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U-WAVEPAK

User's Manual

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

Mitutoyo

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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).

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Conventions for Describing Software Operation

This software is used on Windows operation system.

This manual is written on the assumption that the operation of the software of Windows base is learned.

When the operation of Windows is not known well, please refer to the operation manual of Windows, such as "Microsoft Windows first step guide".

Although this manual explains the screen display and operation on Windows XP, the function and the operation method of this software are the same on every Windows.

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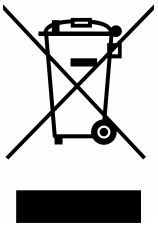

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Service Network

MEMO

1 Basic Knowledge

1.1 Overview

U-WAVE is a wireless communication system.

U-WAVEPAK is the software which supports collection of measurement data from the measuring tool connected to the U-WAVE-T to a computer.

This software has the following purposes.

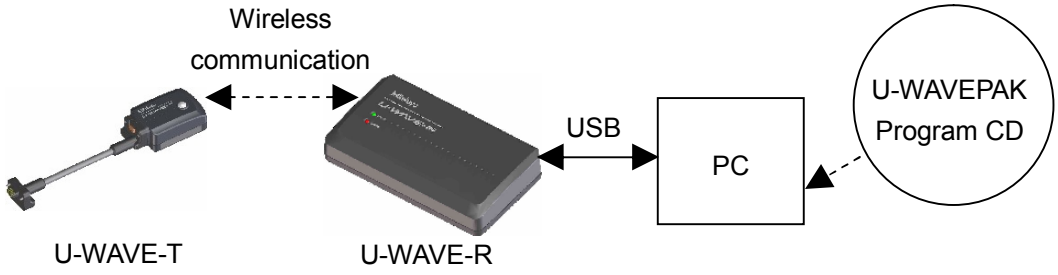
1) Setup of U-WAVE-R and U-WAVE-T

This software sets up the some information for the wireless communication between U-WAVE-R and U-WAVE-T. That information is controlled by this software.

2) Data I/F with the application software on computer

This software notifies measurement data and the status which were sent from the U-WAVE-T as keyboard emulation data to the application software (Microsoft Excel, etc.) on computer.

1.2 System configuration



1.3 Required computer specification

The specifications of the hardware and software required for this program are as follows.

<Hardware Requirements>

- Monitor's resolution is 800 x 600 (or above), color is 256 (or above)
- The free disk space on the hard disk drive above 5Mbytes
  (The minimum capacity for installation)
- CD-ROM Drive
  (It is necessary to install this program.)
- USB Ports
  (It is necessary to connect U-WAVE-R.)

NOTE ・As for the other hardware specification, it is based on the specification requirement of Operating System.

<Software Requirements>

- Operating System :
  Microsoft Windows 2000 Professional (SP4 or above)
  Microsoft Windows XP Home Edition (SP2 or above)
  Microsoft Windows XP Professional (SP2 or above)
  Microsoft Windows Vista
  Microsoft Windows 7

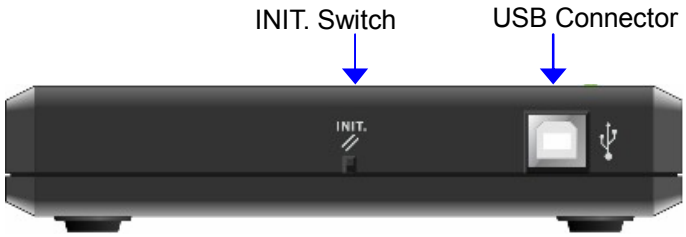
IMPORTANT ・The language of this program and the language of the Operating System must be same setting. Don't use this program on the different language OS.

・Microsoft Excel (above Excel 2000) is necessary to use 'Data Collection Macro for U-WAVE'. Install Microsoft Excel in same PC as U-WAVEPAK.

・'Data Collection Macro for U-WAVE' doesn't support Microsoft Excel of 64-Bit Edition.

1.4 Specification of U-WAVE-R

The specifications of the U-WAVE-R are as follows.

Items	Specifications
Nomenclature (Top)	
Nomenclature (Back)	
LED	Green (POWER) / Red (ERROR)
Switch	INIT. Switch
I/F with PC	USB Connector (Series-B、Female) USB 2.0 (Full-Speed)
Power supply	Bus-power by USB (It is supplied from PC via USB cable.)

IMPORTANT

- Use the 'Self-powered USB hub' when you connect the U-WAVE-R with PC via the USB hub.
- Even if the power of the U-WAVE-R is turned off, information memorized in the U-WAVE-R is preserved.

TIP

- Refer to '7.2.1 Initialization of U-WAVE-R' for Initialization of U-WAVE-R.
- Refer to 'U-WAVE-R User's Manual' for detail specification of U-WAVE-R.

The status of the U-WAVE-R and the status of LED are as follows.

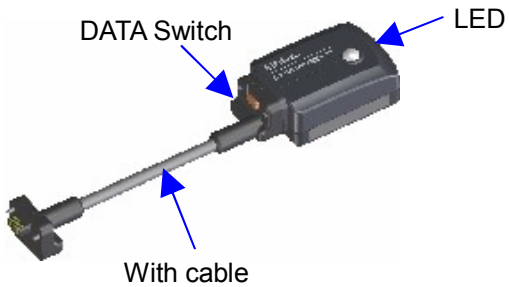
Status of LED	Status of U-WAVE-R
Green LED - ON Red LED - OFF	The power of the U-WAVE-R is turned on. The U-WAVE-R is working.
Green LED - Blinks Red LED - Blinks	(1) The U-WAVE-R is a factory default state. (2) Another U-WAVE-R to which same 'Group ID' and 'Band ID' are registered is detected.
Green LED - Blinks Red LED - OFF	The U-WAVE-R is processing 'All Band ID scan'. (The time required of 'All band ID scan' is about 10 seconds.)
Green LED - ON Red LED - Blinks	Warning! The U-WAVE-R cannot be used. (The power voltage value supplied by PC has reduced.)
Green LED - OFF Red LED - OFF	The power of the U-WAVE-R is turned off.

IMPORTANT ・LED doesn't light when the device driver is not installed.

TIP ・Refer to '2.1.2 Installation of device driver' for Installation of device driver.

1.5 Specification of U-WAVE-T

The specifications of the U-WAVE-T are as follows.

Items	Specifications
Nomenclature	IP67 type Buzzer type 
LED	Green / Red / Orange
Switch	DATA Switch
Battery	Lithium coin cell battery(CR2032) : 1piece

IMPORTANT ・Even if the battery in the U-WAVE-T empties, information memorized in the U-WAVE-T is preserved.

TIP ・Refer to '7.2.2 Initialization of U-WAVE-T' for Initialization of U-WAVE-T.
・Refer to 'U-WAVE-T User's Manual' for detail specification of U-WAVE-T.

1.6 Specification of wireless communication

TIP ・Refer to 'U-WAVE-R User's Manual' and 'U-WAVE-T User's Manual' for detail specification of wireless communication.

1.7 Technical term

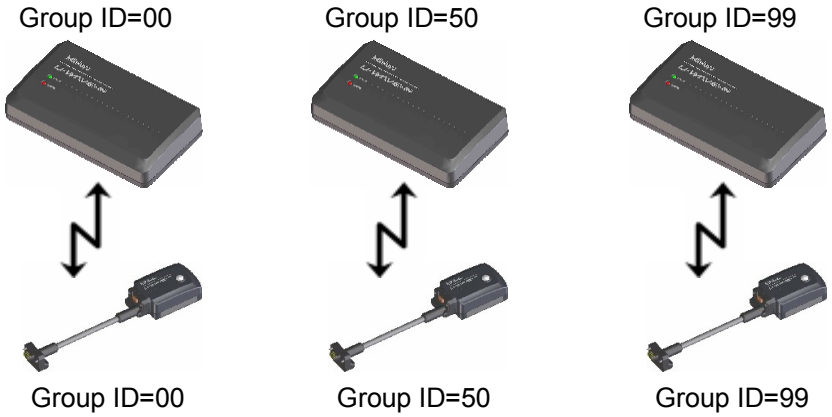
1.7.1 Group ID

It is ID to group the U-WAVE-R and U-WAVE-T.

The U-WAVE-R and U-WAVE-T which have the same group ID can communicate.

When two or more U-WAVE-R are used in a wireless area, the value of group ID of each U-WAVE-R should be different.

The values that can be selected are from 00 to 99.

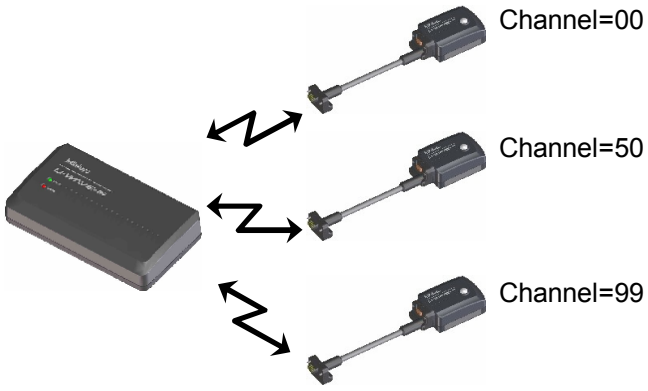


1.7.2 Channel

It is a channel that the user specifies for U-WAVE-T.

When two or more U-WAVE-T are connected with the same U-WAVE-R, the value of the channel of each U-WAVE-T should be different.

The values that can be selected are from 00 to 99.



1.7.3 Band ID

It is ID of the band that allocates it in the wireless communication between the U-WAVE-R and U-WAVE-T.

The U-WAVE-R and U-WAVE-T which have the same band ID can communicate.

The values that can be selected are from 11 to 25.

The frequencies allocated in band ID are as follows.

Band ID	Center frequency (Band width)
11	2405 MHz (2 MHz)
12	2410 MHz (2 MHz)
13	2415 MHz (2 MHz)
14	2420 MHz (2 MHz)
15	2425 MHz (2 MHz)
16	2430 MHz (2 MHz)
17	2435 MHz (2 MHz)
18	2440 MHz (2 MHz)
19	2445 MHz (2 MHz)
20	2450 MHz (2 MHz)
21	2455 MHz (2 MHz)
22	2460 MHz (2 MHz)
23	2465 MHz (2 MHz)
24	2470 MHz (2 MHz)
25	2475 MHz (2 MHz)

NOTE ・When two or more U-WAVE-R are using same band ID, a wireless communication may interfere with each other. Therefore, specify different band ID as much as possible.

1.7.4 Measurement mode

You can specify the measurement mode for each U-WAVE-T by U-WAVEPAK.

Output	Measurement mode
	Button driven
Data output from U-WAVE-T to U-WAVE-R	Push the [DATA] switch from 0 to less than 2 seconds on the U-WAVE-T or on the measuring tool, data is output. After that, LED blinks. Normal: Green LED blinking Error: Red LED blinking
Data output from U-WAVE-R to PC	When receiving data from U-WAVE-T, the U-WAVE-R outputs it to PC directly.
Cancel from U-WAVE-T	Push the [DATA] switch from 2 to less than 5 seconds on the U-WAVE-T. 'Cancel command' is output. Orange LED fast blinks (every 0.1 seconds) while pushing the [DATA] switch.
Cancel from U-WAVE-R to PC	When receiving 'Cancel command' from U-WAVE-T, the U-WAVE-R outputs it to PC directly.
U-WAVE-R scan from U-WAVE-T	Push the [DATA] switch from 5 to less than 10 seconds on the U-WAVE-T. 'U-WAVE-R scan' is executed. Orange LED slow blinks (every 0.3 seconds) while pushing the [DATA] switch.
Error notification from U-WAVE-R to PC	The U-WAVE-R outputs status to PC.

NOTE ·When the U-WAVE-T is a factory default state, 'U-WAVE-R scan' is executed by pushing the [DATA] switch on the U-WAVE-T. And, orange LED slow blinks (every 0.3 seconds) while pushing the [DATA] switch.

1.7.5 Device ID

ID number assigned each U-WAVE-R or U-WAVE-T.

It is factory configuration. It's read-only data for users.

The value of device ID is printed on each U-WAVE-R and U-WAVE-T.

Ranges of this value are from 0000000000 to 1999999999.

1.7.6 All band ID scan

When 'All band ID scan' is executed, the noise level to all band ID (11-25) are investigated in the place where the U-WAVE-R is used.

The values of noise level from 0 to 255.

If the value of noise level is 255, the noise level is an indetermination.

The wireless communication condition of band ID with small noise level is good.

The wireless communication condition of band ID with large noise level is no good.

Therefore, use band ID with small noise level.

NOTE ・The time required of 'All band ID scan' is about 10 seconds.

・When the U-WAVE-R is initialized, 'All band ID scan' is executed.
And, band ID with most small noise level is adopted as a default value.

・When wireless LAN is used near the U-WAVE-R, the noise level might be large.

1.7.7 Data lack check level

There is a sequence number in the Measurement data between U-WAVE-T and U-WAVE-R.

Every time the U-WAVE-T send a measurement data, it increments sequence number.

The U-WAVE-R always checks the sequence number.

When the next formula is met, the U-WAVE-R outputs the status to notice the warning.

The number of measurement data omission > (9 - L)

Where L = the value of 'Data lack check level'

The values that can be selected are from 0 to 9.

1.7.8 U-WAVE-R scan

'U-WAVE-R scan' is executed by pushing [DATA] switch from 5 to less than 10 seconds on the U-WAVE-T.

The U-WAVE-T searches for the U-WAVE-R that registers own device ID by using 'U-WAVE-R scan'.

If the U-WAVE-R that registers device ID of the U-WAVE-T is found, the U-WAVE-T and the U-WAVE-R are automatically connected.

IMPORTANT ・'U-WAVE-R scan' consumes the battery on the U-WAVE-T.
Therefore, execute it only when it is necessary.

2 Installation

2.1 Installation of program and device driver

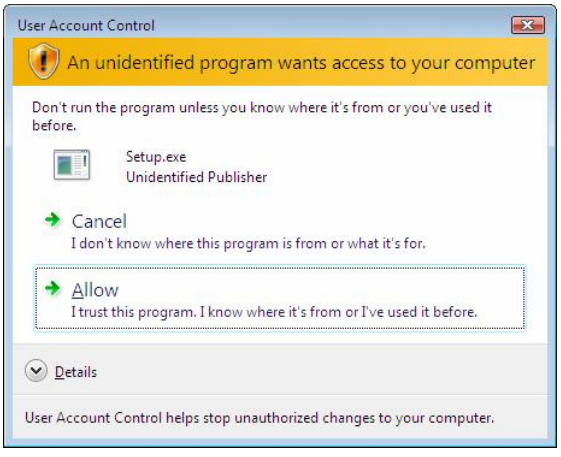
2.1.1 Installation of program

IMPORTANT ・Log in to Windows by 'Administrator'.

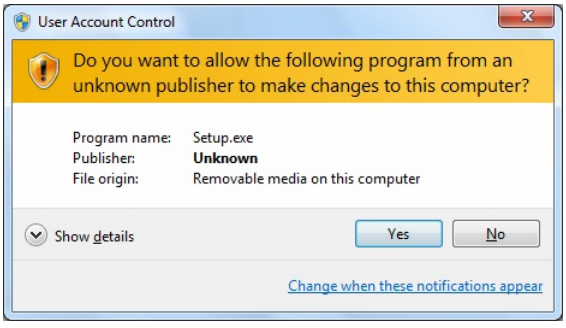
・Do not connect the U-WAVE-R with PC until the operation of 10) is completed.

1) Insert the program CD of U-WAVEPAK in CD drive of PC.

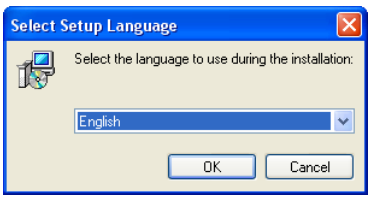
2) Run 'Setup.exe' in 'Setup' folder on CD by Windows Explorer etc.
Select [Allow] when the following dialog is displayed while using Windows Vista.



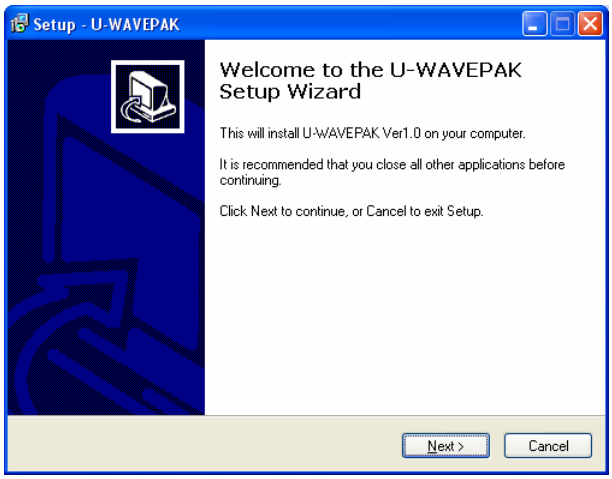
Select [Yes] when the following dialog is displayed while using Windows 7.



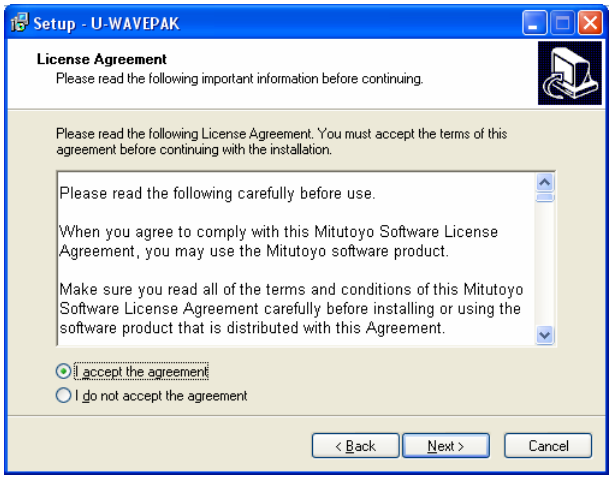
3) Select language and click the [OK] button.



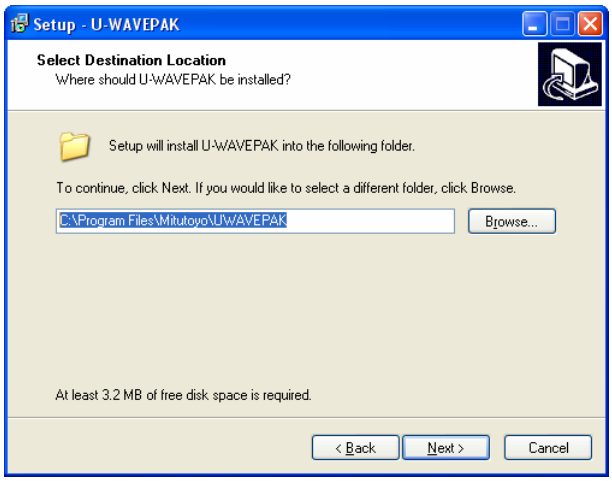
4) Click [Next] button, when the following dialog is displayed.



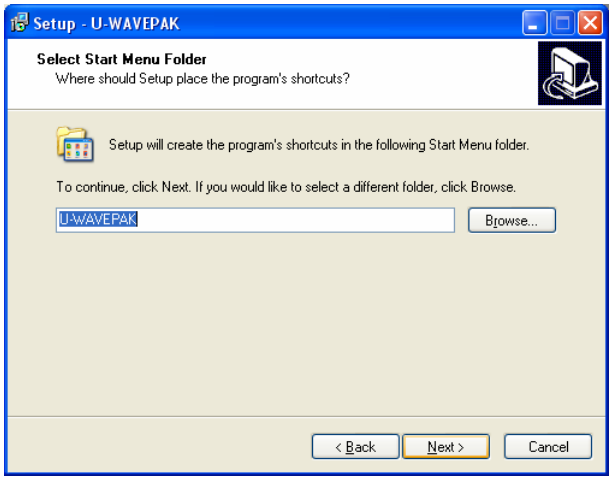
5) When the following dialog is displayed, select [I accept the agreement] and click [Next] button.



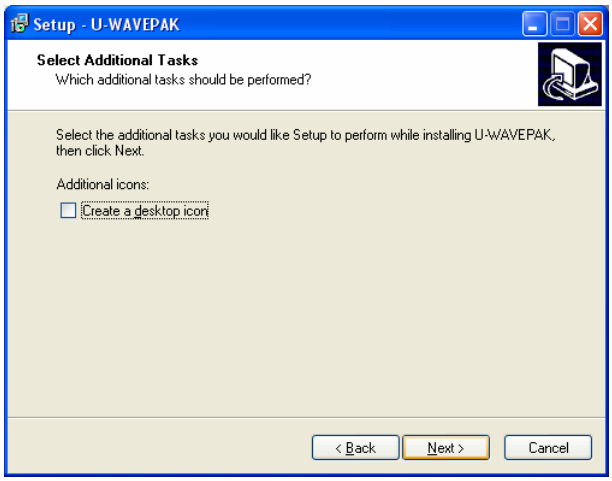
6) Click [Next] button, when the following dialog is displayed.
The folder is different depending on the kind of Windows.



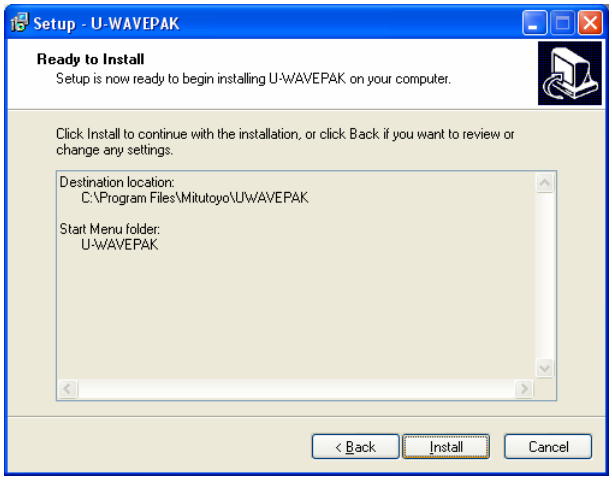
7) Click [Next] button, when the following dialog is displayed.



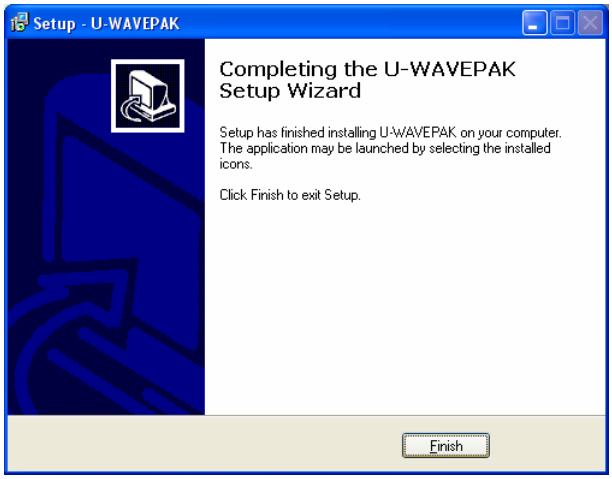
8) Click [Next] button, when the following dialog is displayed.



9) Click [Install] button, when the following dialog is displayed.



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



2.1.2 Installation of device driver

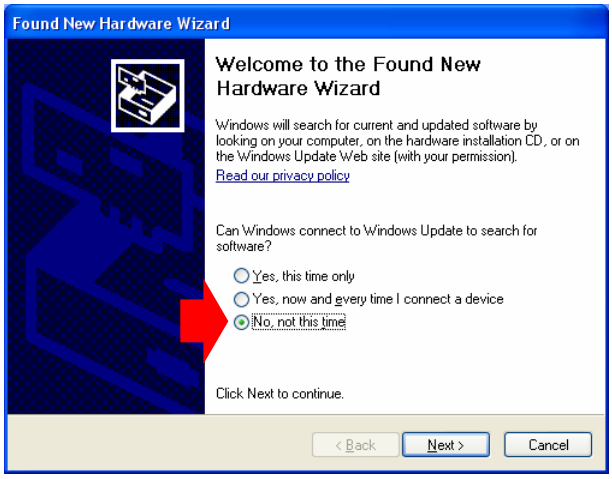
[In case of Windows XP]

IMPORTANT ・Log in to Windows by 'Administrator'.

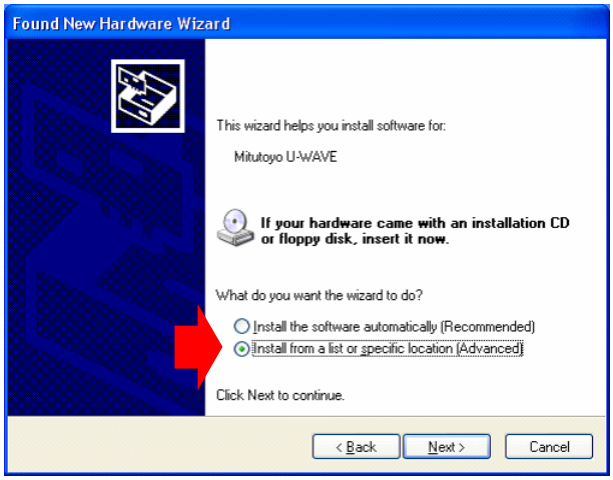
1) Connect a U-WAVE-R to the USB port of PC.

2) If Windows detects a U-WAVE-R, the following dialog is displayed automatically.

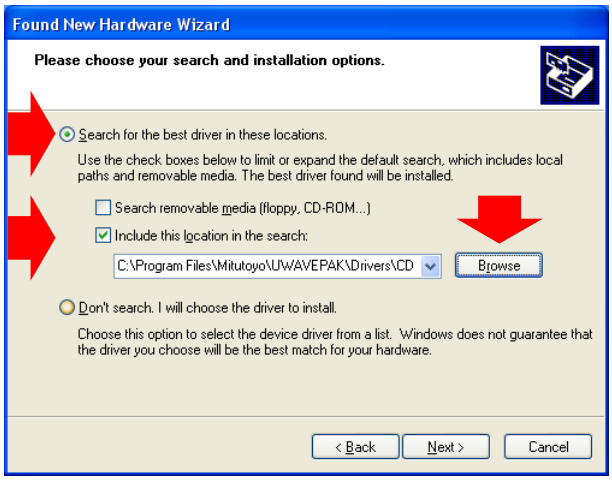
Select the following radio button and click [Next] button.



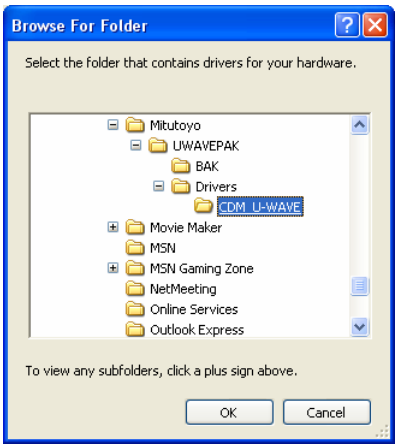
3) Select the following radio button and click [Next] button.



4) Select the following radio button and check box. And, click [Browse] button.



5) In the following dialog, specify the driver to install.



Specify [\Drivers\CDM_U-WAVE\] folder in CD or an installation folder.

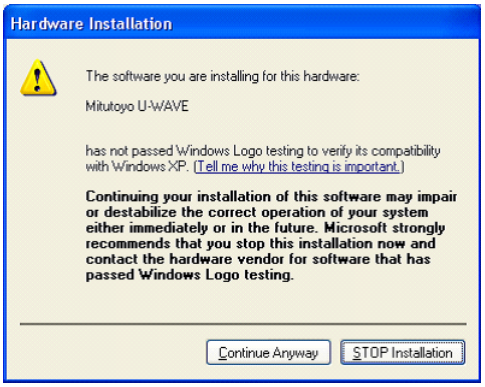
Click the [OK] button after specifying the driver. And click the [Next] button in the dialog of 4).

IMPORTANT

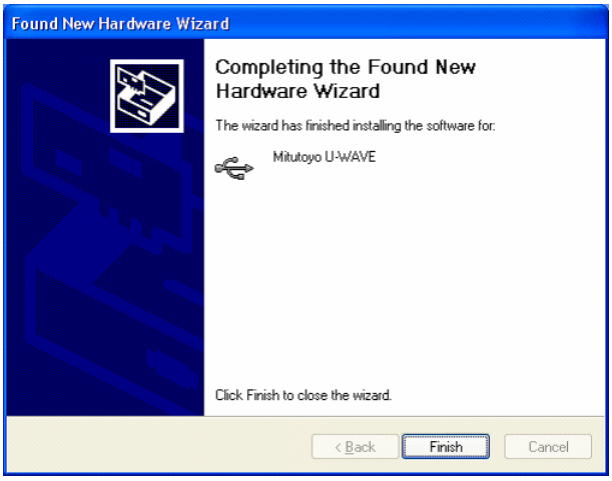
・Two kinds of following drivers are automatically installed.
(1) Driver for VCP (Virtual COM port)
(2) Driver for direct USB
When starting, U-WAVEPAK can select either driver.

・Please use the driver supported by the application software if you connect the U-WAVE-R with the application software other than U-WAVEPAK.
It is necessary to include special DLL (FTD2XX.lib) into the application software to use the driver for direct USB.
It is necessary to specify the RS-232C communication parameters in the application software as follows to use the driver for VCP.
(1) Baud rate = 57600bps
(2) Parity = None
(3) Data bits = 8bits
(4) Stop bits = 1bit
(5) Flow control = RTS/CTS

6) Click [Continue Anyway] button in the following dialog.



7) Click [Finish] button in the following dialog.



The dialog of 2) is displayed again. Therefore, re-operate from 2) to 7).

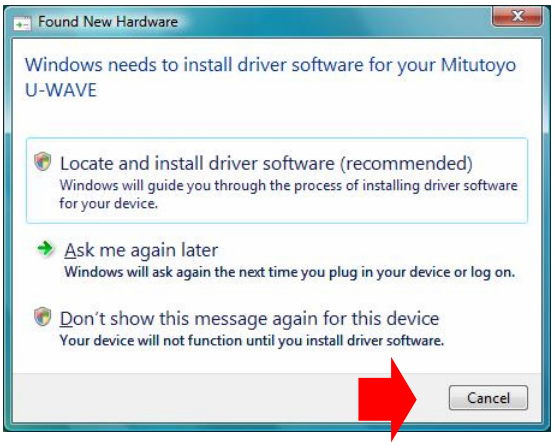
IMPORTANT ·When two or more U-WAVE-R are connected with PC, it is necessary to install the driver for connected all U-WAVE-R.

[In case of Windows Vista or Windows 7]

IMPORTANT ・Log in to Windows by 'Administrator'.

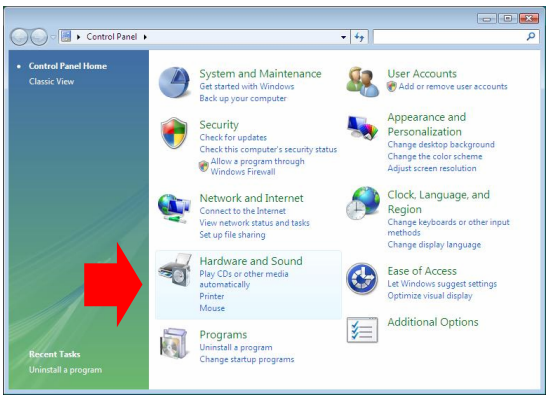
1) Connect a U-WAVE-R to the USB port of PC.

2) Select [Cancel] when the following dialog is displayed while using Windows Vista.

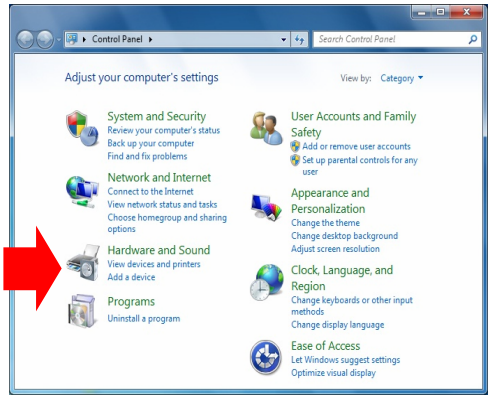


3) Open [Control panel]-[Hardware and Sound] of Windows.

<Windows Vista>

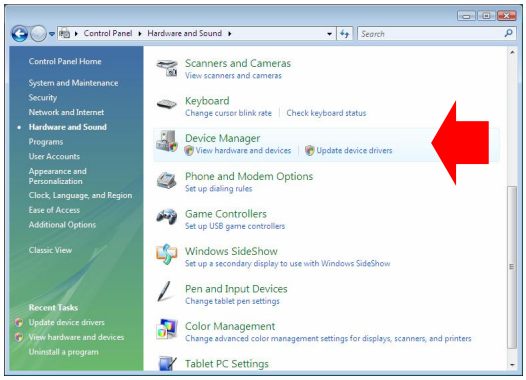


<Windows 7>

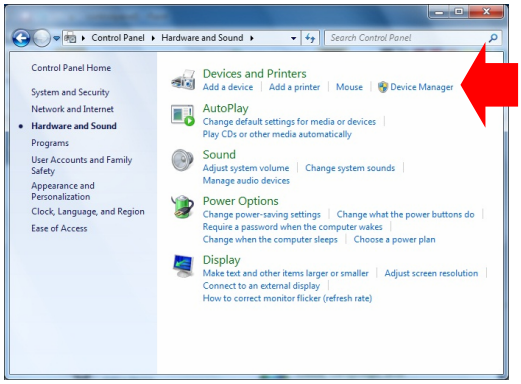


4) Open [Hardware and Sound]-[Device Manager] of Windows.

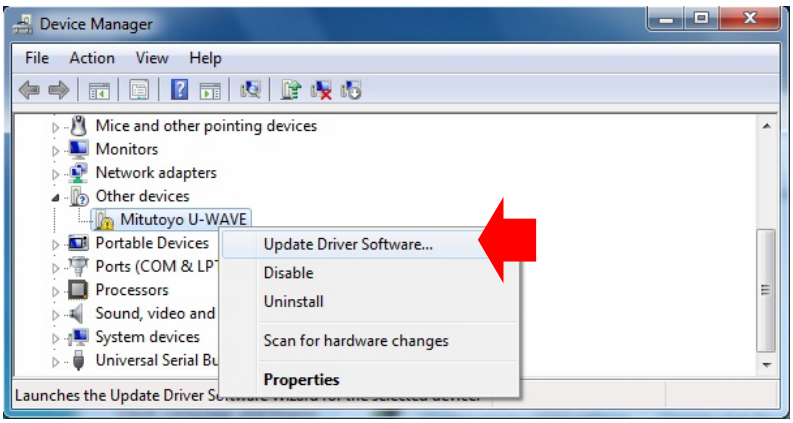
<Windows Vista>



<Windows 7>

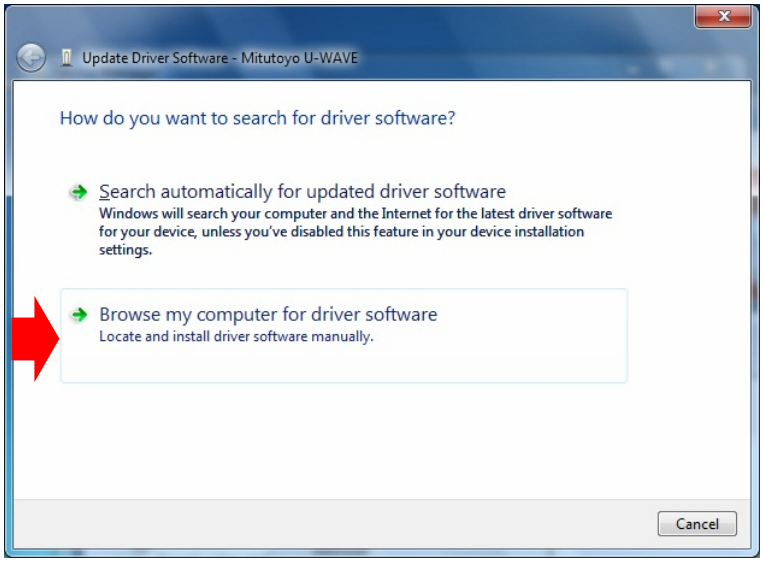


5) Click [Other devices].
Point the cursor to [Mitutoyo U-WAVE].
Right-click in the mouse and select [Update Driver Software].

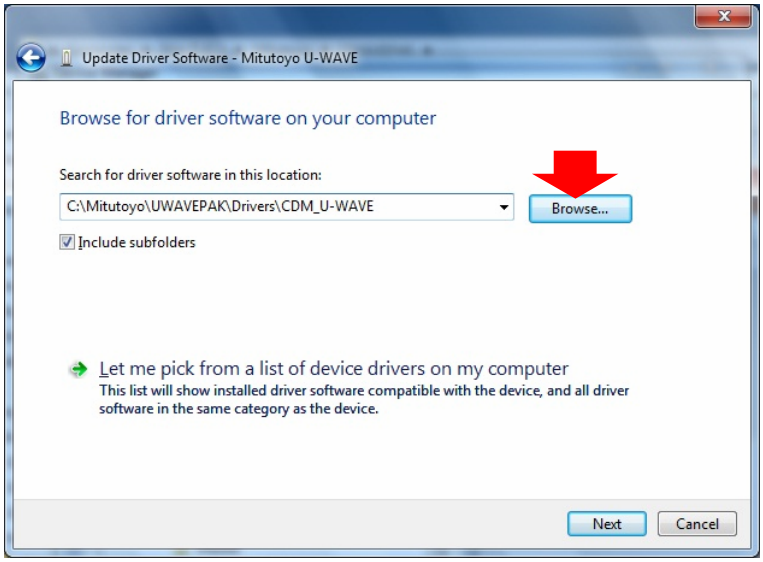


If [Mitutoyo U-WAVE] or [USB Serial Port] is not displayed in [Other devices], the device driver has already been installed. Therefore, close [Device Manager] and end the installation of the device driver.

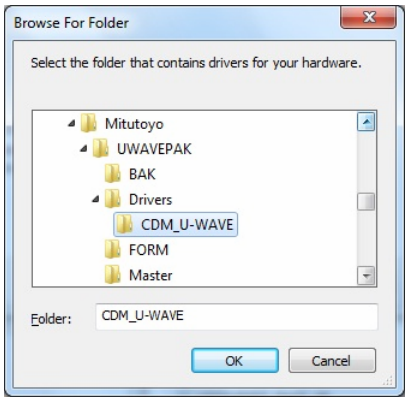
6) Select the following item.



7) Click [Browse] button.



8) In the following dialog, specify the driver to install.



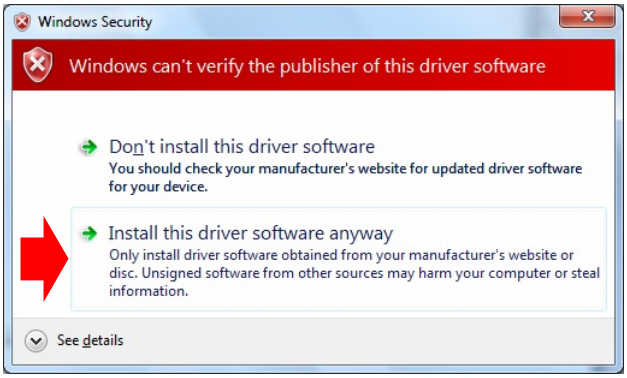
Specify [\Drivers\CDM_U-WAVE\] folder in CD or an installation folder.

Click the [OK] button after specifying the driver. And click the [Next] button in the dialog of 7).

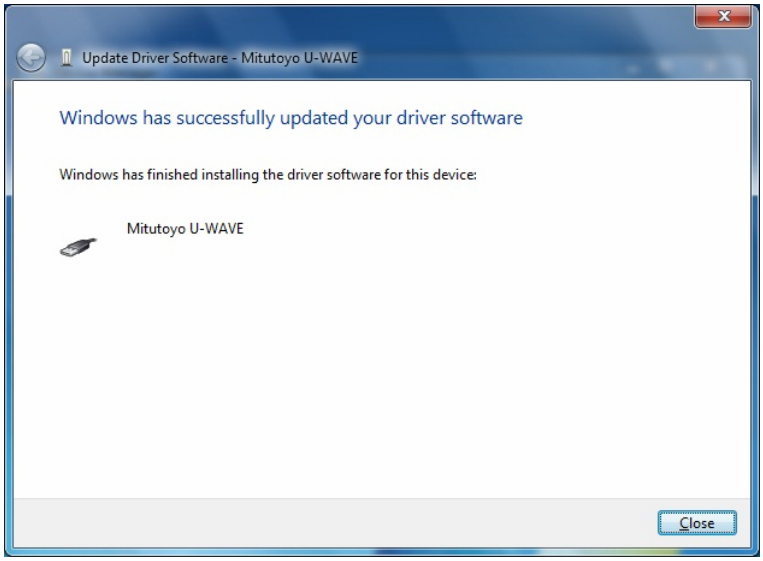
IMPORTANT

- Two kinds of following drivers are automatically installed.
  (1) Driver for VCP (Virtual COM port)
  (2) Driver for direct USB
  When starting, U-WAVEPAK can select either driver.
- Please use the driver supported by the application software if you connect the U-WAVE-R with the application software other than U-WAVEPAK.
  It is necessary to include special DLL (FTD2XX.lib) into the application software to use the driver for direct USB.
  It is necessary to specify the RS-232C communication parameters in the application software as follows to use the driver for VCP.
  (1) Baud rate = 57600bps
  (2) Parity = None
  (3) Data bits = 8bits
  (4) Stop bits = 1bit
  (5) Flow control = RTS/CTS

9) Select the following item.



10) Click [Close] button in the following dialog.



11) The dialog of 5) is displayed again.
Click [Other devices]. Point the cursor to [USB Serial Port].
Right-click in the mouse and select [Update Driver Software].
Therefore, re-operate from 6) to 10).

IMPORTANT ·When two or more U-WAVE-R are connected with PC, it is necessary to install the driver for connected all U-WAVE-R.

[In case of Windows 2000]

IMPORTANT ・Log in to Windows by 'Administrator'.

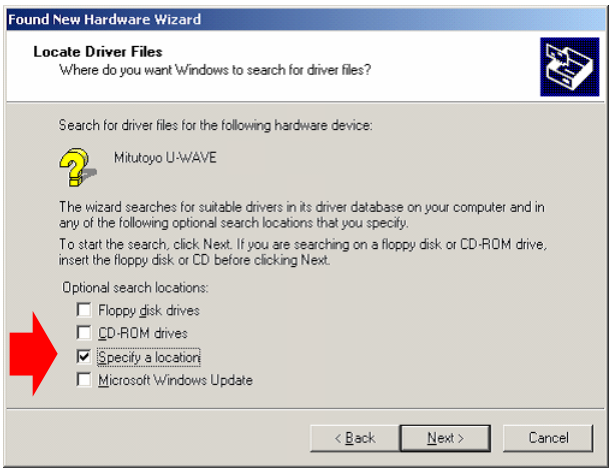
1) Connect a U-WAVE-R to the USB port of PC.

2) If Windows detects a U-WAVE-R, the following dialog is displayed automatically.

   Click [Next] button.

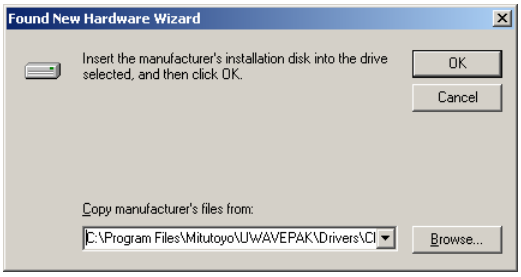
3) Select the following radio button and click [Next] button.

4) Select the following check box. And, click [Next] button.



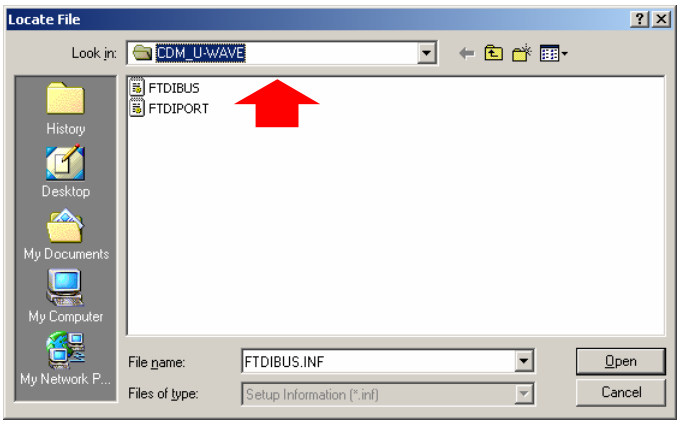
5) In the following dialog, specify the driver to install.

Click [Browse] button.



6) Specify the driver to install by [Look in] in the following dialog.

Specify [\Drivers\CDM_U-WAVE\] folder in CD or an installation folder.

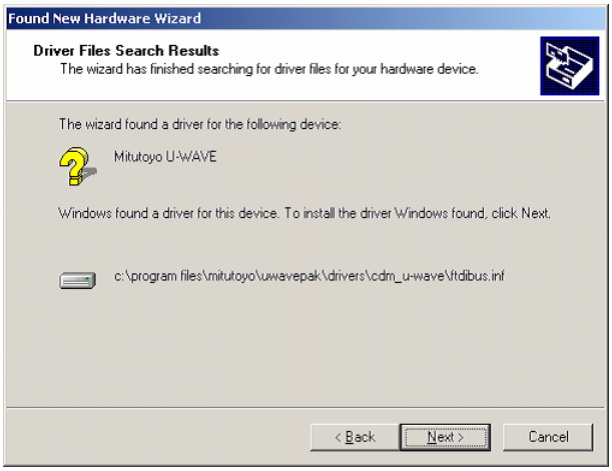


Click the [Open] button after specifying the driver. And click the [OK] button in the dialog of 5).

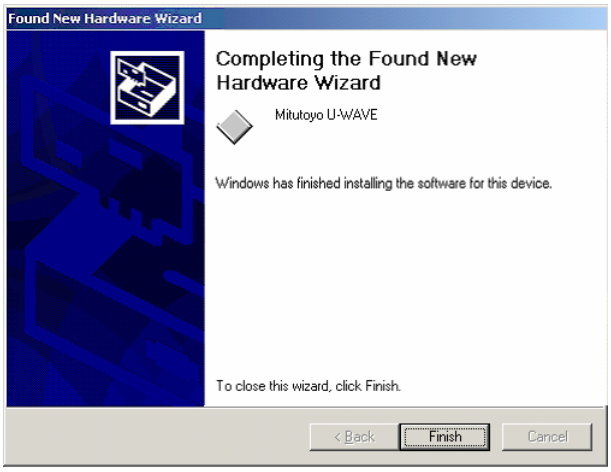
IMPORTANT ・Two kinds of following drivers are automatically installed.
(1) Driver for VCP (Virtual COM port)
(2) Driver for direct USB
When starting, U-WAVEPAK can select either driver.

・Please use the driver supported by the application software if you connect the U-WAVE-R with the application software other than U-WAVEPAK.
It is necessary to include special DLL (FTD2XX.lib) into the application software to use the driver for direct USB.
It is necessary to specify the RS-232C communication parameters in the application software as follows to use the driver for VCP.
(1) Baud rate = 57600bps
(2) Parity = None
(3) Data bits = 8bits
(4) Stop bits = 1bit
(5) Flow control = RTS/CTS

7) Click [Next] button in the following dialog.



8) Click [Finish] button in the following dialog.



PC might have to be restarted.

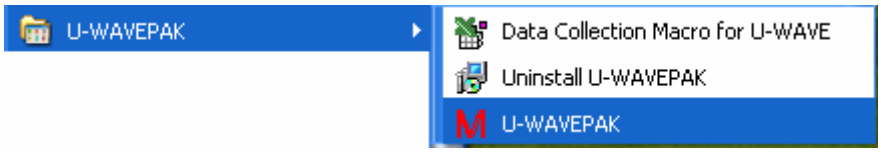
The dialog of 2) is displayed again. Therefore, re-operate from 2) to 8).

IMPORTANT ・When two or more U-WAVE-R are connected with PC, it is necessary to install the driver for connected all U-WAVE-R.

2.2 Starting of program

2.2.1 Starting of U-WAVEPAK

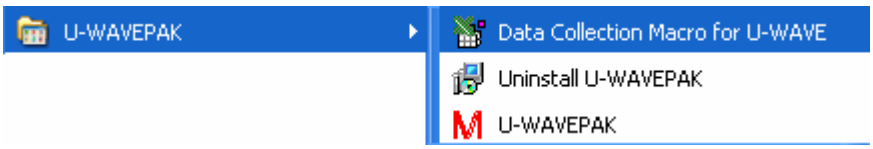
1) Click [U-WAVEPAK] with the program menu of Windows.



IMPORTANT
- Log in to Windows by 'Power users' or above.
- Start this program after connecting U-WAVE-R to the USB port on PC.

2.2.2 Starting of Data Collection Macro for U-WAVE

1) Click [Data Collection Macro for U-WAVE] with the program menu of Windows.



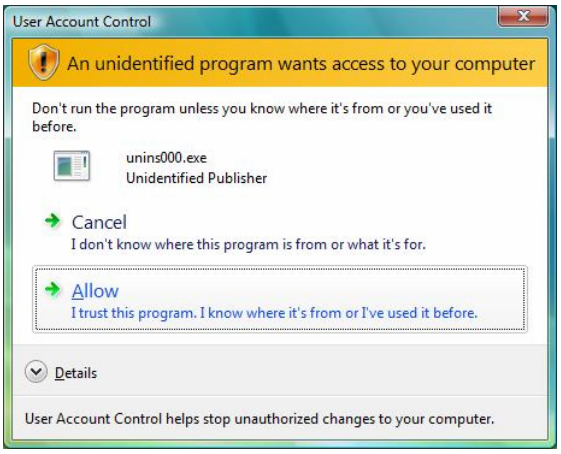
IMPORTANT
- Log in to Windows by 'Power users' or above.
- Microsoft Excel (above Excel 2000) is necessary to use 'Data Collection Macro for U-WAVE'. Install Microsoft Excel in same PC as U-WAVEPAK.
- 'Data Collection Macro for U-WAVE' doesn't support Microsoft Excel of 64-Bit Edition.

2.3 Un-installation of program

1) Click [Uninstall U-WAVEPAK] with the program menu of Windows.

IMPORTANT ・Log in to Windows by 'Administrator'.

2) Select [Allow] when the following dialog is displayed while using Windows Vista.



Select [Yes] when the following dialog is displayed while using Windows 7.

2.4 Un-installation of device driver

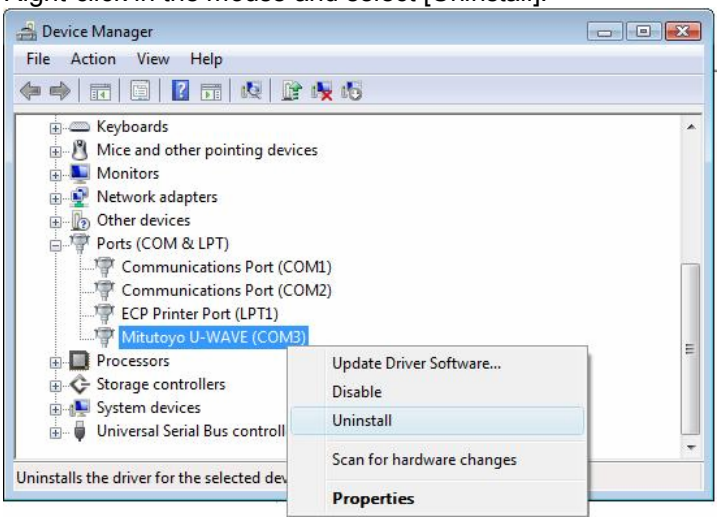
IMPORTANT ・Log in to Windows by 'Administrator'.

・Two kinds of following drivers are un-installed by this operation.
(1) Driver for VCP (Virtual COM port)
(2) Driver for direct USB

1) Connect a U-WAVE-R to the USB port of PC.

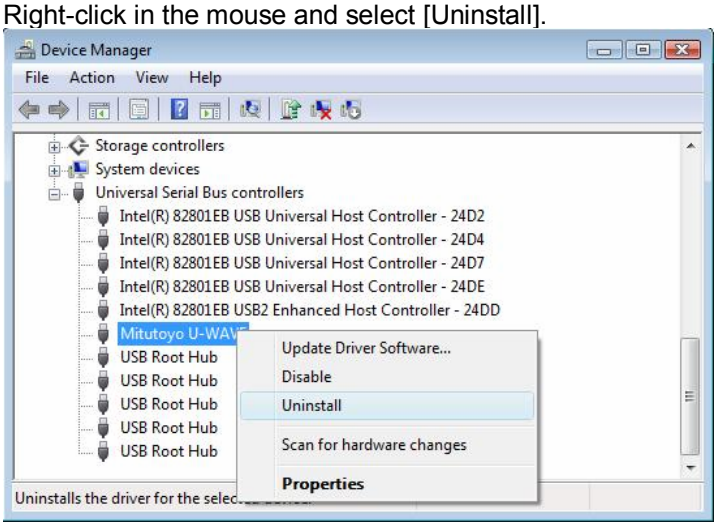
2) Open [Control panel]-[Device Manager] of Windows.

3) Click [Ports (COM & LPT)].
Point the cursor to [Mitutoyo U-WAVE(COM?)].
('?' means an arbitrary number. For example, '3'.)
Right-click in the mouse and select [Uninstall].



4) Check [Delete the driver software for this device] and click [OK] button in the following dialog.

5) Next, click [Universal Serial Bus controllers].
Point the cursor to [Mitutoyo U-WAVE].
Right-click in the mouse and select [Uninstall].



6) Check [Delete the driver software for this device] and click [OK] button in the following dialog.

7) The un-installation of device driver was completed.
Pull out U-WAVE-R from the USB port of PC.

MEMO

3 Menu

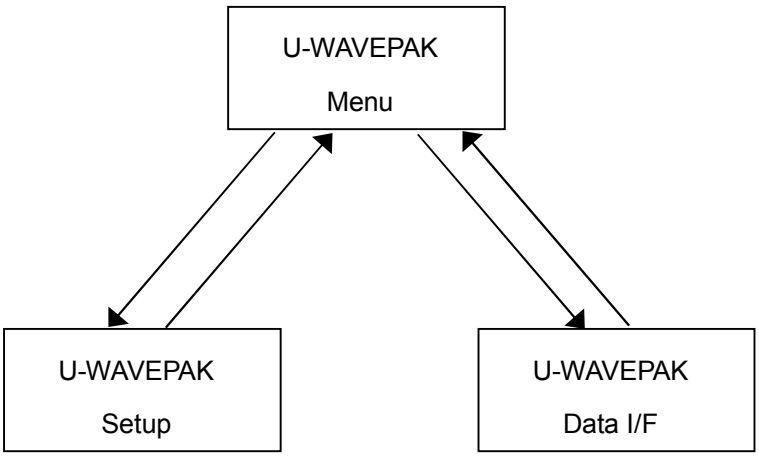
3.1 Menu

3.1.1 Start of menu dialog

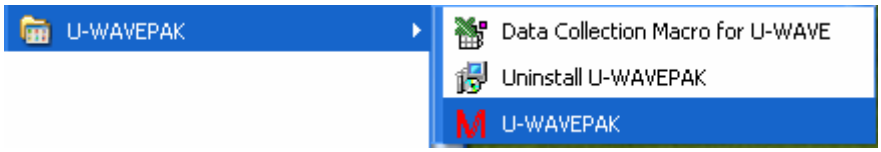
IMPORTANT ・Start this program after connecting U-WAVE-R to the USB port on PC.

・Do not pull out the USB cable during program execution.

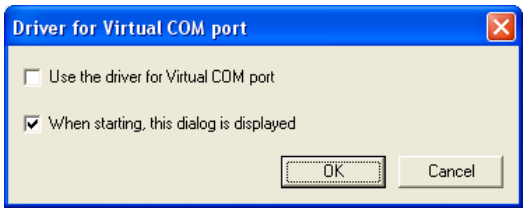
U-WAVEPAK can switch between [Setup] function and [Data I/F] function via the menu dialog.



1) Click [U-WAVEPAK] with the program menu of Windows.



2) To specify the driver, the following dialog is displayed.



If the [Use the driver for Virtual COM port] check box is turning off, the driver for direct USB is used.

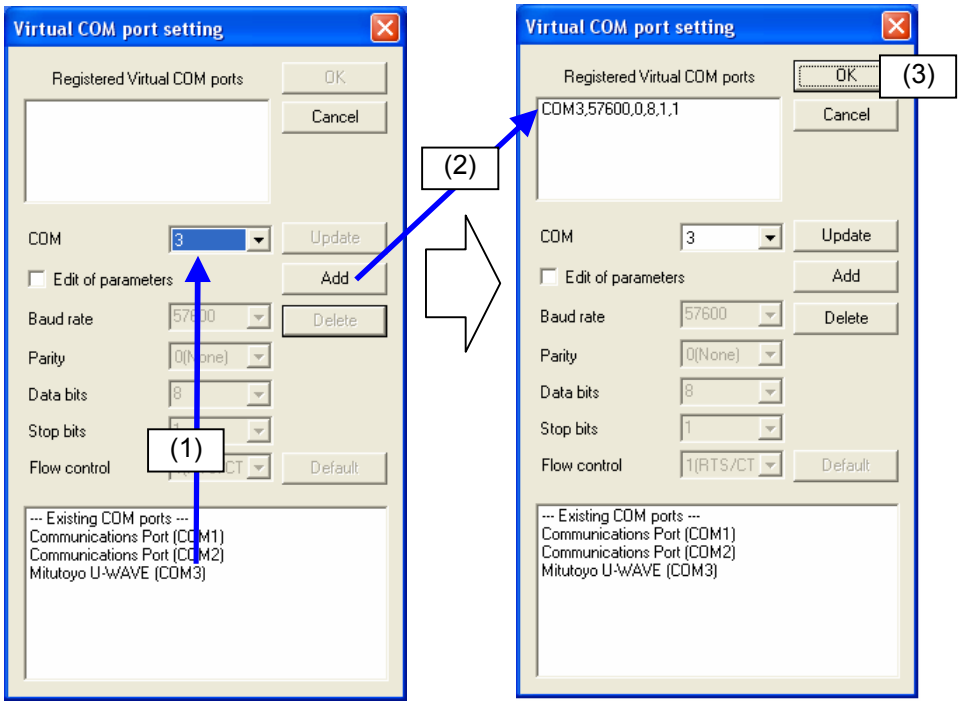
If the [Use the driver for Virtual COM port] check box is turning on, the driver for VCP is used.

If you do not want to display this dialog at the next start, turn off the [When starting, this dialog displayed] check box.

Click the [OK] button to decide the state of the check box on this dialog.

These settings are memorized to the system.

3) When the driver for VCP is used, the following dialog is displayed. When the driver for direct USB is used, this dialog is not displayed.



Execute the following operations if nothing is displayed in the [Registered Virtual COM ports] list.

(1) Select the [COM] list box at the center of the dialog referring to the number of 'Mitutoyo U-WAVE (COM?)' in the [Existing COM ports] list. (For example, '3')

The number of '?' is automatically decided by the USB port where the U-WAVE-R is connected. ('3' might not be actually displayed.)

(2) Click the [Add] button after selecting the COM port number. Virtual COM port for U-WAVE-R is added to the [Registered Virtual COM ports] list.

(3) Click the [OK] button. When start next time, the operations of (1) and (2) are unnecessary because the contents of [Registered Virtual COM ports] are registered.

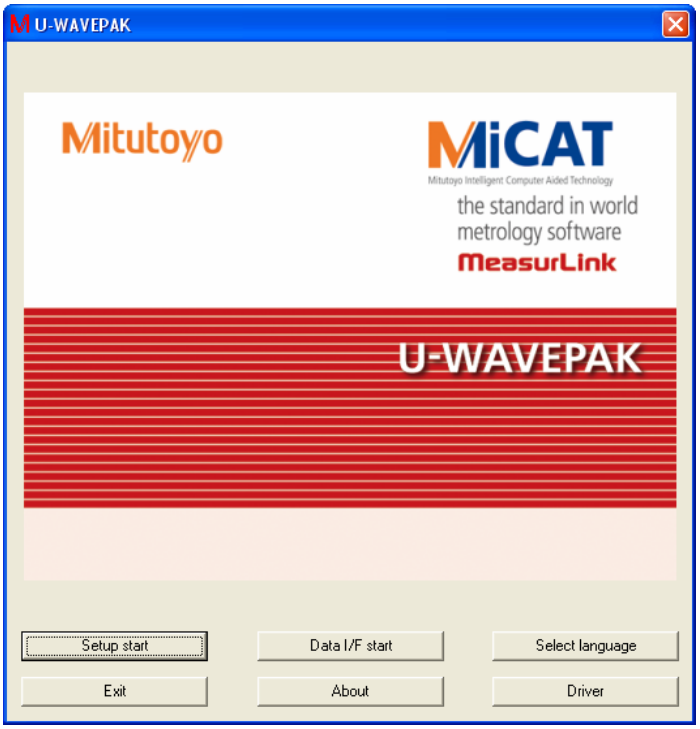
Repeat the operation of (1) and (2) when two or more U-WAVE-R are connected.

If the number of the same Virtual COM port has already been registered, the operations of (1) and (2) are unnecessary.

Click the [Update] button after correcting the number of the [COM] list box if the COM port number displayed in the [Registered Virtual COM ports] list is different from the COM port number in the [Existing COM ports] list.

The content of the [Registered Virtual COM ports] can be deleted by clicking the [Delete] button.

4) The following menu dialog is displayed.



Click the [Setup start] button in this dialog when you setup the U-WAVE-R and U-WAVE-T.

Click the [Data I/F start] button in this dialog when you collect the data from the measuring tool connected with U-WAVE-T.

Click the [Select language] button of this dialog when you select the language of U-WAVEPAK.

Click the [Exit] button in this dialog when you exit U-WAVEPAK.

Click the [About] button of this dialog when you confirm version information for U-WAVEPAK.

Click the [Driver] button of this dialog when you display the dialog for the driver.

NOTE

- Click the [Setup start] button to setup the U-WAVE-R and U-WAVE-T when the U-WAVE-R and U-WAVE-T are the factory default state. When start next time, the U-WAVE-R and U-WAVE-T need not be setup again because the setting contents are registered in the U-WAVE-R and U-WAVE-T.
- Click the [Setup start] button when you change the contents of the setting for registered U-WAVE-R and U-WAVE-T.

IMPORTANT

- When the U-WAVE-R and U-WAVE-T are the factory default state, data cannot be collected from the measuring tool.

3.1.2 Operation to start 'U-WAVEPAK Setup' directly

Execute the following operation if you want to start 'U-WAVEPAK Setup' directly.

1) Start the Windows Explorer.
2) Double-click 'UWAVESET.EXE' in the folder that installs U-WAVEPAK in Windows Explorer.

3.1.3 Operation to start 'U-WAVEPAK Data I/F' directly

Execute the following operation if you want to start 'U-WAVEPAK Data I/F' directly.

1) Start the Windows Explorer.
2) Double-click 'UWAVEMES.EXE' in the folder that installs U-WAVEPAK in Windows Explorer.

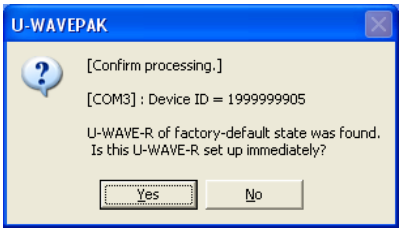
MEMO

4 Setup

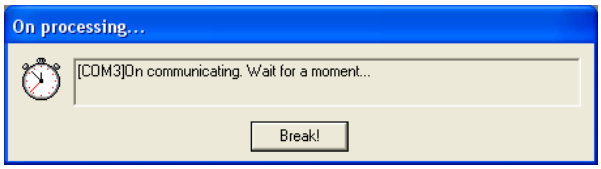
4.1 Setup for U-WAVE of factory default state

4.1.1 New registration of U-WAVE-R

1) Click [Setup start] button in the menu dialog. If the connected U-WAVE-R is a factory default state, the following dialog is displayed.



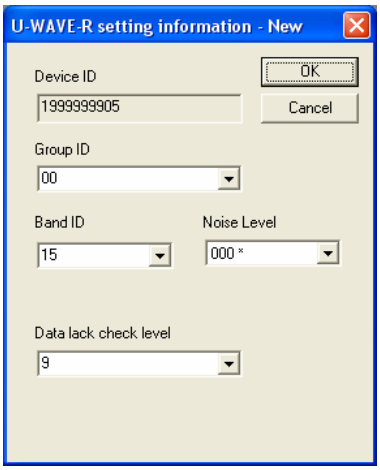
2) Display the following dialog by clicking [Yes] button.



This dialog will be displayed for about 15 seconds.

IMPORTANT
- [On processing] dialog doesn't close indefinitely when the trouble of the communication occurs. In that case, discontinue communicating clicking [Break] button.
- The following matters are considered as a cause of the communication trouble.
  (1) Disconnection of USB cable
  (2) Illegal setting of Virtual COM port
  (3) Breakdown of U-WAVE-R

3) When the communication is completed, the following dialog is displayed.

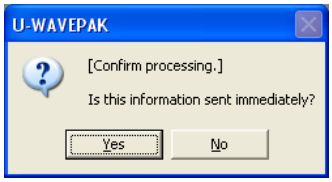


4) Select appropriate [Group ID] and [Band ID]. And, click [OK] button.

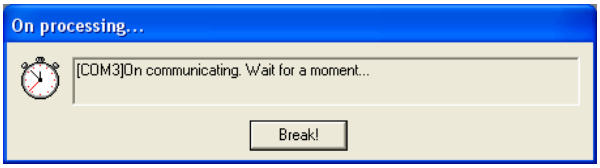
IMPORTANT

- Specify a different value for [Group ID] of each U-WAVE-R when you use two or more U-WAVE-R in wireless area.
- Some troubles occur in a wireless communication when two or more U-WAVE-R with same 'Group ID' exist in wireless area.

5) Click [Yes] button when the following dialog is displayed.



6) The following dialog is displayed while communicating information.

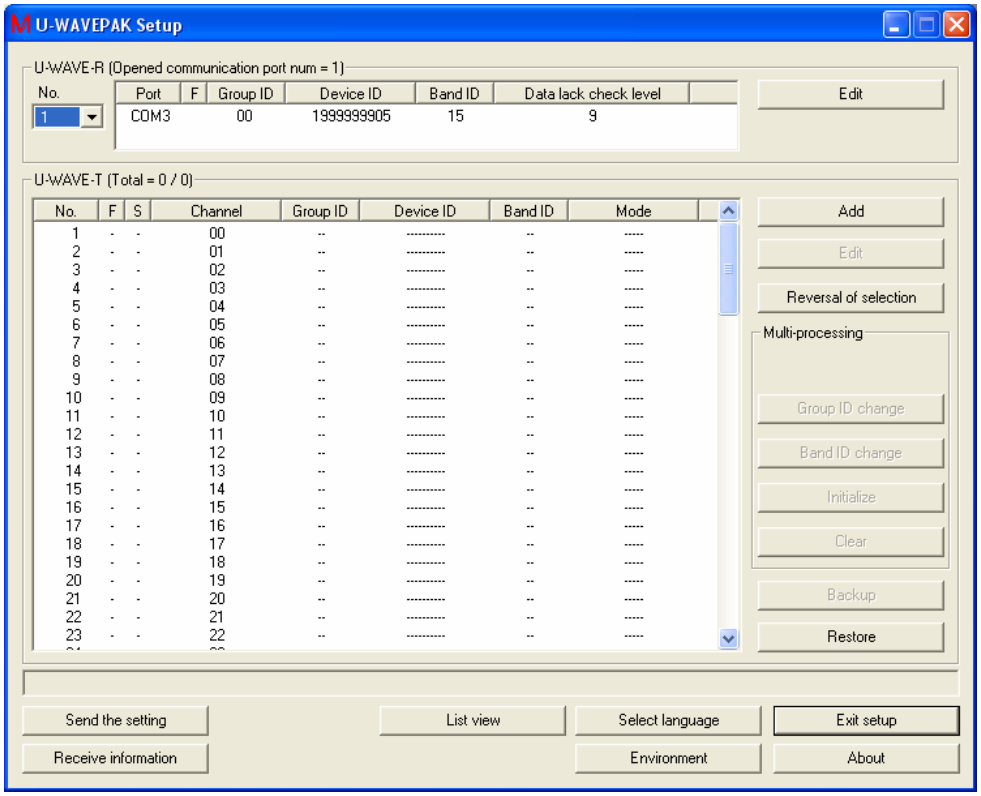


This dialog will be displayed for about 15 seconds.

NOTE

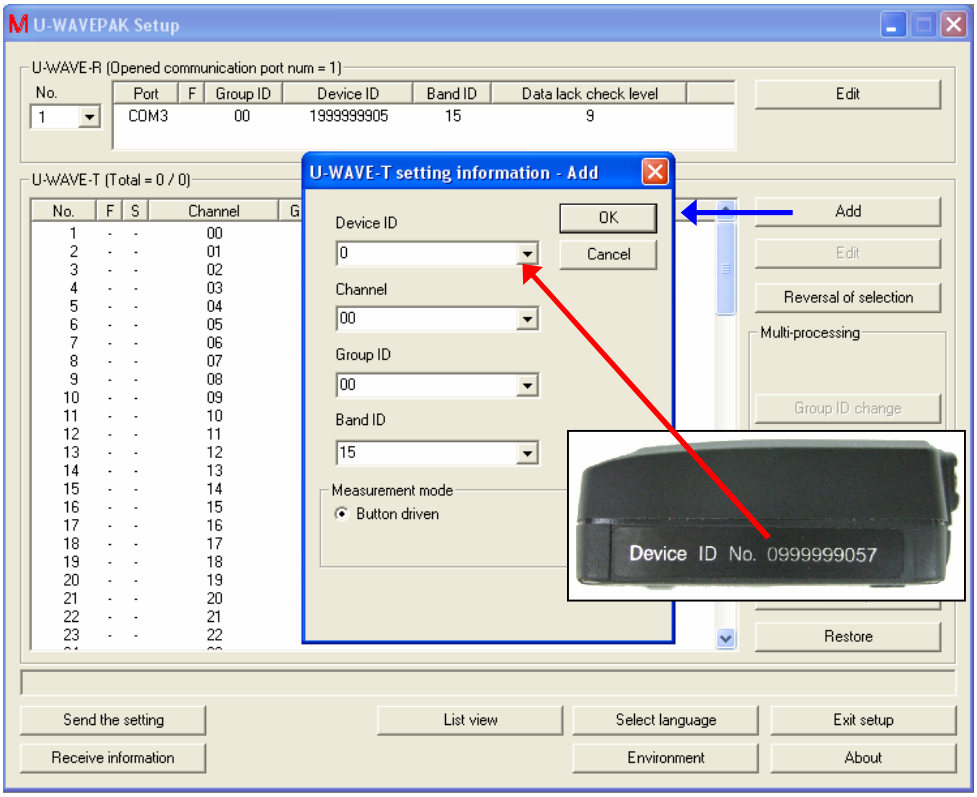
- If two or more U-WAVE-R are connected, the operation from 1) to 6) is repeated.

7) When the communication is completed, the following dialog is displayed.



4.1.2 Addition of U-WAVE-T

1) Click [Add] button on the following dialog to add U-WAVE-T. After that, [U-WAVE-T setting information - Add] dialog is displayed.



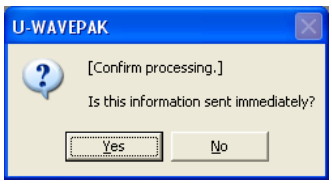
Specify the following values on [U-WAVE-T setting information - Add] dialog.

(1) Input the value of device ID printed on U-WAVE-T to [Device ID].
Device ID is an identification value of each U-WAVE-T.

(2) Select [Channel] registered to the U-WAVE-T.
The range of the selection is 00-99.

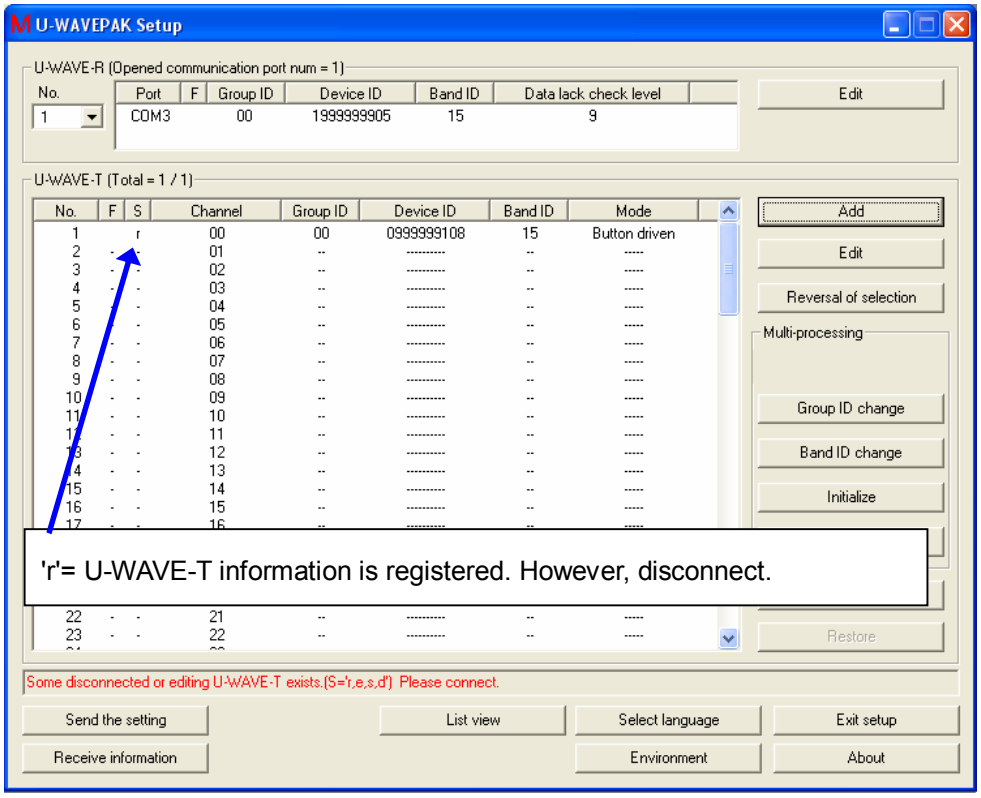
(3) Select the same value as the U-WAVE-R about the value of [Group ID] and [Band ID].

When [OK] button is clicked, the following screen is displayed. And, click [Yes] button.



The setting of U-WAVE-T is sent to the U-WAVE-R at once.

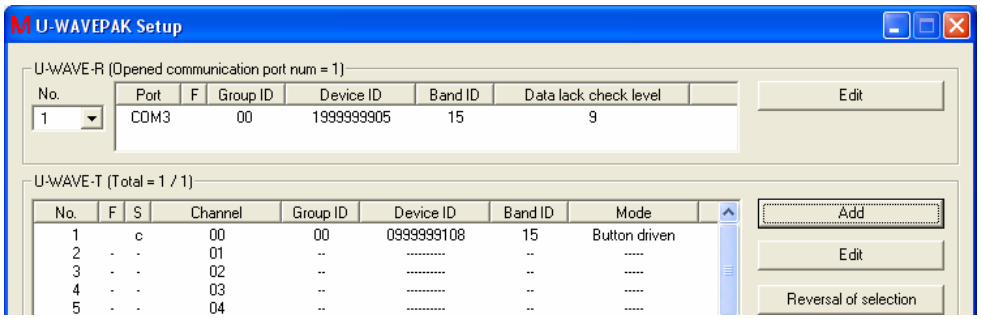
2) When information for U-WAVE-T is registered to U-WAVE-R, the following dialog is displayed.



In this state, the communication by the wireless between the U-WAVE-R and the U-WAVE-T is not connected. Therefore, push an orange [DATA] switch on the U-WAVE-T once (about 1 sec) to connect a wireless communication.

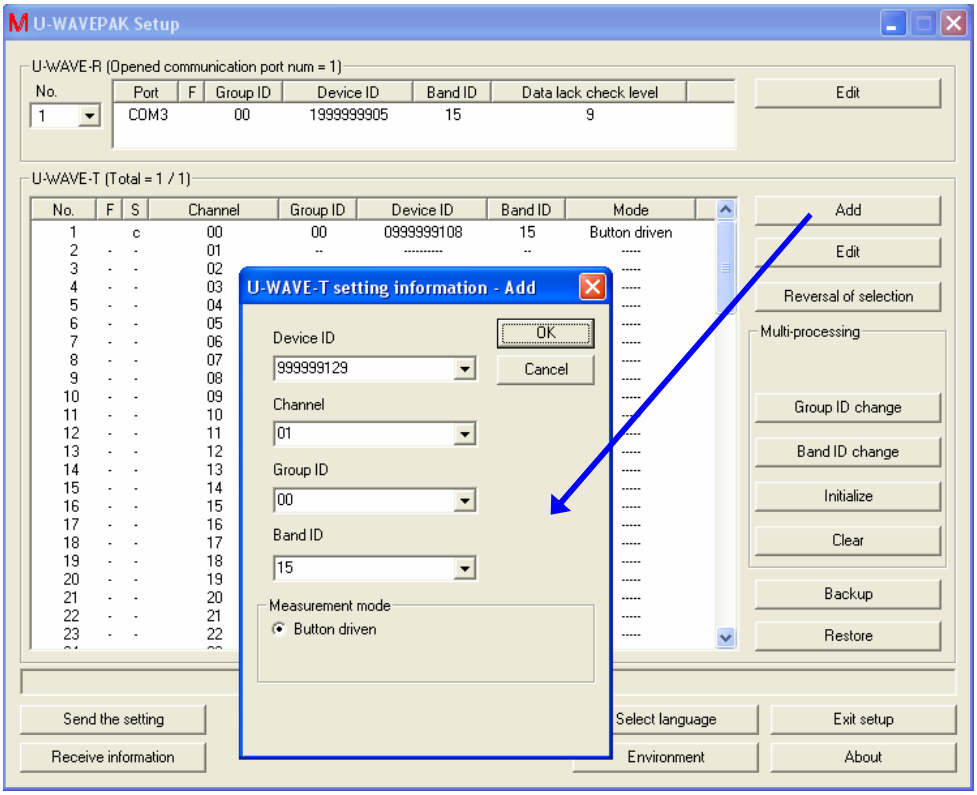
NOTE ・Push the [DATA] switch on the U-WAVE-T after connecting the U-WAVE-T with the measuring tool and turning on the power of the measuring tool .

・If you cannot connect a wireless communication, try 'U-WAVE-R scan' by pushing [DATA] switch from 5 to less than 10 seconds on the U-WAVE-T.



'S' row in this dialog changes from 'r' to 'c' when a wireless communication succeeds. ('c' = Wireless communication is connected.)

3) Repeat operation 1) and 2) if you want to add information for other U-WAVE-T.



NOTE ・The [Channel] that other U-WAVE-T are using on the same U-WAVE-R cannot be specified.

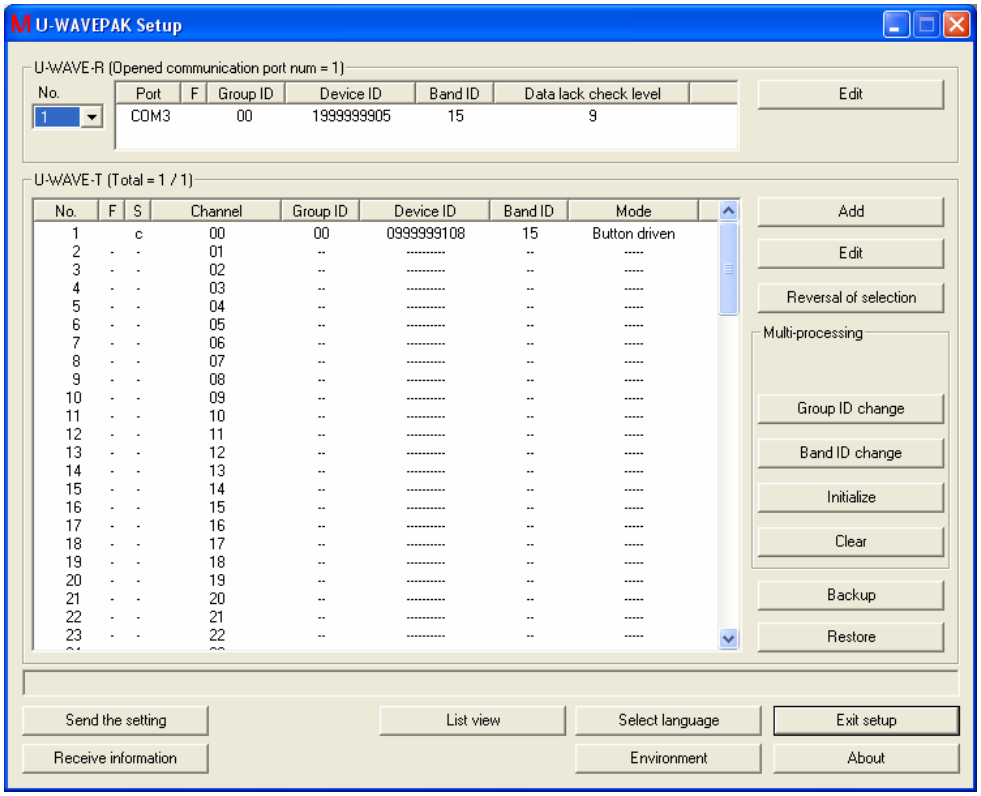
4) Click [Exit setup] button to return to the menu dialog when information for the U-WAVE-T is registered.

IMPORTANT ・Registered Information for U-WAVE-T is memorized in the memory of the U-WAVE-R.

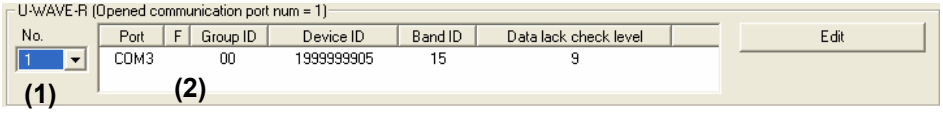
・Even when the power of the U-WAVE-R is turned off, registered information is preserved.

4.2 Functions

Click the [Setup start] button in the menu dialog.
When information has already been registered in the connected U-WAVE-R, the following dialog is displayed after information is automatically received.



4.2.1 Functions for U-WAVE-R information



(1) 'No.' list box
Select 'No.' in this list box if two or more U-WAVE-R are connected.
And, switch U-WAVE-R information in the dialog.

(2) 'U-WAVE-R information' list
U-WAVE-R information registered in the U-WAVE-R is displayed.

(3) 'Port' row
Port where the U-WAVE-R is connected is displayed.
When the driver for VCP is used, 'COM?' is displayed.
When the driver for direct USB is used, 'USB' is displayed.

(4) 'F' row

Flag for U-WAVE-R information is displayed.

The meaning of the flag is as follows.

When the header of 'F' row is clicked, following information is displayed on the screen.

Flag	Meaning
' '	Information on U-WAVEPAK is the same as information on the U-WAVE-R.
'E'	U-WAVE-R information is edited.
'I'	U-WAVE-R information will be initialized.
'S'	'All Band ID scan' will be executed.

(5) 'Group ID' row

'Group ID' specified for U-WAVE-R information is displayed.

(6) 'Device ID' row

'Device ID' of U-WAVE-R is displayed.

(7) 'Band ID' row

'Band ID' specified for U-WAVE-R information is displayed.

(8) 'Data lack check level' row

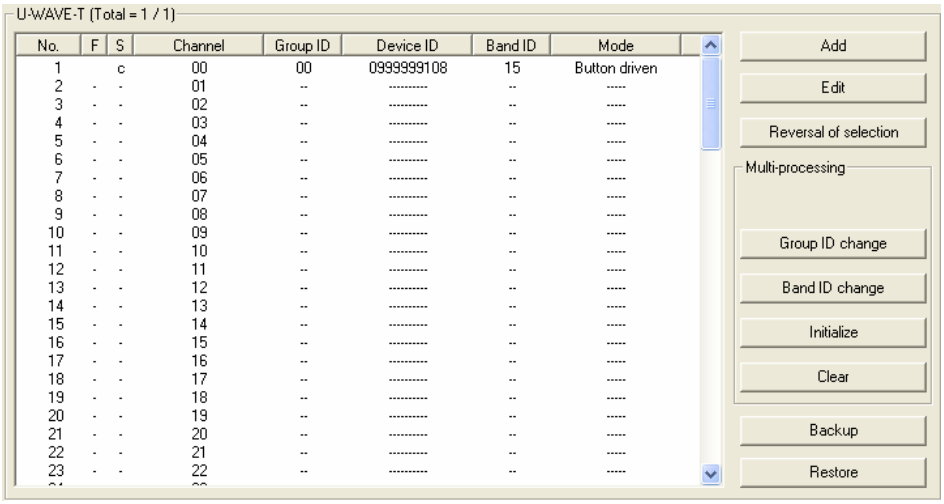
'Data lack check level' specified for U-WAVE-R information is displayed.

(9) [Edit(New)] button

To edit U-WAVE-R information, [U-WAVE-R setting information - edit] dialog is displayed.

If the U-WAVE-R is a factory default state, the name of this button is [New].

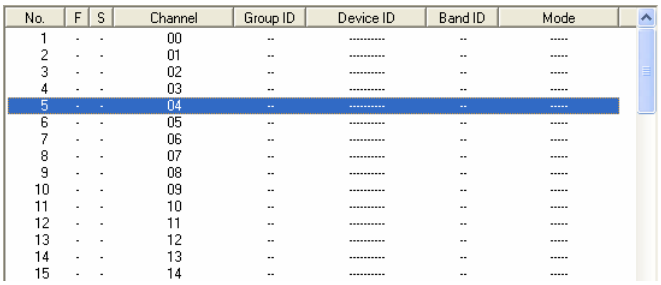
4.2.2 Functions for U-WAVE-T information



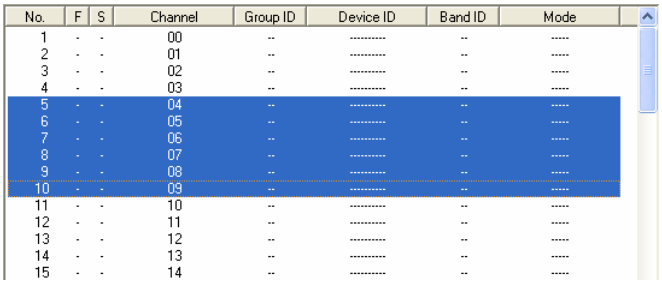
(1) 'U-WAVE-T information' list

U-WAVE-T information registered in the U-WAVE-R is displayed.
The list of 100 U-WAVE-T information can be displayed.

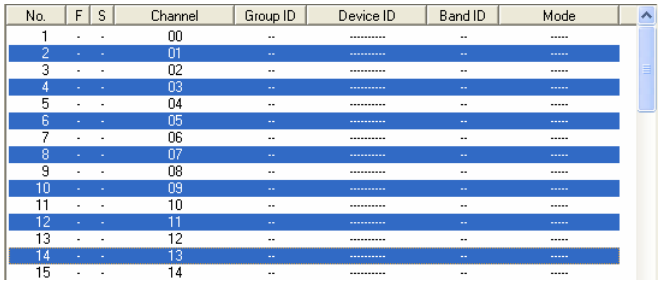
・Click and select the line. The selected line is highlighted.



・Two or more lines can be selected by Shift key + clicking.



・The selection line can be added by Ctrl key + clicking.



(2) 'F' row

Flag for U-WAVE-T information is displayed.

The meaning of the flag is as follows.

When the header of 'F' row is clicked, following information is displayed on the screen.

Flag	Meaning
' '	U-WAVE-T information is registered in the U-WAVE-R.
'E'	U-WAVE-T information is edited.
'I'	U-WAVE-T information will be initialized.
'A'	U-WAVE-T information will be initialized and released.

(3) 'S' row

Status for U-WAVE-T information is displayed.

The meaning of the status is as follows.

When the header of 'S' row is clicked, following information is displayed on the screen.

Status	Meaning
'n'	U-WAVE-T is not registered to the U-WAVE-R.
'r'	U-WAVE-T is registered to the U-WAVE-R. However, disconnect.
'e'	U-WAVE-T information is editing.
's'	U-WAVE-T information is editing. (Source channel)
'd'	U-WAVE-T information is editing. (Destination channel)
'c'	U-WAVE-T is connected to the U-WAVE-R.

(4) 'Channel' row

'Channel' for the U-WAVE-T is displayed.

(5) 'Group ID' row

'Group ID' specified for U-WAVE-T information is displayed.

(6) 'Device ID' row

'Device ID' of U-WAVE-T is displayed.

(7) 'Band ID' row

'Band ID' specified for U-WAVE-T information is displayed.

(8) 'Mode' row

'Measurement mode' specified for U-WAVE-T information is displayed.

(9) [Add] button
To add new U-WAVE-T information, [U-WAVE-T setting information - add] dialog is displayed.

(10) [Edit] button
To edit U-WAVE-T information, [U-WAVE-T setting information - edit] dialog is displayed.

(11) [Reversal of selection] button
Selection items in the U-WAVE-T information list are reversed.

(12) [Group ID change] button
'Group ID' in the U-WAVE-T information list is changed by multi-processing.
This function is executed only to U-WAVE-T information on 'S=n/c'.

(13) [Band ID change] button
'Band ID' in the U-WAVE-T information list is changed by multi-processing.
This function is executed only to U-WAVE-T information on 'S=n/c'.

(14) [Initialize] button
U-WAVE-T information is initialized by multi-processing.
This function is executed only to U-WAVE-T information on 'S=r/e/s/d/c'.

(15) [Clear] button
U-WAVE-T information is cleared by multi-processing.
This function is executed only to U-WAVE-T information on 'S=n'.

(16) [Backup] button
U-WAVE-T information is saved to the CSV file.

(17) [Restore] button
U-WAVE-T information saved to the CSV file is load.

4.2.3 Common functions

(1) Receive data & status & guidance display area
Packet communicated with the U-WAVE-R is displayed.
And, guidance for the operation is displayed.
・Blue characters = Packet received from U-WAVE-R
・Green characters = Packet sent to U-WAVE-R
・Red characters = Guidance for operation

(2) [Send the setting] button
Information in U-WAVEPAK is sent to the U-WAVE-R.
[Sending condition setting] dialog is displayed, and sending information can be specified.

(3) [Receive information] button
Information registered in the U-WAVE-R is received.
The kind of information that can be received is as follows.
・U-WAVE-R information
・U-WAVE-T information
・U-WAVE-R and U-WAVE-T information

(4) [List view] button
[Setting information list] dialog is displayed.
The kind of information that can be displayed is as follows.
・Information of all U-WAVE-R
・U-WAVE-T information of all U-WAVE-R
・U-WAVE-T information of current U-WAVE-R

(5) [Select language] button
[Select language] dialog is displayed.

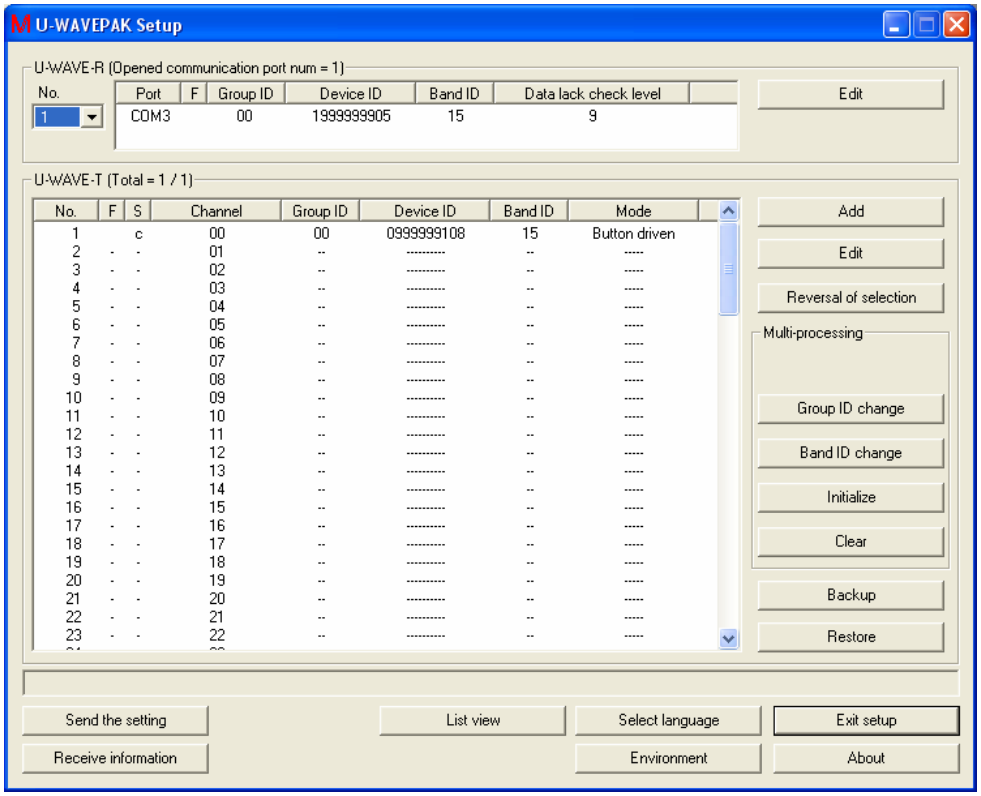
(6) [Environment] button
[Environment] dialog is displayed.

(7) [Exit setup] button
[U-WAVEPAK Setup] is exit.

(8) [About] button
[Version information] dialog is displayed.

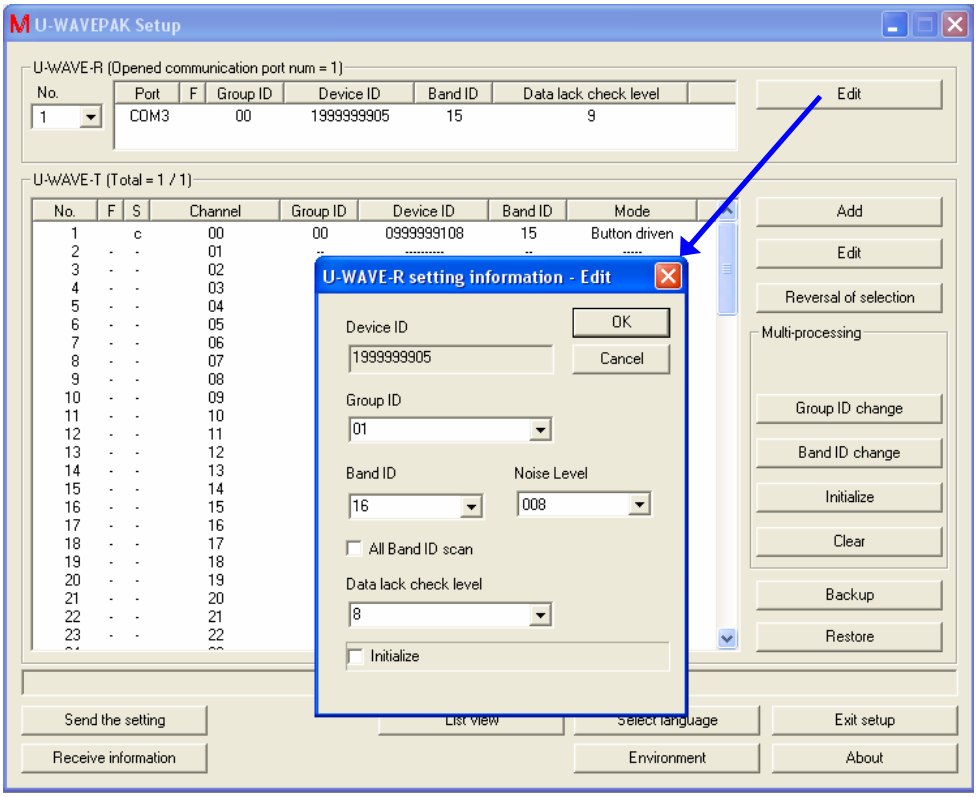
4.3 Edit of U-WAVE-R information

Click the [Setup start] button in the menu dialog.
When information has already been registered in the connected U-WAVE-R, the following dialog is displayed after information is automatically received.



4.3.1 Edit

1) Click [Edit] button on the following dialog to edit U-WAVE-R. After that, [U-WAVE-R setting information - Edit] dialog is displayed.



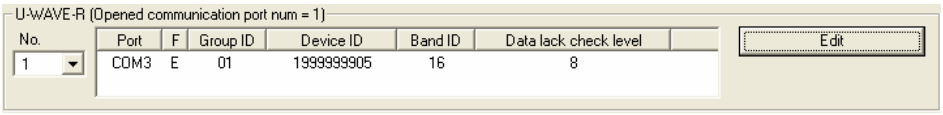
The value at [Group ID], [Band ID] and [Data lack check level] can be edited on this dialog.

IMPORTANT

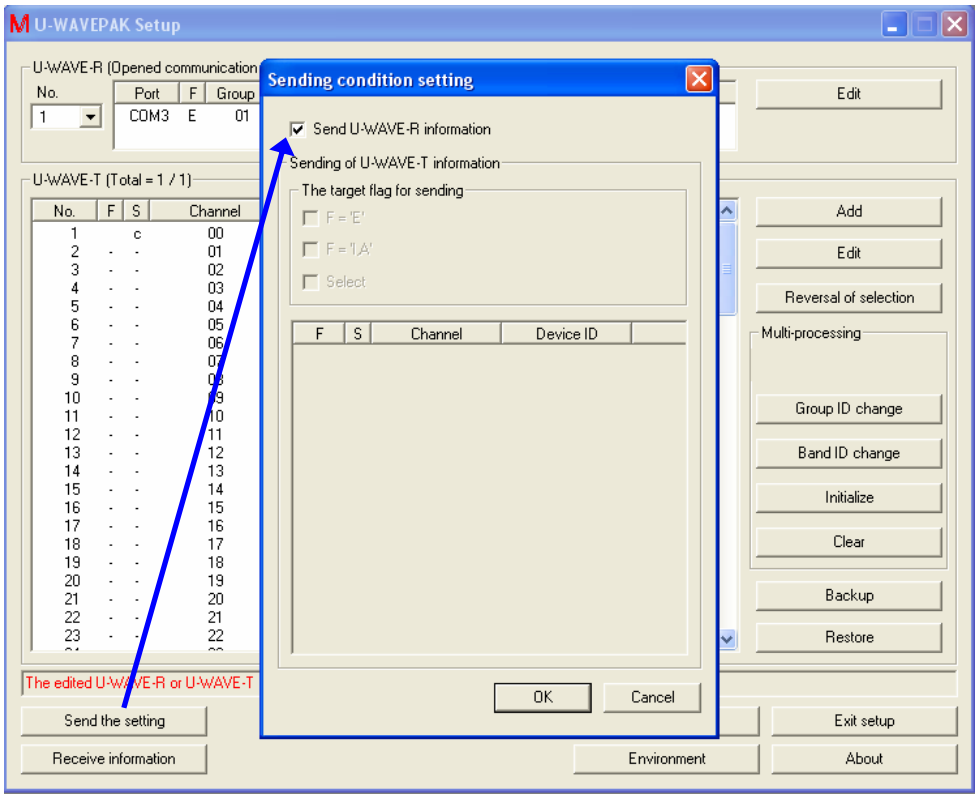
- Specify a different value for [Group ID] of each U-WAVE-R when you use two or more U-WAVE-R in wireless area.
- Some troubles occur in a wireless communication when two or more U-WAVE-R with same 'Group ID' exist.
- Specify a different value for [Band ID] of each U-WAVE-R when you use two or more U-WAVE-R in wireless area.

2) Click [OK] button to complete the edit of U-WAVE-R information.

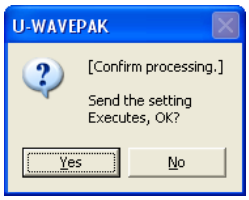
'F' row in 'U-WAVE-R information' list changes to 'E' if the value of [Group ID], [Band ID] or [Data lack check level] is changed.



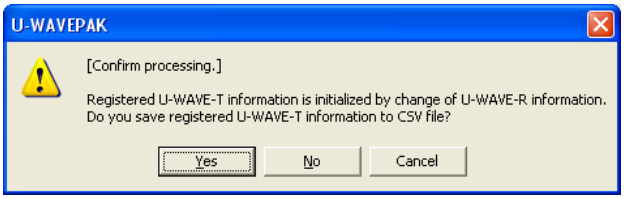
3) Click [Send the setting] button to send edited U-WAVE-R information to the U-WAVE-R. And, click [OK] button after checking on [Send U-WAVE-R information] check box in [Sending condition setting] dialog.



4) Click [Yes] button when the following dialog is displayed.



5) If [Group ID] or [Band ID] of the U-WAVE-R is edited when one or more U-WAVE-T information exists, the following dialog is displayed.

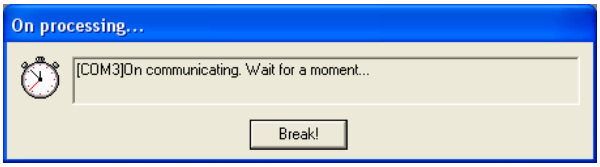


(1) [Yes] = U-WAVE-T information is saved in the CSV file, and U-WAVE-R information is sent to the U-WAVE-R.

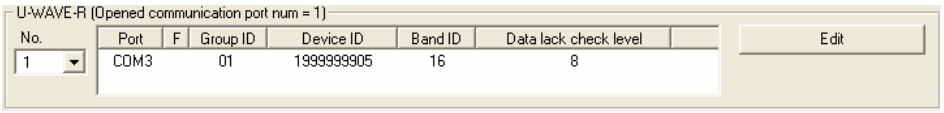
(2) [No] = U-WAVE-R information is sent to the U-WAVE-R without saving U-WAVE-T information in the CSV file.

(3) [Cancel] = U-WAVE-R information is not sent to the U-WAVE-R.

6) The following dialog is displayed while communicating information.



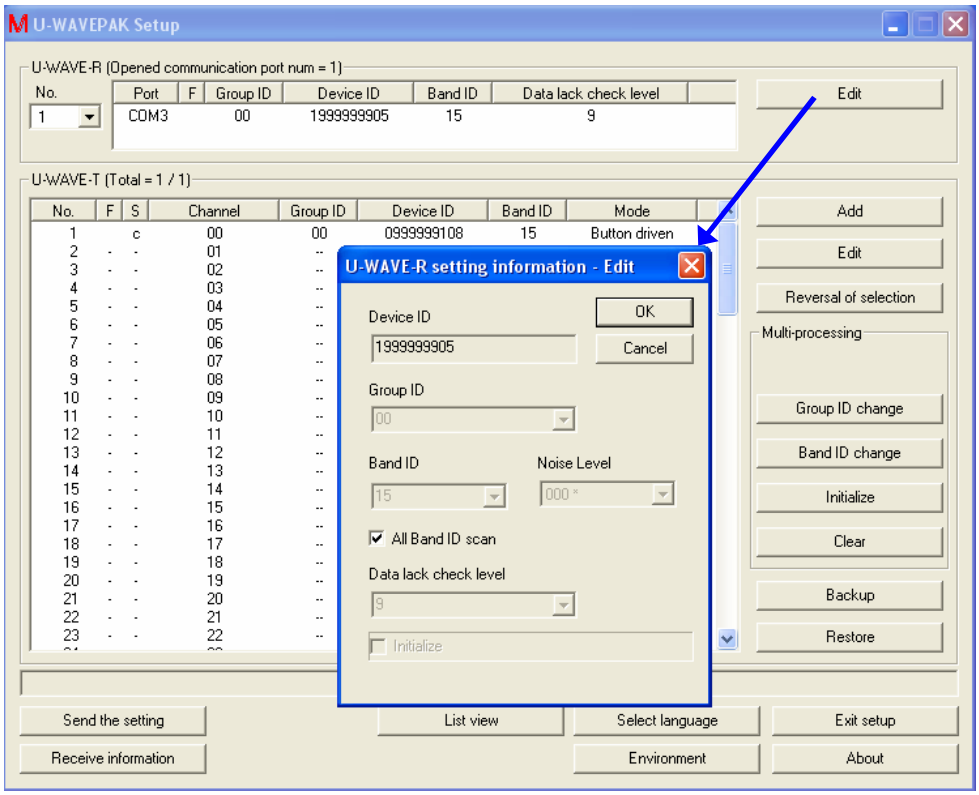
When the communication is completed, 'F' row in 'U-WAVE-R information' list changes to blank.



4.3.2 All Band ID scan

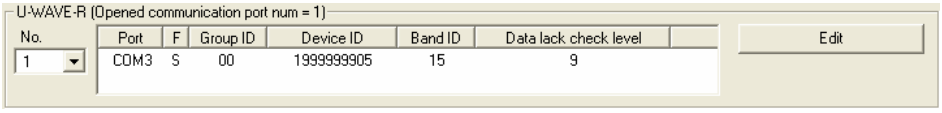
Execute 'All Band ID scan' beforehand when you change band ID of U-WAVE-R information. And, specify band ID with small noise level.

1) Click [Edit] button on the following dialog to edit U-WAVE-R. After that, [U-WAVE-R setting information - Edit] dialog is displayed.

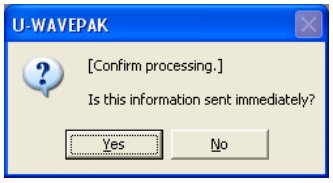


Check [All Band ID scan] check box on this dialog. And, click [OK] button.

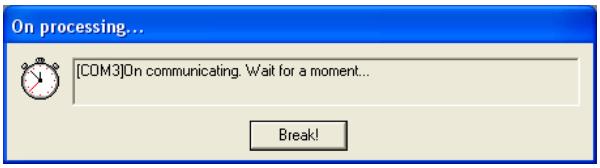
2) 'F' row in 'U-WAVE-R information' list changes to 'S'.



3) Click [Yes] button when the following dialog is displayed.

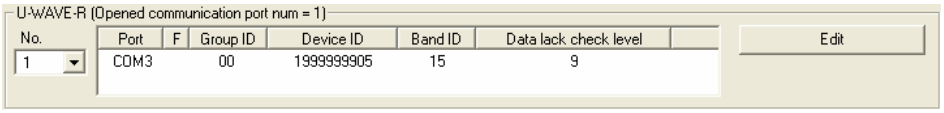


4) The following dialog is displayed while communicating information.

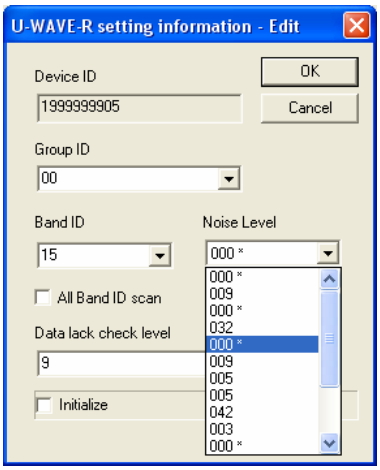


This dialog will be displayed for about 15 seconds.

5) When the communication (All Band ID scan) is completed, 'F' row in 'U-WAVE-R information' list changes to blank.



6) The noise level to each band ID can be confirmed in [U-WAVE-R setting information - Edit] dialog.



The asterisk is marked at the smallest noise level.

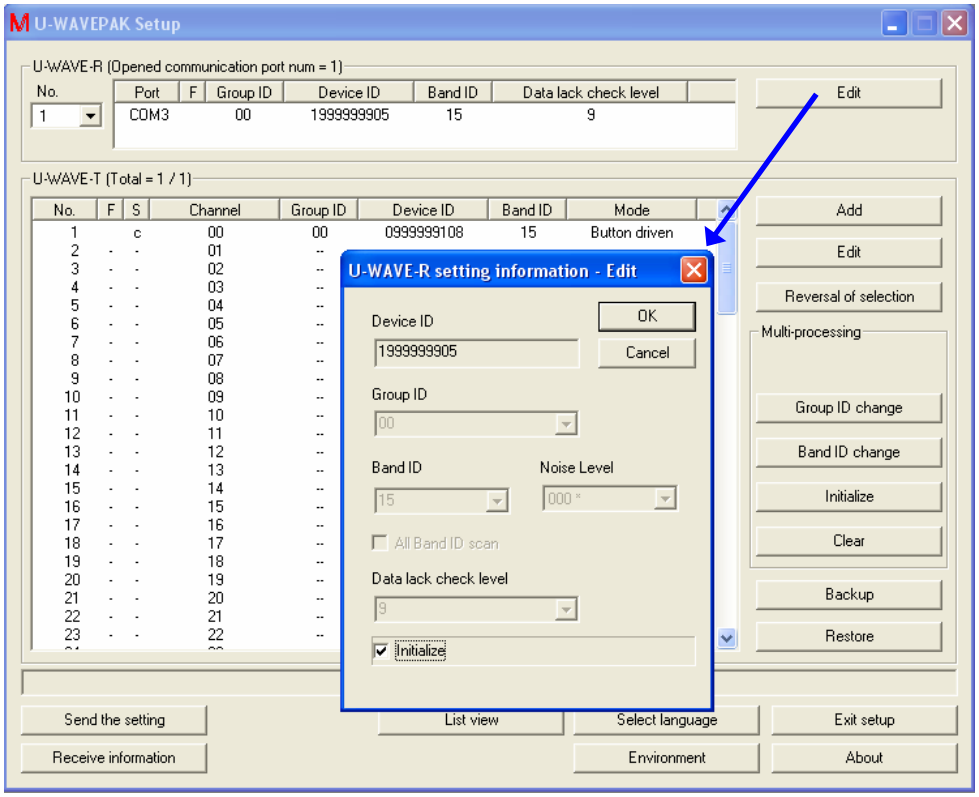
NOTE ·When the power supply of the U-WAVE-R is turned off, the value at the noise level of each band ID is lost. (The value at all the noise levels returns to '255'.)
If you want to know a present noise level, execute 'All Band ID scan' again.

4.3.3 Initialize

Execute this operation if you want to initialize all information registered in the U-WAVE-R.

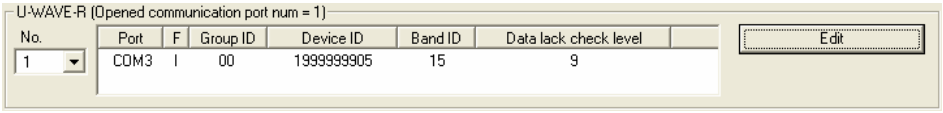
IMPORTANT ・All information registered in the U-WAVE-R returns to the factory default state when the U-WAVE-R is initialized. (Registered information is cleared.)

1) Click [Edit] button on the following dialog to initialize U-WAVE-R. After that, [U-WAVE-R setting information - Edit] dialog is displayed.



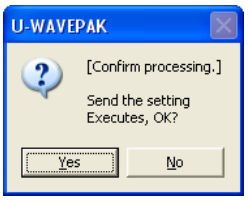
Check [Initialize] check box on this dialog. And, click [OK] button.

2) 'F' row in 'U-WAVE-R information' list changes to 'I'.

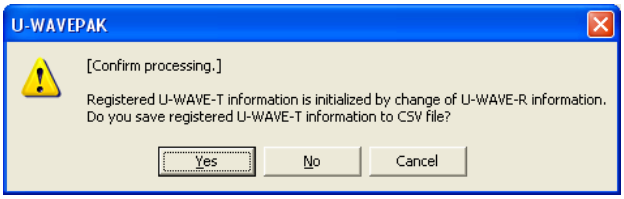


3) Click [Send the setting] button to send command of initialize to the U-WAVE-R. And, click [OK] button after checking on [Send U-WAVE-R information] check box in [Sending condition setting] dialog.

4) Click [Yes] button when the following dialog is displayed.



5) When one or more U-WAVE-T information exists, the following dialog is displayed.

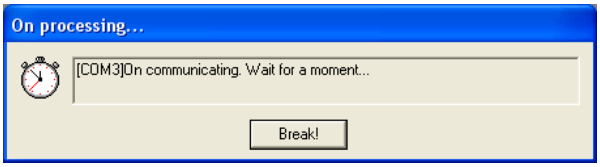


(1) [Yes] = U-WAVE-T information is saved in the CSV file, and U-WAVE-R information is sent to the U-WAVE-R.

(2) [No] = U-WAVE-R information is sent to the U-WAVE-R without saving U-WAVE-T information in the CSV file.

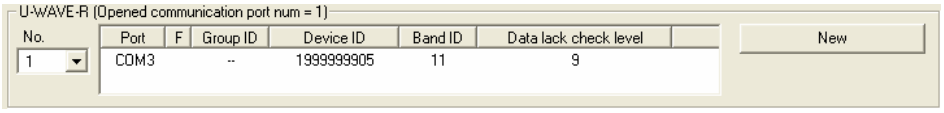
(3) [Cancel] = U-WAVE-R information is not sent to the U-WAVE-R.

6) The following dialog is displayed while communicating information.



This dialog will be displayed for about 15 seconds.

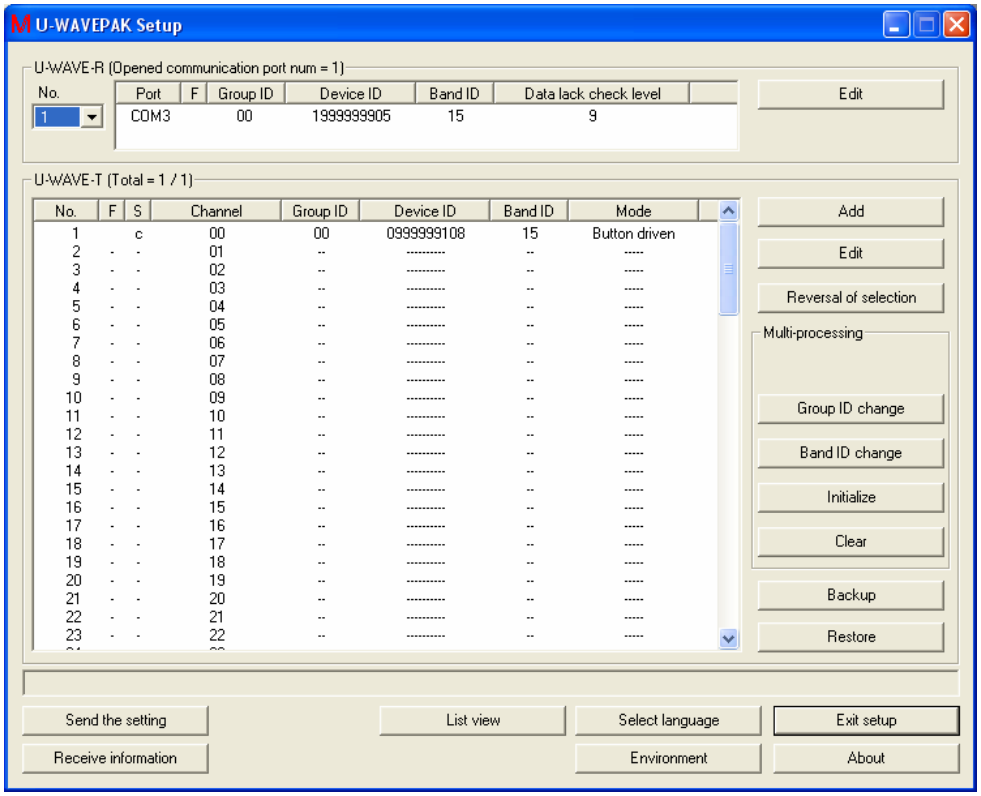
7) When the communication (Initialize) is completed, 'F' row in 'U-WAVE-R information' list changes to blank. And, the [Edit] button changes to [New] button.



Click [New] button if you register new U-WAVE-R information.

4.4 Edit of U-WAVE-T information

Click the [Setup start] button in the menu dialog.
When information has already been registered in the connected U-WAVE-R, the following dialog is displayed after information is automatically received.



4.4.1 Add

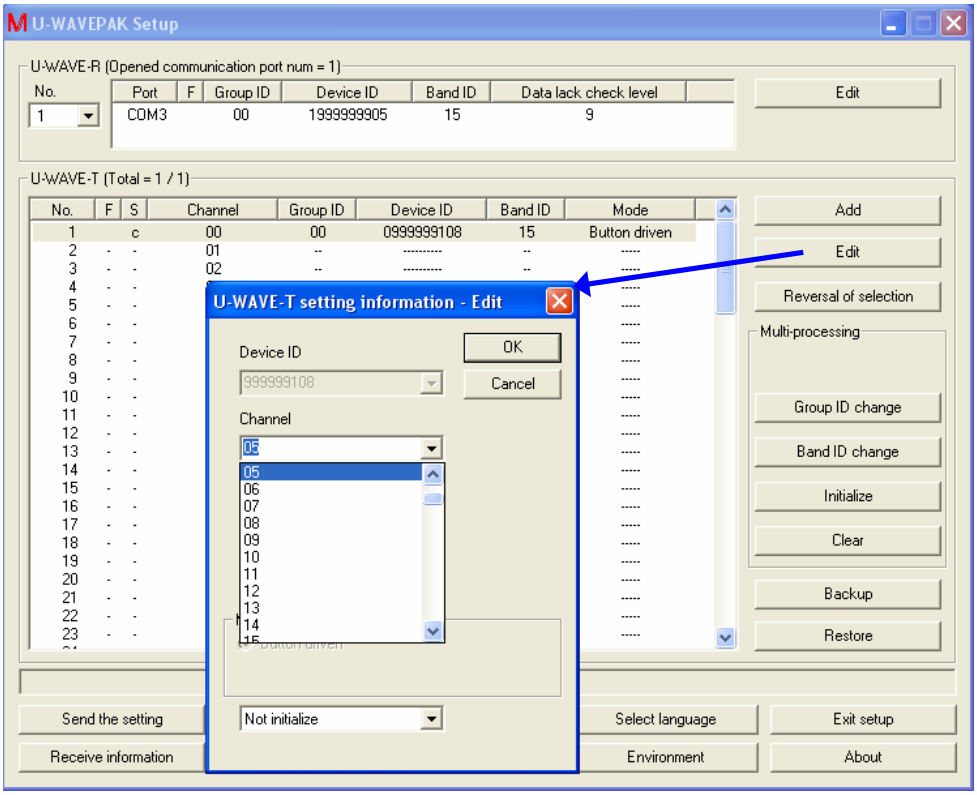
TIP ・Refer to '4.1.2 Addition of U-WAVE-T'.

4.4.2 Edit

4.4.2.1 Change of channel

1) Select the U-WAVE-T that you want to edit on the 'U-WAVE-T information' list.

2) Click [Edit] button on the following dialog. After that, [U-WAVE-T setting information - Edit] dialog is displayed.



Select other channels on this dialog. And, click [OK] button.

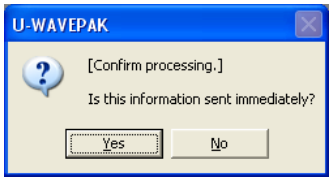
3) The content of 'U-WAVE-T information' list changes.

(1) 'S' row of the source channel changes to 'e'.

(2) U-WAVE-T information is displayed in the destination channel. 'E' is set in 'F' row. And, 'n' is set in 'S' row.

No.	F	S	Channel	Group ID	Device ID	Band ID	Mode
1		e	00	00	0999999108	15	Button driven
2	-	-	01	--	----------	--	-----
3	-	-	02	--	----------	--	-----
4	-	-	03	--	----------	--	-----
5	-	-	04	--	----------	--	-----
6	E	n	05	00	0999999108	15	Button driven

4) Click [Yes] button when the following dialog is displayed.



5) The content of 'U-WAVE-T information' list changes.

(1) 'S' row of the source channel changes to 's'.

(2) 'S' row of the destination channel changes to 'd'.

No.	F	S	Channel	Group ID	Device ID	Band ID	Mode
1		s	00	00	0999999108	15	Button driven
2	-	-	01	--	----------	--	-----
3	-	-	02	--	----------	--	-----
4	-	-	03	--	----------	--	-----
5	-	-	04	--	----------	--	-----
6		d	05	00	0999999108	15	Button driven

In this state, edited information has not been sent to the U-WAVE-T yet. Therefore, execute the following operation on the U-WAVE-T.

Measurement mode on U-WAVE-T	Operations
Button driven	Push the [DATA] switch on the U-WAVE-T.

6) 'S' row of destination channel changes from 'd' to 'c' when a wireless communication succeeds.
And, U-WAVE-T information on the source channel removes from the list.

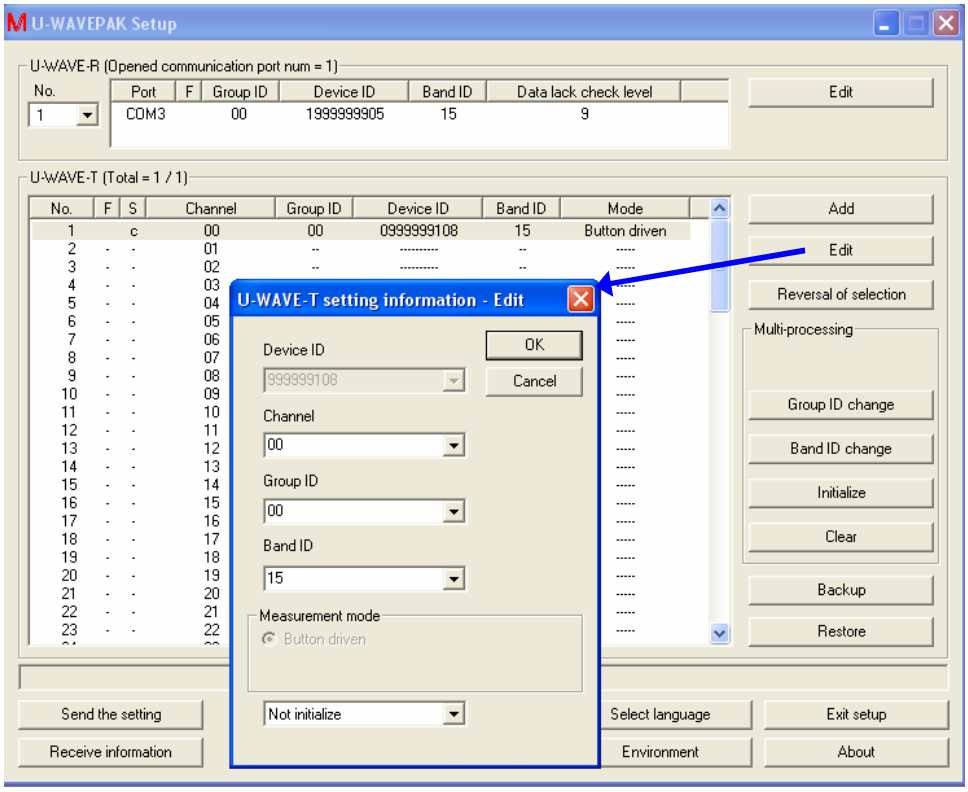
No.	F	S	Channel	Group ID	Device ID	Band ID	Mode
1	-	-	00	--	----------	--	-----
2	-	-	01	--	----------	--	-----
3	-	-	02	--	----------	--	-----
4	-	-	03	--	----------	--	-----
5	-	-	04	--	----------	--	-----
6		c	05	00	0999999108	15	Button driven

NOTE ・If you cannot connect a wireless communication, try 'U-WAVE-R scan' by pushing [DATA] switch from 5 to less than 10 seconds on the U-WAVE-T.

4.4.2.2 Change of group ID or band ID

1) Select the U-WAVE-T that you want to edit on the 'U-WAVE-T information' list.

2) Click [Edit] button on the following dialog. After that, [U-WAVE-T setting information - Edit] dialog is displayed.

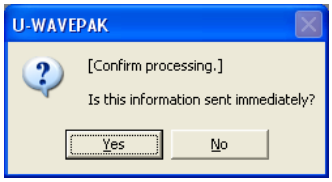


Select other group ID or other band ID on this dialog. And, click [OK] button.

3) 'F' row in 'U-WAVE-T information' list changes to 'E'.

No.	F	S	Channel	Group ID	Device ID	Band ID	Mode
1	E	c	00	99	0999999108	20	Button driven

4) Click [Yes] button when the following dialog is displayed.



5) 'S' row in 'U-WAVE-T information' list changes to 'e'.

No.	F	S	Channel	Group ID	Device ID	Band ID	Mode
1		e	00	99	0999999108	20	Button driven

In this state, edited information has not been sent to the U-WAVE-T yet. Therefore, execute the following operation on the U-WAVE-T.

Measurement mode on U-WAVE-T	Operations
Button driven	Push the [DATA] switch on the U-WAVE-T.

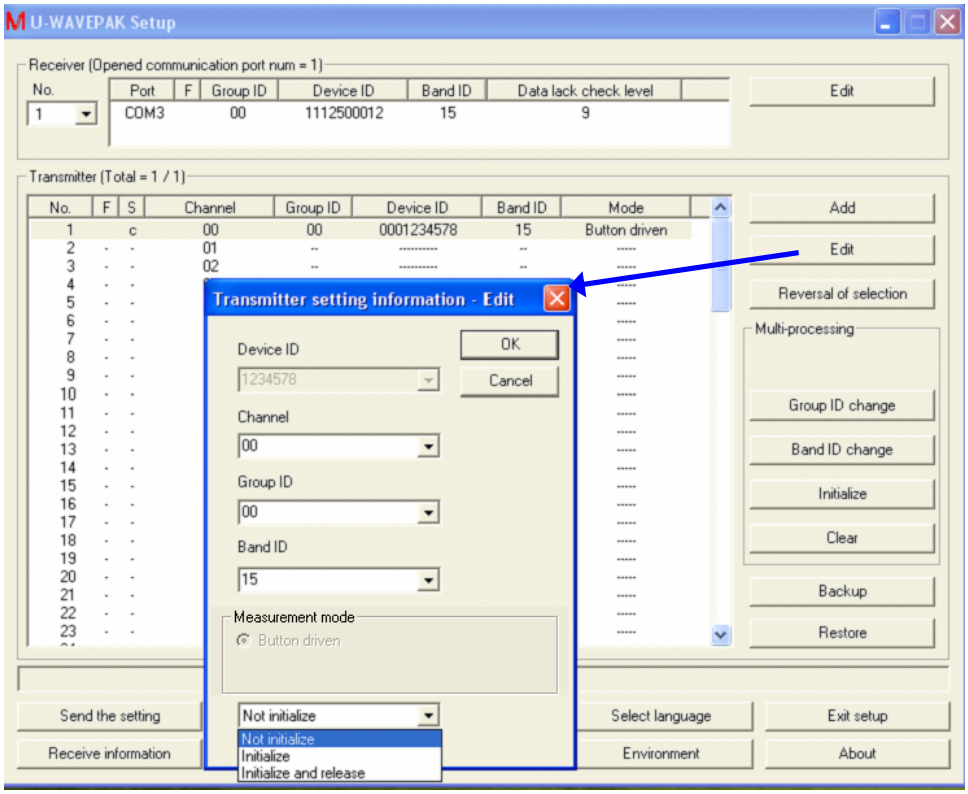
6) U-WAVE-T information is removed from the list when a wireless communication succeeds.

NOTE ・If you cannot connect a wireless communication, try 'U-WAVE-R scan' by pushing [DATA] switch from 5 to less than 10 seconds on the U-WAVE-T.

4.4.2.3 Initialize

1) Select the U-WAVE-T that you want to edit on the 'U-WAVE-T information' list.

2) Click [Edit] button on the following dialog. After that, [U-WAVE-T setting information - Edit] dialog is displayed.



Select following items on this dialog. And, click [OK] button.

(1) [Not initialize] : U-WAVE-T information is not initialized.
'E' is displayed in 'F' row of the U-WAVE-T information list by this selection.

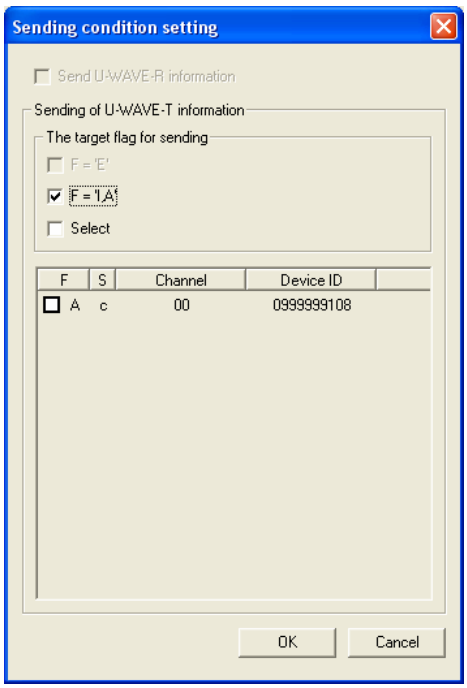
(2) [Initialize] : U-WAVE-T information on the U-WAVE-R is initialized.
However, information on the U-WAVE-T is not initialized.
'I' is displayed in 'F' row of the U-WAVE-T information list by this selection.

No.	F	S	Channel	Group ID	Device ID	Band ID	Mode
1	I	c	00	00	0999999108	15	Button driven

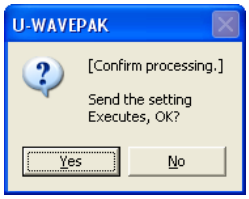
(3) [Initialize and release] : U-WAVE-T information on the U-WAVE-R is initialized and the U-WAVE-T returns to the factory default state.
'A' is displayed in 'F' row of the U-WAVE-T information list by this selection.

No.	F	S	Channel	Group ID	Device ID	Band ID	Mode
1	A	c	00	00	0999999108	15	Button driven

3) Click [Send the setting] button to send edited U-WAVE-T information to the U-WAVE-R. And, click [OK] button after checking on [F = 'I,A'] check box in [Sending condition setting] dialog.



4) Click [Yes] button when the following dialog is displayed.



5) U-WAVE-T information is removed from the list when 'F' row is 'I'.

6) 'S' row changes to 'e' when 'F' row is 'A'.
In this state, edited information has not been sent to the U-WAVE-T yet. Therefore, execute the following operation on the U-WAVE-T.

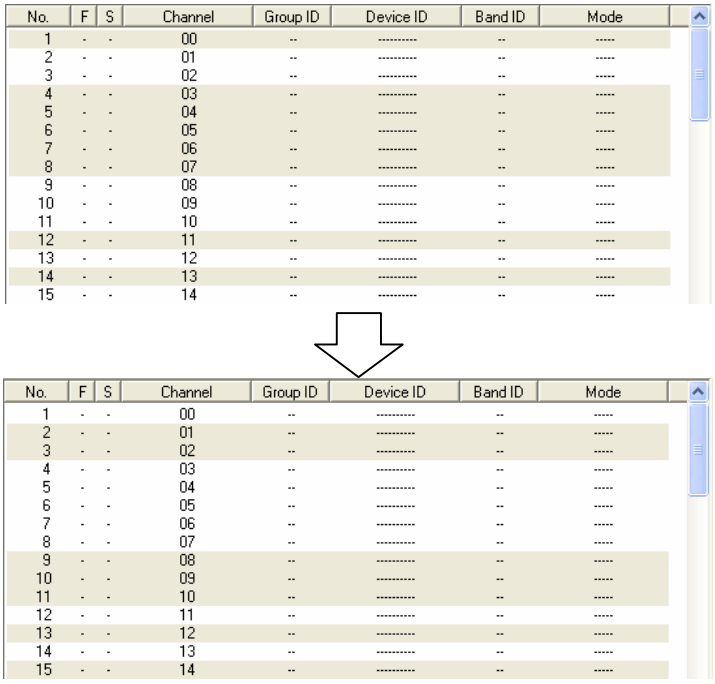
Measurement mode on U-WAVE-T	Operations
Button driven	Push the [DATA] switch on the U-WAVE-T.

7) U-WAVE-T information is removed from the list when a wireless communication succeeds.

NOTE ・If you cannot connect a wireless communication, try 'U-WAVE-R scan' by pushing [DATA] switch from 5 to less than 10 seconds on the U-WAVE-T.

4.4.3 Reversal of selection

1) Click [Reversal of selection] button if you want to reverse the selection in the U-WAVE-T information list.



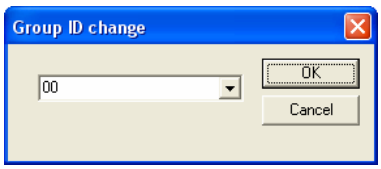
No.	F	S	Channel	Group ID	Device ID	Band ID	Mode
1	-	-	00	--	----------	--	-----
2	-	-	01	--	----------	--	-----
3	-	-	02	--	----------	--	-----
4	-	-	03	--	----------	--	-----
5	-	-	04	--	----------	--	-----
6	-	-	05	--	----------	--	-----
7	-	-	06	--	----------	--	-----
8	-	-	07	--	----------	--	-----
9	-	-	08	--	----------	--	-----
10	-	-	09	--	----------	--	-----
11	-	-	10	--	----------	--	-----
12	-	-	11	--	----------	--	-----
13	-	-	12	--	----------	--	-----
14	-	-	13	--	----------	--	-----
15	-	-	14	--	----------	--	-----

No.	F	S	Channel	Group ID	Device ID	Band ID	Mode
1	-	-	00	--	----------	--	-----
2	-	-	01	--	----------	--	-----
3	-	-	02	--	----------	--	-----
4	-	-	03	--	----------	--	-----
5	-	-	04	--	----------	--	-----
6	-	-	05	--	----------	--	-----
7	-	-	06	--	----------	--	-----
8	-	-	07	--	----------	--	-----
9	-	-	08	--	----------	--	-----
10	-	-	09	--	----------	--	-----
11	-	-	10	--	----------	--	-----
12	-	-	11	--	----------	--	-----
13	-	-	12	--	----------	--	-----
14	-	-	13	--	----------	--	-----
15	-	-	14	--	----------	--	-----

4.4.4 Group ID change(Multi-processing)

TIP ・Refer to '4.5.5 Environment' for the target of the multi processing.

1) Click [Group ID change] button if you want to change the Group ID to two or more U-WAVE-T information.
   The following dialog is displayed.



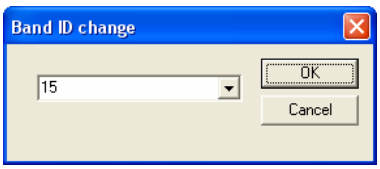
2) Click [OK] button to change the Group ID.
   This function is executed only to U-WAVE-T information on 'S=n/c'.

IMPORTANT ・When U-WAVE-T information is sent to the U-WAVE-R with [Send the setting] button, actual change processing is executed.

4.4.5 Band ID change(Multi-processing)

TIP ・Refer to '4.5.5 Environment' for the target of the multi processing.

1) Click [Band ID change] button if you want to change the Band ID to two or more U-WAVE-T information.
   The following dialog is displayed.



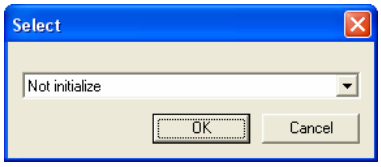
2) Click [OK] button to change the Band ID.
   This function is executed only to U-WAVE-T information on 'S=n/c'.

IMPORTANT ・When U-WAVE-T information is sent to the U-WAVE-R with [Send the setting] button, actual change processing is executed.

4.4.6 Initialize(Multi-processing)

TIP ・Refer to '4.5.5 Environment' for the target of the multi processing.

1) Click [Initialize] button if you want to initialize two or more U-WAVE-T information. The following dialog is displayed.



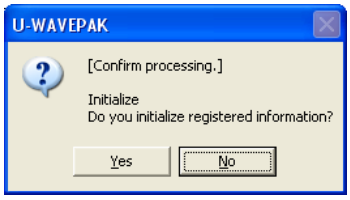
(1) [Not initialize] : U-WAVE-T information is not initialized.
'E' is displayed in 'F' row of the U-WAVE-T information list by this selection.

(2) [Initialize] : U-WAVE-T information on the U-WAVE-R is initialized.
However, information on the U-WAVE-T is not initialized.
'I' is displayed in 'F' row of the U-WAVE-T information list by this selection.

(3) [Initialize and release] : U-WAVE-T information on the U-WAVE-R is initialized and the U-WAVE-T returns to the factory default state.
'A' is displayed in 'F' row of the U-WAVE-T information list by this selection.

2) Click [OK] button to decide the initialization method.
This function is executed only to U-WAVE-T information on 'S=r/e/s/d/c'.

3) In addition, the following dialog is displayed because of the confirmation.



IMPORTANT ・When U-WAVE-T information is sent to the U-WAVE-R with [Send the setting] button, actual initialization processing is executed.

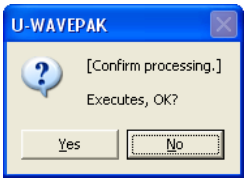
4) When [Initialize and release] is specified, the initialization of the U-WAVE-T is executed by the following operation.

Measurement mode on U-WAVE-T	Operations
Button driven	Push the [DATA] switch on the U-WAVE-T.

4.4.7 Clear(Multi-processing)

TIP ・Refer to '4.5.5 Environment' for the target of the multi processing.

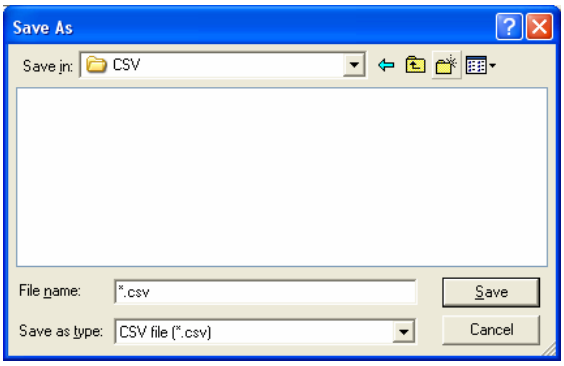
1) Click [Clear] button if you want to clear two or more U-WAVE-T information.
The following dialog is displayed.



2) Click [Yes] button to clear.
This function is executed only to U-WAVE-T information on 'S=n'.

4.4.8 Backup

1) Click [Backup] button if you want to save the contents in the U-WAVE-T information list to the CSV file.
The following dialog is displayed.

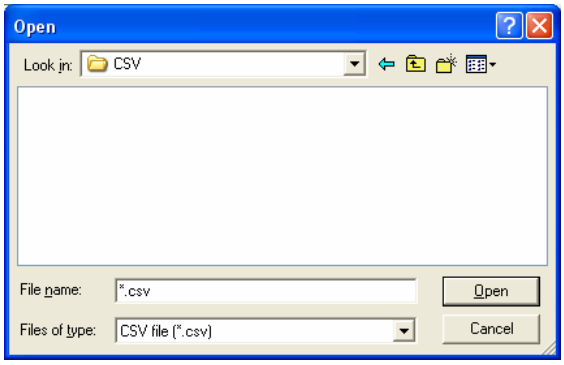


2) Input the CSV file name. And, click [Save] button.

IMPORTANT ・Do not edit contents of the CSV file.

4.4.9 Restore

1) Click [Restore] button if you want to load U-WAVE-T information saved in the CSV file. The following dialog is displayed.



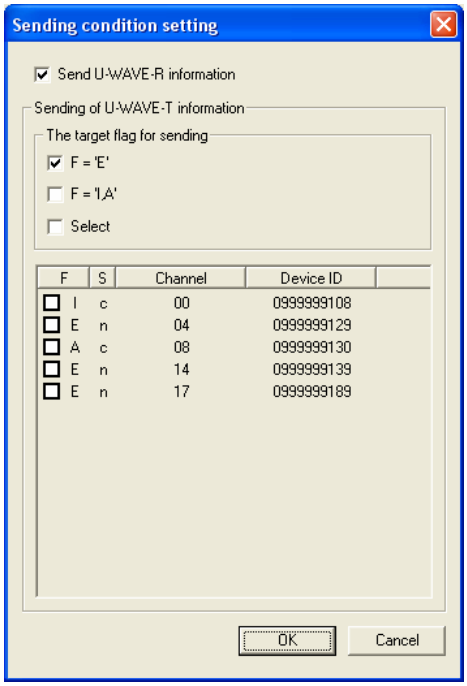
2) Select the existed CSV file for U-WAVE-T information. And, click [Open] button.

TIP ・Refer to '4.5.5 Environment' for the Condition of restore.

4.5 Common operations

4.5.1 Send the setting

1) Click [Send the setting] button if you want to send U-WAVE-R information and U-WAVE-T information in U-WAVEPAK to the U-WAVE-R.
The following dialog is displayed.

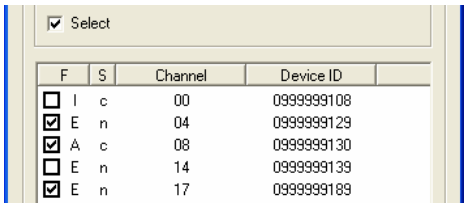


(1) If [Send U-WAVE-R information] check box is checked, U-WAVE-R information is sent.

(2) If [F = 'E'] check box is checked, U-WAVE-T information with the flag of 'E' is sent.

(3) If [F = 'I,A'] check box is checked, U-WAVE-T information with the flag of 'I or A' is sent.

(4) If you want to send specified U-WAVE-T information only, check [Select] check box. And, specify U-WAVE-T information on the list.

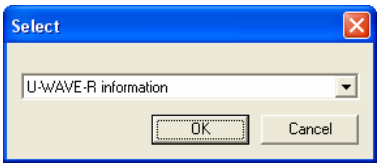


2) Click [OK] button to send specified information to the U-WAVE-R.

3) When [Yes] button is clicked in [Confirm processing] dialog, processing is executed.

4.5.2 Receive information

1) Click [Receive information] button if you want to receive information registered in the U-WAVE-R to U-WAVEPAK.
The following dialog is displayed.



(1) If [U-WAVE-R information] is selected, U-WAVE-R information in the U-WAVE-R is received.

(2) If [U-WAVE-T information] is selected, U-WAVE-T information in the U-WAVE-R is received.

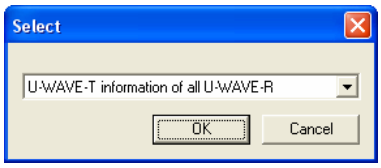
(3) If [U-WAVE-R and U-WAVE-T information] is selected, U-WAVE-R information and U-WAVE-T information in the U-WAVE-R is received.

2) Click [OK] button to receive selected information from the U-WAVE-R.

3) When [Yes] button is clicked in [Confirm processing] dialog, processing is executed.

4.5.3 List view

1) Click [List view] button if you want to see the information list of the U-WAVE-R and the U-WAVE-T on U-WAVEPAK.
The following dialog is displayed.

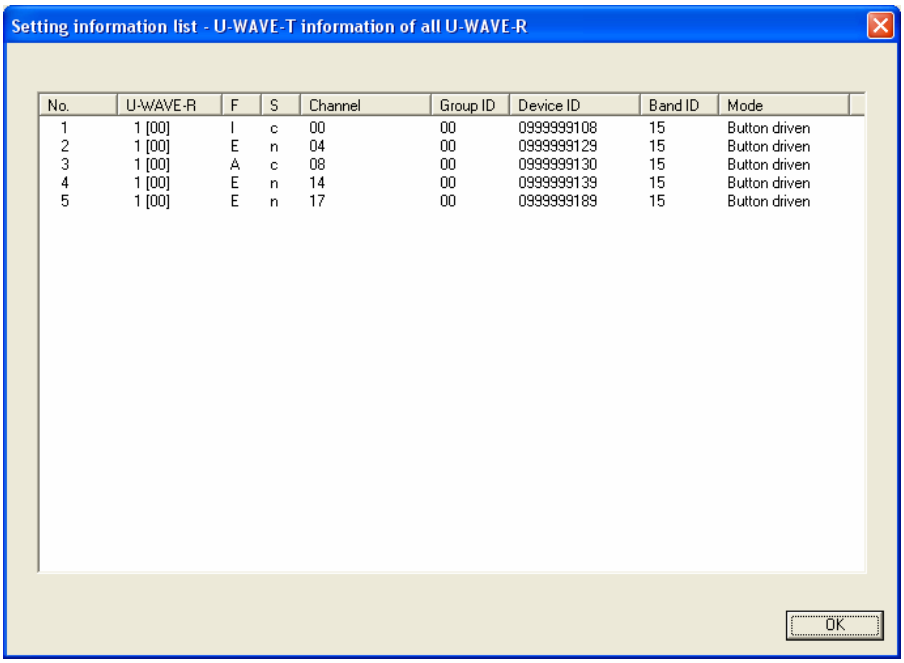


(1) If [Information of all U-WAVE-R] is selected, information on all U-WAVE-R connected with U-WAVEPAK is displayed.

(2) If [U-WAVE-T information of all U-WAVE-R] is selected, all U-WAVE-T information on all U-WAVE-R connected with U-WAVEPAK is displayed.

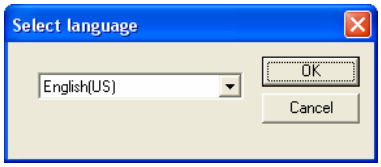
(3) If [U-WAVE-T information of current U-WAVE-R] is selected, all U-WAVE-T information on a current U-WAVE-R is displayed.

2) Click [OK] button to display selected information.
The following dialog is displayed.



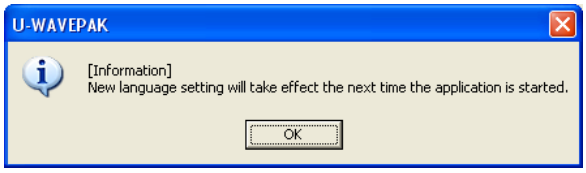
4.5.4 Select language

1) Click [Select language] button if you want to change the language of U-WAVEPAK. The following dialog is displayed.



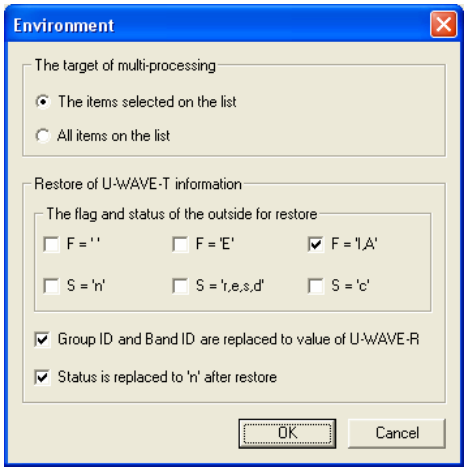
Select the language in the list box.

2) When [OK] button is clicked, the following dialog is displayed.



4.5.5 Environment

1) Click [Environment] button if you want to change the environment of [Setup].
The following dialog is displayed.



(1) The target of multi-processing
[The items selected on the list] : Lines selected on the U-WAVE-T information list are targets of the multi processing.
[All items on the list] : All lines in the U-WAVE-T information list are targets of the multi processing.

(2) The flag and status of the outside for restore
U-WAVE-T information with checked flag or status are not restored from the CSV file.

(3) Group ID and Band ID are replaced to value of U-WAVE-R
When U-WAVE-T information is restored from the CSV file, Group ID and Band ID of U-WAVE-T are automatically replaced with the value of the U-WAVE-R.

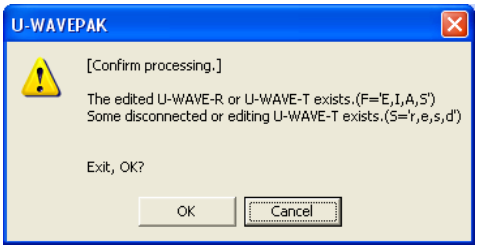
(4) Status is replaced to 'n' after restore
When U-WAVE-T information is restored from the CSV file, the status of U-WAVE-T information is automatically replaced with 'n'.

TIP ・Refer to '4.4.9 Restore' for the restore.

2) Click [OK] button to decide settings.
The settings are memorized to the system.

4.5.6 Exit setup

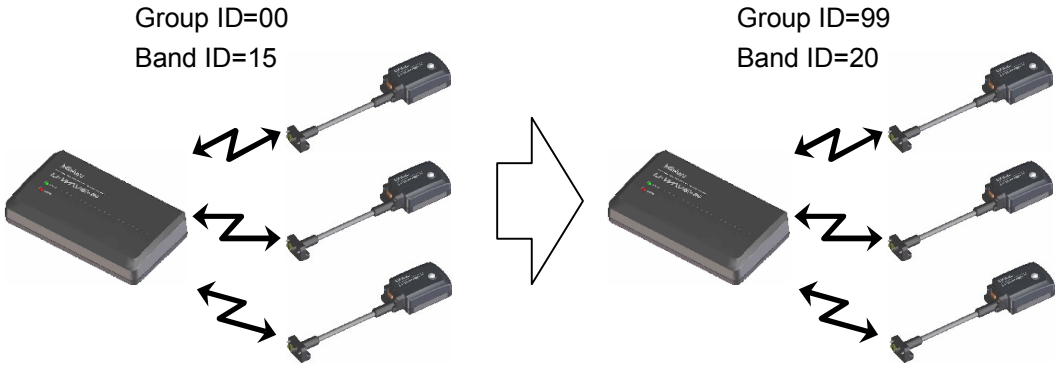
1) Click [Exit setup] button if you want to exit the [Setup].
The following dialog might be displayed by the condition of flag 'F' or status 'S' for information on U-WAVEPAK.



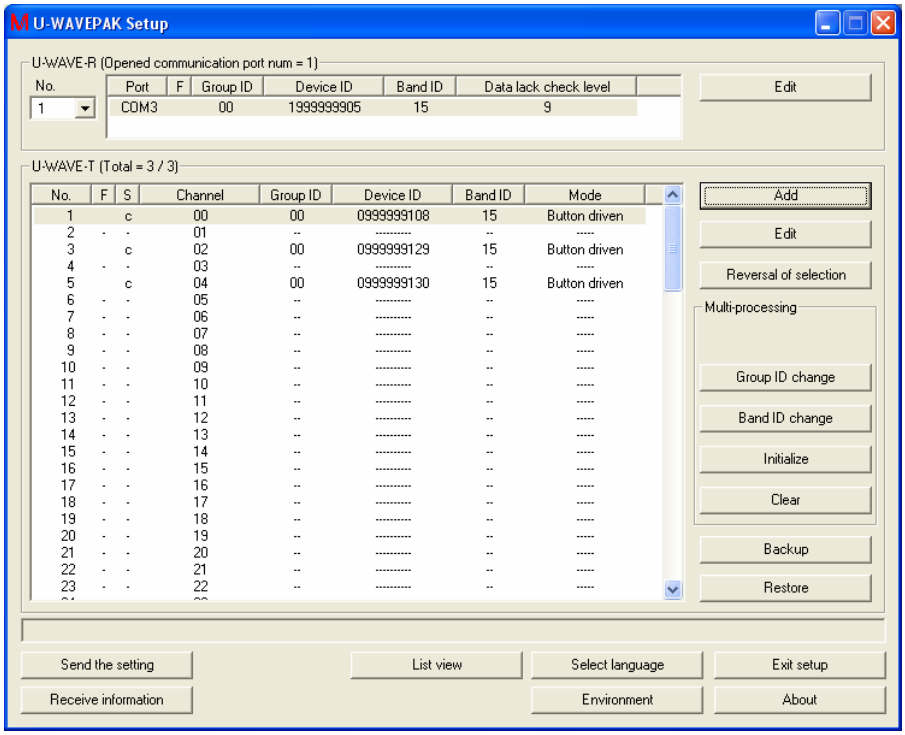
4.6 Concrete operation example

4.6.1 To change group ID or band ID

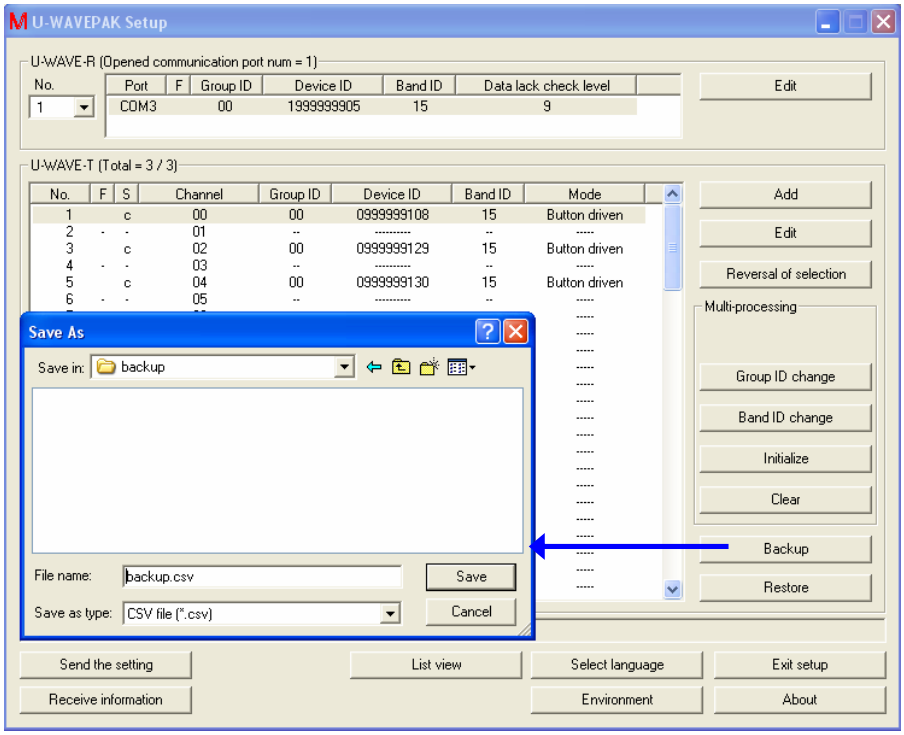
This chapter describes the operation to change registered group ID and (or) band ID.



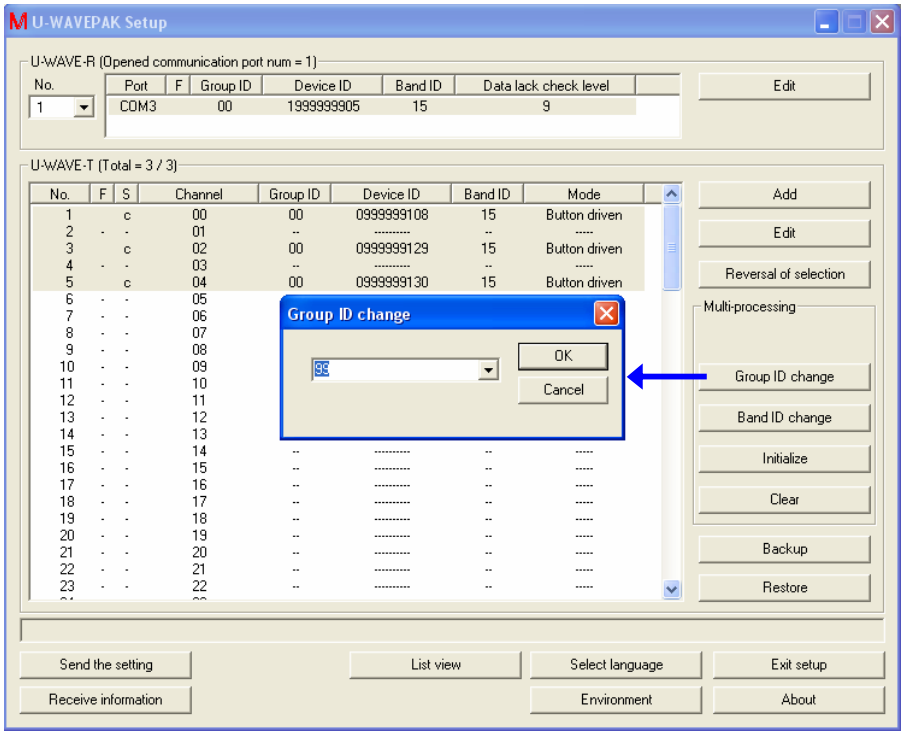
1) Assume that U-WAVE-T are registered in the U-WAVE-R of group ID=00 and band ID=15 as shown in the following dialog.



2) Click [Backup] button to back up U-WAVE-T information to the CSV file. And, back up to the CSV file.

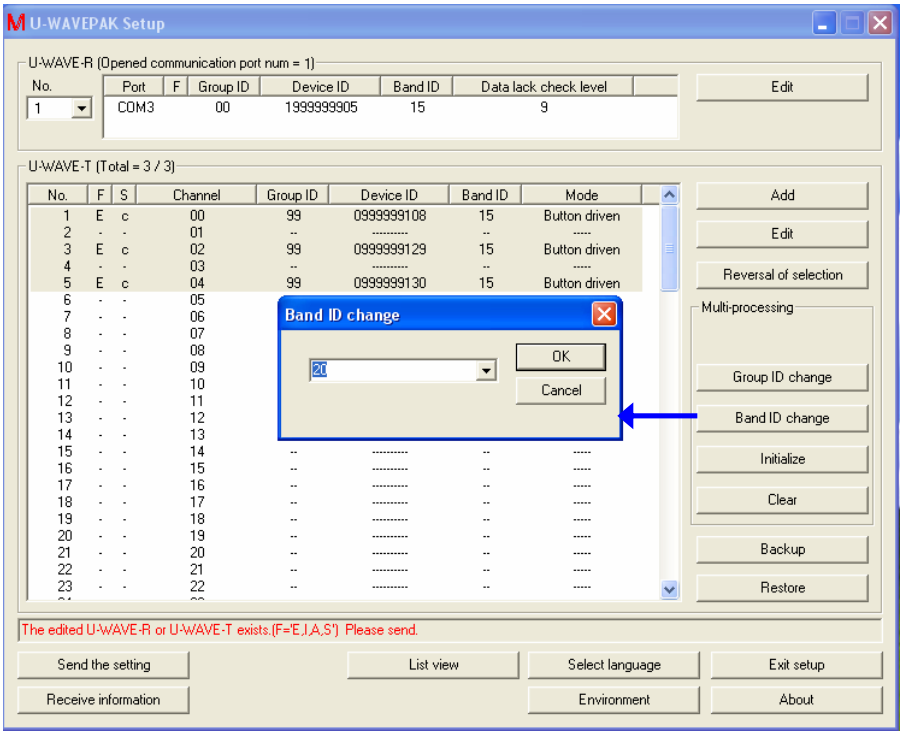


3) Select U-WAVE-T information. And, click [Group ID change] button to change group ID of U-WAVE-T information.



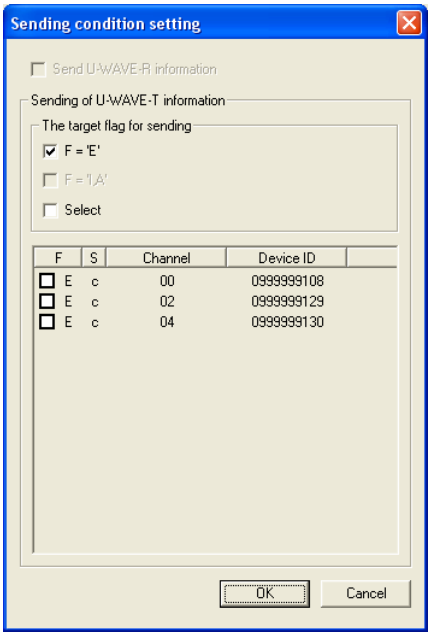
If you want to change only band ID, skip this operation.

4) Select U-WAVE-T information. And, click [Band ID change] button to change band ID of U-WAVE-T information.



If you want to change only group ID, skip this operation.

5) Click [Send the setting] button to send the U-WAVE-T information. And, click [OK] button.



6) 'S' row in 'U-WAVE-T information' list changes to 'e' when the sending of U-WAVE-T information is completed.

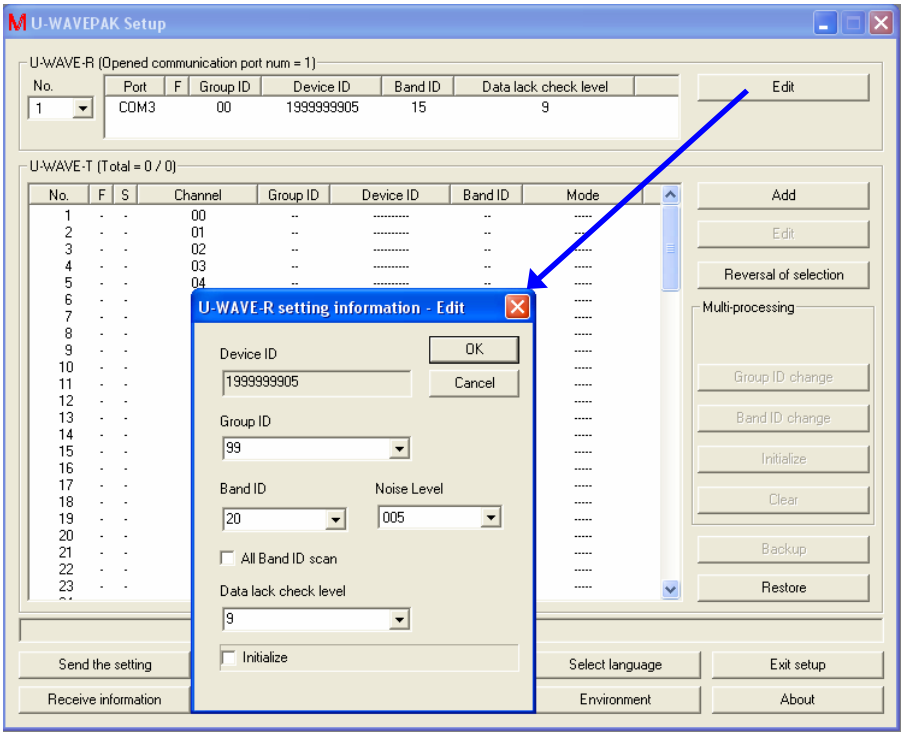
No.	F	S	Channel	Group ID	Device ID	Band ID	Mode
1		e	00	99	0999999108	20	Button driven
2	-	-	01	--	----------	--	-----
3		e	02	99	0999999129	20	Button driven
4	-	-	03	--	----------	--	-----
5		e	04	99	0999999130	20	Button driven

In this state, edited information has not been sent to the U-WAVE-T yet. Therefore, execute the following operation on the U-WAVE-T.

Measurement mode on U-WAVE-T	Operations
Button driven	Push the [DATA] switch on the U-WAVE-T.

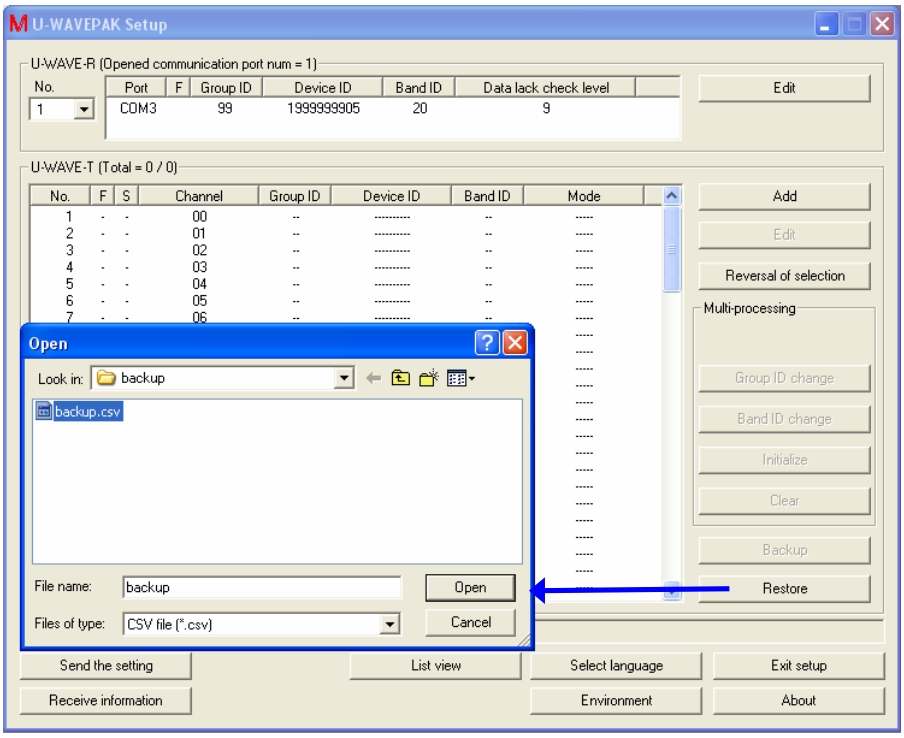
7) U-WAVE-T information is removed from the list when a wireless communication succeeds.

8) Click [Edit] button to change group ID and (or) band ID of U-WAVE-R information.

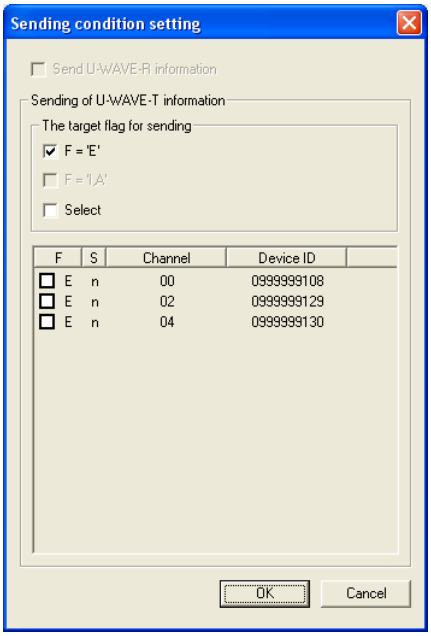


9) Click [Send the setting] button to send the U-WAVE-R information. And, click [OK] button.

10) Click [Restore] button to restore U-WAVE-T information backed up to the CSV file.



11) Click [Send the setting] button to send the U-WAVE-T information. And, click [OK] button.



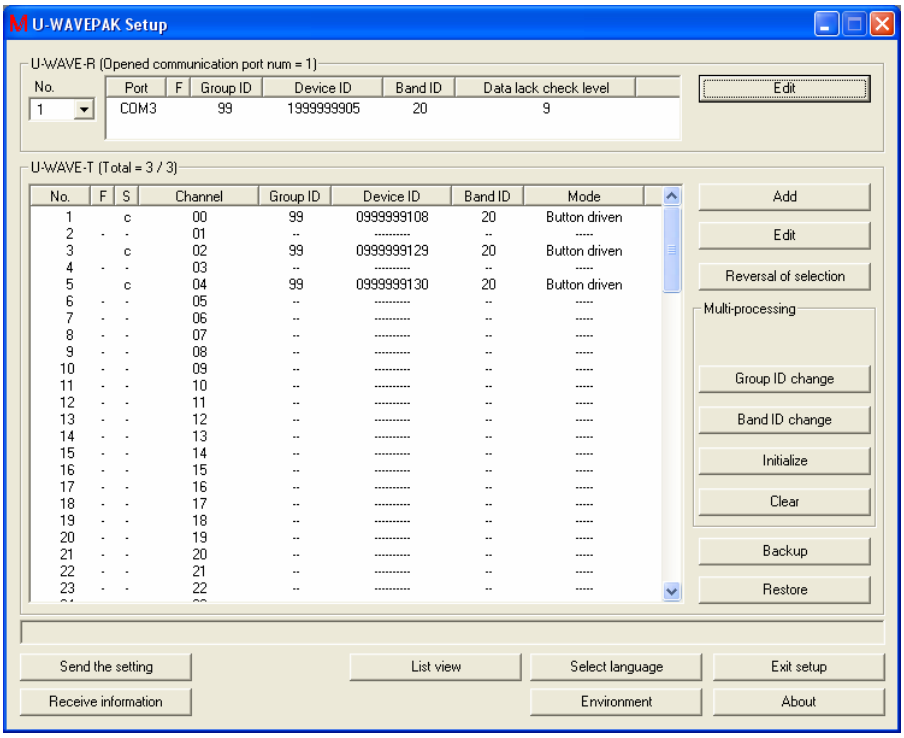
12) 'S' row in 'U-WAVE-T information' list changes to 'r' when the sending of U-WAVE-T information is completed.

No.	F	S	Channel	Group ID	Device ID	Band ID	Mode
1		r	00	99	0999999108	20	Button driven
2	-	-	01	--	----------	--	-----
3		r	02	99	0999999129	20	Button driven
4	-	-	03	--	----------	--	-----
5		r	04	99	0999999130	20	Button driven

In this state, edited information has not been sent to the U-WAVE-T yet. Therefore, execute the following operation on the U-WAVE-T.

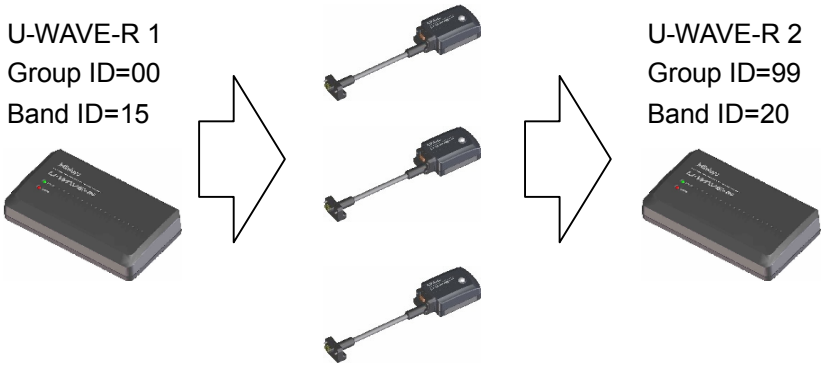
Measurement mode on U-WAVE-T	Operations
Button driven	Push the [DATA] switch on the U-WAVE-T.

13) 'S' row changes from 'r' to 'c' when a wireless communication succeeds.

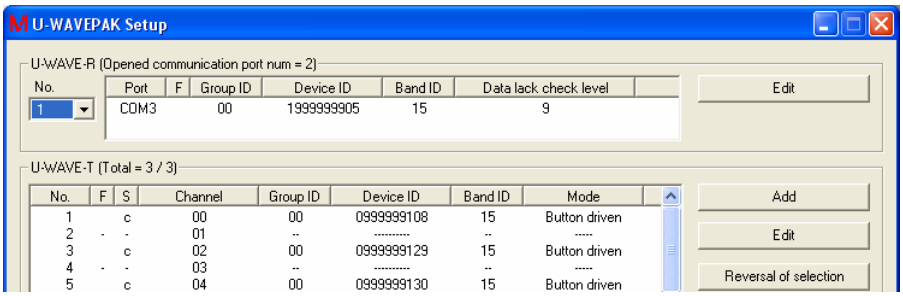


4.6.2 To move the U-WAVE-T between U-WAVE-R

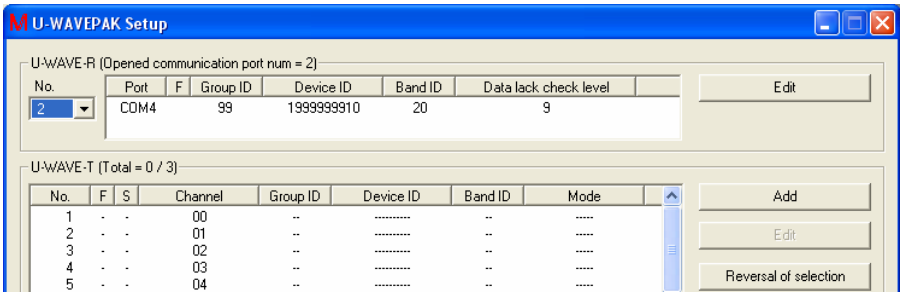
This chapter describes the operation to move the U-WAVE-T between U-WAVE-R.



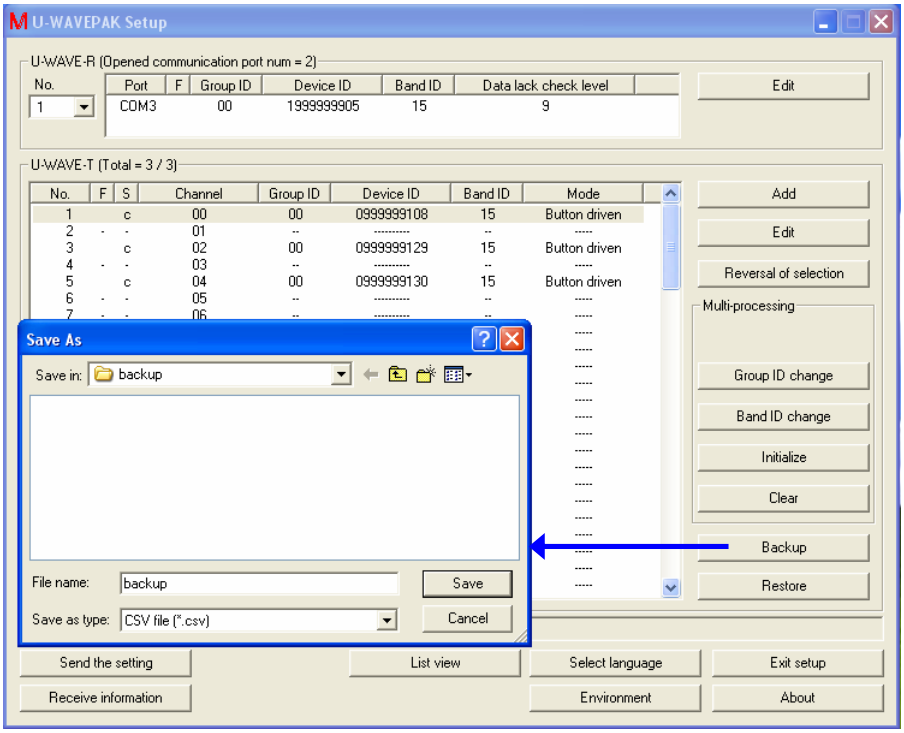
1) Assume that U-WAVE-T are registered in the U-WAVE-R of group ID=00 and band ID=15 as shown in the following dialog.
(Assume this U-WAVE-R to be 'U-WAVE-R 1'.)



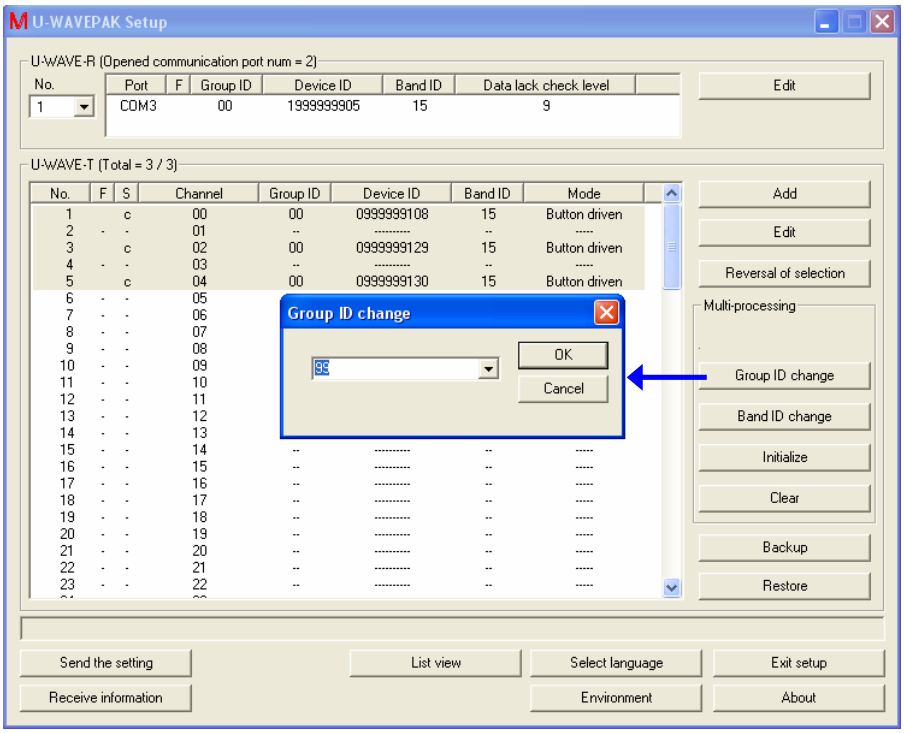
And, assume that U-WAVE-T are not registered in the U-WAVE-R of group ID=99 and band ID=20 as shown in the following dialog.
(Assume this U-WAVE-R to be 'U-WAVE-R 2'.)



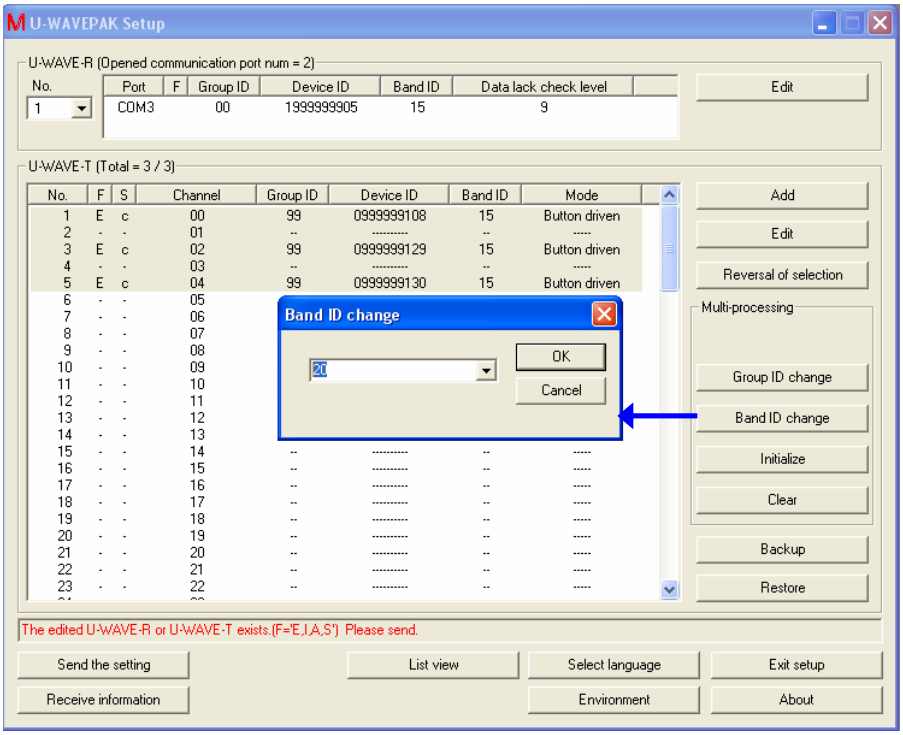
2) Click [Backup] button to back up U-WAVE-T information on 'U-WAVE-R 1' to the CSV file. And, back up to the CSV file.



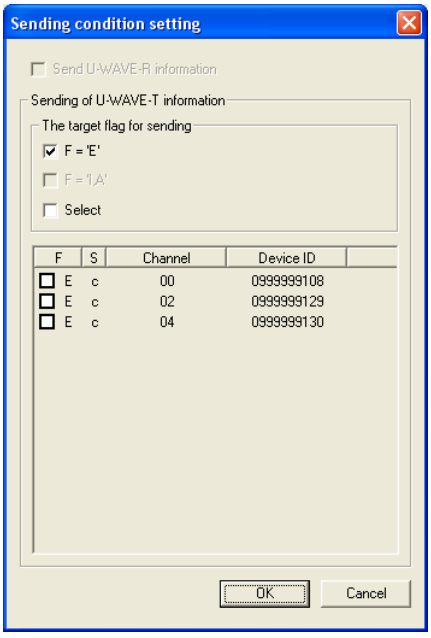
3) Select U-WAVE-T information on 'U-WAVE-R 1'. And, click [Group ID change] button to change group ID of U-WAVE-T information.



4) Select U-WAVE-T information on 'U-WAVE-R 1'. And, click [Band ID change] button to change band ID of U-WAVE-T information.



5) Click [Send the setting] button to send the U-WAVE-T information on 'U-WAVE-R 1'. And, click [OK] button.



6) 'S' row in 'U-WAVE-T information' list changes to 'e' when the sending of U-WAVE-T information is completed.

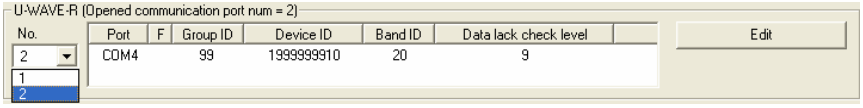
No.	F	S	Channel	Group ID	Device ID	Band ID	Mode
1		e	00	99	0999999108	20	Button driven
2	-	-	01	--	----------	--	-----
3		e	02	99	0999999129	20	Button driven
4	-	-	03	--	----------	--	-----
5		e	04	99	0999999130	20	Button driven

In this state, edited information has not been sent to the U-WAVE-T yet. Therefore, execute the following operation on the U-WAVE-T.

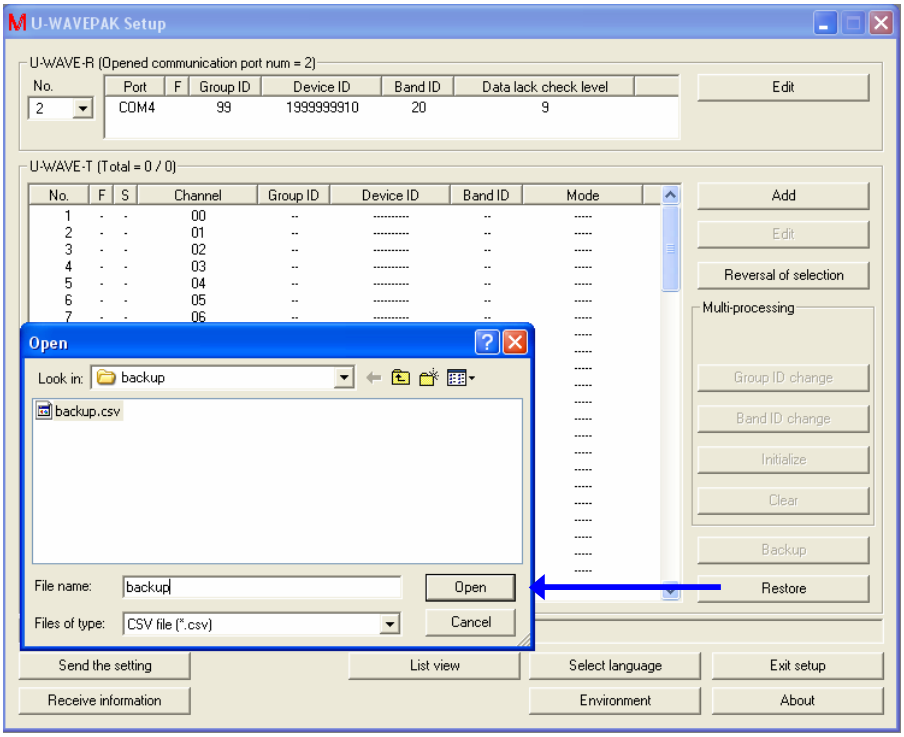
Measurement mode on U-WAVE-T	Operations
Button driven	Push the [DATA] switch on the U-WAVE-T.

7) U-WAVE-T information on 'U-WAVE-R 1' is removed from the list when a wireless communication succeeds.

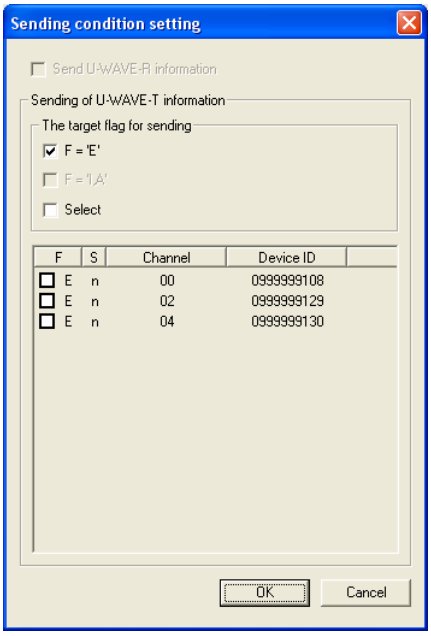
8) Select 'U-WAVE-R 2' on 'U-WAVE-R information' list.



9) Click [Restore] button to restore U-WAVE-T information backed up to the CSV file.



10) Click [Send the setting] button to send the U-WAVE-T information on 'U-WAVE-R 2'. And, click [OK] button.



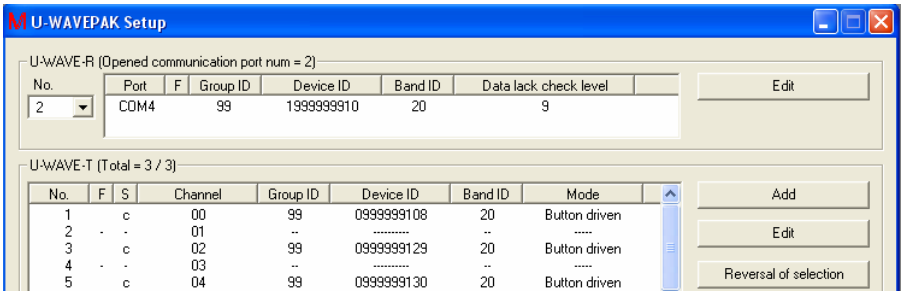
11) 'S' row in 'U-WAVE-T information' list changes to 'r' when the sending of U-WAVE-T information is completed.

No.	F	S	Channel	Group ID	Device ID	Band ID	Mode
1		r	00	99	0999999108	20	Button driven
2	-	-	01	--	----------	--	-----
3		r	02	99	0999999129	20	Button driven
4	-	-	03	--	----------	--	-----
5		r	04	99	0999999130	20	Button driven

In this state, edited information has not been sent to the U-WAVE-T yet. Therefore, execute the following operation on the U-WAVE-T.

Measurement mode on U-WAVE-T	Operations
Button driven	Push the [DATA] switch on the U-WAVE-T.

12) 'S' row changes from 'r' to 'c' when a wireless communication succeeds.



MEMO

5 Data I/F

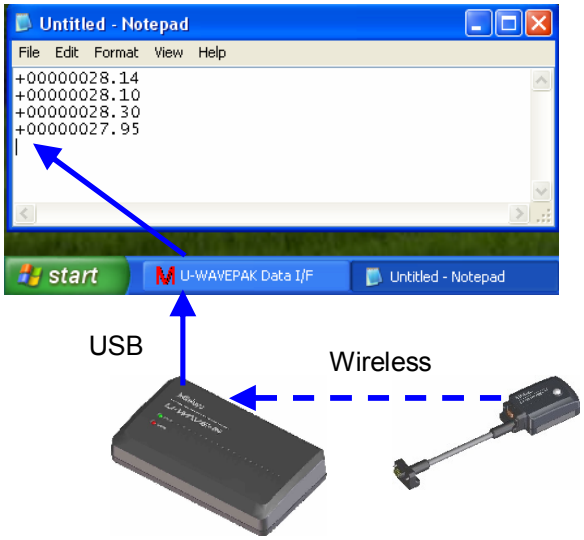
5.1 Basic operations of Data I/F

IMPORTANT ・Use the U-WAVE-R to which one or more U-WAVE-T are registered.

1) Click [Data I/F start] button in the menu dialog. [U-WAVEPAK Data I/F] is minimized and stored in the taskbar of Windows.

2) Start arbitrary application software ('Notepad' or 'Microsoft Excel', etc.) to collect the measurement data.

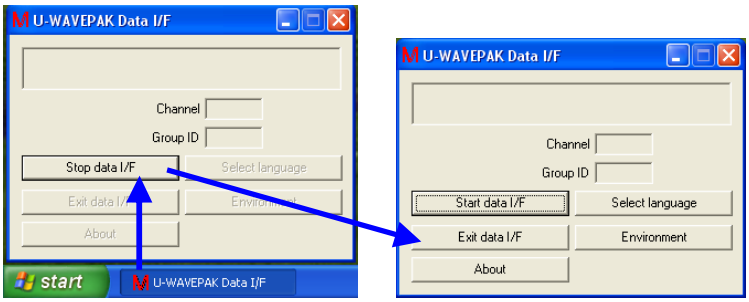
3) When the measurement data is sent by the U-WAVE-T, the measurement data is input to the key input area in the application software via U-WAVEPAK.



NOTE ·[U-WAVEPAK Data I/F] convert the measurement data into the keyboard emulation data. Therefore, the measurement data can be input to the application software that can be input from the keyboard.

·When an orange [DATA] switch on U-WAVE-T or [DATA] switch on measuring tool is pushed, the U-WAVE-T outputs the measurement data.

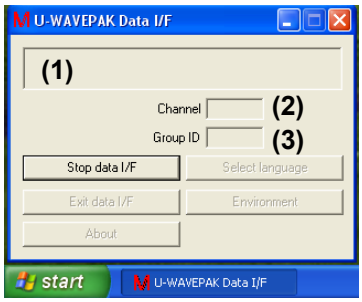
4) When the collection of the measurement data is completed, click [Stop data I/F] button after displaying the following dialog clicking [U-WAVEPAK Data I/F] on the taskbar.



Click [Exit data I/F] button if you want to return to the menu dialog.

Click [Start data I/F] button if you want to restart the collection of the measurement data. And, [U-WAVEPAK Data I/F] will be automatically minimized and be stored in the taskbar of Windows.

5.2 Functions

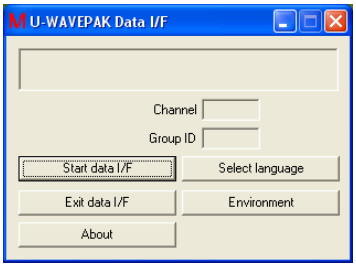


(1) Receive data & status display area
Data or status received from the U-WAVE-R is displayed.

(2) Channel
Channel attached to the data received from the U-WAVE-R is displayed.

(3) Group ID
Group ID attached to the data received from the U-WAVE-R is displayed.

(4) [Stop data IF] button
Reception of data from the U-WAVE-R is stopped.



(5) [Start data I/F] button
Reception of data from the U-WAVE-R is started.

(6) [Exit data I/F] button
[U-WAVEPAK Data I/F] is exit.

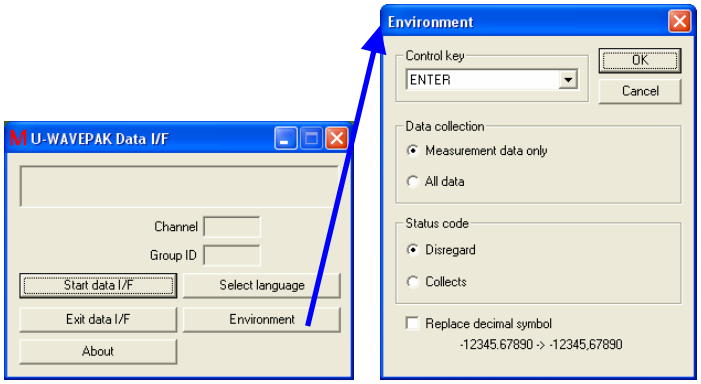
(7) [About] button
[Version information] dialog is displayed.

(8) [Select language] button
[Select language] dialog is displayed.

(9) [Environment] button
[Environment] dialog is displayed.

5.3 Environment

Click [Environment] button if you want to change the settings of the environment.
The settings are memorized to the system.



(1) Control key
Specify the control key that should be attached at the end of the measurement data converted into the keyboard emulation data.

(2) Data collection
Select the method of converting the measurement data into the keyboard emulation data.
When [Measurement data only] is selected, only measurement data is converted into the keyboard emulation data.
When [All data] is selected, the measurement data and attached information (Group ID, Channel and Unit, etc) are converted into the keyboard emulation data.

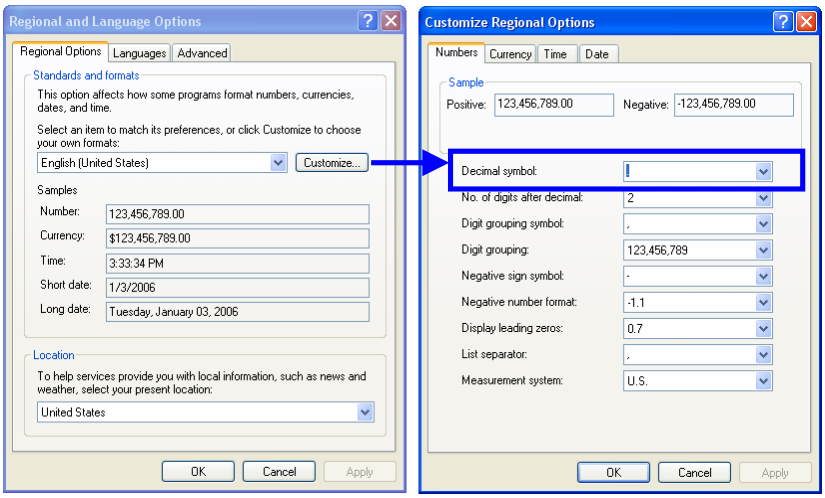
TIP ・Refer to '7.1.2.1 Measurement data packet' for the specification of the measurement data.

(3) Status code
Select whether to convert status received from the U-WAVE-R into the keyboard emulation data.
When [Disregard] is selected, status is not converted into the keyboard emulation data.
When [Collects] is selected, status is converted into the keyboard emulation data.

TIP ・Refer to '7.1.2.2 Status packet' for the specification of the status.

(4) Replace decimal symbol

Specify whether to replace the decimal symbol in the measurement data into the symbol in [Control Panel]-[Regional and Language Options]-[Customize Regional Options] of Windows when the measurement data is converted into the keyboard emulation data.



MEMO

6 Data Collection Macro

The data collection macro is an Excel macro that inputs the measurement data from the Digimatic measuring tools to the Excel sheet via the U-WAVE-T and U-WAVE-R.

If group ID and the channel of U-WAVE are allocated to the measurement item on the input sheet, the measurement data is input to the cell of the corresponding measurement item. Even if this allocation doesn't exist, the measurement data can be easily collected.

If the tolerance is set to the input sheet, the tolerance judgment of the input measurement data is executed.

The format of the file that preserves the measurement data is the same as Excel inspection report making program 'MeasureReport'. 'MeasureReport' can make the inspection report of a free layout by reading the preserved file of measurement data.

6.1 Start of macro

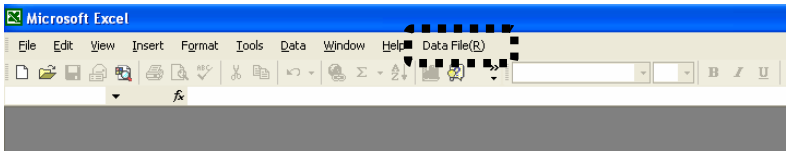
IMPORTANT ・Use the U-WAVE-R to which one or more U-WAVE-T are registered.

IMPORTANT ・Microsoft Excel (above Excel 2000) is necessary to use 'Data Collection Macro for U-WAVE'. Install Microsoft Excel in same PC as U-WAVEPAK.

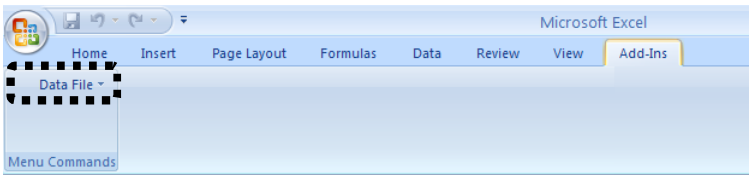
・'Data Collection Macro for U-WAVE' doesn't support Microsoft Excel of 64-Bit Edition.

1) Click [Data Collection Macro for U-WAVE] with the program menu of Windows.

2) Microsoft Excel starts.
Confirm the existence of the [Data File] menu on menu bar.

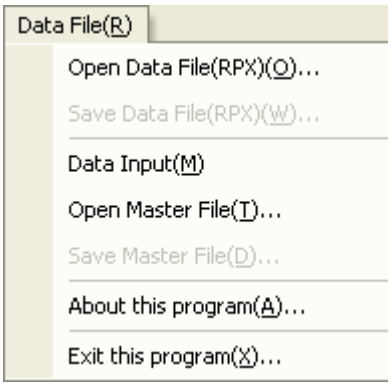


3) In case of Excel 2007 and Excel 2010, the [Data File] menu exists in [Add-Ins] menu.



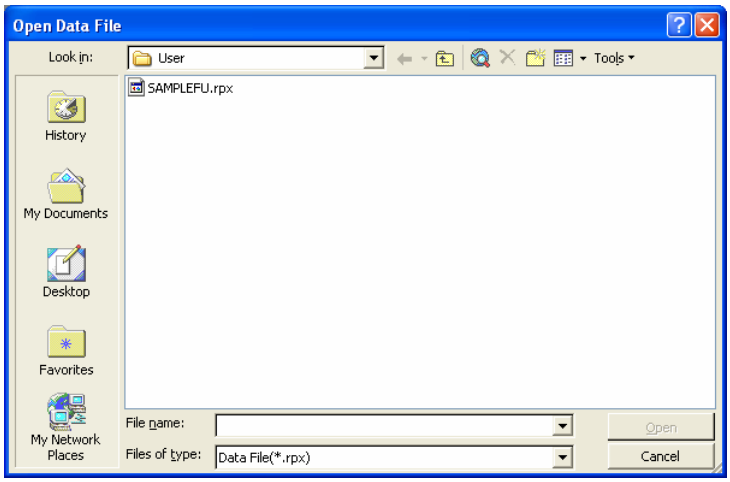
6.2 [Data File] Menu

When the [Data file] of Excel is clicked, the main menu of this program will be displayed.



6.2.1 Open Data File (RPX)

When [Open Data File (RPX)] is clicked, the following dialog will be displayed.



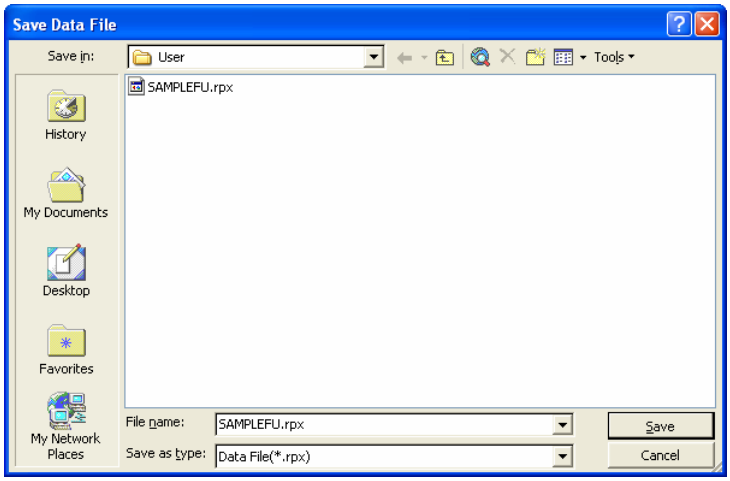
Click [Open] button after selecting the measurement data file in this dialog.

The measurement data file opens, and the display changes into the layout that can input the measurement data.

TIP ・Refer to '6.3 [Data Input] Menu' for details.

6.2.2 Save Data File (RPX)

When [Save Data File (RPX)] is clicked, the following dialog will be displayed.



Input the file name in the dialog and click the [Save] button. The data file will be saved.

6.2.3 Data Input

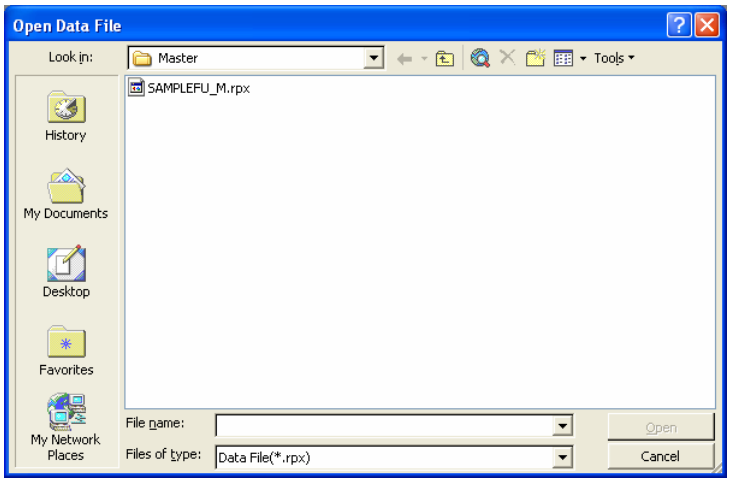
Data can be input in a measurement data file that is currently open.

TIP ・Refer to '6.3 [Data Input] Menu' for details.

6.2.4 Open Master File

A master file is the file of which a design value or a nominal value is already set and its form is equivalent to that of the measurement data file (RPX). However, a measurement data is left as a blank. Since the master file can be assigned to a different folder, it can be managed separately from the measurement data file.

When [Open Master File] is clicked, the following dialog will be displayed.



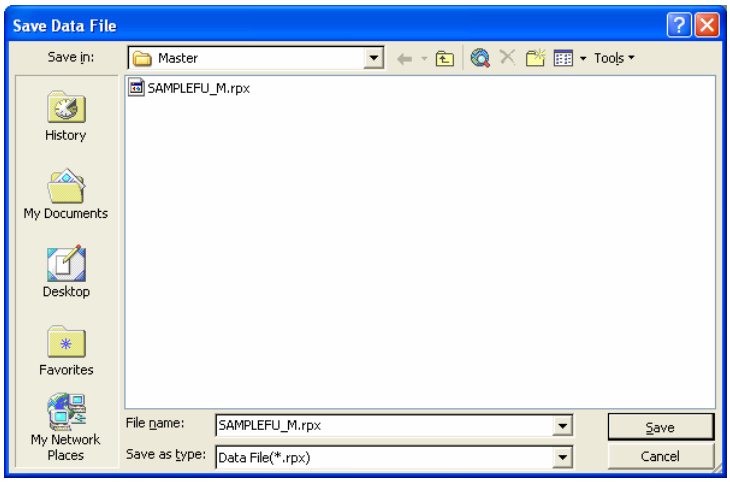
Click [Open] button after selecting the master file in this dialog.

The master file opens, and the display changes into the layout that can input the measurement data.

TIP ・Refer to '6.3 [Data Input] Menu' for details.

6.2.5 Save Master File

When [Save Master File] is clicked, the following dialog will be displayed.



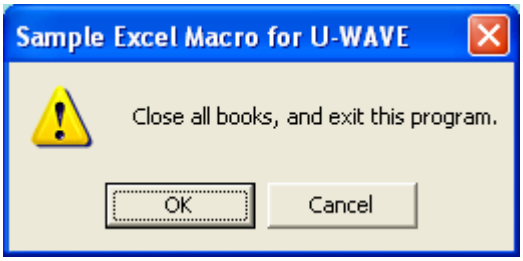
Input the file name in the dialog and click the [Save] button. The master file will be saved.

6.2.6 About this program

When this menu is clicked, version information is displayed.

6.2.7 Exit this program

When clicking the [Exit this program], the following dialog is displayed.



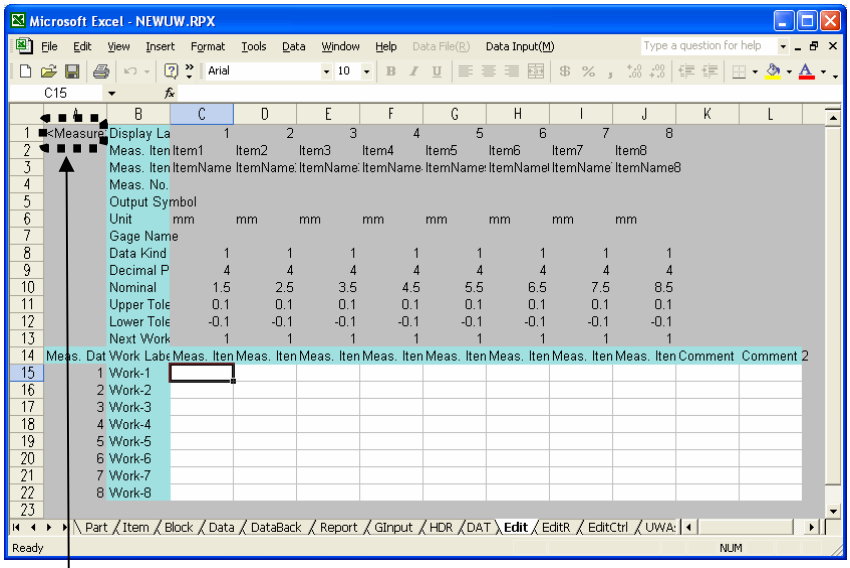
When clicking the [OK] button here, this program and Excel will be closed.

IMPORTANT ・The workbook isn't saved.

6.3 [Data Input] Menu

There are edit mode and measurement mode in the measurement data input. In edit mode, all the data on a sheet including measurement items can be edited. In measurement mode, it is the mode which inputs measurement data, other cells than measurement data and comments are protected, and cannot be input. When you input a measurement data in this mode, tolerance judgment will be executed and the cursor moves to the next cell automatically.

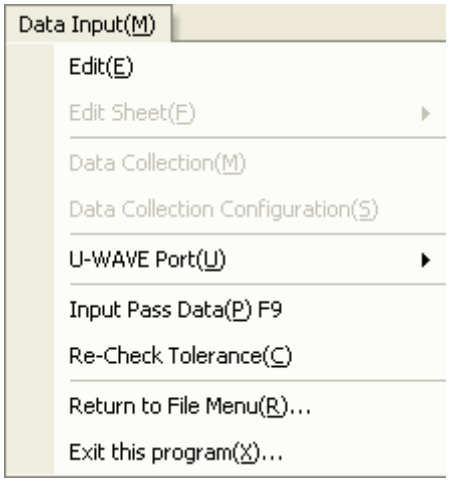
When 'NEWUW.RPX' that is the sample file is opened, and the measurement data input begins, the following screen is displayed.



The mode that has been selected is displayed here.

This input mode is a measurement mode, and the data input from U-WAVE is possible in this state.

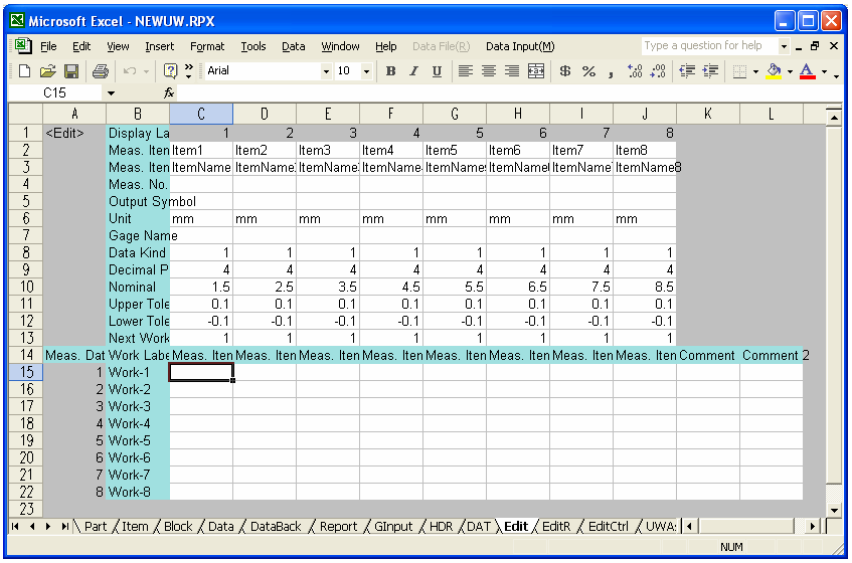
The menu of data input is as follows.



6.3.1 Edit

When this menu is executed, the input mode changes into the edit mode.

The edit mode screen is as follows. In the edit mode, measurement feature, data, and labels can be modified. The input method is the same as in the normal operation of Excel.



6.3.2 Sheet Edit

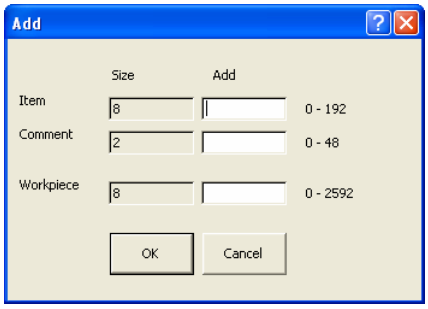
The following submenus are included in the [Sheet Edit] menu.

(1) Add Input Area Size

(2) Delete Input Area Size

6.3.2.1 Add Input Area Size

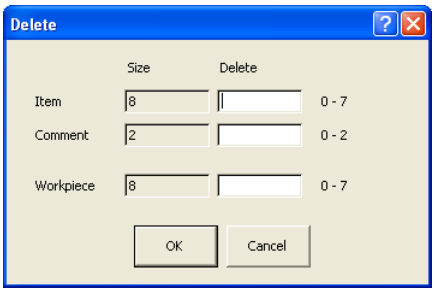
1) Go to the [Data Input] menu and click [Sheet Edit]-[Add Input Area Size].
This command is effective only in the edit mode. The following dialog will be displayed.



2) Enter a desired number in each [Add] box. Click [OK] button.

6.3.2.2 Delete Input Area Size

1) Go to the [Data Input] menu and click [Sheet Edit]-[Delete Input Area Size].
This command is effective only in the edit mode. The following dialog will be displayed.



2) Enter a desired number in each [Delete] box. Click [OK] button.

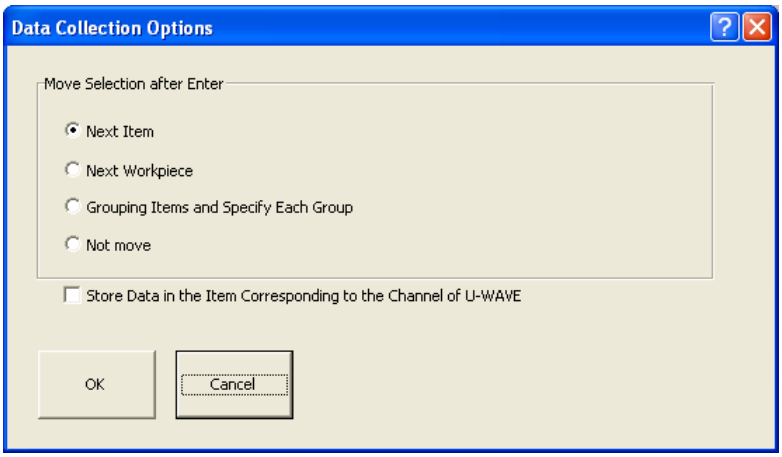
6.3.3 Data Collection

When this menu is executed, the input mode changes into the measurement mode.

The data collection according to the method set in [Data Collection Options] dialog is started.

6.3.4 Data Collection Configuration

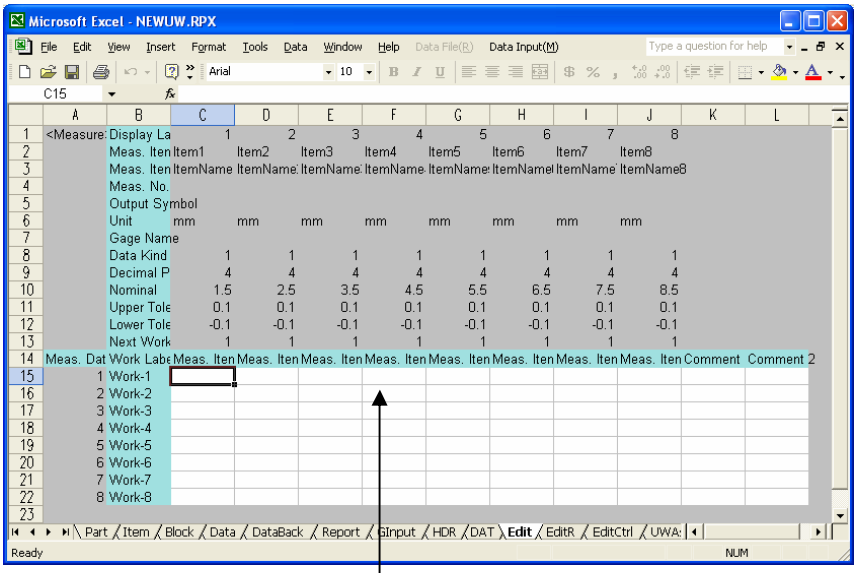
1) Go to the [Data Input] menu and click [Data Collection Configuration].
This command is effective only in the edit mode. The following dialog will be displayed.



6.3.4.1 Move Selection after Enter

6.3.4.1.1 Next Item

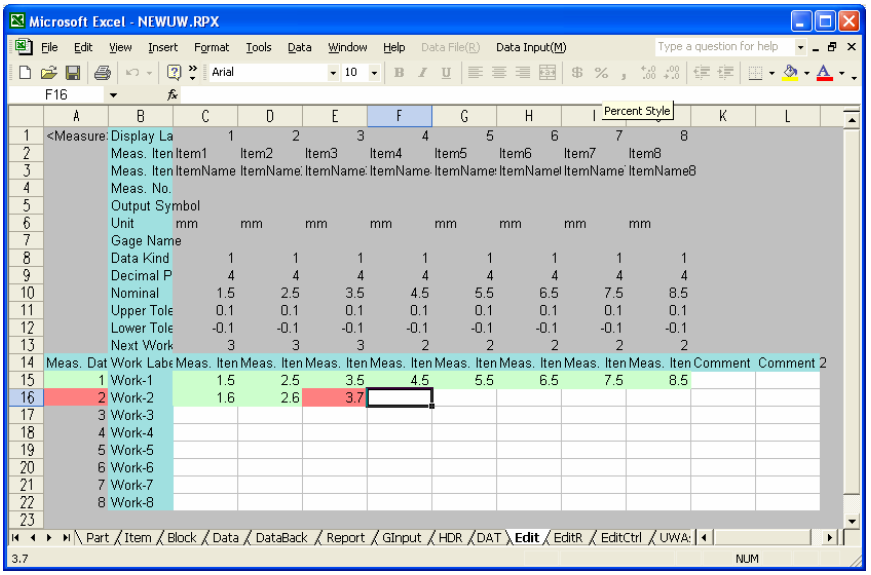
In this data collecting method, the cursor is moved to the cell of the next measurement item after the measurement data is input.



The measurement data from the keyboard and the U-WAVE port can be input on this screen.

TIP ·Refer to '6.3.5 U-WAVE Port' about the method of inputting the measurement data from the U-WAVE port.

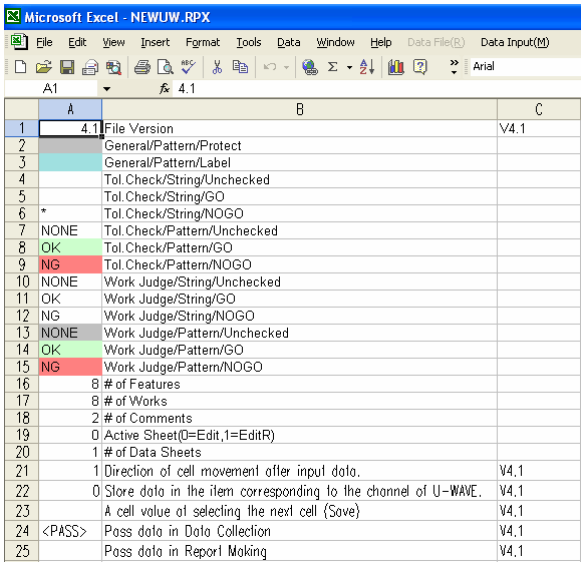
Once the measurement data is input by keyboard or U-WAVE, a tolerance judgment against the current cells and a total judgment on the current workpiece are performed. Color of the cells indicates a judgment result.



Colors can be chosen in the [EditCtrl] sheet. The default values are as follows:

Tolerance judgment: unchecked = no color / good = light green / not good = light red

Workpiece judgment: unchecked = gray / good = light green / not good = light red



	A	B	C
1	4.1	File Version	V4.1
2		General/Pattern/Protect	
3		General/Pattern/Label	
4		Tol.Check/String/Unchecked	
5		Tol.Check/String/GO	
6	*	Tol.Check/String/NOGO	
7	NONE	Tol.Check/Pattern/Unchecked	
8	OK	Tol.Check/Pattern/GO	
9	NG	Tol.Check/Pattern/NOGO	
10	NONE	Work Judge/String/Unchecked	
11	OK	Work Judge/String/GO	
12	NG	Work Judge/String/NOGO	
13	NONE	Work Judge/Pattern/Unchecked	
14	OK	Work Judge/Pattern/GO	
15	NG	Work Judge/Pattern/NOGO	
16	8	# of Features	
17	8	# of Works	
18	2	# of Comments	
19	0	Active Sheet(0=Edit,1=EditR)	
20	1	# of Data Sheets	
21	1	Direction of cell movement after input data.	V4.1
22	0	Store data in the item corresponding to the channel of U-WAVE.	V4.1
23		A cell value at selecting the next cell (Save)	V4.1
24	<PASS>	Pass data in Data Collection	V4.1
25		Pass data in Report Making	V4.1

IMPORTANT ・Do not change other values in the [EditCtrl] sheet.
If other values are changed, the macro will not operate normally.

6.3.4.1.2 Next Workpiece

In this data collecting method, the cursor is moved to the cell of the next workpiece after the measurement data is input. Excluding this operation, it is similar to the case of 'Next Item'.

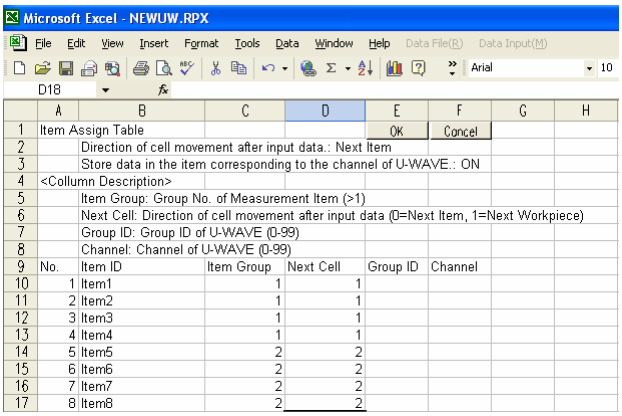
6.3.4.1.3 Grouping items and specify each group

In this data collecting method, In this data gathering process, the measurement items are made a group. And, each group can specify the direction where cursor is moved after the measurement data is input.

When this option is selected by [Data Collection Options] dialog, and [OK] button is clicked, the following sheet is displayed.

'Group of the measurement item' and 'Direction where cursor is moved after measurement data is input' are specified in this sheet.

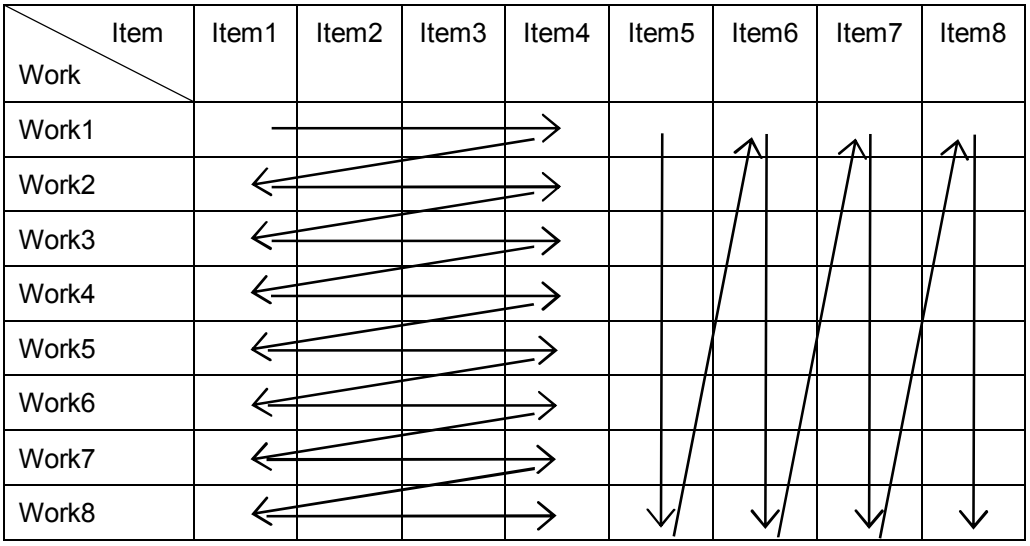
In the following examples, everything from Item1 to Item4 is specified for group 1. And, everything from Item5 to Item8 is specified for group 2.
In addition, the direction of group 1 is specified for 'Next Item'.
The direction of group 2 is specified for 'Next WorkPiece'.



	A	B	C	D	E	F	G	H
1	Item Assign Table				OK	Cancel		
2		Direction of cell movement after input data.: Next Item						
3		Store data in the item corresponding to the channel of U-WAVE.: ON						
4	<Collumn Description>							
5		Item Group: Group No. of Measurement Item (>1)						
6		Next Cell: Direction of cell movement after input data (0=Next Item, 1=Next Workpiece)						
7		Group ID: Group ID of U-WAVE (0-99)						
8		Channel: Channel of U-WAVE (0-99)						
9	No.	Item ID	Item Group	Next Cell	Group ID	Channel		
10	1	Item1	1	1				
11	2	Item2	1	1				
12	3	Item3	1	1				
13	4	Item4	1	1				
14	5	Item5	2	2				
15	6	Item6	2	2				
16	7	Item7	2	2				
17	8	Item8	2	2				

Click [OK] button when the setting is completed in this sheet.

In this case, the measurement procedure progresses according to the arrow of following figure.



6.3.4.1.4 Not move

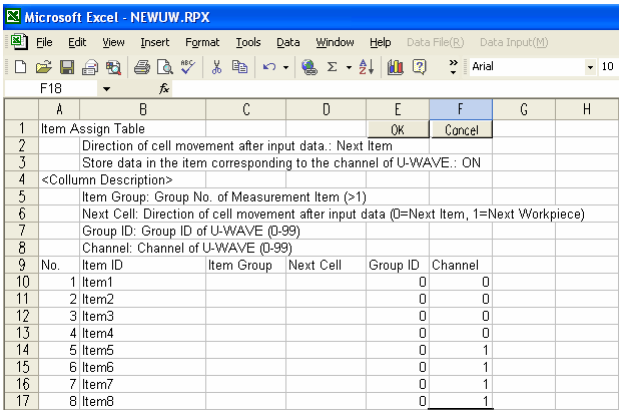
In this data collecting method, the cursor is not moved after the measurement data is input. Excluding this operation, it is similar to the case of 'Next Item'.

6.3.4.1.5 Store data in the item corresponding to the channel of U-WAVE

When this check box is checked in [Data Collection Options] dialog, and [OK] button is clicked, the following sheet is displayed.

Group ID and the channel of U-WAVE are allocated to the measurement item in this sheet.

In the following examples, 'group ID=0' is allocated to all the measurement items. And, 'channel =0' is allocated from Item1 to Item4, and 'channel =1' is allocated from Item5 to Item8.

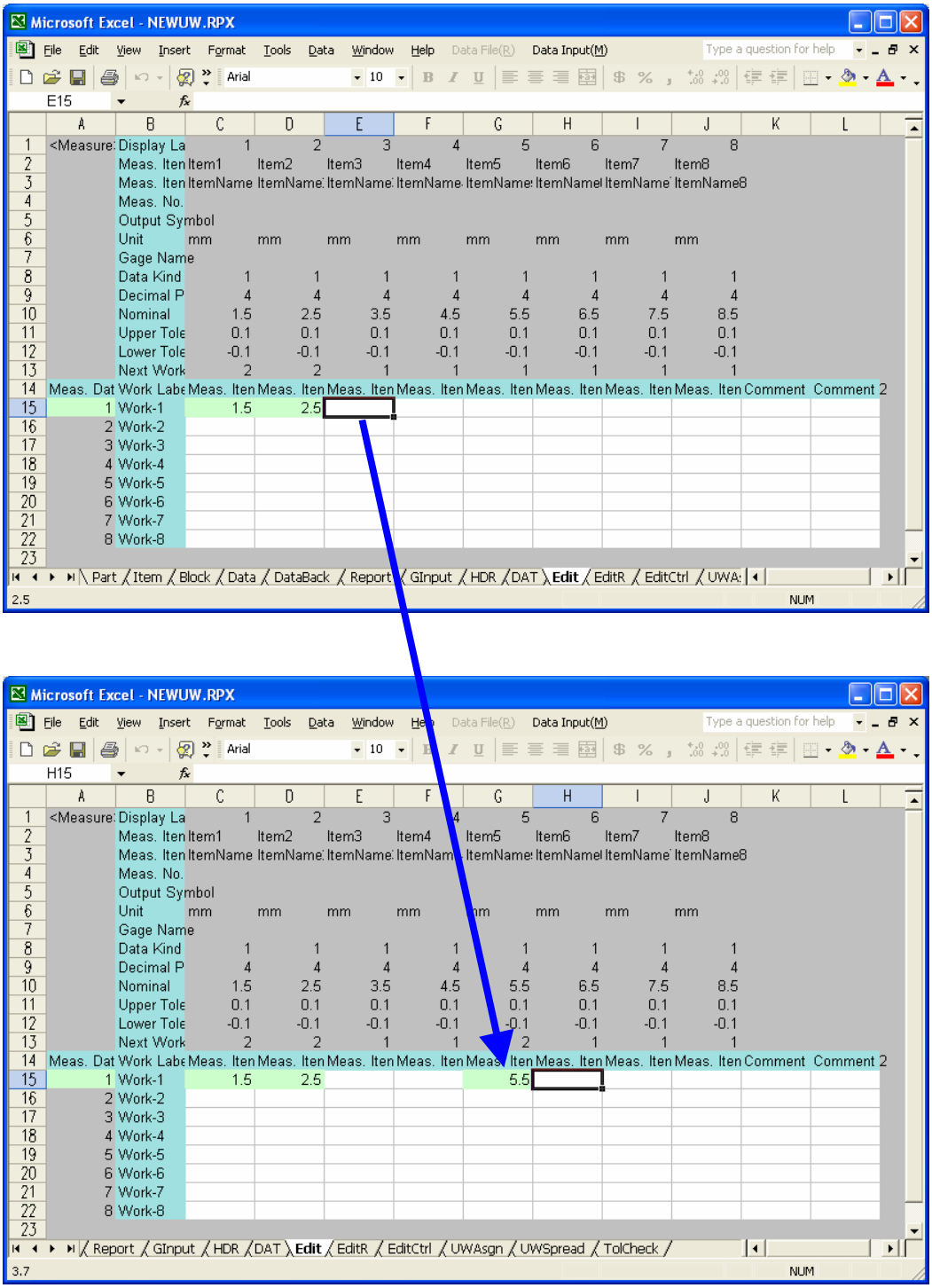


	A	B	C	D	E	F	G	H
1	Item Assign Table				OK	Concel		
2		Direction of cell movement after input data.: Next Item						
3		Store data in the item corresponding to the channel of U-WAVE.: ON						
4	<Collumn Description>							
5		Item Group: Group No. of Measurement Item (>1)						
6		Next Cell: Direction of cell movement after input data (0=Next Item, 1=Next Workpiece)						
7		Group ID: Group ID of U-WAVE (0-99)						
8		Channel: Channel of U-WAVE (0-99)						
9	No.	Item ID	Item Group	Next Cell	Group ID	Channel		
10	1	Item1			0	0		
11	2	Item2			0	0		
12	3	Item3			0	0		
13	4	Item4			0	0		
14	5	Item5			0	1		
15	6	Item6			0	1		
16	7	Item7			0	1		
17	8	Item8			0	1		

Click [OK] button when the setting is completed in this sheet.

In the data collection, only the measurement data from the U-WAVE-T that corresponds to group ID and the channel allocated to the measurement item is input to the cell. If the measurement data from U-WAVE-T different from group ID and the channel allocated in the current measurement item, the measurement data is input after the cursor jumps to right measurement item.

In the following example, the measurement data was input from the U-WAVE-T of group ID and the channel that had been allocated in measurement item5 when a cursor was measurement item3.



6.3.5 U-WAVE Port

The following submenus are included in the [U-WAVE Port] menu.

(1) Open Port

(2) Close Port

(3) Undo of Input

6.3.5.1 Open Port

'U-WAVEPAK data I/F' will be started. Start the data collection.

TIP ・Refer to '5 Data I/F' for details.

NOTE ・Confirm the following setting in the [Environment] dialog of 'U-WAVEPAK data I/F'.

(1) Control key = ENTER

(2) Data collection = All data

(3) Status code = Collects

The measurement data from the measuring tool connected with U-WAVE is sent to Excel as 'Measurement data packet' via U-WAVEPAK, and set in the corresponding cell.

TIP ・Refer to '7.1.2.1 Measurement data packet' for 'Measurement data packet'.

6.3.5.2 Close Port

U-WAVEPAK will be exited.

6.3.5.3 Undo of Input

The data input immediately before is canceled.

Similarly, when the 'Status packet' (the 'status code' is 'data cancel') received from U-WAVE, the data input immediately before is canceled.

TIP ・Refer to '7.1.2.2 Status packet' for 'Status packet'.

6.3.6 Input Pass Data

In the data collection, the input to the cell where the pass data is set beforehand can be skipped.

If the pass data is being set by the next cell when the cell is moved after data is input, it moves to the next blank cell.

The character of the pass data can be set in the [EditCtrl] sheet.

Set the pass data in a current cell by the following operations.

1) Go to the [Data Input] menu and click [Input Pass Data].

6.3.7 Re-checking Tolerance

It is possible to re-check tolerance in the following way.

This command is effective only in the edit mode.

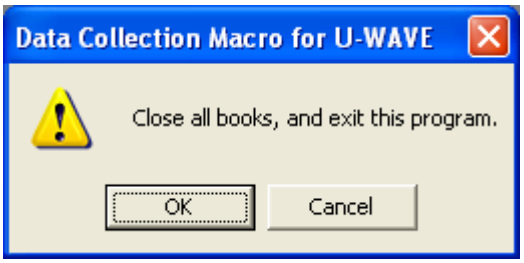
1) Go to the [Data Input] menu and click [Re-check Tolerance].

6.3.8 Returning to File Menu

1) Go to the [Data Input] menu and click [Return to File Menu]. It will return to [Data File] screen.

6.3.9 Exit this program

When clicking the [Exit this program], the following dialog is displayed.



When clicking the [OK] button here, this program and Excel will be closed.

IMPORTANT ·If this program is closed at this time, the measurement data file that are currently open will not be saved.

7 Appendix

7.1 Specification of communication packet

This section shows the communication packet specification for data collection between U-WAVE-R and PC.

7.1.1 Common specifications

(1) Packet data are all coded by ASCII code.

(2) The code of 'Group ID', 'Channel', 'Device ID', and 'Measurement data' are zero-supplied (If the left side integer number are blank, they are filled by zero).

7.1.2 Packets from U-WAVE-R to PC

7.1.2.1 Measurement data packet

When receiving a measurement data from the U-WAVE-T, the U-WAVE-R outputs this packet (DT) to the PC.

Item	Value	Bytes	Description
Packet code	DT	2	Measurement data packet
Version number	1	1	U-WAVE API version number
Group ID	00-99	2	Group ID of the U-WAVE-T
Channel	00-99	2	Channel of the U-WAVE-T
Sign	+/-	1	Use '+' where the measurement data = 0.
Measurement data	????????????	11	?=0-9 or decimal point (Decimal symbol is '.')
Unit	M/I/0	1	M=mm, I=Inch, 0=No unit
Terminator	0Dh	1	CR(Carriage return)
Total		21	

7.1.2.2 Status packet

To notify the state of U-WAVE, the status packet is sent.

Or, it is sent as a return to the request packet from PC.

Item	Value	Bytes	Description
Packet code	ST	2	Status packet
Version number	1	1	U-WAVE API version number
Group ID	00-99	2	(Refer to 7.1.2.2.1.)
Channel	00-99	2	(Refer to 7.1.2.2.1.)
Device ID	0000000000-1999999999 (FFFFFFFFFF)	10	FFFFFFFFFF=unknown
Status code	00-99	2	(Refer to 7.1.2.2.1.)
Terminator	0Dh	1	CR(Carriage return)
Total		20	

7.1.2.2.1 Status code

Code	Message	Detecting device	Description
00	U-WAVE-T's Battery voltage reduction	U-WAVE-T	Battery voltage of the U-WAVE-T reduced. Group ID=Value of the U-WAVE-T. Channel=Value of the U-WAVE-T.
01	Measuring tool doesn't respond	U-WAVE-T	Measuring tool doesn't respond. Measuring tool doesn't connect to the U-WAVE-T. Group ID=Value of the U-WAVE-T. Channel=Value of the U-WAVE-T.
02	The unregistered U-WAVE-T was detected	U-WAVE-R	The U-WAVE-T not registered in the U-WAVE-R was detected. Group ID=Value of the U-WAVE-R. Channel=FF
03	Omission of measurement data	U-WAVE-R	The number of the measurement data omission goes over the alerting level. Group ID=Value of the U-WAVE-T. Channel=Value of the U-WAVE-T.
04	U-WAVE-T disconnected	U-WAVE-R	The U-WAVE-T doesn't connect to the U-WAVE-R. Group ID=Value of the U-WAVE-T. Channel=Value of the U-WAVE-T.
05	No data	U-WAVE-R	The U-WAVE-T's data in the U-WAVE-R is cleared. Group ID=Value of the U-WAVE-T. Channel=Value of the U-WAVE-T.
50	Request packet error	U-WAVE-R	The request packet from PC is illegal. Ex) Illegal packet format; The value in the packet is out of range; The channel isn't registered; Illegal Group ID. Group ID=Value of the request packet. Channel=Value of the request packet.
51	End of search for U-WAVE-T	U-WAVE-R	It was not found though it searched for the U-WAVE-T. Group ID=Value of the request packet. Channel=Value of the request packet.
99	Data cancel	U-WAVE-T	Receive 'data cancel' from the U-WAVE-T. Group ID=Value of the U-WAVE-T. Channel=Value of the U-WAVE-T.

7.1.2.3 U-WAVE-R information packet

When the U-WAVE-R receives the 'Request of information packet', where the 'Destination device' is 'U-WAVE-R', the U-WAVE-R returns this packet (RI) or the 'Status packet'.

Item	Value	Bytes	Description
Packet code	RI	2	U-WAVE-R information packet
Version number	1	1	U-WAVE API version number
Group ID	00-99,FF	2	Group ID of the U-WAVE-R FF=Factory default state
Device ID	0000000000- 1999999999	10	Device ID of the U-WAVE-R
Band ID	11-25	2	Band ID of the U-WAVE-R
Data lack check level	0-9	1	(Refer to 1.7.7.)
State of duplication of U-WAVE-R	0/1	1	0: The duplication U-WAVE-R doesn't exist. 1: The duplication U-WAVE-R exists. (Refer to 7.3.1.)
Noise level of band ID 11	000-255	3	Value detected by 'All band ID scan'. (Refer to 1.7.6.)
Noise level of band ID 12	000-255	3	Value detected by 'All band ID scan'. (Refer to 1.7.6.)
Noise level of band ID 13	000-255	3	Value detected by 'All band ID scan'. (Refer to 1.7.6.)
Noise level of band ID 14	000-255	3	Value detected by 'All band ID scan'. (Refer to 1.7.6.)
Noise level of band ID 15	000-255	3	Value detected by 'All band ID scan'. (Refer to 1.7.6.)
Noise level of band ID 16	000-255	3	Value detected by 'All band ID scan'. (Refer to 1.7.6.)
Noise level of band ID 17	000-255	3	Value detected by 'All band ID scan'. (Refer to 1.7.6.)
Noise level of band ID 18	000-255	3	Value detected by 'All band ID scan'. (Refer to 1.7.6.)
Noise level of band ID 19	000-255	3	Value detected by 'All band ID scan'. (Refer to 1.7.6.)
Noise level of band ID 20	000-255	3	Value detected by 'All band ID scan'. (Refer to 1.7.6.)

Noise level of band ID 21	000-255	3	Value detected by 'All band ID scan'. (Refer to 1.7.6.)
Noise level of band ID 22	000-255	3	Value detected by 'All band ID scan'. (Refer to 1.7.6.)
Noise level of band ID 23	000-255	3	Value detected by 'All band ID scan'. (Refer to 1.7.6.)
Noise level of band ID 24	000-255	3	Value detected by 'All band ID scan'. (Refer to 1.7.6.)
Noise level of band ID 25	000-255	3	Value detected by 'All band ID scan'. (Refer to 1.7.6.)
Dummy	000-255	3	Dummy
Terminator	0Dh	1	CR(Carriage return)
Total		68	

7.1.2.4 U-WAVE-T information packet

When detecting the change of the 'Status of U-WAVE-T', the U-WAVE-R outputs this packet from the PC.

Item	Value	Bytes	Description
Packet code	TI	2	U-WAVE-T information packet
Version number	1	1	U-WAVE API version number
Status of U-WAVE-T	0/1/2/3/4/5	1	(Refer to 7.1.2.4.1.)
Channel	00-99,FF	2	Channel of the U-WAVE-T FF=Factory default state
Group ID	00-99,FF	2	Group ID of the U-WAVE-T FF=Factory default state
Device ID	0000000000- 1999999999	10	Device ID of the U-WAVE-T
Band ID	11-25	2	Band ID of the U-WAVE-T
Measurement mode	0	1	0=Button driven
Terminator	0Dh	1	CR(Carriage return)
Total		22	

7.1.2.4.1 Status of U-WAVE-T

Status	Meaning
0	U-WAVE-T is not registered to the U-WAVE-R.
1	U-WAVE-T is registered to the U-WAVE-R. However, disconnect.
2	U-WAVE-T is connected to the U-WAVE-R.
3	U-WAVE-T information is editing.
4	U-WAVE-T information is editing. (Source channel)
5	U-WAVE-T information is editing. (Destination channel)

7.1.3 Packets from PC to U-WAVE-R

7.1.3.1 Request of information packet

When the U-WAVE-R receives this packet, where the 'Destination device' is 'U-WAVE-R', the U-WAVE-R returns the 'U-WAVE-R information packet' or the 'Status packet'.

When the U-WAVE-R receives this packet, where the 'Destination device' is 'U-WAVE-T', the U-WAVE-R returns the 'U-WAVE-T information packet' or the 'Status packet'.

Item	Value	Bytes	Description
Packet code	IR	2	Request of information packet
Version number	1	1	U-WAVE API version number
Destination device	0/1	1	0=U-WAVE-R 1=U-WAVE-T
Channel	00-99	2	Channel of the U-WAVE-T
Group ID	00-99	2	Group ID of the U-WAVE-R
Method of search for Channel	0/1/2	1	This field is effective where 'Destination device' = 1(U-WAVE-T) only. 0=Return the U-WAVE-T information which corresponding the specific 'Channel'. 1=Search U-WAVE-T from the specific 'Channel' to upper direction, and return the founded U-WAVE-T information. 2=Search U-WAVE-T from the specific 'Channel' to lower direction, and return the founded U-WAVE-T information.
Terminator	0Dh	1	CR(Carriage return)
Total		10	

7.1.3.1.1 About the content of the Status packet

(1) Where the 'Method of search for Channel'=0 and the specific U-WAVE-T isn't registered, the U-WAVE-R returns the 'Status packet' with the following status code.

50 : Request packet error (Specified U-WAVE-T is unregistered.)

(2) Where the 'Method of search for Channel'=1, or 2 and the next U-WAVE-T isn't found, the U-WAVE-R returns the 'Status packet' with the following status code.

51 : End of search for U-WAVE-T

7.2 Initialization of U-WAVE

7.2.1 Initialization of U-WAVE-R

There are a method of using hardware and a method of using software.

IMPORTANT ・All information registered in the U-WAVE-R returns to the factory default state when the U-WAVE-R is initialized. (Registered information is cleared.)

7.2.1.1 Method of using hardware

(1) Turn off the power of the U-WAVE-R by removing out the USB cable from PC.

(2) Push and hold [INIT.] switch on the U-WAVE-R while re-inserting the USB cable in PC.

(3) When the insertion of the USB cable is completed, release [INIT.] switch.

7.2.1.2 Method of using software

Initialize the U-WAVE-R by [Setup] function of U-WAVEPAK.

TIP ・Refer to '4.3.3 Initialize' for a detailed operation.

7.2.2 Initialization of U-WAVE-T

There are a method of using hardware and a method of using software.

IMPORTANT ・All information registered in the U-WAVE-T returns to the factory default state when the U-WAVE-T is initialized. (Registered information is cleared.)

7.2.2.1 Method of using hardware

(1) Remove the coin cell battery from the U-WAVE-T.

(2) Push and hold [DATA] switch on the U-WAVE-T while re-inserting the coin cell battery.

(3) When the insertion of the coin cell battery is completed, release [DATA] switch.

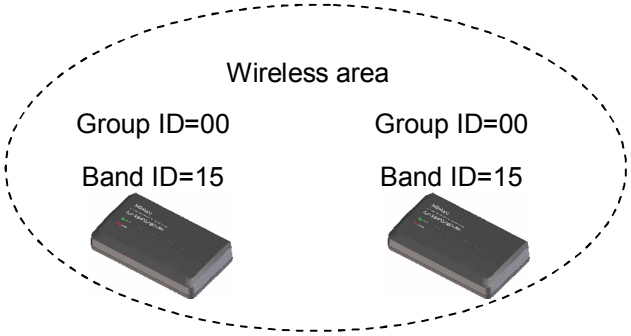
7.2.2.2 Method of using software

Initialize the U-WAVE-T by [Setup] function of U-WAVEPAK.

TIP ・Refer to '4.4.2.3 Initialize' for a detailed operation.

7.3 Restriction for use

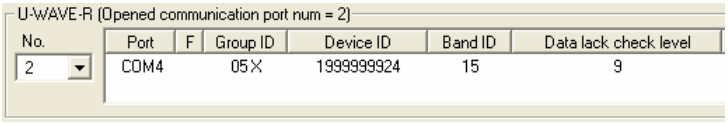
7.3.1 Warning to detection of same group ID and band ID



If two or more U-WAVE-R to which same group ID and band ID are set are detected in the same wireless area, the following warning is shown.

(1) Green and red LED on U-WAVE-R blinks alternately.

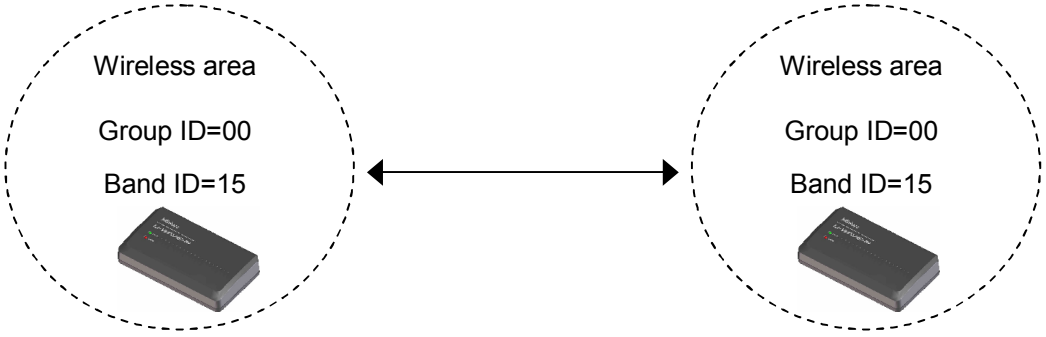
(2) 'X' mark is displayed in the group ID in 'U-WAVE-R information' list of U-WAVEPAK.



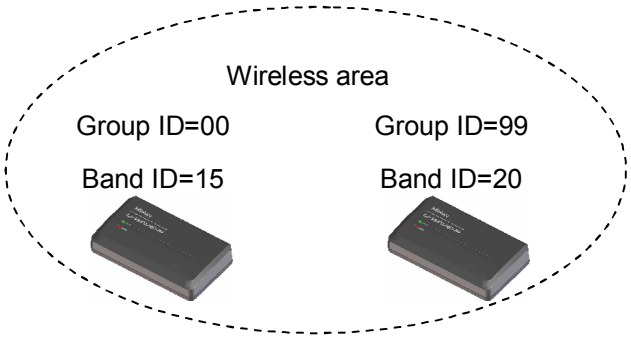
The U-WAVE-R that shows these warning cannot execute a wireless communication to the U-WAVE-T.

Therefore, execute either of following action if this warning is displayed.

(1) Keep away each U-WAVE-R, and separate a wireless area.

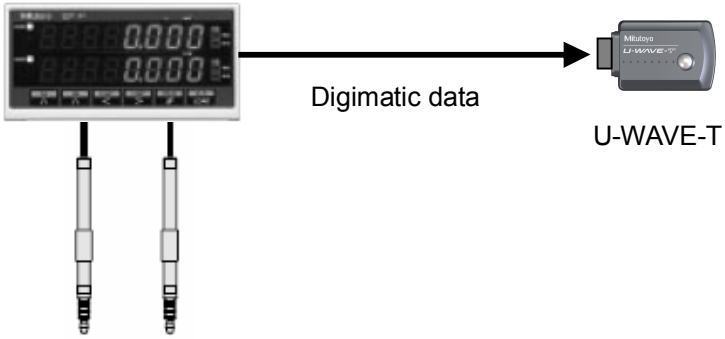


(2) Change group ID and band ID of the U-WAVE-R by U-WAVEPAK.



7.3.2 Device that continuously outputs data of two or more measuring tools

The device that continuously outputs the digimatic data of two or more measuring tools exists.



Note the following point when you use such a device.

(1) The digimatic data output from each measuring tool cannot be discriminated. Therefore, all the digimatic data output from each measuring tool are recognized as digimatic data from the same channel.

7.3.3 Standby or hibernate of Windows

The power supply from PC to the U-WAVE-R stops when Windows goes to the standby or hibernates.

Therefore, do not go to the standby or hibernate in Windows while using U-WAVE-R.

7.3.4 Functions of [DATA] switch

The [DATA] switch exists on U-WAVE-T and the measuring tool.

Functions of each [DATA] switch are as follows.

[DATA] switch	Functions
[DATA] switch on U-WAVE-T	・Data output ・Output of 'Cancel command' ・U-WAVE-R scan
[DATA] switch on measuring tool	・Data output

TIP ・Refer to 'U-WAVE-T User's Manual' for a detailed operation of [DATA] switch.

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