

MobileCollectTM

Using Mitutoyo U-Wave

Tech Note

Using Mitutoyo U-Wave Transmitters with MobileCollect

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1 Introduction

With the support of U-Wave Transmitters by MobileCollect Bases, the user can now use their U-Wave Transmitters in wireless systems that support thousands of non-Mitutoyo gages. U-Wave Transmitters only support Mitutoyo gages while MobileCollect supports Mitutoyo gages and gages from dozens of other gage manufacturers. U-Wave Receivers cannot be used with MobileCollect Wireless.

A U-Wave Transmitter is much easier to pair with a MobileCollect Base than it is with a Mitutoyo U-Wave Receiver. Pairing a U-Wave Transmitter with a U-Wave receiver takes at least 8 mouse clicks/button presses. Pairing a U-Wave Transmitter with a MobileCollect Base can be done with as few as 2 button presses or 3 mouse clicks/button presses. U-Wave Transmitters can be paired with any MobileCollect Base that displays the following logo on the product label.



Logo on products containing the MicroRidge RM2.4 Radio Module

In some cases, it may be necessary to update the firmware in your Base. Free MobileCollect firmware updates are available at www.microridge.com/wl_downloads.htm.

What Does MobileCollect Support?

MobileCollect supports Pairing with and receiving measurements from U-Wave-T and U-Wave Fit Transmitters. MobileCollect does not support MobileCollect Mobile Modules sending measurements to U-Wave receivers. By using MobileCollect Bases, you can eliminate the need for all of your U-Wave Receivers.



U-Wave-T Transmitter & Gage Cable



U-Wave Fit Transmitter

What does MicroRidge Support?

MicroRidge will provide support for pairing U-Wave Transmitters to a MobileCollect Base when using Xpress Setup, Extended Setup or Pairing-on-the-Fly. MicroRidge does not provide support for the Mitutoyo U-WAVEPAK Setup Program, U-Wave Receivers or for using U-Wave Transmitters with U-Wave Receivers.

Requirements for Using U-Wave Transmitters with MobileCollect Bases

There are certain things you must do to ensure that U-Wave Transmitters send to the desired MobileCollect Base. If you follow the rules, you will find it very easy to make U-Wave Transmitter send data to MobileCollect Bases.

- Mitutoyo U-Wave requires a unique Group ID for each receiver within RF range of each other. For Mitutoyo receivers, these Group IDs must be set by the user. A Group ID can be any number from 0 to 99. For MobileCollect Bases, a Group ID is automatically calculated and set to a number between 0 and 99. If necessary, the user can manually change the Group ID. We recommend that you put a label with the Group ID on every Base/Receiver. This label will make it easy to see what Group IDs have been defined. If you have the same Group ID on 2 or more Bases, you may end up sending the U-Wave measurement to multiple Bases. These Group IDs are only used by U-Wave, MobileCollect Mobile Modules do not use Group IDs.
- If the U-Wave Transmitter that you want to use with a MobileCollect Base is currently paired with a U-Wave Receiver, the transmitter must be unpaired from the receiver or the receiver must be disconnected from the computer. If you do not do this step, it may be difficult or impossible to pair the U-Wave Transmitter with the MobileCollect Base.
- Before trying to pair a U-Wave Transmitter with a Base, be sure the transmitter is plugged into a gage and the gage is turned on.

Next Steps

The next sections will help you get familiar with what information the U-Wave Transmitter sends and how to pair the U-Wave Transmitter with a MobileCollect Base. Depending on how you want the gage measurement formatted for your PC application, you may also need to install the MobileCollect Xpress or Extended Setup program on your PC. If you only want the gage measurement sent to your PC, you may not need to install either of the Setup programs.

Tech Note Organization

If you are viewing the PDF version of this Tech Note, you will see page numbers to the right of links within the PDF document. For example the number to the right of the [Support Information](#)¹¹ link indicates the actual page number this link is directed to.

2 Measurement Packet

Measurement packets sent from a U-Wave Transmitter and MobileCollect Mobile Modules both contain the gage measurement and other information. The information in a U-Wave packet is not as extensive as the information in a MobileCollect packet. An overview of what is contained in each of the measurement packets is shown below:

U-Wave Transmitter packet.

- Gage measurement in non-encrypted binary format.
- Group ID of Base. This value can range from 0 to 99. A default value is automatically set by the Base. The user can modify this value if necessary.
- Channel number (user selected). This value can range from 0 to 99.
- The unique 10-character U-Wave Device ID is not included in a measurement packet.

MobileCollect Mobile Module packet.

- Gage measurement in encrypted format.
- Address info of target Base. This info is unique for each Base.
- Unique 6 character identifier of Mobile Module. This identifier is unique for each Mobile Module and cannot be changed by the user.
- User defined 8 character identifier of Mobile Module.
- Battery voltage of the Mobile Module battery.

The measurement packet from a MobileCollect Mobile Module provides better security and eliminates the possibility of multiple Bases (receivers) processing and sending the measurement to a host computer. With the U-Wave Transmitter, it is possible to send the same measurement packet to multiple receivers. Sending a measurement packet to multiple receivers can result in unexpected behavior.

3 Pairing with Base

In order to send measurements to a Base, the U-Wave Transmitter must be paired with the Base. A U-Wave Transmitter can only be paired with one Base at a time. In the pairing process, the Group ID and channel number used for pairing is sent to the U-Wave Transmitter. Also, as part of the pairing process, the U-Wave Transmitter sends its unique U-Wave Device ID number to the Base. The Base remembers this unique Device ID number for channels greater than 0.

Group ID Setting

Be careful with the Group IDs. Each Base/receiver in the wireless system must have a unique Group ID. If you have multiple Bases that have the same Group ID, you may end up sending the same measurements to multiple Bases. If you need to change the Group ID for a Base you must do it from the Xpress Setup or Extended Setup program. You can use one of the Setup programs or ComTestSerial to view the Group ID of a Base.

Xpress Setup	After you find the Base, click the " <i>Base Info & Config</i> " button near the top of the window.
Extended Setup	After you find the Base, click the " <i>Base & Group ID's for U-Wave Transmitters</i> " button near the bottom of the window.
ComTestSerial	Run the serial communications test program included with MobileCollect and click the " <i>Copyright</i> " button. The easiest way to run this program is to access it from one of the Setup programs.

MobileCollect Bases

There are 4 different MobileCollect Base models that can be paired with a U-Wave Transmitter. All of the Bases have the ability to send the measurements to a PC via a USB virtual serial port. The differences between the Base models is summarized below. For more information about the Base options refer to the MicroRidge Web page at www.microridge.com/wl_bases.htm.

USB Base	This is the most commonly used Base. It is connected to your PC via a USB cable and can send information to any application that can receive data from a serial port. This Base is powered via the USB connection.
RS-232/USB Base	This Base contains the features of the USB Base and also includes a DB-9 serial port connection. If you are using the DB-9 connection on this Base, you will need a separate USB power supply.
Wedge/USB Base	This Base contains the features of the USB Base and also includes a USB Keyboard Wedge port. With this Base you can send information to applications that only take keyboard input. The most common use of this Base is to send information to Microsoft Excel.
USB MicroBase	This Base is packaged in small case the size of typical USB flash drives. It cannot be used with the On-the-Fly pairing method since this Base does not have a Reset button.

Pairing the U-Wave Transmitter with a Base

There are 3 methods that can be used to pair a U-Wave Transmitter with a MobileCollect Base. Be sure the U-Wave Transmitter is connected to a gage and the gage is turned on before you try to do the pairing.

There are 3 methods available for pairing a U-Wave Transmitter with a Base are:

- [On-the-Fly](#)⁵ This method uses the Reset button on the back of the Base to start the pairing process and does not require a setup program. If you are only interested in sending the measurement without any U-Wave Device ID or channel information to your computer, this is the quickest way to pair the U-Wave Transmitter. Since the MicroBase does not contain a Reset button, this method cannot be used with the MicroBase.
- [Xpress Setup](#)⁶ This method requires that you have the Xpress Setup program installed on your PC. This method is recommended if you want the U-Wave Device ID or channel number included with measurement that is sent to your PC.
- [Extended Setup](#)⁸ This method requires that you have the Extended Setup Program installed on your PC. This method is required if you want the greatest flexibility in formatting the measurement packet that is sent to your PC.

3.1 Pairing On-the-Fly

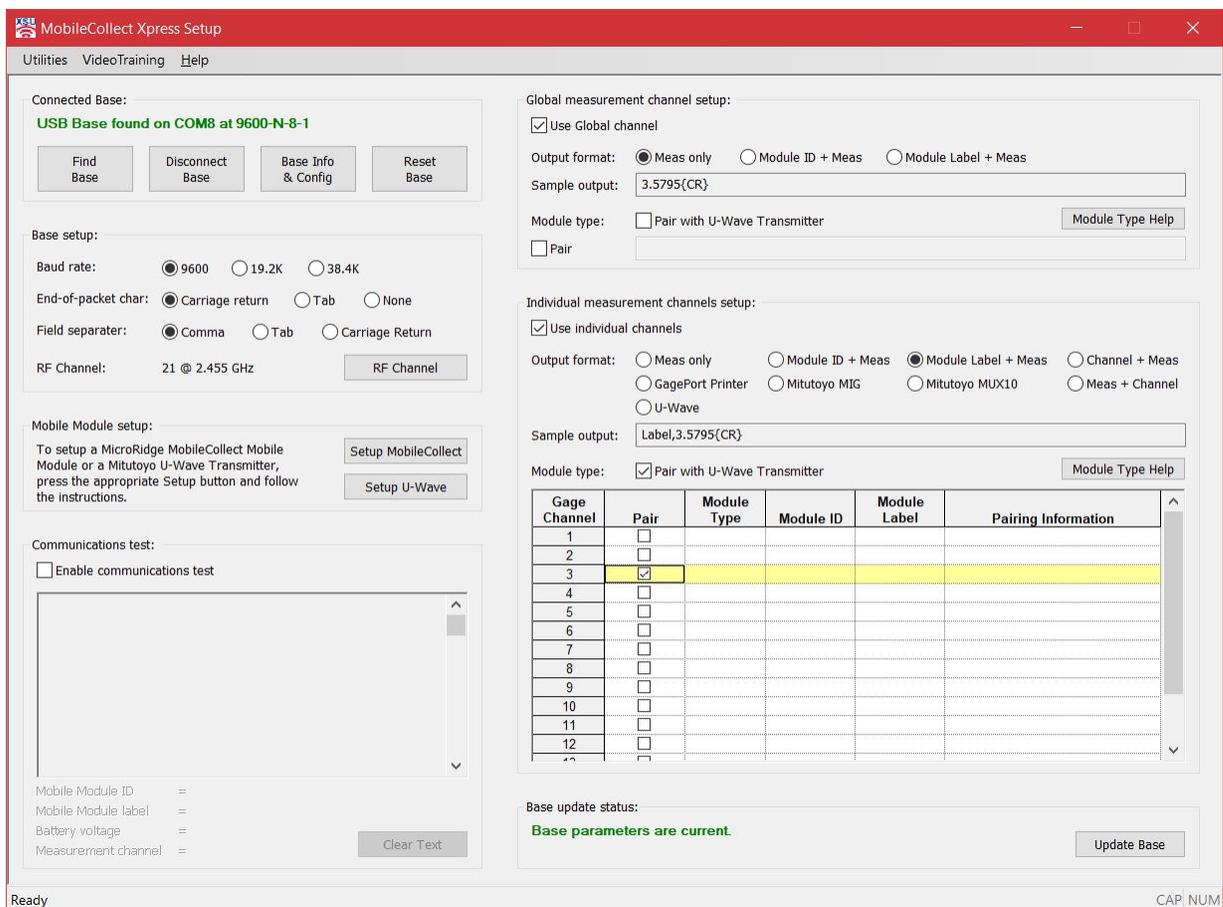
This is a very quick and easy method used to pair a Mitutoyo U-Wave Transmitter with a Base. With this method, you can pair a U-Wave Transmitter with a Base without using any special setup software. This method can be used with the USB Base, RS-232 Base and Wedge Base. This method cannot be used with the USB MicroBase since the MicroBase does not have a Reset button. The disadvantage of Pairing-on-the Fly for a U-Wave Transmitter is that you will only get the measurement. You cannot get other information such as channel number or Device ID.

- Be sure the gage is turned on and the U-Wave Transmitter is plugged into the gage.
- Press and release the Reset button on the back of the Base.
- Press and hold the read button on the U-Wave Transmitter.
- When the left status LEDs (green/green/green) on the Base go out and the right LEDs (red/yellow/green) on the Base are all on, go to the next step.
- Do one of the following based on the status of the orange LED on the U-Wave Transmitter:
 - If the U-Wave Transmitter is currently paired with a Base, the LED will flash orange rapidly for about 4 seconds and then flash orange slowly. Once the slow flashes start, release the read button.
 - If the U-Wave Transmitter is not currently paired with a Base, the LED will flash slowly. After a few flashes, release the read button.

- If the pairing was successful, the green LED on the U-Wave Transmitter blink 2 times. If the pairing was not successful, the red LED on the U-Wave Transmitter blink 3 times
- If the Base does not receive a pairing request, it will automatically exit the pairing mode after 10 seconds.

3.2 Pairing with Xpress Setup

The Xpress Setup program allows you to add the Device ID or channel number information to the measurement packet sent from the Base to your PC. If you do not have the Xpress Setup program installed on your PC, install it now from your Product Resources CD that was included with your Base.



Xpress Setup Program Ready to Pair a U-Wave Transmitter on Channel 3

Should I Pair on the Global or an Individual Channel

If you pair U-Wave on the Global Channel, all you will get is the gage measurement and no information to identify what transmitter sent the information. If you have 3 U-Wave Transmitters paired on the Global Channel you will get 3 measurements without any identifiers. Based on

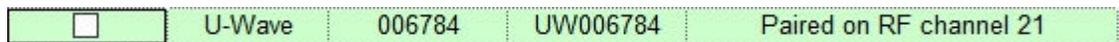
your measurement collection process, this may not work for you. With MobileCollect Mobile Modules, you can have a unique identifier sent with each measurement.

If you want a channel number or unique identifier sent with each U-Wave measurement, you should pair the U-Wave Transmitter on one of the 15 individual channels.

Pair U-Wave with Base

To pair the U-Wave Transmitter with a Base using Xpress Setup, follow the steps below:

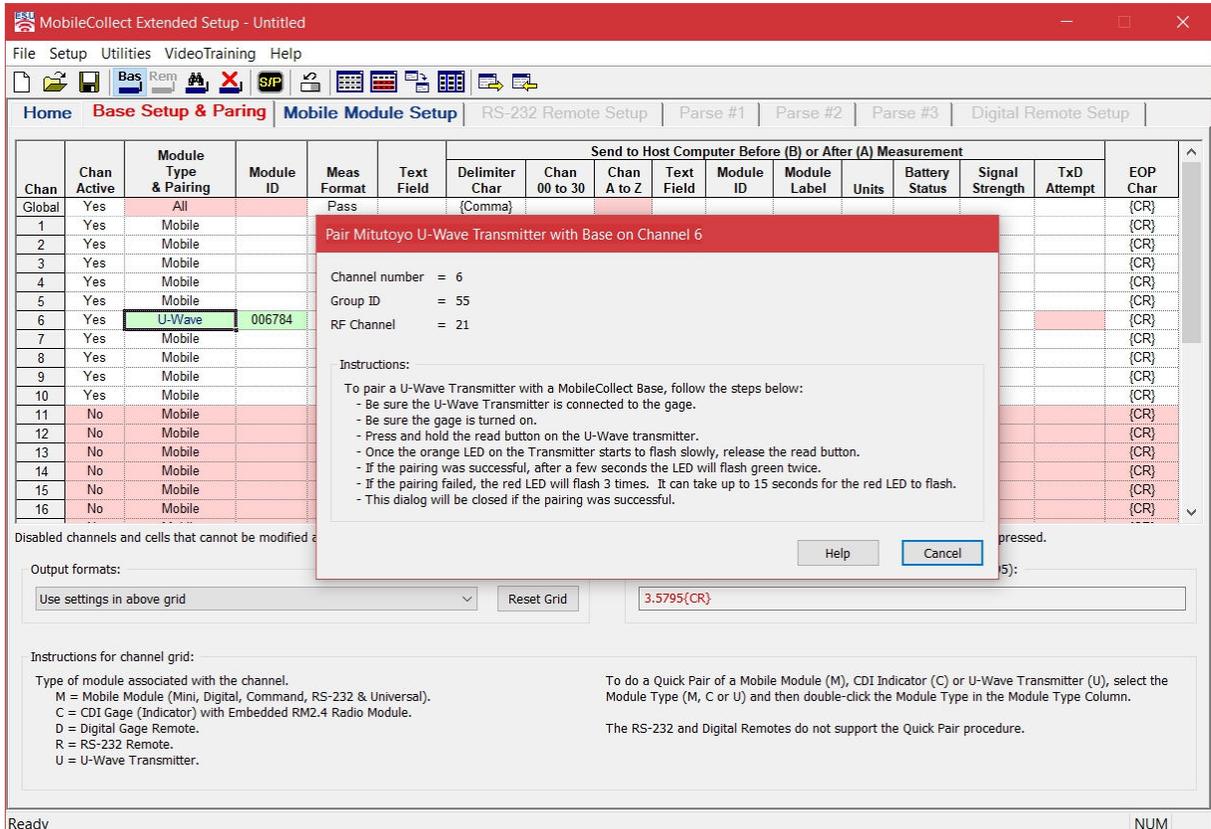
1. Start Xpress Setup and press the "*Find Base*" button.
2. Be sure the Group ID for the Base is unique and not used by any other Base within the RF range. Click the "*Base Info & Config*" button to view/change the Group ID.
3. Decide whether you want to Associate on the Global channel or an Individual channel.
4. Click the "*Pair with U-Wave Transmitter*" in the Global section or on the Individual grid.
5. Check "*Pair*" in the *Global measurement channel setup* group or in the *Individual measurement channel setup* group. The example above shows channel 3 in the grid selected.
6. Press and hold the read button on the U-Wave Transmitter.
 - If the U-Wave Transmitter is currently paired with a Base, the LED will flash orange rapidly for about 4 seconds and then flash orange slowly. Once the slow flashes start, release the read button.
 - If the U-Wave Transmitter is not currently paired with a Base, the LED will flash slowly. After a few flashes, release the read button
7. After a few seconds the LED will flash green twice if the pairing was successful. If the pairing failed it will flash red 3 times.
8. If the pairing was successful, you will see the following message when pairing on an individual channel. If you did the pairing on the Global channel, the message will be slightly different.



9. The initial message will briefly have a bright green background and then change to a light green background as shown above.
10. The Module ID displayed for the individual channels is the last 6 digits of the U-Wave Device ID number. If you paired on the Global channel, there is no Module ID available.
11. The Module Label displayed is UW + the Module ID. If you paired on the Global channel, there is no Module Label available.

3.3 Pairing with Extended Setup

The Extended Setup program allows you to add a variety of prefix and suffix information to the measurement packet sent from the Base to your PC. If you do not have the Extended Setup program installed on your PC, install it now from your Product Resources DVD that was included with your Base.



Extended Setup Showing a U-Wave Transmitter being Paired on Channel 6

Pair U-Wave with Base

To pair a U-Wave Transmitter using the Extended Setup program, follow the steps below.

1. Start Extended Setup and press the **Find Base Unit** button on the Home Tab.
1. Be sure the Group ID for the Base is unique and not used by any other Base within the RF range. Click the "**Base & Group ID's for U-Wave Transmitters**" button on the Home Tab to view/change the Group ID.
2. Go to the **Base Setup & Pairing** tab.
3. If you are going to pair on the Global Channel, double-click the **Module Type & Pairing** cell for the Global Channel row.
 - a. A dialog will appear showing the available Global Channel module types.

- b. Select module type Mitutoyo U-Wave Transmitter.
 - c. Click the OK button.
 - d. Go to step 5.
4. If you are going to pair on an Individual Channel click the **Module Type & Pairing** cell for the channel you want to pair on.
 - a. Be sure the Module Type is set to U-Wave.
 - b. Double-click in the **Module Type & Pairing** cell.
5. The Pair Mitutoyo U-Wave Transmitter dialog shown above will be displayed.
6. Follow the instructions in the dialog box.
7. If the pairing was successful, the green hi-lite will be displayed in the **Module Type & Pairing** and the **Module ID** columns.
8. The Pair Transmitter dialog will automatically close.
9. The green hi-lite will be turned off in about 4 seconds.
10. You are now ready to send gage readings to the Base.

3.4 Unpair from Base

When you pair a U-Wave Transmitter with a Base, the U-Wave Transmitter retains the Base Group ID number and the channel number. If you are paired on the Global channel, the channel number is 0. To unpair the U-Wave Transmitter you need to clear the Group ID and channel number from the U-Wave Transmitter. To clear these items, be sure that a Base in RF range is not in the pairing mode. Press and hold the read button on the transmitter or the gage (there may not be a read button on the gage end of the cable) until the orange LED flashes slowly. Once the slow flashes start, release the read button. The U-Wave Transmitter should now flash the red LED 3 times to indicate that the unpairing process is complete. Be patient waiting for the red LED flashes, we have seen it take up to 15 seconds on some U-Wave Transmitters to flash after you release the read button.

4 Gage Reading & Format

Measurement Output Format with U-Wave Receiver

The measurement output format of a U-Wave Transmitter when using a U-Wave Receiver is as follows.

DT18302+000003.5795I

where:

Prefix	= DT1
Group ID	= 83
Channel	= 02
Sign	= + or -
Measurement	= 000003.5795 (11 characters)
Units	= inches (I), mm (M) or none (0)

Measurement Output Format with MobileCollect Base

The default measurement information sent to your PC from the Base is the measurement only. Examples of the measurement format are:

0.20350

-0.20350

5.168

-5.168

Through the use of the Xpress or Extended Setup Programs, the user has access to a variety of output formats. The information that can be added to the gage measurement include, channel number, Device ID, user defined text, etc. One of the output options matches the U-Wave Receiver format shown above.

5 Support Information

MicroRidge will provide support for pairing U-Wave Transmitters to a MobileCollect Base when using Xpress Setup, Extended Setup or Pairing-on-the-Fly.

MicroRidge does not provide support for the Mitutoyo U-WAVEPAK Setup Program, U-Wave Receivers or for using U-Wave Transmitters with U-Wave Receivers.

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