

Vantage RADIUS User Guide



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CCU and DP:

CAN ICES-3(A) /NMB-3(A)

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1. INTRODUCTION

Radar technology and streaming video for stop bar detection

Radar presence detection

VantageRadius™ is the newest sensor in the Iteris Vantage family that utilizes radar technology for vehicle detection at the intersection stop bar. VantageRadius builds on the success of the Vantage Vector hybrid detector offering a combination of radar and video designed specifically for stop bar detection at the intersection.

Using radar and Iteris' enhanced detection algorithms ensures that VantageRadius can accurately detect vehicles and vehicle speeds as they approach the intersection, enabling the intersection to operate at its peak efficiency. The system is built on the simple-to-use Vantage Next® platform and continues the Iteris tradition of ease of installation and simple configuration.

Monitor your intersection with live video stream

Included with the VantageRadius sensor is a high resolution digital camera that streams live video back to a central management location, providing agencies with the ability to monitor and take action on the operation of their intersection. This video stream can also be used in place of other surveillance cameras to stream live video to your traffic management center video wall and mobile applications from Iteris.

Benefits

- *Low lifecycle cost*
- *Easy to install, configure and maintain*
- *Simple and convenient access*
- *Flexible and scalable*
- *Remote intersection viewing*
- *Visual feedback to ensure sensor is operational*
- *Low power operation*

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 sensor*
- *Virtual zones can be assigned with Boolean logic for greater control*
- *Fail-safe outputs for sensor loss and equipment failure*
- *Non-volatile memory data storage*
- *Self test on power up*
- *Ethernet port for ease of remote access and maintenance*

1.1 Overview

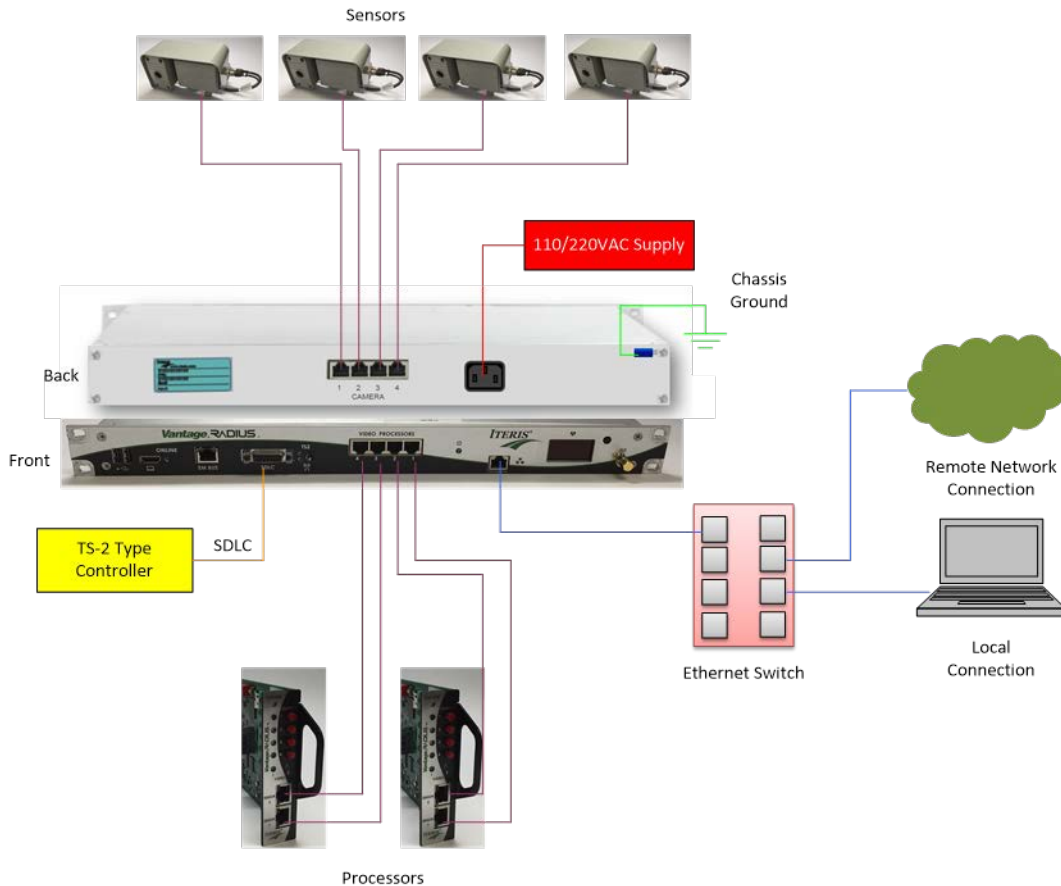
A typical intersection setup will have four sensors, each connected to a Vantage Radius Processor module in the traffic control cabinet. You use the Radius hosted user interface to draw detection zones. To define a detection zone, you designate the four corners of a zone on the radar tracks and then setup the various zone properties. You can define up to 32 detection zones per sensor.

The processor module analyzes the radar data to determine when a vehicle is present in a zone. 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 Radius system. Please refer to the Radius Installation Guide for full instructions of the various modules and setup instructions for the system.

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

System Architecture



2. PROCESSOR CONFIGURATION

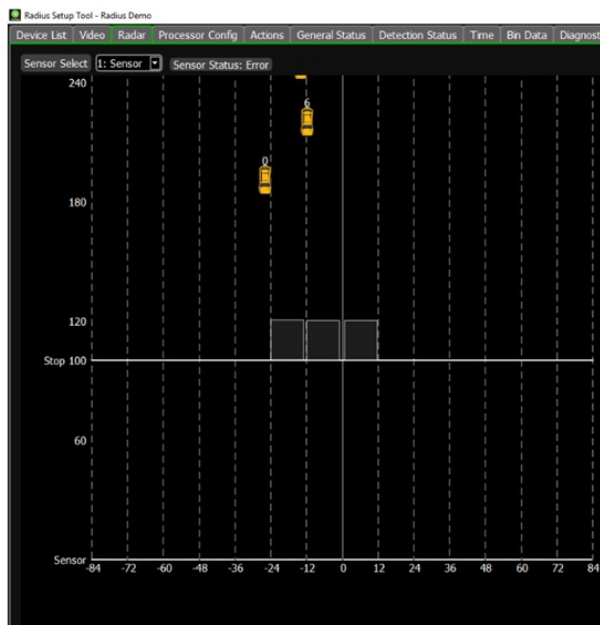
Vantage Radar Detection

The radar sensor used in the Radius system provides data for up to 64 objects (vehicles, bicycles, pedestrians). The data includes position, speed and size. The Radius system processes this data and determines if one or more of the objects is inside a detection zone. Based on the zones parameters an output may be sent to the traffic signal controller to indicate the presence of an object.

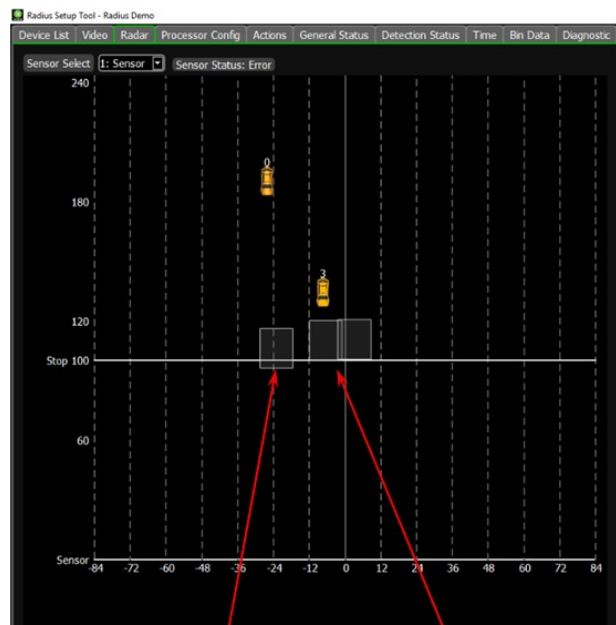
Appropriate zone sizing rules should be observed. The best policy is to use the least number of zones possible to obtain the desired operation and performance.

2.1 Zones Placement and Size

It is very important to have the stop bar distance and zone placement correct for optimal system performance. The system and algorithms use this data to calculate various factors to ensure that vehicles are properly detected and that false calls are minimized.



✓ - Well placed zones, one per vehicle lane



✗ - Zones overlapping

✗ - Zone in front of stop bar

Zones should be placed on a lane by lane basis with a maximum of 8 placed side to side

Do not overlap zones from one movement to another. This may cause false detections for a movement and result in inefficient operation at the intersection.

Ensure zones are drawn where vehicles are moving (within lanes) and also where they stop on a red phase. Drawing them too far forward or backwards may result in missed calls as the vehicles may be outside the detection area.

Zone Types

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 Radius Setup Tool and this tool or VantageLive! 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 Miscellaneous Menu.
- There are a maximum of six out of the 32 zones that can be assigned as count zones (per sensor).
- Refer to Section 10: Technical Information for more details on Count zones.
- The count data is retrieved from the Radius System by communicating through the Ethernet port using Radius Setup Tool (RST) or automatically with VantageLive!.
- The Bin Interval is set under the Miscellaneous menu.

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.

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

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 sensor 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.

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

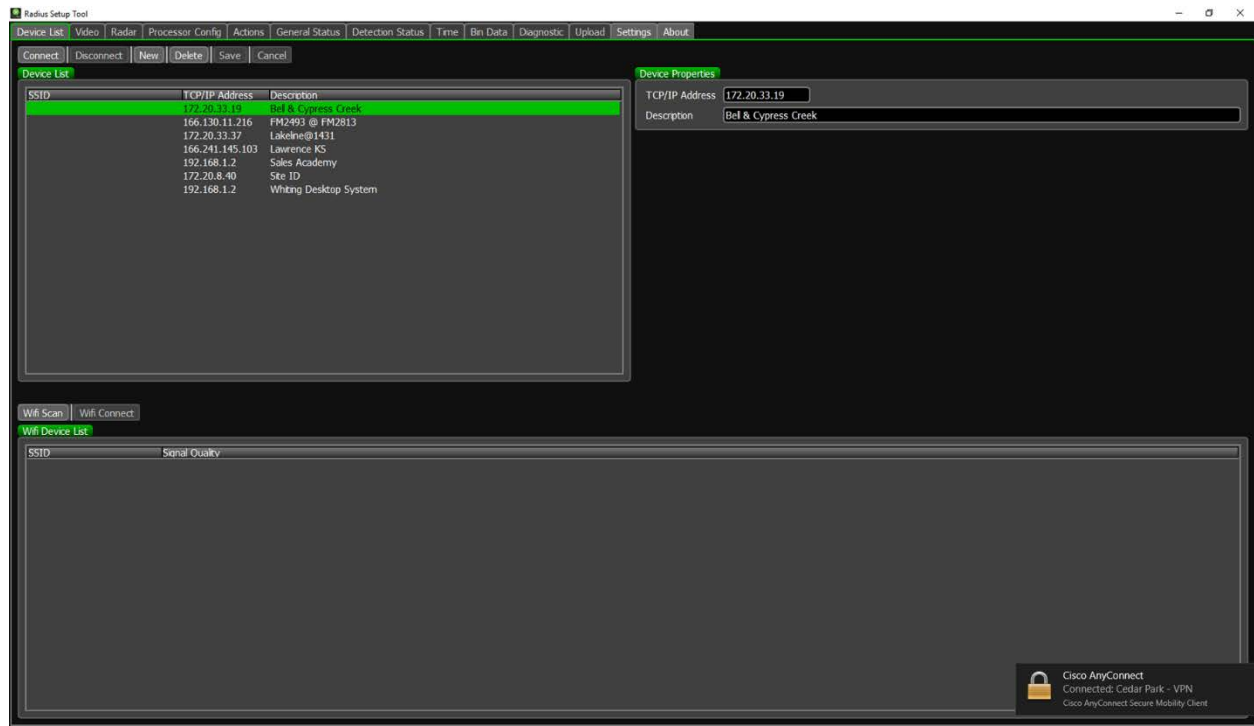
3. Radius Setup Tool (RST)

Programming of the Radius system uses the Radius Setup Tool (RST). This is embedded in the system or can be run remotely on a PC. See [Section 7: Software Installation](#) for installation instructions of this application.

Default IP Address

The default IP Address for the Radius System is 192.168.1.2. This only applies to the physical connection on the front of the CCU and can be changed with the Radius Setup Tool. The Wi-Fi IP Address is fixed and can only be accessed through the RST.

3.1 Device List



Existing Systems

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

Property	Description
SSID	If the device has the Wi-Fi enabled the SSID will display here.
IP Address	Communication to the Radius system is through an Ethernet connection using TCP/IP.
Description	The Description can be used to identify the different intersections or junctions within a group. E.g., Pullman/Dyer, MacArthur/Birch. Once the RST has connected with a Radius system it will replace the description with the Site ID so that both match.

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.

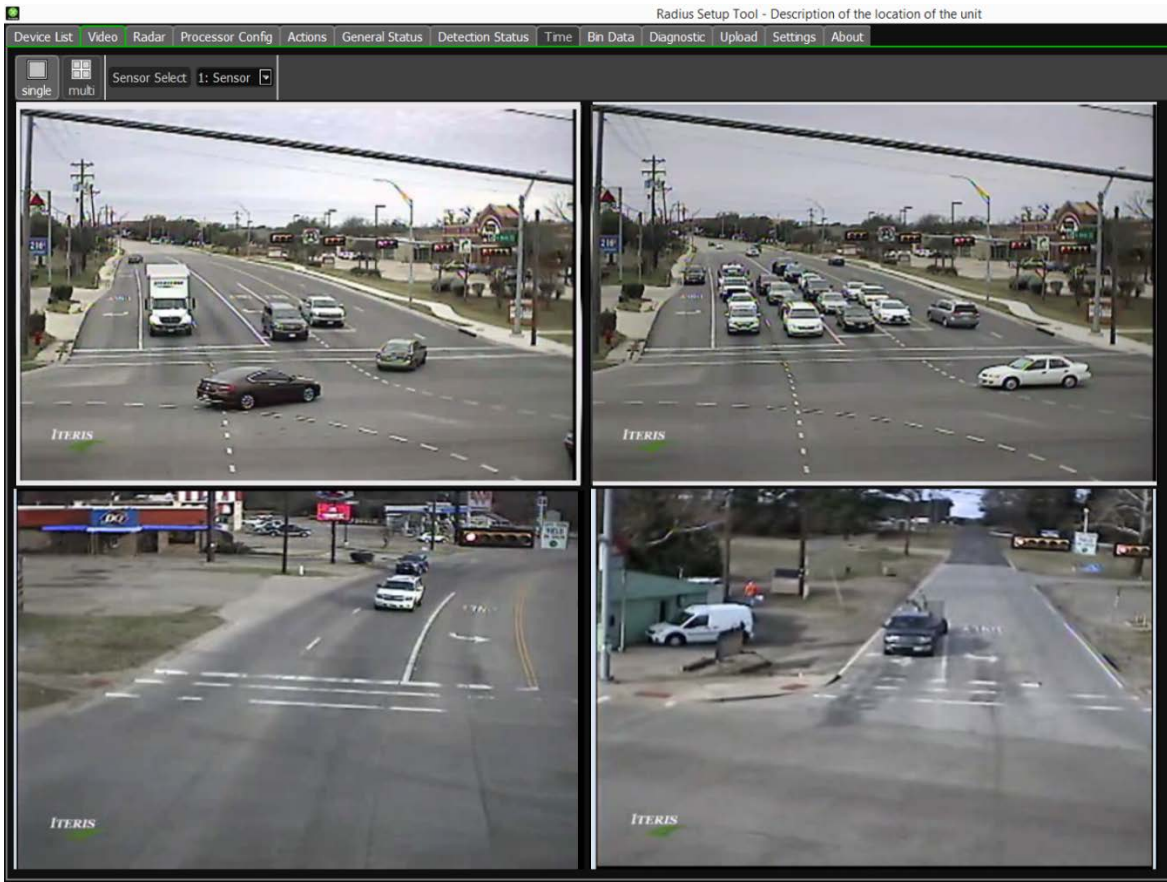
Tab	Description
Connect	To connect to a Radius system, select the system from the Device List and click Connect . The menu options along the top of the pane will become enabled (highlighted) upon a successful connection. For an unsuccessful connection, refer to Section 6: Troubleshooting/FAQ .
Disconnect	Once you have finished maintenance on a device return to the Device List screen and click Disconnect . <input checked="" type="checkbox"/> <i>Note: The RST can only connect to one Radius system at a time. Disconnect from the current system before attempting to connect to another system.</i>
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 stream.



Tab	Description
Single	Displays a single video stream.
Multi	Displays a quad view of all four video streams.
Sensor Select	Selects which sensor video stream will be displayed in single mode.

3.3 Radar

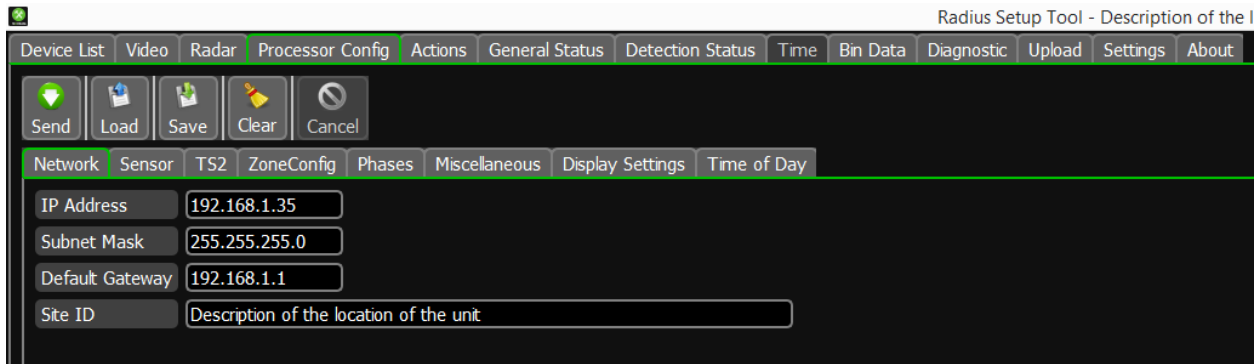
Refer to [Section 4.1: Run Time Display](#) for information on this screen.

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.

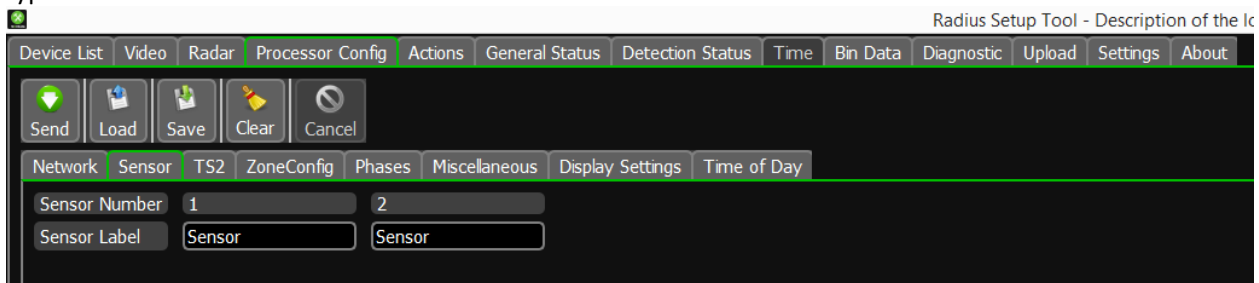
Internally the system communicates through a set of VLANs to each component. Because of this certain IP addresses must be avoided on your network. Here is a list of subnets that cannot be used 192.168.200.x through 192.168.212.x.



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	Set the name of the Radius Intersection to the Intersection Name.


Sensor Settings

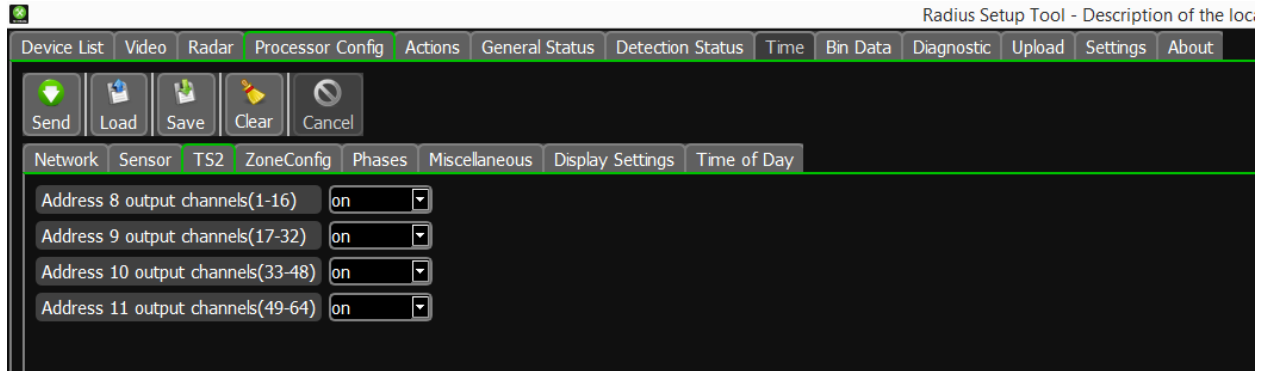
The saved "Sensor Label" is user customizable. The default designation is: "Sensor, however, this can easily be changed. Sensor names can be up to 10 characters in length. To edit a sensor name, click in the box and type the new name.



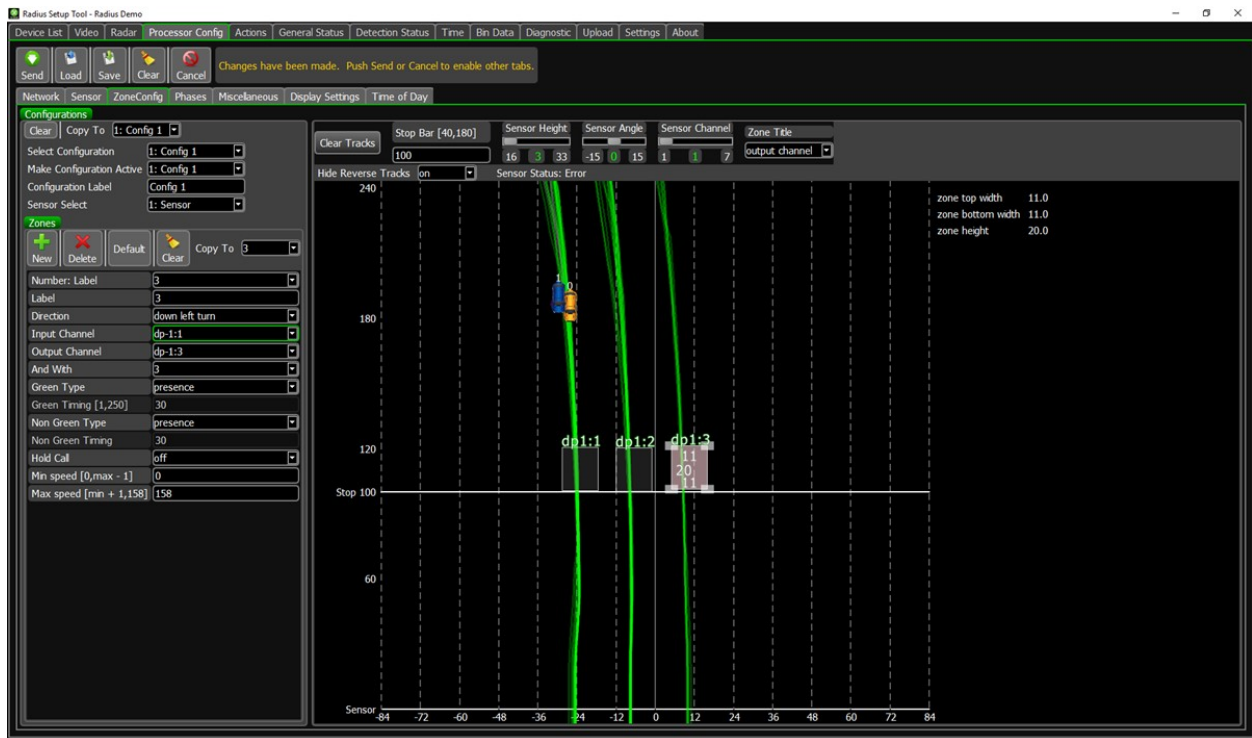
TS-2

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.



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	Cancel the configuration changes.

Radar Settings

As the vehicles are detected and displayed on the screen the RST draws a track. As more vehicles flow the same track the tracks change from purple to green. These green tracks indicate the flow of traffic (traffic lanes) at the intersection. You can use this to accurately draw zones in the desired area of interest.

Property	Description																		
Clear Tracks	This will reset the track drawing. This button should be pressed after any radar settings have been made.																		
Stop Bar	Set the distance from the sensor to the stop bar. A line will be drawn on the screen to indicate the stop bar position. During a red phase ensure the stopped traffic lines up with the stop bar position.																		
Sensor Height	The sensor height is used to ensure accurate distances are measured by the system. Set it to match the height the sensor has been positioned at.																		
Sensor Angle	This setting can be used to 'straighten' the vehicle tracks on a curved approach or when the sensor is set at the pole. This can make it easier to draw accurate detection zones.																		
Sensor Channel	Each sensor installed at the intersection should be set to a different channel. This ensures that they will not interfere with each other.																		
Zone Title	<p>The label above each zone can be set to show different information.</p> <table border="1"> <thead> <tr> <th>Zone Title</th> <th>Function</th> </tr> </thead> <tbody> <tr> <td>AND/W</td> <td>Which zone is logically and'ed with.</td> </tr> <tr> <td>DIRECTION</td> <td>Direction for detection.</td> </tr> <tr> <td>INPUT CHANNEL</td> <td>Channel # to activate zone.</td> </tr> <tr> <td>LABEL</td> <td>User configured label.</td> </tr> <tr> <td>NUMBER</td> <td>Zone # assigned by system.</td> </tr> <tr> <td>OFF</td> <td>No label</td> </tr> <tr> <td>OUTPUT CHANNEL</td> <td>Channel # driven by zone.</td> </tr> <tr> <td>GREEN/YELLOW/RED TYPE</td> <td>Zone type for different input phases.</td> </tr> </tbody> </table>	Zone Title	Function	AND/W	Which zone is logically and'ed with.	DIRECTION	Direction for detection.	INPUT CHANNEL	Channel # to activate zone.	LABEL	User configured label.	NUMBER	Zone # assigned by system.	OFF	No label	OUTPUT CHANNEL	Channel # driven by zone.	GREEN/YELLOW/RED TYPE	Zone type for different input phases.
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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.
Sensor Select	Selects the sensor to modify.

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 Radius Processor module sensor.

Property	Description
New	Creates a new 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.

Note: *The currently selected zone for editing will display it's size in feet (or meters) on the top, bottom and side of the zone to aid in setup. This information is also displayed next to the grid for easier viewing.*

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

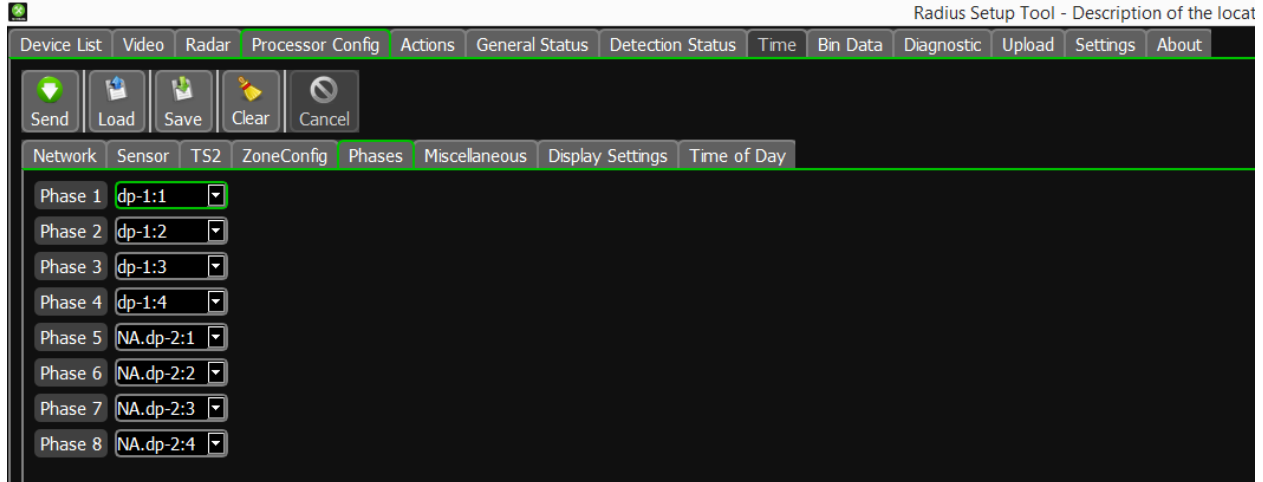
Property	Description
	in length. To edit a Zone Label, click in the box and type the new name.
Direction	<p>The zone direction option can be set to a number of options.</p> <p>ANY (Default) - This setting has the potential to detect vehicles from any direction.</p> <p>DOWN - This setting enables "Wrong 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.</p> <p>DOWN has three options Down Thru, Down Left Turn, Down Right Turn. 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 4.3: On Screen Graphs for more details.</p> <p>UP – This setting enables the detection of departing traffic and rejects any vehicles moving towards the sensor.</p> <p>Select the direction from the drop down box.</p>
Input	<p>This function allows the 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).</p> <p>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 Processor delay inhibit input channel. The choices are DP-x:1 through DP-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 DP-x:1 would correspond with delay inhibit pin 1 and DP-x:2 would correspond with delay inhibit pin 2. Choosing DP-x:3 , DP-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.</p>
Output Channel	<p>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 Processor in the detector rack. Where you physically plug the 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.</p> <p style="text-align: center;">Typical Channel Designators:</p> <p style="text-align: center;">Processor</p> <p style="text-align: center;">DP-x: 1, DP-x:2, DP-x:3, DP-x:4, NONE</p>

Property	Description
	<p>Where x = the camera number</p> <p>Extension Modules</p> <p>Two Channel EM-0:1, EM-0:2</p> <p>Four Channel EM-1:1, EM-1:2, EM1:3, EM-1:4</p> <p>I/O Module</p> <p>IO-2:1 Through IO-2:32</p> <p>If using a TS-2 controller then 64 detector outputs are available through the SDLC connection.</p> <p> Note: For more information on output channels, see the Section 5: Output Channel Assignment in the Next Installation Manual.</p>
<p>And With</p>	<p>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.</p> <p> 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.</p> <div style="display: flex; flex-direction: column; align-items: center;"> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p>Zone Detail # 1 AND/W : 1 Ch/Out : PROC:2 Parent Zone</p> </div> <div style="border: 1px solid black; padding: 5px;"> <p>Zone Detail # 2 AND/W : 1 Ch/Out : NONE Child Zone</p> </div> </div> <p style="text-align: center; color: green;"><i>Correct AND/W Setup Example</i></p> <p>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.</p>

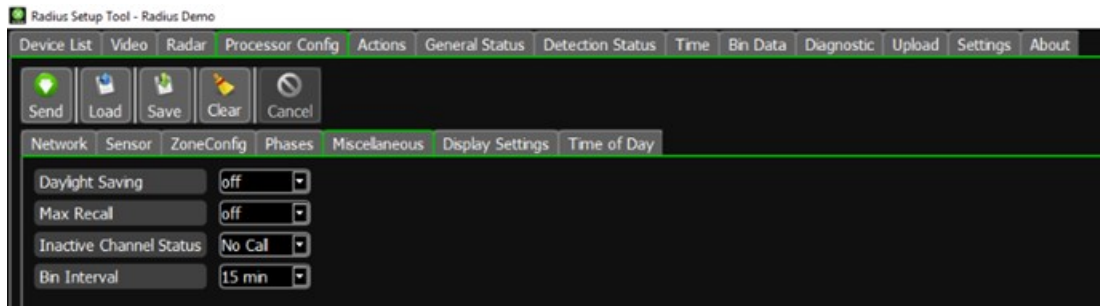
Property	Description																		
	To change the AND/W parameter, select a valid zone number from the drop down list.																		
Detection Type Green Type Non Green Type	<p>This setting allows you to select the type of detection zone to create. There are several different zone types available.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr style="background-color: #f4a460;"> <th>Zone Type</th> <th>Function</th> </tr> </thead> <tbody> <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>CSO</td> <td>Count, Speed, Occupancy zone.</td> </tr> <tr> <td>BIKE</td> <td>Bicycle zone.</td> </tr> <tr> <td>NONE</td> <td>Displays detections on the screen but does not output calls to the controller.</td> </tr> </tbody> </table> <p>If an Input Channel is being used Detection Type changes to Green Type and extra configuration options are displayed. The extra options allows the user to set a different zone type when the Input Channel is inactive. For example using a Count zone during the green phase and setting the zone type to None in the Non-Green phase to avoid mis-counting cross traffic.</p>	Zone Type	Function	PRESENCE	Places a call as long as vehicle is in the zone.	EXTEND	Extend the vehicle call for a programmable length of time.	DELAY	Delay the vehicle call for a programmable length of time.	PULSE	Produces a pulse output for a user programmable rate of time (pulse width).	COUNT	Count vehicles that pass through the zone and store the data.	CSO	Count, Speed, Occupancy zone.	BIKE	Bicycle zone.	NONE	Displays detections on the screen but does not output calls to the controller.
Zone Type	Function																		
PRESENCE	Places a call as long as vehicle is in the zone.																		
EXTEND	Extend the vehicle call for a programmable length of time.																		
DELAY	Delay the vehicle call for a programmable length of time.																		
PULSE	Produces a pulse output for a user programmable rate of time (pulse width).																		
COUNT	Count vehicles that pass through the zone and store the data.																		
CSO	Count, Speed, Occupancy zone.																		
BIKE	Bicycle zone.																		
NONE	Displays detections on the screen but does not output calls to the controller.																		
Detection Timing	For Zone Types that include a timing element this sets the variable from .1 second (1) to 25 seconds (250).																		
Bike Count	<p>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.</p> <p><input checked="" type="checkbox"/> Note: Once six bike zones have been assigned to count then this option in the Attribute switched off. See figure at start of this section.</p>																		
Hold Call	<p>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.</p> <p>This function is similar to the controller latching an input.</p>																		
Min speed	Allows the user to set the minimum speed a vehicle must be travelling to activate the zone.																		
Max speed	Allows the user to set the maximum speed a vehicle must be travelling to activate the zone.																		

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.



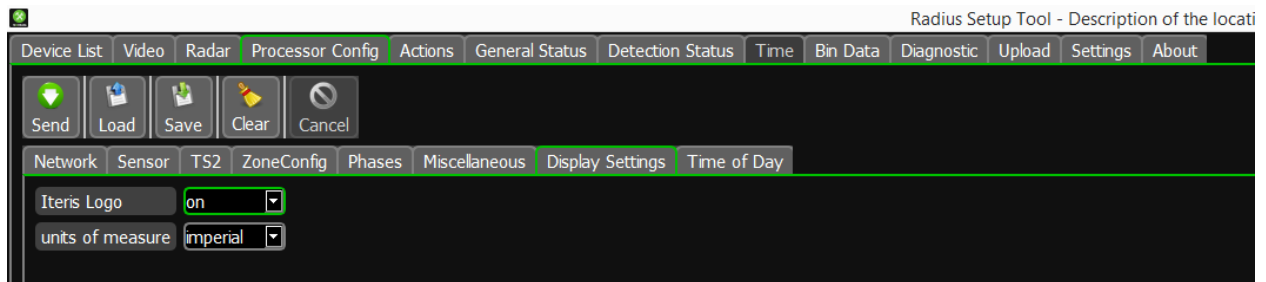
Miscellaneous



Property	Description
Daylight Saving	<u>Daylight Savings Time (Day/Save)</u> - 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

Property	Description
	<p>calls.</p> <p>CALL - If this setting is selected, then all unused channels will place constant calls.</p> <p><input checked="" type="checkbox"/> Note: <i>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".</i></p>
Bin Interval	<p>A Bin Interval needs to be set to tell the system how often the counts should be stored. You can select a bin interval of either: 10 or 20 seconds or 1, 5, 15, 30, or 60 minutes. For example, if you select five minutes, that means that every five minutes count data for all count zones will be time-stamped and binned. The Next System will store this count information into local memory.</p>

Display Settings



Property	Description
Iteris Logo	Turns the Iteris logo display in the bottom left corner of the image on and off.
Units of measure	The system can be set to report size, distances, speeds in either Imperial or Metric units.

Time of Day

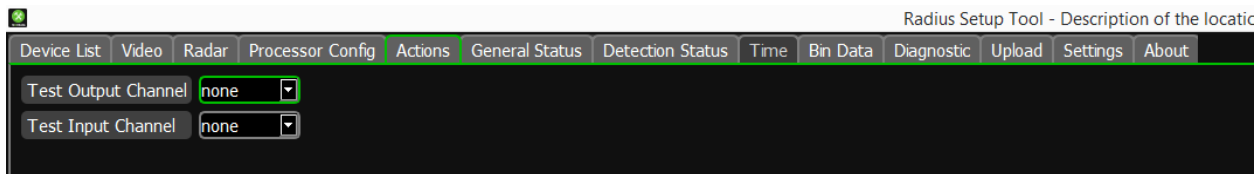
From the **TOD** tab the user can set the system to operate any combination of the five saved configurations at different hour long intervals for each day of the week. This provides the user with the ability to customize sensor zones settings to meet the needs of various situations (i.e., lane closures, 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 sensor configurations based upon the saved schedule.



3.5 Actions

This screen provides various actions in the system.

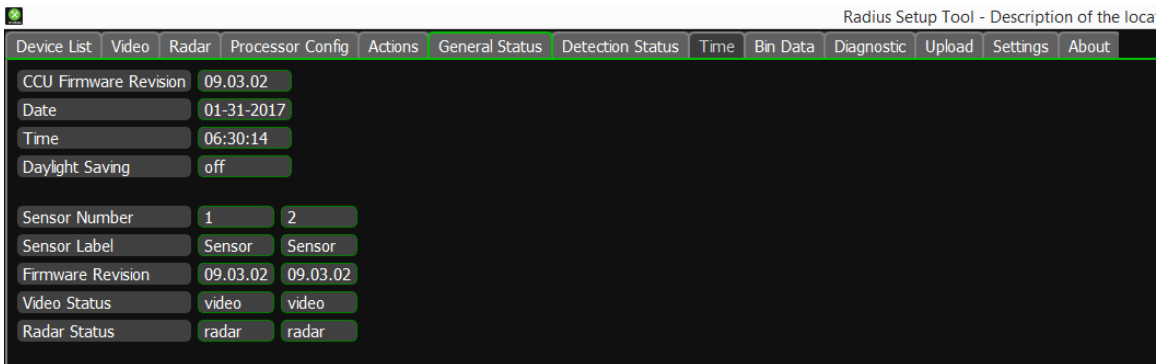


Property	Description
Test Output Channel	This option allows you to test the output channels on the Detection Processors. Select an output channel to test from the drop down box. The output channel will repeatedly toggle on and off at a one second interval. Select None from the drop down box to disable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

3.6 General Status

The **General Status** screen displays information on each of the Radius sensors connected to the system.

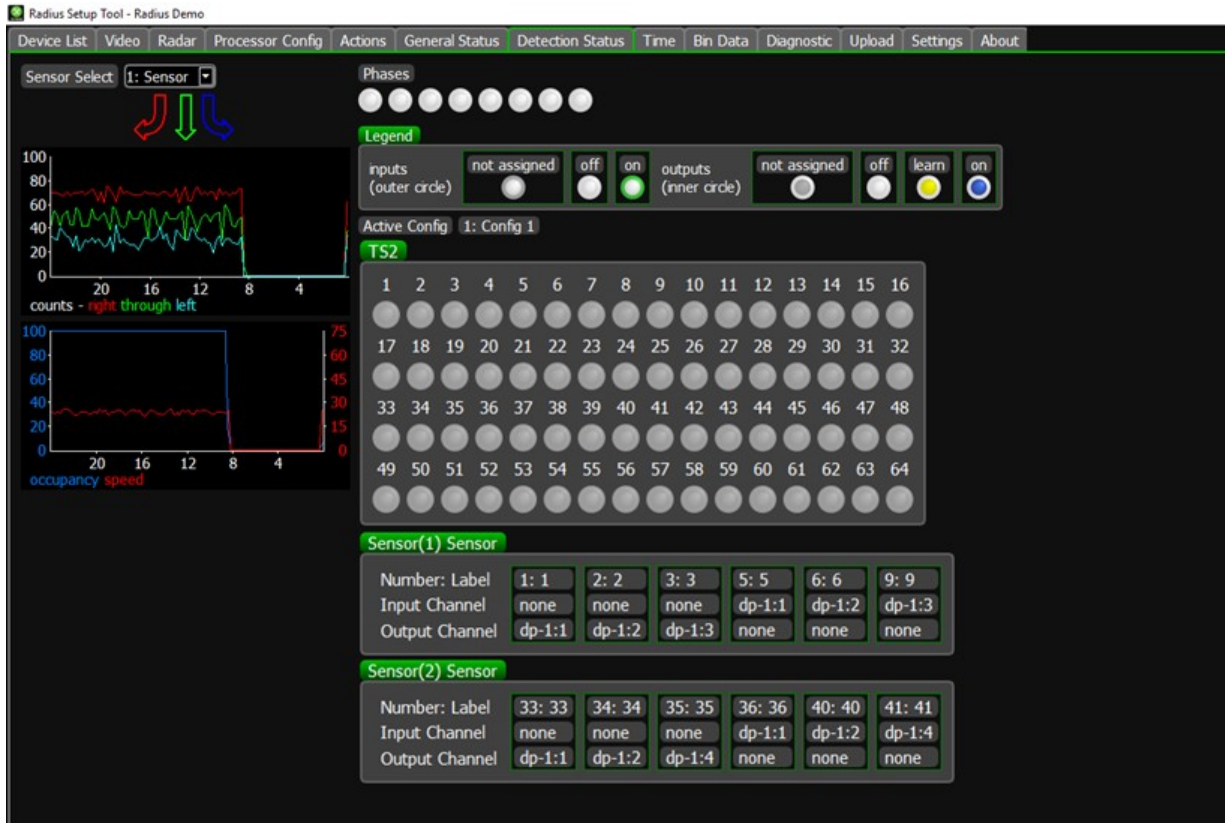
Note: When calling in with technical questions about your Radius system, many times you will be asked what firmware version your system is running. This information is found in the "General Status" page.



Property	Description
CCU Firmware Revision and Firmware Revision	This parameter is the Vantage Next firmware version. For example: "09.03.02". 09 This tells us that it is a Radius system. 03 This tells us that this is a Radius Dual Channel Processor. 02 This is the actual processor firmware version. Many times it is shortened in conversation to just x.02.
Date	System Date
Time	System Time
Daylight Savings	Current Daylight Savings setting
Sensor Number	System defined camera number
Sensor Label	User defined camera label
Video Status	Current status of Video Feed
Radar Status	Current status of Radar Data Feed

3.7 Detection Status

The **Detection Status** screen displays the real time detection status of the Radius system. The current state of each output is displayed near the top of the screen. Use the Sensor Select drop down box to display data associated with a single sensor head.



This screen also displays the zone information for each Radius 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.

[Relative Direction Data](#)

When a zone associated with a relative direction (Down Left Turn, Down Right Turn, Down Thru) detects a vehicle, the associated arrow will light. The arrows can be found top left of the screen

[Volume Data](#)

The volume data graph can be found center left of the screen. It is a rolling 24 hour graph in 15 minute bins of left, right and thru volumes

[Occupancy](#)

The occupancy graph can be found in the center left of the screen. It is a rolling 24 hour graph in 15 minute bins. The 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 24 hours. The occupancy line is in blue.

[Speed](#)

The speed graph is combined with the occupancy graph. The system will calculate the average speed of the traffic during the bin interval. This is displayed on the graph as a red line.

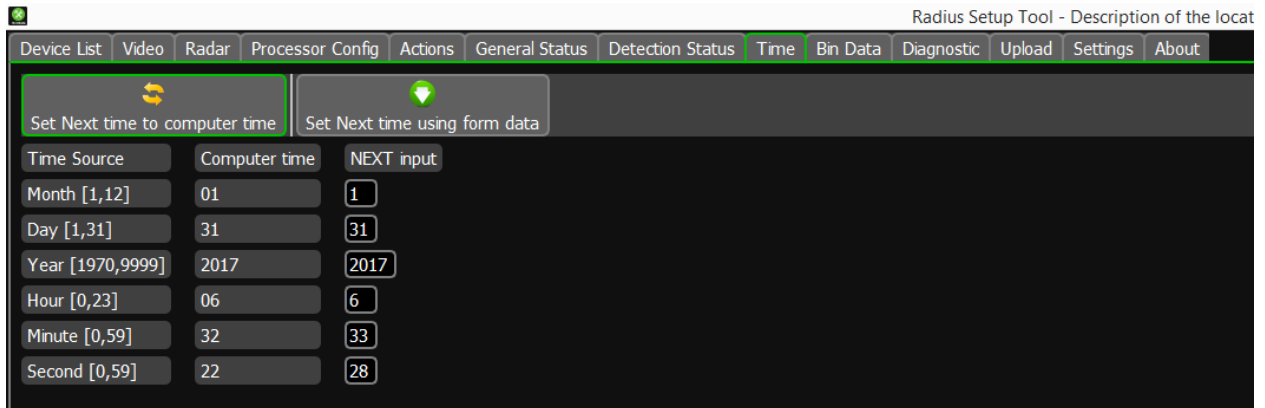
[Phase Information](#)

If Phase Information is enabled the information will be displayed in the top right 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.

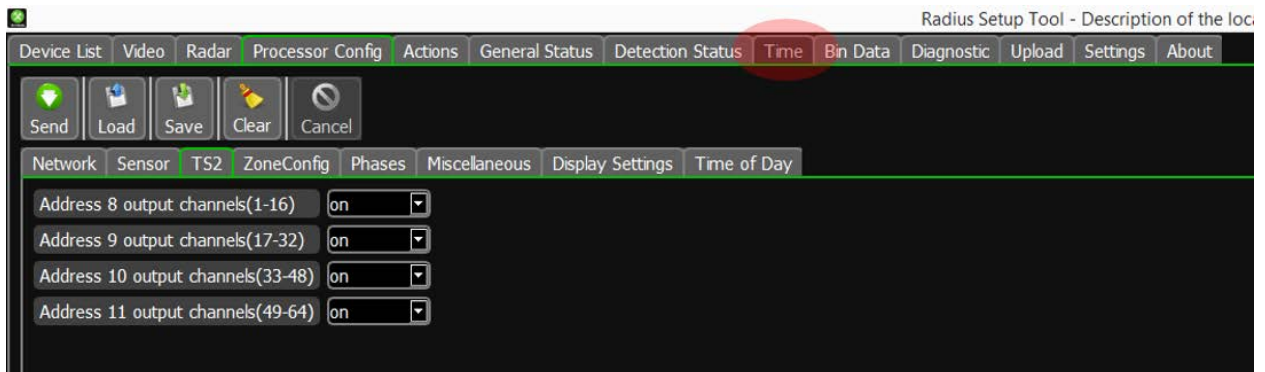
3.8 Time

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

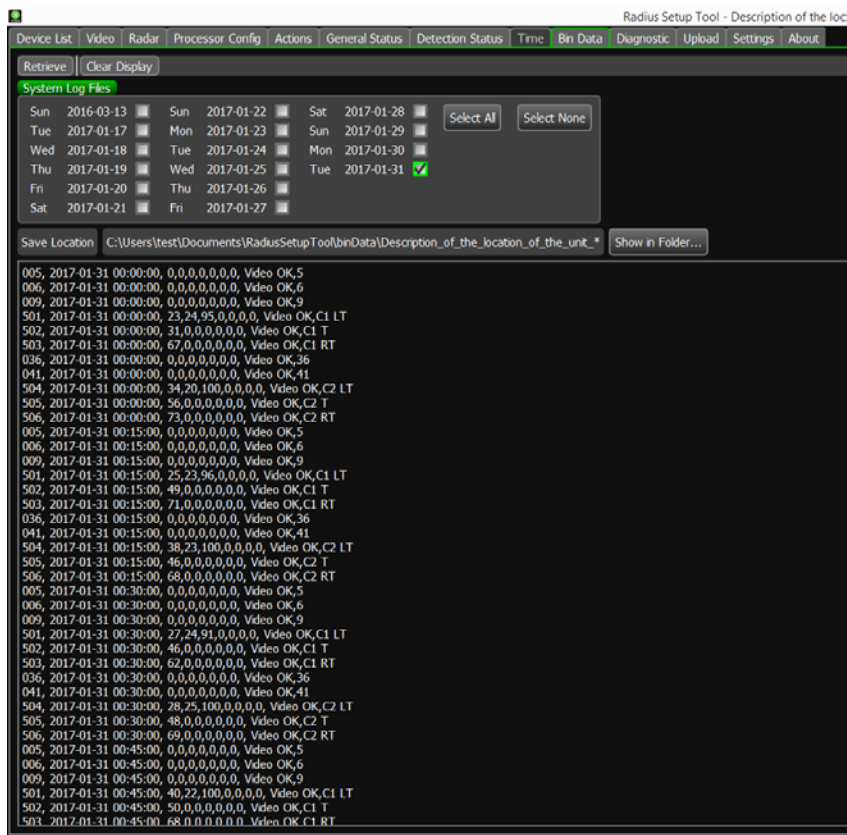
The time and date can be changed manually by entering the information into each of the boxes or the time and date can be synchronized with the PC by clicking **Sync**. Once changes have been made, click **Send** to transfer them to the Radius system.



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.

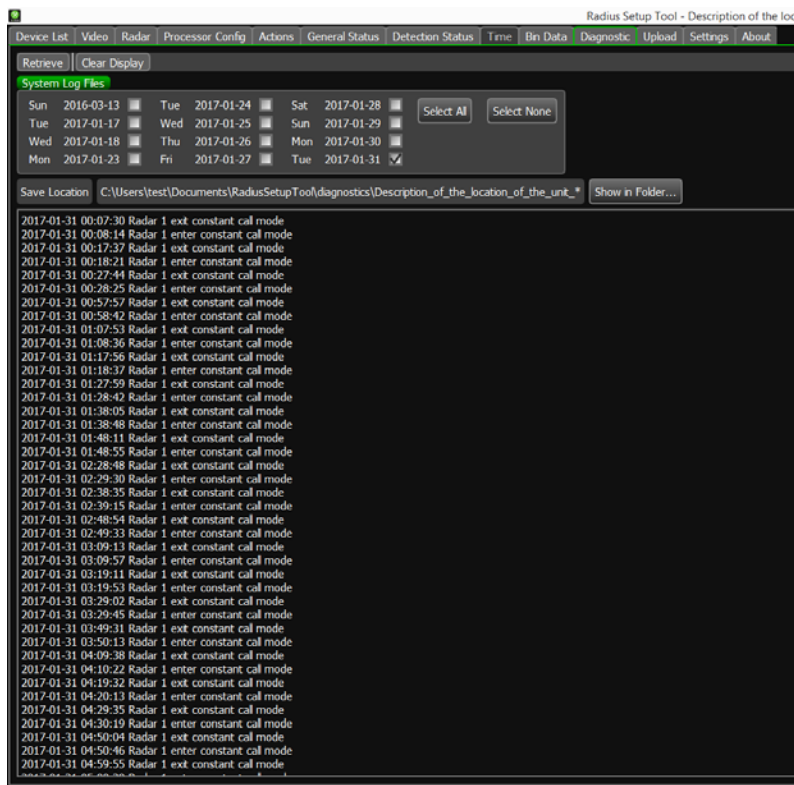


3.9 Bin Data



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.

3.10 Diagnostic Log

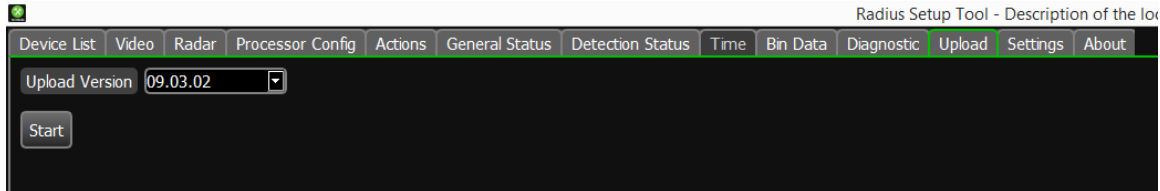


Property	Description
Retrieve	Once a file or files have been selected click on the retrieve button to display the data on the screen.
Clear Display	Clears all data displayed on the screen.
Select All	Selects all the files shown.
Select None	Deselects all the files shown
	Click on the check box next to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

3.11 Upload

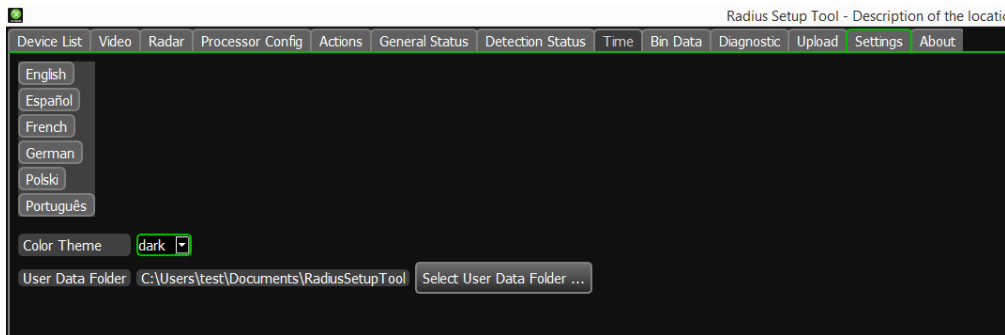
From time to time Iteris will provide updates for firmware to add functions or fix bugs. A batch file will be supplied which will load the new firmware in the correct folder on your PC.

Select the new version from the drop down box and click on the 'Start' button.



The upload process will start. The online LED's on your CCU 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.

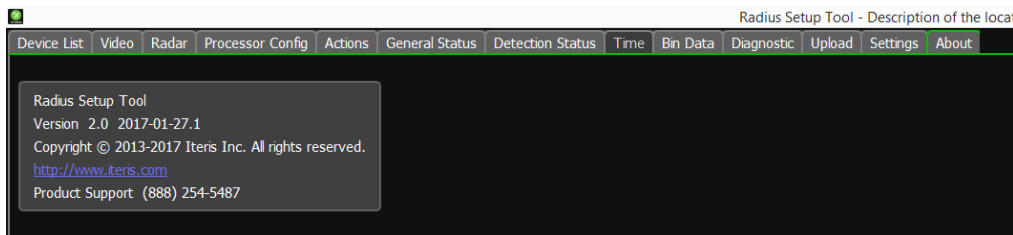
3.12 Settings



Property	Description
Language	Use this screen to choose your preferred language. The application will instantly switch to whichever language is chosen.
Color Theme	Choose dark or light depending on the ambient light and personal preferences.
User Data Folder	Select the folder that Bin and Diagnostic data will be stored in on your PC.

3.13 About

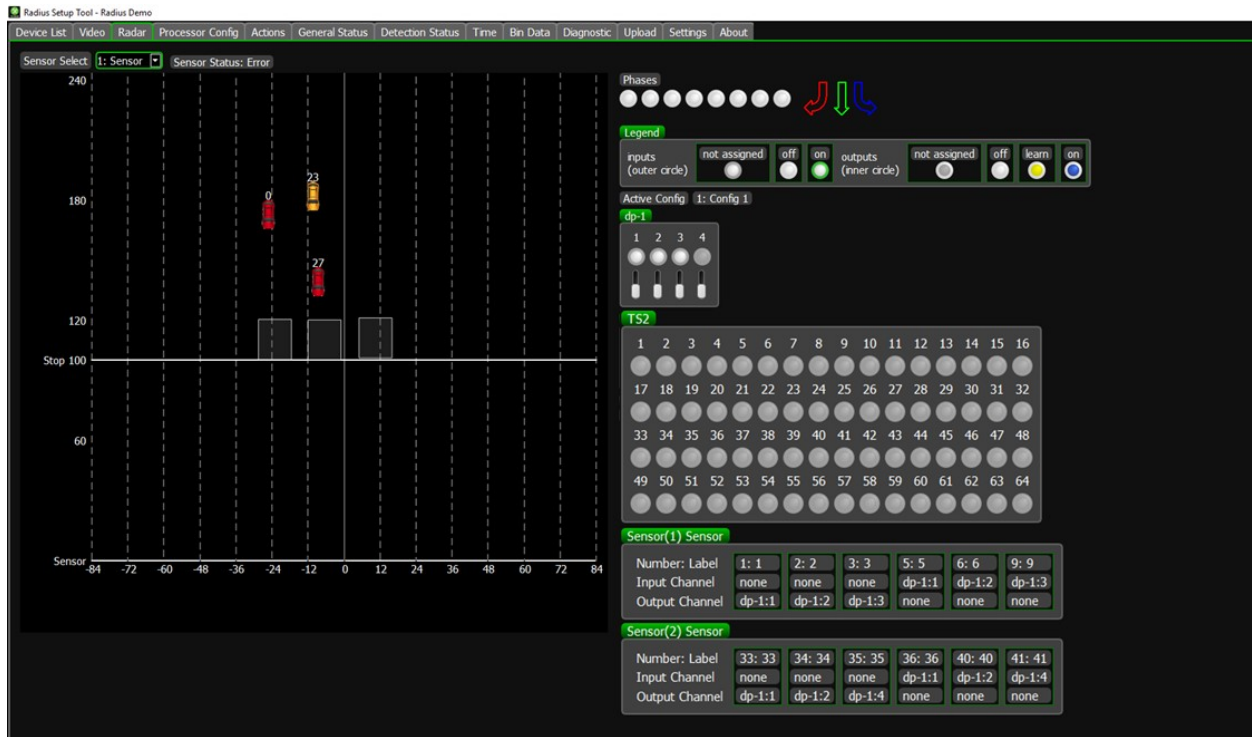
This screen gives some general information about the application and how to contact Iteris in case of questions.



4. OPERATION

4.1 Run Time Display

Note: 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 zone will light up. All detected vehicles will be displayed on the screen with their current speed.

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.

Detection Information

Various information about the setup and current operation is displayed on the screen.

4.2 System Failsafe Modes

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

Radar Error Constant Call:

- Error Frame:
 - If the radar reports
 - interference
 - precipitation (rain/snow)
 - general error
 - or if the received packet is incomplete (missing data) then it is considered as an error frame
- To enter radar error Constant Call:
 - If 60% of received frames are in error in the last 3 minutes we enable Constant Call
- To exit radar error Constant Call:
 - If radar error Constant Call is enabled and we find that percent error frames < 30% in the past 1 minute then we disable error Constant Call.

When the system is in Constant Call all outputs associated with the problem sensor are activated.

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 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.

Next Bin Data Zone Numbers

The data from the automatic counts is stored in memory in 15 minute bins. The data can be accessed through the Radius Setup Tool. See [Section 3.8 Bin Data](#) 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	504	507	510
Down Through	502	505	508	511
Down Right	503	506	509	512

Sensor 1:

501 - Relative left turn

502 - Relative thru

503 - Relative right turn

Sensor 2:

504 - Relative left turn

505 - Relative thru

506 - Relative right turn

Sensor 3:

507 - Relative left turn

508 - Relative thru

509 - Relative right turn

Sensor 4:

510 - Relative left turn

511 - Relative thru

512 - Relative right turn

5. VIDEO VIEWING OPTIONS

There are a number of ways to view the video stream from the Radius system.

5.1 Next Viewer

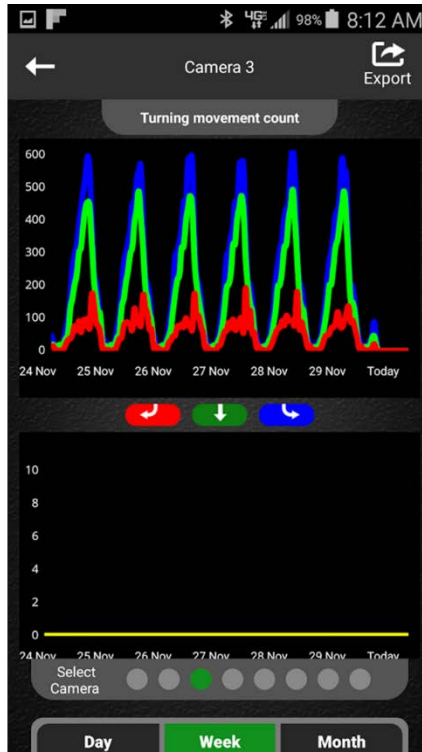
Next Viewer is available for both PCs and mobile devices.

[NVV for Windows](#)



[NVV iOS and Android](#)

This version provides some basic data and diagnostics in addition to the video streams.




5.2 Video Management Systems (VMS)

The Vantage Radius system is compatible with a number of Video Management Systems. Please contact your local Iteris Representative for a current list of compatible systems.

5.3 VLC Player

Video feeds are available direct from the system. Use VLC 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 and 6900 thru 6999).

The video URL is:

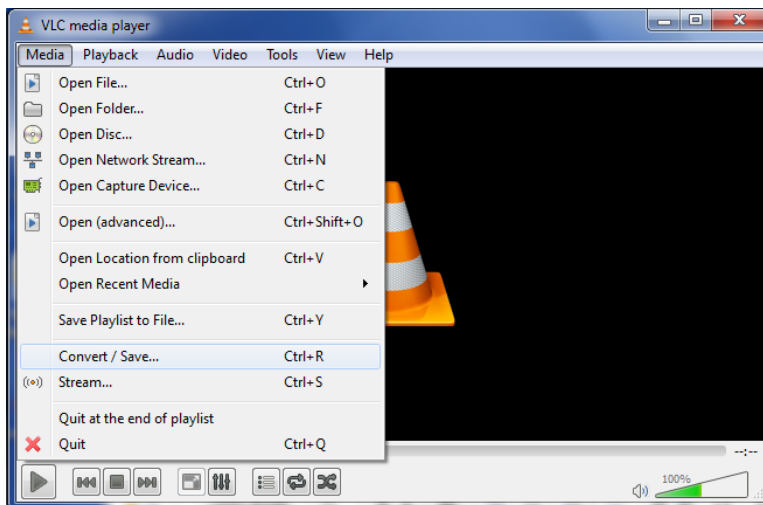
RTSP://x.x.x.x/y

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

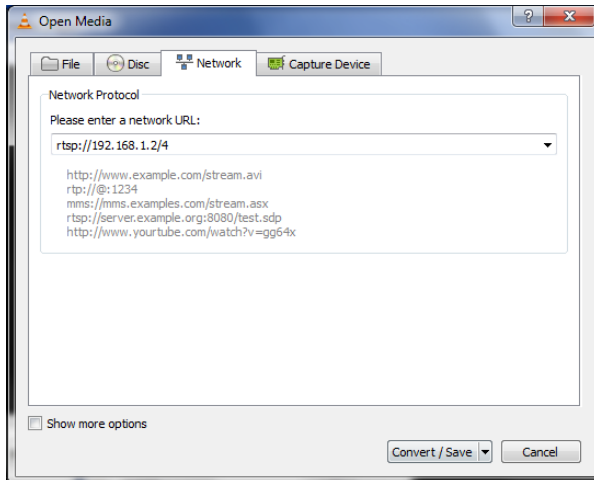
Recording streaming video

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

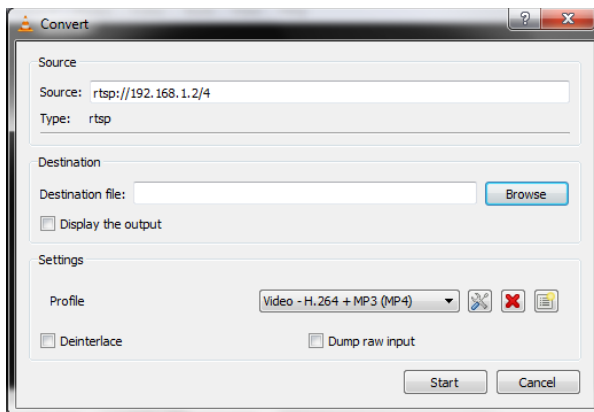
1. Launch VLC media player.
2. Under the “Media” tab select “Convert / Save”.



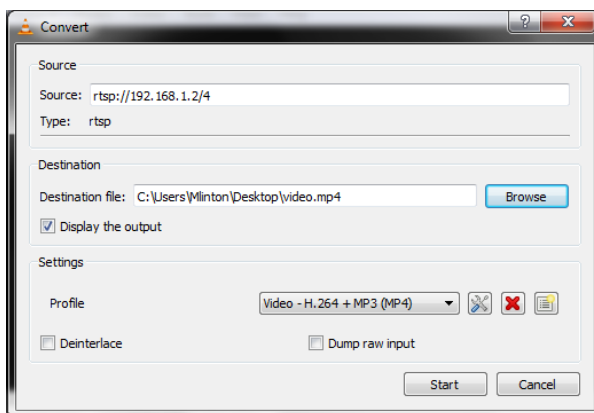
3. Under “Open Media” select the “Network” tab.
4. Enter a network URL.
5. Press the “Convert/Save” button.



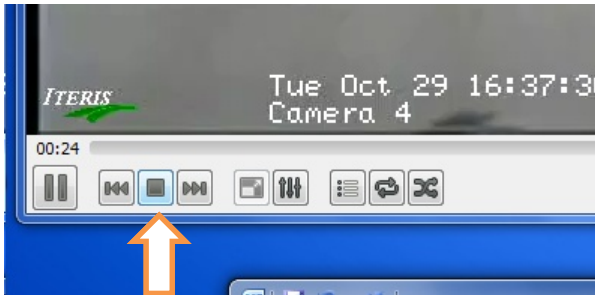
6. Click the Browse button.



7. Select a location to save the video file.
8. Select a file name with an .mp4 extension.
9. If you would like to see the video you are recording then check the “display the output” checkbox. (This step is optional).
10. Click the “Start button”. If you checked the checkbox a video will appear in the VLC media player’s window.



11. When you want to stop recording click the “stop” button.



A video file is now created and saved from the streaming video.

5.4 Network Bandwidth Requirements

There are certain network requirements necessary to get maximum performance for video viewing. The table below gives information on the effect limited network bandwidth has on the video performance.

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 3 video feeds from various Radius systems with 2 people viewing them you will use a network bandwidth of:

$$3 \text{ times } 2 \text{ times } 500\text{kbps} = 3\text{Mbps}$$

6. TROUBLESHOOTING - FAQ

Symptom A: Processors' online LED is blinking constantly.

- i. The processors online LED will blink for a couple seconds during startup. This is normal. For a continuous blinking see the steps below.
- ii. Power cycle the processor to see if blinking goes away.
- iii. Check the red dip switch on the board. All of the switches should be off or open.
- iv. Make sure the reset line of the detector rack is not grounded (pin C).
- v. If the blinking persists there is a problem with the processor and it needs to be sent in for repair.

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

- i. Reset a zone that is associated with the stuck on channel.
- ii. Delete all of the zones associated with that channel and redraw them.
- iii. If none of these suggestions work the processor may have a shorted channel and needs to be sent in for repair.

Symptom C: Processor is locked up with constant calls and no RST response.

- i. Power cycle unit and go to the utilities menu and do a bin reset and log reset.
- ii. Upgrade processor to latest firmware version.
- iii. If these steps fail to remedy the situation the processor maybe bad and needs to be sent in for repair.

Symptom D: 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 data 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.

Symptom E: 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 F: No RST communication with system.

- i. Make sure you are using the correct Ethernet cable (straight not crossover).
- ii. Make sure the RST has the same communication parameters as the Radius 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 G: RST comes up but no mouse movement.

- i. Make sure the mouse connector is properly seated into the CCU. 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 H: Radius 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 I: Radius system places constant calls on unused channels.

- i. 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.
- ii. If these step fail to remedy the situation the processor maybe bad and needs to be sent in for repair.

Symptom J: 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 K: Radius 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.
- iii. Try a different SDLC cable.
- iv. If these step fail to remedy the situation the processor maybe bad and needs to be sent in for repair.

Symptom L: The overlay shows the corners of the zones activating 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 sensors. Each output channel should be used for only 1 sensor view. Having the same channel on multiple sensors can cause erratic channel output behavior.

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

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

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

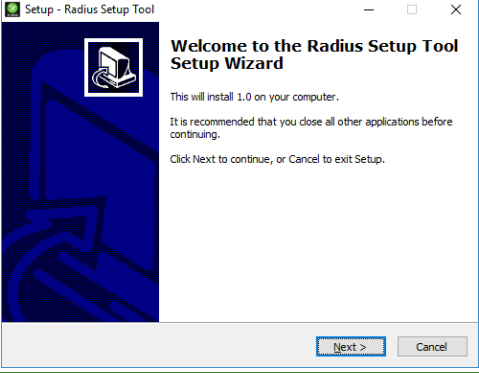
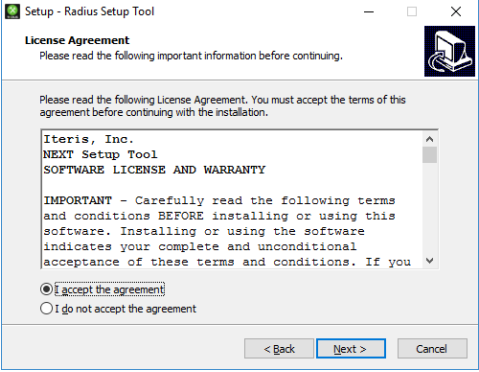
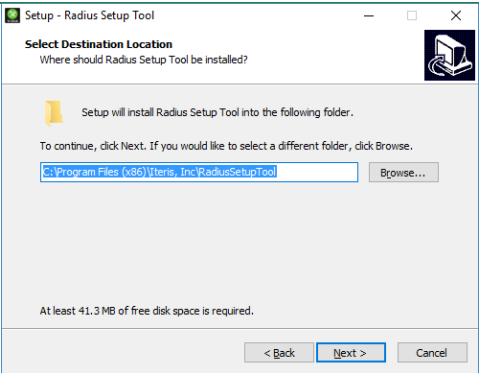
- i. Check the position of the DELAY/EXTEND dip switches. If the switches are in the up position then the green inputs come in on pins 1, 2, 3 and 10. If they are in the default down position they come in on pins D, E, J, and K.

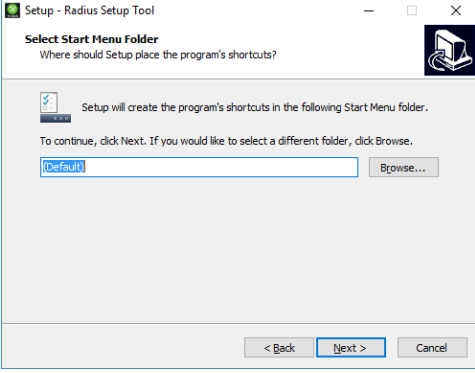
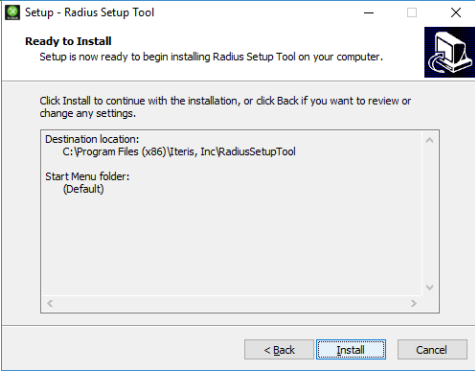
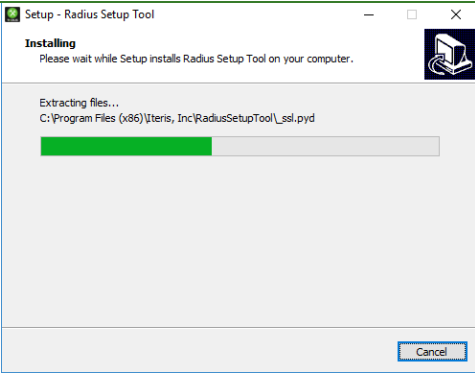
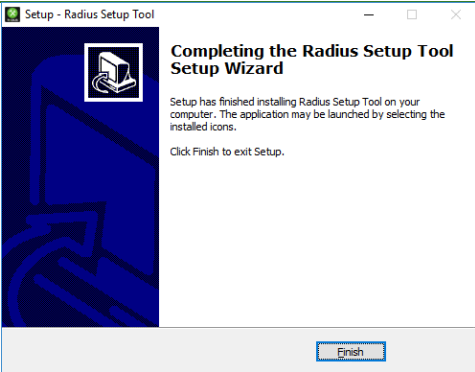
Symptom O: The Interference flag is always on.

- i. Check to see if more than one radar sensor is on the same channel.

7. SOFTWARE INSTALLATION

The Radius Setup Tool (RST) is embedded in the system. It can also be run remotely on a laptop PC. Follow the instructions below to install the app.

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

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

8. TECHNICAL INFORMATION

8.1 Location of Intersection List

Once one PC has been configured for all the Radius systems the user has access to the configuration file can be copied over to other machines to speed up the configuration process. The file to be copied is called

device_list.xml

To find it type %localappdata% into windows file explorer.



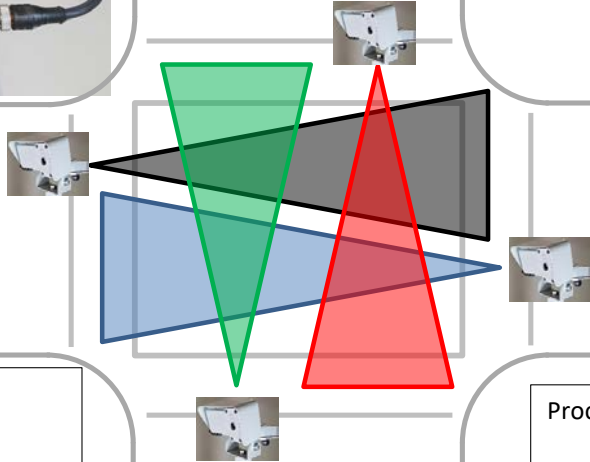
This should expand to

C:\Users\johnsmith\AppData\Local\

Look for the RadiusSetupTool folder and the file can be found inside.

Copy the file and transfer to other machines.

8.2 Intersection Program Sheet

Intersection Name: N/S: _____ E/W: _____	
Sensor Serial Numbers NB: _____ C#: _____ SB: _____ C#: _____ EB: _____ C#: _____ WB: _____ C#: _____	
	
CCU IP Address: _____ Subnet Mask: _____ Default Gateway: _____ Serial Number: _____	Processor Serial Numbers: DP1: _____ DP2: _____

9. MAINTENANCE

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

Connector and Cable Inspection

Periodically, it is wise to check sensor 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.

Camera Cleaning

Over time the video stream may become blurred. Cleaning the camera lens should resolve this issue. 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.


Firmware Upgrades

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

10. 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.



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