VersiCam™
User Guide

ITERIS®
Innovation for better mobility

Part Number 493432201 Rev. F

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1. INTRODUCTION

Powerful yet affordable

The Iteris VersiCam is a complete video vehicle detection solution that is a cost effective replacement to inductive loops and other sensor technologies for many smaller intersections. Other applications include advance detection, highway, ramp metering, and construction-work zones.

Versatility with value

VersiCam™ is an integrated machine vision processor and camera solution, designed for small or semi-actuated intersections. VersiCam offers the same high performance as our Vantage® video detection products in a low-cost package.

VersiCam is a versatile, high resolution video traffic camera specially optimized for machine vision processor technology. The camera offers remote zoom and focus functions to simplify setup and includes a high sensitivity color imager (CCD) to ensure accurate vehicle detection in all lighting conditions.

The VersiCam solution includes the Interface Communication Controller (ICC) that resides in the roadside cabinet. All user interface functions are performed through the ICC such as virtual zone placement, detector output assignment, and video monitoring.

Affordable and accurate

VersiCam compliments the existing Vantage range of Edge®2 video detection products by providing entry level video detection and output presence detection at a cost-efficient price. Your investment is future-proofed by VersiCam's flexible design that can support simple firmware upgrades.

Benefits

- *Optimized for outdoor traffic situations that aids video detection*
- *Integrated mounting brackets reduce installation and setup time*
- *Connectors located on back faceplate simplifies cable connection*
- *Proportional power-controlled internal heater prevents ice and condensation resulting in improved video detection performance in adverse weather conditions.*

Interface Communication Controller (ICC)

- *ICC Card – fits in all 170 input files, NEMA TS-1 and TS-2 cabinets*
- *ICC Shelf-mount - available for non-rack applications*
- *Bracket – flexible and adaptable camera mounting bracket*
- *Cabinet set-up using monitor and mouse*

Vantage VersiCam was designed to meet the needs of semi-actuated and smaller intersections that do not require the full capability of the flagship Vantage Edge2 product. VersiCam provides the same solid detection performance and ease of use as the legendary Edge2 product with a scaled down feature set and at a more competitive price. Now you can bring the proven performance and versatility of Vantage video detection to your smaller intersections at a very cost effective price. Simple, dependable, no frills video detection for your smaller intersections and entry level applications. VersiCam, the intelligent yet affordable solution for smaller intersections.

1.1 Overview

The VersiCam system is composed of the ICC module and the Camera Processor unit. Unlike the Vantage Edge2, the processor is integrated into the camera assembly. The ICC module is rack mountable or can be shelf mounted using an available enclosure just like an Edge2 processor module, however, it only processes communications, provides contact closure outputs and provides power to the Camera Processor Unit. The ICC module has two output channels that can be assigned to any of the six detection zones. Communication, power, and video are interfaced from the ICC module to the Camera Processor unit using an IMSA 39-2 or 40-2, 3 pair stranded, 19AWG multi conductor cable. The new camera housing, that is a scaled down version of the current production RZ-4C camera housing, also provides a new and innovative method for terminating the multi conductor cable wiring. No special connectors are required and no special tools are needed other than a small screwdriver and a pair of 19AWG wire strippers.

Another innovation is the integration of the camera Zoom and Focus operations into the Camera Processor unit, thus eliminating the need for a traditional lens adjustment module (LAM). This also allows the camera Zoom and Focus operations to be performed from the cabinet using the ICC module system menu and a USB mouse. The installer will no longer need to make use of the dark focusing film (filter) or welders glass to open the camera iris during the focusing procedure. VersiCam opens the iris electronically and automatically during the camera focusing process. These functions and procedures will be described in detail in the following sections of this manual.

The interface to the Camera Processor unit is outwardly the same as the Edge2 processor module, utilizing the Menu button, a monitor and a USB mouse to access the VersiCam system menu. Veteran Edge2 users will be pleasantly surprised to see the menu layout for the VersiCam is almost identical to the Edge2 processor, only scaled back to account for the smaller function subset. VersiCam users will enjoy the same signature Vantage ease of use and detection performance as users of the more feature rich Edge2 video detection system.

If you have questions once you have completed the steps within this guide, refer to ***Section 6: Troubleshooting/FAQs*** or contact product support using the number listed in ***Section 9: Product Support***.

1.2 Tools and Equipment

Iteris Supplied Parts

The following items come supplied with the system:

- VersiCam Camera Processor
- ICC Module
- Scotchlok 4460-D Shield Connector
- Surge suppression
- 6’ (1.8meter) coax cable
- Mouse
- Small slotted screwdriver

Customer Supplied Parts

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

- IMSA 39-2 / 40-2, 3 Pair Stranded, 19AWG (Example: Belden 581718)
- Stainless Steel Banding Material
- Cable Strain Relief for IMSA cable
- Miscellaneous Supplies: Electrical Tape, Tie Wraps

☑ ***Note:*** *Refer to* ***Section 10: Technical Information*** *for specification of the IMSA cable.*

Tools Required for Installation

The following tools are required for installation of the VersiCam system:

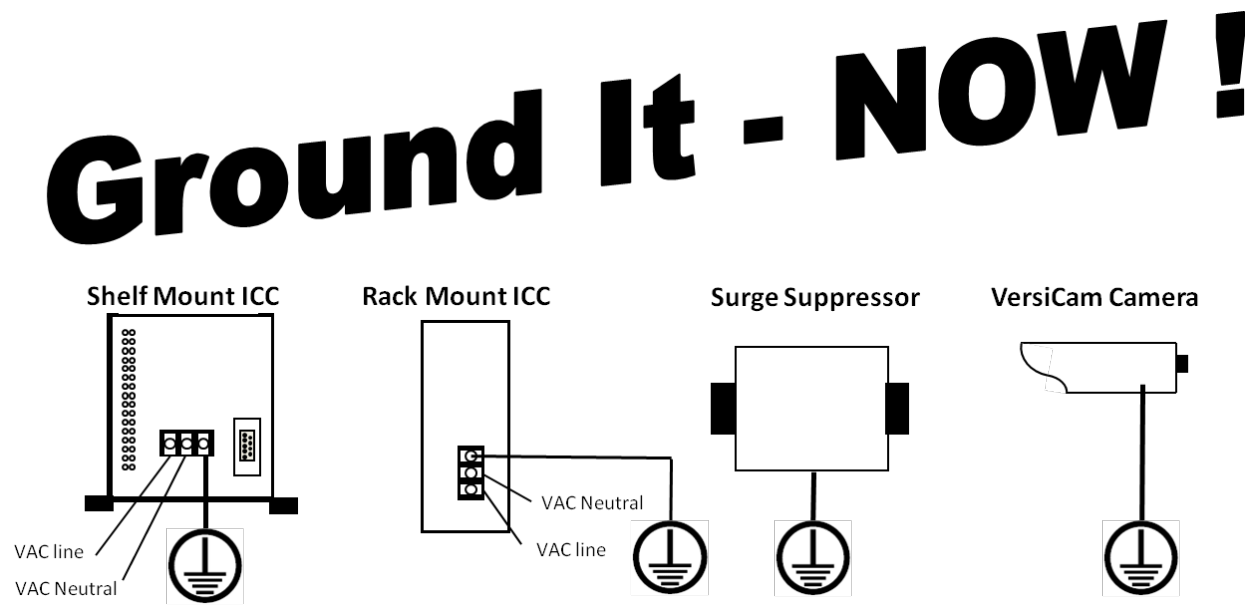
- Various Screwdrivers
- Adjustable Wrench and Nut Drivers
- Wire Strippers and Wire Cutters
- Banding Tool
- Fish Tape (Non-Conductive)
- Hole Saw

2. QUICK START

This section is a highly abbreviated outline of the processes involved in drawing a vehicle detection zone. The topics following this quick start section will cover the process in greater detail. It is strongly recommended that the user take the time to read all the sections to become thoroughly familiar with all the system details.

CAUTION! *The Vantage equipment must be grounded. Failure to ground the Vantage equipment can cause the Vantage equipment to fail. Test your power outlet, socket and power strip to ensure it is grounded.*

CAUTION! *The Vantage equipment is sensitive to static, use correct ESD procedures when handling the modules.*



Note: *Ground components to a common source to avoid ground loops.*

2.1 Installation Process

This checklist can be used as a guideline for some of the necessary considerations that must be remembered whenever installing and turning on an intersection using the Vantage video detection system. This is by no means intended to be a detailed and all inclusive list. All of these areas and topics will be covered in great detail in the following sections of this document.

a. Correct Interface and Power Cable
   - IMSA 39-2/40-2 cable
   - Power cable = 3 conductor, 16awg, stranded wire

b. Surge Protection – Installed and properly grounded

c. Camera Installation
   - Mount the camera bracket, attach camera
   - Electrical connections (Power and Video) properly made
   - Sun shield adjusted - Pulled out (Extended)
   - Camera tilted slightly downward

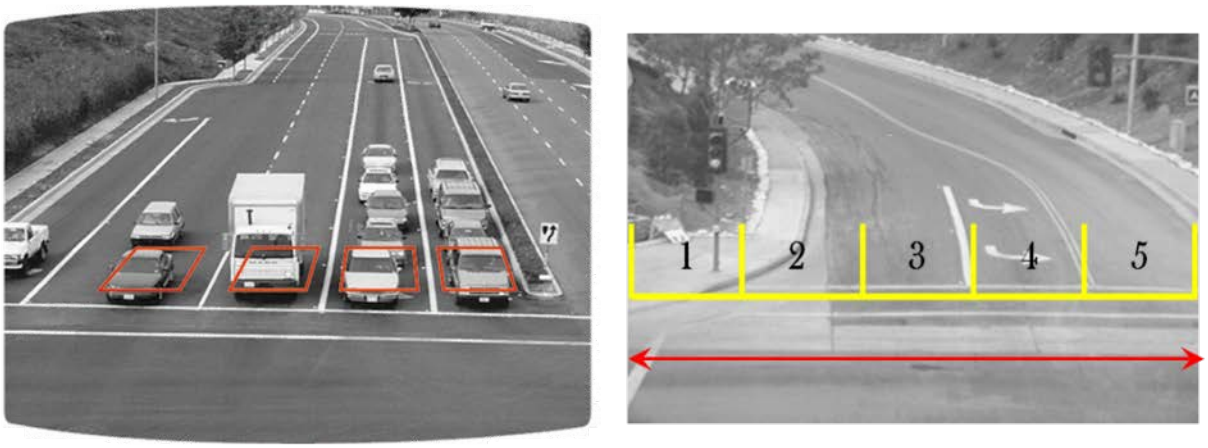
d. ICC Installation
   - Switches properly set
   - Plug the ICC Module into the appropriate slot of the detector rack or input file.
   - Connect the monitor and mouse to the ICC Module.
   - Press and hold the ICC Module "Menu" button in for approximately one second and then release it. This will bring up the VersiCam main menu.

e. Camera Field of View (FOV)
   - No Horizon in FOV
   - Minimum 4 lane width
   - Stop bar area in lower 1/3 of FOV
   - Car bumpers parallel to bottom of screen
   - Adequate area left for advanced detection

You never want the horizon to be included as part of your camera field of view. If the horizon is visible as part of your field of view on East and West approaches, the camera maybe blinded by the sun at sunrise and sunset. The camera should be rotated so that the bumpers of the vehicles are parallel with the bottom of the screen.

Examples of Poor FOVs

Ideally, the camera should be zoomed in until a minimum of 4 lanes are visible, the horizon should not be included as a part of the field of view. The zones should be drawn within the lane lines and should be the size of a medium vehicle.



Examples of Good FOVs

f. Zones

- Size of average vehicle – 12’ (3.6m) long from top line to bottom line of zone
- Vertical markings, curbs and gutters out of zone area
- Symbol markings contained in zone
- LC zones properly drawn
- And/W number same as zone number if not being used

It’s Easy – Left click the mouse button when the cursor is over the "Add" menu item, which is the first choice on the left side of the main menu bar. The sub menu will be displayed showing the various zone parameters of the vehicle detection zone that you are about to create. You can change the zone settings by left or right

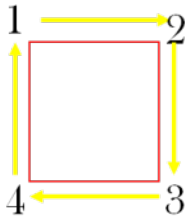
clicking the mouse after moving the cursor up or down to the desired zone parameter. Click the middle mouse button to make a selection and exit out of each zone option item. When you are finished making zone parameter changes, position the mouse cursor over "Exit" and click the left mouse button to exit the "Add" menu.

Some Typical Zone Parameters:

Label 1
Dir ANY
Grn/In NONE
Type PRES
And/W 1
Ch/Out PROC: 2
Exit

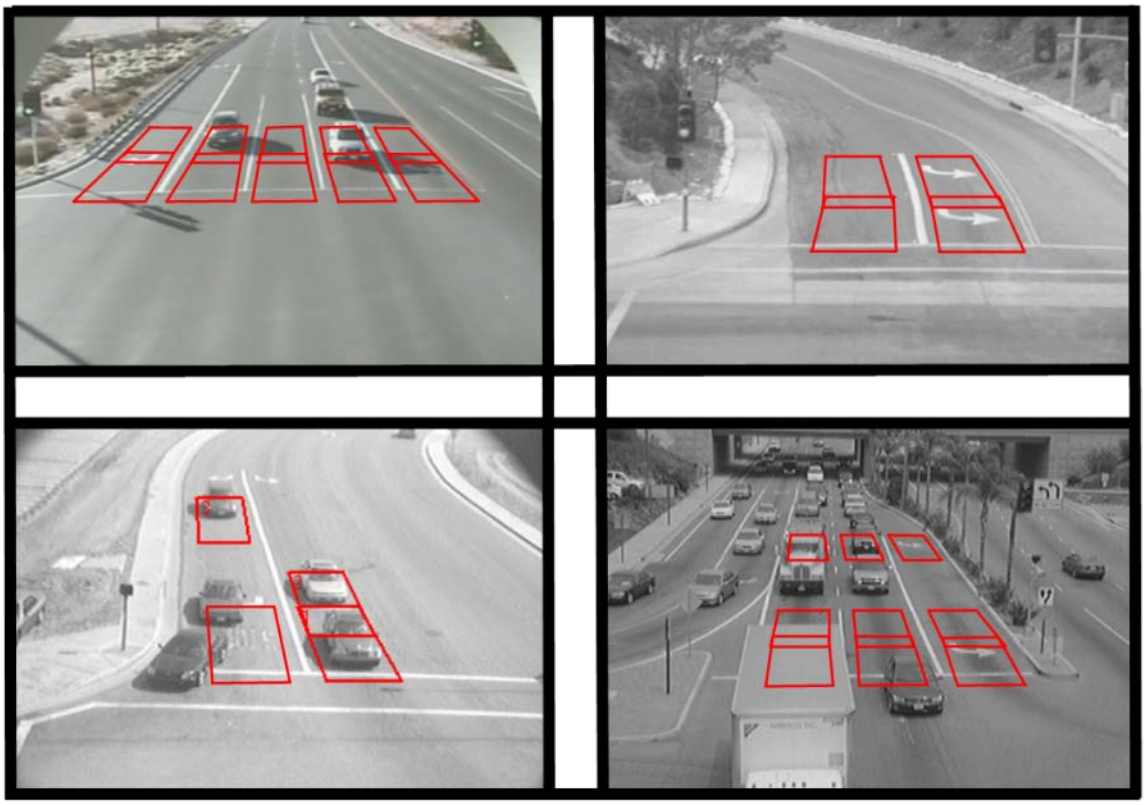
You are now ready to start drawing a vehicle detection zone, place the cursor where you want to anchor the back left corner of the zone. Left click the mouse to anchor the first corner. Now, move the cursor to where you want the right rear corner of the zone, left click the mouse to anchor the corner. Next, move the cursor to where you want to place the right front corner of the zone, left click the mouse to anchor the corner. Finally, move the cursor to where you want to place the left front corner of the zone, left click the mouse to anchor the final corner.

Vehicle detection zones should be drawn the length of a medium size vehicle from back to front bumper, a single zone should not encompass the entire length of the vehicle and the width should be slightly narrower than the lane lines. Multiple or overlapping zones will increase the detection sensitivity. Realize that excessive overlapping may also increase false calls from artifacts in the roadway.



Repeat the process to draw additional zones for all your stop bar traffic, left turns, and advance detection. After your zones are all drawn the way you want them, be sure to left click "Q" (Quit) and save your configuration by left clicking the mouse on Config 1 on the "Save" menu. If you do not save your configuration, it will be lost as soon as you exit the main menu. You may want to save the same configuration to all three configs (1,2,&3) so you will have a backup copy of the configuration if you need it.

LC (fog) zones are located in the top 1/3 of the screen. They are no bigger than ¼" by ¼ ". The LC zones are assigned to channel "0" or "none". They are placed in an area of contrast. We recommend 2 LC zones per approach.



Examples of Good Zones

g. Programming
   - Labels: Camera, Configuration, Zones
   - Check using Mode (MOD) menu item
     - Channel Assignment and Zone Type
   - Set Mode (MOD) 'Inact/Ch to "NoCall"
   - Set Options if needed
   - Set Clock (Clk) Time and Date information
   - Make sure the test switches are all in the middle position (normal)

h. Archive snapshots and configurations using VRAS

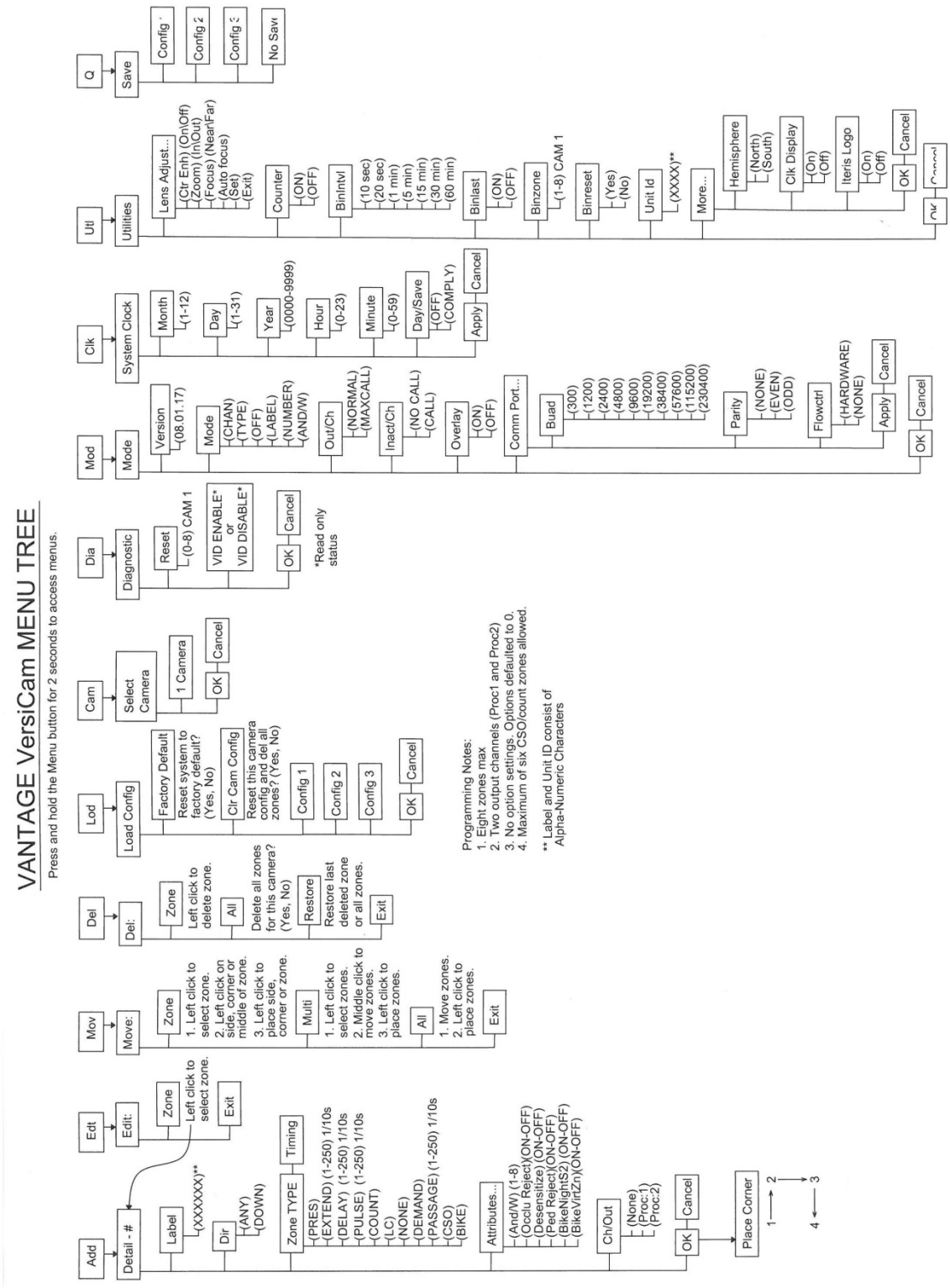
i. Observe operation
   - During critical times
     - Morning and evening transition
     - Midday and night time

After saving the configuration, the new zones will go into a three minute "learn mode", during which time they will place constant calls. An "*" will appear next to each zone that is learning. After the three minutes are up, the "*" will disappear, and zones should start to detect vehicles normally.

j. Document count zones (If used)

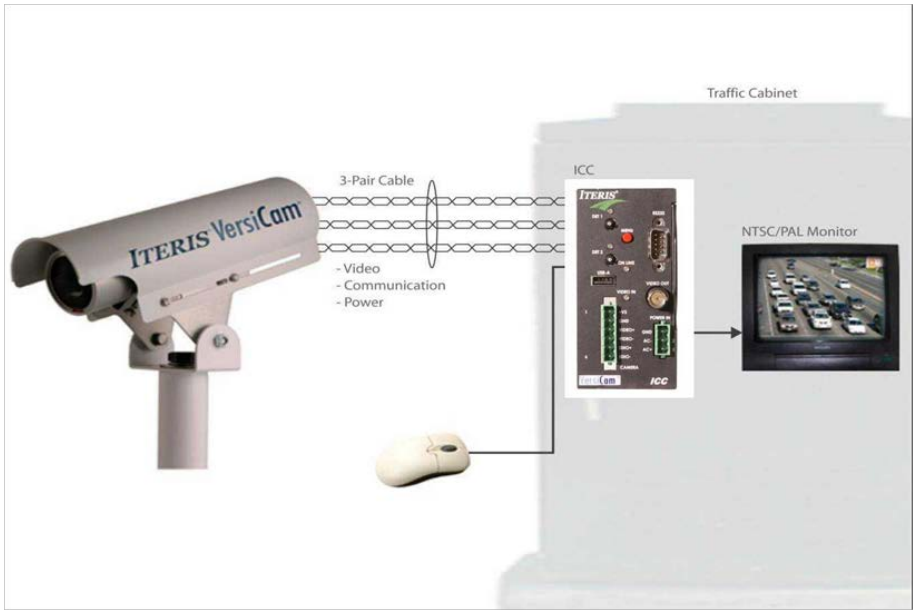
k. Turn OFF menu / Turn Off Monitor

2.1 Menu Tree


VANTAGE VersiCam MENU TREE
Press and hold the Menu button for 2 seconds to access menus.
Add
Edt
Mov
Del
Lod
Cam
Dia
Clk
Util
Q
Detail - #
Edit:
Move:
Del:
Load Config
Select Camera
Diagnostic
System Clock
Utilities
Save
Label
Zone
Zone
Zone
Factory Default
1 Camera
Reset
Month
Lens Adjust...
Config 1
Dir
Left click to select zone.
1. Left click to select zone. 2. Left click on side, corner or middle of zone. 3. Left click to place side, corner or zone.
Left click to delete zone.
Reset system to factory default? (Yes, No)
OK
(0-8) CAM 1
Day
Counter
Config 2
Zone TYPE
Exit
Multi
All
Cir Cam Config
Cancel
Year
BinIntvl
Config 3
Timing
Restore
Reset this camera config and del all zones? (Yes, No)
Hour
Binlast
Attributes...
Config 1
Restore last deleted zone or all zones.
Hemisphere
Ch/Out
Exit
Delete all zones for this camera? (Yes, No)
Minute
Binzone
Config 2
Clk Display
Place Corner
Cancel
Day/Save
Binreset
Config 3
Iteris Logo
OK
Apply
Unit Id
Cancel
More...
Cancel
Programming Notes:
1. Eight zones max
2. Two output channels (Proc1 and Proc2)
3. No option settings. Options defaulted to 0.
4. Maximum of six CSO/count zones allowed.
** Label and Unit ID consist of Alpha-Numeric Characters
*Read only status
VID ENABLE* or VID DISABLE*
Version
Mode
Out/Ch
Inact/Ch
Overlay
Comm Port...
Buad
Parity
Flowctrl
Apply
Cancel
OK
Cancel
Mod
Mode
(08.01.17)
(CHAN) (TYPE) (OFF) (LABEL) (NUMBER) (AND/W)
(NORMAL) (MAXCALL)
(NO CALL) (CALL)
(ON) (OFF)
(300) (1200) (2400) (4800) (9600) (19200) (38400) (57600) (115200) (230400)
(NONE) (EVEN) (ODD)
(HARDWARE) (NONE)
(0000-9999)
(1-12)
(1-31)
(0-23)
(0-59)
(OFF) (COMPLY)
(10 sec) (20 sec) (1 min) (5 min) (15 min) (30 min) (60 min)
(ON) (OFF)
(1-8) CAM 1
(Yes) (No)
(XXXX)**
(North) (South)
(On) (Off)
(On) (Off)
(Ctr Enh) (On\Off) (Zoom) (In\Out) (Focus) (Near\Far) (Auto focus) (Set) (Exit)
Config 1
Config 2
Config 3
No Save
(XXXXXX)**
(ANY) (DOWN)
(PRES) (EXTEND) (1-250) 1/10s (DELAY) (1-250) 1/10s (PULSE) (1-250) 1/10s (COUNT) (LC) (NONE) (DEMAND) (PASSAGE) (1-250) 1/10s (CSO) (BIKE)
(And/W) (1-8) (Occlu Reject)(ON-OFF) (Desensitize) (ON-OFF) (Ped Reject)(ON-OFF) (BikeNightS2) (ON-OFF) (BikeVirtZn)(ON-OFF)
(None) (Proc:1) (Proc:2)
1. Move zones. 2. Left click to place zones.
1 → 2 → 3 → 4

3. INSTALLATION

The VersiCam system is composed of two distinct components, the Camera Processor unit and the ICC module which is located in the traffic control cabinet. The Camera Processor unit and the ICC module communicate over twisted pair cable. The cable transmits data and provides power from the ICC module to the Camera Processor unit. A USB mouse and a video monitor provide the necessary user interface to the ICC module. The module can also be configured using a laptop computer and Iteris VRAS software.

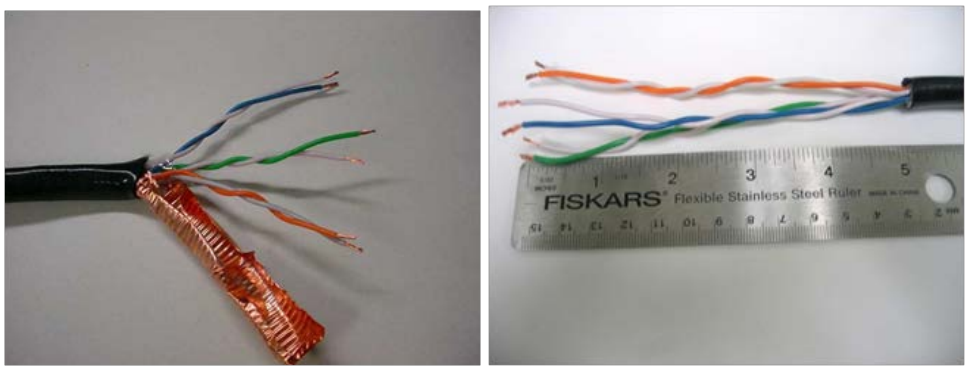


The VersiCam System

3.1 Camera Installation

The Camera Processor unit integrates the camera and video processor into one. Communication data and video are sent back to the ICC module via twisted pair cables.

Camera Processor Unit Wire Terminations



Multi Conductor Cable Wire Pairs

You will require three 19 gauge stranded wire pairs. Carefully strip the multi cable outer jacket back approximately five inches without nicking or damaging the insulation on the wire pairs inside. Scoring the outer jacket lightly with a sharp knife and bending the outer jacket sheath back and forth until it parts is the safest method. Cut the corrugated copper shield and the plastic core wrap flush with the outer jacket being careful not to damage the wire pairs. Separate the three wire pairs and strip each of the wires insulation back approximately 1/4 inch.

Important: *If wire color pairs are not uniquely color coded or marked, be sure to label or number the wire pairs ahead of time so they can easily be identified at the other end. Use of mismatched pairs and wires can lead to installation issues and possible damage to the VersiCam equipment. Also make note of which wire pairs are being used for what purpose i.e., camera power, video, or communication.*

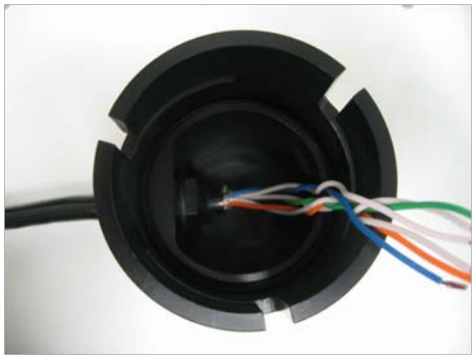
Back Cap Assembly

To separate and remove the back cap assembly from the back of the Camera Processor unit, loosen the camera visor screws and move the sun shield to its extreme forward position. Grasp the back cap assembly firmly and twist it approximately one quarter turn to free the two posts from their detent position in the slots and allow the cap assembly to be pulled free from the back of the Camera Processor unit housing.

Cord Grip

Strain Relief Plug Pushed Over Cable

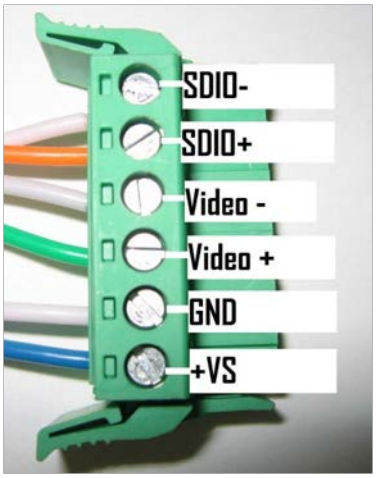
Remove the cable cord grip cap and grommet from the assembly by unscrewing it. Install the grommet and cap on the cable and push the prepared cable through the cord grip body approximately four inches as shown below.



Push Cable Through Cap Assembly

Back of Camera With Cap and Plug Removed

Re-assemble the cord grip. After the cord grip is securely installed back on the cap assembly, tighten the nylon nut down until it the inner rubber grommet firmly grips the cable body. Hand tight is usually sufficient.

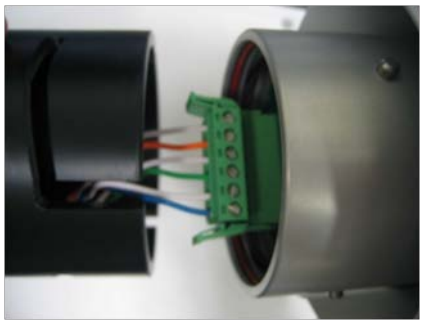


Camera Processor Unit Connector Plug

Connection	Function	Color
SDIO -	Communications	White
SDIO +	Communications	Orange
Video -	Video	White
Video +	Video	Green
GND	Power	White
VS +	Power	Blue

Terminate the wires to the Camera Processor unit connector plug as shown. Be sure to observe the connector orientation. Insert each wire into the correct slot on the Camera Processor unit connector plug. Secure each wire in place by tightening down each screw using a small flat blade screwdriver.

Connect Wires to Connector Plug



Wired Connector Plug in Place

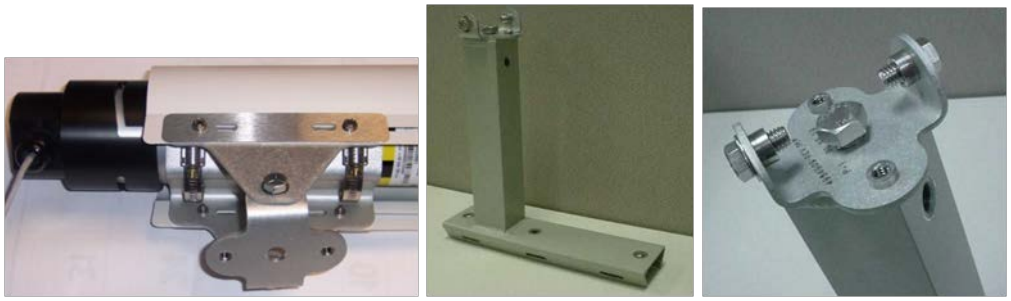
Plug the connector plug into the socket on the back of the Camera Processor unit housing, it is keyed so you can only plug it in one way.

Cap Assembly Re-Installed

Align the slots in the (black) cap assembly with the three posts on the Camera Processor unit housing. Grip the cap assembly firmly and push it into place. When the two posts are fully seated, give the cap assembly a quarter turn to fully secure it to the Camera Processor unit. When you are finished it should look like the picture above.

Pull the camera sun shield back and snug down the camera bracket set screws. Final adjustment of the sun shield will be done later during the Field of View (FOV) setup procedure.

Mount the camera bracket to the pole arm using stainless steel banding material. Do not use hose clamps, they tend to loosen over time and may result in the camera moving and slipping on the pole. The luminare arm or signal mast arm are typical mounting locations. Choose a location where the camera is centered over the approach and has enough height to avoid cross traffic occlusion. A five or six foot extension bracket may be required on signal mast arms to obtain acceptable height. Though some luminare arms will provide good height, they may not be centered over the approach and if they are too far to one side can also create occlusion issues. If you are still unsure about the best camera mounting location, you can always contact your local Iteris Dealer or call Iteris Product Support for recommendations on optimal camera mounting for your application.

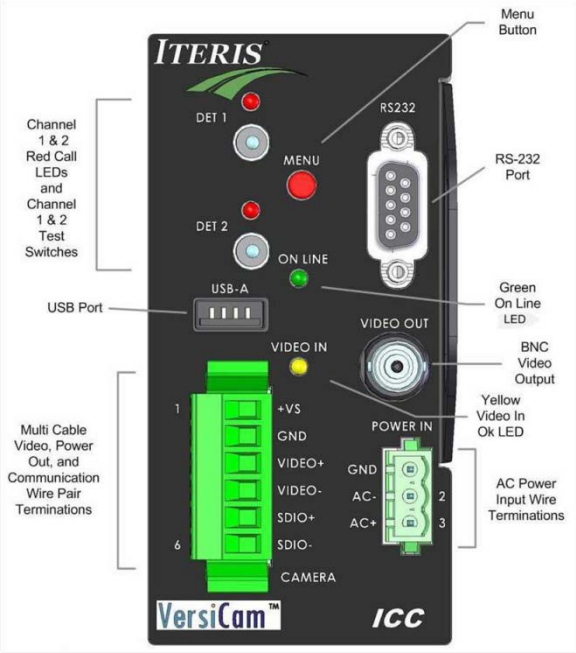


Camera Mount to Camera Bracket (Pedestal)

Connect the Camera Processor unit camera mount to the camera bracket (pedestal) using the center bolt to secure both pieces together. Snug the center bolt and the two side camera mount bolts down temporarily. Final camera aiming will be done during the Field of View (FOV) setup procedure and all bolts will be permanently secured then.

Camera Installed on Pedestal Bracket

3.2 The ICC Module



The VersiCam ICC Module

The ICC module is the cabinet interface to the Camera Processor unit. It provides power to the Camera Processor unit and receives video and data. It places the detection calls in the detector rack or input file. The following section defines some of the features of the ICC module.

Menu Button - press the Menu button for two seconds and then release it to bring up the System Menu Bar on the monitor video overlay.

Green On Line LED - this indication should always be illuminated when the ICC module is operating. Failure of the On Line LED to illuminate, when the proper power is applied, indicates a problem with the ICC module and it should be sent in for evaluation and repair.

USB Port - this port is used for USB communications to the ICC module. This is also where the USB mouse is connected during setup and programming operations.

Yellow Video In Ok LED - this indication should be on solid during normal operation. If this LED fails to illuminate or blinks after the power and other wire terminations have been made, re-check the cabling terminations. If the VIDEO IN OK LED still fails to illuminate or blinks, contact your local Iteris Dealer or Iteris Product Support Team for assistance. Also see the section on the VIDEO IN OK LED in the ICC module installation section for more information.

Multi Cable Wire Pair Terminations - this is where the multi conductor cable wire pairs coming from the Camera Processor unit are terminated to the ICC module. One pair each for power output, video, and communication - three pair total.

AC Power Wire Terminations - the ICC module requires a source of 120 VAC power. If AC power is not available from the detector rack on pins L, M, and N then power should be hooked up here. If power is provided on pins L, M, and N, the front plug is automatically disabled.

Channel 1 & 2 Call LEDs - these indicators should illuminate when calls are being placed to the outputs of the ICC module. They represent open collector outputs triggered by the detection zone that the channel it is associated with.

Channel 1 & 2 Test Switches - these toggle switches have three positions. The default position is in the middle and is the position they should be kept in during normal operation. The switch can be manually pushed up to place a momentary call (contact closure) on the output channel or can be pushed down to place a constant call on the output channel for testing or troubleshooting purposes. When you are done testing, be sure to restore the switch to the middle position for normal operation.

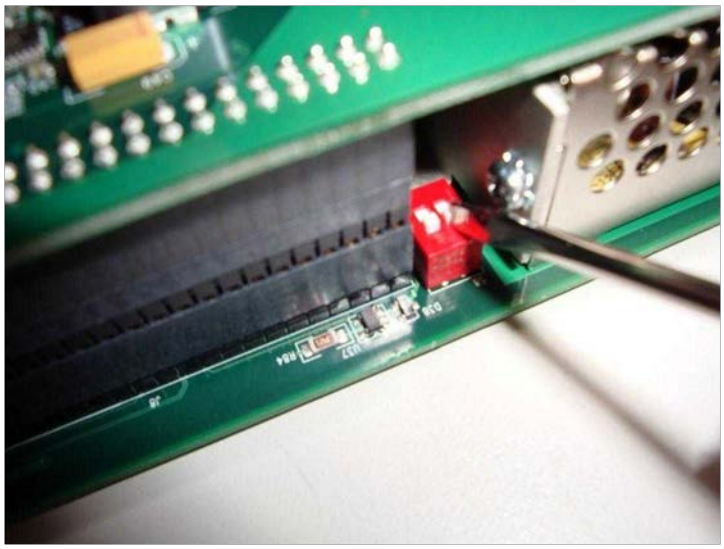
RS-232 Port - this serial port is used to communicate with the ICC module via RS-232. This port would normally be used for firmware upgrades using the Vantage Software Upgrade (VSU) program to upgrade the VersiCam firmware. This port can also be used for direct connection with the Vantage Remote Access Software (VRAS).

BNC Video Out - this is the video output from the ICC module. This is where the user would hook up a video monitor during setup and programming to see the Camera Processor unit output video and video overlay.

ICC Module Configuration Switches

There is a set of configuration DIP switches located on the top side of the bottom board of the VersiCam ICC module as is shown in the following pictures.

Screwdriver Pointing to the DIP Switches On VersiCam Module



Close Up of the DIP Switches Both Shown in the "ON" Position

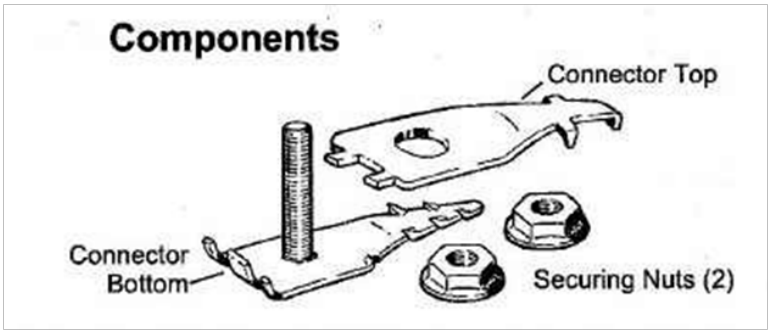
These switches are used to configure the ICC module for use in a NEMA TS-2 type detector rack. Both of the DIP switches should be in the (UP toward the top card edge) "ON" position for use in a TS-2 type detector rack. For other rack types the DIP switches should remain in the (DOWN away from the top card edge) "OFF" position. The position of these switches for operation in racks other than a NEMA TS-2 is not critical.

ICC Module Wire Terminations

There are two sets of wire terminations that must be made on the ICC module. One multi-conductor cable will be used for video, communication, and camera power. A second cable will be used for ICC module power. Both cable terminations will be covered in detail in this section.

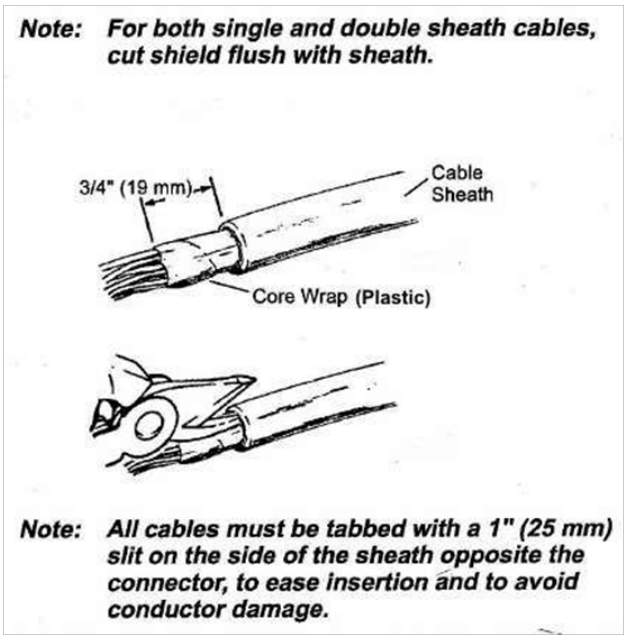
Installation of Grounding Lug

The following section covers installing the grounding lug on the cabinet side of the multi-conductor cable.

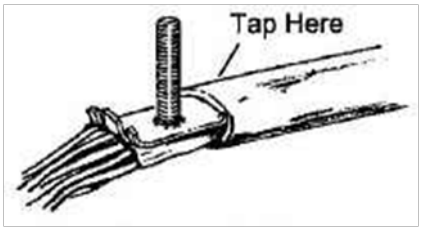


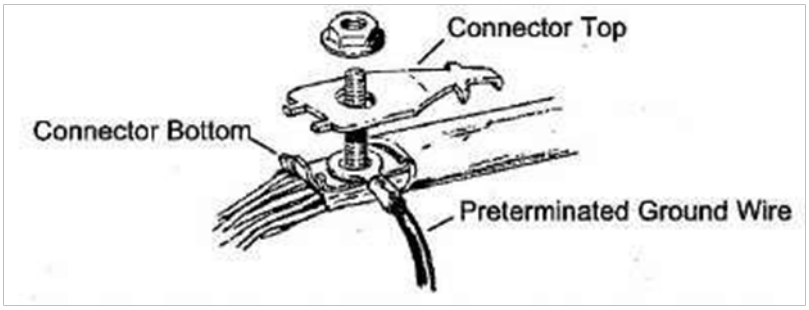
3M Scotchlok 4460-D Grounding Lug

Take the three pair 19 AWG stranded multi-conductor cable and install the grounding lug per manufacturer's instructions. Carefully strip back the cable jacket sheath a total of about 2 ½ inches. Scoring the outer jacket lightly with a sharp knife and bending the outer jacket sheath back and forth until it parts is the safest method. Cut away the corrugated copper shield flush with the cable sheath being very careful not to nick the twisted pair wires inside. Then cut back the cable core wrap (clear plastic) so about 3/4 of an inch remains as shown in the picture below. Take a sharp knife or a pair of shears and carefully make a one inch slit in the cable jacket sheath to ease insertion of the ground lug connector bottom.



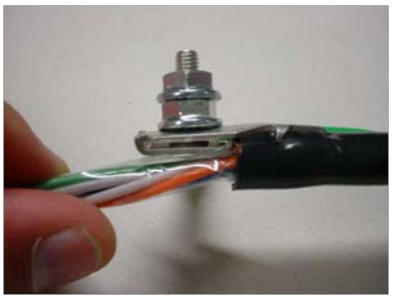
Insert the ground lug connector bottom on the opposite side that you cut the slit in the cable sheath. The lug should be inserted between the core wrap and copper corrugated shield.





Install a ground wire, 14 gauge or larger, to to the post on the grounding lug and then place the connector top over the the post and secure it in place using one of the nuts provided. Run the ground wire the shortest distance, without severe bends, to the cabinet equipment grounding buss.

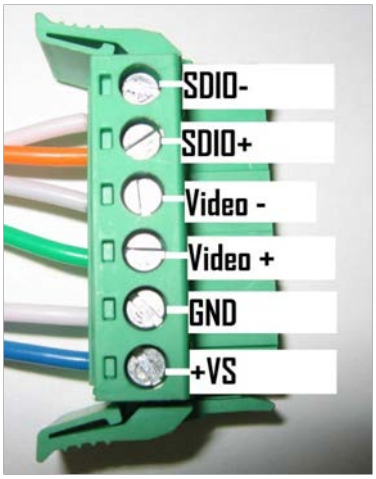
Inserting Connector Bottom (Tap)



Finished Grounding Lug Assembly

ICC Module Wire Terminations

You will require three 19 gauge stranded wire pairs. After the grounding lug has been installed, separate the three wire pairs and strip each of the wires insulation back approximately 1/4 inch.



ICC Module Connector Plug

Connection	Function	Color
SDIO -	Communications	White
SDIO +	Communications	Orange
Video -	Video	White
Video +	Video	Green
GND	Power	White
VS +	Power	Blue

Next, insert each wire into the correct slot on the ICC connector plug as shown. Be sure to take note of the orientation of the plug in the picture. Secure each wire in place by tightening down each screw using a small flat blade screwdriver.

ICC Module with All Connector Plugs Installed

Plug the fully wired connector plug into the ICC Module, it is keyed so you can only plug it in one way.

ICC Module AC Power Requirement

The VersiCam ICC module requires AC power which can be supplied by the plug on the front faceplate or can be supplied from the back of the module on pins L, M, and N. If AC power is available from the rack on pins L, M, and N, the front panel connector is disabled. If the rack does not provide AC power on pins L, M, and N, use the pre-wired AC power cord. Plug it into a suitable 120 VAC source and plug the other end into the socket on the front of the ICC module.

Typically, NEMA users will need to use the front plug for AC power while 332 / 170 type users will have AC power supplied from the cabinet input file (rack).

IC Module AC Power Cord

ICC Module Connector Plug Sockets

AC Power Cord Plug Installed

The three pin socket on the right side of the ICC module face plate is for the power connections. Insert the plug into the socket as shown, the connector is keyed and can only be inserted one way. The table indicates pin assignment when AC power provided from the input file backplane.

Backplane Pins	120VAC
L	Chassis Ground
M	AC- Neutral
N	AC+ Hot

ICC Module Installation

Logic Level Optoisolated Contact Open Collector Outputs

The ICC module is designed to be installed in a standard NEMA TS-1 or TS-2 detector rack or in a standard 332 cabinet type detector input file. To the rack, the ICC module looks like a two channel detector loop amplifier. Though the ICC module foot print takes up two rack spaces like a four channel loop amplifier, the output board edge connector only plugs into one of the detector rack slots - the slot on the right. This slot is where the two logic level contact closure outputs will be placed and will call the phase or phases associated with that detector slot. Where you plug the ICC module in the detector rack will determine what phases it will call when the detection zone associated with that channel is activated.

The ICC module operates on 120 -240 VAC, realize that the module also requires 12 or 24 VDC from the detector rack or output file to operate if you are bringing AC into the front of the module. Having correctly terminated the video, power, and communication wires from the Camera Processor unit as described in the previous section, plug the ICC module into the detector rack or you can install the module into a Vantage VRack1 for stand alone operation. Make sure the ICC module has AC power (and DC power if AC power is being brought in through the front). Make sure the correct polarity has been observed on DC, video, and communication wire pairs. The ICC module should power up and the green ON LINE LED should come on solid. If the Camera Processor unit is properly hooked up to the ICC module, the Yellow VIDEO IN OK LED should also illuminate. If the green ON LINE LED fails to illuminate, check the AC power and power connections. If the green ON LINE LED still fails to illuminate, call for product support, the ICC module may need to be sent in for repair.

Video Sync at Camera Processor	Video Sync at ICC Module	VIDEO IN OK LED
No	No	Off
Yes	No	Flashing
Yes	Yes	On Solid (Normal Operation)

ICC Module "VIDEO IN OK" Yellow LED Indicator

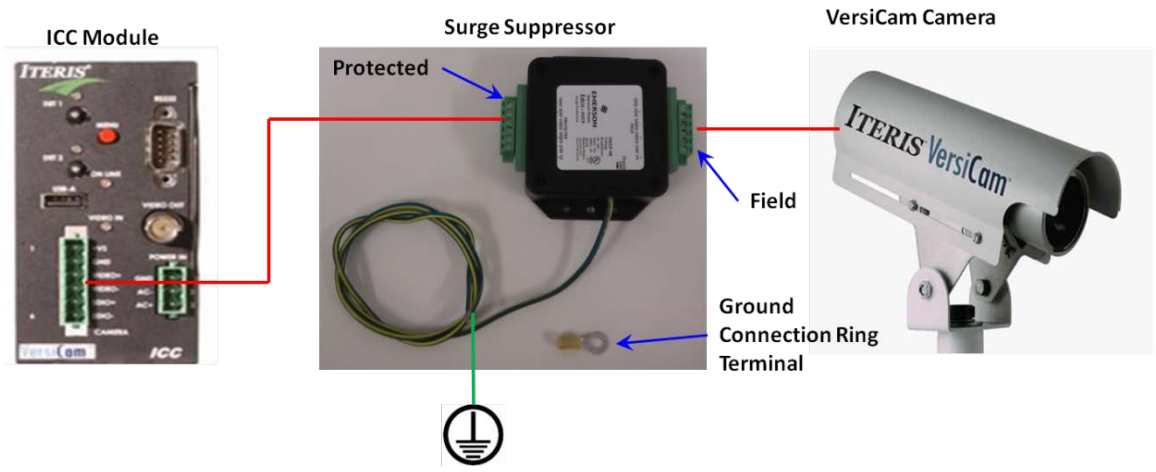
If the yellow VIDEO IN OK LED is "Off" or "Flashing", re-check the video, communication, and power wire connections. During normal operation the yellow VIDEO IN OK LED should be on solid. If after checking the wiring, the VIDEO IN OK LED is still off or blinking, call for product support.

Important: *If using IMSA 39-2 or 40-2 cable ensure the correct white wires go with the matching colored wire.*

Plug the USB mouse into the USB port and connect a monitor to the Video Out port on the ICC module using a coax cable. Turn the monitor "On" and you should be able to view the output video from the Camera Processor unit. Now you are ready to perform system setup.

Surge Protection

The Edco HVCP Series is a hybrid surge protection product featuring DC power, data and video protection in one package. Each separate circuit is capable of handling high-current impulses while tightly clamping transients and allowing critical power and data to be transmitted. The surge protection should be mounted in the traffic cabinet between the incoming cable from the VersiCam camera and the ICC Module.



The specification sheet for the surge protection device is available in **Section 10: Technical Information**. All surge protection must be approved by Iteris for use with the Vantage video detection systems. Failure to install surge protection, or using non-approved surge protection devices, will void the Vantage equipment warranties.

Important: *The surge protection device must be grounded to operate correctly. Failure to correctly ground the surge protection device may result in damage to the VersiCam system. The attached 12 gauge wire should run the shortest distance to ground, without severe bends, and to a common chassis ground point, is usually best. See the surge protection device manufacturer's recommendations for more specific information.*

Also, make sure the surge protector is oriented correctly. The "field" side should come from the VersiCam camera, while the "protected" side should go to the ICC Module. Reversing these surge device connections can result in significantly reduced surge protection and a greater risk of damage to your Versicam system.

3.3 Field Of View Setup

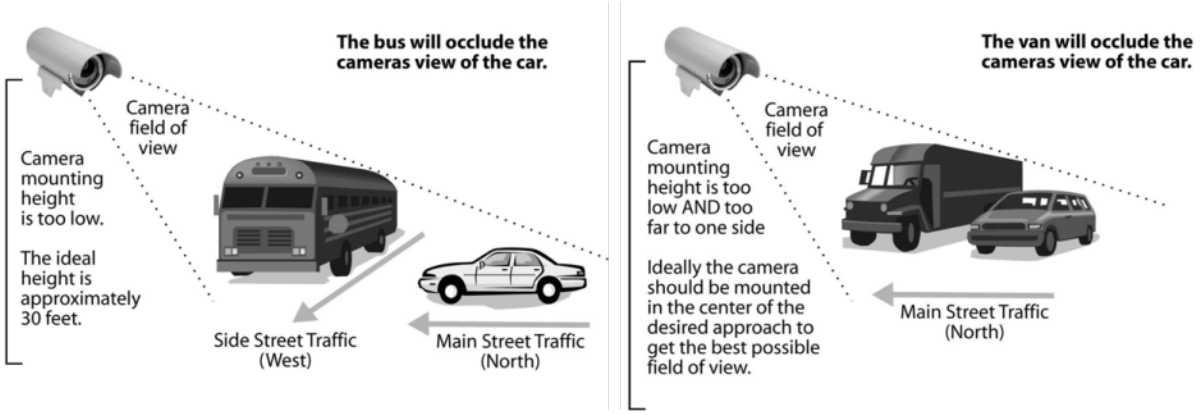
The image provided by the camera is critical to system performance. A good field of view (FOV) will ensure the best possible results from the system.

The following should be kept in mind when adjusting the camera:

- Occlusion
- No Horizon in FOV
- Minimum 3 lane width
- Stop bar area 20% to 60% from bottom of screen
- Car bumpers parallel to bottom of screen
- Adequate area left for advanced detection

Occlusion

A major issue with camera FOV is occlusion. If large vehicles block lanes or smaller vehicles then detection will not be possible.



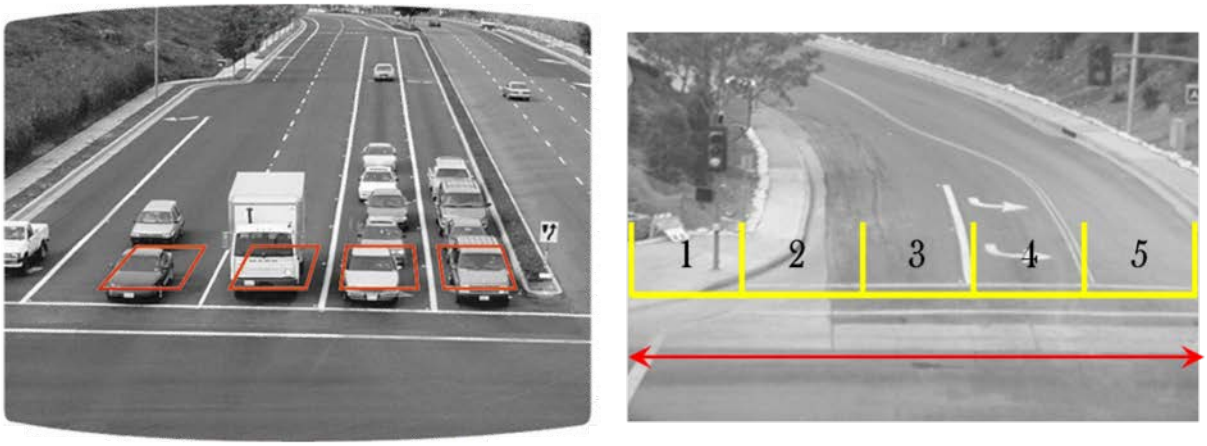
Horizon

You never want the horizon to be included as part of your camera field of view. If the horizon is visible as part of your field of view on East and West approaches, the camera maybe blinded by the sun at sunrise and sunset. The camera should be rotated so that the bumpers of the vehicles are parallel with the bottom of the screen.

Examples of Poor FOVs

Four Lane Minimum Width

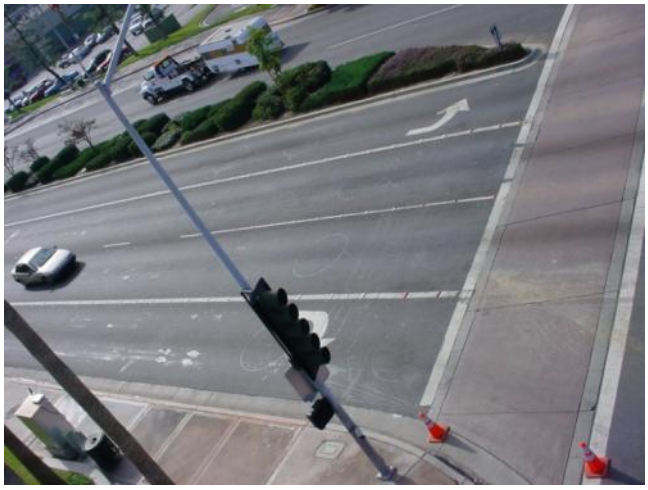
Ideally, the camera should be zoomed in until a minimum of 4 lanes are visible, the horizon should not be included as a part of the field of view. The zones should be drawn within the lane lines and should be the size of a medium vehicle.



Examples of Good FOVs

Physical Camera Adjustment

Centering the Camera – The camera should be mounted so that it is centered, as much as possible, in relation to the field of view (vehicle approach). Extreme side shooting can result in reduced performance and vehicle occlusion. See the section in this manual on "Occlusion" for more information.



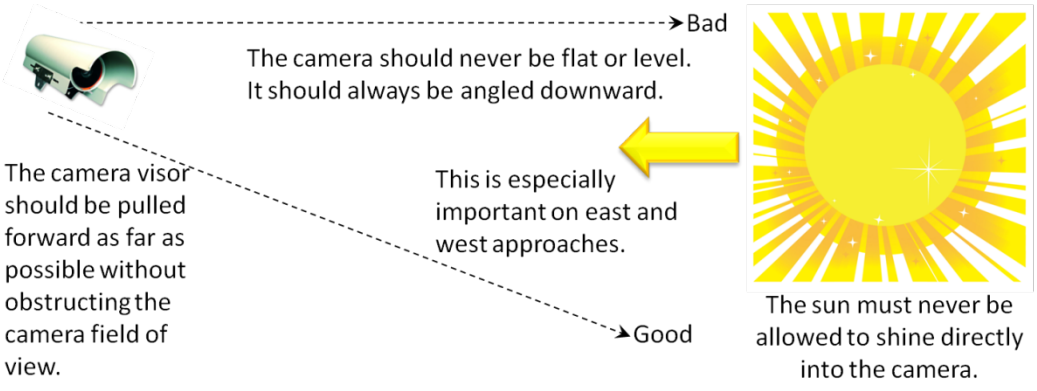
Very Poor Mounting - Side Shoot, Camera Not Centered

Proper Mounting Height – The camera should be mounted at approximately 30 feet for optimal system performance. For lower mountings, like a mast arm mount, a suitable camera extension bracket should be used to increase the camera mounting height to a more workable elevation. A camera mounting height of 25 feet or more can usually be obtained by using an extension bracket. Low mounting heights can result in reduced system performance and vehicle occlusion.

Important: *How far can the camera typically see out at a mounting height of 30 feet?*
The basic formula for LEVEL ground is for every one foot of height you can see out 10 feet. So, on level ground, at a 30 foot mounting height, you should be able to get accurate detection as far as three hundred feet. This measurement is from the camera mounting location, not from the intersection stop bar area.

Note: *The importance of camera centering versus camera height deserves some further discussion. It must be recognized how important centering the camera is to optimal system performance. In many cases centering the camera is more important than getting an additional five feet of height. For instance, when dealing with a short luminaire arm on a very wide roadway, it might be a better choice to mount the camera on the mast arm with a suitable extension bracket. With the right extension bracket you should be able to achieve a mounting height of about 25 feet. While this is less than the 30 feet you would achieve with a luminaire mounting, the ability to center the camera over the roadway in this example makes the mast arm with a six foot extension bracket the better choice. The luminaire mounting would get the camera up a little higher, but because the luminaire arm is short and the roadway is wide, this would place the camera way off to one side and would adversely impact the field of view. Remember there are two considerations for camera mounting (height and centering) and they both must be carefully evaluated.*

Maintain a Proper Camera Angle – The physical camera adjustments are done by adjusting the camera bracket mounting bolts to set the mechanical camera pan and tilt after the camera bracket has been mounted to the arm or pole. The camera should always be tilted slightly downward and should never be flat or beyond horizontal. When could a camera be in danger of being beyond horizontal? When the camera is aiming uphill on a steep grade. The distance the camera can look out is significantly reduced on approaches with a steep uphill grade.



Pull the visor forward – You should have the camera sun shield (visor) far enough forward to give the camera maximum protection from the sun. By loosening the two hose clamp set screws, the camera body can be moved backward in the clamps, effectively lengthening the sun shield visor. Move the camera body back all the way or until the edges of the sun shield visor are just barely visible in the top left and right corners of the field of view. See the following examples.

Too Much Camera Visor in the FOV

Maximum Acceptable Amount of Visor In the FOV

Rotate the Camera Body – Ideally, for most intersection applications, vehicles should flow from the top of the screen to the bottom of the screen. By loosening the two hose clamp set screws, the camera body can rotate to better square up the FOV image. The car bumpers should also end up being parallel with the bottom of the screen.

The Camera Body Should Be Rotated

Acceptable Camera Alignment

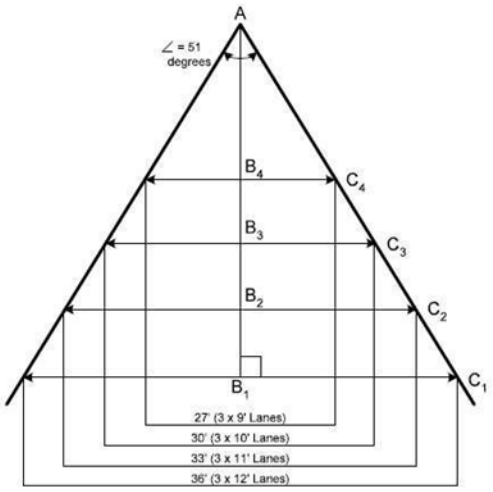
Proper Camera Focus Adjustment – When you are sure that you can obtain the desired FOV, you will need to focus the camera using the LAM. Proper focus is crucial for optimal Vantage system detection performance. A camera that is out of focus can significantly reduce the Vantage systems ability to perform; so it is important to take the time to adjust the focus properly.

For those of you who like mathematical calculations, the following supplemental FOV information is also provided for your reference as reinforcement to the above rules on FOV.

VersiCAM Camera Field of View (FOV) Calculations

This exercise is to develop a table describing the minimum Camera Setback dimensions for use with the VersiCAM.
Assumptions

1. Camera HFOV at maximum WA adjustment is 51 degrees.
2. Minimum HFOV image should include a minimum of 3 traffic lane widths.
3. Typical traffic lane widths are 9, 10, 11 and 12 feet.
4. Camera mounting height range is 15 to 30 feet (Calculate for 5' intervals)
5. Mounting Height for determining the minimum Camera to ROI distance is 0'.

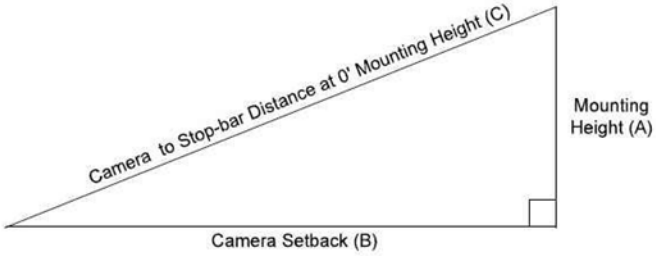


Where:
$A - B_1$ is distance to 3 12' lanes
$A - B_2$ is distance to 3 11' lanes
$A - B_3$ is distance to 3 10' lanes
$A - B_4$ is distance to 3 9' lanes

Solve:
Line $A–B_1$ bisects an angle of 51 degrees
$A–B_1–C_1$ represents a right triangle
Angle $A–C_1$ is 25.5 Degrees
Line $B_1–C_1$ is 18'
Tan 25.5 = Opposite / Adjacent (X)
Tan 25.5 = 18 / X
.4769 = 18 / X
X = 37.74 ~ 38'
Line $A–B_1$ = **38'**

Similarly:
Line $A–B_2$ = 34.59 ~ **35'**
Line $A–B_3$ = 31.45 ~ **31'**
Line $A–B_4$ = 28.30 ~ **28'**

Obtaining the Camera distance to the ROI for various mounting heights simply uses the FOV (0' MH) distance calculated previously and uses it as the hypotenuse of a triangle as described below and then using the Pythagorean theorem with the desired mounting height solves for the the camera setback.



Solve:
$C^2 = A^2 + B^2$
Where A = 25'
and C = 35'
$35^2 = 25^2 + B^2$
$1225 = 625 + B^2$
$B^2 = 1225 - 625$
$B^2 = 600$
B = ~24.5'

Camera to Stop-Bar	Mounting Heights 15'	20'	25'	30'	Lane Widths
38'	34.9'	32.3'	28.6	23.3'	12'
35'	31.6'	28.7'	24.5'	18.0'	11'
31'	27.1'	23.7'	18.3'	7.8'	10'
28'	23.6'	19.6'	12.6'	0'	9'

Required Camera Setbacks

Note:
The values in the table above represent the 'minimum' Camera Setback for various Mounting Heights and Required FOV Widths. Other variations are possible. The key is to remember that for accurate detection where the attained camera FOV compliments the vehicle size where the algorithms will perform the best - a minimum of 3 lane widths should be visible on the monitor.

4. SYSTEM CONFIGURATION

Vantage Video Detection Zone Theory 101

You may have heard the term "complex edges" associated with the Vantage video detection systems. Vantage systems utilize complex edge detection as one of the prominent techniques to effectively detect vehicles. Vehicles tend to have more complex edge content than other undesirable artifacts in the field of view. This edge based algorithm gives Vantage video detection products their exceptional detection stability, even under severe environmental conditions.

For increased opportunity to detect, zones can also be overlapped from front to back or from side to side. This will compensate for vehicles that may not stop exactly at the stop line or a vehicle traversing lanes in the detection area.

Appropriate zone sizing rules should still be carefully observed. The best policy is to use the least number of zones possible to obtain the desired operation and performance. Some people think if one overlapped zone is good, then ten overlapped zones must be better. This is not necessarily the case, because increased opportunity to detect is non-discriminatory. This means that an increased opportunity to detect vehicles may also increase the opportunity to detect undesirable artifacts. It is therefore a wise policy to avoid excessive overlapping, especially over a troublesome area since increased opportunity to detect may lead to false calls under some circumstances.

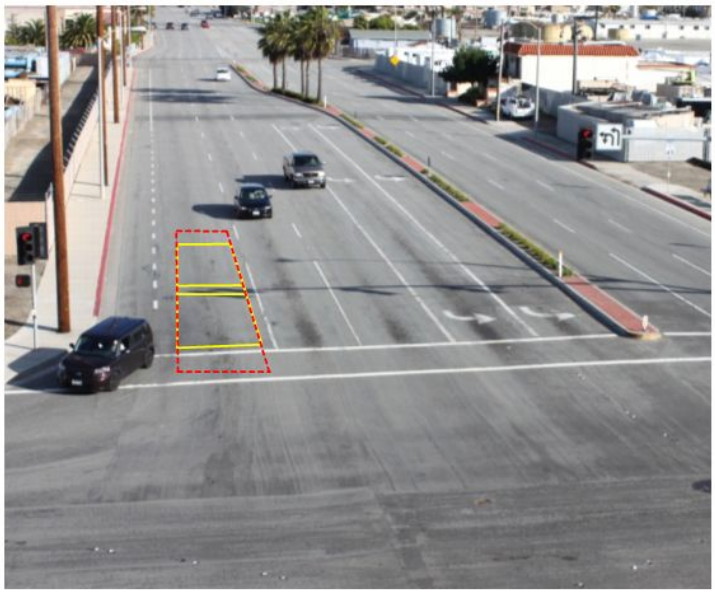
Lane Structure

Background: Starting with firmware revision 08.01.15SP1 VersiCam processors take advantage of a lane zone structure. The lane zone structure tracks vehicles as they travel through the zones. The lane structure helps to detect vehicles better and reject false calls due to shadows. The lane structure extends in front and behind of the existing zones for greater tracking coverage.

Guidelines for setting up effective lane zones: Two or more zones in the same lane are needed to make a lane structure. A single zone will not be included in a lane structure. The zones need to be assigned an output channel. If a zone's output channel is assigned to none then it will not be included in a lane structure.

Important: *If a second detection zone is not required for intersection control it must still be drawn to create the lane structure. The second zone should have a valid detector output, for example Proc:1 and the zone type should be set to none. This will ensure system performance will be maximized.*

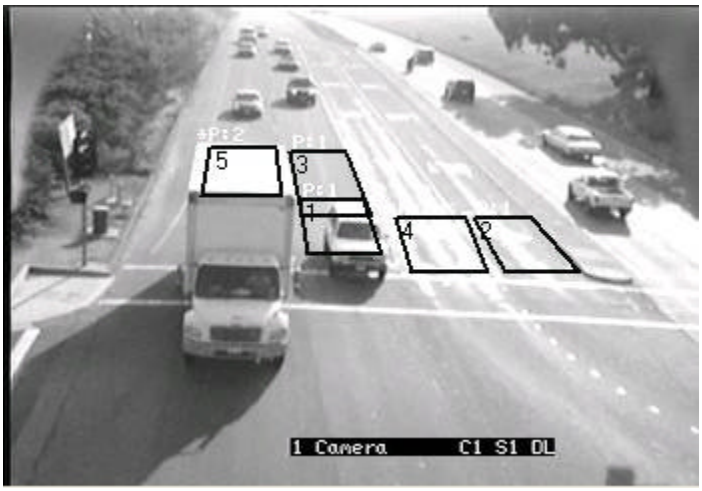
This figure is an example of the Lane Zone Structure. Detection zones are drawn in yellow. The lane zone structure created by the system is shown in red.



Important: *In certain intersection control applications only certain lanes may be needed for traffic control, left turn only for example. In these situations a lane structure should be created in the nearest through lane. This though lane will help the algorithm determine the difference between a vehicle and a shadow (from a vehicle in the though lane).it must still be drawn to create the lane structure. Again the zones in the through lane should have a valid detector output, for example Proc:1 and the zone type should be set to none.*

This is an example of the Lane Zone Structure when only the left turn detection is required. The zones drawn in yellow are required for intersection control. The zones drawn in blue are to aid performance and should be zone type None and have a valid detector output.

Zones Placement and Size



Problem Zone Example

Pay particular attention to zone detail number five, the zone located on top of the large white truck on the left. Notice that the roof of the truck is what primarily fills the detail number five zone area. The white truck roof has very few edges, and in this simulated situation, the truck call might be dropped if the truck were to stop in this position. What can be done?

Overlapping the front stop bar zones, like the zones shown with detail number three and one in the lane to the right of the truck, would most likely remedy this situation. With two overlapped zones, the front zone area would most likely include the cab part of the truck, not just the truck roof. The truck cab, having an abundance of complex edges in the front grill, windshield, and front bumper, would provide ample complex edge content to properly detect this truck. Drawing detection zones too small can create a new set of additional problems. For instance, extremely small zones that ended up on a car roof or just the middle of the car's hood would have the same adverse consequences.

Remember, when resizing zones or making any other zone adjustments, always be mindful of how these changes might affect edge content, which in turn, has the potential to influence your vehicle detection.

Close attention to zone size and zone placement are also important because, ideally, we like to have at least fifty percent of the vehicle we are trying to detect reside in the detection zone area. Again, this has to do with complex edge content; if we only have one tenth of the vehicle in the detection zone area, that may not provide us with enough complex edges to determine that this is a vehicle and not just another undesirable artifact in the detection zone background.

Avoid placing zones on lane lines as any movement of the camera due to wind or other environmental condition may cause false detections.

Zone Types

The "Type" option in the ADD and EDIT menus allows the user to specify the type of detection to be used for a particular zone. Several types of detection are available and are defined below.

PRESENCE (PR) (Default) – places a call while a vehicle is in the zone. When the vehicle exits the zone the call will be dropped.

EXTENSION (EXT) – places a call while a vehicle is in the zone, when the vehicle exits the zone the call is extended for a user selectable length of time. Timing choices range from 1 to 250 in tenths of a second. For example, a value of 50 is equal to five seconds of extension.

DELAY (DLY) – when a vehicle enters the zone area, the call is delayed for a user selectable length of time. Once the delay time has expired the call will be placed. Once the vehicle leaves the zone the call will be dropped. Timing choices range from 1 to 250 in tenths of a second. For example, a value of 50 is equal to five seconds of delay.

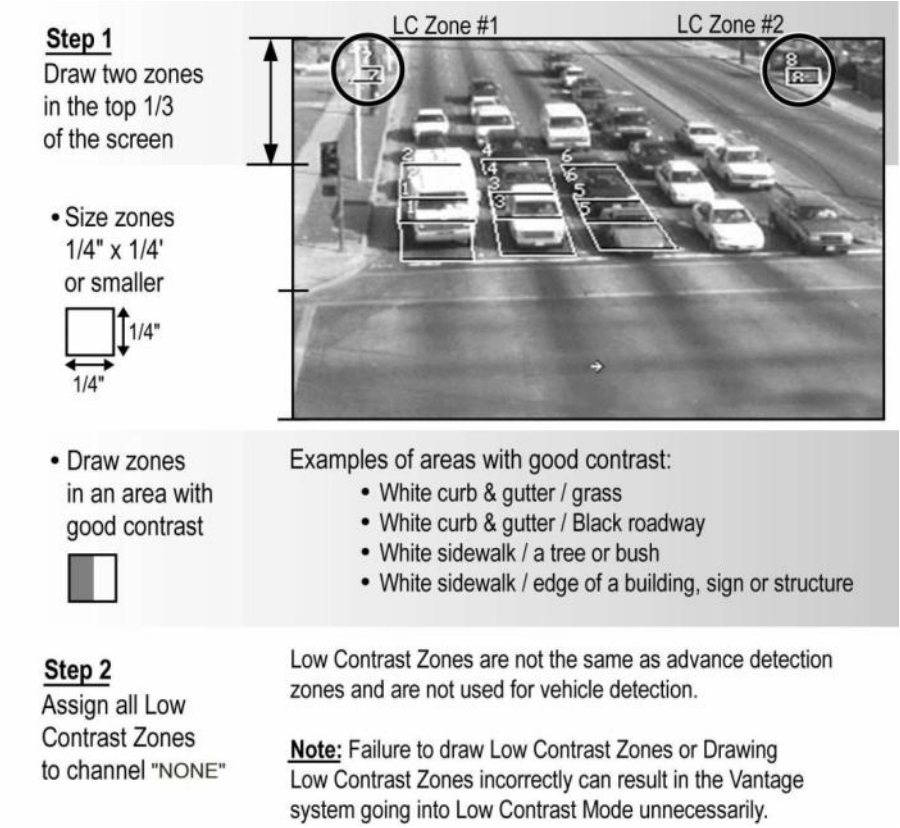
PULSE (PUL) – when a vehicle enters the zone, a pulse is output for a user selectable length of time. The vehicle must leave the zone and a new vehicle must enter before a new pulse will be generated. Timing choices range from 1 to 250 in tenths of a second. For example, a value of three is equal to a 0.3 second pulse.

COUNT (CN) – when a vehicle passes through the count zone area, it is counted. The count data for that zone is then stored in an internal processor bin. Bin interval length can be set from the Utility (Utl) menu option. Vantage Remote Access Software (VRAS) or VantageView can be used to retrieve the stored count data.

- Channel Output (Ch / Out) is recommended to be set to "NONE".
- Draw the count zone using the same guidelines as you would for a normal detection zone. Counts are stored in 'bins' the interval between bin storage is set in the Utilities Menu.
- There are a maximum of six out of the twenty-four zones that can be assigned as count zones (per camera view).
- Refer to Section 10: Technical Information for more details on Count zones.
- The count data is retrieved from the system by communicating through the RS-232 port using Vantage Remote Access Software (VRAS).
- The Bin Interval is set under the Utilities (Utl) menu, Bin Interval (BinIntvl) item

LOW CONTRAST (LC) – these zones are to be placed in areas of high contrast, in the top one third of the field of view (FOV), and the zones must be kept very small - about 1/4" by 1/4" inch. These LC zones provide additional stabilization for the field of view area. At least two of these zones should be drawn in each camera field of view. These zones actually prevent the system from going to Low Contrast mode unnecessarily.

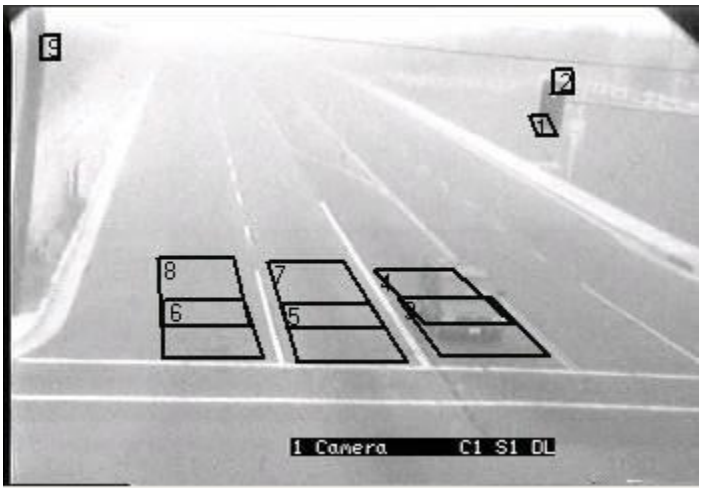
The three LC lines have been replaced by a scene based method. A scanning line dynamically determines the LC status. The "LC ref" function under the utilities menu has been removed since it no longer applies.



☑ ***Note:*** *Low Contrast zones in reality there are many other low contrast conditions other than fog. Because of this, the decision was made to change the name to "Low Contrast Zones" or just "LC" to better reflect their true operation. From this point forward the term "Low Contrast" zones will be used interchangeably.*

Low contrast zones are used to stabilize operation and serve to prevent the system from going into a "Low Contrast" constant call condition unnecessarily. In areas that have snow, sidewalks and curbs may not be the best choice for LC zone placement, since the ground will be covered much of the time during winter months. A sign or edge of a building might be a better choice for LC zone placement in areas that experience extended periods of snow on the ground.

Another important consideration regarding LC zone placement is to make sure the area used for LC zone contrast is not located in the near field of view. The object or region selected for LC zone placement must not only be in the top 1/3 of the field of view, but it also must be physically located and originate in the far region. For example, signal heads or luminaire poles that originate in the near field of view, but also extend into the top 1/3 of the field of view are not a good choice for LC zone placement. There is a possibility, that because of their close proximity to the camera, the contrast will always be such that the system might never see the need go into low contrast mode. The logic behind LC zones is this; if the system can see good contrast in the LC zones located in the far field of view, then the system should have enough contrast to continue to detect vehicles in the stop bar region. Conversely, if the LC zones, located in the far field of view cannot see good contrast, then there may also be significant vehicle detection challenges in the near field of view, so the system reverts to a safe constant call LC mode.



Improper Low Contrast (LC) Zone Placement

In the picture, the Low Contrast zones numbered one and two that are located on top of the signal head and the LC zone number nine on the pole would all be poor choices for LC zone placement. Though these LC zones meet the majority of the necessary criteria for LC zones including, correct size, they are located in the top 1/3rd of the field of view, and they have been placed on an area of contrast; they fail the far field of view test because both the signal head and the pole originate in the near field of view. Low Contrast zone placement should not only be in the top 1/3rd of the FOV, but should also only be placed on objects that originate in the far field of view. Objects in the near field of view will most likely always be clearly visible, even in heavy fog. This improper LC zone setup and placement may result in the system not going into a Low Contrast mode even when the conditions might benefit from this feature.

☑ ***Note:*** *It is also worth noting that this FOV is also very poor. It looks like there is probably horizon included as part of the FOV, this should also be corrected.*

"Low Contrast" zones are now an actual zone type. To create a Low Contrast zone, go to the ADD menu item and select zone type "LC". LC zone parameters are automatically constrained, the system will only allow the user to drawn them in the top 1/3 of the FOV and will restrict their size to less than 1/4 inch by 1/4 inch. This was done in an effort help the user create effective LC zones that conform to the necessary requirements.

NONE (NO) - when a vehicle enters the zone area a call will not be placed. This type can be useful in conjunction with the lane structure and LC and count zones.

Demand and Passage Zones

These two zones types are used in combination they are used in heavily congested traffic lanes only. During heavy traffic when vehicles occupy zones for a long period of time the processor may learn the vehicles as part of the background. Proper usage of demand and passage zones can help to alleviate this situation.

How passage and demand zones work: When traffic is heavily congested the demand zones have a hard time distinguishing the traffic from the background. The demand zones which are congested borrow zone background information from the passage zones which are clear most of the time. The demand zones borrow information from the passage zones to improve algorithm performance.

☑ ***Note:*** *This feature is active from between 7:00 AM and 8:00 PM. Ensure the processors' clock is set correctly.*

How to setup new demand and passage zones: For a heavily congested approach, the demand zone is used just like a presence zone. Draw the demand zone just like you would draw a normal presence zone, starting from behind the stop bar and going back in the lane. Two or three demand zones per congested lane are recommended. The passage zone should be drawn in front of the stop bar area, where vehicles do not occupy the zone all the time. One passage zone per congested lane is recommended. The passage zone has timing associated with it. Leave the timing at the default setting of 3 (Pas:3) and set the channel output to "none".

COUNT SPEED OCCUPANCY (CSO) – These zones are similar to count zones. They collect extra data splitting the count into small, medium and large vehicles and also estimating average speed and road occupancy per Bin Interval.

Achieving Vehicle Separation & Placement

- Key: The camera is aimed with the intersection in the FOV.

This camera is mounted on the signal mast arm.

- CSO zones are placed in the intersection and not above the stop bar. This will allow vehicles to have a gap between them when passing through the count zone. Only one vehicle should occupy the zone at any one time.

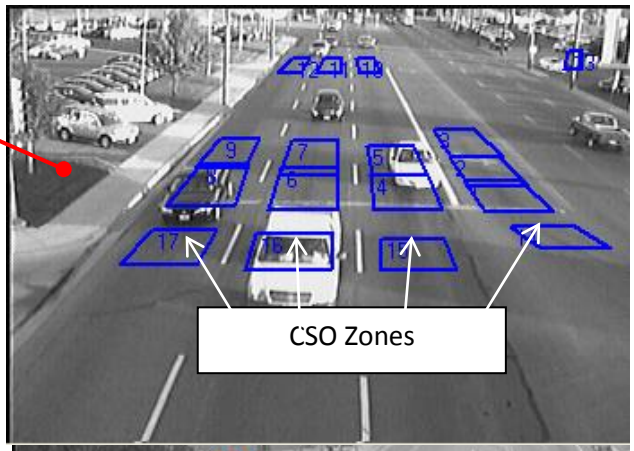
This camera is mounted on a safety light mast arm. This location creates a good FOV for both vehicle detection and counting.

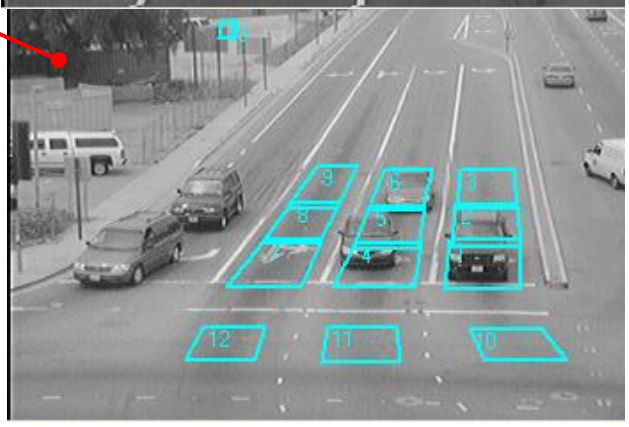
- CSO zones Direction is set to down and is 15 feet from the top of the zone to the bottom of the zone.
- Notice the zones are set in the path the vehicles travel.

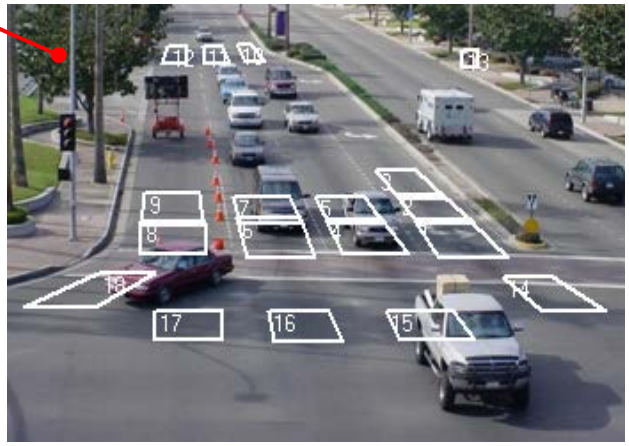
This camera is mounted on the safety light mast arm

- The camera is zoomed out wide enough to place the LT CSO zone where only left turning vehicles will trigger it. It can also accommodate a count zone for the right turn.

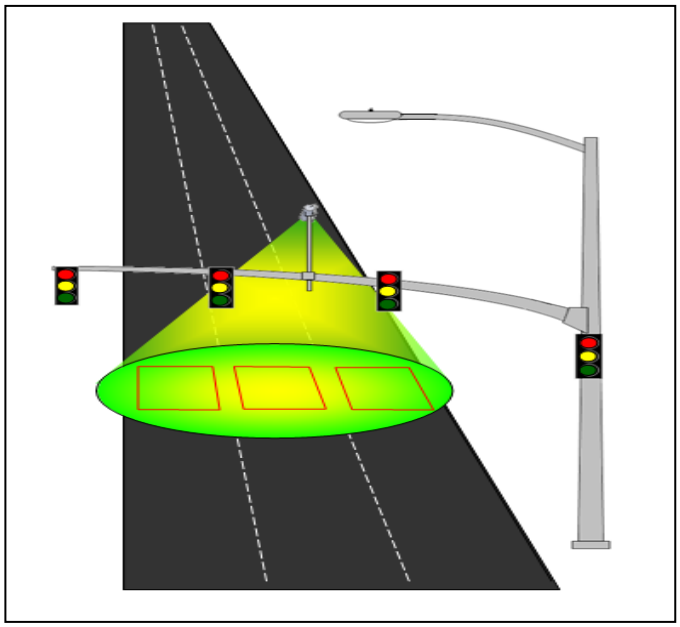
Note: Each of the FOV has at least half of the departing lane in them; this will allow the LT cso zone to be placed correctly



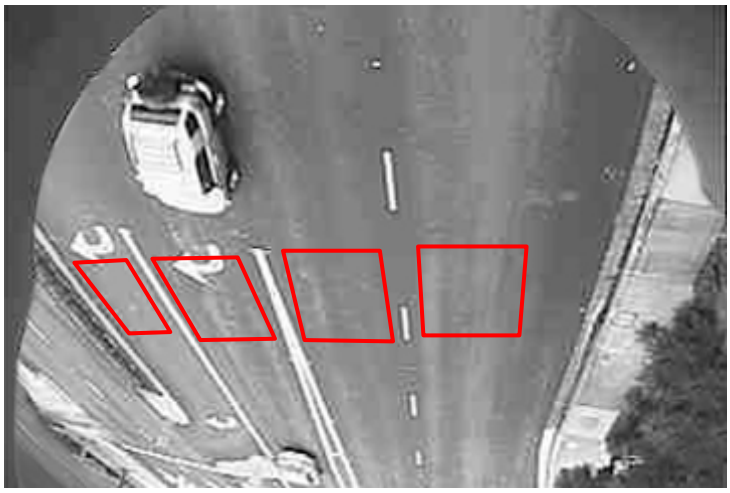




- Key: The camera in this illustration is mounted on the signal mast arm centered over the three lanes of departing traffic.
- The CSO zone has to be programmed down for it to collect data. When installing a camera to view departing traffic the camera must be rotated 180 degrees so that the vehicles enter the zone from the top to the bottom.
- The camera should be aimed at a downward angle close to 45 degrees if possible.



- This is what it looks like when the camera is turned 180 degrees. (upside down)



BIKE – Some intersections have dedicated bike lanes. Some intersections are marked with shared line pavement markings (or "sharrows") where both vehicles and bikes share the same lane. Some intersections have vehicle lanes only. To detect all possible bicyclists bike zones should be drawn wherever a bicyclist may ride in the camera field of view (dedicated, shared or vehicle lanes).

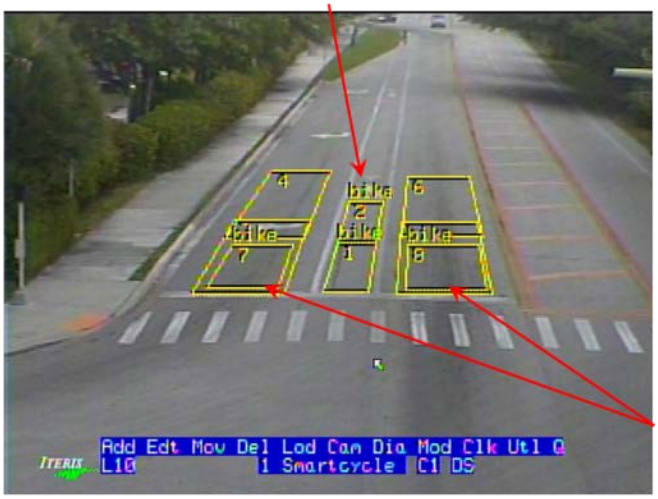
Dedicated Bike Lane Zones

Draw two zones in the bike lane, one at the stop bar and one directly behind it. The zones may touch, but it is not necessary to overlap them. The zone should be about the length of a bicyclist. Refer to the figure below. Be careful not to draw the zones on the lane lines as this may increase the possibility of false calls.

Vehicle Lane Zones

If you need to detect bicyclists in vehicle lanes first draw the regular vehicle detection zone. Please follow all the recommendations for zone drawing outlined in the this manual. Once the vehicle zone is drawn, place a bike zone inside this zone. Refer to the figure below.

Bike Zones drawn in the bike only lane



Bike Zones drawn in vehicle lanes. The bike zones are inside the vehicle zone.

Example for Bike Zones drawn in both bike lanes and vehicle lanes

Bike Detection operation

During operation the zones will activate as traffic passes through. For a Bike Zone, the label "Bike" will be displayed in the center of the zone when a bike passes through. For a Vehicle Zone, the outline of the zone will be displayed when any vehicle or bicycle is detected. If a Bike Zone is drawn inside a Vehicle Zone as described in the above section, both the zone outline and the label "Bike" will be displayed. See the screenshots below for examples of each of these instances.

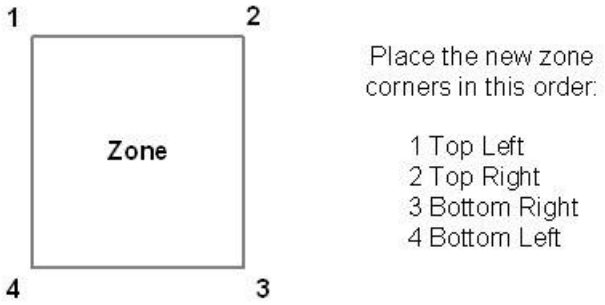
Bicycle detection active in the bike lane

Vehicle only detection active

Bicycle detection active in the vehicle lane

☑ ***Note:*** *TIMING – The Extend, Delay, and Pulse zones all have user programmable timing. To set the timing for these zone types, either click both left and right mouse buttons simultaneously, or push the middle mouse button. The third mouse button may be the mouse wheel on some types of Vantage compatible mice. When this is done, the timing parameter of the zone type is highlighted. Now, by left or right clicking the mouse buttons, you will scroll through a set of timing values in tenths of a second from 1 to 250. When the desired timing value is reached, either click both left and right mouse buttons simultaneously or click the middle mouse button to set your timing choice.*

4.1 Drawing Zones



The first step in drawing a Vantage detection zone is to press and hold the menu button for two or more seconds and then release it; this brings up the main menu bar. Next, move the mouse cursor to the "Add" option and left click the mouse to select it. The last step is to set the various zone parameters and then select "Exit" to start drawing the detection zone.

At this point a "Place Corner" prompt is seen on the screen and the cursor is visible and can be freely moved around on the screen. The corners of the zone that you are about to draw must be anchored in place by clicking the left mouse button. Place the cursor where you want the back top left corner of the new zone to be located and left click the mouse to anchor it in place, then place the cursor where you want the top right back corner of the new zone and repeat this same process. You will be placing each detection zone corner in a clockwise pattern. The next corner to place and anchor in place will be the bottom right corner and the last

corner to place will be the bottom left corner. Having placed and anchored all four corners, the processor will complete the outline of the detection zone. With a little practice, this process is very easy and becomes quite natural. In the following section you will also learn how to edit and easily modify zones that you have already drawn.

After one zone is drawn you may add multiple zones by middle clicking. New zones will be added until they get too small or reach the top of the screen. This feature is called autozone. It is recommended that you start drawing zones at the stop bar and work your way up with the autozone feature. Autozones have a 20% overlap. If more or less overlap is needed first place one corner with a left click then use the autozone. The first placed corner sets the reference for the overlap.

If you have an existing zone and you wish to create new zones with those same properties, you may by following this procedure. First select the zone with the properties you want to clone, by left clicking in the inside of that zone. The selected zone's outline will change from yellow to white. Then select "ADD" from the menu bar. The newly created zone will have the properties of the existing zone.

☑ ***Note:*** *The zone properties, And/W, occlusion rejection, desensitize and zone label are not copied.*

4.2 VersiCam Main Menu

The following sections cover each item on the VersiCam processor main menu. To bring up the VersiCam main menu bar, push the Menu button for more two or more seconds and then release it. The VersiCam processor main Menu bar will appear on the screen.

☑ ***Note:*** *The VersiCam camera processor menu may change as additional features and functions are added to the system. The following sections are based on firmware version 08.01.17. Please check with your authorized Iteris Dealer or the Vantage Product Support Team for updates to this manual.*

Menu Screen on VersiCam Processor

☑ ***Note:*** *The user is presented with an on screen keyboard whenever any text editing field is available. The fields that can be edited with the onscreen keyboard are zone label, camera label, config label, camera cycle and unit id. Use the mouse's middle click button to bring up the onscreen keyboard. To get out of the onscreen keyboard left click the "Ent" key or middle click. The on screen keyboard allows or restricts characters as needed for the field to be edited. For example spaces are not allowed in the unit id field. When the onscreen keyboard is active, using the right click button or "Esc" key will cancel any changes.*

4.3 Add Menu

This menu option allows the user to add new detection zones. The user will select the desired zone parameters and then create the new detection zone by placing each of the detection zone corners. For instructions on how to draw zones, see the "Drawing Zones" section of this document. You can define up to 8 detection zones on the system.

Detail - The zone detail number is a processor generated reference number sequence from 1 through 24 for camera one, 25 through 48 for camera number two on a dual and quad processor, 49 through 72 for camera number three and 73 through 96 for camera number four on a quad processor. See "Zone Identifiers" and the "Detail" menu section for additional information.

Label - The zone label, a user customizable zone identifier. Zone labels can be up to six characters in length. To edit the zone label, move the cursor to the "Label" item and click the right mouse button. The label value will become highlighted, and now, pressing the left or right mouse button will scroll through a series of available ASCII characters. Physically moving the mouse to the right will move the cursor to the next character position. Physically moving the mouse to the left will move the cursor to the left. When you are finished customizing the label characters, either press both left and right mouse buttons simultaneously, or press the mouse wheel button to set your label. The default value for the zone label is normally the same as the zone detail number.

Direction (Dir) - The zone direction option can be set to "ANY" or "DOWN".

ANY (Default) - This setting has the potential to detect vehicles from any direction.

DOWN - This setting enables "Wrong Way Vehicle Rejection". This function helps reject vehicles entering the zone from directions other than down. The function primarily rejects vehicles traveling "up", but can still be used in left turn lanes, for some degree of relief from side street cars, that may stray into the front left turn detection zones while making a left turn. It is best to use "ANY" unless zone directionality is really required.

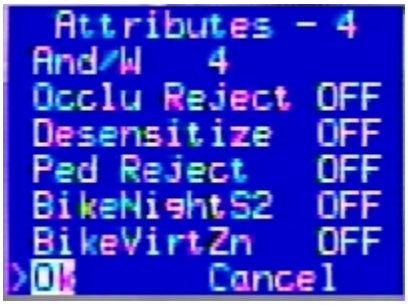
To change the zone direction parameter, move the mouse cursor to the "DIR" and left or right click the mouse buttons until you have your desired zone direction choice. Move the cursor to another menu item to set your selection.

Detector Type (Type) - This setting allows you to select the type of detection zone to create. There are several different zone types available.

Detection Zone Type	Function
PRESENCE	Places a call as long as vehicle is in the zone.
EXTEND	Extend the vehicle call for a programmable length of time.
DELAY	Delay the vehicle call for a programmable length of time.
PULSE	Produces a pulse output for a user programmable rate of time (pulse width).
COUNT	Count vehicles that pass through the zone and store the data.
Low Contrast (LC)	Create an LC zone for low contrast stabilization.
Demand	Demand zone for high traffic congestion.
Passage	Passage zone for high traffic congestion.
CSO	Count, Speed, Occupancy zone.
Bike	Bicycle differentiation zone.

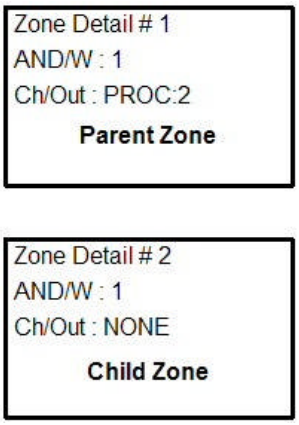
To select or change the zone type, move the mouse cursor to "Type" and left or right click the mouse buttons until the desired zone type is displayed. Move the cursor to a different zone parameter item in the menu to set your zone type choice.

Attributes



And With (AND/W) - This function allows the user to "AND" zones together for special operation. Zones that are AND'ed together will only place a vehicle call when there is a vehicle placing a call in both of the zones simultaneously. If there is a vehicle in only one of the zones, a call will not be placed. If normal operation is desired, be sure that the value of AND/W is set to the same number as the zone detail number; this is the default setting.

CAUTION! *The accidental setting of this parameter to a random value can result in unpredictable and undesirable operation. Be sure you understand the AND/W function before attempting to use it. If you do not intend to use AND/W operation, be sure that the AND/W value is set to the same value as the zone detail number.*



Correct AND/W Setup Example

In the above example please notice that the And/W value number of the child zone is set to the detail number of the parent zone. Also notice that the channel output (Ch/Out) of the child zone is set to NONE. It is also of interest to notice that the parent zone is set up like any other zone, all the changes were made to the child zone. The child zone will now place a call on the output channel of the parent zone (PROC:2 in this example) when a vehicle is present on both zones at the same time.

To change the AND/W parameter, move the mouse cursor to AND/W and click either the left or right mouse button to increment the AND/W values. When the desired value is selected, simply move the mouse cursor to another zone parameter in the menu to set the value. The AND/W value is set to the same value as the zone detail number by default, which effectively "OR's" the channel outputs. If you do not intend to use the AND/W function, be sure that the AND/W value is set to the same value as the zone detail number.

Occlusion Rejection – This feature is recommended to be used when you want to minimize the effects of tall trucks or tree shadows causing false calls in the left turn lanes.

Desensitize – If a zone is desensitized it will no longer participate in the dynamic three-stage algorithm most of the time. If the camera is in LC then the desensitized zone will go into S3 mode. Care should be exercised when turning on the desensitized option because it could lead to missed calls.

Pedestrian Rejection – As the name implies helps a zone reject pedestrian movement. Zones programmed with Pedestrian rejection are less likely to false call due to pedestrian movement.

Bike Night S2 – Because of lighting conditions bicycles are harder to detect at night. Turning this attribute on may help with missed calls in poor lighting conditions as it increases the sensitivity of the zone. The proper solution is to improve the lighting at the intersection. The Bike zone will enter into S2 only when the system is in night mode.

Bike Virtual Zone – If the camera is not mounted directly above the bike lane the Bike zone drawn may not be rectangular but a parallelogram. Due to the position of the camera, the body of the bicycle rider may appear out of the zone, and the call may be missed. This attribute will extend the zone in an attempt to capture the rider. See figure below.

Bike Zones drawn in red. The bicyclist is only halfway in the zone due to camera positioning.

Virtual Bike Zone drawn in blue. Extends automatically by the system to capture the bicyclist.

Channel Out (Ch/Out) - This function allows the user to assign an output channel to the zone. The output channel will place a call to the controller depending upon the position of the ICC Module in the detector rack. Where you physically plug the ICC Module into the detector rack, is where it will place the vehicle calls. Multiple zones can be assigned to a output channel.

Channel Designators:

PROC: 1, PROC: 2

Exit - Click on this option to exit out of the Add menu and return to the main VersiCam menu bar.

4.4 Edit Menu

The "Edit" option on the VersiCam menu brings up all the zone parameters for a specified zone. Click on "Edit" from the VersiCam menu bar, a screen prompt appears saying, "Select Zone". Move the cursor somewhere inside of the zone that you want to view or to change the zone detail parameters, and left click the mouse button. The same screen that you saw when you originally created the zone will appear in the lower left corner of the screen.

Now, you will be able to view or edit all the parameters for the selected zone. This option gives the user a convenient way to view existing zone parameters or to make changes to zone settings quickly and easily at any time. Move the mouse cursor to the desired option in the Detail menu and make the desired changes. When you are finished click the Exit option to return to the VersiCam main menu bar.

☑ ***Note:*** *In order for your changes to be saved, you must still go to the Quit (Q) option on the VersiCam main menu bar and save your changes to a configuration. If you fail to perform this step your zone changes will not be saved.*

☑ ***Note:*** *For a detailed description of each of the parameters in the detail menu, refer to the Add Option section.*

4.5 Move Menu

The Move function has 3 modes.

- Move a single zone or part of a single zone(default setting)
- Move multiple zones
- Move all zones

To move a single zone – Left click on "Mov". Select a zone to move by left clicking in the middle of that zone. The zone outline will turn white when it has been selected. Now a user may move the whole zone, move one side, or move a corner. To move the whole zone left click in the center of the selected zone and move the zone to the desired location then left click to place it.

To move the side of a single zone – Select the zone by left clicking in the middle of the zone. Move the cursor to the side of the zone and left click, move the side and left click to place it.

To move the corner of a single zone – Select the zone by left clicking in the middle of the zone. Move the cursor to the corner of the zone and left click, move the corner and left click to place it.

To move multiple zones - Left click on "Mov". Left click on "Multi". Select the zones you wish to move by left clicking on them. Next middle click, then move the mouse to position the zones. Left click to place the zones in their new position.

To move all zones - Left click on "Mov". Left click on "All". Move the mouse and then left click to place the zones in their new position.

Exit – Click on this option to exit out of the Add menu and return to the main menu bar.

4.6 Delete Menu

This menu selection allows for the deletion of existing zones.

Zone – This deletes individual zones. Move the cursor over the zone to be deleted and click the left mouse button.

All – This deletes all the zones on the selected view. You will be asked "Delete all zones for this camera? Yes/No" Move the cursor over "yes" and click the left mouse button. To cancel this action without deleting move the cursor over "no" and click the left mouse button.

Restore – Restores the last delete action. Restores a single zone or all the zones deleted.

Exit – Click on this option to exit out of the Delete menu and return to the main menu bar.

4.7 Load Menu

The "Load" option (Lod) allows the user to load previously saved configurations.

To Load Factory Defaults – Left click "Lod" and left click on "Factory Default". A warning message will appear, "Reset system to factory default? Yes No". Left click on "Yes". This will clear all zones, unit id, camera labels, alarms, TOD schedules, options, com port parameters and restore them to factory default settings. Please note that the inactive channel defaults to call.

To Clear a Camera's Configuration – Left click "Lod" and left click on "Clr Cam Config". A warning message will appear, "Reset this camera config and del all zones? Yes No". Left click on "Yes". This will clear all of this camera's zones, options, camera alarms and camera label.

- Config 1 - Selecting this configuration will load it, and make it the current configuration.
- Config 2 - Selecting this configuration will load it, and make it the current configuration.
- Config 3 - Selecting this configuration will load it, and make it the current configuration.

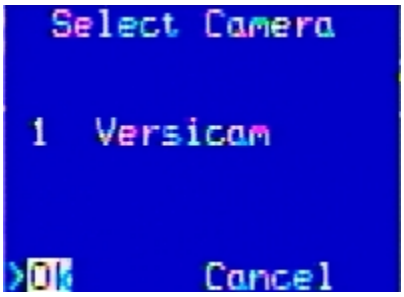
Move the cursor to the configuration that you want to load and run as the current configuration. Left click the mouse button to make your selection, the configuration will be loaded. Next, you must go to the Quit (Q) menu and save to that same configuration to complete the load process.

☑ ***Note:*** *You can also save one configuration to another from this menu option. For instance, if you load configuration two, you could go to the Quit (Q) menu and save it to configuration one (or three). This would overwrite anything previously saved in configuration one and give you another copy of configuration two in configuration one.*

Exit – Click on this option to exit out of the Load menu and return to the main menu bar.

4.8 Camera Menu

The "Camera" menu allows the user to change various camera specific settings on the system.



Camera Label Customization – The saved "Camera Label" is user customizable. The default designation is: "1 Camera, 2 Camera, 3 Camera, 4 Camera, however, this can easily be changed. Camera names can be up to 10 characters in length. To edit a camera name, move the cursor to the camera name that you want to change. Click the right mouse button and the first character of the name will be highlighted. Now, by pressing the left or right mouse button, scroll through a series of available ASCII characters. Moving the mouse to the right will move the cursor to the next character position. Moving the mouse to the left will move the cursor to the left. When you are finished customizing the camera name characters, either press both left and right mouse buttons simultaneously, or press the mouse wheel button to save your changes and to exit out of the editing mode.

4.9 Diagnostic Menu

The "Diagnostic" option menu includes the following functions and system information.

Reset Zone (Reset) - This option is rarely used. This option allows the user to force a single zone, referenced by that zones detail number, to re-learn. Experience has shown that forcing the zone to re-learn, without making zone size or placement adjustments, rarely solves operational challenges.

To reset a detection zone, enter the detail number by right or left clicking the mouse buttons. When the desired zone number has been selected, exit and then Quit (Q) and save to the currently loaded configuration. The selected zone will go into Learn Mode , placing a temporary call on the zones associated output channel.

VersiCam Processor Video Status Flags:

- VIDEO ENABLE - This is a status flag indicating that the system processor frame grabber is working properly.
- SYNC - This is a flag indicating that the system has video sync.

4.10 Mode Menu

The "Mode" option menu includes the following functions and system information.

Note: *When calling in with technical questions about your VersiCam, many times you will be asked what firmware version your system is running. This information is found in the "Mode" menu.*

Version - This parameter is the VersiCam firmware version.

For example: "08.01.17".

08 This tells us that it is a VersiCam system.

01 This tells us that we are running standard intersection detection.

17 This is the actual processor firmware version. Many times it is shortened in conversation to just x.17.

Mode - This option determines the zone reference that will be used to identify the detection zones. The choices are: CHAN, TYPE, OFF, LABEL, NUMBER, or AND/W. By default, this parameter is set to "CHAN", which stands for channel. This is the most commonly used zone reference.

Zone Identifiers

CHAN - Channel refers to the output channel associated with the detection zone. For more information see the section on Channel Output.

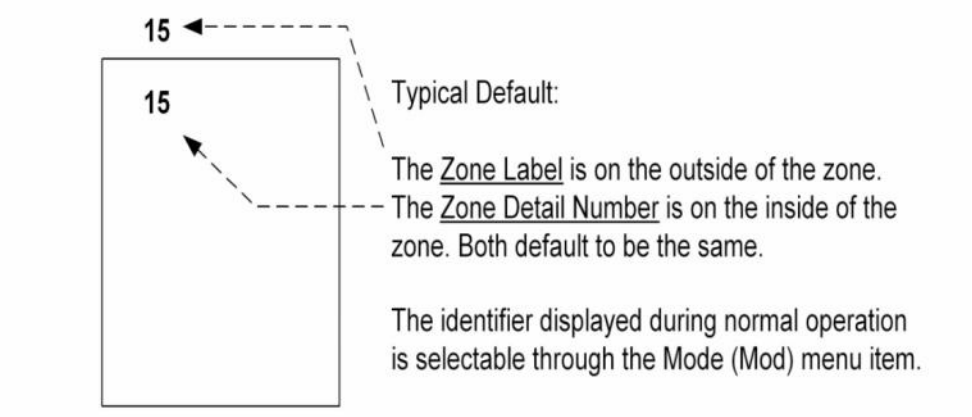
TYPE - Type refers to the zone type: Presence (PR), Pulse (PS), Extension (EX), Delay (DL), Count (CN), None (NO), Advanced (AD), Bike (BI), Demand (DE), Passage (PA), CSO (CS) or Low Contrast (LC). For more information see the section on Zone Type.

OFF - This selection turns off all visible zone references.

LABEL - Label refers to the detection zone label. For more information see the section on Zone Labels.

NUMBER - Number refers to the detection zone detail number. For more information see the section on zone Detail Numbers.

AND/W - And With refers to the detail number of a parent zone that a child detection zone might be referenced to, if this type of operation is enabled. For more information see the section on zone And With operation.



Zone Label and Zone Detail Number

Example Showing Reference by Zone Type

The zones in the picture are being referenced by "Zone Type".

PR = Presence Zone DL = Delay EX = Extension BI = Bike CSO = Count

Output Channel (Out / Ch) - This parameter determines how the output channels will function. This is a global setting.

NORMAL - This is the default setting and is most commonly used during normal operation. The "NORMAL" setting will allow the output channels to function in a "normal" mode. When cars are present in the detection zone the output channel associated with that zone will place a call to the traffic controller.

MAXCALL - The "MAXCALL" setting places constant calls on all output channels.

Inactive Channel (Inact / Ch) - This setting determines how inactive (unused) channels will function. This is a global setting.

NOCALL - This is the default setting and is most commonly used during normal operation. The "NOCALL" setting will cause all unused channels not to place any calls.

CALL - If this setting is selected, then all unused channels will place constant calls.

☑ ***Note:*** *Output Channel and Inactive Channel are two settings that cause new users problems when they are set to other than the default settings. If you are getting constant calls on output channels, even after the learn mode, check the Output Channel setting and make sure it is set to "NORMAL". If unused channels are mysteriously placing constant calls, check the Inactive Channel setting and make sure that it is set to "NOCALL".*

Overlay – This parameter turns the overlay either "ON" or "OFF". The default setting is "ON" which is used during normal Vantage operation. The overlay includes all the zone indicators and camera label information. When the overlay is "OFF", none of this information will be displayed on the screen. The overlay can be restored by pushing the MENU button or by setting the Overlay parameter to "ON" instead of "OFF".

RS-232 Port Communication Parameters:

Baud - Baud rate. The default is 38400, this is the most commonly used baud rate setting for Vantage applications. Other settings are available, however, it is recommended that the setting be set to the default value unless you have been instructed to do otherwise.

Parity - The default is NONE, this is the most commonly used parity setting for Vantage applications. Other settings are available, however, it is recommended that the setting be set to the default value unless you have been instructed to do otherwise.

Flow Control (FlowCtrl) - The default setting is "Hardware" (HRDWRE), which is the most commonly used setting for Vantage applications. Other settings are available, however, it is recommended that the setting be set to the default value unless you have been instructed to do otherwise.

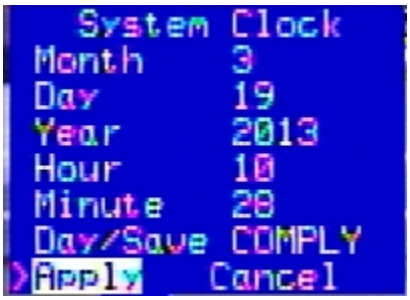
☑ ***Note:*** *The default RS-232 port settings must be used during the Vantage Software Upgrade (VSU) process.*

☑ ***Note:*** *Remember, before any parameter becomes active, you must quit and Save your changes to the current configuration. If you do not quit and save to a configuration after making changes, the parameter changes will not be saved and will not be active.*

Exit – Select Exit to exit the Mode option menu.

4.11 Clock Menu

The system "Clock" option menu includes the following functions:



☑ ***Note:*** *It is important to set your VersiCam system to the correct time and date, because the system makes use of this readily available information. It is also essential for getting proper and accurate time stamps if you decide to collect any count data.*

Month - Left or right click your mouse after selecting the "Month" parameter to set the correct month.

Day - Left or right click your mouse after selecting the "Day" parameter to set the correct day.

Year - Left or right click your mouse after selecting the "Year" parameter to set the correct year.

Hour - Left or right click your mouse after selecting the "Hour" parameter to set the correct hour.

Minute - Left or right click your mouse after selecting the "Minute" parameter to set the correct minute.

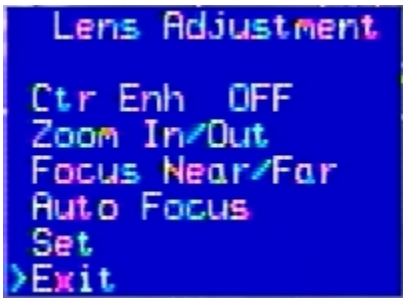
Daylight Savings Time (Day/Save) - Left or right click your mouse after selecting the "Day/Save" parameter to choose whether or not to implement daylight savings time. "Off" or "Comply" are the two available choices.

Exit - This option will take you out of the "Clock" menu and take you back to the main menu bar.

4.12 Utility Menu

The Utility option menu includes the following functions:

Lens Adjustment



After physically adjusting the camera to obtain a suitable Field of View we can fine tune the FOV using the Lens Adjustment functions in the System Menu.

Zoom In / Out - To zoom in or out select "Zoom In Out" and press the left mouse button to zoom in or the right mouse button to zoom out.

Focus Near / Far - This is the manual focus function. You can manually focus using this menu item and the Focus Near / Far menu item.

☑ ***Note:*** *Auto Focus should be used whenever possible to obtain the best focus. If manual focus adjustments are required, you can use Focus Near and Focus Far adjustment.*

Auto Focus - this function should be used once a good FOV is obtained. Select Auto Focus and wait for the small square in the right lower portion of the screen, next to the camera label, to disappear. An asterisk will also appear in the menu. Remember to select "Set" before exiting to save your camera configuration.

Set - this function will save the camera configuration settings (Zoom and focus). After selecting "Set" the menu may momentarily freeze, and an asterisk will be displayed while the settings are being saved. Failure to "Set" (Save) the camera settings before exiting will result in the camera returning to factory default settings once the camera power is removed or interrupted.

Exit - when selected, this function will exit the Adjust Lens menu and return the user back to the Utilities menu.

Counter – When the counter is on you will see the counts for CSO or count type zones displayed on the screen.

Bin Interval – A Bin Interval needs to be set to tell the system how often the counts should be stored. You can select a bin interval of either: 10 or 20 seconds or 1, 5, 15, 30, or 60 minutes. For example, if you select five minutes, that means that every five minutes count data for all count zones will be time-stamped and binned. The VersiCam will store this count information in flash memory.

Bin Last - This function, when turned "On", displays the last count bin data for the count zone selected in the "Bin Zone" parameter. A valid count zone must be specified for the "Bin Zone" parameter in order for this function to work. This feature allows you to display on screen the count zone data for any one of the count zones. The data automatically updates at the top of the Bin Interval. A sample of the data string is shown below:

Count String = Zone Detail Number, Time, Count, Video Status

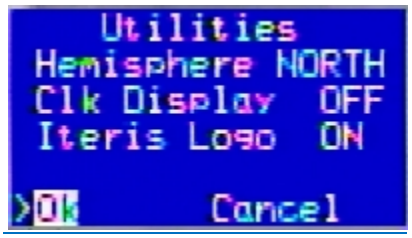
Bin Zone - This parameter tells the "Bin Last" function, when activated (On), which bin last zone count data to display.

Bin Reset - This function allows the user to reset (clear) the data bin.

CAUTION! *All count data will be cleared from memory when this function is turned "On". Unlike most functions, where you must Exit the menu and Quit and Save or select No Save first to activate the function; Bin Reset clears the bin data as soon as you select "On". The parameter will then return to "Off" and the data bin has now been completely cleared.*

Unit ID - This function has two uses. First, it displays the current Unit ID of the VersiCam system. Secondly, it allows the user to set the User ID of the VersiCam system to any four alphanumeric character string consisting of numbers or characters. The primary reason to change Unit ID is for multi-drop applications; if you are not using multi-drop, it is strongly recommended that you leave your Unit ID set to factory default which is "0000".

More



Hemisphere – The internal Real Time Clock is used by the algorithm to estimate when day/night and night/day transitions occur throughout the year. This setting informs the system which hemisphere the system is operating in. This is important as the seasons are reversed from Northern to Southern hemisphere. The default setting is North.

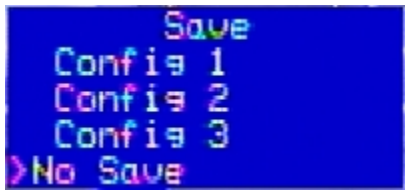
Clock Display – Turns the Real Time Clock display on or off.

Iteris Logo – This gives you the option to turn the Iteris Logo display on or off. The default is set to on.

Exit - This function exits the Utility option menu and returns the user back to the main menu bar.

4.13 Quit Menu

The Quit menu allows you to exit the configuration process once all changes have been made.



Save to:

- Config 1
- Config 2
- Config 3
- No Save

The "Quit" menu item gives the user the option to "Save" up to three different configurations (Config 1 - 3). Simply click on the configuration number that you want to save the current configuration to. You can save the same configuration to multiple memory locations. If you do not want to save your changes, select "No Save" and you will exit the "Quit" menu without saving any information.

Either "Saving to a configuration" or selecting "No Save" will serve to activate functions that require activation like the "Test Channel" (Test / Ch) function found as one of the functions in the "Diagnostics" (Dia) menu.

Configuration Name Customization

The saved "Configuration Name" is also user customizable. The default designation is: "Config 1, Config 2, and Config 3", however, this can easily be changed using the On Screen Keyboard. Configuration names can be up to 10 characters in length.

4.14 VRAS Setup

Iteris provides a PC based application called Vantage Remote Access Software (VRAS) which can be used to perform all the configuration functions described above. This can either be in real time connected to an VersiCam system or ahead of time saving the configuration to the PC's hard drive for upload to an VersiCam at a later date. Complete details of operation of VRAS can be found in the manual that accompanies the software.

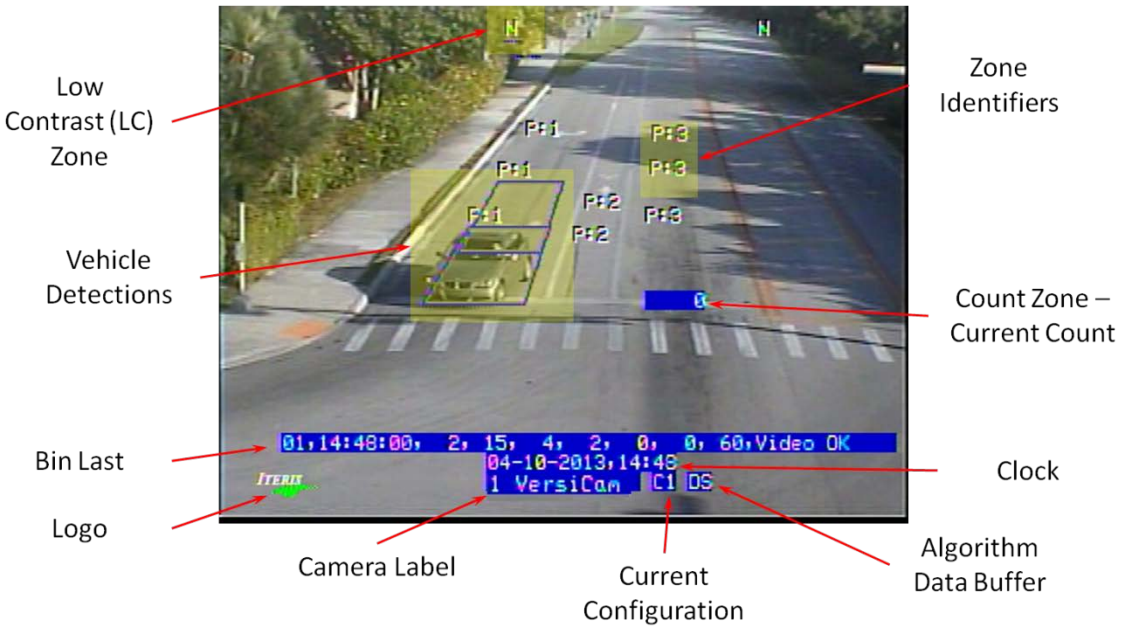
DATA LOG DIAGNOSTIC LOG

The system contains a diagnostic log of all major events that occurred to the VersiCam processor. These events include power resets, constant calls, alarm calls, etc. The log can be accessed through VRAS and can be a useful tool when troubleshooting detection or system performance issues.

5. OPERATION

5.1 Run Time Display

☑ ***Note:*** *The following parameters are being used in VersiCam firmware version v08.01.17, the current VersiCam firmware version at the time of this manuals publication. The following section is somewhat firmware dependent and may change in future firmware versions. Always refer to the current Vantage firmware release notes for the latest information on Vantage firmware features and operation. The following information is a high level look at the Vantage firmware.*



Zones Lighting with Detection

During operation when a vehicle is detected the outline of the zone will light up.

Constant Call

If the algorithm determines that a zone is not detecting it will go into failsafe mode. The output associated with the zone will be turned on and a "@" symbol will be displayed above the zone. The system continues to monitor conditions and if detection quality improves the system will exit this mode.

If the system determines that the whole image is a problem due to percentages from other cameras being in LC or DID all detection outputs will be turned on. The system displays "GCC" on screen to indicate that the system is in constant call due. GCC stands for Global Constant Call. This feature is helpful when camera 1 has constant calls but is not in DID or LC and displays "GCC". Then the user can deduce that camera 2 is in DID or LC causing constant calls on camera 1.

Camera Label

The camera label indicates which camera is currently being viewed, along with other important system information.

Camera Label Elements:

1 Camera - This part of the camera label tells the user that we are looking at camera one. "2 Camera" would signify camera two.

C3 - This part of the camera label tells us that configuration three is the current active configuration. "C1" would indicate configuration one, "C2" would indicate configuration two.

Algorithm Data Buffers

The buffers collect specific information about the intersection and allow the Vantage system to operate in a more intelligent manner. Typically, an even greater level of system operational stability is achieved after both buffers have been filled. If power is disrupted to the VersiCam Camera Processor module all the buffers will be reset.

- DS – Day Short, processor in Day time mode and powered up for 0 to 2 days.
- NS – Night Short, processor in Night time mode and powered up for 0 to 2 days.
- D – Day, processor in Day time mode and powered up for more than 2 days.
- N – Night, processor in Night time mode and powered up for more than 2 days.

5.2 Three Stage System Operation

The following information is a high level look at the Vantage Three Stage System. This section is designed to give the user further insight into their Vantage Edge2 processor operation.

☑ ***Note:*** *The following system was being used in VersiCam firmware version 08.01.17, the current VersiCam firmware version at the time of this manual's publication. The following section is somewhat firmware dependent and may change in future firmware versions. Always refer to the current Vantage firmware release notes for the latest information on Vantage firmware features and operation.*

System operation is broken down into three stages. Each stage is by zone, different zones can be in different stages depending on the road conditions for the zone. For example, some zones may be experiencing glare or shadows when others are not.

Stage 1 (S1) - This stage indicates that the system is in normal operation. Detection should be occurring normally, contrast and field of view image quality is good.

Stage 2 (S2) - This stage indicates a degradation of contrast and or field of view image quality. These conditions usually accompany a decrease in detection strength (weak detections). These conditions trigger the algorithm for increased sensitivity to ensure good detection. This increased sensitivity mode is known as "Hypersensitive" mode.

Stage 3 (S3) - This stage indicates a possible challenging detection condition. Rather than take a chance of detecting poorly, the zone(s) have gone to a failsafe or constant call mode. The system will display a '@' above any zone is S3 mode.

5.3 Learn Mode

Learn Mode is the mode that the VersiCam camera processor uses while it is learning the zone background and your field of view. During the "Learn Mode" the VersiCam camera processor places constant calls on the channels associated with the zones that have changed. These zone changes would include: when zones are first created, when zone size is changed, and when zones are physically moved. Learn Mode can also occur on power-up or after power outages. Receiving and loading new configurations also results in learn mode.

Iteris was one of the pioneers of DZR (Dynamic Zone Reconfiguration). This means that when you make a change to a zone, only the channel associated with that individual zone enters into a learn mode.

When a zone is in "Learn Mode", there will be an " * " next to the zone that is learning. The learn time on the VersiCam camera processors is three minutes.

☑ ***Note:*** *Notice the zone identifiers in the picture are referenced by "Zone Type" and not "Zone Number". This option is set in the VersiCam camera processor "Mode" menu under Mode. CN = Count Zone, PR = Presence Zone, etc. For more information see the section on the Mode Option Menu.*

5.4 System Failsafe Modes

The VersiCam is designed to operate under the challenging conditions that are encountered in the traffic and intersection environment.

However, if failures do occur, or when severe conditions might require it, the VersiCam design incorporates methods to default to a failsafe mode of operation.

Glare Mode

Glare Mode was designed to help in situations where roadway glare, during certain times of the day, may interfere or inhibit the ability to accurately detect vehicles.

"Glare Mode" must be enabled through the "Option" parameter in the "Diagnostic" (Dia) menu. Glare Mode is turned off by default from the factory and must be enabled by the user before it will become active. See the firmware version release notes for specific information on how to enable this feature by setting the correct option number.

When the option is enabled, Glare Mode places a constant call for zones that are saturated by glare. When approximately 75% of a particular zone is covered (saturated) by glare, the output channel associated with that zone will place a constant call to the controller. After a zone is saturated by glare, it takes about three minutes for the processor to generate a constant call condition. It also takes about three minutes to come out of the constant call condition, once the zone is no longer saturated by glare. The zone will revert to normal operation once the glare condition has diminished enough to resume normal operation again.

When the system is in "Glare" mode an indicator is visible in the left potion of the camera label.

Low Contrast Mode

Low Contrast (LC) mode is a failsafe mode that the VersiCam processor will default to during low contrast conditions that could adversely affect the system's ability to adequately detect vehicles. Low Contrast (LC) operates independently of the three stage detection system (S1 - S3). When a camera view is in LC mode, all channels associated with that camera view will place constant vehicle calls. The corners of all the zones will also be illuminated.

Low contrast conditions would include fog and could also include certain contrast limiting conditions like snow and rain. These are just a few of the more common triggers for LC mode.

When an VerisCam camera processor camera view is in LC mode, there is an indicator of "LC" shown in the camera label.

Low Contrast Mode With Multiple Cameras

If one of the cameras, on a two video input Edge2 Processor enters into Low Contrast (LC) mode, the other camera will also enter into a failsafe LC mode and will also place constant calls on all assigned output channels. Realize that the other camera in Failsafe mode will not show "LC" in the camera label.

Other Conditions

Loss of Video - If video and video sync. is lost, the associated camera and all of its assigned zones will place constant vehicle calls.

Loss of Power - If power is lost to the VersiCam camera processor unit, it will place constant vehicle calls on all channels.

6. TROUBLESHOOTING – FAQ

VersiCam Troubleshooting Chart

ICC Symptoms	Cause	Solution
No LEDs on	No 120VAC on back of rack. No 120VAC on front of rack and/or no 12-24VDC on back of rack.	Apply 120 to front or back of rack. Apply 12 -24VDC to back of rack.
On line LED on Video in LED off No picture on monitor	+VS or GND wires not connected, broken or reversed.	Swap +VS and Gnd wires. Troubleshoot +VS or Gnd connection.
On line LED on Video in LED blinking No picture on monitor	Video – wire broken/not connected or Both Video + and Video– wires broken or not connected	Troubleshoot Video- wire and Video+ wire connections.
On line LED on Video in LED blinking Picture on monitor	Video+ wire broken or not connected	Troubleshoot Video+ wire connection.
On line LED on Video in LED blinking Scrambled Picture on monitor	Video+ and Video– wires reversed.	Swap Video+ and Video- wires.
On line LED on Video in LED off Picture on monitor No menu	SDIO+ or SDIO– wires broken, not connected or reversed.	Swap SDIO+ and SDIO– wires. Troubleshoot SDIO+ or SDIO- connection.

Symptom A: VersiCam has no video display on monitor.

Is the video in LED on solid?

Yes – Check the coax flex cable that goes from the processors video out to the monitor.
Check the monitors operation. Does the monitor have power? Try a different monitor. If the video cable and the monitor are good then the fault lies with the processor. Send the VersiCam in for repair.

No – Bypass the surge protector.

Is there video on the monitor now?

Yes – The surge suppressor has failed. Replace the surge protection.

No – Check the coax cable and connectors.

Symptom B: The ICC Module's online LED is blinking constantly.

i. The ICC Module online LED will blink for a couple seconds during startup. This is normal. For a continuous blinking see the steps below.
ii. Power cycle the ICC Module to see if blinking goes away.

iii. Make sure the reset line of the detector rack is not grounded (pin C).
iv. The menu button maybe stuck in the depressed position.
v. If the blinking persists there is a problem with the ICC Module or VersiCam Camera and they need to be sent in for repair.

Symptom C: The ICC Module has an output channel that is locked on.

i. Check the front panel switches. If the switch is in the down position it will place a constant call. The middle position is normal operation.
ii. Is there "GLR" (glare) or "LC" (low contrast) in the camera label? Glare or LC can cause a zones' output channel to lock on.
iii. Reset a zone that is associated with the stuck on channel.
iv. Delete all of the zones associated with that channel and redraw them.
v. If none of these suggestions work the ICC Module may have a shorted channel and needs to be sent in for repair.

Symptom D: The System is locked up with constant calls no menu button response.

i. Unplug the USB mouse. Leave mouse disconnected when not in use.
ii. Power cycle unit and go to the utilities menu and do a bin reset and log reset.
iii. Upgrade VersiCam to latest firmware version.
iv. If these steps fail to remedy the situation the VersiCam maybe bad and needs to be sent in for repair.

Symptom E: System has constant calls.

i. Under the MOD menu is out/ch set for "maxcall"? If it is, set the output channel to "normal".
ii. Does the ICC Module have a good video source? If the video in LED is on then the ICC Module is seeing sync from the camera. If the video in LED is off then the video signal is missing or bad and the processor will output constant calls.
iii. Does the camera label display "LC" or low contrast mode? Then the constant calls are appearing because the processor is in low contrast mode. This is normal behavior if the camera cannot see because of fog. If LC is coming on when it should not, try drawing LC zones over areas of contrast. Try cleaning and focusing the camera lens. If the LC problem persists that camera may need to be sent in for repair. If LC at night time is a problem due to lack of lighting it maybe turned off by setting option 128.

Symptom F: No VRAS or VSU RS232 communication with System.

i. Make sure you are using the correct serial file transfer cable Belkin part # F3B207-06. Try a different serial file transfer cable.
ii. Make sure you know what com ports exist in your computer. If you are not sure what com port number(s) your computer has go to "My computer" right click and select "properties". Under the system properties select the "hardware" tab. Under the hardware tab, select "device manager". Click on the + sign next to Ports. There should be a list of all the serial ports here with there assigned com port numbers.

iii. Make sure the program you are using VSU or VRAS has the same communication parameters as the processor does. The communication parameters for the ICC Module are found under the MOD menu. VSU needs 38400 baud, parity none and flow control hardware to connect.
iv. Has someone changed the Unit ID from the factory default 0000? VRAS will not connect if the Unit ID of the processor is different than the Unit Id of the VRAS address book. You can verify or program the unit ID in the Utility menu of the VersiCam.
v. The computer may have a bad com port. Try to connect with a different computer.
vi. The USB to serial port adapter maybe bad or not compatible. Try another USB to serial converter.
vii. If these steps fail to remedy the situation the ICC Module may have a bad com port and needs to be sent in for repair.

Symptom G: Menu comes up but no mouse movement.

i. Make sure the mouse connector is properly seated into the processor. Unplug mouse and plug it in again.
ii. Try swapping the mouse out with a spare.
iii. Disconnect the mouse. Power cycle the ICC Module. Reconnect the mouse.
iv. If these steps fail to remedy the situation the ICC Module maybe bad and needs to be sent in for repair.

Symptom H: System places constant calls on unused channels.

i. The processor may place constant calls on all channels for 3 minutes when first powered up until a quit and save is done.
ii. Check to make sure under the MOD menu that “inactive channel” is set to “no call”. If inactive channel is set to call then all unused channels will be on.
iii. If these step fail to remedy the situation the processor maybe bad and needs to be sent in for repair.

Symptom I: One channel constantly blinks on and off every second.

i. Make sure the Test/Ch under the DIA menu is programmed for none. If a test/Ch is programmed it will turn on for 1 second and the turn off for 1 second continuously. The test channel will time out after 1 hour.

Symptom J: The overlay shows the zones blinking on and off but the processors outputs do not match.

i. Make sure you are not using the same output channel on 2 or more camera views. Each output channel should be used for only 1 camera view. Having the same channel on multiple cameras can cause erratic channel output behavior.
ii. Make sure an Output Channel has been assigned.

Symptom K: The video on the monitor looks too bright.

i. Adjust the brightness and contrast controls on the monitor.
ii. If these steps fail to remedy the situation the VersiCam maybe bad and needs to be sent in for repair.

Symptom L: The video on the monitor looks dark.

i. Adjust the brightness and contrast controls on the monitor.
ii. Check the Video – and Video+ wires.

iii. If these steps fail to remedy the situation the VersiCam camera maybe bad and needs to be sent in for repair.

Symptom M: After a power cycle my system the time resets to 01-01-2000 and bin data is lost.

i. The battery is dead or missing and needs to be replaced. The part number for the battery is CR2032.

Symptom N: I can connect to my system with VSU but it cannot identify my processors firmware version.

i. Reinstall the newest VSU from the dealer web page for your particular processor. If you are installing multiple VSU's do the oldest first and the newest last. If you follow this procedure you will have the most up to date history file.
ii. Each time you run VSU it installs firmware for a particular processor. It is important to pick the correct VSU version for you processor.
    a. 08.01.17 is used on VersiCam.

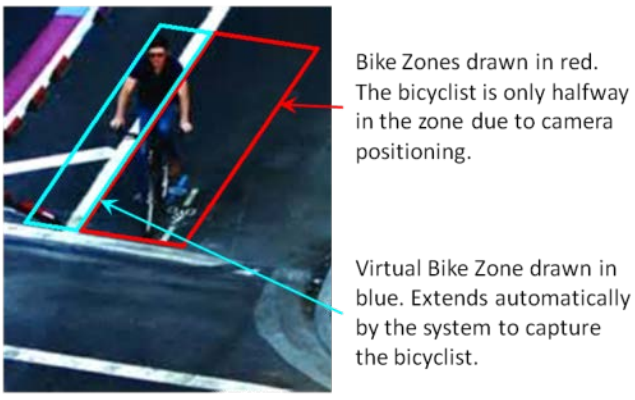
    Some people run into problems when the install the VSU for 04.01.17 and they try to connect to a VersiCam system.

Symptom O: Bike Missed Calls

Bike Night Sensitivity – Because of lighting conditions bicycles are harder to detect at night. Turning this attribute on may help with missed calls in poor lighting conditions as it increases the sensitivity of the zone. The proper solution is to improve the lighting at the intersection.

☑ ***Note:*** *This attribute only works on zones at the stop bar. If you have a zone away from the stop bar, then turning on this attribute will have no effect on performance.*

Bike Virtual Zone – If the camera is not mounted directly above the bike lane the Bike zone drawn may not be rectangular but a parallelogram. Due to the position of the camera, the body of the bicycle rider may appear out of the zone, and the call may be missed. This attribute will extend the zone in an attempt to capture the rider. See figure below.



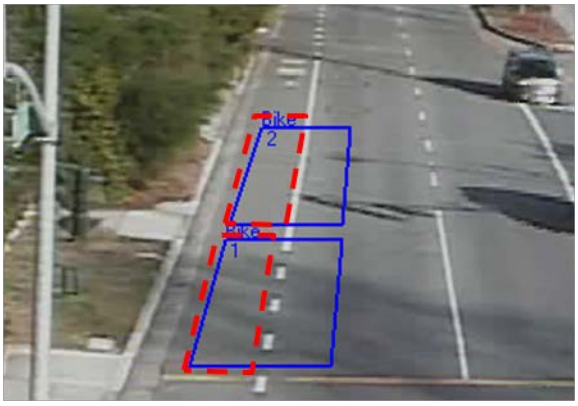
Bike Virtual Zone

On Screen Menu displaying Bike Zone Attributes

☑ ***Note:*** *The two attributes for Bike zones, both are set to off by default.*

Symptom P: Bike False Calls

i. There may be occasions when false calls occur in the bike zone at the stop bar closest to the sidewalk caused by right turn vehicles. To help overcome this, extend the bike zone half way into the next vehicle lane. Making this adjustment will help the algorithm determine if an object is a vehicle or a bicycle. See figure below.



The red dotted rectangle represents a typical bike zone deployment. The blue rectangle represents the corrected measure taken.

Extending Bike Zones into the Vehicle Lanes to overcome false calls

ii. Extending the length of a bike zone to a similar length of a vehicle zone may also help reduce false calls.

Symptom Q: No Spare Inputs on Controller for Bicycle Green Min Time

If the controller you are interfacing to does not have extra inputs for extending the minimum green time you can use the following method.

i. Program a spare phase in the controller with the bike minimum green timing.
ii. Program the Bike Zone to output to this phase.
iii. Overlap the new phase with the existing phase.
iv. When a vehicle only is present the standard minimum green time will activate through the normal phase.
v. When a bicycle is present the extended minimum green time will activate through the additional phase.

Symptom R: Motorcycles and Multiple Bikes

Due to the size and shape of motorcycles the system may occasionally find it difficult to determine if the object is a bicycle or a car and may classify it as a bicycle.

If multiple bicycles appear in a bike zone at the same time the system may occasionally classify them as a vehicle and not produce a detection output.

7. Vantage Software Upgrade (VSU)

The Vantage Software Upgrade Program upgrades the firmware on Vantage video detection devices. The Vantage Software Upgrade Program together with Vantage firmware files allows the end user to upgrade processors. This document describes how to install and use the Vantage Software Upgrade Program.

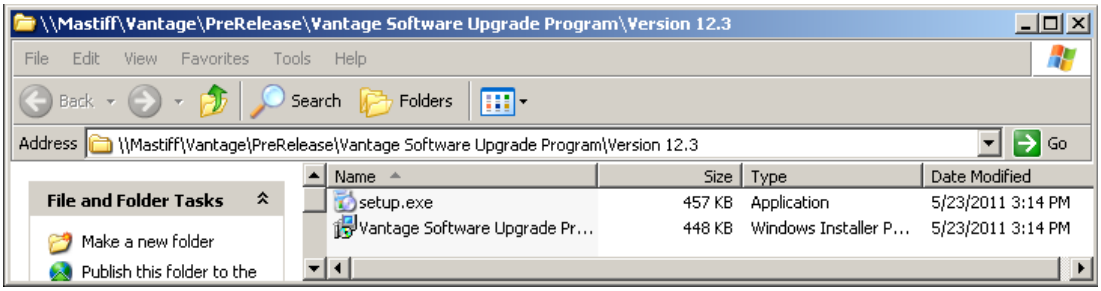
Minimum PC Requirements

- Pentium 400 MHz or better, 512 MB of RAM, mouse, RS232 port and 10 Megs of hard disk space.
- The VSU program needs Microsoft Net Framework 3.5 or higher to be installed prior to VSU being installed.
- The VSU program is compatible with Windows XP, Vista and Windows 7.

Vantage Software Upgrade Program Installation Procedure

Before upgrading firmware in the Edge2 processor the Vantage Software Upgrade Tool must be installed on your PC.

- Download the VSU program file from the Iteris Resource web page.
- Unzip the file.
- Double click on “setup.exe” to install the 12.3 VSU base program on the computer.
- Follow the onscreen prompts to complete the installation of the software.

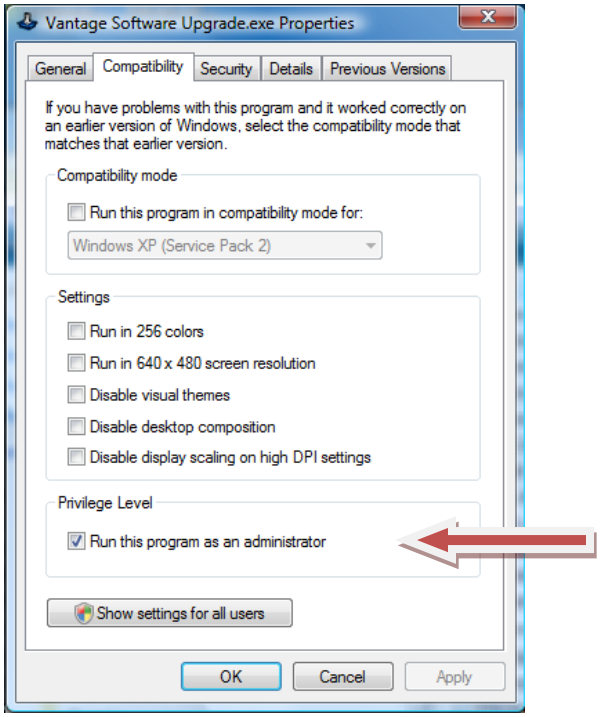


Vantage Software Upgrade Program 12.3 installation files

Vantage Software Upgrade Program Procedure

☑ ***Note:*** *When using Windows Vista or 7 the Vantage Software Upgrade Program must be run in the Administrator mode.*

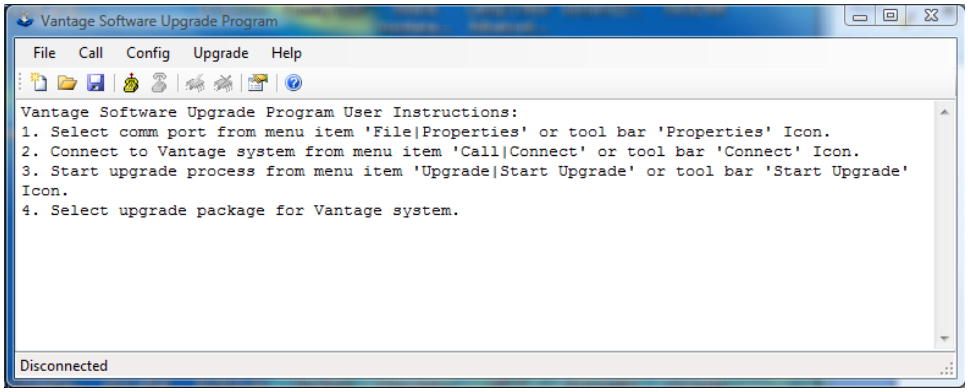
To run program as an administrator right click the VSU icon and select properties. Under the Privilege Level check the “Run this program as an administrator” checkbox. If the Vantage Software Base Program is not run in the administrator mode then the configuration files will not be saved. The configuration files will be erased.



Setting up Administrator Privileges

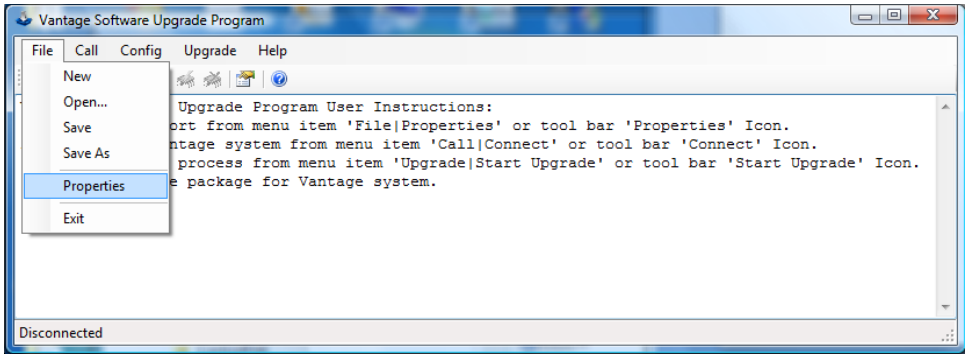
a. Launch the Vantage Software Upgrade Program. The Upgrade program is found in the C:\Program Files\Iteris, Inc\Vantage Software Upgrade Program directory. The program will display a splash screen for a few seconds and then show the beginning form.

Vantage Software Upgrade Program Splash Screen

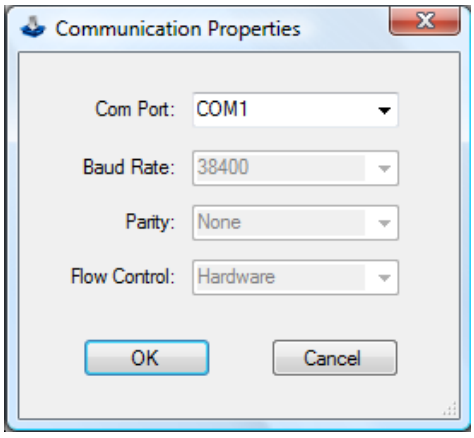


Vantage Software Upgrade Program beginning form

b. Setup comm. port parameters. Under the "file" menu select "properties" or click on the  icon.



Communication Properties

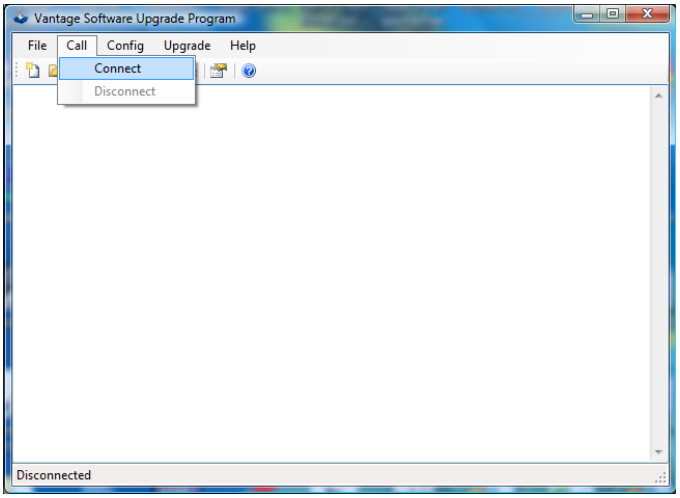


c. Select the serial communications port you wish to use and click on "OK".

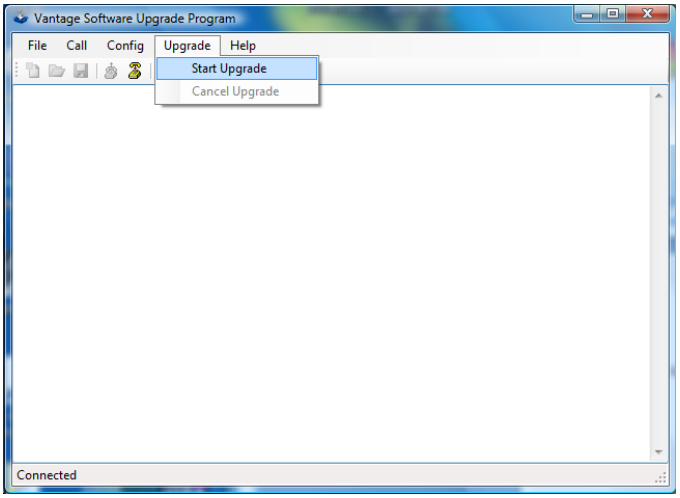
d. Connect serial file transfer cable (null modem cable) from the computers DB9 RS232 port to the Vantage processor's DB9 RS232 port. Belkin sells this cable and the part number is F3B207-10.

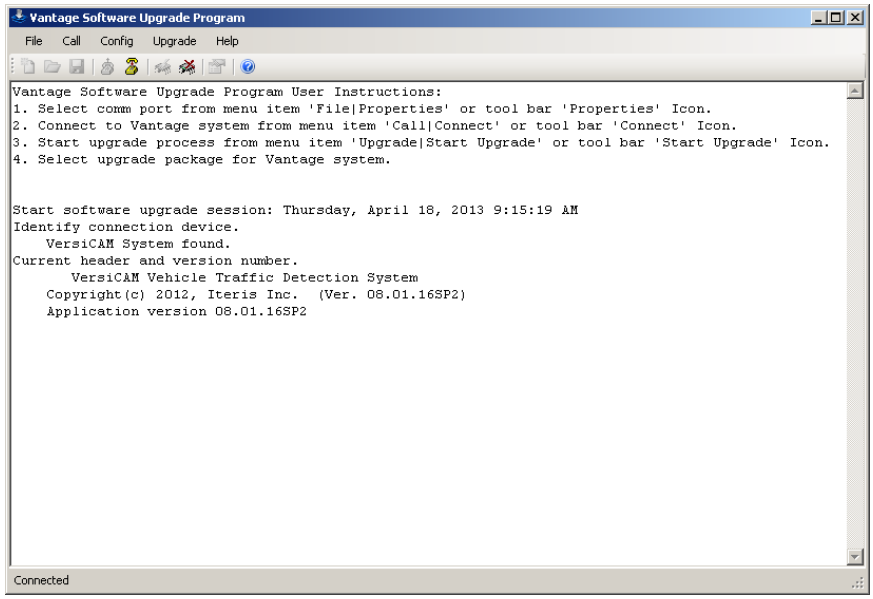
e. Make sure that the target Vantage processor is set to 38400 baud, hardware flow control and parity none. This information is under the "Mod" menu in the processor.

f. Under the “Call” menu select “Connect” or click on the  icon.



g. To start the upgrade, click on “Upgrade” and then “Start Upgrade” or click the  icon.

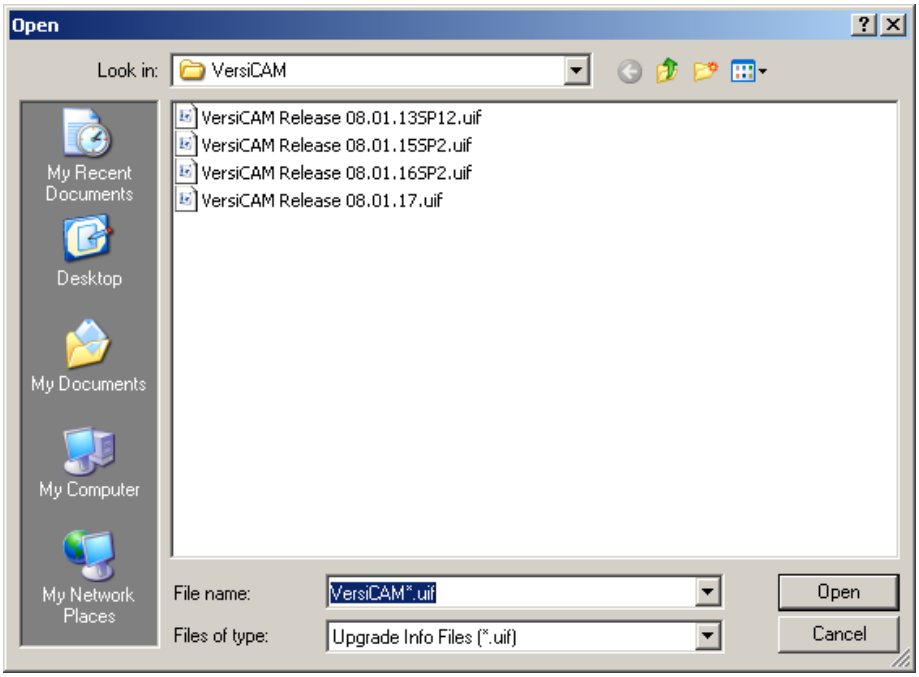




VSU process is started and processor is identified. Edge2-1 processor running 04.01.14.

h. Select a firmware file for upgrade. Firmware choices for upgrade are listed below. Select a file and click on “Open”.

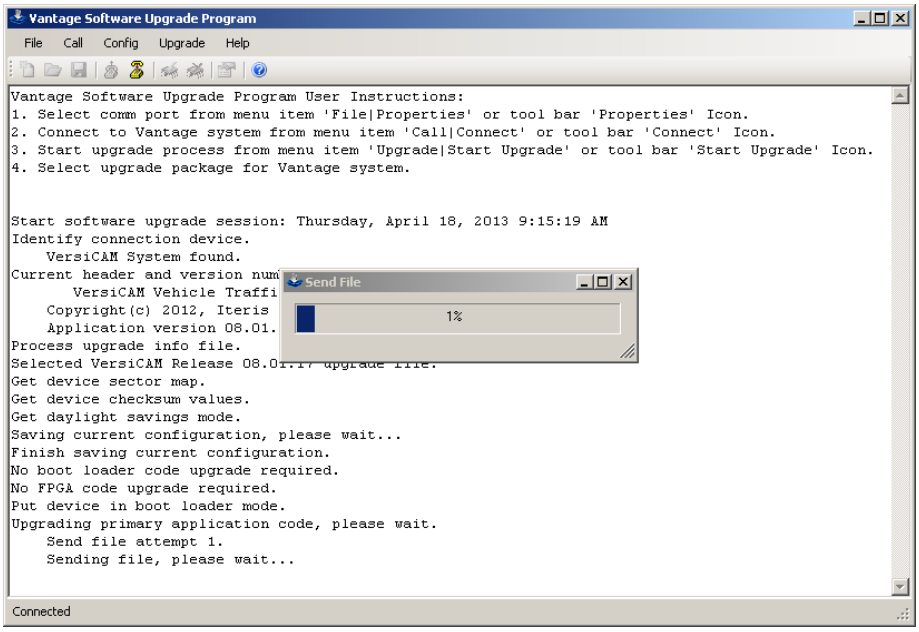
Note: *If no firmware choices exist at this point, firmware files must be installed.*



Firmware Upgrade Choices

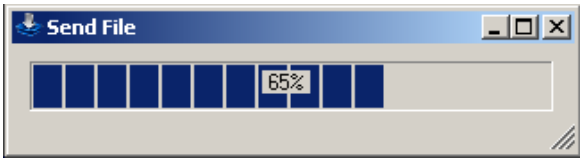
i. Now the VSU process begins. The VSU program automatically saves the current configuration to a file named “VSUUpgrade.vcf”. This file is located in the VSU directory “C:\Program Files\Iteris,

Inc\Vantage Software Upgrade Program\". Vantage Software Upgrade Program begins to send a file to the processor. This process may take several minutes.

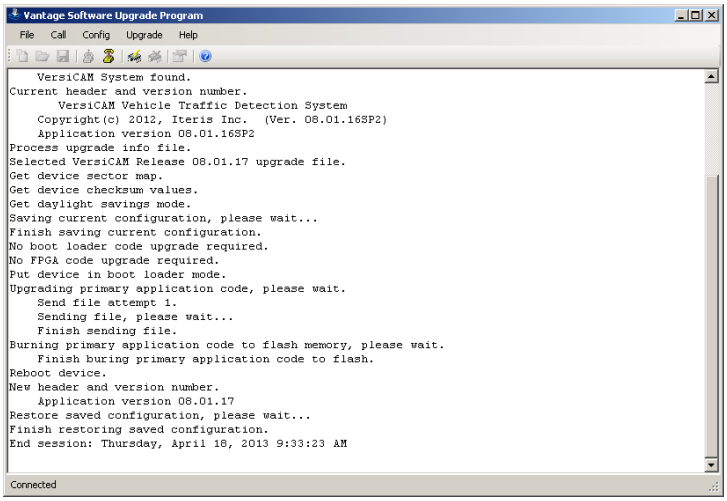


Vantage Software Upgrade progress bar

j. The progress bar shows what percentage of the file has been sent.



k. You may see one, two or three progress bars appear during the VSU process. The firmware on the Edge2 processor has three parts to it, boot loader, FPGA and application. Depending on what version of firmware you start with you may need all three areas to be upgraded. After the files are sent they are burned to flash.

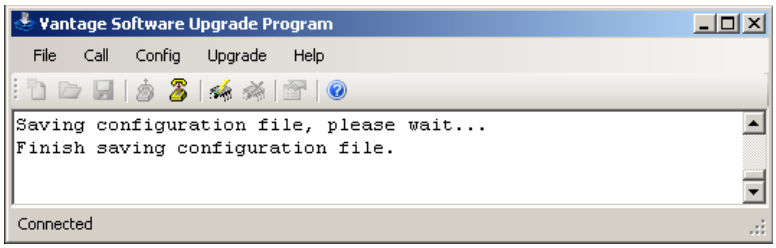


Finished Upgrade session

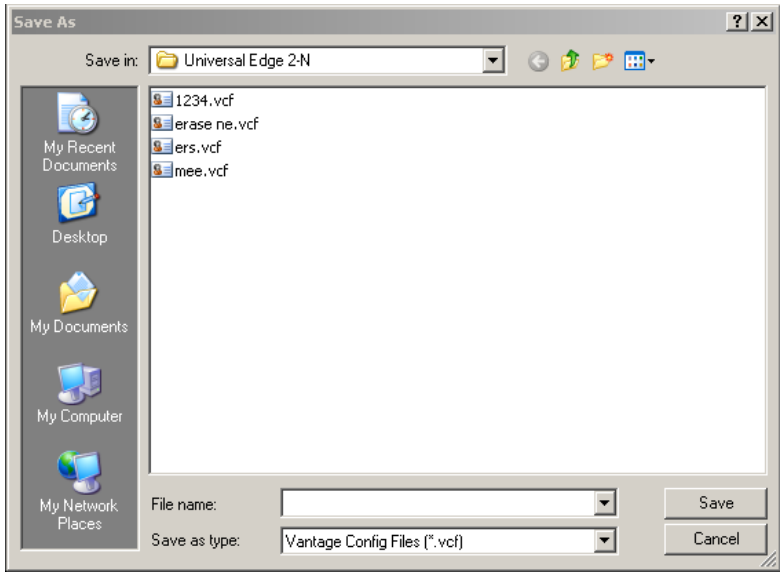
l. After the upgrade the Vantage Software Upgrade Program automatically restores your original configuration. This completes the Vantage Software Upgrade process.

Sending and saving configuration files

Under the config menu there are two choices “send config” or “save config”. To save a configuration select “save config”. Choose a name and click on “save”. The config file is stored in the “C:\program files\Iteris Inc\Vantage software upgrade program” directory. These saved configuration files are compatible with VRAS.



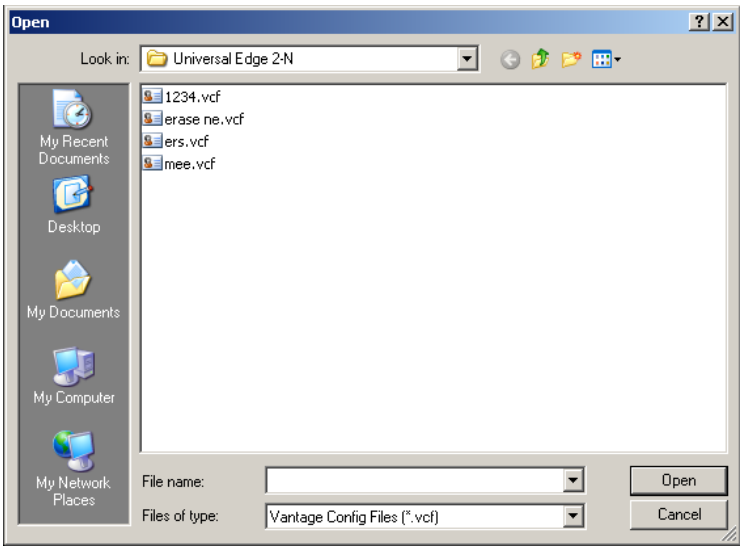
Save config message



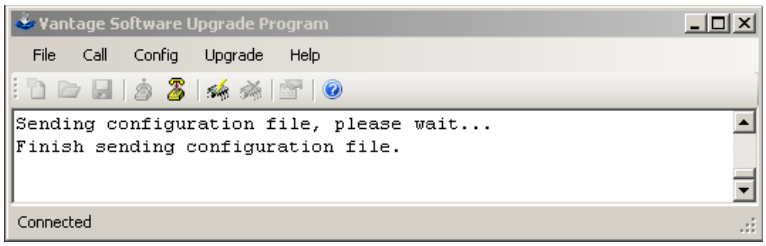
Save Config dialog box

To send a config file to the processor:

Under the “Config” menu choose “Send config”. Choose a file and click on “Open”.



Send File Dialog box



Sending config message

Some Helpful Software Upgrade Tips

Always make sure you are using the correct file transfer cable as described earlier in this section. If the wrong cable is used, you will not be able to connect to the VersiCam system and transfer data effectively.

Make sure the correct comm. settings are set in the VersiCam system before attempting to upgrade firmware using the VSU program. The VersiCam camera processor comm settings under the "Mode" menu should be:

Baud	38400
Parity	NONE
FlowCtrl	HRDWRE

It is a good habit to save your zone configuration on your computer before upgrading firmware, so if something should happen you can easily restore the original zone configuration.

8. MAINTENANCE

The Vantage Video Detection System, once correctly installed, requires a minimal amount of maintenance.

Camera Cleaning

Because Vantage video detection is a machine vision based system, one of the big operational concerns is keeping the front camera glass reasonably clean. A regular maintenance program should be implemented to ensure the front camera glass is kept free from dirt and debris. The camera housing glass should be cleaned at least once a year, or more frequently if required, especially under severe environmental conditions. Dirty camera glass is one of the leading contributors to decreased Vantage system performance. The use of a soft cotton cloth (non-abrasive) and water is the recommended method for camera glass cleaning. Avoid leaving streaks on the glass. Avoid anything that might scratch the glass, cloud the glass, or leave an undesirable residue.

Connector and Cable Inspection

Periodically, it is wise to check camera power and video connections. Look for connector corrosion or moisture damage. Replace any defective connectors. Cabinet power and video cable and connections can also be checked for excessive wear or other defects. Repair or replace the defective cable or connectors as needed.

Firmware Upgrades

Approximately once a year, Iteris releases new firmware upgrades for its Vantage products. By using a program called Vantage Software Upgrade (VSU) you can update to the latest firmware into your Vantage product to add new features and the latest performance enhancements. See the section on "Vantage Software Upgrade" (VSU) in this manual for more detailed information.

9. PRODUCT SUPPORT

The Iteris' Product Support Team consists of a group of highly skilled individuals who 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

Additional Training Materials

Iteris has created a set of interactive training modules which covers the whole range of Vantage products. Contact you Iteris Dealer for more details on this program and how to register.

10. TECHNICAL INFORMATION

IMSA 39-2/40-2 Cable

Aerial and Duct Cable — 300V 6

Spec 39-2 and 40-2 Communications Cable

Product Specifications

Conductors	Solid or Stranded Bare Copper
Insulation	Polyethylene
Color Code	Per Specification
Conductor Configuration	Twisted Pairs
Shield	Corrugated Copper Tape
Jacket	
Spec 39-2	PVC
Spec 40-2	Black PE

Part No.	No. of Pairs	AWG	Solid or Stranded	Nominal OD		Min. Avg. Jacket Thickness		Approx. Weight	
				Inches	mm	Inches	mm	Lbs./1000'	Kg/Km
IMSA Spec 39-2									
580481	3	19	solid	.422	10.72	.045	1.14	87	129
581718	3	19	7 strand	.454	11.53	.045	1.14	91	135
603434	6	19	solid	.510	12.95	.045	1.14	132	196
581164	12	19	7 strand	.686	17.42	.060	1.52	237	353
581855	3	16	7 strand	.586	14.89	.060	1.52	154	229
581751	12	16	solid	.890	22.61	.080	2.03	415	617
581258	25	16	solid	1.140	28.96	.080	2.03	744	1107
IMSA Spec 40-2									
603555	3	19	solid	.424	10.77	.045	1.14	77	115
580125	3	19	7 strand	.444	11.28	.045	1.14	80	119
580382	4	19	solid	.504	12.80	.045	1.14	93	138
580040	4	19	7 strand	.480	12.19	.045	1.14	93	138
603385	6	19	solid	.565	14.35	.060	1.52	132	196
580120	6	19	7 strand	.514	13.06	.045	1.14	119	177
603480	12	19	solid	.666	16.92	.060	1.52	205	305
603403	25	19	solid	.820	20.82	.060	1.52	369	549
603482	25	19	7 strand	1.010	25.65	.080	2.03	422	628
603104	6	16	solid	.666	16.92	.060	1.52	200	298
603994	6	16	7 strand	.683	17.35	.060	1.52	208	309
603223	12	16	solid	.890	22.60	.080	2.03	365	543

Other pair counts and AWG sizes (solid or stranded) available upon request.

Edco HVCP-48 Surge Protection

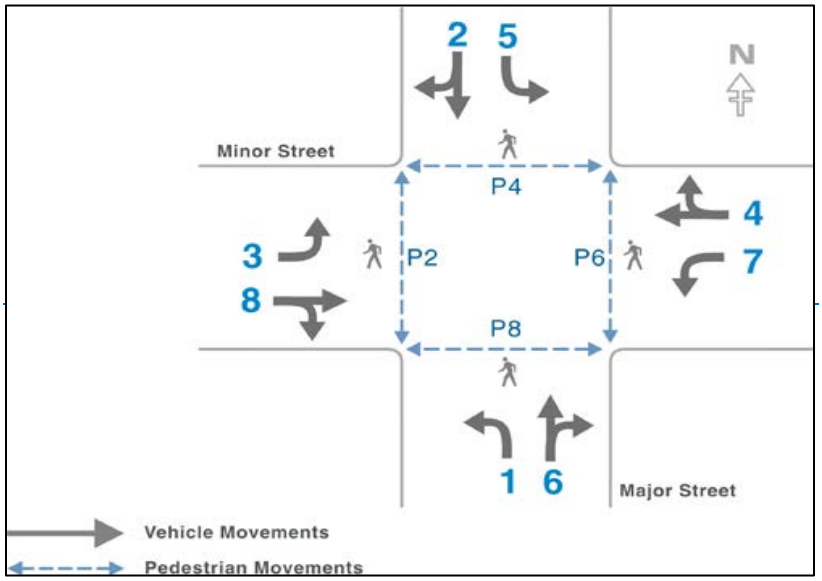
The Edco HVCP Series is a hybrid surge protection product featuring DC power, data and video protection in one package. Each separate circuit is capable of handling high-current impulses while tightly clamping transients and allowing critical power and data to be transmitted.

DC Power Protection (VS)	
Operating Voltage	48 VDC
Operating Current	1 Amp
Clamping Voltage	70 VDC
Total Peak Surge Current Rating	10 kA
SPD Technology	GDT, SAD, Series Element
Connection	5.08mm Terminal Block Plug
High Speed Data Protection (SDIO)	
Clamping Voltage	15 VDC
Total Peak Surge Current Rating	10 kA
SPD Technology	GDT, SAD, Series Element
Connection	5.08mm Terminal Block Plug
Video Protection	
Clamping Voltage	2 VDC
Total Peak Surge Current Rating	10 kA
SPD Technology	GDT, SAD, Series Element
Connection	5.08mm Terminal Block Plug (-BNC Model) Female BNC Jack
Physical Data	
Ground Wire	12 AWG, 36.0â€□ Long
Size	3.3 L x 3.3 W x 1.35 H (inches)
Material	High Impact Plastic
Weight	12 oz.
Mounting	Flange mounted, 3.75â€□ mounting hold distance, (.188 dia.) (2x) DIn Rail mounting (Optional)
Environmental	
Operating Temperature	-40Â°C to +74Â°C
Operating Humidity	0% to 95% Non-condensing
Wiring Terminal	
Wire Range	28-12 AWG
Torque	4.5 LB in
Strip Length	.28 -.31 in
Certifications	
Environmental	RoHS Compliant
Safety	UL 497B Listed, Tested to IEC 802.11
Warranty	1 Year

VersiCam Specification Sheet

	Camera	ICC-Module	ICC-Shelf Mount
Features	• Color imager	• 170 input file compatible	• Compact enclosure
	• 768 x 494 effective pixels	•TS-1 and TS-2 compatible	
	• 470 TV Lines		
	• Automatic white balance		
	• >50dB S/N ratio		
	• 0.1 lux capable		
Lens	Focal length and focus		
	adjustable for horizontal		
	FOV ranging from 5.4º		
	wide to 50.7º wide.		
Connections	Pluggable terminal–6 way	Connector (6-way) for	Connector (6-way) for
	• 2 x DC Power	camera	camera
	• 2 x Differential video	BNC video output, NTSC com-	BNC video output, NTSC com-
	• 2 x Differential control	posite 1V p-p@75Ohm	posite 1V p-p@75Ohm
		USB mouse port	USB mouse port
		RS-232 serial port	RS-232 serial port
Mechanical			
Dimensions	13.5" (L) x 4" (D)	7" (L) x 4.5" (H) x 2.31" (W)	8.3" (L) x 5" (H) x 2.8" (W)
	34.3cm x 10.2cm	17.78cm x 11.43cm x 5.85cm	21cm x 12.7cm x 7.2cm
	Without bracket		
Weight		1.05lbs /0.48Kgs	2.40lbs /1.09Kg
Environment			
Temperature	-31F to +140F	-35F to +165F	-35F to +165F
	(-35C to +60C)	(-37C to +74C)	(-37C to +74C)
Humidity	0 – 100% relative	0 – 95% relative	0 – 95% relative
	Non-condensing	Non-condensing	Non-condensing
Vibration	0.5G, 3 axes, 5-30Hz	0.5G, 3 axes, 5-30Hz	0.5G, 3 axes, 5-30Hz
Shock	10G, all 3 axes	10G, all 3 axes	10G, all 3 axes
Power			
Input	48VDC Output 22W typical	100-240VAC 50/60Hz 0.7A	100-240VAC 50/60Hz 0.7A
Output	Differential video	48VDC	48VDC
	RS-485 serial	27W typical	27W typical

Phase Information



Detector Rack Configurations

332/2070 Type Cabinets

I FILE

SLOT	1	2	3	4	5	6	7	8	9	10	11	12	13	14
U	Φ1	Φ2	Φ2	Φ2	Φ3	Φ4	Φ4	Φ4	Φ1			2P	6P	FS
L		Φ2	Φ2			Φ4	Φ4		Φ3			4P	8P	ST

xP – Ped Switch
FS – Flash
ST – Stop Time

J FILE

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
U	Φ5	Φ6	Φ6	Φ6	Φ7	Φ8	Φ8	Φ8	Φ5			EVA	EVB	RR1
L		Φ6	Φ6			Φ8	Φ8		Φ7			EVC	EVD	RR2

EVx – Emergency Vehicle
RRx – Rail Road

NEMA Type Cabinets

	08 FILE											09 FILE							
	DET 1		DET 2		DET 3		DET 4		P1	P2		DET 5		DET 6		DET 7		DET 8	
BIU	CH 01	CH 03	CH 05	CH 07	CH 09	CH 11	CH 13	CH 15	PE-5	PE-3,4	BIU	CH 17	CH 19	CH 21	CH 23	CH 25	CH 27	CH 29	CH 31
	CH 02	CH 04	CH 06	CH 08	CH 10	CH 12	CH 14	CH 16	PE-6	PE-5,6		CH 18	CH 20	CH 22	CH 24	CH 26	CH 28	CH 30	CH 32

All output channels configurable
PE – Signal Pre-Emption
TS-1 uses backplane/hardwire
TS-2 uses SDLC

Count Bin Capacities

The following information is intended to assist the user in understanding the intersection count data bin storage capacity of VersiCam. Count data is handled in a FIFO (First In – First Out) format. This means that as data is added to the storage memory and the memory allocation becomes filled the oldest data will be dumped to make room for the new data. The VersiCam count data string consists of 16 bytes of information.

The storage capacity is based on the number of bins available (fixed) and the total number of count zones (variable) and the selected count interval (variable). Given the number of bins available, you can easily calculate the storage capacity.

The chart below identifies the maximum number of days of intersection count data that can be stored for the following scenarios —

#1 – One (1) zone per camera at a one (1) hour interval

#2 – Six (6) zones per camera at fifteen (15) minute intervals

Platform	Count Bins (B)	Scenario #1	Scenario #2
VersiCam	83,968	3,487 days	145 days

For scenarios other than shown above the following formula may be used:

D = B / (Zt x (60/I) x 24)

Where:

D = Days
B = Bins
Zt = Total Number of Zones for all Cameras
I = Interval in Minutes

Count String Format:

Count Data String = Zone Detail Number, Date, Time, Count, Video Status

Typical Count Data String:

06,2005-09-15,09:25:00,006,Video OK

06	= Zone Detail Number
2005-09-15	= 9/15/05 (Date)
09:25:00	= 9:25 AM (Time)
006	= Count of 6 Vehicles during the Bin Interval period
Video OK	= Video Status at Time of Count

If the data exceeds the size of the memory buffer, the oldest data is simply over-written (FIFO).

1700 Carnegie Avenue
Santa Ana, CA 92705
Phone: (949) 270-9400
Fax: (949) 270-9401