TeraHertz Portal Scanner

Category: Sensors & Measuring Techniques
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Broker Company Name: STFC Innovations Ltd
Broker Name: Matthew Edwards
Telephone: 01925603141
Email: Matthew.edwards@stfc.ac.uk

Abstract
The scanner works by imaging Terahertz (far IR) energy emitted naturally by the human body and will detect concealed objects that block out this background light. It is a totally passive system that it is 100% safe to use on all people. The technology includes some unique and innovative features such as; non-invasive detection as it does not image intimate areas of the body, and a detection range of up to 10m (meaning there is no need to stop people to scan them). This means that it can be used an unlimited number of times on anyone with maximum safety and no requirements for gender specific screenings. The technology has other potential applications, for example quality or process control.

Description
The Terahertz scanner technology is a concealed items detector that works by receiving and analysing Terahertz energy (far IR) and some visible band energy emitted naturally by the body to detect items such as weapons, liquids or powders. The technology can be used as a standalone security system or integrated into wider security architectures. The present invention in the patent provides a means of scanning and imaging that captures images quickly and is suitable for use in environments where the object to be imaged is larger than the distance of the object from the imaging device.

CCD’s are arranged to detect Terahertz radiation from portions of the field of view. A scanning element directs the radiation onto a sensor and an imaging processor communicates with the sensor to generate a consolidated image of the field of view.

This gives freedom for it to be used as a portable system for short-term security needs, or long term in, for example, airport security. This technology allows for a safe and non-invasive screening process by analysing the radiation naturally emitted by the human body. If an object, such as a weapon or contraband, is being concealed on the person’s body it will block out this radiation and appear as a dark area in the image. The scanner can also blur out intimate areas of the body to preserve the respect and privacy of the public. The technology gives a typical scan and detection range of between 2m and 10m and can be used for versatile indoor operations. It can be installed in a manner similar to CCTV, using wall or ceiling mounts, or it can be used on the floor. This is beneficial as it allows the system to be incorporated in
existing security architectures or in environments with limited space. The scanner can be adapted to be used as a mobile system with a variety of accessories.

- Physical size: 656mm(L) x 556mm(W) x 204mm(D)
- Mass: 24kg
- Operating Temp: 5°C to 45°C
- Relative Humidity: 95% non-condensing
- Input Voltage: 90-240V AC
- Power Consumption: 80W
- Imaging Range: 3m (min) to 10m (max)
- Display: User selectable, options for black and white or colour displays.
- Field of View: 750mm (W) x 1500mm (H) @ 4.5m (FoV increases linearly with distance)
- Sensors: 0.25 THz array, Colour CCTV Camera
- Frame Rate: 6 Hz

Innovations and advantages of the offer
This technology detects naturally emitted radiation and there are no emissions from the scanner, unlike other concealed item detectors, meaning that it is completely safe to use on anyone regardless of age or gender. It also possesses the ability to momentarily scan meaning that there is minimal stoppage whilst scanning, allowing a completely natural detection system.
Unlike other scanners, this technology is completely safe to use on pregnant women. It also provides a much quicker and respectful scan process due to the use of a non-invasive and completely passive detection system, with no capture of intimate areas.

**Application**
This scanner is suitable for security scanning for detecting weapons, explosives and stolen goods. It could also be used for quality and process control.

**Description of Space Heritage**
The technology was developed within RAL Space for applications relating to millimeter and sub-millimeter wave imaging of planets.

This technology description was downloaded from [www.esa-tec.eu](http://www.esa-tec.eu)