



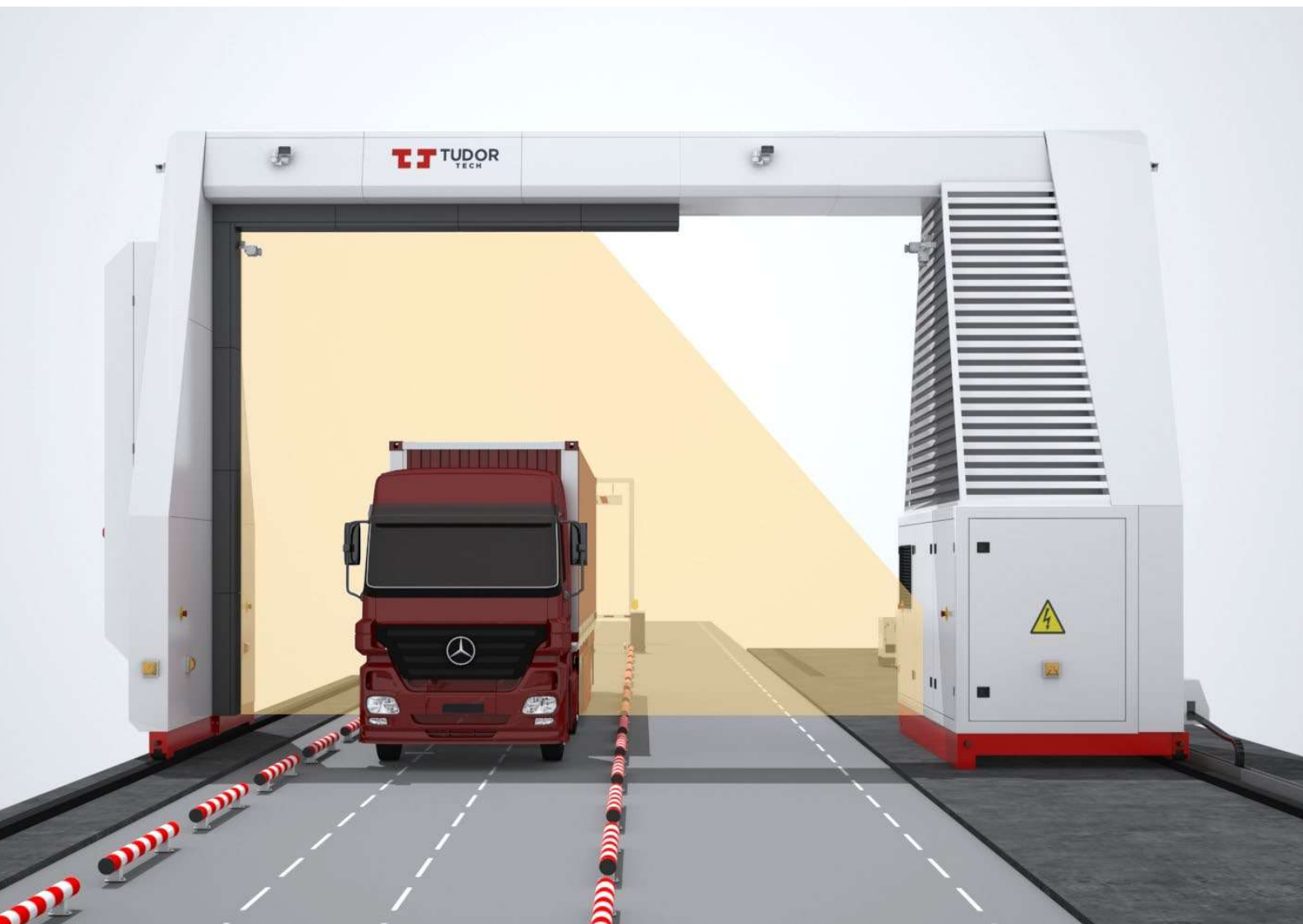
AIRPORT & SEAPORT SECURITY

HOMELAND PROTECTION

BORDER SECURITY

[www.tudor-tech.ch](http://www.tudor-tech.ch)

# TUDOR TECH GL64<sup>TJ</sup>



## ROBOTIC GANTRY SCANNING SYSTEM

The increasing growth of terrorist activities, contraband and illegal transportation drives the demand for high performance security systems. Special attention needs to be paid to the area of international cargo transport that is usually the preferred vector for the contraband with weapons, radioactive and explosive materials, narcotics and other forbidden material, easy to be hidden inside large volume of goods. The daily increasing volume of transported cargo makes it impossible to physically inspect all suspicious transports.

GL64 is based on Tudor Tech's award-winning technology and comes with impressive image analysis capabilities that ensure the highest productivity for cargo inspection applications without compromising the safety and security of the operators.

Having gathered a consistent amount of international awards including The World Intellectual Property Organization „Invention of the year“ award, Tudor Tech's proven concept has received international validation both from the scientific community and from security professionals on all continents.

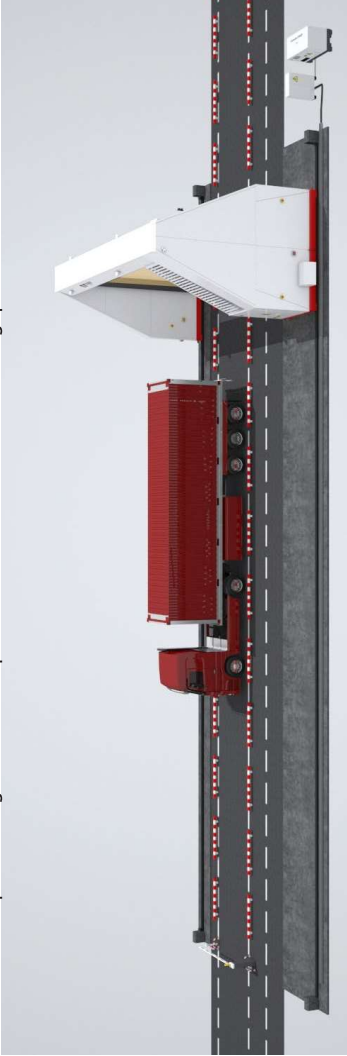


GL64 allows 2 operating modes:

1. One by one scanning of stationary vehicles (optimized solution in terms of penetration and image resolution);



2. Drive through scanning in portal mode (the inspected vehicles can be driven by their driver in order to be fully scanned at low speed that generates an optimized solution in terms of throughput.



Truck loaded with goods and test objects - standard view



### Maximum Safety

TUDOR Tech GL64 fully eliminates the risk of professional or accidental exposure to ionizing radiation by controlling all scanning processes from a Command and Control Center (CCC) that can be supplied in various configurations. The CCC are placed safely outside the Exclusion Area, the scanning being carried by the Gantry Scanning Unit (GSU).

The operation is fully automated, interactive and user friendly, based on the principle of intuitive icons and displaying permanently the status of the system, as well as the sequence in progress.

The operator initiates the scan procedure by simply pressing the corresponding button on the graphical user interface, and the CCC and the process is executed in a fully automated sequence, providing to the operator real time data by graphic animation and sound signals.



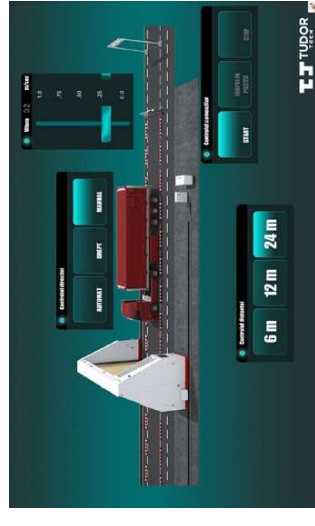
### Intuitive Operation

The 3D interface of the application is very intuitive, indicating at each step the correct course of action, and not leaving room for mistake. It will only allow inputs that are expected by the system at that moment.

All commands and status of the sub-systems are registered in a "Black-box" file. The service menu and the content of the "Black-box" can be remotely administrated and interrogated by supervisors.

The system runs self-test sequences on start-up, providing real-time status information of all subsystems.

The command and control software application is displayed on two monitors and manages the GSU's movement, video surveillance, perimeter protection, barriers' remote operation and the automation of the scanning process.



### Reliability

All the components of the gantr scanning unit are assembled on a custom-designed structure that is compact and lightweight. Its movement is electrical and the system may be powered by local

infrastructure or by an autonomous generator. The fully installed system has minimal impact on local infrastructure and is designed to optimise installation resources.



### Gantry Scanning Unit (GSU)

GSU consist in a lightweight upside-down "U" portal scanning frame (representing the physical support for the scanning tunnel and two technical compartments located beside), moving on two rails by using an electric engine, resulting a highly mobile scanner fully operated from a safe distance.

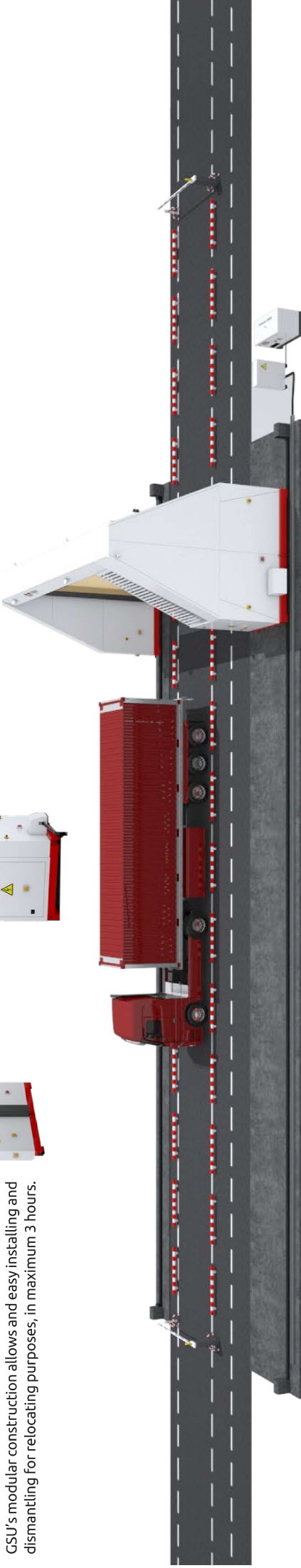
GSU's modular construction allows and easy installing and dismantling for relocating purposes, in maximum 3 hours.



### Imaging Subsystem

Using the latest innovations in transmission imaging and in-house developed electronics, TUDOR Tech GL64 is the first mobile scanner to combine the reliability of high resolution detectors with the functionality of material discrimination.

Ultra-fast sampling electronics and highly sensitive detector arrays ensure the best possible imaging performance even in drive-through scanning. All the hardware and electronics are mounted in stainless steel modular housings for durability and fast service intervention.



### Command and Control

The CCC is permanently connected to the scanning unit through advanced and redundant state-of-the-art encrypted wireless communication through which all commands and data are safely transferred.

When integrated into advanced Integrated Border Management systems TUDOR Tech GL64 can also be operated through a secured internet connection from anywhere in the world or supervised in real-time for prevention of corrupt practices.

### Command and Control Center (FCCC)

The operator is provided with an 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 an automated processes.

Depending on customer requirements, CCC could be customized in other various versions.

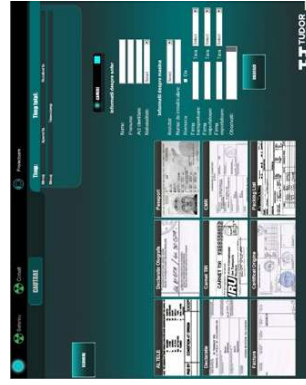


### Software

The software control application has three levels of security access (Operator, Administrator and Service) and actions to be performed are limited to the specific levels. The operator can start the software control application only by using an authorization password for authentication.

The images analysis software application displays the radiographed target image in black and white, with options for filtering and magnifying, respectively the color image resulted through the discrimination filter on different type of materials: organic, inorganic, metals, heavy metals. The operator can apply different filters and processing algorithms in order to improve the penetration or image quality.

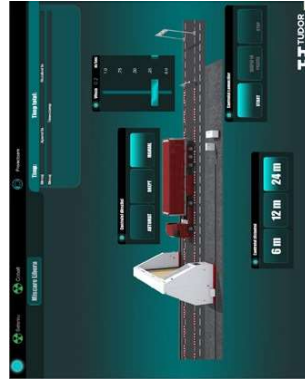
The image is processed in a proprietary format and can be exported to bmp or jpeg format.



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.

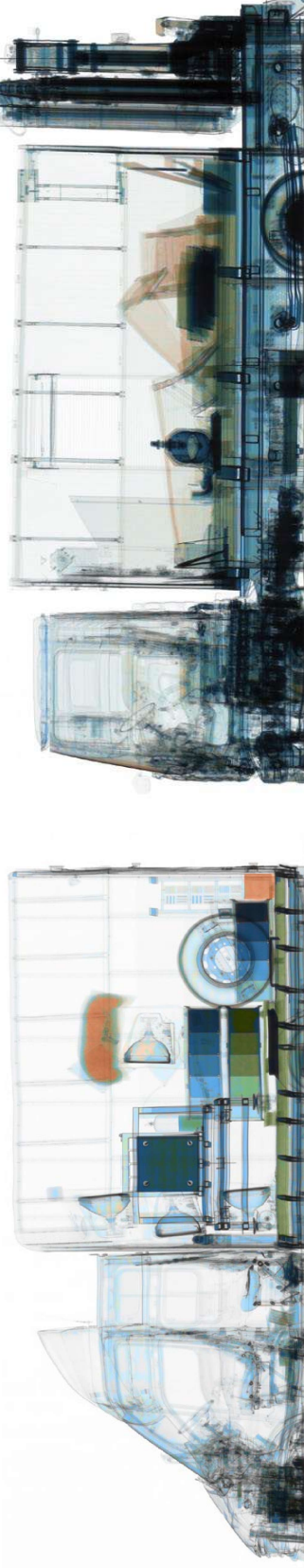


The operator can see at a glance the current state of the system and has easy access to all the parameters that determine the throughput and image quality. All the operations are logged for review or subsequent training.

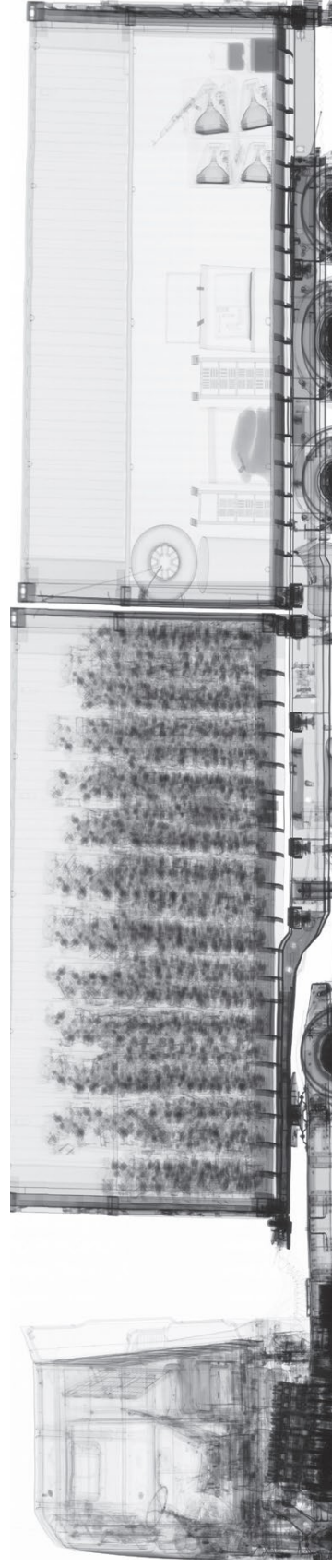


The image analysis application is used to explore the high resolution radiographic image. The operator can apply standard and custom image enhancement operations, can perform measurements and can review the parameters of the system at the time the image was taken. The image can be annotated and saved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

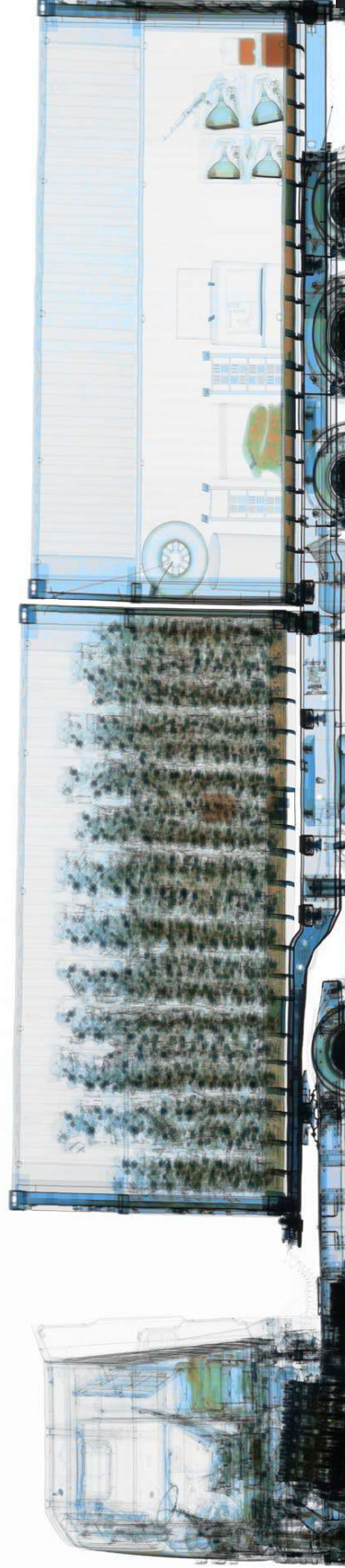
Trucks loaded with goods and test objects - material separation view



Construction accessories - standard view



Construction accessories - material separation view





### Additional options

For advanced checkpoint configurations the GL64 may be supplied with other screening equipment such as radiation detection, baggage and parcel screening, explosives and narcotics trace detection, document analysis and surveillance.

### Dual-energy & high resolution imaging

As a first for cargo & vehicle screening systems, TUDOR Tech GL64 combines the advantages of material discrimination with the high resolution detectors.

Truck loaded with goods and test objects - material separation view



### Command Centre Integration

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

TUDOR Tech GL64 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.

This is an advanced and unique feature as all cargo and vehicle scanners currently in operation can be constantly monitored by the Integrated Border Management structure in the headquarters of the National Authority.

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

### Imaging performance

Energy: 4/6 MeV, interlaced X-ray  
 Steel penetration: 350 mm  
 Wire resolution in air: 1.2 mm  
 Contrast sensitivity: 1%  
 Spatial resolution (horizontal): 4 mm  
 Spatial resolution (vertical): 3 mm  
 Material separation: 4 classes

### Radiation safety

Level of radiation for the operator: less than 1 mSv / year  
 Dose of radiation to the inspected vehicle: less than 10 µSv / scan  
 Dose of radiation to public outside the Exclusion Area: less than 1 mSv/year  
 Radiation Monitoring: individual monitoring for each operator  
 No human presence inside the Exclusion Area

### The Gantry Scanning Unit (GSU)

Type: gantry on rails  
 GSU weight: 30 tons  
 Computer-managed speed and braking during the scanning process  
 Various manufacturers and models depending on specific local conditions  
 Electric engine: electric three-phase; 50kVA

### Operating features

Remote operation via secured wireless technology or via internet connection  
 Maximum size of the inspected vehicle: 3.5 m (width) x 5.0 m (height)  
 other dimensions available on request  
 Time to start scanning: less than 15 minutes  
 Crew requirements: 1 operator/shift  
 Vehicles inspection mode: One by one and sequential scanning modes for stationary vehicles, Drive through scanning mode for moving vehicles  
 Throughput: 30 vehicles in one-by-one scanning mode  
 120 vehicles/hour in drive-through mode  
 Scanning Speed: 0.1 to 1.0 m/sec. in one-by-one scanning mode  
 7 to 11 km/hour in drive through scanning mode  
 Safety features: Warning lights and audible alarm indicating „Radiation ON“ status  
 Exterior lighting for night time operation  
 Digital video surveillance subsystem, allowing the operator to monitor the scanning area  
 Operation: Between -20°C and +55°C; optional extreme conditions kit available on request  
 Relative Humidity: 0-100%



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