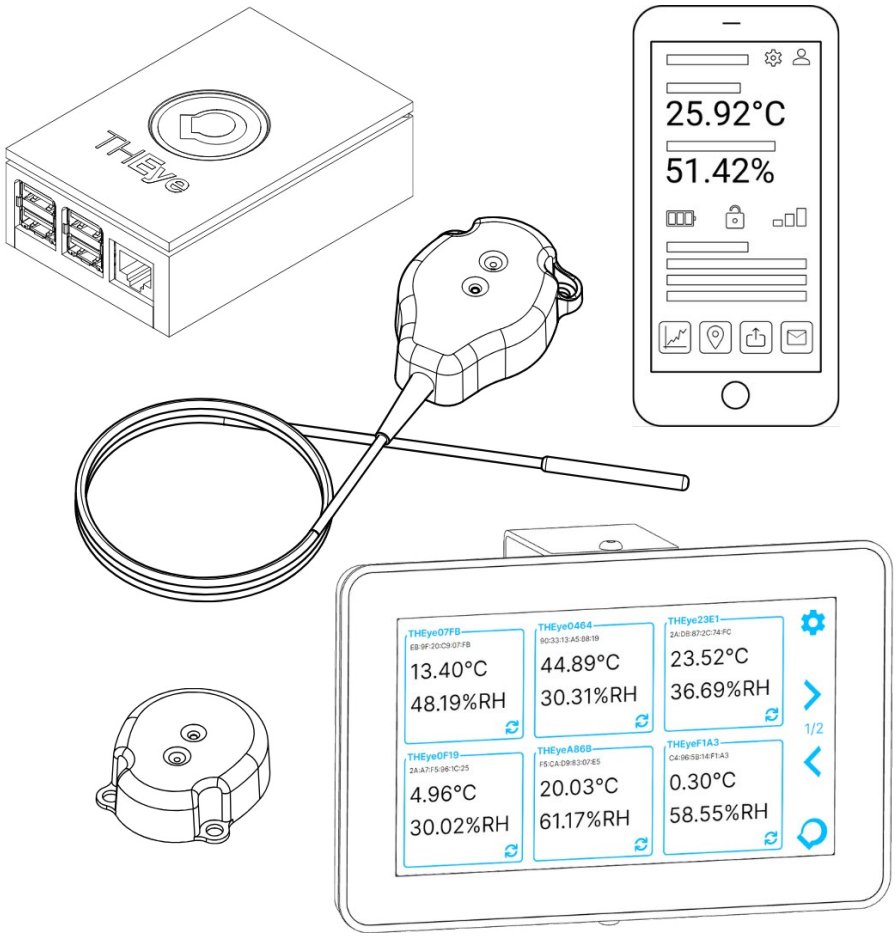
User manual



●oooo by FiveCo

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info@theye.ch / www.theye.ch

THEye

THEye	Compact Bluetooth® logger for secure temperature and humidity recording.
THEye Controller	Smartphone application for monitoring THEye products.
THEye Cloud	Swiss service for data storage and access control (security) of THEye products.
THEye Dashboard	User-friendly web application that provides access to THEye Cloud data and features.
THEye Gateway	Automatically collects data from nearby THEye probes and sends it to THEye Cloud.
THEye Display	Compact wall-mounted display for real-time monitoring of temperatures, humidity, and alarms from your THEye probes.

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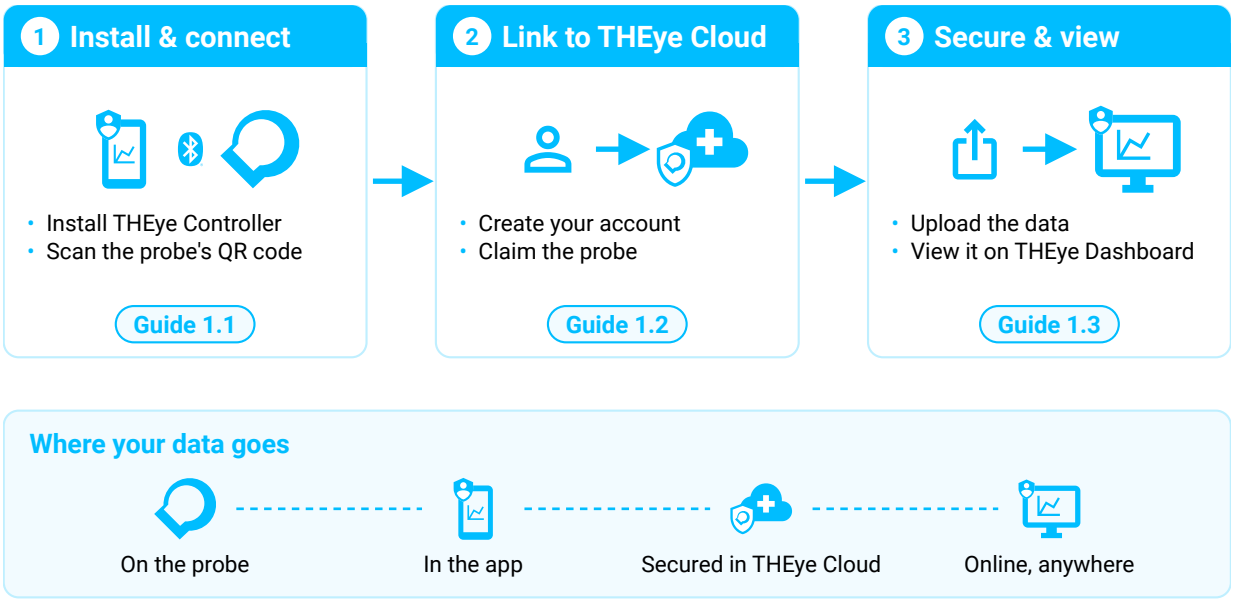
1. Quick start guides

Thank you for choosing a THEye product. For a quick installation, the following quick start guides are available:

- Install THEye Controller and connect to your probe
- Link your probe to a THEye Cloud account
- Secure your data and view it on THEye Dashboard

More advanced operations, such as setting up and starting a new recording or setting the probe's access level, are described later in this manual.

The diagram below gives an overview of the three guides and of the path your data follows, from the probe to THEye Dashboard.

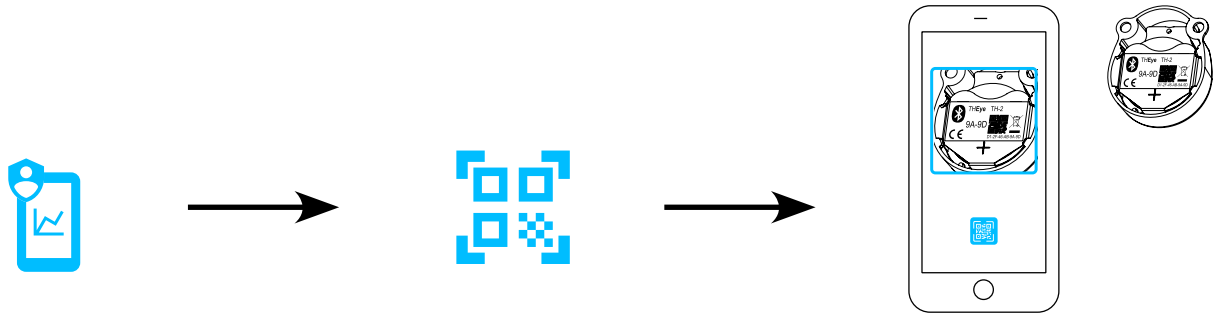


1.1 Install THEye Controller and connect to your probe

1. Install the THEye Controller application

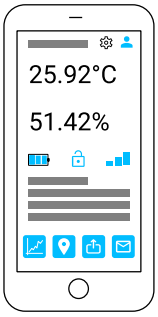


2. Launch the application and connect to your probe by scanning the QR code on its label



To enable the Bluetooth® features, the application asks for permissions when it first starts. All permissions must be accepted for the application to work properly.

3. You now have access to your probe and its many features:

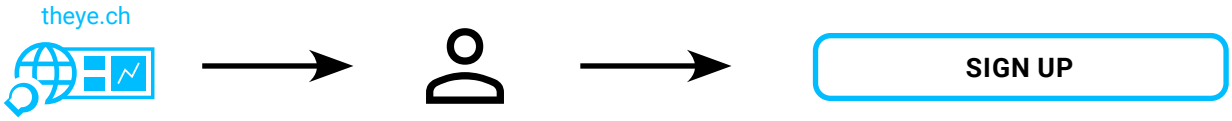


- Access the history of the measurements recorded on the probe.
- Locate your probe by making its LED flash.
- Share the history of measurements.

...and many more.

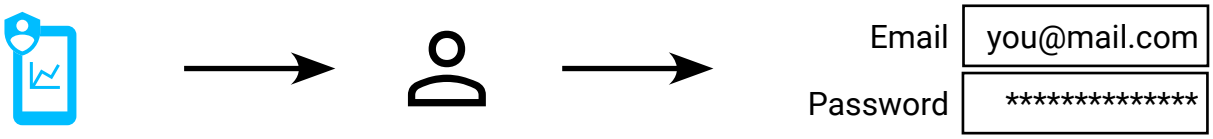
1.2 Link your probe to a THEye Cloud account

1 Create a THEye Cloud account in THEye Dashboard

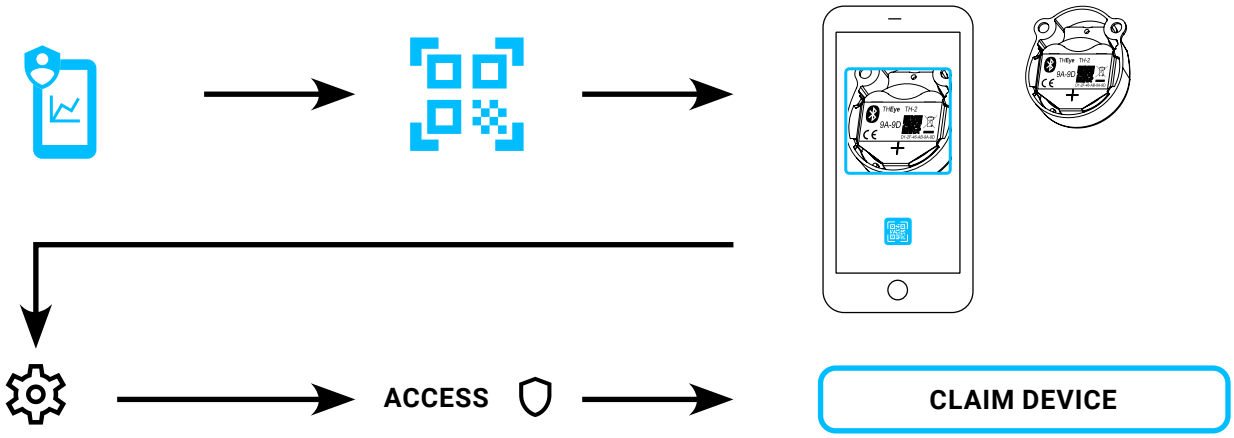


THEye Cloud offers a Free plan with the basic features of the service. For advanced use, paid plans give access to the full potential of the THEye ecosystem (see section 5.3).

2 Log in to the THEye Controller app with your credentials.



3 Connect to your probe from the THEye Controller app and associate it with your THEye Cloud account.

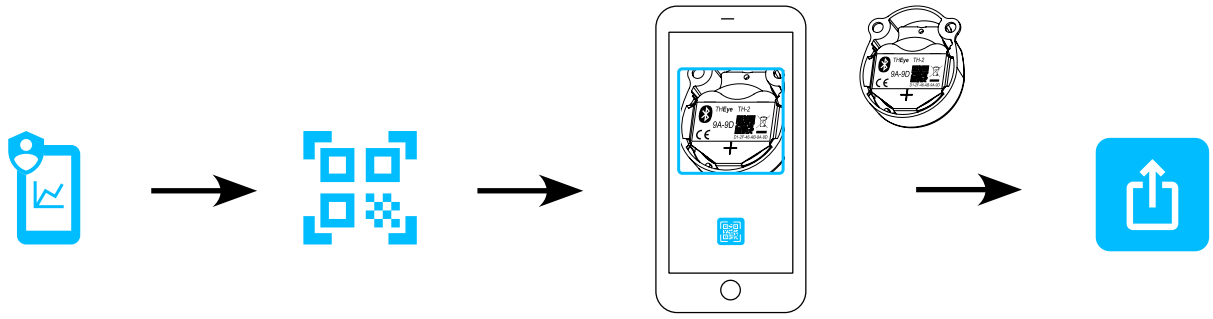


To associate the probe with your THEye Cloud account, it must not be associated with any other account: the OWNERSHIP STATUS field on the Access parameter page must show Free.

For security reasons, the application may ask you to scan the probe label a second time. Make sure you scan the label on the probe itself.

1.3 Secure your data and view it on THEye Dashboard

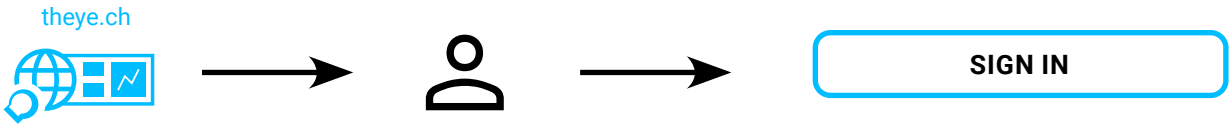
1. If not already done, follow guide 1.2.
2. Connect to your probe and upload the data to THEye Cloud



If the upload button is grayed out, the probe is not associated with any account and THEye Cloud features are not available.

Once the probe is associated with an account, uploading data is ALWAYS possible, regardless of the account used or the probe's access level. However, the data is secured and can only be viewed by the associated account.

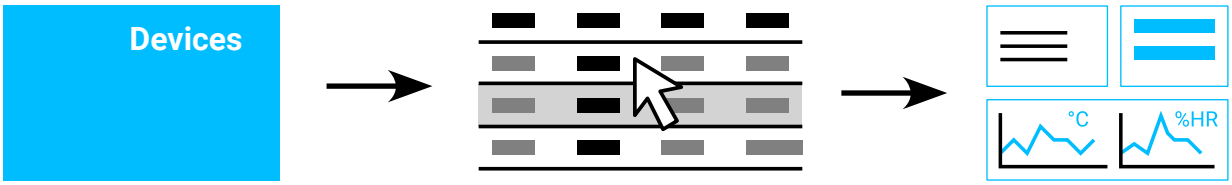
3. Go to THEye Dashboard



THEye Dashboard has several menus:

- Devices : Access the probes associated with your account
- Profile : Access your personal information

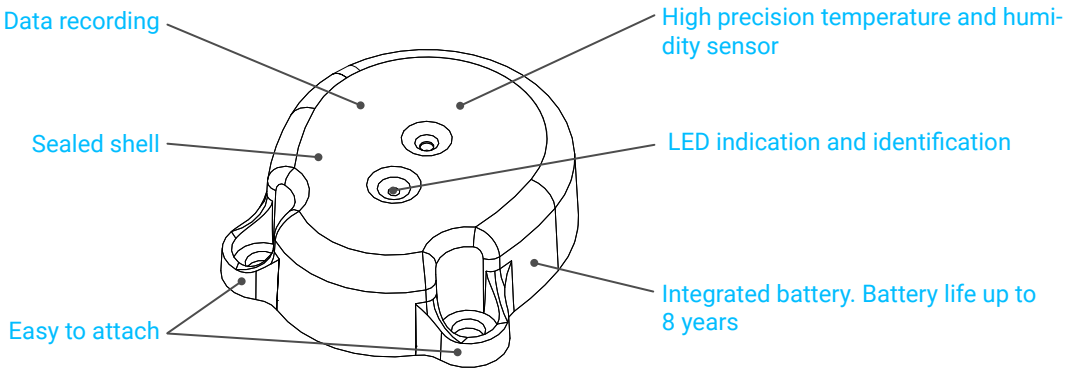
4. Select your probe and view its recordings.



2. Technology

2.1 Overview of the technology

THEye is a compact temperature and humidity probe that securely records data at regular intervals over long periods. Its battery life is up to 8 years. Thanks to Bluetooth® Low Energy, you can view or retrieve the data with a smartphone and the THEye Controller application. The probe can also be linked to THEye Cloud (theye.ch) to secure the recorded data and set its access level.



2.2 Use cases

THEye monitors the environment of any material that may be sensitive to temperature and/or humidity during storage or transport. Data logging shows how the environment has changed, so you can tell whether the material has been exposed to critical conditions.

Typical uses of the probe include:

- Transport and storage of perishable goods (food, wine, tobacco, etc.)
- Transport and storage of sensitive products (medical, biological, etc.)
- Transport and storage of precious objects (furniture, paintings, musical instruments, etc.)
- Wireless measurement in sealed containers (laboratories, R&D, etc.)

2.3 Target audience

THEye is intended for any organization for which ambient temperature and humidity are critical factors in the short, medium or long term, and which needs to monitor them.

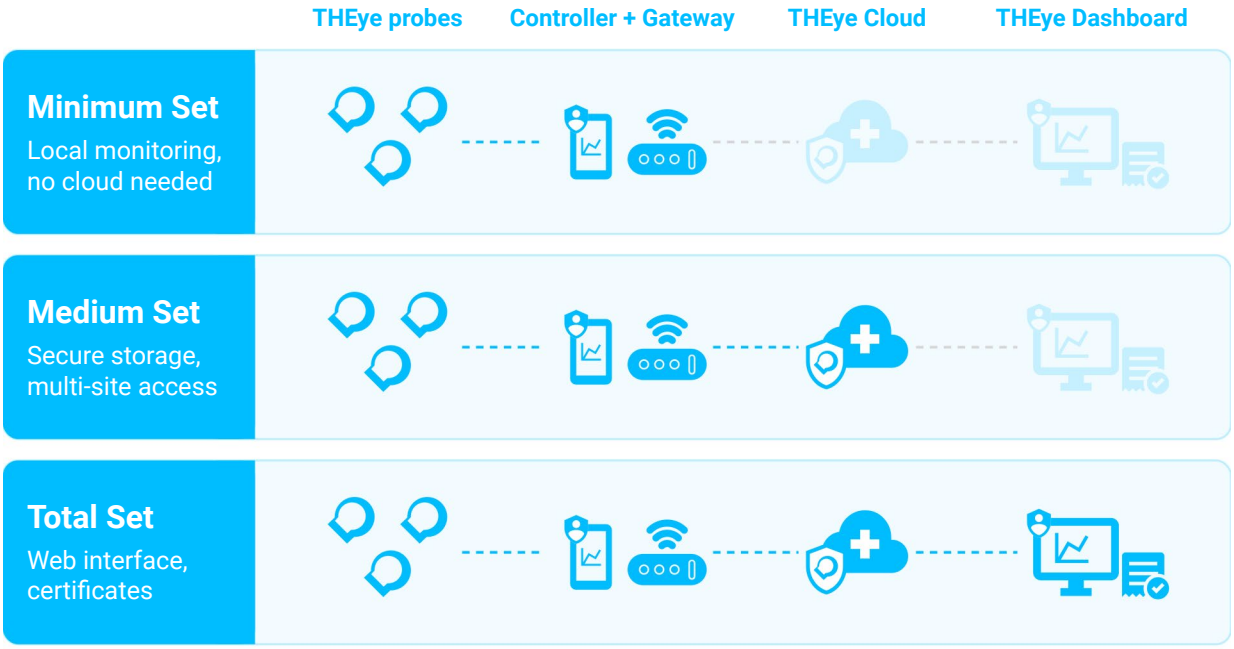
Our customers mainly work in the following sectors:

- Transportation and warehousing
- Insurance
- Medical and biological
- Laboratories
- Research and development
- Metrology

2.4 IoT platform

The THEye TH-2 probe, combined with a comprehensive IoT infrastructure, enables real-time collection, storage and analysis of environmental data, while ensuring secure and intuitive management of this information. Thanks to our modular approach, you can choose from different levels of integration, ranging from simple local monitoring to advanced cloud-based solutions.

The THEye IoT platform offers three levels of integration: the Minimum Set, the Medium Set and the Total Set. Each one adapts to your environmental monitoring and data management requirements, and each set builds on the previous one, as shown below.



Minimum Set

The Minimum Set includes the essentials for monitoring environmental parameters. It suits users looking for a basic solution with simple probe management, for small deployments or environments where no cloud infrastructure is needed.

Medium Set

The Medium Set is ideal for companies that need secure, large-scale data management and access to information from multiple sites.

Total Set

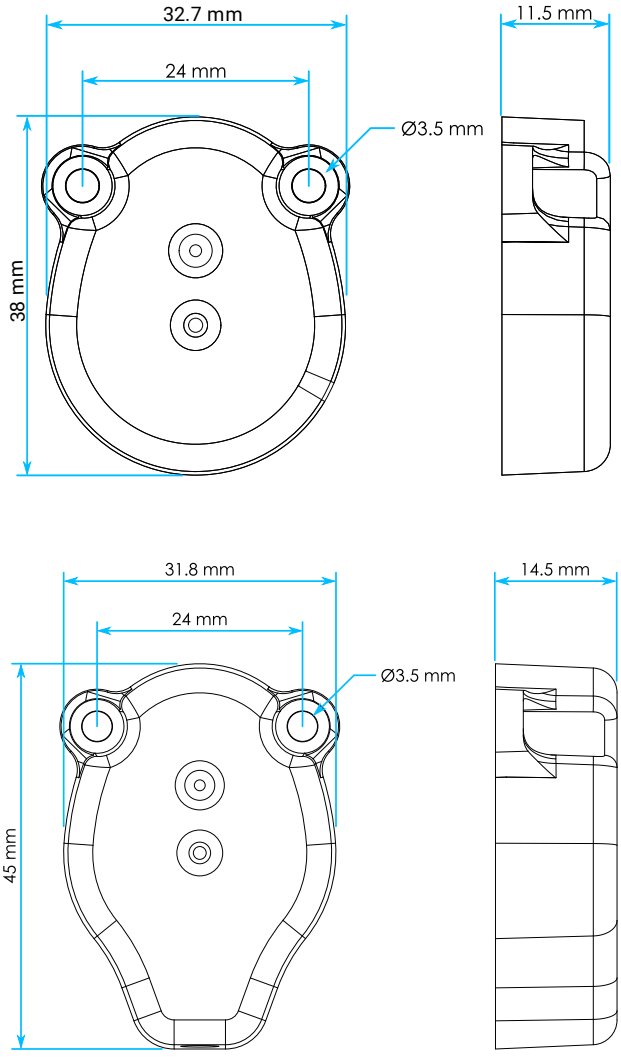
The Total Set is the most comprehensive and integrated option, with all the features for advanced probe and data management. It is a turnkey solution for companies, with an interface and advanced management and certification features.

THEye Display complements this ecosystem: its wall-mounted screen shows environmental data and alarms in real time, and it works independently of the IoT platform and its three levels of integration.

3. Probe range

3.1 Characteristics

3.1.1 Case dimensions



3.1.2 Battery life

The probe has been optimized for low consumption. Its non-removable battery gives it a battery life of up to 8 years, depending on the measurement interval and the conditions of use.

Examples:

- Battery life of 7 years with one measurement every 10 seconds
- Battery life of 8 years with one measurement per minute

These calculations are based on two 1-minute connections per week.

More frequent measurements reduce the battery life.

An active Bluetooth® connection with a smartphone also increases the probe's consumption

and reduces its battery life.

Using the probe outside the indicated temperature range can significantly reduce its battery life.

3.1.3 Memory

The probe uses a specific algorithm to compress the recorded data. The number of measurement points that can be stored in memory depends on the variations in humidity and temperature.

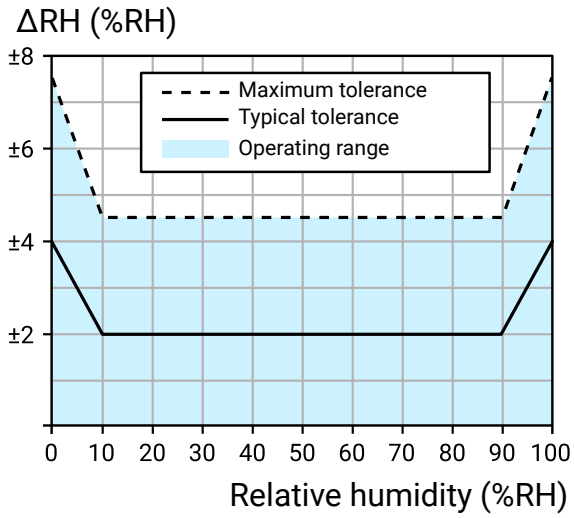
The probe can store a minimum of 172 000 humidity and temperature measurement points, i.e. a history of 120 days at one measurement per minute. For more details on the influence of the interval on the duration of the history, see section 4.4.1.

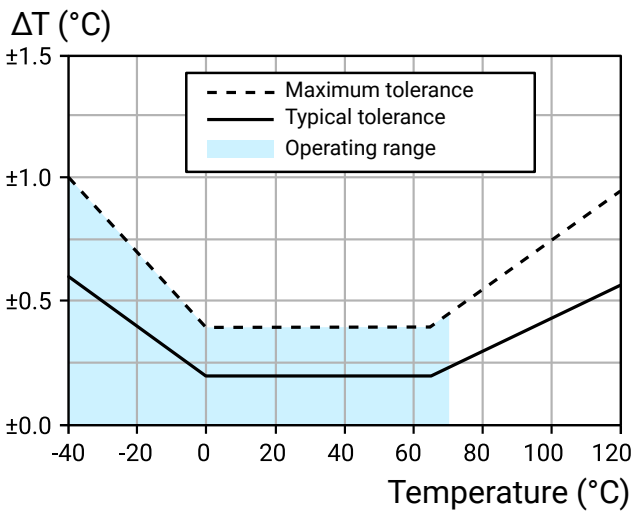
Data compression is optimal if the variation between two measurement points remains between -0.20/+0.15 %RH and -0.35/+0.30 °C. Up to 516 000 measurement points can be recorded if the variations between two points remain within these ranges.

3.1.4 THEye TH-2 – Measurement specifications

Using the probe outside the indicated temperature range may alter its operation, cause irreversible damage and/or significantly reduce its service life.

Humidity			Temperature		
Range :		0%RH : 100%RH	Range :		-40°C : +70°C
Accuracy :	Typical	±2.0%RH (10%RH : 90%RH)	Accuracy :	Typical	±0.2°C (0°C : 65°C)
	Maximum	±4.5%RH (10%RH : 90%RH)		Maximum	±0.4°C (0°C : 65°C)
	Maximum	± 7.5%RH (<10%RH, >90%RH)		Maximum	±1.0°C (<0°C, >65°C)
Resolution :		0.06%RH	Resolution :		0.09°C
Drift :	Typical	<0.25 %RH/year	Drift :	Typical	<0.03 °C/year



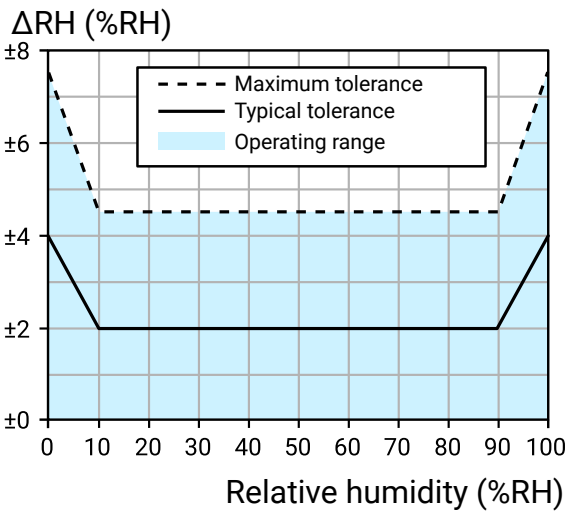


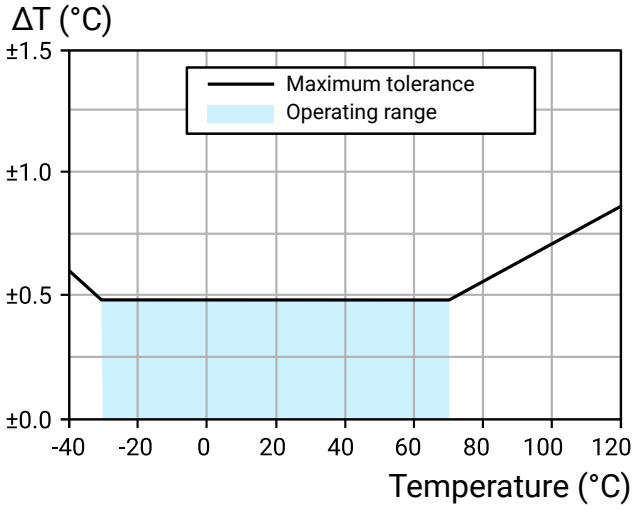
3.1.5 THEye TH-2 – Measurement specifications ISO

Using the probe outside the indicated temperature range may alter its operation, cause irreversible damage and/or significantly reduce its service life.

Humidity			Temperature		
Range :		0%RH : 100%RH	Range :		-30°C : +70°C
Accuracy :	Typical	±2.0%RH (10%RH : 90%RH)	Accuracy :	Maximum	±0.48°C (-30°C : 70°C)
	Maximum	±4.5%RH (10%RH : 90%RH)		Maximum	±0.9°C (<-30°C, >70°C)

	Maximum	± 7.5%RH (<10%RH, >90%RH)			
Resolution :		0.06%RH	Resolution :		0.09°C
Drift :	Typical	<0.25 %RH/year	Drift :	Typical	<0.01 °C/year

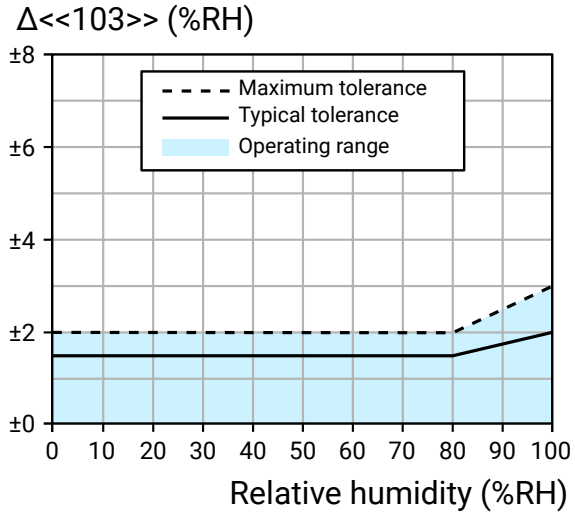


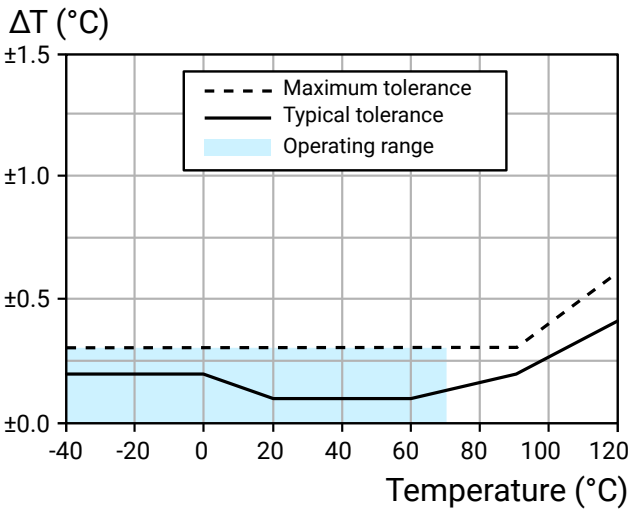


3.1.6 THEye TH-2 – Measurement specifications Performance

Using the probe outside the indicated temperature range may alter its operation, cause irreversible damage and/or significantly reduce its service life.

Humidity			**Temperature**		
Range :		0%RH : 100%RH	Range :		-40°C : +70°C
Accuracy :	Typical	±1.5%RH	Accuracy :	Typical	±0.1°C (20°C : 60°C)
	Maximum	±2%RH (0%RH : 80%RH)		Maximum	±0.3°C (-40°C : 70°C)
	Maximum	±3%RH (>80%)RH			
Resolution :		0.06%RH	Resolution :		0.09°C
Drift :	Typical	<0.25 %RH/year	Drift :	Typical	<0.03 °C/year

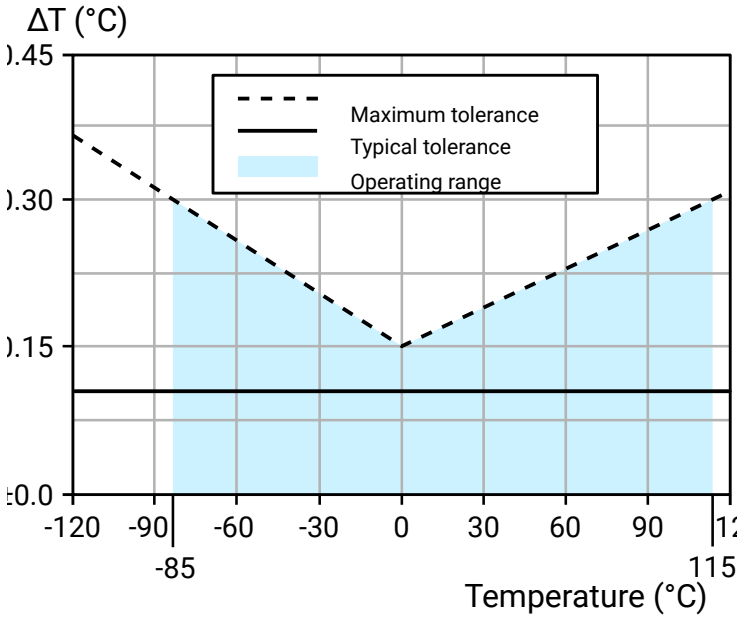




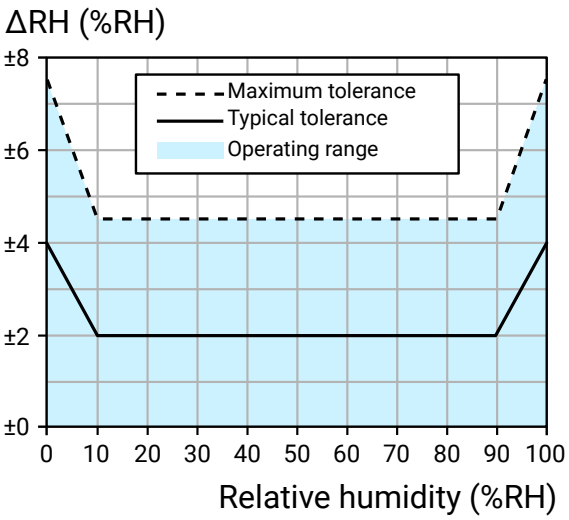
3.1.7 THEye TH-2 T-EXT – Measurement specifications

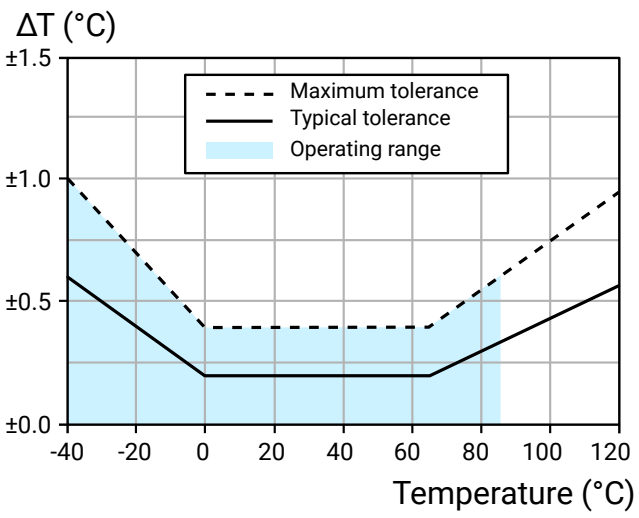
Using the probe outside the indicated temperature range may alter its operation, cause irreversible damage and/or significantly reduce its service life.

External PT1000 probe temperature		
Range :		-85°C : +115°C
Accuracy :	Typical	±0.1°C
	Maximum	±0.15°C (0°C)
	Maximum	±0.3°C
Resolution :		0.01°C
Drift :	Typical	<0.01 °C/year



Probe module humidity			Probe module temperature		
Range :		0%RH : 100%RH	Range :		-40°C : +85°C
Accuracy :	Typical	±2.0%RH	Accuracy :	Typical	±0.2°C
	Maximum	±4.5%RH (10%RH : 90%RH)		Maximum	±0.4°C (0°C : 65°C)
	Maximum	± 7.5%RH (<10%RH, >90%RH)		Maximum	±1.0°C (<0°C, >65°C)
Resolution :		0.06%RH	Resolution :		0.09°C
Drift :	Typical	<0.25 %RH/year	Drift :	Typical	<0.03 °C/year





THEye

3.1.8 Probe comparison table

Feature	TH-2	TH-2 ISO	TH-2 P	TH-2 T-EXT.Lx
Temperature range	-40°C : +70°C	-30°C : +70°C	-40°C : +70°C	External sensor -85°C : +115°C Module -40°C : +85°C
Temperature accuracy	Typ. ±0.2 °C / Max. ±0.4 °C (0-65 °C) / Max. ±1.0 °C (outside range)	Max. ±0.48 °C (-30 to 70 °C) / Max. ±0.9 °C (outside range)	Typ. ±0.1 °C (20-60 °C) / Max. ±0.3 °C (-40 to 70 °C)	External sensor: Typ. ±0.1 °C / Max. ±0.15 °C (0 °C) / Max. ±0.3 °C without calibration – Max. ±0.15 °C (-85 to +115 °C) with calibration certificate
Temperature resolution	0.09°C	0.09°C	0.09°C	0.01°C
Temperature drift	<0.03°C/year	<0.01°C/year	<0.03°C/year	<0.01°C/year
Humidity range	0-100% RH	0-100% RH	0-100% RH	0-100% RH
Humidity accuracy	Typ. ±2.0% / Max. ±4.5% (10-90%) / Max. ±7.5% (outside range)	Typ. ±2.0% / Max. ±4.5% (10-90%) / Max. ±7.5% (outside range)	Typ. ±1.5% / Max. ±2% (0-80%) / Max. ±3% (>80%)	Typ. ±2.0% / Max. ±4.5% (10-90%) / Max. ±7.5% (outside range)
Humidity resolution	0.06%	0.06%	0.06%	0.06%
Humidity drift	<0.25%RH /year	<0.25%RH /year	<0.25%RH /year	<0.25%RH /<<102>>
Recording capacity	Min. 172 000 points / 120-day history	<<2061>>	<<2061>>	Min. 100 000 points / 70-day history
Battery life	7 yrs (1 measurement/10 s) - 8 yrs (1 measurement/min)	<<2068>>	<<2068>>	8 yrs (1 measurement/10 s)
Battery	CR2450	CR2450	CR2450	CR2477
Dimensions	31.8 x 38 x 11.5 mm	31.8 x 38 x 11.5 mm	31.8 x 38 x 11.5 mm	31.8 x 45 x 14.5 mm + cable (1/2/3 m)
Standards	IP68, CE	IP68, CE, ISO/IEC 17025 (temperature)	IP68, CE	IP67, CE
Communication	Bluetooth® 5 LE	Bluetooth® 5 LE	Bluetooth® 5 LE	Bluetooth® 5 LE
Key feature	Standard model	Temperature calibration certified to ISO/IEC 17025 (metrological traceability)	Performance version, enhanced temperature and RH accuracy	Remote PT1000 external sensor, extreme range up to +115 °C, 1/2/3 m cable

3.2 Time management

The THEye ecosystem is global. For this reason, the time scale for measurements is UTC (Coordinated Universal Time) and the time zone used internally is UTC±00:00.

3.2.1 Time zones

Times are converted into the user's time zone by the THEye Controller application, based on the smartphone settings, and by THEye Dashboard, based on the user's settings.

3.2.2 Clock synchronization

The probe's internal clock is synchronized with the THEye Cloud clock through the creation of synchronization points. When a synchronization point is created, the time difference between the two clocks is 5 seconds maximum. In practice, it is about 1 to 2 seconds, depending on the internet connection.

The probe's internal clock drifts over time. The drift depends on the temperature.

Quartz characteristics: ±10 ppm at 25 °C, -0.03 ±0.01 ppm/°C²

The drift is typically:

- 0 seconds (0.9 seconds maximum) per day at 25 °C.
- 1.6 seconds (3 seconds maximum) per day at 0 °C or 50 °C.
- 11 seconds (15.5 seconds maximum) per day at -40 °C or 65 °C.

New synchronization points are created regularly and automatically to compensate for this drift.



For a new synchronization point to be created automatically, a smartphone with an internet connection must regularly connect to the probe through the THEye Controller application.



Recordings viewed in the THEye Controller application are not corrected for time drift. Corrected recordings are available in THEye Cloud and can be viewed in THEye Dashboard.

3.2.3 Time correction

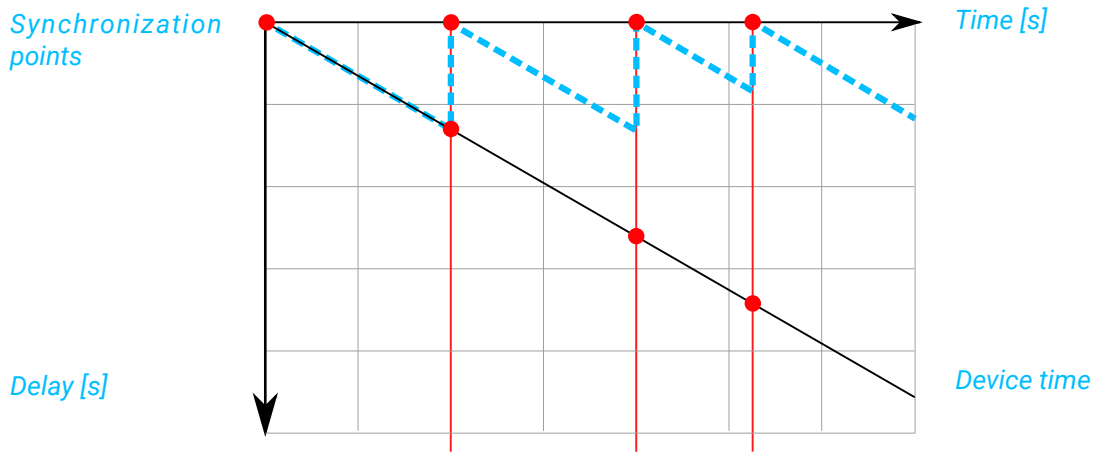
The probe uses an internal clock to measure time. This clock is subject to drift, which can be partially compensated for by synchronization points. For further details, see section 3.2.2.

THEye Dashboard displays data in three modes:

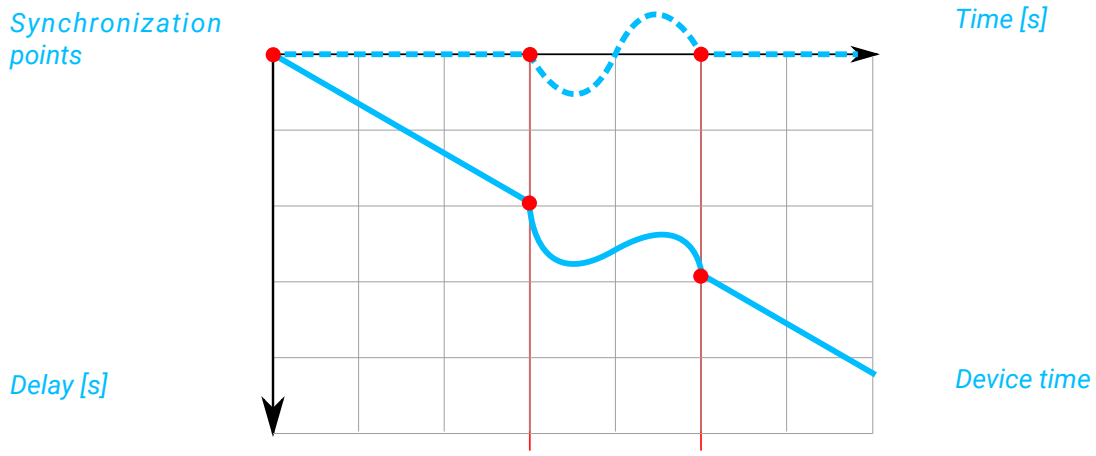
- Without compensation
- With "step" compensation
- With "linear interpolation" compensation

In step compensation, the time drift accumulated by the probe is corrected in a single operation at each new synchronization point, as shown in the following figure.

Step compensation graph:



Linear compensation graph:



3.3 Bluetooth® communication

The probe communicates via Bluetooth® 5.0 Low Energy and is therefore compatible with all smartphones that support this standard, using the THEye Controller application.

The maximum connection range is 10 meters without obstacles.

3.4 Labels

Each probe has three labels. The smallest (24 × 12 mm) is on the probe itself. The medium one (36 × 12 mm) is glued to the side of the packaging box. The large one (31 × 36 mm) is provided for the user's own use.

The labels contain a QR code with the probe serial number. They make it easier to connect the THEye Controller application to the probe (see guide 1.1).

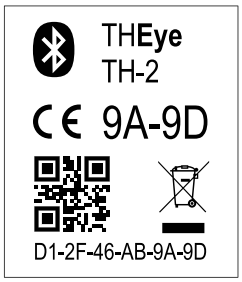
Probe (24x12 mm)



Box (36x12 mm)



Interior (31x36 mm)



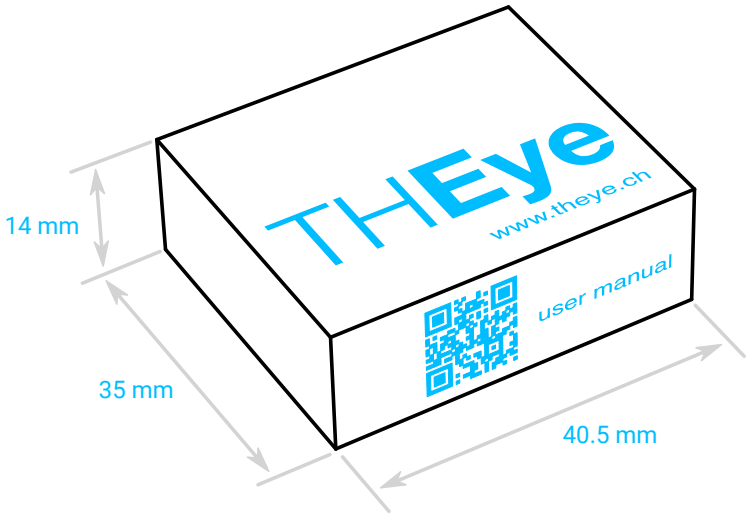
3.5 Packaging

The probe is packed in a cardboard box with external dimensions of 14 × 40.5 × 35 mm, with the THEye logo and a QR code linking to the product documentation website.

The package contains:

- 1x THEye probe
- 1x sticker 31 × 36 mm with the serial number of the probe

On the side of the box, a label shows the serial number of the corresponding probe.



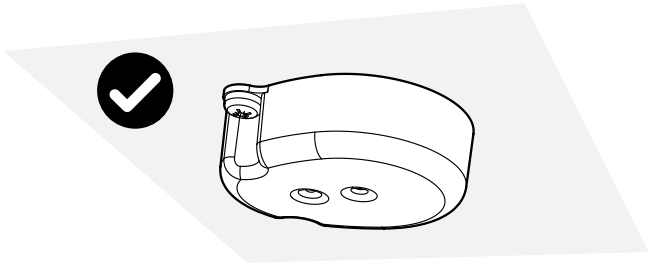
3.6 Installation

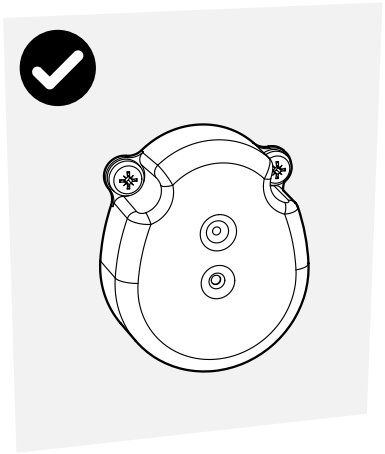
The probe should ideally be installed against a vertical wall or on a ceiling. It can be fixed with one or two screws (not included).

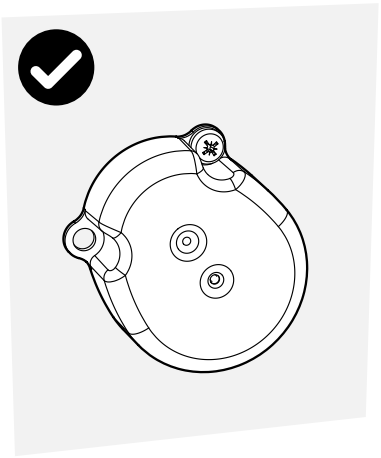
If the probe is laid flat, dust can settle on the sensor over time and distort the measurements.

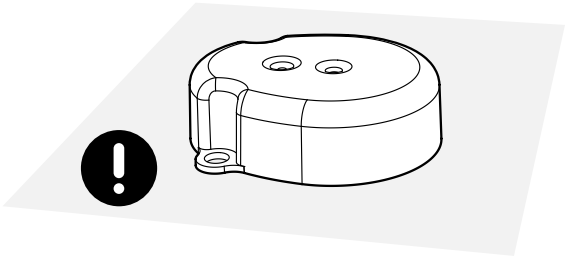
In any case, make sure that the opening at the temperature and humidity sensor is not covered.

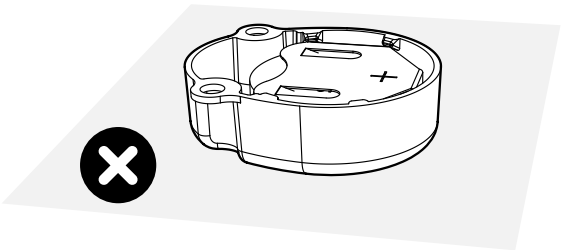
Measurements will be inaccurate if the probe is placed upside down or if the opening at the temperature and humidity sensor is obstructed.











3.6.1 Where should THEye probes be installed?

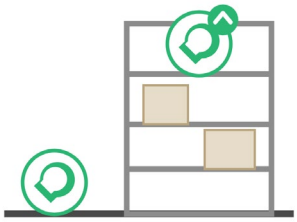
Start with rule 1, then add the next rules depending on how closely you want to monitor the room.

1 **In the center**
Place 1 probe in the middle of the room, for example under a table.



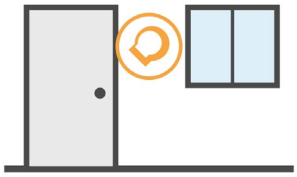
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2 **Low and high**
Add probes on the floor and raised on shelves, spread across the room up to the corners. Cold air stays low, warm air rises.



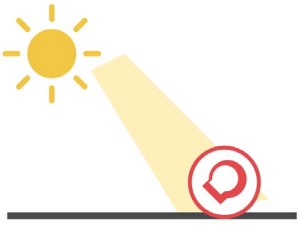
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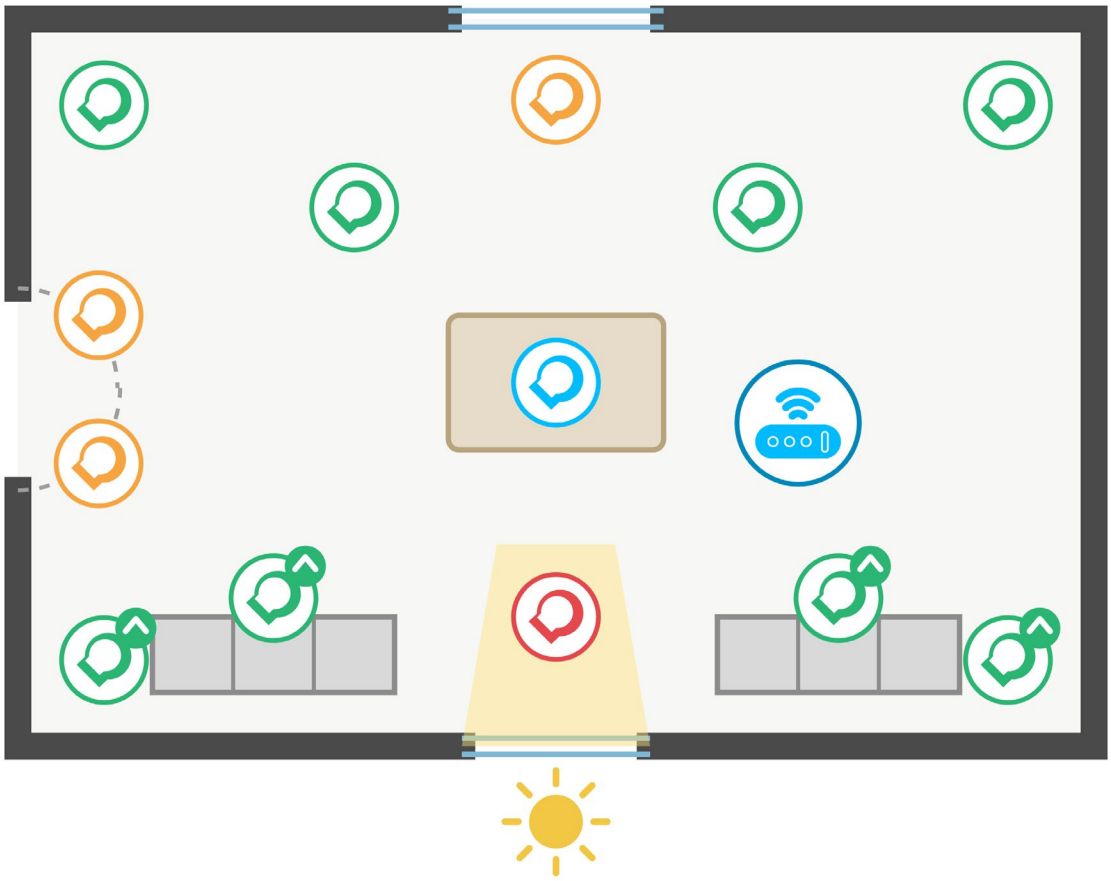
3 **Near openings**
Place 1 probe next to each door, window or vent.



---

4 **In direct sunlight**
Place 1 probe where the sun shines in, at about 3 p.m.



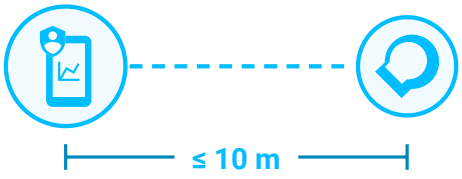


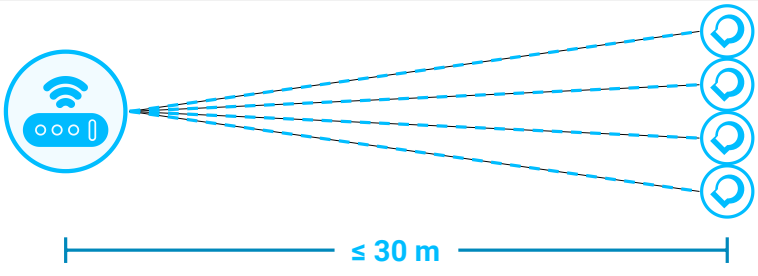
Example of a storage room: the colors match the rules above. With this many probes, a THEye Gateway collects all the measurements automatically.

Smartphone or Gateway?

With THEye Controller, you read one probe at a time, within 10 m. This is enough for a few probes.

With a THEye Gateway, all the probes within 30 m are collected automatically, without anyone on site (see section 7.3).





3.6.2 Usage instructions and limitations

Humidity and temperature sensors are highly accurate environmental sensors that require special care to ensure optimal performance. They are sensitive to pollutants and must be protected from exposure to volatile chemicals, acids, bases and cleaning agents. In particular, ketenes, acetone, ethanol, isopropyl alcohol, toluene, etc. may cause drift, in some cases irreversible. To ensure that the sensors keep their performance, follow these guidelines:

- Avoid exposing the sensor to pollutants, especially volatile chemicals such as solvents or organic compounds. High concentrations and long exposures should be avoided, as they can cause drift in the humidity reading or even irreversibly damage the sensor.
- Note that epoxies, glues, adhesives and plastics often contain chemicals that may outgas during baking and curing and affect the sensor.
- Avoid contact with cleaning agents, such as PCB board wash after soldering, or strong air blasts from an air gun, as they can cause drift in the reading or complete breakdown of the sensor.
- Ensure good ventilation to avoid high concentrations of volatile chemicals, such as solvents, cleaning solutions and detergents (e.g. ethanol, isopropanol, methanol or acetone).

When packaging probes, make sure that the materials used cannot pollute the sensor. To maintain the accuracy and service life of your probes, only use packaging materials that do not outgas.

Metal-in antistatic shielded ESD bags, paper or cardboard-based packaging, and deep-drawn plastic trays such as PE, PET, and PP may be considered. Do not use antistatic polyethylene bags, bubble foils, and foams, as they may contaminate the sensor. Additionally, be cautious when using stickers inside the packaging, as they can also cause contamination if not used properly. Sticker size should be kept to a minimum, and the sticky side should fully adhere to a surface.

Note that many packaging materials may contain additives (plasticizers) that can pollute the sensor. As a general rule, if a material emits a strong odor, it should not be used. Even recommended materials may contain additives, so keep this in mind when selecting packaging materials.

4. THEye Controller

4.1 Downloading and installation

The THEye Controller application can be downloaded from Google Play (Android) and the App Store (iOS):

GET IT ON Google Play

https://play.google.com/store/apps/details?id=ch.fiveco.bttemphum

Download on the App Store

https://apps.apple.com/us/app/theye-controller/id1540575481?itsct=apps_box_badge&itscg=30200

To enable the Bluetooth® features, the application asks for permissions when it first starts. All permissions must be accepted for the application to work properly.

4.2 Symbols

Symbols	Name	Description / Function
	Application info	Opens a window with the application information (version, copyright, privacy policy).
	Access to local logs	Opens the logs previously retrieved from probes and stored locally on the smartphone.
	Not authenticated	Starts the user authentication procedure.
	Authenticated	Opens the profile information.
	User	Represents the user of the associated account.
	Logout	Logs out of the user account.
NAME	Sorting by name	Sorts the list by the local name of the probe.
RSSI	Sorting by RSSI	Sorts the list by RSSI (Received Signal Strength Indicator), i.e. the strength of the Bluetooth® signal received by the application.
T°C	Sorting by temperature	Sorts the list by temperature, in degrees Celsius.
T°F	Sorting by temperature	Sorts the list by temperature, in degrees Fahrenheit.
%RH	Sorting by relative humidity percentage	Sorts the list by relative humidity, in percent.
	RSSI: Weak Signal	Weak Bluetooth® signal (< -80 dBm).
	RSSI: Medium Signal	Medium Bluetooth® signal (< -60 dBm).
	RSSI: Strong Signal	Strong Bluetooth® signal (>= -60 dBm).

Symbols	Name	Description / Function
	Bluetooth® Scan	Scans for nearby THEye devices for 30 seconds.
	Connection by QR code	Starts the connection procedure by scanning the QR code.
	The probe is free	The probe is not associated with a THEye Cloud account.
	The probe is not free	The probe is associated with a THEye Cloud account.
	Battery	Probe battery level.
	Logs	Opens the logs in the probe's memory.
	Location	Locates the probe by making its red LED flash 3 times.
	Sharing	Shares the data in the probe's memory by email.
	Uploading	Securely uploads the data in the probe's memory to THEye Cloud.
	Parameters	Opens the probe parameters.
	Measurement parameters	Opens the probe measurement parameters.
	Alarm parameters	Opens the probe alarm parameters.
	Information parameters	Opens the probe information parameters.
	Access parameters	Opens the probe access parameters.

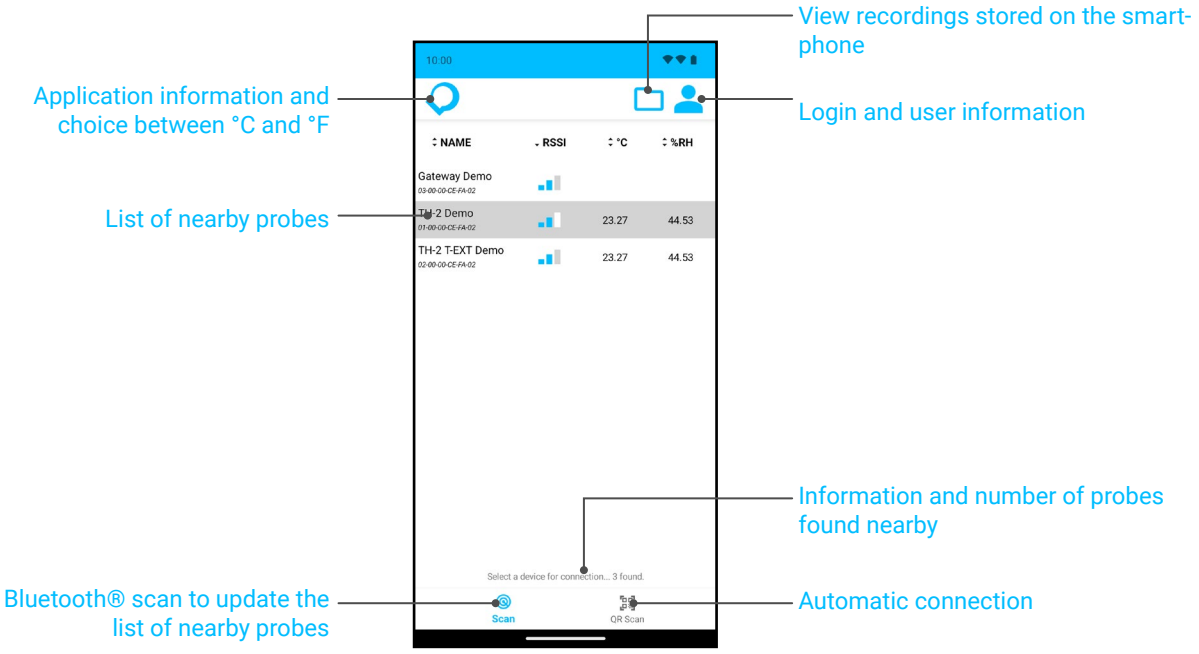
4.3 Application pages

The THEye Controller application is divided into three groups of pages:

- The Home page lets you search for nearby probes and connect to one of them.
- The Device page shows the status of the probe and its current values, and gives access to the history.
- The Parameters pages let you configure the probe: recording parameters (measurement interval), access, etc.

4.3.1 Home page

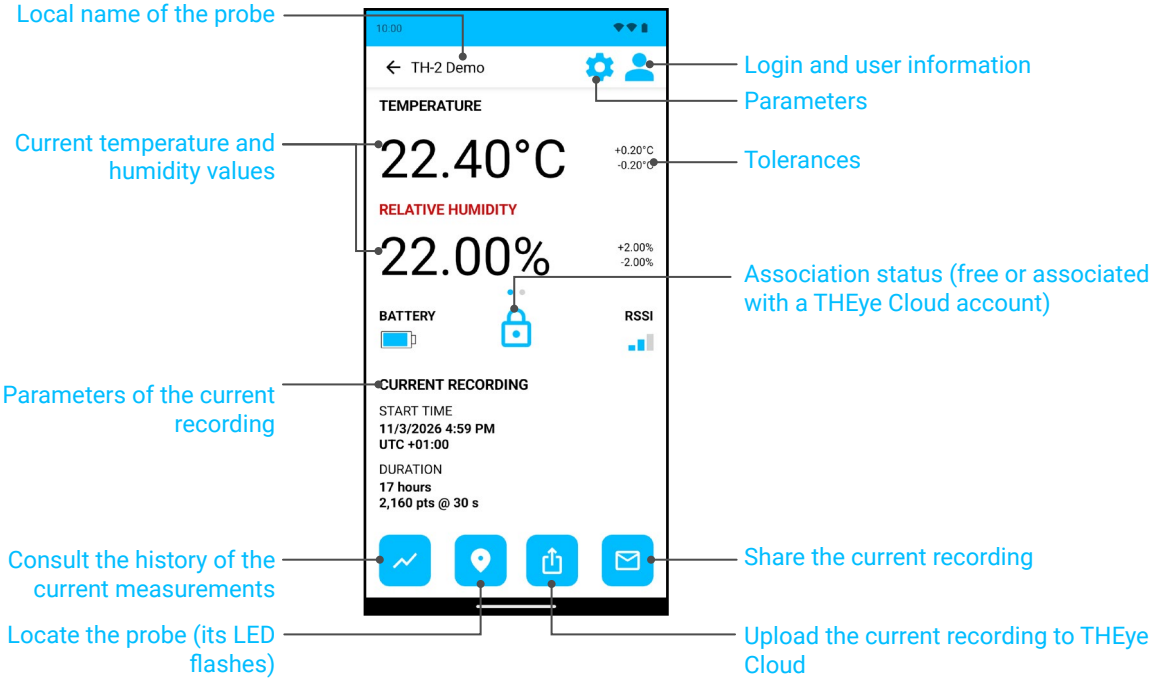
The Home page lets you search for nearby probes and connect to one of them.



Depending on the probe's access configuration (see section 5.2), the temperature and humidity may not appear in the Bluetooth® scan results.

4.3.2 Device page

The Device page shows the current values at a glance and the status of the current recording.



The THEye Controller application can only connect to one probe at a time.

The measurement tolerances shown are the typical tolerances. They depend on the absolute value of the measurement and on time (see sections 3.1.4 to 3.1.7).

The association status indicates whether the probe is free or associated with a THEye Cloud account. See guide 1.2 to associate the probe with a THEye Cloud account.

iOS caches the first name seen for a probe, and there is currently no way to force an update.

Depending on the probe's access configuration (see section 5.2), some values and functions may not be available.

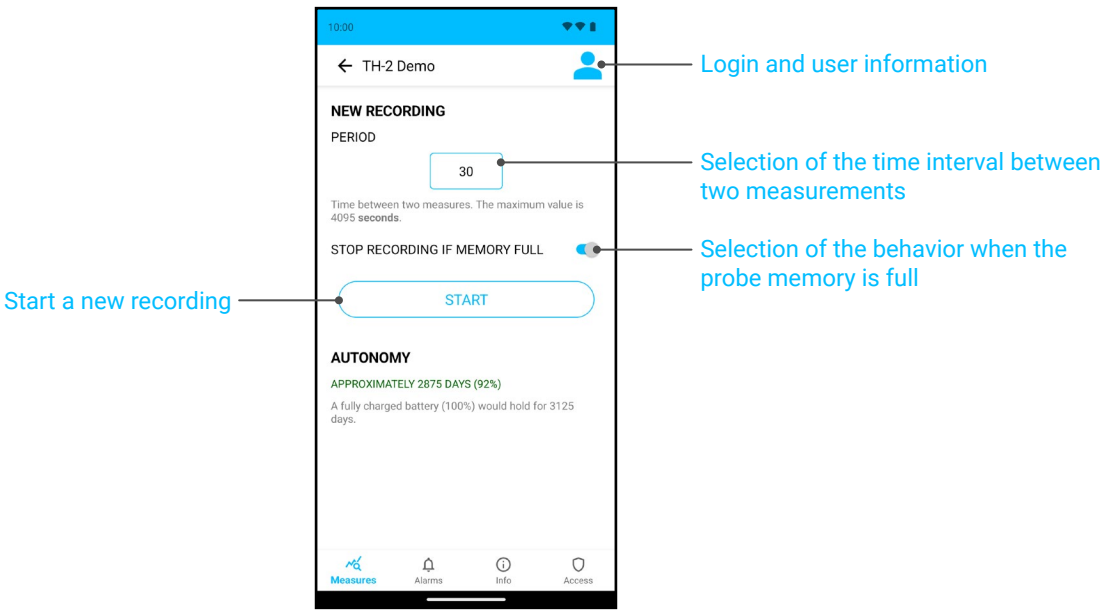
The share button downloads the data from the probe's memory and sends it by email in .csv format.

4.3.3 Parameters pages

Measurement parameters

The "Measurements" parameter page lets you start a new recording sequence.

When a new recording sequence starts, all the measurements stored on the probe are no longer accessible. To access this data later, be sure to collect the current recording, share it by email or upload it to THEye Cloud.



On delivery, the probes may already contain measurement points. To start a new campaign with new points only, change the measurement settings and start a new recording.

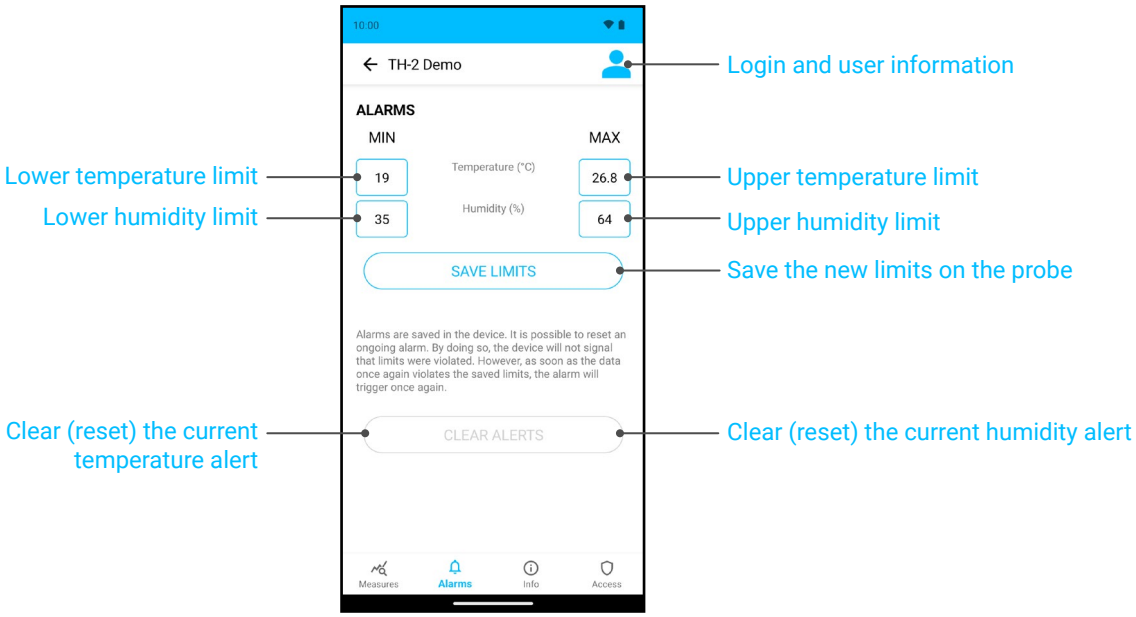
The measurement interval influences the battery life of the probe and the time until its internal memory is full. See section 4.4.1.

The "Stop recording if memory full" parameter defines the behavior of the probe when the recording fills its entire memory. See section 4.4.1.

Alarm parameters

The "Alarm" parameter page lets you define or redefine upper and lower limits for temperature and humidity. When a limit is exceeded, the probe switches to "alert" mode, which is indicated as follows:

- The probe LED flashes twice every 5 seconds.
- The probe and its temperature and humidity values are shown in red in the list of nearby devices on the Home page.
- The words Temperature and Relative Humidity flash red on the Device page.

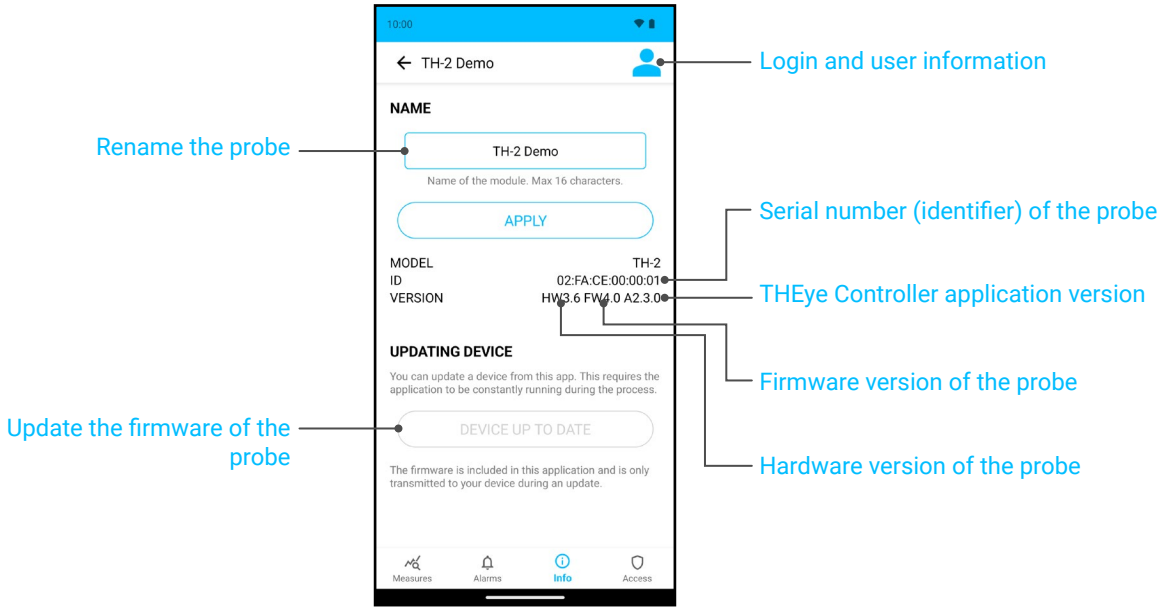


Depending on the probe's access configuration (see section 5.2), the temperature and humidity may not appear in the Bluetooth® scan results.

Setting the limits to their maximum values (-46 °C, +128 °C, 0 %RH, 100 %RH) disables the alarm system.

Information parameters

The "Information" parameter page gathers the information used to identify and update the probe.



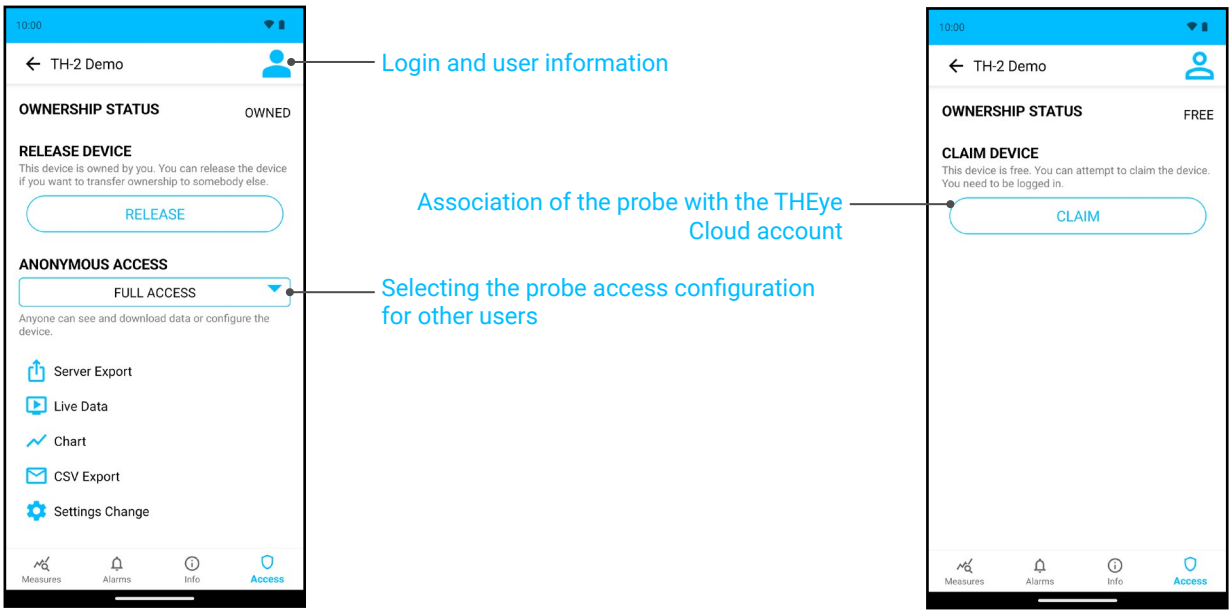
The probe name can contain up to 16 characters. If the name ends with pairs of hash signs (##), they are automatically replaced by the last characters of the serial number. For example, "THEye####" becomes "THEyeF8BC" and "House ##" becomes "House BC".

If a new firmware version is available, it can be installed on the probe with the "Update" button. Data from the current recording may be lost: if needed, first collect the current recording, share it by email or upload it to THEye Cloud.

Depending on the probe's access configuration (see section 5.2), the temperature and humidity may not appear in the Bluetooth® scan results.

Access parameters

The "Access" parameter page lets you associate the probe with a THEye Cloud account. For a probe associated with a THEye Cloud account, it also lets you customize the probe's access for other users according to several configurations.



The probe access configurations are described in section 5.2.

To dissociate a probe from a THEye Cloud account, go to THEye Dashboard and use the "Release" function (see section 6.1.1).

4.4 Features

4.4.1 Start a new recording

When a new recording sequence starts, all the measurements stored on the probe are no longer accessible. To access this data later, be sure to collect the current recording, share it by email or upload it to THEye Cloud.

When you start a new recording, you can set the measurement interval and the behavior when the memory is full.

Measurement interval

It defines the time between two measurements. Although a short interval gives a detailed history, it has some disadvantages:

	Short interval	Long interval
Time resolution	+	-
Battery life	-	+
History duration without data collection	-	+
Data download and transfer time	-	+

As the probe is in standby between measurements, a short interval greatly reduces the total standby time and therefore increases the probe's average consumption.

As the probe's memory is limited (172 000 points), it fills up more quickly with a short interval. The history available without collecting the data with THEye Controller is therefore shorter.

Displaying the history of a period with a short interval greatly increases the amount of data to process, and therefore the download time, the storage space needed on the smartphone, etc.

Examples:

Interval	1s	10s	1min	10min (default)
Battery life	3.5 years	7 years	8 years	8 years
History duration without data collection	1 day and 23 hours	19 days and 21 hours	119 days	3 years and 99 days
Number of points after 1 year	31.5 millions	3.15 millions	525’600	52’560

Stop recording if memory full

This parameter defines the behavior of the probe when the recording fills the whole memory.

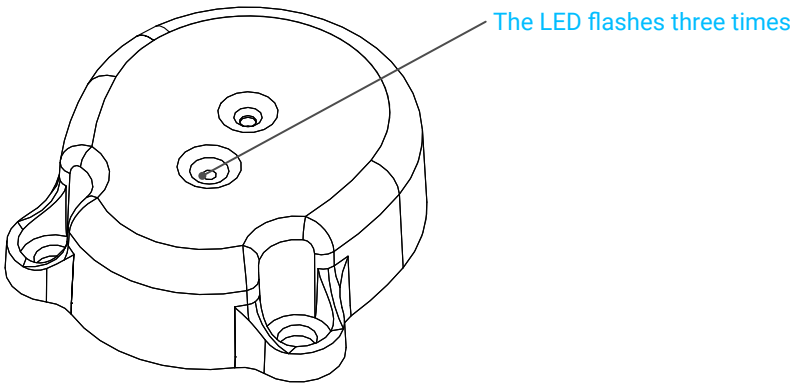
By default, when the memory is full, the oldest measurements are overwritten by the most recent ones. The measurement history therefore "slides" over time, and data older than the memory capacity cannot be collected.

When the "Stop recording if memory full" option is activated, the probe stops recording measurements when the memory is full. This preserves the measurements from the beginning of the recording and prevents them from being overwritten by mistake.

By regularly collecting the data with THEye Controller and uploading it to THEye Cloud, you keep the entire measurement history, regardless of the selected measurement interval.

Locating the probe

When you press the location button, the connected probe identifies itself by flashing its LED three times. The LED is located on the top of the probe, under the white translucent shell.



Dew point calculation

The THEye Controller application calculates the dew point from the current temperature and humidity values, using the following equation (Magnus-Tetens approximation):

$$T_{dp} = \frac{c \cdot \ln(\frac{HR}{100}) + \frac{b \cdot T}{c+T}}{b - \ln(\frac{HR}{100}) - \frac{b \cdot T}{c+T}}$$

Where

T_{dp} Dew point [°C]

T Temperature [°C]

HR Relative humidity [%]

b 17.62

c 243.12 [°C]

4.4.2 Sharing the recording by email

The data collected by the probe can be retrieved and sent by email for further processing.

Structure

When the recording is shared by email, a .csv file is sent. The separator is the semicolon (;) and the file is composed of three data blocks:

Line 1: Recording info header Line 2: Recording information
Line 3: Header of limits Line 4: Limits
Line 5: Values header Line 6 and following: Values

Example of the structure of the .csv file

Recording information

	1	2	3	4
1	Device Name	Timezone	First Timestamp	Last Timestamp
2	THEyeF8BC	UTC+01:00	26.10.2022 10:10:00	28.10.2022 10:20:50

Limits

	1	2	3	4
3	Lower Temperature Limit (°C)	Upper Temperature Limit (°C)	Lower Humidity Limit (%RH)	Upper Humidity Limit (%RH)
4	12	19	20	30

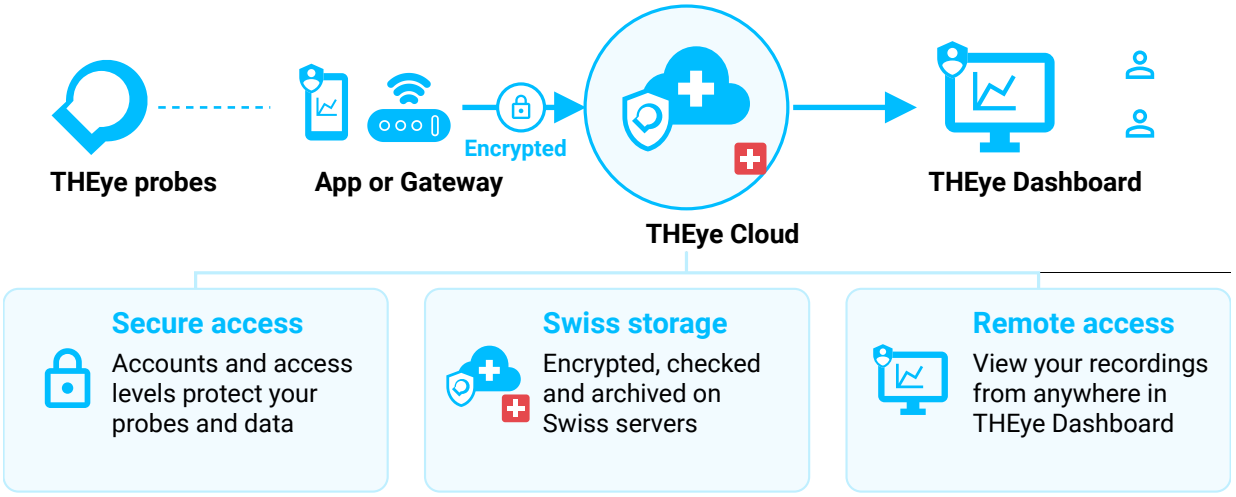
Values

	1	2	3	4	5	6	7
5	ID	Imprecise Time	Temperature Alert	Humidity Alert	Timestamp	Temperature (°C)	Humidity (%)
6	0	False	True	False	26.10.2022 10:10:00	27.55	25
7	1	False	True	False	26.10.2022 10:10:10	27.0	25
...	...	...	...	...	...	...	...

5. THEye Cloud

THEye Cloud is an online service that offers the following features:

- Secure access to the probes with user accounts (locking of recording parameters, visibility of measurements, etc.)
- Secure and archive THEye data on Swiss servers.
- View the recordings remotely in THEye Dashboard.



5.1 Encryption, data integrity

All communications with THEye Cloud are encrypted with standard web security protocols (TLS/SSL).

To ensure the protection (theft) and integrity (corruption) of the recordings, a secret key is shared between the probe and THEye Cloud.

The record transfers between the probe and THEye Cloud are encrypted with the secret key according to the AES standard and are therefore unreadable by THEye Controller or by any malicious application.

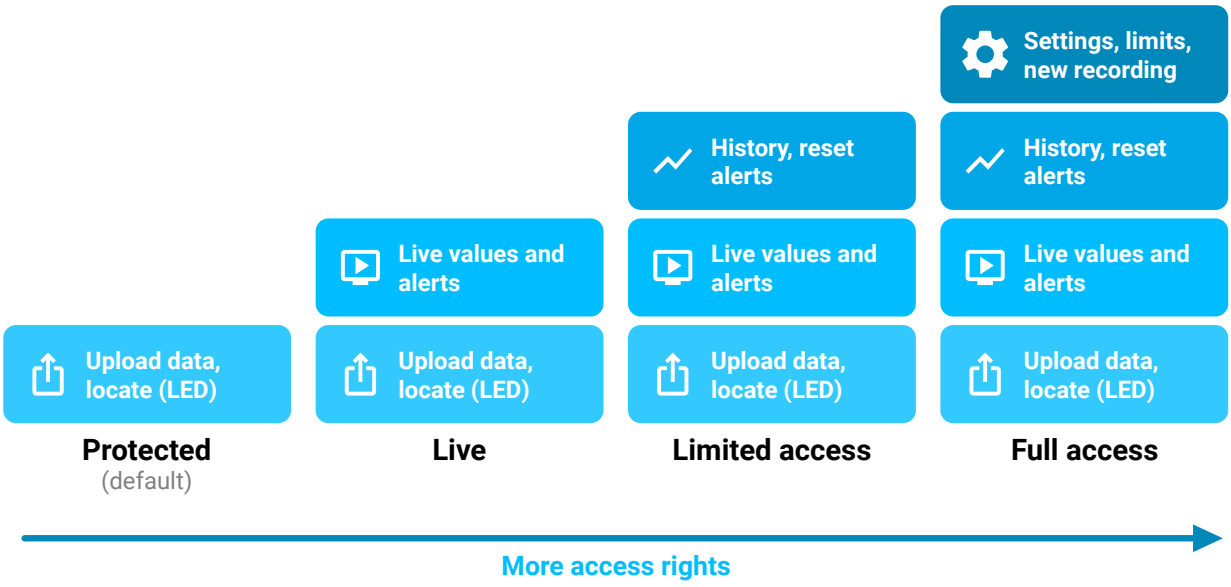
In addition, a digital fingerprint (hash) of the records is transmitted to verify the integrity of the transferred data.

5.2 Access levels

When a probe is associated with a THEye Cloud account, its access for other users can be customized (see section 4.3.3) according to the following four configurations:

- **Full access** : Access to all probe values and parameters.
- **Limited access** : Access to all probe values and to the parameters that cannot compromise the current recording.
- **Live** : Access to all current (live) values of the probe. Does not give access to the history and cannot compromise the current recording.
- **Protected (Default)** : No access to the values and parameters of the probe. However, the user can upload the encrypted recording to THEye Cloud. This configuration allows an anonymous user to collect the recordings for the account associated with the probe without having access to the data.

Each level includes all the rights of the level before it, as shown below. The detailed breakdown is given in the table that follows.



	Configuration	Full access	Limited access	Live	Protected (Default)
BLE Advertisement	Temperature visible when scanning for probes.	✓	✓	✓	X
	Humidity visible when scanning for probes.	✓	✓	✓	X
	Battery status visible when scanning for probes.	✓	✓	✓	X
	Limit violation alerts visible when scanning for probes.	✓	✓	✓	X
Connection to the probe	Sending the encrypted recording to THEye Cloud.	✓	✓	✓	✓
	Locating the probe (flashing LED).	✓	✓	✓	✓
	Current temperature visible when connected to the probe.	✓	✓	✓	X
	Current humidity visible when connected to the probe.	✓	✓	✓	X
	Current battery status visible when connected to the probe.	✓	✓	✓	X
	Alerts visible when connected to the probe.	✓	✓	✓	X
	The humidity limit violation alert can be reset.	✓	✓	X	X
	The temperature limit violation alert can be reset.	✓	✓	X	X
	Viewing the recording in the THEye Controller application.	✓	✓	X	X
	Updating the probe firmware.	✓	X	X	X
	Setting the temperature limits.	✓	X	X	X
	Setting the humidity limits.	✓	X	X	X
	Changing the local name of the probe.	✓	X	X	X
	Configuration and start of a new recording.	✓	X	X	X

5.3 Subscriptions and prices

The THEye Cloud service requires a THEye Cloud account. Several plans are available, including the Free plan, which gives access to the basic features of the service.

Subscription type	FREE	BASIC	PRO	FULL
Number of organizations	0	1	5	Unlimited
Number of user accounts	1	Up to 50	Up to 500	Unlimited
Number of THEye devices managed	5	Unlimited	Unlimited	Unlimited
Dashboard access: charts, calculations (min, max, average, MKT)	✓	✓	✓	✓
Export to *.csv spreadsheet	✓	✓	✓	✓
Generate a PDF certificate	✓	✓	✓	✓
Concatenate data from multiple probes into a single *.csv file	-			
Email alerts and/or notifications via the mobile app	-	✓	✓	✓
Weekly report via email (PDF attachment)	-		✓	✓
Generate a signed PDF certificate	-	-	10/month	On demand
Price	Free	CHF 4.20/ month/THEye device	CHF 5.20/month/ THEye device	On demand
Free trial	-	1 month	1 month	-

Price indicated without tax

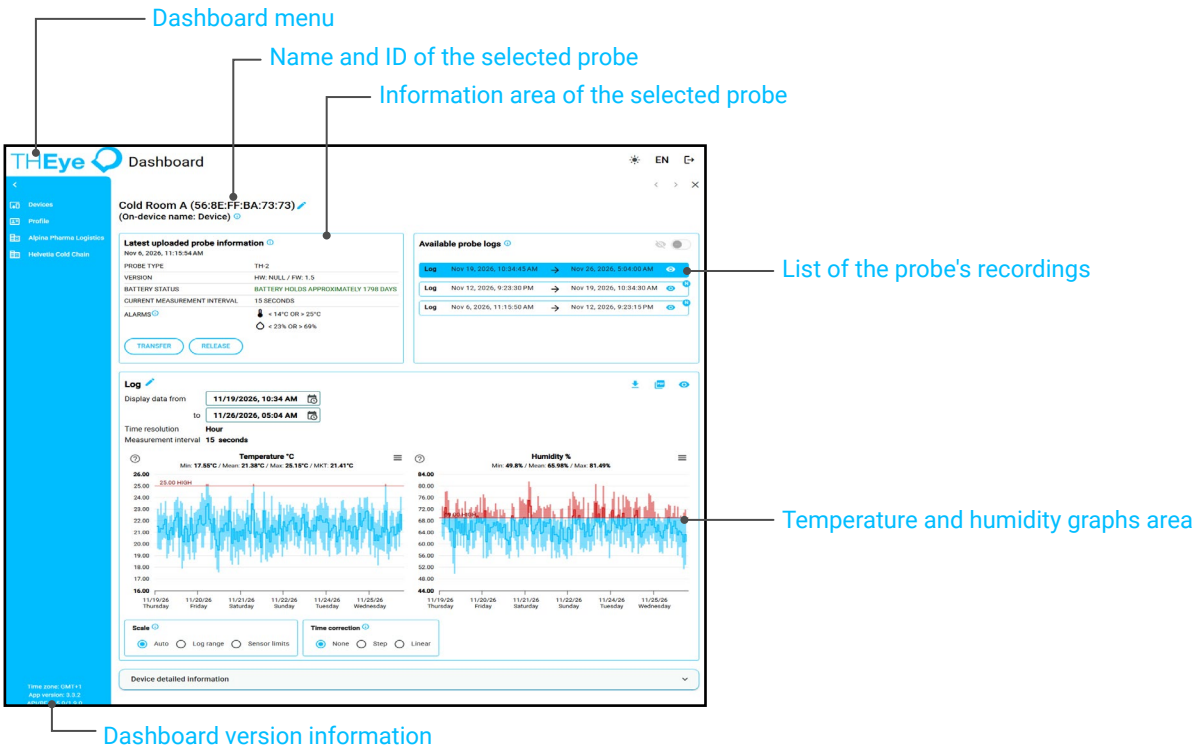
6. THEye Dashboard

The THEye Cloud service is accessible through a web interface, THEye Dashboard. To access it, follow guide 1.3.

6.1 Record review page

The record review page is composed of three areas:

- Probe information area.
- Recording list area.
- Charts area.



6.1.1 Information area of the selected probe

This area gathers the information specific to the selected probe. It also lets you perform the following two actions:

Rename

Changes the name of the probe used in THEye Dashboard.

The name used in THEye Dashboard is an alias that makes it easier to organize the probes in the Dashboard. This alias is independent of the name stored on the probe with the THEye Controller application (see section 4.3.3).

Release

Dissociates the probe from the associated THEye Cloud account. The probe is no longer protected and becomes available to any user again. To associate the probe with a new account, follow guide 1.2 again.

After a release, the probe is no longer protected: any user within Bluetooth® range can read the current recording with the THEye Controller application, even without an internet connection.

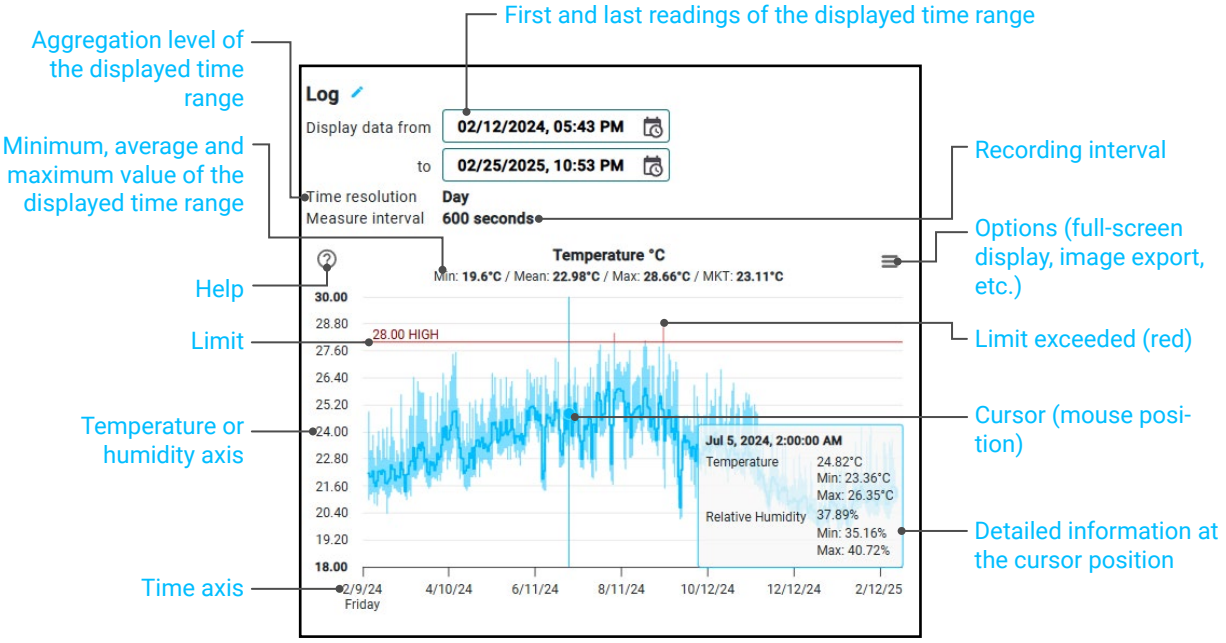
In THEye Dashboard, each owner only sees the recording periods during which the probe was associated with their own THEye Cloud account.

Before releasing a probe, let the THEye Controller application upload the data to THEye Cloud, then start a new recording.

6.1.2 Recording list area

This area shows the available recordings and lets you select the one displayed in the charts area.

6.1.3 Charts area



Adjustment of the time scale

To adjust the time scale, simply make a rectangular selection on the area of interest with the mouse (or zoom with two fingers in the case of a smartphone or tablet).

Adjusting the vertical scale

To adjust the vertical scale, three modes are available:

- Auto: The vertical scale adapts to the data displayed
- Log range: The vertical scale adapts to the data of the entire log
- Sensor limit: The vertical scale adapts to the range of use of the probe.

Time resolution (or aggregation level)

Time series (such as temperature or humidity recordings) usually generate a large amount of data. For example, one measurement every 10 seconds produces 3.15 million points in a year. To display the data quickly, THEye Cloud builds aggregates for each of the following levels:

- Second
- Minute
- Hour
- Day
- Month
- Year

Thus, a year recorded with one measurement every 10 seconds is represented by 525 600 points in the minute aggregate, 8 760 points in the hour aggregate and only 365 points in the day aggregate.

The most suitable aggregation level is selected automatically according to the displayed time range. The selected level is shown in the "Time resolution" field of the graph area.

Calculation of aggregates, averages and extreme values

A point in an aggregate is represented by three values: the average, minimum and maximum of the points contained in the interval of the aggregate level. For example, a point in the minute aggregate contains the average, the maximum and the minimum of all points contained in the represented minute.

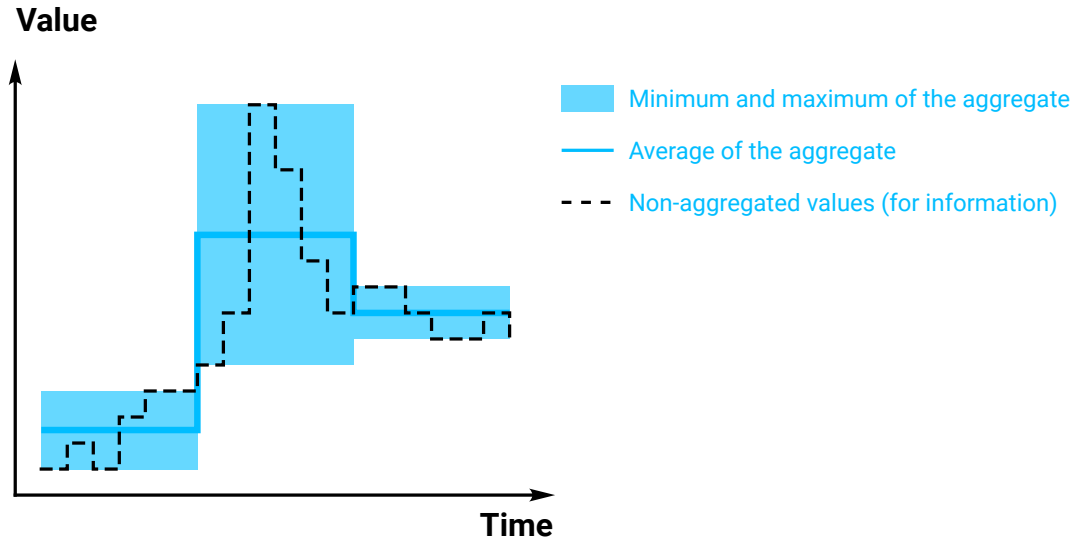
While the average value is a fairly good representation of the readings in an aggregate point, it can hide abnormal values. This is why the minimum and maximum values are also shown, so that no critical information is missed.

For example, consider the following table:

Readings							**Minute aggregate**		
0s	10s	20s	30s	40s	50s	60s	Average	Minimum	Maximum
25°C	26°C	24°C	35°C	26°C	15°C	24°C	25°C	15°C	35°C

In this example, the average of the readings for the minute shown is 25 °C. This may seem like a normal value, but it does not reflect the large variations at seconds 30 and 50. The minimum and maximum values of the aggregate therefore make abnormal variations visible at a glance.

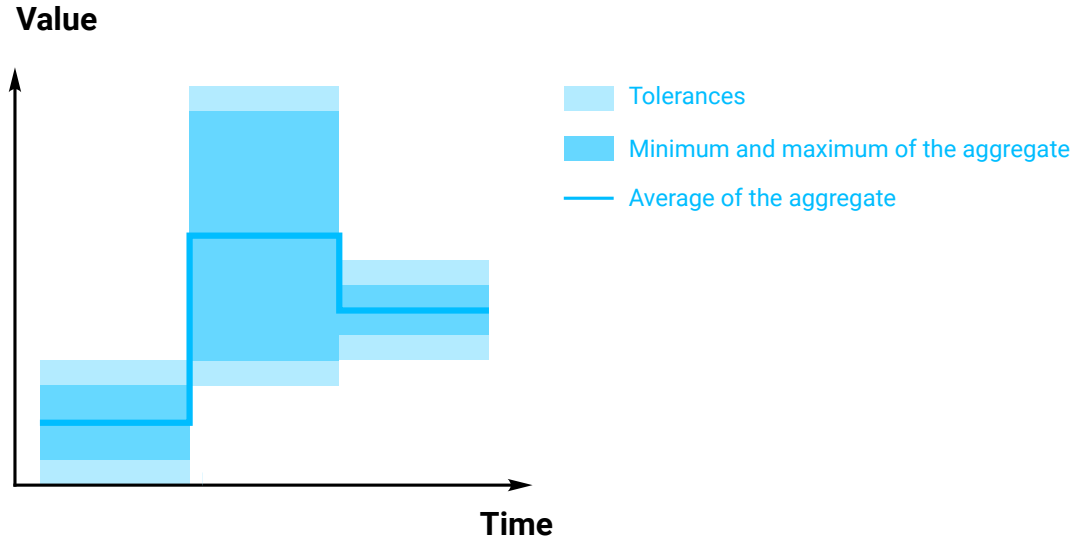
In the graph, the average value is shown as a blue line and the minimum and maximum values as a blue band.



Tolerances

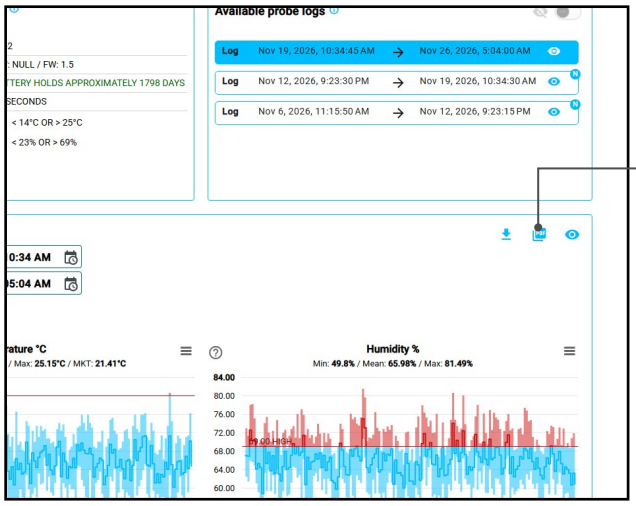
The temperature and humidity values measured by the sensor are subject to tolerances (see sections 3.1.4 to 3.1.7). The typical and maximum tolerances of the sensor are also shown on the graph as a lighter blue area.

When an aggregate and the tolerances are displayed together, they appear as two blue bands of different intensity.



6.2 Data certificate

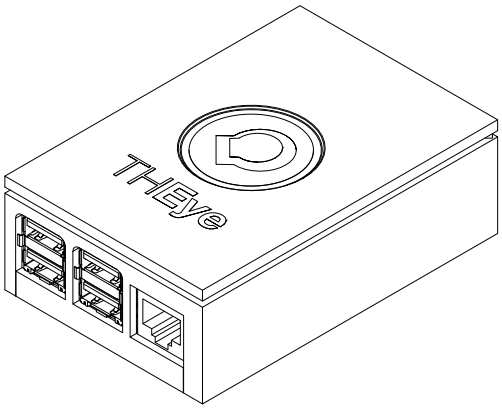
You can obtain a certificate with or without raw data. It is a PDF file generated by THEye Cloud in a few seconds.





The first page of the certificate includes several calculations: minimum, maximum, average and MKT (mean kinetic temperature).

7. THEye Gateway

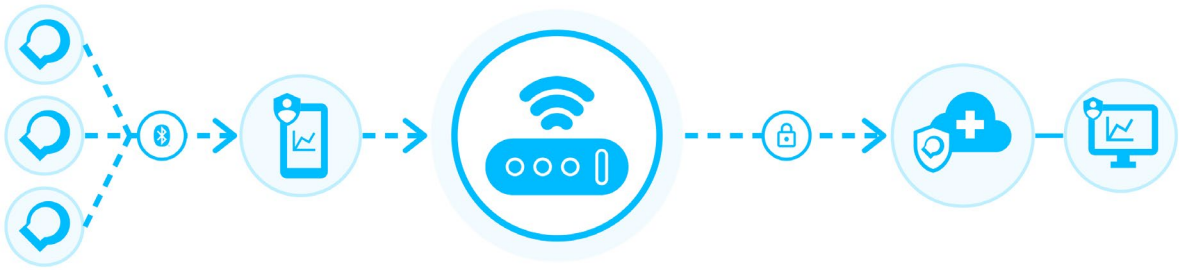


7.1 Overview

The THEye Gateway automatically collects the measurements of nearby THEye probes over Bluetooth® and uploads them to THEye Cloud, where you can view them in THEye Dashboard.

It also watches your probes for alarms. When a probe goes outside its limits, the Gateway can sound its buzzer, and THEye Cloud can notify you by email.

The Gateway has no screen: you configure it with the THEye Controller smartphone app.



7.2 Quick start

Before you start, check that:

- The THEye Controller mobile app is installed on your smartphone.
- Your probes are linked to your THEye Cloud account.
- An internet connection is available, through Wi-Fi or a network cable.

1. **Place the Gateway:** put it centrally among your probes, no more than 30 m away in an open space (see section 7.3).
2. **Power it on:** use the USB-C cable, or PoE on the RJ45 port. Wait for the two short beeps: the Gateway has started and is ready.
3. **Connect to it:** open THEye Controller and select the Gateway on the Home page, or scan its QR code.
4. **Set up the network:** for a wired connection, simply plug in the network cable. For Wi-Fi, open the Network parameters page, press CONFIGURE in the WIFI block, choose your network and

enter its password (see section 7.5.3). Then run the connection test.

5. **Claim it:** on the Access parameters page, press CLAIM DEVICE to link the Gateway to your THEye Cloud account.
6. **Choose the probes:** on the Sync parameters page, select Defined devices list, press DEVICES TO MONITOR and select your probes, or select All devices within range. Set the upload frequency and press APPLY.
7. **Optional — alarms:** on the Alarm parameters page, turn on alarm detection and the buzzer, then press APPLY.

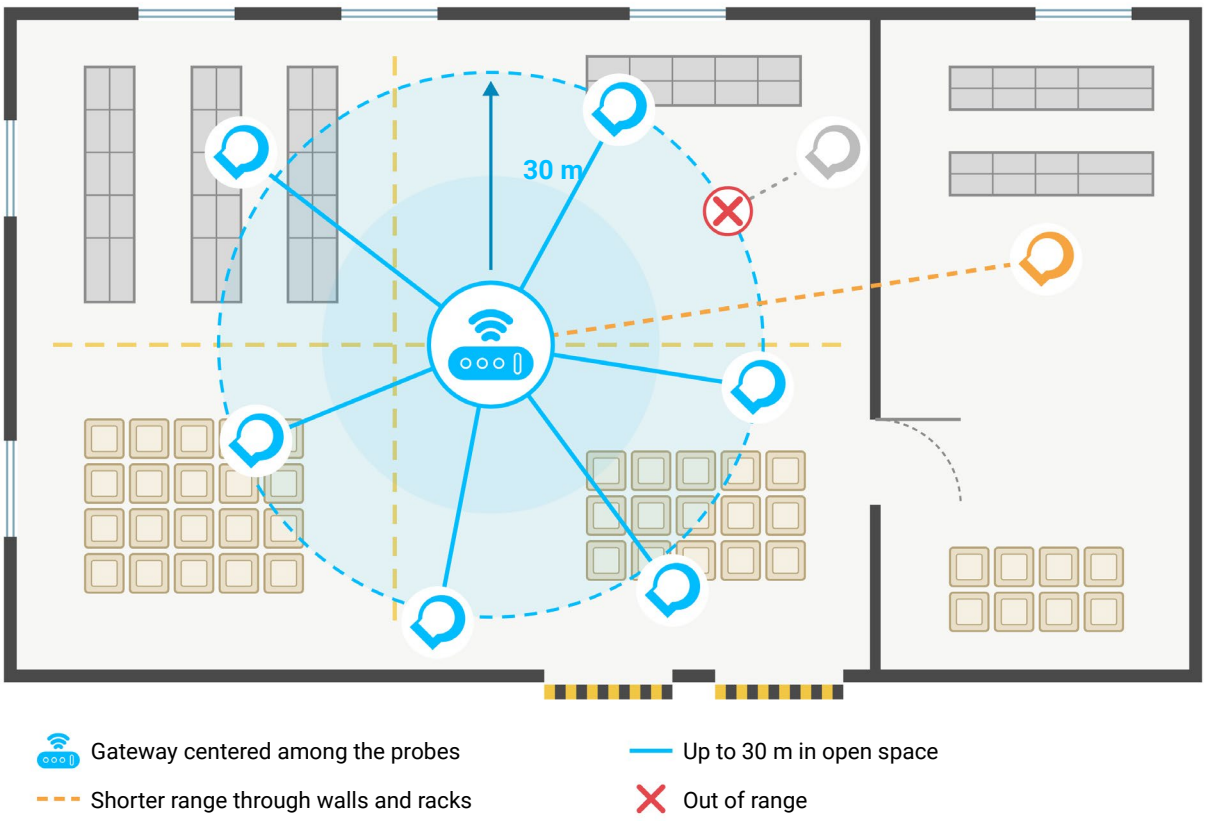
Your probes' live values appear in the app right away, and their first measurements normally reach THEye Dashboard within a few minutes (see section 7.7.3).

7.3 Installation & placement

- Place the Gateway centrally among the probes it monitors. The range is up to 30 m in an open space; expect less through walls, furniture or dense storage.
- Power the Gateway with the USB-C power supply, or with PoE through the RJ45 port.
- The Gateway needs an internet connection, wired or Wi-Fi. To set up Wi-Fi, see section 7.5.3.
- Set up synchronization and alarms as described in section 7.5.3.

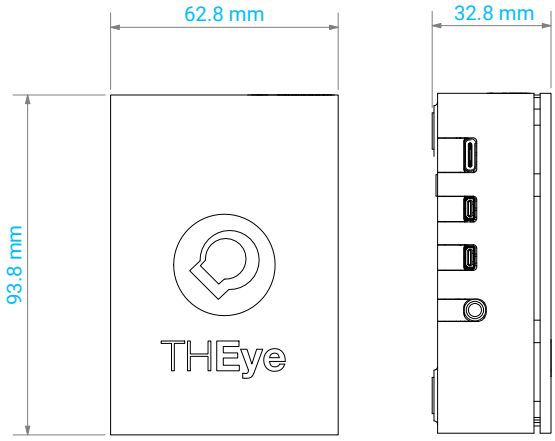
Installation environment (safety)

- Use the Gateway indoors only and keep it dry.
- Do not open, damage or modify the plastic enclosure.
- Do not remove the SD card.
- Avoid powering off the Gateway during normal operation.



7.4 Specifications

7.4.1 Dimensions



62.8 × 32.8 × 93.8 mm (W × D × H)

7.4.2 Power and connectivity

Item	Detail
Power	5 V, 3 A USB-C power supply, or PoE (IEEE 802.3af, 40–57 V) on the RJ45 port
Power consumption	Typical 2–2.5 W, maximum 5 W
Network	Wired Ethernet (RJ45) or Wi-Fi (2.4 / 5 GHz)
Wi-Fi security	WPA / WPA2-Personal (network name and password). Enterprise authentication (802.1X) is not supported
Radio	Bluetooth® Low Energy 5.0: the Gateway reads the probes' measurements, downloads their logs and updates their firmware, and communicates with the THEye Controller app
Max monitored probes	About 100, all within Bluetooth® range. Monitoring many probes makes each synchronization take longer
Indication	Two short beeps at start-up when the Gateway is operational
Operating temperature	0 to 50 °C
Operating humidity	Dry ambient air only; keep away from moisture
Weight	Approx. 112 g

A wired Ethernet connection gives the best performance. If you use Wi-Fi, prefer a 5 GHz network to a 2.4 GHz one.

7.5 Configuration reference

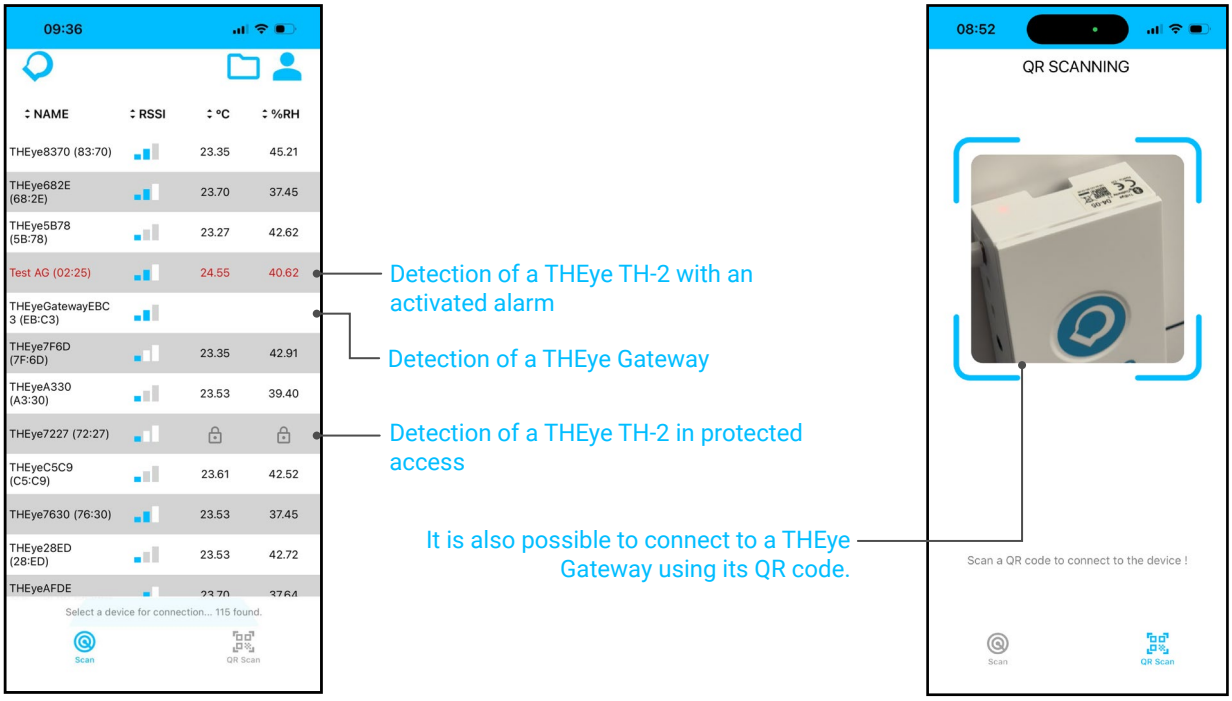
The THEye Controller app configures the Gateway, just as it configures the probes. It has three groups of pages:

- The Home page finds nearby Gateways and connects to one.
- The Device page shows the status of the Gateway, such as the dates of the last and next synchronizations.
- The Parameters pages configure the Gateway: synchronization, alarms, network, information and access.

On the Sync, Alarm, Network and Info parameters pages, a change is only sent to the Gateway when you press APPLY.

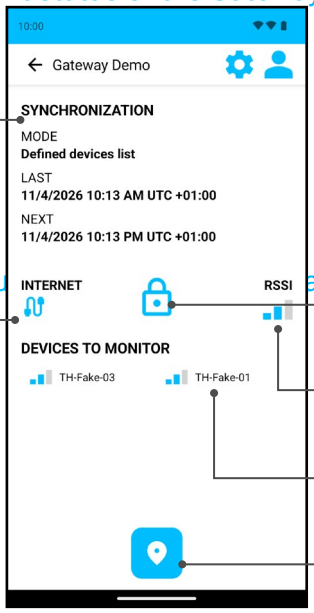
7.5.1 Home page

The Home page lists the nearby probes and Gateways. Select one to connect to it.



7.5.2 Device page

The Device page shows the current status of the Gateway at a glance.



Synchronization status: mode, last and next synchronization dates

Network communication status

Association status (free or associated with a THEye Cloud account)

Bluetooth® signal quality/distance from the THEye Gateway

Monitored probes and their Bluetooth® signal strength (RSSI)

Locate the THEye Gateway by making it beep.

At the bottom of the page, two bu ay:

- Locate makes the Gateway beep, so you can find it.
- Push all uploads the data of all probes to THEye Cloud now, without waiting for the next scheduled synchronization.

There are two synchronization modes (see Sync parameters in section 7.5.3):

- Defined devices list (default): the Gateway synchronizes only the probes you select. Use this when your set of probes stays the same (fixed installation).
- All devices within range: the Gateway synchronizes every probe it detects nearby.

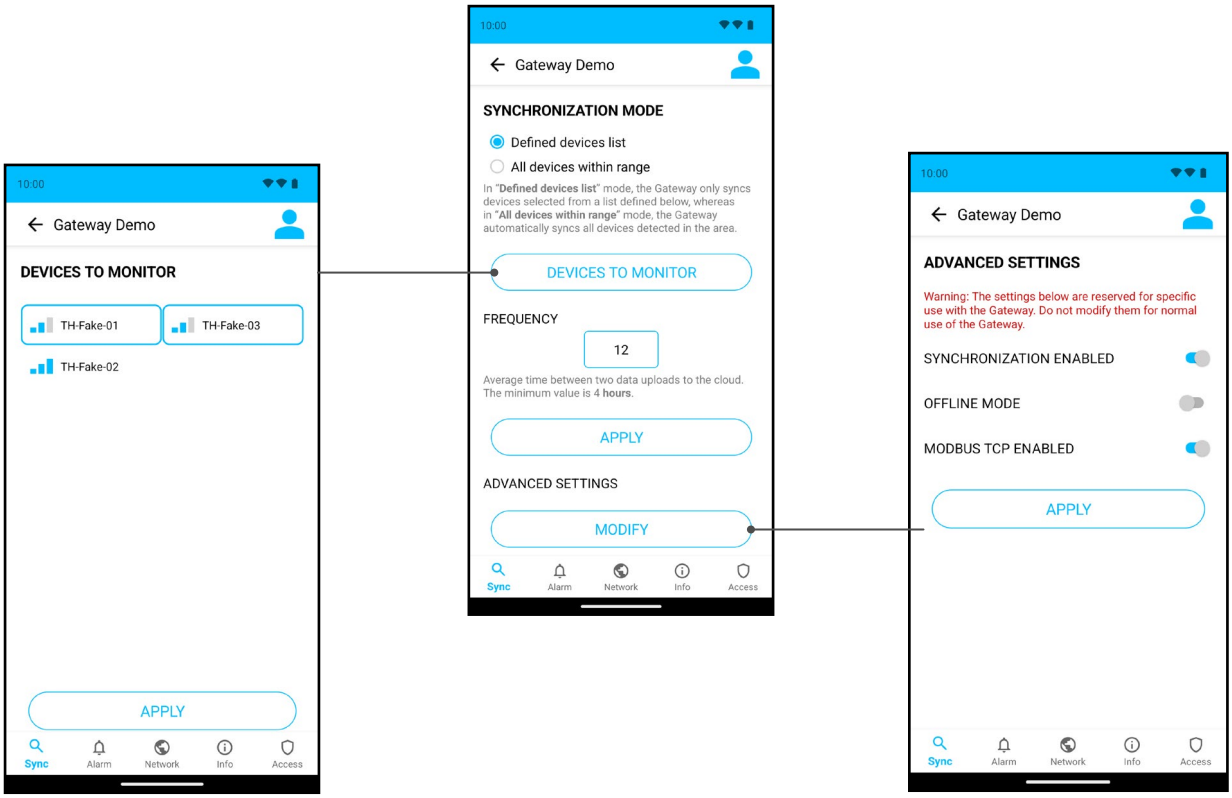
The app can only connect to one Gateway at a time.

iOS only: the name shown is the first one the phone saw, and there is currently no way to refresh it.

7.5.3 Parameters pages

Sync parameters

The Sync parameters page defines which probes the Gateway synchronizes and how often.



In "Defined devices list" mode, select the probes to synchronize from the list of detected probes.

1. Under SYNCHRONIZATION MODE, select Defined devices list or All devices within range.
2. In Defined devices list mode only: press DEVICES TO MONITOR, below the explanation of the modes, select the probes to synchronize from the list of detected probes, then press APPLY.
3. Set the FREQUENCY: the average time between two data uploads to THEye Cloud, in hours. Minimum 4 hours, maximum 24 hours, default 24 hours.
4. Press APPLY.

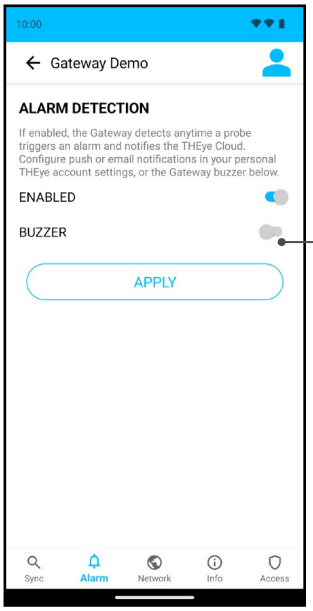
ADVANCED SETTINGS has three options, meant for specific uses; keep the default values for normal use. To change them, press MODIFY under ADVANCED SETTINGS, set the options, then press APPLY.

- SYNCHRONIZATION ENABLED: the Gateway sends data to THEye Cloud (normal operation).
- OFFLINE MODE: turns off every feature that needs an internet connection.
- MODBUS TCP ENABLED: lets a Modbus client read probe data directly from the Gateway (see section 7.9).

Alarm parameters

The Alarm parameters page (ALARM DETECTION) turns alarm detection on or off and sets up the Gateway buzzer.

When alarm detection is enabled, the Gateway constantly listens to nearby probes and reports every alarm to THEye Cloud. It only checks the probes selected on the Sync parameters page.



1. Turn on ENABLED to activate alarm detection. It is off by default. The BUZZER option then appears.
2. Turn on BUZZER to make the Gateway beep when an alarm occurs. The FREQUENCY and DURATION settings then appear.
3. Set the FREQUENCY: the time between two buzzer notifications, in minutes. Minimum 15 minutes, maximum 24 hours, default 1 hour. This does not change how fast an alarm is detected: the Gateway usually detects an alarm in less than a minute when the probe is within range.
4. Set the DURATION: how long the buzzer sounds, in minutes. Minimum 1 minute, maximum 5 minutes, default 1 minute.
5. Press APPLY.

Alarm thresholds are set for each probe in the THEye Controller app (see section 4.3.3). When an alarm is detected, the Gateway beeps at regular intervals until the alarm is cleared in the app.

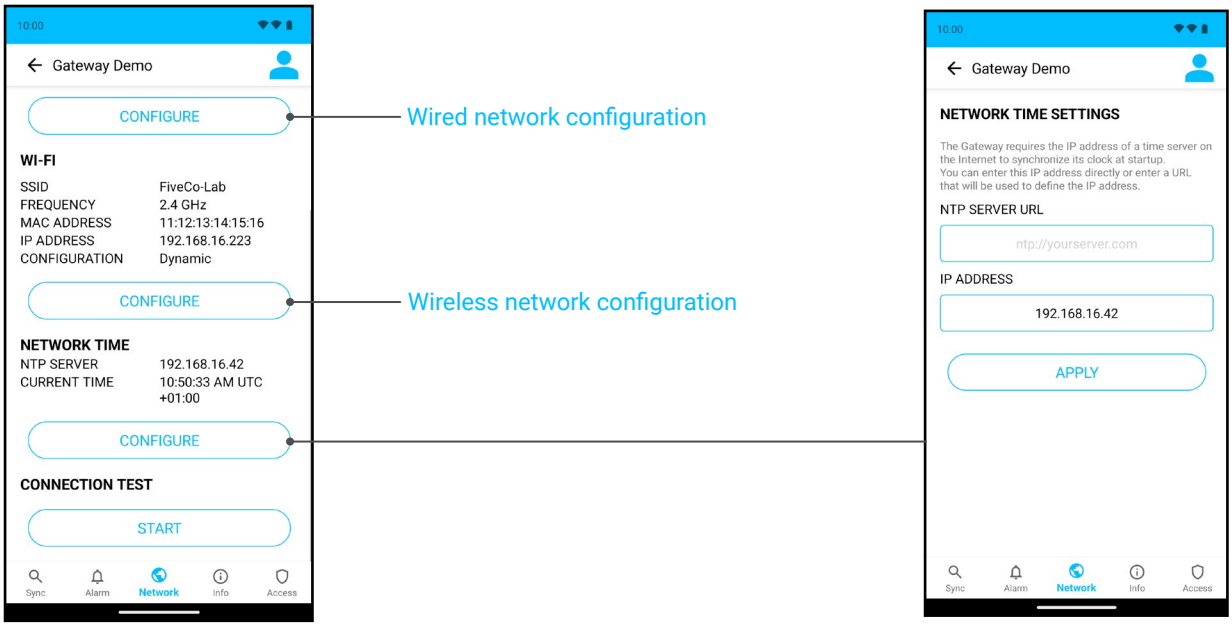
When a monitored probe is in alarm, the THEye Gateway reports it to THEye Cloud, which emails your account address: once when the alarm is detected, then a reminder every 24 hours until the alarm is cleared. No email is sent when the alarm clears.

Email alerts are enabled by default. You can turn them off in your THEye Cloud account settings.

Network parameters

The Network parameters page sets up and tests the connection to THEye Cloud.

The page has three blocks, each showing the current status: ETHERNET, WIFI and NETWORK TIME. The CONNECTION TEST is at the bottom of the page.



Ethernet

Plug a network cable into the RJ45 port. With the default settings (Dynamic), the Gateway gets its address from your network automatically; nothing else is needed. The ETHERNET block then shows the MAC ADDRESS, the IP ADDRESS and the CONFIGURATION (Dynamic or Static).

Wi-Fi

1. In the WIFI block, press CONFIGURE.
2. Make sure ENABLED is on. If you changed it, press APPLY.
3. Press CHANGE NETWORK and select your network in the AVAILABLE list.
4. Enter the password and press CONNECT.

The WIFI block then shows the network name (SSID), the FREQUENCY (2.4 or 5 GHz), the MAC ADDRESS, the IP ADDRESS and the CONFIGURATION. If you only use Ethernet, you can turn Wi-Fi off: turn ENABLED off and press APPLY.

Static IP address (Ethernet or Wi-Fi)

By default, the Gateway gets its IP address automatically (Dynamic). To give it a fixed address:

1. Press CONFIGURE in the ETHERNET or WIFI block.
2. Under ETHERNET IP SETTINGS or WIFI IP SETTINGS, select Static.
3. Enter the IP ADDRESS and the SUBNET MASK, and, if needed, the GATEWAY and the DNS SERVER (both optional).
4. Press APPLY.

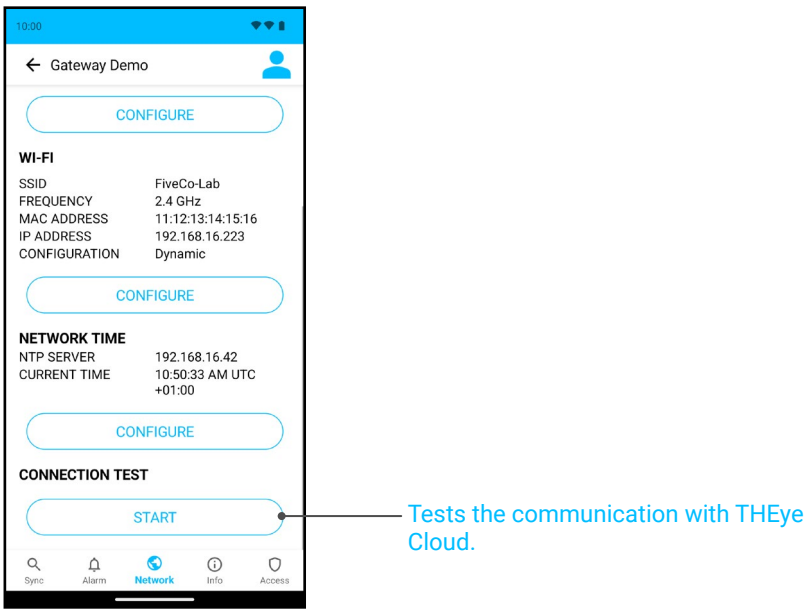
To go back to automatic addressing, select Dynamic and press APPLY.

Network time

The Gateway sets its clock from a time server on the internet (see section 7.6.4). To change the server, press CONFIGURE in the NETWORK TIME block, enter the NTP SERVER URL or its IP ADDRESS, then press APPLY. The CURRENT TIME shown in the block lets you check the result.

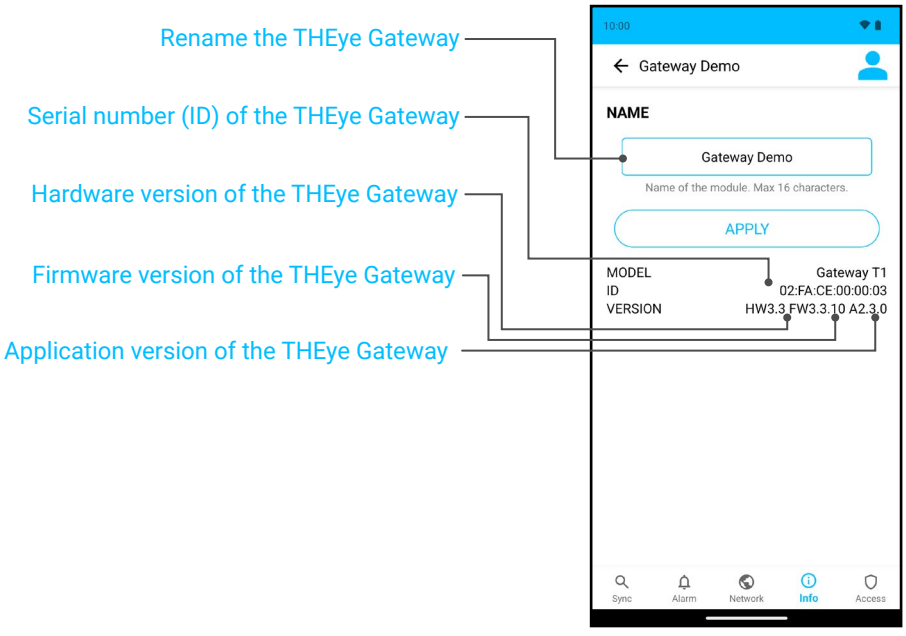
Connection test

Press START under CONNECTION TEST to check the connection to THEye Cloud. The test shows the download speed, the upload speed and the latency.



Info parameters

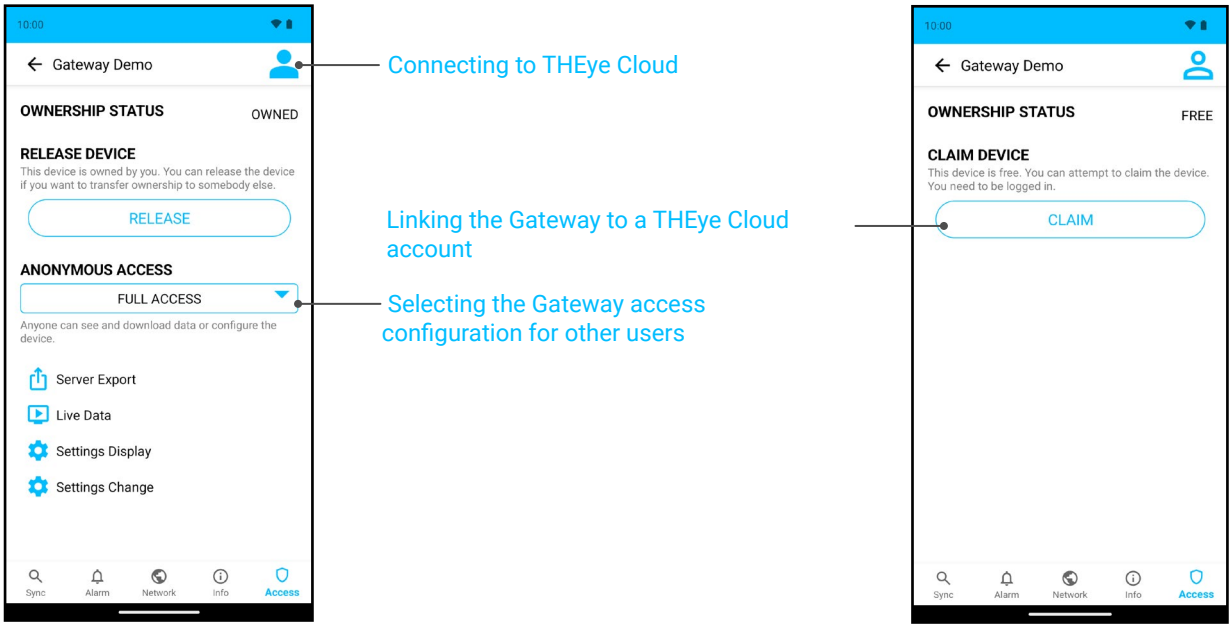
The Info parameters page shows the identification details of the Gateway.



- NAME: the name of the Gateway, up to 16 characters. To rename it, enter the new name and press APPLY.
- MODEL, ID (serial number) and VERSION (hardware, firmware and application versions) are shown for information only.

Access parameters

The Access parameters page links the Gateway to a THEye Cloud account. Once the Gateway is linked, it also lets you choose what other users can do with it.



- CLAIM DEVICE links a free Gateway to your account. You must be logged in. The first time a Gateway is claimed, the app asks you to scan the QR code on the Gateway.
- RELEASE DEVICE removes the link, for example to transfer the Gateway to another account.
- CONFIGURATION sets what other users can do. Select one of the options below.

The CONFIGURATION options are:

- FULL ACCESS: everyone can view and download data or configure the device.
- LIMITED ACCESS: users can view and download data, but device configuration is locked.
- LIVE ONLY: users can only view live data. Access to historical data and device configuration is locked.
- PROTECTED: other users can only upload data to THEye Cloud, without viewing it.

See section 5.2 for the full per-feature breakdown.

7.6 Network integration

This section is for IT administrators who integrate the Gateway into a company network.

7.6.1 Outbound connections

Purpose	Destination	Port	Protocol
THEye Cloud API, authentication and firmware updates	backend.theye.ch	443	TCP / HTTPS
Probe firmware service	backend.fiveco.ch	443	TCP / HTTPS
FiveCo service endpoints (authentication, diagnostics)	contact FiveCo support	443	TCP / HTTPS

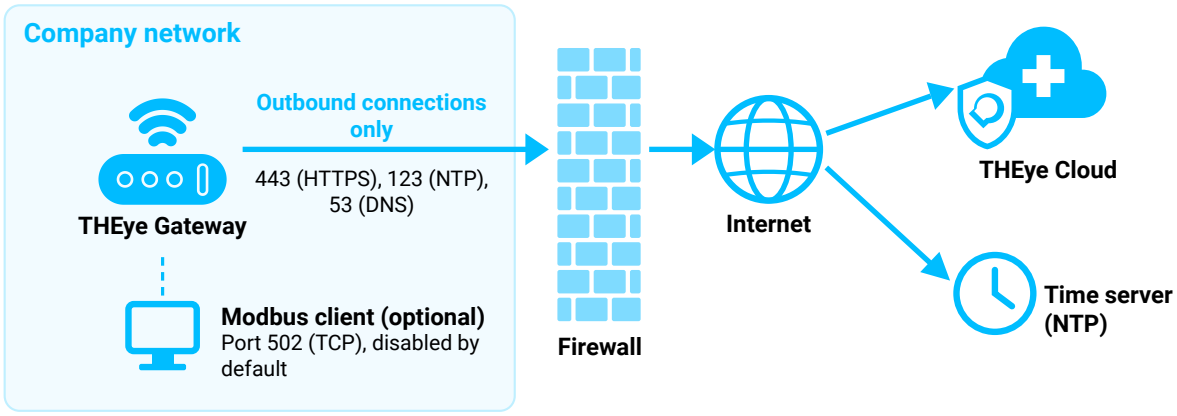
Purpose	Destination	Port	Protocol
Time synchronization	195.176.26.215 (ntp.metas.ch), configurable	123	UDP
DNS	Your DNS server (automatic or configured)	53	UDP / TCP

The Gateway only opens outbound connections. It does not need a public IP address, and no port forwarding is required.

A direct internet connection is required. The Gateway does not support HTTP proxies.

DNS is required: all destinations except the time server are host names.

If your firewall filters by host name rather than by port, contact FiveCo support for the complete list of destinations to allow.



7.6.2 Inbound connections

No inbound connection is required for normal operation. The only inbound port you may need to open is 502 (TCP) for Modbus TCP, which is disabled by default (see section 7.9).

The Gateway does not provide a web interface.

7.6.3 Addressing

The Gateway gets its IP address automatically (DHCP) by default. A static address can be set for Ethernet and for Wi-Fi (see Static IP address in section 7.5.3).

Ethernet and Wi-Fi have separate MAC addresses, both shown on the Network parameters page. Use the one matching your connection type when you create a DHCP reservation.

The ID shown on the Info parameters page is the Gateway serial number.

7.6.4 Time synchronization

The Gateway has no battery-backed clock and sets its time over NTP at start-up. The default server is 195.176.26.215 (ntp.metas.ch); another server can be set on the Network parameters page (see section 7.5.3).

The correct time is required for data upload: until the Gateway has it, it does not connect to

THEye Cloud and no measurements are uploaded. If NTP is blocked on your network, the Gateway detects the probes normally but never uploads.

7.6.5 Security

All communication with THEye Cloud is encrypted with standard web security protocols (TLS), and probe records are AES-encrypted end to end (see section 5.1).

Modbus TCP has no authentication and no encryption. Read the warning in section 7.9 before enabling it.

The USB connector on the enclosure is disabled in software during normal operation.

7.7 Troubleshooting

7.7.1 Symptoms

Symptom	Check
No beeps at power-on	Power source; USB-C cable or PoE; try the other power method
Gateway not in the app's device list	Bluetooth® is on and the app has the required permissions; you are within a few meters; no other phone is connected to the Gateway (only one at a time); no probe firmware update is running
Gateway found, but probes missing from DEVICES TO MONITOR	Probes linked to your account; within range; obstacles between the probe and the Gateway
No data in the Dashboard after setup	Expected delay (see section 7.7.3), or press Push all on the Device page; internet status icon on the Device page; connection test (section 7.5.3)
Internet icon shows disconnected	Cable, or Wi-Fi network and password; static IP settings, if used; firewall rules (see section 7.6.1)
Buzzer keeps sounding	An alarm is active: clear it in the app. Check the buzzer DURATION and FREQUENCY settings
Modbus client cannot connect	Modbus TCP enabled in ADVANCED SETTINGS; port 502 reachable; unit ID 1
Modbus log download returns Locked (State 7)	The probe is protected and the Gateway is not claimed by the same account (see section 7.9.4)
Modbus log download returns Busy (State 8)	The Gateway is busy with a higher-priority operation; retry after 30–60 s (see sections 7.7.5 and 7.9.4)

7.7.2 Beep reference

The Gateway signals three events with its buzzer:

Sound	Meaning
Two short beeps	The Gateway has started and is operational
Two short beeps and one longer beep, once	You pressed Locate in the app
Two short beeps and one longer beep, repeating every few seconds	A probe alarm is active

There is no error beep: if the Gateway fails to start, it stays silent. If you hear no beeps at power-

on, see the table above.

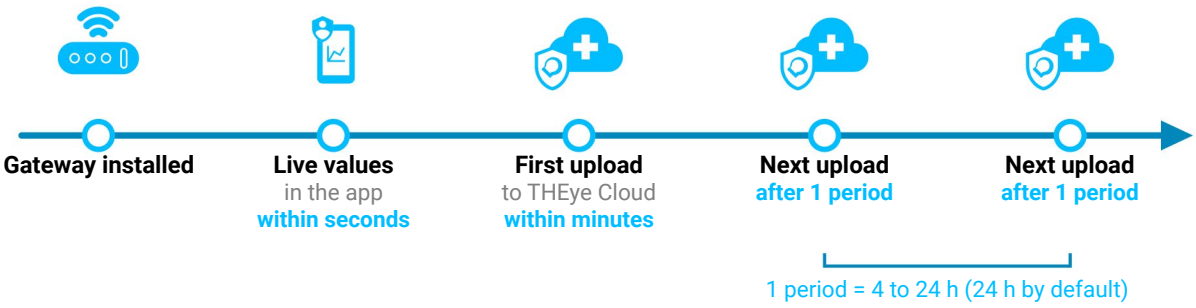
Turning off the BUZZER only silences the alarm. The Gateway still beeps at start-up and when you use Locate.

7.7.3 When will I see data?

Live measurements appear in the THEye Controller app as soon as the Gateway detects your probes.

A probe that has never been synchronized is uploaded to THEye Cloud as soon as the Gateway detects it, so your first measurements normally reach the Dashboard within a few minutes of installation.

After that, each probe is uploaded once per configured period (4 to 24 hours, 24 hours by default). Uploads are grouped and follow a daily schedule, so the next measurements can take up to a full period to appear. This is normal and saves power and bandwidth. To upload the latest measurements right away, press Push all on the Device page (see section 7.5.2).



Need the latest measurements now?
Press Push all on the Gateway Device page.

7.7.4 Claiming

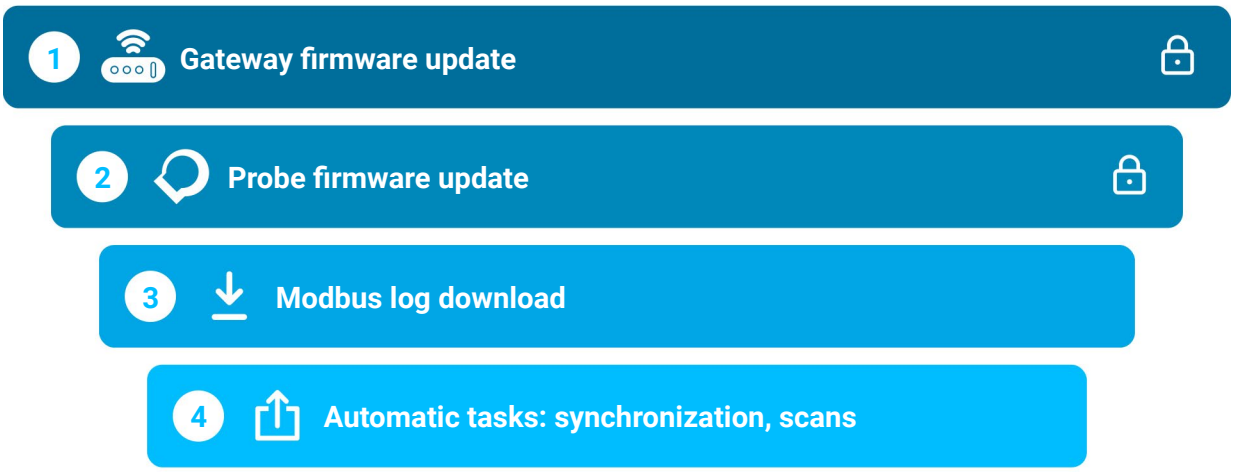
To work with protected probes, a Gateway must be claimed by a THEye Cloud account (see Access parameters in section 7.5.3). The Gateway and the probes it monitors must be claimed by the same account.

7.7.5 Bluetooth® priority

The Gateway shares one Bluetooth® radio between several tasks. A Modbus log download has priority over automatic tasks: it interrupts a running synchronization at once instead of waiting for it to finish. The interrupted synchronization resumes by itself afterwards.

Priority order, highest first:

1. Gateway firmware update
2. Probe firmware update
3. Modbus log download (see section 7.9.4)
4. Automatic tasks: data synchronization and background scans



Highest priority on top · firmware updates are never interrupted

Firmware updates are the exception: a running update is never interrupted, and other requests are refused until it ends (see section 7.8).

What you see in the app: the THEye Controller app can stay connected while the Gateway synchronizes data or serves a Modbus download; it does not interrupt them. A probe firmware update waits until the app disconnects, and while probe firmware is being updated, the Gateway does not appear in the app.

7.8 Firmware update

FiveCo regularly releases firmware improvements and fixes for the Gateway. FiveCo starts each update remotely; the update then runs by itself.

Nothing is required from you: there is no physical intervention, and all your settings are kept. The Gateway restarts as part of the update and then resumes monitoring. Updates cannot be started, scheduled or declined from the THEye Controller app.

An update that is due waits for a running Modbus download to finish, for up to 1 hour; otherwise it is postponed to the next update slot. A probe firmware update also waits until the THEye Controller app disconnects. The Gateway keeps working normally while it downloads its own update. Once an installation starts, nothing interrupts it, and Modbus requests are refused until it ends (see section 7.7.5).

An internet connection is required. A Gateway without internet access cannot be updated remotely.

The installed versions are shown on the Info parameters page (see section 7.5.3).

7.9 Modbus TCP

Modbus is a master-slave protocol: a master (a PLC, a SCADA system or a custom tool) regularly queries the Gateways on the network, which act as slaves.

This section describes how to implement a client that reads live probe data from a THEye Gateway and downloads a probe's historical log. The complete register map is given in section 7.9.5.

The Modbus TCP server is disabled by default. Enable it in the ADVANCED SETTINGS of the

Sync parameters page in the THEye Controller app (see section 7.5.3).

Modbus TCP has no authentication and no encryption. When enabled, any device on the same network that can reach port 502 can read your probe data. Enable it only on trusted networks, and restrict access to port 502 to the systems that need it.

7.9.1 Connection

The Gateway runs a Modbus TCP server with the following fixed parameters:

Parameter	Value
Transport	Modbus TCP
Port	502
Unit ID	1
Byte order	Big-endian (multi-register values, high word first)

Table 1: Modbus TCP server parameters

All addresses in this section are the 1-based data-model addresses (Input Registers 30001+, Holding Registers 40001+). The offset sent on the wire is the address minus the table base (e.g. data-model 30101 is read as offset 100 with function code FC04). Measurements are stored as signed int16, scaled and expressed in the unit given in Table 2. An absent measurement is reported through its mask bit (see section 7.9.3) and reads the sentinel value 0x8000 (int16 -32768); this value must not be treated as a measurement.

The measurement order is fixed and used everywhere a measurement is indexed: the bit position in every bitmask and the register offset inside a probe block:

Index	Measurement	Register unit	Physical value
0	Temperature	°C x 100	Register / 100
1	Humidity	%RH x 100	Register / 100
2	Oxygen	% x 100	Register / 100
3	Carbon dioxide	ppm	Register
4	External temperature	°C x 100	Register / 100
5	Battery voltage	V x 100	Register / 100
6	Dew point	°C x 100	Register / 100

Table 2: Measurement order (bitmask bit index and register offset) and scaling

7.9.2 Reading delay

The timestamp assigned to each measurement corresponds to the moment when the Gateway received the Bluetooth® signal from a probe. It therefore does not correspond to the exact moment when the measurement was taken.

Measurements are updated at most every 5 seconds, the Bluetooth® transmission interval of the probes. Some transmissions do not reach the Gateway, so a new measurement can take several tens of seconds to arrive.

7.9.3 Reading the live snapshot (Input Registers, FC04)

The Input Registers hold a read-only snapshot of every monitored THEye probe, updated continuously as Bluetooth® advertisements arrive. The table is a fixed grid:

- a Gateway header at address 30001 (geometry, identity, counts);
- one 100-register block per probe at address 30101 + id * 100, where id is the probe's stable index (0, 1, 2, …).

Each probe keeps its slot permanently: a probe that leaves range simply stops updating its block, and ids never shift. A client can therefore map each fixed address to a fixed tag.

The probe order (id assignment) is reset only when the synchronization mode is changed (see Sync parameters in section 7.5.3); no other operation reorders the probes, not even adding or removing probes from the monitored list. After a mode change, a client should re-read the Gateway header and re-map its tags.

Procedure

1. Read the Gateway header (address 30001, 25 registers). Number of devices (30020) gives the number N of probes currently in range.
2. For id from 0 to N-1, read the probe block at 30101 + id * 100 (32 registers cover the used range).

Offsets B+32 to B+99 are reserved and read as 0. Do not assume a 32-register block: read the Device block stride (30018) and check the Map version (30016), which is incremented whenever the layout changes.

3. In each block, decode the identity fields (ID, Name, …) then Timestamp, RSSI, the alarm bitmasks and the measurements. Use Measure mask, or test each value against 0x8000, to know which measurements are valid.

See section 7.9.5 for the exact register layout of the header and the probe block.

Probe alarm status

A probe's alarm status is exposed through two 32-bit bitmasks and a status word, all in its block. In each bitmask, bit i refers to measurement i (see the order in Table 2, e.g. bit 0 = Temperature).

Field	Meaning
Current alarm mask	bit i = the current value of measurement i is outside its threshold
Past alarm mask	bit i = measurement i has been outside its threshold since the alarm was reset

Field	Meaning
Status, bit 0	Hidden - the alarm status is hidden; the masks above are therefore not valid
Status, bit 1	Not tested - the probe has not yet been tested

Table 3: Probe alarm status fields

Thresholds and alarm resets are managed by the user in the THEye Controller app.

7.9.4 Downloading a probe log (Holding Registers, FC03/FC16)

On demand, the Gateway connects to a chosen probe over Bluetooth®, downloads and decodes its log, caches it, and streams the decoded rows back through a fixed register window. This decouples the slow Bluetooth® download from the Modbus read speed. The client drives the transfer through the Holding Registers (see section 7.9.5) with a frozen-window + write-acknowledge handshake: the current data window never changes until the client acknowledges it, so a multi-register read is never torn.

Prerequisites — a protected probe's log can only be downloaded when the Gateway is claimed by the same THEye Cloud account that claimed the probe (see Access parameters in section 7.5.3). Otherwise, the transfer ends in the Locked state (see Table 7).

Procedure

1. Start: write the 6-byte MAC to Target MAC (40004, 3 registers, high byte first), then write Control = 1 (40003).
2. Wait: poll State (40001). It moves from Connecting to Downloading, then Decoding (follow Progress).

A synchronization in progress is interrupted to serve the request; the Gateway waits up to about 30 s for it to release Bluetooth®. If the Gateway has not detected the probe recently, it then scans for it (up to 30 s). State stays at Connecting during both.

- State = 6 (Error): the scan did not find the probe, or the connection, download or decoding failed; retry later.
- State = 7 (Locked): the probe is protected and the Gateway is not claimed by the same account that claimed the probe (see Access parameters in section 7.5.3); give up.
- State = 8 (Busy): the request was refused; retry later. Nothing is queued on the Gateway. Busy is returned when a Gateway or probe firmware update is running, another download is running, or Bluetooth® was not released within about 30 s (see section 7.7.5). A connected THEye Controller app does not block or interrupt the download.
- State = 4 (Ready): the decoded log is cached and ready to drain.

3. At Ready, read the schema: Data mask (40008), Row size (40012), Period (40009), Total rows (40010).
4. Drain loop until all rows are read:

- Read the control block (Data count 40013, Window id 40014).
- Read the Data window (40022) and decode Data count rows.
- Write Window ack (40015) = the window id just read. The Gateway then loads the next window (with a new window id).

- Repeat. Stop when State = 5 (Done) or the total row count is reached.

5. Abort: write Control = 0 (40003) at any time. The transfer returns to Idle at once. A new start right after an abort is accepted: State shows Connecting until the aborted download has released Bluetooth®.

Recommended master behavior: on Busy, retry after a delay (for example 30–60 s); on Error, retry later; on Locked, give up.

Row encoding: each row is Row size registers long: a uint32 timestamp (2 registers, UNIX seconds UTC) followed by one int16 per bit set in Data mask, in ascending bit order, each the value scaled as in Table 2. Rows are packed contiguously from address 40022; trailing registers are 0. Row size = 2 + number of bits set in Data mask.

Notes for client implementers:

- Only acknowledge a window id once you have fully read it; acknowledging advances the Gateway. Use the exact id you read; any other value is ignored.
- Read the control block and the data window in two separate FC03 requests (the window alone is 125 registers, the FC03 maximum).
- A full log can hold several hundred thousand points (9 314 windows for the log of the worked example in section 7.9.6); expect many window / acknowledge round trips.

THEye

7.9.5 Modbus TCP registers

All data is encoded in big-endian. The unit ID is fixed at 1. Addresses below are the 1-based data-model addresses. Regs is the number of consecutive 16-bit registers the field spans; multi-word fields are stored high word first.

Address	Regs	Type	Name	Notes
30001	1	uint16	Type	Gateway type
30002	1	uint16	Model	Gateway model
30003	2	uint32	Firmware version	major << 16 | minor
30005	3	bytes	ID	6-byte MAC (serial number), in the order shown in the app
30008	8	bytes	Name	16 UTF-8 bytes
30016	1	uint16	Map version	Layout revision (currently 2)
30017	1	uint16	Device block base	Address offset of probe 0 (= 100)
30018	1	uint16	Device block stride	Registers per probe block (= 100)
30019	1	uint16	Max devices	Max probe blocks that fit in the table
30020	1	uint16	Number of devices	Probes currently in range (N)
30021	1	uint16	Configured devices	Probes configured
30022	1	uint16	Mode	0 = List, 1 = All
30023	1	uint16	Hardware version	major << 8 | minor
30024	2	uint32	Software version	major<<24 | minor<<16 | build<<8 | rev

Table 4: Input Registers - Gateway header

Address	Regs	Type	Name	Notes
B+0	1	uint16	Type	Sensor type
B+1	1	uint16	Model	Sensor model (200/202/203/204/205 = TH)
B+2	2	uint32	Firmware version	major << 16 | minor
B+4	3	bytes	ID	6-byte MAC, big-endian
B+7	8	bytes	Name	16 UTF-8 bytes
B+15	2	uint32	Timestamp	UNIX epoch (UTC) in seconds
B+17	1	int16	RSSI	dBm
B+18	2	uint32	Measure mask	bit i = measurement i present
B+20	2	uint32	Current alarm mask	bit i = measurement i current alarm
B+22	2	uint32	Past alarm mask	bit i = measurement i past alarm
B+24	1	uint16	Status	b0 Hidden, b1 Not tested
B+25	1	int16	Temperature	°C x 100 (0x8000 if absent)
B+26	1	int16	Humidity	%RH x 100 (0x8000 if absent)
B+27	1	int16	Oxygen	% x 100 (0x8000 if absent)
B+28	1	int16	Carbon Dioxide	ppm x 1 (0x8000 if absent)
B+29	1	int16	External Temperature	°C x 100 (0x8000 if absent)
B+30	1	int16	Battery Voltage	V x 100 (0x8000 if absent)
B+31	1	int16	Dew Point	°C x 100 (0x8000 if absent)

Table 5: Input Registers - per-probe block

Address	Regs	Type	Acc	Name	Notes
40001	1	uint16	R	State	Transfer state (see Table 7)
40002	1	uint16	R	BLE state	Bluetooth® connection state (see Table 8)
40003	1	uint16	RW	Control	1 = start download of Target MAC, 0 = stop/abort. Reads back 0 once a start is accepted; follow the transfer with State
40004	3	bytes	RW	Target MAC	Probe MAC, 6 bytes big-endian
40007	1	uint16	R	Progress	Download/decode progress, 0..1000 per mille
40008	1	uint16	R	Data mask	Bitmask of measurements present per row (from Ready)
40009	1	uint16	R	Period	Log sampling period, seconds (from Ready)
40010	2	uint32	R	Total rows	Total number of log points (from Ready)
40012	1	uint16	R	Row size	Registers per row = 2 + bits set in Data mask
40013	1	uint16	R	Data count	Rows valid in the current data window
40014	1	uint16	R	Window id	Id of the current window (increments per window)
40015	1	uint16	RW	Window ack	Write the read window id to advance; mismatches ignored
40016	6	-	R	Reserved	Reserved for future control fields; read as 0
40022	125	-	R	Data window	Data count packed rows; trailing registers zero

Table 6: Holding Registers - log download

State values (40001)

Value	Name	Description
0	Idle	No transfer; waiting for a start request

Value	Name	Description
1	Connecting	Establishing the Bluetooth® connection to the probe (includes waiting for Bluetooth® to be released and scanning for the probe)
2	Downloading	Reading the raw log from the probe
3	Decoding	Decoding the downloaded bytes into rows
4	Ready	Decoded log cached; schema and first window valid
5	Done	All rows have been acknowledged by the client
6	Error	Transfer failed (probe not found, connection, download or decode error)
7	Locked	Probe protected; the Gateway is not claimed by its owner
8	Busy	Bluetooth® busy with a higher-priority operation; request refused, retry later

Table 7: State register values

BLE state values (40002)

Value	Name	Description
0	Attempting	First connection attempt in progress
1	Retrying	A previous attempt failed; retrying
2	Failed	All connection attempts have failed
3	Successful	Connection established successfully
4	Lost	An established connection was lost
5	Closed	Connection was closed intentionally

Table 8: BLE state register values

THEye

7.9.6 Worked example

The values below were read from a real THEye Gateway. Register words are shown in hexadecimal; addresses are data-model addresses, and the offset sent on the wire is the address minus 30001 (Input Registers) or 40001 (Holding Registers).

1. Read the Gateway header — FC04, offset 0, 22 registers (addresses 30001–30022)

```
0034 0258 0003 0000 D83A DD9D 038C 5448
4579 6547 6174 6577 6179 3033 3843 0002
0064 0064 028E 000A 000A 0000
```

Address	Words	Field	Value
30003	0003 0000	Firmware version	3.0
30005	D83A DD9D 038C	<<1612>>	D8:3A:DD:9D:03:8C
30008	5448 … 3843	Name	"THEyeGateway038C"
30016	0002	Map version	2
30017	0064	Device block base	100
30018	0064	Device block stride	100
30020	000A	Number of devices	10 probes in range
30022	0000	Mode	0 = Defined devices list

Probe id therefore starts at address 30001 + 100 + id × 100.

2. Read the block of probe 0 — FC04, offset 100, 32 registers (addresses 30101–30132)

```
0034 00CD 0004 0000 DB3A 373D 3A80 5448
4579 6533 4138 3000 0000 0000 0000 6AB5
1E42 FFC6 0000 0023 0000 0000 0000 0000
0000 0D07 09DC 8000 8000 8000 012C 8000
```

Offset	Words	Field	Value
B+1	00CD	Model	205 (TH family)
B+4	DB3A 373D 3A80	ID	DB:3A:37:3D:3A:80
B+7	5448 … 3000	Name	"THEye3A80" (padded with 0)
B+15	6AB5 1E42	Timestamp	1790254658 = 2026-09-24 12:57:38 UTC
B+17	FFC6	RSSI	−58 dBm
B+18	0000 0023	Measure mask	bits 0, 1, 5: temperature, humidity, battery voltage

Offset	Words	Field	Value
B+20 / B+22	0000 0000	Current / past alarm mask	no alarm
B+25	0D07	Temperature	3335 / 100 = 33.35 °C
B+26	09DC	Humidity	2524 / 100 = 25.24 %RH
B+27	8000	Oxygen	absent (bit 2 not set)
B+30	012C	<<1613>>	300 / 100 = 3.00 V
B+31	8000	<<1614>>	absent (bit 6 not set)

3. Download the log of probe 0

Start — FC16, offset 3: DB3A 373D 3A80 (Target MAC), then FC16, offset 2: 0001 (Control = start).

Wait — FC03, offset 0, polled every 2 seconds. State goes 1 (Connecting) -> 2 (Downloading, Progress rising from 0 to 1000) -> 3 (Decoding) -> 4 (Ready).

Read the control block at Ready — FC03, offset 0, 21 registers (addresses 40001–40021):

```
0004 0005 0000 DB3A 373D 3A80 03E8 0023
000A 0003 8D8C 0005 0019 0001 0000 0000
0000 0000 0000 0000 0000
```

Address	Words	Field	Value
40001	0004	State	4 = Ready
40008	0023	Data mask	temperature, humidity, battery voltage
40009	000A	Period	10 s (sampling period configured on the probe)
40010	0003 8D8C	Total rows	232 844
40012	0005	Row size	5 = 2 + 3 bits set
40013	0019	Data count	25 rows in this window
40014	0001	Window id	1

Read the data window — FC03, offset 21, 125 registers (addresses 40022–40146). The first two rows:

```
6A91 9737 0A76 1469 012E
6A91 9741 0A76 146D 012E
```

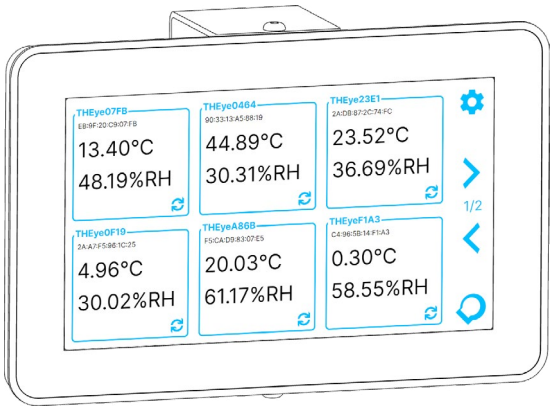
Row	Timestamp	Temperature	Humidity	Battery
0	6A91 9737 = 2026-08-28 14:12:07 UTC	0A76 = 26.78 °C	1469 = 52.25 %RH	012E = 3.02 V
1	6A91 9741 = 2026-08-28 14:12:17 UTC	0A76 = 26.78 °C	146D = 52.29 %RH	012E = 3.02 V

Acknowledge — FC16, offset 14: 0001 (the Window id just read). Reading the control block again returns Window id 0002 and Window ack 0001: the next 25 rows are ready in the data window.

Repeat until State = 5 (Done). This log holds 232 844 rows, so it takes 9 314 windows at 25 rows each. To stop early, write Control = 0 (FC16, offset 2: 0000).

8. THEye Display

The THEye Display is a wall-mounted screen used to display the latest recordings and alerts from nearby THEye probes. It offers real-time display of temperature, humidity, and alarms, with an intuitive interface for easy everyday use. In the event of an alarm, it can be acknowledged directly through the THEye Controller app.



8.1 Quick start guide

Thank you for choosing a THEye technology product: the THEye Display.

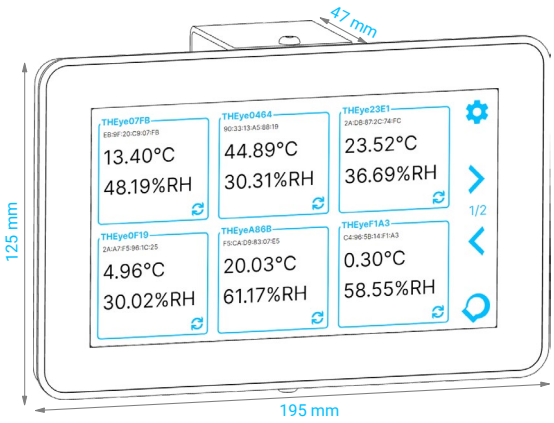
For quick installation, the following start-up guide is available:

- Open the Setup page with the gear icon
- Select the probes to display on the screen
- Organize your probes across pages for easy viewing

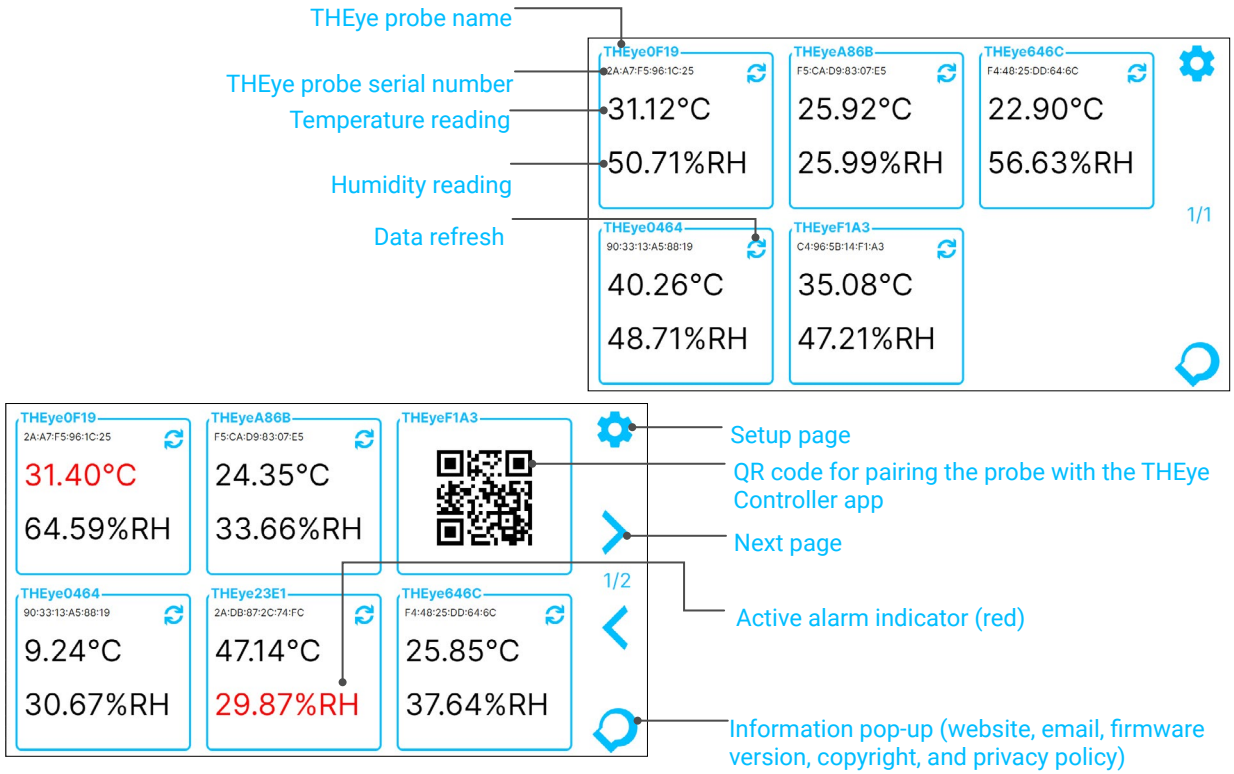
Before starting the THEye Display, make sure the following conditions are met:

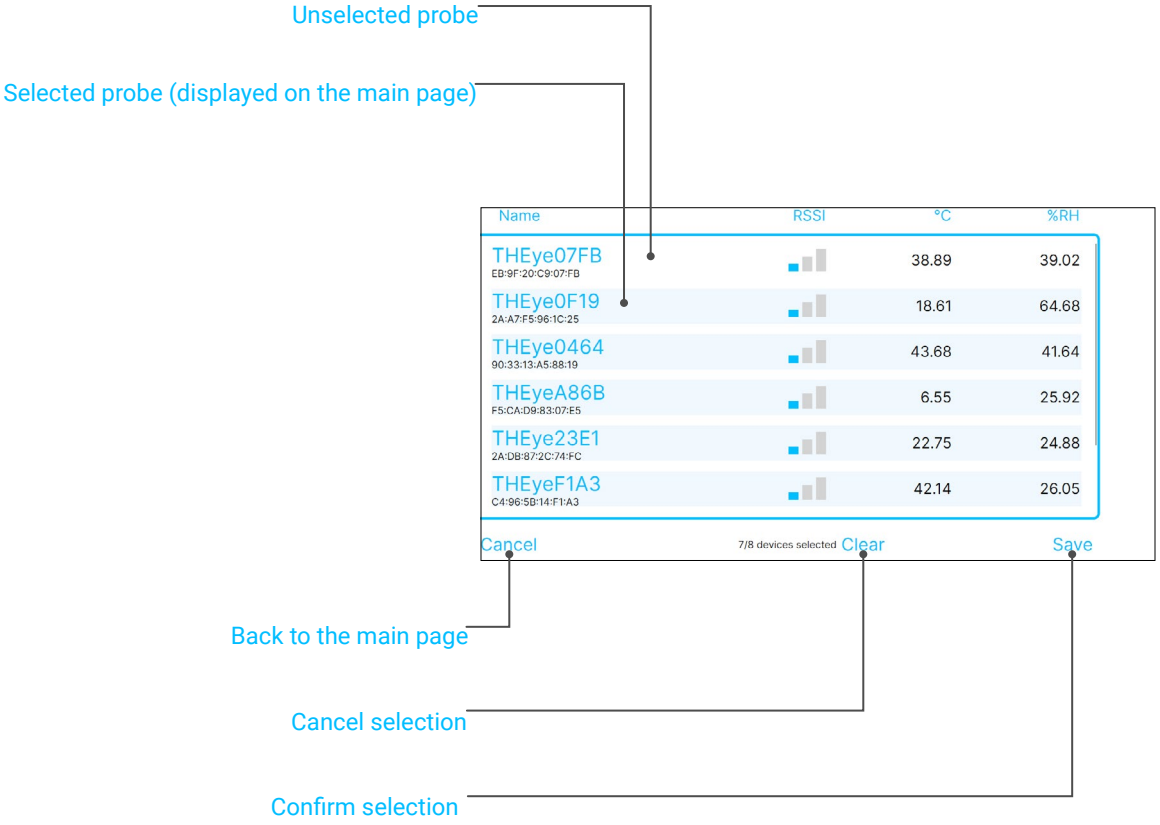
- The THEye Controller mobile app is installed on your smartphone
- Your THEye probes are correctly linked to your account
- The THEye Display is powered via USB-C (5 V, 3 A)

8.2 Dimensions



8.3 How it works





The refresh icon rotates while data is being retrieved. If no new data is received for 1 minute, the icon turns gray. If no data packet is received for 30 minutes, the entire display is grayed out and all values are replaced with a question mark ("?").

9. Alarms

9.1 Principle

Each probe checks that each of its temperature and humidity measurements is within the limits set by the user. As soon as a measurement crosses a limit, the probe switches to "alert" mode. The information then travels up the THEye ecosystem in three levels: the THEye probe, the THEye Gateway, then THEye Cloud.

9.2 Setting the limits

The lower and upper temperature and humidity limits are set for each probe individually, in the THEye Controller app, on the "Alarm" parameter page (see section 4.3.3).

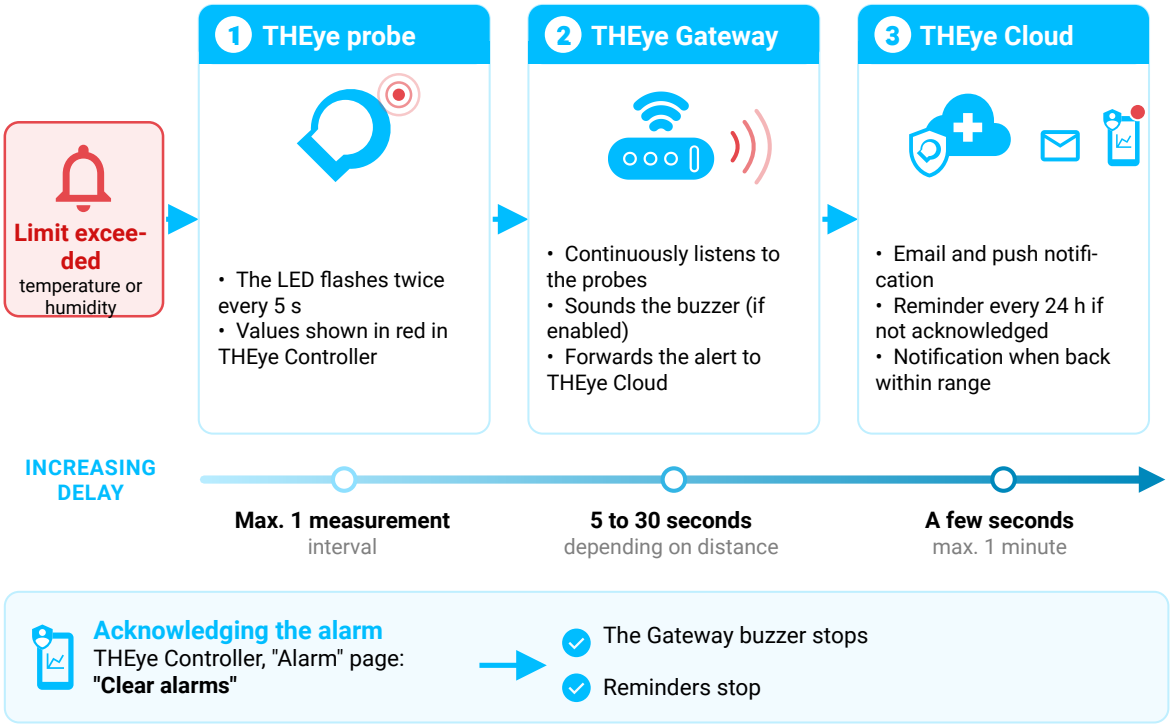


Setting the limits requires the "Full access" access level (see section 5.2).

9.3 Alarm chain

The table and diagram below summarize the path of an alarm, from the probe to the notifications.

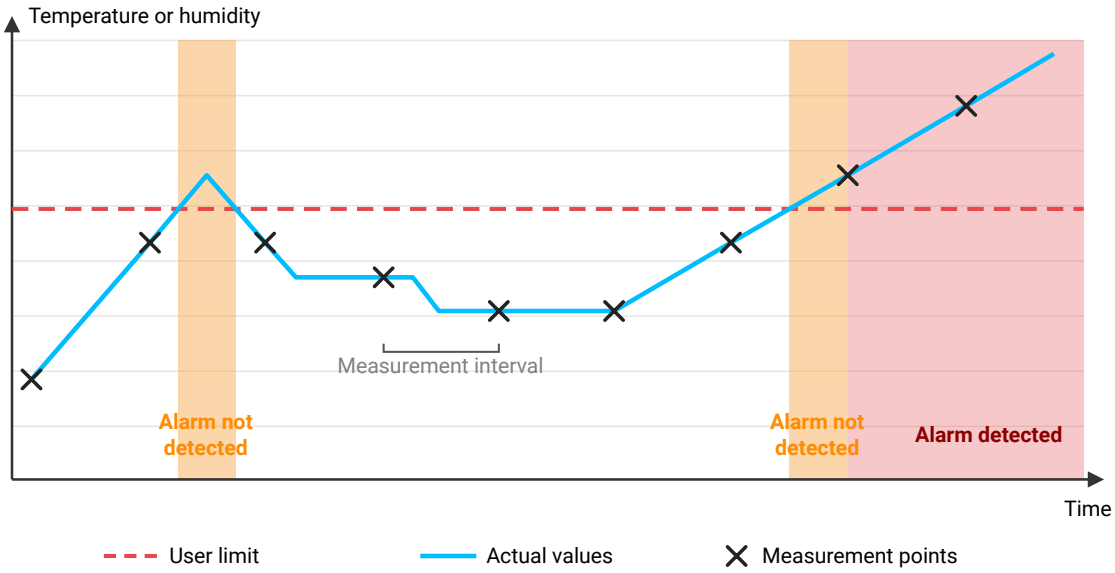
Level	Element	Response	Delay
1	THEye probe	The LED flashes	As soon as a logged measurement exceeds the limit, i.e. at the latest one measurement interval after the limit is exceeded
2	THEye Gateway	Detects the alert, sounds the buzzer (if enabled) and informs THEye Cloud	As soon as it receives the probe's Bluetooth® signal: in practice between 5 and 30 seconds depending on the distance
3	THEye Cloud	Sends an email and a push notification	A few seconds, up to 1 minute when the server is under heavy load



9.3.1 Level 1 – THEye probe

The probe only checks the measurements it records in its log. If a value exceeds the limit just after a measurement has been logged, the overrun is only detected at the next measurement: the delay can be as long as the selected measurement interval (see section 4.4.1).

A brief overrun that occurs between two measurements and ends before the next measurement is therefore not detected.



In alert mode:

- The probe LED flashes twice every 5 seconds (every second when a smartphone is connected to it).
- In the THEye Controller mobile app, the probe and its values are shown in red in the list of nearby devices.
- The words "Temperature" and/or "Relative humidity" flash red on the Device page of the mobile app.

Example: *with a 10-minute interval, the probe measures at 10:10, then at 10:20. If the temperature exceeds the limit at 10:12, the alert is triggered at 10:20. The delay can therefore be a full interval. If the temperature had dropped back below the limit before 10:20, no alert would be triggered.*

9.3.2 Level 2 – THEye Gateway

The THEye Gateway continuously listens to the Bluetooth® signal (advertisement) of the probes on its monitoring list. When a probe is in alert mode, the Gateway:

- sounds its buzzer, if enabled, according to its configuration (frequency and duration, see Alarm parameters in section 7.5.3). The beep repeats at regular intervals until the alarm is acknowledged in the app;
- forwards the information to THEye Cloud. To do so, the Gateway must be connected to the internet.

Alarm detection by the Gateway can also be disabled entirely in its parameters (see section 7.5.3).

Probes in "Protected" configuration: *a protected probe (see section 5.2) does not indicate its alert status in its Bluetooth® signal. The Gateway then only detects the alarm when it transfers the probe's data to THEye Cloud, i.e. according to the synchronization frequency.*

9.3.3 Level 3 – THEye Cloud

As soon as the Gateway reports an alarm, THEye Cloud immediately notifies the people concerned.

THEye Cloud notifications require a suitable subscription (see section 5.3). They also depend on the notification preferences set in the profile settings. The explanations below assume that all notifications are enabled.

- **New alarm:** an email is sent to the user account address, together with a push notification in the THEye Controller mobile app.
- **Unacknowledged alarm:** a reminder is sent at most every 24 hours.
- **Back within the tolerated range:** if the measurement returns within the limits before the alarm has been acknowledged, a push notification is sent.

Under normal conditions, notifications are sent within a few seconds. When the server is under heavy load, the delay can reach 1 minute.

Without a THEye Gateway, the alert stays local: only the probe LED and the THEye Controller app (within Bluetooth® range) show it. Exception: if a smartphone with an internet connection connects to a probe in alert via THEye Controller, the app forwards the information to THEye Cloud, which then sends the email and push notification just as with a Gateway.

9.4 Viewing alarms

- **THEye Controller:** the probe and its values are shown in red in the device list (see sections 4.3 and 7.5.1).
- **THEye Display:** the active alarm indicator is shown in red (see section 8.3).

9.5 Acknowledging an alarm

An alarm is acknowledged in THEye Controller, on the "Alarm" parameter page, with the "Clear alarms" button. Acknowledging the alarm also stops the Gateway buzzer.

Acknowledging an alarm requires the "Full access" or "Limited access" access level (see section 5.2).

10. Standards and safety

To ensure proper use of our technology, it is essential to observe the safety instructions given in this chapter. These recommendations are intended to prevent accidents, protect users and ensure the durability of the device. Please read them carefully and apply them systematically.

10.1 Safety

10.1.1 Children

THEye products must be kept out of the reach of children. Small items may constitute a choking hazard if swallowed. Please keep the product in a safe place when not in use.



Keep out of reach of children

10.1.2 Recycling

When disposing of the product, it is important to follow proper recycling practices. THEye products should either be returned to the supplier, or recycled in their entirety (without disassembly). They can be recycled together with household batteries or with smartphone or laptop-type accumulators and batteries. Collection points and recycling procedures vary according to the directives in force in the country concerned.

10.2 Materials and design

THEye technology has been developed to guarantee waterproofness, vibration resistance, food compatibility and data integrity. As a result, the product cannot be disassembled, in compliance with the requirements of directives 2012/19/EU #21 and 2006/66/EC art. 11. To minimize its environmental impact, the product has been designed with a reduced volume and weight.

10.2.1 Batteries

THEye TH-2, TH-2 ISO and TH-2 P probes incorporate a 3 V CR2450 button cell (540 mAh); the THEye TH-2 T-EXT incorporates a CR2477 button cell. Battery life is up to 8 years, depending on the measurement interval and the conditions of use (see section 3.1.2).

10.2.2 Plastic and resin

THEye products are manufactured from carefully selected materials to guarantee robustness, durability and compliance with the requirements of various applications.

- THEye shell: Made from PBT (Polybutylene Terephthalate) plastic, specifically Celanex 2401/MT Natural grade.
- Resin molded into the shell: two-component epoxy resin that complies with the European food contact regulations (EU) 10/2011 and 2020/1245.

10.3 IP68

THEye TH-2, THEye TH-2 ISO and THEye TH-2 P products comply with the IP68 protection rating. The THEye TH-2 T-EXT complies with the IP67 protection rating.

ID	Description
6	Dust-tight
8	Protected against continuous immersion beyond 1 m

10.4 Storage

THEye TH-2, TH-2 ISO and TH-2 P probes must be stored between -40 and +70 °C. The THEye TH-2 T-EXT probe must be stored between -40 and +85 °C.

The battery self-discharge is:

- <1%/year at 23 °C or below
- Approx. 7%/year at 70 °C

10.5 Working pressure

Experimental laboratory tests:

- Operating altitude: -400 to +5 500 m (relative to sea level)
- Working absolute pressure: 0.05 MPa to 2 MPa (20 bar)

Typical RH error depending on absolute air pressure:

- 0.05 MPa to 0.3 MPa (3 bar): -0.35%/MPa (-0.035%/bar)
- 0.3 MPa to 2 MPa (20 bar): -0.49%/MPa (-0.049%/bar)

10.6 EC Declaration of conformity

EC Declaration of Conformity

Document revision:	2.1 , 2025-02-25
Hereby we:	FiveCo
Address:	En Budron H11, 1052 Le Mont-sur-Lausanne, Switzerland
Product description:	Bluetooth data logger
Type designation(s):	THEye TH2
Trademark:	FiveCo, THEye

innovative engineering

The previous equipment is declared to be in conformity with the following directives and international standards.

From **Directive 2014/53/EU + (EU)2022/2380** Harmonised standards:		Radio equipment device (RED):
ETSI EN 300 328 V2.2.2		RED - 2.4GHz band data transmission
ETSI EN 301 489-17 V3.2.4 (2014/53/EU)		RED - Broadband data transmission
From **Directive 2014/30/EU** Harmonised standards:		Electromagnetic compatibility directive (EMC):
residential	industrial environment	
EN 61000-6-1:2019 **IEC 61000-6-1:2016**	**EN 61000-6-2:2019** **IEC 61000-6-2:2016** **EN IEC 61326-1:2021**	EMC – Immunity
EN 61000-6-3:2021 **IEC 61000-6-3:2020**	**EN 61000-6-4:2019** **IEC 61000-6-4:2018** **EN IEC 61326-1:2021**	EMC - Emission
EN IEC 62479 :2010		Human exposure to low power electronic EMF
EN IEC 62368-1:2020		Safety
Directive (EU)2017/2102 + (EU)2015/863		RoHS 3
(EC)1907/2006 REACH + SVHC 241		Prohibited substances list
- CR2450N battery contains 1,2 dimethoxyethane, and must be correctly recycled		
(EU)2023/1542		Battery waste
(EU)2019/1020 #39		Battery sealed
(EC)2006/66 article 18 + (EU)2018/849		EU Battery
(EU)2019/1021		POP
UN38.3		Lithium transport
IP68 (24 hours under 1.5 meter)		Water + dust protection

Frequency band: Bluetooth LE 2402MHz to 2480MHz ISM Band
Maximum RF output power: < 4dBm (Bluetooth)

The technical files are maintained at the company address listed above.

Persons responsible for making this declaration

Name	Greppin Xavier
Position/Title	CTO - FiveCo
Place of issue	Le Mont-sur Lausanne, Switzerland

10.7 EN12830

The THEye TH-2 ISO complies with the EN 12830 standard for the transport, storage and distribution of temperature-sensitive goods.

The ISO/IEC 17025:2017 certificate is provided upon request.

On the THEye TH-2 ISO, only the temperature measurement is calibrated and certified by Sensirion in accordance with ISO/IEC 17025:2017. Relative humidity has a standard tolerance, identical to the THEye TH-2.

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Review	Date	Author	Note
0.1	08.03.22	NS	Initial version
0.11	13.12.22	PHD	Release version
0.12	05.05.24	MB	Release version
0.13	09.12.24	MB	Release version, multilingual
0.14	20.12.24	MB	Chapter 9.1 Standards and safety chapter added
0.15	22.01.25	MB	Pictures of the smartphone app
0.16	16.07.25	MB	Chapters 9.4 & 9.5 added, Iconography updated
0.17	23.10.25	MB	Updated chapter 8 of the Gateway
0.18	08.01.26	MB	Add chapter 2.4 IoT platform and 8.1 Quick start guide for THEye Gateway Add info chapter 5.3.3 about measurement parameters
0.19	26.03.26	MB	Chapter 5.2 Battery Symbol Description Updated Chapter 5.3.1 Addition of Temperature Unit Selection Chapter 5.3.2 New App Screenshot Chapter 5.3.3 New App Screenshots
0.20	15.07.26	MB	Chapters 3.1.6 & 3.1.7 added Chapter 7.7 Modbus TCP Completely revised Chapter 8.0 THEye Display added
0.21	29.10.26	MB	Chapter 7 THEye Gateway updated Chapter 5.3 Subscriptions and prices updated Chapter 6.1.1 Release: data access and recommended procedure added
0.22	30.10.26	MB	Chapter 9 Alarms added (Standards and safety becomes chapter 10) Screenshot callouts redrawn with horizontal and right-angled leader lines