

EMIL13

THE EMILI SERIES:
MAKING EVERY
LIQUID TRANSPARENT



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The EMILI series offers unprecedented liquid identification and liquid thread detection capability with emphasis on high throughput and ease of use. We are technology leader in microwave liquid sensing, enabled by our partnerships with world leading research institutions like Forschungszentrum Juelich www.fz-juelich.de in Germany and Imperial College London www.imperial.ac.uk in the United Kingdom.

The Emisens sensor technology combines ultra-high performance microwave ceramics and a patented cavity sensor design, multisensory implementation, user-oriented software interface with touchscreen operation and Emisens' liquid database which comprises microwave and infra-red absorption spectra of hundreds of chemical compounds including liquid explosives.

The EMILI series was designed in accordance with the demands for a modern security checkpoint: high throughput, robust, user friendly, minimal training requirement, no ionizing or laser radiation.

Due to the open tray table configuration, the EMILI bottle scanners are suited for a huge range of container sizes and shapes. The minimum volume required for the inspection is about 50-100 ml (depending on container shape), and containers of up to 10 litres (depending on container shape) can be tested.

- Ability to screen containers up to 200mm wide and 600mm tall
- Ability to screen containers from 50ml up to 10Lts (container dependant)
- No movable parts, self calibrating
- No regular maintenance, no consumables
- Non-invasively way of screening items
- Bi-lingual screen messages
- Less time consuming, less messy and less risky than Type A
- More cost effective than Type C and D
Screening in STEBS possible.

TECHNICAL DATA	EMILI 3	EMILI TS	EMILI 2	Dual-Mode Sensor System
Dimensions WxHxT [mm ³]	520x520x720 (450 storage)	290x430x800 (530 storage)	290x430x760 (500 storage)	400x200x150 approx
Weight [kg]	35	25	12	5
Electrical Installation	220/110V, 45w	220/110V, 25w	220/110V, 25w	220/110V, 12v battery
Installation Platform	Non-vibrating platform	Non-vibrating platform	Stable platform	Any
Operation system	Windows 7	Windows 7	Windows 7	Windows 7, XP
Interface	Touchscreen, USB	Touchscreen, USB	Touchscreen, USB	USB
Optional accessories	Verification kit, mouse and keyboard	Transport suitcase, Verification kit, mouse and keyboard	Transport suitcase, Verification kit, mouse and keyboard	Battery, DVD with software
ECAC Standard Type B	3	2	2	N/A



EMILI 3

EMILI 3 – the latest EMISENS release – is the flagship of the EMILI series. Combining Emisens' dual-mode sensor technology with infrared and gravimetric analysis leads to unprecedented performance – without compromising the high throughput and ease of use inherent to the EMILI series. EMILI 3 is compliant with the highest international standard for LEDS (liquid explosive detection systems) by the European Civil Aviation Conference (ECAC Standard 3) which comprises the highest priority liquid explosive threats that EU Member States have agreed upon. High-throughput liquid design for use at Airport security checkpoints lanes. Technology:RF + IR + Gravimetric

- False alarms: < 1% for waters, soft drinks, baby food
< 5% for spirits, perfumes, body care (container dependant), lower false alarms (FAR) over Type C and D
- All container types including metals - Automatic container recognition
- Partially filled containers
- Ability to screen consumer liquids and gels in glass, plastic or ceramic bottles (either opaque or clear) and metal / metallised containers such as soft drinks, alcoholic drinks including spirits, perfumes, shower gels and medicines
- Inspection time: 1 – 3 seconds per bottle, 2 seconds refresh time
- Simple operation and easy to use. One hand operation, no doors to open/close, no push bottom to start inspection
- Touch screen interface, menu driven for user input and operation
- Minimal training requirement. No Special installation requirements or license
- Data recording and network capability
- Low power consumption of 45 Watts max
- Standby power saving mode
- Low maintenance and running costs
- Additional detection capabilities on request

Detector modifications – EMILI 3 was recently trialed at European airports (over 35,000 scans in total), at front of an x-rays conveyor system. A high throughput of 10 containers per minute was revealed from the statistical analysis of the data. The checkpoints could be operated at a maximum throughput of 175 passengers / h with one liquid container per passenger being checked by EMILI 3, without additional staff.

Therefore, EMILI3 would enable an airport to deal with any future lifting of the ban for liquid's in hand luggage of airplane passengers.

Extra detection capabilities can be added on request such as;

This additional detection has been divided into 4 separate groups:

- Flammable liquid detection – standard
- Alcohol detection – standard
- Acid detection – standard

Note: Additional substances may be added to a group upon request, this may be subject to additional cost.

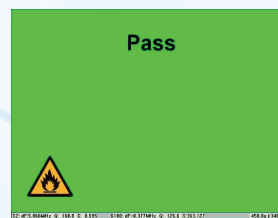
EMILI 3 is the ultimate stand-alone solution for airports of any size. We recommend to place EMILI 3 at front of the X-ray hand luggage inspection or in the airport lobby for clearing liquid containers prior to entering security checks.

Additional detection feature

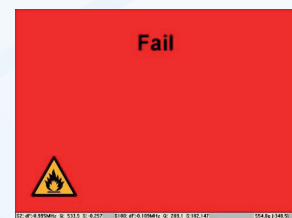
All Emili3 units are supplied for ECAC std 3 liquid explosive detection (LED) as standard, they also have the capability of additional detection.

Method of test

With an addition detection group installed, and when screening an item that falls within that groups parameters, the according icon will be shown on the bottom left hand side of the screen along with the LED result. These results are completely self-contained operations and have no influence on one other. The operator can then proceed with their organisations standard protocol when dealing with a flagged item.



Example 1:
PASSED LED screening
with flammable indication



Example 2:
FAILED LED screening
with flammable indication



EMILI TS

EMILI TS combines most of the advantages of EMILI 2 with lower false alarm rates and metal container analysis. EMILI 2 is compliant with the legal European standard by the European Civil Aviation Conference (ECAC Standard 2).

- All container types including metals
- Inspection time: 1 second per bottle, 2 seconds refresh time
- One hand operation, no push bottom to start inspection
- Touch screen interface, menu driven for user input and operation
- Data recording and network capability
- Minimal training requirement
- Low maintenance and running costs

Highly cost-efficient solution for smaller airports with type A/B false alarm resolution. At front of type C LEDS EMILI TS leads to a significant increase in throughput. EMILI TS is available as a stand alone or as an upgrade for the EMIL 2 units.



EMILI 2

EMILI 2 is a cost efficient solution for ultrafast bottle inspection in checkpoints. The unprecedented dual-mode rf-microwave technology enables inspection time below one second per container. EMILI 2 is compliant with the legal European standard by the European Civil Aviation Conference (ECAC Standard 2).

- All container types except metals
- Inspection time: 1 second per bottle, 1 second refresh time
- One hand operation, no push bottom to start inspection
- Minimal training requirement
- Very low maintenance and running costs

Installations of EMIL 2 worldwide including Vienna International Airport, at front of type A, B and C LEDs. The combination of EMILS 2 at front of type C LEDs has proven to lead to a significant increase in throughput in comparison to type C at front of type B LEDs.

Due to its compact size and low weight it is ideally suited for temporary installations (sport events, concerts) but also for building protection (government buildings, prisons, courts, hotels) and public transportation (trains, underground, ports)



EMISENS DUAL-MODE SENSOR SYSTEM

The Emisens Dual-Mode Sensor System contains a dual-mode sensor + electronics + battery (optional) similar to the one in EMILI 2/TS/3 in a compact package with USB interface to run the user software on a Windows PC, laptop or tablet. The user interface displays the raw-data for the 2 modes graphically and comprises a variety of averaging and data saving options resembling a state-of-art network analyser. In collaboration with our research partners, the dual-mode sensor kit has been successfully used for the non-invasive assessment of water content and ion concentration in plant tissue (see S. Dadshani et al., "**Non-invasive assessment of leaf water status using a dual-mode microwave resonator**", PLANT METHODS, Vol: 11, ISSN: 1746-4811, open access journal, www.plantmethods.com/content/11/1/8).

- Inspection of liquids in glass or plastic containers
- Contact-free conductivity measurements of aqueous liquids
- Water and mineral content in plant tissue and food
- Water and alcohol content in petrol
- Contact-free conductivity and dielectric constant measurements of wafers and substrates for micro- and nanoelectronics such as silicon wafers, conducting polymers and 2D materials like graphene

Customer specific solutions for (industrial) sensor integration are available on request. In direct partnership with Imperial College London and Emisens' UK partner Link Microtek Ltd, we are exploring new applications of the Emisens sensor technology. Emisens and its partners are open for research and developments partnerships with industry and research organizations worldwide.

