



BORDER SECURITY

HOMELAND PROTECTION

AIRPORT & SEAPORT SECURITY

www.tudor-tech.ch

TUDOR SCAN PL64 STATIONARY X-RAY IMAGING SYSTEM



The only scanner in the world fully remote operated
by a single operator from a safe distance, ensuring total
protection against ionizing radiation

TUDOR SCAN PL 64 is high throughput X-ray screening solution, cost effective and optimized solution for container and trucks non-intrusive inspection in border crossing points, sea harbors, access points in military bases or any other high security areas.

The main advantage is the high flexibility of the solution meeting all customer requirements, in terms of performance, reliability and cost operation. TUDOR SCAN PL 64 was designed to provide high radiographic image quality and unparalleled high throughput of up to 200 trucks/containers per hour, avoiding traffic jam at the control site entrance.

High throughput is a key operational performance indicator for the scanner, as it is known that conventional scanners in the industry are creating a significant traffic jam due to low throughput and extremely long time needed for the scanning procedure.

TUDOR SCAN PL 64 is a low dose system, using a radiation dose low enough so that the driver of the inspected vehicle, can drive through the scanning portal without being exposed to ionizing radiation. The driver dose is below 80 nSv/scan that is similar to the dose received while eating one banana.



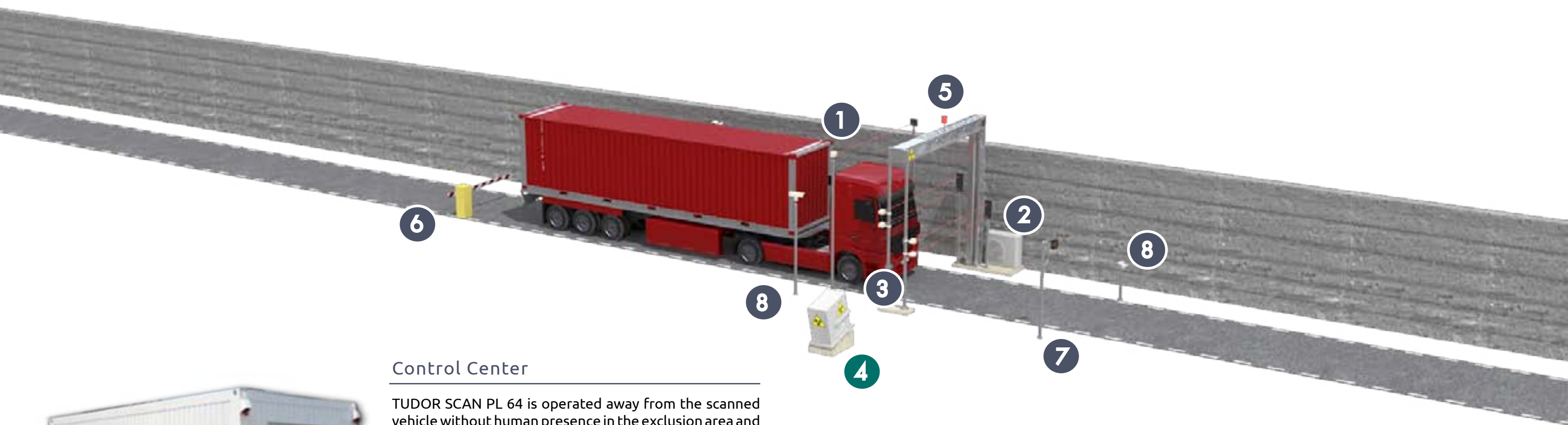
TUDOR SCAN Imaging System main components:

- X-ray generator: Dual energy interlaced pulsed linear accelerator
- Detector boom with high energy and high resolution detectors arranged in an array
- Radiation safety system
 - automatic cabin detection
 - safety interlocks and emergency shutdown devices
 - radiation survey meters
 - video and audio warning devices

- Command and control center, including hardware and software for
 - system operation and control
 - radiographic image and related data acquisition,
 - radiographic image and data analysis
 - data integration and storage
 - video surveillance
- OCR systems:
 - License plate recognition (LPR) for trucks/trailers registration
 - Container code recognition (CCR) for ISO 6346 containers

1. According to the space available and the performances requirements MB Telecom is designing the safety measures needed to ensure a dose level on the perimeter according to international standards and directives.
2. To maintain low noise and high performance, the detection boom has a special conditioning system.
3. Multiple sensors are used to detect cabin and container to start the radiation.

4. X-ray generator and collimation creates a X-ray fan beam tuned for both high image performances and radiation safety.
5. Audio and video warning signal along with emergency stop devices further enhance personnel safety.
6. Entry to scanning is controlled by sensors and barrier.



Control Center

TUDOR SCAN PL 64 is operated away from the scanned vehicle without human presence in the exclusion area and at a safe distance from a possible terrorist detonation. The operator is provided with a touch-based interface that controls the scanner's movement and ensures fast image analysis through multiple enhancement tools. All commands are given through the operating interface and performed by the scanner through automated processes that replace the traditional driver. Necessary equipments fit into 20 feet container.



7. Data from the speed radar sensor allows to maintain the same aspect ratio in the radiographic image regardless the fluctuations of vehicle speed inside the scanning tunnel.
Also, for safety, when the vehicle speed is below the minimum level, usually 3.6 or 5 Km/h, the radiation is automatically stopped.

8. OCR cameras automatically detect truck/trailer registration number and container code.

Features

- High throughput, fixed drive-through inspection system;
- Automatically inspects any type of vehicle driving at any speed below 15 km/h
- Low dose radiation providing protection for the driver of the scanned vehicle, operating personnel and bystanders
- Facilities for control and radiation safety customized according to specific needs of the customer
- Automatic protection of the exclusion area
- Very low cost of ownership for at least 10 years of life time
- Integrated data management
- Database to store all information related to the inspection
- Software black box support for logging of all user commands and parameters
- Video surveillance of the inspection area
- Advanced software, hardware and automation solutions
- Radioactive material detection capability with one additional pass of the inspected vehicle, or additional optional hardware and software.
- CE certification - Product manufactured in the European Union

Specifications

Imaging:

- X-ray energy: Dual 3.5 - 6 MeV
- Penetration: min. 300 mm of steel
- Wire resolution: better than 1 mm
- Spatial resolution: better than 4 mm
- Contrast sensitivity: better than 1%
- Material discrimination: organics, inorganics, metals and high atomic number (Z)

Inspection:

- Maximum size of vehicle to be inspected: 4.5m (wide) x 3.5m (high) x 20 m (length)
- Scan Mode: Drive through, no scan of the truck cabin (driver)
- Accepted speed of scanned vehicle: 3.6 - 15 km/h.
- Throughput :up to 200 trucks/h;

Safety:

- Radiation dose for the driver is below 80 nSv/scan;
- Radiation dose at any point of the controlled area limit is below the legal value of 1 mSv/year for public.

Power requirements:

- Three phase 400V/50Hz maximum 55KVA

Environment:

- Temperature range: 0°C ÷ 55°C standard; -40°C ÷ 60°C with climatic package (optional)
- Humidity: 0% ÷ 100%

Command Centre Integration

Effective supervision of scanning activities and prevention of corrupt practices has always been a serious concern for border control authorities.

TUDOR SCAN scanners can be remotely supervised in real time from a central management location with or without knowledge of the operators and can even be operated from the supervisor console.

Romania's external European Union border already benefits from this advanced and unique feature as all cargo and vehicle scanners currently in operation are constantly monitored by the Integrated Border Management structure in the headquarters of the National Customs Authority.

Additional integration options include automatic traffic management systems, under-vehicle inspection, radiation detection and nuclear, chemical and biological detection capabilities.

Image analysis

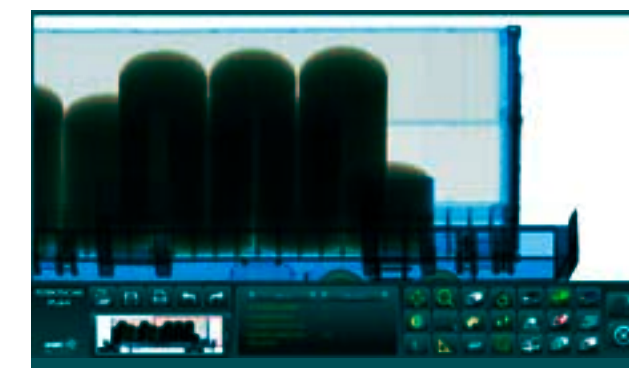
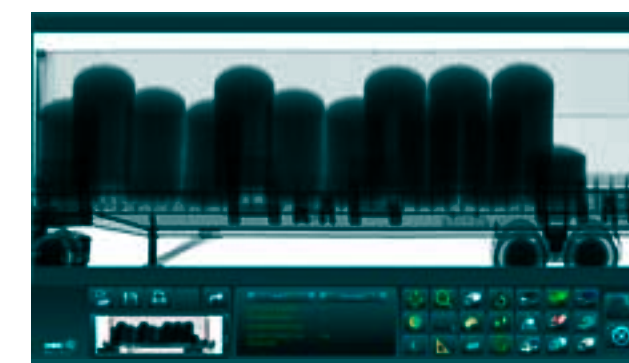
A touch based interface is used to explore the high resolution radiographic image. The operator can apply standard and custom image enhancement operations, can perform measurements and can review the parameters of the system at the time the image was taken. The image can be annotated and saved for review or printed.

Dual-energy & high resolution imaging

Interlaced operation of the linear accelerator allows separation between materials of the scanned objects. Organics, inorganics, metals and high Z materials appear with different color on screen. The material separation feature provides extra information for the operators than can easily evaluate the radiography and establish a more accurate threat level by knowing whether the suspect area is organic, light organic or inorganic. With most of explosives being organic, this feature is extremely useful in identifying bulk explosives and IEDs.

Inspection information

The system is able to acquire textual and image data that describes the items being scanned and the operator can classify large amounts of data thanks to an intuitive gestured based interface.





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