berlinger
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User manual

Multi-alarm temperature indicator

Production   Storage   Transport   Delivery
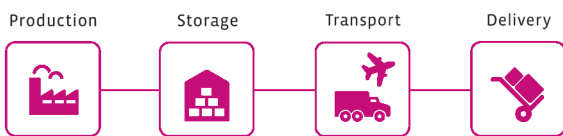
Inhaltsverzeichnis

1) Foreword / introduction

The Berlinger Mini-tag® is a very small but extremely powerful temperature-monitoring device. It measures the ambient temperature precisely and continuously. There can be up to 3 alarm limits programmed and monitored individually. If a temperature limit is exceeded or undershot, an alarm will be immediately triggered and visually displayed via the LED indicators on the device (OK or ALARM icon).

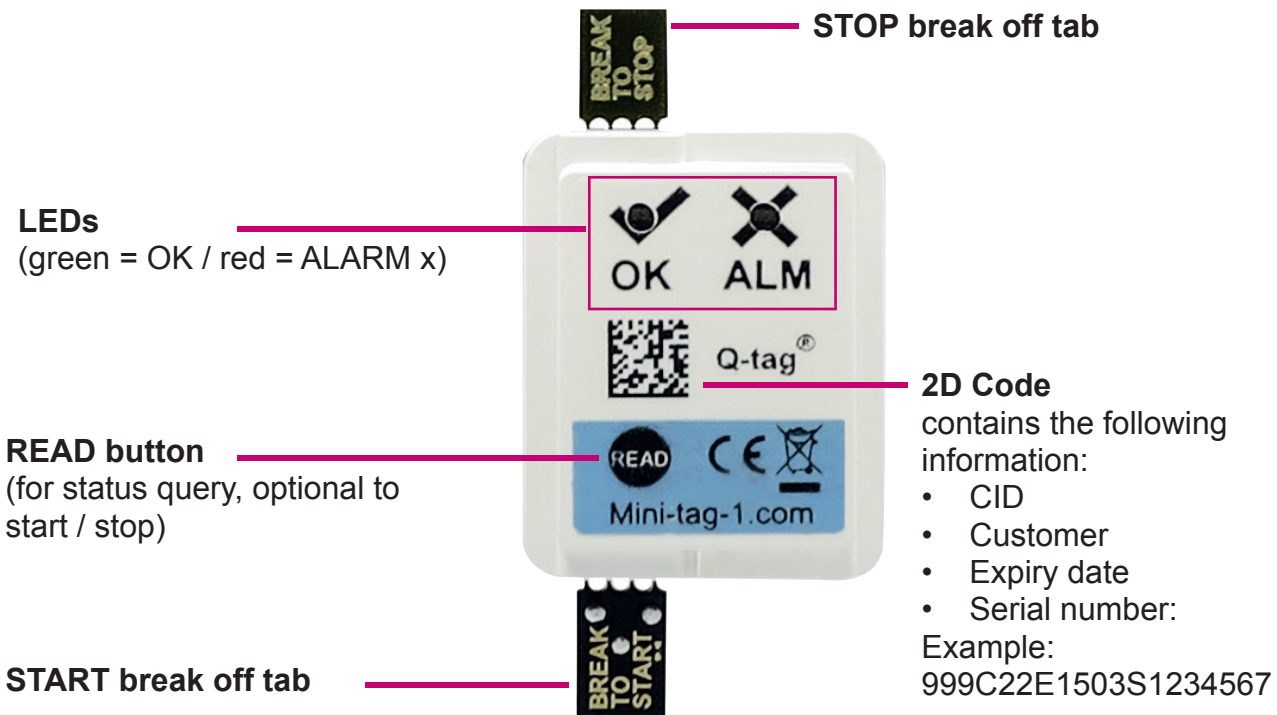# 2) Before commissioning

2.1) Delivery status

The Berlinger Mini-tag® is delivered in inactive mode. Any customer-specific alarm configurations have been factory pre-programmed. Currently, no temperature data is being recorded. The Berlinger Mini-tag® must be started before the measurement mode starts. *(see Chapter 3: Activation)*

2.2) Quality test

The device has passed the necessary high-quality controls at the manufacturer. For the avoidance of transport damage, we recommend checking the following points before using the Berlinger Mini-tag®:

* The LED displays on the front of the panel are not blinking
* All components as described under Point "2.3 Device Explanation" are available.

2.3) Device Explanation

STOP break off tab

LEDs
(green = OK / red = ALARM x)

READ button
(for status query, optional to start / stop)

START break off tab

2D Code
contains the following information:
* CID
* Customer
* Expiry date
* Serial number:
Example:
999C22E1503S1234567

2.4) Alarm programming

Three different alarm limits can be programmed. Alarm limits can be defined with temperature and time (cumulative or single event). The alarm limits are programmed at the factory and cannot be changed upon receipt of the device.
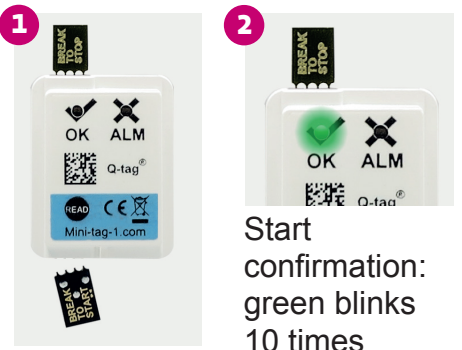
3) Activation

3.1) Activation process

The Berlinger Mini-tag® temperature indicator starts the temperature-measuring operation by breaking off of the START break-off tab or by pressing and holiding the READ button for at least 3 seconds. The desired method of activation is defined upon ordering.
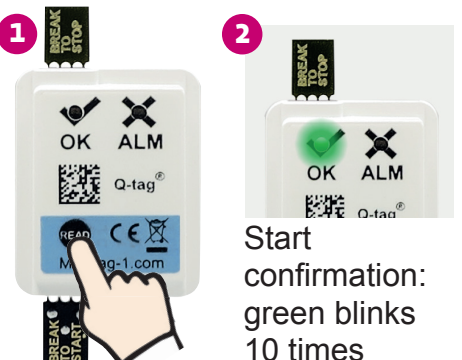
Activation option 1:
By breaking the START break-off tab (standard)

1 The device is started by the START break-off tab (the tab is labelled BREAK TO START) being completely broken off.

2 The successful activation is confirmed by the green LED indicator (OK) blinking 10 times.
(see Chapter 5: LEDs: Explanation of the "start confirmation" blink sequences)

Activation option 2:
By pressing the READ button

1 The device is started by pressing the READ button (with the edge of a fingernail) for at least 3 seconds.

2 The successful activation is confirmed by the green LED indicator (OK) blinking 10 times.
(see Chapter 5: LEDs: Explanation of the "start confirmation" blink sequences)

Note: Once the device is activated, the Berlinger Mini-tag® immediately monitors the programmed temperature limits and registers any violation of a temperature limit.

3.2) Start delay (optional)

If a start delay has been configured at the factory, the countdown starts immediately after activation of the device. The LEDs do not blink during the countdown / start delay. No status queries are possible. After completion of the countdown / start delay, the green LED blinks on the OK symbol 2 times *(see Chapter 5: LEDs: Explanation of the "start measurement operation after expiry of the start delay" blink sequence).* The device is immediately in active mode and monitors the temperature.

3.3) Correct positioning

The activated temperature indicator must be placed immediately and as close as possible to the monitored products in order to obtain the most accurate temperature data of the goods to be monitored. This is an important prerequisite for the temperature measurement to be meaningful.

Note: We recommend that devices without a programmed start delay be preconditioned for 30 minutes prior to activation. Any false measurements on the start of the device can thus be avoided.

4) LED sequence during measurement operation

4.3) Option 1:
Status display only on query

The LEDs only light up when a request is performed. By pressing the READ button once, the status request / alarm identification can be performed at any time. Thus, the status / alarm identification is displayed again every 10 seconds for a duration of one minute *(see Chapters 5 and 6: LED indicators explanation of blink sequences and alarm ID)*. Thereafter, the LED indicator will stop blinking. The status / alarm identification can be displayed again by pressing the READ button once more.

4.2) Option 2:
Continuous status display

The LEDs blink continuously, green for OK or red for ALARM. Thus, the status / alarm identification is displayed by regularly blinking according to optional programmed intervals of 15, 30 or 60 seconds. *(see Chapters 5 and 6: LEDs explanation of the blink sequences and alarm identification)*

Attention: Due to increased battery usage, this option reduces the operating time of the device! The continuous display is terminated when the battery capacity is low. The query is still possible by pressing the READ button until the battery life has expired.

5) LEDs: Explanation of the blink sequences

	Description	1	2	3	4	5	6	7	8	9	10	11	12	Time between blink interval	Query with READ button	Repeat every x seconds during long-term display
						Anzahl blinken										
Possible displays during the measurement operation																
Start confirmation	Blink green 10 times	🟢	🟢	🟢	🟢	🟢	🟢	🟢	🟢	🟢	🟢			1 seconds	-	-
Start measurement operation after expiry of the start delay	Blink green 2 times	🟢	🟢											(0.5 seconds)	-	-
Normal operation (without alarm)	Blink green 1 time	🟢												-	Every 10 seconds, repeating 6 times	15, 30 or 60 seconds
Normal operation and duration reserve * reached warning	Blink green 2 times	🟢	🟢											(0.5 seconds)	Every 10 seconds repeating 6 times	15, 30 or 60 seconds
Possible displays during the stop process																
Stop confirmation	The green and red LED blink each 3 times alternatively	🟢	🔴	🟢	🔴	🟢	🔴							1 second	-	-
Status after stop confirmation without alarm	Blink green 1 time every 10 seconds for 2 minutes	🟢	🟢	🟢	🟢	🟢	🟢	🟢	🟢	🟢	🟢	🟢	🟢	10 seconds	-	-
Status after stop confirmation without alarm but warning that duration reserve * reached	Blink green 2 times every 10 seconds for 2 minutes	🟢	🟢											(0.5 seconds)	-	-
Status after stop confirmation with alarm (without alarm identification)	Blink red 1 time every 10 seconds for 2 minutes	🔴	🔴	🔴	🔴	🔴	🔴	🔴	🔴	🔴	🔴	🔴	🔴	10 seconds	-	-
Possible displays after stop process concluded																
Status display without alarm	Blink green 1 time	🟢												-	Every 10 seconds repeating 6 times	15, 30 or 60 seconds
Status display without alarm but warning that duration reserve * reached	Blink green 2 times	🟢	🟢											(0.5 seconds)	Every 10 seconds repeating 6 times	15, 30 or 60 seconds
Status display with alarm (without alarm identification)	Blink red 1 time	🔴												-	Every 10 seconds repeating 6 times	15, 30 or 60 seconds

*Duration reserve (optional)
With cumulative alarm events, it is also possible to set a duration reserve for the cumulative alarms. This serves as a warning, at least on a cumulative alarm, that the duration of the remaining alarm time is less than the programmed duration reserve.

Example:
Cumulative alarm at >8 °C for 60 minutes with a duration reserve of 10 minutes.
If the temperature accumulated for 50 minutes is over +8 °C, the device will recognise that the duration reserve is reached. This is indicated with the green LED blinking 2 times, instead of 1 time for display of normal operation without alarm. After another 10 minutes in the alarm temperature range, the alarm is triggered and the red LED blinks.

6) LEDs: Alarm identification (optional)

	Description	Anzahl blinken (1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	Time between blink interval	Query with READ button	Repeat every x seconds during long-term display
Possible displays during the measurement operation and after completion of the stopping process
AL1	Blink red 1 time	●												-	Every 10 seconds repeating 6 times	15, 30 or 60 seconds
AL2	Blink red 2 times	●	●											-	Every 10 seconds repeating 6 times	15, 30 or 60 seconds
AL3	Light red 1 time for 2 seconds	▬	▬	▬										-	Every 10 seconds repeating 6 times	15, 30 or 60 seconds
AL1 + AL2	Blink red 3 times	●	●	●										-	Every 10 seconds repeating 6 times	15, 30 or 60 seconds
AL1 + AL3	Light red 1 time for 2 seconds and blink 1 time	▬	▬	▬		●								-	Every 10 seconds repeating 6 times	15, 30 or 60 seconds
AL2 + AL3	Light red 1 time for 2 seconds and blink 2 times	▬	▬	▬		●	●							-	Every 10 seconds repeating 6 times	15, 30 or 60 seconds
AL1 + AL2 + AL3	Light red 1 time for 2 seconds and blink 3 times	▬	▬	▬		●	●	●						-	Every 10 seconds repeating 6 times	15s, 30s oder 60s

7) Ending of the measurement operation

The measurement operation of the Berlinger Mini-tag® temperature indicator can be stopped by either breaking off the STOP break-off tab or by pressing and holding the READ button for 6 or 10 seconds. The desired de-activation method is defined when ordering.
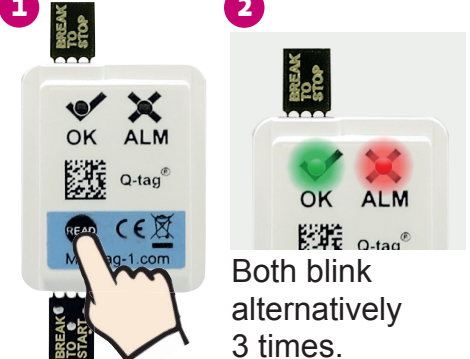
7.1) De-activation option 1:
De-activation by breaking the STOP break-off tab (standard)

1 The device is stopped by the STOP break-off tab (the tab is labelled BREAK TO STOP) being completely broken off.

2 Three seconds after de-activation the green and red LEDs blink alternatively 3 times. This serves as a confirmation that the device has been successfully stopped.
(see Chapter 5: LEDs: Explanation of the "stop confirmation" blink sequences).

Both blink alternatively 3 times.

7.2) De-activation option 2:
De-activation by pressing the READ button

1 The device is stopped by pressing the READ button (with the edge of a fingernail) for 6 or 10 seconds (standard).

2 Three seconds after the ending of the measurement the green and red LEDs blink alternatively 3 times. This serves as a confirmation that the device has been successfully stopped.
(see Chapter 5: LEDs: Explanation of the "stop confirmation" blink sequences).

Both blink alternatively 3 times.

7.3) De-activation option 3:
No stop function

The Berlinger Mini-tag® cannot be stopped. The device is active until the battery capacity is exhausted.

8) LED sequence after stop confirmation

8.1) Option 1:
Display of the device status only on query

The LEDs do not light up after stopping the device. By pressing the READ button once, the status request / alarm identification can be performed at any time. Thus, the status / alarm identification is displayed again every 10 seconds for a duration of one minute. Thereafter, the LED indicator will stop blinking. The status can be shown again by pressing the READ button once more.

8.2) Option 2:
Continuous display of the device status

The LEDs blink continuously green for OK or red for ALARM. Thus, the status / alarm identification is displayed by regularly blinking according to optional programmed intervals of 15, 30 or 60 seconds. *(see Chapter 6: Alarm identification)*

Note: The continuous LED status is terminated when the battery capacity is low. The query is still possible by pressing the READ button until the battery capacity is completely exhausted.

9) Assistance with problems

Problem definition	Possible problem solution	Indications
No stop / start confirmation received	Check: • whether the tab has been completely broken off • if the READ button has been pressed with enough pressure and for long enough	Chapter 3.1: Activation opt. 1 Activation opt. 2
Am I using the correct programming for my current application?	Check (before commissioning): • whether the correct programming is stored on the device. For this, read the data from the 2D Code	Chapter 2.3: Device explanation
How do I know that the battery is coming to the end of its life?	Check: • the expiration date in the 2D Code • With the option "continuous status display during the measurement operation", it can be recognised that the status is no longer displayed. By pressing the READ button, the query is however still possible.	Chapter 2.3: Device explanation Chapter 4.2: Option 2: Continuous status display

10) Technical specifications

External dimensions (L x W x H)	49 x 25 x 4 mm
Weight	4 g
Storage condition (inactive)	0 °C to +30 °C
Operating temperature	-30 °C to +60 °C
Accuracy of temperature measurement	+/- 0.6 °C (-30 °C to -10 °C)
	+/- 0.5 °C (-10 °C to +40 °C)
	+/- 0.6 °C (+40 °C to +60 °C)
Measurement accuracy of the time	+/- 2% max.
Temperature measurement interval	Every 1, 5 or 10 minutes
Operating lifetime	Up to 1 year storage / 3 years useful life
Protection class	IP54

11) Important Information
11.1) 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.

11.2) Battery
The Berlinger Mini-tag® contains a CR Lithium battery. Please pay strict attention to the following points:
- The housing of the Berlinger Mini-tag® must never be opened nor destroyed.
- Never expose the Berlinger Mini-tag® to temperatures above the allowed range (fire, oven, micro waves, etc.).It may cause injuries.
- Always keep the Berlinger Mini-tag® 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 Berlinger Mini-tag® in accordance with the WEEE2012/19/EU guidlines or your local regulations. The device may also be returned to the manufacturer for proper recycling.

11.3) Useful life
The devices can be used up to 4 years after production date (1 year storage / 3 years useful life) on the condition that:
- the status / alarm identification is not displayed continuously (depending on device configuration).
- 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.

Attention
The Berlinger Mini-tag® monitors temperature exposure and not the product quality. Its purpose is to signal if product quality evaluation or testing is required.

12) Contact
If you have any problems with the Berlinger Mini-tag®, please do not hesitate to contact our support:
www.berlinger.com / support@berlinger.com / +41 71 982 89 70

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