HI-TRAC® TMU4

HIGHLY ACCURATE HIGH-SPEED WEIGH-IN-MOTION & CLASSIFICATION SYSTEM

HI-TRAC TMU4 Data Collection System with ARM processor

OVERVIEW

The Q-Free HI-TRAC® TMU4 is a best-in-class high-speed traffic data collection system that leverages artificial intelligence for unrivalled accuracy. The single device supports up to 16 lanes of multiple array configurations using AI loop signature analysis combined with piezo electric axle measurements.

Without impeding traffic, the HI-TRAC TMU4 collects vehicle count, occupancy, and speed data that is used for everything from applying for federal funding to enforcing weight limits.

A fallback design ensures reliable data. If a sensor fails, it is supported by all remaining working sensors or loops. This exclusive design feature enables customers to retrofit existing sites without replacing in-ground sensors to deliver accurate, reliable data in an affordable, scalable system.

ARM processors for AI computing on the edge

HI-TRAC classifiers use dual-core ARM processors to run real-time AI algorithms on the edge.

Classification algorithms are created at the roadside using a deep neural network. Machine learning then trains devices to collect and label loop signatures by classification subcategory.

Machine learning techniques enhance ID and categorization methods for nontraditional vehicles like electric and raised axle vehicles, and low platform, box, and tanker trailers.

BENEFITS

- Collect traffic data with unrivalled accuracy
- Retrofit existing systems to improve accuracy, regardless of current detector configuration
- Maintain accuracy even when a sensor fails
- Minimize installation and maintenance costs
- Save energy with low, solar-powered design (<5 watts)
- Gather data required for FHWA reports and funding
- Gain valuable insights with Kinetic Counts (optional) to make data-driven decisions

Best-in-Class WIM & vehicle Classification

AI-driven data collection with machine learning

Unique fallback design for redundancy

ARM processor for edge computing

ACCURACY AND CONFIGURATIONS

WIM ACCURACY

Config	*EU*	*US*	*GVW*
P-L-P	COST 323 C(15)	ASTM 1318Type II	± 15%
qLq, iLi	COST 323 B(10)	ASTM 1318Type I	± 10%
QLQ, ILI	COST 323 A(5)	ASTM 1318Type III	± 6%

P = Piezo-polymer sensor
q = Half strip (wheel) Piezo Quartz sensor
i = Half strip Intercomp Strain Gauge sensor
Q = Full strip (axle) Piezo Quartz sensor
I = Full strip Intercomp Strain Gauge sensor
L = Inductive loop or Loop Listener

WIM Accuracy Speed Range: 1–130 kph (1–80 mph)

AVC ACCURACY

Length	± 50cm (1.65ft)
Headway	± 7%
Speed	± 1.5%

Vehicle Detection Speed Range: 1–240 kph (1–150 mph)

CLASSIFICATION ACCURACY

Classification of over 100 unique vehicle types using:

- Number of axles
- Axle spacing
- AI loop signature
- Length
- Weight
- Tire type (single, dual, triple)

LANE CONFIGURATION

Weigh-in-Motion/Classification	Lanes
Sensor-Loop-Sensor	16 lanes
Loop-Sensor-Loop	16 lanes
Loop-Loop	16 lanes
Sensor-Loop-Sensor	16 lanes
Strain Gauge-Loop-Strain Gauge	8 lanes
Loop-Strain Gauge-Loop	8 lanes

NOTES:

Sensor refers to either piezo-polymer or piezo-quartz. Piezo-polymer WIM sensor arrays require an in-road temperature probe to compensate for sensor output variations with temperature change. Support for up to 32 piezo-polymer/quartz sensors and up to 32 inductive loops, depending on product variant.

Strain Gauge refers to Bending Plate or Intercomp WIM sensors.

KINETIC® COUNTS

Bring your traffic data to life with Kinetic Counts, Q-Free's sophisticated traffic data collection and analysis tool that equips transportation authorities with valuable insights to make data-driven decisions for their infrastructure planning and investment needs.

DATA REPORTING & HOSTING

Reporting: HI-COMM - data download, analysis, real time VBV view, report generation, and diagnostics

Hosting: Up to three simultaneous connections - Kinetic Counts, Drakewell C2 Web, MS2

TECHNICAL SPECIFICATIONS

Storage capacity:	Standard 8GB MicroSD data storage
	Up to 365 days data storage
Input/output ports:	1 x USB 2.0 port - front panel
	1 x RS232 VBV or ANPR data output
	2 x RS232 trigger output
	1 x Ethernet 10/100Base-T OR 2G/3G/4G modem
	2 x N.O. dry contacts/switch outputs
	2 x Switch inputs
	6 x Temperature probes
Power supply:	85-264V, Freq. 47-63Hz, 3.15A fused
	12V DC nominal (11.6-15.1V), 5A fused
	Solar panel, battery & charge regulator
Power consumption:	4 watts
Environmental:	-40°C to +85°C (-40°F to +185°F)
CE compliant:	EMC, LVD/GPRS, RoHS, REACH, WEEE
IP rating:	IP40
Dimensions: (H x W x D)	178 mm x 432 mm x 279 mm (7" x 17" x 11")
Weight:	7 kg (15.4 lbs)

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