VantageNEXT™

User Guide

FEATURING

PedTrax™

SmartCycle®

Vantage® Vector®

iteris®

4020003-01 Rev. M

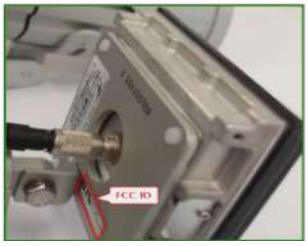
FCC, Class A Statement

This product has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.
This product generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the manufacturer's instruction manual, may cause harmful interference with radio communications.
Operation of this product in a residential area is likely to cause harmful interference, in which case you will be required to correct the interference at your own expense.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
1) This device may not cause harmful interference.
2) This device must accept any interference received, including interference that may cause undesired operation.

FCC RF Exposure Statement

Caution: *To comply with FCC RF exposure compliance requirements, a separation distance of at least 20 cm must be maintained between the antenna of this device and all persons.*



FCC ID Location on Back of Radar

Industry Canada

This unit is compliant to the Industry of Canada specification/ Cet appareil est conforme à la spécification de l'industrie au Canada:
CCU and VP:
CAN ICES-3(A) /NMB-3(A)
Camera:
CAN ICES-3(B)/NMB-3(B)

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1. INTRODUCTION

The most advanced video detection system that delivers superior performance and a scalable platform

Optimum Video Detection System

VantageNext™ is Iteris' next generation of video detection system that capitalizes on the latest generation of processors. The VantageNext uses a powerful state-of-the-art processor and Linux™ OS that enables future functional growth while maintaining proven Iteris video detection performance and reliability. The architecture supports expanding ITS applications and easily integrates with existing and future technologies.

Today's traffic engineers and planners need up-to-the-minute data to ensure maximum efficiency and effectiveness of traffic management solutions. The VantageNext provides all the data necessary to allow the local traffic controller to manage the intersection while delivering network wide data back to the Traffic Management Center.

Simple to Install and Setup

VantageNext improves the lifecycle cost by simplifying the cabling both between the Camera and the Traffic Cabinet and within the Cabinet itself. No special tools are needed for installation.

Benefits

- *Low lifecycle cost*
- *Easy to install, configure and maintain*
- *Simple and convenient access*
- *Flexible and scalable*
- *New and enhanced graphical user interface for operator ease-of-use*
- *Integrated streaming video*
- *Advanced video detection performance*

Features

- *Extension modules in 2, 4, or 32, channel configurations*
- *Fits into Type 170/2070 input files, NEMA TS-1 and TS-2 detector racks*
- *Easy to use menu interface*
- *Auto senses input voltage (+12 or +24 VDC)*
- *High intensity LEDs for easier viewing of status conditions*
- *Up to 32 virtual zones per video input*
- *Virtual zones can be assigned with Boolean logic for greater control*
- *Fail-safe outputs for video loss, low contrast and equipment failure*
- *Non-volatile memory data storage*
- *Self test on power up*
- *Ethernet port for ease of remote access and maintenance*

PedTrax™

Tracking critical pedestrian activity with your Vantage video detection system

Value-Added Data Feeds

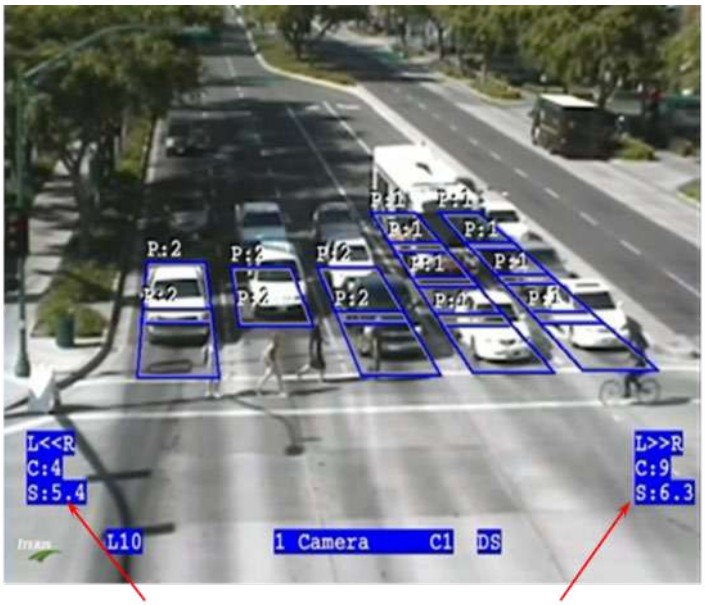
There is an increasing need for more data at signalized intersections, including vehicle, bicycle, and pedestrian information. Agencies are wanting a more complete view of the intersection usage, and ensuring that safety is a key component of all future roadway improvements. To support these efforts, Iteris has developed PedTrax, a video detection feature embedded on the latest Iteris hardware platforms.

Integrated within existing equipment

PedTrax provides bi-directional counting and speed tracking of pedestrians within the cross-walk, automatically collecting this information after normal vehicle detection has been implemented. The PedTrax feature is embedded within the Iteris detection algorithms, and there is no need for any additional equipment for this feature to operate. With count and speed data of pedestrians within the crosswalk, combined with the already available vehicle and bicycle counts, agencies now have the data necessary to support enhanced safety initiatives, improve funding applications, and a focused effort on roadway improvements.

Features

- Provides automated bi-directional pedestrian count data
- Provides automated bi-directional pedestrian speed data
- Works on existing new generation Edge and VantageNext platforms
- On-screen data stream and available bin data
- Included with all new Vantage video detection systems
- Field-upgradeable for latest Vantage hardware platforms



Benefits

- Utilizes previously installed non-intrusive sensor systems
- Additional data stream to existing vehicle and bicycle counts
- Pedestrian speed data can help improve signal timing efficiency
- No additional setup required
- Field-proven detection performance from the industry leader

Vantage® Vector®

Proven Power of Video… and More

The Vantage Vector™ is an all-in-one vehicle detection sensor with a wide range of capabilities (i.e., stop bar detection, advanced-zone detection, moving object sensors) that enable advanced safety and adaptive control applications.

It includes all the proven benefits of Iteris video detection such as high accuracy, high availability, video image for remote viewing, no need to perform costly trenching or pavement cutting for installation, and added bicycle detection capability.

Enhanced Dilemma-Zone Precision

The Vantage Vector™ offers high precision for dilemma zone detection by integrating the video field-of-view with radar sensing. Enhanced information includes the number of vehicles, speed, and distance in user configurable zones that can be used for special applications.

Extended Range for Higher Speed Approaches

The extended range of the advanced zone includes enhanced count, speed, and occupancy (CSO) measurements, where data from advanced detection zones is desired.

Richer Data Enabling New Applications

The Vantage Vector™ enables an exciting new range of speed related intersection safety functions with the availability of vehicle location and speed data.

Additional Benefits

The Vantage Vector™ system adds the following benefits for your vehicle detection needs:

- New graphical-user-interface (GUI) maintains familiar video zone setup procedure ensuring that no new training is required
- Intuitive GUI with symbolic road graphics makes radar sensor setup simple and easy
- Connectivity between sensor head and roadside cabinet using a laptop
- Industry standard detection outputs
- Non-intrusive sensor system for lower installation costs, lower life-cycle costs and safer installation versus in-pavement sensing since no trenching or pavement cutting is required
- Advanced design, color, and mounting blends the sensor into its surroundings for eye pleasing aesthetics
- Video detection up to 400 ft. and Radar detection up to 600 ft.
- Count, speed, and occupancy data
- Power of video and radar sensor fusion extends the detection range for special applications
- Exceptional vehicle tracking for directional discrimination

SmartCycle®

SmartCycle patented technology is embedded in all new Vantage® video detection systems and is a simple upgrade to existing systems in the field. Additional zones can then be drawn to separate bicycle detections from vehicle detections.

Existing Vantage users as well as those new to the technology will be up and running quickly.

No need for additional equipment

The SmartCycle® solution requires no additional detection systems or manual call buttons placed at the signal. SmartCycle combines video vehicle detection and bicycle differentiation in one.

Multiple outputs allow precision cycle timing depending on whether a bicycle is present or not.

1.1 Overview

A typical intersection setup will have four sensors, each connected to a VantageNext CCU and Processor module in the traffic control cabinet. You use the VantageNext's hosted user interface to draw detection zones on the sensor's video image. To define a detection zone, you designate the four corners of a zone on the video picture and then setup the various zone properties. You can define up to 32 detection video zones per camera view.

In addition two types of detection can be configured on the integrated radar sensor. 16 Detection zones and 5 trip lines can be defined on the radar image. These zones are configured in the same way as the video detection zones.

The processor module analyzes the camera image and radar data to determine when a vehicle is present in a zone or trip line. Vehicle detection information is passed to the traffic control equipment for real-time adaptive control. Video can also be sent via by various communication methods to be displayed and monitored at a traffic management center.

This User Guide will walk you through the setup and startup, of the Next system. Please refer to the VantageNext Installation Guide for full instructions of the various modules and setup instructions for the camera.

If you have questions once you have completed the steps within this guide, refer to ***Section 5: Troubleshooting/FAQs*** or contact product support using the number listed in ***Section 10: Product Support***.

2. PROCESSOR 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: Next Video 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.

Correct zone placement is very important to the optimal performance of the system. After zones have been placed and the configuration saved, the algorithm creates Lane Structures. These Lane Structures use the zone placement to estimate the road lanes. This aids the algorithm by creating internal flags ahead of the detection zones. These flags help identify whether the object is a vehicle or a bike. Helps reject moving shadows from vehicles in adjacent lanes and helps reject slow moving or complex shadows from building or trees for example.

Lane structure does not follow curve in roadway

Good Lane Structure

Poor Lane Structure

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 VP1:1 and the zone type should be set to none. This will ensure system performance will be maximized.

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 VP1:1 and the zone type should be set to none.

Zones Placement and Size

Pay particular attention to zones where roofs of large vehicles primarily fills the zone area. Roofs have very few edges, and in this situation, the call might be dropped if the vehicle were to stop in this zone. 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.

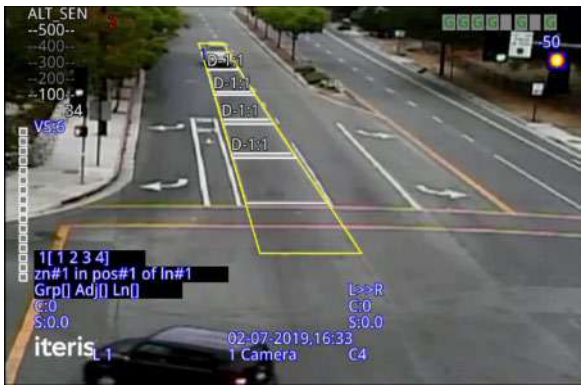
Close attention to zone size and zone placement are also important because, ideally, we like to have at least fifty percent of the vehicle we are trying to detect reside in the detection zone area. Again, this has to do with complex edge content; if we only have one tenth of the vehicle in the detection 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.

Auto Zone Function

To easily create well drawn zones within a lane the Next Setup Tool provides an automatic zone placement function. Follow the steps below to use this method.

Step	Display
Create a zone inside the lane lines from the stop bar to the far area of detection.	
Pull the top of the zone back to make the zone the length of a single vehicle	

Step	Display
Add another zone and place over the top of the first zone.	
Center click on the mouse and the new zone will conform to the original zone shape following the lane lines.	
Repeat until all zones have been configured for the lane.	
Enable lane structure to ensure the configuration is correct. Note: You must assign valid outputs to the zones and send the configuration to the system before you can view the lane structure.	

2.1 Zone Types

Detection zones can be drawn on both the video and radar sensors.

Zone Type	Video	Radar	Trip Line
Presence	Yes	Yes	Yes
Extension	Yes	Yes	Yes
Delay	Yes	Yes	Yes
Pulse	Yes	Yes	No
Count	Yes	Yes	No
Low Contrast	Yes	No	No
None	Yes	Yes	Yes
Demand/Passage	Yes	No	No
Classification Speed Occupancy (CSO)	Yes	Yes	No
Bike	Yes	No	No
Advance	Yes	No	No

The "Type" option 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 Next Setup Tool and this tool 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 32 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 Next System by communicating through the Ethernet port using Next Setup Tool (NST) or automatically with VantageView.
- 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 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.

Draw a minimum of 2 LC zones in the upper 1/3 of the screen to prevent from going into LC mode prematurely

LC zones should have good contrast on a vertical surface such as a sign, tree, or building.

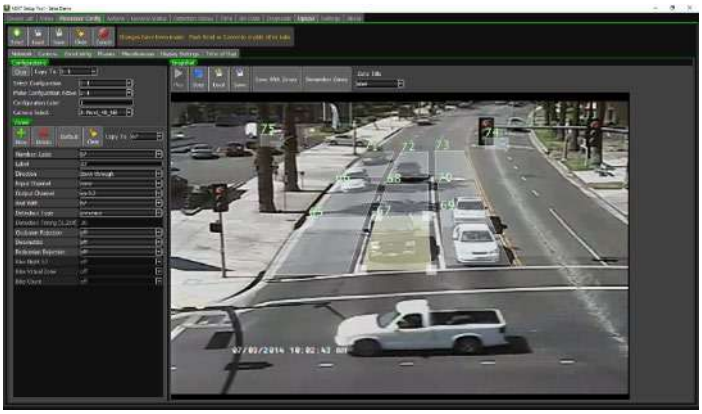
LC zones should NOT be placed on a mast arm at the intersection, or on any light source.

☑ ***Note:*** *Low Contrast zones where formally described as Fog zones. In reality, there are many 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 with Fog zones.*

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 zone numbered 74 the signal head and the LC zone number 75 on the tree 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.

"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 GREEN INPUT (Grn/In) function and lane structure.

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".

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).

All Bike zones can be programmed with extension time by adding extension time to the zone when the zone is configured. The extension places a call while the bike is in the zone, when the bike exits the zone the call is extended for a user selectable length of time. Timing choices range from 0 to 250 in tenths of a second. For example, a value of 50 is equal to five seconds of extension.

☑ ***Note:*** *Setting the time to zero disables the extension and the zone will operate like a standard bike presence zone, ie, the output will only be active while the bike is in the zone.*

Bike zones can have dual functionality providing both presence/extension calls and counting bicycles. Up to six Bike zones can be assigned as count zones. Setting the attribute 'Bike Count' to 'On' enables bike counting in that zone. Refer to ***Section 3.3: Processor Configuration/Zones*** for more details on setting bike counting.

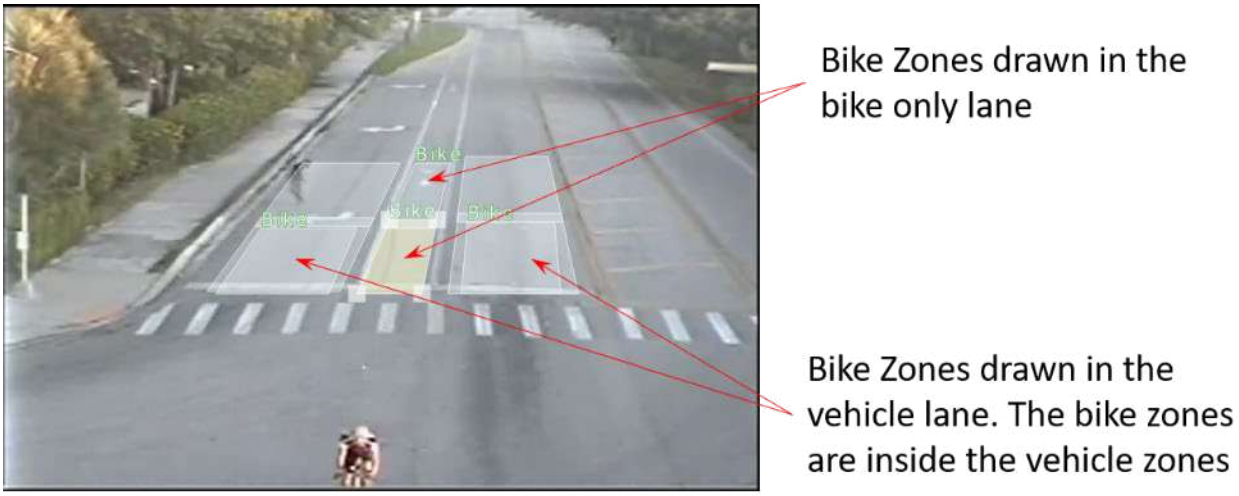
☑ ***Note:*** *Once six bike zones have been assigned to count then this option in the Attribute menu will be switched off.*

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

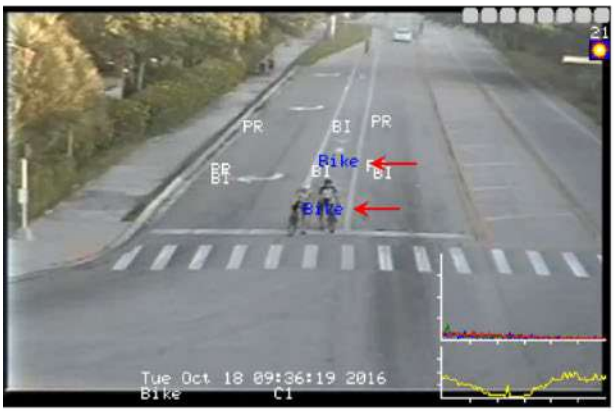
If you need to detect bicyclists in vehicle lanes first draw the regular vehicle detection zone. Please follow all the recommendations for zone drawing outlined in this manual. Once the vehicle zone is drawn, place a bike zone inside this zone. Refer to the figure below.



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

Bicycle extension active

ADVANCED (ADV) – The purpose of this zone is to accurately model how an advanced zone behaves. As the zone detects a vehicle it will output a 300ms pulse. If the zone continues to be occupied, the system will then count down the duty cycle timer. Once the duty cycle timer has timed out a second pulse will be output. This cycle will continue until the system drops the detection call. The second is a duty cycle adjustable from 300mS to 3000mS.

Radar Trip Lines

In Trip Line mode multiple trip lines can be programmed to supply an output when a vehicle crosses a point at the approach.

- Each trip line can be programmed to only output a call if the vehicle speed is between certain speeds (minimum and maximum)
- Each trip line can be programmed for a specific tolerance (width). The system will output a call all the time any vehicle is within this detection area (if the vehicle is within the speed limits)
- Trip Line 1 will record CSO information and should be set to the position nearest the stop line for highest accuracy.

☑ ***Note:*** *The default min speed setting is 0mph and the max speed setting is 255mph. This ensures all vehicles provide an output. To restrict the output to vehicles only travelling a certain speed set the min and max speeds. See diagram below.*

2.2 PEDTRAX

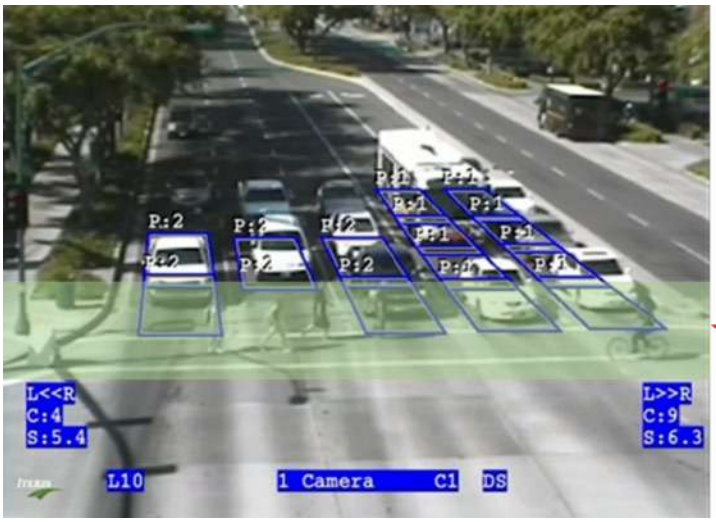
PedTrax provides bi-directional counting and speed tracking of pedestrians within the cross-walk, automatically collecting this information after normal vehicle detection has been implemented. The PedTrax feature is embedded within the Iteris detection algorithms, and there is no need for any additional equipment for this feature to operate. With count and speed data of pedestrians within the crosswalk, combined with the already available vehicle and bicycle counts, agencies now have the data necessary to support enhanced safety initiatives, improve funding applications, and a focused effort on roadway improvements.

Firmware Requirements

PedTrax is available in firmware version 09.02.20 or later. If you are not running this version of firmware you can get the latest version from the Iteris Resource Center. See ***Section 13: Product Support*** for more information on the Resource Center.

Processor Configuration

Once the vehicle detection zones are drawn the processor automatically generates the Pedestrian Crossing area based on the detection zones drawn closest to the Stop Bar.



Pedestrian Zone Generated by System based on Detection Zones

☑ ***Note:*** *The system expects that detection zones are drawn close to the Stop Bar.*

☑ ***Note:*** *The system ignores Count and CSO zones in calculating this area if there are no outputs associated with these zones.*

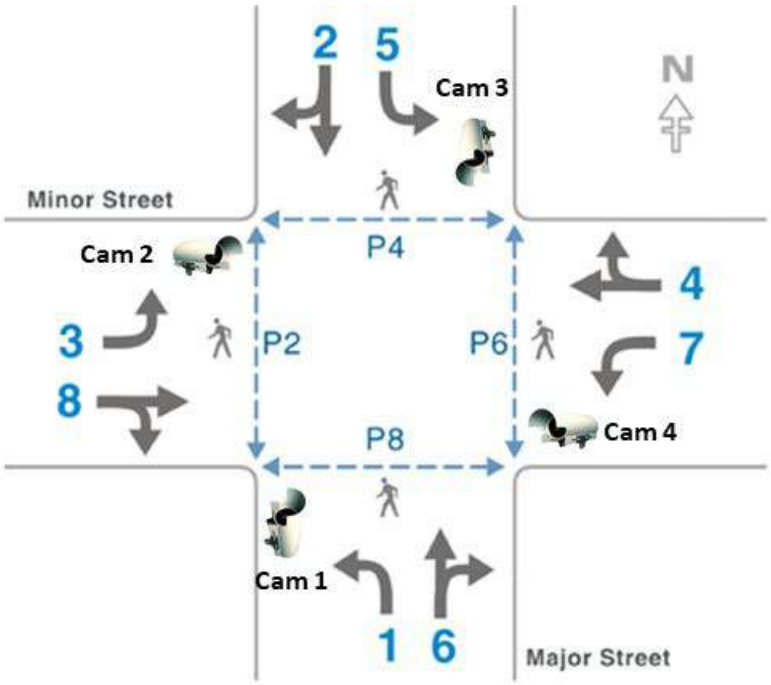
Pedestrian Output

Pedestrian detected outputs are available in firmware version 09.02.20SP1 and newer. This output will trigger when a pedestrian is in the crosswalk. Separate outputs may be programmed for each direction of travel. See ***Section 3.3: Camera Settings*** to program the PedTrax outputs.

☑ ***Note:*** *The same output may be programmed for both directions of travel.*

Pedestrian Crossing Against Don't Walk Signal

Pedestrian alarms are available in firmware version 09.02.20SP1 and newer. This alarms will trigger when a pedestrian is in the crosswalk and a conflicting phase is green. The conflicting phases will vary based on the intersection phasing. The diagram below represents a typical 8 vehicle phase, 4 pedestrian phase intersection. See ***Section 3.3: Camera Settings*** to program the PedTrax alarm outputs.

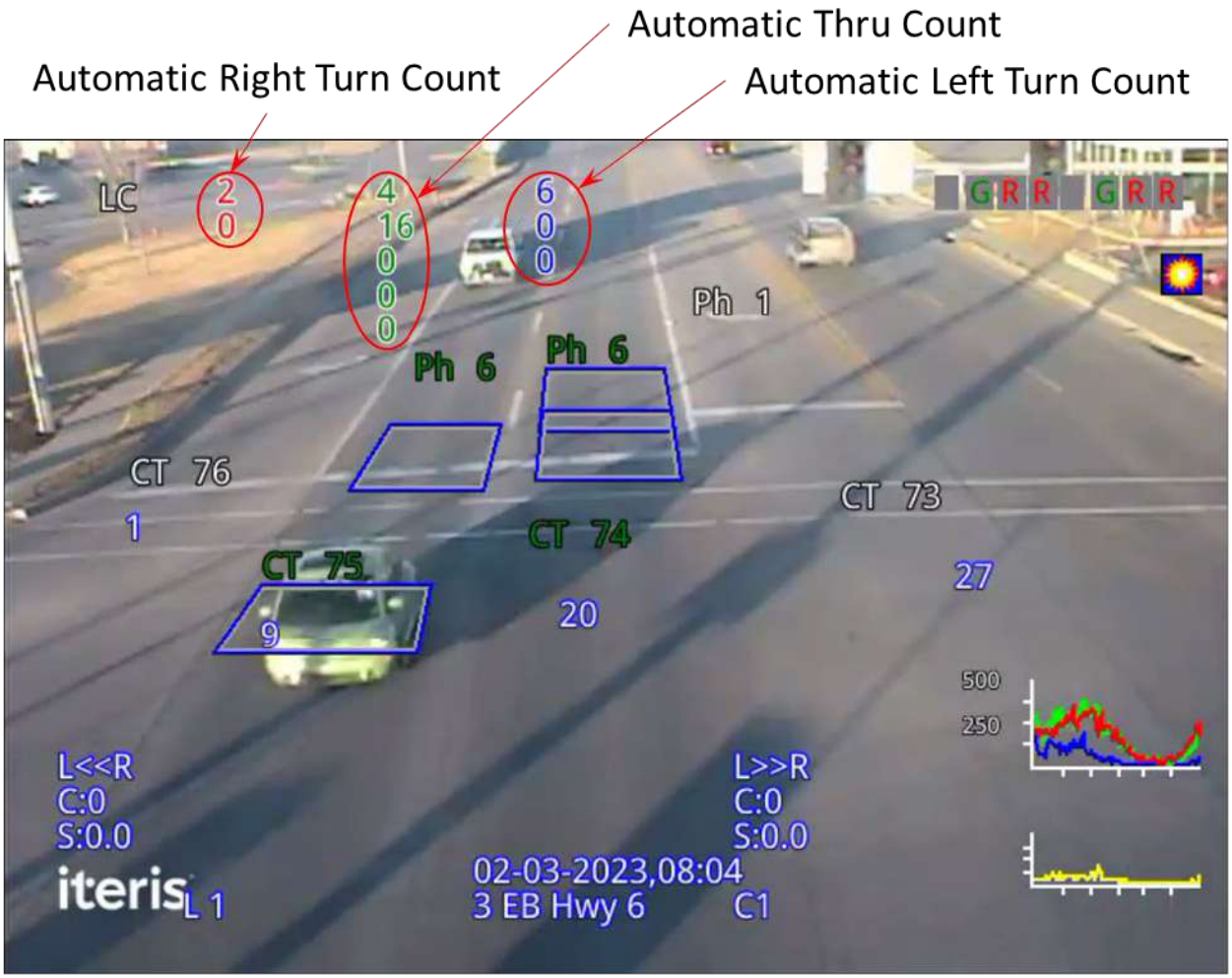


Camera 1 sees Vehicle phases 2, 5 and Pedestrian phase P4
Camera 2 sees Vehicle phases 4, 7 and Pedestrian phase P6
Camera 3 sees Vehicle phases 1, 6 and Pedestrian phase P8
Camera 4 sees Vehicle phases 3, 8 and Pedestrian phase P2

For Camera 1, Pedestrian phase P4 conflicts with Vehicles phases 2, 3, 5 and 6.
For Camera 2, Pedestrian phase P6 conflicts with Vehicles phases 4, 5, 7 and 8.
For Camera 3, Pedestrian phase P8 conflicts with Vehicles phases 1, 2, 6 and 7.
For Camera 4, Pedestrian phase P2 conflicts with Vehicles phases 1, 3, 4 and 8.

2.3 Automatic Vehicle Counting

Beginning with firmware version 02.01.22SP4 the system automatically counts all movements of vehicles. This is displayed on the screen and is stored in the Bin Data.



2.4 Video-Radar Sensor Fusion

How it works

When using a Vector Sensor head, you have selected the most power combination of sensor types. The radar and video complement each other very well, allowing optimum functionality and performance. By utilizing the strengths of each sensor type to compensate for limitations in the other our algorithms can enhance our detection performance. Reducing the chances of either a missed detection or a false detection. In this way we can both improve the efficiency of Movement of Traffic (MOT) while reducing the risk of stranding a vehicle at the stop bar.

With the correct sensor type and setup, the system will automatically begin the fusion process. The system identifies and aligns the detection data from both algorithms. The two algorithms will independently perform their function and determine if a vehicle is present. The fusion algorithm then compares the results of each detection decision. If both agree, no compensation will be made. If they do not agree, the fusion algorithm weighs the confidence of each detection algorithm and the algorithm with higher confidence is used to determine the detector output.

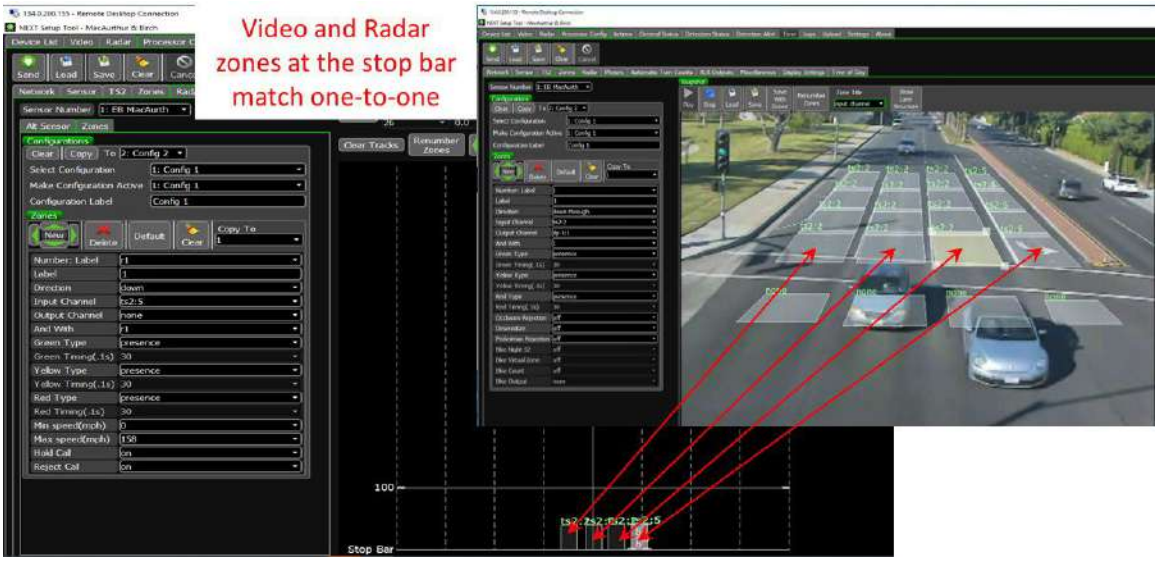
Setup

1. Ensure you are using a Vector sensor head.
2. Ensure the radar function is enabled.
3. For each vehicle lane, created by a lane structure, one radar zone MUST be drawn at the stop bar. See image below.

Important: Failure to match the number of radar zones to the number of vehicle lanes will result in the fusion algorithm to not perform correctly.

Important: The radar zones must be configured as presence zones. The channel output must be set to none.

Important: Do not put a radar zone where a bike lane has been created. This will result in the fusion algorithm to not perform correctly.



☑ ***Notes:*** *Phase inputs are not required.*

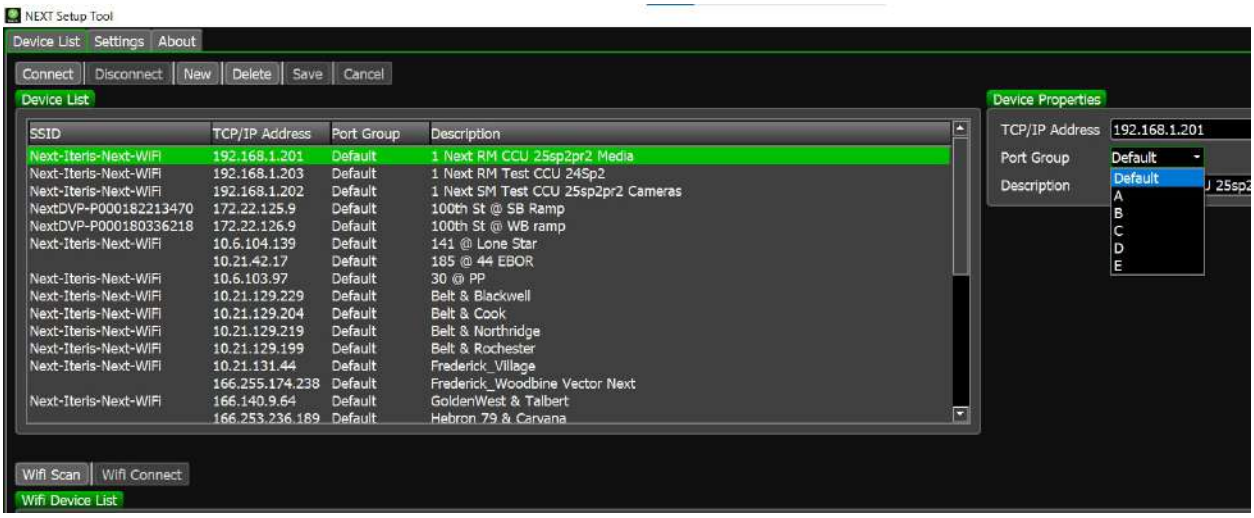
☑ ***Notes:*** *The sensor fusion does not eliminate S3 mode from the system.*

3. NEXT SETUP TOOL (NST)

Programming of the Next system uses the Next Setup Tool (NST). See ***Section 7: Software Installation*** for installation instructions of this application.

☑ ***Note:*** *Default IP Address for the Next system is 192.168.1.2*

3.1 Device List



Existing Systems

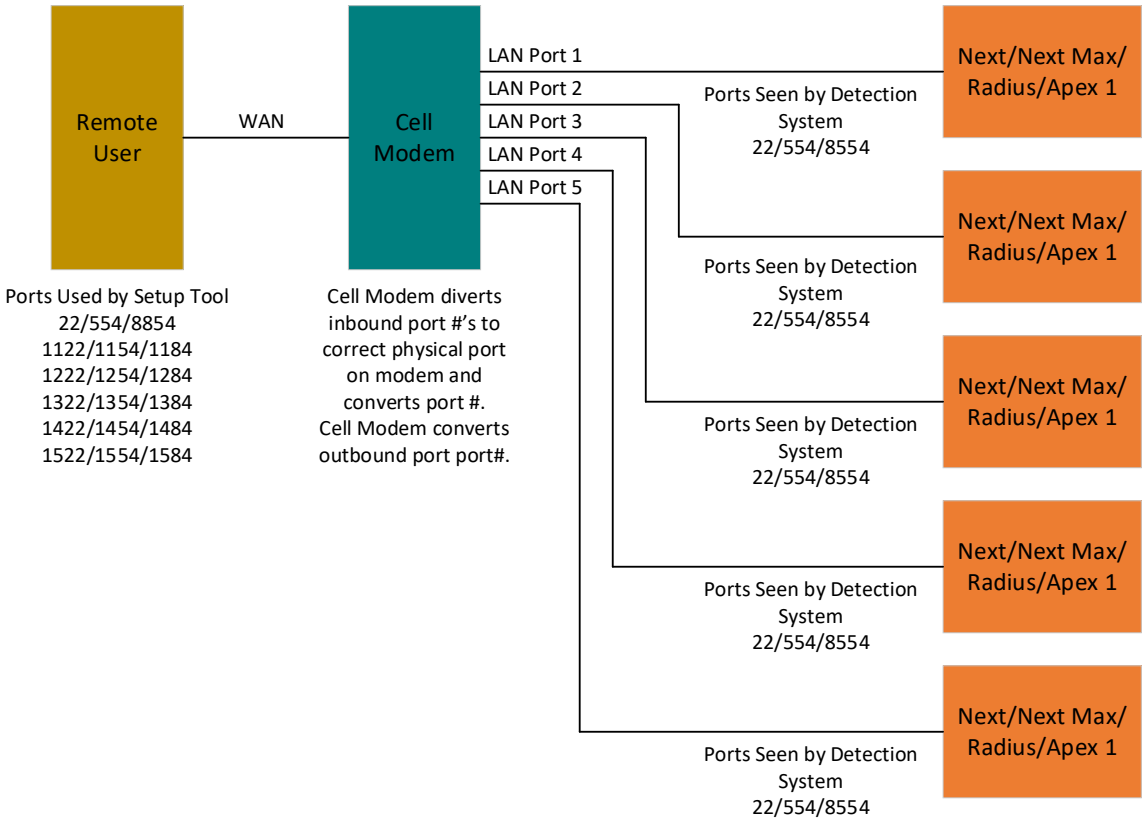
The **Device List** screen provides an address book of all Next system installations previously configured and saved. It provides the application with the information needed to communicate with the Next camera system either locally or remotely.

Property	Description
SSID	This is the captured Wi-Fi label from the device.
IP Address	Communication to the Next camera system is through an Ethernet connection using TCP/IP.
Port Group	Selects alternate Ethernet ports for communication between the setup tool and the system.
Description	The **Description** can be used to identify the different intersections or junctions within a group. E.g., Pullman/Dyer, MacArthur/Birch.

Port Forwarding

If multiple devices need to share the same IP Address, for example when they are behind a cell modem, then they will be a network issue and the detection system(s) will not be accessible. To resolve this issue, it is possible to have the setup tool 'talk' on alternative ports to avoid the network issue.

☑ ***Note:*** *The cell modem must have the ability to configure port forwarding.*



There are five port groups plus the default setting.

Port Function	Default	Group A	Group B	Group C	Group D	Group E
SSH	22	1122	1222	1322	1422	1522
RTSP Single Stream	554	1154	1254	1354	1454	1554
RTSP Quad Stream	8554	1184	1284	1384	1484	1584

Modifying an Existing Device

To modify the parameters on an existing entry, click on the device to be changed in the Device List and enter the new properties in the box. Click **Save** to store the updated device parameters or **Cancel** to cancel the action.

Property	Description
Connect	To connect to a Next camera system, select the system from the Device List and click **Connect**. The menu options along the top of the pane will change from grey to blue upon a successful connection. For an unsuccessful connection, refer to ***Section 5: Troubleshooting/FAQ.***
Disconnect	Once you have finished maintenance on a device return to the Device List screen and click **Disconnect**. ☑ ***Note:*** *The NST can only connect to one Next camera system at a time. Disconnect from the current system before attempting to connect to another system.*
New	To add a device to the system click **New**. Enter the device properties in the system and click **Save** to store the device parameters or **Cancel** to cancel the action.
Delete	To delete a device from the system, select the device from the Device List and click **Delete**.
Save	To save a newly created or modified device click **Save**. The device parameters will be stored in the system.
Cancel	The **Cancel** button has two functions. First, if the user is creating a new device it cancels the creation of a new device without saving the information in the device list. Second, if the user is editing an existing device it will put the last deleted device back into the Device List if it was removed by the user in error.

Wi-Fi Devices

Property	Description
SSID	Wi-Fi Label for device.
Signal Quality	Numeric value for strength of signal.

3.2 Video

The Video screen allows for viewing of video and adjustment of the camera Field of View.

☑ *Note:* *Camera FOV* – see **Section 3.4: Field of View Setup** in the Next Installation manual for more detail on good FOV setup.

Property	Description
Single	Displays a single camera video stream.
Multi	Displays a quad view of all four camera video streams.
Camera Select	Selects which camera video stream will be displayed in single mode. This is also the camera that the FOV adjustments will be made to.
Unlock/Lock	Unlocks or Locks the camera FOV adjustments
Zoom	The slider shows the current zoom position (Pos: x). Move the slider left to zoom out. Move the slider right to zoom in.

Property	Description
Autofocus	Once the preferred zoom position is achieved click on the Autofocus button to focus the camera.
Set	Once the preferred zoom position is achieved and the camera is focused click on the set button to store these settings in the camera module. If a power reset were to occur the camera module will return to this set position.

☑ ***Note:*** *Camera FOV Adjustments are only enabled when the page is in 'Single' mode.*

3.3 Radar

The Radar screen allows for viewing of radar detections and detection status.

☑ ***Note:*** *The phase and detection status is only available on this page for the PC version of the setup tool. To see this information on the embedded version of the setup tool refer to the Detection Status tab.*

3.4 Processor Configuration

Network

Each Next camera system is set to a default IP address before leaving the factory. Before connecting the system to your network the IP Address must be changed. Contact your IT Department to confirm what the IP Address should be set to.

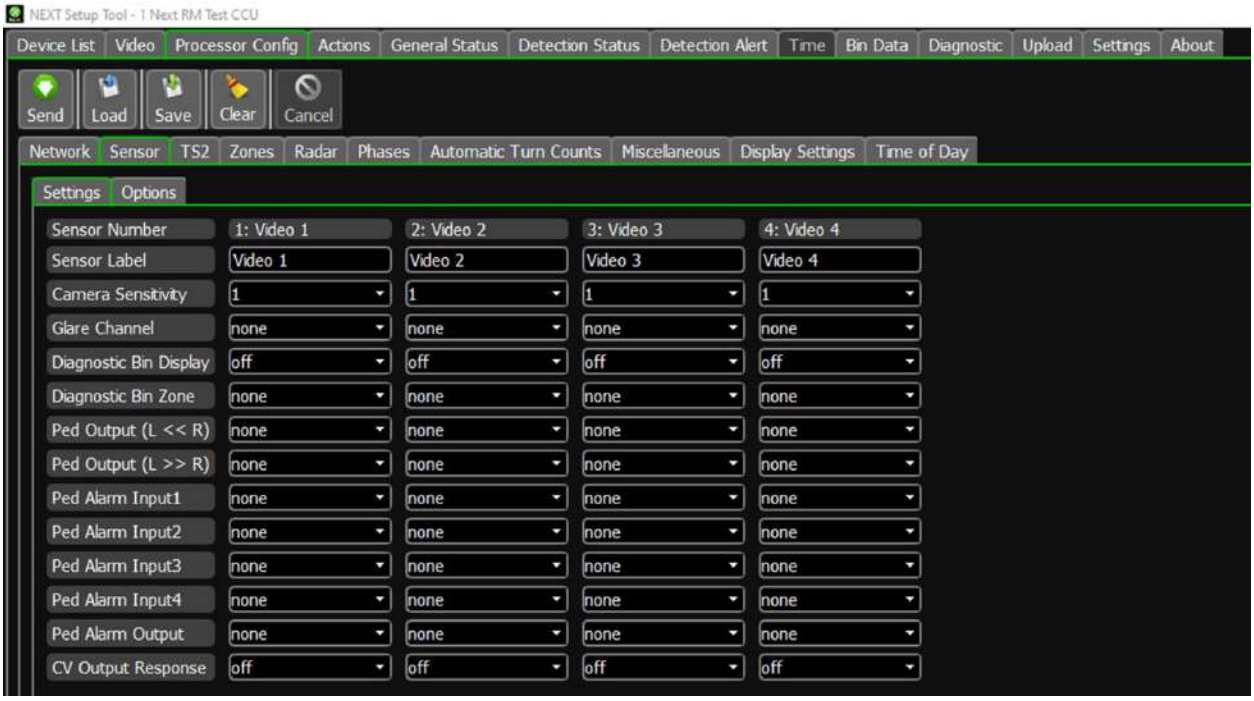
☑ ***Note:*** *Default IP Address for the Next system is 192.168.1.2*

Internally the system communicates through a set of VLANs to each component. Because of this certain IP addresses must be avoided on your network. Here is a list of subnets that cannot be used 192.168.200.x through 192.168.212.x.

Property	Description
IP Address	This is the IP Address assigned to the field device.
Subnet Mask	A subnetwork, or subnet, is a logically visible subdivision of an IP network.
Default Gateway	The gateway address is a router interface connected to the local network that sends packets out of the local network.
Site ID	A description of the site name. This will appear on the Device List page.

Sensor Settings

This screen allows various settings to be made on a per sensor basis.

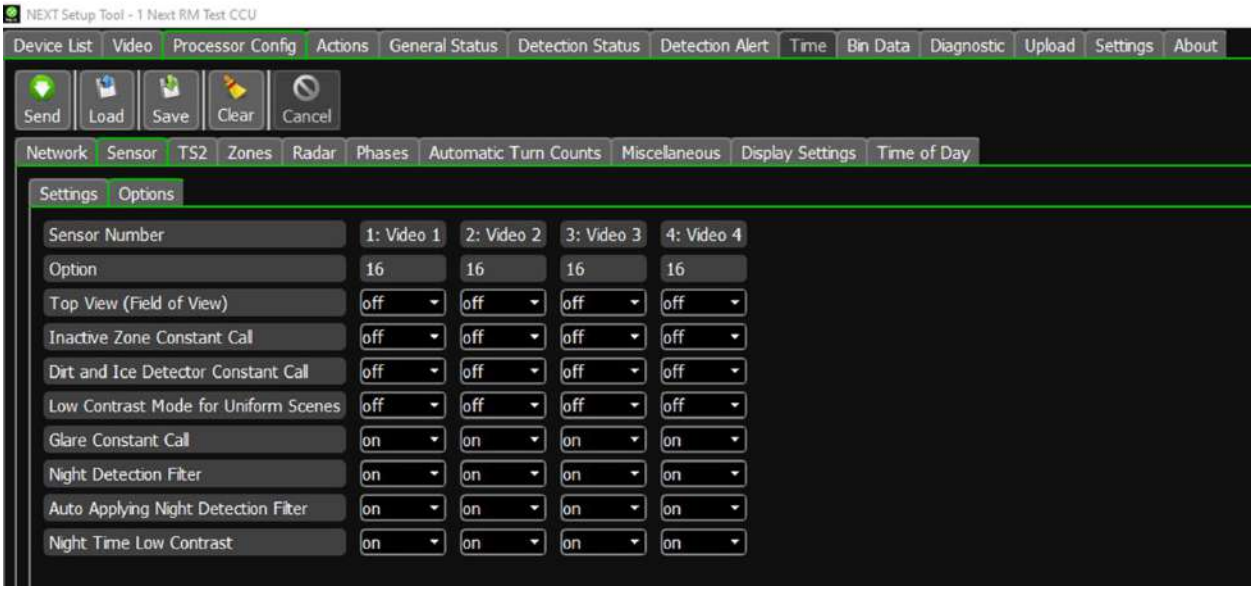


Property	Description
Sensor Label	The saved "Sensor Label" is user customizable. The default designation is: "Camera 1, Camera 2, Camera 3, Camera 4", however, this can easily be changed. Camera names can be up to 10 characters in length. To edit a camera name, move the cursor to the camera name that 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.
Camera Sensitivity	Set to 1 for normal performance. May be set to 10 in situations where the camera image may be compromised by glare, shadows or other high contrast conditions.
Glare Channel	This function allows the user to select an unused output channel to place a constant call whenever the Next Video Processor is in "Glare Mode". ☑ ***Note:*** *This is not a global function parameter; in other words, on a two camera system this function must be set on a per camera view basis. Also, remember not to*

Property	Description
	share any of the same output channels between camera views. If you use VP-1:1 on Camera 1, do not use VP-1:1 for Camera 2.
Diagnostic Bin Display	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
Diagnostic Bin Zone	This parameter tells the "Bin Last" function, when activated (On), which bin last zone count data to display.
Ped Output Channel L<<R	Choose a valid output for the Pedestrian Detected function. See **Section 2.3: Ped Output** for more details
Ped Output Channel R>>L	Choose a valid output for the Pedestrian Detected function. See **Section 2.3: Ped Output** for more details
Ped Alarm Input1..4	Select the Pedestrian Conflicting Phases for the Pedestrian Alam. See **Section 2.4: Ped Alarm** for more details
Ped Alarm Output Channel	Choose a valid output for the Pedestrian Alarm. See **Section 2.4: Ped Alarm** for more details
CV Output Response	This setting allows the Pedestrian Output to respond faster. It will result in higher variability of output and should only be enabled at the recommendation of Iteris personnel.

Sensor Options

There are a number of options that can be set for specific installation situations.



CAUTION! *Randomly setting different option numbers is not recommended and could result in improper operation and unexpected consequences. If you are unsure what a particular option number does, then do not enable it. It is best to leave this set at its factory default, unless instructed by Vantage Product Support staff to do otherwise. If you have further questions about this function please contact your Vantage Product Support Team for more information.*

Note: *The option information and its operation change from time to time to reflect the algorithm changes and advances.*

Option	Default	Description
Option	N/A	This row provides a decimal equivalent of the sensor option settings for each sensor. You may be asked for this number by Product Support or Engineering as part of any troubleshooting process.
Top View (Field of View)	Off	This option should be used with a near field of view. A near field of view is when less than two car lengths can be seen in each lane. The near field of view sees the tops of the vehicles. When to use this option: Only when the camera is pointed down at a steep angle and only two car lengths can be seen in the FOV.
Inactive Zone Constant Call	Off	This special constant calling per lane is only active if more than one zone is defined per lane. The processor identifies the first zone in each lane. If these

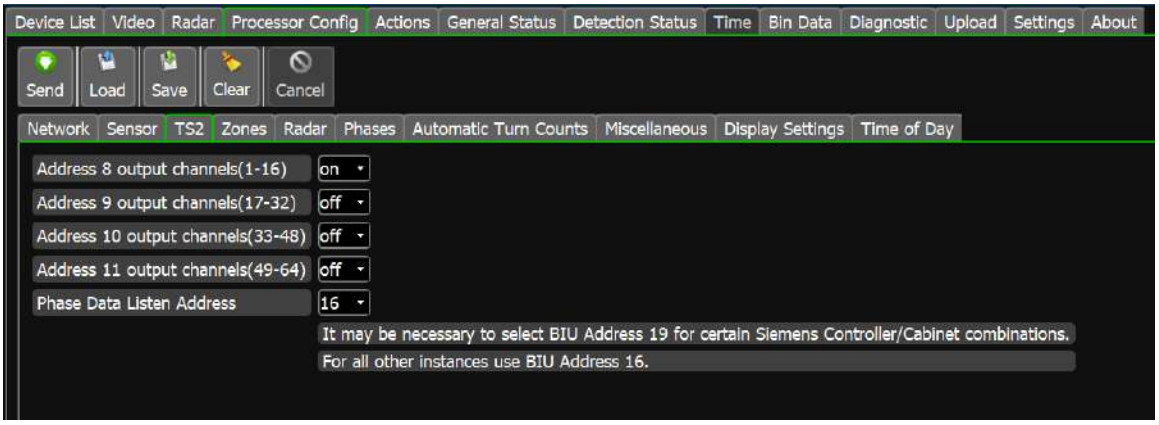
Option	Default	Description
		zones do not report any activity within a given time period and there is low contrast within the zone then they place a call. The zone inactivity maybe caused by fog, dirt or ice build up on the cameras lens. When this special constant call mode is active an ampersand (@) will be displayed next to the affected zones. When to use this option: The option should be set to On at intersections that expect to experience snow, ice and fog. This option should be used at intersections that have a reasonable amount traffic volume. This option should not be used on side street approaches because it may make them recall. This option works best if the front zones in each lane are over the stop-bar or road marks like the left and straight arrows.
Dirt and Ice Detector Constant Call	Off	The DID option is off by default in this release. When turned On the DID option helps detect the buildup of dirt and ice on the front glass of the camera. When dirt and ice appear at the top part of the image a "T" will appear in the camera label. When dirt and ice appear everywhere on the image a "W" will appear in the camera label. When "T" and "W" appear together the Edge2 processor will place constant calls on all used channels for a camera view. The constant call will persist until the condition clears up. The DID option only works during the day time. Only when the DID option is On will "T" and/or "W" appear in the camera label. When to use this option: The DID should be turned On at intersections that expect to experience snow, ice and fog. The DID may help ensure that calls are placed when the camera view is obstructed by dirt, ice and fog. When the DID is Off "T" and "W" will not be displayed and constant calls will not be placed due to dirt or ice.
Low Contrast Mode for Uniform Scenes	Off	When a camera view has no detections and no motion and the scene is uniform the processor holds off going into LC if this option is Off. When to use this option: If a camera view is looking at a fairly low contrast, uniform scene and you want it to go into LC mode then turn this option On. Use this option if you believe that a camera view has the possibility to be blocked by snow build up.
Glare Constant Call	On	When the glare mode option is set to On the processor analyzes each zone for glare, if a zone becomes saturated with glare, then the output channel associated with that zone will place a constant call. This algorithm allows the zones that are most affected by glare, to place a constant call until the glare condition dissipates to allow normal detection again.

Option	Default	Description
		When to use this option: Use the glare option when having difficulty detecting vehicles in glare. Zones must be completely saturated before glare mode will trigger. It can take up to three minutes to enter glare mode or exit glare mode after the proper conditions have been met.
Night Detection Filter	On	With NightFilter set to ON the processor will filter out false calls due to reflections and headlight glare. It is recommended to run night filter so that there are not too many false calls at night, especially when the ground is wet. If vehicles are not being detected at night then this option can be turned off. This means that there will be no filtering of night time detections. All the detections will be allowed to pass through. When to use this option: It recommended to always turn this option on unless instructed by Iteris personnel.
Auto Apply Night Detection Filter	On	Based on nighttime conditions, the processor will run the night filter when the algorithm believes it is beneficial to do so and will not run the night filter when conditions are less than ideal (which means no filtering and all the detections will pass through). It is recommended to run NightFilter in the Auto mode because when conditions are bad detection filtering stops. ☑ ***Note:*** *NightFiltAuto can only operate when NightFilter is ON. When Ni the choice for NightFiltAuto is, there will be no night filtering at all.* When to use this option: It recommended to always turn this option on unless instructed by Iteris personnel.
Night Time Low Contrast	On	This option prevents LC (fog) at night. When a night time field of view contains a uniform background grayscale value, the processor may go into LC mode. When to use this option: This option is normally not needed, since a properly set system clock usually remedies most night time LC problems. However, some low light intersections contain uniform contrast and can still cause LC mode at night. This option will prevent the processor from going into LC (Low Contrast) mode due to low light uniform contrast conditions. This option should be used very carefully, since a negative consequence of enabling this option is that if a camera fails with a valid sync pulse, but no video, the processor may not place constant calls for that camera.

TS-2

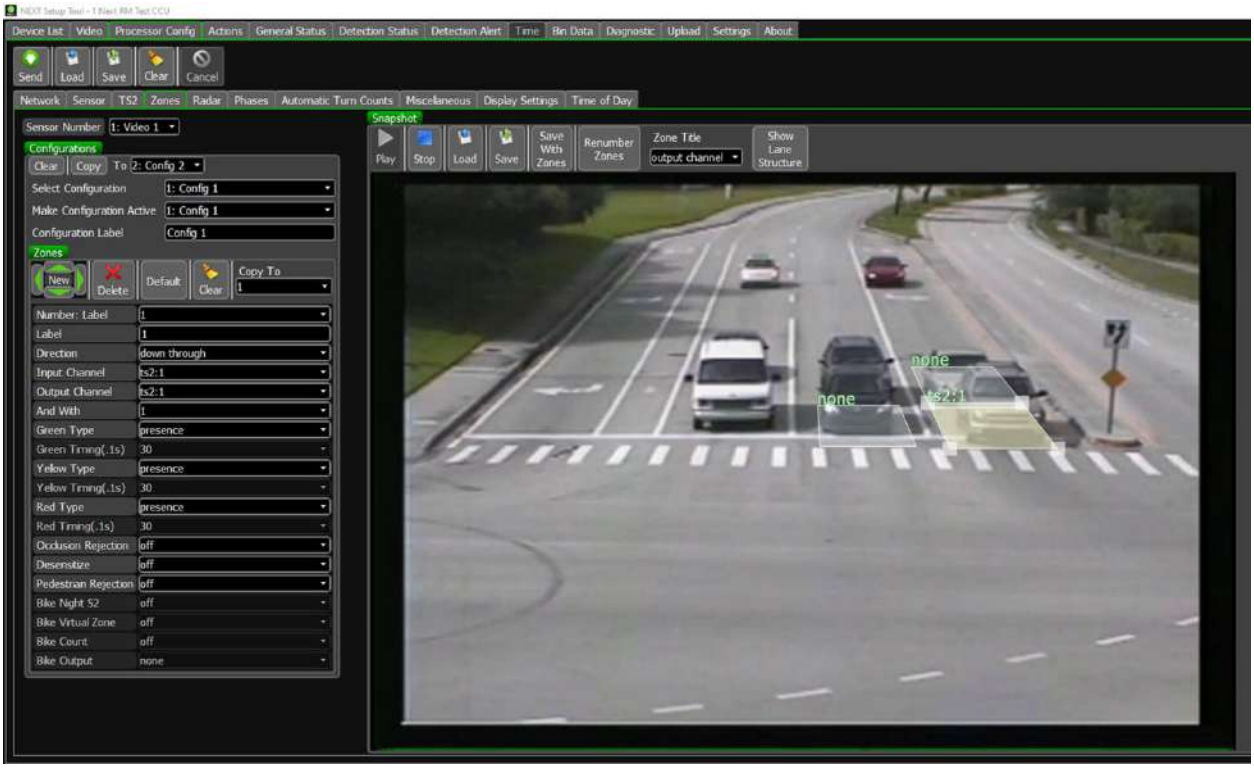
For TS-2 type controllers detector outputs and phase inputs can be sent over the SDLC connection. This screen allows the user to set the options for the various rack addresses that can be accessed through the SDLC connection.

☑ ***Note:*** *This tab can only be seen if the SDLC cable is connected to an active TS-2 system.*



☑ ***Note:*** *For certain Siemens Controller/Cabinet combinations the phase data is broadcast on address 19. For all other Controller/Cabinet combinations use address 16.*

Zone Configuration



General

Property	Description
Send	Sends the current configuration to the system.
Load	Loads a configuration from the local computer.
Save	Saves a configuration to the local computer.
Clear	Clears all the current settings and loads the defaults.
Cancel	Cancels the configuration changes.

Sensor Number	Selects the sensor to work on.

Configuration

Property	Description
Clear	Clears the settings for the currently selected configuration.
Copy To	Copies the current configuration to another configuration.
Select Configuration	Selects the configuration to work on.
Make Configuration Active	Selects the configuration the system will use for detection.
Configuration Label	The saved "Configuration Label" is also user customizable. The default designation is: "Config 1, Config 2, Config 3, Config 4 and Config 5", however, this can easily be changed. Configuration names can be up to 10 characters in length.

Snap Shot

Property	Description
Play	Starts the live video stream.
Stop	Pauses the live video stream.
Load	Loads an image from disk.
Save	Saves the current image to disk (no overlay/zone information).

<table>
<tr><th>Property</th><th>Description</th></tr>
<tr><td>Save with Zones</td><td>Saves the current image to disk (with all zone information).</td></tr>
<tr><td>Renumber Zones</td><td>Will automatically renumber all zones starting at 1 for camera 1, 33 for camera 2, 65 for camera 3 and 97 for camera 4.</td></tr>
<tr><td>Zone Title</td><td>Choose the label type to display above the zone on the OSD
<table>
<tr><th>Label Type</th><th>Function</th></tr>
<tr><td>And with</td><td>Zone number that this zone is anded with</td></tr>
<tr><td>Direction</td><td>Down, Left, Thru or Right</td></tr>
<tr><td>Input channel</td><td>The input channel associated with the zone</td></tr>
<tr><td>Label</td><td>The zone label</td></tr>
<tr><td>Number</td><td>The zone number</td></tr>
<tr><td>Off</td><td>No labels</td></tr>
<tr><td>Output channel</td><td>The output channel associated with the zone</td></tr>
<tr><td>Green type</td><td>The zone type when a green input is present</td></tr>
<tr><td>Non-green type</td><td>The zone type when the green input is not present</td></tr>
</table></td></tr>
<tr><td>Show/Hide Lane Structure</td><td>Click on this button to show and hide the lane structure. Section 2.1: Lane Structure for more details.</td></tr>
</table>

Zones

This section allows the user to add, edit or delete 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. You can define up to 32 detection zones on each Next Video Processor module camera view.

Property	Description
New	Creates a new zone.  The new zone may be created above, below, to the left or the right of the currently selected zone.
Delete	Deletes the currently selected zone.
Default	Sets the currently selected zone to default settings.
Clear	Clears all settings for the currently selected zone.
Copy To	Copies the currently selected zone configuration to another zone.

Property	Description
Number	The zone detail number is a processor generated reference number sequence from 1 through 32 for camera one, 33 through 64 for camera number two, 65 through 96 for camera number three and 97 through 128 for camera number four.
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	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. DOWN has three options Down Thru, Down Left, Down Right. By selecting one of the three options the system will automatically begin counting vehicles and storing them in bin data memory for use with the On Screen Graphs. See ***Section 4.5: On Screen Graphs*** for more details. Select the direction from the drop down box.
Input Channel	This function allows the Video Processor to utilize the NEMA TS-1 detector rack "delay inhibit" or green phase input lines from the controller, if they are available (332 cabinet input files do not normally come wired with this capability). Using this feature the user can program a detection zone to respond differently depending on the delay inhibit line status. For example, a zone could be programmed to Extend on Green and Delay on Red (not green). To enable this feature left click on the "Grn/In" menu item. The menu options will expand to include options for: Green (Grn), and Not Green (NGrn). "Grn/In" refers to the Video Processor delay inhibit input channel. The choices are DVP-x:1 through DVP-x:4 and extension modules could also be a choice if they are being used. Most NEMA TS-1 detector racks are only wired for two delay inhibit pins per slot (pins 1 and 2). Choosing DVP-x:1 would correspond with delay inhibit pin 1 and DVP-x:2 would correspond with delay inhibit pin 2. Choosing DVP-x:3 , DVP-x:4, or EM:03, or EM:04 would most likely have no effect, since they correlate with pin 3 and pin 10 respectively. There is normally no delay inhibit logic wired to these pins.

Property	Description
Output Channel	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 Video Processor in the detector rack. Where you physically plug the Video Processor or Extension Module into the detector rack, is where it will place the vehicle calls. Multiple zones can be assigned to a single processor or extension module output channel. Typical Channel Designators Video Processors: DP-x:1, DP-x:2, DP-x:3, DP-x:4, NONE Where x = the camera number Extension Modules: Two Channel - EM-0:1, EM-0:2 Four Channel - EM-1:1, EM-1:2, EM-1:3, EM-1:4 I/O Module: EM-2:1 Through EM-2:32 If using a TS-2 controller then 64 detector outputs are available through the SDLC connection. TS2:1 thru TS2:64 ☑ ***Note:*** *For more information on output channels, see the* ***Section 5: Output Channel Assignment*** *in the* ***Next Installation Manual****.*
And With	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 ur and undesirable operation. Be sure you understand the AND/W function before attemp it. If you do not intend to use AND/W operation, be sure that the AND/W value is set to value as the zone detail number.* Zone Detail #1: AND/W: 1 Ch/Out: DP-1:2 Parent Zone Zone Detail #2: AND/W: 1 Ch/Out: NONE Child Zone *Correct AND/W Setup Example*

<table>
<tr><th>Property</th><th>Description</th></tr>
<tr><td></td><td>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 (VP-1:2 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.</td></tr>
<tr><td>Detection Type</td><td>This setting allows you to select the type of detection zone to create. There are several different zone types available.

<table>
<tr><th>Zone Type</th><th>Function</th></tr>
<tr><td>PRESENCE</td><td>Places a call as long as vehicle is in the zone.</td></tr>
<tr><td>EXTEND</td><td>Extend the vehicle call for a programmable length of time.</td></tr>
<tr><td>DELAY</td><td>Delay the vehicle call for a programmable length of time.</td></tr>
<tr><td>PULSE</td><td>Produces a pulse output for a user programmable rate of time (pulse width).</td></tr>
<tr><td>COUNT</td><td>Count vehicles that pass through the zone and store the data. Count zones may be programmed to delay a fixed time before counting an object. The default is set to zero seconds. This feature may be used for certain count applications where an object needs to be detected for a time before the count is validated.</td></tr>
<tr><td>Low Contrast (LC)</td><td>Create an LC zone for low contrast stabilization.</td></tr>
<tr><td>Demand</td><td>Demand zone for high traffic congestion.</td></tr>
<tr><td>Passage</td><td>Passage zone for high traffic congestion.</td></tr>
<tr><td>CSO</td><td>Count, Speed, Occupancy zone.</td></tr>
<tr><td>Bike</td><td>Bicycle differentiation zone.</td></tr>
<tr><td>Advanced</td><td>Advanced loop simulator.</td></tr>
</table>
Note: Input channel is selected then the zone type can be different for each phase, Green, Yellow and Red.</td></tr>
<tr><td>Detection Timing</td><td>For Zone Types that include a timing element this sets the variable from .1 second (1) to 25 seconds (250).</td></tr>
<tr><td>Occlusion Rejection</td><td>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.</td></tr>
</table>

Property	Description
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.
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.
Bike Count	Bike zones can have dual functionality providing both presence/extension calls and counting bicycles. Up to six Bike zones can be assigned as count zones. Setting this attribute to 'On' enables bike counting in that zone. ☑ ***Note:*** *Once six bike zones have been assigned to count then this option in the Attribute m switched off. See figure at start of this section.*
Bike Output	Bike zones can have a second output associated with them. This second output can be used to drive the Iteris Bike Indicator when the Bike Zone detector output is unavailable. For example when the Bike Zone detector output is a virtual output is a TS2 environment.

Radar Configuration

CAUTION! *Starting October 2021 Iteris began the shipment of the 4D/HD radar sensor in the Vector sensor head. These sensor heads are not compatible with the previous Vector sensor heads shipped with Next.*

The two types of Vector sensor head ***CANNOT*** *be mixed in a single system. A system must contain all of one type or the other. If a system has a mixed set of Vector sensor heads then the radar function will be disabled and a warning will be displayed on the NST.*

The two types of sensor head can be identified by the labelling on the back of the shroud.

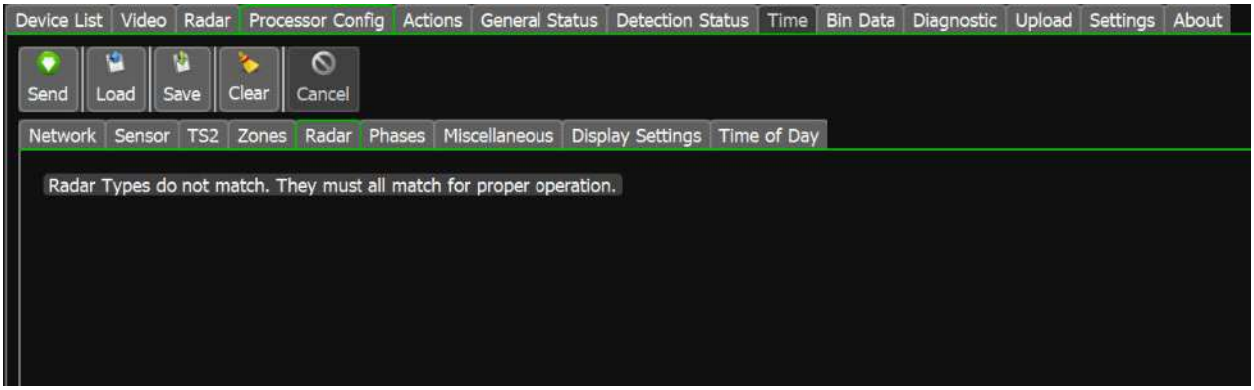
The original sensor heads are labelled 'N'.

The new sensor heads ae labelled 'N45'.

Original

4D/HD

Screen shot of NST showing incompatible or mismatched Vector sensor heads.



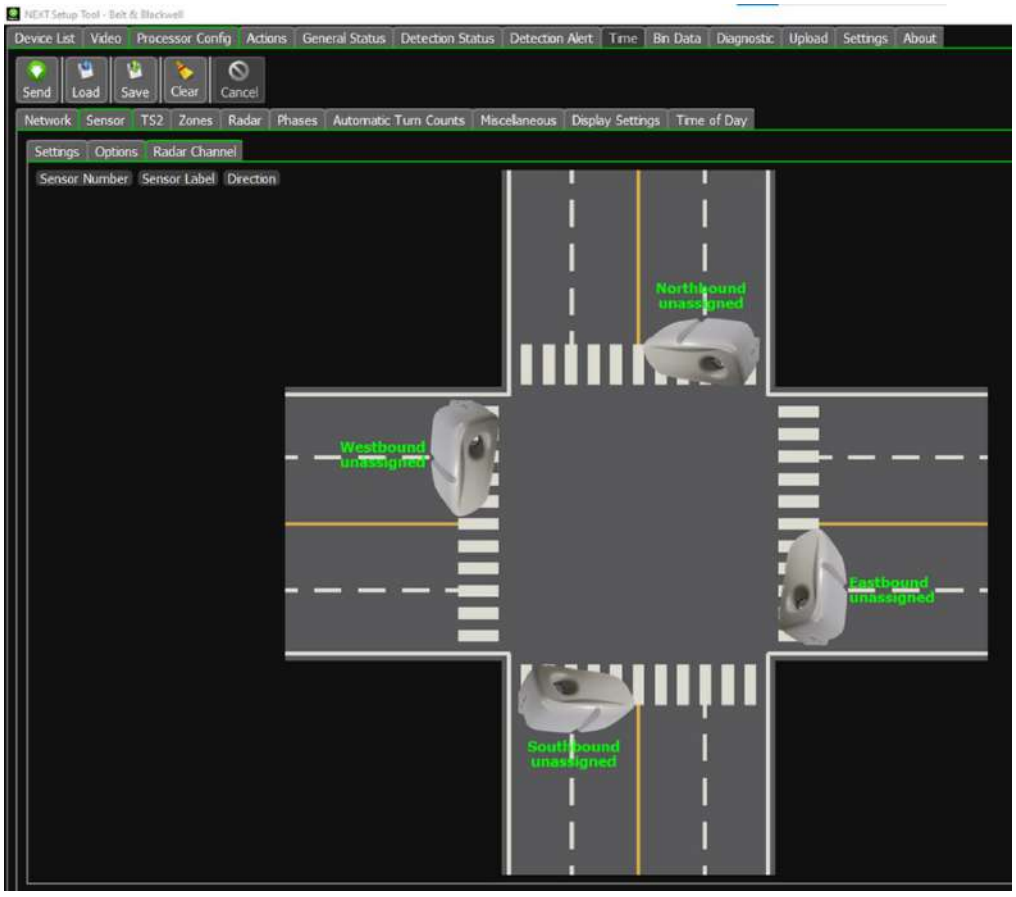
Type 29 Radar Channel Settings

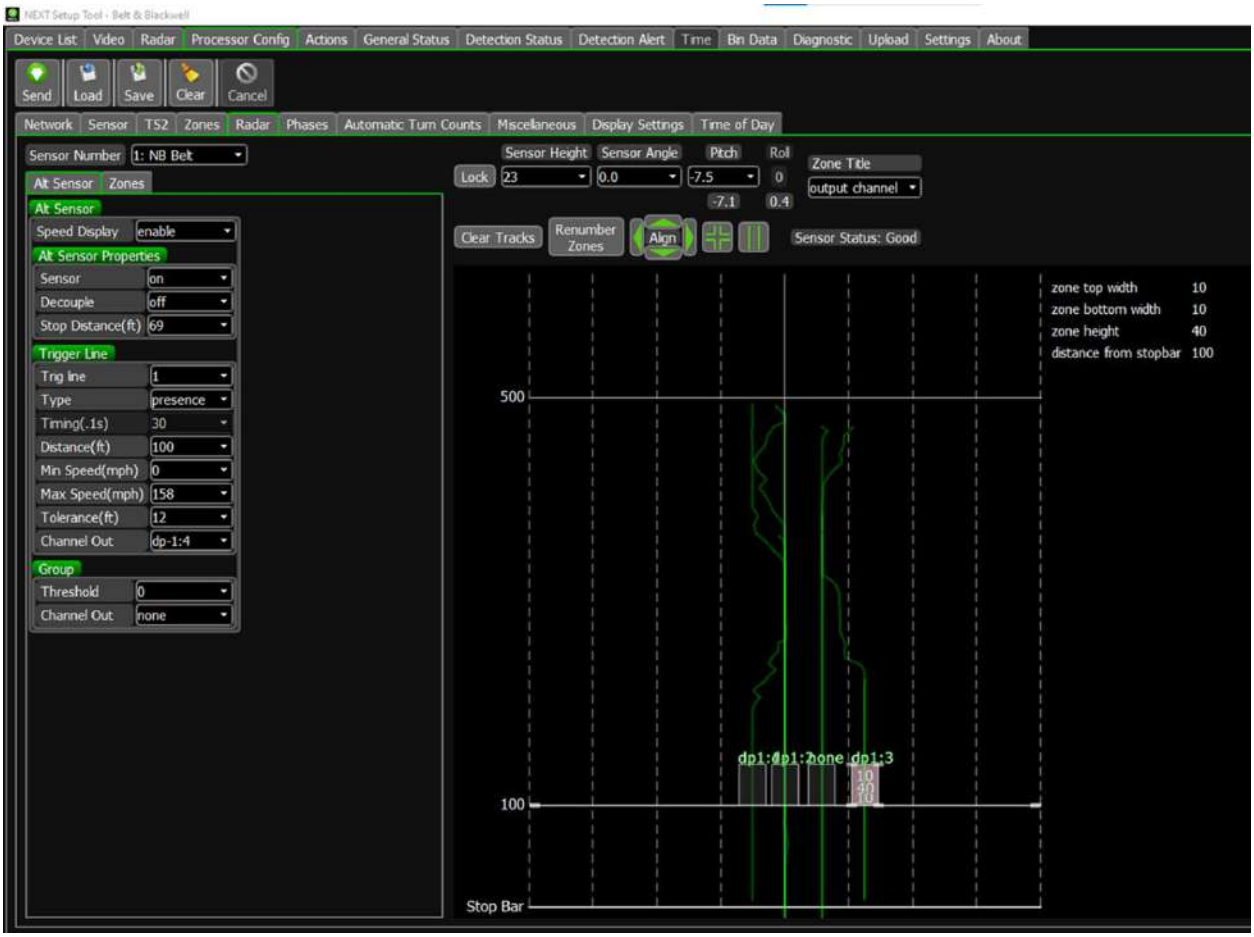
If using the original, Type 29 radar, channel settings will continue to be available on the same page as the zone configuration. See details below.

Type 29 Radar Sensor Channel Setting

Type 45 - 4D/HD Radar Channel Settings

Each sensor installed at the intersection should be set to a difference channel. This ensures that they will not interfere with each other. Select the position of each sensor from the drop-down box and the system will automatically configure the correct channel.





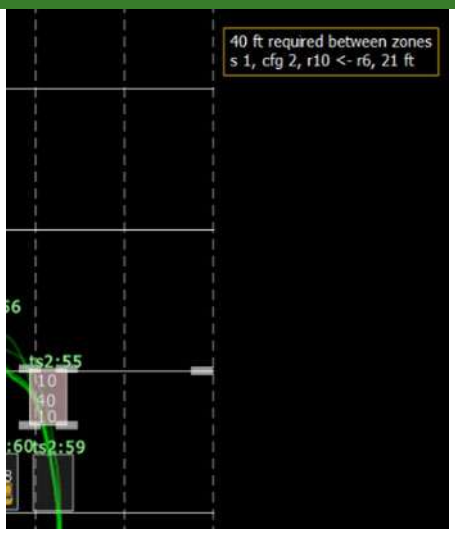
General

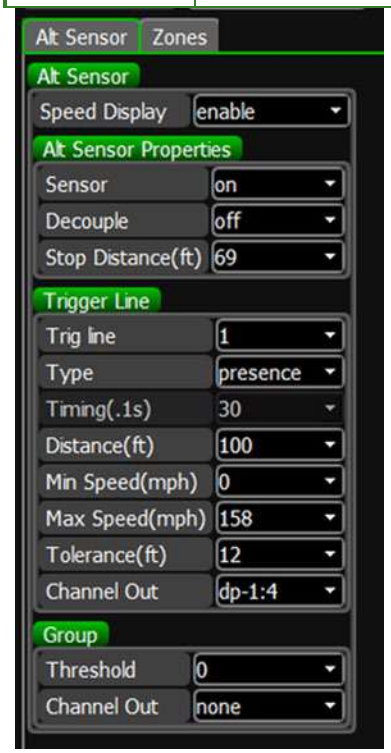
Property	Description
Send	Sends the current configuration to the system.
Load	Loads a configuration from the local computer.
Save	Saves a configuration to the local computer.
Clear	Clears all the current settings and loads the defaults.
Cancel	Cancels the configuration changes.

Sensor Select	Selects the sensor to work on.

Radar Settings

<table>
<tr><th>Property</th><th>Description</th></tr>
<tr><td>Sensor Height</td><td>Set the unit’s approximate Height from the ground.</td></tr>
<tr><td>Sensor Angle</td><td>Adjust so that the radar vehicle icons are travelling relatively vertically on the screen.</td></tr>
<tr><td>Pitch</td><td>Set the pitch to a value between 0º and -9º based on the geometry of the intersection. Adjust the radar sensor to this angle. The system will display the actual pitch as measured by the radar sensor.</td></tr>
<tr><td>Roll</td><td>Roll should be 0º ±0.5º. The system will display the actual roll as measured by the radar sensor.</td></tr>
<tr><td>Zone Title</td><td>Choose the label type to display above the zone on the OSD
<table>
<tr><th>Label Type</th><th>Function</th></tr>
<tr><td>And with</td><td>Zone number that this zone is anded with</td></tr>
<tr><td>Direction</td><td>Down, Left, Thru or Right</td></tr>
<tr><td>Input channel</td><td>The input channel associated with the zone</td></tr>
<tr><td>Label</td><td>The zone label</td></tr>
<tr><td>Number</td><td>The zone number</td></tr>
<tr><td>Off</td><td>No labels</td></tr>
<tr><td>Output channel</td><td>The output channel associated with the zone</td></tr>
<tr><td>Green type</td><td>The zone type when a green input is present</td></tr>
<tr><td>Non-green type</td><td>The zone type when the green input is not present</td></tr>
</table></td></tr>
<tr><td>Clear Tracks</td><td>As vehicles progress down the screen tracks are drawn to help identify the lanes of traffic. If adjustments to the radar sensor are made either physical or with the settings above the ‘Clear Tracks’ button should be pressed to restart the tracing of vehicles at the approach.</td></tr>
<tr><td>Renumber Zones</td><td>Will automatically renumber all zones starting at r1 for sensor 1, r33 for sensor 2, r65 for sensor 3 and r97 for sensor 4.</td></tr>
<tr><td>Align</td><td>After selecting a zone hit one of the align arrows to automatically align that zone with the one adjacent to it.</td></tr>
<tr><td>Default Zone Type</td><td>The system can default to preferred zone sizes for either intersection control or highway data collection. Choose the appropriate zone type for the application.</td></tr>
<tr><td>Sensor Status</td><td>Indicates the operation of the radar sensor. Will display error flags if the radar is experiencing issues.</td></tr>
<tr><td>Zone Size</td><td>The size of the current zone selected in shown.</td></tr>
<tr><td>Zone Placement Error</td><td>A 40’ vertical gap is required between zones. If two zones are place close together a warning will appear at the side of the screen.</td></tr>
</table>

Property	Description
	 ***Caution:*** *Zone configuration cannot be saved or sent to the system while an error occurs.*



Alt Sensor

Speed Display	Enables the display of the last vehicle speed on the video screen.

Alt Sensor Properties

Property	Description
Sensor	Enables the radar functionality for the selected sensor.
Decouple	This option enables and disables the link between the Radar and Video functions in the system. When enabled the system continuously monitors that when the radar sensor detects a vehicle that at some point shortly after one or more of the video zones produces a detection. If a situation arises when this does not occur regularly over a period of time the system assumes that something is blocking the video image. At this point the system will turn on the detection output associated with the video zones nearest the stop line while the radar sensor detects vehicles. The 'F' Flag will be displayed on the screen to indicate this Fallback Mode is active. In this way the intersection can work at some level of efficiency. The system continues to monitor the situation and will revert to normal operation when the video system detections return to normal. There may be occasions when this mode will inhibit the correct function of the system and so an option to turn of this function is offered.
Stop Distance	Enter the distance from the sensor to the stop bar.

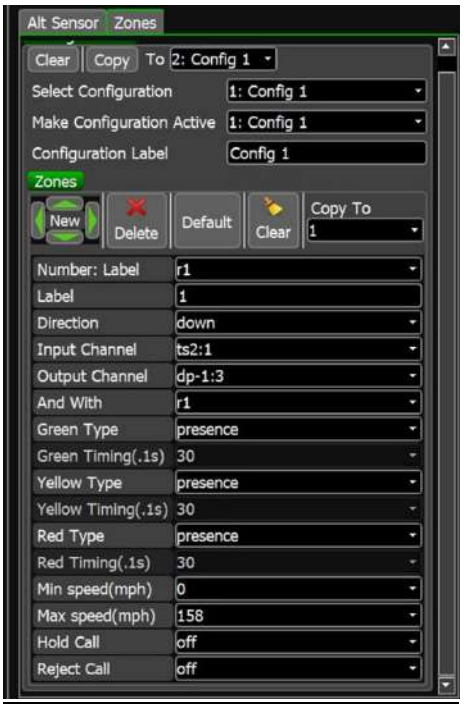
Trigger Line

Property	Description
Trigger Line	Select the Trigger Line to be configured 1 thru 5.
Type	This setting allows you to select the type of trigger line to create. There are several different types available. **Zone Type** / **Function** PRESENCE — Places a call as long as vehicle is at the trigger line. EXTEND — Extend the vehicle call for a programmable length of time. DELAY — Delay the vehicle call for a programmable length of time. NONE — No output, used for reference only.
Timing	For Zone Types that include a timing element this sets the variable from .1 second (1) to 25 seconds (250).
Distance	Distance behind the Stop Bar.
Min Speed	A vehicle has to travel above this speed to trigger the output.
Max Speed	A vehicle has to travel below this speed to trigger the output.
Tolerance	This is the distance (in feet) either side of the trip line that the Vector will activate.
Channel Out	A valid detector channel to send the output to.

Group

Property	Description
Threshold	The Group mode will output a call anytime the total number of vehicles detected by the radar exceeds a programmed threshold. This function can be used to supply information on platoons approaching the intersection for various applications.
Channel Out	A valid detector channel to send the output to.

Zones



Configuration

Property	Description
Clear	Clears the settings for the currently selected configuration.
Copy To	Copies the current configuration to another configuration.
Select Configuration	Selects the configuration to work on.
Make Configuration Active	Selects the configuration the system will use for detection.
Configuration Label	The saved "Configuration Label" is also user customizable. The default designation is: "Config 1, Config 2, Config 3, Config 4 and Config 5",

Property	Description
	however, this can easily be changed. Configuration names can be up to 10 characters in length.

Zones

Property	Description
New	Creates a new zone.  The new zone may be created above, below, to the left or the right of the currently selected zone.
Delete	Deletes the currently selected zone.
Default	Sets the currently selected zone to default settings.
Clear	Clears all settings for the currently selected zone.
Copy To	Copies the currently selected zone configuration to another zone.
Number	The zone detail number is a processor generated reference number sequence from 1 through 32 for camera one, 33 through 64 for camera number two, 65 through 96 for camera number three and 97 through 128 for camera number four.
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	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. DOWN has three options Down Thru, Down Left, Down Right. By selecting one of the three options the system will automatically begin counting vehicles and storing them in bin data

Property	Description
	memory for use with the On Screen Graphs. See ***Section 4.5: On Screen Graphs*** for more details. Select the direction from the drop down box.
Input Channel	This function allows the Video Processor to utilize the NEMA TS-1 detector rack "delay inhibit" or green phase input lines from the controller, if they are available (332 cabinet input files do not normally come wired with this capability). Using this feature the user can program a detection zone to respond differently depending on the delay inhibit line status. For example, a zone could be programmed to Extend on Green and Delay on Red (not green). To enable this feature left click on the "Grn/In" menu item. The menu options will expand to include options for: Green (Grn), and Not Green (NGrn). "Grn/In" refers to the Video Processor delay inhibit input channel. The choices are DVP-x:1 through DVP-x:4 and extension modules could also be a choice if they are being used. Most NEMA TS-1 detector racks are only wired for two delay inhibit pins per slot (pins 1 and 2). Choosing DVP-x:1 would correspond with delay inhibit pin 1 and DVP-x:2 would correspond with delay inhibit pin 2. Choosing DVP-x:3 , DVP-x:4, or EM:03, or EM:04 would most likely have no effect, since they correlate with pin 3 and pin 10 respectively. There is normally no delay inhibit logic wired to these pins.
Output Channel	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 Video Processor in the detector rack. Where you physically plug the Video Processor or Extension Module into the detector rack, is where it will place the vehicle calls. Multiple zones can be assigned to a single processor or extension module output channel. Typical Channel Designators Video Processors: DP-x:1, DP-x:2, DP-x:3, DP-x:4, NONE Where x = the camera number Extension Modules: Two Channel - EM-0:1, EM-0:2 Four Channel - EM-1:1, EM-1:2, EM-1:3, EM-1:4 I/O Module: EM-2:1 Through EM-2:32 If using a TS-2 controller then 64 detector outputs are available through the SDLC connection. TS2:1 thru TS2:64

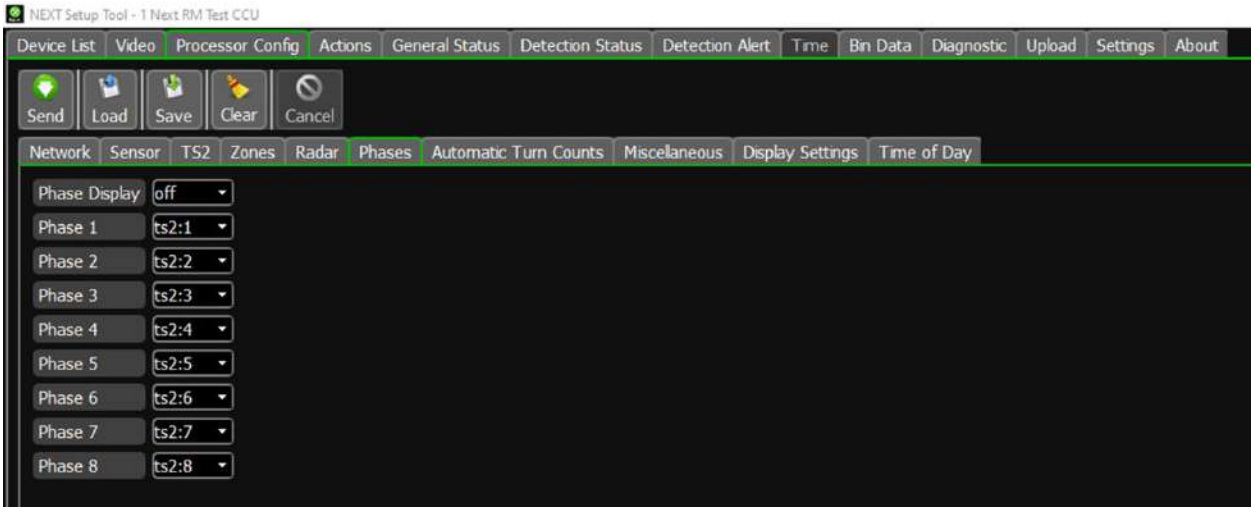
Property	Description
	☑ ***Note:*** *For more information on output channels, see the* ***Section 5: Output Channel Assignment*** *in the* ***Next Installation Manual****.*
And With	This function allows the user to "AND" zones together for special operation. Zones that are AND'ed together will only place 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 and undesirable operation. Be sure you understand the AND/W function before atte it. If you do not intend to use AND/W operation, be sure that the AND/W value is set value as the zone detail number.* Zone Detail #1: AND/W: 1 Ch/Out: DP-1:2 Parent Zone Zone Detail #2: AND/W: 1 Ch/Out: NONE Child Zone *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 (DP-1:2 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.

<table>
<tr><th>Property</th><th>Description</th></tr>
<tr><td></td><td></td></tr>
<tr><td>Detection Type</td><td>This setting allows you to select the type of detection zone to create. There are several different zone types available.
<table>
<tr><th>Zone Type</th><th>Function</th></tr>
<tr><td>PRESENCE</td><td>Places a call as long as vehicle is in the zone.</td></tr>
<tr><td>EXTEND</td><td>Extend the vehicle call for a programmable length of time.</td></tr>
<tr><td>DELAY</td><td>Delay the vehicle call for a programmable length of time.</td></tr>
<tr><td>PULSE</td><td>Produces a pulse output for a user programmable rate of time (pulse width).</td></tr>
<tr><td>COUNT</td><td>Count vehicles that pass through the zone and store the data.</td></tr>
<tr><td>NONE</td><td>No output, used for reference only.</td></tr>
<tr><td>CSO</td><td>Classification, Speed, Occupancy zone.</td></tr>
</table></td></tr>
<tr><td>Detection Timing</td><td>For Zone Types that include a timing element this sets the variable from .1 second (1) to 25 seconds (250).</td></tr>
<tr><td>Min Speed</td><td>A vehicle has to travel above this speed to trigger the output.</td></tr>
<tr><td>Max Speed</td><td>A vehicle has to travel below this speed to trigger the output.</td></tr>
<tr><td>Hold Call</td><td>When using phase inputs it is possible to set each zone to hold the call to the controller once the zone has detected a vehicle. The zone will remain active with or without a vehicle present until the phase associated with the zone turns green. The zone will remain off until another vehicle enters the zone and the cycle is repeated.

This function is similar to the controller latching an input.</td></tr>
<tr><td>Reject Call</td><td>When using phase inputs it is possible to set each zone to drop the call in the event a rogue object is present during a red to green phase transition. Objects that are moving will not be affected and the calls will be placed normally.</td></tr>
</table>

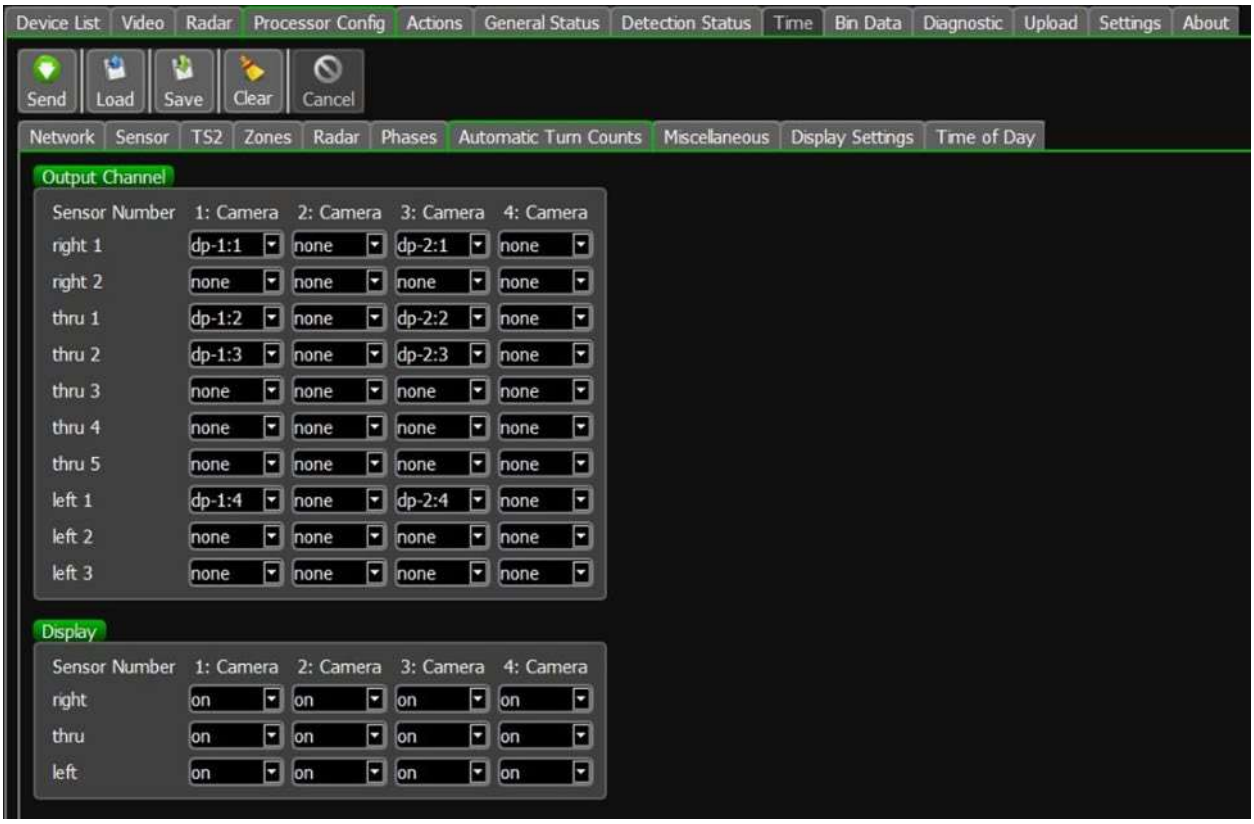
Phases

The system can accept inputs from the controller to indicate when each phase is in Green. From the drop down boxes assign each phase at the intersection to an input to the system. The phase display can be turned on and off.



Automatic Turn Counts

There are two settings associated with the Automatic Turn Counts.



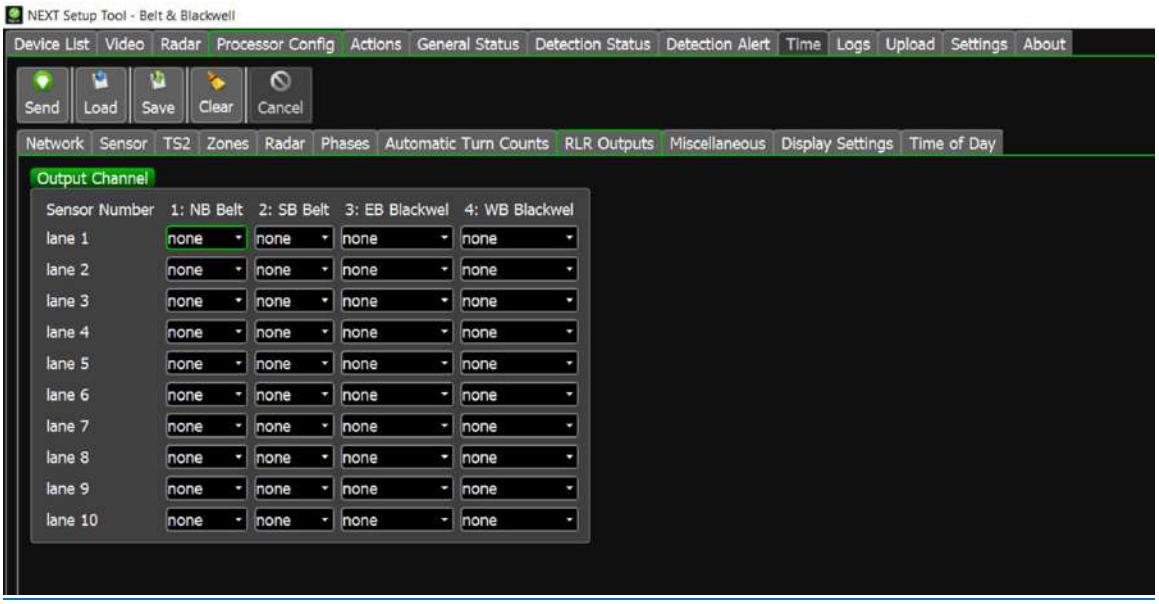
Output Channel

For each count lane that the system identifies a detector output can be applied. Each time a vehicle is counted a pulse is sent to the controller. Any valid detector output can be applied to a count. Multiple counts may use the same detector output.

Display

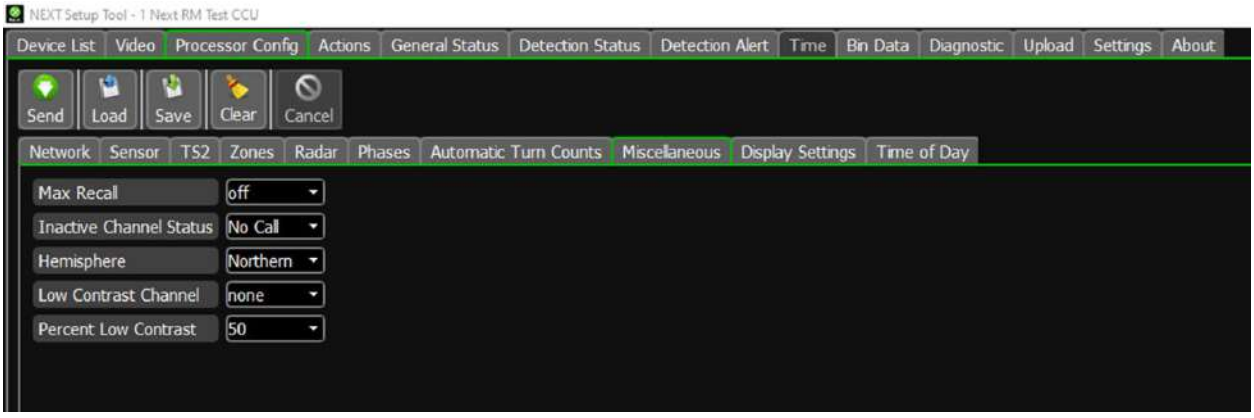
For each sensor the on-screen display for the automatic counts can be turned on or off. Each movement has its own setting to allow for FOV which do not include all movements of vehicles.

Red-Light Running Outputs



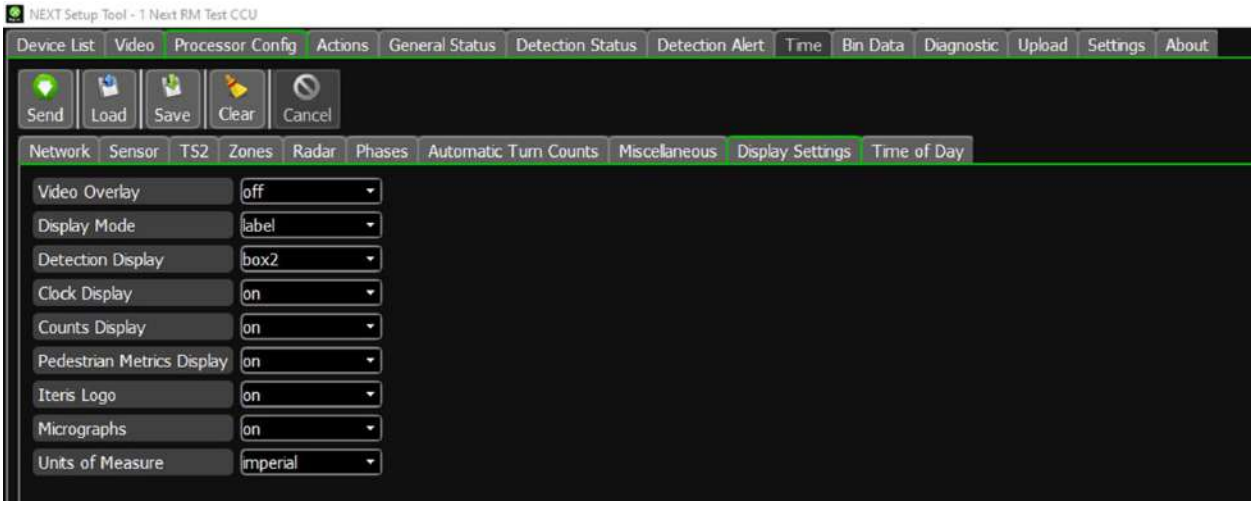
If phase inputs are being used the system will automatically count red-light running vehicles. For each vehicle lane that the system identifies a detector output can be applied. Each time a red-light running vehicle is counted a pulse is sent to the controller. Any valid detector output can be applied to a count. Multiple lanes may use the same detector output.

Miscellaneous



Property	Description
Daylight Savings	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.
Max Recall	This parameter determines how the output channels will function. This is a global setting. OFF - 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. ON - The "MAXCALL" setting places constant calls on all output channels.
Inactive Channel Status	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".*
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.
Low Contrast Channel	This option gives the user the ability to tie an output channel to Low Contrast (LC) mode. This means that whenever the system goes into Low Contrast mode the assigned channel will place a call. If "NONE" is selected this feature is disabled. If you choose to tie an output channel to Low Contrast mode, the output channel must not already be assigned as a vehicle detection channel; in other words you must assign a dedicated channel for this special LC output.
Percent Low Contrast	This is the percentage of cameras on a processor that have to exhibit the problem for the alarm to be enabled. It is default to 100% for single camera installations. It can be set to 50% or 100% for two or more camera installations.

Display Settings



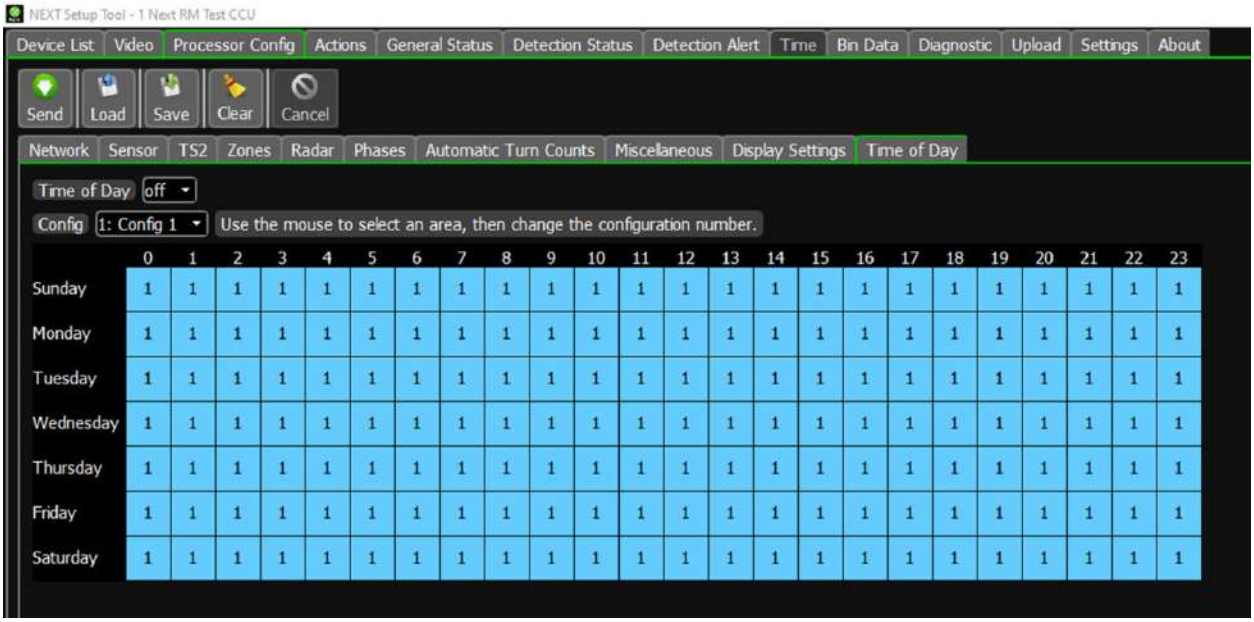
Property	Description
Video Overlay	This parameter turns the overlay either "ON" or "OFF". The default setting is "ON" which is used during normal Next operation. The overlay includes all the zone indicators and camera label information. When the overlay is "OFF", none of this information will be displayed on the screen.
Display Mode	This option determines the zone reference that will be used to identify the detection zones. The choices are: CHAN, TYPE, INPSTS, 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. INPSTS – Inputs refers to the phase input that is assign to the zone. 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.

Property	Description
	 *Example Showing Reference by Zone Type* The zones in the picture are being referenced by "Zone Type". AD = Advanced PR = Presence Zone DL = Delay EX = Extension BI = Bike CS = Count
Detection Display	There are three options for the system to display when a vehicle is detected: 1. Classic – Displays a blue box around the detection zone when activated 2. Zone Configuration – Display a red box when all zones are drawn. The zone changes to blue when detections occur. 3. Animation – As detections occur the sides of the zone track the vehicle.
Clock Display	Turns the Real Time Clock display on or off.
Counts Display	When the counter is on you will see the counts for CSO or count type zones displayed on the screen.
Pedestrian Metrics Display	Turns the PedTrax OSD display on and off.
Iteris Logo	Turns the Iteris logo display in the bottom left corner of the image on and off.
Micrographs	Turns the ATV and Occupancy graphs on and off.
Units of Measure	Selects Imperial or Metric for any speed data output.

Time of Day

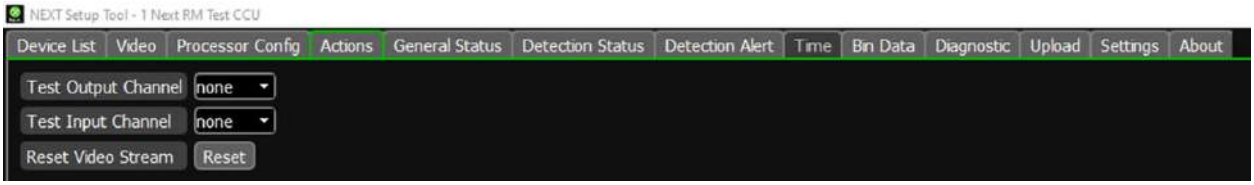
From the **TOD** tab the user can set the camera to operate any combination of the five saved configurations at different hour-long intervals for each day of the week. This provides the user with the ability to customize camera zones settings to meet the needs of various situations (i.e., lane closures, weather). By default, configuration **1** is set for every hour-long interval.

To enable the TOD function, select 'On' from the drop-down box. When enabled this function will select the camera configurations based upon the saved schedule.

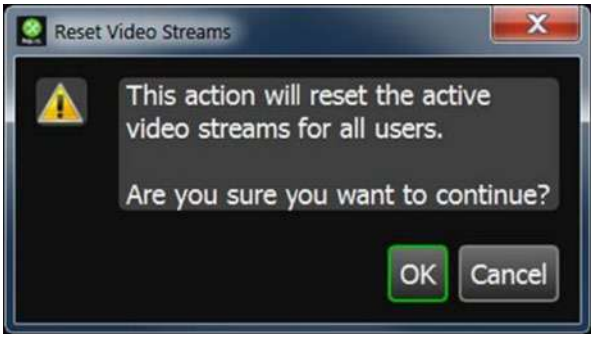


3.5 Actions

This screen provides various actions in the system.



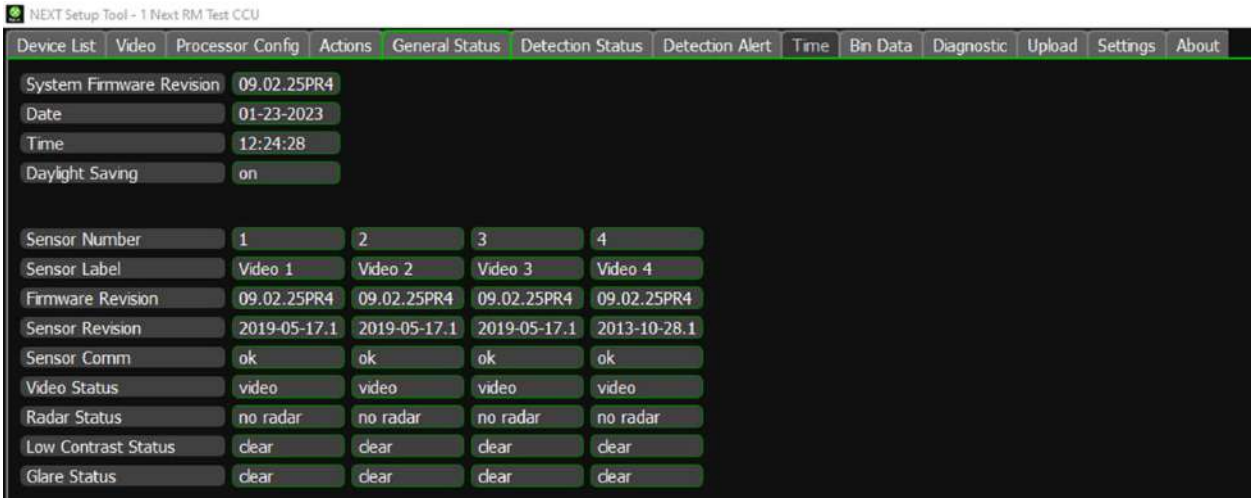
Property	Description
Test Output Channel	This option allows you to test the output channels on the Video Processors. Select an output channel to test from the drop down box. The output channel will repeatedly toggle on and off at a one second interval. Select None from the drop down box to disable this test.
Test Input Channel	This option is for testing inputs on the Video Processors. Select an input channel to test from the drop down box. The input channel will repeatedly toggle on and off at a five second

Property	Description
	interval. Any phase input or zone that is dependent on the selected input will activate. Select None from the drop down box to disable this test.
Reset Video Stream	This button allows you to terminate all current video streams from the Next. All users viewing video will need to restart their session after this button is pressed. It's take up to 90 seconds before the system is able to restart the streams. During this time all detection is working normally. The following warning box will appear to confirm the reset before the system terminates all video streams. 

3.6 General Status

The **General Status** screen displays information on each of the Next cameras connected to the system.

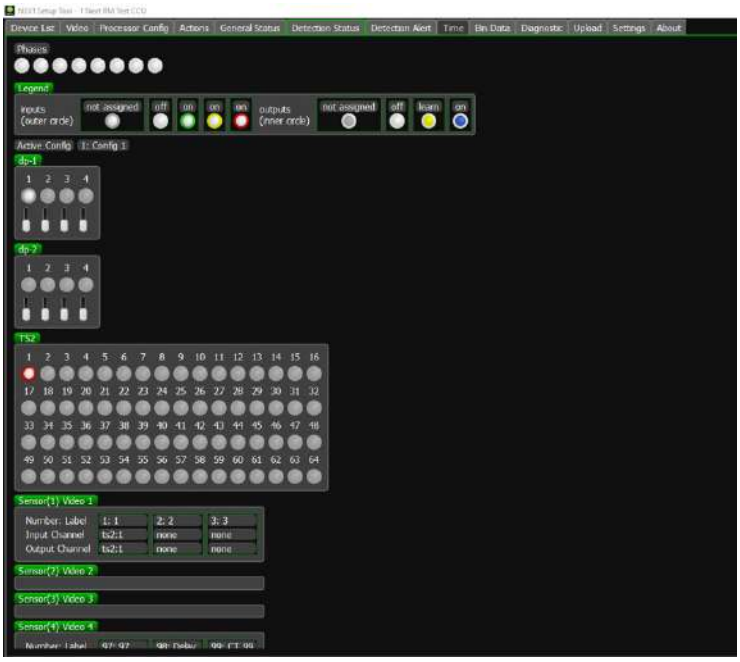
☑ ***Note:*** When calling in with technical questions about your Next system, many times you will be asked what firmware version your system is running. This information is found in the "General Status" page.



Property	Description
CCU Firmware Revision and Firmware Revision	This parameter is the Vantage Next firmware version. For example: "09.02.22". 09 This tells us that it is a Next camera processor system. 02 This tells us that we are running standard intersection detection. 22 This is the actual processor firmware version. Many times it is shortened in conversation to just x.22.
Date	System Date
Time	System Time
Daylight Savings	Current Daylight Savings setting
Sensor Number	System defined sensor number
Sensor Label	User defined sensor label
Firmware Revision	See note above “CCU Firmware Revision”
Sensor Revision	Firmware version of sensor electronics
Sensor Comm	Current status of communications to the sensors
Video Status	Current status of Camera Video Feed
Radar Status	Current status of Radar Data Feed
Low Contrast Status	Current status of Low Contrast Mode
Glare Status	Current status of Glare Mode

3.7 Detection Status

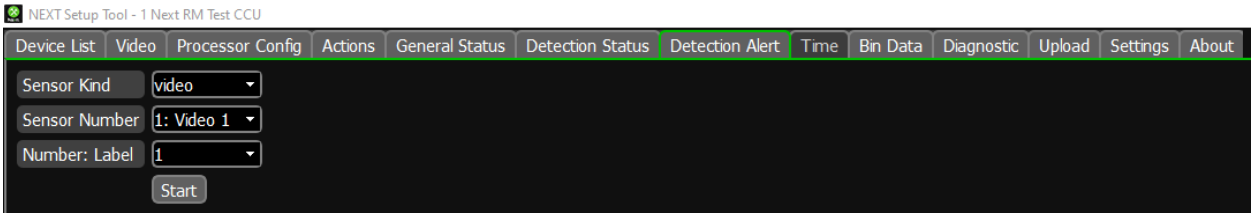
The **Detection Status** screen displays the real time detection status of the Next system. The current state of each output is displayed near the top of the screen. The switches below the output display can be used to manually toggle the output on and off for testing purposes. If phase inputs are available their status will be displayed at the top of the screen.



This screen also displays the zone information for each Next sensor connected to the system. Use this information to ensure the zones have been configured correctly and that there are no conflicts with the detector outputs.

3.8 Detection Alert

The **Detection Alert** screen enables an audible output when a selected zone is activated.

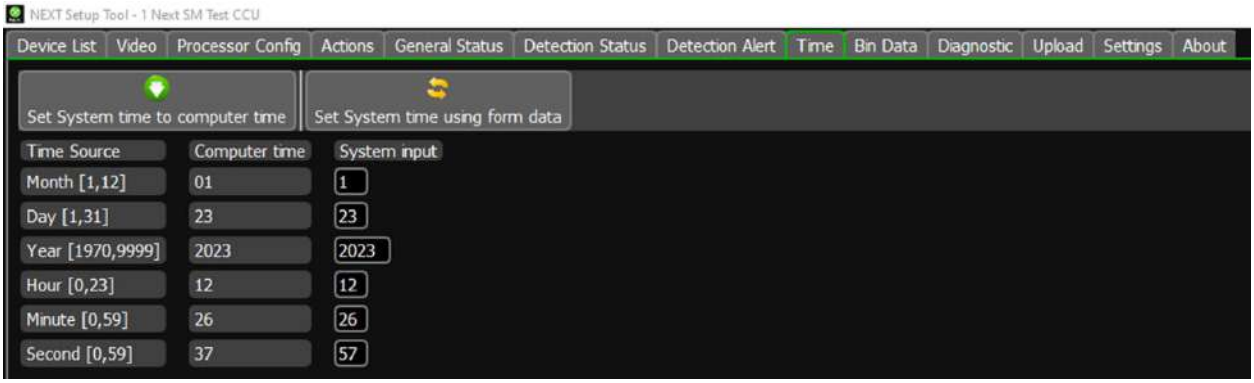


Property	Description
Sensor Type	Choose either zones from the video or radar portion of the detection system.
Sensor Number	Choose the sensor for the approach to be observed.
Number: Label	Choose the zone number to be observed.

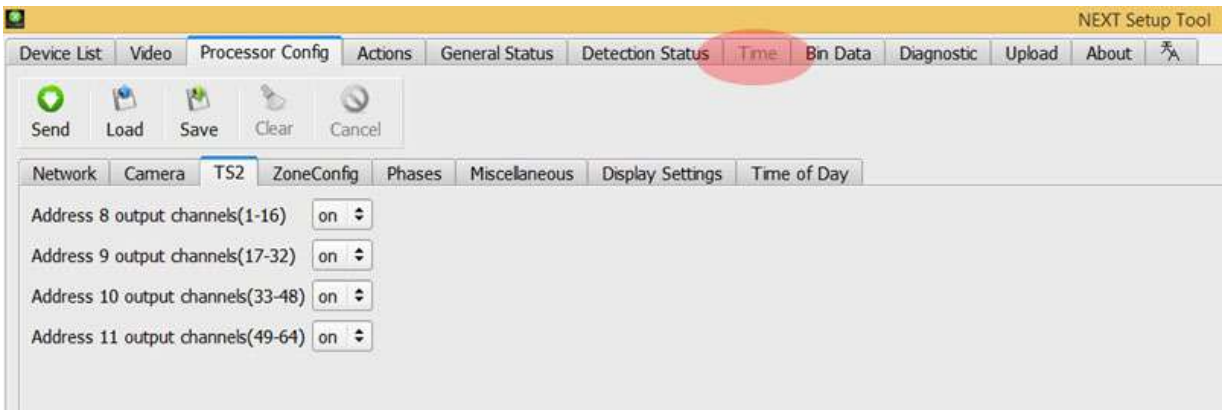
3.9 Time

The **Time** screen displays the current time and date set in the PC and the Next camera system.

The time and date can be changed manually by entering the information into each of the boxes and clicking on 'Set Next Time Using Form Data' button. Alternatively the time and date can be synchronized with the PC by clicking the 'Set Next Time to Computer Time' button.

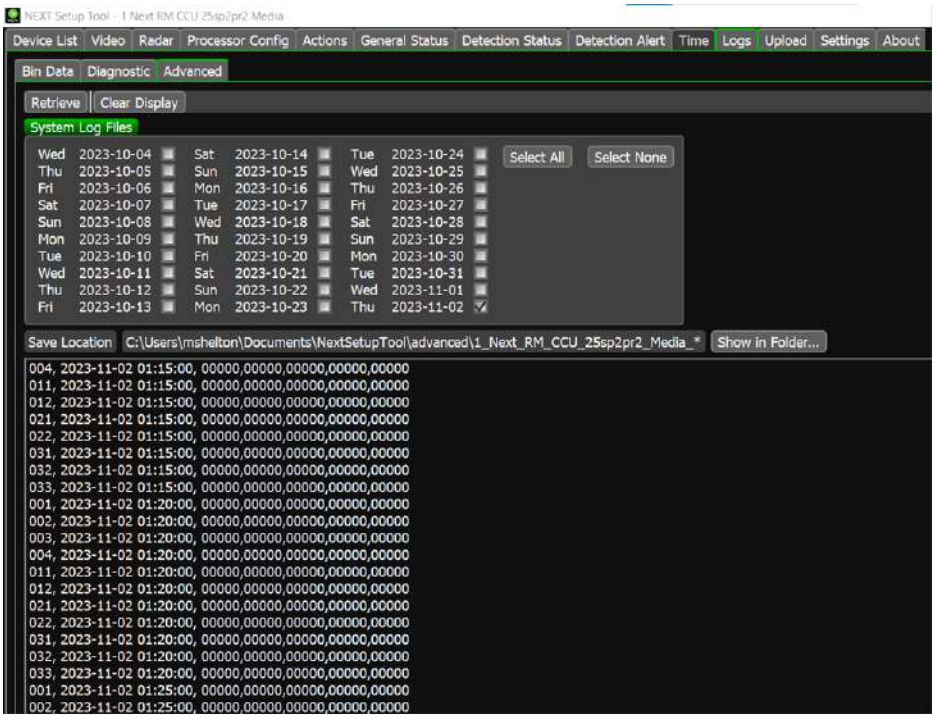


Note: If the system is connected to TS-2 (SDLC) system this tab is grayed out and the time is received from the controller through the SDLC connection.



Important: If the time observed on the overlay and general status page differ then we recommend that the Next system is rebooted. This usually occurs when the SDLC connection is made after the Next system is booted. Always connect the SDLC before powering on the Next system.

3.10 Logs



Property	Description
Retrieve	Once a file or files have been selected click on the retrieve button to display the data on the screen.
Clear Display	Clears all data displayed on the screen.
Select All	Selects all the files shown.
Select None	Deselects all the files shown
	Click on the check box next to each day to select an individual day or days.
Show in Folder	Displays the Windows folder where Bin Data files are stored.

☑ ***Note:*** *See section 10 - Technical Information for details of data formats for each of the types.*

Bin Data

Contains data for all count type functions.

Diagnostics

Contains data for internal performance diagnostics.

Advanced Data

Contains data on Red-Light Running and Queue Length and Delay functions.

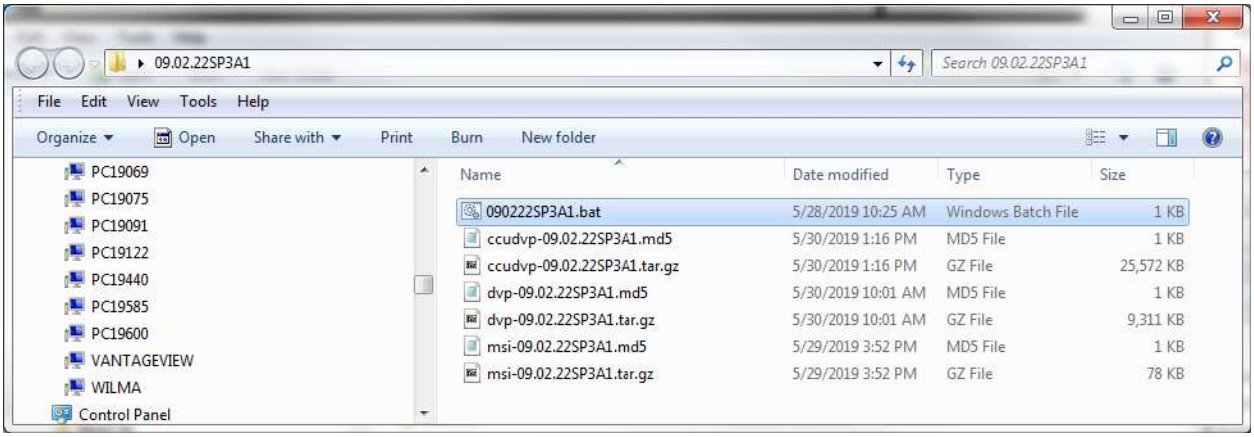
3.11 Upload

Upgrade instructions for Vantage Next

1. In the NEXTSetupTool directory create a folder named upload.

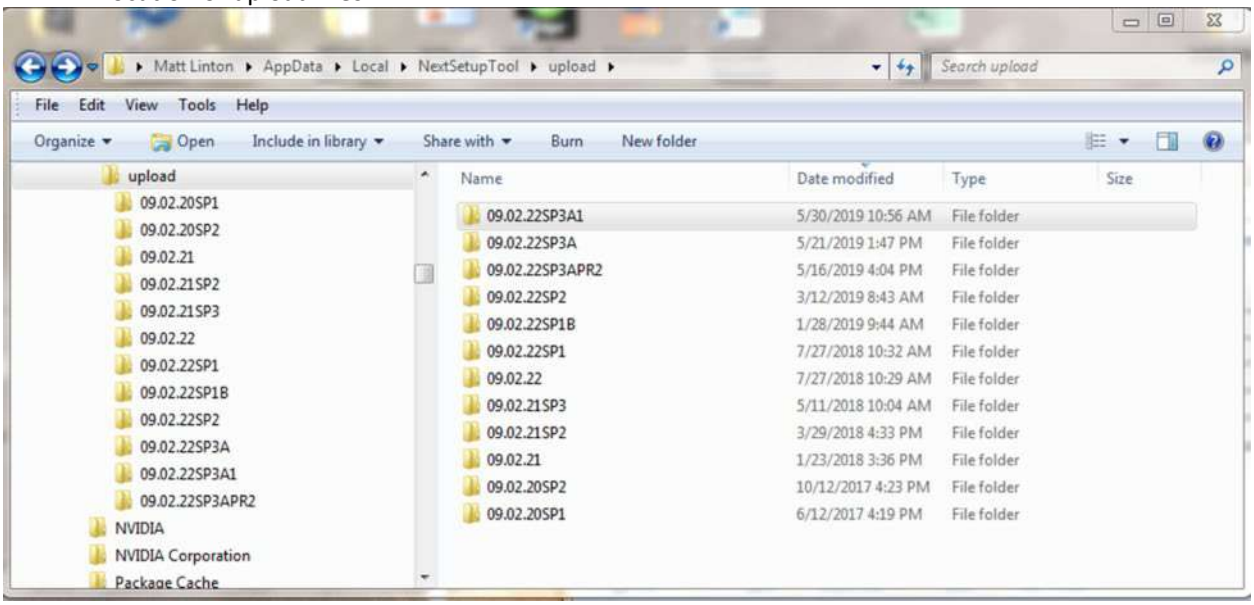
   For example:

   C:\Users\AppData\Local\NEXTSetupTool\upload

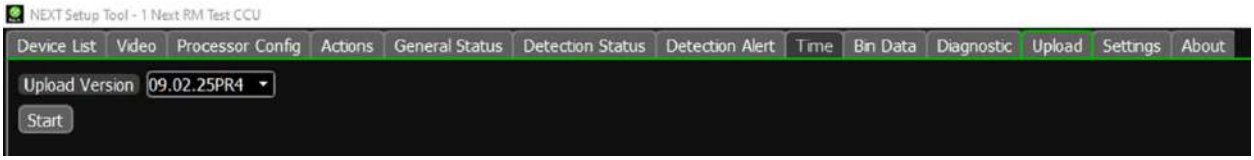


2. Download the Next upgrade files from the Iteris file sharing site. The file is named 09.01.18sp1pr2.zip. Unzip the file and place it in the newly created upload folder.

   Location of upload files

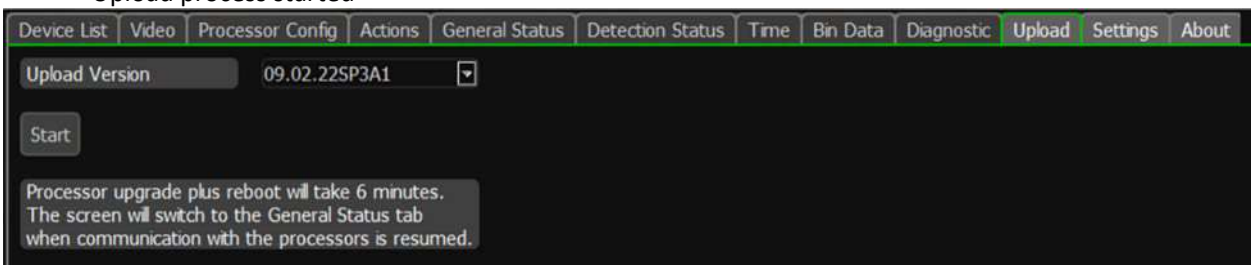


3. Launch the Next Setup tool and connect to the Next system. Click on the upload tab at the top. You should see Upload Version 09.01.18sp1pr2. Click on the start button.



4. The upload process will start. The online LED's on your VP will blink off then on. The whole process takes about three minutes. When the upload process is complete the General Status tab will be displayed. The status page shows the new firmware versions of the CCU and VP's.

Upload process started



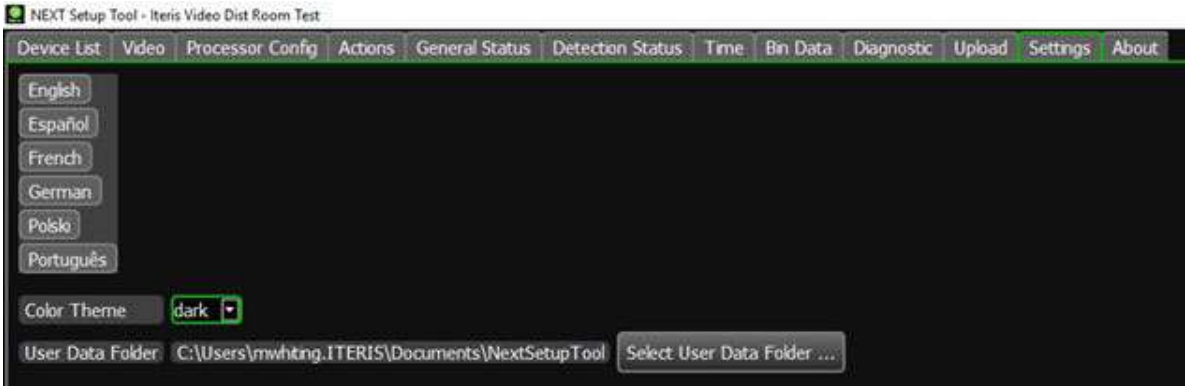
Upload process complete. CUU and VP's are showing their new firmware versions.

3.12 Settings

Use this screen to choose your preferred language. The application will instantly which to whichever language is chosen.

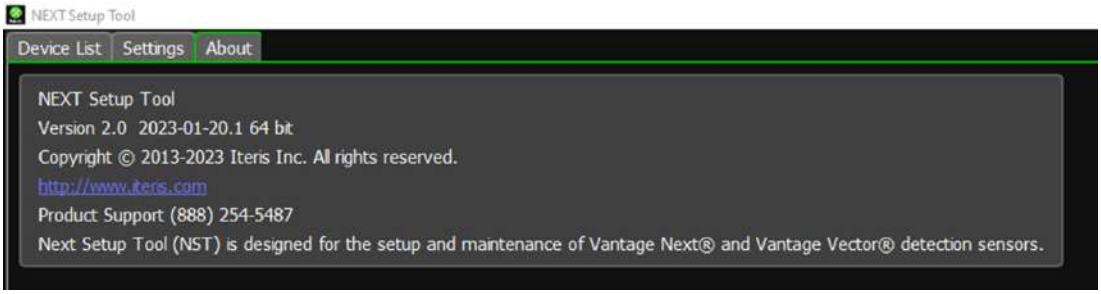
You may also choose a dark or light theme for the app to improve viewing in bright conditions.

Data stored during a Bin or Diagnostic Log download can be stored to a preferred folder by default.



3.13 About

This screen gives some general information about the application and how to contact Iteris is case of questions.



4. OPERATION

4.1 Run Time Display

Note: The following parameters are being used in Vantage firmware version v09.01.18, the current Next System 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.

Zone Labels

If a phase input is associated with a zone then the zone label will be displayed in the color of the active phase (red, yellow or green).

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.

Phase Information

If Phase Information is enabled the information will be displayed in the top left of the screen. For TS-2 applications Red, Yellow and Green information will be displayed. For other applications only the Green information will be displayed.

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

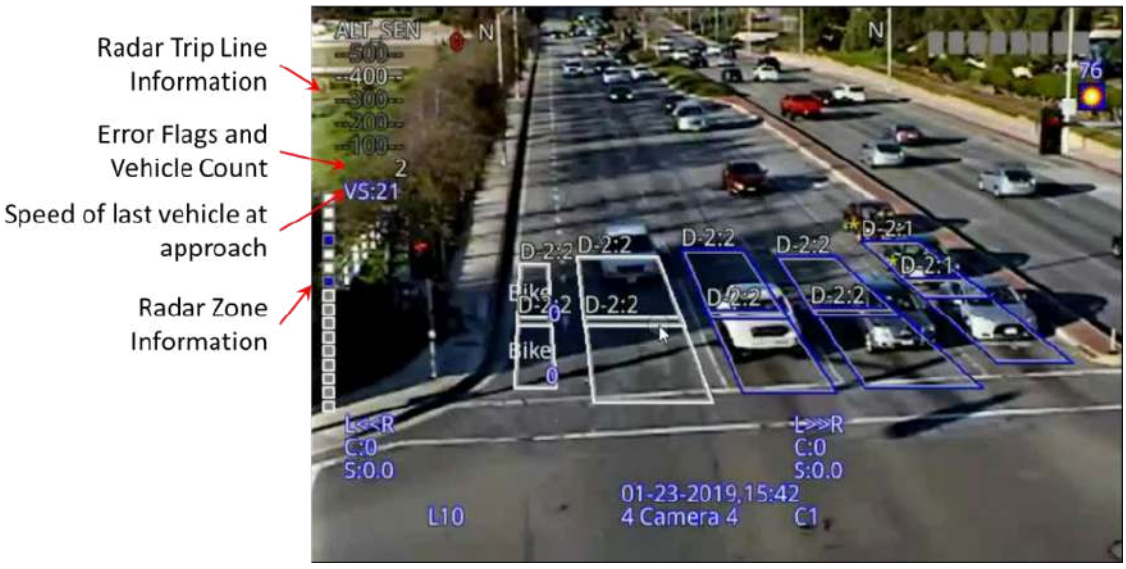
The buffers collect specific information about the intersection and allow the Vantage system to operate in a more intelligent manner. Typically, an even greater level of system operational stability is achieved after both buffers have been filled. If power is disrupted to the Video Processor module all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

The mode is indicated by an icon in the top right of the screen. The  icon indicates day and the  indicates night.

Vector Functionality

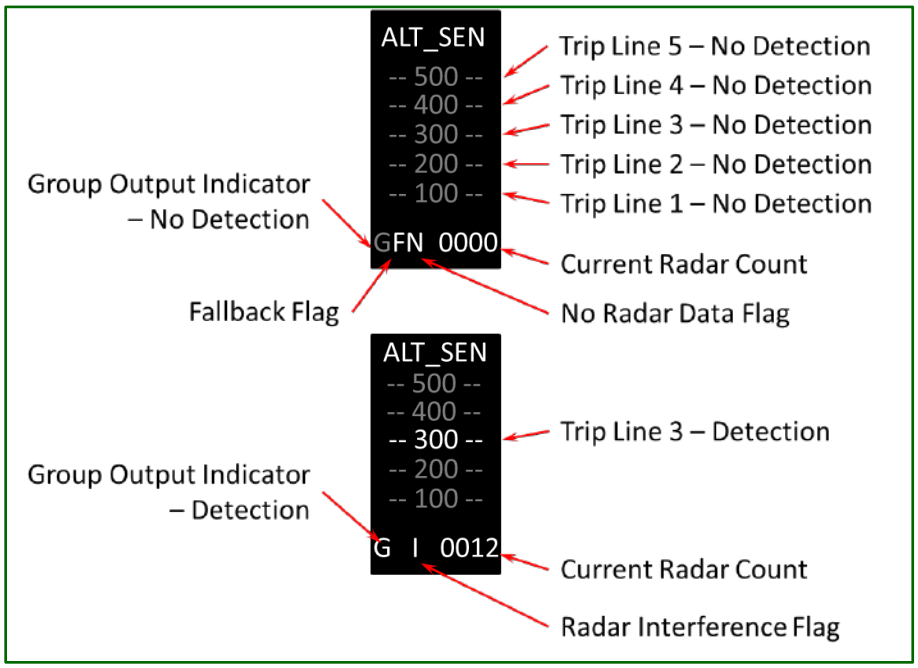
During normal operation the system will display information on the radar in the upper left corner of the screen. This box contains various information.



Radar Sensor Display

Trigger Line Mode

The system displays the three trip line distances. When no vehicles are present at that point on the approach then the distance is gray and the associated output is off. When a vehicle passes that point on the approach then the distance turns white and the associated output is activated.



Radar Zones

The 16 radar zones for each sensor are represented on the left side of the screen. The top box represents zone 1 and the bottom box represents zone 16.

The inside and outside of the boxes indicate difference conditions.

Outside Color	Description	Inside Color	Description
White	Inactive Zone	**Gray**	Inactive Zone
Gray	Active Zone – No Phase Input	**White**	Active Zone – No Detection
Red	Active Zone – Phase is Red	**Blue**	Active Zone – Vehicle Detected – No Phase Input
Yellow	Active Zone – Phase is Yellow	**Red**	Active Zone – Vehicle Detected – Phase is Red
Green	Active Zone – Phase is Green	**Yellow**	Active Zone – Vehicle Detected –Phase is Yellow
		Green	Active Zone – Vehicle Detected – Phase is Green

Counts

The current count of vehicles at Trip Line 1 will be displayed. This will reset based on the time set for the Bin Interval in the system.

Flags

G – This flag indicates if the Group Threshold has been exceeded and the output activated. It is dark gray when the output is off and white when on.

F – This indicates that the Fallback mode is active and the video outputs are being triggered by the radar data.

☑ *Note:* ***See Section 5.5 Decouple Option*** *for more information on this function.*

N – This flag indicates that no data is being received from the radar sensor. Troubleshoot the system to determine the issue.

I – This flag indicates that the radar is seeing high levels of interference in its frequency operating range. Troubleshoot the system to determine the issue.

Speed Display

The speed of the last vehicle through the radar sensor detection area is displayed below the trip line display on the screen. See the image below.

4.2 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 Next System operation.

☑ ***Note:*** *The following system was being used in Vantage firmware versions 09.01.18, the current Next System 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.

4.3 Learn Mode

Learn Mode is the mode that the Vantage Next System uses while it is learning the zone background and your field of view. During the "Learn Mode" the Next System 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 Next System is three minutes.

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

4.4 System Failsafe Modes

The Vantage Next System 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 Next System design incorporates methods to default to a failsafe mode of operation.

If an alarm is triggered the alarm icon will flash in the top right corner of the display  .

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 icon will flash in the top right corner of the screen. 

Low Contrast Mode

Low Contrast (LC) mode is a failsafe mode that the Next System 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 a Next Video Processor camera view is in LC mode an icon will flash in the top right corner of the screen  .

Low Contrast Mode With Multiple Cameras

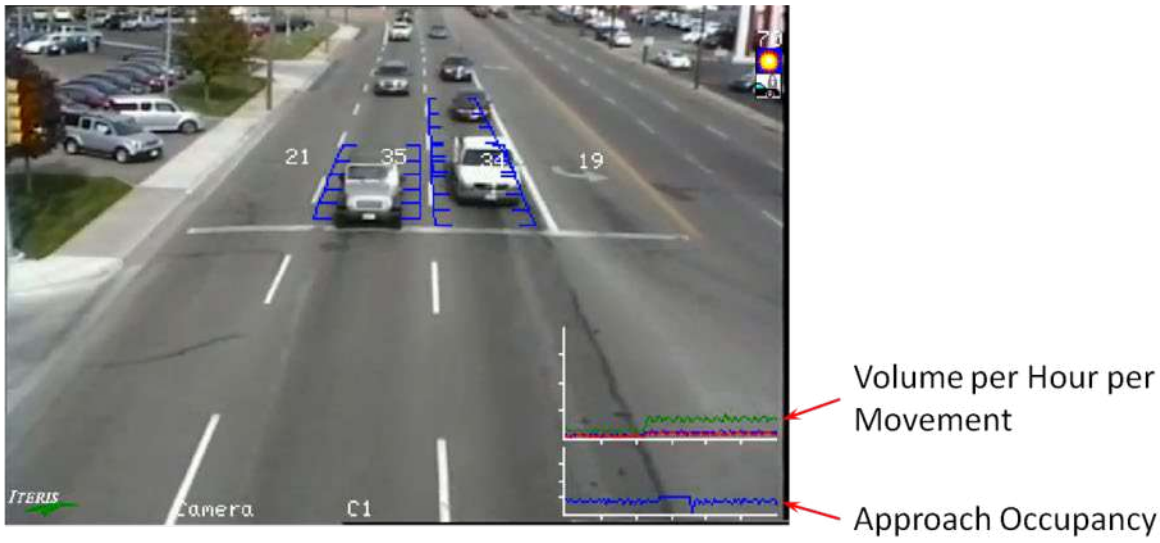
If one of the cameras, on a two camera Next System enters into Low Contrast (LC) mode, the other camera will also enter into a failsafe LC mode and will also place constant calls on all assigned output channels. Realize that the other camera in Failsafe mode will not show "LC" in the camera label.

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 Vantage Next Video Processor unit, it will place constant vehicle calls on all channels.

4.5 On Screen Graphs



Occupancy

The occupancy graph can be found in the bottom right corner of the screen. It is a rolling 24 hour graph in 15 minute bins. The Next Video Processor calculates the active time for all zones against the total possible active time and calculates the approximate occupancy for the approach.

The graph's y-axis is fixed to 100%. The graph's x-axis

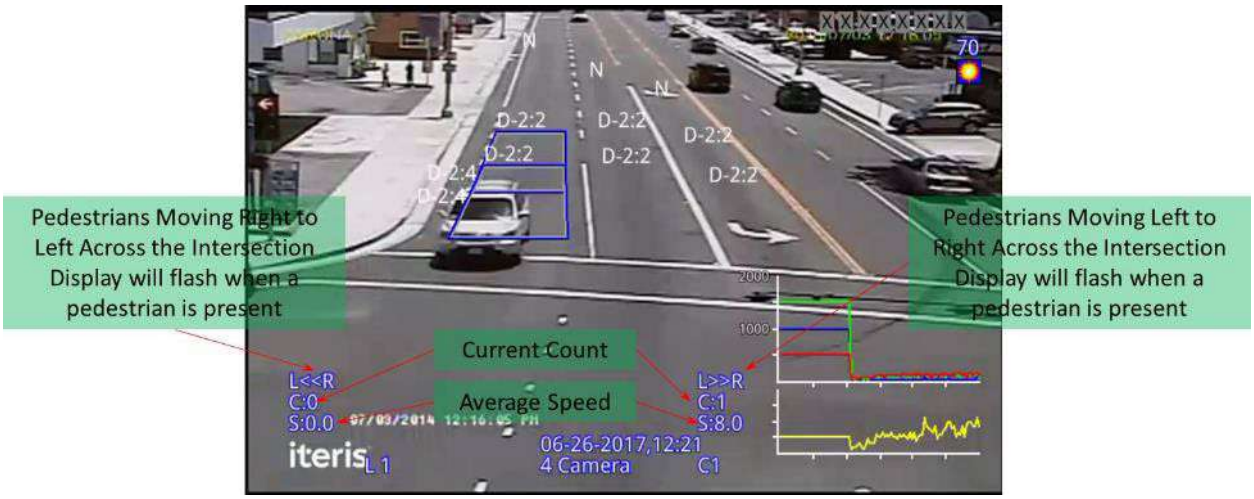
Automatic Traffic Volumes

The system automatically counts the number of vehicles for each zone placed closest to the stop bar in each lane and displays a rolling 24 hour graph in 15 minute bins. The system calculates the approximate traffic volume for each movement every 15 minutes by totaling the counts for each movement and multiplying by four.

The graph's y-axis is fixed to 2000 which is approximately the maximum number of vehicles per hour at saturation. The red line on the graph is for the right turn movement, the blue line on the graph is for the left turn movement and the green line on the graph is for the through movement. See ***Section 3.3: Processor Configuration/Zones*** for how to set the zone movement options.

☑ ***Note:*** *For the graphs to display properly the system Bin Interval must be set to 15 minutes. Any other setting will cause the graphs to be incorrect.*

On Screen Display



The On Screen Display is based on the current Bin. At the end of the Bin Interval the data is stored in the system and the display is reset.

The On Screen Display may be disabled through the NST.

Next Bin Data Zone Numbers

The data from the automatic counts is stored in memory in 15. The data can be accessed through the Next Setup Tool. See ***Section 11 Technical Information*** for more information on retrieving Bin Data.

Automatic counts are stored in special bin zones. Refer to the table below for information on each bin zone number and how it relates to the system.

Direction	Sensor 1 Bin Data Zone Numbers	Sensor 2 Bin Data Zone Numbers	Sensor 3 Bin Data Zone Numbers	Sensor 4 Bin Data Zone Numbers
Down Left	501 Relative left turn	504 Relative left turn	507 Relative left turn	510 Relative left turn
Down Through	502 Relative thru	505 Relative thru	508 Relative thru	511 Relative thru
Down Right	503 Relative right turn	506 Relative right turn	509 Relative right turn	512 Relative right turn

5. TROUBLESHOOTING - FAQ

Symptom: No video display on monitor.

i. Check the monitor cable.
ii. Check the monitors operation. Does the monitor have power? Try a different monitor. If the monitor cable and the monitor are good then the fault lies with the processor. Send the processor in for repair.
iii. If using a HDMI to VGA adaptor ensure the adaptor is powered and the connections are good.

Symptom: Video Processors' online LED is blinking constantly.

iv. The processors online LED will blink for a couple seconds during startup. This is normal. For a continuous blinking see the steps below.
v. Power cycle the processor to see if blinking goes away.
vi. Check the red dip switch on the board. All of the switches should be off or open.
vii. If the blinking persists there is a problem with the processor and it needs to be sent in for repair.

Symptom: Video Processor has an output channel that is locked on.

i. Is there "GLR" (glare) or "LC" (low contrast) in the camera label? Glare or LC can cause a zones' output channel to lock on.
ii. Reset a zone that is associated with the stuck on channel.
iii. Delete all of the zones associated with that channel and redraw them.
iv. Is the zone that is stuck on programmed as the LC output channel? If the processor is in LC mode the LC out channel will be on for as long as the processor is in LC mode.
v. If none of these suggestions work the processor may have a shorted channel and needs to be sent in for repair.

Symptom: Video Processor is locked up with constant calls and no NST response.

i. Upgrade processor to latest firmware version.
ii. If these steps fail to remedy the situation the processor maybe bad and needs to be sent in for repair.

Symptom: Video Processor has constant calls.

i. Under the Miscellaneous tab is the Max Recall set to "on"? If it is, set the output to "off".
ii. Does the processor have a good video source? If the video in LED is on then the processor 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 1 or more cameras labels display the LC Icon? 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.
iv. Does the monitor camera label display "S3" stage 3? Then the constant calls are appearing because the processor is in "S3" stage 3 detection. If the strength of detections degrades enough the processor will go from S1 to S2 to S3. If S3 is coming on when it should not, try cleaning and focusing the camera lens. Try drawing the zones where the vehicles travel. If the S3 problem persists that camera may need to be sent in for repair.
v. Does the camera label display "GCC" or global constant call? One camera maybe in LC causing the other camera to constant call.

Symptom: Extension module has constant calls.

i. Does the extension module have a dash (-) in its display? If so the extension module needs to be reset to get an address (0,1,2,3…).Make sure Cat-5 cable is connected and power cycle the extension module.
ii. Does the extension have a Cat-5 cable connected from the CCU RJ45 out to the extensions modules RJ45 input port? Connect the Cat-5 cable. Push in the Cat-5 cable until it clicks.
iii. The Cat-5 cable maybe bad. Try another Cat-5 cable between the processor and the extension module.
iv. Are the test switches in the down position? If yes then move them to middle position.
v. If these steps fail to remedy the situation the extension module maybe bad and needs to be sent in for repair.

Symptom: No NST communication with system.

i. Make sure you are using the correct Ethernet cable (straight not crossover).
ii. Make sure the NST has the same IP address sub-range as the Next system.
iii. The computer may have a bad Ethernet port. Try to connect with a different computer.
iv. The Ethernet Switch/Router may have a bad port. Try a different port or different switch/router.
v. If these steps fail to remedy the situation the processor may have a bad com port and needs to be sent in for repair.

Symptom: NST 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 system. Reconnect the mouse.
iv. If these steps fail to remedy the situation the processor maybe bad and needs to be sent in for repair.

Symptom: Next system places constant calls in TS2 rack.

i. Check the system in set for SDLC communications.
ii. If this steps fails to remedy the situation the processor maybe bad and needs to be sent in for repair.

Symptom: Next system places constant calls on unused channels.

i. The system may place constant calls on all channels for 3 minutes when first powered up until the learn period has expired.
ii. Check to make sure under the Miscellaneous tab 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: One channel constantly blinks on and off every 1 seconds.

i. Make sure the Test Output Channel under the Actions tab is programmed for none. If a Channel 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: Next system placing constant calls on the TS2 controller.

i. Make sure SDLC cable is firmly attached to the CCU and the controller.
ii. Make sure the correct SDLC address is selected either 08:09 or 10:11. The SDLC address is programmed in the MOD menu.
iii. During a NST snapshot the Plus places constant calls to the controller.
iv. Try a different SDLC cable.
v. If these step fail to remedy the situation the processor maybe bad and needs to be sent in for repair.

Symptom: The overlay shows the corners of 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 that the Glare out, LC out and Video Lock channels are not assigned to the same channels being used by zones.

Symptom: 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 camera maybe bad and needs to be sent in for repair.

Symptom: The video on the monitor looks dark.

i. Adjust the brightness and contrast controls on the monitor.
ii. Check the RJ-45 connectors at both ends of the Cat-5 cable to the camera. A poor connection can result in high resistance and a dark picture.
iii. If these steps fail to remedy the situation the camera maybe bad and needs to be sent in for repair.

Symptom: I cannot zoom and focus my camera with the NST.

i. Check the RJ-45 connectors at both ends of the Cat-5 cable to the camera. A poor connection can result in high resistance and a problem with communications to the camera.
ii. In extremely cold weather apply power to the camera and let it warm up for a while before using the NST to adjust the field of view.
iii. Connect the NST to a different camera and see if you can zoom and focus.
iv. If these steps fail to remedy the situation the LAM maybe bad and needs to be sent in for repair.

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

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

Symptom: The green inputs on my Next system do not work.

i. Check the position of the DELAY/EXTEND dip switches. If the switches are in the up position then the green inputs come in on pins 1, 2, 3 and 10. If they are in the default down position they come in on pins D, E, J, and K.

Symptom: 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.

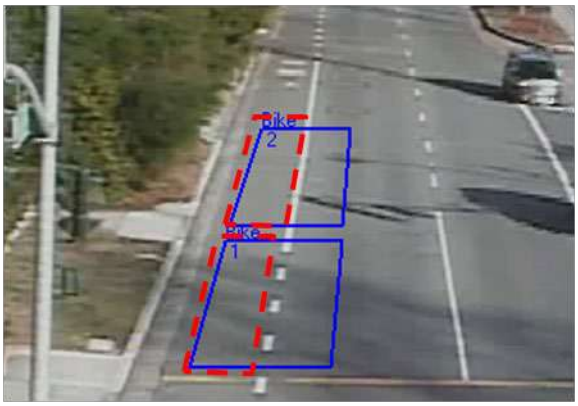
Bike Virtual Zone

On Screen Menu displaying Bike Zone Attributes

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

Symptom: Bike False Calls

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.



Extending Bike Zones into the Vehicle Lanes to overcome false calls

Symptom: 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: 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.

Symptom: Processors not Connected

After the first time a Processor is connected to the CCU the system assigns an internal IP Address. Swapping the patch cables from the Processor to the CCU after this occurs will cause the system to become unstable. If cables have been swapped power cycle the CCU and Processors to restore normal operation

Symptom: Reduced Radar Range

Tilt the Vantage Vector™ radar unit up slightly. This small adjustment will increase the radar's range if it is pointed to far down towards the stop bar. Be sure to keep the tilt adjustment minimal. You may need to verify the radar's settings are correct using the setup tool and processor menu after making a physical adjustment to the radar's tilt, refer to ***Section 4*** and ***Section 5*** to learn more.

Symptom: Vehicles Dropped by Radar Before they Reach the Stop Bar

1. Tilt radar unit down slightly then verify that the vehicles reach the stop bar on the radar screen. Ensure the radar's settings are correct using the setup tool and processor menu after making a physical adjustment to the radar's tilt, refer to ***Section 4 SETUP TOOL*** and ***Section 5*** to learn more.
2. Check the near and far speed settings in the processor, refer to ***Section 5: PROCESSOR SETUP***. The speed limit that is set within the processor will direct the radar to ignore vehicles traveling slower than that threshold.

6. VIDEO STREAMING OPTIONS

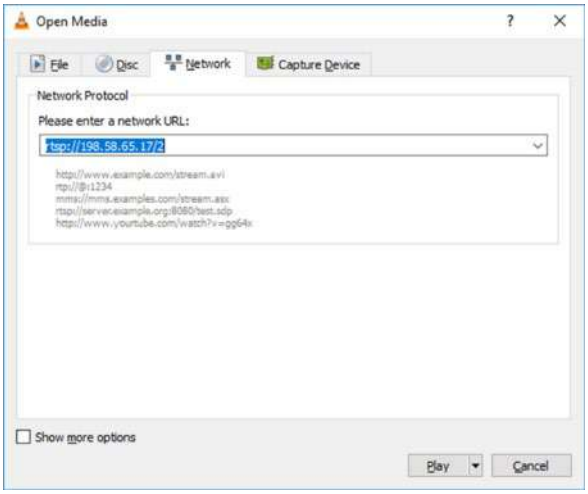
6.1 Streaming Video

Video feeds are available direct from the system. Use Next Viewer (either PC or mobile version), VLC Player or a similar app which is capable of accepting RTSP streams.

☑ ***Note:*** *RTSP streams can be blocked by firewall rules. Check with your IT department to ensure the necessary ports for RTSP are open (554, 8554 and 6900 thru 6999).*

6.2 VLC Player or Similar

If using VLC Player or similar enter the following URL in the Open Network Stream box.



The video URL for individual streams is:

RTSP://x.x.x.x/y

Where x.x.x.x is the IP Address and y is the channel # (1, 2, 3 or 4).

The video URL for a quad streams is:

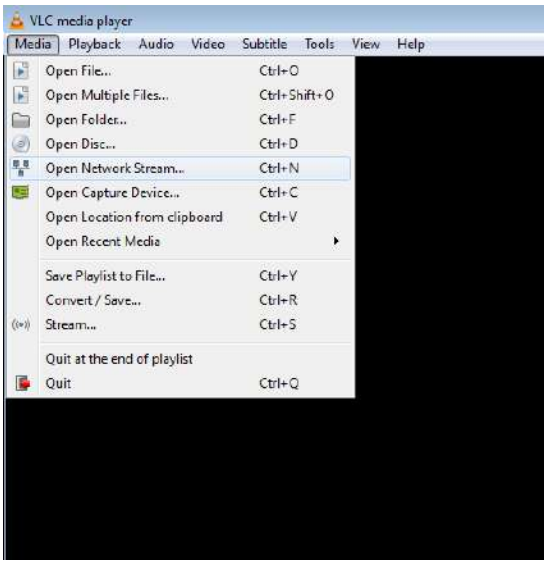
RTSP://x.x.x.x:8554/1

Where x.x.x.x is the IP Address.

6.3 Recording streaming video

How to record a Next generation video stream with VLC media player.

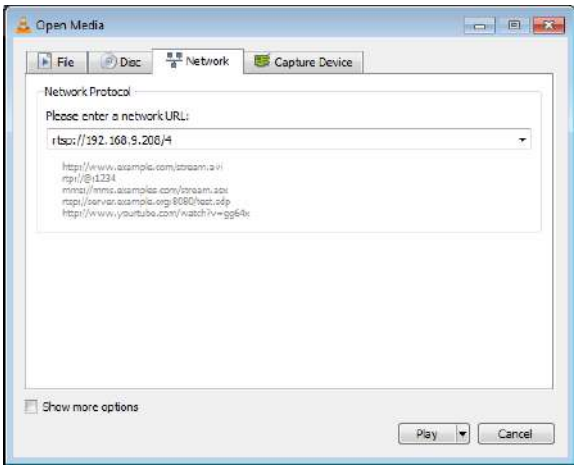
1. Open a media stream with VLC. Under media select Open Network Stream.



2. Enter in the IP information for the Next video stream. The format is rtsp://ip address/camera number.

   Example: rtsp://192.168.9.208/4 <- camera 4 is being recored in this example.

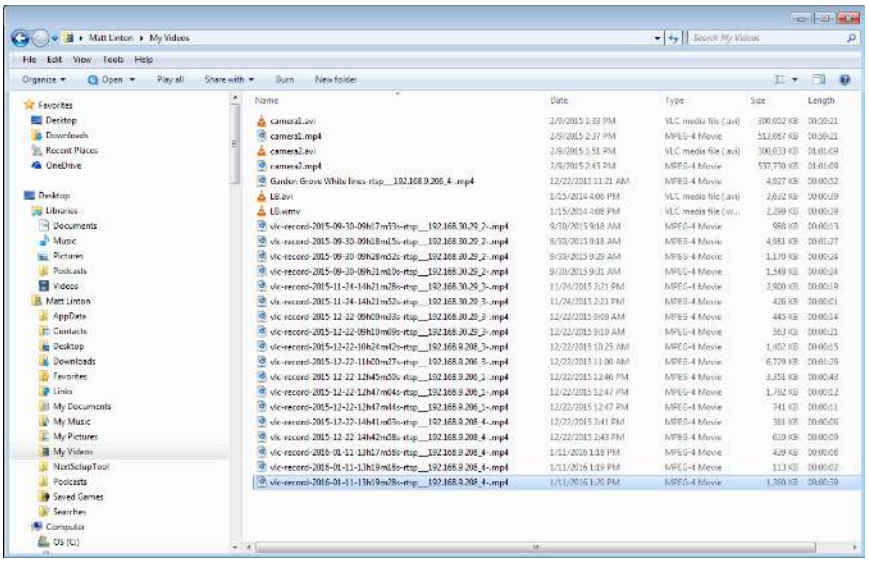
3. Click on the play button.



4. Streaming video is displayed in VLC.

5. Under the playback section select record. This starts the recording. To stop recording under playback select record again.

6. The Video Clip is saved to the My Videos folder on your computer.



6.4 Iteris Video Viewer (iVV)

Iteris Video Viewer is an app that connects directly to any of your deployed Next, Radius and Edge systems and streams video to your screen. It has the ability to show 1, 2 or 4 streams simultaneously from a single intersection. An unlimited number of intersections can be configured for later viewing.

iVV is available for Windows PCs by downloading from the Iteris Resource Center.

iVV is available for iOS devices by downloading from the Apple Store. The User Guide is available on the Iteris Resource Center.

iVV is available for Android devices by downloading from the Google Play Store. The User Guide is available on the Iteris Resource Center.

6.5 Next Video Viewer (NVV)

Next Video Viewer is an app that connects directly to any of your deployed Next systems and streams video to your screen. It has the ability to show 1, 2 or 4 streams simultaneously from a single intersection. An unlimited number of intersections can be configured for later viewing.

NVV is available for Windows PCs by downloading from the Iteris Resource Center.

NVV is available for iOS devices by downloading from the Apple Store. The User Guide is available on the Iteris Resource Center.

NVV is available for Android devices by downloading from the Google Play Store. The User Guide is available on the Iteris Resource Center.

6.6 Network Bandwidth Requirements

There are certain network requirements necessary to get maximum performance from video streams from the Next system.

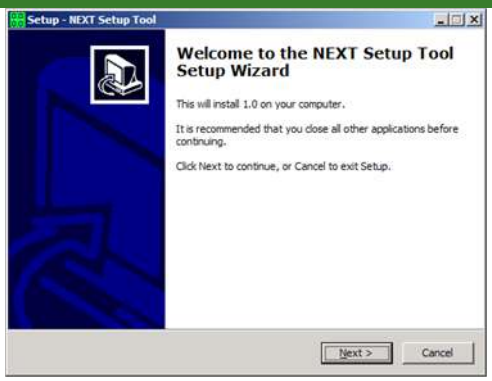
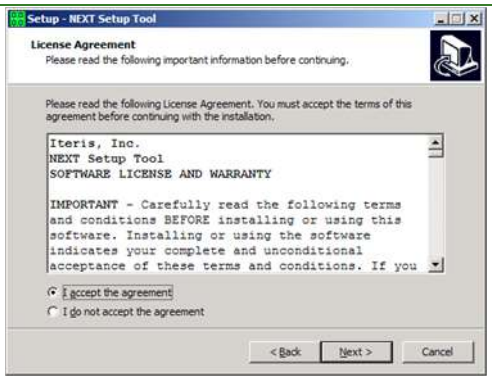
Each video stream uses approximately 500kbps. Multiple the total number of video feeds by the number of people viewing those feeds to calculate total network bandwidth.

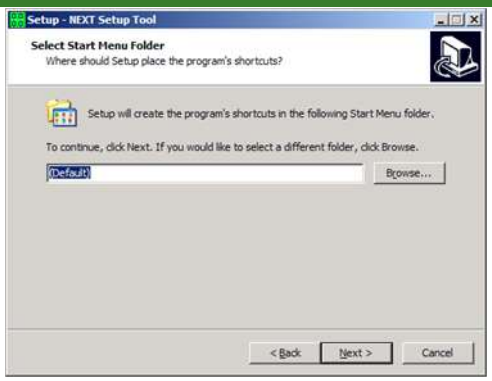
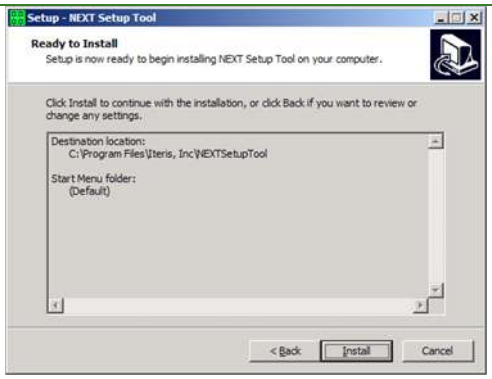
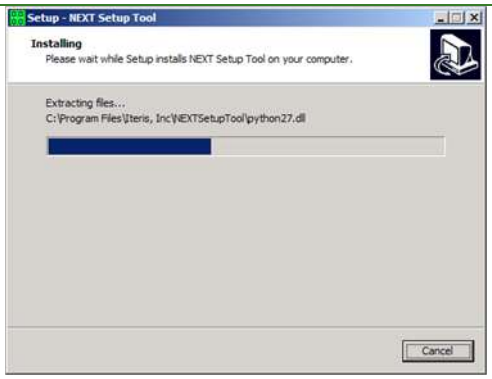
For example if you have 6 video feeds from various Next systems with 2 people viewing them you will use a network bandwidth of:

6 times 2 times 500kbps = 6Mbps

7. SOFTWARE INSTALLATION

7.1 Installing the Next Setup Tool (NST)

Step	Screen Shot
i. Start the installation by clicking on the NEXTSetup.exe file on the CD provided.	
ii. Check the 'I accept the agreement' box. Click on the Next button.	
iii. Accept or change the installation folder. Click on the Next button.	
iv. Accept or change the Start Menu folder. Click on the Next button.	

Step	Screen Shot
	
v. Click on the Install Button	
vi. The installation will begin and the progress bar will be shown.	
vii. Installation complete. viii. Click on the Finish button.	

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 cat-5 cable connections. Look for connector corrosion or moisture damage. Replace any defective connectors. Cabinet cat-5 cable and connections can also be checked for excessive wear or other defects. Repair or replace the defective cable or connectors as needed.

9. PRODUCT SUPPORT

Product Support Team

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

☎ Toll free: (888) 254-5487

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

www.iteris.com

Iteris Resource Center

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

www.iteris.com/support

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

10. TECHNICAL INFORMATION

10.1 Automatic Bin Data Zone Numbers

	Sensor 1	Sensor 2	Sensor 3	Sensor 4
Direction - Down Left count (LT)	501	504	507	510
Direction – Down Through count (T)	502	505	508	511
Direction – Down Right count (RT)	503	506	509	512
Left to Right ped movement (PD) Introduced in version 09.02.20SP1	601	603	605	607
Right to Left ped movement (PD) introduced in version 09.02.20SP1	602	604	606	608
Vector Sensor Radar (AS) near trip line	651	652	653	654
Automatic Right turn counts lane 1 (R1) Introduced in version 09.02.22SP2	701	711	721	731
Automatic Right turn counts lane 2 (R2) Introduced in version 09.02.22SP2	702	712	722	732
Automatic Thru counts lane 1 (T1) Introduced in version 09.02.22SP4	703	713	723	733
Automatic Thru counts lane 2 (T2) Introduced in version 09.02.22SP4	704	714	724	734
Automatic Thru counts lane 3 (T3) Introduced in version 09.02.22SP4	705	715	725	735
Automatic Thru counts lane 4 (T4) Introduced in version 09.02.22SP4	706	716	726	736
Automatic Thru counts lane 5 (T5) Introduced in version 09.02.22SP4	707	717	727	737
Automatic Left turn counts lane 1 (L1) Introduced in version 09.02.22SP3A	708	718	728	738
Automatic Left turn counts lane 2 (L2) Introduced in version 09.02.22SP3A	709	719	729	739
Automatic Left turn counts lane 3 (L3) Introduced in version 09.02.22SP3A	710	720	730	740

☑ ***Note:*** *Zone numbers highlighted in red will be included in a future firmware release.*

10.2 Bin Data Structure - Vehicle and Bike Zones

This includes automatic zone numbers 701 thru 740.

Data String:

051, 2019-07-23 11:45:00, 13,0,0,0,0,0,0, Video OK, LT

xxx, yyyy-mm-dd hh:mm:ss, V, x, x, x, x, x, I, Video **Status, Label**

String Definition:

xxx – Zone Detail Number

yyyy-mm-dd – Year-Month-Day

hh:mm:ss – Hour:Minute:Second

V – Volume (Count) for the bin interval

x – Not used for this firmware version

x – Not used for this firmware version

x – Not used for this firmware version

x – Not used for this firmware version

x – Not used for this firmware version

x – Not used for this firmware version

I – Amount of green time for the bin interval (seconds)

Video Status – OK or No Video

Zone Label – Automatic or user configured

10.3 Bin Data Structure - Automatic Direction Counts

This includes automatic zone numbers 501 thru 512

Data String:

504, 2019-07-23 11:45:00, 10,0,23,0,0,0,0, Video OK,C2 LT

xxx, yyyy-mm-dd hh:mm:ss, V, x, O, x, x, x, x, Video Status, Label

String Definition:

xxx – Zone Detail Number

yyyy-mm-dd – Year-Month-Day

hh:mm:ss – Hour:Minute:Second

V – Volume (Count) for the bin interval

x – Not used always zero

O – Occupancy **NOTE**: Only for the first zone number with each sensor (501, 504, 507, 510). All other zones not used, always zero.

x – Not used always zero

x – Not used always zero

x – Not used always zero

x– Not used always zero

Video Status – OK or No Video, Video GLR, Video LC

Zone Label – Automatic or user configured

10.4 Bin Data Structure -Vector Trip Line

This includes automatic zone numbers 651 thru 654.

Data String:

011, 2019-07-23 11:30:00, 25,29,6,10,5,10,300, Video OK, RT

xxx, yyyy-mm-dd hh:mm:ss, V, S, O, Csm, Cmd, Clg, I, Video Status, Label

String Definition:

xxx – Zone Detail Number

yyyy-mm-dd – Year-Month-Day

hh:mm:ss – Hour:Minute:Second

V – Volume (Count) for the bin interval

S – Average Vehicle Speed for the bin interval

O – Occupancy, expressed as a percentage for the bin interval

Csm – Volume (Count) for small vehicle classification

Cmd – Volume (Count) for medium vehicle classification

Clg – Volume (Count) for large vehicle classification

I – Amount of green time for the bin interval (seconds). **Note**: this is always zero for Vector Trip Lines

Video Status – OK or No Video

Zone Label – Automatic or user configured

10.5 Bin Data Structure - PedTrax

The system bin interval applies to the pedestrian data.

Data String:

605, 2019-08-01 00:00:00, 1, 0, 0, 6.3, 6.3, 6.3, 0, Video OK,C3 PD

xxx, yyyy-mm-dd hh:mm:ss, V, x, x, S, MaxSpd, MinSpd, I, Video Status, Zone Label

☑ ***Note:*** *The order and content of the data string for PedTrax data is different from that of the Count or CSO zones for Vehicles and Bicycles. Count and CSO zone data is not affected by the addition of PedTrax.*

String Definition:

xxx – Zone Detail Number

yyyy-mm-dd – Year-Month-Day

hh:mm:ss – Hour:Minute:Second

V – Volume (Count) for the bin interval

x – Not used for PedTrax in this firmware version

x – Not used for PedTrax in this firmware version

S – Average Pedestrian Speed for the bin interval

MaxSpd – Speed of the fastest pedestrian for the bin interval

MinSpd – Speed of slowest pedestrian for the bin interval

I – Amount of green time or walk time for the bin interval (seconds) when logic level inputs are used.

Video Status – OK or No Video

Zone Label – Automatic or user configured

☑ ***Note:*** *Speed data is recorded with a single decimal place, e.g., 2.8*

10.6 Log Data Structure

Each line in the log data has the following structure

Data String:

yyyy-mm-dd hh:mm:ss text string

String Definition:

yyyy-mm-dd – Year-Month-Day

hh:mm:ss – Hour:Minute:Second

text string – One of the log entries listed above

Log Data Entries

Possible Diagnostic Entries – Replace # with Camera Number

- Camera # enter alt sensor fallback
- Camera # exit alt sensor fallback
- Camera # alt sensor no data
- Camera # alt sensor interference
- Camera # alt sensor errors
- Camera # alt sensor no errors
- System running TOD config #

- System running config #
- System rebooted
- Login by privilege user
- Login by non_privilege user
- Login by VSU user
- User entered system level access
- Logoff by user
- User set reboot in boot loader mode flag
- User entered reboot system command
- System entered DID mode
- System exit DID mode
- Camera # algo DID in T mode
- Camera # algo DID in W mode
- Camera # algo DID in TW mode
- Camera # algo in all clear mode
- System enter low contrast mode
- System exit low contrast mode
- System enter constant call mode
- System exit constant call mode
- Camera # enter low contrast mode
- Camera # exit low contrast mode
- Camera # algo detection quality in S1 mode
- Camera # algo detection quality in S2 mode
- Camera # algo detection quality in unknown mode
- Camera # enter glare mode
- Camera # exit glare mode
- Menu enabled
- Menu changes aborted
- Reset system to factory default & reboot system
- Changes saved to config #
- Changes not saved to config
- System enter alarms mode
- System exit alarms mode
- Camera # - Video restored
- Camera # - Video lost
- Radar Error Entries

The following group of messages are put in the log when the unit boots up to show the extension modules enumerated on the EM bus. What is shown below are all possible modules. The '#' in the first column is an incrementing number of each extension module in the order of enumeration. The '#' for total shows the total number of extension modules found.

- ue module set
- #,EM_2CHAN(2)
- #,EM_2CHAN(4)
- #,EM_4CHAN(2)
- #,EM_4CHAN(4)
- #,IO_24CHAN
- #,IO_32CHAN
- #,EM_MCOMM
- #,EM_MCOMM(64)
- #,TS2(####)
- #,EM_PROC(2)
- #,EM_PROC(4)
- total,#

10.7 Advanced Data Red-Light Running

Zone Numbers

	Sensor 1	Sensor 2	Sensor 3	Sensor 4
Lane 1	1	11	21	31
Lane 2	2	12	22	32
Lane 3	3	13	23	33
Lane 4	4	14	24	34
Lane 5	5	15	25	35
Lane 6	6	16	26	36
Lane 7	7	17	27	37
Lane 8	8	18	28	38
Lane 9	9	19	29	39
Lane 10	10	20	30	40

Red-Light Running Data Structure

Red-Light Running data is stored in time bins.

a. 0-2 seconds
b. 2-5 seconds
c. 5-10 seconds
d. 10-40 seconds
e. 40 seconds and beyond

Data String:

011, 2023-07-23 11:45:00, 00013,00011,00022,00024,00014

xxx, yyyy-mm-dd hh:mm:ss, a, b, c, d, e

String Definition:

xxx – Zone Detail Number

yyyy-mm-dd – Year-Month-Day

hh:mm:ss – Hour:Minute:Second

a = container a data

b = container b data

c = container c data

d = container e data

e = container f data

10.8 Advanced Data - Queue Length and Delay

Zone Numbers

	Sensor 1	Sensor 2	Sensor 3	Sensor 4
Lane 1	101	111	121	131
Lane 2	102	112	122	132
Lane 3	103	113	123	133
Lane 4	104	114	124	134
Lane 5	105	115	125	135
Lane 6	106	116	126	136
Lane 7	107	117	127	137
Lane 8	108	118	128	138
Lane 9	109	119	129	139
Lane 10	110	120	130	140

Queue Length and Delay Data Structure

This includes automatic zone numbers 701 thru 740.

Data String:

101, 2023-07-23 11:45:00, 13,12,11,10

xxx, yyyy-mm-dd hh:mm:ss, QT, QM, QS, QU

String Definition:

xxx – Zone Detail Number

yyyy-mm-dd – Year-Month-Day

hh:mm:ss – Hour:Minute:Second

QT - Queue Total

QM - Queue Max

QS - Queue to Serviced

QU - Queue Unserviced

10.9 Location of Intersection List

The intersection list for the NST can be found at:

C:\Users\another\AppData\Local\NextSetupTool

Type %localappdata% into file explorer to quickly get to this folder.

Copy the file: ***device_list.xml*** to other machines to quickly populate a new PC with the list of intersections.

10.10 Recommended items for installation

Below is a list of the items needed to install the Next system. Refer to the Installation Guide for more details.

Cable – CAT-5E/6E Shielded Outdoor Rated

CAT5ECABLEGUY.COM	C5E-1000-CMXTT
PRIMUS CABLE	C5CMXT-2152BKWS
PRIMUS CABLE	C5CMXT-416BK
VERTICAL CABLE	059-486/CMXT

Stripping Tool

B&H PHOTO VIDEO	15015C
PLATINUM TOOLS	15015

Crimp Tool

PLATINUM TOOLS	100054C

Connectors – Shielded

PLATINUM TOOLS	100022 (Bag of 50)
PLATINUM TOOLS	100022C (Clamshell of 50)
PLATINUM TOOLS	100023C (Clamshell of 10)

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