

# Introduction of R&S QPS100 Quick personal security scanner — R&S millimeter body scanner —

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**Abstract** The R&S QPS100 is a state-of-art millimeter-wave body scanner that automatically detects concealed items carried on the body or in clothing.

**Keywords** millimeter-wave, transmitter, technology report

## 1. General

The R&S QPS100 security scanner delivers high-precision and efficient security control while ensuring an unobtrusive and comfortable experience for scanned persons. It consists of a flat panel with more than 3000 transmitters that emit extremely low-power millimeter waves in very short succession and just as many receivers that record high-resolution 3D information. Persons being scanned stand squarely in front of the panel as if facing a mirror. Holding their arms slightly away from their bodies, they first face the panel for short time and then turn their back to the panel for short time. The scanner's height ensures full head and shoulder coverage of tall individuals.

## 2. Technology

The detection software uses machine-trained algorithms to search for conspicuous or all material types. The scanner searches for anomalies indicating objects rather than for certain items, enabling it to discover unknown and new threats.

The R&S QPS100 is designed for implicit privacy. Rather than generating photo-like image, it evaluates physical information such as depth and phase data. Detected locations of interest are marked on symbolic body graphic. The R&S QPS100 also poses no health hazard whatsoever. It operates on frequencies similar to those of a vehicle distance warning system. The transmit power at the scanned person's location is almost undetectable and several orders of magnitude lower than cell phone missions.

- Frequency range from 70GHz to 80GHz
- Multistatic operation with 3000 transmitters and 3000 receives
- Approx. 1mW transmit power

- Data acquisition time : approx. 16ms
- Fully electronic, no moving parts

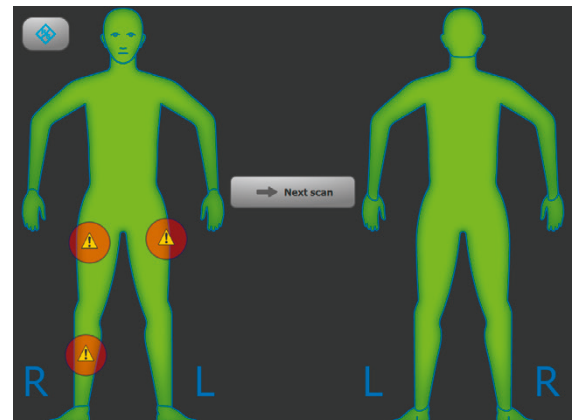


Fig.1 Visualized scan results

## 3. Detection characteristics

- Detection of all types of concealed objects (metal, ceramic, plastic, liquid)
- Outstanding full-body coverage, complete head shoulder and leg illumination of tall and oversized individuals
- High system resolution, bandwidth and dynamic range for high detection performance and minimum false alarms
- Approved by the European Civil Aviation Conference (ECAC)

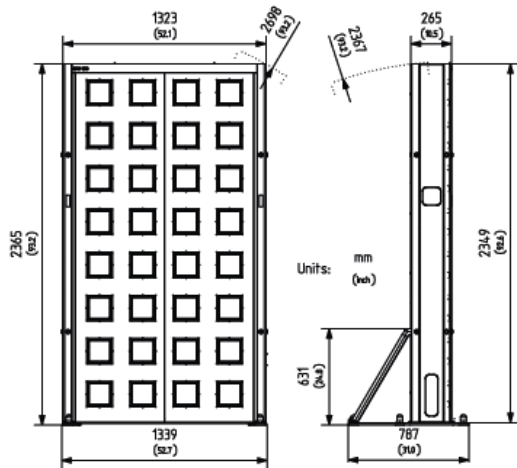


Fig. 2 R&S QPS100 outlook

#### 4. Benefits

- Flat instrument with small footprint, low weight and high positioning flexibility
- Mobile version (on wheel) also available
- High throughput of up to 400 persons/h
- Reliable, quiet continuous operation
- Simple touch panel operation
- Software updates to meet future requirements
- Open, transparent scanning environment, no booth
- Comfortable scanning posture

#### References

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