



# Smartphone / Tablet Thermal Imager

Auto trace High / Low object temperature

Connecting through Smartphone / Tablet with Android APP through type 'C' USB or type 'C' micro USB adaptor

Model No. :  **MS-ITC2U**

**MS-ITC2UT** ( With distance to object measurement display)

Thank you for purchasing MEET Smartphone / Tablet Thermal Imager !

## 1. Contents

- Thermal imager detector
- Storage case
- Operating manual
- Type 'C' to micro USB adaptor

Download iSTC USB APP :



OR



'iSTC USB'



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Model No.	MS-ITC2U	MS-ITC2UT
Thermal image detector	Low power CMOS, shutterless	
Thermal image resolution	80 (H) x 62 (V), 4960 pixels	
Spectral response	8 ~ 14μm (Thermal LWIR)	
Measure temperature range	-20°C ~ 1000°C ( - 4°F ~ 1832°F )	
Resolution (Min.)	0.1 °C ( 0.1 °F )	
Adjustable emissivity	1 ~ 99	
Fixed focus distance	0.5 m	
10 color palettes selectable	★	
Image frequency	≤ 9 Hz	
1/4" screw	For tripod	
Image storage / File format	JPEG into Smartphone / Tablet memory and display	
Operating and storage condition (temperature; humidity)	0°C ~ 40°C ( 32°F ~ 104°F ) ; 10% ~ 80%RH	
Type 'C' USB input or through Type 'C' / micro USB adaptor	★	
Dimensions (LxWxD) mm (approximate)	61 x 41 x 25	
Powered by / Operating duration	Smartphone / Tablet depends on device itself	
Weight (approximate) grams	22	

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## 5. Care and handing

- Keep the Imager dry, if it gets wet, dry it immediately.
- Use and store the Imager in normal temperature.
- Handle the Imager gently and carefully.
- Keep the Imager clean. Wipe the case occasionally with a cloth. Do not use chemicals, cleaning solvents, or detergents.

## 6. Download free APPS

A. Scan below QR code or download free 'iSTC USB' Android APPS from Google Play Store.

\*NOTE: SHOULD BE ANDROID 8.0 OR ABOVE SUPPORT OTG DEVICE.



OR



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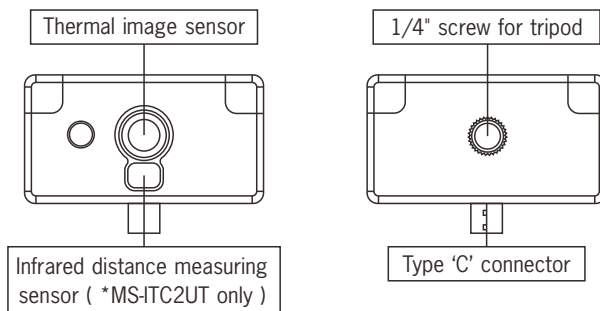
## 2. Specifications

Model No.	MS-ITC2U	MS-ITC2UT
- Display - Date / Time	Display through Smartphone/ Tablet ( with Android 8.0 version or above and support OTG output)	
Menu setting and display	Through Smartphone / Tablet	
<b>NEW</b> Real time isotherm graphic display	★	
<b>NEW</b> Data logging	Auto trace and capture high/ low temp. every 60 seconds and stored in memory	
<b>NEW</b> Self Temperature compensation adjust (by manually input)	★	
<b>NEW</b> Distance to object measurement display		( 1 ~ 320cm)
<b>NEW</b> 8 types of measurement mode include 2 types of 'Auto Capture' Data Logging mode	1) Thermal 'Image' 2) 'Target' temp. (flexible setting) 3) 'High' temp. (Auto trace) 4) 'Low' temp. (Auto trace) 5) 'High/ Low / Target' temp. (Auto trace) 6) 'Skin temp.' (Auto trace) 7) 'Alm Vs Target', Auto capture and record 'pre-set' High / Low differential temp. vs 'Target' 8) 'Alm Vs Object', Auto capture and record pre-set High / Low differential temp. of the object	



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## 3. Descriptions



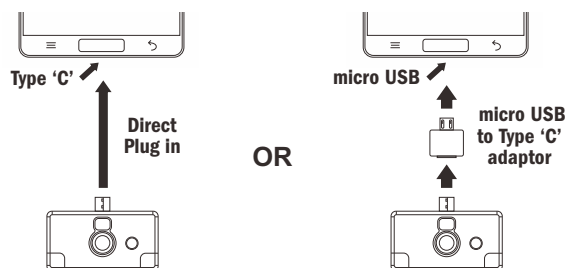
## 4. Safety instructions

The Imager has been designed for safe use, but must read, understand and follow operating instructions and Safety Rules in this manual before using this product.

- Do not use this Imager if it operates abnormally.
- Do not submerge it in water.
- Do not leave or operate near objects of high temperature.
- Do not operate the Imager around explosive gas, vapor or dust.

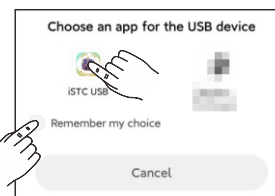
— 4 —

B. Insert the Imager direct to type 'C' input of Smartphone or use micro USB to type 'C' adaptor to Smartphone with micro USB.



C. Please tap 'iSTC USB' and or default setting to enter APPS.

Select 'iSTC USB' to drive OTG device



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## 7. Description on screen display

- 1 Measuring mode select ( 8 types)
- 2 Device ID no.
- 3 Real time isotherm display
- 4 Visual and or thermal image display area
- 5 Temp. reading of ' Free target ' 'Free' ( White icon)
- 5a On screen scrolling ' Free target ' temp. indicator when at 'Target Temp.' / 'Hi /Lo/Tgt' / 'Alm Vs Tgt' mode
- 6 Lowest temp. reading display 'Low' ( Blue icon)
- 6a Auto trace lowest temp. indicator
- 7 Highest temp. reading display 'High' ( Red icon)
- 7a Auto trace Highest temp. indicator
- 8 Distance reading display from sensor to the object (MS-TC2UT only)
- 9 Sensor resolution display
- 10 Current temp. range display
- 11 Scrolling temp. range setting when at 'manual' mode
- 12 Palette select button
- 13 ON / OFF select button of visible camera
- 14 Change over select button of front or rear camera
- 15 Snap button to store current full information into Smartphone
- 16 Setting button to enter setting page

17 Input value for Temp. compensation to match / adjust or compare the reading

Low temp. 20.0 High temp. 29.5

17a Max. / Min. temp. setting when at 'Alm Vs Tgt' / 'Alm Vs Obj.' mode

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## 8. At a glance of measured display

**Free target temp.**

- A1 - White curve
- A2 - White icon
- A3 - White display **22.7°C**

**Lowest temp.**

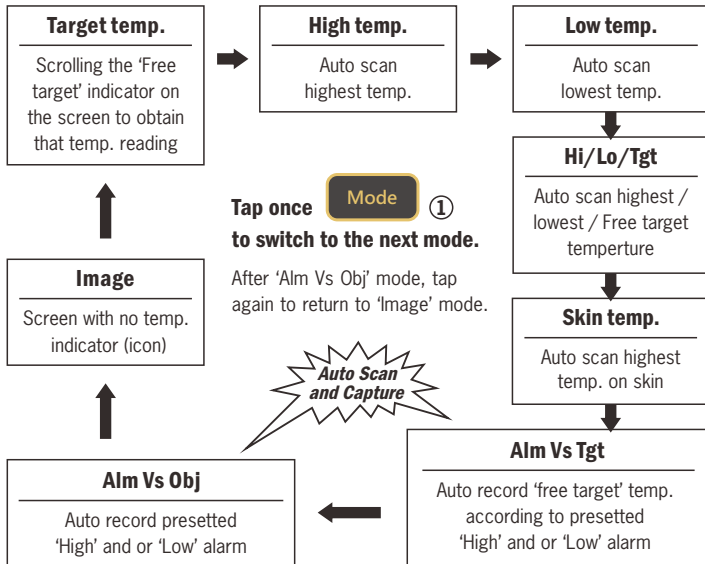
- B1 - Blue curve
- B2 - Blue icon
- B3 - Blue display **15.1°C**

**Highest temp.**

- C1 - Red curve
- C2 - Red icon
- C3 - Red display **26.6°C**

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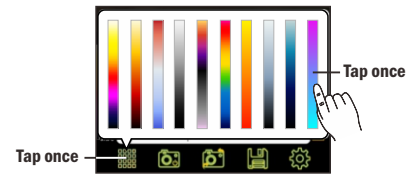
## 9. Measuring mode select



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## 10. 'Setting' mode select

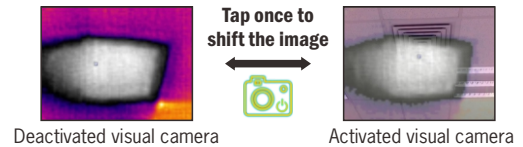
**Palette select button** ⑫  
Tap once the button ⑫ to enter 10 different palette selection page. Tap once to desired palette to confirm.



**Activate / deactivate visual camera button** ⑬

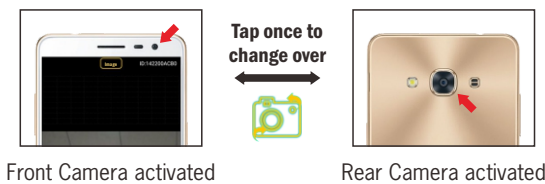
Tap once to activate or deactivate visual camera for Visible / Thermal / Thermal + Visual (overlap) Image display.

NOTE: Due to located of Camera head are not in parallel with thermal sensor, so the same object at visual and thermal are not perfectly overlapped.



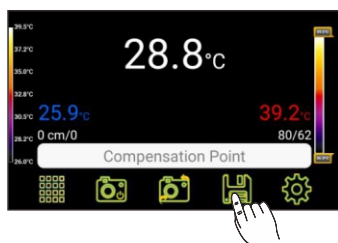
— 10 —

**Change over select button of front / rear camera** ⑭



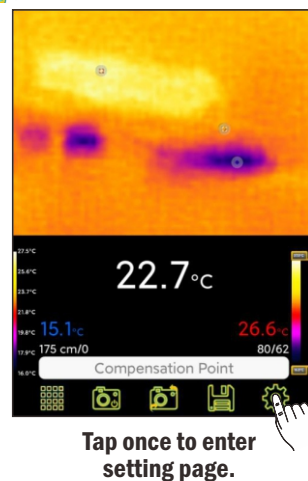
**Store current information button** ⑮

Tap once to store full information (picture)



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**Enter 'Setting' mode** ⑯



Max°C: 90  
Min°C: 20  
Alpha%: 99  
Emiss: 95

Material	Emissivity	Material	Emissivity
Aluminum	30	Glass	90 - 95
Bitumen	90 - 98	Iron Oxides	78 - 82
Concrete	95	Paint	80 - 95
Asbestos	95	Plastic Cement	85 - 95
Ceramics	90 - 95	Paper	70 - 94
Brass	50	Sand	90
Brick	90	Rubber	95
Carbon	85	Wood	94
Oil Sludge	94	Textile	94
Frozen Food	90	Lead	50
Hot Food	93	Marble	94
Ice	96 - 98	Cloth (Black)	98
Snow	83	Gypsum	80 - 90
Human Skin	98	Water	92 - 96

Auto U-D L-R °C °F

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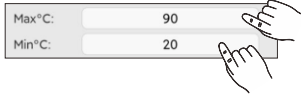
**Details inside 'SETTING' page**

**a) Manually setting of thermal temp. range.**

**Step 1** Tap '√' Auto button once to shift manual setting

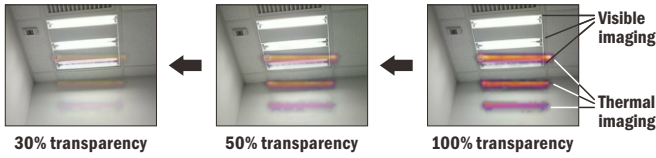
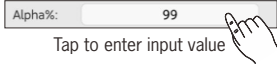


**Step 2** Tap to enter input value



NOTE: Deactivate 'manual' mode when not in use.

**b) Transparency adjust between Thermal and Visual Image**



NOTE: Due to located of Camera head are not in parallel with thermal sensor, so the same object at visual and thermal are not perfectly overlapped. It is good to identify the object through visually.

**d) Flipping the view of thermal image**



Tap  L-R button to flip the thermal image upside - down

**e) Select °C or °F measurement unit**

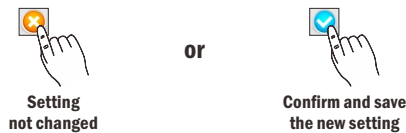


Tap the °F button shift to measure at Fahrenheit ( °F )  
Unit changed to °F

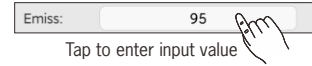
**f) Confirm and save the setting**

**MUST complete this procedure whether setting changed or not !**

In the upper right corner of the setting menu, click the corresponding icon to complete the final setting/s (whether or not) to exit the setting menu and back to measuring mode.



**c) Setting Emissivity**

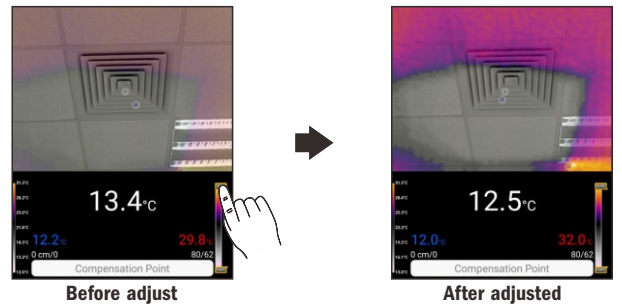
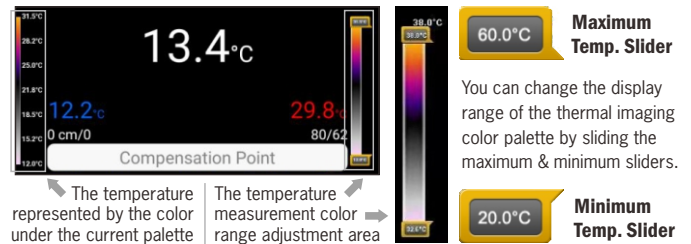


For more accurate measuring results, please select from below table the most suitable emissivity value for different object material.

Material	Emissivity	Material	Emissivity
Aluminum	30	Glass	90 ~ 95
Bitumen	90 ~ 98	Iron Oxides	78 ~ 82
Concrete	95	Paint	80 ~ 95
Asbestos	95	Plastic Cement	85 ~ 95
Ceramics	90 ~ 95	Paper	70 ~ 94
Brass	50	Sand	90
Brick	90	Rubber	95
Carbon	85	Wood	94
Oil Sludge	94	Textile	94
Frozen Food	90	Lead	50
Hot Food	93	Marble	94
Ice	96 ~ 98	Cloth ( Black )	98
Snow	83	Gypsum	80 ~ 90
Human Skin	98	Water	92 ~ 96

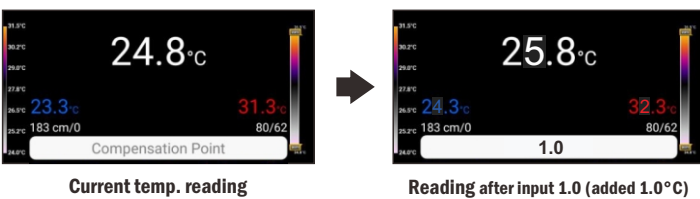
**11. Adjust temperature display range of color palette**

The temperature bar on the right side of the measurement data area is a slider for adjusting the temperature color range, and the temperature bar on the left shows the temperature represented by the color under the current color palette.



**12. Setting the temp. compensation value (reading)**

iSTC USB has the function of adjusting the temperature through 'compensation point'. It is usually used when the detection target has a known standard value ( ie. standard temperature probe / source ). By input the compensation value, a more accurate measurement reading can be achieved. Enter the positive value to increase the temperature point, and the negative value to decrease the temperature value. Enter the corresponding value in the temperature 'compensation point' column to adjust the overall detection reading.



**NOTE :**

This function availability except at 'Alm Vs tgt' and 'Alm Vs obj.' mode.

**13. Visible imaging screen size adjustment**

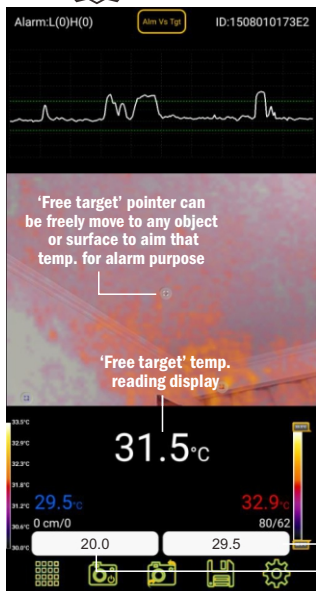
When the size of the visible screen and the thermal imaging screen are not to scale, the size of the visible screen can be adjusted by pressing the volume key of the Smartphone. The volume 'up' key ( + ) is to enlarge the visible screen, and the volume 'down' key ( - ) is to reduce the visible screen.

You may adjust according to actual necessary.



# 14. How to set 'Alm Vs Tgt.' and 'Alm Vs Obj.' data logging

## A) 'Alm Vs Tgt.' Record 'Target' alarm temp.

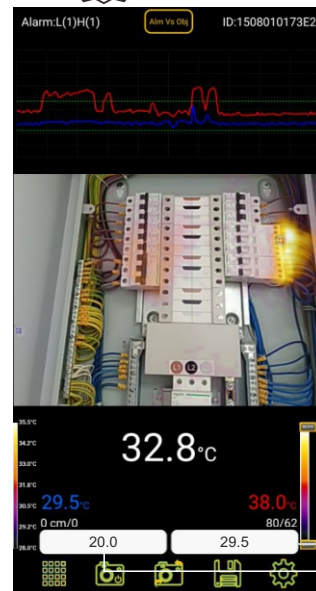


**Introduction :**  
 User can freely move 'Free target' pointer on screen intended to record on any target object. The image sensor automatically snap the whole picture recorded once the alarm triggered. Users can use this unique function for the following application scenarios:

- For electrical or mechanical they can check and monitor the temperature rise of Wires / Cables; Busbar; Magnetic Contactor; Fuse; Circuit Breaker; Junction Connection; AC Motors etc.
- HVAC / Plumbing / Air-Conditioning measures and record High / Low temp. ; Hot / Cold water flows; status of air duct / ventilation etc.
- Catering, food processing; thermal leakage of chilled chamber
- Water leakage on walls; floors; ceiling; basement, monitoring water / air steam restoration, etc.
- Air leakage of doors; windows; etc.

Alarm setting for 'Low' temp.      Alarm setting for 'High' temp.

## B) 'Alm Vs Obj.' Record 'Object' alarm temp.

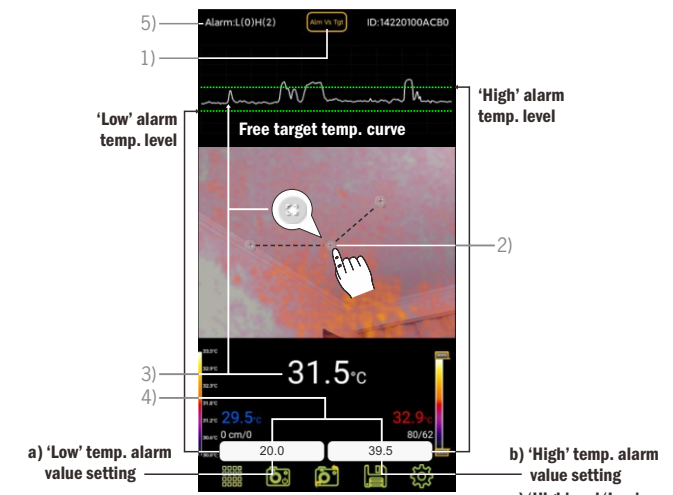


**Introduction :**  
 In this 'Alm Vs obj.' alarm data logging mode, user can record either 'High' / 'Low' / 'High' and 'Low' alarm temp. on any object or space / location within Visible image screen.  
 The thermal sensor scan and trace temp. on object ; space / location every second. Once presetted alarm temp. range exceeded, the thermal sensor will automatically snap the whole screen picture with full information and save it in the Smartphone. User can use this unique function for the following applications :

- Inside electrical panel, used to monitor or record / trouble shooting of Wires / Cables; Fuse / RCD / MCB ; Busbar / Link / Joint Connection; Contacts of Magnetic Contactor; etc.
- Inside Electronic equipments, find out temp. rise of electronic components on PCB; UPS; Inverter etc.
- Large area monitor water leakage on floors / walls / basement; under ceiling.
- Large area monitor of food storage, such as frozen food; Wines; chilled drinks as well as temp. controlled chamber.
- HVAC ; Refrigeration; Plumbing; Mechanical; Machine; Industrial; Building automation; Agriculture; Laboratory; Warehouse etc. used to monitor / record / analysis.

Alarm setting for 'Low' temp.      Alarm setting for 'High' temp.

### How to set 'Alm Vs Tgt' mode ?



- 1) Tap the mode button to select 'Alm Vs Tgt' mode.
- 2) Move the 'Free target' pointer on screen to record target temp.
- 3) Read the current 'target' temperature, such as 31.5°C.
- 4) There are three options to set up the temp. alarm range :
  - a) **Low temp. alarm**  
 If only low temp. alarm is required, please input the max. value '999.9' in the high temp. alarm column. For example, when the temp. is lower than 20°C to alarm, enter '20.0' at the low temp. alarm column, as shown below :  

20.0

999.9
  - b) **High temp. alarm**  
 If only 'high' temp. alarm is required, please input the min. value '- 20.0' in the low temp. alarm column. For example, when the temp. is higher than 40°C to alarm, enter '40.0' at the high temp. alarm column, as shown below :  

-20.0

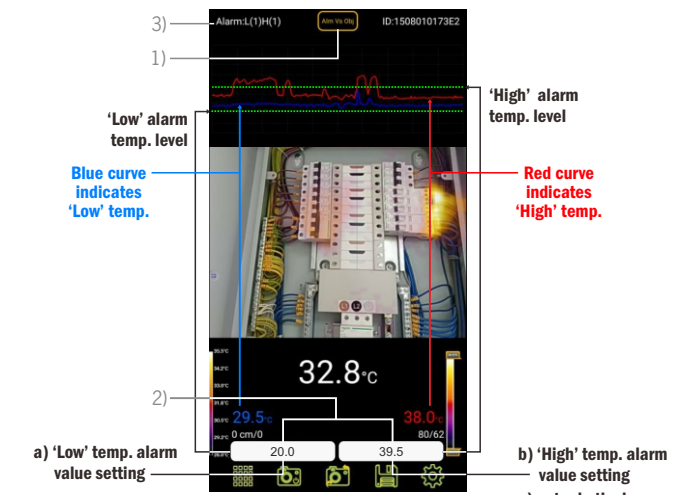
40.0
  - c) **High and low temp. alarm**  
 For 'high' temp. alarm and 'low' temp. alarm at the same time during detection, just input the corresponding values in the high temp. and low temp. alarm column. For example, when the alarm is below 25°C and the alarm is above 45°C, input as shown below :  

25.0

45.0

5) **Alarm: L(0)H(2)**  
 In the upper left corner of the operating interface is the number of alarms, and the number of alarm records in parentheses. L ( Low ) is low temp. alarm, H ( High ) is high temp. alarm. The recording interval is 1 time per minute ( if it occurred multiple times in 1 minute, it will only record once ). The number of times the alarm record could be recorded depends on the capacity of the Smartphone.  
 NOTE : Recorded photos can be viewed inside 'Photo Album' or 'File Management' of the Smartphone.

### How to set 'Alm Vs Obj' mode?



- 1) Tap the mode button to select 'Alm Vs Obj.' mode.
- 2) There are three options to set up the temp. alarm range :
  - a) **Low temp. alarm**  
 If only low temp. alarm is required, please input the max. value '999.9' in the high temp. alarm column. For example, when the temp. is lower than 20°C, it will alarm, enter '20.0' at the low temp. alarm column as shown below :  

20.0

999.9
  - b) **High temp. alarm**  
 If only high temp. alarm is required, please input the min. value '- 20.0' in the low temp. alarm column. For example, when the temp. is higher than 40°C, it will alarm, enter '40.0' at the high temp. alarm column as shown below :  

-20.0

40.0
  - c) **High and low temp. alarm**  
 If there is a high temp. alarm and low temp. alarm at the same time during detection, just input the corresponding values in the high temp. and low temp. alarm column. For example, when the alarm is below 25°C and the alarm is above 45°C, input as shown below :  

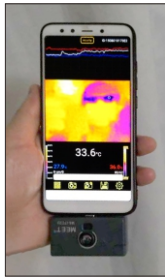
25.0

45.0

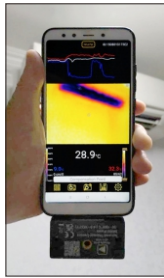
3) **Alarm: L(1)H(1)**  
 In the upper left corner of the operating interface is the number of alarms, and the number of alarm records in parentheses. L ( Low ) is low temperature alarm, H ( High ) is high temp. alarm. The recording interval is 1 time per minute ( if it occurred multiple times in 1 minute, it will only record once ). The number of times the alarm record could be recorded depends on the capacity of the Smartphone.  
 NOTE : Recorded photos can be viewed inside 'Photo Album' or 'File Management' of the Smartphone.

# How to use Thermal Imager with more flexibility

- MS-ITC2U / MS-ITC2UT can be plug in either front or rear side of your Smartphone.



From front side (towards face)



From rear side (towards front)

- The imager is enable to connect with Smartphone through extended type 'C' cable. Measuring made more flexible either on tripod stand or by extended telescopic pole.

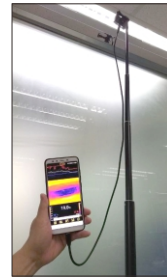


Imager fixed on tripod and connected to Smartphone through extended cable



Type 'C' extended cable (option)

Tripod stand (option)



Imager fixed on telescopic pole and connected to Smartphone through extended cable



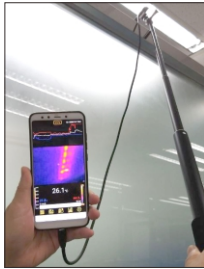
Telescopic pole (option)

## Wide Application

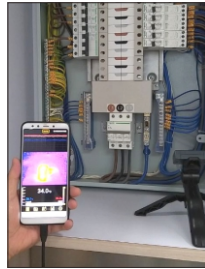
- Electrical and Mechanical safety inspection check :



Imager permanently fixed inside the Electrical distribution board or Plant room through extension cable, enable user to record / download full information without opening the distribution board or the Plant room.

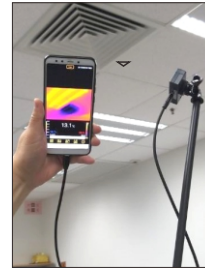


Monitoring status of electrical or mechanical equipment from outside walls

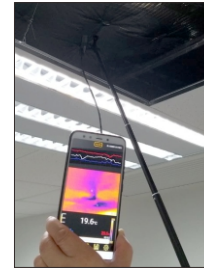


Check / Monitor / Measure overheat or abnormal conditions of RCD / MCB / Mainswitch / Cables / Busbar / Link connection etc.

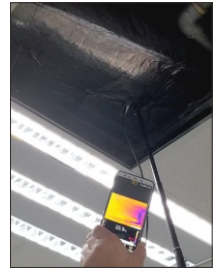
- HVAC / Refrigerating check :



Measuring temperature of air-conditioning vents or tracing the direction of air flows

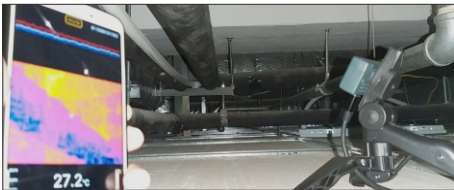


Trace or find 'air duct leakage' inside false ceiling



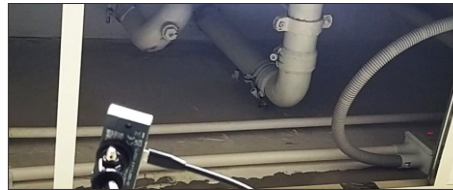
Abnormal temperature check of ventilation system or insulated problem

- Identify Pipelines :



Distinguish hot and cold pipe of air-conditioning system or plumbing water flows

- Locates water leaks on walls; ceilings; floor; basement :



Auto trace and point out Max./ Min. temperature through 'Free target pointer' ( icon )

\*Note: Wider the differential temp. between water leaks and the walls higher the picture of thermal image effect displayed



## How to spot out problems through Thermal Imager

• Locates buried drainage pipe of split type Air-conditioner

Location of buried drainage pipe

\*Note: Must run Air-conditioner more than half an hour at lowest temperature

• Check whether the temperature of beverage or frozen foods are in best temperature condition

'Free target pointer' shows 13.1°C

Min. temp. display : 5.5°C

• Check or fault finding mechanical trouble shooting, such as overload heat generated by motor running, etc.

'Free target pointer' shows 29.7°C

Max. temp. on points 33.0°C

• Pin point exact location heat accompanied by redness swelling on our body

Inflamed and swollen located

\*Please select to 'Skin temp.' mode, imager will scan and trace the Max. temp. and points out.

• Check and locate leakage door seal of a refrigerator

Constant temp. on door seal means no leakage

Max. temp. on surface shows 35.2°C

• Check temp. distributed inside storage chamber of a refrigerator, reference ①

Low temp. zone

Min. temp. display : -24.8°C

• Check temp. distributed inside storage chamber of a refrigerator, reference ②

'Free target pointer' shows 9.6°C

Low temp. zone

Min. temp. display : -3.7°C