



1 March 2021

Re: Experimentation Description; Reference Number: 55084

Description of equipment and theory of operation:

The QPS Walk is the next generation of a walk through body scanning, designed to improve individuals' security. The system is meant to be installed in fixed indoor locations, generally in entrances to secured areas. The QPS Walk automatically detects the existence of concealed unauthorized objects on an individual's body.

The system consists of three main part:

1. Gate – responsible for scanning the subjects. This part of the system is the active part from RF point of view.
2. Compute server – responsible for image reconstruction and automatic detection. The server is connected to the gate by a 10 Gbps optical Ethernet link.
3. GUI – a touch screen equipped computer used by operator

The QPS Walk consists of 224 transmitters and 448 receivers. Each transmitter has a unique time slot at which he is allowed to transmit; only a single transmitter is active at any instant.

While active, a transmitter radiates a train of 15 UWB electromagnetic pulses at a rate of 12 MHz. When all 15 pulses have been transmitted, the transmitter is switched to the next one. When all 224 transmitters have transmitted 15 pulses, the transmit cycle starts at the beginning. The duration of one transmit cycle can be calculated as $224 * 15 / 12 \text{ MHz} = 0.28 \text{ ms}$.

The QPS Walk is intended to detect the presence of concealed metallic and non-metallic objects on an individual's body. The QPS Walk does not require the person to stop and adopt a particular pose for the scanning to occur. The scanning is performed while the person continues to move through the QPS Walk. This has the potential of simplifying and improving the security in public places.