HT INSTUNENTS HT305-HT304k Irradiance Sensor User Manual

HT305, HT304k
User Manual

Contents

PRECAUTIONS AND SAFETY MEASURES

The HT305 and HT304k accessories have been designed in accordance with the safety directives applicable to electronic measuring instruments. In this manual, the HT305 model will be referred to as the “accessory” unless otherwise stated. For your own safety and to avoid damage to the accessory, it is recommended that you follow the procedures described in this manual and carefully read all instructions preceded by the symbol ⚠.Before and after taking measurements, the following instructions should be carefully observed:

⚠ **CAUTION**

- Do not perform measurements in the presence of gas, explosive materials, or flammable materials, or in dusty environments.
- Even if no measurement is being performed, please avoid all contact with the circuit to be tested, with exposed metal parts, unused measuring terminals, circuits, etc.
- Do not perform measurements if you find any abnormalities in the accessory such as deformation, breakage, material leakage, etc.
- Pay extreme attention when measuring volumetric voltages higher than 25V in special environments (construction sites, etc.) and higher than 50V in normal environments due to the risk of electric shock.

The following symbols are used in this manual and on the accessories:

⚠ **CAUTION:** It is essential to consult the instruction manual to identify the nature of the potential hazard and what action needs to be taken.


The symbol on the accessory indicates that the appliance and its accessories must be collected separately and disposed of correctly.

REMOVAL INSTRUCTIONS

- Do not subject the solar cell's protective glass to mechanical impact to prevent damage.
- Avoid rubbing the protective glass with abrasive materials.
- Do not apply any binding force to the accessory output.
- Do not subject the output plug or connecting cable to strong mechanical shock.
- Clean the glass thoroughly with a soft damp cloth before taking measurements.
- Do not use alcohol, acetone or solvents to clean the glass.
- Install the accessory in a location free from obstacles that could cast shadows or cause light reflections on the sensor different from those experienced by the PV modules to be tested.

⚠ **CAUTION**
If the accessory is to be used to measure radiation in photovoltaic installations:

- The assembled sensor is parallel to the surface of the panels, with a maximum error of + 2°. If the sensor is not perfectly parallel to the surface of the modules, the measured result may change.
- Use the appropriate mounting bracket provided with the accessory and install it in a position that allows the cell to be exposed to the same radiation as the PV modules/strings (usually a central position with respect to the axis of the panels). Once the bracket is in place, tighten the mounting screws and ensure that the sensor and module are parallel.
- Allow the sensor to be exposed to the test conditions (irradiance, temperature, tilt angle) for at least 1 minute before performing measurements, to prevent the sensor from being used before it has reached operating conditions.

GENERAL DESCRIPTION

The accessory you have just purchased, if used according to the instructions given in this manual, ensures accurate and reliable measurements thanks to the stability of the cell used and the possibility of compensating for

the effects of temperature on the cell itself with the built-in temperature sensor.

2.1 FUNCTIONS ACCESSORIES HT305

The HT305 accessory only measures radiation when connected to the SOLAR03 remote module via a built-in monocrystalline cell and can be used with two types of modules, built according to two different technologies:

- MONOFACIAL units → measurement of radiation only on the front side of the unit (F)
- BIFACIAL modules → measurement of the radiation both on the front of the module (F) and on the back of the module (obtained by reflection from the environment) by dividing the high back part (BH = BackHigh) and the low back part (BL = BackLow). In this case it is necessary to use three HT305 cells

⚠ CAUTION
Irradiance can only be measured by connecting the HT305 accessory to the SOLAR03 remote control, which automatically detects the measurement sensitivity after connection.

2.2 FUNCTIONS ACCESSORIES HT304K

The HT304k accessory measures radiance when connected to the SOLAR-02 remote module and with Master instruments with 3-pole HT connectors (PVCHECK, PVCHECKs, I-V400x, I-V500w, SOLAR I-Vx) with a built-in monocrystalline cell and can be used on MONOFACIAL modules.

⚠ CAUTION

- The HT304k accessory cannot be connected to the SOLAR03 remote control, as it has a 3-pole connector.
- The back of the HT304k model indicates the calibration constant of the accessory (sensitivity) and the temperature coefficients to compensate for its effects (alpha) which must be set on the SOLAR-02 remote control or on the Master devices with 3-pole HT connectors (PVCHECK, PVCHECKs, IV400x, I-V500w, SOLAR I-Vx) to obtain the correct radiation value.

PREPARATION FOR USE

3.1 THE QUESTIONNAIRE

Before shipment, the accessory has been inspected from an electrical and mechanical point of view. All possible precautions have been taken to ensure that it arrives undamaged. However, we recommend that you quickly check it to detect any possible damage that may have occurred during transport. If any discrepancies are found, contact your dealer immediately. We also recommend that you check that the packaging contains all the items specified in § 7.3.1. In the event of any discrepancies, please contact your dealer. If the accessory should be returned, please follow the instructions in § 8.

3.2 DURING USE

Please read the following tips and instructions carefully.

⚠ CAUTION
Failure to follow the cautionary notes and/or instructions may damage the device and/or its components, or pose a hazard to the operator.

- Avoid moving or obscuring the sensor during use.
- When the accessory is connected to the circuit being measured, do not touch unused terminals.

3.3 POWER SUPPLY

The accessory is a passive sensor and does not require an external power supply.

3.4 STORAGE

To ensure accurate measurement and protect the accessory from possible damage, after a long storage period in

harsh environmental conditions, wait for the device to return to normal operation (see § 7.2).

NOMENCLATURE

4.1. ACCESSORY DESCRIPTION

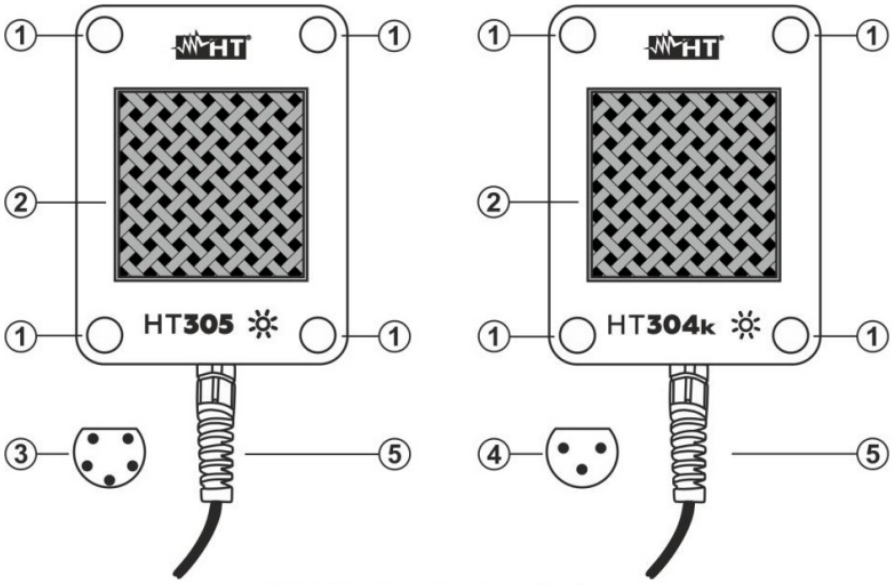

Fig. 1 Accessory description

1. Holes for screws that secure the accessory to the metal bracket
2. Single-crystal reference cells
3. 5-pole output connector (HT305)
4. 3-pole output connector (HT304k)
5. Cable for connecting to Master instruments or remote units

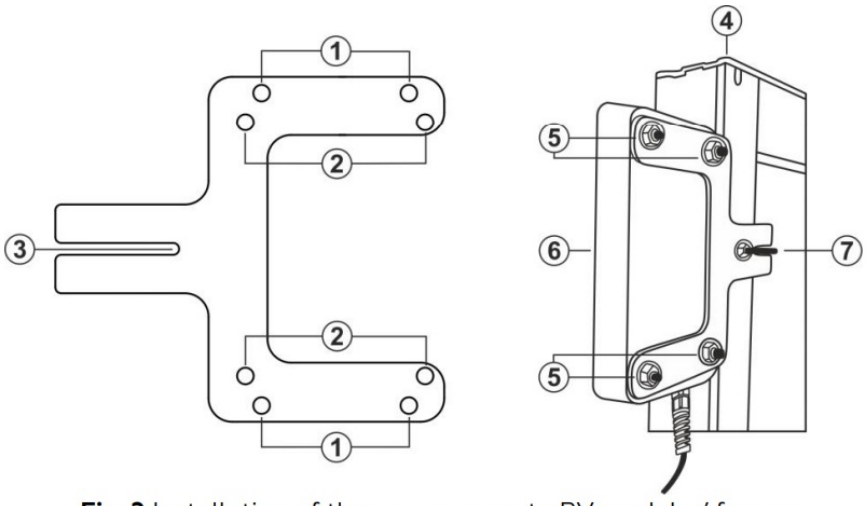

Fig. 2 Installation of the accessory onto PV modules' frame

1. Holes for screws that attach HT304N accessories to metal bracket
2. Holes for screws that attach accessories HT305 and HT304k to metal bracket
3. Slot for attaching bracket to PV module frame
4. PV module frame
5. Screws that secure accessories to the mount
6. Accessories assembled to bracket

7. Screw for mounting bracket to PV module frame

OPERATING INSTRUCTIONS

5.1. USE OF THE ACCESSORY

This manual contains instructions to be followed if the accessory is to be used for radiation measurements on photovoltaic installations. The procedures described are generally also applicable to other applications.

1. Attach the supplied bracket (see Figure 2 – left side) in a central position with respect to the axis of the PV modules (see Figure 2 – right side). The bracket has a screw fixing system, compatible with the holes found on the back of the PV module frame (see Figure 2 – part 3).
2. Make sure the bracket always rests on the edge of the unit.
3. Once the mount is positioned, place the accessory on the support.
4. Connect the connector of the connection cable (5 poles for HT305 or 3 poles for HT304k – see Figure 1 – parts 3 and 4) to the SOLAR03 remote control (HT305) or to the SOLAR-02 remote control or Master instrument with 3 poles HT connector (HT304k).
5. Make sure that the sensor and the light emitting module under test are parallel (maximum error + 2°). If the sensor is not perfectly parallel to the surface of the module, the measured result may change significantly.
6. Tighten the mounting screws.
7. Expose the accessory sensor to test conditions (irradiance, temperature, tilt angle) for at least 1 minute before performing measurements, to prevent the sensor from being used before it has reached operating conditions.

MAINTENANCE

⚠ CAUTION

When using and storing the accessory, carefully follow the recommendations listed in this manual to prevent possible damage or hazards during use.

6.1 CLEANING

Use a soft, damp cloth to clean the accessory. Never use acetone, solvents, alcohol, sponges or abrasives, etc.

TECHNICAL GAMES

TECHNICAL FEATURES

Accuracy referred to STC conditions (1000W/m2, 25°C, AM=1.5)

Irradiance measurement

Measuring range [W/m2]	Accuracy
5 ÷ 100	±(3.0% reading + 5W/m2)
101 ÷ 1400	±3.0% reading

7.2 GENERAL FEATURES

Reference Guidelines

EMC:…….. IEC/EN61326-1
Technical documents:…… IEC/EN61187

Calibration: ……..IEC/EN60904-2
Pollution level: ……2
Electrical properties

Photocell type: ……Monocrystalline
Internal temperature sensor: ……PT1000
Field of view: ……≥160°
Output connector: ……5-pin HT connector (HT305) 3-pole HT connector (HT304k)
Output cable length: ……approx. 2m
Mechanical properties

Dimensions (L x W x H): ……111 x 85 x 28 mm (4 x 3 x 1 inch)
Weight (with connection cable): ……240g (8 oz)
Mechanical protection: ……IP65 according to IEC/EN60529
Environmental conditions for use
Operating temperature: **……**-20°C ÷ 70°C (-4°F ÷ 158°F)
Operating humidity: <95%RH (10°C÷30°C) no condensation
……<75%RH (30°C÷40°C) no condensation
……<55%RH (40°C÷50°C) no condensation
Maximum operating altitude:…… 2000m (6562ft)
This accessory complies with the European EMC Directive 2014/30/EU
This accessory complies with the requirements of the European Directives 2011/65/EU (RoHS) and 2012/19/EU (WEEE)

7.3 ACCESSORIES
7.3.1. Standard accessories
See attached packing list

SERVICE

8.1. WARRANTY CONDITIONS
This appliance is warranted against any material or manufacturing defects, in accordance with the general terms and conditions of sale. During the warranty period, defective parts may be replaced. However, the manufacturer reserves the right to repair or replace the product. If the appliance is returned to the after-sales service or to a retailer, the transport costs are at the customer's expense. However, the shipment will be arranged in advance. A report stating the reasons for the return of the product must always be included with the shipment. Use only the original packaging for shipment; any damage resulting from the use of non-original packaging materials will be charged to the customer. The manufacturer declines all liability for personal injury or property damage.

The warranty does not apply in the following cases:

- Repairs and/or replacement of accessories and batteries (not covered by warranty).
- Repairs that may be necessary due to misuse of the device or its use with incompatible devices.
- Repairs that may be necessary due to improper packaging.
- Repairs that may become necessary due to intervention by unauthorized personnel.
- Modifications to the device made without the express permission of the manufacturer.
- Use not specified in the device specifications or in the user manual.

8.2 SERVICE

If the device does not work properly, before contacting the service, please check the condition of the battery and replace it if necessary. If the device still does not work properly, make sure that the product is used according to the instructions in this manual. If the device is returned to the after-sales service or to the dealer, the transport is at the customer's expense. However, the shipment will be arranged in advance. The shipment is always accompanied by a report stating the reasons for the return of the product. Use only the original packaging for shipping; any damage caused by the use of non-original packaging materials will be charged to the customer.

WHERE

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Documents / Resources

	HT INSTUNENTS HT305-HT304k Irradiance Sensor [pdf] User Manual HT305-HT304k, HT305-HT304k Irradiance Sensor, Irradiance Sensor, Sensor

References

- **User Manual**