



Congratulations!

On choosing this FUTECH instrument. FUTECH provides measuring instruments of precision and quality. Contributions from professional end users enable us to offer innovative, easy-to-use equipment.

TEMPVIEWER 3600

IMPORTANT!

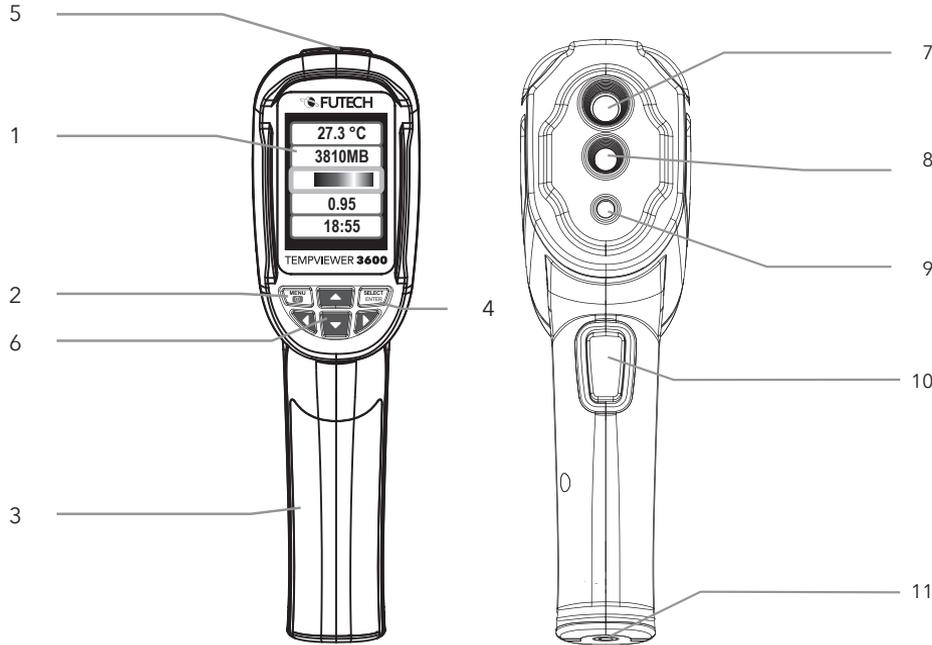
Read the instructions for use carefully before using the instrument. Keep them in a safe place for consultation when necessary.

Whether on or off, keep the instrument out of reach of children.

This equipment is a high quality precision instrument which must be handled with care. Avoid shocks and vibration. After use, always replace the instrument in its carrying bag. Make sure that the bag and instrument are dry; otherwise condensation may occur in the device. Make sure that the windows are free of dirt, and clean them using a soft cloth and a glass cleaning product only. Always use the locking device during transportation. Regularly inspect the accuracy of the instrument. You have sole responsibility for the accuracy of your work. Under no circumstances take the instrument apart. Do not use the instrument in rain or near flammable materials. Technical modification or alterations to the instrument may be carried out without prior notice. The manufacturer's responsibility shall in no case exceed the value of the costs of repair or replacement of the instrument. Respect the environment and do NOT discard the instrument or batteries in household waste. Take them to a recycling centre.

TEMPVIEWER3600

MANUAL



Parts of housing

1. Display
2. Power / Menu button
3. Battery compartment
4. Selection / Enterbutton
5. Micro SD card
6. Navigation (↑, ↓, ←, →)
7. Infrared sensor
8. Camera
9. LED light
10. Record button
11. Thread 1/4"

Menu

- a. Temperature unit (°C/°F)
- b. Background temperature
- c. Free storage space Micro SD
- d. color palette
- e. Emissivity value
- f. Markpoint Min./Max.-value
- g. Ambient temperature
- h. Date/Timesettings
- i. Number of saved photos
- j. Brightness display



How does an infrared thermometer work?

Each object transmits infrared rays. The power of these rays depends on the type of material (expressed as "radiation coefficient" or "emissivity" of a material) and of course the temperature of the object. An infrared detector absorbs these rays and the electrons in the device turn them into temperature ($^{\circ}$ C or $^{\circ}$ F).

This thermal camera shows the temperature of all objects in the vicinity on a thermal image (color scale with, for example, blue is cold and red is warm). This camera can mix the thermal image with an optical image. This will make the measuring area more visible and you can understand where a cold or hot spot is exactly.

Radiation coefficient or emissivity

The amount of infrared energy radiated by an object is proportional to the temperature of the object and the ability of the material to radiate energy. This ability refers to "radiation coefficient" or "emissivity". Emissivity is the ratio of the average emission power to a black radiator at the same temperature. Emission is for most materials between 0.10 and 1.00. Materials with low emissivity (<0.60) emit little energy, typically for materials with a shiny, light surface (eg metals). Materials with high emissivity (>0.90) emit much energy, typically for matte dark areas. The lower the emissivity, the more difficult it is to accurately measure.

This thermal camera has the ability to set the emissivity of the meter object from 0.10 to 1.00. If you set the correct radiation coefficient, you will measure more accurately. Look for the correct value in the table next to it. In case of doubt, use 0.95, which can be used for 90% of applications.

ASPHALT	0,90 - 0,98
CONCRETE	0,94
CEMENT	0,96
SAND	0,90
SOIL	0,92 - 0,96
WATER	0,92 - 0,96
ICE	0,96 - 0,98
SNOW	0,83
GLASS	0,90 - 0,95
CERAMIC	0,90 - 0,94
MARBLE	0,94
PLASTER	0,80 - 0,90
MORTAR	0,89 - 0,91
BRICK	0,93 - 0,96
CLOTH (BLACK)	0,98
SKIN (HUMAN)	0,98
LEATHER	0,75 - 0,80
CARaCOAL (POWDER)	0,96
LACQUER	0,80 - 0,95
LACQUER (MATT)	0,97
RUBBER (BLACK)	0,94
PLASTIC	0,85 - 0,95
TIMBER	0,90
PAPER	0,70 - 0,94
CHROMIUM OXIDES	0,81
COPPER OXIDES	0,78
IRON OXIDES	0,78 - 0,82
TEXTILES	0,90

How big is the measuring area?

The further you are of the object whose temperature you want to measure, the greater the measurement area. The larger the measuring surface, the less the accuracy. We therefore recommend using the camera as close as possible to the objects to be measured.

The applicable distance is 50cm.

This thermal camera has a measurement ratio of 10: 6. This means that at a measurement at a distance of 100cm of the object, the measuring surface is approximately 60x60cm in size.

GOOD TO KNOW...

- *An infrared thermometer must adapt to ambient temperature. This may take up to 30 minutes to adjust to high temperature fluctuations. So wait a few minutes between measuring a hot and cold object.*
- *An infrared thermometer can not be measured through transparent surfaces (eg. glass). He will then measure the temperature of the glass.*
- *Steam, dust, smoke ... make measurements with an infrared thermometer less accurate to unreliable..*

To work

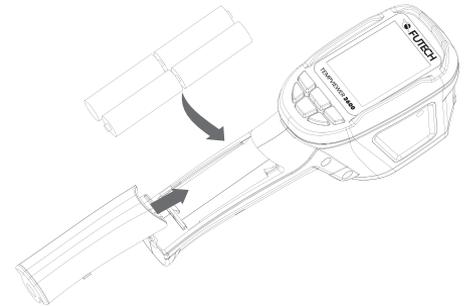
- Insert 4x AA batteries into the device. Consider the polarity. This is indicated in the device.
- Press 5 sec. On the "Power / Menu key" to turn on the unit.
- During the measurements there is a central mark to see. The measured temperature of this point is displayed in the upper left corner of the screen. The emissivity value is shown in the upper right corner. At the bottom left, the minimum and maximum values are displayed within the measurement range. If desired, this minimum and maximum value can be displayed with a marker on the displayed thermal / visual image. (See min. / Max. Value)
- To save images on the MicroSD card, aim the Tempviewer3600 on the surface to measure and press the "Recording key." "Store photos yes no" will appear on the screen. Press the "Power / Menu key" to save the image, press the "Select / Enter key" if you don't want to save the image. If "FULL" appears at the bottom of the screen, you must clear the MicroSD card.
- To switch off the device, press the "Power / Menu key" for 5 seconds until the unit starts counting down.

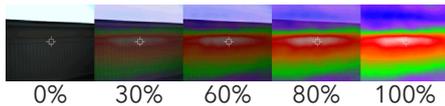
Removing noise

Does the image display noise? Then start the device and make sure the sensor is close to the work surface. Press 5 seconds on the Navigation key ▲ until "Adjust" appears on the screen. This process takes about 30sec.

Led light

Tempviewer3600 features an LED light. This can be activated by pressing the Record key (10) for about 5 seconds. Repeat this step to turn off the LED light again.





Mixing images

The Tempviewer3600 can combine visual images in 5 ways with thermal imagery. The heat image can be displayed 0, 30, 60, 80 or 100%, respectively, over the visual image. To choose how much% of the heat image is visible on the visual image, use the Navigation keys ◀ and ▶.

MENU

- To adjust settings in the menu, briefly press the “Power / Menu key”. The menu will be visible. Use the Navigation buttons ▲ and ▼ to scroll through the menu with the yellow selection box.
- To adjust a menu function, bring the yellow selection box to the desired item and press the “Select / Enter” key. Choose the desired setting with the Navigation buttons ▲ and ▼ And confirm with the “Select / Enter key”.
- Press the “Power / Menu key” to exit the menu.

a. - Unit (°C / °F)

The Tempviewer3600 can measure in both °C and °F. To switch between these units, press the “Power / Menu key”. Move with the Navigation buttons ▲ and ▼ to the “Temperature Unit (°C / °F)” option (**a**) and confirm with the “Select / Enter” key. Choose with the Navigation buttons ~ and ?? The desired unit and confirm with the “Select / Enter key”

b. - Background temperature of reflective substrate (Low emissivity)

The temperature of the background can be set from 0 °C to 36 °C. This is especially necessary as temperature compensation for shiny surfaces (low emissivity). Heat or cold peaks of and around the object can affect the surface temperature and measurement accuracy of the measured object. This becomes especially clear when the radiation coefficient of the measured object is low. In these situations, only set the temperature of the reflective background to get the measured result as accurate as possible. In all other cases, use a temperature of 0 °C (**recommended**).

c. - Free storage space Micro SD

Here you can see how much MB is still available on the Micro SD card (if placed).

d. - Color palette

There are 5 different color settings for the thermal image on the Tempviewer3600. To set the preferred pallet press the "Power / Menu key". Move with the Navigation buttons ▲ and ▼ To the "Color pallet" option **(d)** and confirm with the "Select / Enter key". Choose with the Navigation buttons ▲ and ▼ the desired color palette and confirm with the "Select / Enter key"

e. - Emissivity

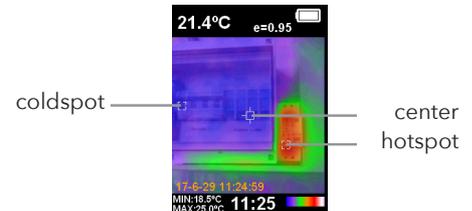
The emissivity values of the Tempviewer3600 are adjustable from 0.10 to 1.00. Look for the correct value in the table. In case of doubt, set the emissivity value to 0.95. To set the emissivity, press the "Power / Menu key". Move with the Navigation buttons ▲ and ▼ To the "Emissivity Value" **(e)** option and confirm with the "Select / Enter" key. Use the Navigation buttons ▲ and ▼ to select the desired emissivity factor and confirm with the "Select / Enter key".

f. - Indicates Min./Max.-value

To display these minimum and maximum values, press the "Power / Menu key" and move with the Navigation buttons ~ and ?? To the setting "Min./Max.value" **(f)** and confirm with the "Select / Enter" key. Use the Navigation buttons ~ and ?? To turn the option on / off and confirm with the "Select / Enter key".

g. - Ambient temperature

The unit takes into account the ambient temperature. The temperature of the space can be read here.



h. - Date and time

Stored images are provided with Date and Time. This can be set very easily via the menu. Press the "Power / Menu key". Move with the Navigation buttons ▲ and ▼ To the "Date / Time Settings" (h) option and confirm with the "Select / Enter" key. Two lines of values appear on the screen. At the top of the date (YY MM DD) and at the bottom of the hour (HH MM). Move with the Navigation keys ◀ And ▶ between the different values (active value in yellow) and choose with the Navigation buttons ▲ and ▼ The desired value. Confirm the set date and time with the "Select / Enter key"

i. - Saved pictures

With the included MicroSD card, up to 25,000 images can be saved. The menu shows the number of saved pictures. To view saved images, press the "Power / Menu key" and move with the Navigation keys ▲ and ▼ To "Saved pictures" (i) and confirm with "Select / Enter key". Stored images are called "IMG#.bmp", where # represents the serial number of the image. Use the Navigation buttons ▲ and ▼ To view the desired image and confirm with the "Select / Enter key".

j. - Brightness of display

To change the brightness of the display, press the "Power / Menu key" and move with the Navigation keys ▲ and ▼ To the "Brightness display" (j) and confirm with the "Select / Enter key". Use the Navigation buttons ▲ and ▼ To set the desired brightness and confirm with the "Select / Enter key".

Maintenance

Use a damp cloth to clean the appliance. Never use abrasives, isopropyl alcohol or solvents to clean the device, lens, sensor or screen.

GENERAL

Description

The following directions should enable the person responsible for the product, and the person who actually uses the equipment, to anticipate and avoid operational hazards. The person responsible for the product must ensure that all users understand these directions and adhere to them.

Adverse Use

- Use of the product without instruction.
- Use outside of the intended limits.
- Disabling safety systems.
- Removal of hazard notices.
- Opening the product using tools, for example screw- driver, unless this is specifically permitted for certain functions.
- Modification or conversion of the product.
- Use after misappropriation.
- Use of products with obviously recognizable damages or defects.
- Use with accessories from other manufacturers without the prior explicit approval of FUTECH.
- Inadequate safeguards at the work site, for example when using on or near roads.
- Deliberate dazzling of third parties.
- Controlling of machines, moving ob-

jects or similar monitoring application without additional control and safety installations.

WARNING

Adverse use can lead to injury, malfunction and damage. It is the task of the person responsible for the equipment to inform the user about hazards and how to counteract them. The product is not to be operated until the user has been instructed on how to work with it.

LIMITS OF USE

Environment

Suitable for use in an atmosphere appropriate for permanent human habitation: not suitable for use in aggressive or explosive environments.

DANGER

Local safety authorities and safety experts must be contacted before working in hazardous areas, or in close proximity to electrical installations or similar situations by the person in charge of the product.

RESPONSIBILITIES

Manufacturer of the product

Laseto N.V., Belgium, BE0808.043.652, hereinafter referred to as FUTECH, is responsible for supplying the product, in-

cluding the user manual and original accessories, in a completely safe condition.

Manufacturers of non FUTECH accessories

The manufacturers of non FUTECH accessories for the product are responsible for developing, implementing and communicating safety concepts for their products, and are also responsible for the effectiveness of those safety concepts in combination with the FUTECH product.

Person in charge of the product

The person in charge of the product has the following duties:

- To understand the safety instructions on the product and the instructions in the user manual.
- To be familiar with local regulations relating to safety and accident prevention.
- To inform FUTECH immediately if the product and the application becomes unsafe.

HAZARDS OF USE

WARNINGS

- The person responsible for the product must ensure that it is used in accordance with the instructions. This person is also accountable for the training and the deployment of personnel who use the product and for the safety of the equipment in use.
- The absence of instruction, or the inadequate imparting of instruction, can lead to incorrect or adverse use, and can give rise to accidents with far-reaching human, material, financial and environmental consequences.
- All users must follow the safety directions given by the manufacturer and the directions of the person responsible for the product.
- Watch out for erroneous measurement results if the product has been dropped or has been misused, modified, stored for long periods or transported.
- Periodically carry out test measurements and perform the field adjustments indicated in the user manual, particularly after the product has been subjected to abnormal use and before and after important measurements.
- If the product is used with accessories, for example masts, staffs, poles, you may increase the risk of being struck by lightning.
- Do not use the product in a thunderstorm.
- Inadequate securing of the working site can lead to dangerous situations, for example in traffic, on building sites, and at industrial installations.
- Always ensure that the working site is adequately secured. Adhere to the regulations governing safety and accident prevention and road traffic.
- If the accessories used with the product are not properly secured and the product is subjected to mechanical shock, for example blows or falling, the product may be damaged or people may sustain injury.
- When setting-up the product, make sure that the accessories are correctly adapted, fitted, secured, and locked in position. Avoid subjecting the product to mechanical stress.
- During the transport, shipping or disposal of batteries it is possible for inappropriate mechanical influences to constitute a fire hazard.
- Before shipping the product or disposing of it, discharge the batteries by running the product until they are flat. When transporting or shipping batteries, the person in charge of the product must ensure that the applicable national and international rules and regulations are observed. Before transportation or shipping contact your local passenger or freight transport company.
- High mechanical stress, high ambient temperatures or immersion into fluids can cause leakage, fire or explosions of the batteries.
- Protect the batteries from mechanical influences and high ambient temperatures. Do not drop or immerse batteries into fluids.
- Short circuited battery terminals can overheat and cause injury or fire, for example by storing or transporting in pockets if battery terminals come in contact with jewellery, keys, metallized paper or other metals.
- Make sure that the battery terminals do not come into contact with metallic objects.
- During the operation of the product there is a hazard of squeezing extremities by moving parts.
- Keep extremities in a safe distance from the moving parts. If the product is improperly disposed of, the following can happen: If polymer parts are burnt, poisonous gases are produced which may impair health. If batteries are damaged or are heated strongly, they can explode and cause poisoning, burning, corrosion

or environmental contamination. By disposing of the product irresponsibly you may enable unauthorized persons to use it in contravention of the regulations, exposing themselves and third parties to the risk of severe injury and rendering the environment liable to contamination.

The product must not be disposed with household waste. Dispose of the product appropriately in accordance with the national regulations in force in your country.

Remove batteries from a device if it is not used for several months to prevent damage.

If your instrument does not reach the required tolerance, it should be returned to your service centre or to your reseller for service. Repairs carried out by unauthorised personnel will automatically invalidate the guarantee.

TECHNICAL INFORMATION

ACCURACY	± 2°C
TEMPERATURE RANGE	± -20°C ~ 300°
DISPLAY	2,4 INCH HIGH RESOLUTIONS COLOR SCREEN
SENSITIVITY	0,15°C
EMISSIVITY	0,10 ~ 1,00 (ADJUSTABLE)
OPTICAL RESOLUTION	10:6
LASER CLASS	NOT APPLICABLE
RESPONSE TIME	0,15 SEC.
SPECIAL RESPONSE TIME	6 ~ 14 µM
SCREW THREAD	1/4"
INDICATION RANGE	THE THERMAL IMAGE CAN BE MIXED ON THE SCREEN WITH AN OPTICAL IMAGE
PROTECTION	IP54
DIMENSIONS (L X B X H)	212 X 95 X 62 MM
WEIGHT	320 G
OPERATING TEMPERATURE	-5°C ~ 40°C
STORAGE TEMPERATURE	-20°C ~ 50°C
POWER SUPPLY	4X AA ALKALINE
RELATIVE HUMIDITY	10% ~ 80%RH

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