



User Manual

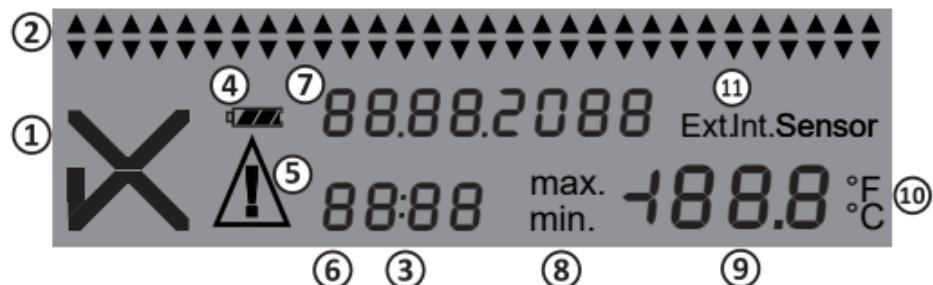
# Fridge-tag 2 L

INTERNAL/EXTERNAL SENSOR



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## 1. Display explanations

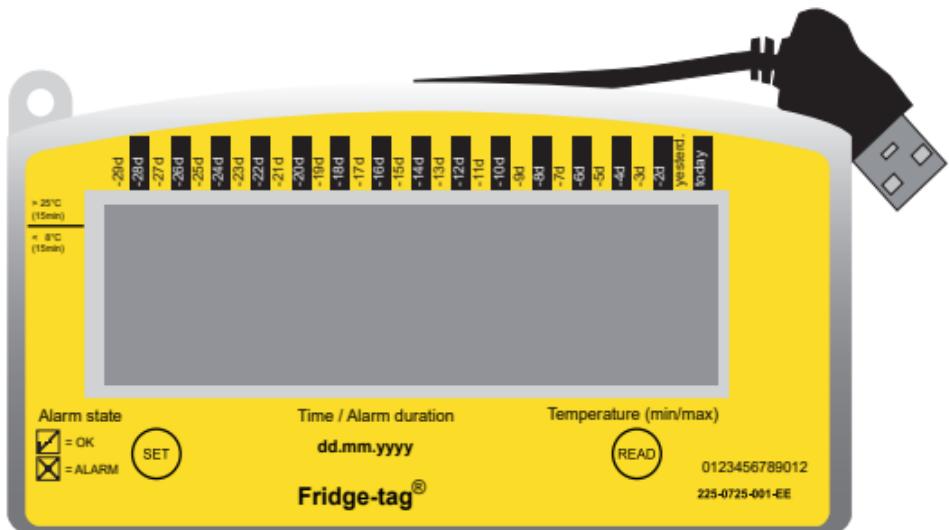


1. ✓ (OK symbol) or ✗ (Alarm symbol)
2. Daily HIGH/LOW ▲▼ (Alarm indicator)  
(showing history of the last 30 days)
3. Power on indicator (double point is flashing)
4. Battery power symbol  
(This icon indicates the remaining capacity of the battery)
5. Additional △ (Warning symbol)
6. Time, duration and text indicator
7. Date and text indicator
8. Indicator of measured minimum/maximum temperature
9. Temperature display
10. Indicator of the temperature measurement unit (°F/°C)
11. Indicator of activated sensor:  
Int. = internal sensor (inside the Fridge-tag 2 L)  
Ext. = external sensor (cable with temperature sensor)

Note: All illustrations in the operation manual refer to the Fridge-tag 2 L with internal sensor. Differences between internal and external sensors are additionally described.

## 2. State of delivery/Sleep Mode

Fridge-tag 2 L is shipped in its so-called "Sleep Mode".

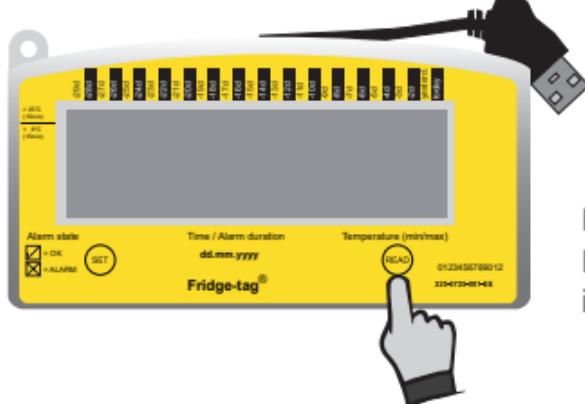


The display (LCD) is blank.

## 3. Quality check prior to activation (in Sleep Mode)

The following chart shows which information will be indicated on the LCD screen upon successive READ button pressings while in Sleep Mode.

Note: After approx. 60 seconds without any button pressing the Fridge-tag 2 L goes back into Sleep Mode; the display is blank again.



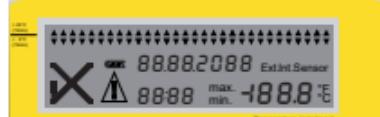
Press continuously  
READ to gather  
information.

# Display check - Fridge-tag 2 L

Pressing the READ-button

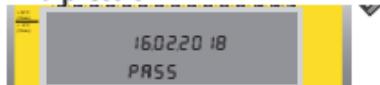
Displayed Information

## 1st press of READ:



Display test:  
all segments activated

## 2nd press of READ:



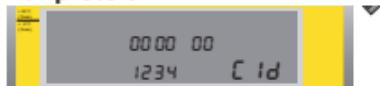
Indication of date and production test result: 16<sup>th</sup> February 2018/PASS

## 3rd press of READ:



Indication of the current temperature and which sensor is activated (internal/external)  
Display shows---°C if external sensor is not connected.

## 4th press of READ:



Indication of configuration ID number (e.g. 1234)

## \*5th press of READ:



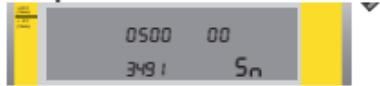
Indication of upper Alarm settings.  
Example shows duration and temperature limits: 10 hours, >+8°C, high

## \*6th press of READ:



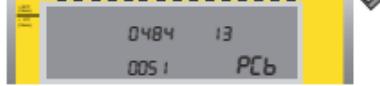
Indication lower Alarm settings: example shows duration and temperature limits: 60 min., <-0.5°C, low

## 7th press of READ:



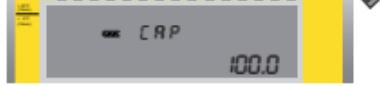
Serial number of the device

## 8th press of READ:



PCb number  
(manufacturer information only)

## 9th press of READ:



Battery power:  
3 bar = full (>70%)  
2 bar = half-full (30-70%)  
1 bar\*\* = low (0-30%)  
\*\*Device should be replaced.

## 10th press of READ:



The display is blank again.

(\*only indicated if factory preset, otherwise skipped)

## 4. Placing (the sensor of) the Fridge-tag 2 L

### Fridge-tag 2 L with an internal sensor

The activated Fridge-tag 2 L must be placed immediately in its predetermined location. It is recommended and important to place the device in the center of the refrigerator for an optimal temperature observation. Please do not place the device into a freezer as the screen will freeze and the battery will lose power prematurely.

### Fridge-tag 2 L with an external sensor

Two hours before activating the Fridge-tag 2 L 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 a perfect temperature observation.

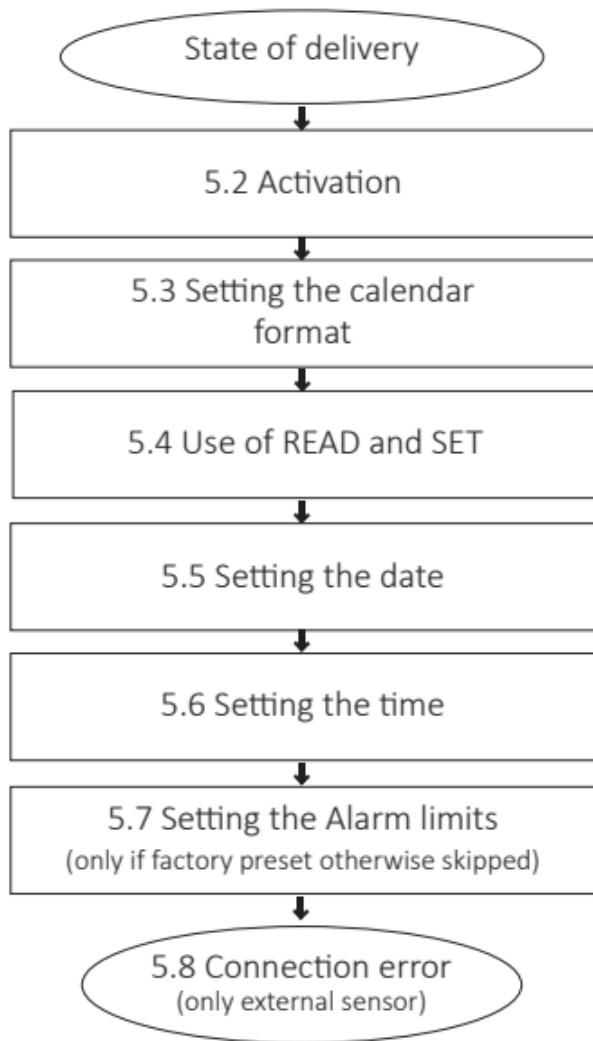
For the right positioning of the external sensor within the fridge, please follow the instructions of WHO, CDC or any other governmental requirements of your country.



- ① External sensor
- ② Flat cable
- ③ Fridge-tag 2 L device

## 5. Activation process

### 5.1. Overview sequences of activation

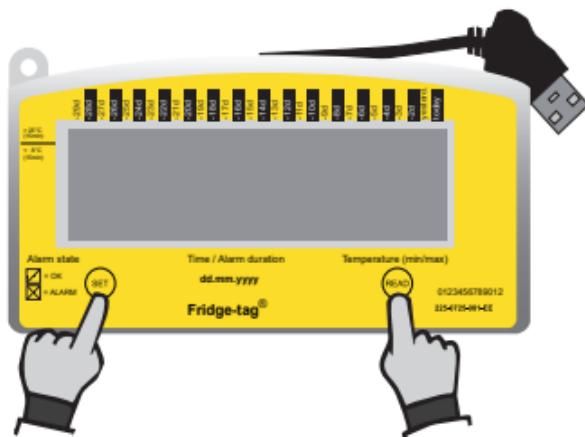


Note: If the activation process has not been completed- after approx. 60 seconds without any button operation- the device will go back into Sleep Mode. The activation starts from the beginning.

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 6 "Read and change settings/How to correct setting mistakes".

## 5.2. Activation

To activate the device press the SET and the READ button simultaneously for more than 3 seconds.



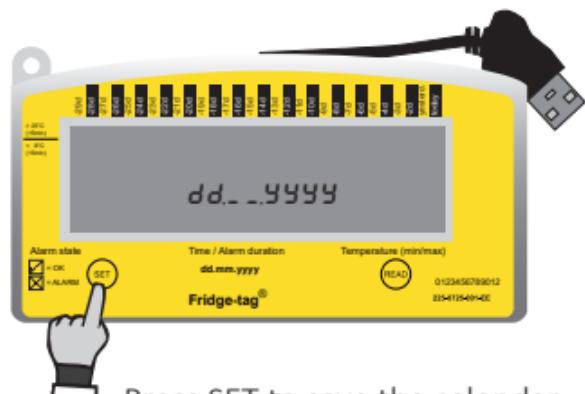
Note: Once the device is activated, it cannot be stopped anymore.

Successful activation is visible when the following indication will appear on the screen:



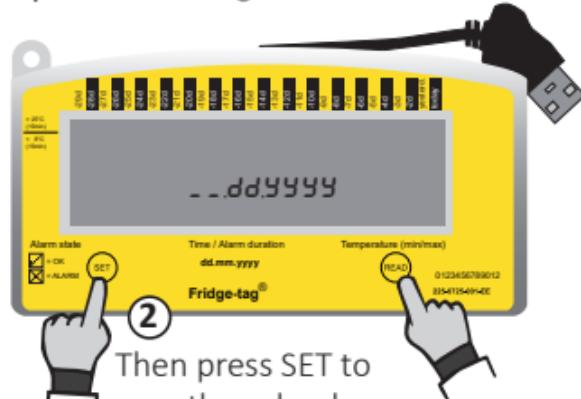
## 5.3. Setting the calendar format

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



Press SET to save the calendar format.

## Option 2: Setting the date format to: mm.dd.yyyy



①

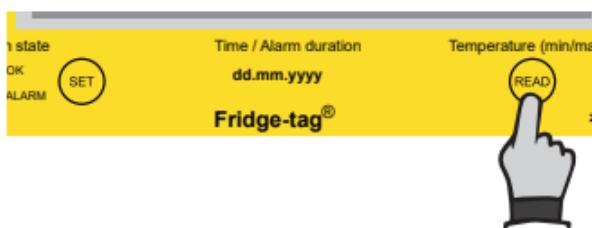
Press READ to change the calendar format.

②  
Then press SET to save the calendar format

After setting the calendar format, the first digit of the date will start flashing.

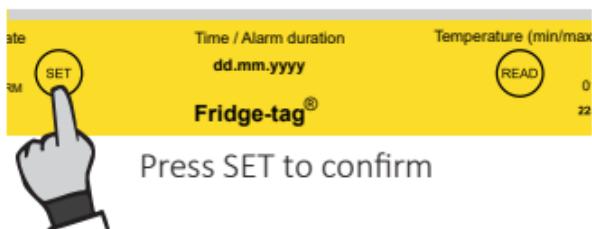
### 5.4. Instruction for the use of the READ and the SET button

The READ button is used to adjust the number. 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

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

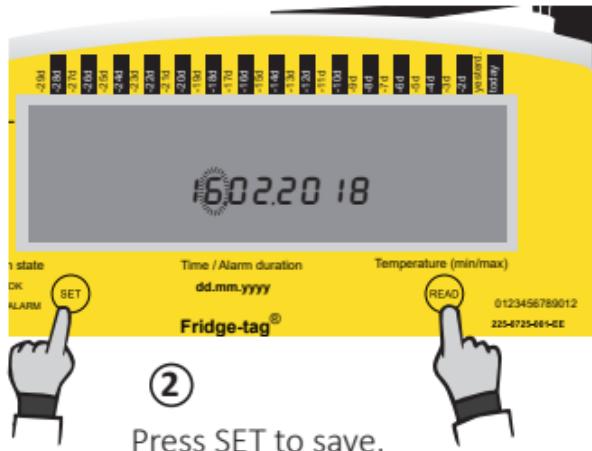
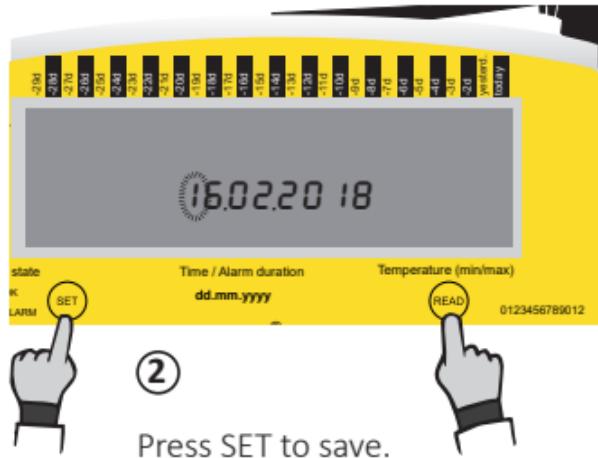


Press SET to confirm

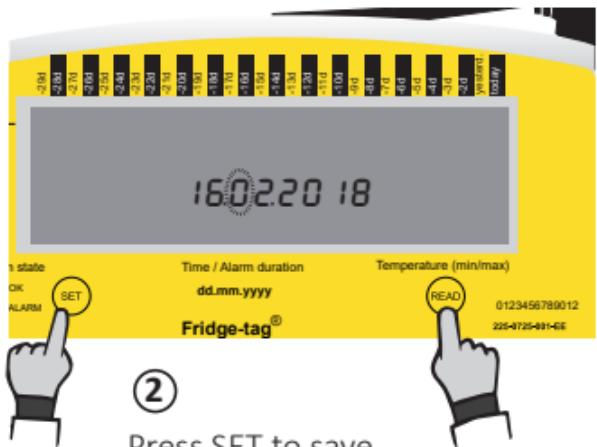
Note: If SET is pressed mistakenly, continue with the set up instructions for changing the mistake are described in chapter 6.

## 5.5. Setting the date

The following example shows how to set the date to: 16<sup>th</sup> of February 2018 (16.02.2018) in Europe format



The 3<sup>rd</sup> digit is  
flashing:

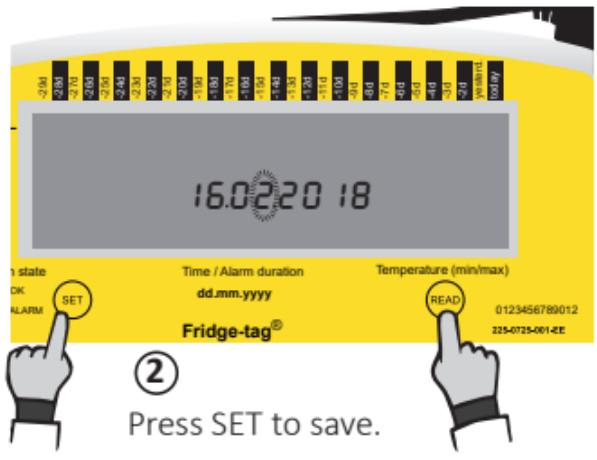


② Press SET to save.

①

Press READ until "0"  
appears as the third  
digit.

The 4<sup>th</sup> digit is  
flashing:



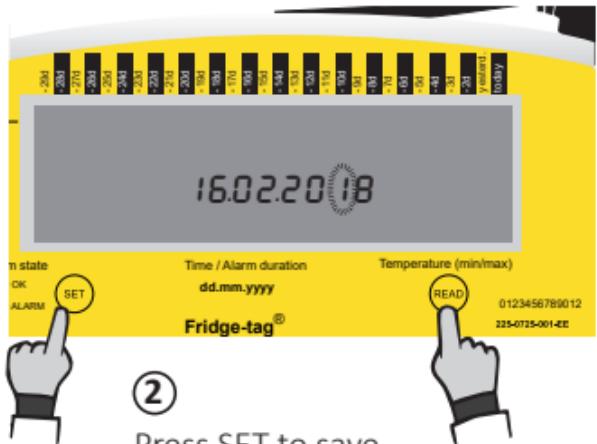
② Press SET to save.

①

Press READ until "2"  
appears as the fourth  
digit.

Note: The fifth and sixth digit is set automatically.

The 7<sup>th</sup> digit is  
flashing:

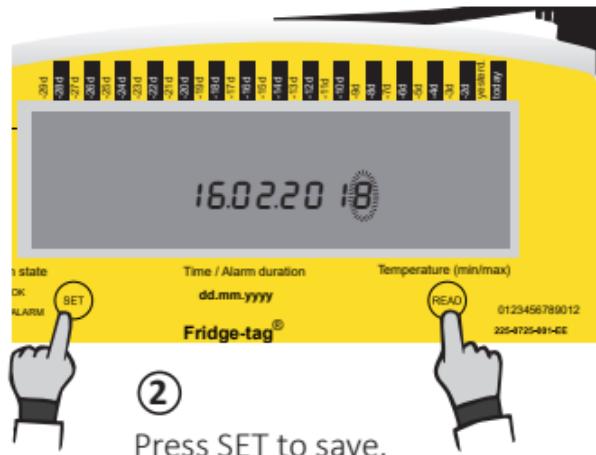


② Press SET to save.

①

Press READ until  
"1" appears as the  
seventh digit.

The 8<sup>th</sup> digit is  
flashing:



①

Press READ until "8" appears as the eighth digit.

The date is now set to: 16.02.2018

---

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

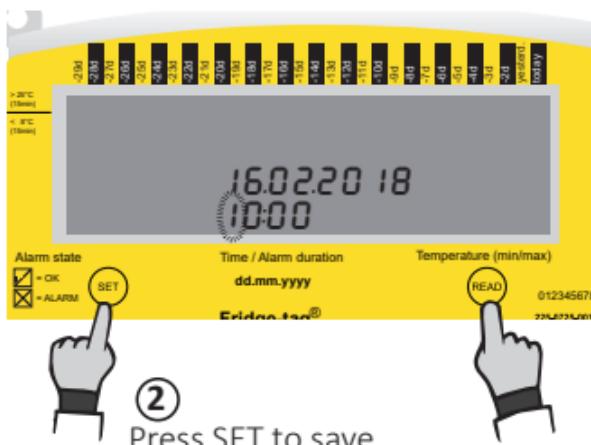
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## 5.6. Setting the time

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

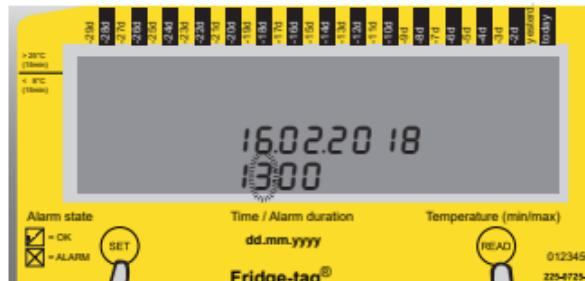
Note: The clock function operates as a 24 hour clock  
(e.g. 1:47 pm = 13:47).

The 1<sup>st</sup> digit is  
flashing:



①

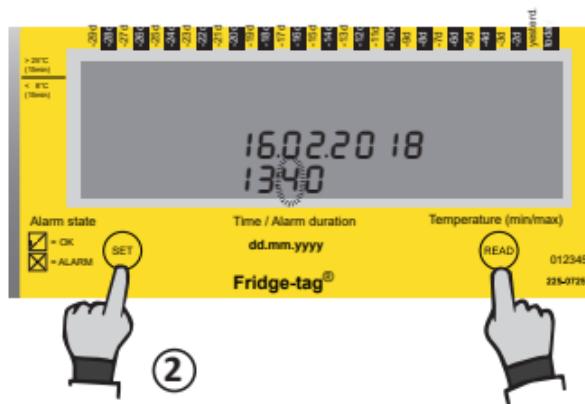
Press READ once until  
"1" appears as the  
first digit.



The 2<sup>nd</sup> digit is  
flashing:

①

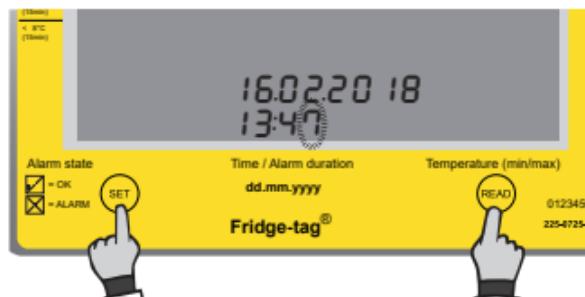
Press READ three  
times until "3"  
appears as the second  
digit.



The 3<sup>rd</sup> digit is  
flashing:

①

Press READ four times  
until "4" appears as  
the third digit.



The 4<sup>th</sup> digit is  
flashing:

①

Press READ seven  
times until "7"  
appears as the fourth  
digit.

The time is now set to: 13:47

**Note:** If the device is configured with self-programmable Alarm limits proceed with the following chapter. If not, the activation is now completed.

**Internal sensor:** Continue with chapter 4. Placing the Fridge-tag 2 L

**External sensor:** Connect the device with the external sensor and continue with chapter 5.8, Connection error.

**Note:** During max. 1 minute after activation no temperature is displayed on the screen.

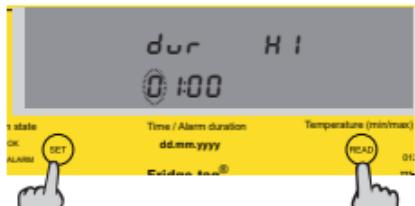
---

## 5.7. Setting the Alarm limits (Not standard, only by special order)

This adjustment is done in 4 steps:

1. Setting the duration of the upper Alarm limit
  2. Setting the temperature of the upper Alarm limit
  3. Setting the duration to the lower Alarm limit
  4. Setting the temperature of the lower Alarm limit
- 

1. and 3. Setting the HI & LO Alarm duration, they are completed in the same manner



- ② Press SET to confirm the number.

The 1<sup>st</sup> digit of the duration of the Alarm limit is flashing:

①

Press READ to adjust the number.

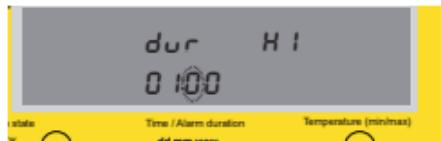


- ② Press SET to confirm the number.

The 2<sup>nd</sup> digit of the duration of the Alarm limit is flashing:

①

Press READ to adjust the number.



The 3<sup>rd</sup> digit of the duration of the Alarm limit is flashing:

- ① Press READ to adjust the number.

- ② Press SET to confirm the number.



The 4<sup>th</sup> digit of the duration of the Alarm limit is flashing:

- ① Press READ to adjust the number.

- ② Press SET to confirm the number.

The duration of the Alarm limit is now set.

## 2. and 4. Setting the HI and LO Alarm temperature, they are completed in the same manner

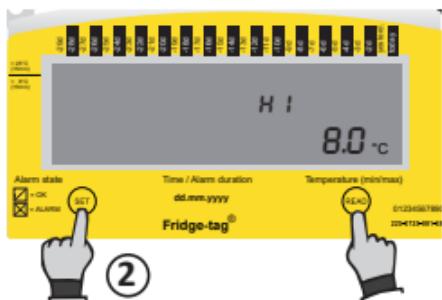
**For internal sensor:** Alarm temperature limits must be no lower than -20 °C (-4 °F) and no higher than +50 °C (+122 °F).

**For external sensor:** Alarm temperature limits must be no lower than -35 °C (-31 °F) and no higher than +55 °C (+131 °F).

First you have to choose the range of the desired temperature limit. You have the choice between negative and positive temperatures. In case of a positive limit in Fahrenheit scale you may further choose if the limit shall be equal or above +100 °F. This choice is done by repetitively pressing READ until the desired range is indicated.

**Note:** The temperature measurement unit (°C/°F) can only be changed after the device is activated in the menu. Go to chapter 6, "Read and change settings/How to correct setting mistakes".

Instruction for setting a positive temperature limit between 0 °C/0 °F and +50 °C/+122 °F (internal sensor) and 0 °C/0 °F and +55 °C/+131 °F (external sensor)



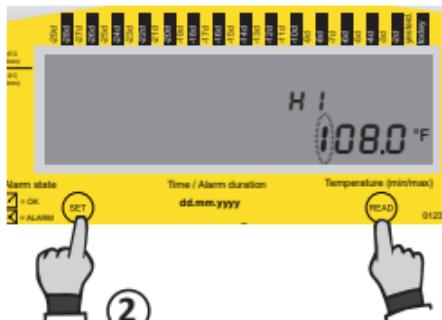
- ① Press READ until the display shows, no flashing sign

Press SET to adjust the limit between 0 °C/0 °F and +50 °C/+122 °F.

The next digit can now be set. Press READ until you reach the desired number. Then press SET to confirm it. Then the next digit will start flashing. Continue until all digits of the Alarm temperature are set.

Instruction for setting a positive Fahrenheit temperature limit equal or above +100 °F

Note: the maximum Celsius temperature is +50 °C (internal sensor) and +55°C (external sensor). This Option is only for temperatures in Fahrenheit.

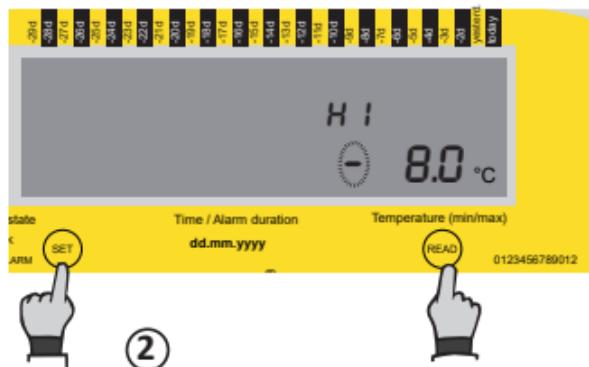


- ① Press READ until a flashing leading "1" is indicated on the display:

Press SET to adjust the limit equal or above +100 °F.

The next digit of the temperature starts flashing. Set the number and continue until all digits of the Alarm temperature limit are set.

## Setting a negative temperature limit below 0 °C/0 °F



② Press SET to set the limit below 0 °C/0°F.

①

Press READ until the flashing "--" sign is indicated on the screen:

The next digit can now be set. Press READ until you reach the desired number. Then press SET to confirm it. Then the next digit will start flashing. Continue until all digits of the Alarm temperature limits are set.

---

As soon as the parameters of the upper Alarm limit are set, the first digit of the duration of the lower Alarm limit will start flashing. Proceed the same way as you did with the upper Alarm limit.

**Internal sensor:** As soon as the last digit of the lower Alarm limit is confirmed, the activation is completed.

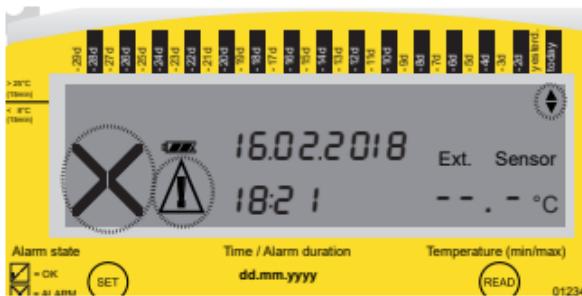
**External sensor:** As soon as the last digit of the lower Alarm limit is confirmed, the activation is completed. Connect the device with the external sensor.

**Note:** In case the desired temperature limit cannot be confirmed, check if the temperature is set within the allowed operating temperature range.

## 5.8. Connection error (external sensor only)

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

- the buzzer will sound two beeps at interval of three minutes for maximum 168h (7 days).
- the whole display starts blinking.
- any confirmation will stop the display 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 168h (7 days).



Display status:  
external sensor error

### 5.8.1. How to fix the connection error

Please check the following two points:

1. if the external sensor is properly connected with the device.
2. if the external sensor cable has any defects.

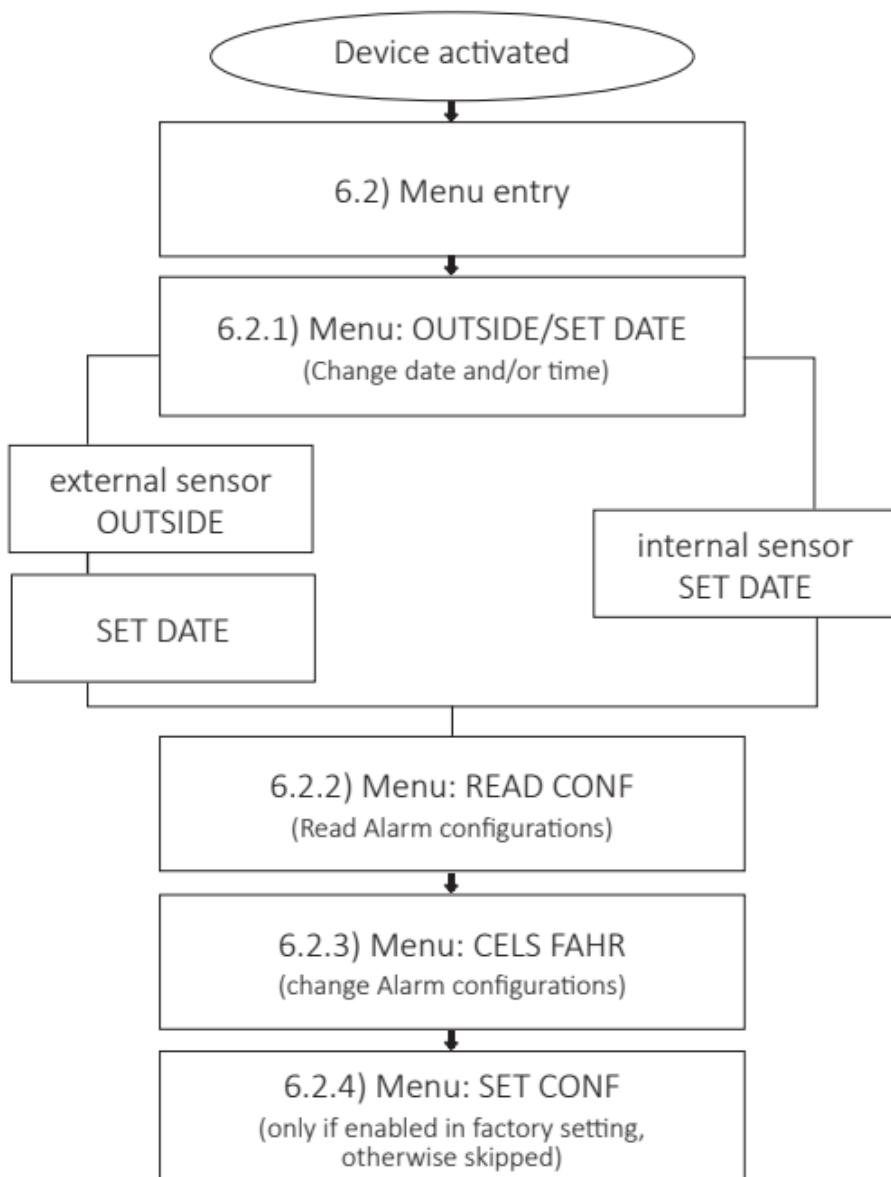
**Note:** As soon as the error(s) have been cleared, the measuring will continue and the connection error buzzer stops automatically. During max. 1 minute after the connection no temperature is displayed on the screen.

**Note:** Fix the connection error before stopping the warning. Otherwise new temperature records will not be captured.

**Note:** During a connection error no data will be recorded.

## 6. Read and change settings / How to correct setting mistakes

### 6.1. Overview menu

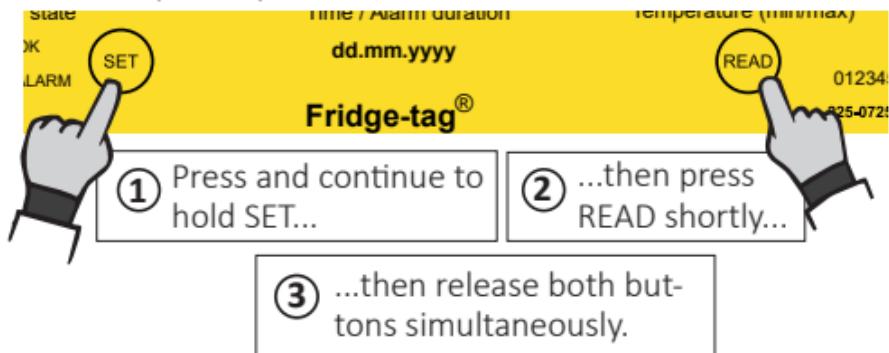


**Note:** If you scroll through the menu and you reach the display of the measuring mode again you need to restart from the beginning by accessing the menu.

In order to adjust more than one setting (e.g. time & Celsius to Fahrenheit) you must complete each change and return to menu mode for the 2<sup>nd</sup> change.

## 6.2. Menu entry to 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:



"SET DATE" (internal sensor) is now displayed on the screen.

"OUT SIDE" (external sensor) is now displayed on the screen.

You entered the menu mode and may choose which item to see or change.

---

You can access the following 4 menus:

**OUT SIDE (external sensor):** first screen, shows the temperature measured with the internal sensor of the Fridge-tag 2 L (normal ambient temperature).  
Press READ once to get to SET DATE.

**SET DATE (internal sensor):** Configuration with internal sensor, SET DATE is directly shown.

1. SET DATE- change date and/or time settings
2. READ CONF- read the Alarm settings
3. CELS FAHR- change to Celsius or Fahrenheit
4. SET CONF- change the Alarm settings  
(only if enabled in factory setting)

---

Use the READ button to scroll through the menu.

Use the SET button to access the corresponding menu.

### **6.2.1. Access the menu "SET DATE"**

The display shows the menu "OUT SIDE" (external sensor) Press READ until the display shows "SET DATE".

The display shows the menu "SET DATE" (internal sensor). Press SET to access the menu to adjust the date format, date or time settings. Then follow the steps as described in chapter "Setting the date and time".

**Note:** Time and date adjustments have no effect on the Alarm records. Once the device is activated, it cannot be stopped anymore. The number of time adjustments during the same day is unlimited.

**Note:** After the adjustment has been done, the Fridge-tag 2 L will be locked for 24 hours from the following midnight (e.g. changes on the 15<sup>th</sup> Sept., device locked from 00:01 am on the 16<sup>th</sup> until 00.01 am on the 17<sup>th</sup>). This is for security reasons.

---

### **6.2.2. Access the menu "READ CONF"**

The display shows the menu "SET DATE". 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 continuously press READ to scroll through the preset Alarm parameters.

---

### **6.2.3. Access the menu "CELS FAHR"**

The display shows the menu "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.

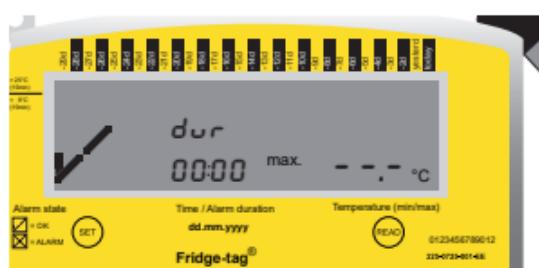
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### **6.2.4. Access\* the menu "SET CONF"**

The display shows the menu "SET DATE". Press READ until the display shows "SET CONF". Press SET to access the menu to change the Alarm configurations. To change the Alarm limits (duration or temperature) please proceed as described in chapter "Setting the Alarm limits".

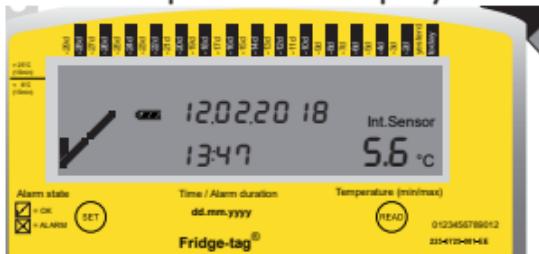
\*Changes of the Alarm limits are only possible for devices which are programmed with this feature.

## 7. Display indication during measurement mode



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

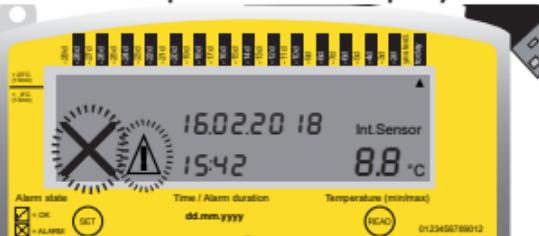
### 7.1. Example of OK Display - during measurement



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 2 L will also

indicate that the measuring is made with an internal sensor or an external sensor. A ✓ (OK symbol) is indicated during normal operation as long as no Alarms have been recorded. The temperature and time conditions were within the preset Alarm limits.

### 7.2. Example Alarm Display - during measurement



If the temperature and time conditions are outside the preset Alarm limits the following information will be displayed on the screen:

- The ✓ (OK symbol) will be replaced by X (Alarm symbol).
- An additional arrow (Alarm indicator) will be indicated in the upper display area to show which Alarm limit has been violated and on which day.
- In addition to the X (Alarm symbol) the ▲ (Warning symbol) will appear beside the X.

## 8. Alarm trigger function

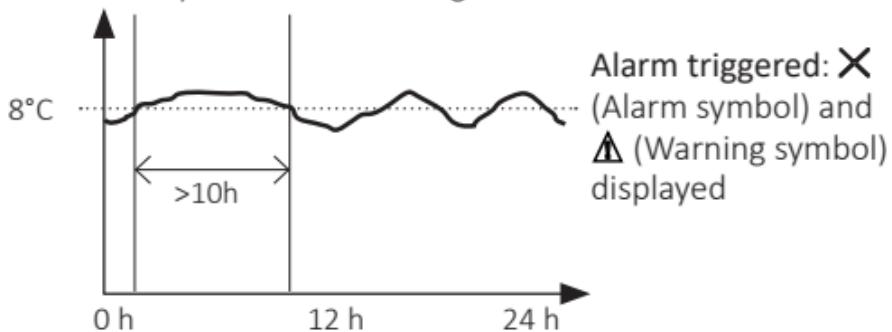
### 8.1. Single Event Alarm triggering

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 set Alarm limits for longer than the set Alarm trigger time.

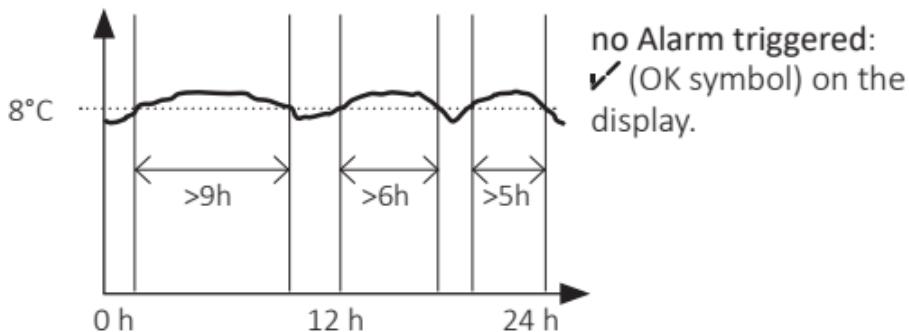
#### Upper Alarm triggering

Setting upper limit: Temperature  $> 8.0^{\circ}\text{C}$ , Duration  $> 10\text{h}$

For an upper Alarm to be triggered the temperature needs to be continuously above  $8^{\circ}\text{C}$  for longer than 10h.



In the example below the sum\* of the daily upper temperature excursion is about 20h. No Alarm will be triggered! The temperature was not continuously out of the set Alarm limits for more than 10h in one row.

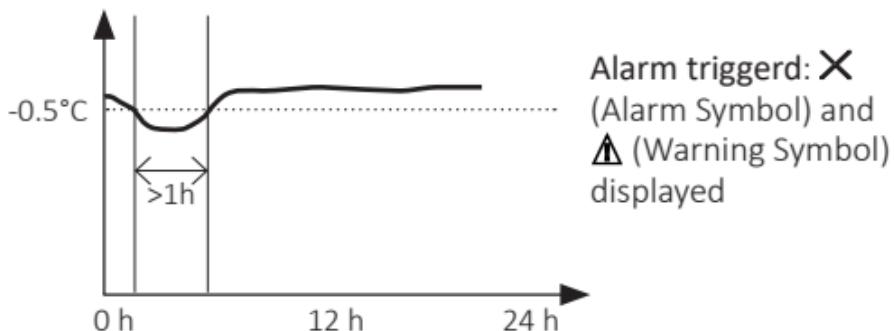


\* The sum of the excursions is visible in the daily statistics under the column "Cumulative daily time above the limit".

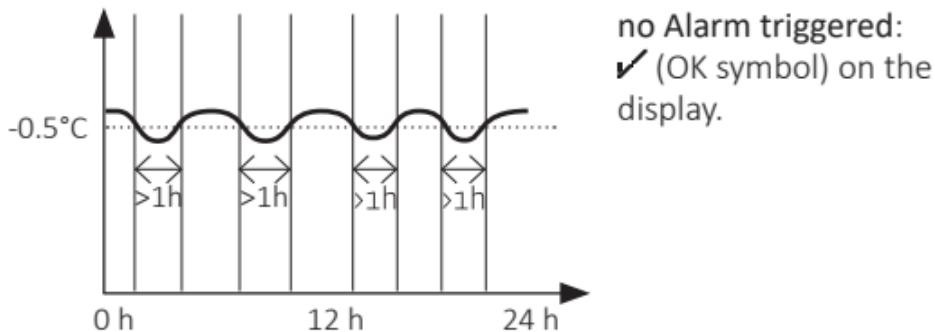
## Lower Alarm triggering

Setting lower limit: Temperature <-0.5°C, Duration >1h

For a lower Alarm to be triggered the temperature needs to be continuously below -0.5°C for longer than 1h.



In the example below multiple low temperature excursions\* are occurring. No Alarm will be triggered. Each temperature excursion was less than 1h out of the set Alarm limits.

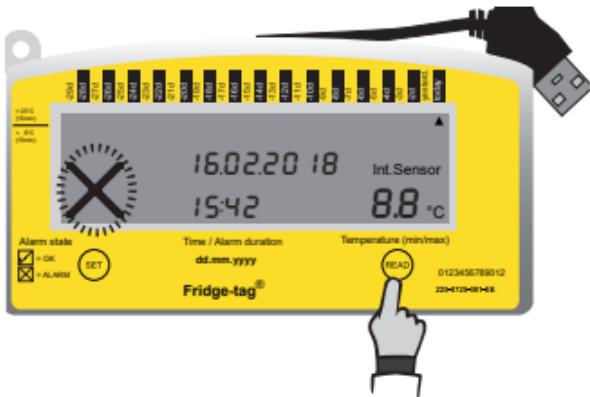
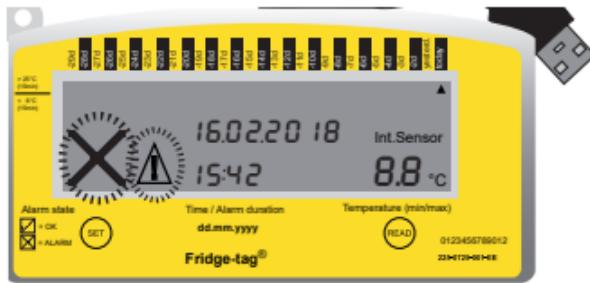


\* The sum of the excursions is visible in the daily statistics under the column "Cumulative daily time below the limit".

## 8.2. Alarm display and confirmation options

### Option 1- Alarm indication "all Alarms":

With this option the Alarms will be visible on the display with an **X** (Alarm symbol) for 30 days.



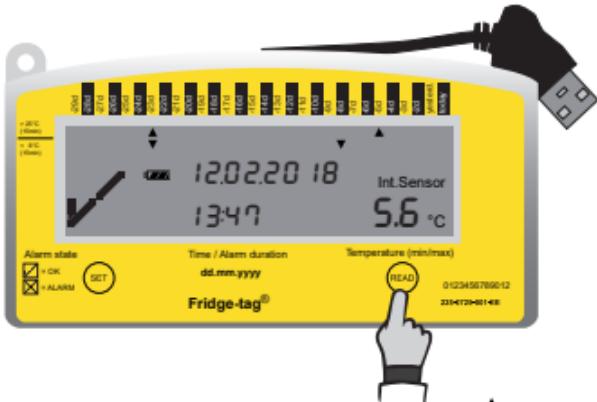
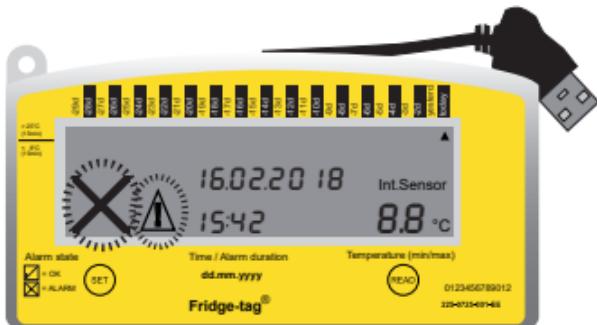
By pressing the READ button, the **▲** (Warning symbol) will be disabled for the corresponding Alarms. The **X** (Alarm symbol) cannot be canceled nor reset.

#### Note:

- In this mode only one upper and one lower Alarm will be triggered per day.
- The **X** (Alarm symbol) will be present on the display for 30 days.
- The **▲** (Warning symbol) can be ticked off by confirming all existing Alarms with the READ button in the history "read out mode".
- The Alarm buzzer stops when the Alarm is confirmed within the set Alarm limits. Otherwise the buzzer pauses for approx. 1h and starts again for up to 168h (7 days).

## Option 2 - Alarm indication "unconfirmed Alarms":

the Alarms will be visible with an **X** (Alarm symbol) until all Alarms (in the last 30 days history) have been confirmed as solved by pressing the read button. Afterwards the display will show a ✓ (OK symbol) until a new Alarm is triggered.



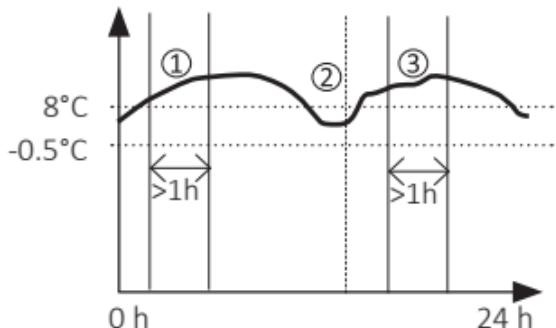
By pressing the READ button the **⚠** (Warning symbol) will be disabled for the corresponding Alarms. The **X** (Alarm symbol) disappears and will go to the ✓ (OK symbol) again.

## Confirmation options of currently triggered Alarms of the day:

### 1. Device is within the set Alarm limits.

Press the READ button and the **X** (Alarm symbol) and **⚠** (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.

Example see next page.

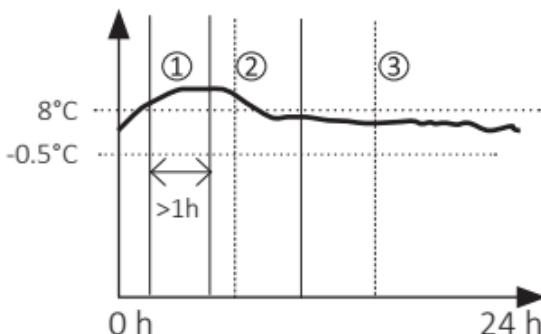


**Settings:** upper limit Temperature  $>8.0^{\circ}\text{C}$  and duration  $>1\text{h}$   
 lower limit Temperature  $<-0.5^{\circ}\text{C}$  and duration 1h

1. Alarm triggered: **X** (Alarm symbol) on display and **Δ** (Warning symbol) enabled
2. Alarm confirmed in temperature good condition: **✓** (OK symbol) on display
3. Alarm triggered: **X** (Alarm symbol) on display and **Δ** (Warning symbol) enabled again.

## 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. 1h. The **X** (Alarm-) and the **Δ** (Warning symbol) will stay for the corresponding Alarm. If after 1h, the temperature is still outside the limit, the buzzer will restart beeping.



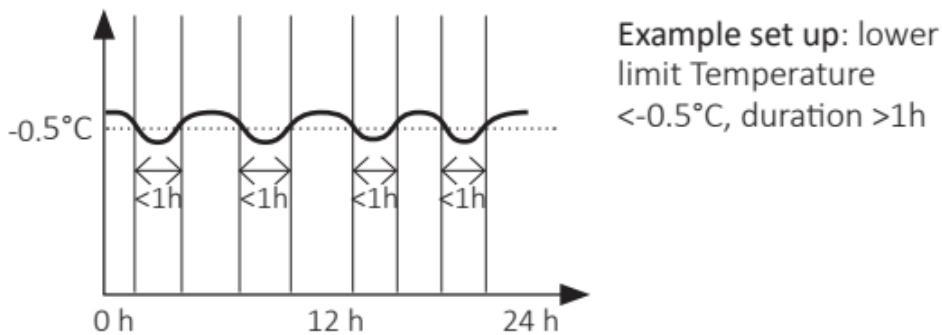
**Settings:** upper limit Temperature  $>8.0^{\circ}\text{C}$  and duration  $>1\text{h}$   
 lower limit Temperature  $<-0.5^{\circ}\text{C}$  and duration 1h

1. Alarm triggered: **X** (Alarm-) on display and **Δ** (Warning symbol) enabled.
  2. Alarm confirmed during temperature Alarm condition: **X** (Alarm-) and **Δ** (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 **X** (Alarm-) and the **Δ** (Warning symbol) react is specified in the configuration of the device and factory setting at time of order.

### 8.3. Cumulative daily time above/lower the limit

The Alarm trigger algorithm is based on a single event, although the Fridge-tag 2 L is measuring- daily based- the individual total time above or below the temperature limits. This measurement is not used for any Alarm condition. This value is only available in the generated PDF/ASCII files.

**Note:** It could be the case that the total cumulative time above/below the temperature limits are higher than the configured single event Alarm time without any Alarm triggering.



In the above example multiple low temperature excursions with exposure times of less than 1h occurred.

The cumulative daily time below the limits will measure about 3.5h but no Alarm will be triggered. The same behavior also applies to the upper Alarm.

---

## 9. Audio Alarm - (optional factory setting)

In case of an upper or lower Alarm trigger, 3 audible Alarm signals will be triggered immediately. (500ms ON/500ms OFF). Thereafter:

- Every minute 1 Alarm signal for maximum 168h (7 days)
- After 168h (7 days) buzzer will stop
- If an Alarm event is confirmed (READ is pressed) while still violating the limits, 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 5.8.

## 10. Reading the History / Read out mode

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

Note: The external sensor of the Fridge-tag 2 L can remain at its location for the read out process. Please consider, that there may occur a connection error after more than 10 minutes without connection between the device and the sensor.

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

Example of an OK display - during read out of the history

The following information is indicated on the screen:

- The ✓ (OK symbol)
- The corresponding ▲ flashing arrow (example: high arrow of "today")
- Highest recorded temperature (example: +10.5 °C)
- The time duration out of the preset temperature high limit (example 00:32; hh:min).



Press READ once

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)
- The time duration out of the preset temperature low limit (example 00:00; hh:min).



Press READ a second time

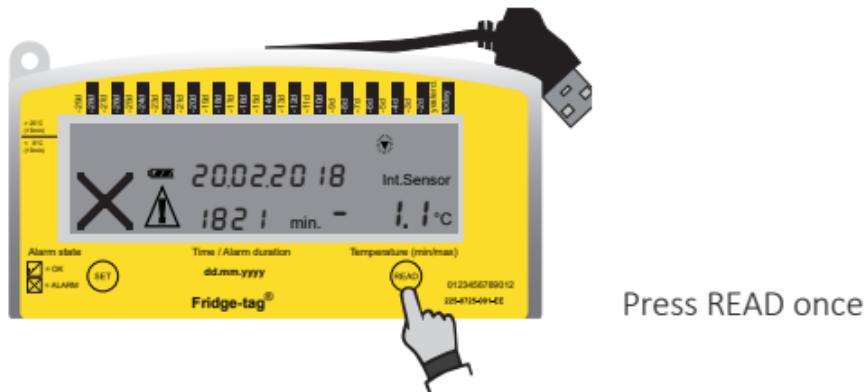
Note: in the "Read out Mode" the flashing arrows display the day where your are (30-day-history) and show the ▲ highest and ▼ lowest measured temperature corresponding day. If there was a violation also the duration is shown.

**Note:** Continue repetitively pressing the READ button to read out day per day the details of the past 30 days.

**Note:** When you reach an Alarm event, the indication on the screen of the Fridge-tag 2 L will be different to the indication of an OK display.

---

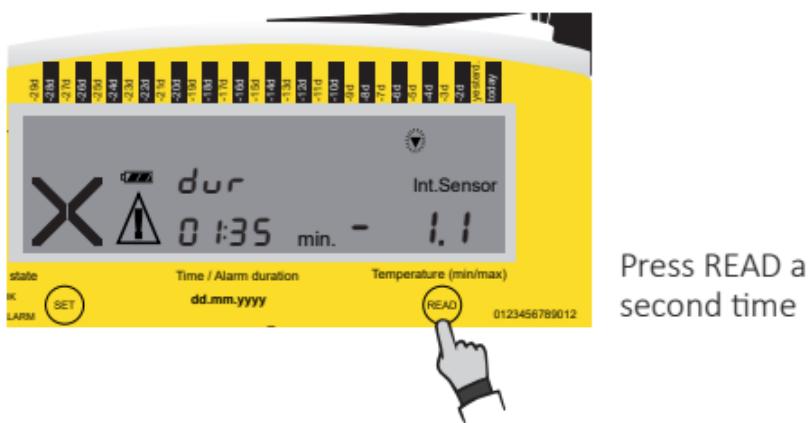
**Example of an Alarm display - during reading out of the history 1<sup>st</sup> displayed screen of a "Lower Alarm event"**



- The following information is indicated on the screen:
- The **X** (Alarm-) and the **⚠** (Warning symbol)
- The corresponding **▼** (Alarm indicator) (Lower Alarm limit)
- Day of Alarm (example: 5 days ago -5d)
- The date of excursion (example: 20.02.2018)
- The time of excursion (example: 18:21)

---

**2<sup>nd</sup> displayed screen of a "Lower Alarm event":**



The following additional information is indicated on the screen:

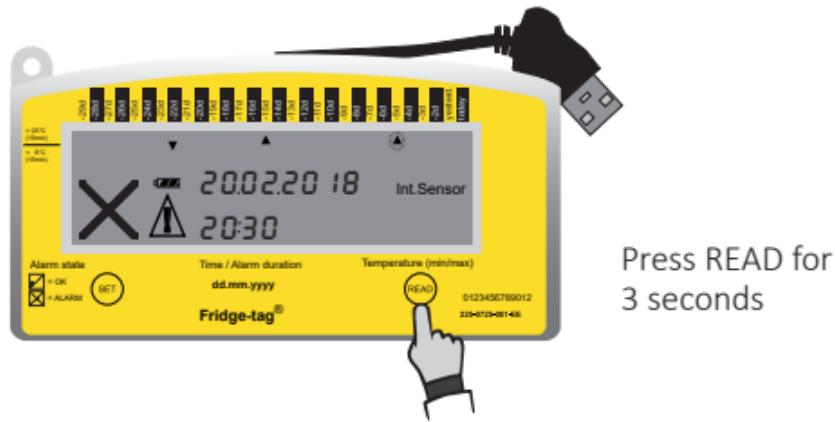
- Highest recorded temperature (example: -1.1°C)
  - The time duration out of the preset low temperature limit (example: 01:35; hh:mm)
  - Temperature recording in this example with internal sensor
- 

## 10.2. Option 2:

Read out only Alarms directly on the device - use Alarm-Super-Jump function (30 day history)

If you like to read out only the Alarms directly on the device, press and hold the READ button for at least 3 seconds.

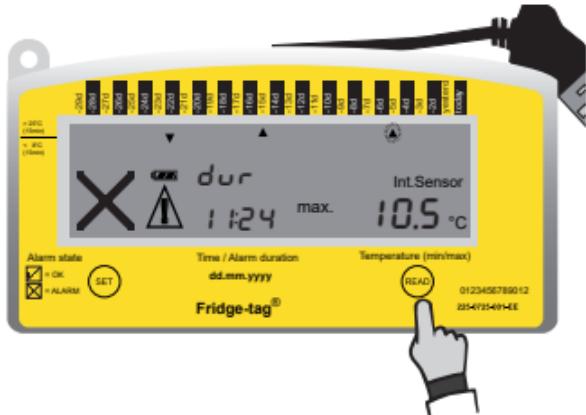
1<sup>st</sup> displayed screen of the latest Alarm event:



The following information is indicated on the screen:

- The **X** (Alarm symbol) and the **▲** (Warning symbol)
- The corresponding **▲** (Alarm indicator) (Higher Alarm limit)
- Day of Alarm example: 5 days ago -5d
- The date of excursion example: 20.02.2018
- The time of excursion example: 20:30

2<sup>nd</sup> displayed screen of the latest Alarm event



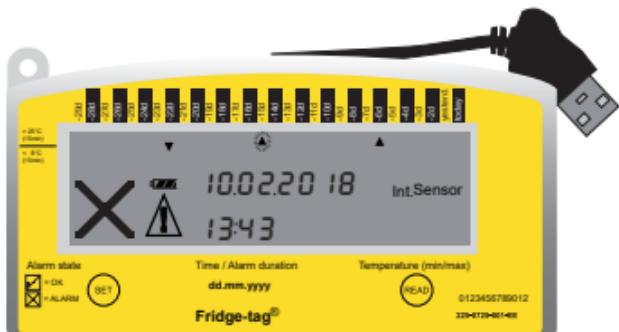
Then press READ again

The following additional information is indicated on the screen:

- Highest recorded temperature example: +10.5 °C
  - The time duration out of the preset high temperature limit example 11:24; hh:mm.
  - Temperature recording with example: internal sensor

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

1<sup>st</sup> displayed screen of the next Alarm event:



Note: Repeat the action to press the READ button for 3 seconds to jump directly to the next Alarm event. And so on.

### 10.3. Option 3: Read out data from the files generated by the Fridge-tag 2 L by connecting it with a computer

Plug the Fridge-tag 2 L into any computer via USB Interface. Make sure the device is plugged in properly.



---

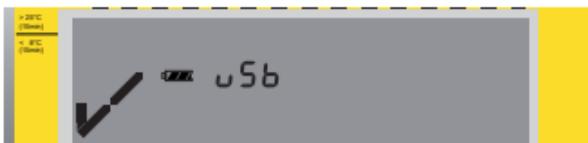
Wait sufficient time for the device to generate the ASCII and PDF files (approx. 2 min). Now choose the appropriate file generated by the Fridge-tag 2 L.

#### USB connection of a Fridge-tag 2 L.

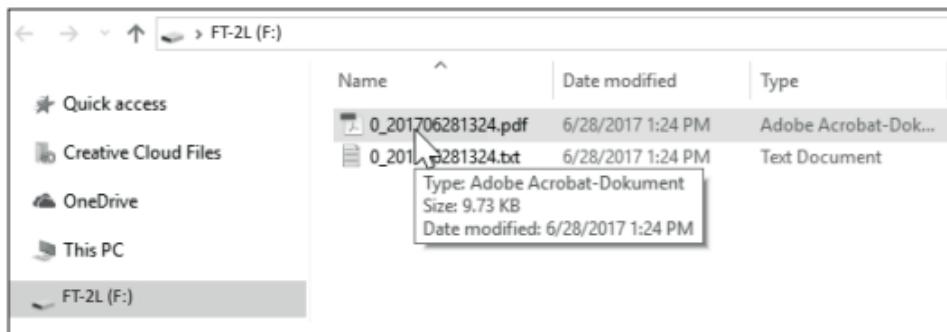
You can see the progress bar by continuously appearing arrows in the upper display area.



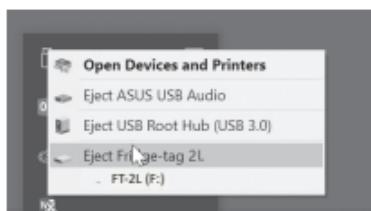
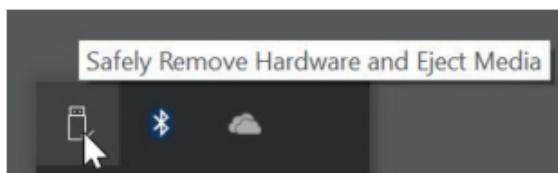
Note: This process must not be interrupted, until the OK symbol appears on the display, indicating that the report creation is complete.



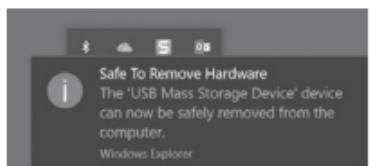
The hard drive of the Fridge-tag 2 L is shown in your explorer  
Open the appropriate file generated by the Fridge-tag 2 L.



Note: For a proper USB-port disconnection of the device, please always use the "Safely Remove Hardware" function on your PC/Mac.



Right mouse click on the icon "Safely Remove Hardware and Eject Media". (Choose the right device to remove).



Do not disconnect the device before you receive the following message:

Note: For this process no additional software is necessary.

## 10.4 PDF report explanation

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

① Document title and device type

② Device ID and self explaining information

③ Alarm settings

④ Measuring and Logging interval

### PDF document of the Fridge-tag® 2 L

①

Identification number:

510600000006

01/01/2018 20:37h

Activation date:

29/02/2018 13:40h

Above +8°C for 1min

Below +2°C for 1min

1min (fixed)

Logging interval:-

5min

② Date and time of report creation:

01/03/2018 12:03h

③ Upper alarm limit:

Low battery since:

12/03/2018

④ Lower alarm limit:

5min (fixed)

⑤ Measurement interval:-

1min (fixed)

⑥

Test String 1

Test String 2

Test String 3

⑦ Event and alarm table with current info on top

⑧ Up to 3 user definable strings (max. 30 characters each). Factory pre setting

⑨ Placeholder for handwritten notes

⑩ Note 1: Hint for measurement interval

Note 2: Legend for events column, (hh:mm -> 1 time stamp/half day)

⑪ Placeholder for date and signature

⑫ Battery warning event timestamp

No.	Date (MM/yyyy)	Event/so	Average temp.	Cumulative temp. below the limit	Alarm trigger times	Max. temp.	Cumulative daily time above the limit	Alarm trigger time	Status	Duration	Signature / index	Action taken
1	Today		+1.8°C	11h:45min	00:00h	+5.8°C	0min	In progress	ok	0min		
2	01/03/2018	ALARM	+1.5°C	17h:25min	00:00h	+5.7°C	0min	ok	ok	0min		
3	01/03/2018	ALARM	+1.0°C	18h:00min	00:00h	+4.5°C	0min	ok	ok	0min		
4	01/03/2018	ALARM	+2.0°C	16h:30min	00:00h	+6.4°C	0min	ok	ok	0min		
5	01/03/2018	ALARM	+0.5°C	14h:45min	00:00h	+7.5°C	0min	ok	ok	0min		
6	01/03/2018	ALARM	+2.3°C	9h:30min	00:00h	+5.5°C	0min	ok	ok	0min		
7	12/02/2018	ALARM	+0.9°C	9h:24min	00:00h	+6.5°C	0min	ok	ok	0min		
8	12/02/2018	ALARM	+1.7°C	21h:00min	00:00h	+2.8°C	0min	ok	ok	0min		
9	12/02/2018	ALARM	+0.9°C	13h:22min	00:00h	+8.5°C	14min	ok	ok	0min		
10	12/02/2018	ALARM	-3.4°C	20h:15min	00:00h	+6.0°C	0min	ok	ok	0min		
11	12/02/2018	ALARM	+0.3°C	20h:15min	00:00h	+5.9°C	0min	ok	ok	0min		
12	12/02/2018	ALARM	+0.9°C	19h:47min	00:00h	+6.4°C	0min	ok	ok	0min		
13	12/02/2018	ALARM	+0.5°C	19h:19min	02:28h	+8.3°C	24min	ok	ok	12:51h		
14	12/02/2018	ALARM	+2.4°C	11h:14min	00:00h	+8.6°C	0min	ok	ok	10:59h		
15	12/02/2018	ALARM	+3.3°C	10h:44min	00:00h	+8.6°C	0min	ok	ok	0min		
16	12/02/2018	ALARM	+3.3°C	10h:25min	00:00h	+8.2°C	13min	ok	ok	12:53h		
17	12/02/2018	ALARM	+5.0°C	21h:38min	22:41h	+8.3°C	32min	ok	ok	0min		
18	12/02/2018	ALARM	+3.1°C	10h:22min	00:00h	+8.2°C	2h:36min	ok	ok	0min		
19	12/02/2018	ALARM	+4.0°C	17h:30min	05:30h	+9.3°C	3h:40min	ok	ok	11:27h		
20	12/02/2018	ALARM	+5.4°C	11h:09min	00:00h	+8.0°C	4h:54min	ok	ok	10:29h		
21	12/02/2018	ALARM	+4.6°C	19h:15min	00:00h	+8.6°C	1h:56min	ok	ok	11:09h		
22	12/02/2018	ALARM	+4.6°C	19h:15min	00:00h	+8.6°C	1h:56min	ok	ok	11:57h		
23	12/02/2018	ALARM	+5.0°C	19h:59min	00:14h	+8.6°C	1h:14min	ok	ok	11:43h		
24	12/02/2018	ALARM	+1.2°C	14h:57min	00:00h	+8.1°C	0min	ok	ok	0min		
25	12/02/2018	ALARM	-2.1°C	21h:53min	00:00h	+8.1°C	0min	ok	ok	0min		
26	12/02/2018	ALARM	+0.3°C	18h:1min	00:00h	+8.5°C	0min	ok	ok	0min		
27	12/02/2018	ALARM	+0.5°C	18h:34min	18:27h	+1.4°C	2min	ok	ok	13:42h		
28	12/02/2018	ALARM	+2.8°C	0min	+25.5°C	+27.5°C	2min	ok	ok	00:00h		

⑬ Pending event alert every minute  
2h = time of start alert, ok = alarm configuration changed, warn = alarm activated

⑭ Date and place: \_\_\_\_\_  
Signature: \_\_\_\_\_

⑮

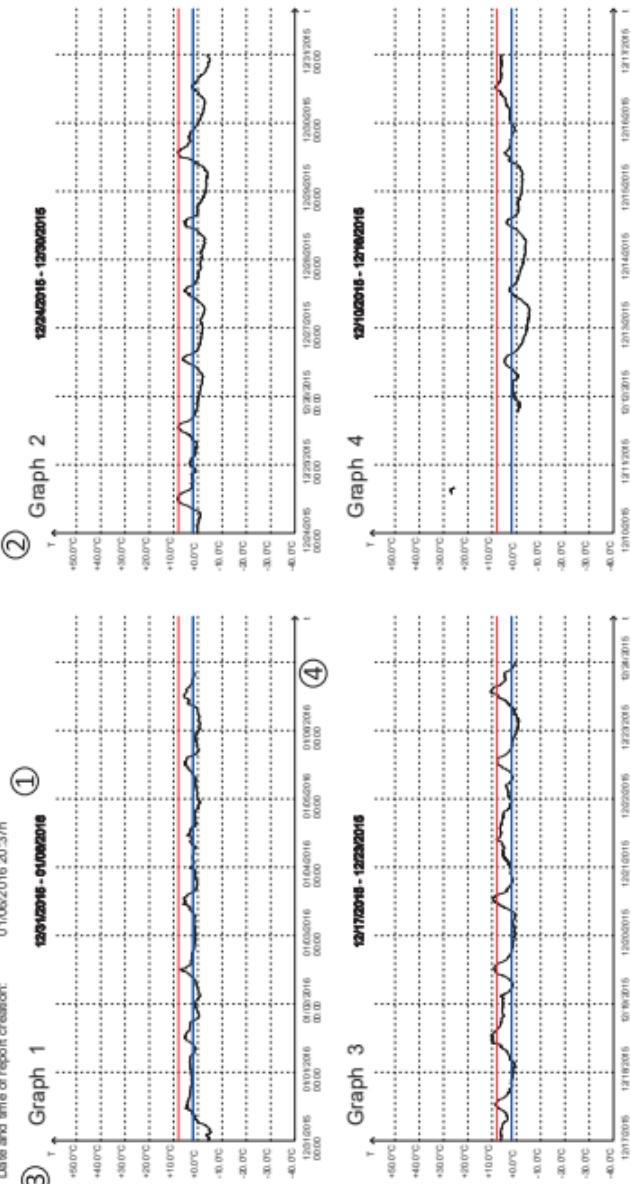
# Sample of a PDF-file generated by a Fridge-tag 2 L with external sensor

- ① Graphic represents 7 days of data
- ② Incremental numbered graphs
- ③ Temperature scale
- ④ Timescale
- ⑤ Alarm limits

## PDF document of the Fridge-tag® 2 L

Identification number:  
Date and time of report creation:

510500000006  
01/02/2016 20:37



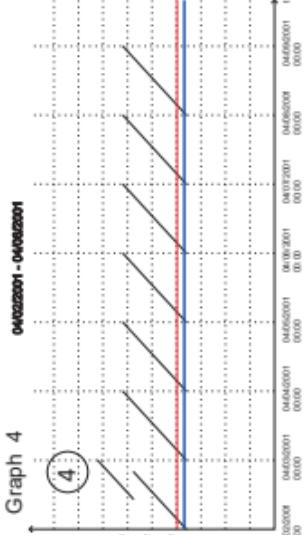
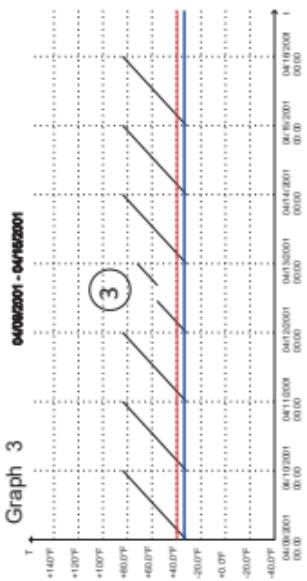
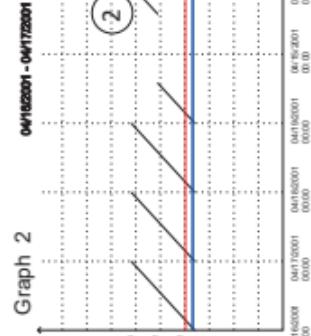
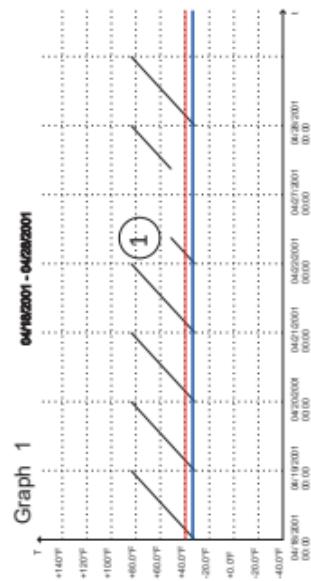
⑤   
Alarm limits

## Graph behavior when manual date/time changed

- 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)

### PDF document of the Fridge-tag® 2 L

Identification number:  
SER 123  
Date and time of report creation:  
01/01/2001 04:05h



Alarm limits

## 10.5. Auto scaling of graphs in PDF

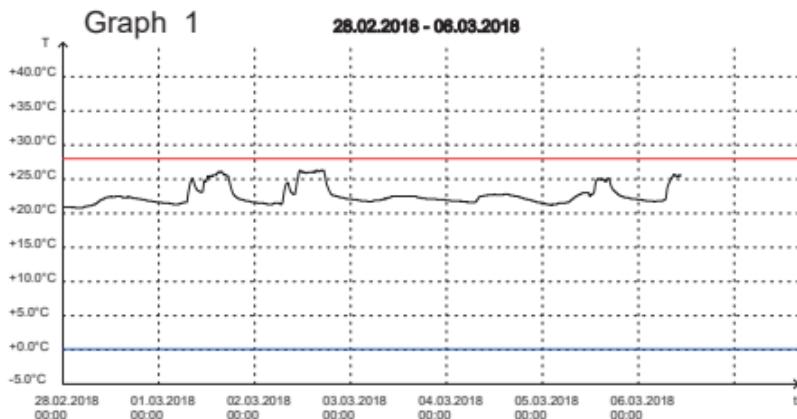
The graph of the report is created dynamically depending on the following settings:

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

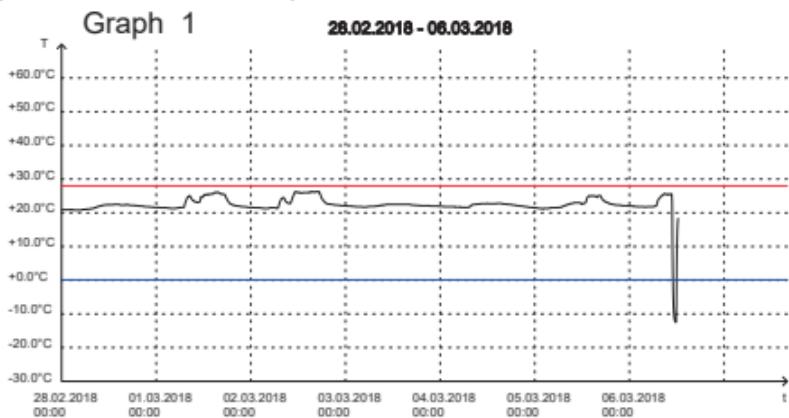
This is valid for all graphs in the PDF file until:

- the highest and lowest measured values drop out the history
  - the temperature settings (self configurable device only) are changed

**Example below:** The scale of the graph is displayed from the alarm limits set. Temperature scale from +40 °C to -5 °C for the limits of +0.5 °C and +28°C.



**Example below:** The scale of the graph is displayed from the highest and lowest measured temperature values. Temperature scale from -30 °C to +60 °C. Lowest measured temperature: -12 °C, highest measured temperature: +25°C.



# Sample of a PDF-file generated by a Fridge-tag 2 L with internal sensor.

## PDF document of the Fridge-tag® 2 L

Identification number: 510500000006  
 Date and time of report creation: 01/06/2016 20:37h  
 Activation date: 12/10/2015 13:40h  
 Upper alarm limit: Above +8.0°C for 1min  
 Lower alarm limit: Below +2.0°C for 1min  
 Measurement interval:<sup>1)</sup> 1min (fixed)  
 Logging interval: 5min

No.	Date (MM/dd/yyyy)	Events <sup>2)</sup>	Lower alarm limit				Upper alarm limit				Signature / notes	Action taken
			Status	Min. temp.	Cumulative daily time below the limit	Alarm trigger time	Status	Max. temp.	Cumulative daily time above the limit	Alarm trigger time		
1	Today	+1.8°C	ALARM	-1.0°C	11h 4min	00:00h	In progress	+8.0°C	0min			
2	01/05/2016	+1.5°C	ALARM	-0.8°C	17h 29min	00:00h	ok	+5.7°C	0min			
3	01/04/2016	+1.5°C	ALARM	-1.0°C	15h 1min	00:26h	ok	+4.5°C	0min			
4	01/03/2016	+2.0°C	ALARM	-0.1°C	16h 9min	00:00h	ok	+6.4°C	0min			
5	01/02/2016	+1.7°C	ALARM	-1.1°C	14h 54min	00:00h	ok	+7.5°C	0min			
6	01/01/2016	+2.3°C	ALARM	-0.7°C	9h 35min	08:19h	ok	+5.5°C	0min			
7	12/31/2015	+0.9°C	ALARM	-5.3°C	9h 24min	00:00h	ok	+5.3°C	0min			
8	12/30/2015	-1.7°C	ALARM	-5.1°C	22h 46min	00:01h	ok	+2.5°C	0min			
9	12/29/2015	+0.9°C	ALARM	-4.2°C	13h 22min	00:00h	ok	+8.5°C	14min			
10	12/28/2015	-0.3°C	ALARM	-3.4°C	20h 1min	00:00h	ok	+6.0°C	0min			
11	12/27/2015	+0.0°C	ALARM	-2.9°C	19h 42min	00:00h	ok	+5.9°C	0min			
12	12/26/2015	+0.0°C	ALARM	-2.2°C	19h 47min	00:00h	ok	+6.4°C	0min			
13	12/25/2015	+2.3°C	ALARM	-0.5°C	13h 19min	02:28h	ALARM	+8.3°C	24min			
14	12/24/2015	+2.4°C	ALARM	-1.2°C	11h 14min	00:00h	ALARM	+8.6°C	30min			
15	12/23/2015	+3.3°C	ALARM	-1.3°C	10h 34min	00:00h	ALARM	+11.0°C	2h 55min			
16	12/22/2015	a_19:35	+3.3°C	ALARM	-0.5°C	7h 25min	06:37h	ALARM	+8.2°C	13min		
17	12/21/2015	+5.0°C	ALARM	+1.7°C	58min	22:41h	ALARM	+8.3°C	32min			
18	12/20/2015	+3.1°C	ALARM	+0.3°C	10h 32min	00:00h	ALARM	+10.2°C	2h 38min			
19	12/19/2015	+4.6°C	ALARM	+0.7°C	7h 33min	05:36h	ALARM	+9.3°C	3h 4min			
20	12/18/2015	+5.4°C	ALARM	+0.4°C	4h 9min	00:00h	ALARM	+10.8°C	4h 54min			
21	12/17/2015	+4.6°C	ALARM	+1.1°C	3h 18min	18:54h	ALARM	+8.8°C	1h 36min			
22	12/16/2015	+5.3°C	ALARM	+1.9°C	3min	00:11h	ALARM	+9.0°C	1h 14min			
23	12/15/2015	+0.5°C	ALARM	-2.8°C	14h 59min	00:00h	ok	+5.1°C	0min			
24	12/14/2015	-1.2°C	ALARM	-4.1°C	20h 57min	00:01h	ok	+4.1°C	0min			
25	12/13/2015	-2.1°C	ALARM	-5.7°C	21h 52min	00:00h	ok	+3.1°C	0min			
26	12/12/2015	+0.3°C	ALARM	-4.5°C	19h 1min	00:00h	ok	+5.1°C	0min			
27	12/11/2015	-0.5°C	ALARM	-1.7°C	5h 34min	18:27h	ok	+1.4°C	0min			
28	12/10/2015	+26.8°C	ok	+25.3°C	0min		ALARM	+27.5°C	2h 20min		13.42h	

1) Sampling and data analysis every minute

2) 1 = time / date changed, a = alarm configuration changed, ok = status checked

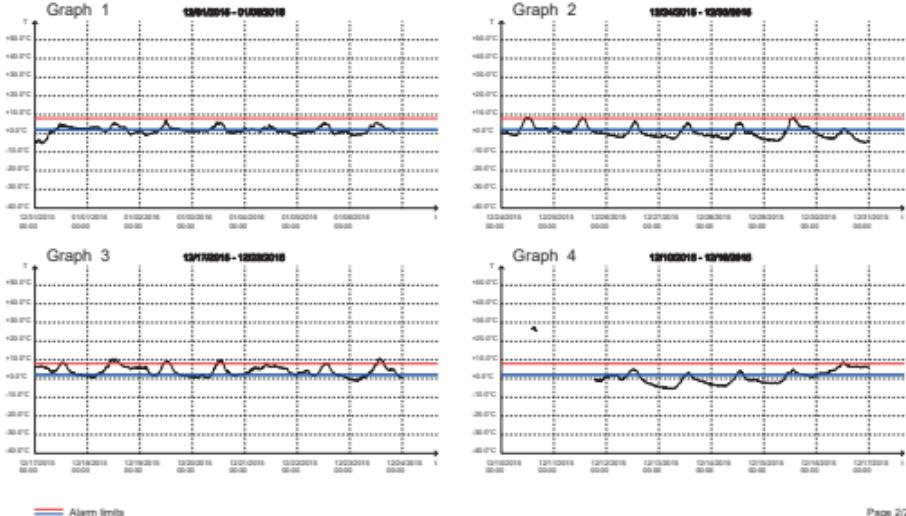
Date and place: \_\_\_\_\_

Signature: \_\_\_\_\_

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## PDF document of the Fridge-tag® 2 L

Identification number: 510500000006  
 Date and time of report creation: 01/06/2016 20:37h



## 10.6. Temperature record duration (optional factory setting)

Selectable record duration: 28, 56, 84, 112 days.

**Note:** File names on the Fridge-tag 2 L are write protected. The names may only be changed after downloading onto a computer. Changing is either possible directly on unopened files or via open and save commands with the 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 of "Today" is not yet complete
Status: OK	No Alarm has been triggered the past 30 days (No Alarm has yet been triggered since the last data 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 out of range	Cumulative daily time outside of the Alarm limits
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 8 "Alarm trigger function".

## 10.7. Verification process

This process is to verify if the files (PDF and ASCII-file) created by the Fridge-tag 2 L are authentic and have not been manipulated or accidentally changed (meets the strict FDA 21 CFR Part 11 requirements).

### 1st step:

Download the software Berlinger Verifier from our website: [www.berlinger.com/verifier](http://www.berlinger.com/verifier)



### 2nd step:

Open the software. The following window will appear:

### 3rd step:

Click on "Open file"



### 4th step:

Select the file you would like to verify.

**Option 1:** Select the files directly from the Fridge-tag 2 L 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 the PDF or the ASCII-file. The same OK or ERROR messages will appear.

## 11. Explanations of terms

### Read out mode

In order to avoid incorrect data, the Fridge-tag 2 L does not collect any readings while in the Adjustment or Read-out mode (e.g. changing time, date and during reading of history). The Fridge-tag 2 L 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 2 L measures temperatures above +55 °C or below -40 °C, it shows "HI" and "LO" on the screen and also in its extreme temperature memory. The regular measurements and monitoring of Alarmlimits will continue as usual. As soon as the temperature is between +55 °C and -40 °C numbers will be displayed again.

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## 12. Expire code explanation

Sample: exp 2020-07

The sample shows the expiry date of the Fridge-tag 2 L as July 2020 (2020-07).

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More information about the Fridge-tag 2 L can be found in the sales brochure and on the website: [www.berlinger.com](http://www.berlinger.com)

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## 13. Technical specifications

Storage condition (inactive)	0 °C to +30 °C
*Operating temperature (internal sensor)	-25 °C to +55 °C
*Operating temperature (external sensor)	-40 °C to +60 °C
Display visible (internal sensor)	-10 °C to +55 °C

Accuracy of temperature measurement	
internal sensor	external sensor
+/- 0.8 °C (-25 °C to -10 °C)	+/- 0.8 °C (-40 °C to -30 °C)
+/- 0.5 °C (-10 °C to +40 °C)	+/- 0.5 °C (-30 °C to +40 °C)
+/- 0.8 °C (+40 °C to +55 °C)	+/- 0.8 °C (+40 °C to +60 °C)

Accuracy of time measurement	+/- 30 minutes/year
Temperature measurement interval	every minute
Operating lifetime Fridge-tag 2 L	up to 3 ½ years
Estimated battery lifetime	(check battery indicator)

Protection class (internal sensor)	IP64
Protection class (external sensor)	IP50

\* for temperatures below 0 °C (+32 °F) we highly recommend to use an external sensor in order to avoid a shorter battery life.

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## 14. 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 and use of the device.
  - for any problems with the temperature controlling and/or cooling unit.
  - for the bad 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 2 L contains a CR Lithium battery. Please pay strict attention to the following points:
- The housing of the Fridge-tag 2 L must never be opened nor destroyed.
- Never expose the Fridge-tag 2 L to temperatures above the allowed range (fire, oven, micro waves, etc.). It may cause injuries.
- Always keep the Fridge-tag 2 L out of the reach of Children.
- The battery complies with IATA DGR Packaging Instruction 970 Section 2.
- Dispose or recycle the Fridge-tag 2 L 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.

## Useful life

The devices can be used up to 3 ½ years after production date (½ year storage / 3 years useful life) on the condition that:

- the buttons are not pressed for very long time, e.g. if jammed between the goods in a shipment.
- storage and operation of the device should remain 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 end of the useful life is indicated by the battery indicator on the display (see chapter 1 "Display information" on page 3).

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## Attention

- The Fridge-tag 2 L monitors temperature exposure and not the product quality. Its purpose is to signal if product quality evaluation or testing is required.
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