

GreyScan ETD-100

Absolute and accurate detection of inorganic explosives materials in the field and laboratory environment.

Highly Portable

Advanced Detection

Fast Analysis

Simple Operation



The **ETD-100** is an advanced, automated explosive trace detection (ETD) device designed to detect homemade inorganic salt-based explosives commonly used as ingredients in Improvised Explosive Devices (IEDs).

Highly Sensitive, Detects a Wide Range of Explosives and their compositions. The device detects a broad range of compositions of explosives at low 20-60 nanogram quantities, which contain nitrates, chlorates and perchlorates amongst others. This enables the targeting of widely used improvised, inorganic salt-based explosives devices. The device will alarm and identify by name all threat material even when multiple explosive compounds are found in the same sample.

Complements IMS Technology

The ETD-100 is configured to detect only inorganic explosive material, so it is a complementary technology to existing Ion Mobility Spectrometry (IMS) and can be used in tandem with minimal impact on checkpoint throughput.

Automatic Protection

The ETD-100 is fluid based and is protected from overload of residual contamination. This enables no clear-down issues requiring service, which maximises uptime availability. This feature makes it amenable to the analysis of visible powder (i.e., larger than trace).

Proprietary Algorithm

The GreyScan proprietary algorithm, utilises an extensive library of ion separations, to produce the most advanced automated threat detection algorithm in the industry. GreyScan provides reliable detection of threat compounds across all operating conditions, with a false-alarm rate of near zero.

Key Capabilities

- Able to detect homemade inorganic salt-based explosives (nitrate, chlorate, perchlorate)
- Compact and portable
- Suitable for mobile and stationary applications
- Capable of entry point screening, and forensic lab analysis
- Non-radioactive – Liquid Phase Capillary Zone Electrophoresis(CZE)
- High resolution detection
- Low cost, user replaceable reagent cartridge and sample filter
- Remote connectivity enabled (Wi-Fi or wired network)
- Detailed Electropherogram report
- Battery or mains power operated
- Automatic internal self-calibration
- Optimised to use GreyScan approved commercial swabs
- Low / No false positive rate
- Simple to operate

Technology Performance

GreyScan is able to detect homemade inorganic explosives with a high degree of sensitivity.

People, vehicles, cargo and personal belongings can be screened with industry standard swabs, which are inserted into the ETD-100 by the operator. A proprietary reagent is then mixed with the sample to maximise sampling efficiency, and this is injected into a specialised high voltage separator, Ions are separated in this process (CZE), and their peaks are accurately measured as they pass through the detection system. CZE differentiates between molecules by measuring the time it takes a substance to reach the trace detector.

Market Applications

Entry Points:

e.g. Military, Embassies, Border Control, Government Agencies, Rail and Bus Passenger Screening, Events and Public Security, Commercial Premises / Offices, Festivals, Sports, Concerts, Major Events, Critical Infrastructure, Nuclear Reactors, Oil and Gas, and Secured Facilities

Mobile & Stationary Forensic Labs:

e.g. Police, Bomb Squad, Army and Security Agencies

Cargo & Mail Screening:

e.g. Aviation, Rail, Bus, Sea Cargo and Post Office



Highly Selective, Low False Alarm Rates.

The on-board digital signal processing and advanced detection algorithms ensure that highly sensitive detection performance (nanograms) is accompanied with exceptionally low false alarms, resulting in increased operational screening performance by allowing personnel to focus on investigation of valid alarms and their potential threats. The device incorporates configurable visual and audible detection alarm indicators when explosives are detected.

Easy to Operate. The ETD-100 provides a guided start-up and verification process, plus automatic continuous self-calibration. These features, plus a simple and intuitive touchscreen interface, lowers the learning curve for non-expert users and eliminates the need to deal with time-consuming or complex

procedures, such as manual calibration, start-up checks, or parts replacement. With a large screen the device can be used in all lighting conditions and provides exceptional damage resistance to the scratches, drops, bumps of everyday use.

Accessibility. End users can access the ETD-100 with an assigned level of authority dependent on the level of training and deployment type. These access levels are set to replicate typical access protocols familiar to the end user after being trained to use any ETD device. The device has been explicitly designed to sit within the con-op and training level of currently trained ETD operators, thereby minimizing the impact of implementing the technology into a checkpoint scenario.

Greater Uptime. Features including a short start-up time, automatic self-calibration, an easy-to-use interface, real-time analysis, and fast clear-down after an alarm all make the ETD-100 ideal for security situations where high throughput and high detection probability are required.

Low Operating Cost. Designed to minimize cost of ownership, the ETD-100 has eliminated the majority of consumables and need for replacement parts. No calibration traps, grids, or membranes are required. Consumables consist of reagent fluids, swabs, filters and sample traps for collecting sample particulates. In addition, the ETD-100 has a minimum requirement for standard preventive maintenance activities, thus eliminating corresponding costs for parts replacement that add to annual operating costs.

Key Technical Specifications

Connectivity	Ethernet, Wi-Fi, USB2.0
Weight	14.5kg (32.0 lbs)*
Analysis Time	Less than 1 minute
Start-up Time	10 – 15 minutes
Dimensions	(W x D x H) 48.8 x 38.6 x 22.9 cm (19.20" x 15.20" x 9.00")
Operating Temperature+	+5°C to +40°C (40°F to 104°F)
Explosives Detection	Nitrates, Chlorates, Perchlorates
Limit of Detection	20-60 ng range (depending on the specific ion)
IP Rating	IP63 Compliance (Pelican Case Closed)
Power	AC 100—240 VAC, 50-60 Hz; DC: 24VDC. 3.75A MAX
Detection Alarm	Audible / Visual (configurable)
Reagent Cartridge Capacity	Approximately 1500 scans

* Device configuration with main power configuration only and without reagent cartridge installed. +Specifications subject to change

The ETD-100 can detect many compounds that consist of nitrates/chlorates/perchlorates. The following compounds have been recognised by the TSA, Smiths Detection and other agencies as the main IED threats:

Explosive Type	Compound	Formula	Detectable by IMS	Detectable by GREYSCAN	GREYSCAN	
					Detectable Anion	Limit of Detection (of the compound)
Fertiliser	Urea Nitrate	(NH ₂) ₂ .COH.NO ₃	Yes (limited sensitivity)	Yes	Nitrate	240ng
Fertiliser	Ammonium Nitrate	NH ₄ NO ₃	Yes (limited sensitivity)	Yes	Nitrate	80ng
Fertiliser	Potassium Nitrate	KNO ₃	No	Yes	Nitrate	100ng
Fertiliser	Sodium Chlorate	NaClO ₃	No	Yes	Chlorate	25ng
Flares /Pyrotechnics	Potassium Chlorate	KClO ₃	No	Yes	Chlorate	100ng
Flares /Pyrotechnics	Potassium Perchlorate	KClO ₄	No	Yes	Perchlorate	100ng

