

H2B™ Technical Specification

Operational	
Conditions of operations	Hand-held, on-site
Response Time, typical	1 sec
Type of measurement	Non-contact
Data sampling	Point detection
Light source	UV LED
Detection spectral range	UV-VIS
Object pre-treatment	Not required
Control and communication	
Control unit	Integrated micro-controller
Data processing	Real-Time
Data visualization	Integrated display
Data storage	Via WiFi connection to PC
General	
Power consumption	2 W
Voltage	12 VDC
Dimensions (LxWxH)	20 x 6.5 x 15 cm
Weight	530 g

Features:

- Non-contact point detection of microbial contamination on the surfaces
- Decontamination control
- Instant response
- Robust design for on-site use
- No sampling, no consumables
- WiFi connection for external data logging
- Integration in sensor network is possible



Hand-held Bio-contamination detector

H2B™



H2B™ is a non-contact optical sensor for point detection of microbial contamination on various solid surfaces in security, safety and medical applications where surfaces are exposed to accidental, natural or intentional contamination. It serves as a selective point inspection tool for bio-cleanness control and assessment of the decontamination efficiency, which is commonly quoted as "how clean is clean enough".

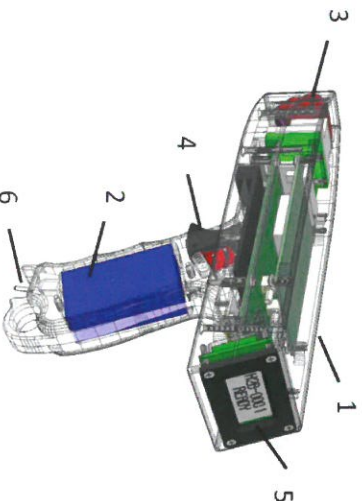


Fig.1 H2H: 1 - sensor head; 2 – battery; 3 - optical window; 4 – trigger; 5 – display; 6 –On/Off switch.

H2B™ is a small-size and lightweight hand-held sensor for on-site use (Fig.1). It has up to 6 hours of autonomous operational capacity with rechargeable battery (2). The inspection of the surface is carried out by UV-light beam through the optical window (3). The sensor operation is controlled by the trigger (4). The result of testing is instantly visualized on the display (5) and transmitted to the data logger via WiFi.

How it works

H2B™ operation is based on the measurement and analysis of specific Light Induced Fluorescence (LIF) of microbial cells. The UV-LED light source serves to probe the surface. When the surface is contaminated, the light pulse induces the optical response of microbial cells registered by photo-detector. This signal is processed by integrated micro-controller and visualized as a number of counts.

Various surfaces may provide different baseline values, thus influencing the detection. The H2B™ utilizes automatic baseline correction and subtraction procedures to eliminate such influences. When the baseline is set, it is stored in the device and is further subtracted from the signal value. Due to that the testing can be done virtually on any solid surface.



Fig.2 Display modes and measurement result.

The testing of the designated surface for bio-contamination control consists of two consequent steps:

1. Setting the baseline for controlled surface (mode Base, value B:);
2. Measurement of the microbial signal (mode MEAS, value S:);

The corresponding operation modes are switched by trigger with following indication on the display (Fig.2). If the signal is below or equal the baseline, the sensor reports "CLEAN", otherwise the number of counts is displayed.

This number of counts shows the significance of detected contamination. The Limit of Detection (LOD) varies for different surfaces, and the corresponding table of LOD and count-to-CFU ratio are provided in the user manual.

Sensor design

H2B™ sensor is assembled in a sealed plastic housing (IP68) and can withstand harsh decontamination. The sapphire glass window protects the optical channel of the sensor against any mechanical damages. The optical window is equipped with triple posts to set a testing position of the sensor against the surface, and by soft light intercepting gasket to minimize the influence of ambient light during the testing.

The sensor is designed for one-handed operation: all procedures are controlled by single trigger in the sensor grip. The grip has On/Off switch and clasp ring to fix the sensor on the user's belt.

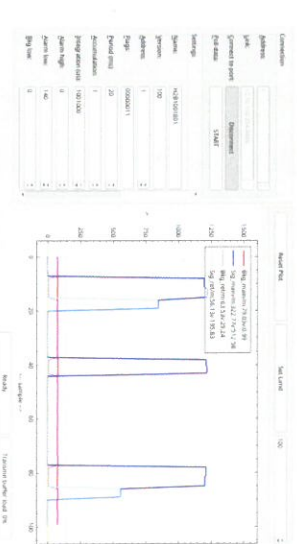


Fig.3 Data logger software window.

Data Logger

The results of the surface testing can be reported in real-time to external Control Unit (PC, tablet, etc.) for storage and post-analysis. Every result is accompanied with a time stamp thus allowing to document the measurements for contamination mapping and protocoling the post-cleaning results.

Keywords: bio-detection, on-site inspection, detection, biological threats, decontamination control, operational safety.