QUANTUM

THE POWER BEHIND VEHICLE CLASSIFICATION

Quantum overview

Quantum is a second generation AVDC solution designed as a comprehensive multi-sensor integration platform.

The team behind Quantum have been designing, developing and installing Automatic Vehicle Detection and Classification (AVDC) systems around the world since 1996.

At the heart of a fully integrated AVDC solution sits Quantum, connecting the detection, classification, customer identification and enforcement sensors into a single unified system.

Our detection and classification solutions serve integration partners who use Red Fox ID technology in large-scale ITS projects including electronic toll collection, open road tolling, express toll lanes and advanced custom detection and classification solutions. With more than 1260 lanes committed, Quantum is a field proven, reliable and flexible AVDC solution.

One AVDC solution, multiple sensing options, greater design flexibility, lower risk to market.

Patented technology

The basic main loop arrangement has been further enhanced to provide improved detection accuracy, particularly for hard-to-detect vehicles such as motorcycles. In stop and go traffic motor-cycles weaving between vehicles present a significant detection and tracking challenge as do two motorcycles riding side by side in a travel lane. Quantum's patented loop arrangement, and patented straddle algorithm, and overhead detection, together with its strength in combining multiple sensor streams, raises the accuracy bar above that of simple main loop only systems.

What It Does

Quantum software analyses vehicle signatures provided by in-ground or overhead sensors, in real-time, to produce information on all vehicle types passing through the detection zone. This includes counting the axles on each vehicle, classifying the vehicle based on a custom rules file, placing the vehicle in the correct lane, and recording the speed and direction of travel. Additional, optional, sensors provide accurate positional triggers for front and rear automatic licence plate recognition (ALPR) cameras and a sophisticated correlation engine allows additional sensor data, for example tag reads, to be combined with the vehicle data to provide a single comprehensive transaction for each vehicle. Safety features include wrong way vehicle detection and over height alarms.

Quantum fully integrates the AVDC sensors fault and status and provides a well-defined API that enables both push and pull integration with upstream maintenance and monitoring tools (MOMS). This ensures a timely delivery of fault information facilitating quick response times to system faults. In addition to timely fault processing Quantum's AVDC designs include sophisticated handling of fault conditions whilst maintaining the highest level of transaction accuracy. Equipment will fail from time to time and how your AVDC system adapts has a direct impact on revenue.

In typical axle-based classification systems Quantum has a detection accuracy of >=99.96% in all traffic conditions and all types of weather. In a typical 5 class profile-based class table Quantum will achieve accuracies above 99.5%. if you have an overhead project and class table in mind come and talk to us for the numbers.

Installation & Set-to-work

The Quantum solution is designed for easy and quick installation with detailed set-to-work guidance and sophisticated tools provided to support the field teams during the production roll out. The tools provided cover all aspects of the Quantum family from in-ground loops to overhead LiDAR systems.

The tools and set-to-work instructions embody the practical experience gained from over 25 years of installation experience. We invest the engineering time in tool development so that road side support staff can maximise their productivity on production sites.

Full training is available covering installation, configuration and design for the Quantum solution.

Quantum Tools

The Quantum system is fully supported by a suite of tools designed to assist both designers and field support teams.

- Quantum Replay is an offline version of the embedded runtime system that can act as a real time simulator for lane controller development and testing, as a tool to test and refine class tables and also as a post-installation debug tool.

- Quantum Dettune is a sophisticated loop detector tuning system, working with both Northstar and Nortech detectors. This tool provides an 'all channels' real time streaming view of the detectors making loop tuning a significantly easier process as there is immediate feedback of the tuning choices made. Quantum Detune fully supports remote tuning over a network connection.

- Quantum Vision provides for the simultaneous visualisation of both loop and LiDAR data, and Quantum output, so that performance can be quickly evaluated.

- Quantum LiDAR includes a number of useful set-to-work tools that automatically generate key configuration parameters.

Rules Driven Classification

Quantum vehicle class tables are defined using a rules-based engine and are easily modified to suit customer requirements allowing tailor made vehicle classification solutions.

Red Fox at Work

2015	First technology partner Tetra-HGS, Turkey
2016	First 4+1 MLFF (multi-lane free-flow) system installed in Turkey (309 lanes)
2016/22	309 lanes (65 toll sites) of MLFF in Turkey
2017/16	FSM Bridge over the Bosporus 4+1 then additional 2+1
2017	Martyrs Bridge (south) over the Bosporus 4+1
2017	First 5+1 MLFF system installed in Turkey
2017/18	Yavuz Sultan Selim Bridge (3rd Bridge) over the Bosporus 4+1
2018	First Quantum Licensee licence signed - ETCC
2018	First express lane system installed in USA - SRTA (96 lanes)
2019	First 5+2 MLFF system installed on ISTHA toll road (78 lanes)
2019	First 3+1 MLFF system installed on E-470 toll road (8 lanes)
2019	First LiDAR evaluation site installed - Chicago (2 lanes)
2020	Second Quantum Licensee licence signed - Conduent
2020	Project win E-470 (97 lanes) & HPTE (126 lanes)
2020	First AET single lanes installed - ISTHA (49 IPO lanes)
2021	Project win OTIC (296 lanes)
2021	First Quantum Hybrid (loops+LiDAR) - OTIC
2021	Martyrs Bridge (north) over the Bosporus 4+1
2021	Project win - CTRMA
2021	Third Quantum Licensee licence signed - KAPSCH TRAFFICCOM USA
2021	First LiDAR only express lane test site
2022	Project win ACTC I-680 Interim Express Lane - Above ground LiDAR system
2022	Project win VDOT I-64 Express Lanes - Above ground LiDAR system
2022	First multi-lane WIM test site - Istanbul, Turkey
2022	Dedicated 2 lane loop/LiDAR test site - UK