Vantage
SmartSpan®
User Guide

iteris®

FCC, Class A Statement

This product has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

This product generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the manufacturer's instruction manual, may cause harmful interference with radio communications.

Operation of this product in a residential area is likely to cause harmful interference, in which case you will be required to correct the interference at your own expense.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1) This device may not cause harmful interference.

2) This device must accept any interference received, including interference that may cause undesired operation.

1. INTRODUCTION

Superior performance for the toughest environment

Many traffic management agencies using span-wire mounted signals have not previously been able to widely deploy video vehicle detection, as it has traditionally been mounted on rigid traffic signal mast arms. Until now, span-wire mounted cameras provided tough challenges for image processing algorithms, due to uncontrolled and random camera movement.

As the global leader in video vehicle detection, Iteris provides Vantage SmartSpan® with Dynamic Zone Stabilization (DZS) algorithms. With DZS, camera movement is tracked and compensated to provide accurate stop-bar as well as field proven Vantage® traffic data collection in a single solution.

Simple to install and setup

Both experienced and new users of video detection will find the installation and configuration of Vantage SmartSpan® to be simple and quick. The system may be rack or shelf mounted inside a traffic cabinet, and is NEMA and Type 170/2070/ATC traffic controller compatible. The system has the capability to perform well in either isolated or networked intersections.

Features and Benefits

- • Stop-bar detection
- • Advanced detection
- • Traffic data collection
- • Non-intrusive to reduce installation and maintenance costs
- • Simple and flexible installation and setup
- • Full motion color video provides detection verification
- • Compact, lightweight, and inconspicuous camera design

1.1 Overview

This User Guide will walk you through the installation, setup, and startup specific to the camera mounting and Registration Zones of the Vantage SmartSpan™ processor. Please refer to the Vantage Edge2 manual for full instructions on the installation and setup of the standard functions of the Vantage range of Video Detection Cameras and Processors.

If you have questions once you have completed the steps within this guide, refer to *Section 5: Troubleshooting/FAQs* or contact product support using the number listed in *Section 6: Product Support*.

The Vantage SmartSpan® product is a one-to-one solution requiring an individual processor for each camera.

Dynamic Zone Stabilization

The heart of the Vantage SmartSpan® system is the Dynamic Zone Stabilization technology. This technology constantly monitors key points at the approach and compensates for movement due to wind and other factors. This ensures the best possible detection in difficult environments.

Recommendations

Vantage SmartSpan® has been optimized for the following intersection parameters:

- Four Lanes or Less
- Span Wire Length <120'
- Single or Dual Span (Tethered)
- Reasonable Lane Markings
- Intersection Lighting at Night
- Span Types – Box/Suspended Box/Diagonal/Zee
- Tight Span (Tether) tighten to the correct specifications to ensure optimal performance

Vantage SmartSpan® will continue to operate well outside of these parameters but there is a possibility that performance may drop off.

1.2   Tools and Equipment

Use the table below to ensure you have the tools and components necessary to complete the installation process.

Prepare	Description
Power and Coax	Ensure that 110V or 220V AC power is available.
Mounting Position	The unit is intended to mount on a either a single span or a dual span (tethered) span wire mount. *(Span tension should be torqued to specifications)*
Required Tools	Various wrenches, coax stripping tool, screwdrivers, etc.
Package Contents	Vantage SmartSpan™ Camera, Processor and Ship Kit.
Other Required	We recommend a Power Surge Panel for reliable operation.

Iteris Supplied Parts

The following items come supplied with the Vantage SmartSpan® system:

- Camera Assembly
- Camera Mounting Bracket (Single Span)
- SmartSpan® Processor
- Video surge suppression

Customer Supplied Parts

The following items should be supplied by the customer/installer of the system:

- Power Cable (3 conductor 16awg)
- Coax Cable (Belden 8281)
- Power surge protection
- For dual span, vertical pole or flat bar (ex. Pelco Bracket)

☑ *Note: Refer to Edge2 Manual for specification of the Power and Coax cables.*
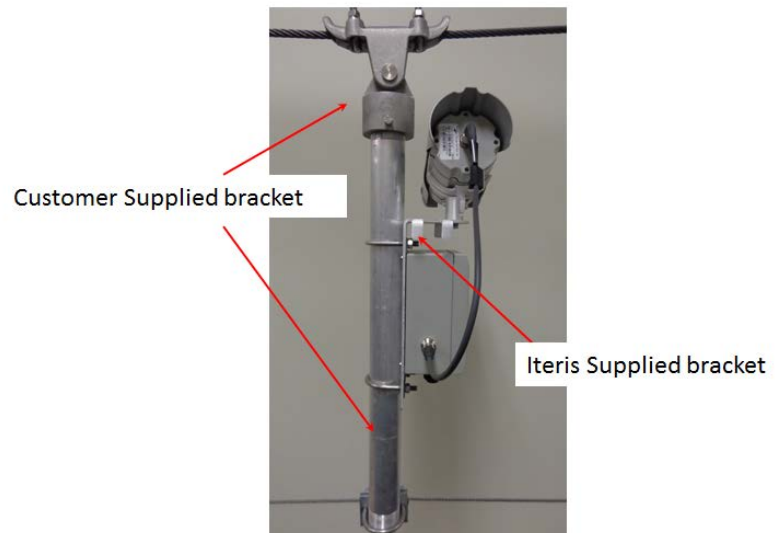
2. INSTALLATION

Camera Installation

2.1 Dual Span Mounting

Use the following instructions when mounting the Vantage SmartSpan® unit on a Dual Span Wire application:

Mounting on Round Poles

  A. At the installation site, hang the round pole on the Dual Span Wire.
  B. Loosen camera rotation bolt and turn camera 90 degrees, tighten bolt.
  C. Discard hex nuts from the 2 U-bolts provided in the Vantage SmartSpan® ship kit.
  D. Run the U-bolts through the holes in the Vantage SmartSpan® mounting bracket.
  E. Install the 2 U-bolt plates and use the 4 Nylock nuts, provided in the Vantage SmartSpan® ship kit, gradually and evenly tighten the nuts until the Vantage SmartSpan® unit is rigid and secure on the round pole.

Customer Supplied bracket

Iteris Supplied bracket

Mounting on Flat Poles

Use the following instructions when mounting on a flat pole.

  A. Locate holes on mounting bar that match those on the Vantage SmartSpan® mounting bracket and insert two 3/8" bolts supplied.
  B. Tighten nuts to secure the Vantage SmartSpan® camera to the flat bar

2.2   Single Span Mounting

Use the following instructions when mounting the Vantage SmartSpan® unit on a Single Span Wire application:

A. Disconnect cable from the Vantage SmartSpan® Electronics box.
B. At the installation site, hang the Vantage SmartSpan® unit on the Single Span Wire.
C. Two sets of bolts are supplied in the Vantage SmartSpan® ship kit. Select the appropriate length according to the diameter of the Span Wire.
D. Use the 4 shorter bolts and washers, for Span Wire diameters smaller than ½ inch or use the 4 longer bolts and washers for 1/2 - 7/8 inch Span Wire diameters.
E. Thread selected bolts through the block supplied in the Vantage SmartSpan® ship kit.
F. From under the Span Wire, insert the bolts through the holes on the Vantage SmartSpan® bracket, install the 4 hex nuts, provided; gradually and evenly tighten the block against the Span Wire until the Vantage SmartSpan® unit is rigid and secure.
G. Connect camera cable back to the Vantage SmartSpan® Electronics box. (connector is keyed)
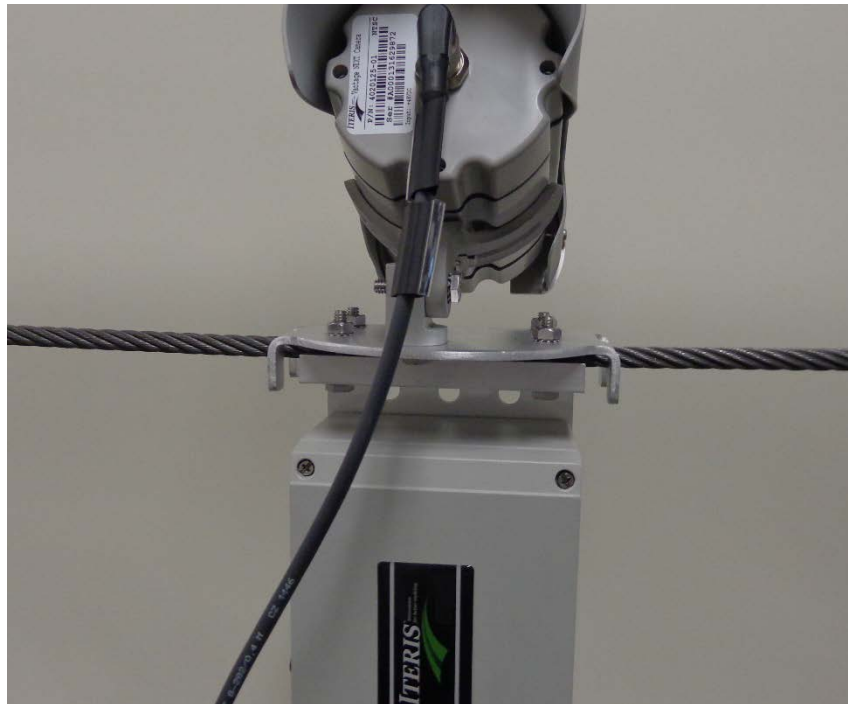
2.3 Electrical Connections

Connect the coax and AC cables as described in the steps below.

✅ *Note: Cable connections for the Vantage SmartSpan™ are similar to those of the Vantage RZ4A camera.*

A. Slide the coax and power cables through the black cord grips on the electronics box.

Tightening Cord Grips

B. Using the coax stripping tool, strip the coax cable then connect it to the board inside electronics box.

👉 *Important: When stripping and connecting the coax cable, be sure to strip to the specifications as shown. Ensure the copper wire is inserted into the green connector while the metal ground fibers are resting on the copper base of the board.*

C. Tighten down the coax board clamp.
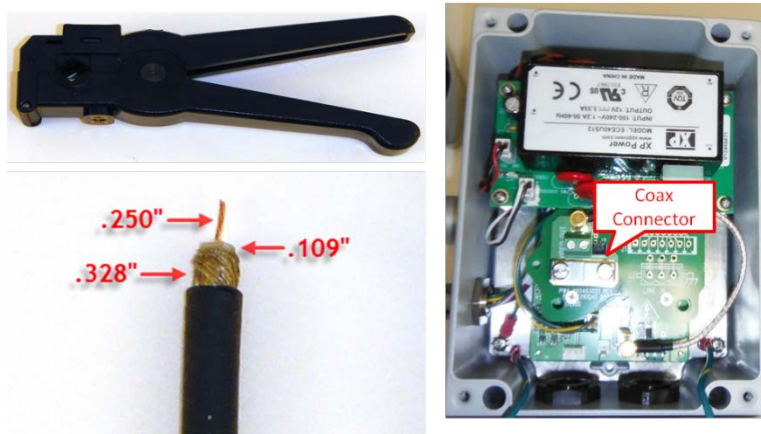
Connecting Coax Cable

☒ *Caution: Before proceeding ensure the power is OFF at the circuit breaker.*

D. Strip and connect the AC wiring to the small connector inside the electronics box.

☒ *Caution: When stripping and connecting the AC cable, be sure to insert the Black (L), White (N) and Green (GND) wires into the correct connections. If not connected properly, unit malfunction or personal injury may result.*
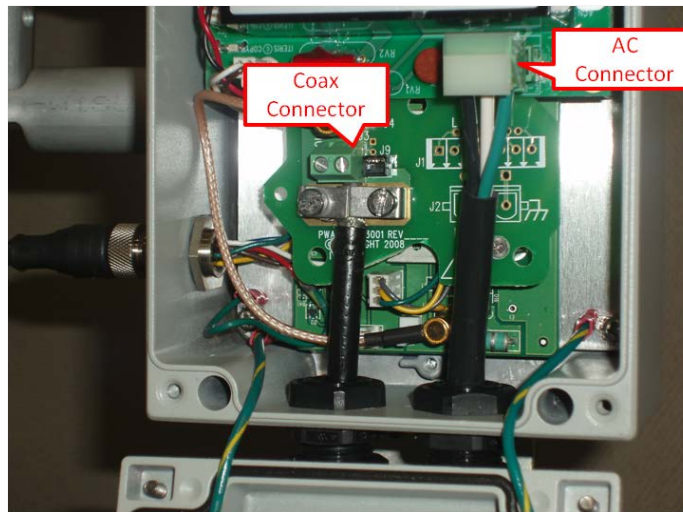

Connecting AC Cable

E. Plug the coax connection into the main VDE board in the electronics box.
F. Plug the AC connection into the power board in the electronics box.

Connecting AC Cable

G. Tighten the cord grips under the electronics box to fasten coax and AC cables in place.

Electronics Enclosure with Coax and Power Connections

☑ *Note: Restore the AC power after connecting the coax and AC cables.*

☑ *Note: Camera Field of View and Focus settings are covered in Section 3.2 below.*

Cabinet Installation

2.4 Install Processor

A. In the cabinet, slide-in and connect the Vantage SmartSpan™ processor into the detector rack.

Installing Processor

B. Attach a video surge protector then connect the coax cable from the camera unit to the **Video In**.

Coax Cable

Coax from
SmartSpan™
Camera

Surge Arrestor

SmartSpan™ Processor

Attaching Coax to Processor Video In

C. Power on the system (camera and processor units).

2.5 Field Of View Setup

Use an AdvancedLAM (Lens Adjustment Module) to correctly set the camera field of View. Refer to the Edge2 manual for guidelines on the correct adjustment.

☑ *Note: If the camera is moving during installation manually stabilize it during field of view and zones drawing phases of the setup.*

2.6 Processor Setup

☑ *Note: This section of the manual covers the drawing of the Registration Zones. Please refer to the Edge2 manual for information on setting the detection zones, outputs and other system configuration settings.*

Registration Zones

The Dynamic Zone Stabilization technology at the core of the SmartSpan® system relies on identifying key points in the field of view to track for camera movement. These areas are identified by the users by drawing special zone types called *Registration Zones (Reg-zones)*. These zones are used to identify physical landmarks present in the background. The system uses features found in these areas to help track camera movement and to compensate for and improve detection performance. Correct positioning of these zones, are key to the performance of the system.

Registration Zone Positioning

Reg-zones are drawn on areas containing strong *horizontal edges* in the background with good contrast such as at the Intersection of stop bar and lane lines. The horizontal line should be at the center of the Registration Zone.

Acceptable Positions for Registration Zones	Unacceptable Positions for Registration Zones
Stop bar or pedestrian cross walk (Horizontal Line) lane markings near the center of the field of view (Vertical Line)	Lane marking near the top or bottom of the field of view
	Permanent or temporary road furniture
	Temporary lane markings

Reg-zones typically should be half the width and as long as a regular zone (Presence, Extension, Delay, etc) the maximum size is limited by the system. The idea is to keep the horizontal and vertical lane marking within the 'Registration Zone' as the camera is moving.

Important: '*When drawing the 'Registration Zones' the first zone should be placed on the left side of the screen and the second 'Registration Zone' should be to the right of the first one. Try avoiding placing the Reg-zone on the curb area where a vehicle can occlude the Horizontal and Vertical lines.*

*Note: Drawing **small** Registration Zones will have a negative effect on system performance.*

The maximum number of Registration Zones is four. The total number of Registration Zones to use will depend on a number of factors:

- Available background information, lane lines, etc
- Total number of detection, LC and count zones required

A minimum of two zones are required for reliable performance from the system. Four Registration Zones are recommended.

Once all the Registration Zones are drawn continue by drawing the detection zones and completing the system setup and configuration.

Note: During operation markers on either side of the screen will indicate the actual movement of the camera from the home position.
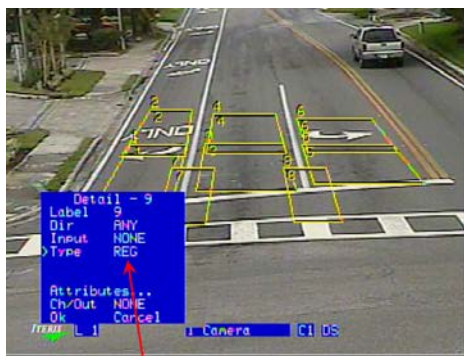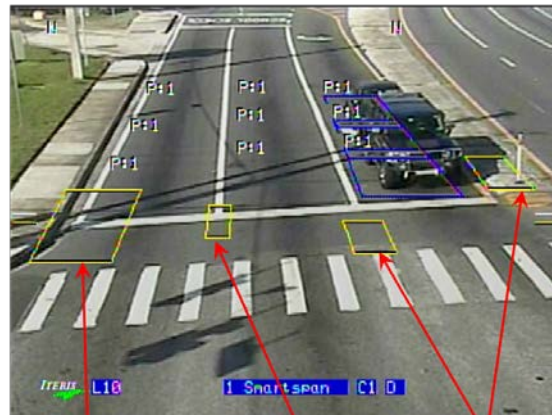

Select zone type Reg
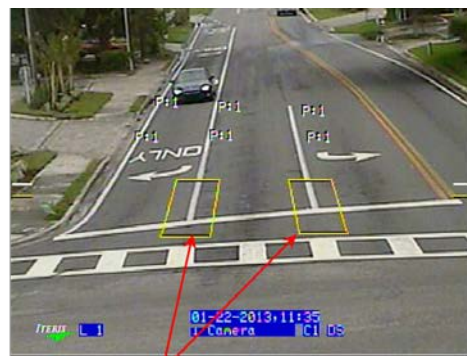
Registration Zones placed correctly

*An example of Good Registration Zone position*

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Examples of Bad Registration Zones

Fallback Mode

There are times when the algorithm is unable to compensate for movement in the camera. This may be caused by a number of reasons including the lane markings obscured by snow or sustained winds forcing the camera to point straight up or down.

In this mode the system "falls back" to standard detection operation. The user has the choice to either allow the system to attempt to detect in this mode or to move into a failsafe constant call. Setting this mode is through the camera menu selection:
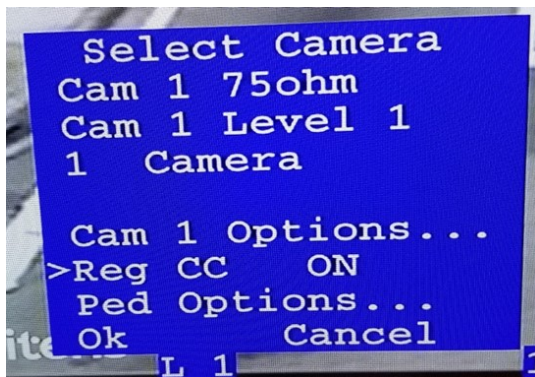
Use the left mouse button to toggle the function on and off. The function is set to on by default.

VRAS Setup

If you are using VRAS to setup the system we recommend that a number of snapshots of the approach are captured using the **Continuous Snapshots** function. Review the snapshots and choose the one that best represents the FOV of the camera in a stable position (not effected by wind).

3. VERIFICATION OF OPERATION

On Screen Markers

There are two on screen markers at the left and right edges of the screen. These markers indicate the actual tracked movement of the field of view to the drawn zones.
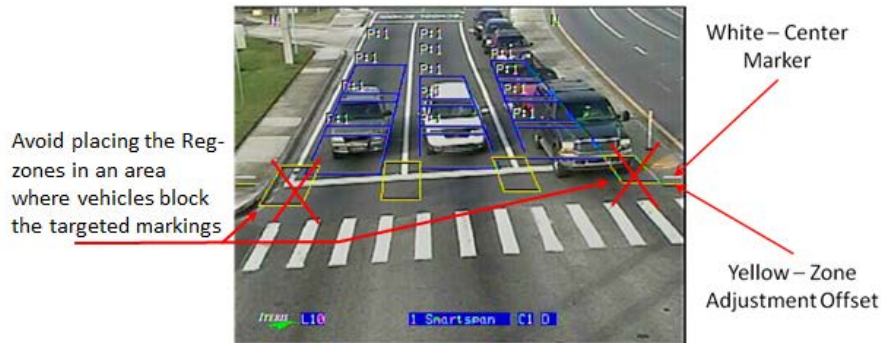
Registration Zones

The Registration Zones can be displayed during normal operation to help confirm system performance. The Registrations Zones display is defaulted to off. To turn the Registration Zones display on:

a.   Select *RegDisp* from the *Diag* menu.
b.   Turn off *RegDisp* when verification complete.

Detection Outputs

After completing the setup of the system performance should be reviewed and the detection outputs for each phase should be confirmed.

☑ *Note: Detection Zones do not move in sync with image. This is a design feature and not a system error.*

4. TROUBLESHOOTING - FAQ

The following information contains tips and suggestions for SmartSpan™ installation.

Symptom A: False Calls - Zones Close to Lane Lines

If you are experiencing an unusually high number of false calls because the detection zones are crossing lane markings during camera movement use the desensitize option.

Symptom B: False Calls – Large Camera Movement

If you are experiencing an unusually high number of false calls because the camera movement is extreme add a delay timer to the detection zones of 0.2s. This will help the system to determine if the call in due to a vehicle or a large camera movement.

Symptom C: Poor Tracking Performance.

- Check that the Registration Zones are positioned correctly on the field of view.
  - Use diagnostics (RegDisp) to confirm they adjust to the movement.
- Count Zones drawn below the stop bar should have the channel output set to NONE.
  - If this is not followed, the Count Zone becomes the bottom most zone in the lane structure and can cause the stop bar detection algorithm to be looking at the wrong area in the image to find a stop bar and therefore impact its performance.

Symptom D: I programmed a Registration Zone but it is now a Detection Zones

The maximum number of Registration Zones is four. Once the user hits the maximum number allowed any additional Registration Zones drawn will be defaulted to a Presence Zone by the system.

Symptom E: The stop bar and lane lines are not visible

If the stop bar and lane lines become obscured by traffic, snow or other conditions the SmartSpan® system will continue to operate. Registration Zone functions will be vetoed by the system and no compensation for camera movement will occur. This may result in a temporary drop in performance. Once the stop bar and lane lines become visible the system will begin to compensate for camera movement.

FAQ: Can I upgrade my standard Edge®2 processor to SmartSpan® technology.

Due to the large difference in the code structure between a SmartSpan® and an Edge®2 processor it is not possible to convert from one to the other.

5. PRODUCT SUPPORT

The Iteris® Product Support Team consists of a group of highly skilled individuals that are knowledgeable and readily available to answer your questions or assist you with any of our Vantage products. Please do not hesitate to contact us at:

☎ Toll free: (888) 254-5487

For more information on Iteris, as well as the products and services that we provide, visit our website at:

🖥 www.iteris.com

Iteris Resource Center

This site contains additional training and technical support information covering the whole range of Vantage products. Registration is easy. Visit the address below to register and begin enjoying the benefits immediately.

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The Resource Center app is available from the Apple App Store or the Google Play store.

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