

① If you are not logged in, follow "3.2 log in" to log in.

② Tap the " measurement navigation file" you want to measure.（screen 3.2(A)）
   　　>> The screen switches and a list of measuring instruments to use is displayed.
   　　※ See 「3.3.Create a measurement navigation file」 to create a measurement navigation file.

③ Tap the connection mark 🔗 , then tap the "DATA button" on the matching measuring instruments.（screen 3.2(X)）
   　　>> When the connection is successful, the color of the connection mark changes to orange.
   　　>> Then tap the "DATA button" on the U-WAVE. The measured value is displayed at Ⓐ.
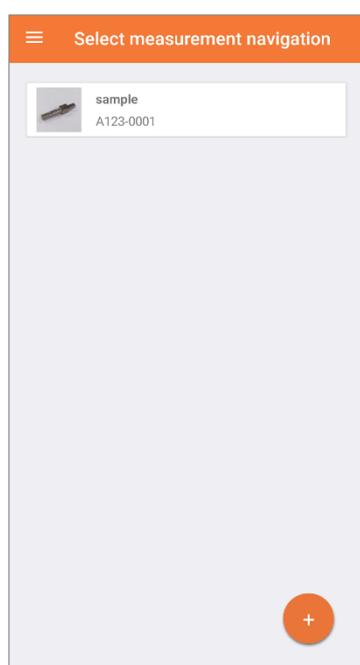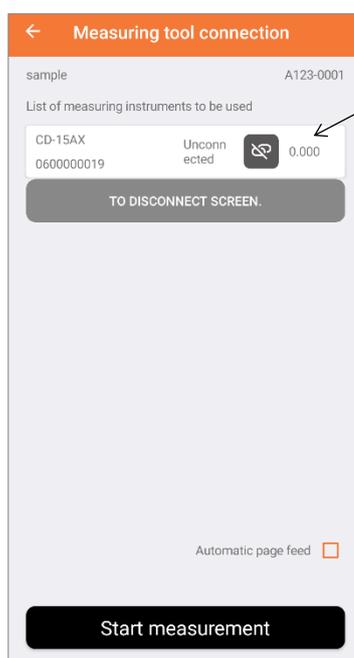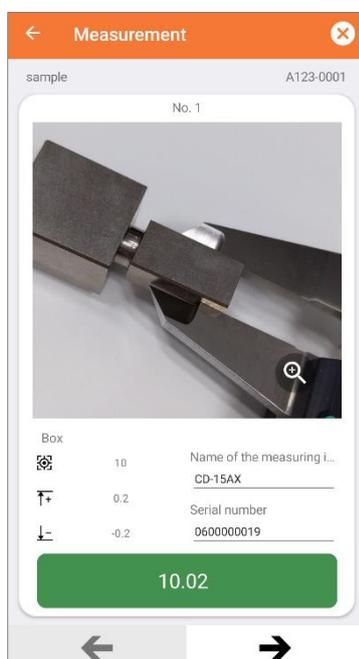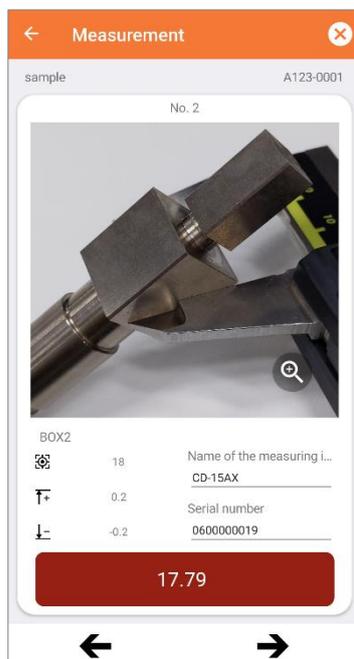


screen 3.2(A)　　　　　　screen 3.2(B)

Screen 3.2(X)

Tip. When disconnecting the measuring instrument, use the "disconnect screen" or "Bluetooth devices screen" (the screen can be switched with the ≡ button or the menu that appears when you swipe from the left).
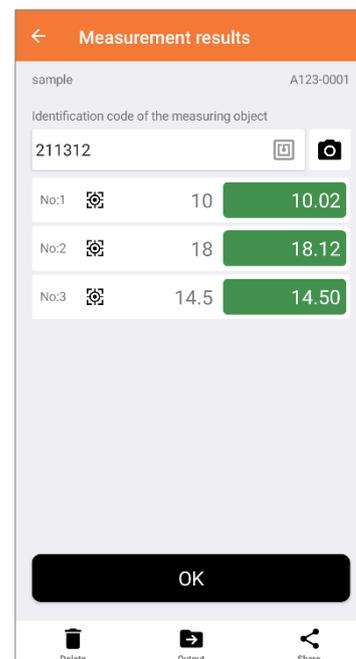
④ Tap the "Start measurement" button after connecting all the measuring instruments you want to connect to Bluetooth®.[Note.4]

>> The screen switches and "measurement".

⑤ Please measure as the app navigates. [Note.5]

>> In the tolerance judgment of the measured value, the display color is green for pass, red for fail.

（screen 3.2(C)(D)）

⑥ Display a list of results when navigation is over.（screen3.2(E)）

Enter the identification code (such as slip number or serial number) of the measured item, and then tap the "OK" button.

（Tap the camera button to use the barcode or QR code.Alternatively, you can also enter from NFC or IC tag [Note.6]）

>> Save the measurement result internally and then return to screen ③.



| screen 3.2(C) | screen 3.2(D) | screen 3.2(E) |

Tip. By checking "Automatic page feed", when the tolerance judgment passes in the received measuring instrument data, automatic page feed is performed.

Tip. "Name of Measuring tool" and "serial number" can be rewritten arbitrarily.
Please use this rewrite function when working with a substitute due to tool damage etc.

Tip. You can change pages by swiping left or right.
If you perform too quickly, the screen display may be disturbed.
In that case, please close and restart the application.

---

[Note.4] This application has a function to input the measured value manually.

[Note.5] To suspend the measurement, tap the ⊗ at the top right of the screen

[Note.6] This app only supports "card manufacturing unique Identification number" of NFC and IC tag

# 3.5. View measurement results

① If you are not logged in, follow "3.2 log in" to log in.

② Tap 「≡」button
>> The menu appears from the left side of the screen

③ Tap the "Measurement results" menu
>> Switch the screen to "Select measurement result/part" and display the list of measurement navigation files.

④ Tap a part (or measurement navigation file)
>> Display a list of measurement results in order of measurement date. (screen 3.3(A))

⑤ Tap the measurement result
>> The screen switches and displays the measurement result. (screen 3.3(B))
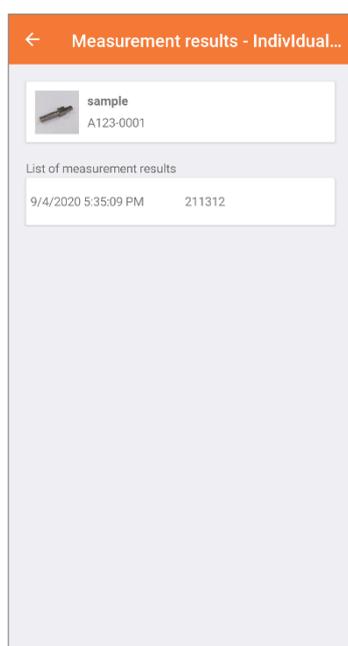

screen 3.3(A)
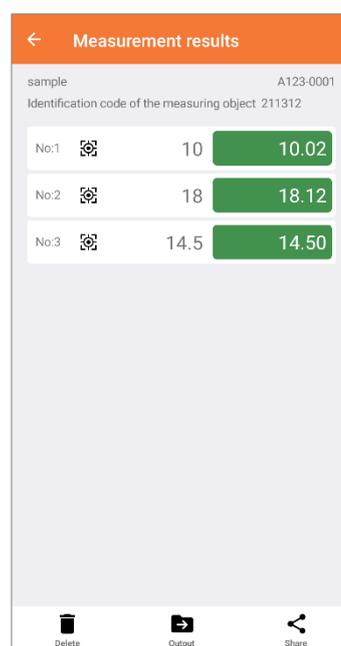

screen 3.3(B)

Tip. To output the measurement result to a CSV file,
tap the "Output" button.
Tip. To attach to an email or save to cloud storage,
tap the "Share" button.
(May not be possible depending on the device)

# 3.6. Duplicate and edit measurement navigation file

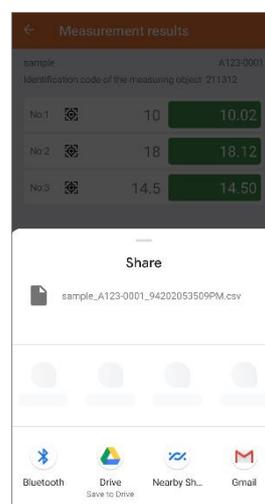This chapter describes how to edit the registered measurement navigation file again.

① If you are not logged in, follow "3.2 log in" to log in.

② Tap and hold the " measurement navigation file" you want to duplicate.
>> 「Copy & Edit ✎」 button is displayed at the bottom of the screen.（screen 3.5(A)）

③ Tap「Copy＆Edit ✎」button.
>> The screen switches to "Navi Regist/Edit".

④ Edit the cover sheet of the measurement navigation file.（screen 3.5(B)）

⑤ Edit the "Part name" or "Name of the measurement navigation".
Be sure to edit either of the above two items

⑥ Replace photo（not required）

⑦ Tap "Create navigation(s)" button.
The operation from here is the same as "3.3 Create a measurement navigation file".
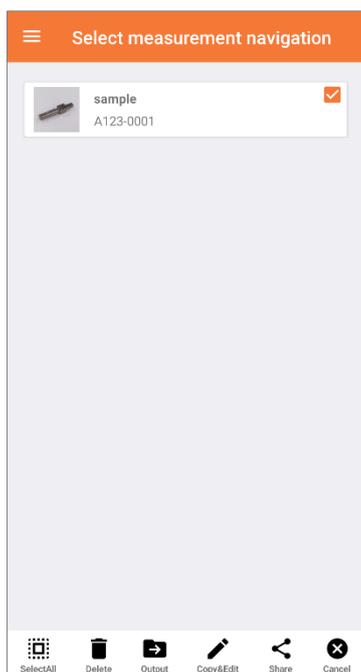


screen 3.5(A)
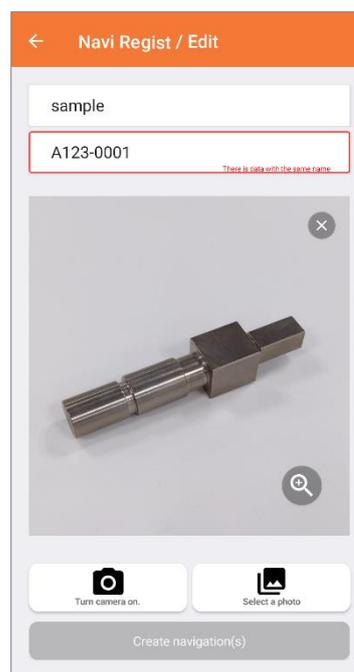


screen 3.4(B)

Tip. 「Copy & edit」 button is displayed only when one measurement navigation file is selected.
Tip. you can delete a registered measurement navigation file from the menu at the bottom
of the screen that appears when you press and hold the measurement navigation file
on the "measurement navigation file selection screen".

# **3.7.** How to transfer measurement navigation files to Windows 10 PC

<Operation on PC >

① Press "Windows" key + "R" key

>>

"Run" dialog is displayed.

② Enter "fsquirt" in the "Open" field and press the OK button.（screen 3.6(A)）

>>" transfer files using Bluetooth " dialog is displayed

③ Press "Receive file" in this dialog（screen 3.6(B)）

>>"Waiting for a connection" is displayed（screen 3.6(C)）

※ If you are not in "waiting for connection", your computer may not have the Bluetooth<sup>®</sup> function or it may be disabled. Please contact your PC administrator or PC manufacturer.
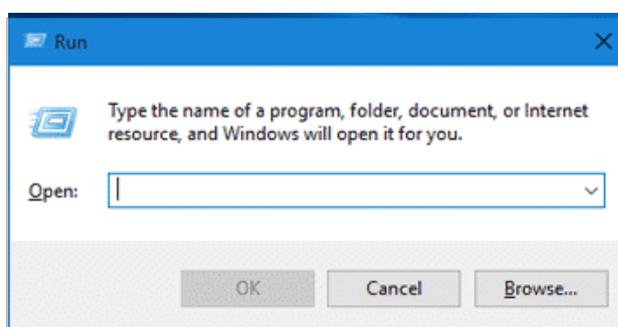


screen 3.6(A)
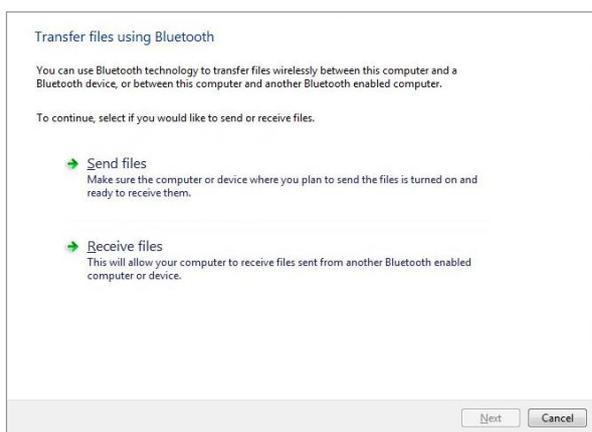


screen 3.6(B)
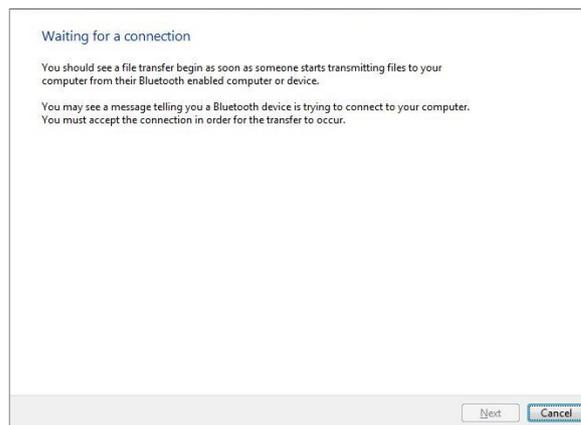


screen 3.6(C)

<Operations on the application side >

④　Perform up to　⑤　of "3.2. log in".（screen 3.6(D)）

⑤　Tap the "Share" button.
　　　　>> The screen switches and the menu is displayed .(the display differs depending on the device)(screen 3.6(E))

⑥　Tap the "Bluetooth" button.
　　　　　　>>Switch to the screen for selecting "Name" on the PC.

⑦　Tap the destination PC name.(screeen 3.6(F))

⑧　The file is transferred to the Windows PC side, so operate according to the on-screen instructions to save the file.
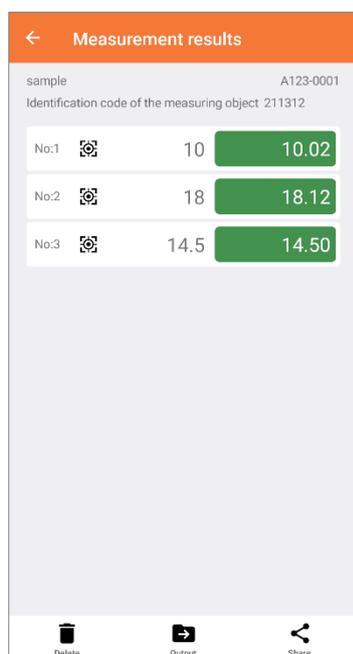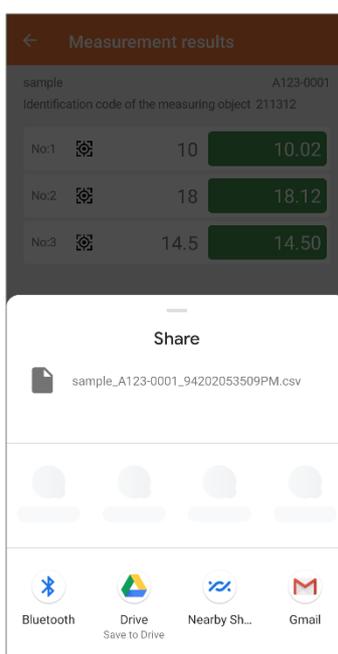
| | | |
|---|---|---|
| screen 3.6(D) | screen 3.6(E) | screen 3.6(F) |
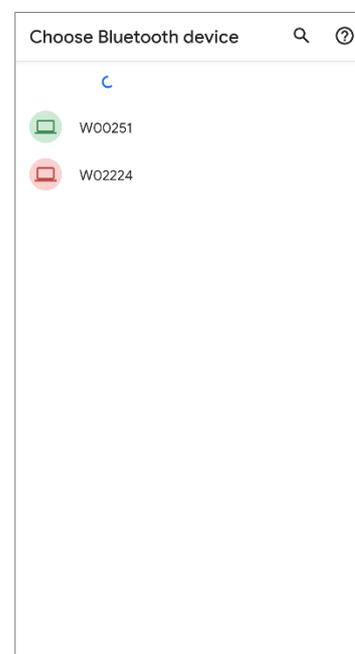
The format of the measurement result file is as follows:

```
" Part name","Sample"
" Inspection record name","A123-0001"


" Item name","Item1","Item2","Item3"            Measurement
" Upper limit of size","0.5","0.5","0.6"         procedure used
" Nominal value","10","18","14.5"
" Lower limit of size","-0.5","-0.5","-0.6"


" Date of measurement","2020/07/14 14:35:11"
"SN","576374411185"                              Measurement
" Measurement results","10.02","18.12","14.50"   result
" Enable","Enable","Enable","Enable"
" ID (measurer, employee number, etc.)","mitutoyo taro","mitutoyo taro","mitutoyo taro"
```

**Character encoding :  UTF-8 without BOM**

**Canceled data flag:**
   **"Disable" indicates canceled data**
   (This line is output only when cancel data output is set)

**ID indicating the person who measured**

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# **3.8.** Export of measurement navigation file（backup）

① If you are not logged in, follow "3.2 log in" to log in.
② Tap and hold the measurement navigation file you want to export.（screen 3.7(A)）[Note.7]
              >> A menu is displayed at the bottom of the screen.
③ Tap "Output" to save to the smartphone internal storage, "Share" to output to the external storage(screen 3.7(B)(C)) [Note.8]
      >> Switch to the selected screen (the screen differs for each device). Follow the on-screen instructions.

     Tip. If you want to export to a Windows PC with Bluetooth®, perform ”Operation on PC” in "エラー! 参照元が見つかりません。 How to transfer measurement navigation files to Windows 10 PC” and select "Bluetooth" from "Share" of this application.

     Tip. Transferring file using Bluetooth® takes a long time to complete due to the large file size when using high resolution pictures. USB copy is recommended.
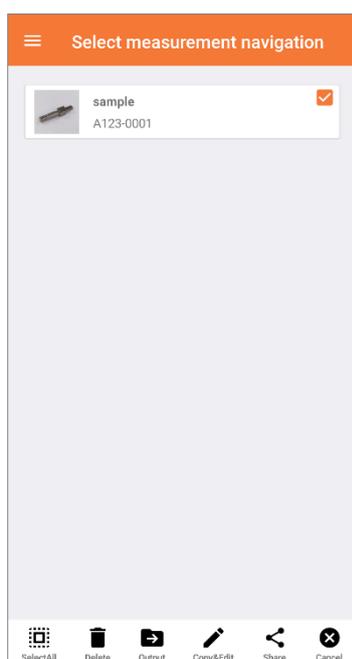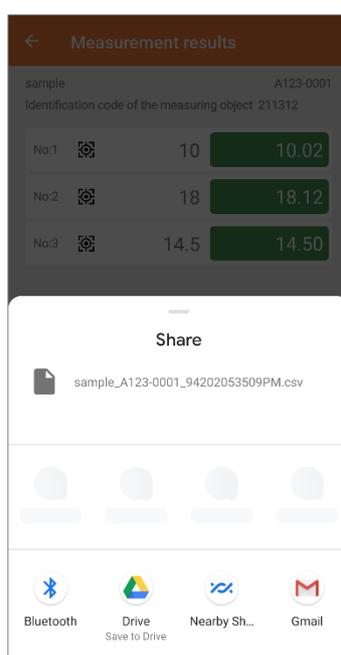


screen 3.7(A)             screen 3.7(B)             screen 3.7(C)
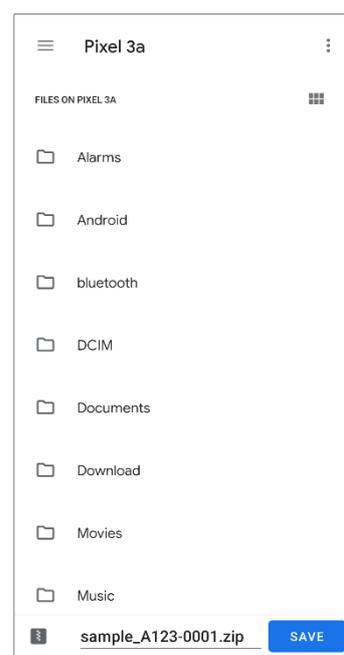
---

[Note.7] "Registered user information" cannot be exported.

[Note.8] The sharing destination menu displayed after tapping the "Share" button varies depending on the device.

# **3.9.** Import measurement navigation file（restore）

① If you are not logged in, follow "3.2 log in" to log in.

② Tap the 「＋」 button.

     >> 📁📄 icon is additionally displayed to the left of the + button.(screen 3.8(A))

③ Tap the 「📁 Read」 button. [Note.9]

     >>The screen switches to "File select"

④ Select the import file.
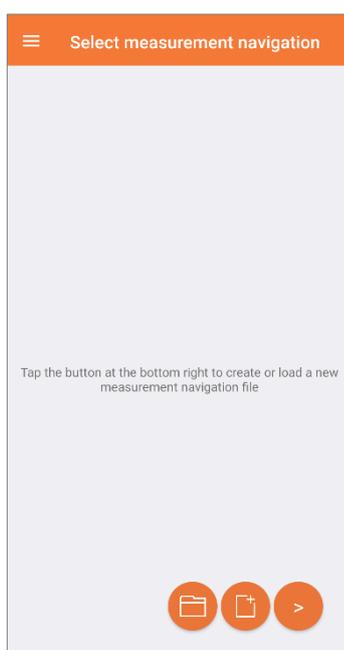


screen 3.8(A)

Tip. Before importing from a Windows PC, copy the import file from PC to the device. (See "3.7 How to transfer measurement navigation files to Windows 10 PC ")

Tip. Some devices may not be able to read if the import file is too large.

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[Note.9] "Registered user information" and "Measurement result" cannot be imported

# 4. Settings

This chapter describes the operation settings and registrant information management functions.
The setting items depend on the ID authority (see "3.1 Register the ID").
Login with the "ID" that has the authority according to the setting/management contents.

## 4.1. Waiting time for automatic page feed (measurer/administrator)

This item is adjusted when automatic page feed is too fast while measuring with automatic page feed checked (see page.12).(screen 4(A))
It means the waiting time from "Receive measurement value" to "Start feeding to the next step page".

## 4.2. Change ID registration information (measurer/manager)

On this screen, you can change/initialize the registered information of the logged-in person. (screen 4(A))
Items to be changed are "ID", "Password", and "NFC ID number".
This ID (user) can also be deleted on this screen.

> Tip. "Permission" cannot be changed. Please register a new ID.
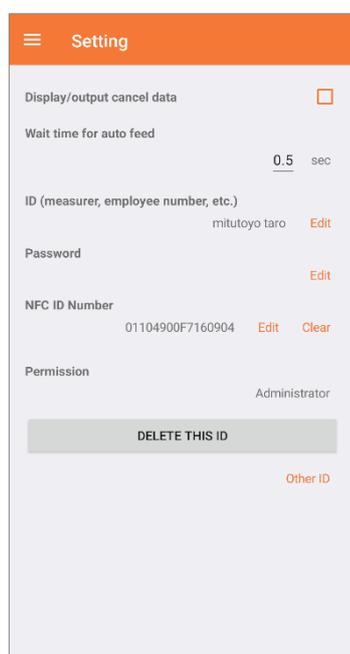
screen 4(A)

## **4.3.** Display/output cancellation data (administrator only)

In this application, the measured values (cancelled data) for which data has been canceled are also recorded in the internal storage when measuring with navigation.
"Administrator" can "permit" the display and file output of the cancellation data.(screen 4(A))

Tip. All users (both "measurer" and "administrator") will display/output when this setting is ON.

## **4.4.** Clear other registered ID information (administrator only)

This is an operation to clear the "password" and "NFC ID number" other than the current login ID.
Press "Other measurer" on screen 4(A) and select "Select other ID" on screen 4(B).
The screen switches to screen 4(C), so tap the item you want to clear.

a) The password will be initialized to "0000", so please set the password again the next time the corresponding ID logs in.
b) The NFC ID number is clear only. so please set the NFC again the next time the corresponding ID logs in.

Tip. "ID" can only be changed by this ID owner.

| ← Users list |
| --- |
| ID (measurer, employee number, etc.) : user<br>Permission : Measurer |
| ID (measurer, employee number, etc.) : user2<br>Permission : Measurer |

screen 4(B)

| ← Setting |
| --- |
| ID (measurer, employee number, etc.)<br>user2 |
| Password<br>Clear |
| NFC ID Number<br>552B2830000104E0  Clear |
| Permission<br>Measurer |
| DELETE THIS ID |
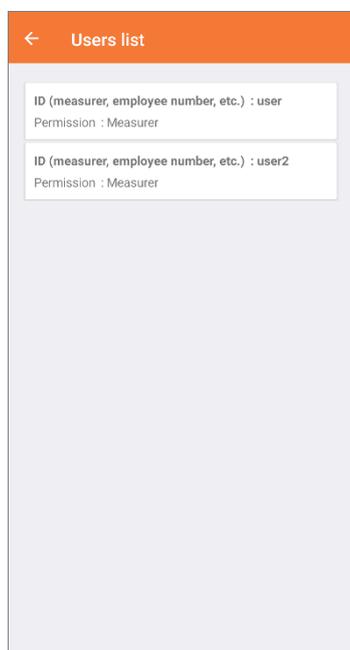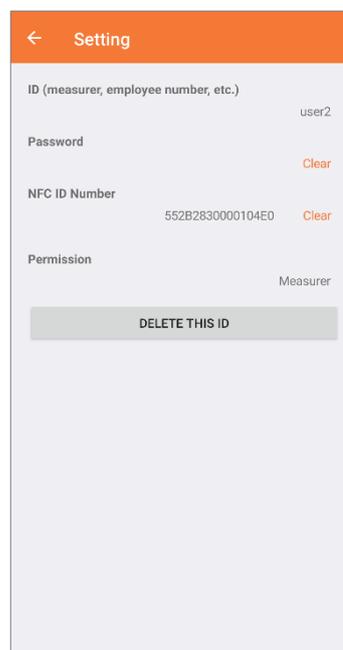
screen 4(C)

# 5. Specifications

| 項目 | 内容 |
|---|---|
| Primary specification | ・Recording of measured values<br>・Navigation of measurement<br>・Tolerance judgment (without "unit conversion function")<br>・CSV file output of measurement results<br>・File output and input of measurement navigation<br>・User authentication by NFC<br>　　- NFC Type A/B/F's card unique serial number ※<br>　　　　(Readable card type depends on the device used)<br>・Sending measurement results via cloud storage or email attachment<br>　　　　(Depends on user's operating environment) |
| Usable tools | Mitutoyo's U-WAVE-TCB/TMB connectable measuring instruments |
| Number of connected tools | The number of U-WAVE-TCB / TMB that can be connected per measurement procedure depends on the Android device. |
| Supported OS | Android™ 7.x〜　(Vertical display only) |
| Display language | Japanese, English |

※ User-written value of IC tag cannot be used

| Items | Values |
|---|---|
| Number of registered IDs per device | 5 |
| Number of registered measurement navigation files per device | 30 |
| Number of measurement pages per measurement navigation file | 100 pages |
| Recommended Picture file size | 5 MB<br>(4000 pixels<br>on the long edge) |

# **6.** Troubleshooting

■ The measured value is not displayed in the app even if the DATA button of U-WAVE is pressed
    Cause① ：The app and U-WAVE-TCB/TMB are not connected.
    Solution① ：Connect according to "3.2.log in

    Cause② ：Battery of measuring instruments/U-WAVE-TCB/TMB are empty
    Solution② ：Replace batteries.

    Cause③ ： U-WAVE-TCB/TMB are connected to another device.
    Solution③ ：Disconnect from another device that is connected to
                    or remove the battery from U-WAVE-TCB / TMB.

    Cause④ ：The receiving device is far from the transmitter, or there is an obstruction in between.
    Solution④ ：Shorten the distance between the receiving terminal and the transmitter, or remove obstacles.

■ The LED on the U-WAVE-TCB/TMB lights up in red and does not connect to the app.
    Cause ：The measuring instruments are not turned on.
    Solution ：Turn on the power of measuring instruments.

■ NFC or camera button is not displayed
    Cause① ：NFC or camera function of smartphone is not enabled.
    Solution① ：Enable NFC and camera functions.
        (Please read the instruction manual of your smartphone, because the operation differs depending on the device.)

    Cause② ：The smartphone does not have the corresponding function.
    Solution② ：The function is not available on the device.

■ Export cannot select multiple measurement navigation files at once
    It's in the specifications.
    Please export one by one.

■ Some characters such as "-" cannot be entered.
    Cause ：Software keyboard does not match this application
            With the toggle input method keyboard, characters that are not supported by this
            application are temporarily output, so the user may not be able to continue inputting.
    Solution ：Change to another software keyboard
        (Please read the instruction manual of your smartphone, because the operation differs depending on the device.)

■ File output file size becomes zero.
    Cause ：The file output operation was performed with the PC connected via USB file transfer.
    Solution ：Please try again after disconnecting from the PC.

■ The operation of the application is slow, or the screen switching is slow
  Cause：A lot of internal data of the application.
  Solution①：Delete unnecessary measurement navigation files and measurement results.
  Solution②：After backing up the necessary measurement navigation files, reinstall the app.
     Please be aware that all measurement data will be lost and cannot be returned.


■ Cannot edit the registered measurement navigation file contents.
  Cause：It's in the specifications.
     Once registered, you cannot directly rewrite it because the measurement navigation file
     and measurement result are linked.
  Solution：Use the function of re-editing as another measurement navigation file.(See "3.6
     Duplicate and edit measurement navigation file")


■ The screen display is distorted.
  Cause：Operated faster than the device was capable of.
  Solution：Please close and restart the application.


 ※ If troubleshooting cannot solve the problem, refer to the user's manual of the U-WAVE unit.

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