USER MANUAL

Fridge-tag 3

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User Manual Fridge-tag 3

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Berlinger & Co. AG

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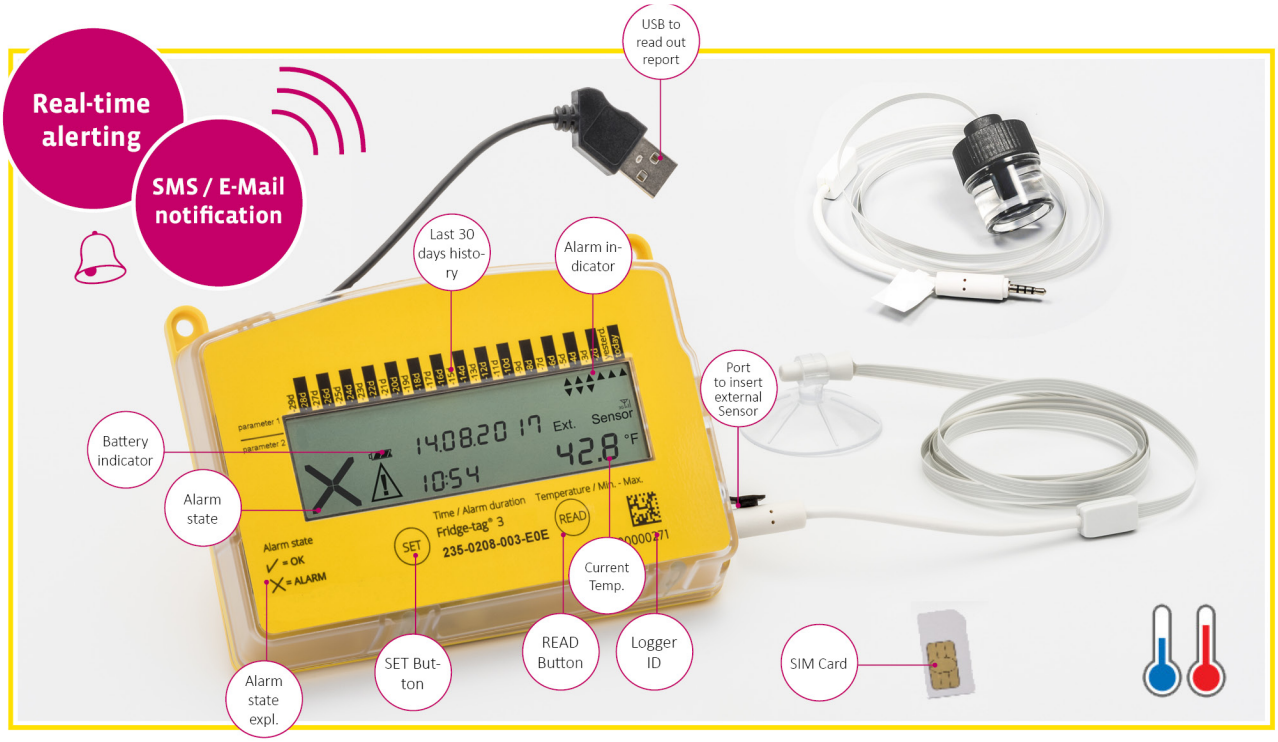
1. Home

Berlinger Fridge-tag 3



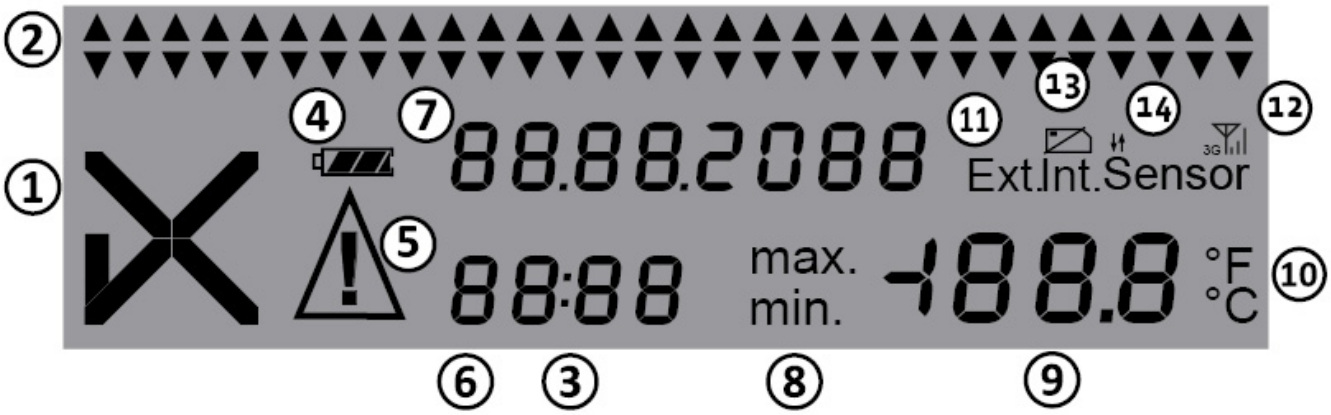
Real-time alerts when it matters most
From anywhere to everywhere

Thanks to a programmable built-in cellular module, it enables operators all around the world to receive automatically generated real-time alerting or warning messages by SMS. Additionally it can be easily integrated into a web based server application.
In case of a temperature deviations, the Fridge-tag 3 sends immediately a notification by SMS to predefined person(s) in charge. A fully comprehensive emergency plan can now be activated in order to prevent damage of the goods.

- Built-in cellular module
- Real-time alert
- Notification by SMS and E-Mail

Technical Specification
Product Information Overview

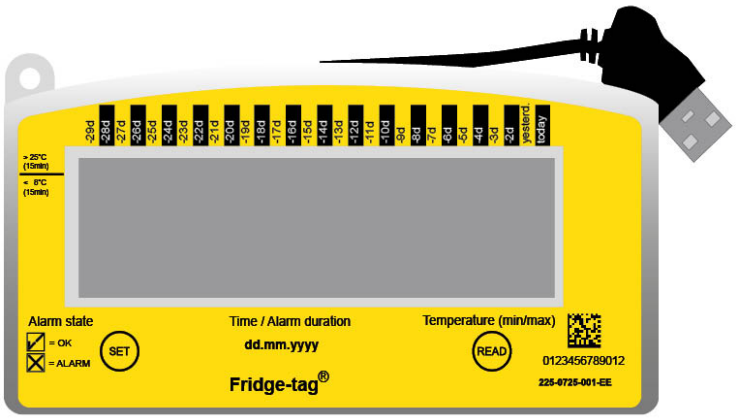
2. Display explanations



1. OK symbol ✓ or alarm symbol ✕
2. Daily HIGH/LOW alarm indicators ▲▼ (showing the history of the last 30 days)
3. Operation indicator (colon is flashing)
4. Battery indicator (indicates the remaining capacity of the battery)
5. Additional warning symbol ⚠ . Indicates that one or more alarms are not confirmed.
6. Time, duration and text display
7. Date and text display
8. Display of measured minimum/maximum temperature
9. Temperature display
10. Display of the temperature measurement unit (°F/°C)
11. Display of the activated sensor:
    Int. = internal sensor
    Ext. = external sensor (cable with temperature sensor)
12. Cellular signal strength
13. SIM card indicator (displayed = no SIM card inserted)
14. Data transfer indicator

3. State of delivery / sleep mode

The Fridge-tag is shipped in sleep mode.

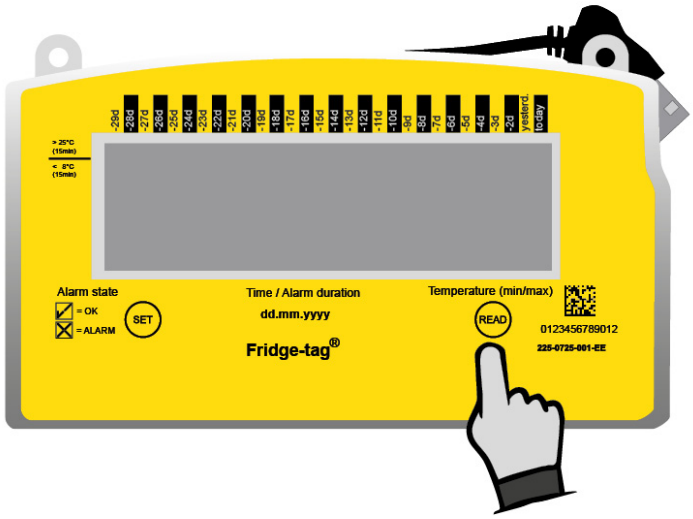


The display (LCD) is blank.

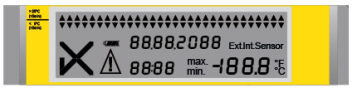
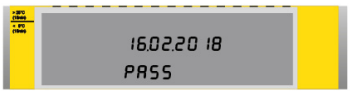
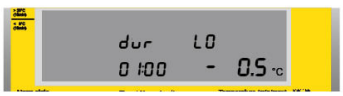
4. Read out information prior to activation (in sleep mode)

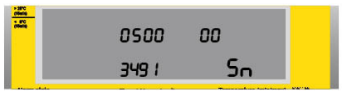
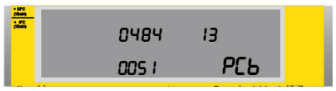
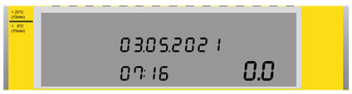
The following page shows which information will be indicated on the screen upon successive READ button pressings while in sleep mode.

Note: After approx. 60 seconds without to press any button of the Fridge-tag the devices goes back into sleep mode; the display is blank again. Start from the beginning.



Press repeatedly READ to gather information.

After 1st pressing of READ		Display test: all segments activated
After 2nd pressing of READ		Indication of date and production test result: 16 February 2018/PASS (quality check passed)
After 3rd pressing of READ		Indicaton of the Network configuration Status: (✓) configured (✗) not configured (go to chapter Initial device configuration).
After 4th pressing of READ		Indication of the current temperature and which sensor is activated (internal/external). Display shows —.-°C if external sensor is not connected.
After 5th pressing of READ		Indication of configuration ID (e.g. 1234)
After 6th pressing of READ		Indication of upper alarm settings. Example shows duration and temperature limits: 10 hours, >+8°C, high
After 7th pressing of READ		Indication of lower alarm settings. Example shows duration and temperature limits: 1 hour, <–0.5°C, low

After 8th pressing of READ		Serial number of the device
After 9th pressing of READ		PCb number (manufacturer information)
After 10th pressing of READ		Battery power: 3 bars = full (>70%) 2 bars = half-full (30–70%) 1 bar = low (0–30%)** **Device should be recharged.
After 11th pressing of READ		Disable user clock adjust. For more information, please see chapter Activation process
After 12th pressing of READ		The display is blank again.

5. Inserting a SIM card

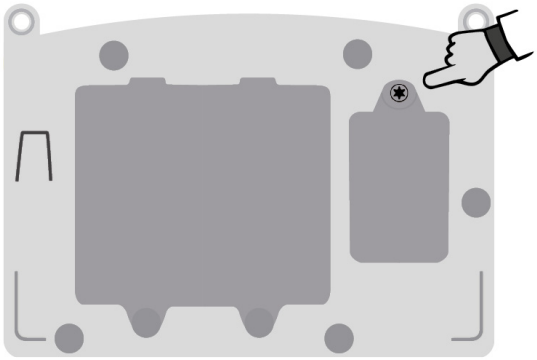
Note: If using the device with a Datamanagement Software (Berlinger SmartView, etc.), make sure that the system is set up before you go on with the next steps.

SIM card specifications

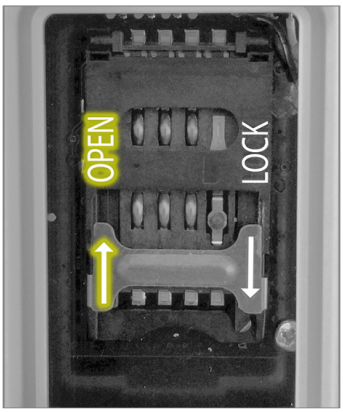
Dimension:	Mini(classic) SIM, 25 mm, 15 mm, 0,76 mm
Telephone number:	If the SIM card is already preinstalled the number is printed on the label.
PIN-Code:	If the SIM card is already preinstalled, no PIN code is necessary.

5.1. Installation of the SIM card

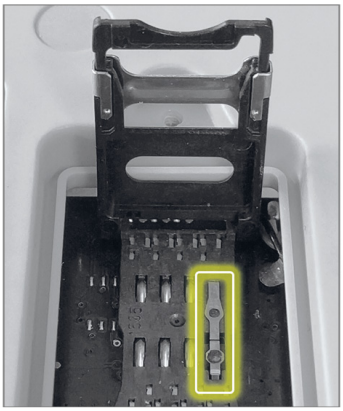
Note: Only necessary if the SIM card is not preinstalled at factory.



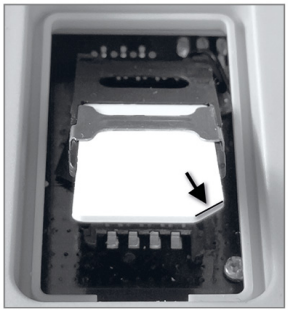
Remove cover
Remove the SIM card cover with a screwdriver. (Screwdriver (Torx) is not included.)

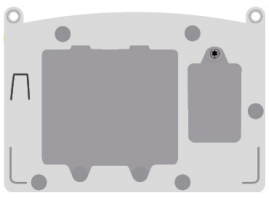


Open metal frame
Slide the metal frame upwards (in the direction OPEN) indicated by the arrow.

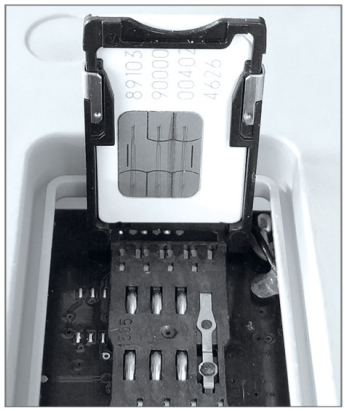
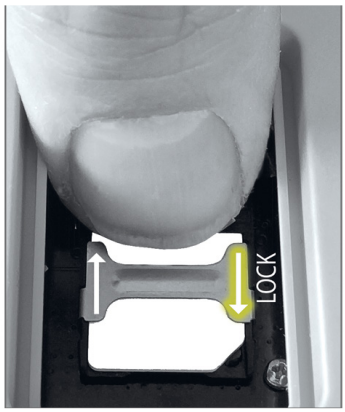
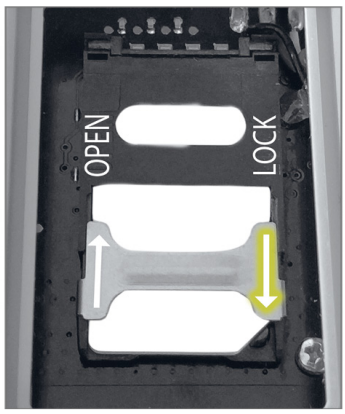
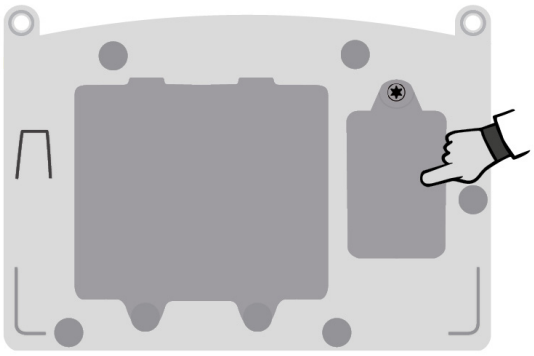


Lift SIM card insert tray
After opening the metal frame lift SIM card tray upwards.
Note: Pay attention that this pin is not damaged.





Insert SIM card
Insert the SIM card as shown left. The diagonal edge of the SIM card must be located on the bottom right if device is placed as shown on the right.

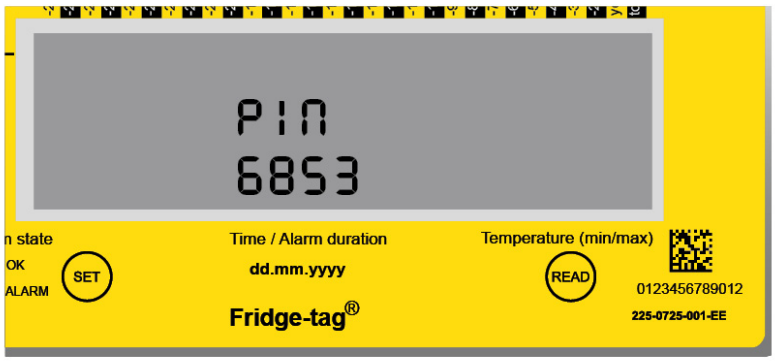
	**SIM card insert tray with properly inserted SIM card** SIM card chip (contacts) facing downwards.
	**Close insert tray** Press the SIM card insert tray down, hold and slide the metal frame forwards to lock the SIM card insert tray. Slide the metal frame in the arrow direction (LOCK).
	**SIM card correctly inserted** The SIM card tray is locked correctly when the SIM card insert tray can no longer be opened.
	**Close SIM card cover** Close the SIM card cover with the screwdriver.

5.2. Enter the SIM card pin code

Only required if the SIM card is locked with a PIN code (secret number).
Once the new SIM card is inserted, the following display appears.
If it does not appear, press SET for 3 seconds.
Note: Not valid for all configurations.

	Enter the first digit of the PIN code. Digit 1 lashes and is ready for input. The PIN code is always 4 digits long.
	The digits are changed by pressing the READ button. The SET button confirms the input, the flashing display moves to the next digit.

As soon as all 4 digits have been set and match the PIN from the mobile provider, press the SET and READ buttons simultaneously to save the password.



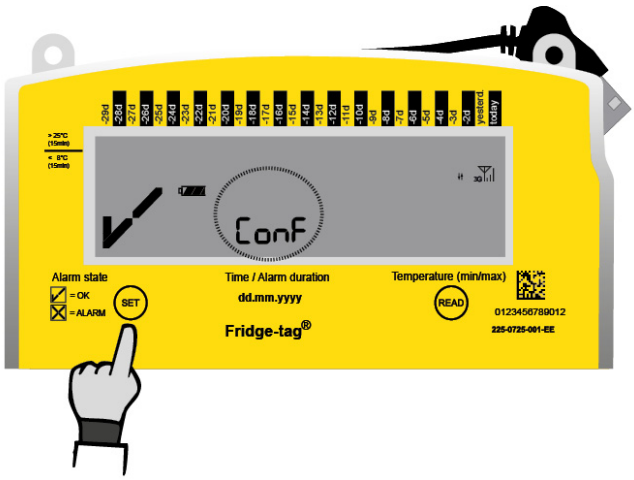
Press SET and READ simultaneously.

Note: The SIM card will be locked after three (3) incorrect PIN entries. The SIM card can only be unlocked with a mobile phone using a matching PUK code. The SIM card cannot be unlocked with the Fridge-tag 3.

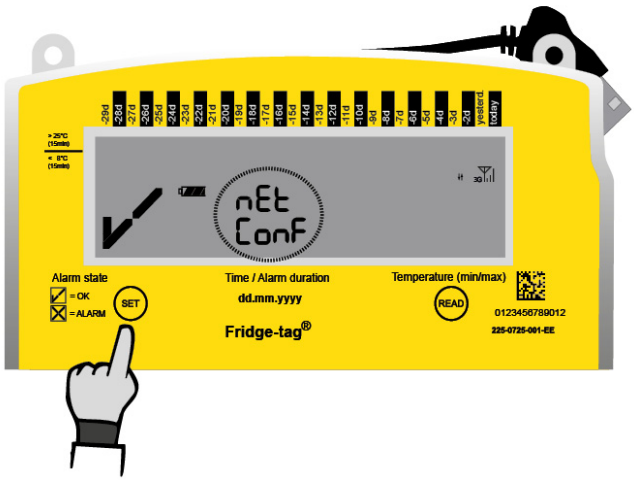
6. Initial device configuration

Note: Only necessary if device not configured, see chapter Read out information prior to activation, 3rd pressing of Read.

Standalone Version



Cloud Version



Press SET for 3 seconds to start the configuration.

Make sure that the network signal strength is displayed in the top right. The Conf or nEt ConF display flashes while the configurations files are downloading. This process can take several minutes.
Note: Without signal reception no configuration takes place. After successful configuration, the display shows an OK symbol (figure below) for 30 seconds then the display goes blank and the screen is left empty. The initial configuration is complete.

Error 2 and Error 3 appear if an error occurs during configuration. Pressing the SET button for 3 seconds restarts the configuration. Device has a 1 hour waiting period before you can restart the configuration.
Note: Error 2 or Error 3 depend on data transfer, e.g. the SIM card has no data plan. If the error

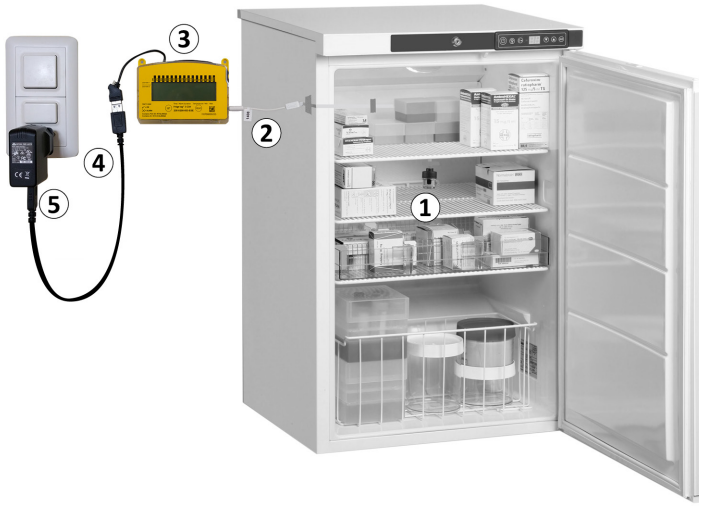
persists, please contact our support team.

7. Placing the external sensor

Placing the Fridge-tag with an external sensor

Two hours before activating the Fridge-tag, the external sensor must be placed in its predetermined location. It is recommended and important to place the external sensor in the center of the refrigerator for an optimal temperature observation and to avoid any incorrect measurements when starting the device.

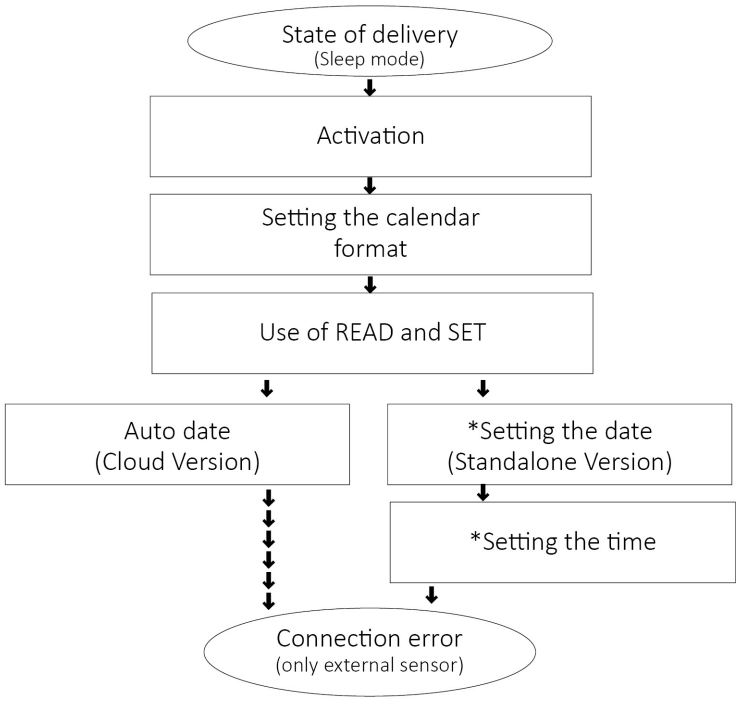
For the right positioning of the external sensor within the fridge, please follow the instructions of WHO, CDC or any other governmental requirements of your country.



1. External Sensor
2. Flat cable
3. Fridge-tag 3
4. USB powering
5. Charging at an outlet

8. Activation process

Overview: sequences of activation



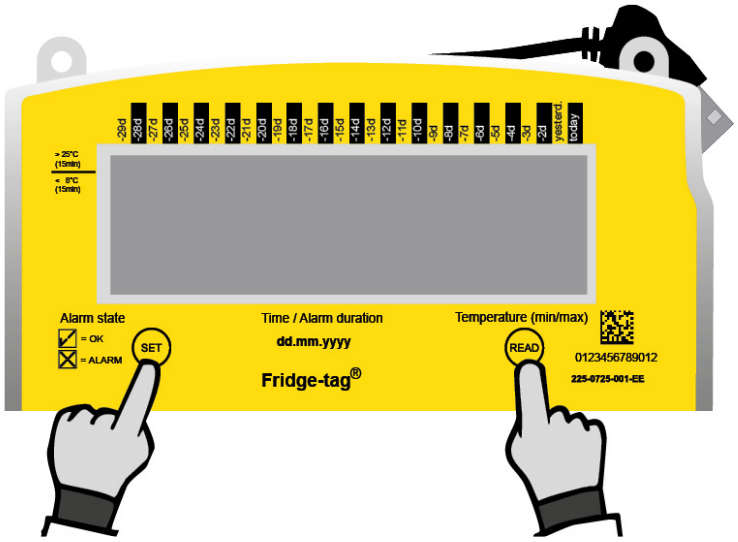
Note: As long as the activation process has not been completed – after approx. 60 seconds without any button operation – the device will go back into sleep mode. The activation process has to be started from the beginning.

If you want to read or change settings (e.g. change °F to °C) after the activation has been completed, proceed as described in Chapter “Read and change settings / How to correct setting mistakes”.

***Setting the date** and ***Setting the time:** If “Disable User Clock Adjust” in the configuration is enabled point “Setting the date” and “Setting the time” are skipped upon actviation.

8.1. Activation of the device

To activate the device, press the SET and the READ button simultaneously during at least 3 seconds.



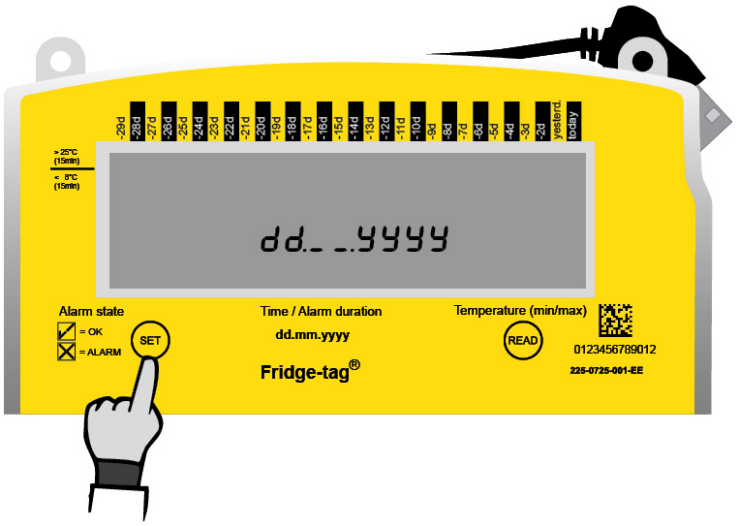
Note: Once the device is activated, it cannot be deactivated anymore.

If you want to activate the device and the following display „un def“ appears, the device is not configured. Please go to the Initial device configuration and start the configuration again.

Activation has been successful completed when the following indication appears on the screen. Please go on with the next steps to finish the activation process of your device.

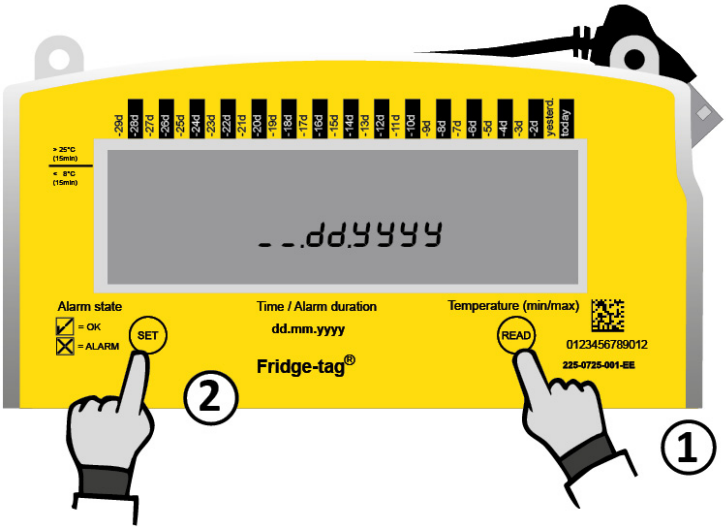
8.2. Setting the calendar format

Option 1: Setting the calender format to: dd.mm.yyyy



Press SET to save the calendar format.

Option 2: Setting the calender format to: mm.dd.yyyy



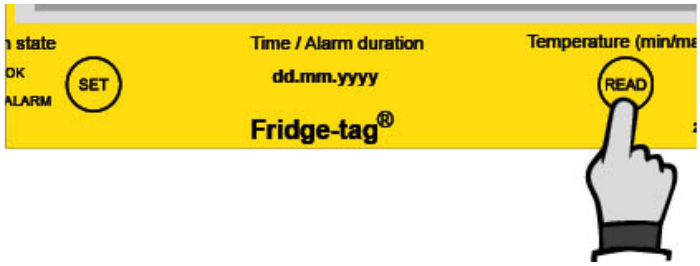
1. Press READ to change the calendar format.
2. Then press SET to save the calendar format.

After setting the calendar format, the first digit of the date will start flashing. Standalone Version only or in some configurations.

8.3. Using the READ and the SET buttons

READ button

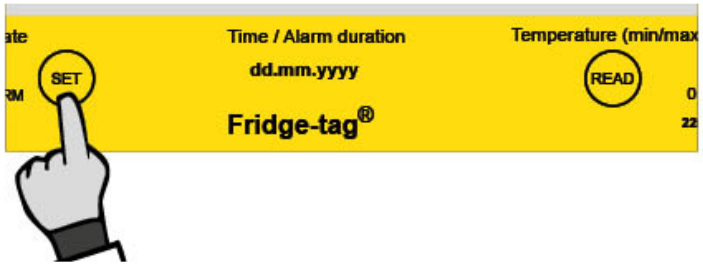
The READ button is used to adjust the numbers. Each time you press the READ button, the number in the flashing digit will increase by 1. If you press READ more than necessary, continue pressing the READ button until you obtain the desired number.



Press READ to adjust the number

SET button

The SET button is used to save the number. After pressing the SET button, the next digit will start flashing.



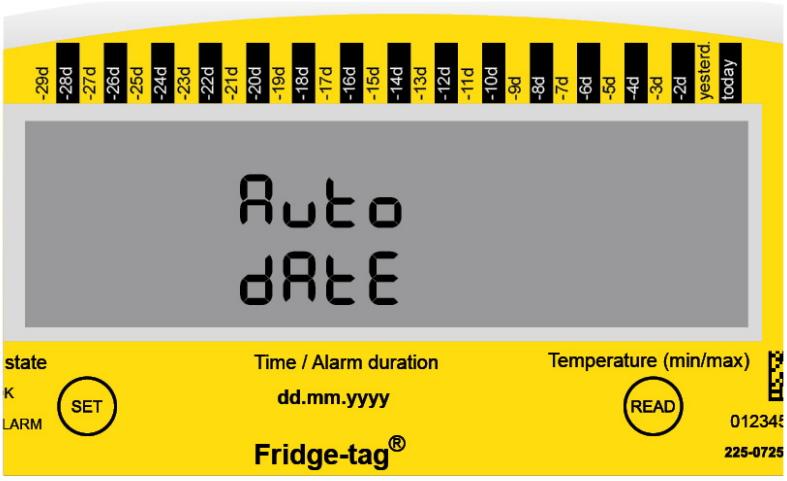
Press SET to confirm.

Note: If SET is pressed mistakenly, continue with the setup instructions. The chapter Read and change settings / How to correct setting mistakes describes how to rectify the error.

8.4. Auto date

Cloud Version

If you have ordered the Cloud Version the following display appears. Go on to this chapter



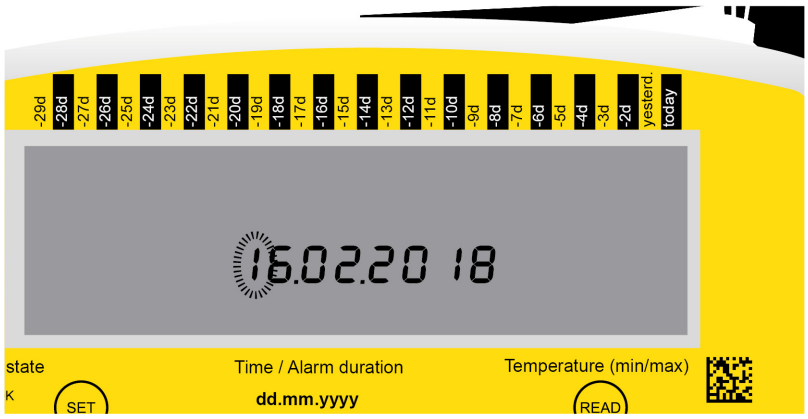
Standalone Version

If you use the Standalone Version, after setting the calendar format, the first digit of the date will start flashing. Go on with this chapter setting the date and time.

8.5. Setting the date

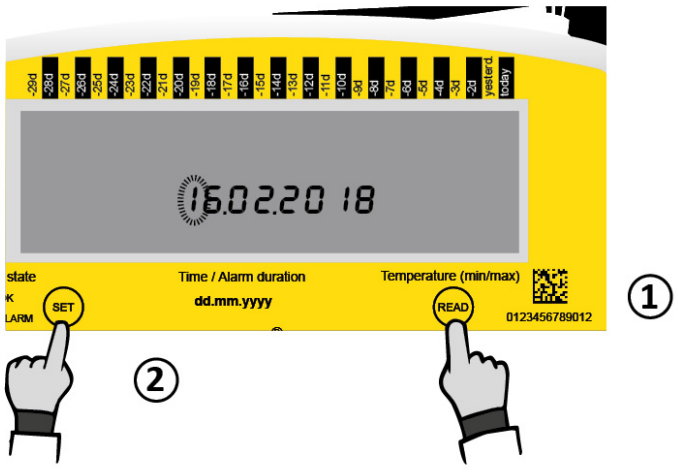
Set date / time on server

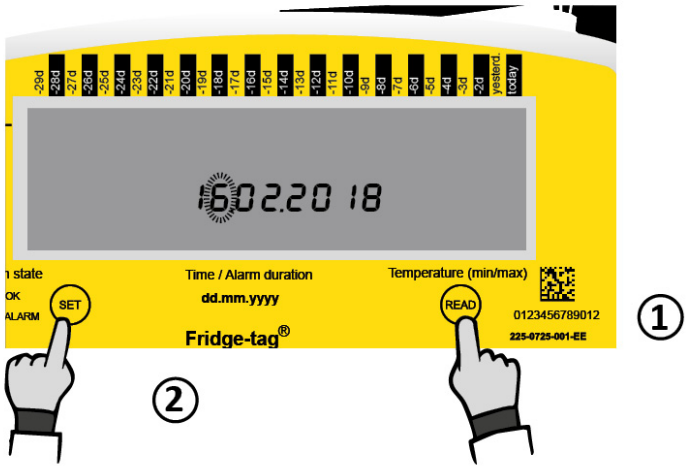
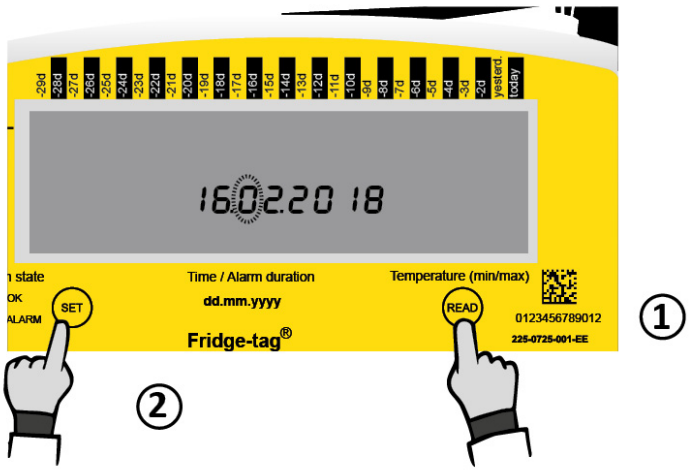
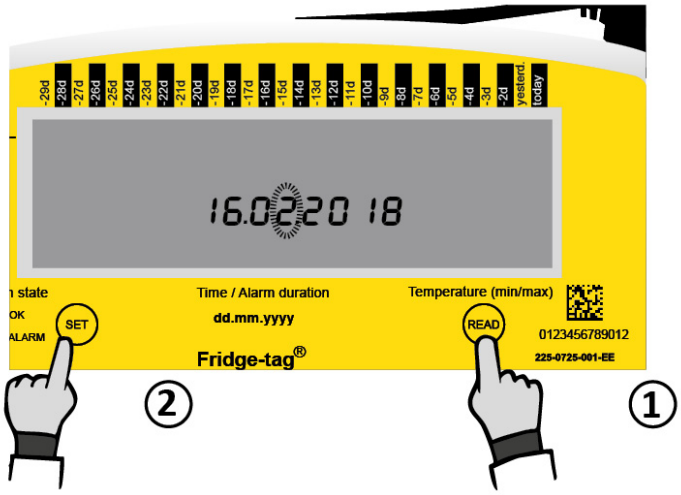
Depending on the configuration of the device the date and time are set via server and auto date will appear on the screen. Go on with this chapter connection error.
Setting the date and time manually is disabled.

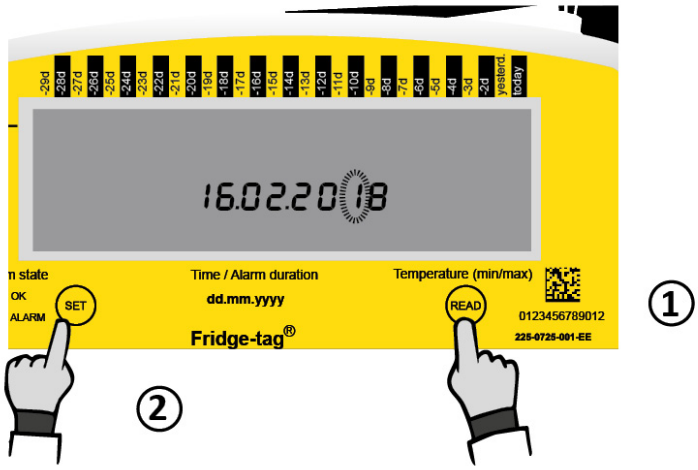
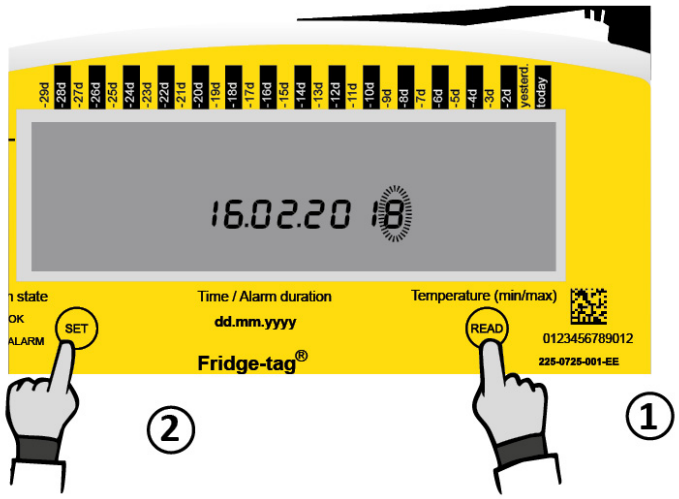


Set date manual (Standalone Version)

The following example shows how to set the date to:
16 February 2018 (16.02.2018) in European format.

The 1st digit is flashing.		1. Press READ until “1” appears as the first digit. 2. Press SET to save.

The 2nd digit is flashing.		1. Press READ until “6” appears as the second digit. 2. Press SET to save
The 3rd digit is flashing.		1. Press READ until “0” appears as the third digit. 2. Press SET to save.
The 4th digit is flashing.		1. Press READ until “2” appears as the fourth digit. 2. Press SET to save. **Note:** The fifth and the sixth digit are set automatically.

The 7th digit is flashing.		1. Press READ until “1” appears as the seventh digit. 2. Press SET to save.
The 8th digit is flashing.		1. Press READ until “8” appears as the eighth digit. 2. Press SET to save.

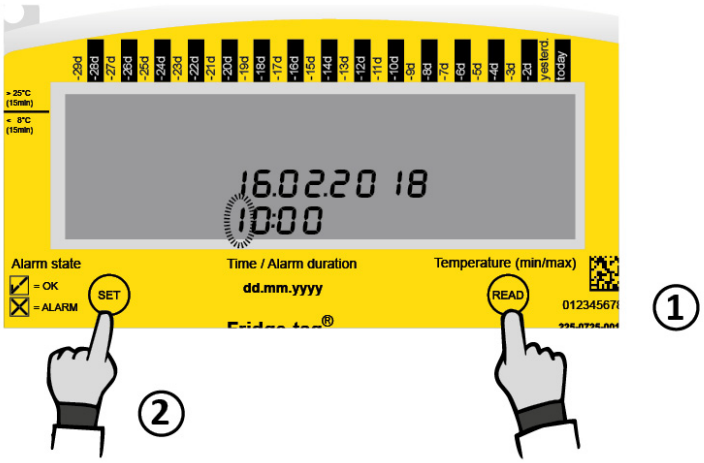
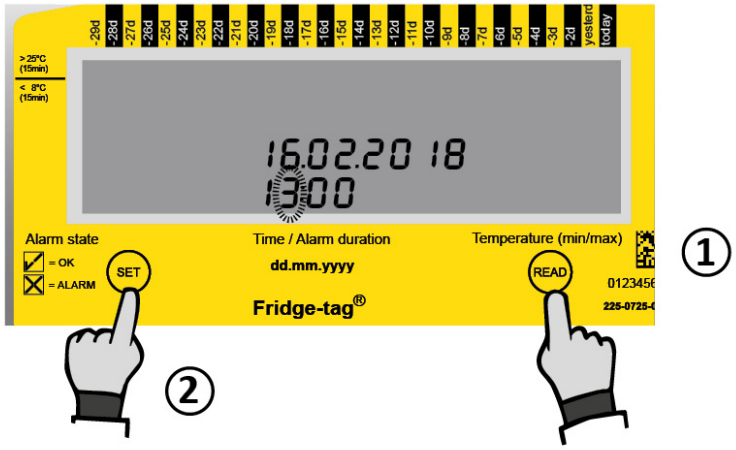
The date is now set to: 16.02.2018.

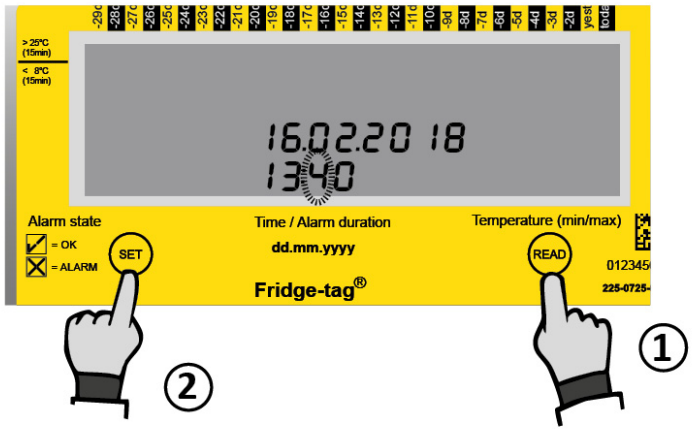
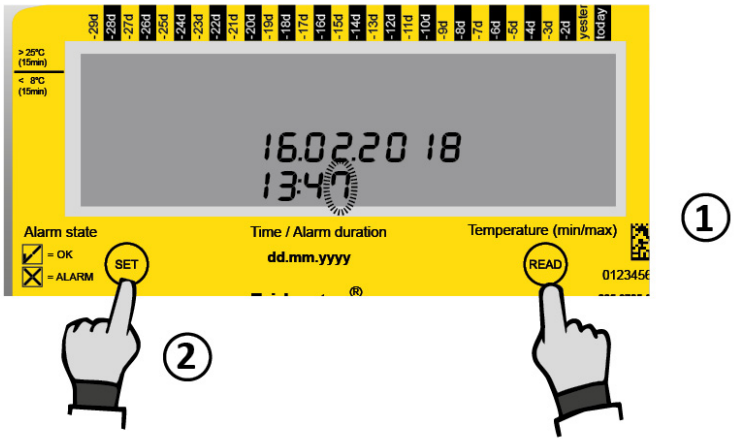
Note: After setting the date, the first digit of the time will start flashing.

8.6. Setting the time

This example shows how to set the time to 13:47.

Note: The clock operates as a 24-hour clock
(e.g. 1:47 pm = 13:47).

The 1st digit is flashing:		1. Press READ until “1” appears as the first digit. 2. Press SET to save.
The 2nd digit is flashing.		1. Press READ until “3” appears as the second digit. 2. Press SET to save.

The 3rd digit is flashing.		1. Press READ until “4” appears as the third digit. 2. Press SET to save.
The 4th digit is flashing.		1. Press READ until “7” appears as the fourth digit. 2. Press SET to save.

The time is now set to 13:47.

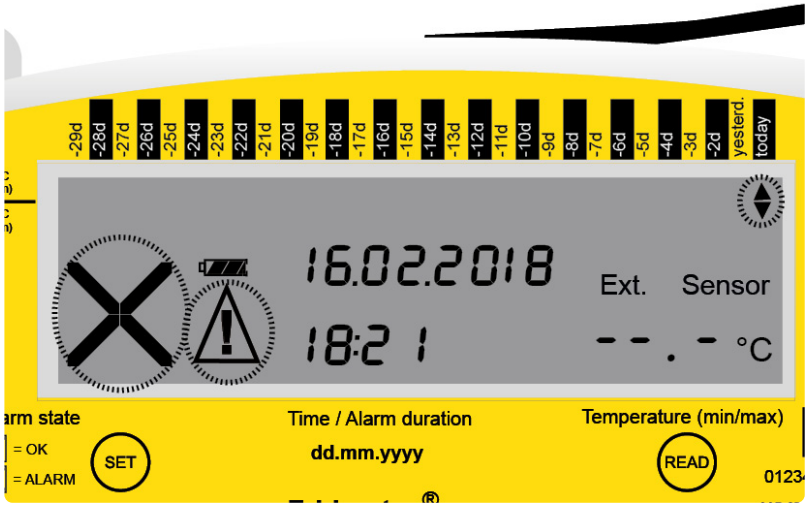
As soon as the last digit of the time setting is confirmed, the activation is completed. Connect the device with the external sensor. During max. 1 minute after activation no temperature is displayed on the screen.

8.7. Connection error (external sensor only)

After 10 minutes (factory standard) without a connection between the device and the external sensor the following display appears and:

- The buzzer will beep twice at intervals of three minutes for a maximum of 168 hours (7 days).
- The whole display starts blinking.
- Any button pressed will stop the display from blinking.
- The buzzer only stops if the connection error is corrected. If the error still exists, the buzzer continuously beeps at a three-minute interval for 168 hours (7 days).

Display status: external sensor error



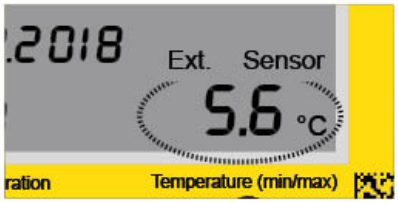
How to fix the connection error

Please check the following two points:

1. If the external sensors properly connected with the device?
2. Does the external sensor cable have any defects?

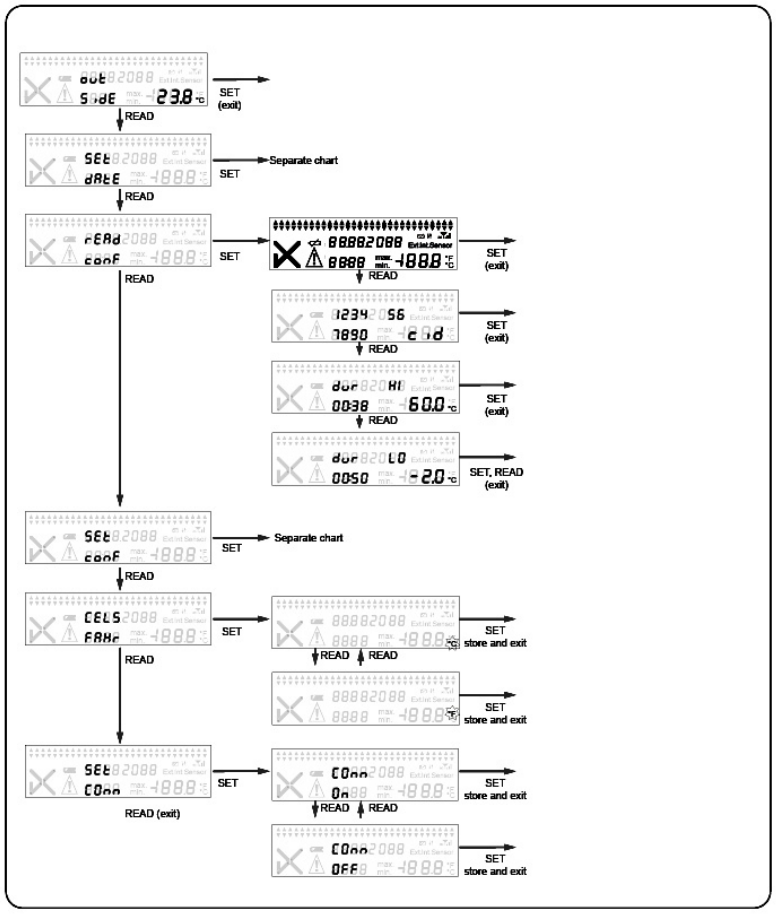
Note: As soon as the error(s) have been cleared, the measuring will continue and the connection error buzzer stops to beep automatically. During max. 1 minute after the connection no temperature is displayed on the screen.

During a connection error no data will be recorded.



9. Read and change settings / How to correct setting mistakes

Overview: menu



Note: If you scroll through the menu and you reach the display of the measuring mode, you need to restart from the beginning by accessing the menu.
In order to adjust more than one setting (e.g. time and Celsius to Fahrenheit) you must complete each change and return to menu mode for the 2nd change.

9.1. Initial menu (read and change settings)

To change the date format, the date, the time, the temperature measurement unit or the alarm settings or to read the preset alarm limits please proceed as follows:

1. Press and hold SET …
2. … then press READ …
3. … then release both buttons simultaneously.

Note: Date and time can only be modified in the Standalone Version. Using the Cloud Version log in – into your Datamanagementsystem (SmartView, etc.) to make any changes.

OUTSIDE (external sensor) is now displayed on the screen.
You entered the menu mode and may choose which entry to see or change.

You can access the following 4 menus:

OUTSIDE (external sensor): first screen, shows the temperature measured with the internal sensor of the Fridge-tag 3 (normal ambient temperature).
Press READ once to get to SET DATE.

1. SET DATE: change date and/or time settings
2. READ CONF: read the alarm settings
3. CELS FAHR: change the temperature unit
4. SET CONN: de-/activate Flight Mode

Use the READ button to scroll through the menu.
Use the SET button to access the corresponding menu.

Access the menu “SET DATE”

The display shows OUTSIDE. Press READ until the display shows SET DATE.
Then follow the steps as described in Setting the date and Setting the time.
Note: Time and date adjustments have no effect on the alarm records. Adjustments can only be made for date and time settings and for changing the temperature measurement unit. Once the device is activated, it cannot be stopped anymore. The number of adjustments during the same day is unlimited. After an adjustment has been made, the Fridge-tag 3 will be locked for 24 hours from the following midnight (e.g. changes on 15 September., device locked from 00:01 am on the 16 September until 00:01 am on the 17 September). This is for security reasons.

Access the menu “READ CONF”

The display shows OUTSIDE (external sensor). Press READ until the display shows READ CONF. Then press SET to access the menu to read the current alarm configurations. First the display check appears. Then press READ repeatedly to scroll through the preset alarm parameters.

Access the menu “CELS FAHR”

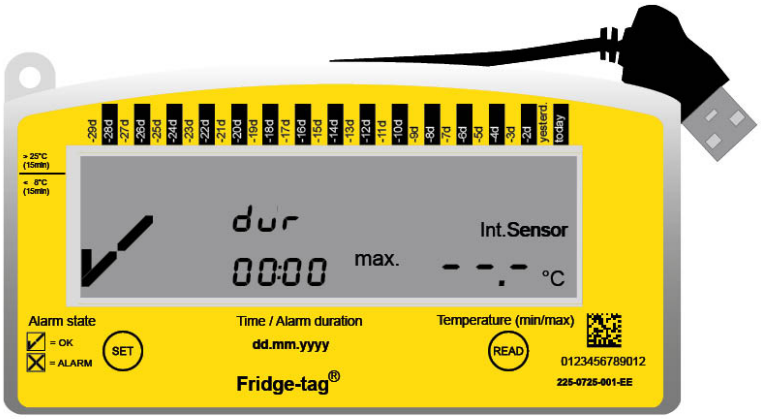
The display shows SET DATE. Press READ until the display shows CELS FAHR. Then press SET to access the menu to change the temperature measurement unit. To change the measurement unit (Celsius/Fahrenheit) press READ until the display shows the desired sign (°C/°F). Press SET to confirm the measurement unit.

Access the menu “SET CONN”

The display shows OUTSIDE (external sensor). Press READ until the display shows „SET CONN“. Press SET to get to the flight mode status menu (active/inactive). To change the flight mode (active/inactive), press READ until the desired unit active/inactive appears on the display and then press SET to confirm this. In flight mode, the device does not react on SMS or send SMS, nor sends any data.

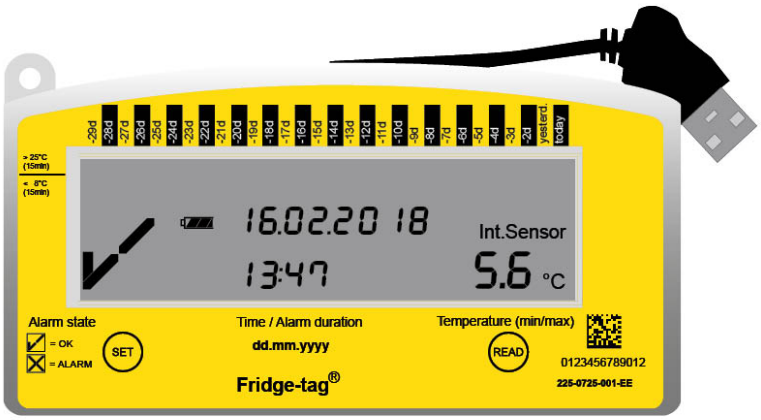
10. Screen displays during measurement mode

Indication for max. 1 minute after completing the activation or after connecting the device with the external sensor. For a maximum of 1 minute no temperature is displayed on the screen, indicated by —.-.



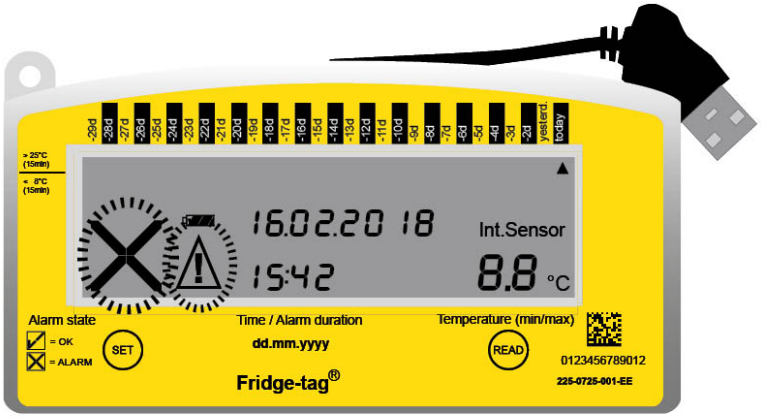
Example OK display – during measurement

Once the device is fully activated the OK symbol ✔ , the current temperature reading, the time and the date will be displayed on the screen. The Fridge-tag will also indicate whether the measuring is made with an internal sensor or an external sensor. The OK symbol ✔ is shown during normal operation as long as no alarms have been recorded. The temperature and time conditions were within the preset alarm limits.



Example alarm display – during measurement

If the preset alarm limits are exceeded, the following information will be displayed on the screen:



- ✓ (OK symbol) will be replaced by ✕ (alarm symbol)
- An additional alarm indicator ▲ will be indicated in the upper display area to show which alarm limit has been exceed and on which day.
- In addition to the alarm symbol ✕ the warning symbol ⚠ will appear next to it.

11. Readout and settings options via SMS

These chapters are only valid in the Standalone Version:

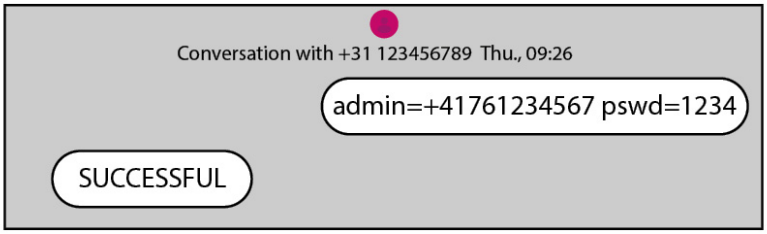
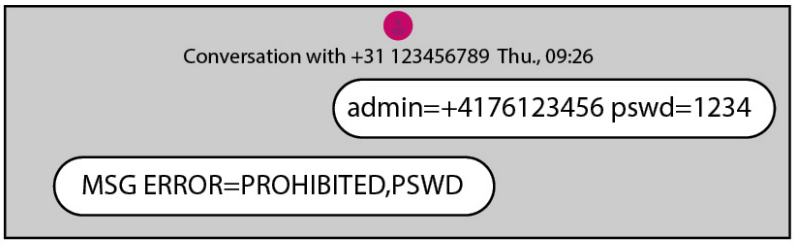
- Assigning administrator rights
- Adding alarm recipient
- Delete alarm recipients
- Changing alarm limits via SMS
- Weak battery alarm status
- SMS commands and error messages
- Example of an alarm notification

These chapters are valid for Cloud and Standalone Version:

- Status query
- Confirmation of alarm status

11.1. Assigning administrator rights

Set admin rights: the actual administrator sends a SMS with the content “admin=+41761234567 (example mobile number of new administrator) followed by a space and pswd=1234” (example password) to the device.

	The change of the administrator state, will be confirmed by the device with “SUCCESSFUL”
	Error Message when entering a wrong Password MSG ERROR= “PROHIBITED, PSWD”

Note: Only administrators have the right to set new alarm settings and add/remove new recipients for alarm notifications.

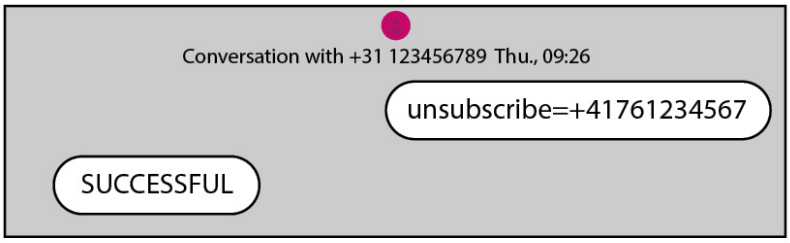
11.2. Adding alarm recipients

Admin sends a SMS with the command “subscribe=+41761234567” (mobile number of a new recipient to the device). The device confirms with “SUCCESSFUL”.

Note: A total of 5 different alarm recipients can be assigned. A separate SMS must be sent for each alarm recipient.

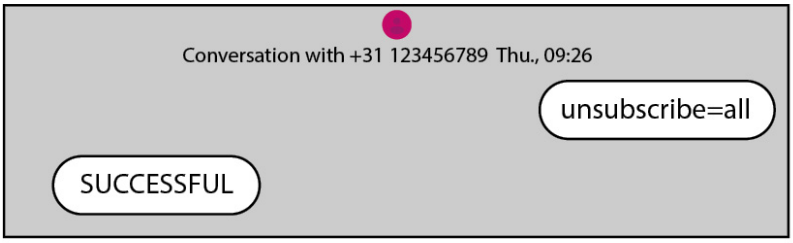
11.3. Delete alarm recipients

Admin sends a SMS with the command “unsubscribe=+41761234567” (example mobile number of the removing recipient) to the device. The device confirms with “SUCCESSFUL”.



Delete all alarm receipients

Admin sends a SMS with the command “unsubscribe=all”. The device confirms with “SUCCESSFUL”.

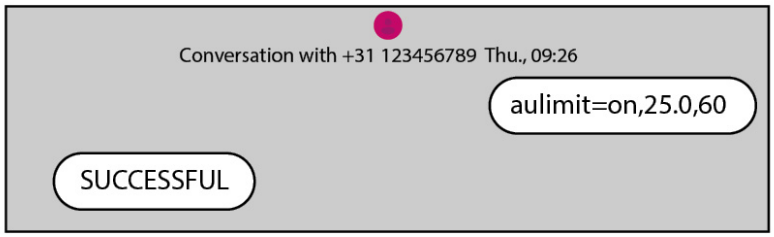


11.4. Changing alarm limits via SMS

Commands for setting alarm limits:

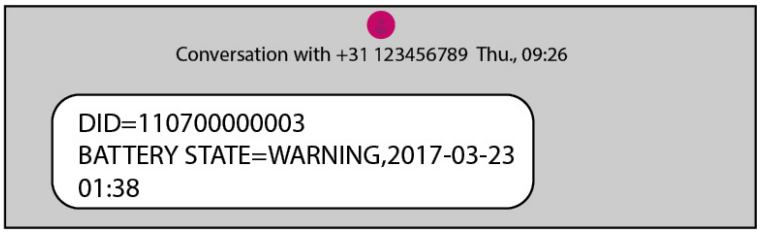
Commands	Status (on/off)	°C (00.0)	Duration in minutes
aulimit=on,25.0,60	Upper alarm limit “on”	Temperature limit “25.0”	Time alarm “60”
allimit=on,15.0,60	Lower alarm limit “on”	Temperature limit “15.0”	Time alarm “60”
wulimit=off,0.0,0	Upper warning limit “off”	Temperature limit “0.0”	Time alarm “0”
wllimit=off,0.0,0	Lower warning limit “off”	Temperature limit “0.0”	Time alarm “0”

Successful changes to the alarm limits are acknowledged as “SUCCESSFUL” by Fridge-tag 3.



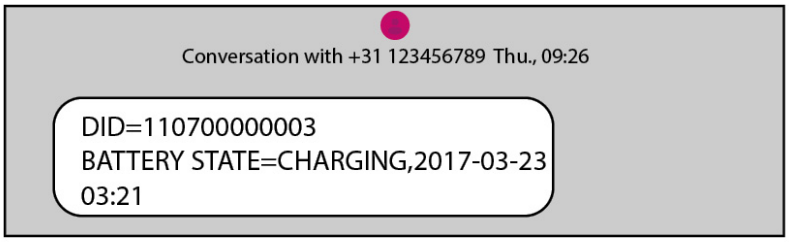
11.5. Weak battery alarm status

If the battery capacity drops below 30%, Fridge-tag 3 sends a SMS alarm notification. The Cloud Version sends the information to your Data Management Software (SmartView, etc.).



“Battery State=Warning”

Note: Connect device to power source and charge immediately. As soon as the battery back of the device is charging, a SMS is sent for confirmation with the message “Charging“. When the available battery capacity is too low, the Fridge-tag 3 automattically switches into flight mode. No data communication takes place until the battery is charged.



“Battery State=Charging”

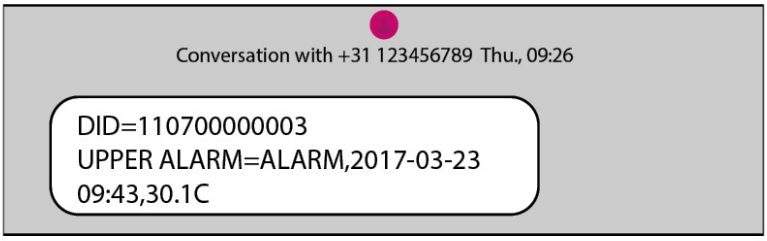
11.6. SMS commands and error messages

Upper case/lower case:
SMS commands are not case-sensitive.

Typing errors:
When there is a typing error in the command input, the Fridge-tag 3 does not send a confirmation SMS. The command is not executed. The SMS with the correctly written command must be typed and sent again.

Date format:
Depending on the current the format settings the date format is either YYYY-MM-DD (2017-03-23) or YYYY-DD-MM (2017-23-03).

11.7. Example of an alarm notification

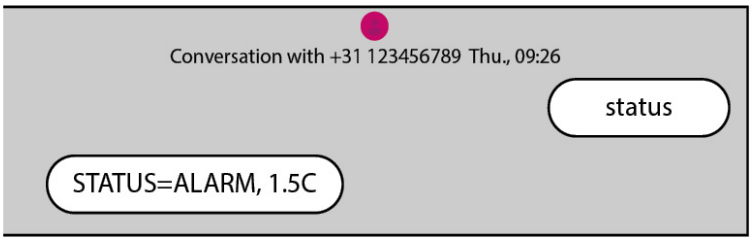


Example above:

Identification number:	DID=11070000003
Alarm Status:	Upper Alarm=Alarm
Date:	2017-03-23
Time:	09:43
Temperature measured at alarm event:	30.1°C

11.8. Status query

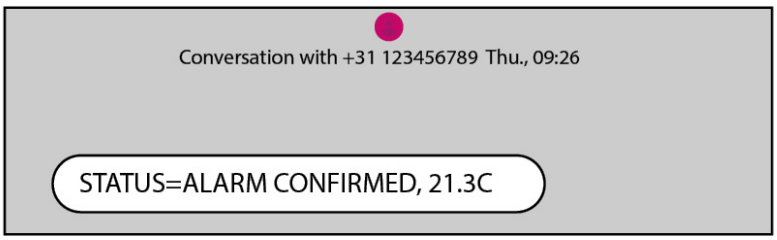
Sending a SMS to device with the content “status” triggers a response with the status OK or Alarm and the current temperature.



Fridge-tag 3 is in the Alarm state, the current temperature is 1.5°C.

11.9. Confirmation of alarm status

Confirmation of the alarm status on Fridge-tag 3 sends a confirmation SMS from the device.



The temperature at the time of confirmation is 21.3 °C

The alarm has been confirmed on the device directly by the user. Confirming an alarm can only be made if the device gets back within the set temperature limits. The alarm cannot be confirmed with a SMS command, only direct on the device.

Note: Every registered alarm recipient gets the confirmation SMS.

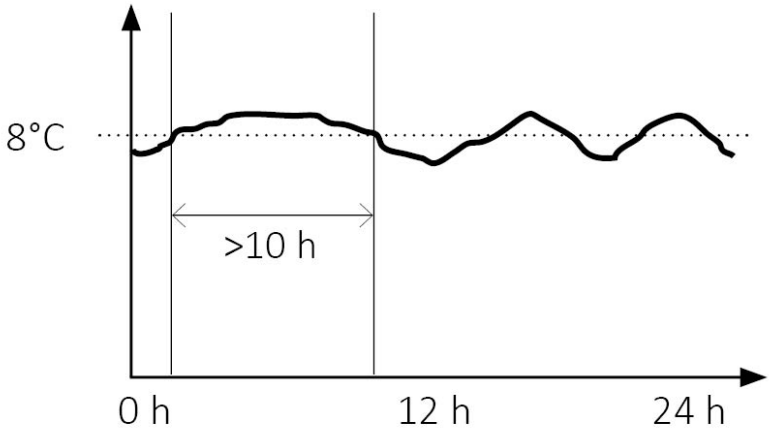
12. Alarm trigger function

Single-event alarm triggering

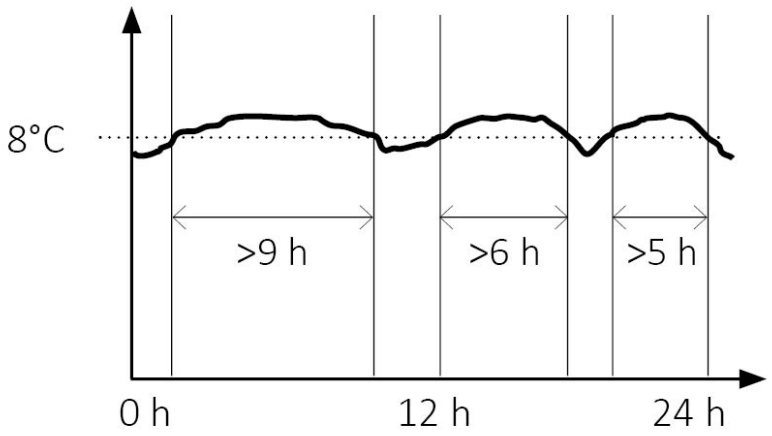
The upper or lower alarm triggering is done with a single-event alarm algorithm. Any kind of alarm is triggered if the temperature is continuously out of the preset alarm limits for longer than the preset alarm trigger time.

Upper alarm triggering

Setting upper limit: Temperature >8.0°C, duration >10 hours
For the upper alarm to be triggered the temperature needs to be continuously above 8°C for more than 10 hours.
Alarm triggered: alarm symbol ✕ and warning symbol ⚠ displayed.



In the example below the sum* of the daily upper temperature deviation is about 20 hours. No alarm will be triggered! The temperature was not continuously out of the preset alarm limits for more than 10 hours in one row.
No Alarm triggered: OK symbol ✓ on the display.

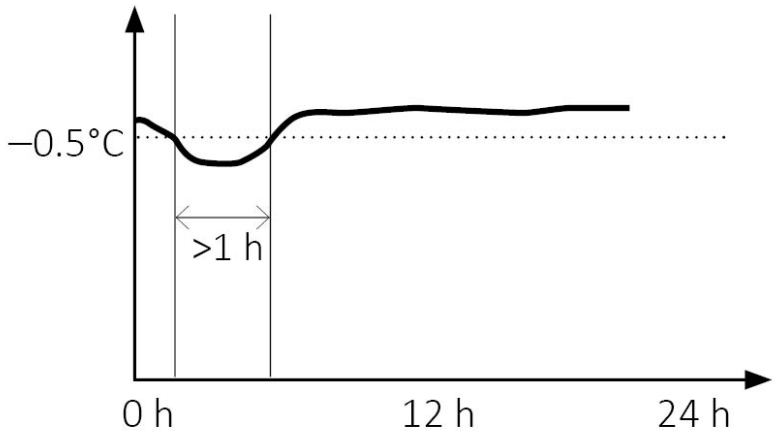


*The sum of the deviations is visible in the daily statistics in the column “Cumulative daily time above the

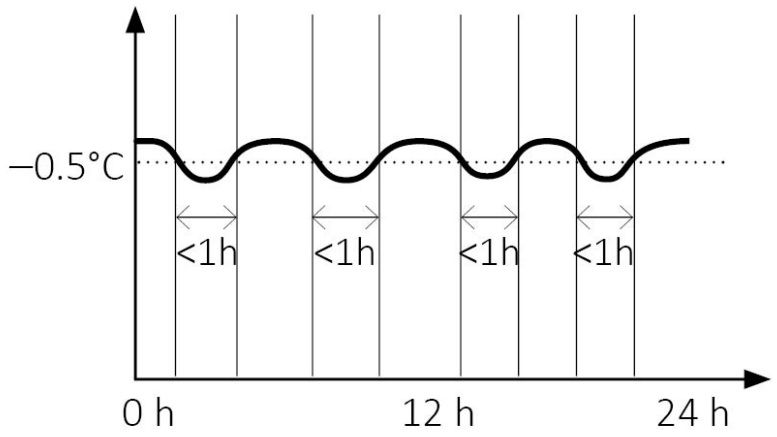
limit.”

Lower alarm triggering

Setting lower limit: Temperature <–0.5°C, duration >1 hour
For a lower alarm to be triggered the temperature needs to be continuously below –0.5°C for more than 1 hour.
Alarm triggered: alarm symbol ✕ and warning symbol ⚠ displayed.



In the example below multiple low temperature deviations* are occurring. No alarm will be triggered. Each temperature deviation was less than 1 hour out of the preset alarm limits.
No Alarm triggered: OK symbol ✓ on the display.



*The sum of the deviations is visible in the daily statistics in the column “Cumulative daily time below the limit.”

12.1. Alarm display and confirmation options

Option 1: Alarm indication “all alarms”

With this option the alarms will be visible on the display with an alarm symbol ✕ for 30 days.

By pressing the READ button, the warning symbol ⚠ will be disabled for the corresponding alarms. The alarm symbol ✕ cannot be canceled nor reset.

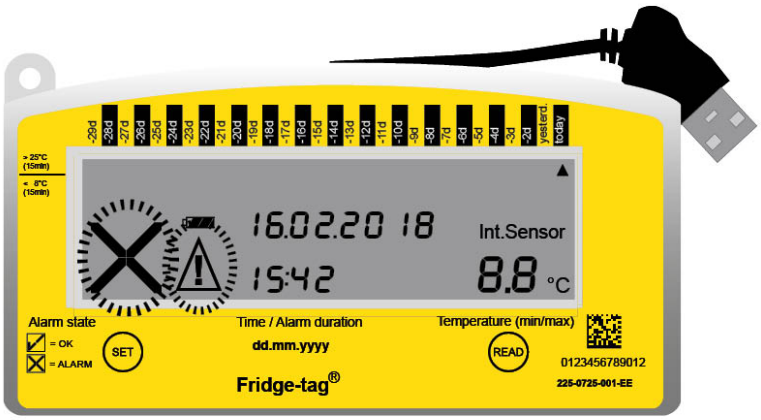
Note:

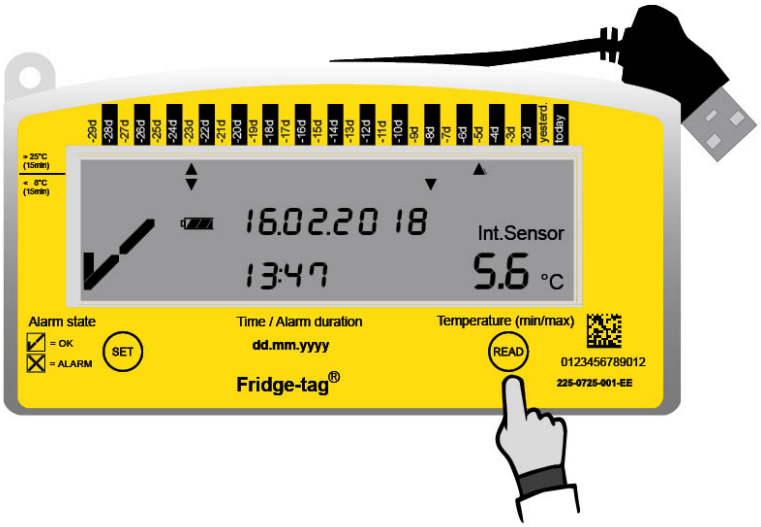
- In this mode only one upper and one lower alarm will be triggered per day.
- The alarm symbol ✕ will be present on the display for 30 days.
- The warning symbol ⚠ can be deactivated by confirming all existing alarms in the readout mode.
- The alarm buzzer stops when the alarm is confirmed within the set alarm limits. Otherwise the buzzer pauses for approx. 1 hour and starts again for up to 168 hours (7 days).

Option 2: Alarm indication “unconfirmed alarms”

The alarms are shown with the alarm symbol ✕ until all alarms (in the 30-day history) have been

confirmed as solved by pressing the READ button. Afterwards the display will show the OK symbol ✓ until a new alarm is triggered.





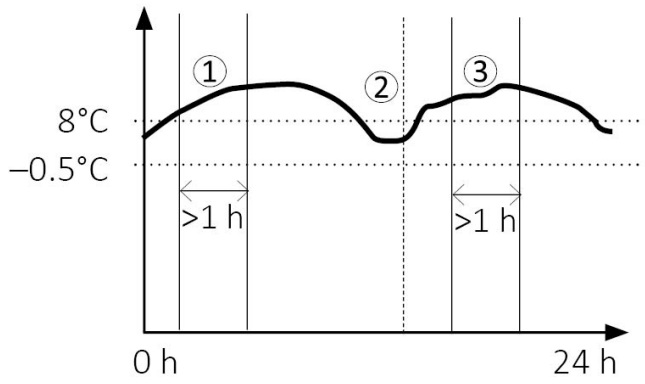
By pressing the READ button the warning symbol ⚠ will be disabled for the corresponding alarms. The alarm symbol ✕ disappears and the OK symbol ✓ will be shown again.

Confirmation options of currently triggered alarms of the day

1. Device is within the set alarm limits

Press the READ button and the alarm symbol ✕ and the warning symbol ⚠ will immediately disappear and the optional buzzer stops. A new alarm will be triggered as soon as the set alarm limits are exceeded again.

Settings: upper temperature limit >8.0°C and duration >1 hour, lower temperature limit <–0.5°C and duration 1 hour

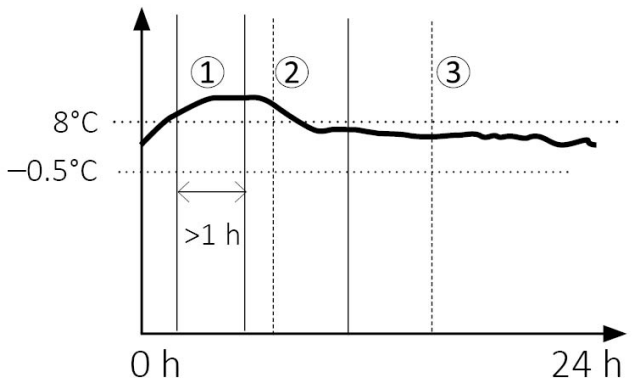


1. Alarm triggered: alarm symbol ✕ and warning symbol ⚠ on display
2. Alarm confirmed within the set temperature limits: ✓ (OK symbol) on display
3. Alarm triggered: alarm symbol ✕ and warning symbol ⚠ on display.

2. Device is outside the set alarm limits

If the READ button is pressed still during a temperature violation the buzzer will be muted for approx. 1 hour. The alarm symbol ✕ and the warning symbol ⚠ will stay on the display for the corresponding alarm. If the temperature still exceeds the limit after 1 hour, the buzzer will restart beeping.

Settings: upper temperature limit Temperature >8.0°C and duration >1 hour, lower temperature limit <–0.5°C and duration 1 hour



1. Alarm triggered: alarm symbol ✕ and warning symbol ⚠ on display.
2. Alarm confirmed when the temperature exceeds the set temperature limits: alarm symbol ✕ and warning symbol ⚠ remain on display.
3. Temperature is back within the alarm limits. Now the alarm can be successfully confirmed. OK symbol ✓ on display.

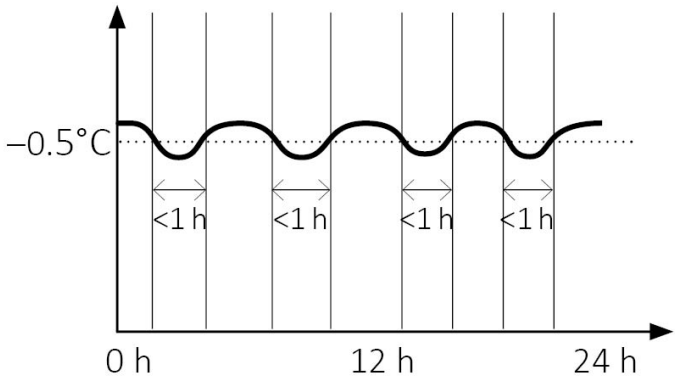
Note: How the alarm symbol ✕ and the warning symbol ⚠ react is specified during configuration of the device in the factory settings.

12.2. Cumulative daily time above/below the limit

The alarm trigger algorithm is based on a single event, although the Fridge-tag is measuring on a daily basis the individual total time above or below the temperature limits. This measurement is not used for any alarm condition. These recordings are only available in the generated PDF/ASCII files.

Note: It could be that the total cumulative time above/below the temperature limits is longer than the configured single-event alarm time without any alarm triggering.

Example setup: lower temperature limit <–0.5°C, duration >1 hour



In the above example multiple low temperature deviations with exposure times of less than 1 hour occurred. The cumulative daily time below the limits adds up to about 3.5 hours but no alarm will be triggered. The same behavior also applies to the upper alarm.

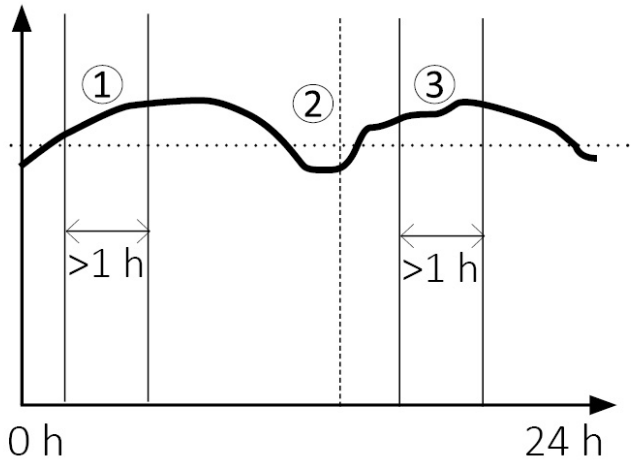
12.3. Not confirmed alarms

If a an alarm event is not confirmed on the device and the device gets back within the set temperature limits, an alarm will be retriggered when the limit is violated again.

This ensures that a forgotten confirmation of an alarm event on the device itself, does not result in a missed following alarm.

Events on not confirmed Alarms

Settings: upper temperature limit >8.0°C and duration >1 hour, lower temperature limit <–0.5°C and duration 1 hour



1. Alarm triggered: alarm symbol ✕ and warning symbol ⚠ on display
2. Alarm **not confirmed** within the set temperature limits: alarm symbol ✕ and warning symbol stay ⚠ on display.
3. Alarm retriggered: A new alarm notification is sent to the predefined recipients, the alarm symbol ✕ and warning symbol ⚠ on display.

Note: Only the first alarm on a day is recorded in the ASCII/PDF report

13. Remote Alarm Notifications

In case an upper or lower alarm is triggered, the predefined recipient(s) will be notified as follows:

Standalone Version:	SMS Notification
Cloud Version:	Make sure that the system is set up to your needs (e.g. in SmartView SMS and Email Notifications are available).

14. Audio alarm (optional factory setting)

In case an upper or lower alarm is triggered, 3 audible alarm signals are emitted immediately. Thereafter:

- Every minute 1 alarm signal for maximally 168 hours (7 days).
- After 168 hours (7 days) the buzzer will stop.
- If an alarm event is confirmed (READ is pressed) while the limits are still exceeded the buzzer pauses for approx. 1 hour and then restarts beeping every 3 minutes.
- Confirmation within the alarm limits will stop the buzzer.

In case of a connection error see chapter Connection error.

15. Reading the history / Readout mode

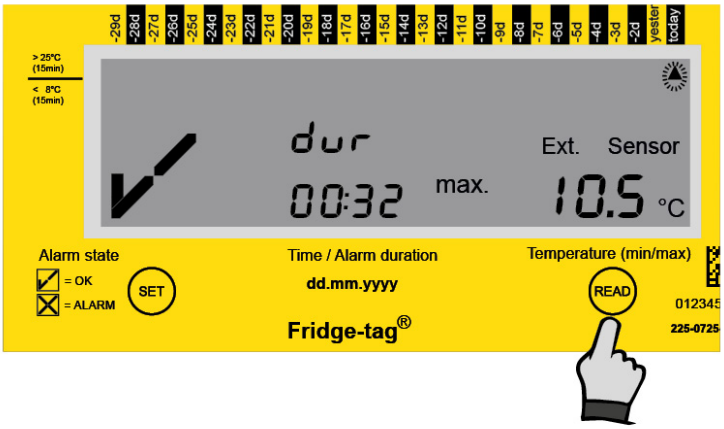
The information of the temperature deviations can either be viewed for the past 30 days directly on the device or for 28/56/84/112 days in the generated files (PDF/ASCII).

Note: The external sensor of the Fridge-tag can remain at its location for the readout process. Please consider that there may occur a connection error after more than 10 minutes without connection between the device and the sensor.

The Fridge-tag 3 is SmartView compatible. The generated data can be uploaded as follows:
SmartView User Manual – Fridge-tag 3

15.1. Option 1: Read out day per day directly on the device (30-day history)

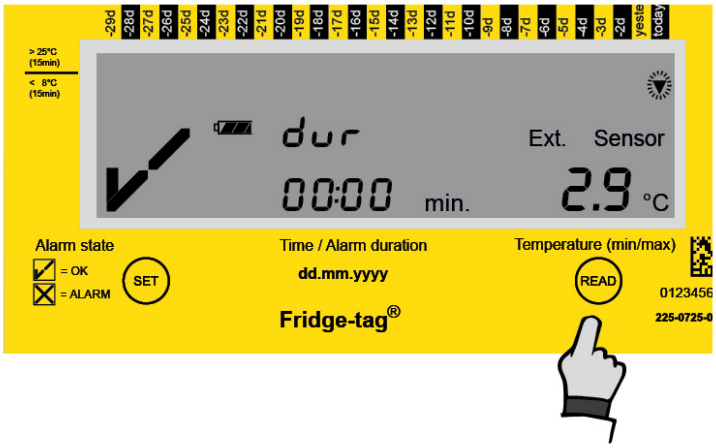
Example of an OK display during readout of the history



Press READ once

The following information is indicated on the screen:

- The OK symbol ✔
- The corresponding flashing arrow ▲ (example: high arrow “today”)
- Highest recorded temperature (example: +10.5˚C)
- Duration of the exceedance of the preset high limit temperature (example 00:32; hh:min)



Press READ a second time

The following information is indicated on the screen:

- The OK symbol ✔
- The corresponding flashing arrow ▼ (example: low arrow of “today”)

- Lowest recorded temperature (example: +2.9˚C)
- Duration of the underrun of the preset low temperature limit (example 00:00; hh:min)

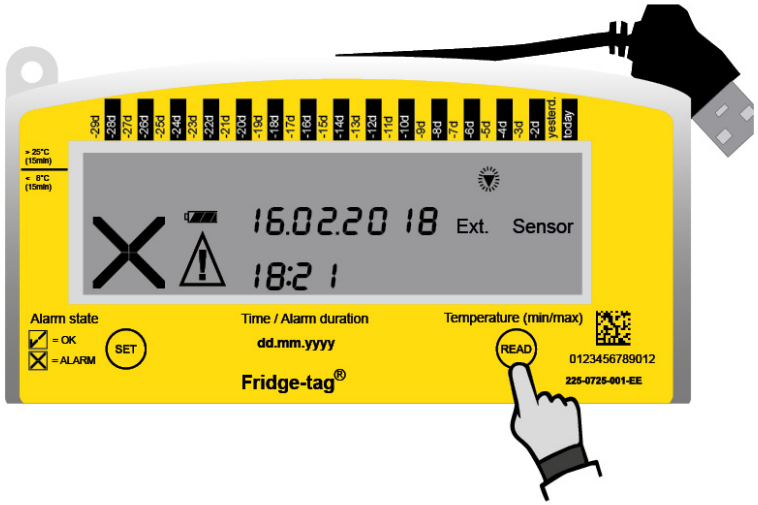
Note: in the Readout mode the flashing arrows display the day where your are (30-day history) and show the highest ▲ and lowest ▼ measured temperature of the corresponding day. If a limit has been exceeded also the duration is shown.

Note: Press repeatedly the READ button to read out day per day the details of the past 30 days.

When you reach an alarm event, the indication on the screen of the Fridge-tag will be different than the OK display.

Example of an alarm display during readout of the history

1st display of a “lower alarm event”

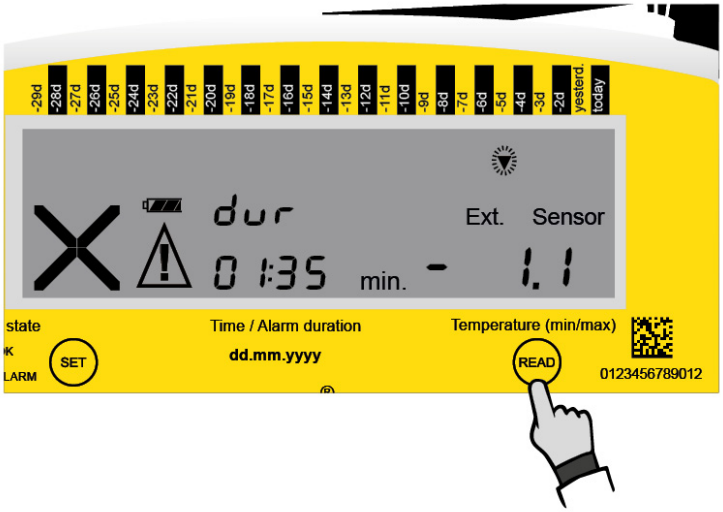


Press READ once

The following information is indicated on the screen:

- The alarm- ✕ and the warning symbol ⚠
- The corresponding alarm indicator ▼ (lower alarm limit)
- Day of alarm (example: 5 days ago: –5d)
- The date of the alarm (example: 16.02.2018)
- The time of the alarm (example: 18:21)

2nd display of a “lower alarm event”



Press READ a second time

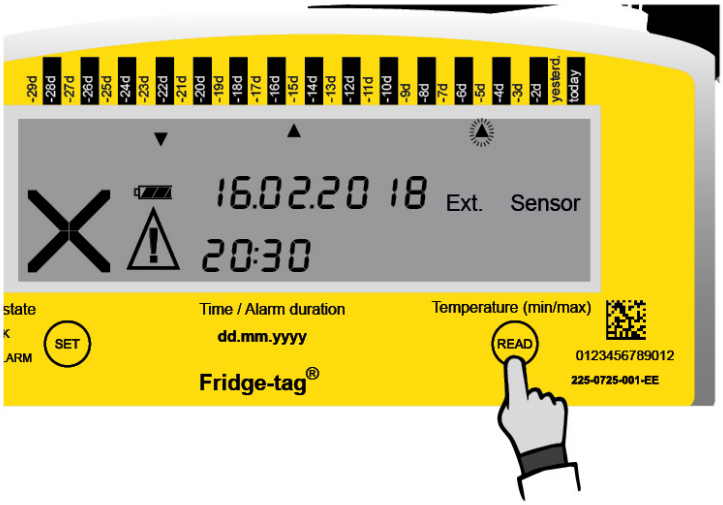
The following additional information is indicated on the screen:

- Lowest recorded temperature (example: –1.1˚C)
- The duration of the exceedance of the preset low temperature limit (example: 01:35; hh:mm)

15.2. Option 2: Read out alarms directly on the device – use the Alarm Super Jump function (30-day history)

If you like to read out the alarms directly on the Fridge-tag 3, press the READ button for at least 3 seconds.

1st display of the latest alarm event

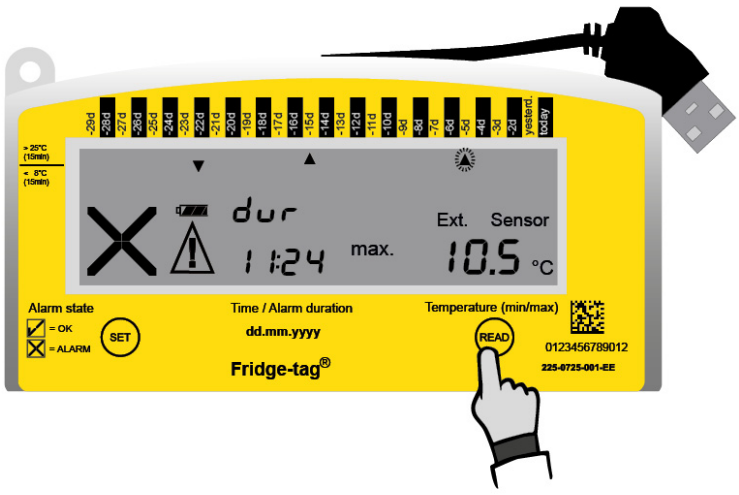


Press READ for 3 seconds

The following information is indicated on the screen:

- The alarm symbol ✕ and the warning symbol ⚠
- The corresponding alarm indicator ▲ (higher alarm limit)
- Day of alarm (example: 5 days ago: –5d)
- The date of the alarm (example: 16.02.2018)
- The time of excursion (example: 20:30)

2nd display of the latest alarm event



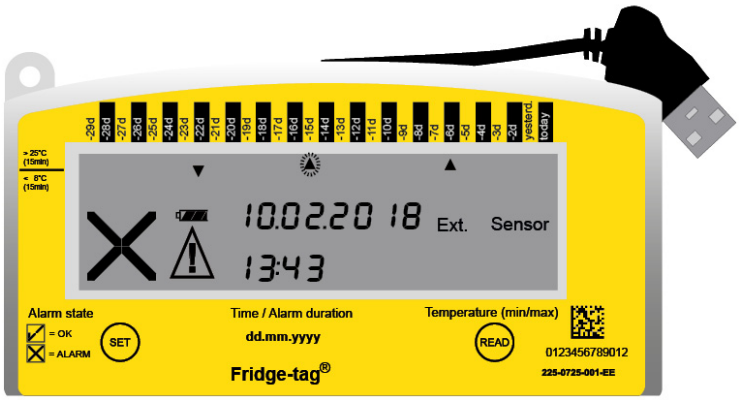
Press READ again

The following additional information is indicated on the screen:

- Highest recorded temperature (example: +10.5˚C)
- The duration of the exceedance of the preset high temperature limit (example: 11:24; hh:mm.)

Note: Press the READ button again for at least 3 seconds and the next alarm event will appear on the screen.

Display of the next alarm event



Note: Press the READ button again for 3 seconds to jump to the next alarm event. And so on.

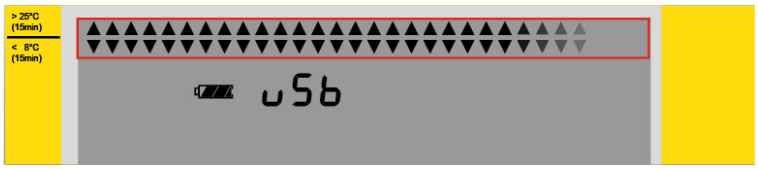
Note: Pressing SET in the „Read out Mode“ brings you back to the „Measurement Mode“.

15.3. Option 3: Read out data from the files generated by the Fridge-tag 3 by connecting it with a computer

Plug the Fridge-tag 3 into any computer via USB interface. Make sure the device is plugged in properly.
Note: Disconnect the external sensor from the device first.

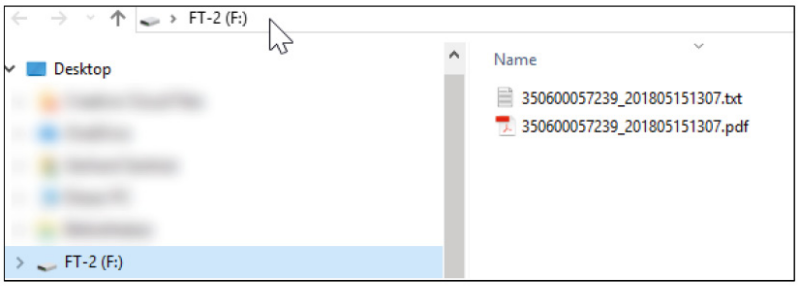
The Fridge-tag 3 will now generate a PDF and ASCII report of the last 28, 56 days (factory preset). This process may take up to 2 minutes. Now use the appropriate file generated by the Fridge-tag 3.

USB connection of the Fridge-tag 3
The continuously appearing arrows in the upper display area indicate that the device is processing.

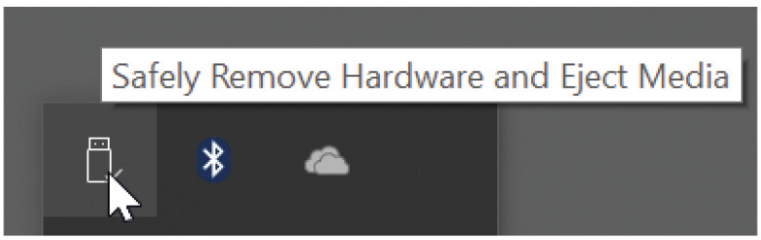


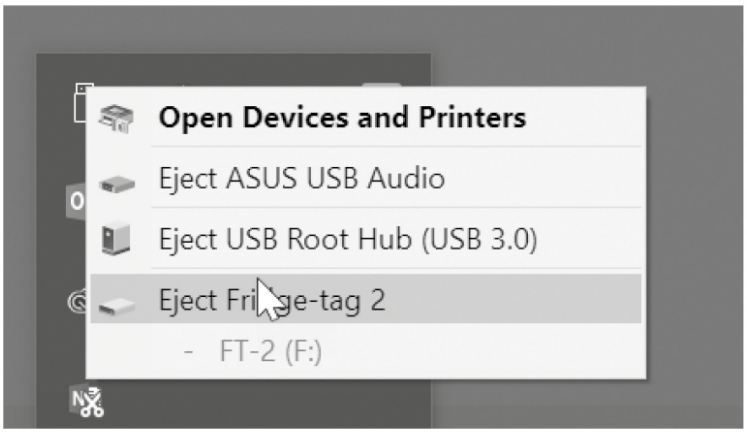
Note: This process must not be interrupted until the OK symbol ✓ appears on the display. This indicates that the creation of the ASCII and PDF files has been successfully completed.

The hard drive of the Fridge-tag 3 is shown in your explorer. Open the desired file generated by the device.



Note: To disconnect the device properly, please always use the function “Safely Remove Hardware” on your PC/Mac.

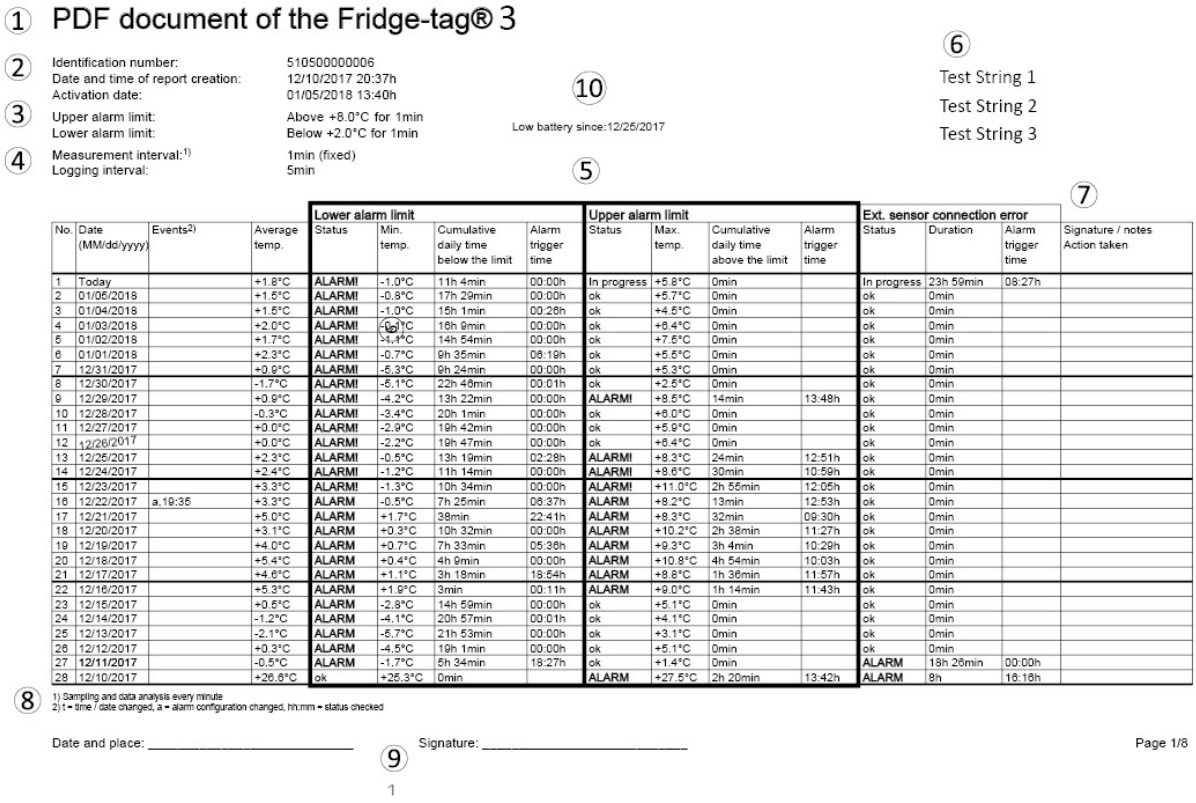


	Right-click the icon “Safely Remove Hardware and Eject Media” in the Windows taskbar (lower right corner). (Choose the corresponding device to remove.)
	Do not disconnect the device before you receive the depitcted message, otherwise the device can be damaged.

Note: For this process no additional software is necessary.

15.4. PDF report explanation

Sample of a PDF file generated by a Fridge-tag 3 with external sensor (page 1/ 2)



① PDF document of the Fridge-tag® 3

② Identification number: 510500000006
Date and time of report creation: 12/10/2017 20:37h
Activation date: 01/05/2018 13:40h

③ Upper alarm limit: Above +8.0°C for 1min
Lower alarm limit: Below +2.0°C for 1min

④ Measurement interval:[1] 1min (fixed)
Logging interval: 5min

⑤

⑥ Test String 1
Test String 2
Test String 3

⑦

⑩ Low battery since:12/25/2017

				Lower alarm limit				Upper alarm limit				Ext. sensor connection error			
No.	Date (MM/dd/yyyy)	Events[2]	Average temp.	Status	Min. temp.	Cumulative daily time below the limit	Alarm trigger time	Status	Max. temp.	Cumulative daily time above the limit	Alarm trigger time	Status	Duration	Alarm trigger time	Signature / notes Action taken
1	Today		+1.8°C	ALARM!	-1.0°C	11h 4min	00:00h	In progress	+5.8°C	0min		In progress	23h 59min	08:27h	
2	01/05/2018		+1.5°C	ALARM!	-0.8°C	17h 29min	00:00h	ok	+5.7°C	0min		ok	0min		
3	01/04/2018		+1.5°C	ALARM!	-1.0°C	15h 1min	00:26h	ok	+4.5°C	0min		ok	0min		
4	01/03/2018		+2.0°C	ALARM!	-0.1°C	16h 9min	00:00h	ok	+6.4°C	0min		ok	0min		
5	01/02/2018		+1.7°C	ALARM!	-1.4°C	14h 54min	00:00h	ok	+7.5°C	0min		ok	0min		
6	01/01/2018		+2.3°C	ALARM!	-0.7°C	9h 35min	06:19h	ok	+5.5°C	0min		ok	0min		
7	12/31/2017		+0.9°C	ALARM!	-5.3°C	9h 24min	00:00h	ok	+5.3°C	0min		ok	0min		
8	12/30/2017		-1.7°C	ALARM!	-5.1°C	22h 46min	00:01h	ok	+2.5°C	0min		ok	0min		
9	12/29/2017		+0.9°C	ALARM!	-4.2°C	13h 22min	00:00h	ALARM!	+8.5°C	14min	13:48h	ok	0min		
10	12/28/2017		-0.3°C	ALARM!	-3.4°C	20h 1min	00:00h	ok	+6.0°C	0min		ok	0min		
11	12/27/2017		+0.0°C	ALARM!	-2.9°C	19h 42min	00:00h	ok	+5.9°C	0min		ok	0min		
12	12/26/2017		+0.0°C	ALARM!	-2.2°C	19h 47min	00:00h	ok	+6.4°C	0min		ok	0min		
13	12/26/2017		+2.3°C	ALARM!	-0.5°C	13h 19min	02:28h	ALARM!	+8.3°C	24min	12:51h	ok	0min		
14	12/24/2017		+2.4°C	ALARM!	-1.2°C	11h 14min	00:00h	ALARM!	+8.6°C	30min	10:59h	ok	0min		
15	12/23/2017		+3.3°C	ALARM!	-1.3°C	10h 34min	00:00h	ALARM!	+11.0°C	2h 55min	12:05h	ok	0min		
16	12/22/2017	a, 19:35	+3.3°C	ALARM	-0.5°C	7h 25min	06:37h	ALARM	+8.2°C	13min	12:53h	ok	0min		
17	12/21/2017		+5.0°C	ALARM	+1.7°C	38min	22:41h	ALARM	+8.3°C	32min	09:30h	ok	0min		
18	12/20/2017		+3.1°C	ALARM	+0.3°C	10h 32min	00:00h	ALARM	+10.2°C	2h 38min	11:27h	ok	0min		
19	12/19/2017		+4.0°C	ALARM	+0.7°C	7h 33min	05:36h	ALARM	+9.3°C	3h 4min	10:29h	ok	0min		
20	12/18/2017		+5.4°C	ALARM	+0.4°C	4h 9min	00:00h	ALARM	+10.8°C	4h 54min	10:03h	ok	0min		
21	12/17/2017		+4.6°C	ALARM	+1.1°C	3h 18min	18:54h	ALARM	+8.8°C	1h 36min	11:57h	ok	0min		
22	12/16/2017		+5.3°C	ALARM	+1.9°C	3min	00:11h	ALARM	+9.0°C	1h 14min	11:43h	ok	0min		
23	12/15/2017		+0.5°C	ALARM	-2.8°C	14h 59min	00:00h	ok	+5.1°C	0min		ok	0min		
24	12/14/2017		-1.2°C	ALARM	-4.1°C	20h 57min	00:01h	ok	+4.1°C	0min		ok	0min		
25	12/13/2017		-2.1°C	ALARM	-5.7°C	21h 53min	00:00h	ok	+3.1°C	0min		ok	0min		
26	12/12/2017		+0.3°C	ALARM	-4.5°C	19h 1min	00:00h	ok	+5.1°C	0min		ok	0min		
27	12/11/2017		-0.5°C	ALARM	-1.7°C	5h 34min	18:27h	ok	+1.4°C	0min		ALARM	18h 26min	00:00h	
28	12/10/2017		+26.8°C	ok	+25.3°C	0min		ALARM	+27.5°C	2h 20min	13:42h	ALARM	8h	16:16h	

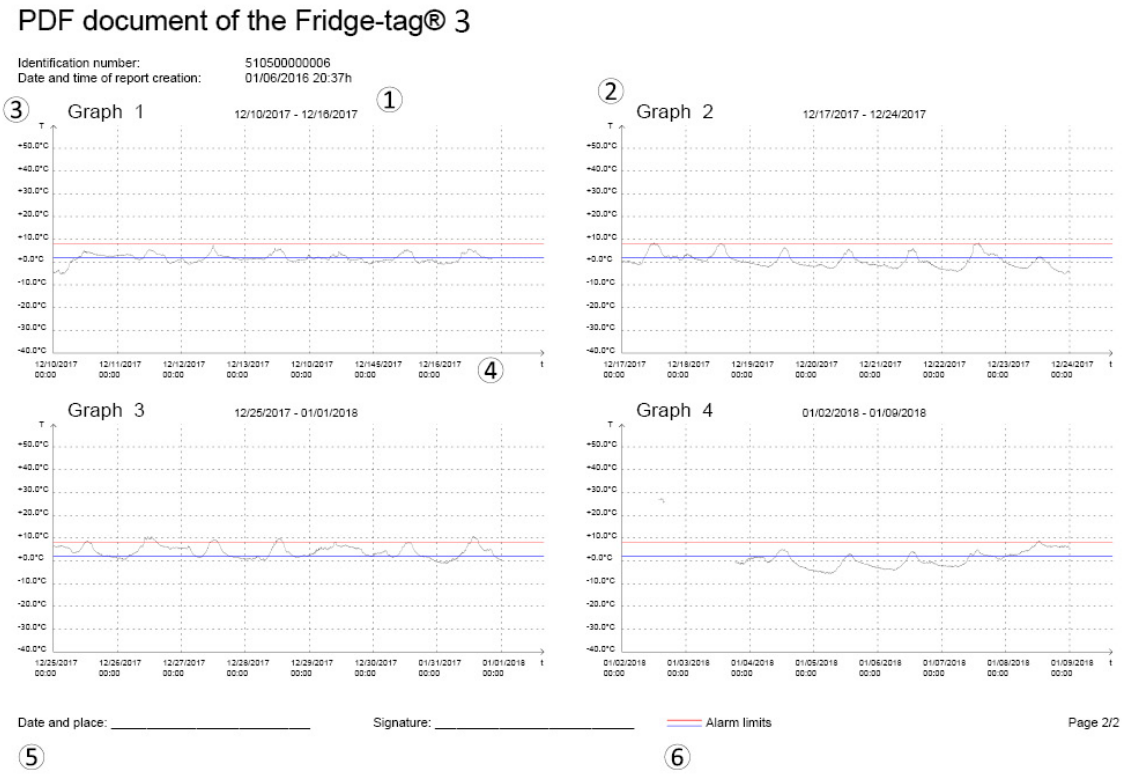
⑧ 1) Sampling and data analysis every minute
2) t = time / date changed, a = alarm configuration changed, hh:mm = status checked

Date and place: _____ ⑨ Signature: _____ Page 1/8

1

1. Document title and device type
2. Device ID and further information
3. Alarm settings
4. Measuring and logging interval
5. Event and alarm table (latest info in line 1, top line)
6. Up to 3 user-defineable strings (max. 30 characters each). Factory preset.
7. Placeholder for notes
8. Note 1: Reference for masurement interval
   Note 2: Legend for events column (hh:mm —> 1 time stamp/half day)
9. Placeholder for date/place and signature
10. Battery warning with timestamp

Sample of a PDF file generated by a Fridge-tag 3 with external sensor (page 2/ 2)



1. Each graph shows data from a period of 7 days
2. Incrementally numbered graphs
3. Temperature scale
4. Time scale
5. Placeholder for date/place and signature
6. Alarm limits

Graph behavior when date / time is changed manually

PDF document of the Fridge-tag® 3

Identification number: ser123
Date and time of report creation: 01/01/2001 04:05h

Graph 1 12/10/2017 - 12/16/2017

Graph 2 12/17/2017 - 12/24/2017

Graph 3 12/25/2017 - 01/01/2018

Graph 4 01/02/2018 - 01/09/2018

Page 2/8

Date and place: _____ Signature: _____ Alarm limits

1. Date change positive
2. Date change negative
3. Time change positive (e.g. summer/winter time)
4. Time change negative (e.g. summer/winter time)

15.5. Autoscaling of graphs in PDF

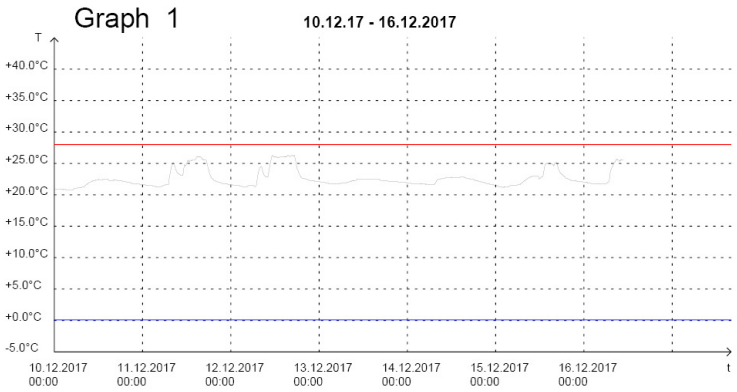
The graph of the report is created dynamically depending on the following settings:

- the alarm limits of the device
- the highest and lowest measured value

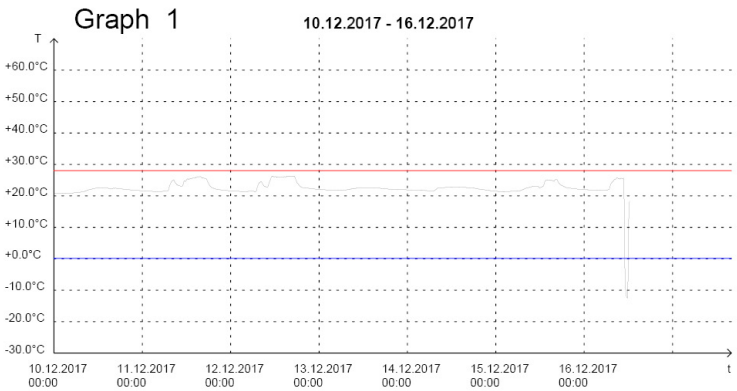
This is valid for all graphs in the PDF file until:

- the highest and lowest measured values drop out of the history
- the temperature settings are changed

Example below: The scale of the graph depends on the alarm limits set. The temperature scale ranges from +40°C to –5°C for the limits of +0.5°C and +28°C.



Example below: The scale of the graph depends on the highest and lowest measured temperature values. The temperature scale ranges from –30°C to +60°C. Lowest measured temperature: –12°C, highest measured temperature: +25°C.



15.6. Temperature record duration (optional factory setting)

Selectable record duration: 28, 56 days.

Note: File names on the Fridge-tag are write protected. The names may only be changed after downloading the files onto a computer. Changing is either possible directly on unopened files or via open and save commands with Adobe Reader. Using other programs may cause loss of the digital signature.

Date:	Date of measurement
Event: t	Time/date changed
Event: a	Alarm configuration changed
Event: hh:mm	Time stamp: status checked
Average temp.	Average temperature
Status: in progress	The data collection “Today” is not yet complete
Status: OK	No alarm has been triggered in the past 30 days. (No alarm has yet been triggered since the data was read out on the device.*)
Status: Alarm ⚠	Alarm(s) have been triggered (With ⚠ means that the details of the corresponding alarm have not been read out yet.*)
Status: Alarm	Alarm(s) have been triggered (Without ⚠ means that the details of the corresponding alarm have already been read out on the device.*)
Min. temp.	Lowest recorded temperature
Cum. duration	Cumulative daily time below/above the limit
Alarm trigger time	Time at which the alarm was triggered
Max. temp.	Highest recorded temperature
Duration	Duration of an external sensor connection error

*For more information go to chapter “Alarm trigger function”

15.7. Verification process

This process verifies if the files (PDF and ASCII) created by the Fridge-tag are authentic and have not been manipulated or accidentally changed (meets the strict FDA 21 CFR Part 11 requirements).
Note: Please ensure that the latest version of “JAVA Runtime” is previously installed on your computer.

Step 1
Download the software Berlinger Verifier from our website: www.berlinger.com/verifier

Step 2
Open the software. The following window will appear:

Step 3
Click on “Open file”

Step 4
Select the file you would like to verify.

Option 1
Select the files directly from the Fridge-tag which is connected to your computer.

Option 2
Select the files from the place where you saved them on your computer.

When the file is correct and in its original condition, the following window will appear:

In case the file has been changed, an error message will appear.

Proceed the same way with PDF and ASCII files. The same OK or error messages will appear.

16. Explanations of terms

Readout mode:
In order to avoid incorrect data, the Fridge-tag does not measure the temperature while settings are changed or during or Readout mode (e.g. changing time, date and during reading of history). The Fridge-tag will fall back into normal operation after approx. 60 seconds without pressing any buttons.

External sensor:
After 10 minutes (factory setting) without connection between external sensor and device, two audio signals sound every three minutes for a maximum of 168 hours (7 days) and the entire display starts flashing.

HI or LO indicator (external sensor):
If the Fridge-tag measures temperatures above +55°C or below –40°C, it shows HI or LO on the screen. The temperature will not be logged and not be shown in the PDF/ASCII file. The regular measurements and monitoring of alarm limits will continue as usual. As soon as the temperature is between +55°C and –40°C numbers will be displayed again.

17. Expire code explanation

Production Date:	Feb., 2019 (example)
Quality control:	Passed
Expiry Date:	Aug., 2022 (example) estimated Battery-life-time
Date of activation:	Write the date of activation in this field.

18. Important Information

Liability

The manufacturer shall not be held liable:

- If the device was used beyond the manufacturer's given limitations.
- For any claims due to the improper storage or use of the device.
- For any problems with the temperature-controlling and/or-cooling unit.
- For the quality of any monitored goods.
- For incorrect readings if the device was used beyond its expiry date.

Warranty: 2 years from date of delivery.

Battery

The Fridge-tag 3 contains a LiPo battery. Please pay strict attention to the following points:

- The housing of the Fridge-tag 3 must never be opened nor destroyed.
- Never expose the Fridge-tag 3 to high temperatures (fire, oven, microwaves, etc.). It may cause injuries.
- Always keep the Fridge-tag 3 out of the reach of children.
- The battery complies with IATA DGR Packaging Instruction 970 Section 2.
- Dispose or recycle the Fridge-tag 3 in accordance with the WEEE 2012/19/EU guidelines or your local regulations. The device may also be returned to the manufacturer for proper recycling.

Operating lifetime

n/a (USB powered device)

- Storage and operation of the device remains inside the recommendations of the manufacturer. Especially temperatures below 0°C or +32°F could have a negative influence for the operating lifetime of the battery.

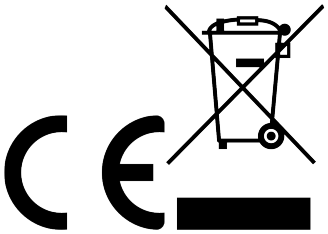
The remaining capacity of the battery is indicated by the battery indicator on the display (see Chapter Display explanations).

Attention

- The Fridge-tag 3 measures the ambient temperature and not the quality of the monitored goods. Its purpose is to signal if product quality evaluation is required.

Subject to change. Please note that all information in this document is correct at the time of publication. Due to our policy of continuous product development, we reserve the right to change this information without prior notice.

Regulatory certification



Manufactured by:

Berlinger & Co. AG
Mitteldorfstrasse 2
9608 Ganterschwil
SWITZERLAND

19. Regulatory information

FCC INFORMATION (USA):

Applicable to US model only

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

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.

Caution: Changes or modifications not expressly approved by the party responsible for compliance could void the users' authority to operate the equipment.

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

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

RF Exposure warning: This device is intended for mobile operation. Please maintain a minimum separation distance of 20 cm with the device.

ISED Canada statement:

Applicable to US model only

This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions:

1. This device may not cause interference and
2. This device must accept any interference, including interference that may cause undesired operation of the device.

Declaración de ISED Canada:

Le présent appareil est conforme aux CNR de L´industrie Canadienne applicables aux appareils radio exempts de licence.
L‘exploitation est autorisée aux deux conditions suivantes:

1. l‘appareil ne doit pas produire interferences, et
2. l‘utilisateur de l‘appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d‘en compromettre le fonctionnement.

RF exposure statement:
This equipment complies with ISED Canada RSS-102 radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20 cm between the radiator & your body.

Declaración de exposición a la radiación:
Cet équipement est conforme aux ISED Canada RSS-102 limites d‘exposition aux radiations définies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé avec distance minimum de 20 cm entre le radiateur et votre corps.

20. Firmware

Firmware: 3.3p0

21. FAQ / Glossary

Frequently Asked Questions (FAQ)

For technical problems or questions, please visit the Berlinger Support Center: FAQ – Fridge-tag 3

Glossary of Symbols

Symbol	Description
✓	OK symbol
✕	alarm symbol
▼	LOW alarm indicator
▲	HIGH alarm indicator
⚠	warning symbol

The warning box includes important informations or warnings.