



# Sublime

Real-time sublimation front monitoring system



## Wireless

Wireless power harvesting and communication:

- The introduction and retrieval can be automated with ease
- Compatible with fully automatic systems
- External Gateway suitable for complete automation in the SCADA / PLC

## Battery free

Powered by radio frequency transmission device:

- Avoid auto-heat and product temperature variations
- No charging station needed
- Simplify the introduction and retrieval logistics

## Single use

One single usage for each Freeze-drying process:

- No post sterilization needed
- Save time and money
- No possible cross-contamination



## Real-time sublimation front monitoring system

### 5 T° measurement points

As a result of its design 5 temperature measurement points could be placed along the device.

- Sublimation front monitoring PAT tool
- Better accuracy to optimize primary drying step
- Process improvement and understanding



## Key features

- Wireless real-time communication
- Sublimation front monitoring in vials
- 5 temperature sensors embedded
- Battery-free
- Single use
- Up to 50 sensors per batch
- Application: Lyophilization/Freeze-drying
- cGMP compliant

## Centering & holder piece

Centering piece and a sensor holder at the bottom to ensure the correct position of the sensor in the vials with the minimum product interference.



## Main specifications

- 433 MHz power transmission
- 2,4 GHz BLE communication to Gateway
- $\pm 0,5^{\circ}\text{C}$  accuracy
- Temperature range:  $-60^{\circ}\text{C}$  to  $+60^{\circ}\text{C}$
- IP68
- Measurement interval: 1 min to 24 h
- Pressure:  $10^{-5}$  to 3 bars

## Data management

Real time data can be displayed, collected and analyzed through FDA 21 CFR Part 11 compliant SCADA interface.

Better understanding of the sublimation front progress and optimizing the freeze-drying processes thanks to Sublime.



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