berlinger
feel safe

Fridge-tag® 2 L

with external sensor

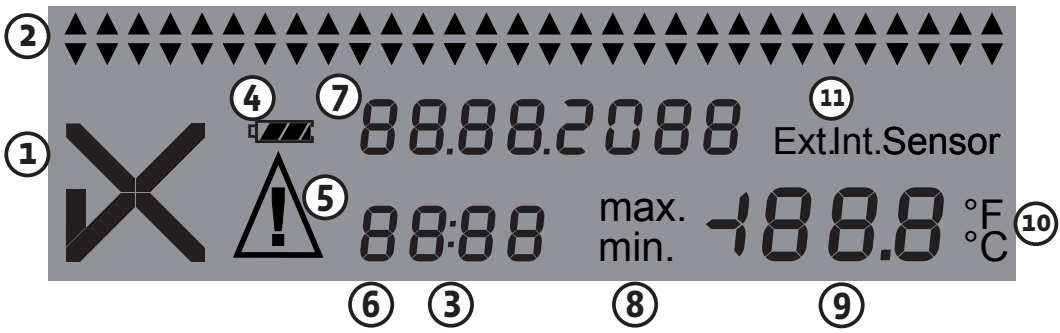
OPERATION MANUAL

THERMCO®
PRODUCTS, INC

Content

Page

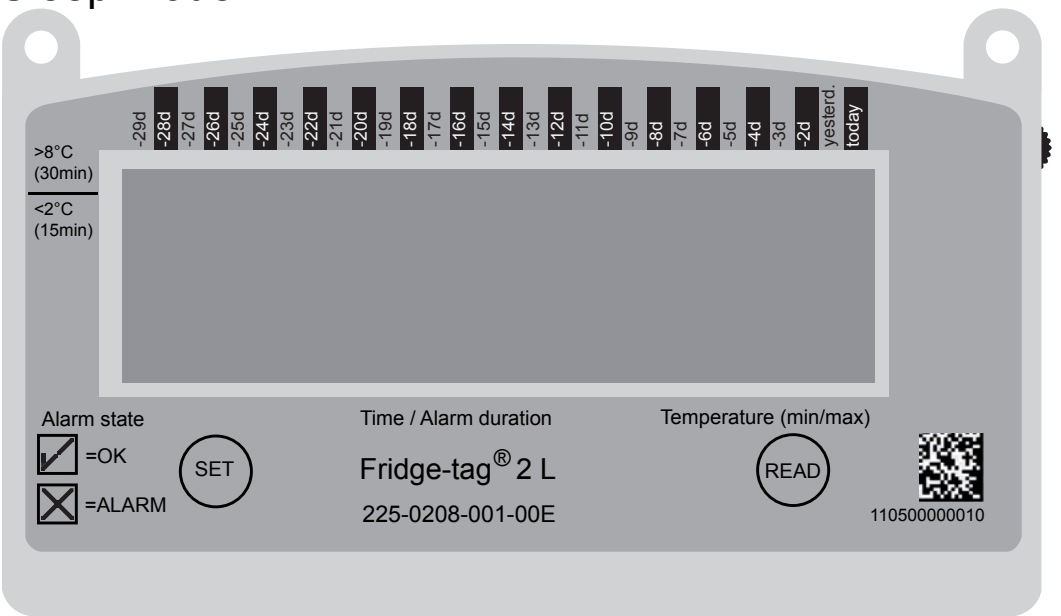
1) Display explanations



1. OK (√) or ALARM (X) indicator
2. Daily HIGH / LOW alarm indicator
   (showing history of the last 30 days)
3. Power on indicator (double point is flashing)
4. Battery power
   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)

2) State of delivery / Sleep Mode

Fridge-tag® 2 L ext. sensor is shipped in its so-called „Sleep Mode“.



The display (LCD) is blank.

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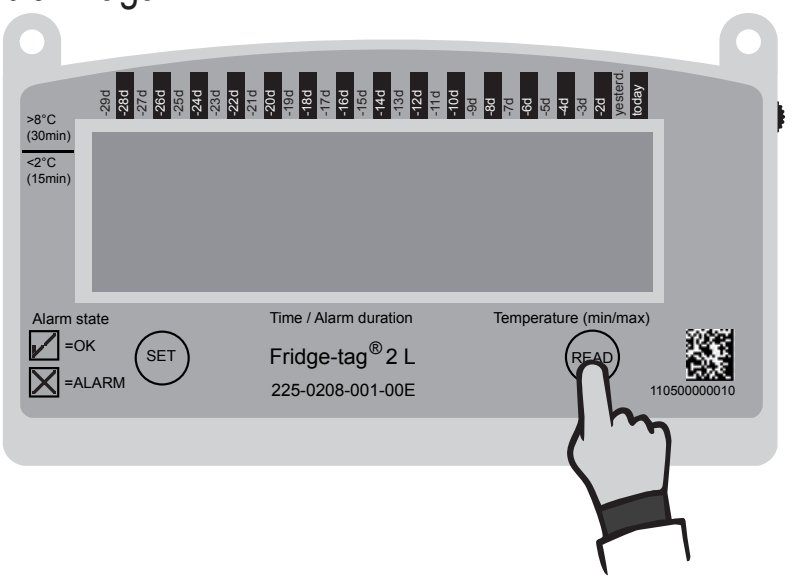
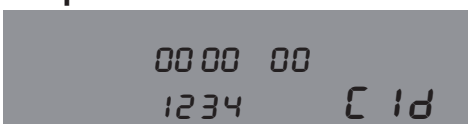
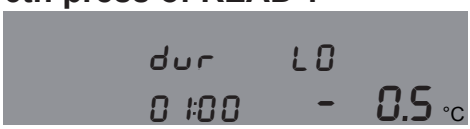
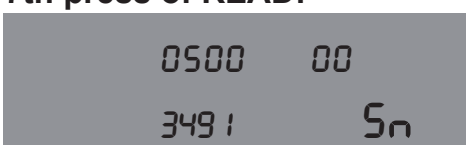
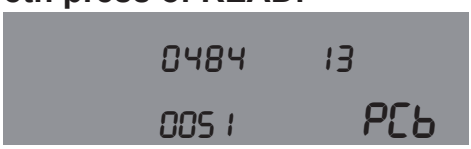
3) Quality check prior to activation (in Sleep Mode)

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

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



Press continuously READ to readout information

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. September 2015 / PASS
3rd press of READ: 	Indication of the current temperature and which sensor is activated (--.-°C if ext. 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 temperture 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)

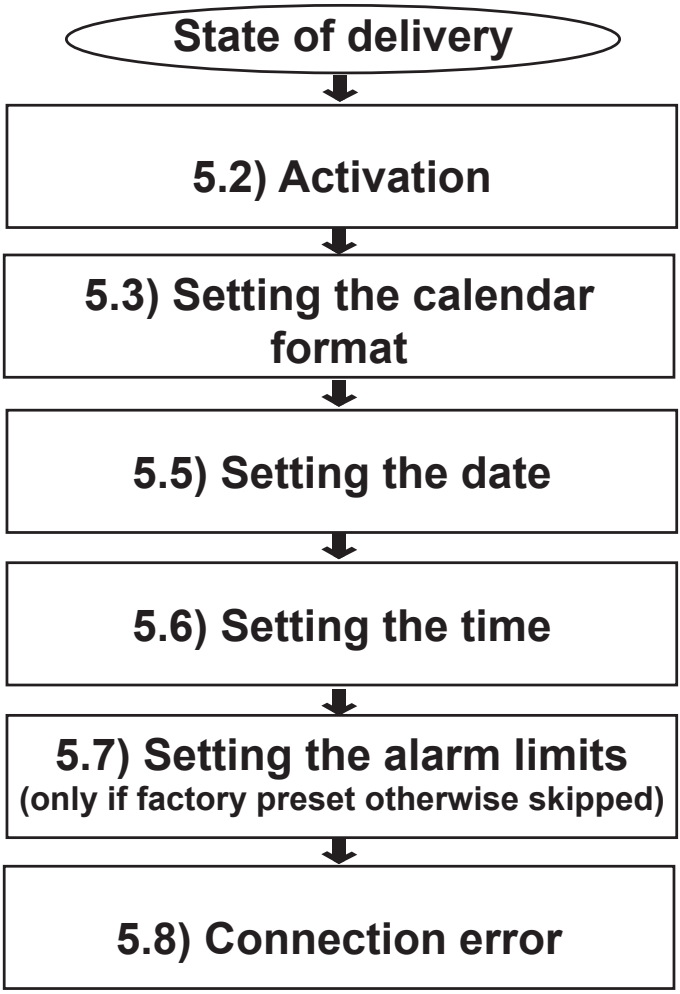
4) Placing the sensor of the Fridge-tag® 2 L

Fridge-tag® 2 L with an 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 as close to the supervised goods as possible to ensure a perfect temperature observation.

5) Activation process

5.1) Overview sequences of activation

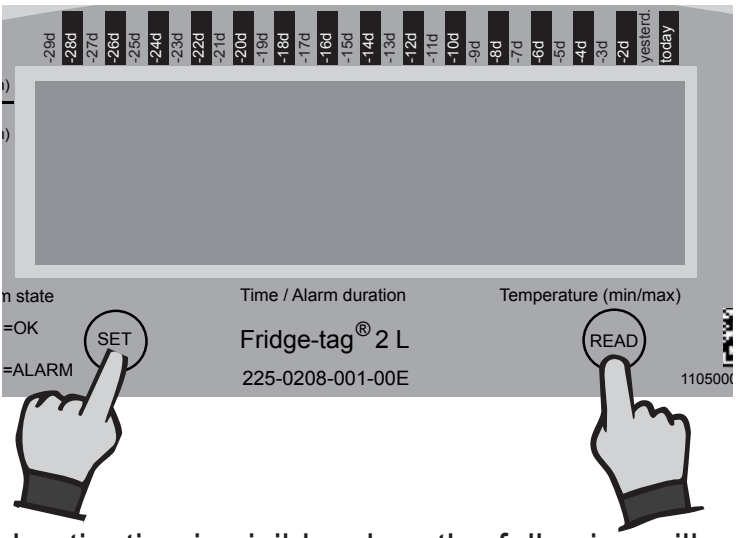


NOTE:
If the activation process has not been completed - after approx. 60 seconds without any button operation - the device will go back into sleep mode. The activation starts from the beginning.

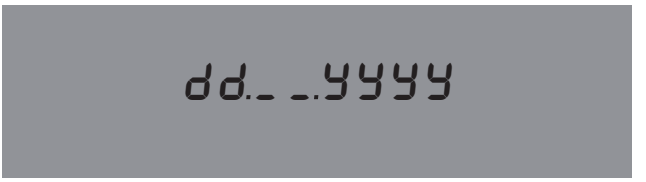
If you want to read or change settings (e.g. change °F to °C) after the activation has been completed, proceed as described in chapter „Read and Change settings / How to correct setting mistakes“

5.2) Activation

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

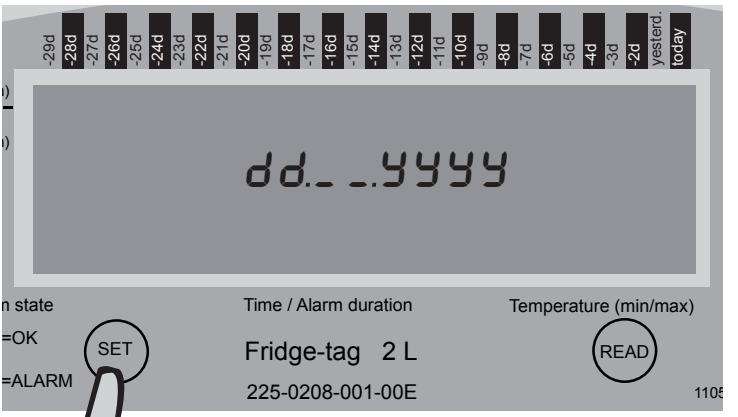


Successful activation is visible when the following will appear on the screen:



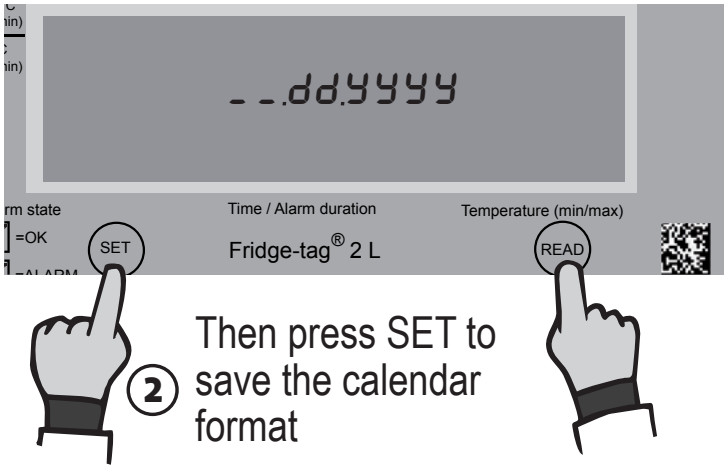
5.3) Setting the calendar format

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



Press SET to save the calendar format

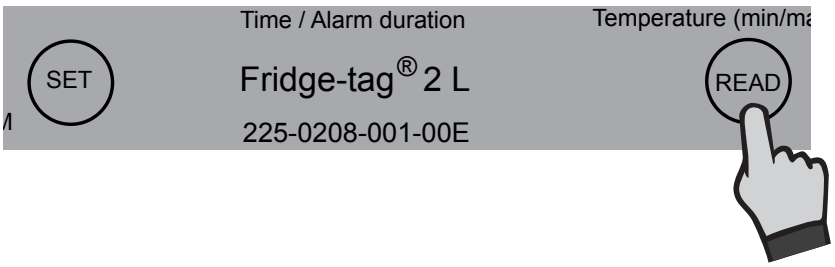
Option 2: Setting the date format to: mm.dd.yyyy



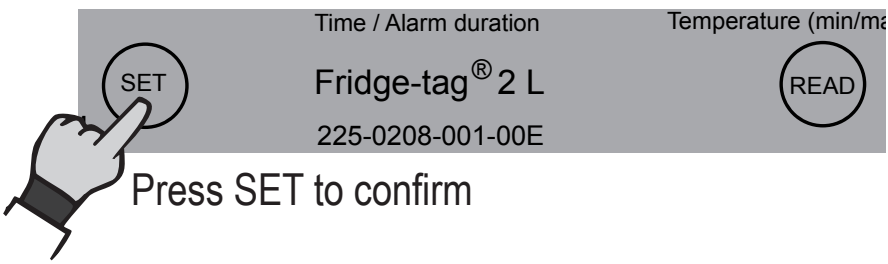
After setting the caldendar format, the first digit of the date will start flashing.

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.



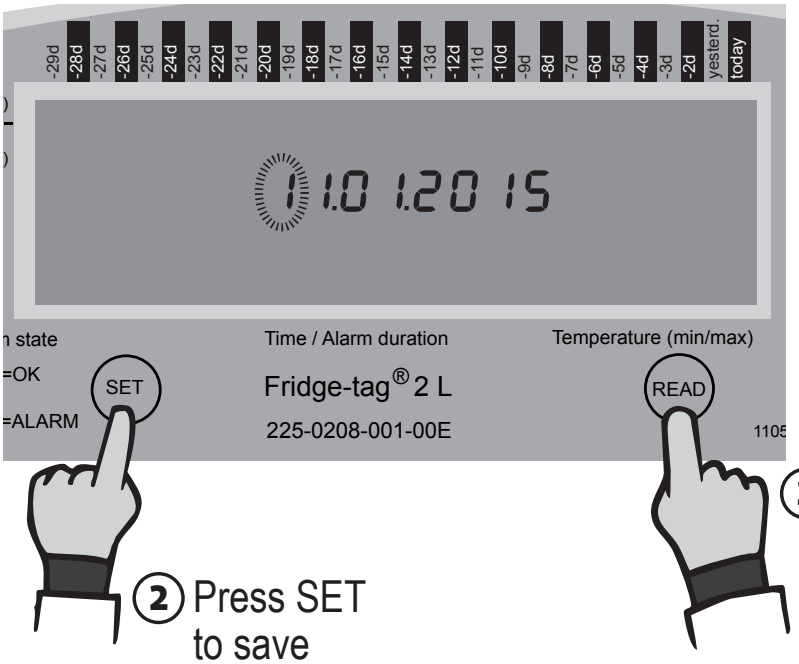
The **SET button** is used to save the number. After pressing the SET button the next digit will start flashing.



Note: If SET is pressed mistakenly, continue with the set up. Instructions for changing the mistake are described in chapter „Read and change settings / How to correct setting mistakes„

5.5) Setting the date

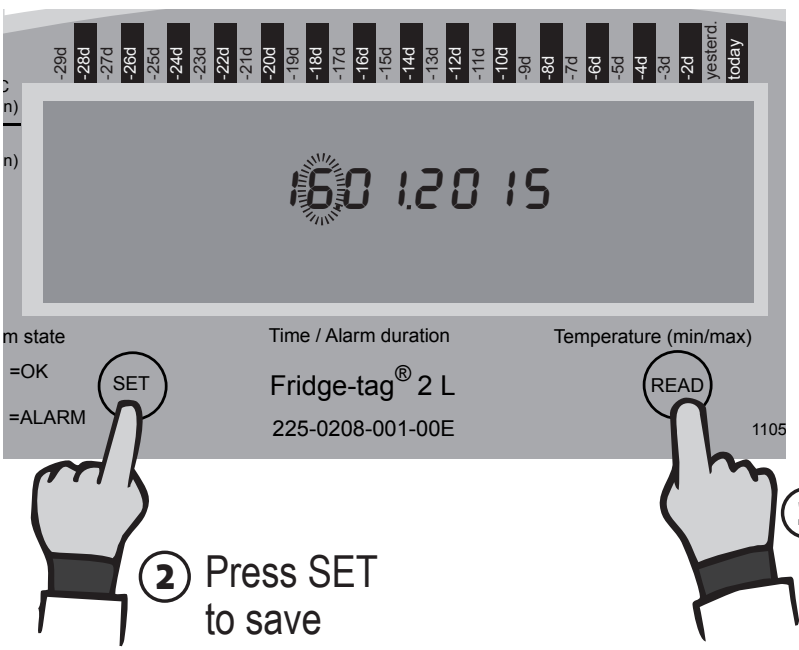
The following example shows how to set the date to: 16th Sep. 2015 (16.09.2015) in Europe format



The first digit is flashing:

1 Press READ until „1“ appears as the first digit

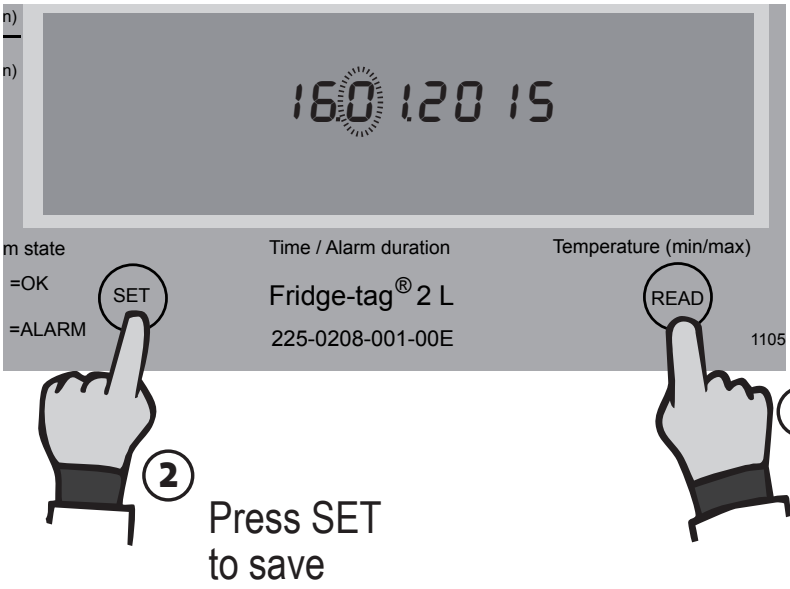
2 Press SET to save



The second digit is flashing:

1 Press READ until „6“ appears as the second digit

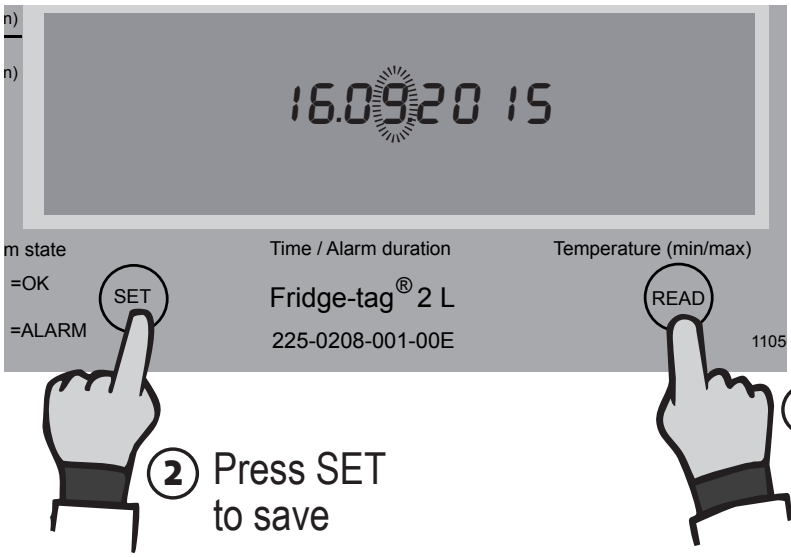
2 Press SET to save



The third digit is flashing:

1 Press READ until „0“ appears as the third digit

2 Press SET to save

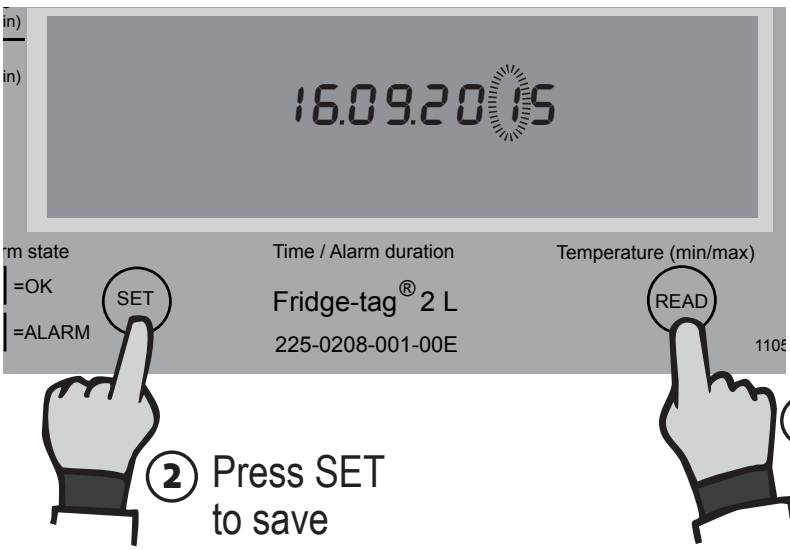


The fourth digit is flashing:

1 Press READ until. „9“ appears as the fourth digit

2 Press SET to save

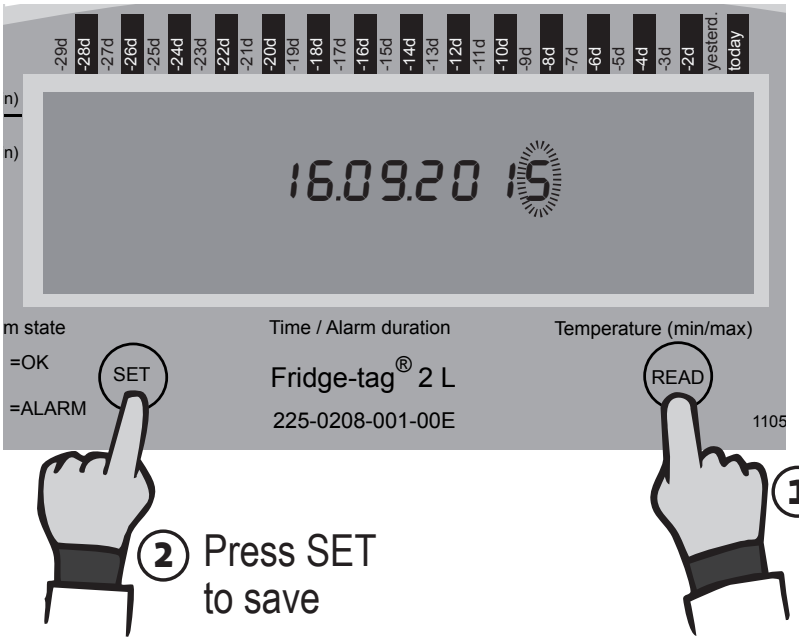
Note: The fifth and sixth digit is set automatically.



The seventh digit is flashing:

1 Press READ until „1“ appears as the seventh digit

2 Press SET to save



The eighth digit is flashing:

Press READ until „2“ appears as the eighth digit

Press SET to save

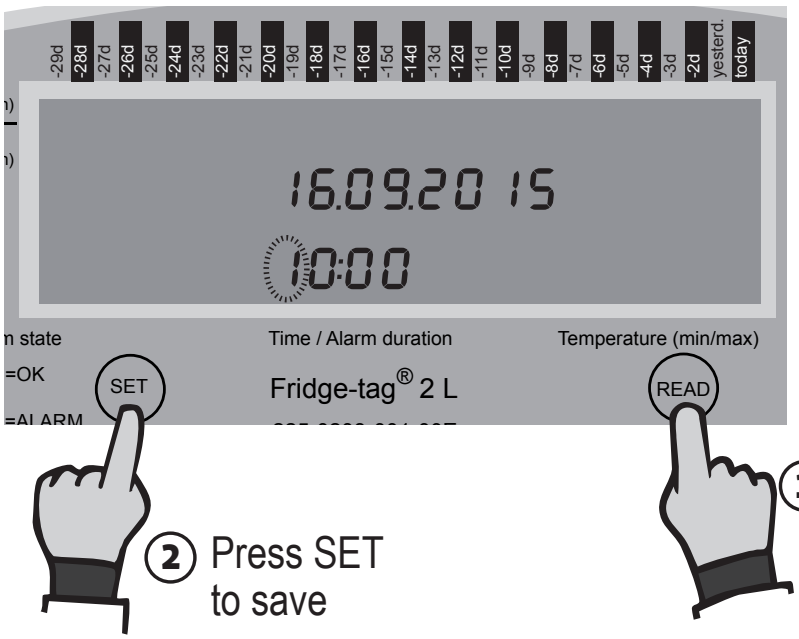
The date is now set to: 16.09.2015

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

5.6) Setting the time

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

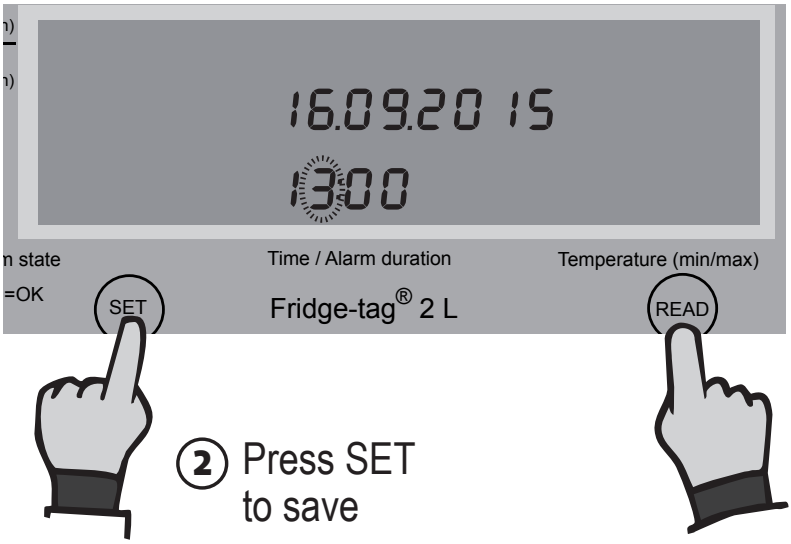
Note: The clock function operates as a 24 hour clock (e.g. 1:47 pm = 13:47).



The first digit is flashing:

Press READ until „1“ appears as the first digit

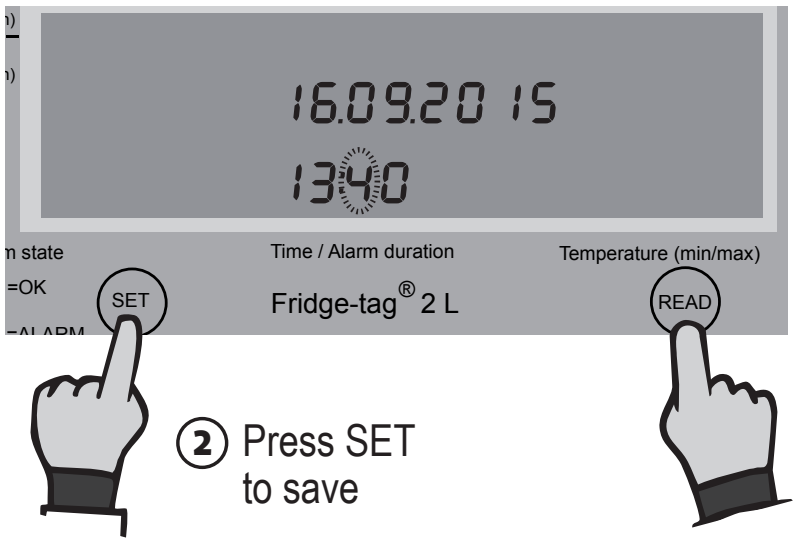
Press SET to save



The second digit is flashing:

① Press READ until „3“ appears as the second digit

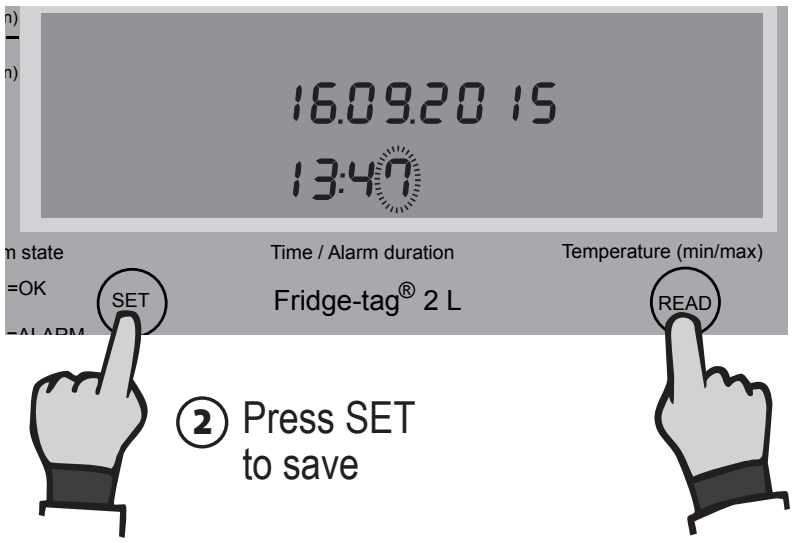
② Press SET to save



The third digit is flashing:

① Press READ until „4“ appears as the third digit

② Press SET to save



The fourth 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

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“

If the device is configured with self-programmable alarm limits proceed with the following chapter.

If not, the activation is now completed. Connect the device with the external sensor and continue with chapter 5.8 Connection error.

Note: During max. 1 minute after the connection 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

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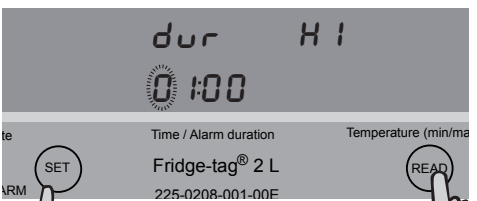
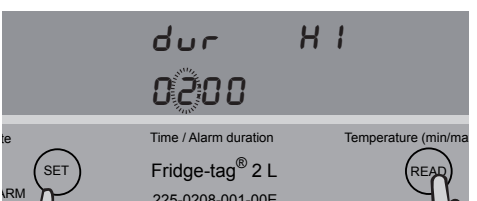
1) and 3) Setting the HI & LO alarm duration, they are completed in the same manner



The first digit is flashing:

1 Press READ to adjust the number.

2 Press SET to confirm the number

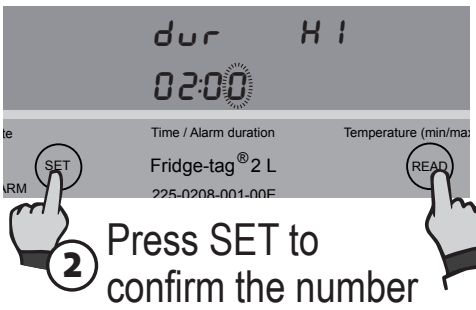


The second digit is flashing:

1 Press READ to adjust the number.

2 Press SET to confirm the number

The third digit is flashing:



The fourth digit is flashing:

The duration of the alarm limit is now set.

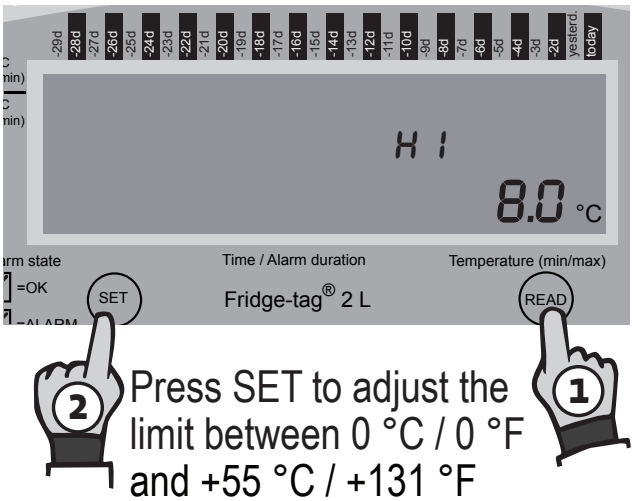
2) and 4) Setting the HI & LO alarm duration, they are completed in the same manner

Note: 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 „Read and change settings / How to correct setting mistakes“.

Instruction for setting a positive temperature limit between 0 °C / 0 °F and +55 °C / +131 °F



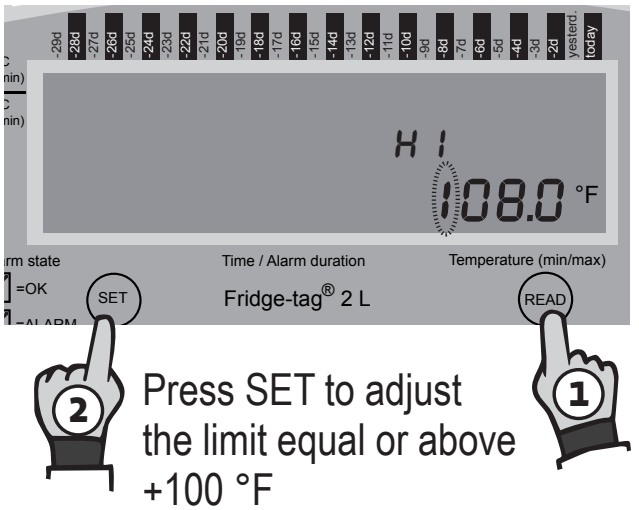
Press READ until the display shows **no flashing sign**:

Press SET to adjust the limit between 0 °C / 0 °F and +55 °C / +131 °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

(Important: the maximum Celsius temperature is +55 °C. This Option is only for temperatures in Fahrenheit)

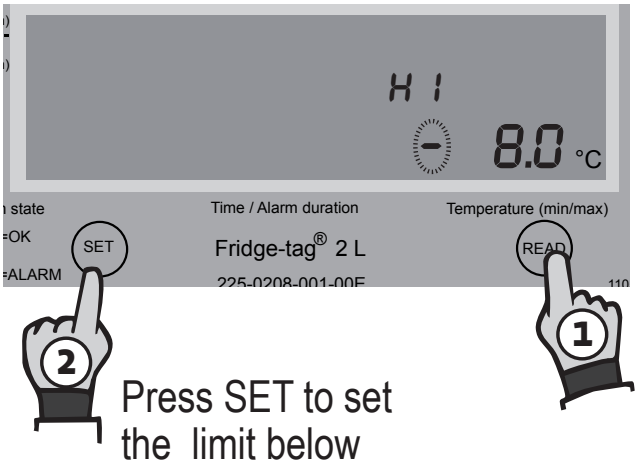


Press READ until a flashing leading **„1“** is indicated on the display:

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 are set.

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



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

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

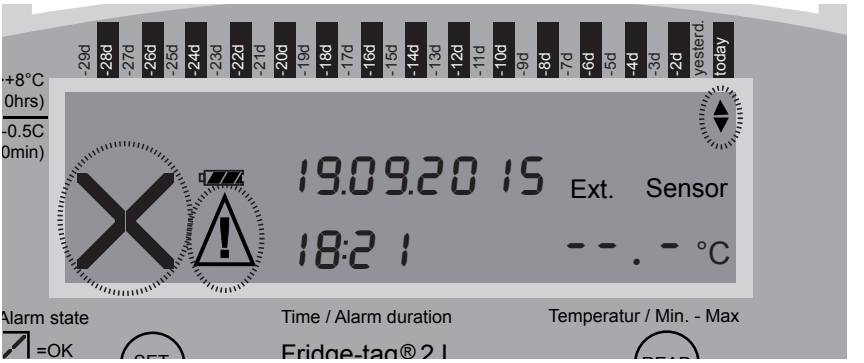
As soon as the parameters of the upper alarm limit are set, the first digit of the duration of the lower alarm limit will start flashing. Proceed the same way as you did with the upper alarm limit.

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

After 10 minutes without a connection between the device and the sensor, the following alarm will be shown on the display.

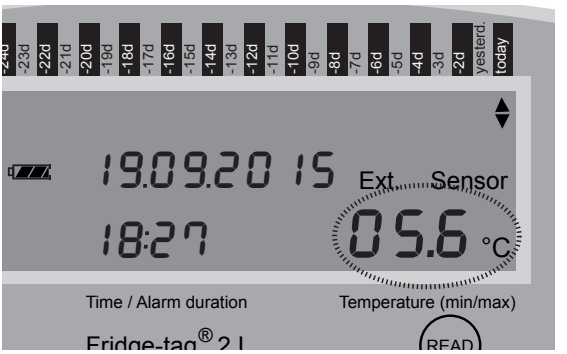


Please check the following two points:

1. If the sensor of the Fridge-tag® 2 L is properly connected with the device. Be sure to firmly press and twist the connector until you hear it „click“ into place.

2. If the sensor cable of the Fridge-tag® 2 L has any defects.

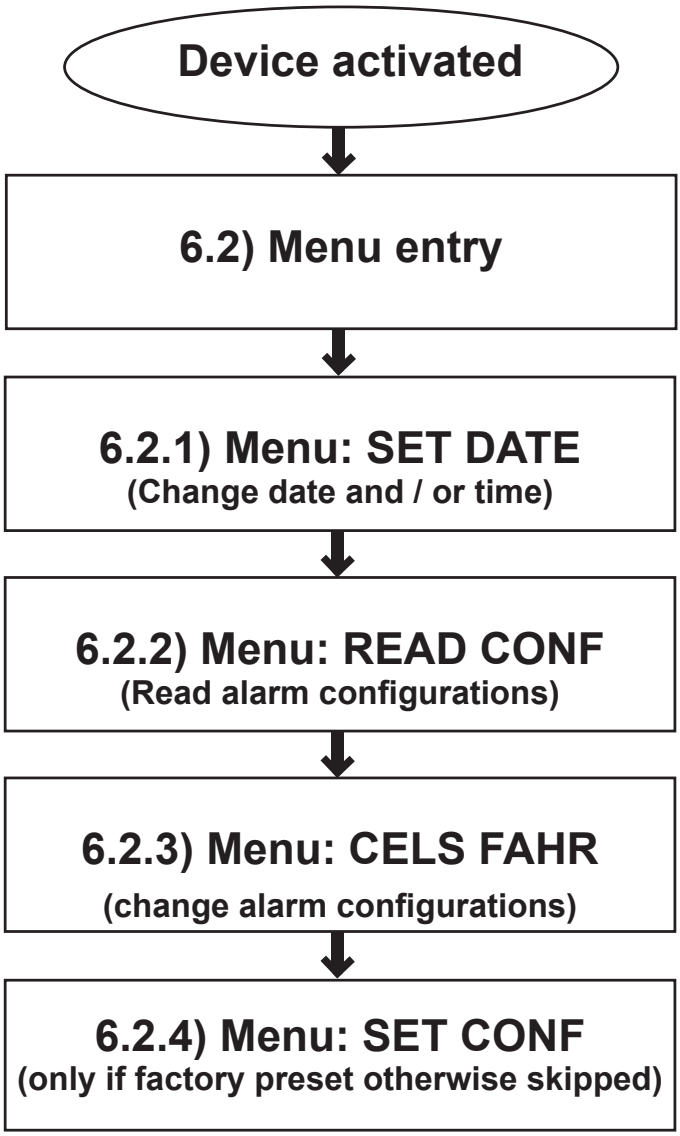
As soon as one of the above mentioned errors have been fixed, the display shows current temperature again, the measuring will now continue.



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

6) Read and change settings / How to correct setting mistakes

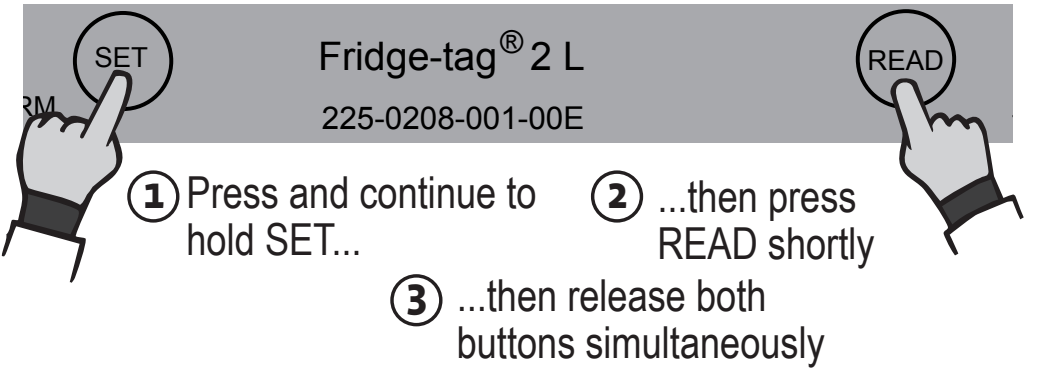
6.1) Overview menu



NOTE:
If you scroll through the menu and you reach the display of the measuring mode again you need to restart from the begining 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 2nd 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 pre-set alarm limits please proceed as follows:



„OUT SIDE“ is now displayed on the screen.

You have now entered change mode and you may choose which item you want to change

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You can access the following 4 menus:

OUT SIDE - first screen, shows the temperature measured with the int. sensor of the Fridge-tag® 2 L (normal ambient temperature)

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 factory pre-set)

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“. **Press READ** until the display shows „SET DATE“. Now you can adjust the date format, date or time settings. Then follow the steps as described in chapter „Setting the date and time”.

Information:

- 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 ext. sensor will be locked for 24 hours after the clock passes midnight and through the entire next day. (e.g. changes on the 15th Sep., device locked from 00:01 am on the 16th until 00.01 am on the 17th). This is for security reasons.

  NOTE: If you experience this problem please wait for the time on the device to cross over midnight and try again.

6.2.2) Access the menu „READ CONF“

The display shows the menu „OUT SIDE“. **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 pre-set alarm parameters.

6.2.3) Access the menu „CELS FAHR“

The display shows the menu „OUT SIDE“. **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 mesurement unit.

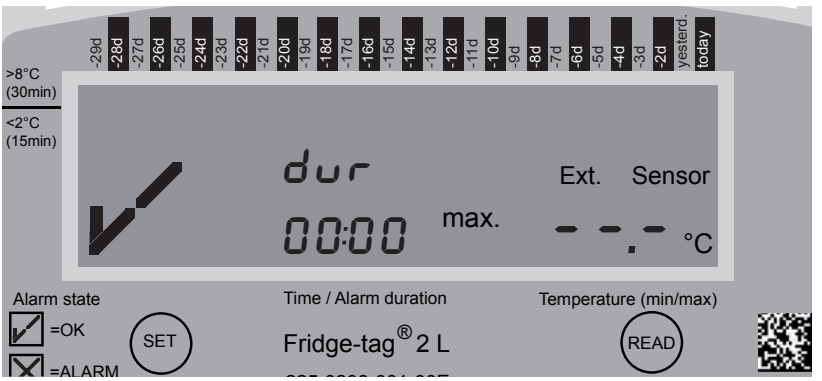
6.2.4)* Access the menu „SET CONF“

The display shows the menu „OUT SIDE“. **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.

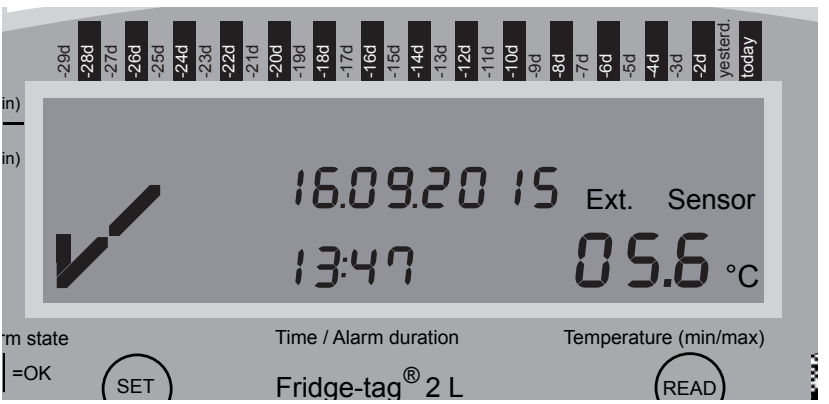
7) Display indication during measurement mode

For max. 1 minute after completing the settings or after connecting the device with the sensor, the following display will appear.



For a maximum of 1 minute no current temperature is displayed on the screen, indicated by (--.-).

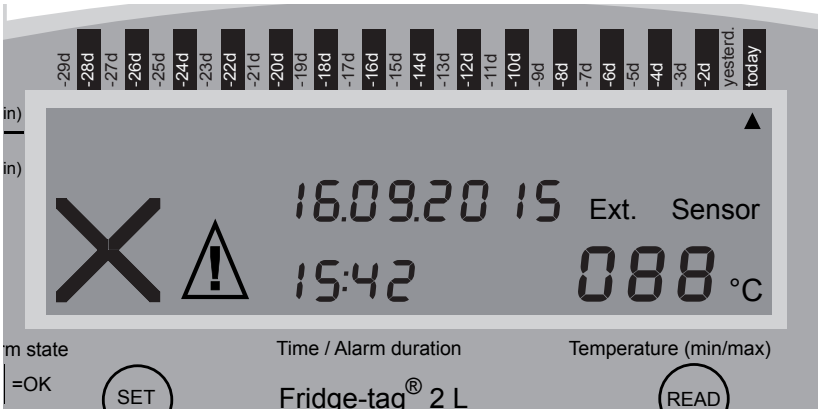
Example of OK Display - during measurement



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 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 parameters.

Example of ALARM Display - during measurement



If the temperature and time conditions are outside the preset alarm parameters the following will be displayed on the screen:

- The (√) OK symbol will be replaced by (X) ALARM symbol
- An additional arrow 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) Warning symbol

Option 1: The warning symbol will remain visible until the user reads the details of the triggered alarm/s from the display. After that it will disappear. ALARM indications cannot be cancelled nor reset.

Option 2: The warning and ALARM symbol (X) will remain visible until the user reads the details of the triggered alarm/s from the display. After that both symbols will disappear and the display will go back to the OK Symbol (√).

Note: How the ALARM symbol (X) and the warning symbol react is specified in the configuration of the device.

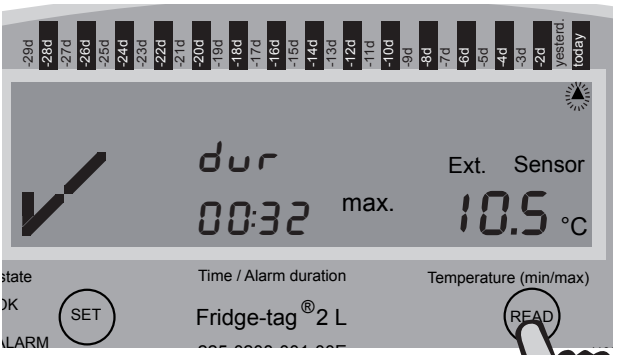
9) Reading the History

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

Note:
The external sensor of the Fridge-tag® 2 L can remain at it‘s location for the read out process. Please consider, that a connection error will occur if the sensor is disconnected from the Fridge-tag® 2 L for more than 10 minutes. This alarm can be cleared - see how in chapter 5.8.

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

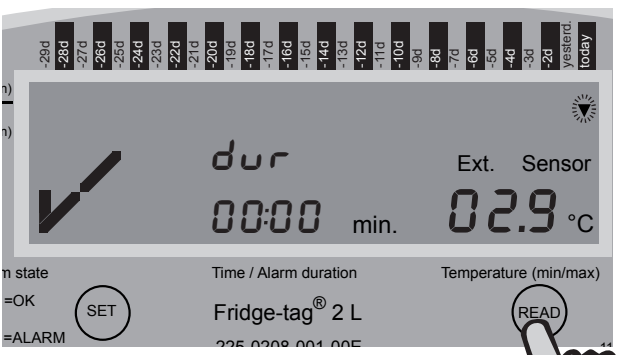
Example of an OK display - during read out of the history



Press READ once

The following information is indicated on the screen:

- The **OK** symbol
- The corresponding 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**; hrs: min).



Press READ a second time

The following information is indicated on the screen:

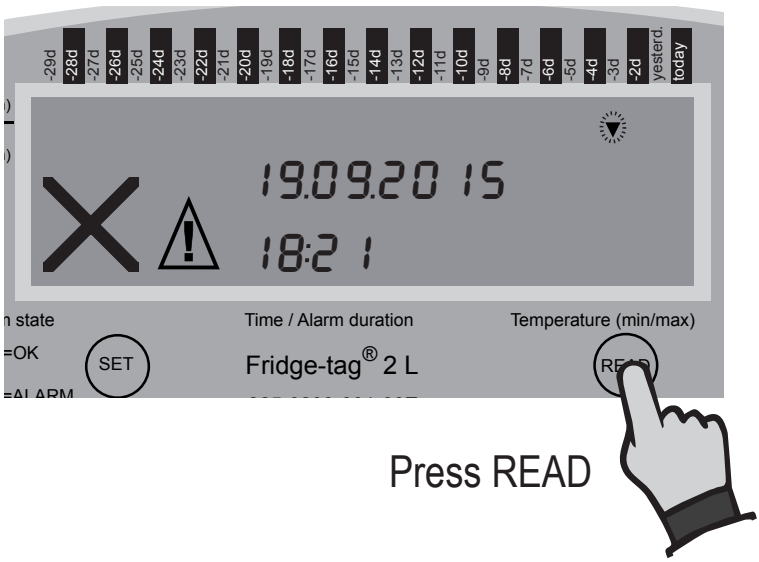
- The **OK** symbol
- The corresponding arrow (example: **low** arrow of „today“)
- Lowest recorded temperature (example: **+2.9˚C**)
- The time duration out of the preset temperature low limit (example **00:00**; hrs: min).

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

Information:

When you reach an ALARM event, the indication on the screen of the Fridge-tag® 2 L ext. sensor will be different to the indication of an OK display.

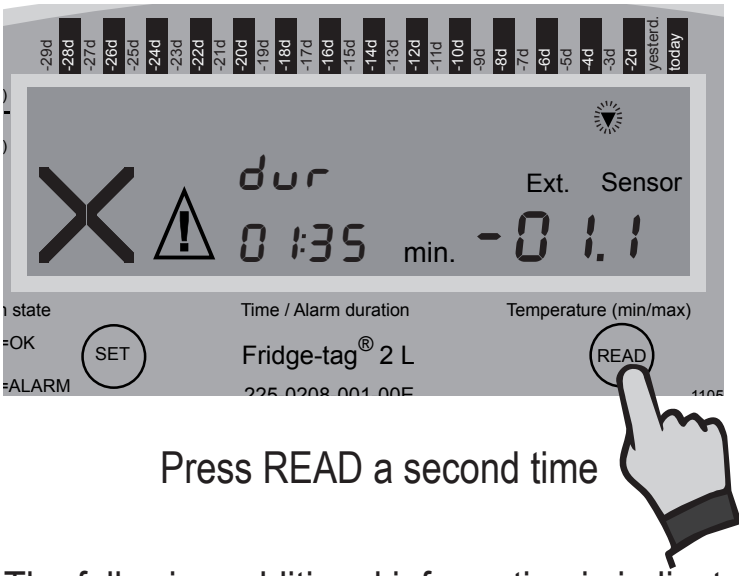
Example of an ALARM display - during reading out of the history 1st displayed screen of a „lower ALARM event“



The following information is indicated on the screen:

- The **ALARM** symbol
- The corresponding arrow: **Lower ALARM limit**
- Day of Alarm: 3 days ago (**-3d**)
- The date of excursion: **19.09.2015**
- The time of excursion: **18:21**

2nd displayed screen of a „lower ALARM event“:



Press READ a second time

The following additional information is indicated on the screen:

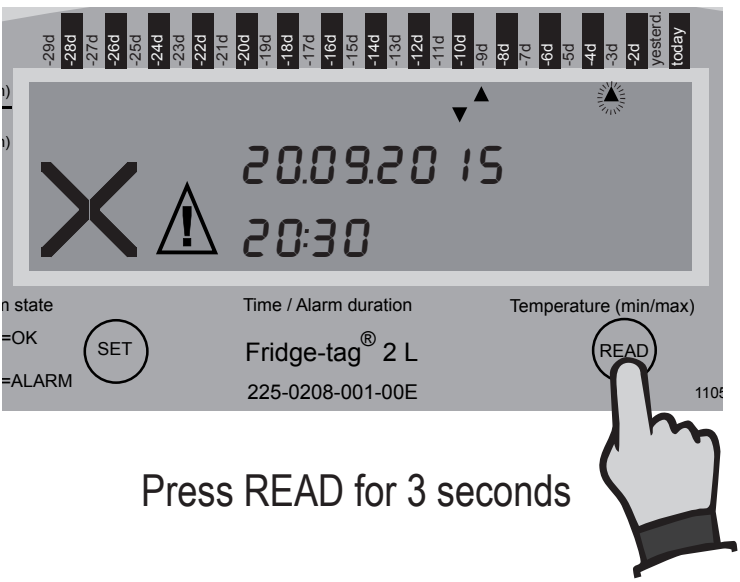
- Lowest recorded temperature: **-1.1˚C**
- The time duration out of the preset temperature low limit: **01:35**; hrs:min
- Temperature recording with: **external sensor**

9.2) Option 2: Read out only alarms on the screen

(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**. These steps will also stop the device from beeping, except the temperature is still out of the allowed temperature range.

1st displayed screen of the latest ALARM event:

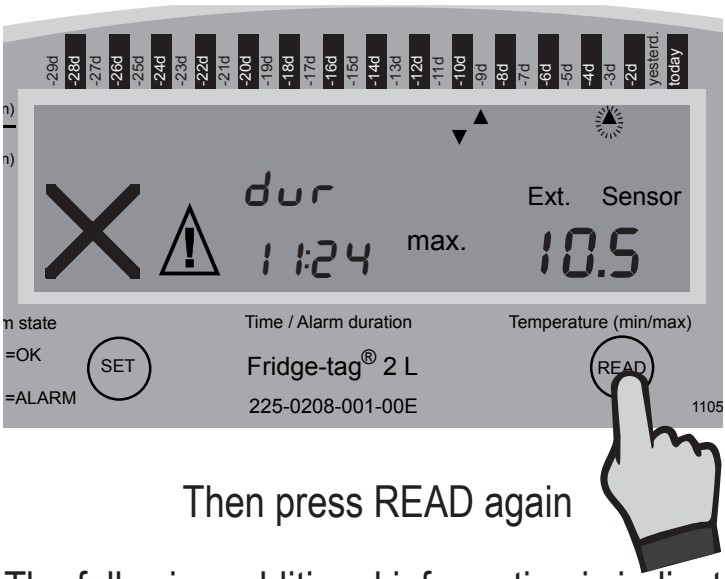


Press READ for 3 seconds

The following information is indicated on the screen:

- The **ALARM** symbol
- The corresponding arrow: **Upper ALARM limit**
- Day of Alarm: 3 days ago (**-3d**)
- The date of excursion: **20.09.2015**
- The time of excursion: **20:30**

2nd 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 temperature high limit (example **11:24**; hrs:min).
- Temperature recording with: **external sensor**

Information:

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

Read out Audio ALARM (optional factory setting)

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

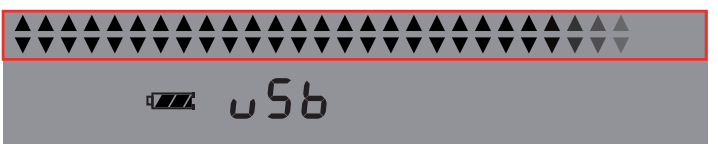
During 10 minutes	⇨	Every minute 1 ALARM -signal
During 50 minutes	⇨	Every 10 minutes 1 ALARM -signal
During 11 hours	⇨	Every hour 1 ALARM -signal

Acknowledge audible ALARM: Press the READ button (repeatedly)

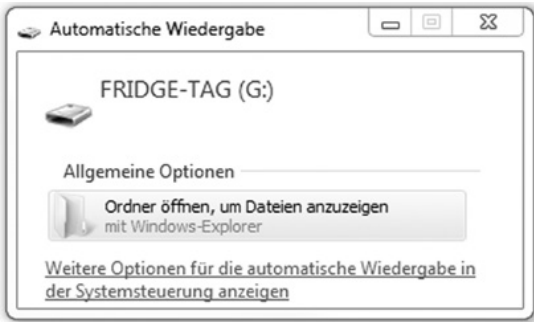
9.3) Option 3: Read out data from the files generated by the Fridge-tag® 2 L with ext. sensor by connecting it with a computer

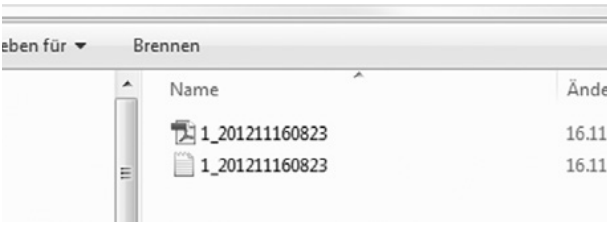
Plug the Fridge-tag® 2 L into any computer via USB Interface. Make sure the device is plugged in properly.

Wait sufficient time for the device to generate the ASCII and PDF files (depending on the programming, this process may take a couple of minutes). You can see that the device is working from the continuously appearing arrows in the upper display area.



When the report creation is complete, one of the following windows will appear: Open the appropriate file generated by the Fridge-tag® 2 L.



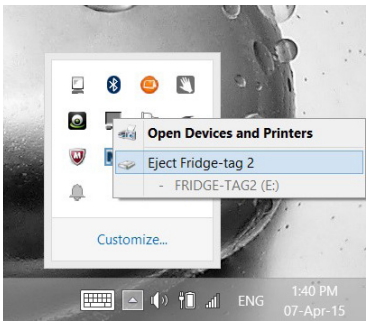


Information:

For this process no additional software is necessary.

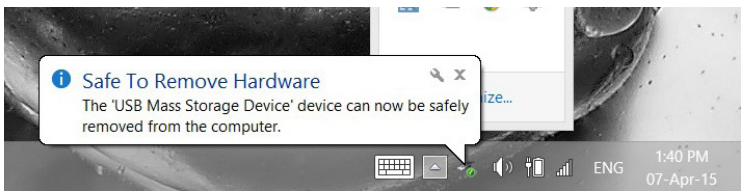
Note:

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 . Eject … (choose the right device to remove).

Do not disconnect the device before you receive the following message, otherwise this could damage the device!



Sample of a PDF-file

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

				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	0min		
2	01/05/2016		+1.5°C	ALARM!	-0.8°C	17h 29min	00:00h	ok	+5.7°C	0min		ok	0min		
3	01/04/2016		+1.5°C	ALARM!	-1.0°C	15h 1min	00:26h	ok	+4.5°C	0min		ok	0min		
4	01/03/2016		+2.0°C	ALARM!	-0.1°C	16h 9min	00:00h	ok	+6.4°C	0min		ok	0min		
5	01/02/2016		+1.7°C	ALARM!	-1.1°C	14h 54min	00:00h	ok	+7.5°C	0min		ok	0min		
6	01/01/2016		+2.3°C	ALARM!	-0.7°C	9h 35min	06:19h	ok	+5.5°C	0min		ok	0min		
7	12/31/2015		+0.9°C	ALARM!	-5.3°C	9h 24min	00:00h	ok	+5.3°C	0min		ok	0min		
8	12/30/2015		-1.7°C	ALARM!	-5.1°C	22h 46min	00:01h	ok	+2.5°C	0min		ok	0min		
9	12/29/2015		+0.9°C	ALARM!	-4.2°C	13h 22min	00:00h	ALARM!	+8.5°C	14min	13:48h	ok	0min		
10	12/28/2015		-0.3°C	ALARM!	-3.4°C	20h 1min	00:00h	ok	+6.0°C	0min		ok	0min		
11	12/27/2015		+0.0°C	ALARM!	-2.9°C	19h 42min	00:00h	ok	+5.9°C	0min		ok	0min		
12	12/26/2015		+0.0°C	ALARM!	-2.2°C	19h 47min	00:00h	ok	+6.4°C	0min		ok	0min		
13	12/25/2015		+2.3°C	ALARM!	-0.5°C	13h 19min	02:28h	ALARM!	+8.3°C	24min	12:51h	ok	0min		
14	12/24/2015		+2.4°C	ALARM!	-1.2°C	11h 14min	00:00h	ALARM!	+8.6°C	30min	10:59h	ok	0min		
15	12/23/2015		+3.3°C	ALARM!	-1.3°C	10h 34min	00:00h	ALARM!	+11.0°C	2h 55min	12:05h	ok	0min		
16	12/22/2015	a,19:35	+3.3°C	ALARM	-0.5°C	7h 25min	06:37h	ALARM	+8.2°C	13min	12:53h	ok	0min		
17	12/21/2015		+5.0°C	ALARM	+1.7°C	38min	22:41h	ALARM	+8.3°C	32min	09:30h	ok	0min		
18	12/20/2015		+3.1°C	ALARM	+0.3°C	10h 32min	00:00h	ALARM	+10.2°C	2h 38min	11:27h	ok	0min		
19	12/19/2015		+4.0°C	ALARM	+0.7°C	7h 33min	05:36h	ALARM	+9.3°C	3h 4min	10:29h	ok	0min		
20	12/18/2015		+5.4°C	ALARM	+0.4°C	4h 9min	00:00h	ALARM	+10.8°C	4h 54min	10:03h	ok	0min		
21	12/17/2015		+4.6°C	ALARM	+1.1°C	3h 18min	18:54h	ALARM	+8.8°C	1h 36min	11:57h	ok	0min		
22	12/16/2015		+5.3°C	ALARM	+1.9°C	3min	00:11h	ALARM	+9.0°C	1h 14min	11:43h	ok	0min		
23	12/15/2015		+0.5°C	ALARM	-2.8°C	14h 59min	00:00h	ok	+5.1°C	0min		ok	0min		
24	12/14/2015		-1.2°C	ALARM	-4.1°C	20h 57min	00:01h	ok	+4.1°C	0min		ok	0min		
25	12/13/2015		-2.1°C	ALARM	-5.7°C	21h 53min	00:00h	ok	+3.1°C	0min		ok	0min		
26	12/12/2015		+0.3°C	ALARM	-4.5°C	19h 1min	00:00h	ok	+5.1°C	0min		ok	0min		
27	12/11/2015		-0.5°C	ALARM	-1.7°C	5h 34min	18:27h	ok	+1.4°C	0min		ALARM	18h 26min	00:00h	
28	12/10/2015		+26.6°C	ok	+25.3°C	0min		ALARM	+27.5°C	2h 20min	13:42h	ALARM	8h	16:16h	

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

Date and place: _____ Signature: _____ Page 1/2

If you need to use the individual temperature readings please open the ASCII file. Scroll down in order to find the recordings of temperatures stamped with the date and time based on the logging interval.

```
  t AccST: 0
  Events: 0
Data:
          yyyy-MM-dd hh:mm  T
          2016-01-04 16:19  6.4
          2016-01-04 16:24  6.7
          2016-01-04 16:29  6.8
          2016-01-04 16:34  6.6
          2016-01-04 16:39  6.3
          2016-01-04 16:44  6.2
```

.txt file

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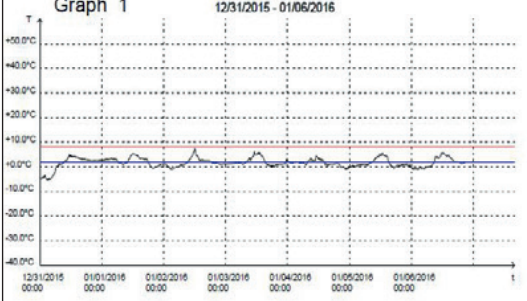
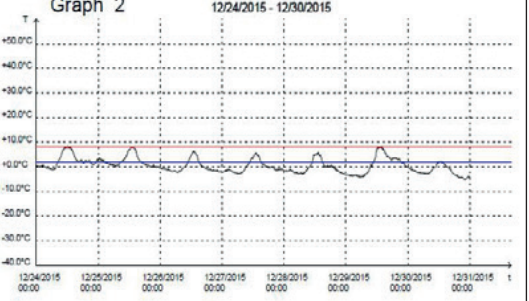
PDF document of the Fridge-tag® 2 L

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

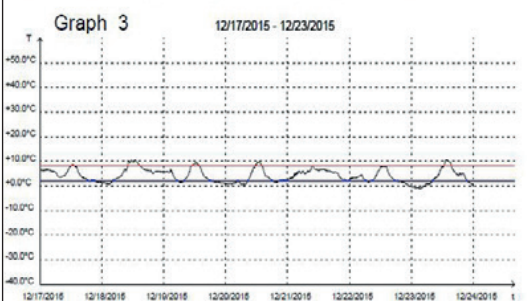
Graph 1 12/31/2015 - 01/06/2016



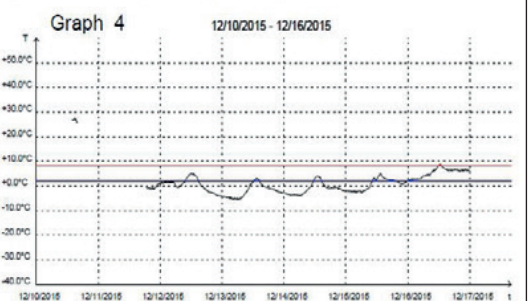
Graph 2 12/24/2015 - 12/30/2015



Graph 3 12/17/2015 - 12/23/2015



Graph 4 12/10/2015 - 12/16/2015



9.4) Temperature record duration
(optional factory setting)
Selectable record duration: 28, 56, 84, 112 days.

Information: File names on the Fridge-tag® 2 L ext. sensor 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.

Explanation of PDF report:

Date	Date of measurement
Event: t	Time / date changed
Event: a	Alarm configuration changed
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 „Warning symbol“

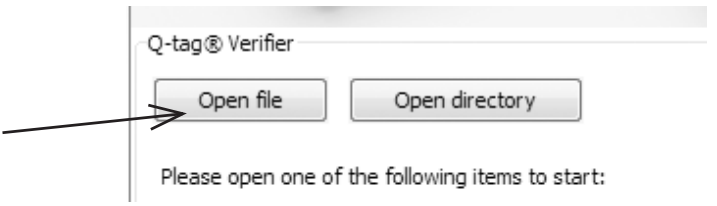
9.5) Veryfication process

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

1st step:
Download the software „Verifier“ from our website:
www.berlinger.com

2nd step:
Open the software. The following window will appear:

3rd step:
Click on „Open file“



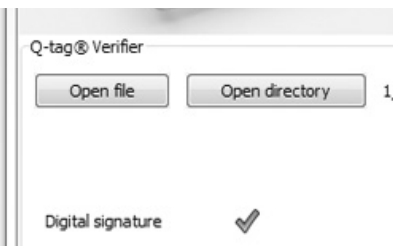
4th step:
Select the file you would like to verify.

Option 1:
Select the files directly from the Fridge-tag® 2 L ext. sensor 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 .txt -file. The same OK or ERROR messages will appear.

10) Explanations of terms

Read out mode

In order to avoid incorrect data, the Fridge-tag® 2 L ext. sensor 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 ext. sensor will fall back into normal operation after approx. 60 seconds without pressing any buttons. After 10 minutes without a connection between the sensor and the device, an alarm will be shown on the display.

HI or LO indicator (with an external sensor)

If the Fridge-tag® 2 L ext. sensor 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 alarm limits will continue as usual. As soon as the temperature is between +55 ºC and -40 ºC numbers will be displayed again.

11) Expire code explanation

Sample: exp 2016-07

The sample shows the expiry date of the Fridge-tag® 2 L ext. sensor as July 2016 (2016-07).

More information about the Fridge-tag® 2 L ext. sensor can be found in the sales brochure and on the website: www.berlinger.com

12) Technical specifications

Storage condition (inactive)	0 °C to +30 °C
Operating temperature (ext. sensor)	-40 °C to +60 °C
Accuracy of temperature measurement (ext. sensor)	+/- 0.8 °C (-40 °C to -30 °C) +/- 0.5 °C (-30 °C to +40 °C) +/- 0.8 °C (+40 °C to +60 °C)
Accuracy of time measurement	+/- 30 minutes/year
Temperature measurement interval	every minute
Operating lifetime	up to 3 years (check battery indicator)
Protection class	IP64

13) 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 ext. sensor contains a CR Lithium battery. Please pay strict attention to the following points:

- The housing of the Fridge-tag® 2 L ext. sensor must never be opened nor destroyed.
- Never expose the Fridge-tag® 2 L ext. sensor to temperatures above the allowed range (fire, oven, micro waves, etc.).It may cause injuries.
- Always keep the Fridge-tag® 2 L ext. sensor out of the reach of Children.
- The battery complies with IATA DGR Packaging Instruction 970 Section 2 and is therefore not considered as dangerous good.
- Dispose or recycle the Fridge-tag® 2 L in accordance with the WEEE 2012/19/EU guidlines 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 1/2 years after production date (1/2 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 low battery indicator on the display (go to page 5 „display explanation“).

Attention

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