User's Manual

Muscle & Fat Z2

Marvotech

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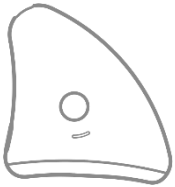
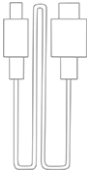
Package List

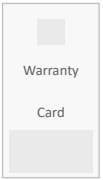


Muscle & Fat * 1



Type-C USB data line * 1

Simple operation guide * 1

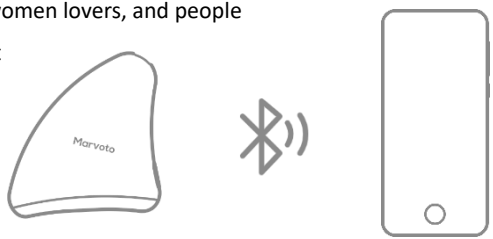


Warranty Card * 1

Product Introduction

Muscle & Fat Z2 is a portable ultrasonic intelligent measuring device that uses the principle of ultrasound to quickly measure the thickness of subcutaneous fat in multiple parts of the human body and muscle detection.

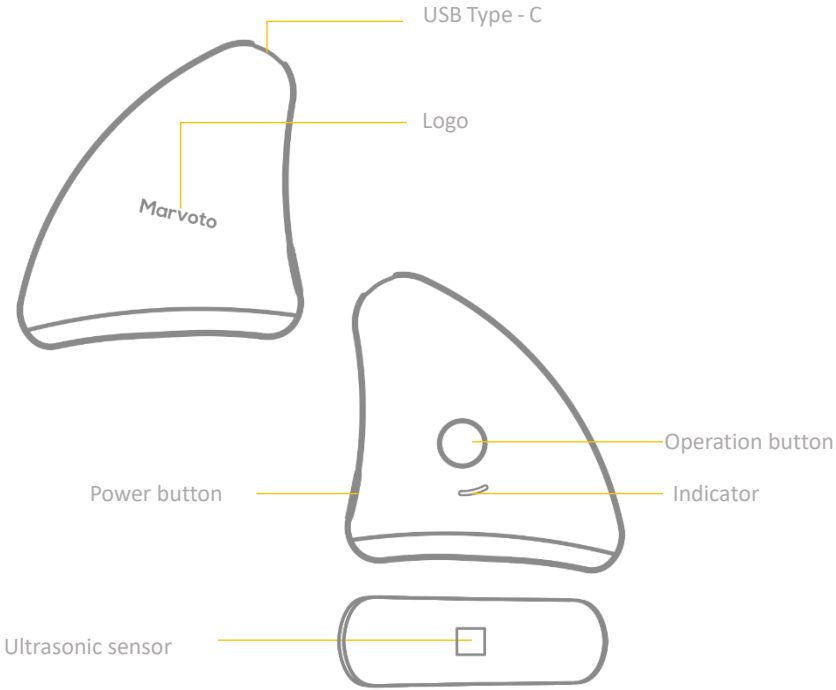
It can help obese people, fitness people, women lovers, and people with diabetes to monitor subcutaneous fat and muscle for a long time.



The Z2 product is composed of device-side and mobile-side application software (hereinafter referred to as APP).

The device side is responsible for transmitting and receiving ultrasonic signals, performing signal conversion and a series of signal processing operations, and outputting the ultrasound image data of the subcutaneous tissue. The image data is then transmitted to the APP side through wireless Bluetooth for display, and the APP side software fates the ultrasound image Thickness recognition, analysis and automatic measurement and output fat thickness value.

Structure Description



Power on and off

Power on： Press the power button to turn on;

Power off： Press and hold the power button for 2s to turn off;

Indicator status：

Blue slow flashing	Waiting for Bluetooth connection
Blue normally on	Bluetooth connection is successful (device can be used)
Blue flashing	Device upgrading
Green normally on	USB charging (off state)
Green flashing	Wireless charging (off state)
Light off	Fully charged

**The device will automatically shut down if it is not connected for 10 minutes after it is turned on.*

** The wireless charging function is subject to the actual purchased device configuration.*

APP Installation

Scan the QR code below to download and install the APP “Muscle & Fat”.

Download QR code for APP

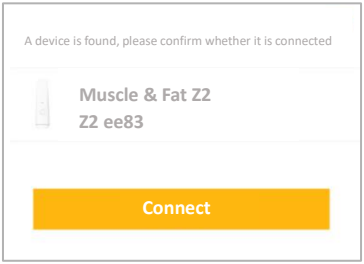
Muscle & Fat

Follow the instruction to register and log in user account after APP installation.
Muscle & Fat APP supports iOS and Android system.

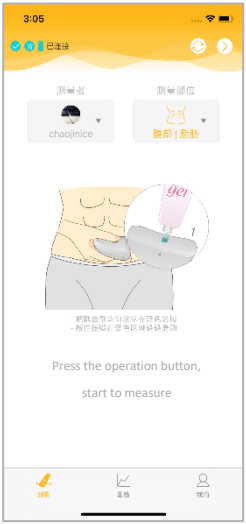
Connect the device

New users connect to the device as follows:

1. Turn on the Bluetooth of APP device；
2. Turn on the device Z2；
3. Search for the device at the homepage of APP；
4. Select the device from the list after searching;

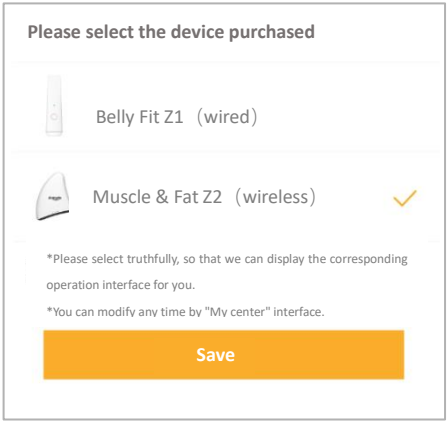


List device of searched



Home page displayed after the device is connected.

App in Android system supports Z1（wired version）and Z2（wireless version）, New users need to set the device type first：

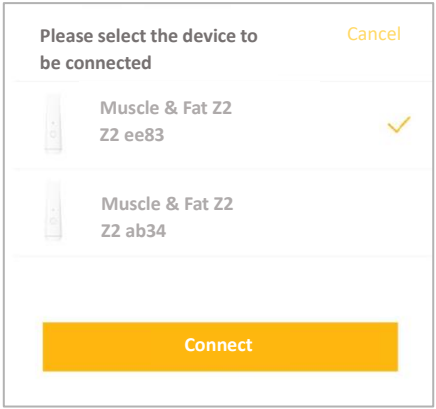


Switch to connect to other devices：

1. Turn on the other Z2 equipment;

2. Click the " " icon in the upper right corner of the homepage to search for devices;

3. Select the new Z2 device in the searched device list and connect.

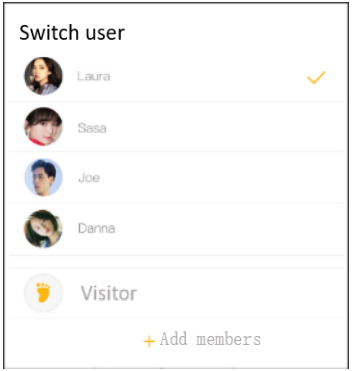


Change other mobile phones to connect to Z2 device：

1. First turn off the "Bluetooth" function in the control center of the current mobile phone;
2. Turn on the "Bluetooth" function of another mobile phone;
3. Enter the APP homepage and wait for the Z2 device to be searched automatically;
4. Select the device in the searched device list and connect.

The control center page of iOS.
For Android system, please refer to the according operation.

User



Tap the User Icon to pop up the user list.

Select the user or visitor for measurement.

** After selected a user, the Icon will show the user on the homepage and the measurement record will save under the user.*

** Measurement record will not be saved under Visitor Mode.*

Measurement positions

Tap “Select” and select the body part and function to measure.

There are two functions, "fat measurement" and "muscle exploration".

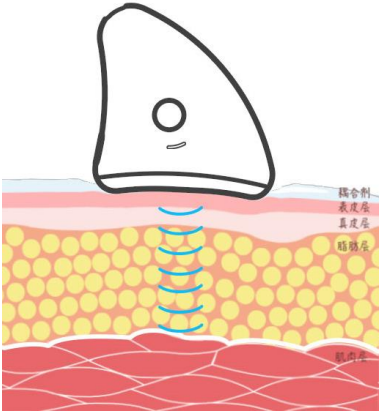
Z2 provides "Waist", "Abdomen", "Arm", "Thigh" and "Calf" for fat measurement at the moment.

Muscle exploration supports "Abdomen", "Arms-Front", "Thighs" and " Calf " only.

** Under Visitor Mode, please select “Gender” before select body part to measure.*

Fat Measurement

The Z2 device uses the technology of ultrasound to measure the thickness of subcutaneous fat and muscle.
As shown in the figure, the structure of skin and subcutaneous tissue from top to bottom is: epidermis layer → dermis layer → fat layer → muscle layer → visceral fat / bone / internal organs and other tissues.
The outer muscle layer is wrapped with thick fascia to separate the fat from the muscle. The Z2 device automatically recognizes the outer muscle fascia and calculates the distance from the epidermis to the outer muscle fascia. This distance is the thickness of the subcutaneous fat.



Measurement recommendations

In order to eliminate the interference of the fascia in the fat layer, we recommend that the Z2 device fits the skin and slides slowly during the measurement. The specific steps are as follows:

1) **Determine the measurement location;**
2) **Add Gel：**

   Squeeze a pistachio-sized gel onto the ultrasonic sensor;
3) **Evenly spread the Gel：**

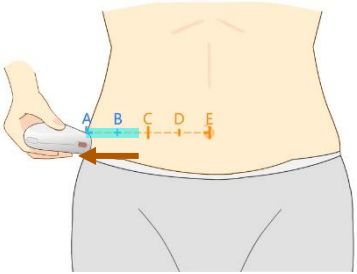
   Slide the ultrasonic sensor in the measurement area several times to make the Gel evenly;

4) **Place to start position：**

   Place it at the starting point, keep the device perpendicular to the skin, and keep the ultrasonic sensor close to the skin;
5) **Measure in a sliding way：**

   Press and hold the operation button and slide it gently on the surface of the skin at a constant speed.

Measuring part——Waist

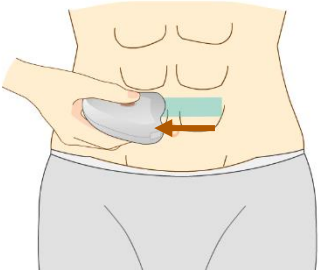


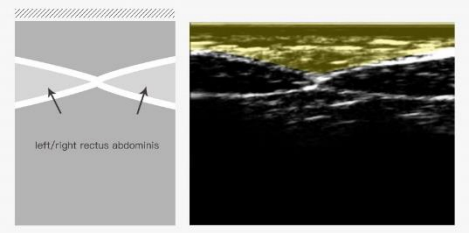
Waist measurement position:

- Keep body standing;
- Find the midpoint from the belly button to the waist (point C in the figure),

It is recommended to start from 2CM next to point C and slide towards point A to measure and this area is a measurable area.

Measuring part——Abdomen





Abdomen measurement position:

- Keep body standing;

-The rectus abdominis area above the navel, starting from the far left of the rectus abdominis and sliding to the right;

- The cross-shaped area on the image is the rectus abdominis,

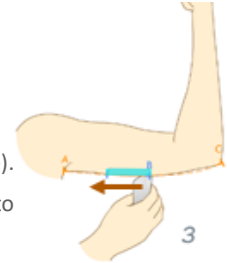
  Above the rectus abdominis is the subcutaneous fat layer;

Measuring part——Arm

Arm measurement position:

- Keep your upper arms level and your elbows vertical.
- Find the midpoint of the elbow and armpit (point B in the figure).

It is recommended to start the measurement from point B to point A and this area is a measurable area.



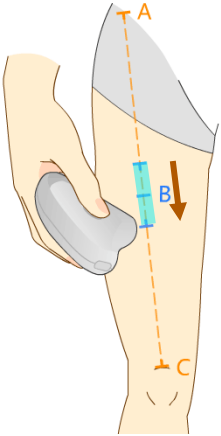
Tips:

Compared with the waist, the subcutaneous fascia of the arm is much and complicated.

If the ultrasound image shows a lot of subcutaneous fat fascia interfere with the measurement, please try to slightly adjust the starting point of the measurement to the inside or outside of the arm, and then slide towards the armpit;

For users with soft flesh, the force may be difficult to control when sliding. You can try several times to find the hand feel based on the ultrasound image.

Measuring part——Thigh



Thigh measurement position：

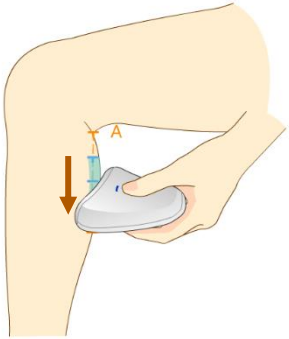
- Keep body standing;
- Find the midpoint between the iliac spine and the upper edge of the knee (point B in the figure).

It is recommended that the area 3cm above and below point B is the measurement area, sliding measurement from top to bottom.

Tips:

If there are more fascia interferences in the area of point B, move a little bit to the outside or inside of the thigh.

Measuring part——Calf



Thigh measurement position：

-Maintain a sitting position with the calf slightly forward;

-As shown in the picture, 2cm below the knee fossa (point A) as the starting point, slide down to measure;

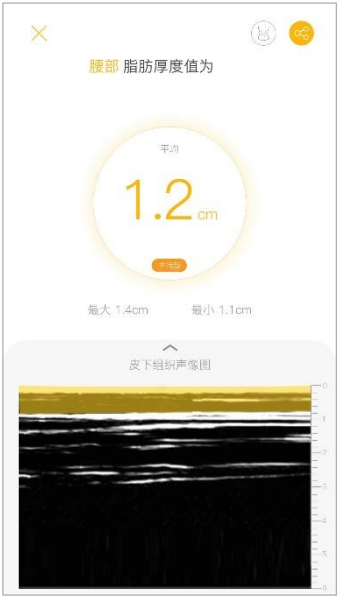
Suggestions:

-In sliding measurement, the ultrasonic sensor must be completely attached to the skin and kept vertical;

-Maintain a moderate sliding speed (5 cm sliding speed in 2 seconds);

-Gel is easy to dry, please replenish Gel in time

APP measurement interface:



Real-time ultrasound image of subcutaneous tissue and measured values;

When you see the correct image, release the button to complete the sliding measurement, and the measurement data will be displayed simultaneously. The current measurement results and images will be automatically saved to the history record.

Swipe up on the page to view the distribution range of fat thickness.

Press the button again to start a new measurement.

**For long-term monitoring of fat changes, it is recommended to measure each time at a fixed location to ensure comparability.*

Distribution range of fat thickness in each part

		Skinny	Firm body	Voluptuous	Plump	Fat	Obese
Waist	Male	<0.5	0.5~0.7	0.8~1.0	1.1~1.3	1.4~1.7	>1.7
	Female	<0.6	0.6~0.7	0.8~1.0	1.1~1.3	1.4~1.7	>1.7
Abdomen	Male	<0.5	0.5~0.7	0.8~1.1	1.2~1.4	1.5~1.8	>1.8
	Female	<0.6	0.6~0.8	0.9~1.2	1.3~1.5	1.6~1.9	>1.9
Arm	Male	<0.4	0.4	0.5	0.6	0.7	>0.7
	Female	<0.6	0.6~0.7	0.8~0.9	1.0~1.2	1.3~1.5	>1.5
Thigh	Male	<0.4	0.4~0.5	0.6~0.7	0.8~0.9	1.0~1.1	>1.1
Calf	Female	<0.5	0.5	0.6	0.7~0.8	0.9~1.0	>1.0

Unit: cm
The above standards are based on Marvoto research.
Just for reference.

Muscle exploration

The Z2 device will collect ultrasound images of the muscles under the skin, explore the shape of the muscles through the ultrasound images, and manually measure the thickness of the muscle layer.

At present, APP supports the exploration and measurement of muscles in four parts: the "rectus abdominis" of the abdomen, the "biceps" of the upper arm, the "rectus femoris" of the thigh, and the "gastrocnemius" of the calf.

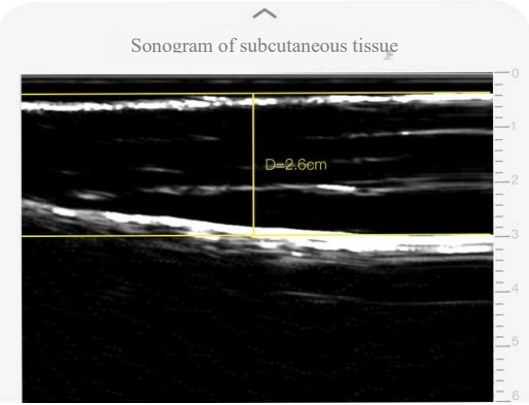
Operation Steps:

1. Acquire muscle ultrasound images

Click the "Measurement Part" button on the homepage → select "Muscle Exploration" in the pop-up window → select body part → apply Gel → press and hold the button to slide the measurement (operate according to the interface graphic guide until a better image is displayed).

2. Manual measurement of muscle thickness

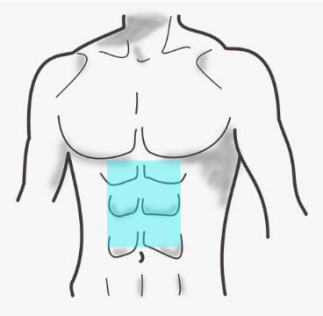
Click on the muscle image, a yellow measuring ruler will be displayed on the image, as shown below:



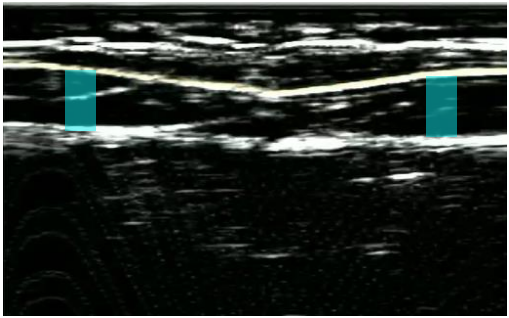
Slide the upper ruler line to the upper boundary of the muscle layer, and the lower ruler line to the lower boundary of the muscle layer.

Click the "Save" button in the upper right corner of the interface to save the current measurement results.

Rectus abdominis exploration

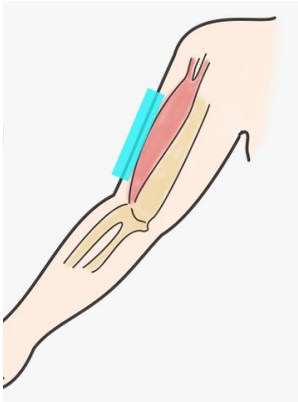


The position of the rectus abdominis

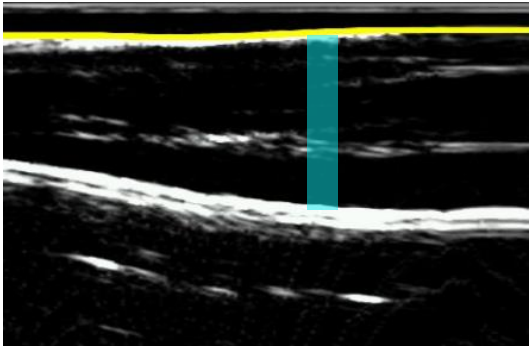


Ultrasound images of left rectus abdominis and right rectus abdominis

Biceps Exploration

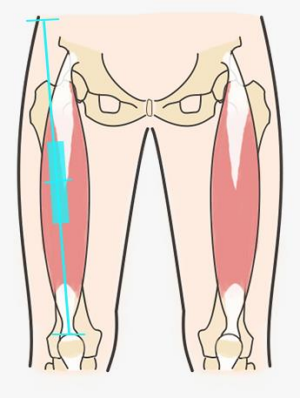


The position of the biceps

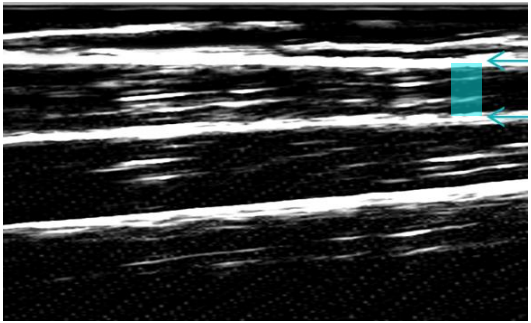


The ultrasound image of biceps

Rectus femoris exploration

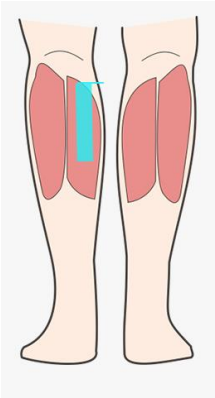


The position of the thigh

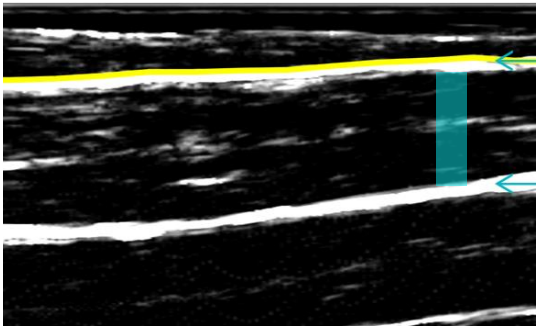


The ultrasound image of rectus femoris
（Below the rectus femoris is the intermediate femoris）

Gastrocnemius exploration



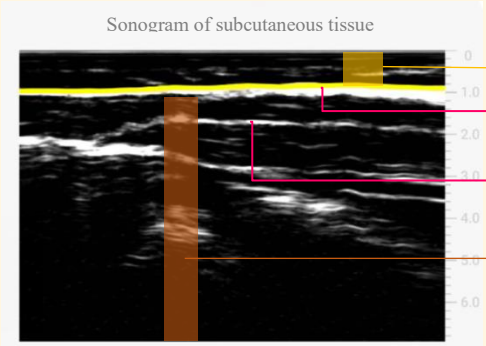
The position of the calf



The ultrasound image of gastrocnemius
（Depth 4cm）

Image interpretation

Correct image Example 1：



Subcutaneous fat layer

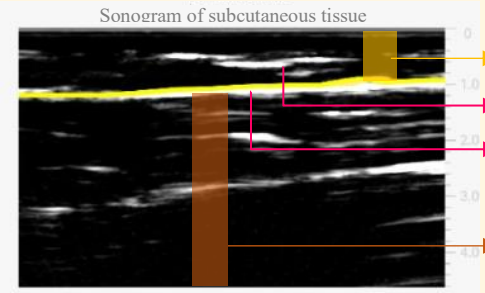
Fascia between the fat layer and the muscle layer

Fascia within the muscle layer

Muscle layer and internal tissues below the muscle layer

※This ultrasound image is a better subcutaneous tissue image. The fascia between the fat layer and the muscle layer is continuous and thick, and the algorithm can accurately identify it.

Correct image Example 2：



Subcutaneous fat layer

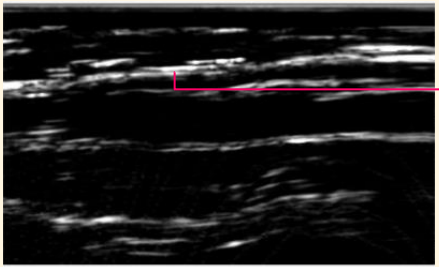
Fascia in the fat layer

Fascia between the fat layer and the muscle layer

Muscle layer and internal tissues below the muscle layer

※This ultrasound image is also a better image. Although there are some white fascia in the subcutaneous fat layer, it is only a short section. The dividing fascia between the fat layer and the muscle layer is continuous and thick, so the algorithm can accurately identify it.

Incorrect image Example 1：



The fascia displayed
is not continuous
and not rough

※This ultrasound image is not a qualified image. There are many lines on the image, and there is no continuous and thick line. The algorithm cannot identify the fat layer.

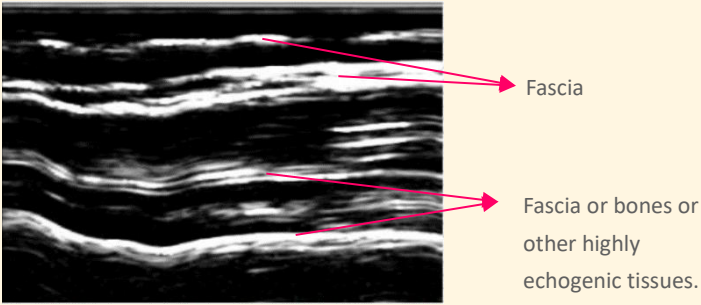
Suggestions:

1) Ensure that the Gel is sufficient during measurement;

2) Try to swing or rotate the angle of the device to see if it can make the fascia show thick and bright lines;

3) Try to change the measurement position slightly;

Incorrect image Example 2：



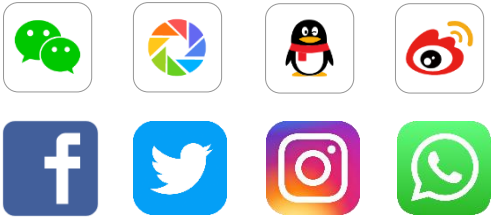
※This ultrasound image is not a qualified image. There are many lines on the image, and they are all continuous thick and bright lines, which can easily mislead the algorithm to recognize.

Suggestions:

It shows that the structure of the subcutaneous tissue here is complicated (objective reasons), and it is recommended to try again in the area near the current location.

Share

Tape the “ “ in the upper right corner of the measurement page or record browsing page, share the measurement results to WeChat /Moment/Q zone/Sina Weibo/Facebook/Twitter/Instagram and WhatsApp.



Firmware upgrade

Z2 devices may require "firmware upgrade" and "Bluetooth software upgrade".

Click the " > " icon in the upper right corner of the homepage to enter the "Device Details" page.

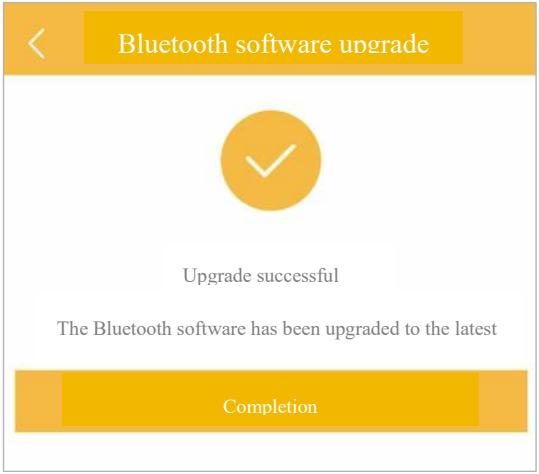
If there is a new firmware version or Bluetooth software version, there will be "NEW" prompts in the "Firmware Version" and "Bluetooth Software" fields. Click to enter the firmware upgrade page or Bluetooth software upgrade page, and follow the page prompts to upgrade.

Please keep the normal connection between the device and the App device during the upgrade.

The firmware upgrade time is about 1 minute (depending on the size of the upgrade package and the performance time of the App device system).

The Bluetooth software upgrade time is about 40 seconds (depending on the size of the upgrade package and the length of the App device system performance).

The upgrade completion page will prompt "Upgrade successful", as shown in the figure below:



Q&A

Q：What is Muscle & Fat Z2?

A： The Muscle & Fat Z2 can measure the thickness of subcutaneous fat (the distance from the epidermis to the outer fascia of the muscle layer, including the thickness of the epidermis, dermis, and fat layer) and the thickness of the subcutaneous muscle layer of a specific part of the body. Help people who are losing weight and sculpting to carry out body shape monitoring to further control their body shape and improve their health.

Q：What is the operation principle of Muscle & Fat Z2?

A： Muscle & Fat Z2 uses the principle of ultrasound

Ultrasound is a sound wave with a frequency exceeding 20000 Hz. Ultrasound has the characteristics of directional propagation, reflectivity, and non-invasiveness, so it is often used for ultrasound imaging of human body. Muscle & Fat Z2 uses the ultrasonic sensor to transmit and receive ultrasonic signals, and uses electrical signal processing and digital processing to generate ultrasound images of human subcutaneous tissue. Using the algorithm calculates the thickness of subcutaneous fat on the image and displays it on the APP.

Q：What body parts can Muscle & Fat Z2 measure?

A： Muscle & Fat Z2 provides "Waist", "Abdomen", "Arm", "Thigh" and "Calf" for fat measurement and supports to explore the muscle of "Abdomen", "Arms-Front", "Thighs" and “Calf ". More measure parts are developing.

Q：Is Muscle & Fat Z2 age-appropriate for everyone?

A：Recommended for adults over 18 years of age, there may be some errors in the measurement under age 18.

Q：Why apply coupling the gel when measuring?

A： An ultrasonic coupling gel is a gel made with water as the main ingredient. During the ultrasound send the sound wave to the body, the air between the ultrasound probe (ultrasonic sensor) and the skin will reflect the ultrasound. To minimize this difference, a suitable coupling gel has to be utilized., a clearer image will be conducted. The coupling gel also makes it easier for the probe to slide on the skin.

Clean with paper towel after the measurement completed.

Q: How much Gel should be applied?

A: Too much or too little Gel may cause errors. If you find that the Gel on the skin is little or dry out during the measurement, please add it in time to avoid affecting the measurement.

Gel can be purchased on Marvoto's official website.

Q：Does the degree of pressing (the device to the skin) when measuring affect the result?

A： Yes. Excessive pressing (obviously skin is depressed) will cause the result become smaller. When measuring, keep the ultrasonic sensor in full contact with the skin or press lightly. It is recommended to adjust the pressure according to the ultrasound image.

Q：Why there is a big discrepancy in my measurements?

A： The pressing pressure, not measuring the same point, the angle between device and skin and the amount of coupling gel will affect the measurement result. It is recommended to pressing the device lightly to the skin when measuring, and try to measure the same point every time, and keep the device perpendicular to the skin.

Q：Why fail to get the result？

A： After the test, the APP cannot display the data. Most of the reasons are because it did not operate a correct or clear ultrasound image, which caused the algorithm to fail to identify the fat layer.

The ultrasound image not displayed or displayed in APP is incorrect or not clear.

(一) There are no bright, continuous white lines (fascia) on the ultrasound image.

1) Check whether the measurement method is correct;

2) Check whether the Gel is missing or dry, and add Gel in time;

3) Check whether the ultrasonic sensor is in good contact with the skin during sliding measurement.

Please adjust and try several times until a bright white line (fascia) detected by ultrasound sensor and displayed in the image.

(二) **The white lines in the ultrasound image are too many and chaotic.**

It shows that the subcutaneous tissue structure of the current measurement site is complex, the algorithm is difficult to identify.

Please try moving to a nearby area to see if the image improves.

Q：Can Muscle & Fat Z2 measure visceral fat?

A： No. The Muscle & Fat Z2 measures subcutaneous fat and cannot measure visceral fat.

Q：Which systems does the Muscle & Fat Z2 support?

A： Muscle & Fat Z2 supports Bluetooth 4.2 and above versions of Android (Android 7.0 and above) and iOS (iOS 9.0 and above) mobile phones or Pads.

Q：How to connect Muscle & Fat Z2?

A： 1）Turn on the device Z2;

2）Turn on the Bluetooth of APP device;

3）Wait for the APP to automatically search for the Z2 device;

Or click the " " icon in the upper right corner of the homepage to actively search for Z2 device connection.

Q：The Muscle & Fat Z2 cannot be turned on?

A： Short press the power button to turn on the device. If the light does not on after pressing the power button for a while, it may be because the device is out of power. Please charge the device and try again.

Q：Can’t find the Muscle & Fat Z2?

A： 1) Confirm that the device is turned on (the indicator light flashes slowly in blue);

2) Make sure that no other mobile phones or Pads are connected to the device; (If there are other mobile phones or Pads connected to the device, the indicator light is always blue, and you can turn off the Bluetooth of the other mobile phones or Pads to disconnect)

3) Confirm that the GPS location service function of the mobile phone is turned on.

Q：Muscle & Fat Z2 is disconnected during use:

A: Check if you have accidentally turned off the Bluetooth of your mobile phone or the device has shut down because of no power.

Q：How many mobile phones or Pads can be connected to the Muscle & Fat Z2 at the same time?

A: When the Muscle & Fat Z2 is turned on, it can only be used with one mobile phone or Pads at a time.

Q: Can the Muscle & Fat Z2 be used while charging?

A: The Muscle & Fat Z2 will automatically shut down when it enters the charging state. Please turn it on when it is not charging.

Q: The firmware upgrade fails or the Bluetooth software upgrade fails?

A : 1) Ensure that the normal connection between the Z2 device and the App device is maintained during the upgrade;

2) Confirm that the network connection of the App device is normal;

3) After the upgrade fails, re-upgrade again to see if it can be successful, if it still does not work, try with another App device.

Product specifications

Product name: Muscle & Fat Z2	Model: Z2
Size: about 98×91×30 mm (length × width × height)	Weight: About 90g
Battery Type: Rechargeable Lithium -Ion battery	Battery capacity: 1000mAh
Probe frequency: 5MHz	Rated input: 3.7V 1.5W
Measuring range: 0-55mm	Measurement error: ±1mm
Data transmission: Wireless Bluetooth transmission (support Bluetooth 4.2 and above);	
System support: iOS 9.0 and above； Android 7.0and above;	
Measurement body parts: Waist, Abdomen, Upper arms, Thighs & Calves;	
Measurement function: Fat measurement and muscle exploration;	
Charging time: About 1.5h	FCC ID：
Use time (reference): If used for 10 minutes a day, about 14 days of continuous use.	

After-sales service and support

Warranty regulations

1. Since the date of purchase, the ultrasonic probe of this product is guaranteed for 3 months, and the remaining parts are guaranteed for 12 months.
2. The warranty is in the form of maintenance, the user needs to send the product together with the filled-in warranty card to the sales service center.
3. For products that exceed the warranty period, please contact the after-sales service center to provide repair parts for repairing services.
4. During the warranty period, the following conditions will not be eligible for warranty service:

   - Damage due to accident, abuse, misuse, or use of substandard supplies;
   - Out of warranty;
   - Unauthorized disassembly repair or unauthorized modification;
   - Measurement failure due to scratched ultrasound probe;
   - The purchase record does not match the serial number of the warranty machine;
   - Damage caused by man-made and the other force majeure.

Certification

SRRC FC CE

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and (2) this device must accept any interference

received, including interference that may cause undesired operation.

FCC warning:

Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

-Reorient or relocate the receiving antenna.

-Increase the separation between the equipment and receiver.

-Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

-Consult the dealer or an experienced radio/TV technician for help.

The device has been evaluated to meet general RF exposure requirement. The device can be used in portable exposure condition without restriction.

※The display method of the model approval code: printed on the outer packaging.

Thank you for using Marvoto Muscle & Fat Z2 !
If you have any problems during using, please contact us as soon as possible.
Marvoto customer service team will answer your questions carefully.

Customer Hotline: +86 574 63205418

Email: cs@marvoto.com

Company website: www.marvoto.com

WeChat official account: marvoto