



# Condition Monitoring Systems CryoBeacon & SmartTag

Operation Manual



**MVE Biological Solutions**

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**Register your logger:**  
<https://register.mvebio.com>

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[monitor@mvebio.com](mailto:monitor@mvebio.com)

**Visit [www.mvebio.com](http://www.mvebio.com) for  
more information.**



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# 1 General

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## 1.1 Purpose

This operating manual contains important information for safe, correct and economical operation of the MVE Condition Monitoring Systems (CMS), CryoBeacon and SmartTag. Observing the instructions will help to avoid dangers, reduce repairs, increase reliability, and prolong the service life of the loggers.

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## 1.2 Distributor Identification

MVE Biological Solutions US, LLC  
3055 Torrington Drive  
Ball Ground, Georgia 30107 USA  
Telephone: +844-683-2796  
Email: [monitor@mvebio.com](mailto:monitor@mvebio.com)  
Website: [www.mvebio.com](http://www.mvebio.com)

### 1.2.1 Products Covered

This manual applies to the following products:

- CryoBeacon – Passive condition monitoring for shipment and storage tracking.
- SmartTag – Near real-time condition monitoring for shipment tracking (temperature, light, shock, orientation, acceleration, and geo-position).

### 1.2.2 Regulatory Information

These products comply with applicable international standards and directives.

#### 1.2.2.1 CryoBeacon

RED Directive 2014/53/EU

ROHS Directive 2011/65/EU and WEEE Directive 2012/19/EU

REACH Directive 2009/1907/EU CE Mark Low Voltage 2014/35/EU

FCC CFR Title 47 Part 15 Subpart B Contains FCC ID: X8WBT840

ICES-003 Contains IC: 4100A-BT840

#### 1.2.2.2 SmartTag

FCC CFR Title 47 Part 15 Subpart B

CE Marking: These devices conform to the low voltage directive (2014/35/EU)

Compliant with RTCA/DO-160G UN38.3

ROHS Directive 2011/65/EU and WEEE Directive 2012/19/EU





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## 1.3 Warranty

MVE will warrant condition monitoring systems (CMS) to be free from defects in material or workmanship for one (1) year from initial shipment to the original purchaser from the MVE warehouse.

MVE's liability for goods that do not conform to the product warranty shall be strictly limited, at MVE's sole option, to one of the following:

- i. Repair of the goods;
- ii. Replacement of the goods with new goods that conform to the product warranty;  
or
- iii. Refund of the price paid by the original buyer for the goods.

Repair, replacement, or refund, at MVE's sole option, shall be the original buyer's sole and exclusive remedy for any actual failure of the goods to conform to the product warranty. MVE shall have no liability

to the original buyer for any loss, damage, cost, or expense of any nature whatsoever, except as expressly provided herein.

Any CMS replaced under warranty shall be warranted for the greater of: (a) the unexpired portion of the original warranty period applicable to the device, or (b) ninety (90) days from the date of replacement.

For warranty claims, contact Customer/Technical Support at +844-683-2796 or [monitor@mvebio.com](mailto:monitor@mvebio.com).

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## 2 CryoBeacon

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### 2.1 Basic Safety Instructions

Never open the housing of the logger. Defective parts or components must only be replaced with parts and components approved by MVE Biological Solutions.

If the logger shows visible damage, it must not be put into operation.

The RJ45 connector only works with proprietary probes provided or approved by MVE Biological Solutions and is not supported by any standard.

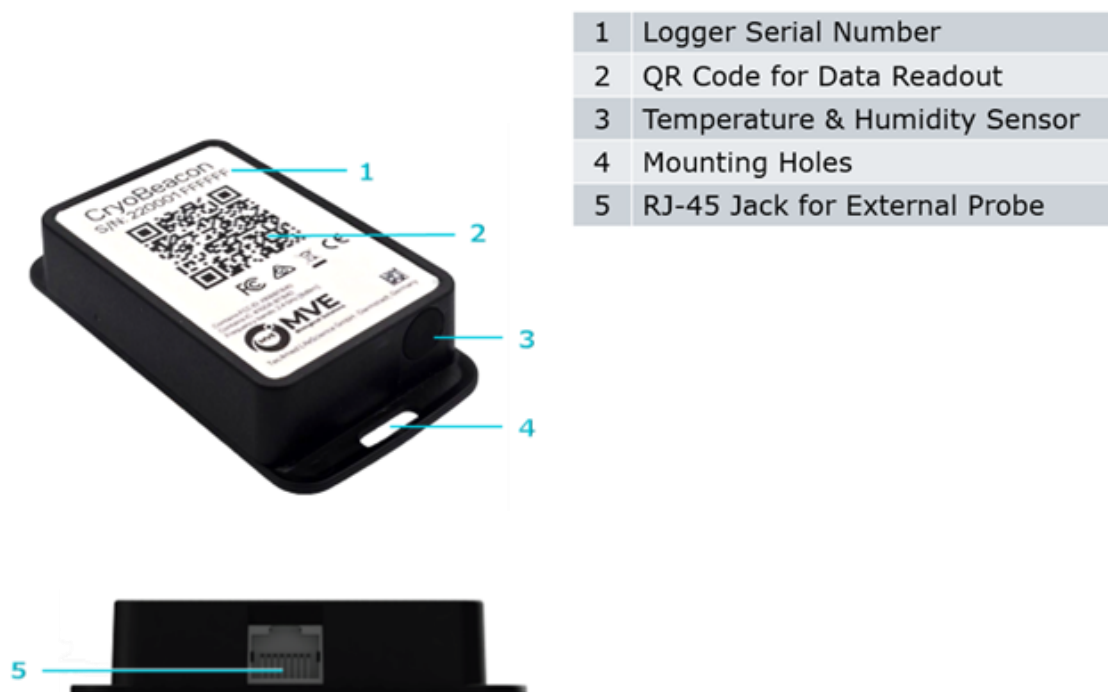
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### 2.2 Functional Description

The CryoBeacon logs ambient temperature and humidity. With the external analog probe, cryogenic temperature conditions are monitored during transit or in storage. The data can be accessed via the MVECloud after scanning with the Tec4App.



## 2.2.1 Design and Components



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## 2.3 Operation

Before operating, ensure the unit is dry and the battery charge is >10% (approximately 3 weeks of battery charge remaining). The battery charge for a specific logger can be viewed on the app or website after scanning the logger.

Do not place the logger near open flames or other heat sources (strong sunlight, gas oven, heater, etc.).

Ensure the temperature/humidity sensor and membrane are not covered. Do not immerse the logger in liquid.

Avoid throwing or skidding the logger or applying excessive external forces.

If no external probe is connected, cover the RJ45 port to keep it dry and protected from liquids.

Operate, store, and distribute the logger in the following ambient conditions only: min. -29°C/-20°F; max. +60°C/+140°F.

If CMS is being installed on a charged shipper or cold dewar, NER should not be measured until 5 hours after installation to allow the cork/cover to equilibrate with the dewar which was properly cooled per MVE's Vapor shipper and Dewar instructions.

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## 2.4 Tips for Saving Energy

For optimal battery life, initiate Bluetooth data readouts 1-2 times per day.

The operation of the logger in low temperatures may decrease the battery runtime.



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## 2.5 Cleaning & Care

Before cleaning, disconnect the external probe from the logger, if applicable. Ensure the connector port is kept dry and protected from all liquids. Clean only the exterior surface of the logger using a soft cloth that is lightly dampened with water. Do not immerse the logger in water, expose it to running water, or allow moisture to enter the device. Do not use harsh chemicals, solvents, abrasive cleaning agents, or sharp objects, as these may damage the logger and void the warranty.

---

## 2.6 Service Instructions

### 2.6.1 Connecting External Probe

Remove the RJ45 protection cover, if applicable.

Plug the external probe into the RJ port.

Pull gently on the probe to ensure proper connection.

*NOTE:* The locking tab of the connector must face upwards.

After connecting the external Pt-100 temperature probe, the CryoBeacon records both the internal temperature and the probe temperature. If no probe is connected, the CryoBeacon only records the internal temperature.

### 2.6.2 Probe Adjustment or Replacement

Tools and materials required:

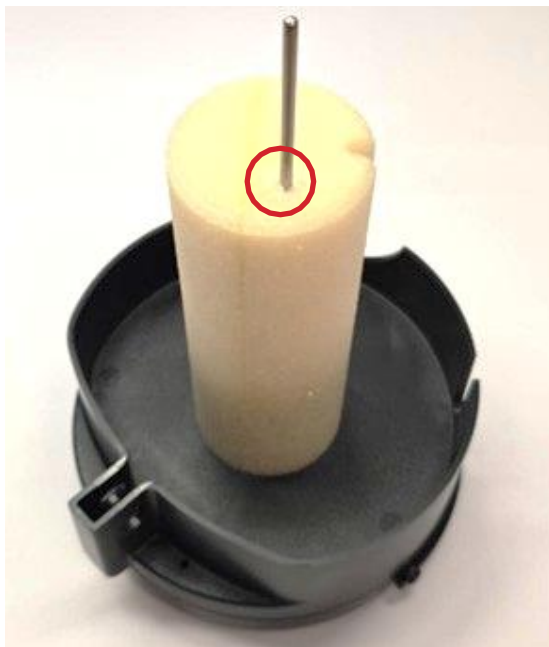
- #1 Phillips screwdriver
- GE Silicone Sealant: Advanced Silicone, Clear, 3 oz, Tube, 301% to 500% Elongation Range

*NOTE:* To prevent contamination from silicone or loose foam, do not adjust or replace probe over the open tank.

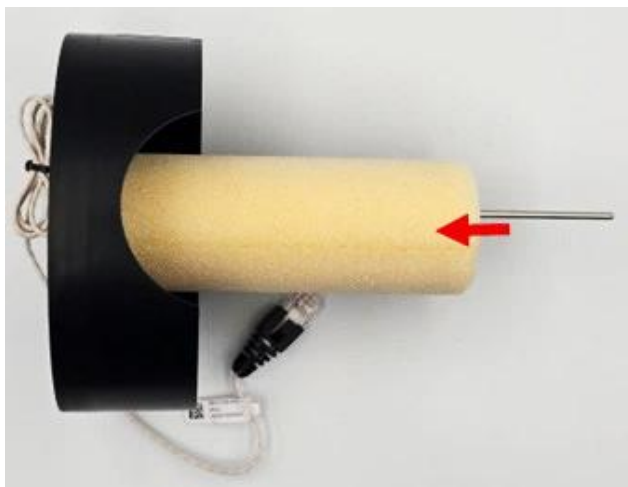
1. Remove the CryoBeacon following the instructions for your tank model under the Model-Specific Operations section.



2. Remove existing silicone from between the probe and cork surfaces by pulling it off gently.



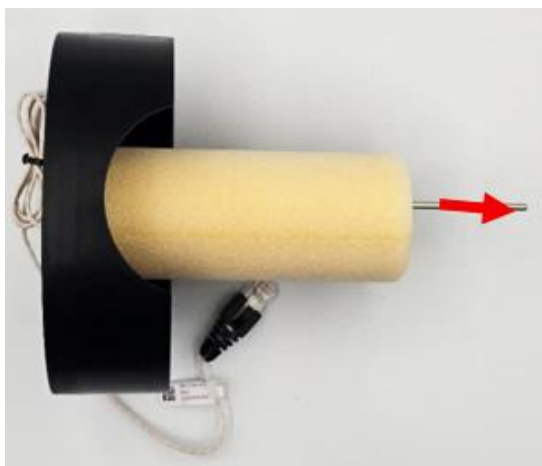
3. To remove the probe, push the exposed probe tip into the cork and then pull the cable from the top side of the assembly. See the direction in the image below.



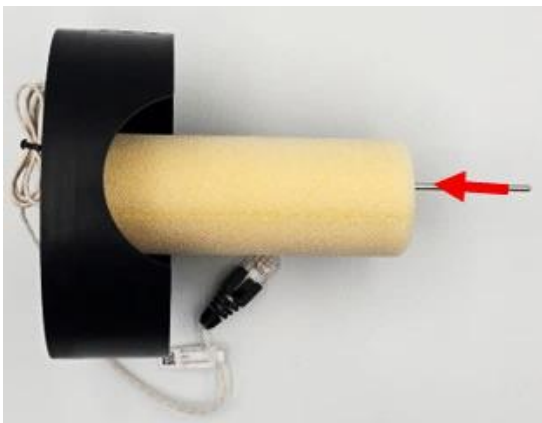


4. To adjust the height of the probe:

- a. Pull the probe downward from the cork if the desired height is to be lower in the dewar or vapor shipper.



- b. Push upward on the probe into the cork, while also pulling on the cable in the cover if the desired height is to be higher in the dewar or vapor shipper.



*NOTE: The standard probe protrusion recommended by MVE Biological Solutions from the bottom of the cork foam to the tip of the probe:*

- SC 4/2V: 1 5/8" (41.3mm)
- SC 4/3V: 1 1/2" (38.1mm)
- 47L: 2" (50.8mm)

*It is the responsibility of the end user to independently verify and validate any dimensions to ensure suitability for their intended application.*

5. Reinstall the CryoBeacon following the instructions for your tank model under the Model-Specific Operations section.
6. Apply silicone sealant around the probe (or wire) where it meets the cork to seal the gap between the probe or wire and the hole in the cork. Apply the silicone 360 degrees around the probe, and it is recommended not to have any strands of



silicone protruding from the silicone bead. After applying, allow 24 hours for the silicone to fully cure before putting into service.



### 3 MVE CryoBeacon Technical Data

|                                                   | Description                                                      | Details                                                                                                                                                           |
|---------------------------------------------------|------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Record &amp; transmission configuration</b>    | Record interval                                                  | 10 minutes                                                                                                                                                        |
|                                                   | Transmission interval                                            | On-demand when scanning the CryoBeacon                                                                                                                            |
| <b>Operating conditions</b>                       | Operating temperature                                            | -29°C to +60°C                                                                                                                                                    |
|                                                   | Humidity range                                                   | 0% rH to 100% rH, non-condensing                                                                                                                                  |
| <b>Liquid Nitrogen (LN2)</b>                      | Down to -200°C                                                   | Analog Pt-100 4-wire class A probe<br>Diameter: Cable 2.1mm; Sheath 3mm<br>Length: Cable 1000mm; Sheath 100mm<br>RJ45 connector<br>Temp. range: -200°C ... +100°C |
| <b>Ambient Sensors calibrated by manufacturer</b> | Temperature                                                      | -40°C to +85°C with accuracy of $\pm 0.2^\circ\text{C}$<br>0.1°C resolution                                                                                       |
|                                                   | Humidity                                                         | 0% rH ... 100% rH non-condensing<br>$\pm 2\%$ rH accuracy (at 20% rH ... 80% rH)<br>0.1% rH resolution                                                            |
| <b>Memory &amp; Logging</b>                       | Non-volatile memory event and interval triggered with thresholds | Capacity: 5,000 data points in circular buffers                                                                                                                   |
| <b>Data transfer &amp; analysis</b>               | Wireless                                                         | Data transfer via 2.4 GHz Bluetooth connection                                                                                                                    |
| <b>2.4 GHz for data transfer</b>                  | 2.4 GHz to read out data                                         | Max. 400m range (line of sight)                                                                                                                                   |

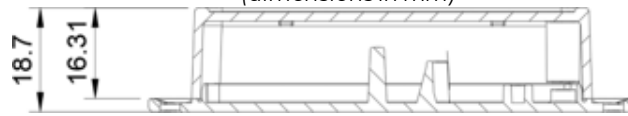


|                       | Description                                                                        | Details                                                                                                                                                                                                  |
|-----------------------|------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Battery               | CR2477 3V Lithium coin cell                                                        | Battery life depends on the data rate and ambient temperature; approximately 12 months<br>For transport, no marking obligation of the lithium metal button cell (ADR special provision 188 and IATA DGR) |
| Housing & Mounting    | ABS Housing Mounting:<br>e.g., Screw M3 ISO 7380<br>FL or industrial adhesive tape | Dimensions: 88mm x 47mm x 19mm<br>Distance of mounting holes: 80mm<br>Maximum tightening torque: 8 in-lbs (0.9 Nm)<br>Weight: approx. 47g                                                                |
| Water Ingress         | IP 50 protection                                                                   | Sensor protection through membrane<br>Penetration of fluids is to be prevented (Corrosion damage/short circuit)                                                                                          |
| Approvals & Standards | EC Declaration of Conformity (CE marking)                                          | RED Directive 2014/53/EU<br>ROHS Directive 2011/65/EU<br>WEEE Directive 2012/19/EU<br>REACH Directive 2009/1907/EU<br>CE Mark Low Voltage 2014/35/EU                                                     |
|                       | FCC                                                                                | FCC CFR Title 47 Part 15 Subpart B<br>Contains FCC ID: X8WBT840                                                                                                                                          |
|                       | IC (Canada)                                                                        | ICES-003 Contains IC: 4100A-BT840                                                                                                                                                                        |
| Export information    | Product tariff code                                                                | 9031 8080                                                                                                                                                                                                |
|                       | Country of origin                                                                  | DE (EU)                                                                                                                                                                                                  |
|                       | Data regarding legal control                                                       | ECCN = N, AI = no                                                                                                                                                                                        |



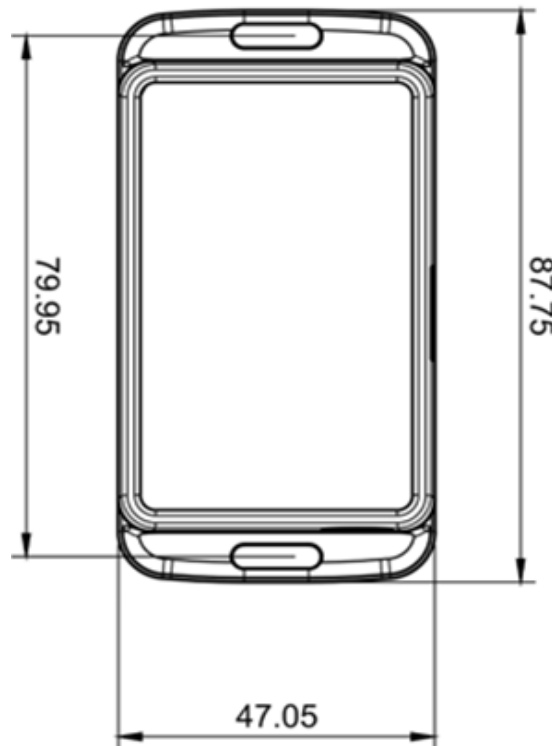
## 4 Housing Dimensions & Mounting Template

Housing Cross Section  
(dimensions in mm)



Housing Measurements (dimensions in mm)

*Note: Print this page as a mounting template*





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## 5 Storage Intervals

| Record Interval (min) | Full memory reached in (days) |
|-----------------------|-------------------------------|
| 1                     | ~4 days                       |
| 2                     | ~8 days                       |
| 3                     | ~12 days                      |
| 4                     | ~15 days                      |
| 5                     | ~19 days                      |
| 6                     | ~23 days                      |
| 10                    | ~38 days                      |
| 12                    | ~46 days                      |
| 15                    | ~57 days                      |
| 20                    | ~76 days                      |
| 30                    | ~114 days                     |
| 60                    | ~229 days                     |

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## 6 SmartTag

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### 6.1 Basic Safety Instructions

Never open the housing of the logger. Defective parts or components must only be replaced with parts and components approved by MVE Biological Solutions.

If the logger shows visible damage, it must not be put into operation.

Disconnect the logger from the power supply before any cleaning and maintenance and after each use.

Only charge using the MVE Biological Solutions USB charging cable.

Using the charging cable, connect the logger only to a 5V USB power supply.

---

### 6.2 Functional Description

The SmartTag is a multifunctional and flexible real-time tracking solution. Integrated sensors measure temperature, light, shock, orientation, acceleration, and geo-position and send them to the cloud software via the mobile network.

The SmartTag can be used as a stand-alone near real-time monitoring system working as a live logger.

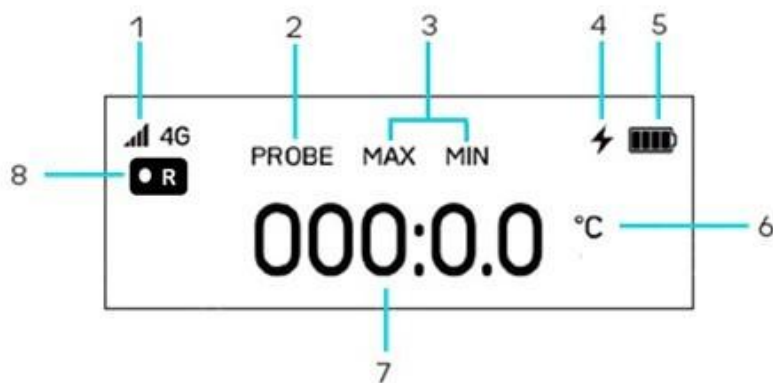


The SmartTag is a multi-use logger and can be recharged and used multiple times. It operates as the link to the MVECloud, offering full IoT functionality via mobile connectivity worldwide.

## 6.2.1 Design & Components



## 6.2.2 Display Description



1. Connection Icon
2. Probe Indicator
3. Temperature Status
4. Charging Indicator

5. Battery Status
6. Temperature Unit
7. Temperature Value
8. Record Icon



## 6.3 Operation

Before use, make sure the charging cable and probe connector are dry. Only charge the logger at ambient temperatures of 0°C to +45°C.

Operate, store and distribute the logger in the following ambient conditions only:

- Min: -29°C/-20°F
- Max: +60°C/+140°F

If the logger shows visible damage, do not put it into operation.

Do not operate the logger near open flames or other sources of heat. Protect the logger and cables from heat and moisture.

Do not immerse the logger in liquid.

Avoid throwing or skidding the logger or applying excessive external forces.

If CMS is being installed on a charged shipper or cold dewar, NER should not be measured until 5 hours after installation to allow the cork/cover to equilibrate with the dewar.

### 6.3.1 Startup

The SmartTag is deactivated prior to shipping. A short press of either the STOP or START button will illuminate the LCD display. The SmartTag will display the temperature on the LCD screen, but it is not recording data at this point.



### 6.3.2 Start Recording

Press and hold the START button for at least 5 seconds to initiate the record mode. The record icon  will illuminate on the left side of the LCD display. The recorded data can be viewed in the MVECloud or Tec4App.



### 6.3.3 Stop Recording

The STOP button is deactivated on the device to prevent accidental stoppage during shipment.

MAX and MIN temperatures can be viewed on the device by pressing the START button to scroll through the data.





### 6.3.4 Checking Battery Status & Charging

A short press will illuminate the LCD screen to view the battery icon in the upper right corner of the screen.

If the battery power is low before the first use, fully charge the logger using the provided charging cable.

While charging, the flash icon will be displayed next to the battery icon. See the appropriate “Charging” section in this manual under “Model-Specific Operations” based on your model.



### 6.3.5 Approved Airlines

Email Customer Service for a list of approved airlines.

#### 6.3.5.1 Data Recording & Transmission Interval

The SmartTag measures temperature, shock, light and geo-position.

The SmartTag records the measured parameters at an adjustable interval. The default interval is 10 minutes.

The SmartTag transmits the parameters to the cloud in an adjustable interval. The default interval is 60 minutes.

The intervals can be changed by MVE on request (shorter intervals = higher power consumption, longer intervals = lower power consumption).

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## 6.4 Cleaning & Care

Clean only the exterior surface of the logger using a soft cloth that is lightly dampened with water. Do not immerse the logger in water, expose it to running water, or allow moisture to enter the device. Do not use harsh chemicals, solvents, abrasive cleaning agents, or sharp objects, as these may damage the logger and void the warranty.

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## 6.5 Service Instructions

### 6.5.1 Probe Adjustment or Replacement

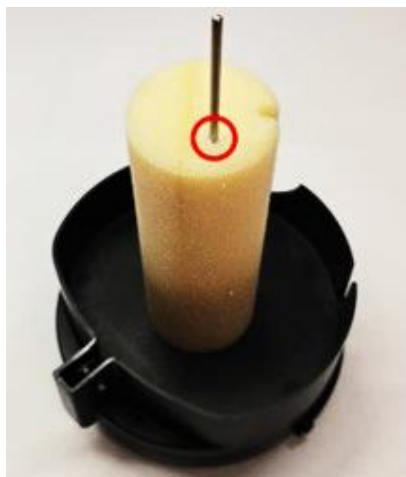
Tools and materials required:

- #1 Phillips screwdriver
- GE Silicone Sealant: Advanced Silicone, Clear, 3 oz, Tube, 301% to 500% Elongation Range

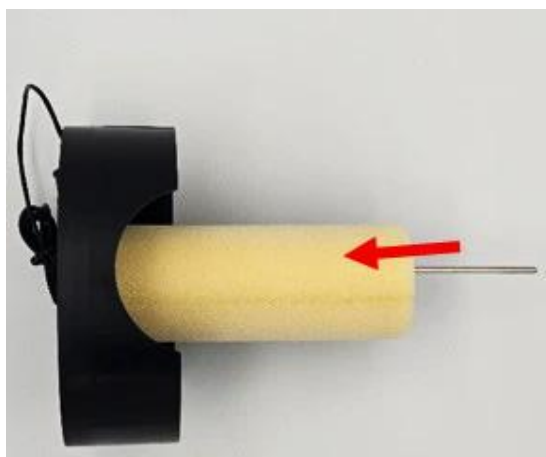
*NOTE: To prevent contamination from silicone or loose foam, do not adjust or replace probe over the open tank.*



1. Remove the SmartTag following the instructions for your tank model under the Model-Specific Operations section.
2. Remove existing silicone from between the probe and cork surfaces by pulling it off gently.



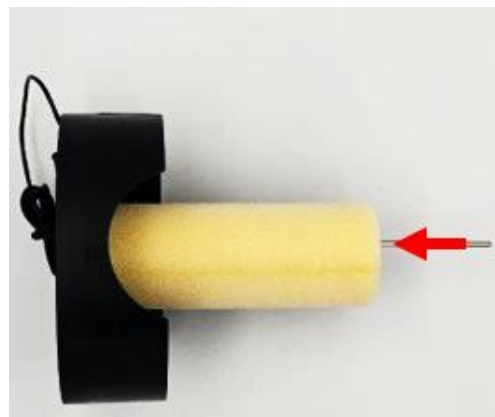
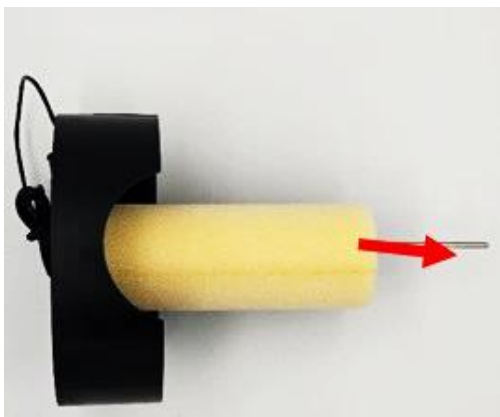
3. To remove the probe, push the exposed probe tip into the cork and then pull the cable from the top side of the assembly. See the direction in the image below.





4. To adjust the height of the probe:

- a. Pull the probe downward from the cork if the desired height is to be lower in the dewar or vapor shipper.
- b. Push the probe upward into the cork, while also pulling on the cable in the housing if the desired height is to be higher in the dewar or vapor shipper.



*NOTE: The standard probe protrusion recommended by MVE Biological Solutions from the bottom of the cork foam to the tip of the probe:*

- SC 4/2V: 1 5/8" (41.3mm)
- SC 4/3V: 1 1/2" (38.1mm)
- 47L: 2" (50.8mm)

*It is the responsibility of the end user to independently verify and validate any dimensions to ensure suitability for their intended application.*

5. Reinstall the SmartTag following the instructions for your tank model under the Model-Specific Operations section.
6. Apply silicone sealant around the probe (or wire) where it meets the cork to seal the gap between the probe or wire and the hole in the cork. Apply the silicone 360 degrees around the probe. It is recommended not to have any strands of silicone



protruding from the silicone bead. After applying, allow 24 hours for the silicone to fully cure before putting into service.



### 6.5.2 Charging the Logger

1. Release the fasteners using a #1 Phillips screwdriver by turning each fastener  $\frac{1}{4}$  turn counterclockwise and remove the cover of the CMS.





2. Pull the white tab on the bottom of the SmartTag to remove the dust cover of the charging port.



3. Plug the MVE USB charging cable into the SmartTag. The screen will flash “PDF” indicating that the logger is searching for a computer to upload a PDF document via USB. When using a standard power supply and not a computer, this can be ignored and the screen will return to normal display where it will display a ⚡ symbol, indicating that the unit is charging. A red LED will also appear, showing that the unit is charging.



4. When fully charged, the screen will display a ⚡ symbol indicating that the unit is fully charged. The red LED will turn off, indicating that the unit is fully charged.



When fully charged, remove the cable and replace the dust cover on the charging port.



5. Replace the housing cover by aligning the locating tab on the cover with the corresponding slot on the lower housing. See below in the red circle.





6. Secure the fasteners using a #1 Phillips screwdriver to turn each fastener  $\frac{1}{4}$  turn clockwise. If using an alternate method, the fasteners should not exceed a maximum torque of 8 in-lbs (0.9 Nm).



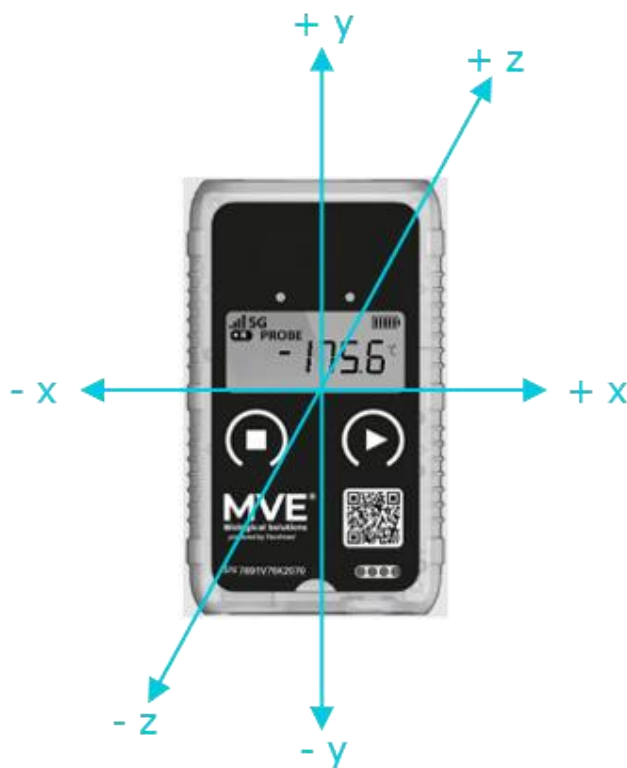
## 6.6 MVE SmartTag Technical Data

|                              | Description                             | Details                                                                                                                                                                                                    |
|------------------------------|-----------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Record & Transmission        | Record interval                         | 1 / 2 / 5 / 10 / 30 / 60 min                                                                                                                                                                               |
|                              | Transmission interval                   | 10 / 20 / 30 / 60 / 120 min                                                                                                                                                                                |
| Ambient Operating Conditions | Humidity range                          | 5% rH to 95% rH                                                                                                                                                                                            |
| External Temperature Probe   | PT100 sensor 4-wire connection, class A | -200°C to 100°C<br>100 mm sheath & 1000 mm cable<br>DIN EN 60751 (IEC 60751)<br>$\pm(0.15 + 0.002 \times  t )^{\circ}\text{C}$ where t is temp in degrees Celsius ( $\pm 0.542^{\circ}\text{C}$ at -196°C) |
| Internal Temperature Sensor  | Calibrated by manufacturer              | -30°C to 70°C<br>$\pm 0.5^{\circ}\text{C}$ (-20°C to +40°C)<br>0.1 °C resolution                                                                                                                           |
| Light Sensor                 | Detect whether box is open              | 0 to 52,000 Lux                                                                                                                                                                                            |
| Geo-Positioning              | Detect geolocation of device            | Geo-positioning via cellular and WiFi triangulation                                                                                                                                                        |
| Battery                      | Li-Ion                                  | Battery runtimes on following pages                                                                                                                                                                        |
| Casing                       | ABS casing                              | Dimensions:<br>103 x 61.3 x 23.9 mm                                                                                                                                                                        |
| Weight                       | SmartTag                                | 140 g                                                                                                                                                                                                      |
| Accelerometer                | 3 axes: x, y and z 1-8 g                | 1-8 g factory-calibrated<br>Resolution: 1 g                                                                                                                                                                |
| Approvals & Standards        | Compliance                              | FCC CFR Title 47 Part 15 Subpart B                                                                                                                                                                         |
|                              | 100 mm husk & 1000 mm cable             | CE Marking: These devices conform to the low voltage directive (2014/35/EU)                                                                                                                                |



|                   | Description             | Details                                                                                        |
|-------------------|-------------------------|------------------------------------------------------------------------------------------------|
|                   |                         | RTCA/DO-160G compliant<br>UN38.3<br>ROHS Directive 2011/65/EU and WEEE<br>Directive 2012/19/EU |
| Protection        | IP 64                   | Sensor protection through<br>membrane                                                          |
| GSM Module Config | Global roaming included | Global LTE 4G/5G<br>Fallback 2G network                                                        |

## 6.7 Orientation



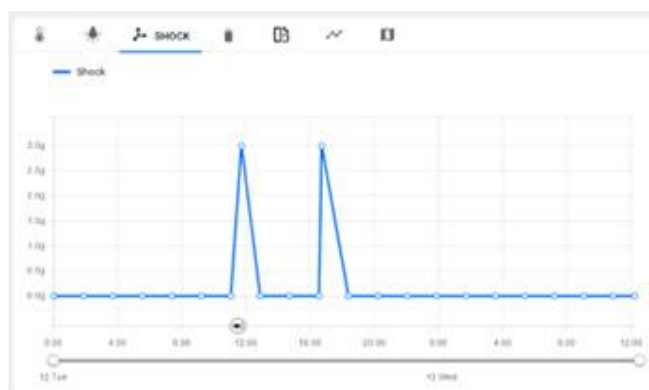


## 6.8 Shock Values (G Values Related to Drop in Height)

| Sensor Threshold | 10cm | 30cm | 50cm | 70cm | 90cm | 110cm | 130cm | 150cm |
|------------------|------|------|------|------|------|-------|-------|-------|
| Lev1             | ✓    | ✓    | ✓    | ✓    | ✓    | ✓     | ✓     | ✓     |
| Lev2             | ✗    | ✓    | ✓    | ✓    | ✓    | ✓     | ✓     | ✓     |
| Lev3             | ✗    | ✗    | ✓    | ✓    | ✓    | ✓     | ✓     | ✓     |
| Lev4             | ✗    | ✗    | ✗    | ✓    | ✓    | ✓     | ✓     | ✓     |
| Lev5             | ✗    | ✗    | ✗    | ✗    | ✓    | ✓     | ✓     | ✓     |
| Lev6             | ✗    | ✗    | ✗    | ✗    | ✗    | ✓     | ✓     | ✓     |
| Lev7             | ✗    | ✗    | ✗    | ✗    | ✗    | ✗     | ✓     | ✓     |
| Lev8             | ✗    | ✗    | ✗    | ✗    | ✗    | ✗     | ✗     | ✓     |

## 6.9 Shock Sensors

The shock sensor indicates the impact and the time when the impact occurred.



## 6.10 Battery Life with Transmission Intervals

Battery runtime in days is equal to the transmission interval in minutes.

| Transmission Interval (min) | Battery Runtime (days) |
|-----------------------------|------------------------|
| 120                         | 120                    |
| 60                          | 60                     |
| 30                          | 30                     |
| 20                          | 20                     |
| 10                          | 10                     |



## 7 Model-Specific Operations

This section describes the operating instructions for the two model series: 4/2V & 4/3V and the 47L.

### 7.1 4/2V & 4/3V

#### 7.1.1 4/2V & 4/3V CryoBeacon Removal

Tools and materials required:

- #1 Phillips screwdriver
  - GE Silicone Sealant: Advanced Silicone, Clear, 3 oz, Tube, 301% to 500% Elongation Range
7. Release the fasteners using a #1 Phillips screwdriver by turning each fastener  $\frac{1}{4}$  turn counterclockwise and remove the cover of the CMS.





8. Unplug the probe by pressing the tab on the cable connection and pulling outward, away from the datalogger.



9. Using a #1 or #2 Phillips screwdriver, remove the two SS #6-32 × 3/16" LG 18-8 fasteners securing the CryoBeacon to its bracket. Always remove the CryoBeacon before repositioning the probe to avoid probe damage and failed temperature readings.





10. Remove the wrapped probe cable from the wire retention tab and remove the cable tie if Probe wire length adjustment is needed.



### 7.1.2 4/2V & 4/3V CryoBeacon Installation

1. Replace the CryoBeacon onto the bracket as shown below. Replace the fasteners (2x, circled in red). Tighten by hand. If using an alternate method of tightening, the fasteners should not exceed a maximum torque of 8 in-lbs (0.9 Nm). For alignment of the CryoBeacon, the edge of the CryoBeacon case and the edge of the bracket should be flush (indicated by the green arrows). This will create the proper angle to match the window on the cover of the housing.





2. Plug the wire connector back into the CryoBeacon as shown below.



3. Replace the housing cover by aligning the locating tab on the cover with the corresponding slot on the lower housing. See below in the red circle.





4. Secure the fasteners using a #1 Phillips screwdriver to turn each fastener  $\frac{1}{4}$  turn clockwise. If using an alternate method, the fasteners should not exceed a maximum torque of 8 in-lbs (0.9 Nm).



### 7.1.3 4/2V & 4/3V SmartTag Removal

1. Release the fasteners using a #1 Phillips screwdriver by turning each fastener  $\frac{1}{4}$  turn counterclockwise and remove the cover of the CMS.





2. Lift the SmartTag out of its bracket by pulling either end of the datalogger. Always remove the SmartTag before repositioning the probe to avoid probe damage and failed temperature readings.



3. Unplug the probe by turning the lock nut counterclockwise on the cable connection to loosen, then pull the two ends of the connection to disconnect.



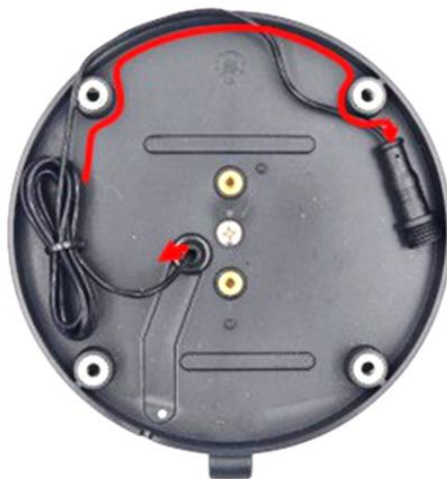


4. If adjusting the probe position, remove the fasteners (2 each SS #6-32 X 3/16" LG 18-8) that mount the bracket to the housing and remove the bracket. This will allow the probe wire to move freely.



#### 7.1.4 4/2V & 4/3V SmartTag Installation

1. With the probe in the desired location, fold the wire, replace the cable tie, and place the wrapped portion of the cable where the wire retention clip will hold the cable in place. Route the connection side of the wire following the red line shown below.



2. Replace the bracket in the housing, by aligning the location holes in the bracket with the locating pins on the housing. The screw holes in the bracket should line up with the threaded inserts in the housing. Once aligned, place the fasteners (2x) through the bracket into the threaded inserts. Tighten by hand. If using an



alternate method, the fasteners should not exceed a maximum torque of 8 in-lbs (0.9 Nm).



3. Place the SmartTag back into the bracket with the display and buttons facing upward. Route the cable as shown below





4. Reconnect the probe by aligning the arrows on the connector(s). This connection is keyed so no excessive force should be applied when making the connection, as it may damage the pins in the connector. Tighten the nut to secure the connection.



5. Replace the housing cover by aligning the locating tab on the cover with the corresponding slot on the lower housing. See below in the red circle.





- Secure the fasteners using a #1 Phillips screwdriver to turn each fastener  $\frac{1}{4}$  turn clockwise. If using an alternate method, the fasteners should not exceed a maximum torque of 8 in-lbs (0.9 Nm).



### 7.1.5 4/2V & 4/3V Charging

- Release the fasteners using a #1 Phillips screwdriver to turn each fastener  $\frac{1}{4}$  turn counterclockwise and remove the cover of the CMS.





2. Pull the white tab on the bottom of the SmartTag to remove the dust cover of the charging port.



3. Plug the charging cable into the SmartTag. The screen will display a  symbol, indicating that the unit is charging. A red LED will also appear, showing that the unit is charging.





4. When charging is complete, the red LED will turn off, the charge symbol will disappear, and the battery symbol will show as full (5 dark bars inside). When fully charged, remove the cable and replace the dust cover on the charging port.



5. Replace the housing cover by aligning the locating tab on the cover with the corresponding slot on the lower housing. See below in the red circle.





- Secure the fasteners using a #1 Phillips screwdriver to turn each fastener  $\frac{1}{4}$  turn clockwise. If using an alternate method, the fasteners should not exceed a maximum torque of 8 in-lbs (0.9 Nm)



---

## 7.2 47L

### 7.2.1 47L CryoBeacon Removal

- Release the fasteners using a #1 Phillips screwdriver by turning each fastener  $\frac{1}{4}$  turn counterclockwise and remove the cover of the CMS.





- 
2. Lift the end of the CryoBeacon upward and slide it out of the cradle. Unplug the probe by pressing the tab on the cable connection and pulling outward.





3. Remove the CryoBeacon and cradle from the CMS housing. If adjusting the probe length, remove the tape holding the probe wire into the groove prior to adjustment; replace when done.



### 7.2.2 47L CryoBeacon Installation

1. With the probe in the desired location, press probe wire into groove while pushing wire bundle over the pegs as shown.





2. Secure probe wire into groove using tape and route connector-end of probe wire as shown.



3. Plug connector firmly into CryoBeacon. Slide CryoBeacon into adapter, and push adapter down into place.





- Slide CryoBeacon down into beacon adapter and press down to engage CryoBeacon slot with rib.



- Align lid as shown using alignment feature and secure the fasteners using a #1 Phillips screwdriver to turn each fastener 1/4 turn clockwise.



### 7.2.3 47L SmartTag Removal

Tools and materials required:

- #1 Phillips screwdriver
- GE Silicone Sealant: Advanced Silicone, Clear, 3 oz, Tube, 301% to 500% Elongation Range



1. Release the fasteners using a #1 Phillips screwdriver by turning each fastener  $\frac{1}{4}$  turn counterclockwise and remove the cover of the CMS.



2. Unplug the charge port cable from the bottom of the SmartTag and set lid aside.





3. Remove the probe by turning the lock nut counterclockwise on the cable connection to loosen, then pull the two ends of the connection to disconnect.



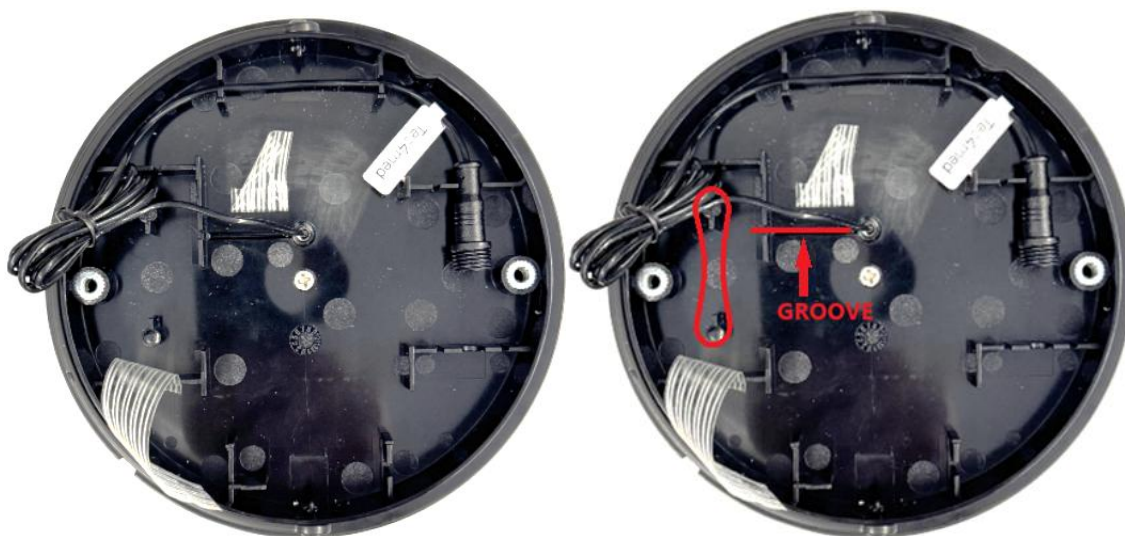
4. Lift the SmartTag out of the CMS housing. If adjusting the probe length, remove the tape holding the probe wire into the groove (1) and the tape securing the wire bundle (2). Pull wire from or push wire into the bundle as needed for desired length.





### 7.2.4 47L SmartTag Installation

1. With the probe in the desired location, press probe wire into groove while pushing wire bundle over the pegs as shown.



2. Replace tape to secure the probe wire in the groove, and to hold the wire bundle down onto the pegs. Route probe wire as shown.



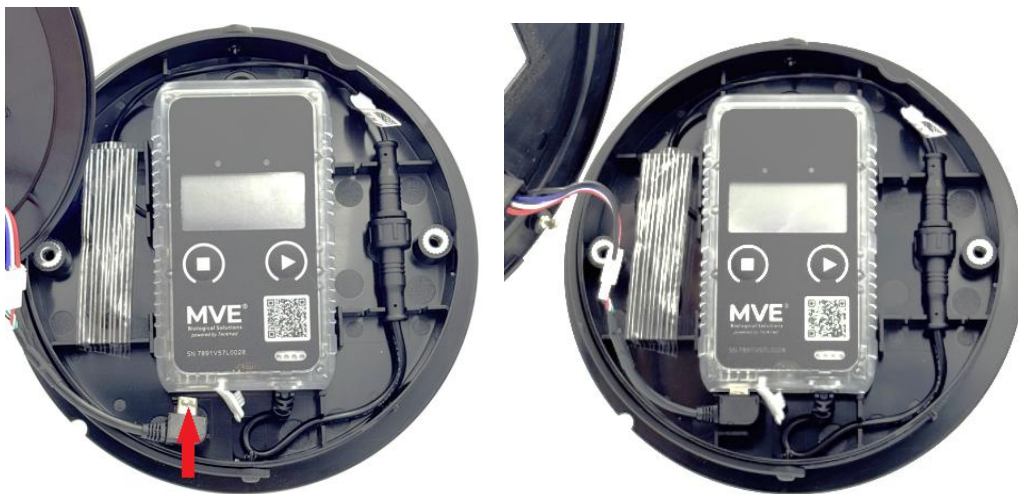
3. Place SmartTag into housing and reconnect the probe by aligning the arrows on the connectors. This connection is keyed so no excessive force should be applied when making the connection, as it may damage the pins in the connector. Tighten



the nut to secure the connection and press the connector firmly into the housing slots.



4. Plug the USBC charge port cable into the SmartTag.





5. Align lid as shown using alignment feature and secure the fasteners using a #1 Phillips screwdriver to turn each fastener  $\frac{1}{4}$  turn clockwise.



### 7.2.5 47L Charging

1. Pull lightly on the dust plug and swivel out of the way of the charge port. Plug the USB-C charging cable into the USB-C charge port. The red LED will illuminate, and a charge symbol will appear next to the battery icon:





2. When charging is complete, the red LED will turn off, the charge symbol will disappear, and the battery symbol will show as full (5 dark bars inside).



## 8 Troubleshooting

| Logger     | Fault                                                   | Resolution                                                                                 |
|------------|---------------------------------------------------------|--------------------------------------------------------------------------------------------|
| CryoBeacon | App not recognizing the logger                          | Verify smart device has Bluetooth enabled.                                                 |
|            | Abnormal temperature readings                           | Visually inspect the external probe and/or wire for damage.                                |
|            | Temperature not as expected inside the dewar            | Verify the probe length to ensure probe is in the desired location.                        |
|            | Temperature reading inside the dewar is reading ambient | Ensure the external probe is securely connected to the CryoBeacon.                         |
|            | CMS cover is loose                                      | Confirm all quarter-turn fasteners are secure.                                             |
| SmartTag   | Data is not recording to the cloud                      | Verify the R appears on the LCD screen. See "Start Recording" instructions in this manual. |
|            | Abnormal temperature readings                           | Visually inspect the external probe and/or wire for damage.                                |
|            | Temperature not as expected inside the dewar            | Verify the probe length to ensure probe is in the desired location.                        |
|            | CMS cover is loose                                      | Confirm all quarter-turn fasteners are secure.                                             |
|            | Light sensor is not sensing light                       | Remove the cover and verify the logger bracket is secure in the housing.                   |

Tutorials are available at [www.mvebio.com](http://www.mvebio.com)

Contact Customer Service at 844-683-2796 or email [monitor@mvebio.com](mailto:monitor@mvebio.com) for further assistance.



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## 9 Disposal of Product

Local or national environmental laws and regulations may prohibit disposal of electrical and/or electronic equipment such as the Tec4Med dataloggers. Contact local city or town offices for instructions on proper disposal of electrical or electronic equipment. Alternatively, MVE may be contacted for disposal information.



## 10 Certificate of Conformance

|                                                                                                                                                                                                                                                                                         |                                                       |       |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|-------|---------------|
|  <b>Certificate of Conformance</b>                                                                                                                                                                     |                                                       |       |               |
| <p>This document certifies that the accompanying Condition Monitoring System or component meets MVE Biological Solutions' internal quality standards, is calibrated, and operates as designed.</p> <p>MVE Biological Solutions has been audited and certified to EN ISO 13485: 2016</p> |                                                       |       |               |
| Sign:                                                                                                                                                                                                                                                                                   | <i>Max Mortensen</i>                                  | Date: | Sep 9th, 2025 |
| Name:                                                                                                                                                                                                                                                                                   | Max Mortensen, Ph.D.                                  |       |               |
| Title:                                                                                                                                                                                                                                                                                  | Vice President Quality Assurance & Regulatory Affairs |       |               |
| <p>This certificate is not to be interpreted as a warranty, neither express nor implied.</p>                                                                                                                                                                                            |                                                       |       |               |

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

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

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. The Federal Communications Commission (FCC) warns users that changes or modifications to the unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.



## 11 Revision History

| REV | ECR      | DATE    | DESCRIPTION                                                                                                                                                                                                                                                                            |
|-----|----------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|     |          |         |                                                                                                                                                                                                                                                                                        |
| B   | CB101952 | 10/2026 | Updated behavior for SmartTag configuration that allows simultaneous recording and charging. Added Revision history table. Added instructions for SmartTag charging, and removal of loggers specific to the 47L product family. Revised formatting and made minor grammatical updates. |
| A   | CB101676 | 9/2025  | Initial Release                                                                                                                                                                                                                                                                        |



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