

# C-SHIELD

NOVEL SYSTEM FOR DETECTION  
AND IDENTIFICATION OF CHEMICAL HAZARDS





wider scope  
of detected agents



substance  
identification



reduced false-  
positive  
readouts

## Why should you innovate CBRN systems?

Commercially available equipment for CBRN detection, though technologically advanced, is still often prone to certain deficiencies, which are indispensable part of detectors based on single detection technology, for instance ion mobility spectroscopy (IMS), photo ionization detection (PID), electrochemical cell (EC), etc. Said deficiencies are related to the detectors' sensitivity (some compounds may not be detected at low concentrations), false alarms generation, and susceptibility to environmental interferences. These issues are crucial factors undermining the overall performance of the detection systems, and potential false alarms may generate extra operational costs for end users.

## Importance of sensor data fusion

The existing limitations of detection technologies are known for a long time to the CBRN practitioners. This awareness sparked numerous research projects focusing on the improvement of CBRN detection systems. One of the already tested and proven methods for refining CBRN detection systems is the application of heterogeneous sensor signal processing.

Heterogeneous detection system uses at least two different detection technologies. The signal from these detectors is post-processed to compensate for potential deficiencies of each integrated sensor. Furthermore, the application of heterogeneous sensor signals enables the implementation of data fusion algorithms for substance identification purposes. Consequently, end users' situational awareness is improved.



based on multiple years  
of research



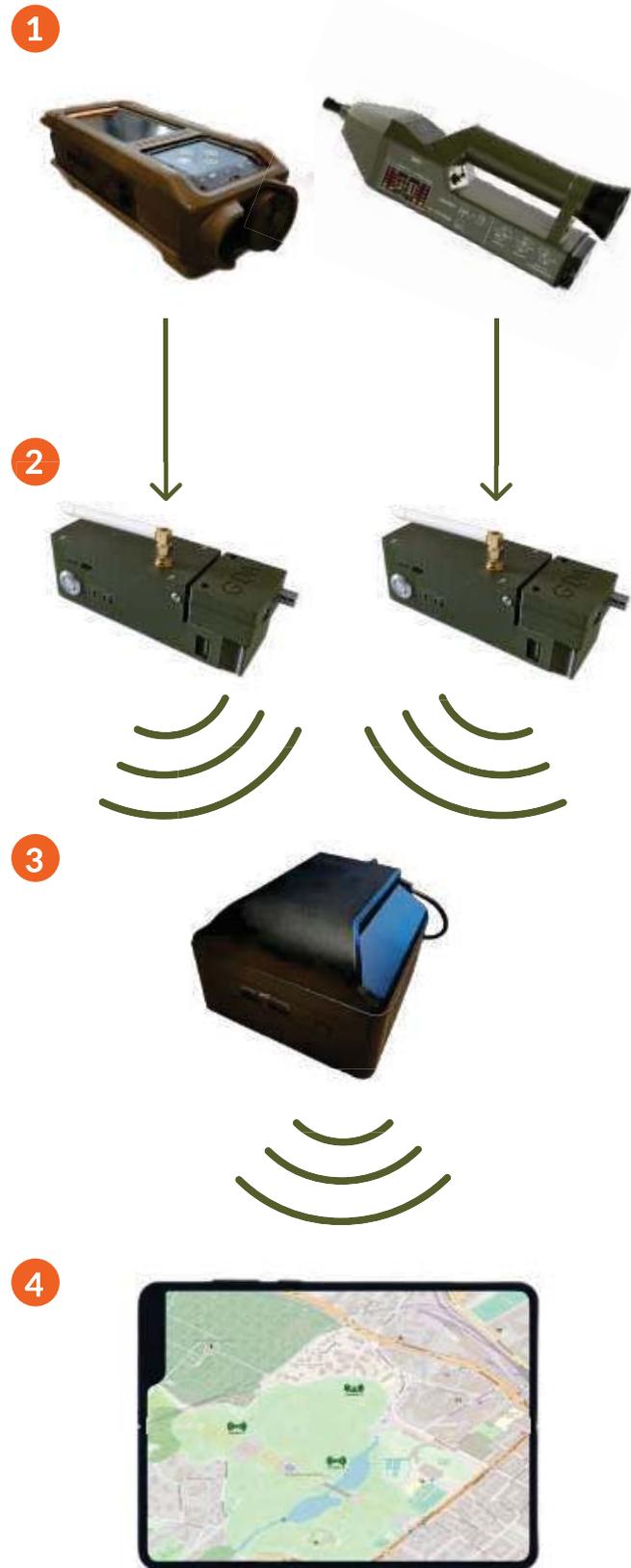
developed  
for dual use  
applications



direct answer to end-  
user requirements  
(IFAFRI capability gaps)

# C-SHIELD will solve your problems

C-SHIELD emerged as a remedy to decrease false alarm ratio of commercial sensors. The system uses commercially available chemical detectors (1), which are fitted with dedicated adapters (2). There is a specific microcontroller-based adapter for each type of the detection instrument. The role of the adapter is to collect data from the detector, unify the data format, and transmit the data frame to the sensor node. The sensor node (3) is a microcomputer-based device, which collects and merges the data from connected detection instruments. The sensor node has enough computational power to run data fusion algorithms enabling classification and identification of the detected chemical substance. The data from the sensor nodes is presented in real-time in (4) Command & Control application.



## Supported sensors

**GDA-P** by AIRSENSE is an ion mobility spectrometer.  
Specification available at:  
[www.airsense.com/en/products/gda-personal](http://www.airsense.com/en/products/gda-personal)

**AP4C** by Proengin is a flame photometric detector.  
Specification available at:  
[www.proengin.com/en/product/2/chemical-detection/5/ap4c](http://www.proengin.com/en/product/2/chemical-detection/5/ap4c)

The list of supported sensors can be further increased. Contact us if you wish to integrate other detection instruments with the C-SHIELD solution.

# Detection capabilities

The C-SHIELD solution combines the libraries of integrated detection instruments. As a result, the system can detect:

- Nerve agents
- Blister agents
- Blood agents
- NTA
- Choking agents
- Toxic industrial contaminants

## Identification

Improved capabilities with chemical hazard identification. The solution provides end users with information on estimated substance ID together with its probability score, and estimated concentration level.

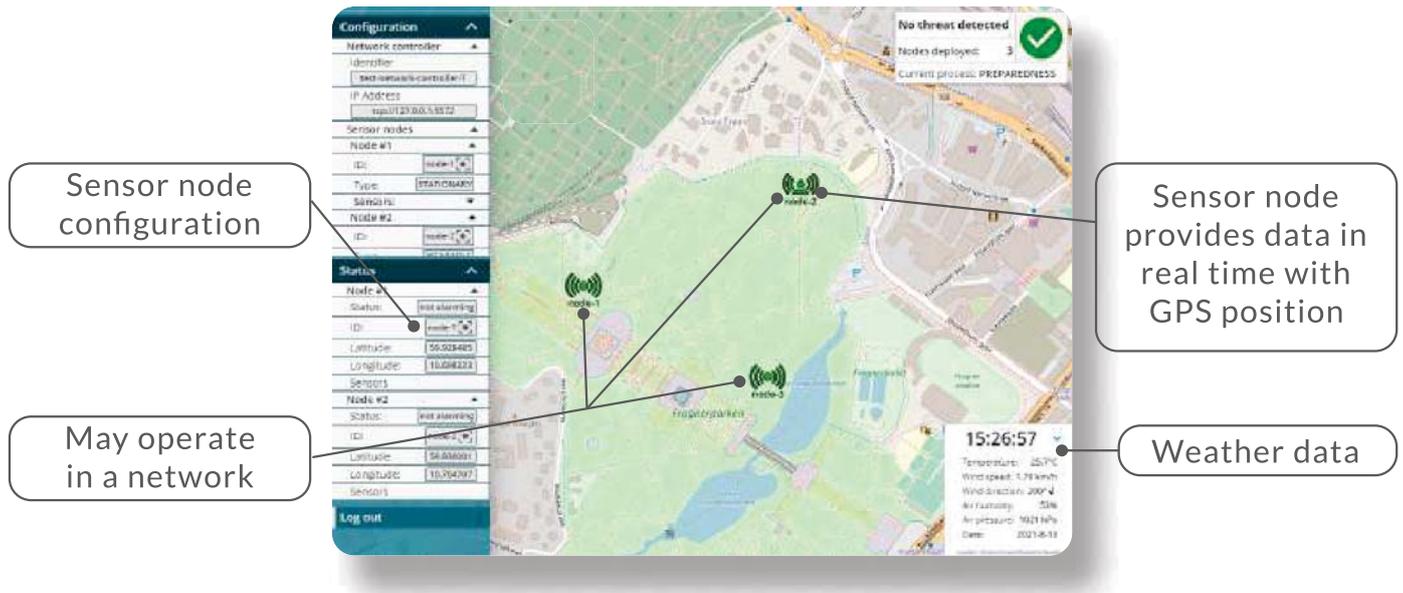


## Why should you choose C-SHIELD?

Benchmark against commercial CBRN systems

	Existing systems	C-SHIELD
CWA and TIC detection	✓	✓
Processing heterogeneous sensor signals	✗	✓
Limiting false alarms through software algorithms	✗	✓
Identification of the substance class and substance ID	✗	✓
Modularity / easy extension with additional third party SW & HW modules	✗	✓

# User interface



# Specification

Detection technologies	GDA-P: Integrated Ion Mobility Spectroscopy AP4C: Flame Photometric Detection
GDA detector adapter	Communication interface (for detector): RS232, Bluetooth Communication interface (for sensor node): Wi-Fi, Ethernet Size: 140x52x46 mm (L x H x W) Weight: ~250g Power supply: DC 12V, USB, PoE or rechargeable Li-Ion battery pack Power consumption: 2 W Operational time on battery: >8 hours
AP4C detector adapter	Communication interface (for detector): RS422 Communication interface (for sensor node): Wi-Fi, Ethernet Size: 140 x 52 x 46 mm (L x H x W) Weight: ~250g Power supply: DC 12V, USB, PoE or rechargeable Li-Ion battery pack Power consumption: 2 W Operational time on battery: >8 hours
Sensor node	Onboard data processing (data fusion) Integrated with C-SHIELD database Power supply: DC 18-22V or PoE Power consumption: 60 W Communication interface: Wi-Fi, Ethernet Modularity: Daisy Chain connection
GUI	Dedicated C-SHIELD GUI Or Integration with existing C2 system with open API

## Contact Us!

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This project has received funding from

**ITTI**



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101005292\*.