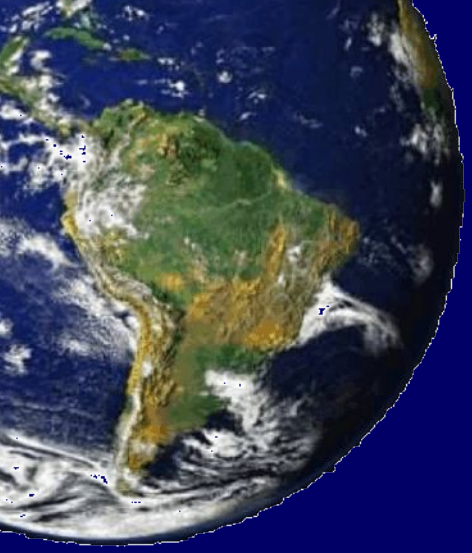
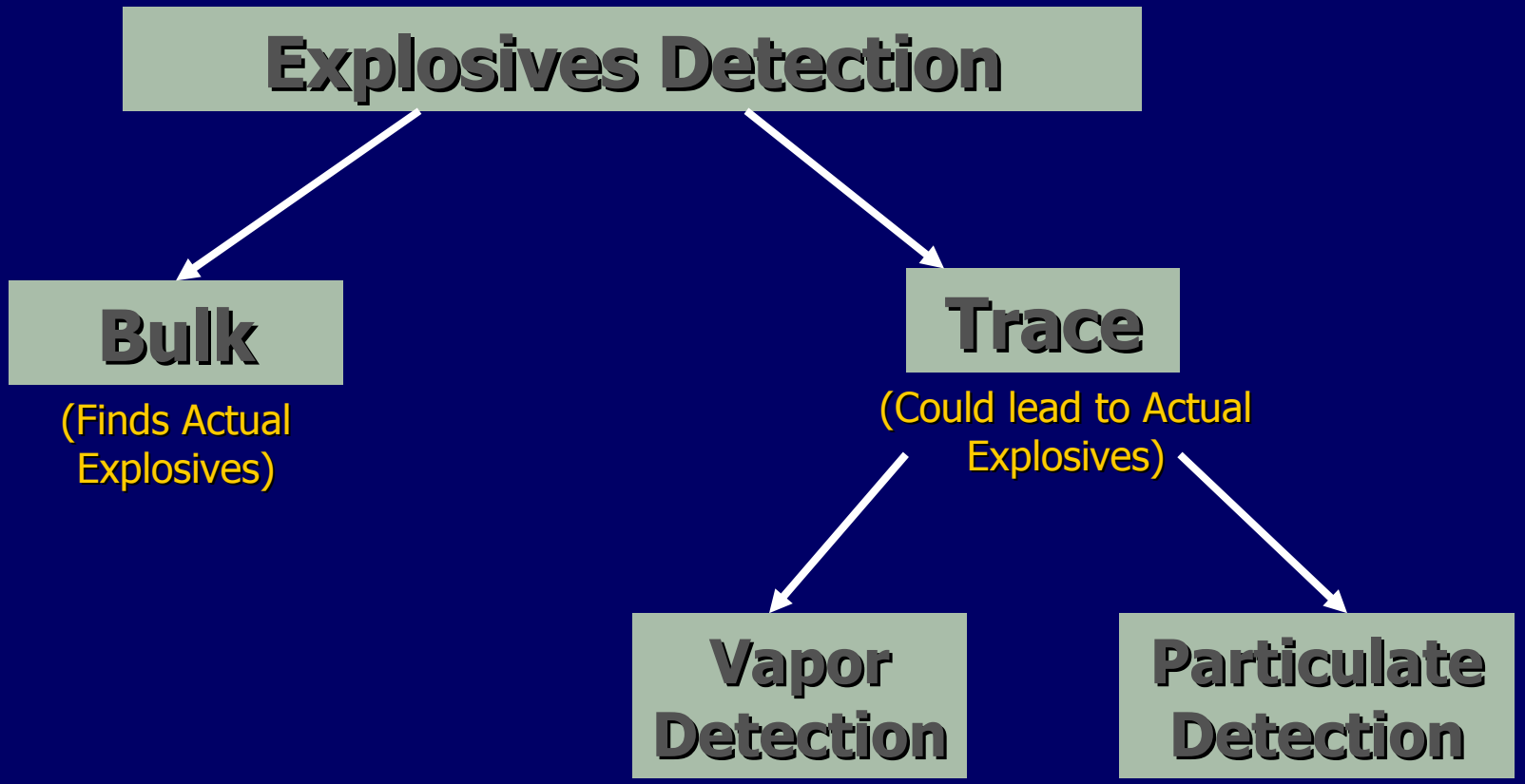


RS DYNAMICS

EXPLONIX

Advanced Portable System for Explosive Agents Sampling Detection and Analysis

GENERAL OVERVIEW OF EXPLOSIVES DETECTION



GENERAL OVERVIEW OF EXPLOSIVES DETECTION

1. Bulk explosives detection involves the detection of a macroscopic mass of explosives material (a visible amount of explosives), usually based on either imaging or on molecular properties of the explosive. Bulk detection methods are less dependent on sampling techniques than trace detection methods. Bulk detection is not usually applicable for direct scanning of persons (health hazard).

2. Trace explosives detection involves the detection of explosives by collecting and analyzing tiny amounts of explosive Vapor or particles (a microscopic amount of explosives). Trace detection includes several different technologies using various analyzing techniques.

PRINCIPLES OF TRACE DETECTION

Trace explosives detection refers to both Vapor and particulate forms:

b) Vapor – gas phase molecules that are emitted from a solid or liquid explosive. The concentration of explosives in the air is related to the Vapor pressure of the explosives material and to other factors such as the amount of time the explosives material is present in a location, temperature, its packing, air circulation in the location, etc.

c) Particulate – microscopic particles of the solid explosives material that adhere to surface (i.e., by direct contact with the explosive, or indirectly, through contact with someone's hands who has been handling explosives)

EXPLOSIVES VAPOR DETECTION

Definitions:

Vapor pressure:

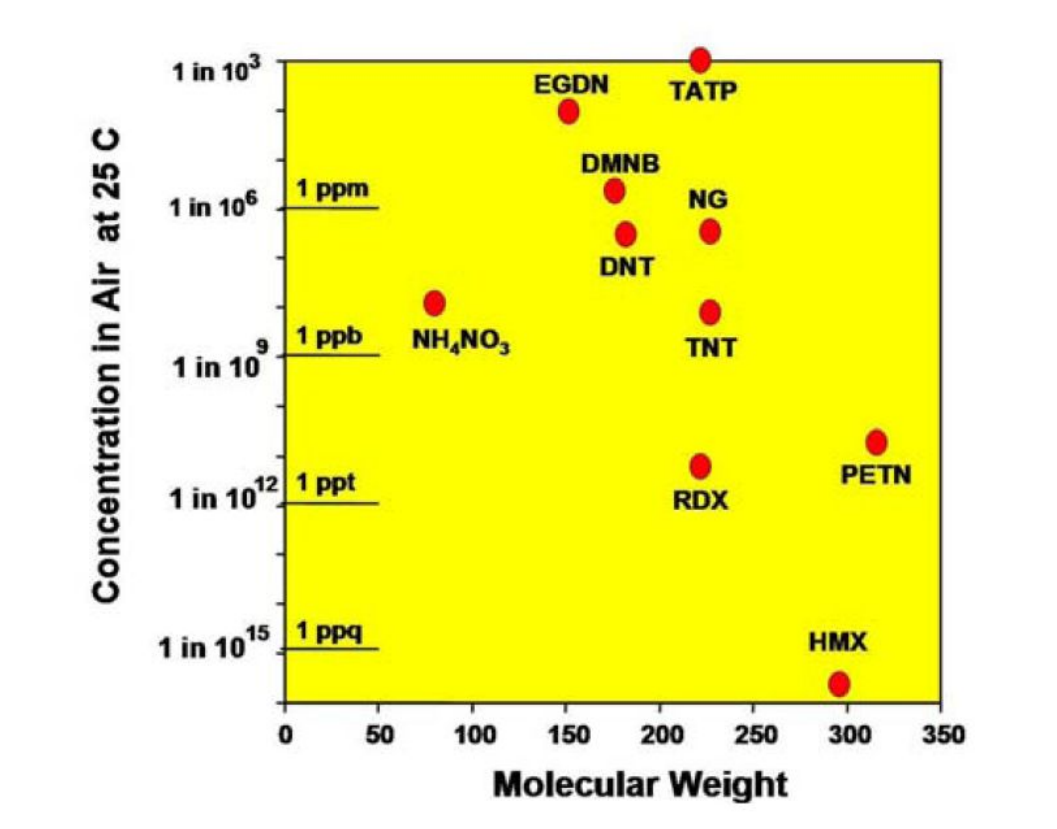
All solids and liquids emit Vapor in real-world environments. At a given temperature, the amount of Vapor emitted is characteristic of that particular substance.

Explosives Tend to Produce Little Vapor:

Most explosive materials do not eVaporate readily. This tendency is a function of the explosives Vapor pressure, which directly relates to the amount of the explosive material released into the air. Thus, sampling strategies are very important due to the usually small amount of Vapor-phase explosives material emitted from solid explosives material.

EXPLOSIVES VAPOR DETECTION

Vapor Concentration of Explosives



The figure shows the maximum Vapor concentration in air for several explosives at room temperature. Note that vertical axis has a logarithmic scale, so that each hash mark corresponds to a factor – of-ten increase in Vapor concentration. In general, explosives can be categorized by their Vapor pressures and Vapor concentrations.

EXPLOSIVES VAPOR DETECTION

High, Medium And Low Vapor Pressure

High Vapor pressure explosives include ethylene glycol dinitrate (EGDN), nitroglycerin (NG), and 2,4-dinitrotoluene (DNT). These explosives have equilibrium Vapor concentrations in air on the order of about one part per million (1ppm), which means that there will be roughly one molecule of explosive Vapor for every million molecules in the air.

Medium Vapor pressure explosives have equilibrium Vapor concentrations in air near one part per billion (1ppb). The medium Vapor pressure group includes TNT (2,4,6-trinitrotoluene) and ammonium nitrate (NH_4NO_3)

EXPLOSIVES VAPOR DETECTION

Low Vapor pressure explosives have equilibrium Vapor concentrations in air near or below the one part per trillion (1ppt) level, an additional factor of approximately 1000 lower than the medium Vapor pressure explosives. The low Vapor pressure group includes HMX (octogen), RDX (hexogen or cyclonite), and PETN (pentaerythritol tetranitrate). These Vapor pressure are for pure materials. Vapor pressure for mixtures containing these explosives may be even lower.

EXPLOSIVES PARTICULATE DETECTION

Sample collection technique can profoundly affect the usefulness of trace detection methods

Particulate detection: The acquisition and analysis of microscopic solid explosives material. The sample is collected by contacting the surface of the sampled item.

Particulate contamination consists of microscopic solid particles. Explosives in general tend to be sticky, and a person handling a piece of the solid explosives material will quickly transfer some amount of contamination to his or her hands. Contamination with the explosives material will be transferred to any additional surfaces touched by the hands, which likely will include the person's clothing as well as doorknobs, tabletops, and other objects that were touched.

EXPLOSIVES PARTICULATE DETECTION

Careful handling of the explosive and the proper use of disposable gloves reduces the spread of particulate contamination; however, reducing it to zero is almost impossible. Most bomb builders and carriers will not have the expertise to do a clean job and there will be particulate contamination present; thus, the particulate method of sampling has wide applications.

EXPLOSIVES VAPOR DETECTION

Vapor sampling requires no contact, the sampling is performed by sucking the air, where Vapor-phase of explosives material may be presented.

Explosive material exists in two "Vapor" forms that may be captured by a sampling device:

flying micro-particles (often stick to dust particles) - explosives with low Vapor pressure, mostly plastic explosives

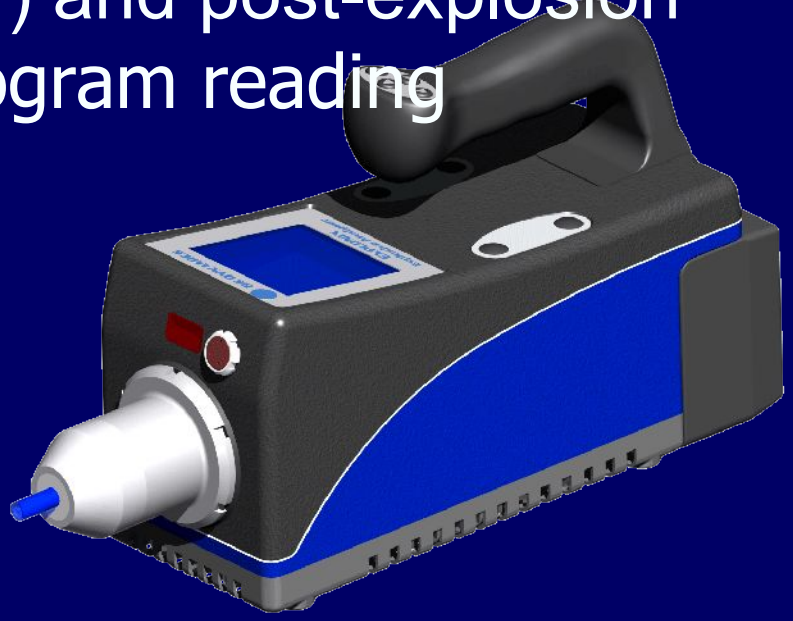
true Vapors (explosives with high Vapor pressure)

A sufficient flow have to be applied to collect enough "flying particles", to reach the system detection limit.

Both trace detection systems have specific application range.

EXPLONIX

EXPLONIX is a highly sensitive, portable, multi-functional explosives detection and analytical system offering optimal power and flexibility for fast, reliable detection and identification of all ICAO standard explosives including all plastic types (even without taggant), home mades (TATP) and post-explosion residues down to picogram reading



EXPLONIX

What is in the case:

EXPLONIX Ethernet Adapter

EXPLONIX

Docking Station

CLA Charger

Exchangeable Vapor Mode Nose

External GPS Module

Connecting Cable to the PC (USB or RS 232)

Software CD

Second Battery Pack

Docking Station Mains Cable

Particulate Needle Sampler

Detector Cartridges

Set of Calibration Standards

Below: Vapor Mode Sampler Cartridges

Particulate Needle Samplers with Holders (4 units)

SAMPLING PRINCIPLES

EXPLONIX

EXPLONIX provides choice of:

Two following ultra-fast 1- second response vapor modes:

- Continuous Vapor Mode with instant reading
- Analytical Vapor Mode with instant reading and identification

or

- Analytical Particulate Mode with detailed identification

CONTINUOUS VAPOR MODE

EXPLONIX

Continuous Vapor mode enables the fastest screening of surveyed subjects and is very efficient for fast localization of explosives traces while securing high sensitivity and prevention of the problem of system overload.

Sampling using Continuous Vapor Mode

Continuous Vapor Mode provides instant 1-second reading and displays the volume of possible explosives material on the screen.

CONTINUOUS VAPOR MODE

EXPLONIX

Newly-patented, Continuous Vapor Sampler offers real continuous screening and fast reading/cleaning

Continuous Vapor Sampler

Inserting the Continuous Vapor Sampler into the instrument inlet

ANALYTICAL VAPOR MODE

EXPLONIX

The innovative Analytical Vapor Mode offers instant 1- second reading during the measuring interval and displays on the screen the quantitative volume of possible explosives material being measured. In this way the operator can instantly scan the screening subject. When explosives material is indicated the operator stops scanning and continues sampling from the given location. In this way a lot of time is being saved by not taking blind samples.

After collecting the sample, final evaluation of explosives is performed in under 30 seconds providing identification into several basic groups of commonly occurring explosives while securing ultra-low false alarm rate and extreme overload resistance.

ANALYTICAL VAPOR MODE

EXPLONIX

Analytical Vapor Mode Sampler is the same as Continuous Vapor Sampler, offering high-flow vapor sampling for capturing even the minutest levels of airborne micro-particles with excellent self-cleaning capabilities.

ANALYTICAL PARTICULATE MODE

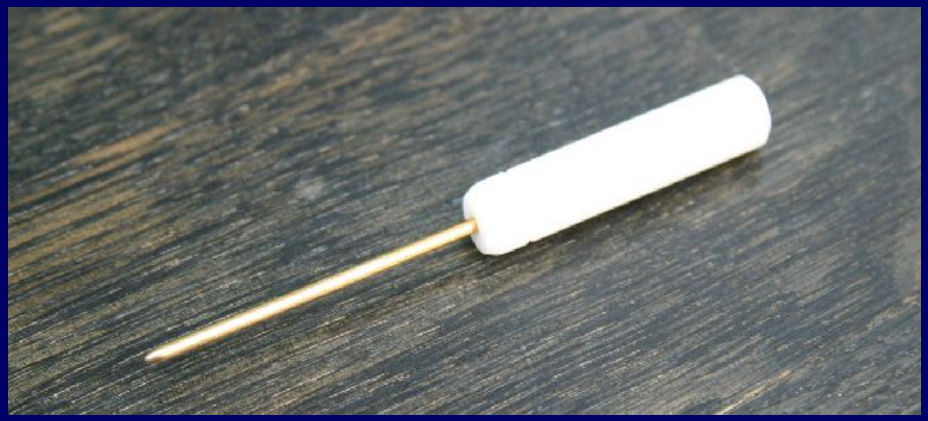
EXPLONIX

Analytical Particulate Mode offers explosive identification with ultra-low false alarm rate, extreme overload resistance and fast cleaning and enables detailed identification of explosives in under 30 seconds also showing the quantitative volume of explosive material being measured.

ANALYTICAL PARTICULATE MODE

EXPLONIX

Analytical Particulate Mode facilitates a highly effective sampling method. The needle sampler can collect even in the tiniest crevices or on flat smooth surfaces without any need for gloves and facilitates reliable detection even in heavy rain. New “Needle Sampler” offers effective pre-separation of interfering compounds during analysis and excellent self-cleaning capabilities.



ANALYTICAL PARTICULATE MODE

EXPLONIX

Needle Sampler easy penetrates to tiniest crevices like knob holes, mobile phones/PDA's keyboard gaps, where more amount of traces may be found

ANALYTICAL PARTICULATE MODE

EXPLONIX

After collecting the sample, the Needle Sampler is inserted into the EXPLONIX sampling inlet to release the captured micro-particles and start the analytical process.

INTERNET COMMUNICATION

EXPLONIX

Internet communication between a control computer and a remote EXPLONIX located anywhere world-wide using a direct Internet connection - no computer needed

Remote operation via wire or wire-less Ethernet, Internet, possible Cell GSM (GPRS, HSCSDA modem) provides full remote control of all operations, set-up, configuration and calibration, data download, measured data evaluation system upgrade and system check from manufacturer

EXPLONIX_VIEW Windows XP/Vista software provides user-friendly communication between the instrument and any PC platform giving comfortable configuration and full remote control via cable, direct instrument connection to the Internet or GSM network

EXPLONIX Internet Communication Bridge

BAR CODE READER

EXPLONIX

Built-in 2-D or 1-D Barr-Code reader for instant identification of scanned subjects (baggage).

Both the measured data together with baggage identification are automatically stored and sent wirelessly to the airport logistic data system.

EXPLONIX automatically transmits the laser beam reading the bar code

ADDITIONAL FEATURES

EXPLONIX

- Operates in factory pre-sets and/or user- defined profiles, adapting the system capabilities to various application tasks and operating conditions
- Communication: USB 2.0, RS 232, RJ45 Ethernet
- Operating system: Vista/WinXP/2000 compatible
- Power Supplies: Internal Battery, 100-240 VAC or 12 VDC via Docking Station
- Battery Operation: 2 to 4 hours depending on the operation mode
- Continuous operation in Docking Station
- Warm-up time: 30 sec to 1 minute

ADDITIONAL FEATURES

EXPLONIX

- User-friendly one button operation
- Automatic system check on start-up
- Automatic calibration of all measuring channels
- Display: full graphic back-light
- Dimensions: 105 x 260 x 170 mm (including handle), weight: 3.2 kg without batteries
- Shipping weight: 13 kg (incl. transport case calibration kit, docking station, accessories)
- Keyboard input: multi-function sealed keys
- Operating environment: -5 to + 45 °C
- Acoustic, visual or remote alarm for all channels
- Vapor sampling rate: 70ml/min to 7 litres/min (preset)

BASIC APLICATION

EXPLONIX

- Rapid hand-held detection, identification and location of contraband explosives

- Easy checking of passengers and baggage

- True Continuous Vapor Mode screening for fast localization and identification of explosive traces

- Easy integration with other security technologies (X-Ray scanners, bomb-squad robots)

- Sensitive identification of “post-explosion residues”

BASIC APLICATIONS

EXPLONIX

EXPLONIX

FREQUENTLY ASKED QUESTIONS:

Q: Does EXPLONIX use radioactive source?

A: No radioactive source is used

Q: Does EXPLONIX utilize IMS detection technology?

A: No.

Q: What kind of detection technology EXPLONIX uses?

A: EXPLONIX uses a new generation of selective chemiluminescence, especially developed for EXPLONIX use

EXPLONIX

FREQUENTLY ASKED QUESTIONS:

Q: What is the advantage of the “Docking Station”?

A: When EXPLONIX is put into the docking station, it features continuous mains and/or car battery operation, while the main battery is automatically quick-charged. Docking station can also be used as a charger for second battery, while the operation requires only hand work.

Q: What is the battery capacity?

A: 1 hour to 2.5 hours operation, depending on the sampling technique

EXPLONIX

FREQUENTLY ASKED QUESTIONS:

Q: Is there any calibration procedure provided?

A: EXPLONIX is equipped with fully automatic self-calibration procedure that allows quantitative calibration of the unit. Procedure takes only 1 minute in which the system is fully calibrated for all of the explosives using the delivered set of calibration standards. Does not require special education.

Q: Is there any problem when some other chemicals are sampled into the unit?

A: EXPLONIX offers exceptional resistance against disturbing and overloading chemicals

EXPLONIX

FREQUENTLY ASKED QUESTIONS:

Q: Is there any security or customs problem when travel with calibration standards, that are a part of the EXPLONIX package?

A: No, standards are very safe, diluted liquid contains only nanograms of explosives. This amount can not cause any explosion and is not understood as a “Dangerous Goods”, requiring special transport rules.

Q: Do I need to use gloves when sampling in Particulate Mode?

A: No, the patented “Needle Sampler” is placed in special Teflon holder that does not require any special handling

EXPLONIX

FREQUENTLY ASKED QUESTIONS:

Q: What is the system cleaning time after massive exposition of the sample?

A: Generally less than 15 seconds

Q: Is there any additional cleaning time necessary for cleaning particulate or vapor sampler?

A: No, both samplers are automatically cleaned during the analytical period down to picogram level. After the end of the analyses (15 to 20 seconds depending on the sampling technique) the sampler is clean.

EXPLONIX

FREQUENTLY ASKED QUESTIONS:

Q: What to do if the particulate sampler is not possible to clean, for instance if heavily contaminated by a difficult chemical?

A: This is a seldom case, however the needle sampler is a consumable item and could be quickly replaced.

Q: Is there any self-test?

A: EXPLONIX automatically tests all the internal parts during the starting-up procedure.

Q: How long the “start-up” (warming-up) takes?

A: From 30 seconds to one and half minute

EXPLONIX

FREQUENTLY ASKED QUESTIONS:

Q: Is there any remote control?

A: Yes, EXPLONX offers full remote control via wire or wire-less Internet, Ethernet or possibly Cell GSM modem

Q: What operation can be run remotely?

A: All the standard operations, data download, calibrations, control of automatic monitoring mode. During remote control, the EXPLONIX operational panel, including display and manual controls, are virtually transferred to the remote control computer screen. The remote operation is self-explanatory and does not require any special education.

FREQUENTLY ASKED QUESTIONS:

EXPLONIX

Q: Is there any possibility for the remote Internet factory checking?

A: EXPLONIX is equipped with a possibility to deeply check, diagnose, set-up, calibrate and maintain all the internal parts of the unit. Manufacturer offers this service to any customer. The checking is possible for any instrument located anywhere world-wide if instrument connects directly to the Internet. This saves a lot of founds and time otherwise spent on sending the unit back to service point.

EXPLONIX

FREQUENTLY ASKED QUESTIONS:

Q: Is it possible to integrate EXPLONIX as a additional (alternative) detection technology for X-Ray scanners or any kind of other detection technologies?

A: Yes, it is very easy due to EXPLONIX open software system, offering full remote control via standard LAN network protocol.

Q: Is there any possibility to connect Barr-Code reader to comfortably identify checked baggage?

A: Optionally, EXPLONIX offers built-in INTERNAL 1-D or new generation 2-D Barr-Code reader that automatically identifies any subject, marked by a Barr-Code. The Barr-Code data are automatically added to the measured data table.

EXPLONIX

FREQUENTLY ASKED QUESTIONS:

Q: What is the meaning of “Profiles”?

A: EXPLONIX offers several factory pre-set operational Profiles, containing a set of operational parameters, that suit best to specific kind of job or operating environment. There is also possibility to set user specific profiles.

The system of Profiles simplifies the use of the system as no special education and/or training is required for setting-up the instrument or understanding of the measuring job.

The selecting of proper Profile quickly optimizes the system features to enhance the detection capabilities and false alarm rate to maximum!

EXPLONIX

FREQUENTLY ASKED QUESTIONS:

Q: Is there any automatic system for data logging?

A: Yes, EXPLONIX uses advanced, self-explanatory data logging system, that opens automatically “Site data file”, marked with a date and name of the site. The file also contains all the system configuration, so that the operator does not need to configure the unit if return to previously done job.

EXPLONIX in Docking Station

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- production
- sales

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