BRUKER

Standoff CWA/TIC Detection

- Toxic Gas/Vapour Threat Mitigation – **RAPID*plus***

CBRNE

Innovation with Integrity

Choose Innovation – Choose Bruker

Bruker is recognised as the leading authority on the use of detection and identification technologies to mitigate the threat from the accidental or deliberate release of toxic gases, explosives and radioactive materials that could kill or injure civilians and military personnel.

We offer the world's most comprehensive range of threat detection and identification solutions and can help you to assess how these can be best employed to protect people, property and military assets.

We develop, manufacture and supply technology worldwide for a range of customers and end users that need to protect people and property. These include, but are not limited to, national armies who need to protect their troops, as well as governments, commercial enterprises and multi-national corporations who need to protect their employees and clients from the ever-increasing threat from terrorism.

Bruker is strongly committed to meeting its customers' needs by continuing to revolutionise the design, manufacture and distribution of detection tools based on our core technologies; by providing solutions that are regarded as the 'Gold Standard' by threat mitigation experts.

Toxic Gas Threat Mitigation: RAPID*plus*

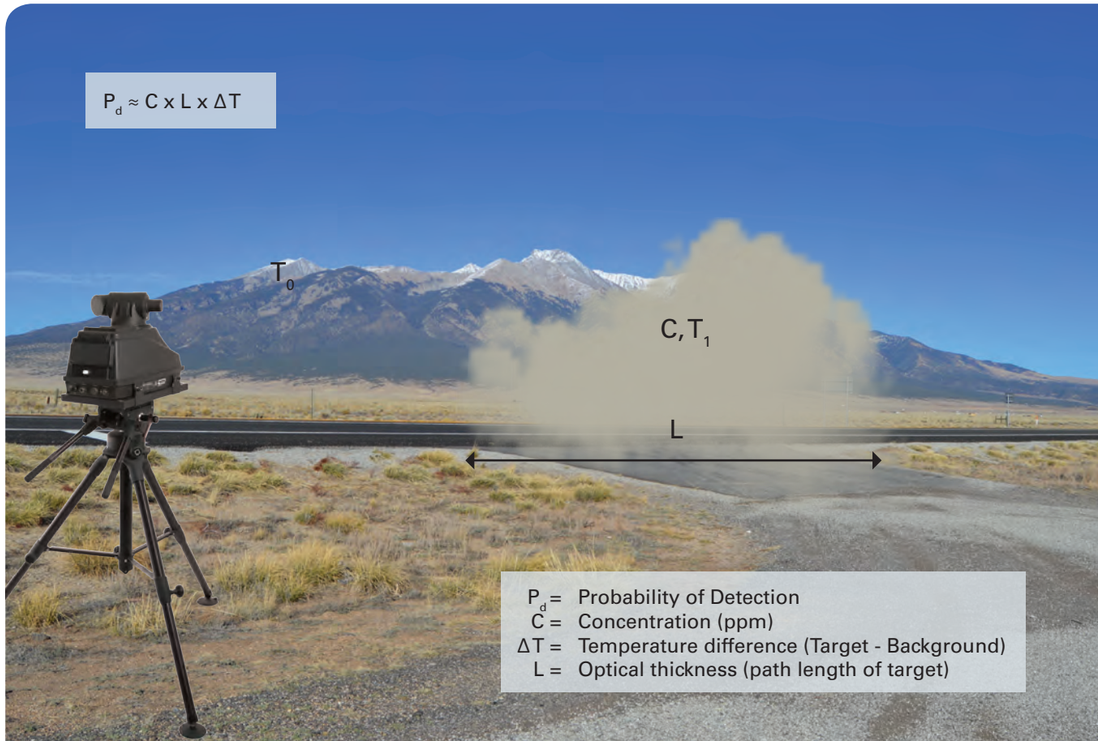
The Bruker RAPID*plus* is a second-generation passive standoff detector, designed to detect and identify toxic chemical clouds at a distance.

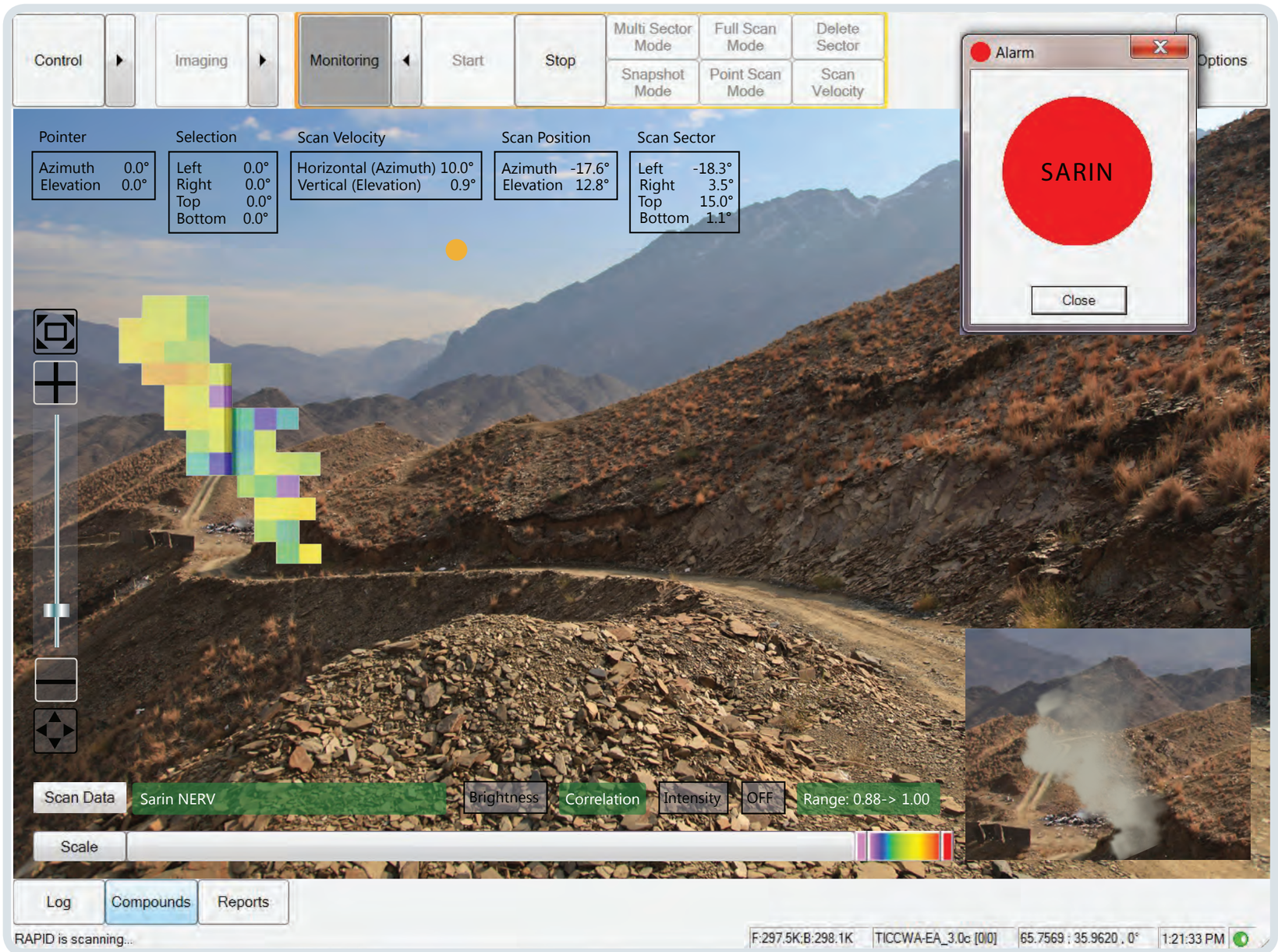
With a range that can be measured in kilometres, all known chemical warfare agents (CWA) and many critical Toxic Industrial Chemicals (TIC) can be detected automatically and identified immediately from a library stored on a connected computer. This robust system, built to exacting Military Standards, can be operated as a stand-alone device, for example, being deployed from a vehicle and then operated from a tripod. For full integration, there are versions of the RAPID*plus* that can be mounted permanently on vehicles, ships and helicopters, where it will provide real-time detection and identification even while underway.

For land-based integration projects, two standard colours of the RAPIDplus are available depending on the camouflage requirements. For Maritime applications the grey version of RAPIDplus features a special exterior and salt-water-resistant seals.

At the heart of RAPID*plus* is a passive infrared sensor system based on a Fourier Transform InfraRed (FT-IR) component. If a hazardous chemical cloud enters the field of view and which exhibits even a small temperature difference between the cloud and the background, characteristic IR data can be obtained. These data, known as IR spectra, are transferred via Ethernet to a PC and software compares them with entries in a spectral database (library) to identify the threat.

PRINCIPLE OF OPERATION





Terrain overlay images are simulated and for illustration purposes only

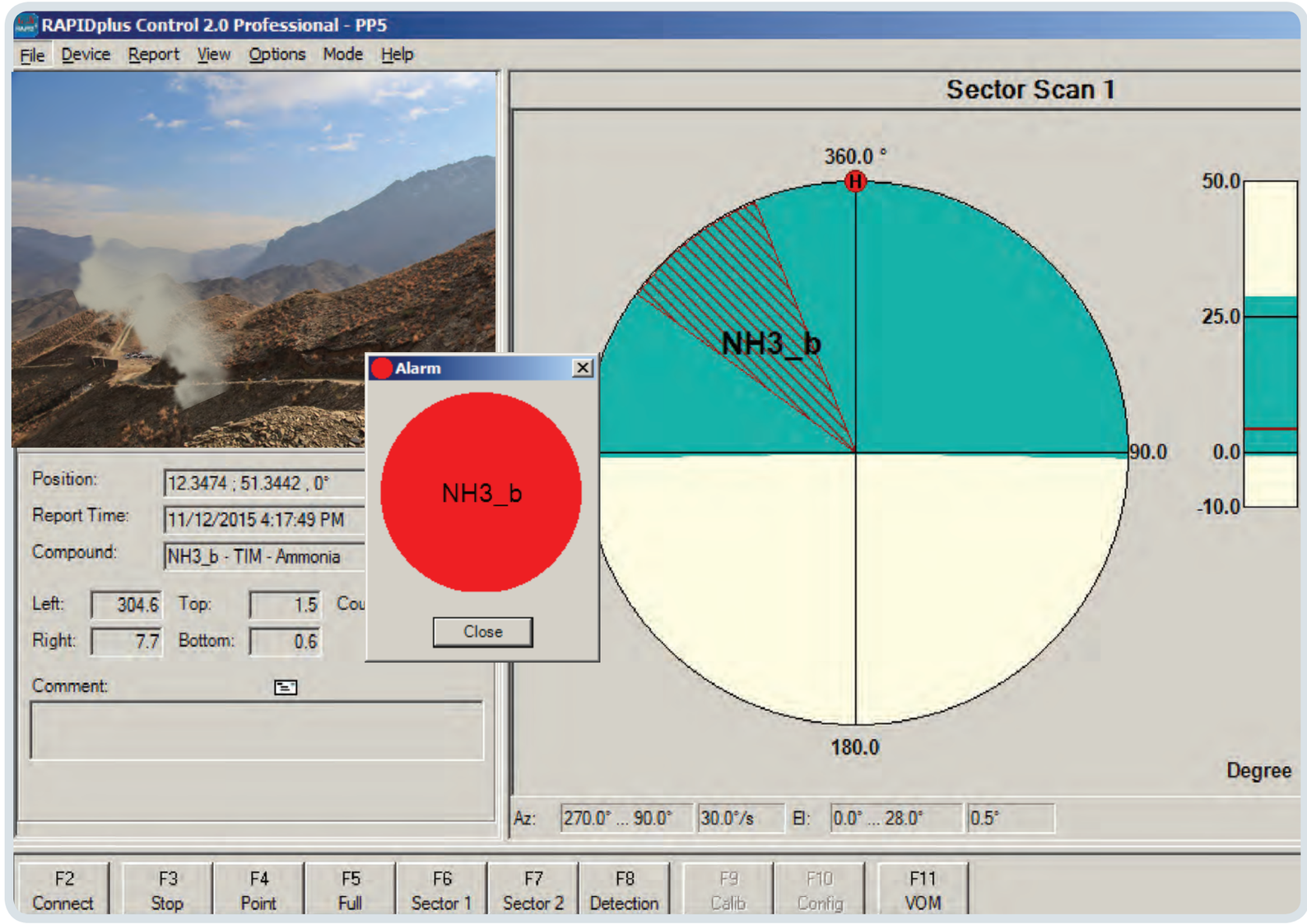
RAPID*plus* Control Software

VIDEO OVERLAY MODE

A spatial scanner, mounted on the top of the RAPID*plus* offers operator-selected coverage of the target region; rotating through a full 360°. The elevation range of the scanner can be set between +50° to -10°, and runs in a raster pattern, giving precise, controlled coverage of the target areas. A colour camera is integrated with the scanner and is aligned with the IR view. This camera allows the operator to direct RAPID*plus* to specific regions

RAPID*plus* system provides an advanced display of the region of interest. First, a series of images of the area are taken and stored, then stitched together to form an overview image. The operator is then able to interact with this overview, based on the requirements of the mission or deployment. Sectors can be chosen, using the zoom controls if required, and the threat substances defined by reference to the compounds available from the library. A live video feed, superimposed in a section of the panorama, facilitates immediate monitoring of the areas of interest.

When any of the defined threat substances are detected, a visual alarm is raised almost instantly, and an intrusive pop-up graphic identifies the detected compound. Additionally, this visual alarm can be linked to an audible alarm in the computer. Under alarm conditions, the image changes and shows the relative concentrations of the detected substances. These are superimposed as blocks of colour at the locations where the detection events have taken place. RAPID*plus* continues to track these detection event as concentrations change and the cloud moves.



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RAPID*plus* Control Software

STANDARD MODE

When required, RAPID*plus* system can also be operated with the Standard Mode (legacy) display of the original RAPID system. This mode is preferred when RAPID*plus* is being used on a moving mobile platform. Further, when combinations of RAPID and RAPID*plus* systems are in the same fleet it enables the use of a consistent display and therefore a consistent concept of operation even for static measurements. In this way, operators can move seamlessly between original and next-generation systems with ease.

The spatial scanner, mounted on the top of the RAPID*plus* offers full coverage of the target region. The operator can select their target area from a full 360° rotation with elevation settings from +50° to -10°. The software controlling the scanner head moves it in a raster pattern, giving precise, controlled coverage of the target. A colour video camera, aligned with the IR view, allows the operator to direct RAPID*plus* to specific regions from which measurements are taken.

The graphical user interface of the Standard Mode provides a live video feed from the colour camera associated with the spatial scanner. This is shown in a dedicated, user-resizable, display element. In a separate segment of the main display, the chosen sector scan is shown and the associated elevation/suppression setting is shown in nearby. As with the RAPID*plus* Video Overlay Mode, any alarm is shown with an intrusive pop-up graphic and the sector in which the release has been detected is identified readily in the sector view. The pop-up visual alarm can be linked to the controlling computer's speakers to produce an audible alarm as soon as the visual alarm is shown.

Should the deployment requirements change, the Video Overlay Mode can be accessed quickly using the VOM button, which is found in the lower segment of the Standard Display.

RAPID*plus* Vehicle Integration

Picture: SAAB Group, Vehicle Systems and CBRN

DESIGNED FOR VEHICLE INTEGRATION

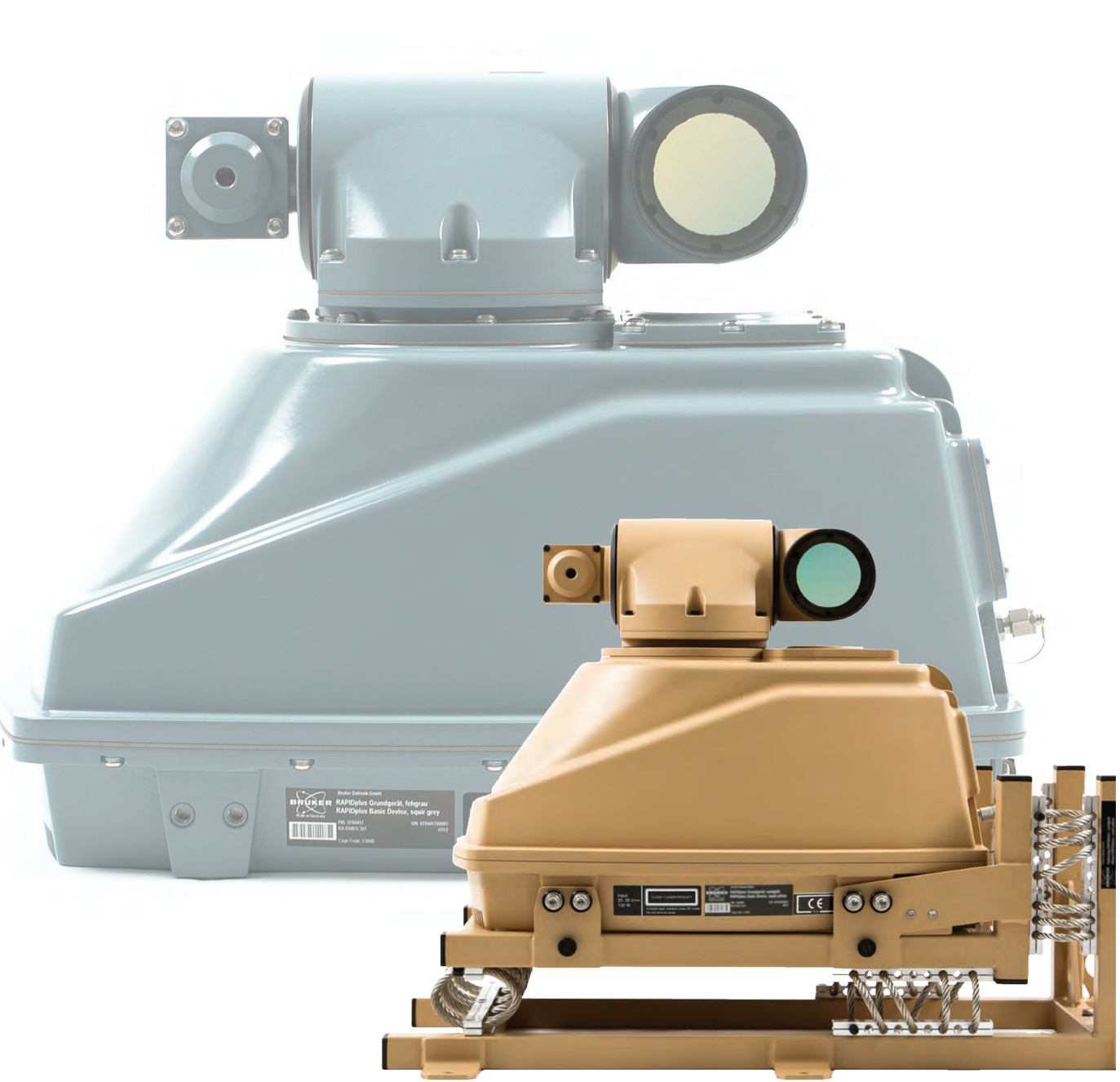
Whenever military or first responder personnel need to deploy into a toxic environment, speed of response and personal safety is paramount. To mitigate these situations, solutions have been developed and refined to provide secure mobile detection platforms.

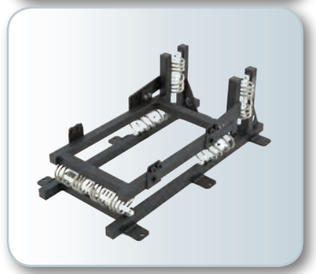
Supporting the protection of the operators and crews and simultaneously deploying detection technology integrated with a vehicle platform offers a number of clear advantages, including the capability to deploy standoff detection devices such as RAPID*plus*. Standoff detection gives advanced warning of potential threats as it can detect clouds of toxic gas at distances measured in kilometres, whilst still keeping the vehicle and its crew out of harm's way.

RAPID*plus* can be deployed on a tripod as required, but optimum deployment readiness is achieved when the system is integrated with the selected mobile platform. Bruker offers proven anti-shock mounts, which have been fully optimised for integration with vehicles, ships and helicopters, and other mobile platforms. These mounts are also available in different finishes depending on your requirements.

Bruker has significant experience in system integration and can provide installation guidance, project management and other services to ensure effective deployment of RAPID*plus* on your mobile platform project.

RAPID*plus*: At a Glance





PRODUCT OVERVIEW

The RAPIDplus is a compact, robust passive infrared detector for standoff detection of chemical agent clouds. All known chemical warfare agents (CWA) and critical Toxic Industrial Chemicals (TIC) are monitored, detected and identified automatically. This system, built to exacting Military Standards, can be mounted on a variety of mobile platforms, including vehicles, ships and helicopters, and performs real-time field screening while underway. The passive sensor, scanner, electronics and control unit are integrated in a single compact housing.

With its compact and robust design, RAPID is used in both stationary and mobile applications. Mounted on a tripod, it can be operated as a stand-alone device that can be deployed at will. In addition, a shock mount and an Ethernet interface facilitate vehicle and mobile platform integration.

Key Attributes of RAPID*plus*:

- Robust and compact design
- Passive detection; no external laser
- Advanced graphical user interface
- Minimal power consumption
- Fast event detection and alarm
- Continuous monitoring even when underway

These key attributes distinguish RAPID*plus* as an efficient and reliable chemical agent detector that provides unsurpassed standoff chemical detection capability, whilst keeping the operator out of harm's way.

Current specifications of the Bruker RAPIDplus can be found in the Product Specification Sheet (PSS), a copy of which is available on request.

Global Resources – Local Focus

Bruker has support centres of technical expertise in every major area of the world providing sales, applications and engineering support for our complete product range. With more than 6,000 employees at 90 locations worldwide you can be confident that the support team fronts a uniquely integrated global resource. Research and development specialists, applications professionals and highly trained engineers in every field are dedicated to your investment in our equipment.

Superior Detector Performance
For highly sensitive detection, identification and quantification of chemical, biological, explosive and radiation threats. Superior performance and high reliability comes as standard.

Applications Support
Systems are configured to meet your needs and result from our detailed evaluation of your requirements.

Standards & Compliance
All our systems are manufactured in ISO9001 compliant factories; so you can be assured of superior quality and performance.

Software & Data Systems
Designed to industry standards on the Microsoft® platform, our software can be integrated with your security management software.

Training
User Training and User-Level Maintenance is part of our standard Scope of Supply. Our goal is simple; to minimise your cost of ownership.

Low Maintenance
All our systems are designed for extended maintenance periods and reduce the through-life-costs of your investment.

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