Tire Anomaly and Classification System (TACS™)

- TACS Spec Sheet
- VectorSense Spec Sheet
- VectorSense Installation Drawing

We make highways talk™

TACS™

Supporting the screening of commercial vehicles at highway and ramp speeds

The Tire Anomaly and Classification System (TACS™) screens commercial vehicles at weigh station facilities to identify vehicles that have tire problems that affect safety.

The Tire Anomaly and Classification System (TACS) supports the screening of commercial vehicles at highway (up to 100 mph) and ramp speeds at weigh station facilities to identify those vehicles which are unsafe due to flat, missing, or mismatched dual tires.

TACS™ consists of the following components:

- **In-Road Sensors** – for tire detection and measurement
- **Roadside Electronics –** to capture information from the In-Road Sensors and pass this information to the weigh station for use by weigh station operations
- **Weigh Station Work Station, Software and Graphical User Interface (GUI)** – to present information to weigh station operators and support their setting of commercial vehicle screening criteria based on data provided by TACS

Integration with VI²M™, IRD's cloud-based data collection, reporting and analytics software, provides long-term data storage and advanced analysis capabilities.

When connected with IRD's iSINC® electronics, TACS is capable of integration to weigh station screening systems including: Weigh-in-Motion, Electronic Screening (ie: License Plate Readers, transponders, USDOT Readers, HazMat Readers, etc.), vehicle dimensioning systems, vehicle tracking systems, etc.

Features

- Detects flat, missing and mismatched dual tires
- Measures continuously across the full lane width
- When used in conjunction with an iSINC® system, TACS offers several improvements to weigh-in-motion sorter systems:
  - Identifies the presence of dual tires to augment vehicle classification
  - Identifies wide-base steering axle tires to appropriately sort commercial vehicles that have higher allowable front axle weights
  - Detects off-scale vehicles

TACS integrates with IRD's operator display to identify tire problems

Features

In-Road Sensors and Sensor Interface Electronics

In order to support integrated operations, TACS includes three (3) in-road tire and axle measurement sensors spaced approximately eighteen inches (18″) apart.

The Sensor Interface Electronics are housed in a roadside pull box, or in a roadside cabinet that is within 40′ from the end of the sensor.

The In-Road Sensors have the following installation requirements:

- Each of the in-road tire measurement sensors are installed into a slot the road that is three inches (3″) wide and one and one half inches (1.5″) deep
- In-road inductive loops must meet local requirements; the recommended loop dimensions are 6′ x 6′, inductive loop wire shall be 14 AWG, IMSA 51-5. (Note: Preformed inductive loops may also be used if approved by local agencies)
- Standard lengths for in-road tire measurement sensors are 11.5′, 12′, 12.5′ and 13′; other lengths are also available up to 17.5′

Installation of the In-Road Sensors (including cure time for the epoxy material) can be performed within four (4) hours.

Roadside Electronics

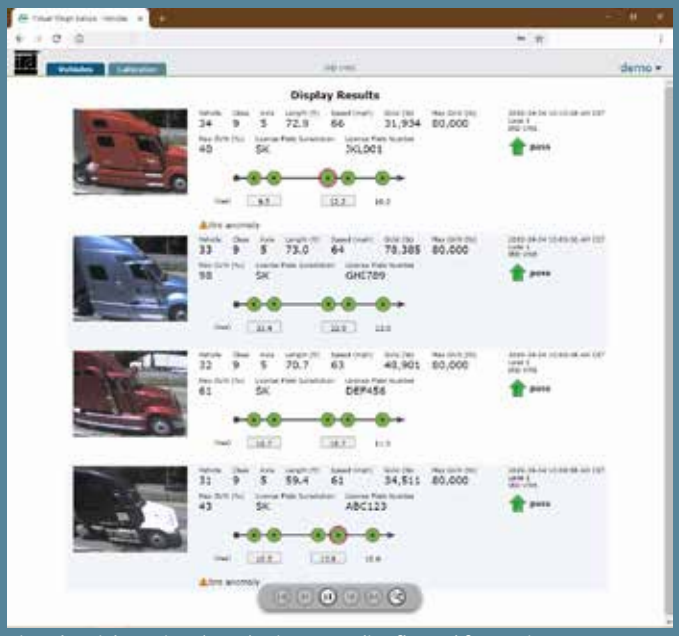
The In-Road Sensors connect via the Sensor Interface Electronics to the Roadside Electronics. The Roadside Electronics connect to and communicate with the Weigh Station Work Station which receives tire and vehicle record data in near real time via a network connection.

The Roadside Electronics operate and meet all performance specifications at all temperatures between -40˚F to +160˚F (-40˚C to 71˚C).

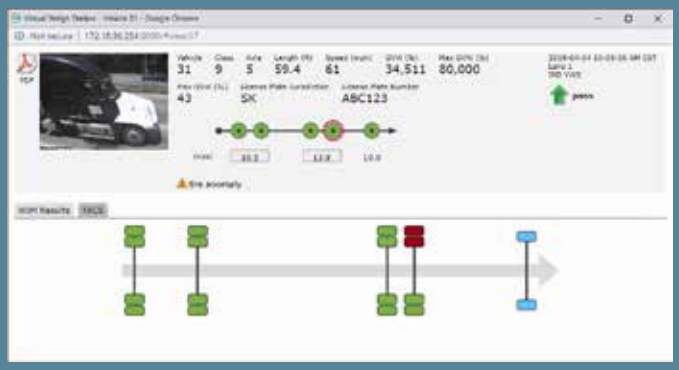
Weigh Station Work Station, Software and Graphical User Interface (GUI)

When combined with an IRD iSINC system and IRD operator display, the Software and Graphical User Interface provides a graphical representation of each vehicle based on axle and tire configuration, the vehicle speed, axle spacing, and alerts for tires found to have an anomaly.

TACS is capable of being displayed either on an independent display, or as an integrated part of the existing IRD operator display or virtual weigh station software:



Virtual Weigh Station (VWS): tire anomalies flagged for station operator



VWS vehicle record: position of tire anomaly is indicated on axles

International Road Dynamics Inc.

ISO 9001 2015

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Find out more about IRD on our website: www.irdinc.com

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We make highways talk™

VectorSense™

Introducing the New Sensor Technology

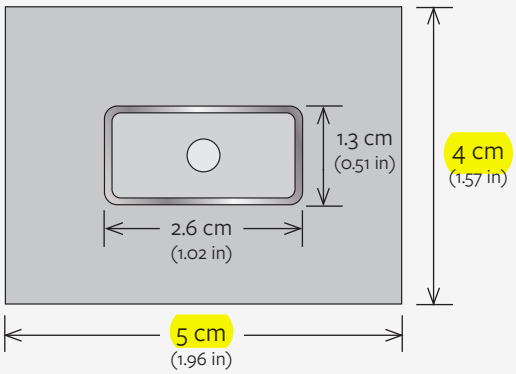
▶ Features

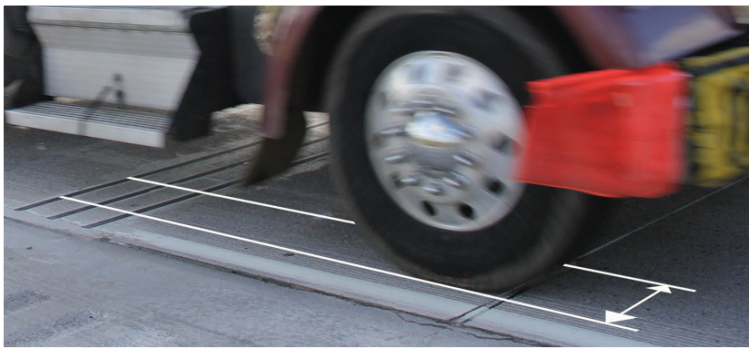
- The VectorSense™ sensor suite provides a new measurement technology for CVO, toll road operations, and traffic data collection applications.
- Each in-road sensor can be installed in a saw cut approximately 5 cm (1.96 in) wide by 4 cm (1.57 in) deep. The length can be customized to accommodate the lane width being instrumented up to 5 m (16.4 ft).
- A standard installation consists of 3 in-road sensors spaced approximately 25 cm (9.84 in) apart providing support for vehicle speed measurement and system redundancy, combined with one or two inductive loops.
- Installation, including cure time for the epoxy material, can be performed in less than four (4) hours.

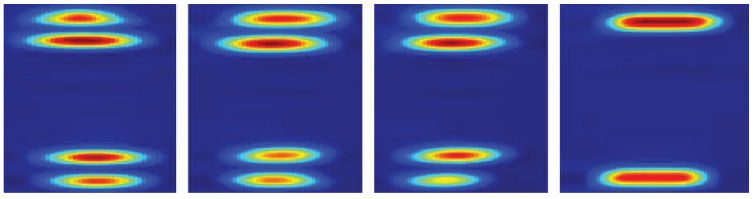
▶ VectorSense Specifications (Preliminary)

Contact Pressure Measurement Range (kPa)	0-1400
Linearity (%FSO)	≤± 2
Operating Temperature Range	-40 to +72 °C (-40 to 161.6 °F)

Sensor & Grout Dimensions







Footprint Data: 2D plot of the VectorSense system output for a 4-axle truck.

VectorSense™ Sensor Suite - Applications/Features Matrix

	Grout in Place or Treadle	Axle Detection	Axle Spacing Wheelbase	Speed	Single/ Dual Detection	Super Single Detection	Tire Anomaly	Tire Pressure	Axle Width	Lane Position (Stress Profile)
Bicycle Detection / Classification	GIP	✓		✓						
Existing WIM Performance Improvement	GIP	✓	✓	✓	✓	✓				✓
Toll Lanes - slow speed classification	Both	✓	✓	✓	✓	✓				
Fleet Managers - Tire Anomaly Detection	GIP	✓			✓	✓	✓	✓		
Access Control and Exit/Security	Both	✓			✓	✓	✓	✓		
Traffic Data Collection - ASTM Type II	GIP	✓	✓	✓	✓	✓	✓			
Traffic Data Collection - High Performance	GIP	✓	✓	✓	✓	✓	✓	✓		
Traffic Management - Real Time Ops	GIP	✓	✓	✓	✓	✓	✓	✓		
Toll Lanes - slow speed sensor with WIM	Both	✓	✓	✓	✓	✓	✓	✓		
Toll Lanes - ETC	GIP	✓	✓	✓	✓	✓	✓	✓		
Toll Lanes - ORT	GIP	✓	✓	✓	✓	✓	✓	✓		
Origin / Destination	GIP	✓	✓	✓	✓	✓	✓	✓	✓	
Enforcement - Tire Information (TACS w/ WIM)	GIP	✓	✓	✓	✓	✓	✓	✓	✓	✓
Pavement Design & Maintenance	GIP	✓	✓	✓	✓	✓	✓	✓	✓	✓

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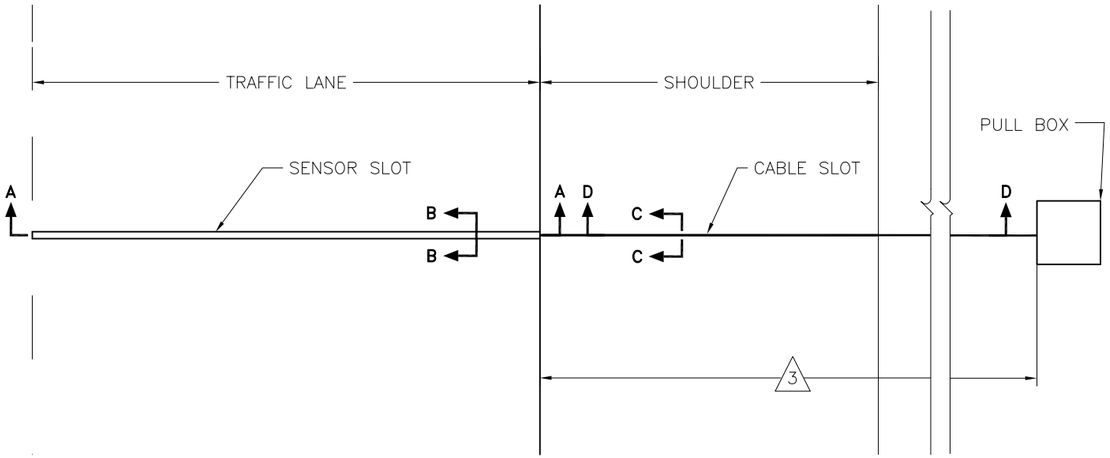
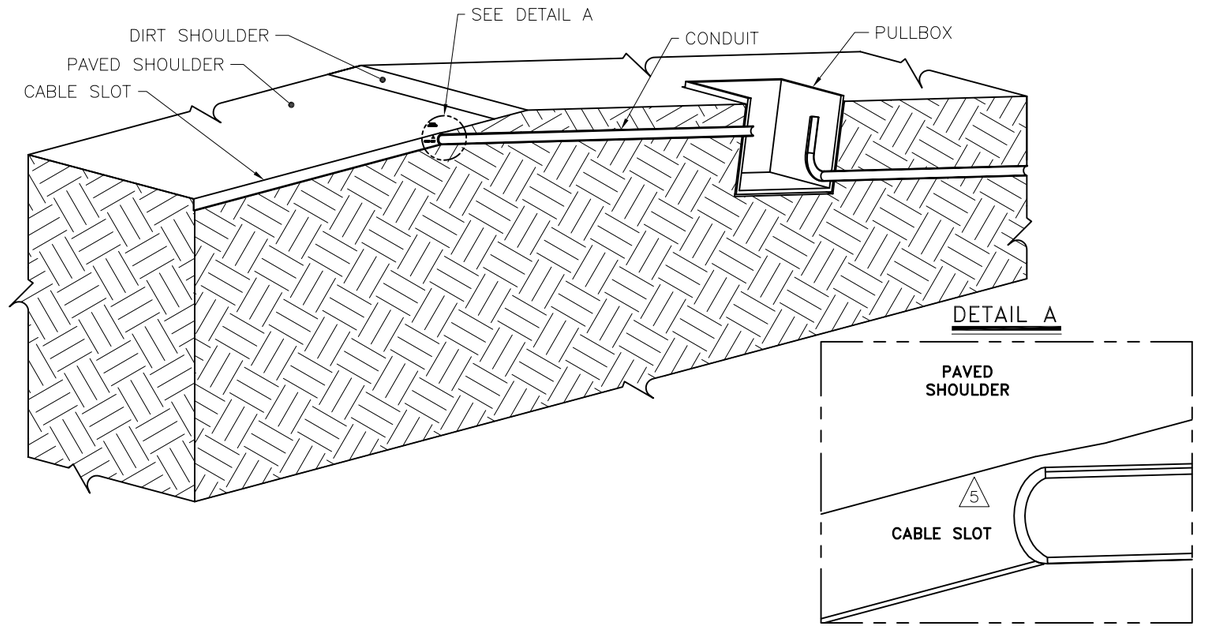
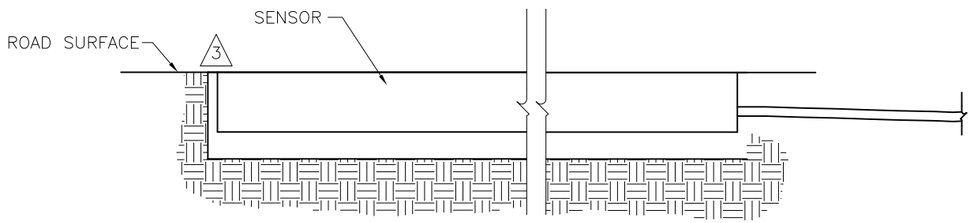
PLAN VIEW – SENSOR INSTALLATION



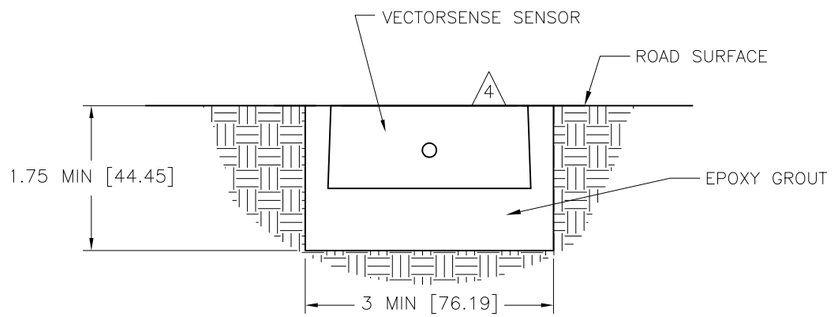
SECTION D–D (CABLE ROUTING DETAILS)



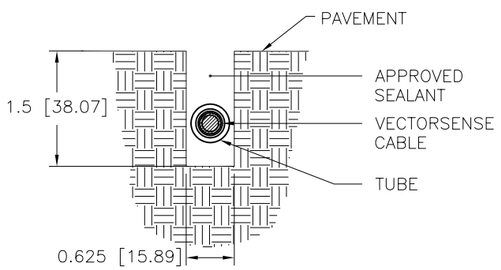
SECTION A–A



SECTION B–B



SECTION C–C



NOTES:

1. CRACKS IN THE ROADWAY MUST NOT BE LOCATED CLOSER THAN 18 [450] UPSTREAM AND 18 [450] DOWNSTREAM OF THE SENSOR.
2. SLOT LENGTH IS 2 [51] LONGER THAN SENSOR.
3. INSTALL PULL BOX WITH VECTORSENSE™ ELECTRONICS AS CLOSE TO ROADSIDE AS FEASIBLE; MAXIMUM 16 [4.9] FROM END OF SENSORS TO CENTER OF PULL BOX.
4. SENSOR GROUT MUST BE GROUND FLUSH WITH ROAD SURFACE AFTER GROUT HAS CURED.
5. CHIP END OF SAW CUT CABLE SLOT TO CREATE SUFFICIENT OPENING FOR CABLE AND TUBING ENTRY INTO CONDUIT

ORIGINAL

REV.	DESCRIPTION	DWN/DSN	APPR.	APPR.	DATE
A	INITIAL RELEASE - ECO-12040	LPr	LPr	THa	OCT 25/17
B	CHANGES AS PER ECO-15597	MKa/JBu			JUL 17/20

NOT TO SCALE

SIZE: B

DIMENSIONS IN: in[mm]

INTERNATIONAL ROAD DYNAMICS INC.
SASKATOON SASKATCHEWAN CANADA

DWG. TITLE: INSTALLATION DETAIL VECTORSENSE

DWG. No. 81304402

REV.: B

CAD FILE: 81304402_B.DWG

SHEET 1 OF 1