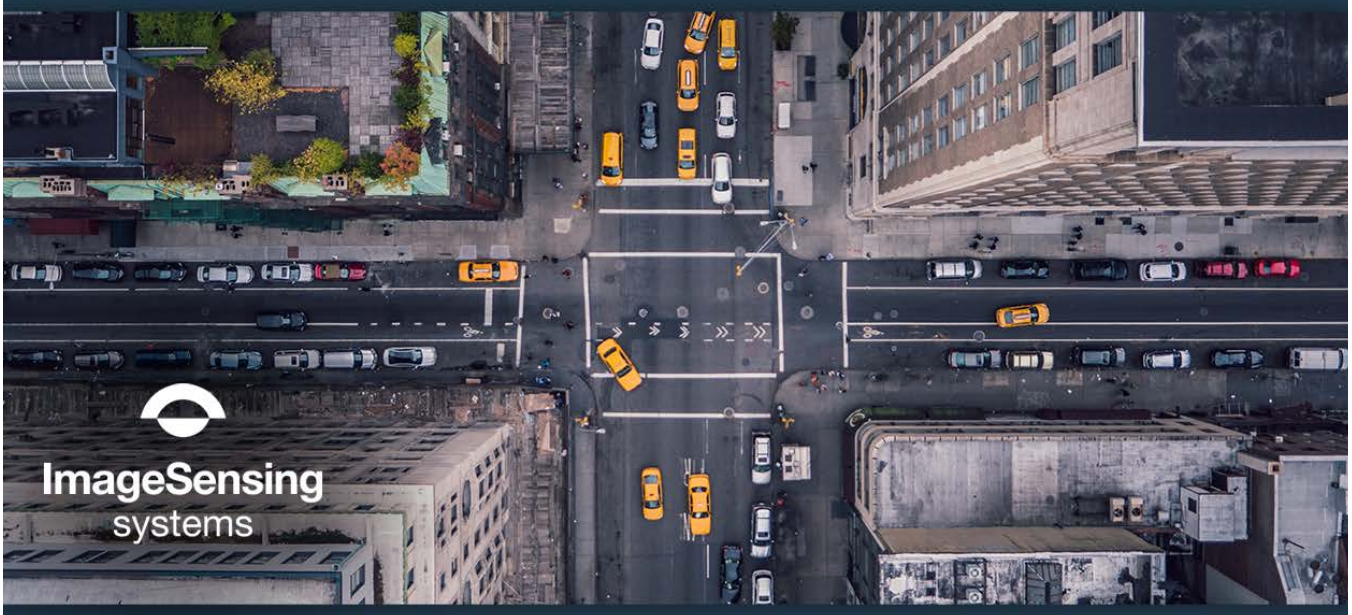
Autoscope®

Autoscope OptiVu

User Guide



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Record of Revisions

Revision	Date	Affected Pages	Description
A	04/2023	All pages	Initial release.
B	05/2024	page 1-6, page 1-10 thru page 1-16, page 3-4 thru page 3-7, page 5-10, page 5-13, page 5-45 thru page 5-47, page 5-48, page 5-51, page 5-57, page 6-2, page 6-10 thru page 6-12, page 6-16, page 6-18	4.3 release.
C	05/2024	page 5-10, page 6-13, page 6-19	4.3.1 release.
D	02/2025	page 1-17, page 6-35 thru page 6-39	4.4.0 release.

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Chapter 1: Introduction

General

Autoscope OptiVu is taking video detection to new heights by offering the most advanced detection algorithms with Artificial Intelligence (AI) and machine learning on the market today. The camera and processor provides high performance vehicle detection, bicycle, and pedestrian detection, enhanced traffic data collection in real-time, and Smart City ready with connectivity to other systems.

Building on more than three decades of proven above ground video detection experience, Autoscope OptiVu delivers the highest levels of innovation and performance in an easy-to-use detection solution that supports a variety of traffic management and ITS applications. The performance of OptiVu is robust and reliable, and is based on a new hardware platform designed to enable future capabilities and solutions.

There are five primary components, and one optional component to the Autoscope OptiVu system.

- OptiVu Processor
- OptiVu Camera
- Autoscope USB Adapter
- Autoscope Vision I/O 24 Module (Optional)
- PSU and PoE switch
- Supervisor Software

OptiVu Processor

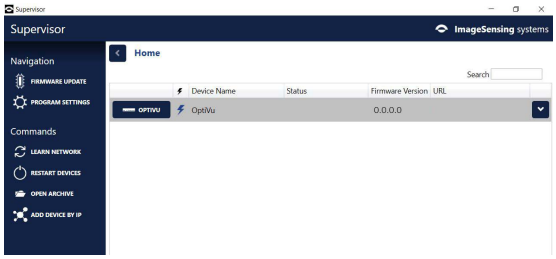
OptiVu Camera

Autoscope USB Adapter

Autoscope Vision I/O 24 Module (Optional)

PSU and PoE Switch

Supervisor Software



OptiVu Processor

The OptiVu Processor is typically installed in a traffic cabinet and provides the detection, data, and communication from the video camera to the traffic controller and other equipment. In addition, the OptiVu Processor provides network protection by containing communications with the OptiVu Camera to within the OptiVu system, keeping extraneous network traffic out of the system.

Table 1-1: OptiVu Processor Specifications

Item	Description
Electrical	Power: 24 to 48 VDC to processor Power Consumption: • AC 110V / 60Hz: 22W • AC 220V / 50Hz: 22W
Environmental	Temperature: -29°F to 165°F (-34°C to +74°C) Relative Humidity: 95%
Dimensions and Weight	Height: 2.17 in (55 mm) Width: 9.25 in (235 mm) Length: 4.92 in (125 mm) Weight: 6.5 lbs (2.95 kg)
Video	HD streaming video output: H.264 720p (1280 x 720) video output
Communications	10/100/1000 WAN and Ethernet ports USB 2.0 and 3.0
Regulatory	FCC Part 15 NEMA TS 2-2021
Warranty	Three (3) years

OptiVu Processor Layout

The various connections and indicators for the OptiVu Processor are shown in Figure 1-1 and described in Table 1-2.

Figure 1-1: OptiVu Processor

Table 1-2: OptiVu Processor Connectors and Indicators

Item	Description
1	**Power connector:** Connection for the 24-48 VDC input power from the Power Supply to the OptiVu Processor. This provides the power required for the OptiVu Processor and the connected OptiVu Cameras to operate. This can be screwed in to prevent from disconnection or removed to power off the processor.
2	**Power tricolor LED:** Indicates whether power is applied to the OptiVu Processor. The LED indicates the following: • Green: Power is good. • Red: The OptiVu Process is not in an operational state. • Yellow: Booting (may see a brief flash).
3	**System status LED:** Used for diagnostic and status purposes. When lit, this LED indicates the OptiVu Processor's status. • Status LED – Green: OptiVu Processor is operating normally. – Yellow: OptiVu Processor is booting. – Red: Failure.
4	**HDMI port:** Reserved for future use.
5	**Two standard USB ports:** Currently used to connect the USB SDLC cable, record video, and restore the OptiVu Processor in the event of a catastrophic software failure.

Table 1-2: OptiVu Processor Connectors and Indicators (Continued)

Item	Description
6	**WAN RJ45 connector:** Used to connect to a network outside of the Controller Cabinet, such as the Traffic Management Center (TMC). This allows a TMC operator to monitor and change the configuration for the OptiVu Processor and connected OptiVu Cameras. The network address is defined through the Supervisor. For information on defining the IP address see "Add Device by IP" on page 6-6.
7	**Camera RJ45 connector:** Used to connect to a PoE switch to support up to four cameras and bridged to the Maintenance port.
8	**I/O RJ45 connector:** Reserved for future use.
9	**Expansion RJ45 connector:** Reserved for future use.
10	**Maintenance RJ45 connector:** Used to connect to a computer running Supervisor which is used to configure the OptiVu Processor and OptiVu Camera on site without having to disconnect the WAN port. To facilitate communications with an attached device, this port acts as a DHCP server, assigning an IP address to the connected device.

Ethernet Port LEDs

There are five Ethernet ports on the OptiVu Processor (items 6, 7, 8, 9, and 10 in the table). Each is an RJ45 connector which uses a standard Ethernet cable (Cat5e or Cat6).

There are two LEDs associated with each RJ45 port which indicate the speed of the network connection and activity as follows:

- Left LED (1000M): Green indicates a network speed of 1GB per second.
- Right LED: Blinking green means there is activity on the Ethernet port.

OptiVu Camera

The OptiVu Camera is an HD video camera that provides high resolution video to the OptiVu Processor. The OptiVu Camera is shown in Figure 1-2 and its specifications are described in Table 1-3.

Figure 1-2: OptiVu Camera

Table 1-3: OptiVu Camera Specifications

Item	Description
Electrical	Power: 48 VDC (37-57 VDC), max power 12.95W
Environmental	Temperature range: -40°F to 167°F (-40°C to +75°C) Humidity: 0 to 90% (non-condensing)
Dimensions	Height: 6 in (152.4 mm) Width: 4.4 in (111.8 mm) Length: 14.7 in (373.4 mm) Weight:
Camera	CMOS image sensor Minimum Illumination: 0.004 to 0.0004 lx Resolution: HD 720p White balance: auto

Table 1-3: OptiVu Camera Specifications (Continued)

Item	Description
Lens	10x zoom lens Standard configuration: • Horizontal: 62° - 7.6° • Vertical: 34.4° - 4.4° • Focal length: 4.7 - 47 mm
Housing	Aluminum die cast and resin Waterproof and dust-tight housing (IP68) Hydrophilic faceplate coating Adjustable sun and weather shield with drip guard
Video Output	HD stream
Regulatory	FCC Part 15, Subpart B, Class A regulations NEMA TS 2-2021
Warranty	Three (3) years

Autoscope USB Adapter

The Autoscope USB adapter provides communication with the controller via SDLC. One end is a 15 Position D-Sub Receptacle with Latch Block and the other end is a USB connector with thumbscrews.

The Autoscope USB adapter is shown in Figure 1-3 and its specifications are described in Table 1-4.

Figure 1-3: Autoscope USB Adapter

Table 1-4: Autoscope USB Adapter Specifications

Item	Description
Electrical	Power: 500 mW
Environmental	Temperature range: -30°F to 165°F (-34°C to +74°C) Humidity: 0 to 95% (no condensation)
Dimensions	Height: 0.9 in (23 mm) Width: 2 in (50 mm) Length: 19.3 in (490 mm) Weight: 2.9 oz (82 g)
Voltage	USB-VCC (5 VDC)
Current	Max of 500 mA
Max Frequency	120 MHz
Regulatory	FCC* NEMA TS 2-2026

* This device complies with the requirements in part 15 of the FCC rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesired operation.

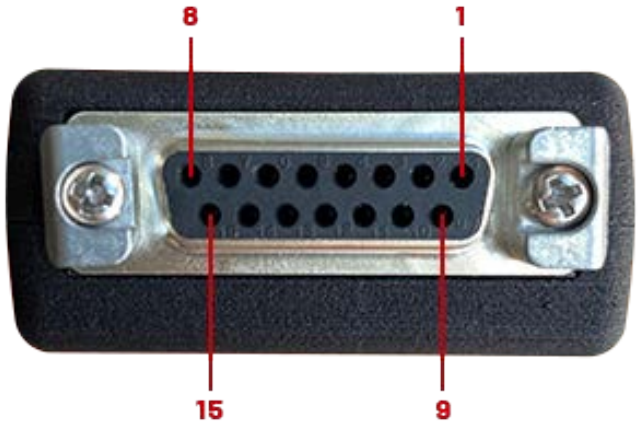
SDLC Data Connector

A female DB-15 connector is used for the SDLC. This refers to TS2 Port 1 communications. For information on the I/O Module, see "Vision I/O 24 Module" on page 1-10.

The pinouts for the male connector are described in Table 1-5.

Table 1-5: SDLC Connector Pinouts

Pin 1	RxD+	RxD-	Pin 9
Pin 2	Logic Ground	Not Used	Pin 10
Pin 3	RxD CLK+	RxD CLK-	Pin 11
Pin 4	Logic Ground	Chassis Ground	Pin 12
Pin 5	TxD+	TxD-	Pin 13
Pin 6	Not Used	Not Used	Pin 14
Pin 7	TxD CLK+	TxD CLK-	Pin 15
Pin 8	Logic Ground		



Vision I/O 24 Module

The Vision I/O 24 Module is an optional card that converts detection data from the USB adapter to standard wired inputs and outputs in the traffic cabinet. It is used when a Synchronous Data Link Control (SDLC) connection to the controller is unavailable, such as with a TS1 controller or with a Type 170 controller. Typically, the module is installed in an unused standard NEMA or Caltrans TEES detector rack slot or into a shelf mount stand-alone enclosure in the traffic control cabinet.

The I/O Module is shown in Figure 1-4 and its specifications are described in Table 1-6.

Figure 1-4: Vision I/O 24 Module Front Panel

Table 1-6: Vision I/O 24 Module Specifications

Item	Description
Electrical	Power Input: 10.8 VDC min; 26.5 VDC max Current draw: 50mA per channel Hot swappable: Yes
Environmental	Temperature range: -29°F to 165°F (-34°C to +74°C) Relative Humidity: 0-95% (non-condensing)
Dimensions	Height: 4.5 in (114 mm) Width: 2.3 in (59 mm) Length: 6.9 in (175 mm); excluding handle Weight: 0.5 lbs (0.2 kg)
I/O	• 16 inputs • 24 outputs (open collector, active low)
Regulatory	FCC Part 15, Class A ICES EN55022, EN55024, EN61000-6-1 NEMA TS 2-2003

LEDs

The LEDs on the Vision I/O 24 Module are described below.

- Outputs: When lit, indicates the particular output is active.
- Inputs: When lit, indicates particular input is active.
- Status: Indicates the status of the connection to the USB adapter as follows:
  - Flashing green: Communications between the I/O module and USB adapter are OK.
  - Flashing orange: There is no communication between the I/O Module and USB adapter; data is corrupt.
  - Not lit: The I/O Module is powered OFF.

Connectors

The connectors on the front of the Vision I/O 24 Module are described below.

- Inputs/Outputs: A DB-44 pin connector that is used to connect the I/O harness from the cabinet to the Vision I/O 24 Module. For a description of the pinouts, see Table 1-7.
- I/O Data: A DB-9 connector that is used to connect the cable from the USB adapter. For a description of the pinouts, see Table 1-8.

Table 1-7: Inputs/Outputs Connector Pinouts

Pin	Description	Pin	Description	Pin	Description
1	Input 1	16	Input 16	31	Output 14
2	Input 2	17	Reserved	32	Output 13
3	Input 3	18	Ground	33	Output 12
4	Input 4	19	Output Status	34	Output 11
5	Input 5	20	Ground	35	Output 10
6	Input 6	21	Output 24	36	Output 9
7	Input 7	22	Output 23	37	Output 8
8	Input 8	23	Output 22	38	Output 7
9	Input 9	24	Output 21	39	Output 6
10	Input 10	25	Output 20	40	Output 5
11	Input 11	26	Output 19	41	Output 4
12	Input 12	27	Output 18	42	Output 3
13	Input 13	28	Output 17	43	Output 2
14	Input 14	29	Output 16	44	Output 1
15	Input 15	30	Output 15		

Table 1-8: I/O Data Connector Pinouts

Pin	Signal
1	Reserved
2	Reserved
3	Detector RS485 +

Table 1-8: I/O Data Connector Pinouts

Pin	Signal
4	Detector RS485 -
5	Logic ground
6	Reserved
7	Reserved
8	Reserved
9	Reserved

Jumper Pins

The jumper pins for the Vision I/O 24 Module are shown in Figure 1-5 and described in Table 1-9.

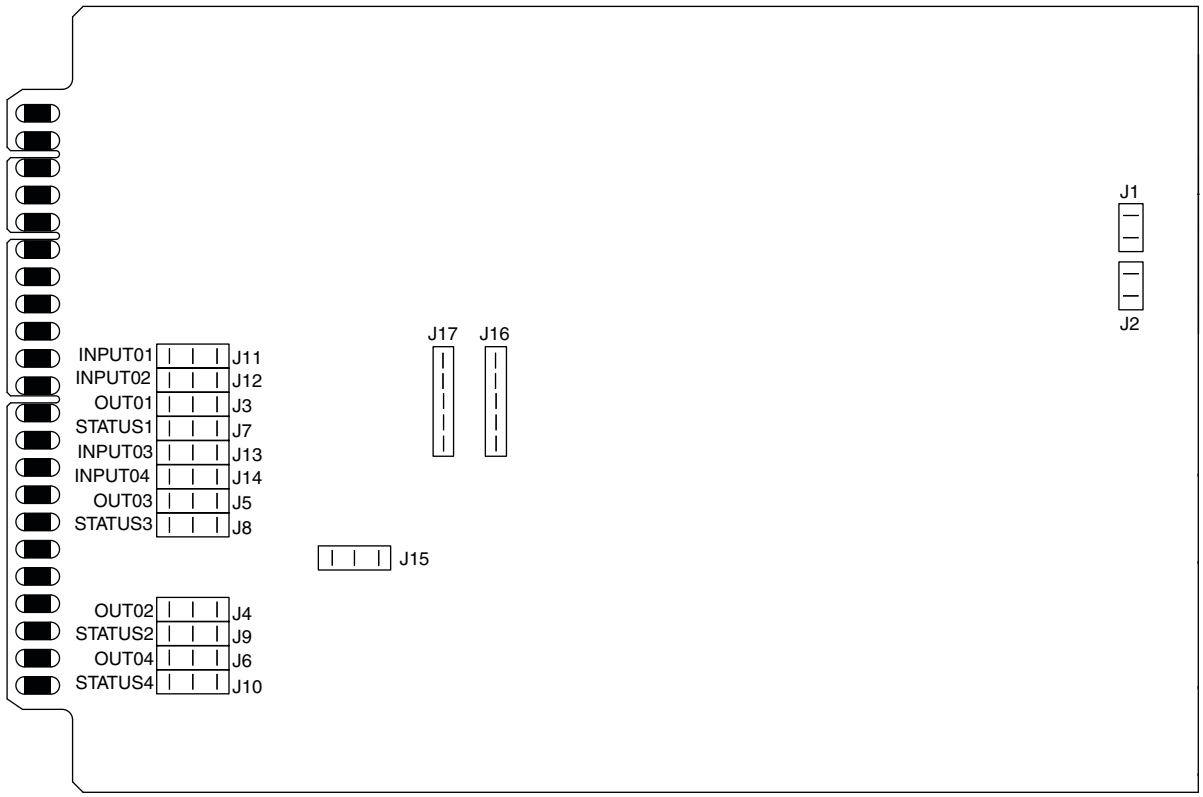


Figure 1-5: Jumper Pin Locations

Table 1-9: Jumper Chart Default Settings

Jumper	Jumper Across Pins 1 & 2	Factory Default	Jumper Across Pins 2 & 3
J1 & J2[a]			
J3 (OUT01)	To Edge Connector pin F.	2-3	Output 1 isolated.
J4 (OUT02)	To Edge Connector pin W.	2-3	Output 2 isolated.
J5 (OUT03)	To Edge Connector pin S.	2-3	Output 3 isolated.
J6 (OUT04)	To Edge Connector pin Y.	2-3	Output 4 isolated.
J7 (STATUS1)	To Edge Connector pin 7.	2-3	Status 1 isolated.
J8 (STATUS2)	To Edge Connector pin 20.	2-3	Status 3 isolated.
J9 (STATUS3)	To Edge Connector pin 16.	2-3	Status 2 isolated.
J10 (STATUS4)	To Edge Connector pin 22.	2-3	Status 4 isolated.
J11 (INPUT01)	To Edge Connector pin 1.	2-3	Input 1 isolated.
J12 (INPUT02)	To Edge Connector pin 2.	2-3	Input 2 isolated.
J13 (INPUT03)	To Edge Connector pin 13.	2-3	Input 3 isolated.
J14 (INPUT04)	To Edge Connector pin 14.	2-3	Input 4 isolated.
J15	Run mode.	1-2	Diagnostic mode. **Note:** This will cause the outputs to randomly cycle, which may cause undesirable behavior in the controller.
J16 & J17[b]			

h. J1 and J2 are for communications termination. The jumper should always be in for both.

i. J16 and J17 are for manufacturing use only and no jumpers are supplied.

Rear Edge Connector

The pinouts for the rear edge connector are shown in Figure 1-6 and described in Table 1-10.

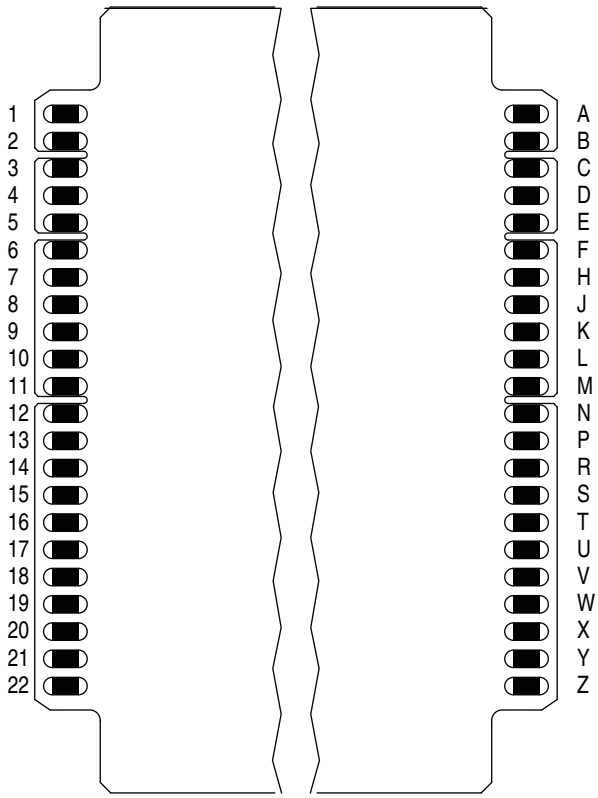


Figure 1-6: Rear Edge Connector Pinouts

Table 1-10: Rear Edge Connector Pinouts

Pin	Description
1	Input 1
2	Input 2
3	Not Used
4	Not Used
5	Not Used
6	Not Used
7	Status Output 1
8	Not Used
9	Not Used
10	Not Used
11	Not Used
12	Not Used
13	Input 3
14	Input 4
15	Not Used
16	Status Output 3
17	Not Used
18	Not Used
19	Not Used
20	Status Output 2
21	Not Used
22	Status Output 4

Pin	Description
A	Logic Ground
B	+ Power
C	Reset
D	Not Used
E	Not Used
F	Output 1
H	Logic Ground
J	Not Used
K	Not Used
L	Chassis Ground
M	Not Used
N	Not Used
P	Not Used
R	Not Used
S	Output 3
T	Logic Ground
U	Not Used
V	Not Used
W	Output 2
X	Logic Ground
Y	Output 4
Z	Logic Ground

Supervisor Software

The Supervisor software provides the means to communicate with and configure Autoscope devices. The OptiVu devices currently supported by the Supervisor software include:

- OptiVu Processor
- OptiVu Camera

For information on the installation and operation of the OptiVu system hardware components, see Chapter 3: "Installing the Hardware".

NOTE: The Supervisor software for the OptiVu product line is compatible with Autoscope Vision v3.8.4 or higher. However, the Autoscope Software Suite for the *Terra* line is **NOT** compatible with the OptiVu Camera and OptiVu Processor.

Accessing Online Help

The Supervisor provides a help system for each screen and for various functions that can be performed. To access the help system, press F1 on the keyboard. A separate window appears with the help page for the screen currently being displayed in the Supervisor. Various tabs provide for locating and displaying specific information in the help system.

Prerequisites

The following are required in order to install and operate the Supervisor software.

- A computer with a minimum of 700MB free disk space to install the Supervisor application (4GB of free disk space if the C++ and .NET dependencies below also need to be installed).
- Microsoft Windows operating system (32 or 64 bit):
  - Windows 11
  - Windows 10
- .NET framework version 4.5.1 or above. If not installed, the installer will install a version.
- Visual C++ Redistributable 2010, 2012, 2013 or 2015. If not installed, the installer will install a version.

Terminology

The following terms are used throughout this manual.

- **Action** - what takes place when a condition has been met.
- **All Call** - a condition where all of the outputs associated with an approach OptiVu Camera are set to ON. This is usually in response to a failsafe condition caused by something other than contrast loss.
- **Condition** - a detection objective for a given zone, e.g., Contrast loss - when contrast levels in the scene (difference between light and dark) drop below a system defined threshold.
- **Contrast loss** - when contrast levels in the scene (difference between light and dark) drop below a system defined threshold.
- **Delay On Red** - during the RED phase, the length of time to delay setting the output to ON when detection takes place.
- **Detection** - the result of one or more conditions being met in a zone.
- **Extend On Green** - during the GREEN phase, the length of time to keep the output ON after a condition is no longer detected.
- **Failsafe** - the mode of operation that the OptiVu Camera enters when it determines it is not able to perform detection or when the zoom setting for the camera is changed.
- **Output** - the signal sent to the Controller when the condition is met.
- **Phases** - the right-of-way (green), yellow change, and red clearance intervals in a cycle assigned to various traffic and pedestrian movements through an intersection.
- **RESTful API** - an application program interface (API) that uses HTTP requests to perform GET, PUT, POST, and DELETE operations for defined devices.
- **Recall** - what occurs when the OptiVu Camera enters failsafe.
- **Zone** - a defined area, usually one or more lanes, where detection is to take place. May also be referred to as "detection zone." One or more zones can be defined for an approach (e.g., right-turn lane, through lanes, left-turn lane) or highway.

Conventions

In this manual all references to traffic patterns and associated graphics are based on driving and road conventions.

Chapter 2: Pre-Installation Considerations

General

This chapter provides information that should be considered prior to installing the OptiVu system hardware.

Required Tools

Tools that will be needed for installing the OptiVu system hardware are:

- Mounting bracket supplies including stainless steel banding
- Din rail or mounting plate and screws for mounting
- 9/16-inch open-end wrench or adjustable wrench
- 5/16-inch nut driver
- 3/16-inch Allen wrench
- #2 straight slot screwdriver
- RJ45 connectors
- RJ45 crimping tool
- Outdoor Cat5e or Cat6 Ethernet cable
- Tie wraps for cable strain relief
- Radios or cell phones to communicate between the cabinet and the bucket truck
- Computer and Ethernet network cable
- Faceplate cleaning supplies (lint-free lens tissue/cloth and spray bottle with water)

Cables

The following describes the various cables that are used with the OptiVu system.

Power Supply Connection

Power to the power supply must be 120/240 VAC supplied from the traffic control cabinet. Power to the power supply should be from the protected side of the cabinet.

Ethernet Cables

There are five Ethernet ports on the OptiVu Processor. Each is an RJ45 connector which uses a standard Ethernet cable (Cat5e, or Cat6). For a description of the LEDs associated with each port see "Ethernet Port LEDs" on page 1-5.

OptiVu Camera Cables

OptiVu Cameras communicate with the OptiVu Processor in the traffic cabinet across a communications network.

The Ethernet cables also carry power to the cameras and provide communications between the OptiVu Camera and the OptiVu Processor via the PoE switch. The cable used to connect the OptiVu Cameras to the OptiVu Processor should be a Cat5e or Cat6 outdoor rated cable. The maximum recommended distance is 300 ft with the supported firmware. If additional distance is required, optional extenders can be used.

Camera wire is terminated at both ends of the RJ45 connectors.

NOTE: A maximum of four OptiVu Cameras can be connected to the OptiVu Processor.

Use the following guidelines to install the Ethernet cable between the OptiVu Camera intersection location and the traffic control cabinet. The cable can be installed to the OptiVu Camera by pulling it up the pole or dropping it down the pole, whichever is more convenient.

10. As the site plans direct, pull the cable through an underground conduit. The cable may also run overhead.
11. To avoid moisture seeping into connections, install all Ethernet cables in a continuous run (with no extenders), where possible.
12. Label each cable entering the traffic control cabinet to correspond to the OptiVu Camera to which it is connected.
13. Terminate the labeled cables with RJ45 connectors according to the agency's standard practices.

Camera Placement

The optimum camera placement is on a signal mast arm or luminaire arm across the intersection from the stop line (see Figure 2-1).

IMPORTANT: The OptiVu Cameras do not operate in a side-fired configuration, they are meant to be mounted facing on-coming or receding traffic.

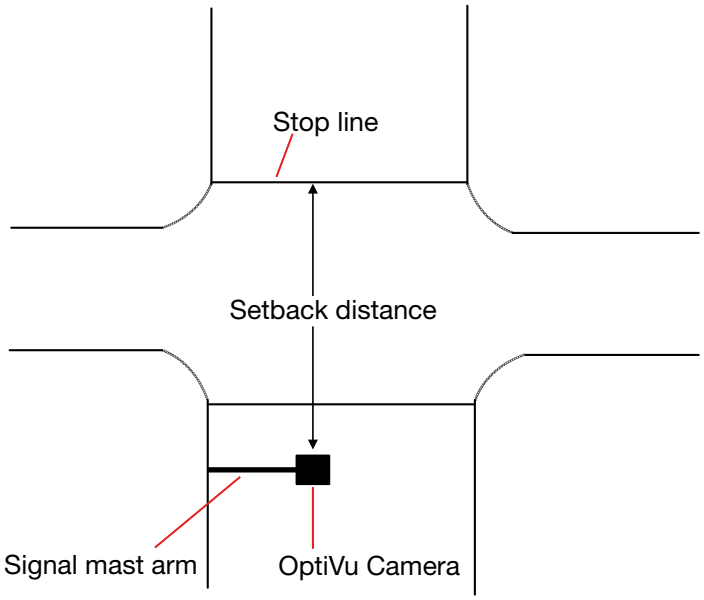
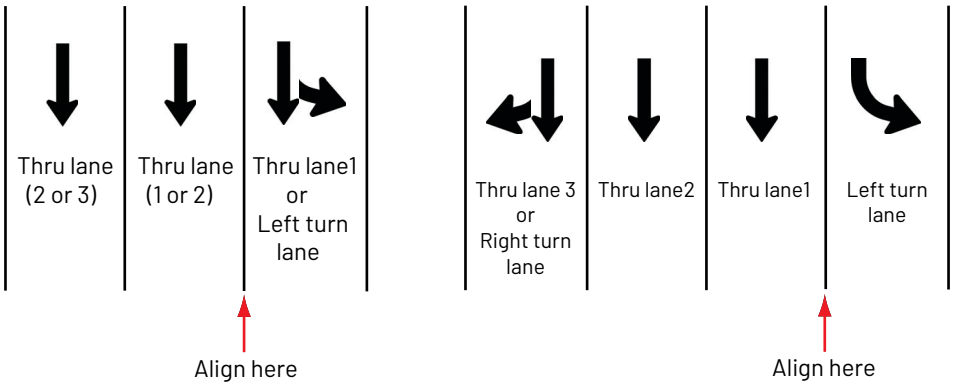


Figure 2-1:OptiVu Camera Placement

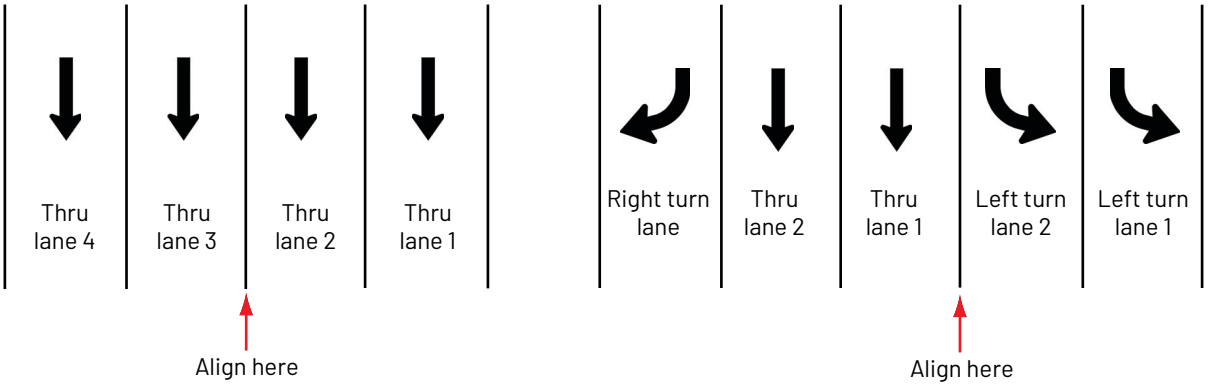
The camera should be located horizontally on the mast arm or luminaire in a level position and aimed towards approaching traffic. The actual alignment will depend on the number of lanes and whether there is a dedicated left turn lane.

Aim the camera according to the following figures.



Two or Three Lanes **Four Lanes with Left Turn**

Figure 2-2:Camera Alignment Between Lanes 1 and 2



Four Thru Lanes **Five Lanes with Left Turn**

Figure 2-3:Camera Alignment Between Lanes 2 and 3

NOTE: For six lanes, or if the alignment along the desired lane lines is not possible, shift to the nearest lane line towards the center of the field-of-view.

Field-of-View (FOV)

The camera should be aimed according to the field-of-view required to meet the detection objectives for the installation. This is the area in which detection is to take place. The field-of-view is set by adjusting the barrel rotation, pan, tilt, and zoom settings during the aiming procedure.

For example, in Figure 2-4, the camera (Cam) is set to detect southbound traffic. The solid green line represents where the camera should be aligned when it is installed (see "Camera Placement" on page 2-3). The dashed red line indicates approximately where the outside edges of the field-of-view will be; showing an extra lane width on either side of the stop line.

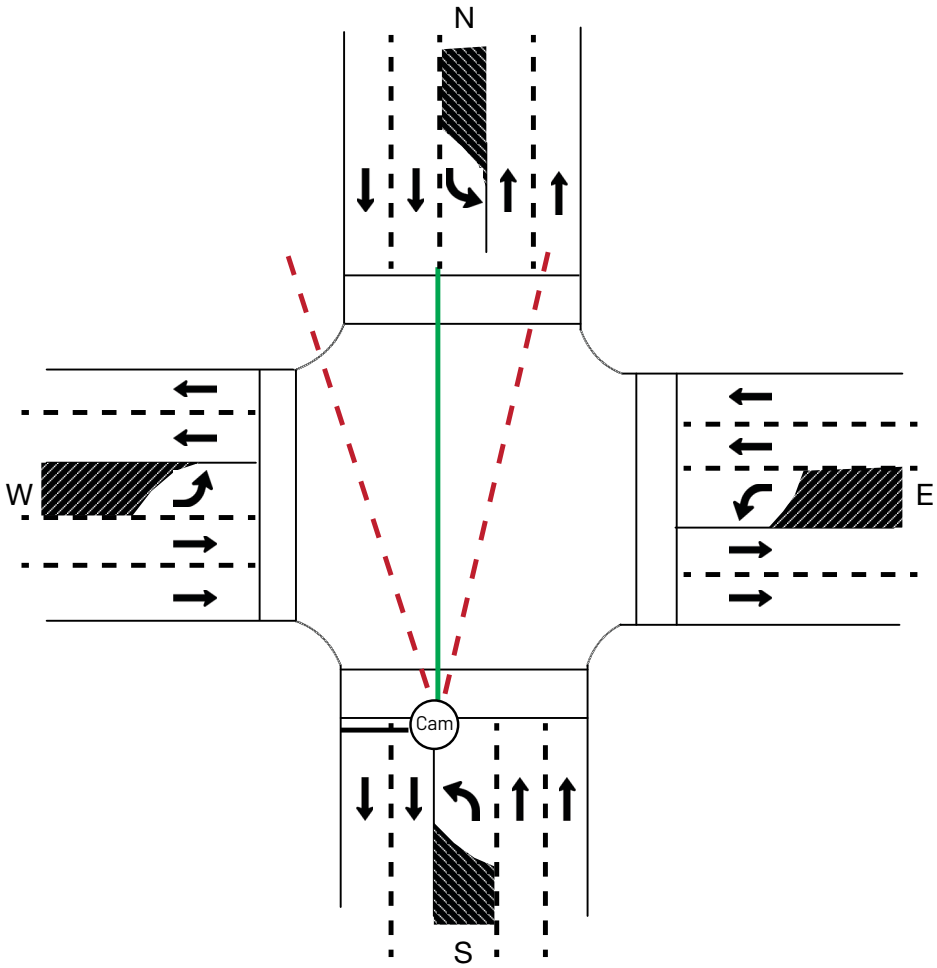


Figure 2-4:Field-of-View

Chapter 3: Installing the Hardware

General

The purpose of this chapter is to describe how to install the hardware components of the OptiVu system. It is recommended that installers read Chapter 2 prior to installing the hardware components of the system.

Installation Procedure

The sequence described below is one of several that could be used to install the hardware components of the OptiVu system. This is the one recommended by Image Sensing Systems (ISS), especially if there is only one installer.

In this sequence, the OptiVu Processor, power supply, and PoE are installed, followed by the OptiVu Camera.

Warning

Hazard of damage to personnel and system components.

- Ensure that power is turned OFF at the branch breaker before starting installation of any device.
- Installing any device with power to the device turned ON may severely damage the OptiVu Processor, any camera, or additional devices connected to it. Installing a OptiVu Processor with incorrect line power wiring could severely damage both the OptiVu Processor and any OptiVu Cameras connected to it.
- Ensure that the power wires are connected correctly to the terminals.
- Connect ground to the silver screw on the front.

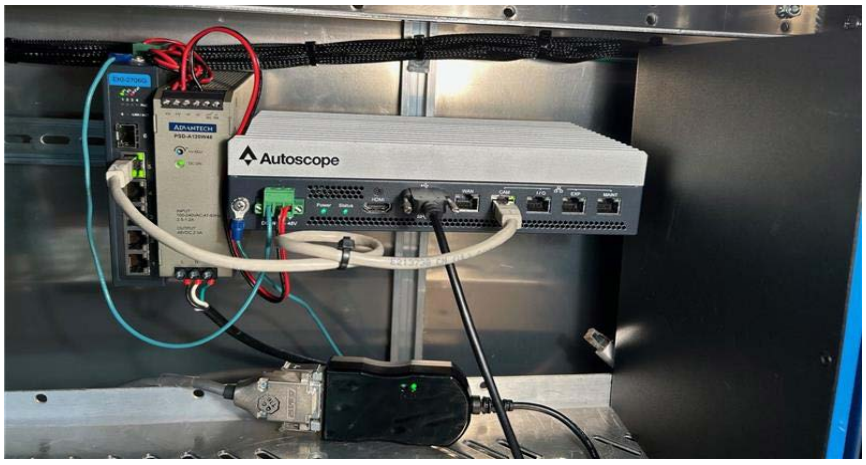
Processor, Power Supply, and PoE Installation

The OptiVu Processor, power supply, and PoE switch should be installed together. They can be installed on the same din rail as shown below or in different parts of the cabinet if more convenient.

1. Start by mounting all devices on the din rails or by placing them close to the final location.
2. Connect the DC power connections from the power supply to the OptiVu Processor and the PoE switch. The power supply will have V1 and V2 connections.

   Connect the red wire to V+ and the black wire to V1- on the power supply. Then connect the red wire to the + on the Processors power connector. Connect the red wire to V2+ on the power supply to the V1+ on the PoE switch. Then connect the black wire to the V2- on the power supply and the V1- on the PoE switch.
3. Connect the Cam port on the Processor to port 5 on the PoE switch.

   Do not connect the Ethernet cables that will be going to the cameras yet.



4. Connect the ground screw on the front of the processor and near the power connector on the PoE switch to earth ground.

5. Make sure the power is OFF at the source or if a switch is used, connect the AC power from the clean side of the cabinet to the power supply and verify the power lights come on both the Processor and the PoE switch. If desired, a circuit breaker can be installed before the connection to the power supply.
6. Connect a laptop to the maintenance port of the Processor before moving on to the Camera Install.

IMPORTANT: Do not connect the camera Ethernet cables to the PoE switch. Make sure the laptop is set to DCHP for the Ethernet port.

The Processor will assign the laptop an IP address that will allow connection to the cameras.

7. If connecting to a modem or fiber, see WAN setup on page 5-9.
8. Once the cameras are connected, check the voltage on the power supply to ensure the supply is still providing 48V.

OptiVu Camera Installation

1. Is a Pelco Astro-Brac being used for mounting the OptiVu Camera?

Yes	No
a) Remove the Tilt Bracket from the OptiVu Camera. b) Install the Pelco bracket according to the manufacturer's recommendations. c) Connect the OptiVu Camera to the Pelco bracket. **Note:** Take care to steady the sensor while mounting to the bracket. d) Continue with Step 6.	Continue with the next step.

2. Using 3/4-inch stainless steel banding, attach the mounting bracket to the signal mast arm or luminaire.

3. Align the Tilt Bracket with the Mounting Bracket and slide the sensor assembly onto the Mounting Bracket.
4. Route the cable to the traffic control cabinet according to local procedures.

5. If required by your organization, measure the height of the sensor.
6. Use Figure 3-1 to wire the RJ45 connector.

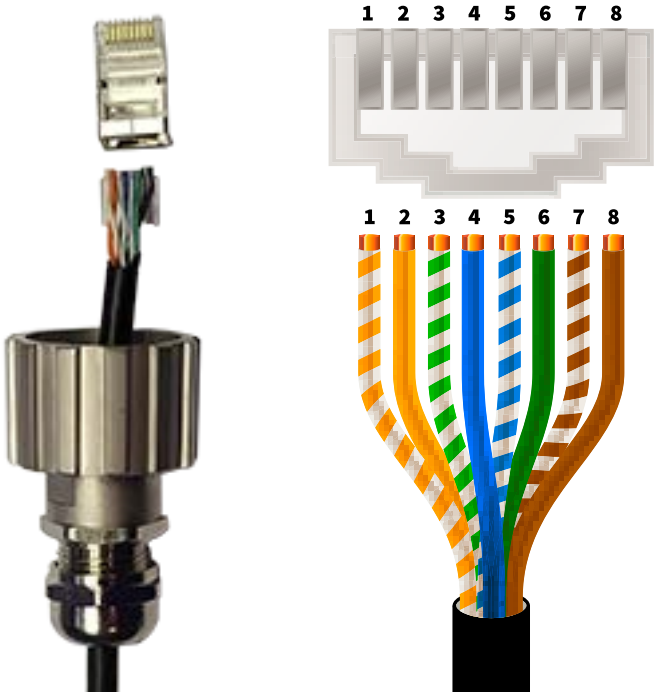
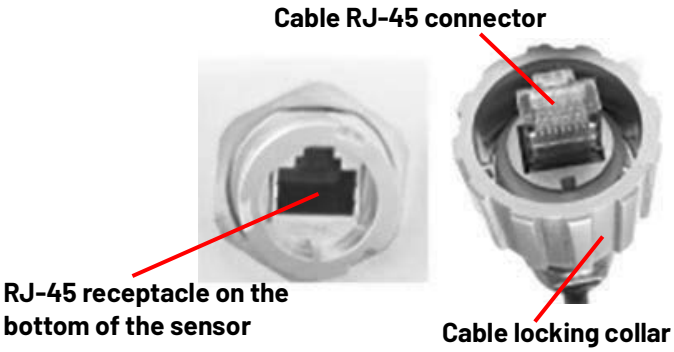


Figure 3-1: Ethernet Connector Wiring Diagram

7. Use an RJ45 crimper to crimp the RJ45 connector to the cable.
8. Undo the protective cap on the sensor's connector.
9. Insert the RJ45 connector from the cable to the RJ45 receptacle on the bottom of the sensor.

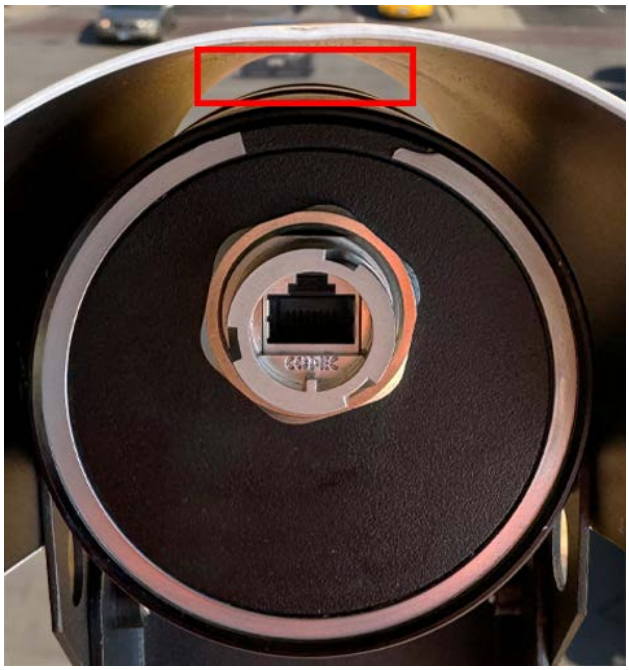


10. Tighten the cable's locking collar by turning it a quarter turn to the right.

Warning

Make sure the mains are turned off prior to connecting wires from the OptiVu cable to the breakout box.

11. At the end of the cable in the cabinet, use Figure 3-1 and crimp the included RJ45 connector to the cabinet end.
12. Connect the other end of the cable to the PoE switch.
13. To view the video stream, see "OptiVu Camera Setup".
14. Looking from the back, sight down the sensor using the top of the camera and aim the camera at the detection area.



15. If necessary, loosen the pan and tilt adjustment screws.

16. Pan the sensor left or right to center the image on the detection area, then tilt the sensor up or down to point the top of the camera just behind the stop line. This will typically provide a good field-of-view.
17. Tighten down all screws and bolts.
18. Check the camera lens for fingerprints or other dirt. If required, clean the lens (see "Cleaning the Lens" on page A-1).
19. Configure the system (see Chapter 6:"Supervisor Operations").

Chapter 4: Software Installation

General

This chapter describes how to install the Supervisor software.

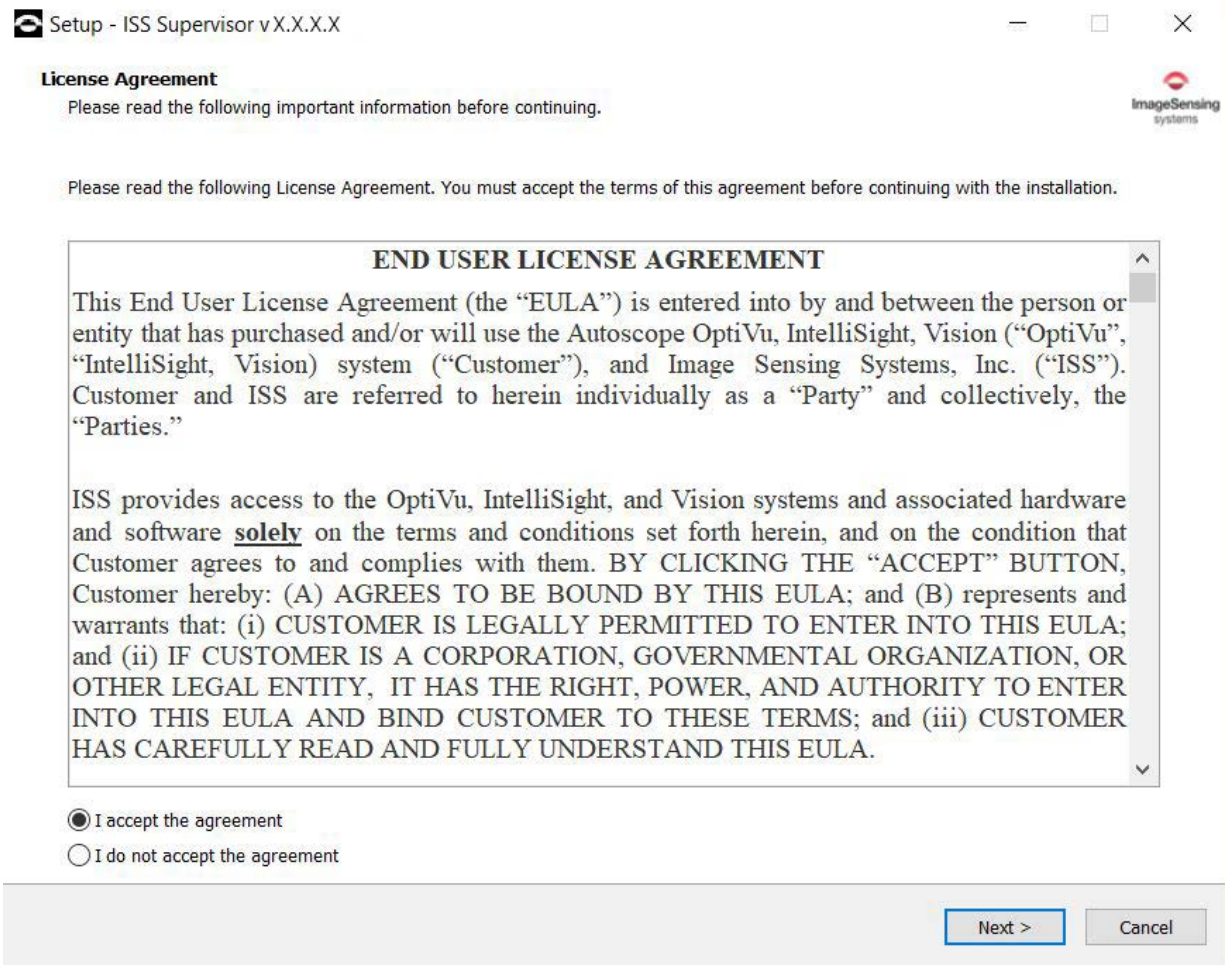
NOTE: You must have Administrator rights on the computer in order to install the Supervisor.

Installing the Software

To install the software, do the following.

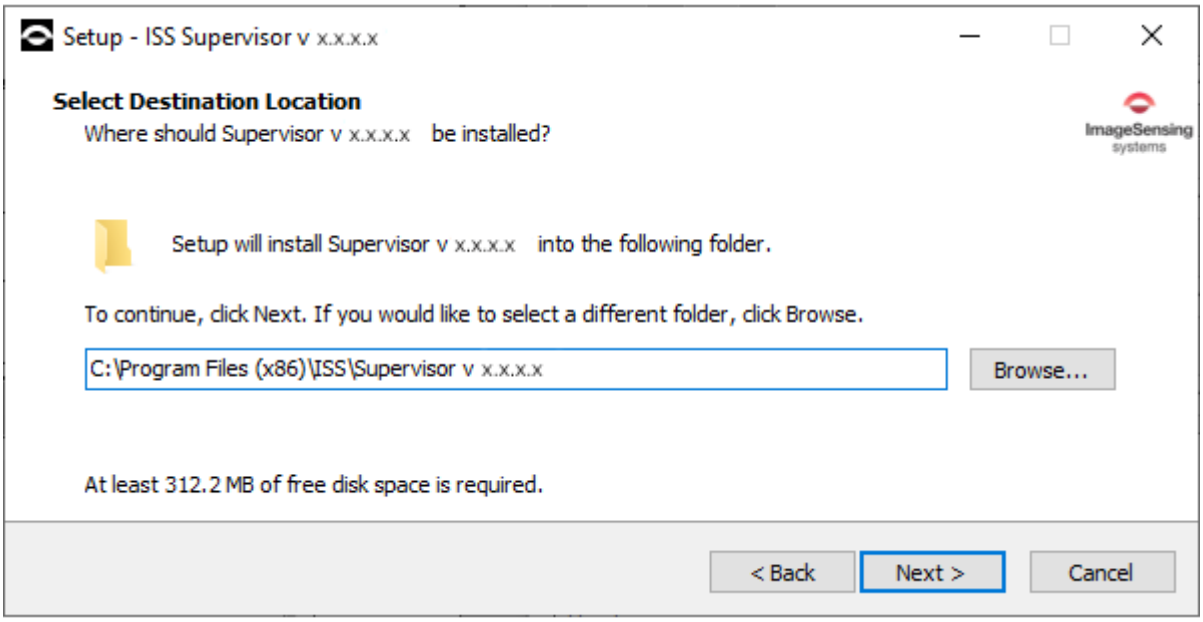
1. Locate and double-click the file **ISSSupervisorSetup_vx.x.x.x.exe** (where x.x.x.x is the version number).

   The following appears.



2. Select the **I accept the agreement** radio button.
3. Click **Next**.

The following appears.

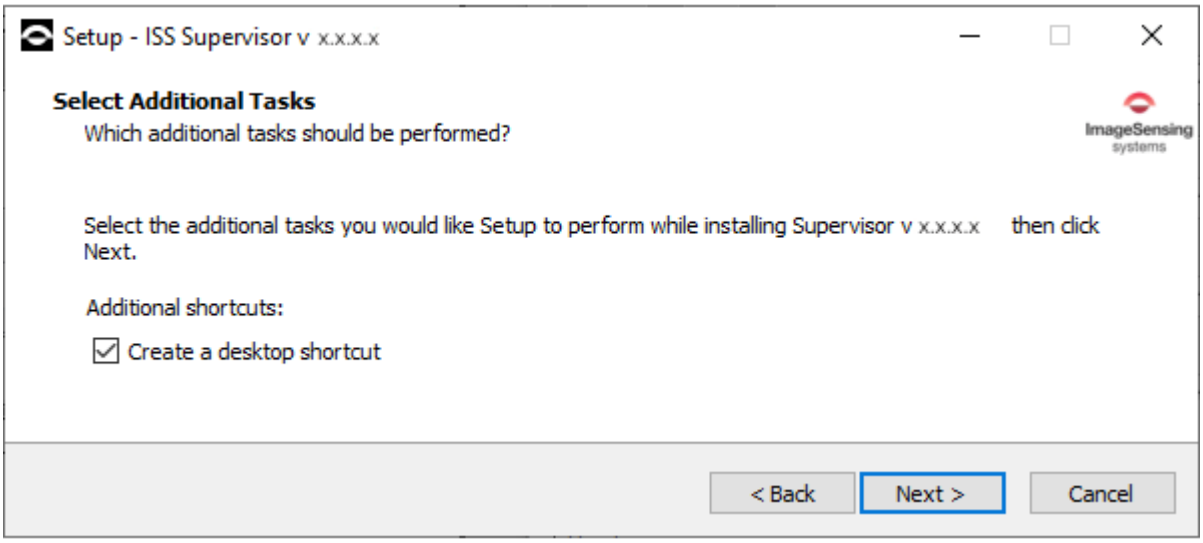


4. Do you want the files installed in the default location?

Yes	No
Continue with the next step.	1. Click **Browse**. 2. Select the new location. 3. Verify the new location appears in the box. 4. Continue with the next step. **Note:** The firmware update files will be installed in the *InstallFiles* folder in this location.

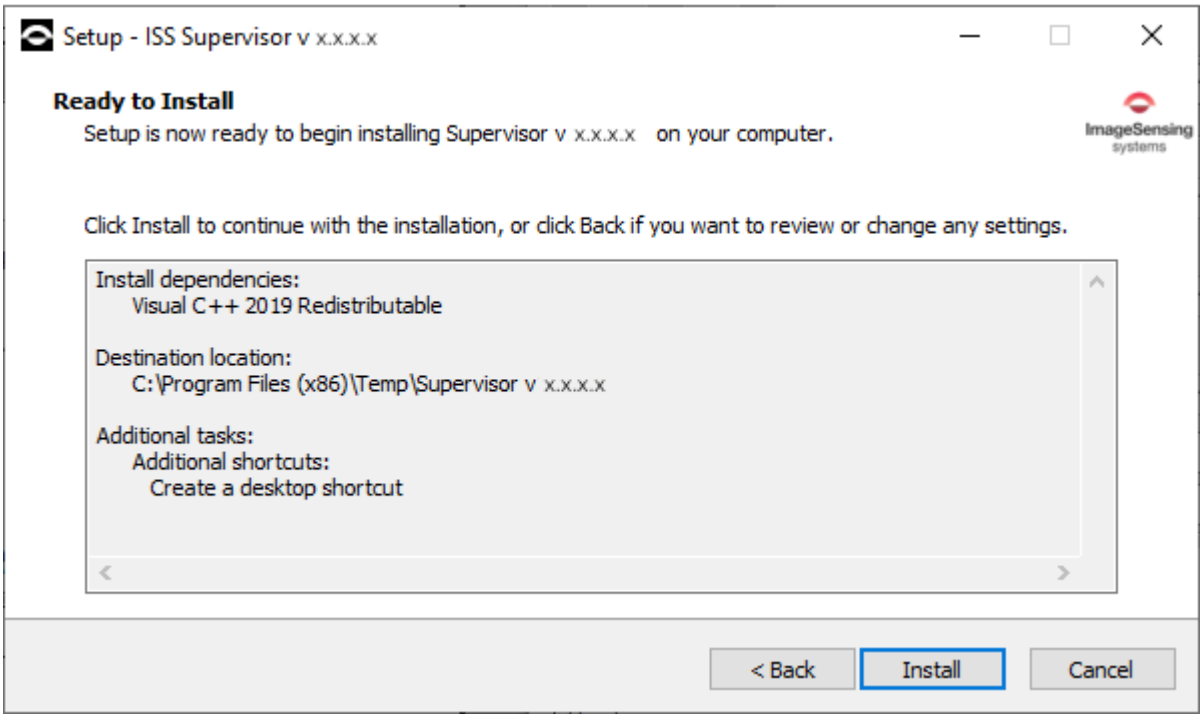
5. Click **Next**.

The following appears.



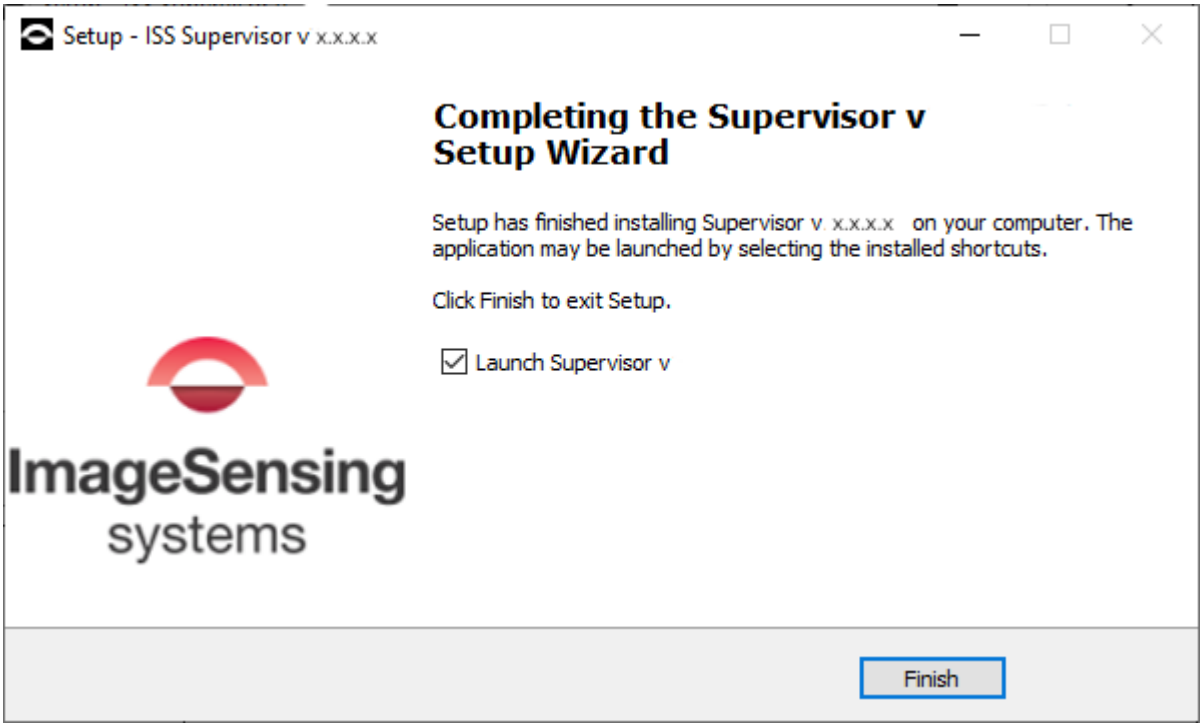
6. Click **Next**.

The following appears.



NOTE: If the Visual C++ Redistributable dependency is not on the computer, it will be installed automatically.

7. Click **Install**.
   Wait for the following to appear.



8. To start the Supervisor automatically after the install is complete, select the check box.
9. Click **Finish** to complete the install.

   A shortcut for the Supervisor is placed on the desktop.

Chapter 5: Configuring OptiVu Devices

General

The purpose of this chapter is to describe how to set up a OptiVu Processor and to configure the OptiVu Cameras that are connected to the OptiVu Processor.

Starting the Supervisor

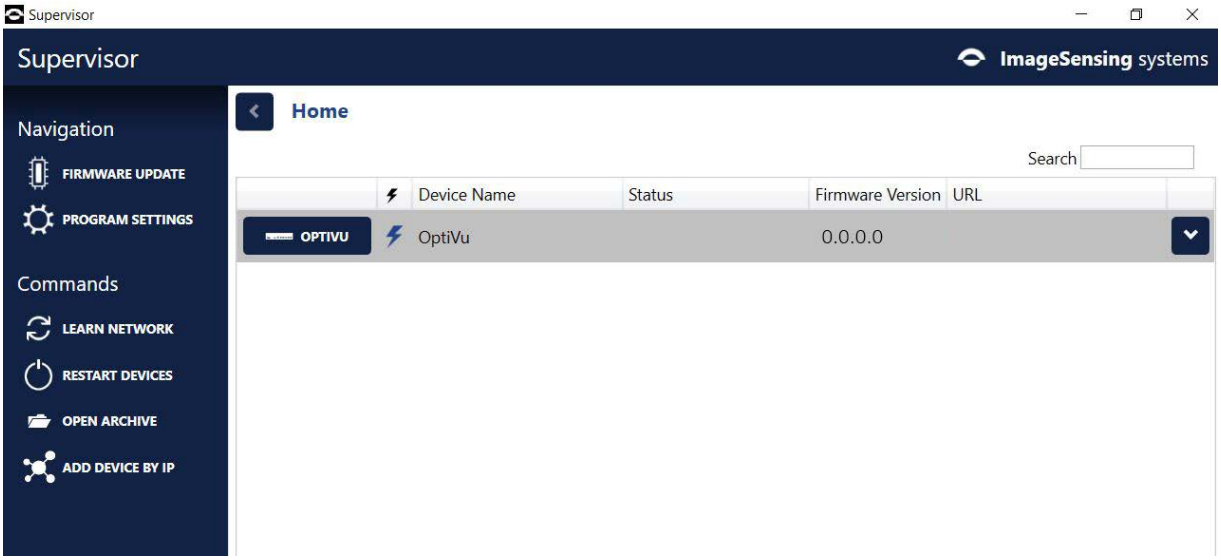
To start the Supervisor software, do the following.

1. Connect the computer to the OptiVu Processor using one of the following methods.

   Ethernet cable: Plug one end of a Cat5e or Cat 6 cable into the computer and the other end into the Maintenance connector on the OptiVu Processor. Set the computer's Ethernet connection to DHCP.

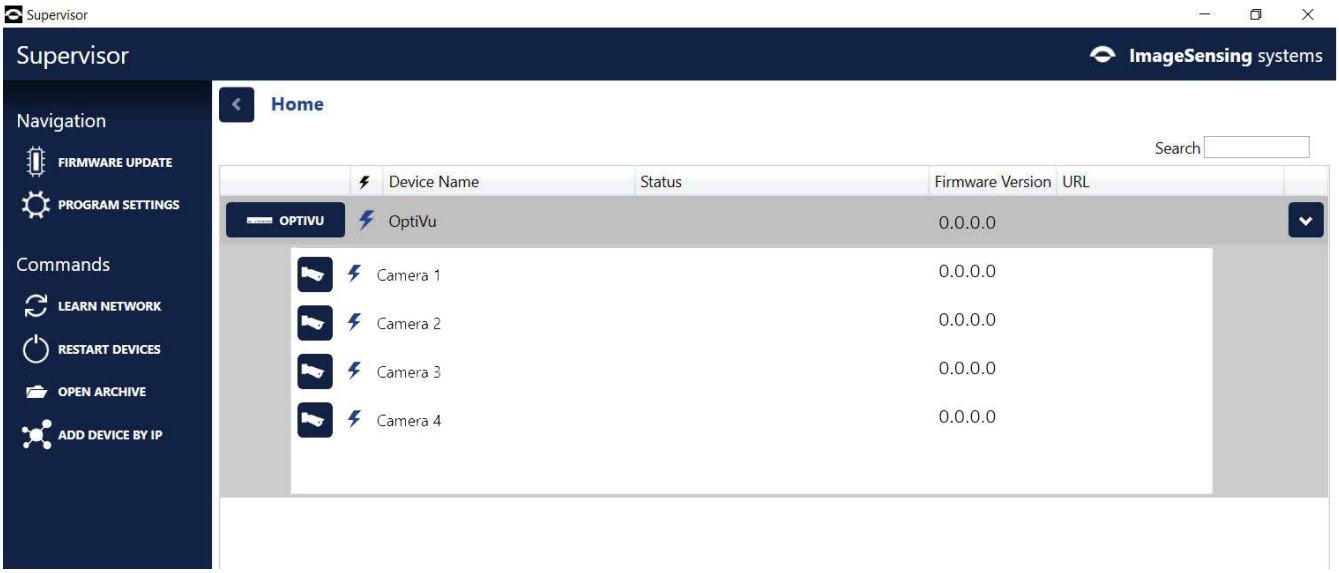
2. Double-click the Supervisor shortcut on the desktop.

   The Home screen appears. For a description of the various areas, see "Supervisor Home Screen" on page 6-1.



NOTE: All detected OptiVu Processors appear in the device list. If devices do not appear in the list, click **LEARN NETWORK**. If OptiVu Processors are connected through a routed network, if may be necessary to enter the IP address of the OptiVu Processor to include it in the device list. For more information, see "Add Device by IP" on page 6-6.

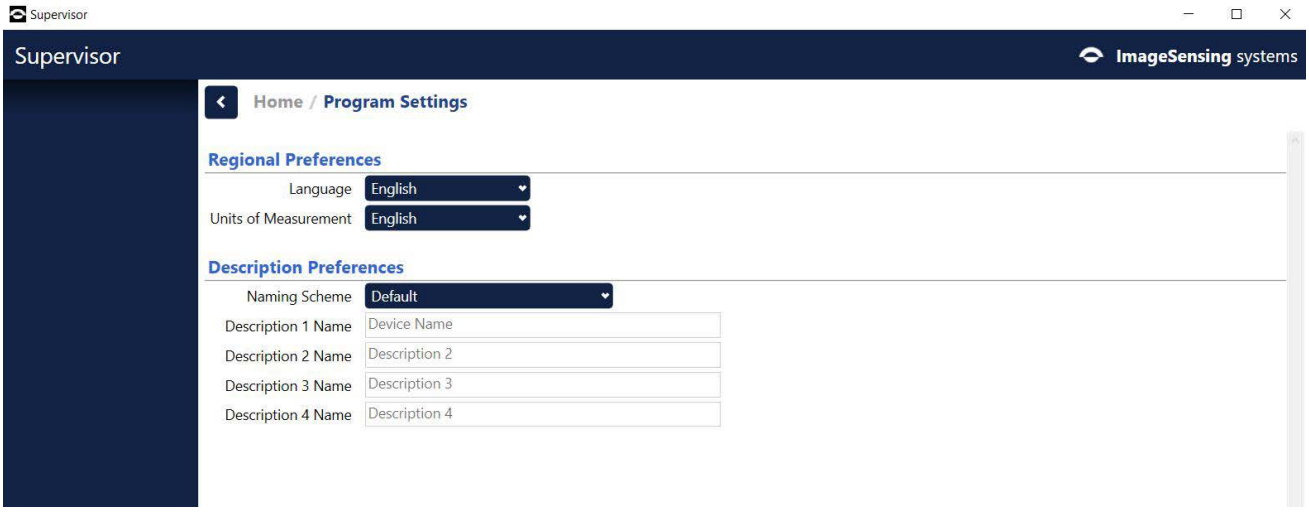
To view the cameras, click the drop-down indicator to the right of the URL listing.



Program Settings

The following defines parameters that are used by the Supervisor, regardless of the connected devices.

1. In the Commands section of the Supervisor Home screen, click **Program Settings**.



NOTE: At present, English is the only supported language.

2. Select the measurement units for distances.
   - **English** - translates all distance measurements into feet, and all speed measurements into mile-per-hour (mph).
   - **Metric** - translates all distance measurements into meters, and all speed measurements into kilometers-per-hour (kph).
3. For **Naming Scheme**, select the scheme to be used for the heading names of the four description fields. If **Custom** is selected, enter a name for each of the four descriptions.
4. When finished, return to the Home screen and perform the setup for each device.

Device Screen

The device screen is used to set up the configuration for the device.

NOTE: For the OptiVu Processor, this screen will display in a quad-format - an image for each active OptiVu Camera connected to the OptiVu Processor. The order of display is dependent on which cameras were added as Camera 1, Camera 2, Camera 3, and Camera 4. they will be displayed as follows:

- Camera 1 - upper left
- Camera 2 - upper right
- Camera 3 - lower left
- Camera 4 - lower right

To see a list of the Device Screen field descriptions, see Table 5-11.

Figure 5-2: Device Screen

Table 5-11: Device Screen Field Descriptions

Item	Description
1	Actions that can be performed. For more information see: • Device Settings - OptiVu Processor, see "OptiVu Processor Setup" • Device Settings - OptiVu Camera, see "Camera Device Settings" • "Operations Log" • "Firmware Update" - *only appears when the device is an OptiVu Processor* • "Config Management" - *only appears when the device is an OptiVu Camera* • "Device Info" - *only appears when the device is an OptiVu Processor*
2	Commands that can be executed: • "Restart Device" - Restarts the device. *Only appears when the device is an OptiVu Processor.* • "Save Archive" - Captures the current state of a device. *Only appears when the device is an OptiVu Processor.* • "Restore Archive" - Downloads the contents of a previously saved archive file into the selected device. • "Set Time" - Sets the time of the device. *Only appears when the device is an OptiVu Processor.* • "USB Video Recording Service" - Records video clips from Autoscope cameras attached to an Autoscope processor. • "Clearing the Configuration" - Removes the configuration for an OptiVu Camera. This includes all zone set up information and the camera calibration. *Only appears when the device is an OptiVu Camera.*
3	Display window - Shows a snapshot from the device and any detection zones that are already defined. For OptiVu Processor devices, a snapshot from each connected OptiVu Camera appears.
4	Camera Setup - Discover cameras, adjust zoom and distortion (warp). *Only appears when the device is an OptiVu Camera.*
5	Camera Calibration - Perform "Camera Calibration" for the camera. Required before Zone Setup can be done. *Only appears when the device is an OptiVu Camera.*
6	Zone Setup - Set up the detection zones. Requires that "Camera Calibration" be done before option is active. *Only appears when the device is an OptiVu Camera.*
7	Shows device status messages.
8	Snapshot/video controls. Click to refresh the images, play video, record video and stop video.

Item	Description
9	Version of the Supervisor software currently running on the computer.

OptiVu Processor Setup

To configure the OptiVu Processor, do the following.

1. Start the Supervisor.
2. On the Home screen, click the device icon for the OptiVu Processor to be configured.

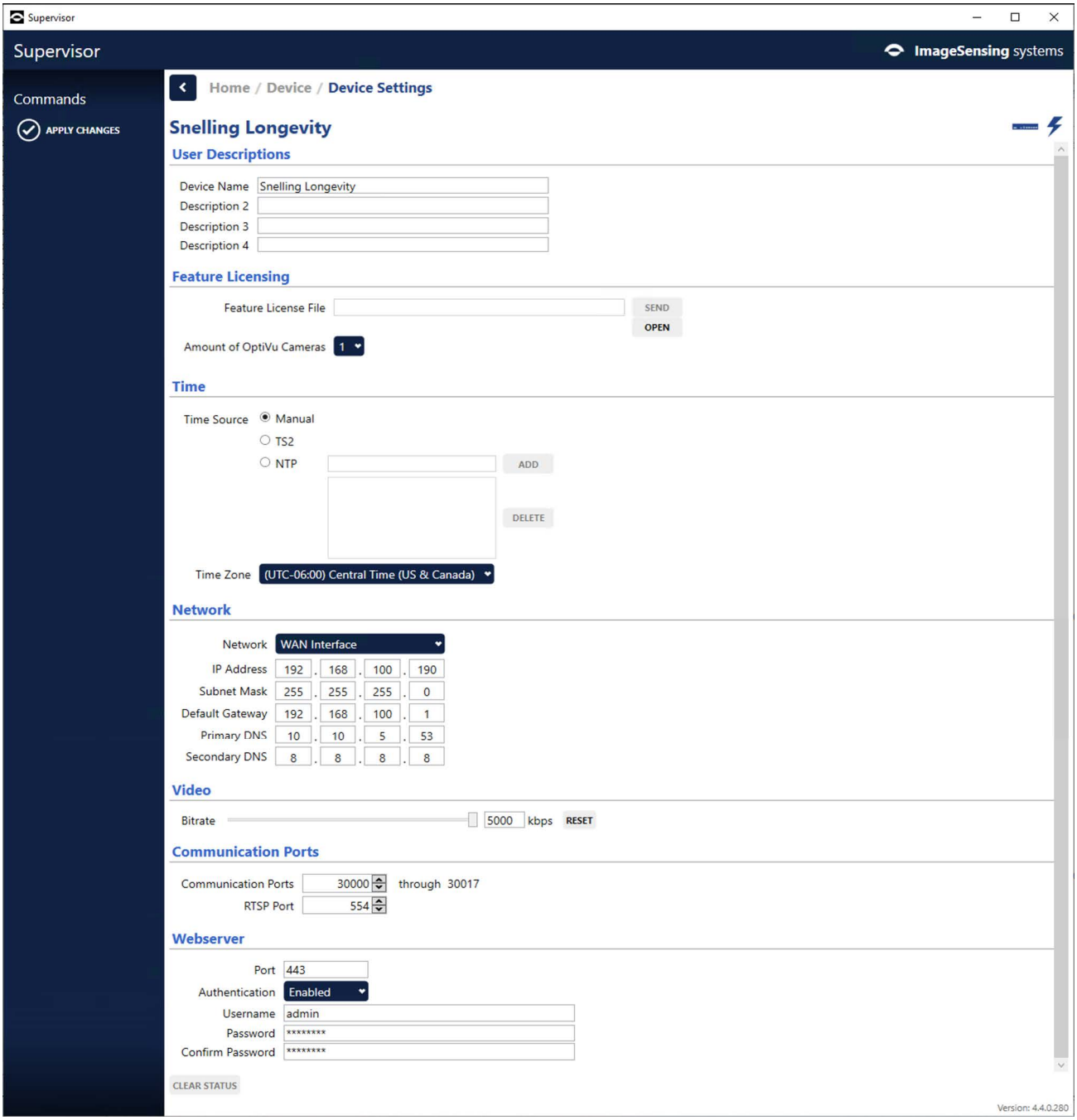
   The following appears.

   If cameras were already discovered, an image of all setup cameras will appear if the cameras are connected and online; one in each of the four quadrants of the image area. The order of appearance is determined by the order in which the cameras were added. The first camera will display in the upper left; second in upper right; third in lower left; fourth in lower right.

   If needed, use the video controls to refresh the images.

3. In the Navigation section, click **Device Settings**.

The following appears.



User Descriptions

4. Enter descriptions for each field as needed. The description entered for the first field is what appears as the Device Name in the other Supervisor screens.

Feature Licensing

5. If you received a new license file, click **OPEN** and select **File**. Next, click the send button and your system will reboot with the new license loaded.

6. Select the amount of OptiVu cameras connected to the processor.

Time

7. For **Time Source**, select the method to be used to synchronize the clock in the OptiVu Processor.
   - **Manual** - Select to synchronize the clock to the connected computer. After applying changes, you must click **SET TIME** in the Commands section of the Device or Home screen.
   - **TS2** - Select if the OptiVu Processor's clock is set by TS2 time set commands from a TS2 compatible controller. The OptiVu Processor monitors the TS2 time every minute and if the difference between the two is greater than two seconds, the TS2 time is applied to the OptiVu Processor.
   - **NTP** - Select if the clock is to be synchronized with an NTP server. Enter the URL or IP address of the NTP time server to be used and click **ADD**. At least one (and up to five) NTP servers must be added. If more than one NTP server is entered, the first is used as the primary. If for some reason the server cannot be contacted, the second will be tried and so on. To delete a time server from the list, select it and click **DELETE**.

     NOTE: If a URL is entered instead of an IP address, the DNS fields in the Network section must be filed in.

8. For **Time Zone**, select the time zone where the OptiVu Processor is installed.

Network

9. Only the WAN Interface is user changeable. For the WAN interface, the addressing applies to the WAN connector, which is used to connect to a network outside of the Controller Cabinet, such as the Traffic Management Center (TMC).

   Enter the IP Address, Subnet Mask, and Default Gateway for the WAN Interface.

   NOTE: If port forwarding is used, the OptiVu Processor should be configured with a static IP address that is on the same network as the router/cell modem.

   - **IP Address** - Address to be used for the WAN network interface.
   - **Subnet Mask** - Subnet Mask to be used for the WAN network interface.
   - **Default Gateway** - Default Gateway to be used for the WAN network interface.
   - **Primary DNS** - Address of the primary DNS server. Only available for the WAN interface.
   - **Secondary DNS** - Address of the secondary DNS server. Only available for the WAN interface.

Video

10. Move the slider or enter a value from 100 to 5000 to set the rate, in kilobits per second, to be used when viewing video on the Device screen for the OptiVu Processor. The default is 2048 kbps.

    The bitrate has no effect on the static image (snapshot). It only has an effect when playing video, and it should be set according to what the viewing device or network can handle.

    NOTE: The value selected in this section only affects the bitrate of the quad display. Individual sensor stream bitrates are set in their respective Device Settings page.

Communications Ports

11. This area is used when the OptiVu Processor is connected to a router or cell modem and port forwarding is required.
    e) For **Communication Ports**, select or enter the starting port number in the sequence to be used. The system requires two ports for the OptiVu Processor and two for each OptiVu Camera connected to the OptiVu Processor.
    f) For **RTSP Port**, select or enter the port number to be used for video streaming (used for both the Supervisor and third party programs).
    g) Communications and RTSP ports must be configured as part of the router/cell modem forwarding configuration. For additional information, see "Port Forwarding" on page 6-32.

Webserver

12. This area is used to set the port and enable and set up a username and password for the webserver.
    - **Port** - enter the port number used to access the webserver.

      Valid entries are 443, 8443, or a number between 41952 and 65535. The default is 443. If the port specified is already in use, a message will be posted to the Operations Log and the value will revert back to the last working port.

      NOTE: If port forwarding is used, the webserver port must be configured as part of the router/cell modem forwarding configuration.

    - **Authentication** - select whether or not a username and password is required to access the webserver.

      If **Enabled**, enter the **Username** and **Password**. A maximum of 20 characters can be entered for each.

      The default username and password is **admin/ISS12345**

13. Click **APPLY CHANGES**.
14. If the Time Source selected was **Manual**, return to the Device screen and click **SET TIME** in the Commands section.
15. Return to the Home screen.
16. Configure the OptiVu Cameras connected to the OptiVu Processor.

OptiVu Camera Setup

Each OptiVu Camera connected to a OptiVu Processor must be configured in order for vehicle detection to take place. When setting up a camera, the following must be accomplished.

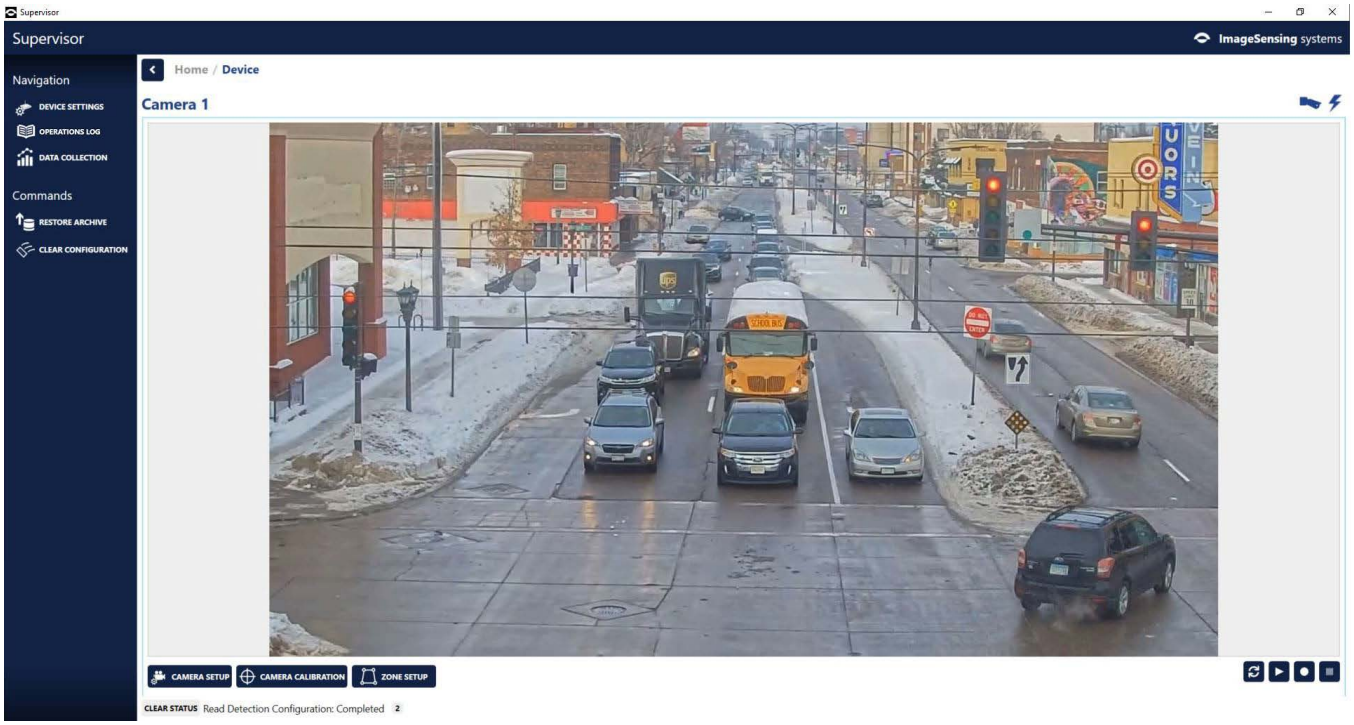
- Configure the device settings
- Adjust the zoom and focus if needed
- Calibrate the camera
- Add zones (stopline, advance)
- Assign conditions, actions, and optionally, video overlays to each zone

Camera Device Settings

The Device Settings screen for the OptiVu Camera is used to assign names to the user description fields for the cameras.

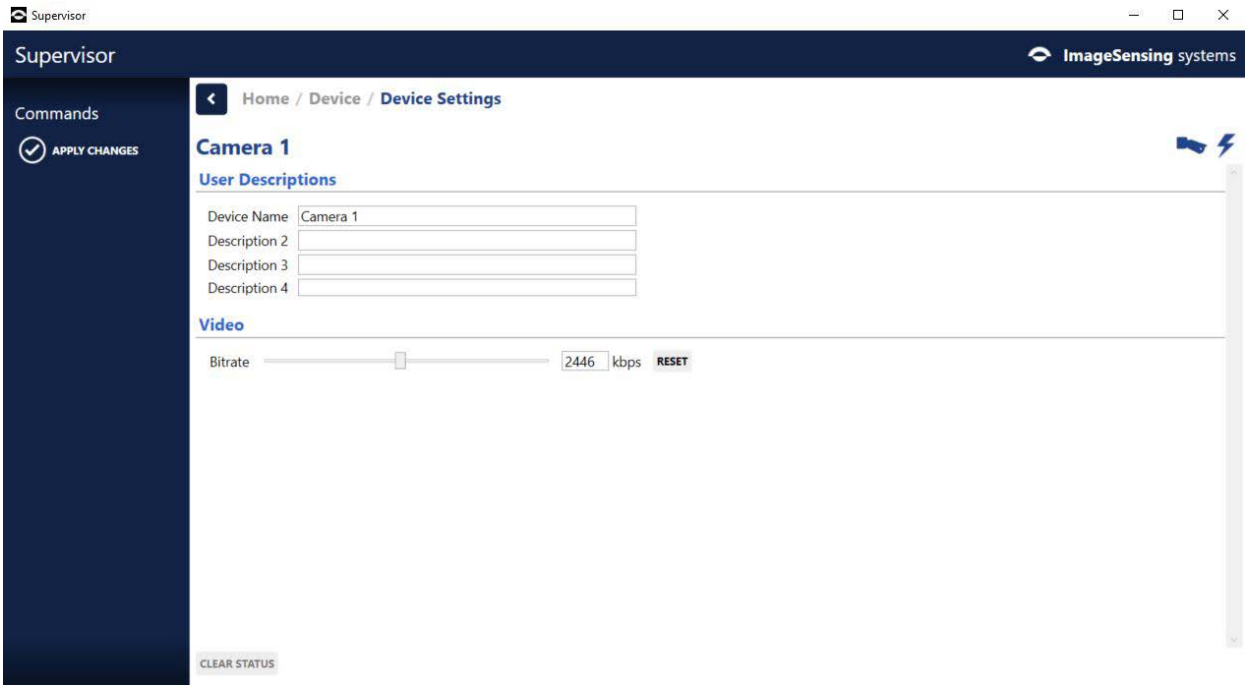
1. On the Home screen, click the device icon for the OptiVu Camera to be configured.

   The following appears.



2. In the Navigation section, click **Device Settings**.

The following appears.



3. In the **User Descriptions** section, enter descriptions for each field as needed. The description entered for the first field is what appears as the Device Name in the other Supervisor screens.
4. In the **Video** section, move the slider or enter a value from 100 to 5000 to set the bit rate to be used when viewing video from the OptiVu Camera.

   The bitrate has no effect on the static image (snapshot). It only has an affect when playing video, and it should be set according to what the viewing device or network can handle.

   To set the value back to the default (2048), click **RESET**.

   NOTE: The value selected for the sensor has no effect on the quad video display for the OptiVu Processor.

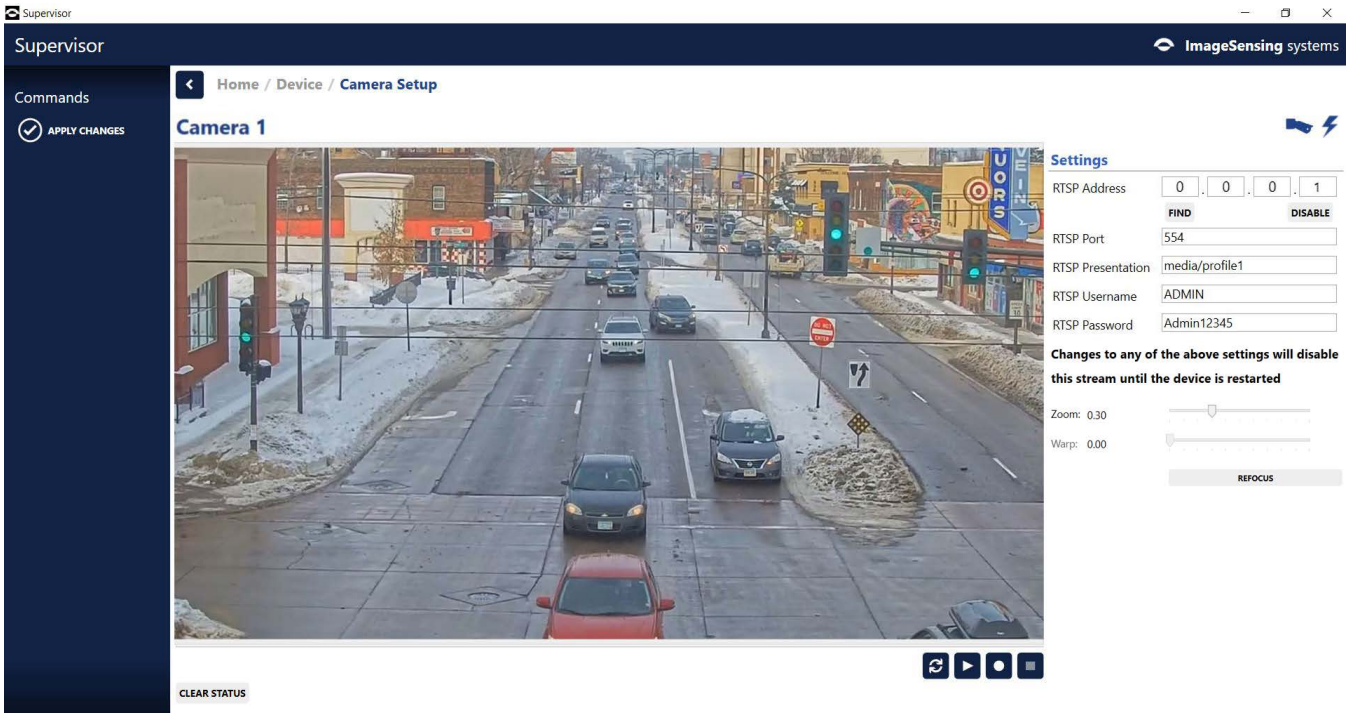
5. Click **APPLY CHANGES**.
6. Return to the Device screen and check the camera setup.

Camera Setup

The Camera Setup screen is used to find the cameras IP address, check the field-of-view from the camera display, and see other information about the OptiVu Camera. It is also used to change the zoom of the video image.

1. On the Device screen for the camera, click **CAMERA SETUP**.

   The following appears.



RTSP Address - IP address of the OptiVu Camera.

FIND - click the **FIND** button to find the first camera. Click it again to find the next one, and so on. Once the desired camera is found for the position, clicking apply will save the settings. Move on to the next camera in the list.

DISABLE - click the **DISABLE** button if a camera was saved in the wrong order. This will free it up to be used in another position.

NOTE: This only needs to done during the initial camera setup.

2. Click **APPLY CHANGES**.
3. The RTSP address will automatically find the camera and set it to the camera's IP address.
4. Click the refresh button to verify that the video stream is working.

5. Repeat sets 1-5 for any additional cameras.

   If a specific order is desired, unplug all the cameras and plug one in at a time to learn it. Repeat for each camera.

RTSP Port - should be 554 unless specifically changed by the user.

RTSP Presentation - defines the channel and stream you are trying to connect to. For OptiVu Cameras, this setting is **media/profile1**.

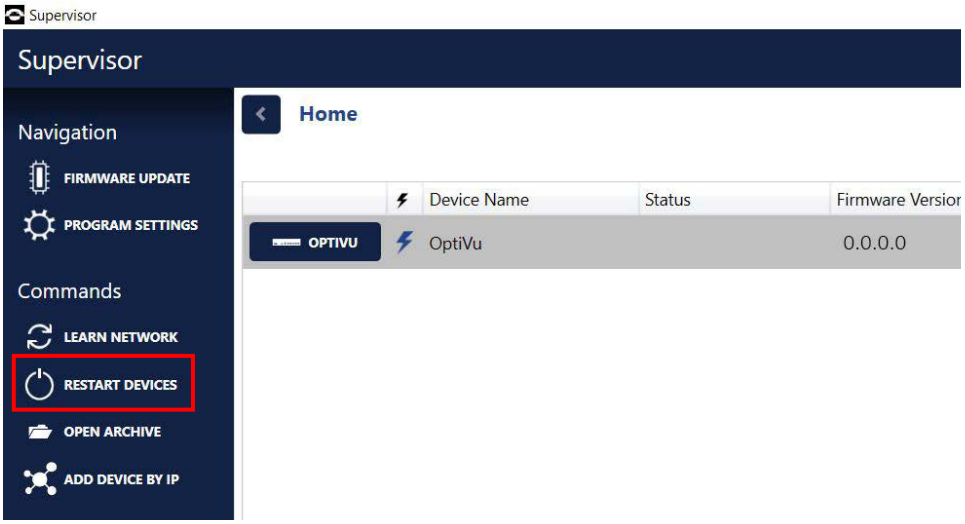
RTSP Username - sets the username needed to log into the camera. The default is **Admin**.

RTSP Password - password needed to log into the camera. The default is **Admin12345**.

IMPORTANT: **Changes to any of the above settings will disable this stream until the device is restarted** - after entering the camera settings, the processor will need to be restarted before streaming can resume.

Before the restart, the snapshot will still work so the camera can be zoomed and focused. If desired, all four cameras can be setup before the restart.

6. To restart, go back to the Home screen. Make sure the processor is selected. Click **RESTART DEVICES** on the left side under the **Commands** section.



7. Once restarted, the status bar will say **Restart Device: In Progress**. When complete, the status bar will say **Restart Device: Completed**.
8. Return to the Camera Setup screen.
9. Click the **PLAY** button to start the video stream.
10. Use the slider to zoom in or out until the desired field-of-view is shown.

    NOTE: It will take a few seconds to show the new field-of-view.

    Zoom - zooms in or out to get desired field-of-view.

    Warp - not used for OptiVu Cameras.

    Refocus - if the camera looks out of focus, click refocus.

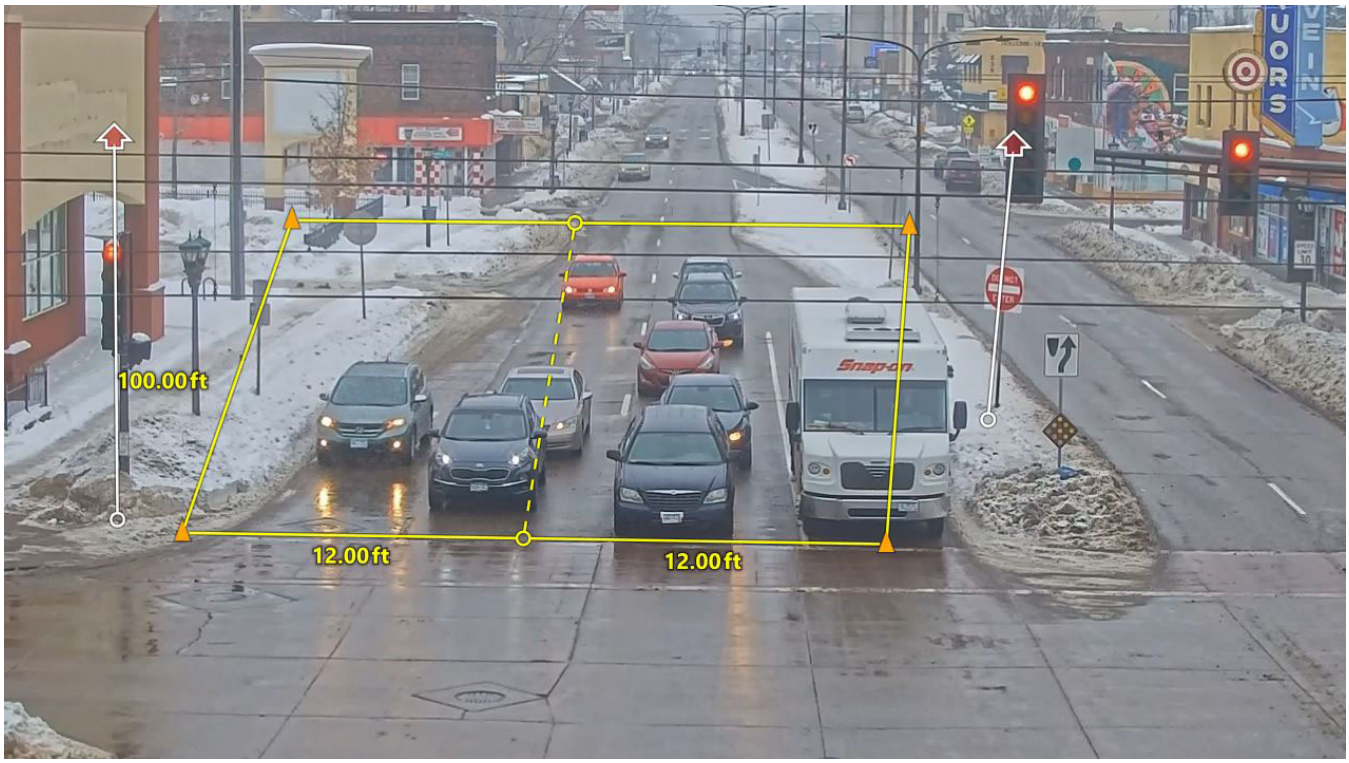
11. After entering all the settings, click **APPLY CHANGES**. Under the video image, a message will be shown that shows the RTSP URL that was set.
12. Click the **PLAY** button to start a video stream.
13. When complete, return to the Device screen and set the camera's calibration.

Camera Calibration

Before detection zones can be defined for the OptiVu Camera, the camera must be calibrated in order to teach the camera how to translate from flat 2D video to 3D space. The camera must be mounted in a forward facing or receding configuration, not in a side-fired configuration.

1. On the Device screen for the camera, click **CAMERA CALIBRATION**.

   The following appears.



2. Move the cursor to one of the corner or lane markers, then click and drag to the desired location.

   NOTE: It is important that the calibration overlay has parallel lines. This would not be a problem for most intersections where the lane lines are parallel to one another as in the image shown above. If the lane lines are not parallel, then the calibration overlay must be set differently.

3. Repeat for each corner/marker until the zone covers the detection area and calibration lines are arranged so that they line up with the lane lines.
4. To add additional lanes to the zone, in the Commands section click **ADD LANE**.
5. Adjust the markers to line up with the lane lines.

6. Edit the distance measurements as required by clicking on a value and typing a new one.
7. Align the vertical bars with a vertical structure in the image, such as a post, a pole, or the edge of a building.

   If possible, the bars should be spread apart.
8. Click **APPLY CHANGES**.
9. Return to the Device screen and set up detection zones.

Zone Setup

Detection zones are the areas where vehicle, bicycle, and/or pedestrian detection takes place. One or more zones can be defined; the number is dependent on the requirements of the site. After laying out the physical zones, conditions, actions, and video overlays can be assigned.

The Zone Setup screen can be reached from the Device screen of the OptiVu camera. To see a list of the Zone Setup field descriptions, see Table 5-12.

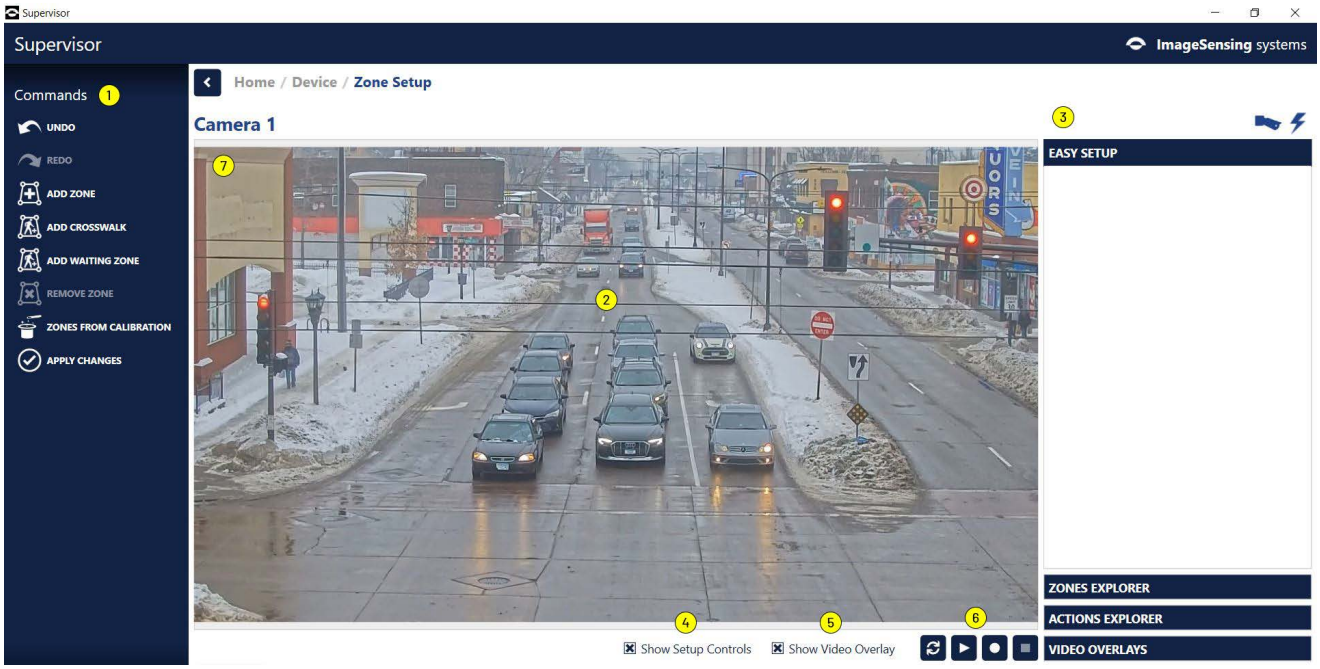


Figure 5-3: Zone Setup Screen

Table 5-12: Zone Setup Screen Field Descriptions

Item	Description
1	Click to perform the specific operation. • **Undo** - click once to undo the last action performed. Click again to undo the action before that, and so on. • **Redo** - click one to redo the last action undone. Click again to redo the undo before that, and so on. • **Add Zone** - adds a zone to the setup (see "Adding a Stop Line Presence Zone" and "Adding an Advance Presence Zone". • **Remove Zone** - removes the selected zone from the setup. • **Zones From Calibration** - creates the same zones that were laid out in the "Camera Calibration" process. • **Apply Changes** - saves the changes made to the configuration.
2	Roadway where zones will be set up.

Item	Description
3	"Changing Zone, Condition, and Action Descriptions" panel - used to assign conditions to a zone, as well as the actions to be taken when detection takes place. This panel is also used to add text overlays on the video display. For information on the various sections within this panel, see: • "Easy Setup" • "Zones Explorer" • "Actions Explorer" • "Video Overlays"
4	Select the check box to have overlays displayed on the static image on the Zone Setup screen only.
5	Select the check box to have video overlays displayed on the image when video is playing.
6	Snapshot/video controls. Click to refresh the image, play video, record video, and stop video. **NOTE:** When recording video, the following characters cannot be used as part of the name. • Asterisk (*) • Back slash (\) • Closed brace (}) • Dollar sign ($) • Forward slash (/) • Greater than (>) • Less than (<) • Percent sign (%) • Pipe (|) • Question mark (?)
7	Display window - shows a snapshot from the device and any detection zones that are already defined.

Adding a Stop Line Presence Zone

This type of zone is defined at the stop line of the intersection and detects the presence of vehicles and bicycles as they enter the zone. One or more zones can be defined for an intersection; the number is dependent on the requirements of the site. After laying out the physical zones, conditions, and actions can be defined for each zone.

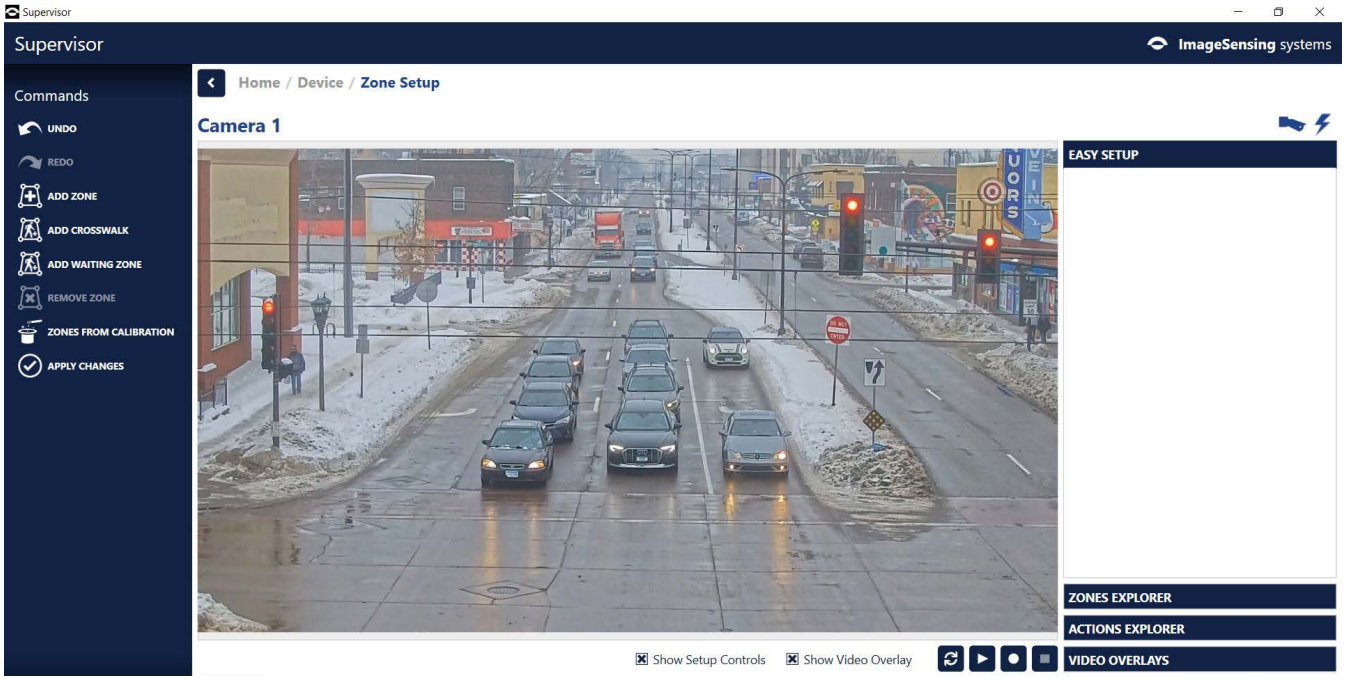
NOTE:

- Including overlapping zones in a configuration is not recommended as this can cause poor detection performance.
- Adding or editing a zone while playing video may cause these operations to appear delayed or jerky.
- A single zone covering multiple lanes is not recommended for Data Collection, as counts may not be accurate for shared zones. Also, single zones for multiple lanes is not recommended when using Pulse or Snappy outputs.

Zones can be added by either importing the calibration layout or manually.

Add Zone From Calibration

1. On the Device screen for the camera, click **ZONE SETUP**.



2. Click **ZONE FROM CALIBRATION**.
3. Select the lane layout from the list.
   - **No Turn Lanes:** one zone appears, covering all lanes defined in the calibration.
   - **Left Turn Lane:** two zones appear, one for a left turn lane and one covering the remainder of the lanes defined in the calibration.
   - **Right Turn Lane:** two zones appear, one for the right turn lane and one covering the remainder of the lanes defined in the calibration.
   - **Left and Right Turn Lanes:** two or three zones appear, one for a right turn lane, one for a left turn lane, and if more than two zones were defined in the calibration, one covering the remainder of the lanes.
   - **Preserve All Lanes:** a zone for each lane defined in the calibration appears.

The zone layout done on the calibration screen appears on the image and the lanes are defined according to the selection. Right-click on a zone to see its defined direction; if neither Right Turn nor Left Turn are checked, the zone is a through zone.

4. For zones not already designated as right or left turn, and if vehicles can exit the zone by making a right or left turn, do the following.
   a) Right-click on the zone.
   b) Under **Turn Direction**, select the appropriate check box.
   c) Click elsewhere on the image.
5. Modify zone positions as required.
6. To change the zone description, highlight the description in the **Easy Setup** section and type a new one.

   Any number of alphanumeric and special characters can be used.
7. Assign conditions, actions, and video overlays as required.

NOTE:

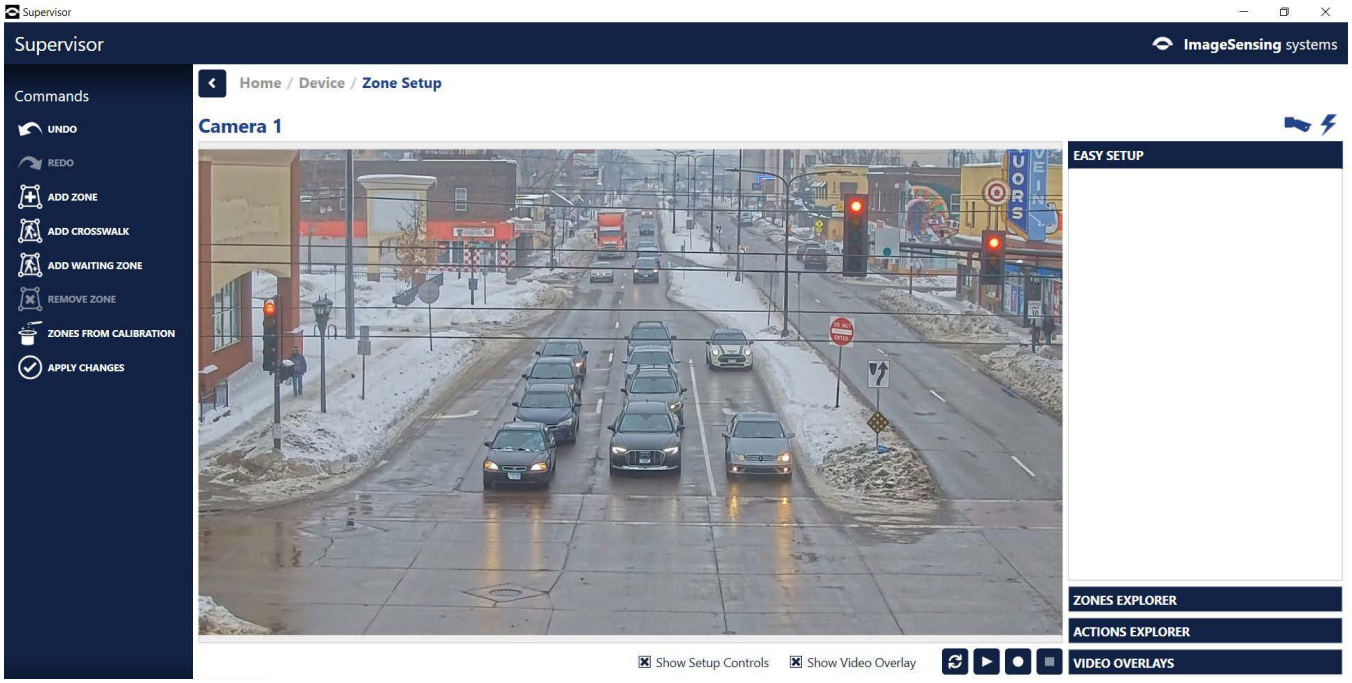
- By default, the vehicle presence condition is selected for each zone. In addition, green is selected for the zone display color when a vehicle is detected and gray when no vehicle is present in the zone. There is no default output assigned.
- For each selected condition (vehicle and bicycle differentiation) an output must be assigned unless the Set Output action is removed in the "Zones Explorer" or "Actions Explorer" section.
- The **Show Video Overlay** check box is used to display overlays only when video is playing. The **Show Setup Controls** check box is used to display overlays on the "Zone Setup" screen for both static images and video.
- After all zones are defined and configured, it is recommended that the configuration be archived (see "Save Archive" on page 6-7).

8. When complete, click **APPLY CHANGES**.

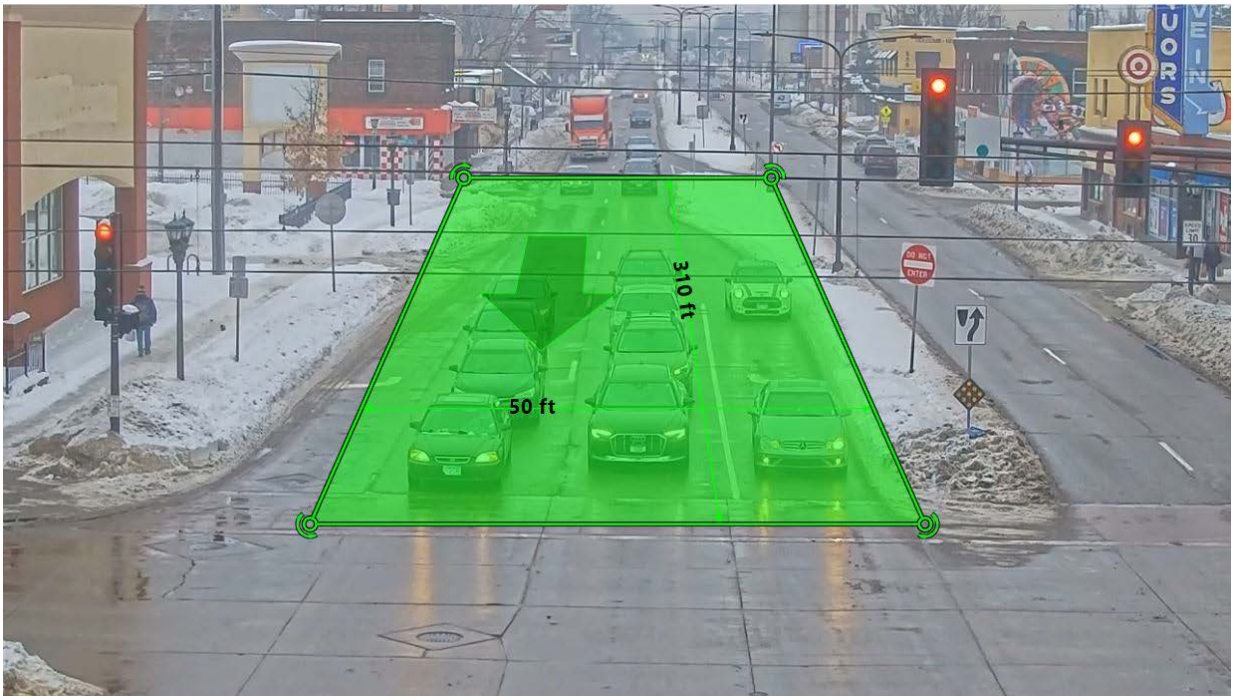
   Changes go into effect immediately and can be viewed live.

Add Zone Manually

1. On the Device screen for the camera, click **ZONE SETUP**.



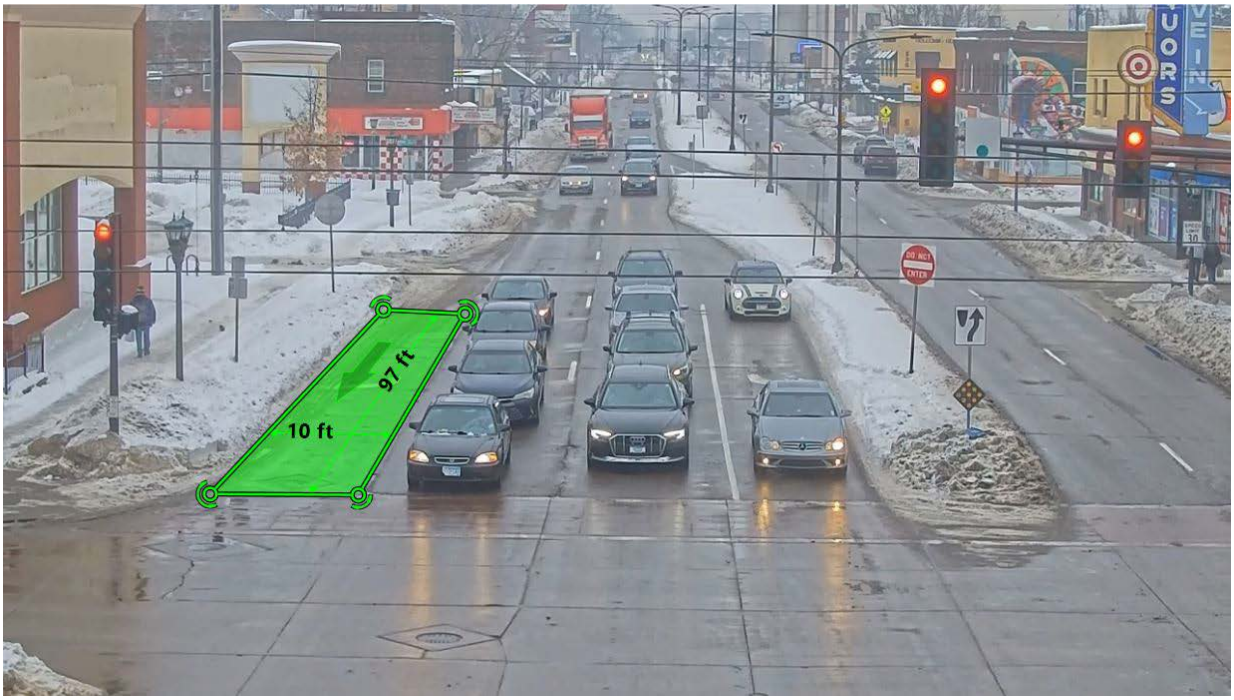
2. Click **ADD ZONE**.



3. Move the cursor to one of the corner markers, then click and drag to the desired location.

The arrows at the corners of the zone can be used to rotate the zone.

4. Repeat for each corner until the zone covers the detection area and lane lines are arranged so that they line up with the zone lines.



5. To add additional zones similar to the previous one, right-click on the previous lane to display the following. Otherwise, just click add zone and repeat Step 3 **and** Step 4.

6. Select whether the new zone is to be added to the left or right of the current zone.

   The new zone is added to the configuration.

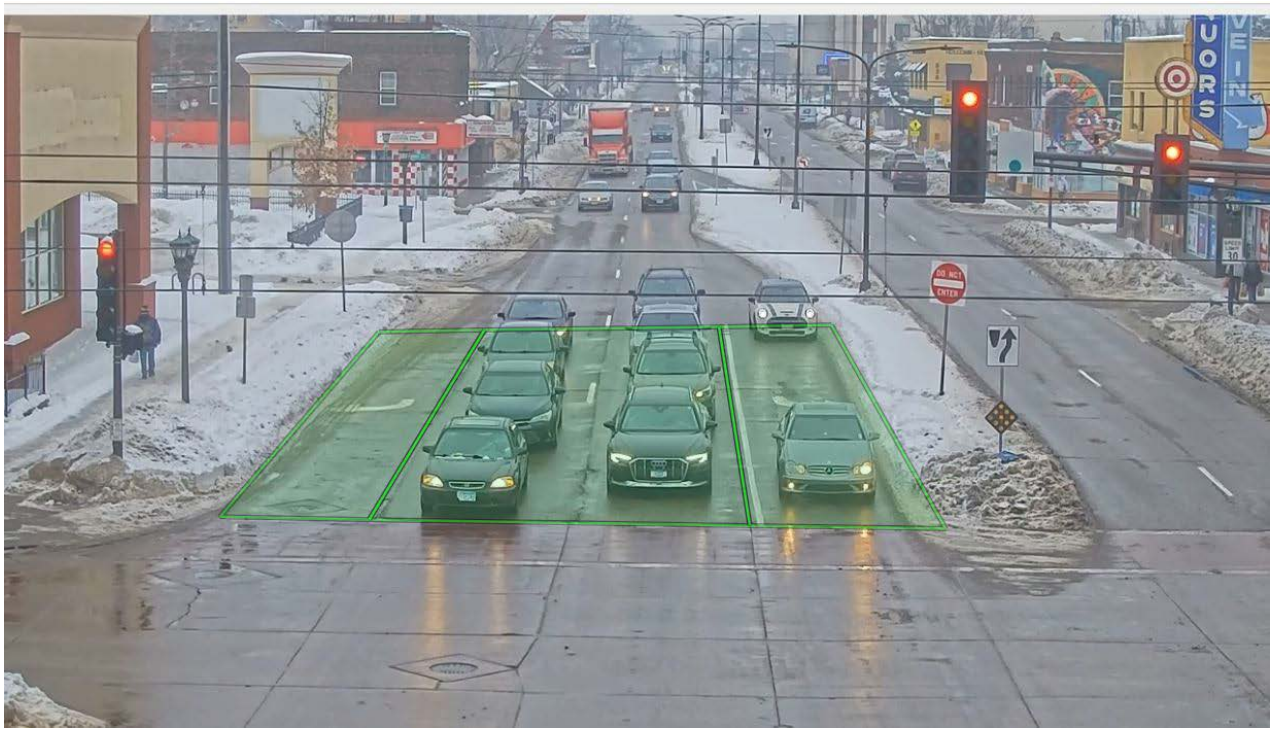
NOTE: Because the original zone is probably not a perfect square or rectangle, the distance measurement shown for the new zone will be different from the original.

7. Adjust the corner markers as required.
8. Can a vehicle make a right or left turn to exit the zone?

Yes	No
a) Right-click on the zone. b) Under Turn Direction, select the appropriate check box. c) Click elsewhere on the image. d) Continue with the next step.	Continue with the next step.

9. Add additional zones as required.

   The following shows a total of two zones that have been defined for the through lanes.



10. To change the zone description, highlight the description in the **Easy Setup** section and type a new one.

    Any number of alphanumeric and special characters can be used.

11. Assign conditions, actions, and video overlays as required (seepage 5-33).

NOTES:

- By default, the vehicle presence condition is selected for each zone. In addition, green is selected for the zone display color when a vehicle is detected and gray when no vehicle is present in the zone. There is no default output assigned.
- For each selected condition (vehicle and bicycle presence) an output must be assigned unless the Set Output action is removed in the"Zones Explorer" section.
- The **Show Video Overlay** check box is used to display overlays only when video is playing. The **Show Setup Controls** check box is used to display overlays on the "Zone Setup" screen for both static images and video.
- After all zones are defined and configured, it is recommended that the configuration be archived (see "Save Archive" on page 6-7).

12. When complete, click **APPLY CHANGES**.

    Changes go into effect immediately and can be viewed live.

13. Do you want to add an advance zone?

Yes	No
See "Adding an Advance Presence Zone" on page 5-27.	Continue to the next step.

14. Do you want to add a receding zone?

Yes	No
See "Adding Receding Traffic Zones" on page 5-29.	Continue to the next step.

15. Do you want to add a pedestrian crosswalk zone?

Yes	No
See "Adding a Pedestrian Crosswalk Zone" on page 5-31.	Continue to the next step.

16. Do you want to add a pedestrian waiting zone?

Yes	No
See "Adding a Pedestrian Waiting Zone" on page 5-32.	Continue to next step.

Adding an Advance Presence Zone

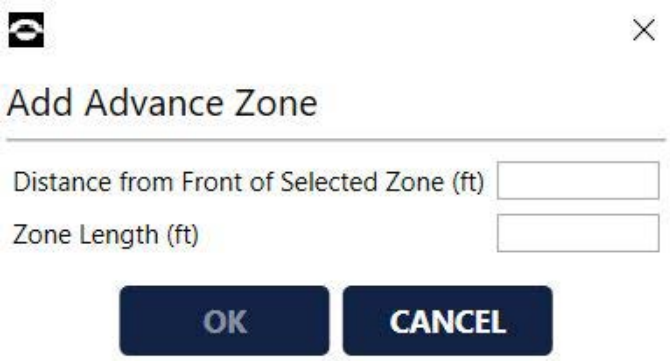
An advance zone provides vehicle detection in an area prior to the intersection stop line.

NOTE: Adding or editing a zone while playing video may cause the operation to appear delayed or jerky.

1. On the "Zone Setup" screen, select the **Stop Line Zone** from which the Advance Zone is to be created.

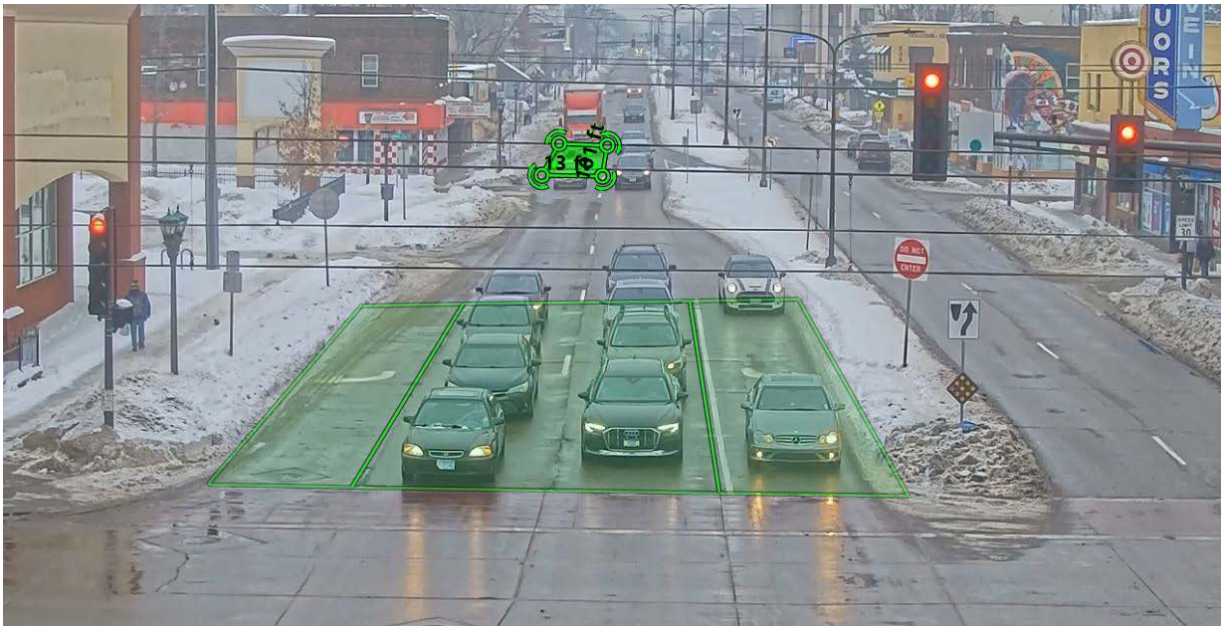
   NOTE: the width of the Advance Zone will mimic the Stop Line Zone.

2. Right-click on a current zone and select **Advance Zone**.



3. For **Distance from Front**, enter how far back from the front of the selected zone to the front edge of the Advance Zone is to be.
4. For **Zone Length**, enter how far back the zone is to be extend.
5. Click **OK**.

   The zone is added in the specified location.



6. If necessary, move the cursor to one of the corner markers, then click and drag to the desired location.

   The arrows at the corners of the zone can be used to rotate the zone.

7. Repeat for each corner until the zone covers the desired area.
8. To change the zone description, highlight the description in the **Easy Setup** section and type a new one. Any number of alphanumeric and special characters can be used.
9. Assign conditions, actions, and video overlays as required (see page 5-33).

NOTE:

- By default, the vehicle presence condition is selected for each zone. In addition, green is selected for the zone display color when a vehicle is detected and gray when no vehicle is present in the zone. There is no default output assigned.
- For each selected condition (vehicle and bicycle presence) an output must be assigned unless the Set Output action is removed in the "Zones Explorer" section.
- The **Show Video Overlay** check box is used to display overlays only when video is playing. The **Show Setup Controls** check box is used to display overlays on the "Zone Setup" screen for both static images and video.
- After all zone are defined and configured, it is recommended that the configuration be archived (see “Save Archive” on page 6-7).

10. When complete, click **APPLY CHANGES**.

    Changes go into effect immediately and can be viewed live.

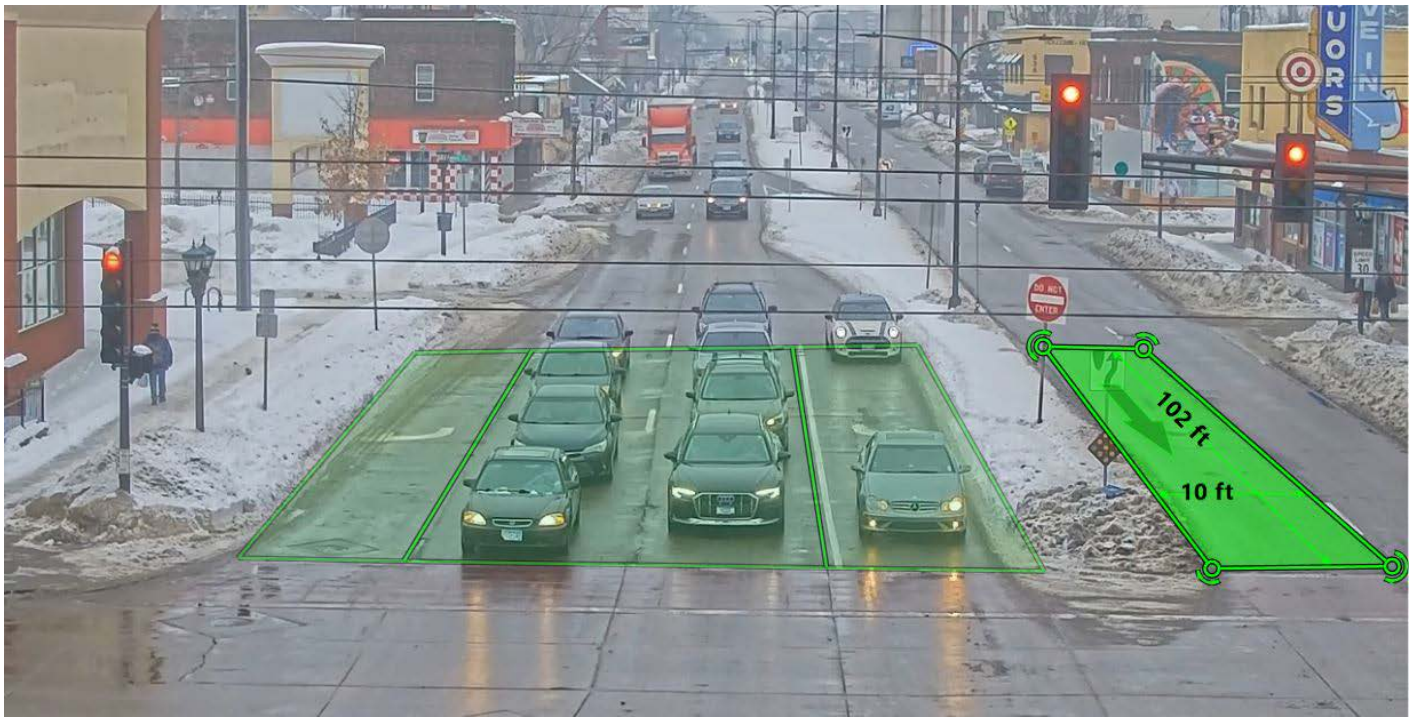
Adding Receding Traffic Zones

A receding traffic zone can be set up and used to trigger an advance zone at the next intersection to alert the controller that traffic is coming. A receding traffic zone should be placed far enough up from the current stop line so that any occluding traffic movement is not detected. Additionally, signs and any other objects should not be in the part of the zone where vehicles would be exiting.

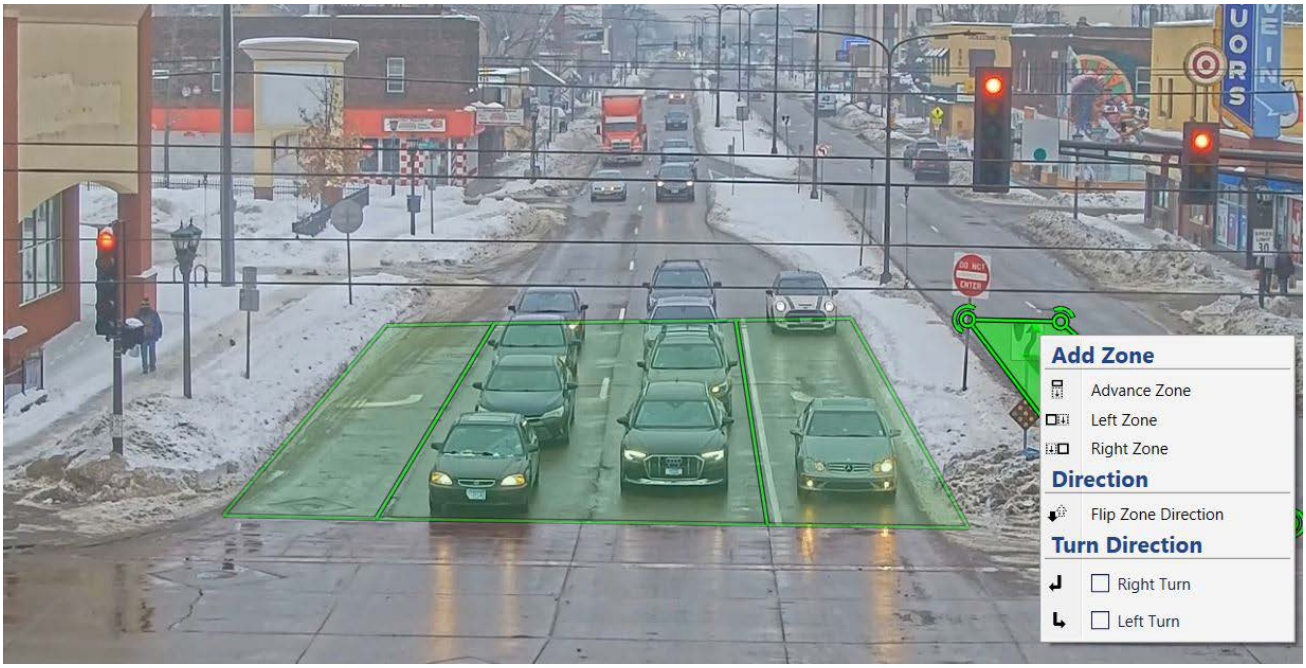
Receding zones are ideally placed where there is maximum visual separation between vehicles, which is usually as close to the stop line as possible without undesired occluding traffic activating the zone.

Performance of receding zones will be maximized when occlusion from adjacent receding zones is minimized.

1. On the "Zone Setup" screen, click **ADD ZONE**.



2. Move the cursor to one of the corner markers, then click and drag to the desired location.
3. Repeat for each corner until the zone covers the detection area and lane lines are arranged so that they line up with the zone lines.



4. Right-click on the zone and select **Flip Zone Direction**.
5. To add additional zones similar to the previous one, right-click on the zone and select the appropriate option.

   NOTE: Because of the direction change, to add a new zone to the right, select **Left Zone**; to the new zone to the left, select **Right Zone**.

6. To change the zone description, highlight the description in the **EASY SETUP** section and type a new one.

   Any number of alphanumeric and special characters can be used.

7. Assign conditions, actions, and video overlays as required (seepage 5-33).

NOTE:

- By default, the vehicle presence condition is selected for each zone. In addition, green is selected for the zone display color when a vehicle is detected and gray when no vehicle is present in the zone. There is no default output assigned.
- For each selected condition (vehicle and bicycle presence) an output must be assigned unless the Set Output action is removed in the "Zones Explorer" section.
- The **Show Video Overlay** check box is used to display overlays only when video is playing. The **Show Setup Controls** check box is used to display overlays on the "Zone Setup" screen for both static images and video.
- After all zone are defined and configured, it is recommended that the configuration be archived (see "Save Archive" on page 6-7).

8. When complete, click **APPLY CHANGES**.

Adding a Pedestrian Crosswalk Zone

Adding a crosswalk zone detects when pedestrians are present in the crosswalk.

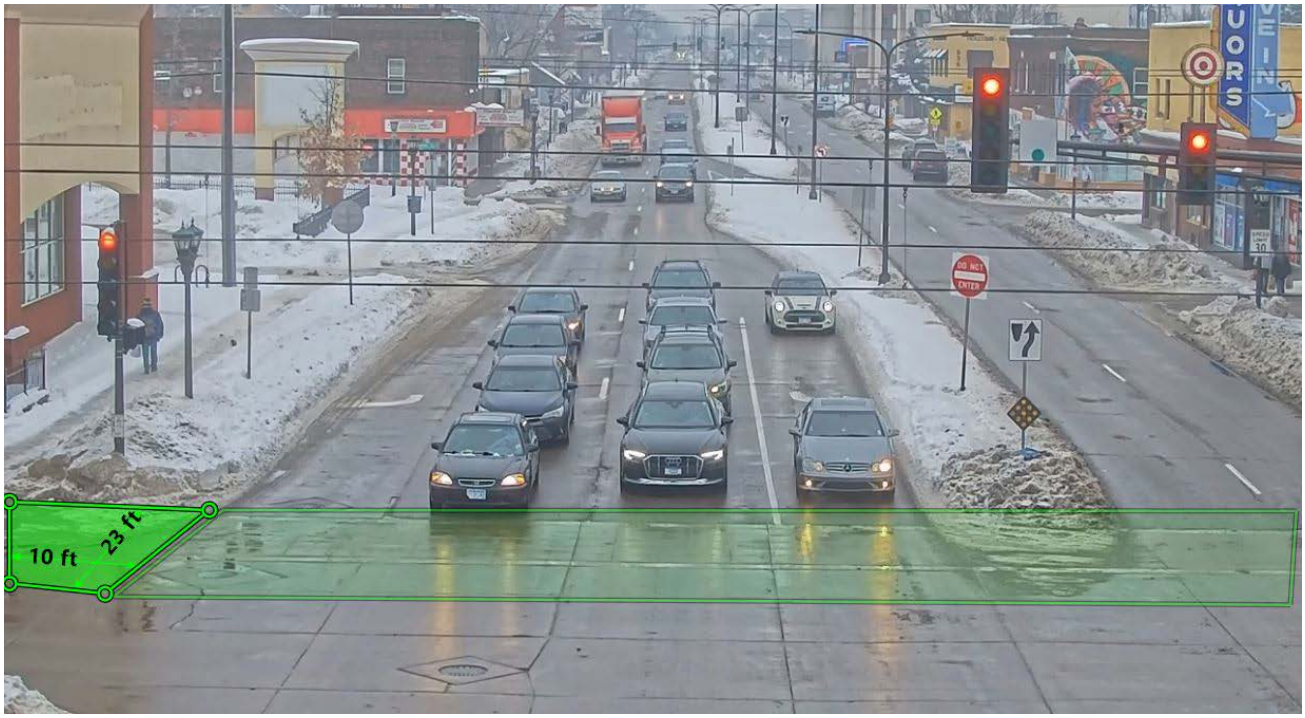
1. On the "Zone Setup" screen, click **ADD CROSSWALK**.
2. Move the cursor to one of the corner markers, then click and drag to the desired location.

3. Repeat for each corner until the zone covers the crosswalk area.
4. To set conditions and actions using Easy Setup, see "Easy Setup" on page 5-36.
5. To define where pedestrians are in the crosswalk zone and activate the output, assign a pedestrian crossing rule (see "Assigning a Pedestrian Crossing Rule" on page 5-49).
6. Assign a pedestrian presence rule as required (see "Assigning a Pedestrian Presence Rule" on page 5-51).
7. When complete, click **APPLY CHANGES**.

Adding a Pedestrian Waiting Zone

Adding a pedestrian waiting zone detects when pedestrians are waiting to cross an intersection.

1. On the "Zone Setup" screen, click **ADD WAITING ZONE**.



2. Move the cursor to one of the corner markers, then click and drag to the desired location.
3. Repeat for each corner until the zone covers the waiting zone area.
4. If adding an additional waiting zone, repeat steps 1-3.
5. When complete, click **APPLY CHANGES**.

Assigning Conditions, Actions, and Overlays

Each zone will have conditions and actions associated with it in the following structure.

Zone 1
- Condition 1
  - Action 1
  - Action 2
- Condition 2
  - Action 1
  - Action 2

Zone X
- Condition 1
  - Action 1
  - Action 2
- Condition 2
  - Action 1
  - Action 2

The zone is the defined area of detection.

A condition defines the purpose of the zone. Currently, the conditions that can be assigned to a zone include:

- **Vehicle Presence:** the purpose of the one is to detect the presence of vehicles and bicycles when traveling in the direction of the zone. This includes, cars, trucks, buses, motorcycles, bicycles, etc. This condition is selected by default in the "Easy Setup" section.
- **Bicycle Presence:** the purpose of the zone is to detect and differentiate the presence of bicycles from other types of vehicles. When selected, a bicycle icon appears at the front of zone. This condition can be selected in either the "Easy Setup" or "Zones Explorer" sections.
- **Crossing Pedestrian:** provides a means of sending an output when a pedestrian crosses a certain area traveling a specific direction.
- **Pedestrian Presence:** the purpose of the zone is to detect the presence of pedestrians. The condition can be selected in the "Zones Explorer" section.
- **Pulse:** provides a means of sending an output when vehicles exit the zone.
- **Phase Color:** provides a means of sending an output for a defined phase state.
- **Presence with Phase:** the purpose of the zone is to detect the presence of vehicles during a selected phase.
- **Snappy:** provides a presence output during RED, and a pulse output during GREEN.

- **Speed:** provides a means of sending an output when the average speed of specified sample count is outside the defined limit.
- **Stopped Vehicle:** provides a means of sending an output when a vehicle is stopped in a zone.

An action defines what the system is to do when a condition is activated. Currently, the actions that can be defined include:

- **Display zone:** on the video, the zone or bicycle icon is outlined in the selected colors. One color indicates when the condition is active, and a second color indicates when the condition is not active. Only one Display zone action can be associated with a condition.
- **Set output:** the selected output is sent to the controller when detection takes place. On power up or when Apply Settings is activated, all assigned outputs are set to "call" (ON), and stay in "call" until detection sets the output OFF or for a maximum of five minutes, whichever occurs first. The initial state of an output can be changed in the "Actions Explorer" section.

IMPORTANT: Caution should be used when setting the initial state to OFF, as this is a system failsafe option (see "Failsafe Operations" on page 6-30). Setting the initial state to OFF should only be used for zones that are not responsible for placing calls at the stopline (i.e., zones that will not leave vehicles stranded during sensor or system start up).

If more than one output is to be associated with a condition, the "Zones Explorer" section must be used. If no output is to be associated with a condition, it must be removed in either the "Zones Explorer" or "Actions Explorer" section. If the same output is assigned to multiple conditions, it can be set to a logical AND/OR operation in Actions Explorer (the default is OR).

An overlay is something that can be defined to appear on the video image. This includes the outline of the zone, condition LEDs, output LEDs and/or user-defined text and/or a phase label that can be added to the image.

The Show Video Overlay check box is used to display overlays only when video is playing. The Show Setup Controls check box is used to display overlays on the "Zone Setup" screen for both static images and video.

The types of overlays that can be added to a video image are:

- **Zone Outline:** this overlay shows the lines that define the zone.
- **Output LED:** added from the "Actions Explorer" section, this overlay provides an LED icon for the selected output. The LED changes intensity when the associated condition is activated.
- **Condition LED:** added from the "Actions Explorer" section, this overlay provides an LED icon for the selected condition (vehicle and bicycle presence). The LED changes intensity when the condition is activated.

- **Device Name**: added from the "Video Overlays" section, this overlay displays the name of the camera on the video image.
- **System Time:** added from the "Video Overlays" section, this overlay displays the current date and time on the video image.
- **Firmware Version:** added from the "Video Overlays" section, this overlay displays the firmware version of the camera on the video image.
- **Active Config:** added from the "Video Overlays" section, this overlay displays the current active Config Management configuration on the video image.
- **Static Text:** added from the "Video Overlays" section, this overlay displays user-defined text on the video image.
- **Phase Label:** added from the"Video Overlays" section, this overlay displays a signal head label to show the phase color information on the video image.
- **FYA Phase Label:** added from the "Video Overlays" section, this overlay provides an icon of a yellow arrow on the video image.
- **Walk Indication:** added from the"Video Overlays" section, this overlay provide an icon of a pedestrian on the video image.

There are four sections in the Conditions, Actions, and Overlays panel: "Easy Setup", "Zones Explorer", "Actions Explorer", and "Video Overlays".

Easy Setup

The Easy Setup section provides a quick way to set conditions and corresponding actions for each zone. When a zone is added to the configuration, the vehicle presence condition is automatically selected. The display action is set to green when a vehicle is detected and gray when no vehicle is present in the zone.

When using the Easy Setup you must select an output that is to be sent to the controller when vehicle/bicycle/pedestrian detection takes place.

NOTE: If an output is not be associated with a condition, either the "Zones Explorer" or "Actions Explorer" section must be used instead of Easy Setup.

To set conditions and actions using Easy Setup, do the following.

1. Select a zone, either in the image or by clicking the zone description in the Easy Setup section.

NOTE: A presence condition is automatically selected for each defined zone.

2. To assign the Bicycle Presence condition to the zone, select the **Bicycle** check box.

   A bicycle icon appears in the lane.

3. To define what color the zone/bicycle icon is to be outlined in on the video, click a color block and select a color. Click elsewhere on the screen to close the color selection pop-up.

   The first block defines the display color when a vehicle/bicycle, pedestrian is detected (present in the zone) and the second block defines the color when the zone is empty (no detection).

NOTE: It is recommended that red not be used, as this is the color used by the system to indicate when the camera is in failsafe (see "Failsafe Operations" on page 6-30).

4. In the field to the right of the color blocks, select the output that will be sent to the controller when detection takes place.

   NOTE:

   - If the output selections do not appear when the box is clicked, deselect then reselect the condition check box.
   - An output must be selected for each active condition. If an output is not to be associated with a condition or if more than one output is to be associated with a condition, either the "Zones Explorer" or "Actions Explorer" section must be used instead of Easy Setup. Multiple outputs for a single condition do not appear on the Easy Setup screen.
   - To change the initial state of the output or to set the output options, use the "Actions Explorer".

5. To change the zone description, highlight it and type a new description. For additional information about changing descriptions, see Changing Zone, Conditions, and Actions Descriptions on page 5-62.
6. When all conditions and actions have been defined, click **APPLY CHANGES**.

   All assigned outputs are set to "call" (ON), and stay in "call" until detection sets the output OFF or for a maximum of five minutes, whichever occurs first.

NOTE: After all zones are defined and configured, it is recommended that the configuration be archived (see "Save Archive" on page 6-7).

Zones Explorer

The Zone Explorer section provides greater control than the Easy Setup over the assignment of conditions and actions. Use this section to do the following.

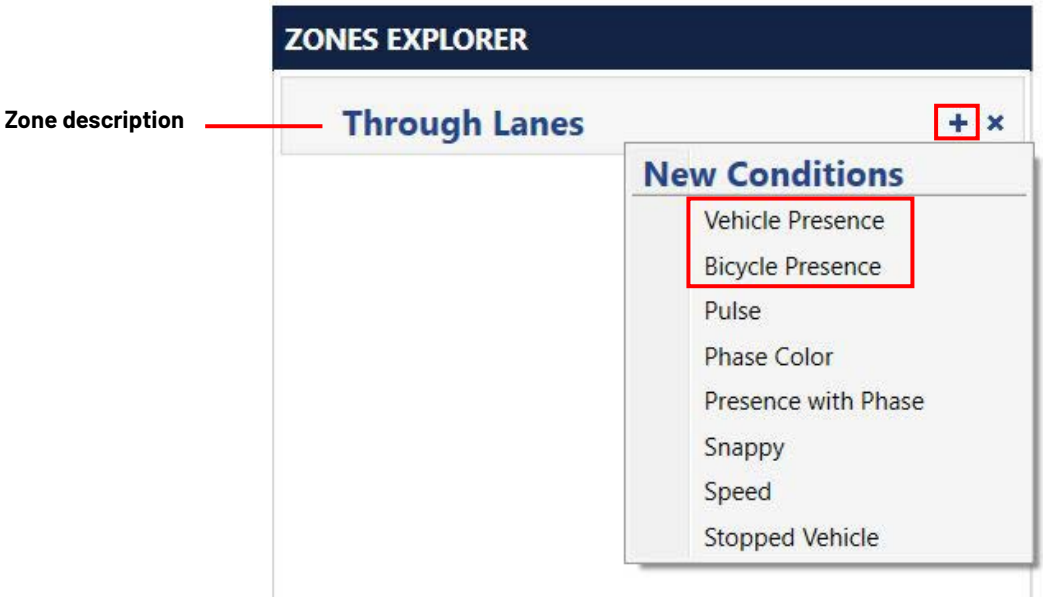
- Assign zone conditions for Vehicle or Bicycle Presence if not already assigned in the Easy Setup section.
- Assign zone conditions for Presence during a specified phase.
- Set a delay for Vehicle or Pedestrian Presence.
- Assign zone conditions for Pulse, Phase Color, Presence with Phase, Snappy, Speed, and Stopped Vehicle.
- Assign zone condition for Pedestrian Crossing Rule in a Crosswalk Zone.
- Assign more than one Set Output action to a single condition.
- Remove Set Output actions from a condition.
- Remove the Display Zone action from a condition.

NOTE: A single zone covering multiple lanes is not recommended when using Pulse or Snappy output.

Assigning Vehicle or Bicycle Presence Condition

To use the Zones Explorer to assign Vehicle and/or Bicycle Presence conditions and actions not already assigned in the Easy Setup section, do the following.

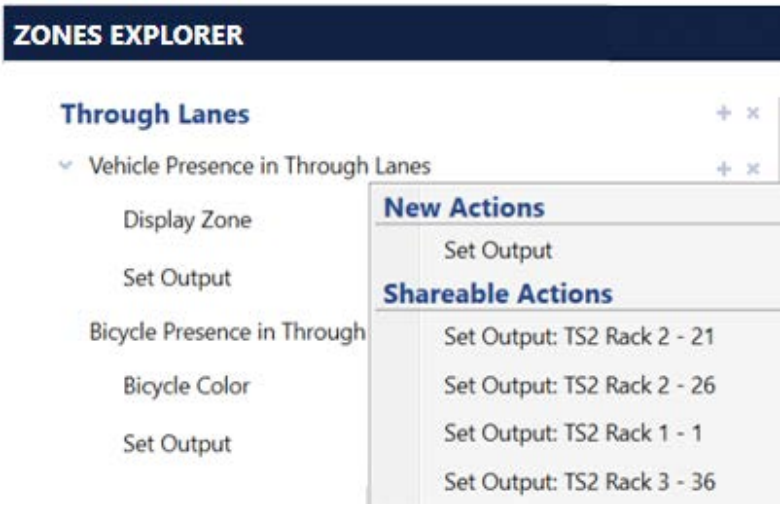
1. Click the Zones Explorer heading to expand the section.



2. To the right of the zone description, click the plus sign and select the presence condition (Vehicle or Bicycle) to be added.

   A Set Output action is automatically added to the presence condition.

   NOTE: If adding a Bicycle Presence condition, a bicycle icon appears in the lane.



3. To add actions (Set Output, and/or Display Zone or Bicycle Color), select the condition, click the plus sign (+) then select the action to be added.

   Select from the following options:

   - **Set Output** - adds another output action to the condition in both the Zones Explorer and Actions Explorer. Select the output from the drop-down.

     NOTE: Assigning the same output to more than one condition produces, by default, a logical OR operation in the Actions Explorer.

   - **Display Zone** - (only appears for vehicle presence) adds a display action if one does not exist for the condition. This action is used to define what color the zone is to be outlined in on the video when the presence condition is detected.

     NOTE: It is recommended that red not be used, as this is the color used by the system to indicate when the camera is in failsafe.

   - **Bicycle Color** - (only appears for bicycle presence) adds a bicycle color action if one does not exist for the condition. This action is used to define what color the bicycle icon is to be outlined in on the video when the presence condition is detected.
   - **Shareable Actions** - adds an output action that is already used by another condition. Select the output to be shared.

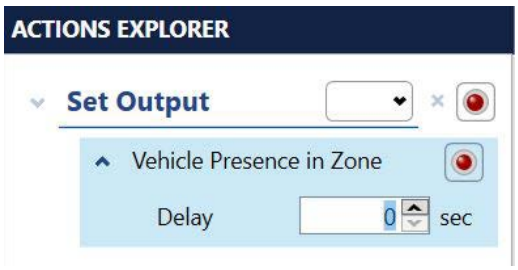
4. To change the zone description, condition or action, highlight it and type a new description. For additional information about changing descriptions, see "Changing Zone, Condition, and Action Descriptions" on page 5-62.

5. Do you want to delay the activation of a Vehicle Presence condition?

Yes	No
Continue with the next step.	Proceed to Step 9.

One use of this function is for right turn zones that share an output with a through zone. For example, a right turn lane could have a delay in case a car that is making a right turn can turn right away and does not need to wait for a green light. If there is not a car waiting in the through lanes, and the right-turning vehicle clears the zone before the delay, there is no call to the controller.

6. Click the drop-down indicator to the left of Vehicle Presence.



7. Select or enter the number of seconds to delay.
8. To collapse the options box, click the arrow to the left of Vehicle Presence.
9. When all conditions and actions have been defined, click **APPLY CHANGES**.

   All assigned outputs are set to "call" (ON), and stay in "call" until detection sets the output OFF or for a maximum of five minutes, whichever occurs first.

   To change the initial state of the output or to set the output options, use the "Actions Explorer".

NOTE: After all zones are defined and configured, it is recommended that the configuration be archived (see "Save Archive" on page 6-7).

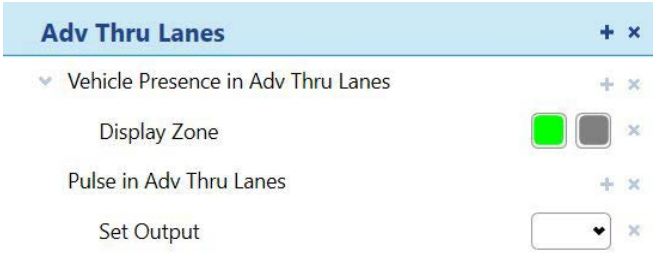
Assigning a Pulse Condition

The Pulse condition is used to send an output to the controller every time a vehicle exits the defined zone. In a system that utilizes a gap timer to extend on green, the activated (pulsed) output would reset the timer. In a system that utilizes counts, each exiting vehicle causes a pulse. A typical use would be in an Advance zone to determine whether the green phase should be extended.

NOTE: A single zone covering multiple lanes is not recommended when using Pulse outputs.

1. In the Zones Explorer section, click the plus sign (+) to the right of the zone description and select **Pulse**.

A Set Output action is automatically added to the Pulse condition.



2. Use the drop-down menu to select an output to be sent to the controller every time a vehicle exits the zone.

   To change the initial state of the output or to set the output options, use the "Actions Explorer".

3. When all conditions and actions have been defined, click **APPLY CHANGES**.

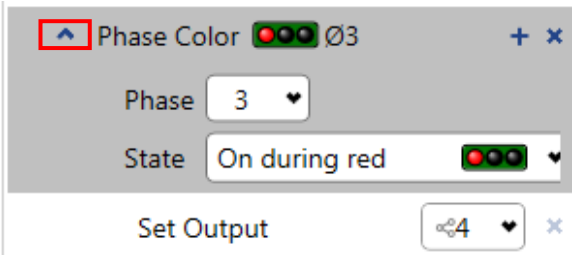
Assigning a Phase Color

The Phase Color condition is used to set an output according to the state of a Color Condition particular phase. The Phase Color condition would normally be used in conjunction with a Presence condition having the same output. A typical scenario would be a left turn lane with two zones in order to detect more than two vehicles in the lane. In the Actions Explorer section, the presence outputs from the two zones could be added with the output from the Phase Color condition for left turn signal operation.

1. In the Zone Explorer section, click the plus sign (+) to the right of the zone description and select **Phase Color**.

   A Set Output action is automatically added to the Phase Color condition.

2. Click the drop-down indicator to the left of Phase Color.



3. Use the drop-down menu to select the Phase this condition is associated with.
4. For State, click the drop-down menu to select the state associated with the phase.
5. Use the drop-down menu to select an output to be sent to the controller when the Phase Color condition is met.

   To change the initial state of the output or to set the output options, use the "Actions Explorer".

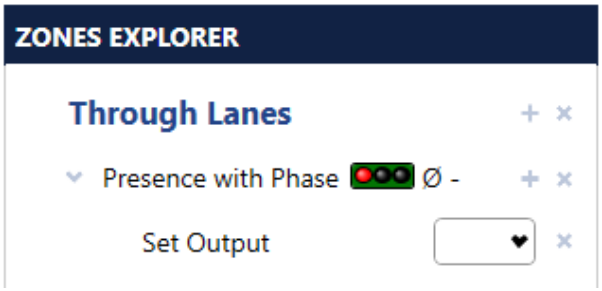
6. When all conditions and actions have been defined, click **APPLY CHANGES**.

Assigning a Presence with Phase Condition

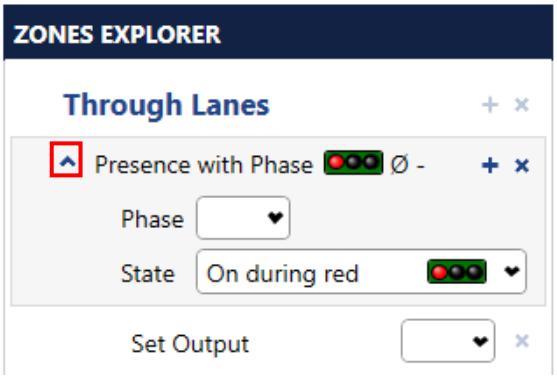
The Presence with Phase condition is used to add a Vehicle presence with a Presence with phase as a single condition.

1. In the Zones Explorer section, click the plus sign (+) to the right of the zone description and select **Presence with Phase**.

A Set Output action is automatically added to the condition.



2. Click the drop-down indicator to the left of Presence with Phase.



3. Use the drop-down menu to select the Phase this condition is associated with.
4. For State, click the drop-down menu to select the state associated with the phase.
5. Use the drop-down menu to select an output to be sent to the controller when the Presence with Phase condition is met.

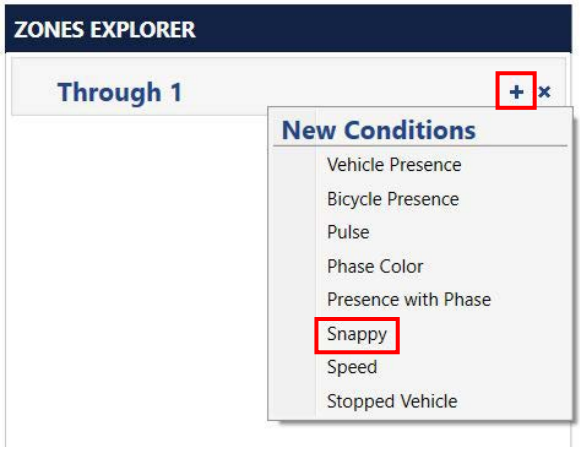
   To change the initial state of the output or to set the output options, use the "Actions Explorer".
6. When all conditions and actions have been defined, click **APPLY CHANGES**.

Assigning a Snappy Condition

The Snappy condition is used to set an output that will be sent to the controller when vehicles are present in the zone during the red phase and then again when each vehicle exits the zone.

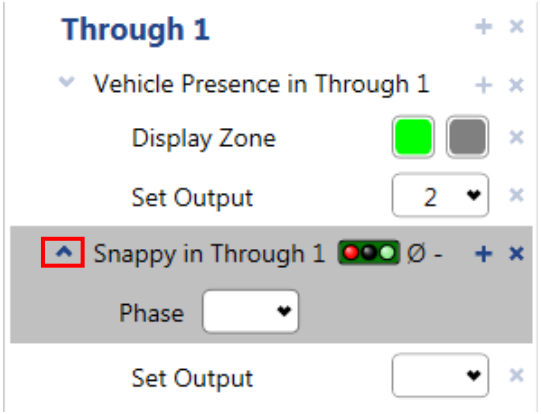
NOTE: A single zone covering multiple lanes is not recommended when using Snappy outputs.

1. In the Zones Explorer section, click the plus sign (+) to the right of the zone description and select Snappy.



   A Set Output action is automatically added to the Snappy condition.

2. Click the drop-down indicator to the left of Snappy.



3. Use the drop-down menu to select the Phase this condition is associated with.
4. Use the drop-down menus to select an output to be sent to the controller when the Snappy condition is met.

   To change the initial state of the output or to set the output options, use the "Actions Explorer".

5. When all conditions and actions have been defined, click **APPLY CHANGES**.

Assigning a Speed Condition

The Speed condition is used to trigger an output, based on the average vehicle speed for the specified sample count. A zone with this type of condition would normally be set upstream from an intersection. The output could be set to activate a sign or hold a phase at an intersection.

Example 1: Sign Activation

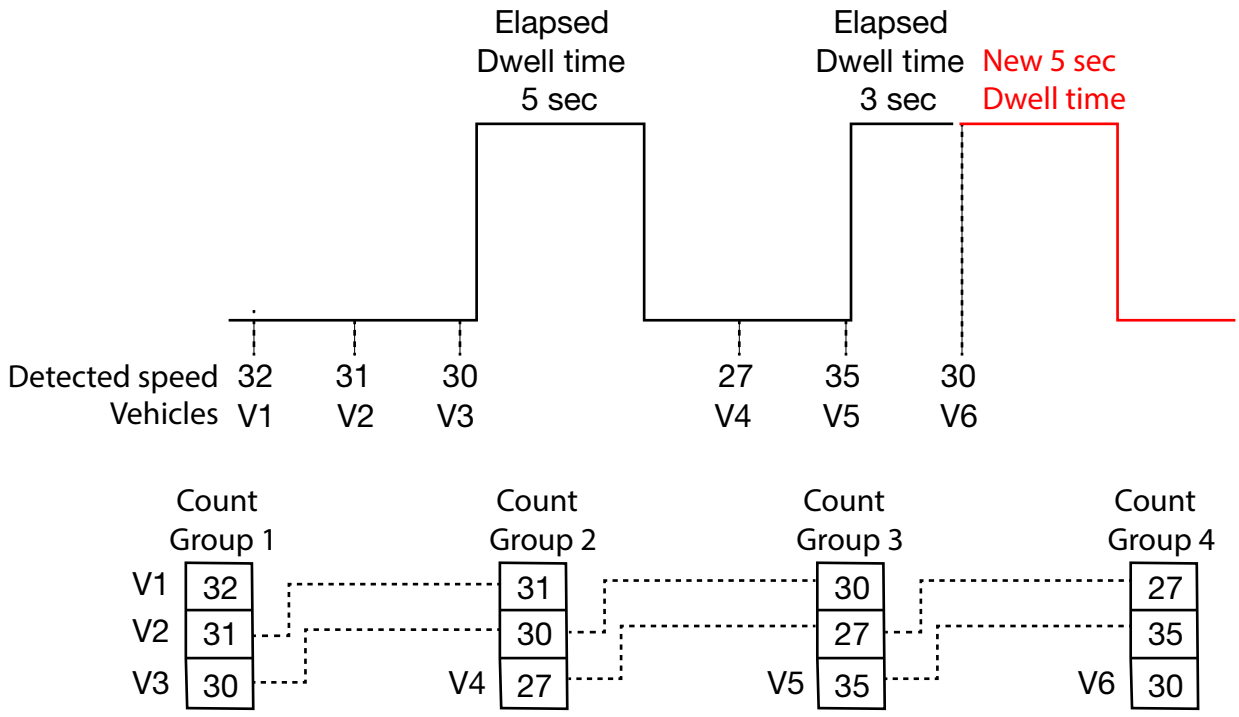
Set the condition so that if the detected traffic speed is less than the defined threshold speed, a sign placed upstream from the zone could be activated to indicate a slow traffic condition ahead. Or, if the detected speed is greater than the threshold speed, a sign could be activated to instruct the driver to slow down.

Example 2: Hold Phase at Intersection

If traffic travels at a speed that might make it impossible to stop in time for the phase change, an output could be sent to signal the controller to hold the phase to allow time for the vehicle to get through the zone safely.

When setting up the Speed condition, the sample count and dwell time determine when the condition is activated (ON) and deactivated (OFF). The following show the ON/OFF sequence when:

Threshold = Greater than; Speed = 30; Dwell = 5 seconds; Sample count = 3



In the graphic above, Count Group 1 is created after the first three vehicles are detected (Count=). The average speed of the group is greater than 30(Speed=)

causing the condition to activate (turn ON) and remain active for a period of five seconds (Dwell=) before turning OFF.

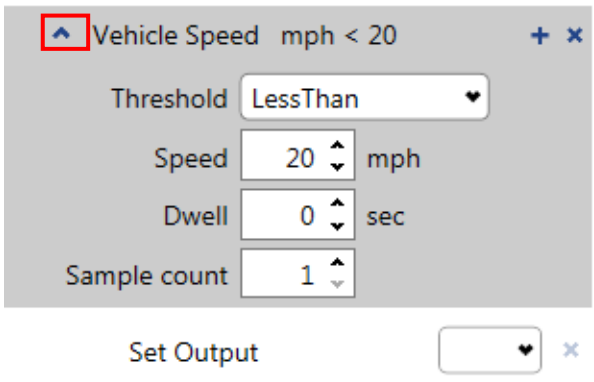
Count Group 2 is created when vehicle V4 is detected after the dwell time expired. The speed of vehicle V1 (32) from Group 1 is dropped and the speed of vehicle V4 (27) is added, creating an average that is not greater than the set limit, so the condition remains inactive (stays OFF).

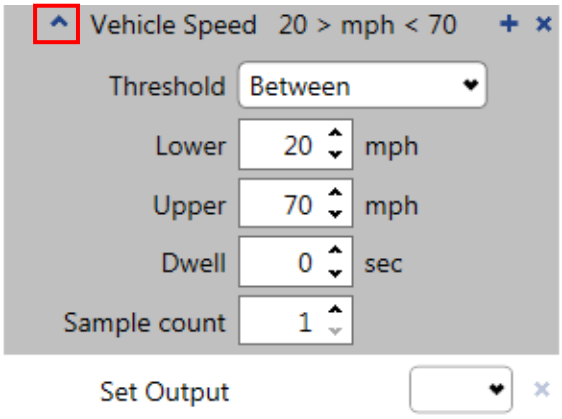
Count Group 3 is created when vehicle V5 is detected. The speed of the first vehicle from Group 2 (31) is dropped and the speed of vehicle V5 (35) is added, making the average above 30 and causing the condition to activate again. However, before the set dwell time expires, vehicle V6 is detected, creating Count Group 4, whose average is still above 30 causing the condition to remain ON and a new dwell period to begin.

To set up a Speed condition, do the following.

1. In the Zones Explorer section, click the plus sign (+) to the right of the zone description and select **Speed**.

2. Click the drop-down indicator to the left of Vehicle Speed.





3. Use the drop-down menu to select the **Threshold**.

- **Greater Than:** the condition is met when the detected speed is greater than the value for Speed.
- **Less Than:** the condition is met when the detected speed is less than the value for Speed.
- **Between:** the condition is met when the detected speed is between the values for Lower and Upper.
- **Outside:** the condition is met when the detected speed is less than the value for Lower or more than the value for Upper.

4. For **Speed**, select or enter the speed when the threshold is Greater Than or Less Than.

IMPORTANT: It is recommended that the defined speed NOT be the same as the posted speed limit, as this could result in false triggers.

5. For **Lower**, select or enter the lowest speed to be used when the Threshold is Between or Outside.
6. For **Upper**, select or enter the fastest speed to be used when the Threshold is Between or Outside.
7. For **Dwell**, select or enter the maximum number of seconds the condition is held active (ON) without a new vehicle being detected.

   At the end of the specified time, the condition will go inactive (OFF). If another vehicle is detected before the dwell time expires, a new count average is calculated. If the new average drops below the set speed, the dwell period continues to its expiration. If, however, the new average keeps the condition active, the old period ceases and new dwell period begins.

   Example: Speed=30, Dwell=10

   If the condition is active and a new vehicle is detected that brings the average below 30, the dwell period continues to the end of the 10 seconds.

   If the new vehicle is detected 3 seconds into the 10 second dwell time and it keeps the average above 30, the current dwell time stops and a new 10 second dwell time begins.

8. For **Sample count**, select or enter the number of vehicles to be used in sampling for an average speed.

   NOTE: a sample count of one (1) does not use averaging.

9. Use the drop-down menu to select an output to be sent to the controller when the Speed condition is met.

   To change the initial state of the output or to set the output options, use the "Actions Explorer".

10. When all conditions and actions have been defined, click **APPLY CHANGES**.

Assigning a Stopped Vehicle Condition

The Stopped Vehicle condition is used to send an output when a vehicle is stopped in a zone.

1. In the Zones Explorer section, click the plus sign (+) to the right of the zone description and select **Stopped Vehicle**.

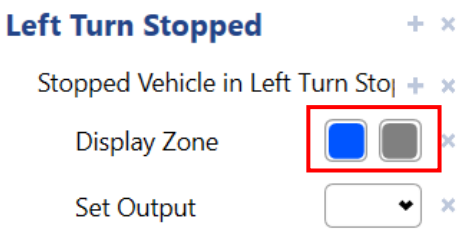
   A Set Output action is automatically added to the Stopped Vehicle condition.

2. Click the plus sign (+) to the right of the Stopped Vehicle condition to add a new action.

   A display zone action can be added to the zone, which will change the color of the zone when a vehicle is stopped.

   NOTE: If a display zone is used, it is best to delete the default vehicle presence condition or at least the display zone action assigned to the presence condition to ensure the presence display does not cover the stopped display.

3. To change the color of the display zone, click on each color and select the desired option.



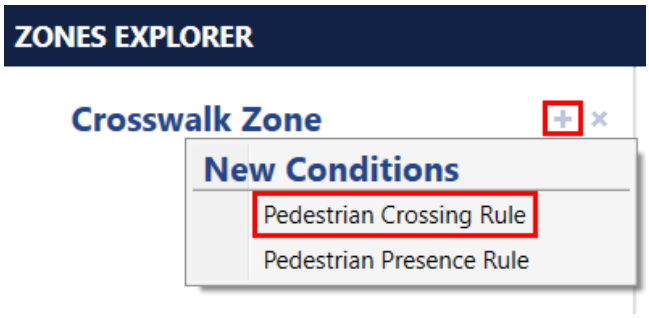
4. When all conditions and actions have been defined, click **APPLY CHANGES**.

Assigning a Pedestrian Crossing Rule

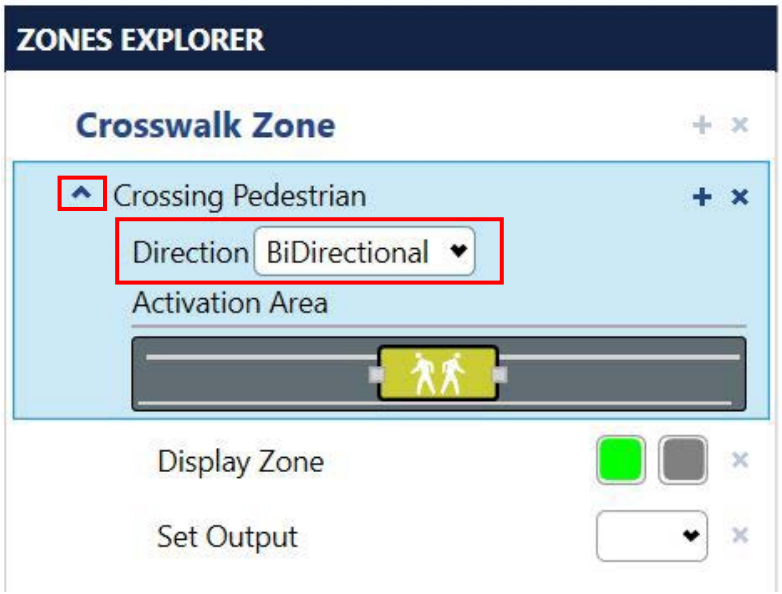
The Pedestrian Crossing Rule is used to define segment(s) in the crosswalk zone and to send an output.

NOTE: Multiple Pedestrian Crossing Rules can be added.

1. When a crosswalk zone has been added, in the Zones Explorer section, click the plus sign (+) to the right of the zone description and select **Pedestrian Crossing Rule**.



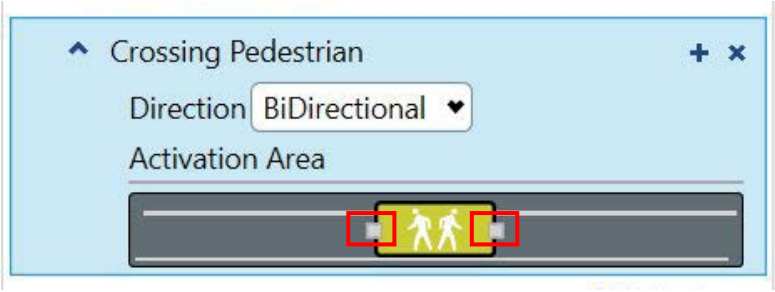
2. Click the drop-down menu to define where a pedestrian is in the crosswalk zone and to select the direction of the crossing pedestrian. (Bi-Directional, A to B, or B to A).



NOTE: The yellow pedestrian icon will change depending on which direction is selected.

3. To change the placement of the activation area, select the yellow pedestrian icon and drag to the desired location.

4. To change the size of the activation area, select the box on either side of the yellow pedestrian icon and drag left or right to increase or decrease the size.

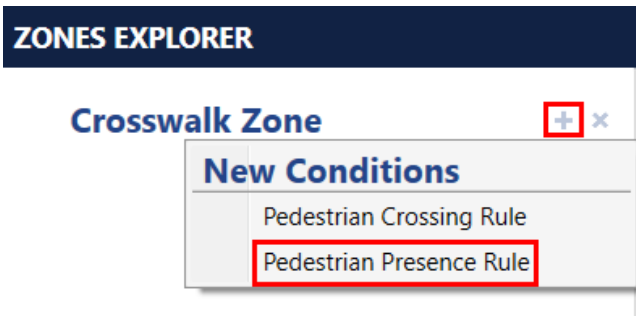


5. In the Set Output field, select the output that will be sent to the controller when detection takes place.
6. To add additional pedestrian crossing rules, repeat steps 1-5.
7. When all conditions and actions have been defined, click **APPLY CHANGES**.

Assigning a Pedestrian Presence Rule

The Pedestrian Presence Rule is used to detect when a pedestrian is present in the crosswalk or a waiting zone.

1. In the Zones Explorer section, click the plus sign (+) to the right of the zone description and select **Pedestrian Presence Rule**.

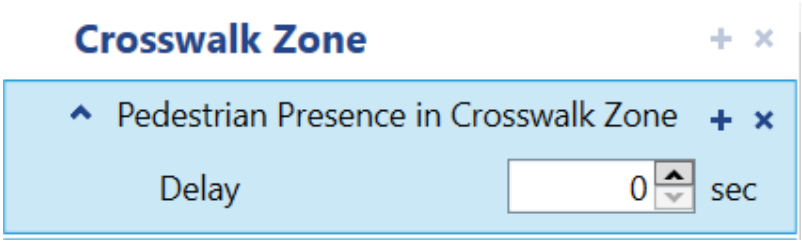


2. To define what color the display zone is to be outlined in on the video, click a color block and select a color. Click elsewhere on the screen to close the color selection pop-up.

   The first block defines the display color when a pedestrian is detected (present in the zone) and the second block defines the color when the zone is empty (no detection).

   NOTE: It is recommended that red not be used, as this is the color used by the system to indicate when the camera is in failsafe (see "Failsafe Operations" on page 6-30).

3. Select or enter the number of seconds to delay. The value can be between 0 and 120 seconds. Default is 0.



4. In the Set Output field, select the output that will be sent to the controller when detection takes place.
5. When all conditions and actions have been defined, click **APPLY CHANGES**.

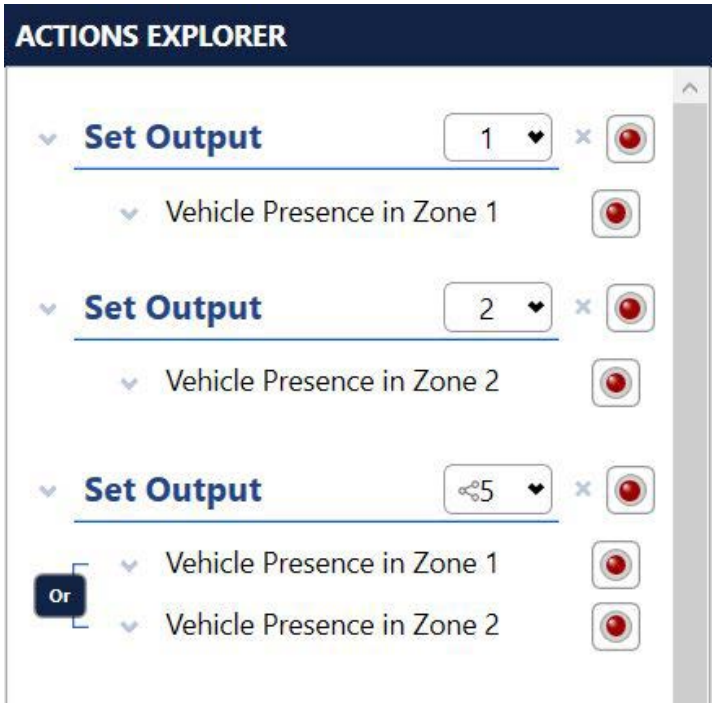
Actions Explorer

The Actions Explorer section is used to:

- View, by output, which conditions/zones an output is assigned to.
- Set the AND/OR logic for conditions with the same output.
- Remove Set Output actions from a condition.
- Assign phase inputs.
- Change the initial state (ON/OFF) of a pulse output.
- Enable output options for the Recall, Extend On Green, and Delay On Red features.
- Set a delay for vehicle presence.
- Add a digital LED overlay for output and/or presence conditions on the video. The LED indicator associated with the overlay will light up when the output or condition is activated.

To use the Actions Explorer, do the following.

1. Click the **Actions Explorer** heading to expand the section.

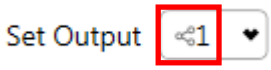


2. To change the description of an output or condition, highlight it and type a new description. For additional information about changing descriptions, see "Changing Zone, Condition, and Action Descriptions" on page 5-62.

   To change the output assigned to a zone/condition combination, select the output then use the drop-down menu to select the new output.

   NOTE: Outputs that cannot be shared do not appear in the list.

If a symbol appears to the left of the number, it indicates that the output is assigned to more than one set output action.



Changing the output changes it for all conditions that use the output.

By default, outputs with multiple conditions are set to a logical OR operation. To change the operation to a different setting, click on it (click on Or to change to And and vice versa).

NOTE:

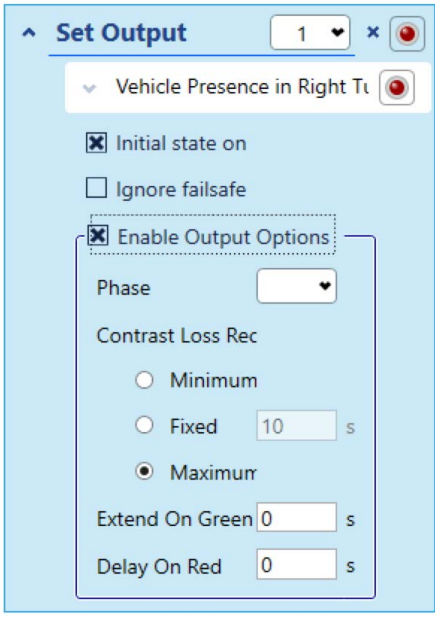
- To assign Phase inputs, set Recall, Extend On Green, and Delay On Red options or change the initial state of the output for a Vehicle Presence, Bicycle Presence, Phase Color and/or Speed condition, see Step 3.
- To add a delay when two or more vehicle presence zones share an output, see Step 13.
- To change the pulse width for Pulse or Snappy conditions, see Step 17.

3. For a Vehicle Presence, Bicycle Presence, Phase Color and/or Speed condition, do you want to assign inputs, set Recall, Extend On Green, and Delay On Red options or change the initial state of the output?

Yes	No
Continue with the next step.	Proceed to Step 13.

4. To display the output options click the drop-down indicator to the left of Set Output.

   The following appears.



5. To change the initial state of the output from ON to OFF, uncheck the **Initial state on** check box.

IMPORTANT: Caution should be used when setting the initial state to OFF, as this is a system failsafe option (see "Failsafe Operations" on page 6-30). Setting the initial state to OFF should only be used for zones that are not responsible for placing calls at the stopline (i.e., zones that will not leave vehicles stranded during sensor or system start up).

6. To have an output ignore failsafe, check the **Ignore failsafe** check box. Outputs will still be active if detection occurs and the system is in failsafe, but detection will likely not be accurate, so neither will the outputs.

IMPORTANT: Do not check ignore failsafe on stop bar zones. The ignore failsafe feature should only be used on non-safety critical outputs.

7. To set or change any of the options, select the **Enable Output Options** check box.
8. Use the drop-down menu to select the **Phase** to be monitored for Contrast Loss Recall, Extend On Green, and Delay On Red.
9. For Contrast Loss Recall operations, select the option to be used when scene contrast falls below the system defined level.

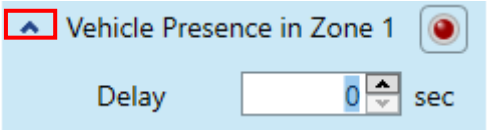
   If Fixed Recall is selected, enter a value between 1 and 240 seconds. The default is 10.

NOTE: The recall options only apply to behavior during contrast loss. For additional information, see "Recall Function" on page 6-28.

10. For **Extend On Green**, enter a value between 0 and 120 seconds. Default is 0. For additional information, see "Extend On Green" on page 6-28.
11. For **Delay On Red**, enter a value between 0 and 120 seconds. Default is 0. For additional information, see "Delay On Red" on page 6-28.
12. To collapse the output options box, click the arrow to the left of Set Output. Any changes made are retained when the box is collapsed.
13. Do you want to delay the activation of a Vehicle Presence condition?

Yes	No
Continue with the next step.	Proceed to Step 17.

14. Click the drop-down indicator to the left of Vehicle Presence.



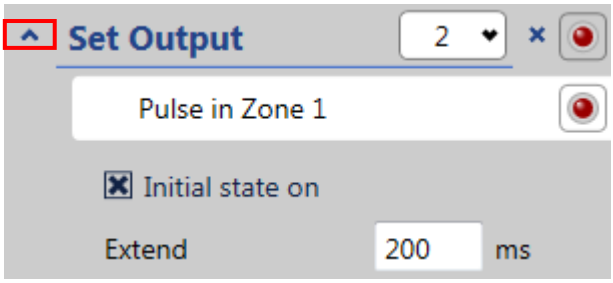
15. Select or enter the number of seconds or tenth of a second to delay.
16. To collapse the options box, click the arrow to the left of Vehicle Presence.

17. For Pulse or Snappy conditions, do you want to change the pulse width from the default of 200 ms or the initial state of the output?

Yes	No
Continue with the next step.	Proceed to Step 23.

18. Click the drop-down indicator to the left of Set Output.

    The following appears.

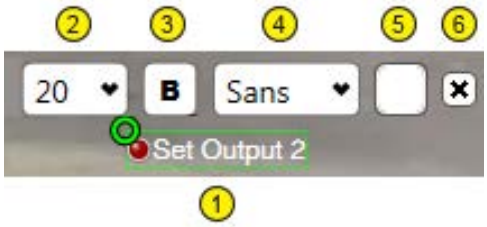


19. To change the initial state of the output from ON to OFF, uncheck the **Initial state on** check box.
20. For **Extend**, enter a value between 200 and 400 milliseconds.
21. To collapse the output options box, click the arrow to the left of Set Output.
22. To add an output and/or presence LED overlay on the video, click the red button on the right side.
23. To display the overlay, select one or both of the following.

    NOTE: Both are selected by default.

    - **Show Video Overlay:** the icon and overlay text will appear on the image when video is played.
    - **Show Setup Controls:** the icon and overlay text will appear on the static image.

24. To change the text and appearance of the overlay, click on it.



Item	Description
1	Highlight the text and type what is to be displayed. Any number of alphanumeric and special characters can be entered. To move the overlay grab the green circle and place the overlay anywhere on the image.
2	Select the size of the font in which the text is to be displayed. The default is 20 point.
3	Select if the text is to be displayed in bold type.
4	Select the font family. • Sans (default): the typeface does not use serifs, small lines at the end of the characters. • Serif: the typeface uses small lines at the ends of the characters.
5	Click to select the color the text is to be displayed. The default is white.
6	Click to remove the overlay from the image.

25. If any changes are made, click **APPLY CHANGES**.

    All assigned outputs are set to "call" (ON), and stay in "call" until detection sets the output OFF or for a maximum of five minutes, whichever occurs first. After all zones are defined and configured, it is recommended that the configuration be archived (see "Save Archive" on page 6-7).

Video Overlays

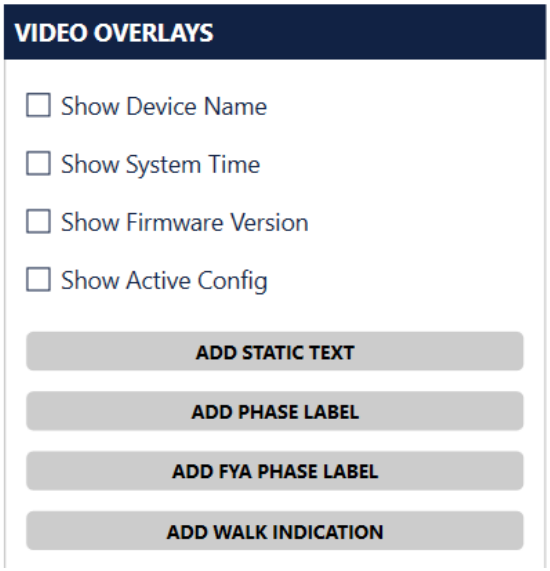
Video Overlays are supplemental text that can be added to the video image. The types of overlays that can be added are:

- Device Name: adds the name of the camera to the video display.
- System Time: adds the current date and time to the video display.
- Firmware Version: adds the version of the firmware installed on the camera to the video display.
- Active Config: adds the currently active Config Management configuration to the video display.
- Static Text: adds user-defined text to the video display.
- Phase label: adds a signal head label to show the phase color information on the video image.
- FYA Phase Label: adds an icon of a yellow arrow to the video display.
- Walk Indication: adds a walk signal indicator to the video display.

NOTE: For more information, see "Signal Head Label Overlays" on page 6-29.

To add overlays to the video display, do the following.

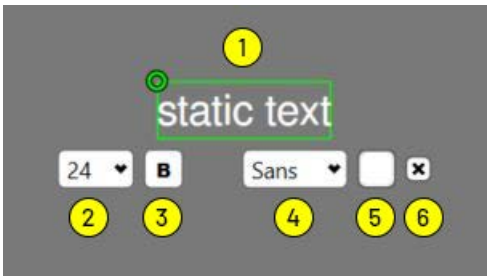
1. Click the **VIDEO OVERLAYS** heading.



2. To add the standard overlays, select the check box.
3. To display the overlays, select one or both of the following.
   - **Show Video Overlay:** the icon and overlay text will appear on the image when video is played.
   - **Show Setup Controls:** the icon and overlay text will appear on the static image.

4. To add a user-defined overlay, click **ADD STATIC TEXT**.

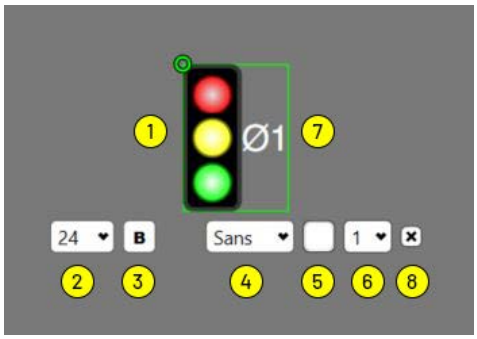
   Overlay text appears on the image. To change the text and appearance of any of the overlays, click on it.



Item	Description
1	The text of the overlay. To change the static text, highlight the text and type what is to be displayed. Any number of alphanumeric and special characters can be entered. To move the overlay, grab the green circle and place the overlay anywhere on the image.
2	Select the size of the font in which the text is to be displayed. Default sizes are: • 44 point: Device Name • 30 point: System Time • 24 point: Static Text • 30 Point: Firmware Version
3	Select if the text is to be displayed in bold type.
4	Select the font family. • Sans (default): the typeface does not use serifs, small lines at the ends of the characters. • Serif: the typeface uses small lines at the ends of the characters.
5	Click to select the color the text is to be displayed. The default is white.
6	Click to remove the overlay from the image.

5. To add a signal head label, click **ADD PHASE LABEL**.

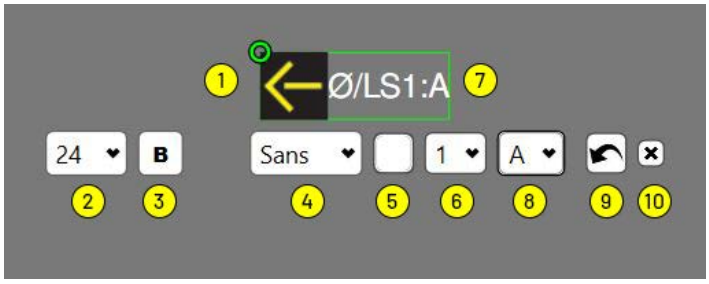
   A signal head label appears on the image. To change the text and appearance of any of the overlays, click on it.



Item	Description
1	The signal head label. To move the overlay, grab the green circle and place the overlay anywhere on the image.
2	Select the size of the font in which the phase label text is to be displayed. Default is 24 point.
3	Select if the text is to be displayed in bold type.
4	Select the font family. • Sans (default): the typeface does not use serifs, small lines at the ends of the characters. • Serif: the typeface uses small lines at the ends of the characters.
5	Click to select the color the text is to be displayed. The default is white.
6	Select the phase/load switch associated with the label. When a phase is selected, the text area appears.
7	The text displays the selected phase for the signal head.
8	Click to remove the overlay from the image.

6. To add a flashing yellow arrow, click **ADD FYA PHASE LABEL**.

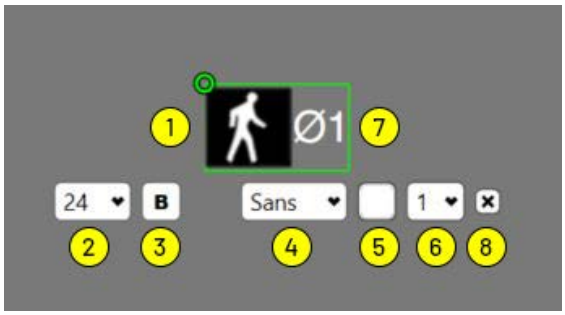
   A yellow arrow icon appears on the image. To change the text and appearance of any of the overlays, click on it.



Item	Description
1	The flashing yellow arrow icon. • Green arrow. • Yellow arrow. • Yellow flashing arrow. • Red arrow. To move the overlay, grab the green circle and place the overlay anywhere on the image.
2	Select the size of the font in which the phase label text is to be displayed. Default is 24 point.
3	Select if the text is to be displayed in bold type.
4	Select the font family. • Sans (default): the typeface does not use serifs, small lines at the ends of the characters. • Serif: the typeface uses small lines at the ends of the characters.
5	Click to select the color the text is to be displayed. The default is white.
6	Select the permissive phase/load switch associated with the label. When a phase is selected the text area appears.
7	The text displays the selected permissive phase and FYA mode.
8	Click to select the desired mode (A-L).
9	Click to change the orientation of the arrow.
10	Click to remove the overlay from the image.

7. To add a walk signal indicator, click **ADD WALK INDICATION**.

   A pedestrian icon appears on the image. To change the text and appearance of any of the overlays, click on it.



Item	Description
1	The walk indicator icon. The icon changes appearance as follows: • Green phase: icon is steady white walking person. • Yellow phase: icon is flashing orange hand. • Red phase: icon is steady orange hand. To move the overlay, grab the green circle and place the overlays anywhere on the image.
2	Select the size of the font in which the phase label text is to be displayed. Default is 24 point.
3	Select if the text is to be displayed in bold type.
4	Select the family. • Sans (default): the typeface does not use serifs, small lines at the ends of the characters. • Serif: the typeface uses small lines at the ends of the characters.
5	Click to select the color the text is to be displayed. The default is white.
6	Select the phase/load switch associated with the label. When a phase is selected, the text area appears.
7	The text displays the selected phase for the walk indicator.
8	Click to remove the overlay from the image.

8. If any changes are made, click **APPLY CHANGES**.

NOTE: After all zones are defined and configured, it is recommended that the configuration be archived (see "Save Archive" on page 6-7).

Changing Zone, Condition, and Action Descriptions

The descriptions of all zones, conditions, and actions can be changed by the user. To change any description, highlight it and type a new description. Any number of alphanumeric and special characters can be used; however the displayed string is limited to the size of the Supervisor screen. The results of description changes are dependent on the order in which changes are made.

Zone Descriptions

Zone descriptions can be changed in either the "Easy Setup", "Zones Explorer", or "Actions Explorer" sections. Change made in one section automatically appear in the other section. In addition, the zone description change also appears in the default condition description if the condition description has not been changed. The default descriptions are dependent on how the zone is created. If the zone is created by selecting Add Zone, the default description is "Zone." If the zone is created by selecting Zones From Calibration, the defaults are as follows.

Selection	Default Descriptions
No Turn Lanes	Through Lanes
Left Turn Lane	Through Lanes and Left Turn Lane
Right Turn Lane	Right Turn Lane and Through Lanes
Left and Right Turn Lanes	Right Turn Lane, Through Lanes, and Left Turn Lane
Preserve All Lanes	Zone 1, Zone 2, and Zone 3

Condition Descriptions

Condition description can be changed in the "Zones Explorer" and "Actions Explorer" sections. Changes made in one section automatically appear in the other section. The default descriptions for the two conditions are:

Vehicle Presence in xxx

Bicycle Presence in xxx

The xxx is the description of the zone to which the condition is associated. When using the default condition descriptions, if the zone description is changed, the condition description is automatically updated to reflect the change. However, if the condition description is changed first and then the zone description second, the condition description will not be updated with the new zone description.

Action Descriptions

The two default action descriptions are Display Zone and Set Output. The Display Zone description can only be changed in the "Zones Explorer". The Set Output action description can be changed in the "Zones Explorer" and "Actions Explorer" sections. Change made in one section automatically appear in the other section.

Removing Zones, Conditions, Actions, and Overlays

Zones

Removing a zone removes any conditions and actions assigned to the zone.

1. On the Zone Setup screen, select the zone.
2. Click **REMOVE ZONE** in the Commands section or the X to the right of the zone description in the Easy Setup, Zones Explorer, or Actions Explorer sections.
3. Click **APPLY CHANGES**.

Conditions

Removing a condition removes any actions/outputs associated with the condition.

1. Select the condition.
2. In the Easy Setup section, deselect the check box, or in the Zones Explorer or Actions Explorer sections, click the X to the right of the condition description.
3. Click **APPLY CHANGES**.

Display Actions

Display actions are automatically removed if the zone or condition associated with it is removed.

1. In the Zones Explorer or Actions Explorer sections, click the X to the right of the color blocks.
2. Click **APPLY CHANGES**.

Output Assignments

Output assignments are automatically removed if the zone or condition associated with it is remove.

1. In the Zones Explorer or Actions Explorer sections, click the X to the right of the assignment block.
2. Click **APPLY CHANGES**.

Video Overlays

1. For standard overlays, in the Video Overlays section, deselect the check box for the overlay or click the text on the video image, then click the X on the right side.
2. For LED overlays, click the LED symbol in the Actions Explorer or click the text on the video image, then click the X on the right side.
3. For static text overlays, click the text on the video image, then click the X on the right side.
4. Click **APPLY CHANGES**.

Clearing the Configuration

This operation clears (removes) the configuration set for a camera view. This includes all zone set up information and the camera calibration for the camera. To clear a configuration, do the following.

1. On the Device screen, in the Commands section click **CLEAR CONFIGURATION**.
2. When the pop up window appears, click **YES** to clear the configuration or **NO** to cancel the operation.

Chapter 6: Supervisor Operations

General

This chapter describes the operations that can be performed with the Supervisor software.

Supervisor Home Screen

The Home screen is displayed each time the Supervisor is started. This screen lists all of the OptiVu Processors that are within the same network segment as the Supervisor. This screen is also the starting point for configuring the OptiVu Processor and OptiVu Cameras.

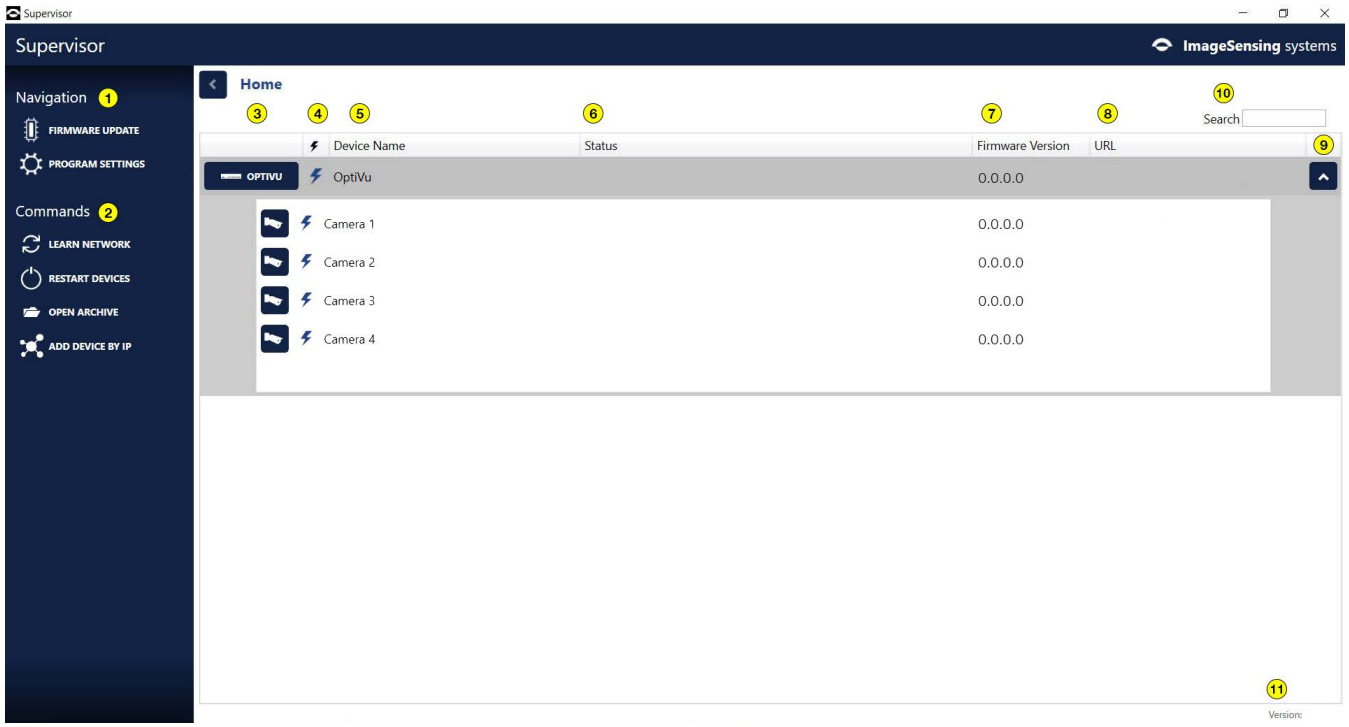


Figure 6-1: Home Screen

To sort the order of devices, click on a column heading to sort the devices according to the column information.

To select multiple devices, use the Shift and Ctrl keys. To select all devices, select any device then press Ctrl+A. To deselect a device, press the Ctrl key and click on the Device Name.

To remove a device from the list, right-click on it and select **Remove Device**.

NOTE: Only off-line devices can be removed in Supervisor. Devices that are shown as online cannot be removed.

Only the devices selected on the Home screen will appear in the Device Name list on the "Operations Log" and "Firmware Update" screens.

Table 6-1: Home Screen Descriptions

Item	Description
1	Navigation: links to other operational screens (see Table 6-2).
2	Commands: click to perform the specific operation (see Table 6-3).
3	Device type icon. Click to access the Device screen for the device.
4	Communication indicator. Sensor status is displayed as follows: Gray lightning bolt with red line: disconnected or is an archive file.  Blue lightning bolt with red line: connected and configured sensor is unhealthy. For example, the video stream is not available.  Blue lightning bold with black line: connected and unconfigured sensor.  Solid blue lightning bolt: connected and configured sensor is healthy.  If the processor's lightning bolt has a line through it, a camera underneath needs attention.
5	Name of the device as entered in the first User Description field on the Device Settings screen.
6	Status information about the device.
7	Firmware version currently installed in the device. For information on upgrading the firmware, see "Firmware Update" on page 6-19.
8	The URL from where the video stream is obtained.
9	Click to expand or collapse a display of the cameras associated with the OptiVu Processor.
10	Search field: Used to search for devices based on model, description, firmware version, device ID, etc. A maximum of 30 characters can be entered.
11	Version of the Supervisor software currently running on the computer.

Navigation

The Navigation section on a screen provides links to other screens from which certain operations can be performed. The following table lists all of the navigation links and the screen and device type for which the operations can be performed.

Table 6-2: Navigation Section

Navigation Link	Screen	Device
"Config Management"	Device	OptiVu Camera
"Device Info"	Device	OptiVu Processor, OptiVu Camera
Device Settings	Device	OptiVu Processor Setup, OptiVu Device Settings
"Firmware Update"	Home, Device	OptiVu Processor, OptiVu Camera
"Operations Log"	Device	OptiVu Processor, OptiVu Camera
"Outputs, Phases, Failsafe, and All Call for OptiVu Devices"	Home, Device	OptiVu Processor, OptiVu Camera
"Program Settings"	Home	N/A

Commands

The Commands section on a screen lists the executable operations that can be performed from that screen. The following table lists all of the commands that can be initiated and the screens on which they appear.

Table 6-3: Commands Section

Command	Can Be Initiated From
"Add Device by IP"	Home screen (see page 6-1)
Add Lane	Camera Calibration screen (see page 5-16)
Add Zone	Zone Setup screen (see page 5-18)
"Adding Receding Traffic Zones"	Zone Setup screen (see page 5-29)
"Adding a Pedestrian Waiting Zone"	Zone Setup screen (see page 5-32)
Apply Changes	Device Settings, Notification Settings, Camera Setup, Camera Calibration, and Zone Setup screens
Cancel Install	Firmware Update screen (see page 6-19)
Clear Configuration	Device screen (see page 5-4)
"Download Log"	Operations screen (see page 6-22)
"Learn Network"	Home screen (see page 6-1)
Open	Firmware Update screen (see page 6-19)
"Open Archive"	Home screen (see page 6-1)
Redo	Camera Calibration (see page 5-16) and Zone Setup screens (see page 5-18)
Remove Lane	Camera Calibration screen (see page 5-16)
Remove Zone	Zone Setup screen (see page 5-18)
"Restart Device"	Device screen (see page 5-7 and page 5-11)
Restart Devices	Home screen (see page 6-1)
"Restore Archive"	Device scree (see page page 5-7 and page 5-11)
"Retrieve Log"	Operations Log screen (see page 6-22)
"Save Archive"	Device screen (see page 5-7 and page 5-11)
"Set Time"	Home and Device screens (see page 6-1, page 5-7, and page 5-11)
Start Install	Firmware Update screen (see page 6-19)

Table 6-3: Commands Section (Continued)

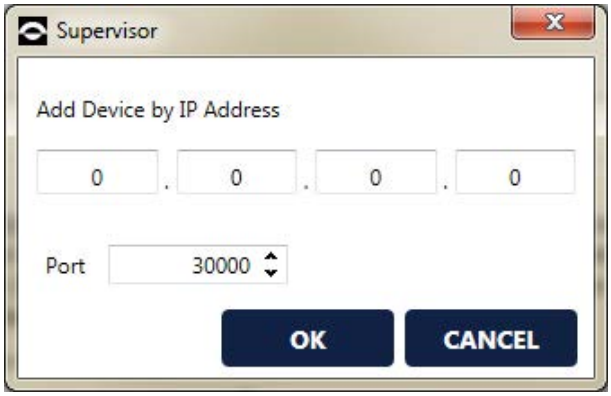
Command	Can Be Initiated From
Undo	Camera Calibration (see page 5-16) and Zone Setup screens (see page 5-18)
USB Video Recording	Device screen (see page 5-4 and page 6-35)

Add Device by IP

When reaching a device through a router network, that router may prevent the normal discovery of the Device. To help Supervisor *find* a device you can directly add in its IP address. This operation is initiated from the Home screen and is used to add to the device list, an OptiVu Processor that is connected to a routed network. All active OptiVu Cameras that are connected to the OptiVu Processor are also added to the device list.

1. On the Home screen, click **ADD DEVICE BY IP**.

   The following appears.



2. Enter the network IP address of the WAN port for the OptiVu Processor to be added to the device list.

   NOTE: The address much be a Class A, B, or C address. For information on address classes, consult your IT department.

3. Select or enter the port number used by the OptiVu Processor when doing port forwarding. This would be the number for the Communication Ports field on the Device Settings screen for the OptiVu Processor. Click **OK**.

   The OptiVu Processor and all connected active cameras are added to the list. If the OptiVu Processor does not appear in the list, verify the IP address and that the OptiVu Processor is connected to the network and active.

Archive Files

An archive file captures the current state of a device. An archive file can be added to the device list in order to view the information it contains. It can also be used to restore settings to a device or to clone settings for a replacement device.

Save Archive

This operation is initiated from the Device screen, and is used to save the device state to an archive file (xxx.arch). The following information is saved.

Table 6-4: Archived Saved Settings

Setting	OptiVu Camera	OptiVu Processor
Detection configureation	X	
Camera calibration	X	
Zone setup, including output assignments and any defined overlays	X	
Device settings		
User descriptions	X	X
Time source		X
Time zone		X
Network configuration		X
Communication ports		X
Operations log	X	X
Device properties		
Device ID	X	X
Firmware version	X	X
Model	X	X
Archive date	X	X

1. On the Home screen, click the icon of the OptiVu Processor for which the archive file is to be created.
2. On the Device screen, in the Commands section click **SAVE ARCHIVE**.
3. In the Save Archive window, select where the file is to be stored.
   It is a good idea to create a new folder and save the archive in that folder.
4. In the **File name** field, enter a name for the file or keep the default.
5. Click **SAVE**.
   An archive file will be saved for the OptiVu Processor and each camera.

Open Archive

This operation is initiated from the Home screen, and is used to open a previously saved archive file and create an archive device in the device list. An archive device is not connected to a real device and has a slightly different icon to differentiate it from real devices.

Real Device Archive Device

Despite not being connected, users can navigate to other pages and view archived contents specific to those pages. Users are not able to make changes and save them back into the archive file.

To open an archive file, do the following.

1. On the Home screen, click **OPEN ARCHIVE**.
2. When the Open window appears, locate and select the archive file (xxx.arch) to be opened.
3. Click **OPEN**.

   A new device appears in the device list on the Home screen.

   NOTE: Since this is not a real device, the communication icon (lightning bolt) will be gray with a red line through it.

Restore Archive

This operation is initiated from the Device screen, and is used to download the contents of a previously saved archive file into the selected device.

For the OptiVu Camera, if an archive has assigned outputs, it is possible that during the restore, the I/O server cannot be found or the output is already reserved. The archive will still be sent to the device, but a pop up message will indicate that another I/O server or output must be selected.

If the model of the archive does not match the model of the device, then a message will be displayed indicating that the archive cannot be restored.

NOTE: Archives are not generally backwards compatible.

The settings that get restored are as follows:

Table 6-5: Archived Restored Settings

Setting	OptiVu Camera	OptiVu Processor
Detection configuration	**X**	
Camera calibration	**X**	
Zone setup, including output assignment and any defined overlays	**X**	
Device settings		
User descriptions	**X**	**X**
Time source	**X**	**X**
Time zone	**X**	**X**

To restore an archive file, do the following.

1. On the Home screen, click the icon for the device for which the archive file is to be restored.
2. On the Device screen, click **RESTORE ARCHIVE**.
3. When the Open window appears, locate and select the archive file (xxx.arch) to be restored.
4. Click **OPEN**.

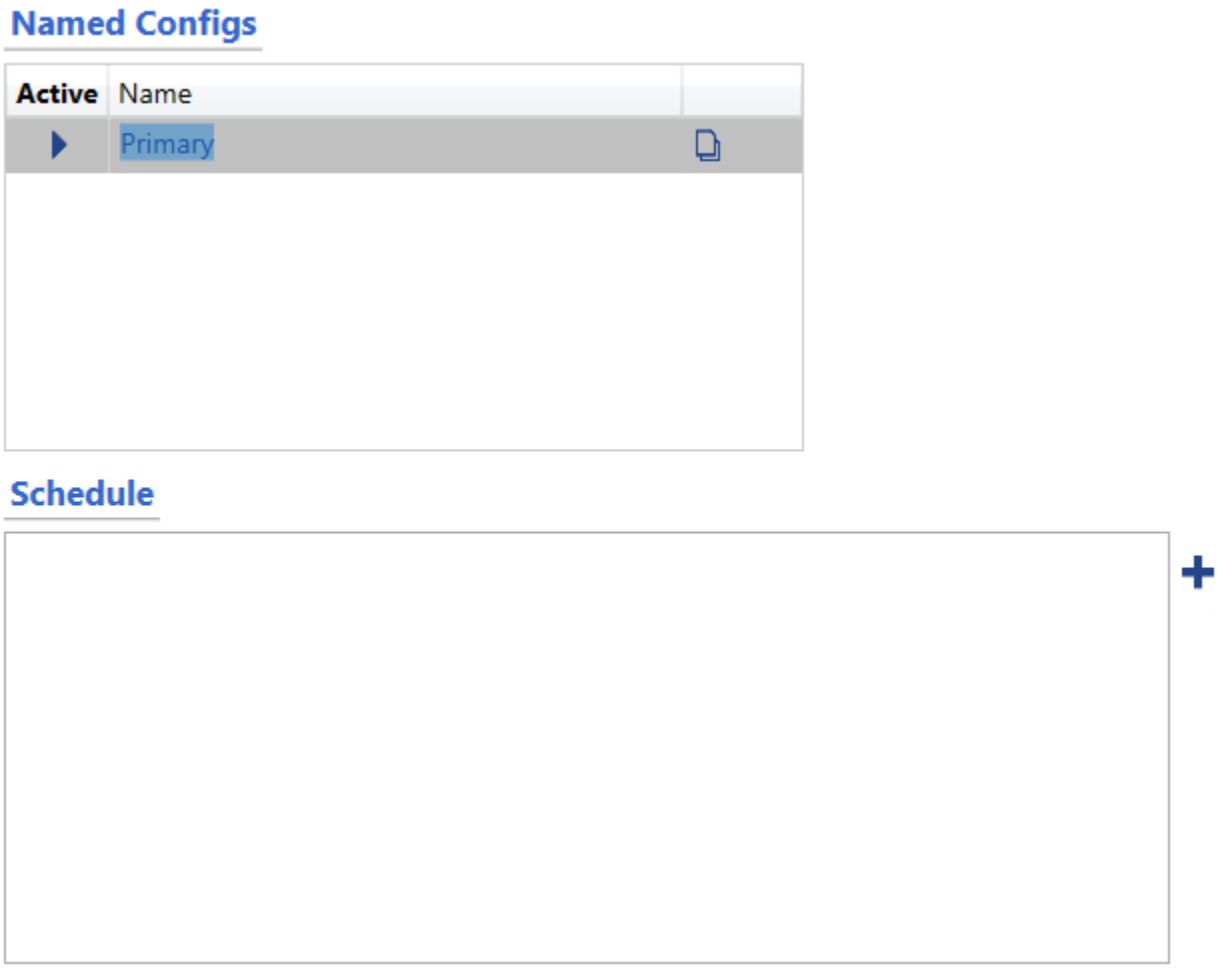
   The archive settings are downloaded into the device.

Config Management

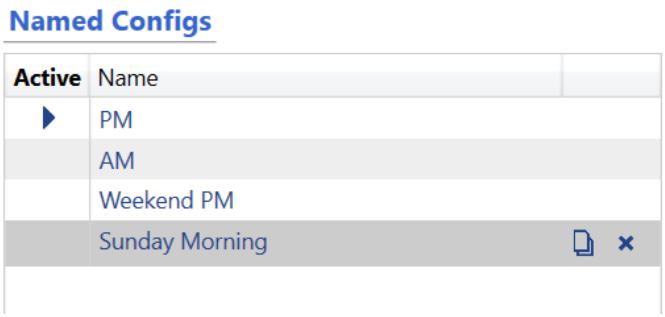
This operation is initiated from the Device screen for OptiVu Cameras. It is used to create and save multiple zone configurations that can be activated at different times of the day, weekdays, weekends, and specific times during the week. The following are some examples of how this could be used.

- A third car trip is used in the AM but not in the PM.
- There are multipurpose lanes that would have zones in them in the PM but not the AM because traffic would be moving in the other direction.
- Different configurations are needed in the AM , PM, and during rush hour traffic.

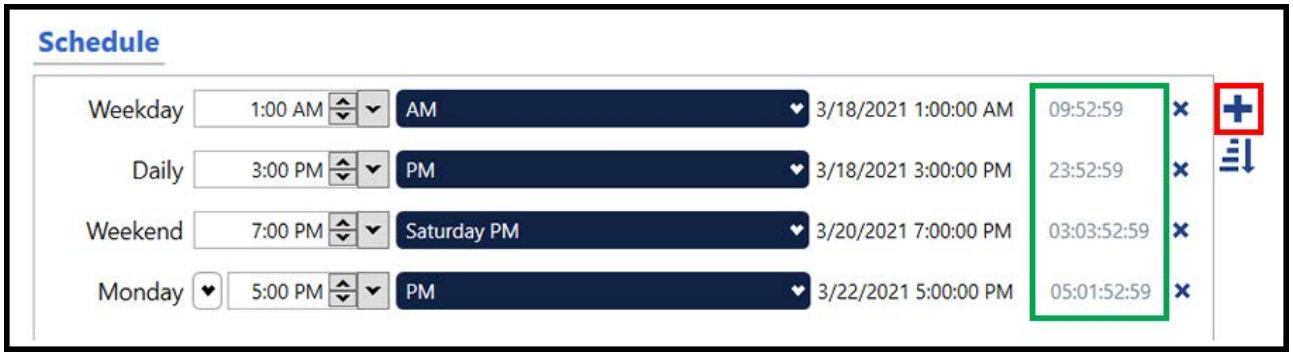
1. Create a zone configuration (see "OptiVu Camera Setup" on page 5-11).
2. On the Device screen for the OptiVu Camera, click **CONFIG MANAGEMENT**.



3. In the **Named Configs** section, select and change the name for the first configuration from the default name of *Primary* to something else (e.g., Daytime config, Nighttime config, etc).
4. Click the page icon to the right to create a copy.



5. Highlight the copy and change the name for the second configuration.
6. Repeat Step 4-5 for other configurations.
7. In the Schedule section, click the plus sign (+) to the right to add a schedule.

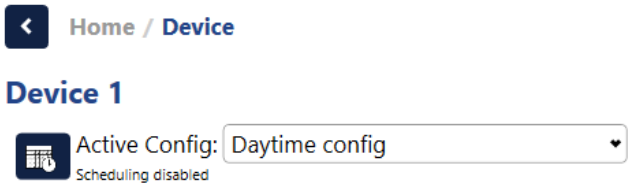


8. To sort all scheduled changes from the next one scheduled, to the farthest out, click the sort icon.

9. Choose an option from the drop-down menu: Daily, Weekday, Weekend, or Day of the Week.
10. For each schedule created, select the configuration to which the schedule is associated.
11. Select the starting time when the configuration is to be active.

    NOTE: The timer (green box above) indicates when the next expected config change will occur based off the schedule.

12. After all configurations and schedules have been created, return to the Device screen.



    The currently active configuration is shown and scheduling is disabled.

13. To set up zones for a configuration, select the configuration in the Archive Config field, then click zone setup on the bottom of the screen.

14. On the **Zone Setup** screen, configure zones as desired.
15. When complete, return to the Device screen.
16. Repeat Step 13-15 for each defined configuration.
17. To activate the configuration schedules, click the icon to the left of **Active Config**.

The name of the currently active configuration and an indication that scheduling is enabled is displayed. In addition, at the bottom of the screen, Zone Setup and Camera Calibration will be grayed out and a lock icon will appear next to it. Zone setups cannot be edited while scheduling is enabled.

NOTE:

- If you try to enable a configuration that has a schedule different from the current configuration, a pop-up warning appears. Selecting **YES** changes the Active Config; selecting **NO** keeps the current Active Config.
- The calibration does not change between each configuration created and they will all share the same calibration. Only use one calibration when using scheduler.

Data Collection

This operation is initiated from the Device screen for OptiVu Cameras. When the sensor is configured and operational, data collection starts automatically without any user intervention.

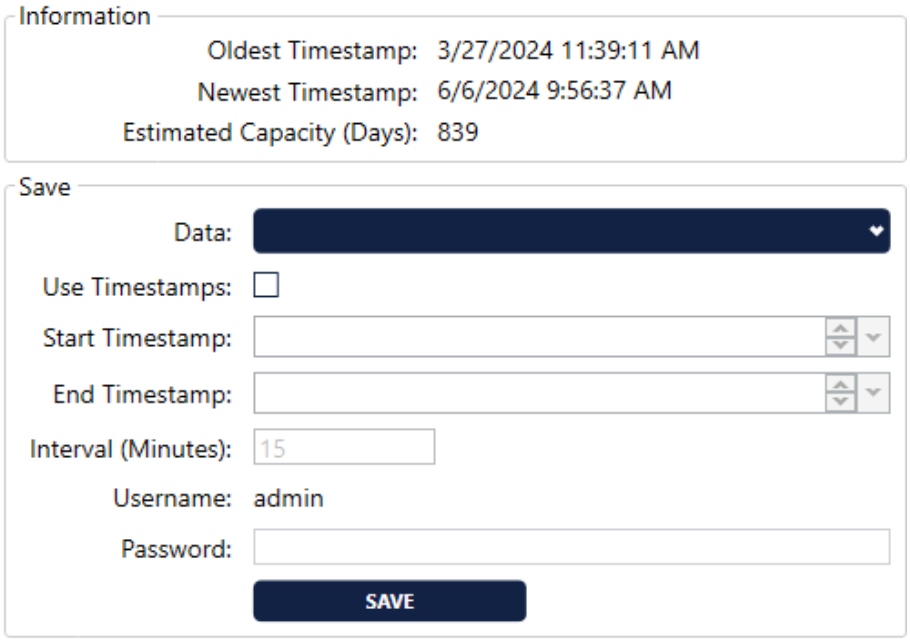
The collected data is stored as records in the internal memory of the processor, which can hold up to 1GB of data per camera. When the memory limit is reached, the oldest records are purged to make room for new records.

All data is stored in the OptiVu Camera in GMT and Metric units. When requested through the Data Collection function, it is presented to the user in local time based on the Time Zone setting for the OptiVu Processor to which the sensor is connected and the selection for Units of Measurement on the "Program Settings" screen. When data is requested using the API interface, it is presented in GMT and Metric units.

NOTE: A single zone covering multiple lanes is not recommended for Data Collection, as counts may not be accurate for shared zones.

1. On the Home screen, click the icon for the OptiVu Camera for which the data is be saved.
2. On the Device screen, click **DATA COLLECTION**.
   The following appears.

   NOTE: The information is updated approximately every 60 seconds.



- Oldest Timestamp: data of the oldest record currently in the database.
- Newest Timestamp: date of the most recent record currently in the database.

- Estimated Capacity: an estimate of when the database will be full. Once full, the oldest records are purged to make room for new records.

3. For **Data**, select one of the following.
   - Bin Statistics: save data that can be binned via an interval. When this is selected, the **Interval** field is enabled (see "Bin Statistics" on page 6-15).
   - Detections: save vehicle detection information (see "Detections" on page 6-16).
   - Zone Status: save status information for all defined zones (see "Zone Status" on page 6-17).
4. Select the **Use Timestamp** check box to retrieve data/information according to a start and end time. Select a start and end timestamp. Use the drop-down menus to select and edit the start and end dates.

   If not selected, all data will be saved.
5. If the Data type is Bin Statistics, enter the time **Interval**, in minutes, for which information is to be reported. The default is 15 minutes.
6. If Authentication is enabled on the Device Settings screen for the OptiVu Processor, enter the **Password** required to access the information.

   NOTE: The **Username** is entered by the system.
7. Click **SAVE**.
8. When the Save window appears, click **SAVE** to use the default file name and location, or change the name and/or location, then click **SAVE**.

   The default name is: ww_xx_yy_zz.csv

   where:
   - ww = device name
   - xx = device ID
   - yy = date the file was created in the format YYYYMMDD
   - zz = time the file was created in the format HHMMSS
9. To view the data, double-click the CSV file to have it displayed in the default program for your system or right-click on the file, select **Open with**, then select the program to be used to view the data.

Bin Statistics

Bin statistics is information about activity within a zone during an interval time. The eleven comma separated fields are described below.

NOTE: The data returned is only for the currently configured zones. If a zone name has been changed, only the data collected under the current zone name will be returned.

Table 6-6: Bin Statistics Field Description

Field	Description
1	Time the information was recorded.
2	Zone ID, a randomly generated number when a zone is created in the Supervisor.
3	Zone title.
4	Occupancy time; the amount of time objects were in the zone during the bin interval.
5	Average speed of all objects in the zone during the bin interval. The unit (MPH/KPH) is dependent on the selection for Unit of Measurement on the Program Settings screen.
6	Volume of objects through the zone during the bin interval.
7	Count of vehicles that traveled through the zone during the bin interval.
8	Count of vehicles that turned right when leaving the zone during the bin interval.
9	Count of vehicles that turned left when leaving the zone during the bin interval.
10	Count of pedestrians that traveled from A to B and left the crosswalk zone during the bin interval.
11	Count of pedestrians that traveled from B to A and left the crosswalk zone during the bin interval.

Detections

Detection is information about detected objects for each defined zone. The seven comma separated fields are described below.

Table 6-7: Detection Field Descriptions

Field	Descriptions
1	Time an object was detected.
2	Zone ID, a randomly generated number when a zone is created in the Supervisor.
3	Zone title.
4	Type of object detected (vehicle, bicycle, or pedestrian).
5	Speed of the detected object. The unit (MPH/KPH) is dependent on the selection for Unit of Measurement on the Program Settings screen.
6	Length of the detect object. The unit (feet or meters) is dependent on the selection for Unit of Measurement on the Program Settings screen.
7	Direction the object traveled when leaving the zone.

Zone Status

Zone status is information about whether or not objects (vehicles/bicycles/pedestrians) were in a defined zone during the recorded time period. The seven comma separated fields are described below.

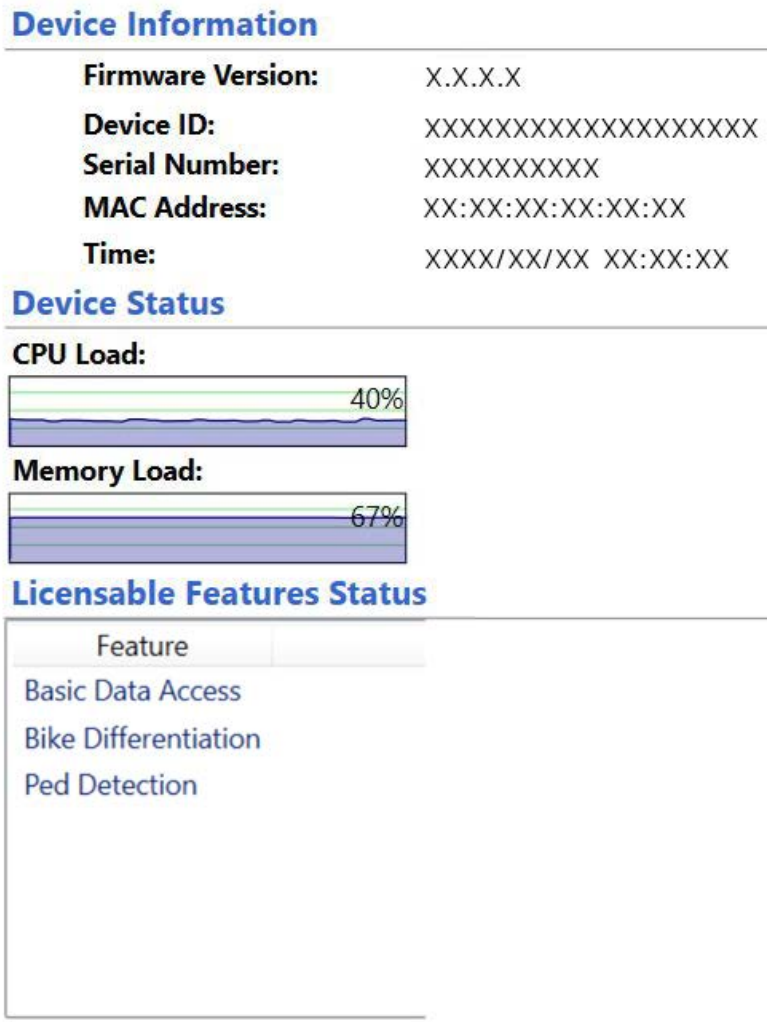
Table 6-8: Zone Status Field Descriptions

Field	Descriptions
1	Time the information was collected.
2	Zone ID, a randomly generated number when a zone is created in the Supervisor.
3	Zone title.
4	Vehicle detection indicator (1 vehicle detected; 0 vehicle not detected).
5	Bicycle detection indicator (1 bicycle detected; 0 bicycle not detected).
6	Pedestrian detection indicator (1 pedestrian detected; 0 pedestrian not detected).
7	Average speed of all objects in the zone during the time frame. The unit (MPH/KPH) is dependent on the selection for Unit of Measurement on the Program Settings screen.

Device Info

This function indicates how busy the device is. It also displays information such as the firmware version, device ID, serial number, MAC address, system time, and the current licensable features.

To display the information, click **DEVICE INFO** in the Navigation section on the Device screen.



Firmware Update

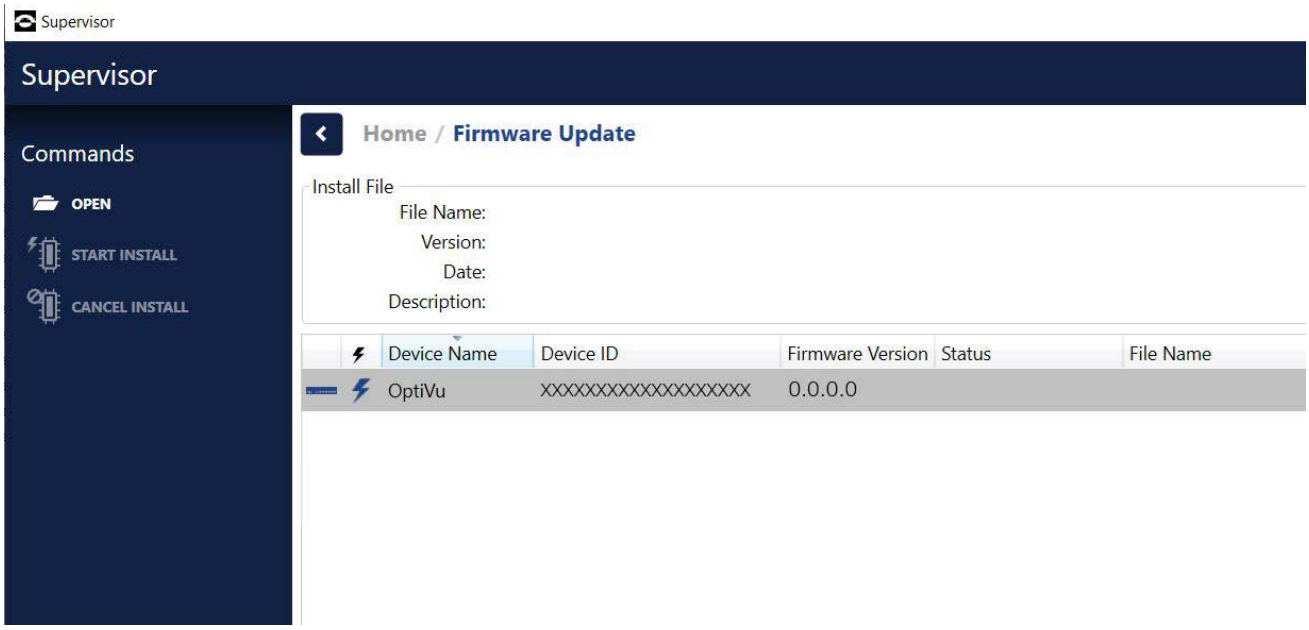
This operation is used to either upgrade or downgrade the version of the firmware running on the OptiVu Processor. The Firmware Update screen can be reached from either the Home screen or Device screen.

The OptiVu Processors selected will be listed on the update screen.

If no devices are selected on the Home screen when **FIRMWARE UPDATE** is clicked, then all of the devices listed on the Home screen will appear on the Firmware Update screen.

1. In the Commands section of either the Supervisor Home or Device screen, click **FIRMWARE UPDATE**.

   The following appears.



2. In the **Device Name** list, select the device(s) to receive the firmware update.

   Use the Shift or Ctrl keys to select multiple devices. To select all devices, select any device, then press Ctrl+A.

   NOTE: In the above, an OptiVu Processor and four of its OptiVu Camras have been selected.

3. In the Commands section, click **OPEN**.

   Windows Explorer should open the InstallFiles folder for the version of the Supervisor currently running. If not, navigate to where the Supervisor was installed. The default is *C:\Program Files (x86)\ISS\Supervisor vx.x.x\InstallFiles* (where vx.x.x is the firmware version number).

4. Select the file **Autoscope_devicexxxx**.
5. Click **OPEN**.

6. In the Commands section, click **START INSTALL**.

   NOTE: **Cancel Install** becomes disabled once the firmware file transfer is completed and the install beings.

7. The update is complete when the Status column indicates *Firmware Install Completed* and the communications icon indicates that the device is connected.

Learn Network

This operation is executed from the Home screen, and is used to locate devices that are installed in the network segment. The Supervisor send out a broadcast message on all active Ethernet networks, and any device that responds is shown in the device list.

Learning the network is usually not required, as the devices normally *announce* themselves on the local network segment. This allows the device list to populate automatically, in most cases. To perform a learn, click **LEARN NETWORK** in the Commands section of the Home screen. Any device found in the network appears in the device list.

NOTE: Devices that had been added to the configuration through an Add by IP Address operation are refreshed when a Learn Network operation is performed.

Operations Log

Each device maintains an operations log which contains messages about operations errors, warnings, and other helpful information about device operations. When the log gets full, the oldest 10 percent of the messages are deleted to make room for new entries.

The Operations Log can be reached from the Device screen. To see a list of the Operations Log field descriptions, see Table 6-9.

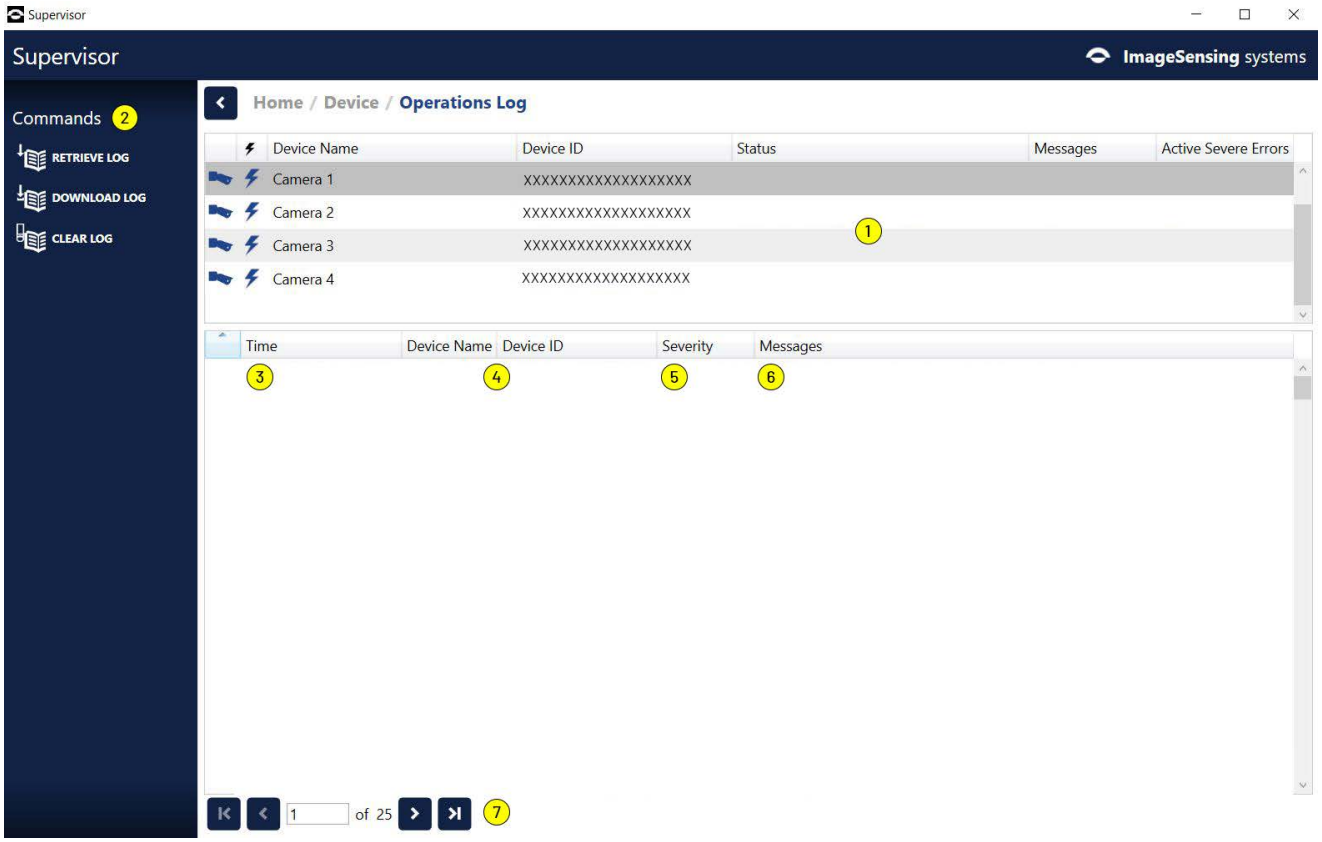


Figure 6-2: Operations Log Screen

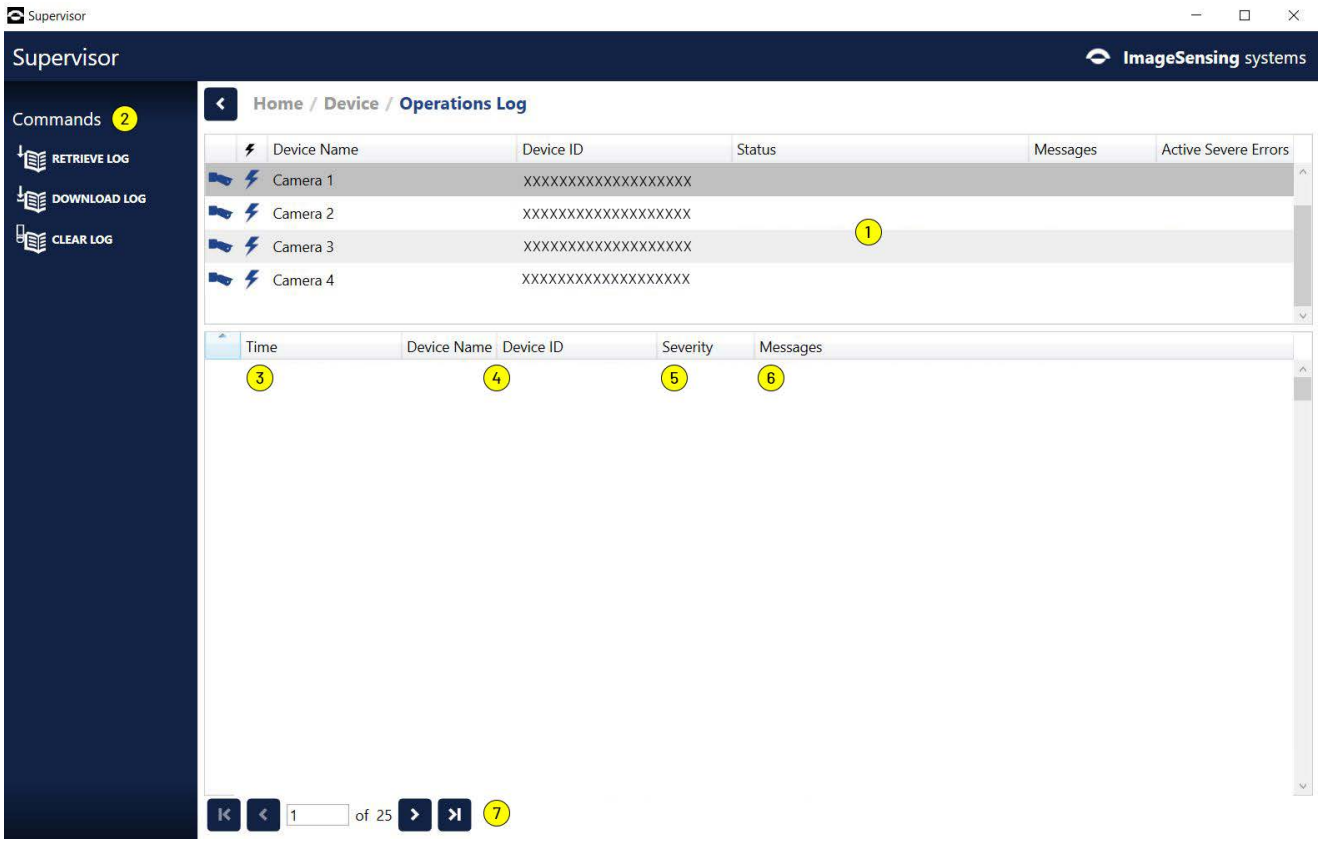
Table 6-9: Operations Log Field Descriptions

Item	Description
1	Device List - Displays the following information for each listed device. • Name of the device • Device's identifier • Status of the last action performed • Number of messages in the log • Number of active severe errors in the log
2	Commands: click to perform the specific operation. For additional information, see: • "Retrieve Log" on page 6-24. • "Download Log" on page 6-25. • "Clear Log" on page 6-25.
3	Date and time the message was issued
4	Name and ID of the device from which the message was read.
5	Severity of the message: • Informational: helpful information that requires no action. • Error: indicates a problem that caused the device to reboot in order to attempt to fix itself. • Severe Error: in some circumstances this type of error can prevent proper operation of the device. However, this type of error is also generated when the device reboots, even when the reboot is user initiated (e.g., device restart, firmware update, etc.). • Warning: indicates something that may require attention, but that does not prevent the device from operating properly.
6	The message that was issued. There are four levels of log messages: • 1000s: main, general purpose messages • 2000s: detailed log messages • 3000s: communications related messages • 4000s: diagnostic messages
7	Paging navigation options. • Enter a number to go to that page. • Click the single arrow to go back or ahead one page at a time. • Click the arrows with a bar to go to the first or last page.

Retrieve Log

This operation retrieves and displays the current log for the select device(s).

1. In the Navigation section on the Device screen, click **OPERATIONS LOG**.
   The following appears.



2. Select the device for which the log is to be displayed.
   Use the Shift or Ctrl keys to select multiple devices. To select all devices, select any device then press Ctrl+A.
3. In the Commands section, click **RETRIEVE LOG**.
   The log is displayed.
4. To display updated log messages, click **RETRIEVE LOG** again.
5. To copy messages, do the following.
   a) Select the message to be copied. To select more than one message, use the Shift and Ctrl keys.
   b) Right-click one of the selected messages and click **COPY** or press **Ctrl+C** on the keyboard.
   c) Paste the messages into any word processor, text editor, spreadsheet, or database application.

Download Log

This operation downloads the current log for the selected device(s).

1. Select the device for which the log is to be downloaded.

   Use the Shift or Ctrl keys to select multiple devices.
2. In the Command section, click **DOWNLOAD LOG**.
3. When the Save Log dialog box comes up, choose where the logs will be saved.
4. Keep the default file name or type a new one.
5. Click **SAVE**.

Clear Log

This operation clears the current log for the selected device(s).

1. Select the device for which the log is to be cleared.

   Use the Shift or Ctrl keys to select multiple devices.
2. In the Commands section, click **CLEAR LOG**.

When the confirmation message appears, click **YES** to clear the log, or **NO** to cancel the operation.

Outputs, Phases, Failsafe, and All Call for OptiVu Devices

These terms are defined as follows.

- Outputs: the signal sent to the Controller by the OptiVu Processor when a OptiVu Camera detects the condition associated with the output (e.g., vehicle presence).
- Phases: the right-of-way (green), yellow change, and red clearance intervals in a cycle assigned to various traffic and pedestrian movements through an intersection.
- Failsafe: the mode of operation that the OptiVu Camera enters when it determines it is not able to perform detection. Output behavior during failsafe is determined by the cause of failsafe and the recall option selected on the Enable Output Options page.
- All Call: the condition where all outputs reserved for a camera are set to ON. This occurs when:
  - The OptiVu Processor is not longer able to communicate with a OptiVu Camera.
  - The OptiVu Camera enters failsafe for a reason other than a contrast loss.
  - The OptiVu Camera enters failsafe due to contrast loss and Maximum Recall is selected for the output options.

Assigning Outputs

Outputs are actions that are assigned to detection conditions (Vehicle, Bicycle or Pedestrian Presence, Phase Color, Pulse, or Snappy) defined for each zone in a OptiVu Camera's configuration. When the condition is met, the defined output is set to ON. A Set Output action is automatically added when a condition is added to the zone.

When an output is assigned to a detection condition, it is registered for that OptiVu Camera on the OptiVu Processsor to which the camera is connected. Once reserved, the output cannot be assigned to a different device. Outputs that cannot be shared by other devices or by other conditions do not appear in the selection list.

One or more outputs can be assigned for certain conditions (see Table 6-10). If more than one output is to be assigned to a condition the "Zones Explorer" (see page 5-38) or "Actions Explorer" (see page 5-52) must be used. If the same output is assigned to multiple conditions, it can be set to a logical AND/OR operation in the Actions Explorer (the default is OR).

In the Zone Setup for a OptiVu Camera, as soon as apply changes is clicked all assigned outputs are set to call (ON). The outputs stay in call until detection toggles the output low or for a maximum of five minutes, whichever occurs first.

Table 6-10: Sharable Outputs

Condition	Can Output Be Shared
Vehicle Presence	Yes, with outputs belonging to Vehicle Presence or Bicycle Presence of the same device.
Bicycle Presence	Yes, with outputs belonging to Vehicle Presence or Bicycle Presence of the same device.
Pedestrian Presence	Yes, with outputs belonging to Vehicle Presence or Bicycle Presence of the same device.
Phase Color	Yes, with outputs belonging to Vehicle Presence or Bicycle Presence of the same device.
Pulse	No
Snappy	No
Speed	Yes, with outputs belonging to Vehicle Presence or Bicycle Presence of the same device.
Stopped Vehicle	Yes, with outputs belonging to Vehicle Presence or Bicycle Presence of the same device.

Phases

Phases are the time intervals for the green, yellow, red cycle assigned to various traffic and pedestrian movements through an intersection. The OptiVu System can use phase color information to modify output behavior, and can utilize phase color information.

Recall, Extend On Green, and Delay On Red functions can be defined for an output associated with a phase. Additionally, phases can be represented on the video by adding a signal head label overlay.

Recall Function

The Recall function is accessed through a Set Output action in the "Actions Explorer" section on the Zone Setup page and is used to determine what actions are taken when the sensor is in Failsafe mode due to contrast loss.

- **Minimum Recall:** the output is turned ON during a NOT GREEN phase state and OFF during the GREEN phase state. If sporadic detection takes place during green, output is turned ON for the duration of the detection event.
- **Fixed Recall:** the output is ON during RED and remains ON into the green phase for the number of seconds specified. The call is released when the time limit expires. For example, if Fixed Recall is selected and set to 10 (the default), when the phase changes from RED to GREEN the output will remain ON for an additional 10 seconds before reverting to OFF. If detection takes place after the fixed time has expired, the output will turn ON and OFF to extend the GREEN.
- **Maximum Recall:** the output remains ON all of the time, regardless of any phase-input state. This is the default setting.

Extend On Green

The Extend On Green function is accessed through a Set Output action in the "Actions Explorer" section on the Zone Setup page. It is used when the phase is GREEN and defines the length of time, in seconds, to extend the output ON state after the zone becomes vacant.

For example, when detection takes place (a vehicle enters the zone) the associated output is set ON; when detection is no longer taking place (the vehicle has left the zone) instead of the output going to OFF it will remain ON for the length of time specified. If another vehicle enters the zone before the Extend On Green timer runs out, the timer resets and begins again as the vehicle exits the zone.

The most common use of this feature is to allow time for a vehicle that has left the detection zone to reach the intersection while the phase is still green.

Delay On Red

The Delay On Red function is accessed through a Set Output action in the "Actions Explorer" section on the Zone Setup page. It is used when the phase is RED and defines the length of time, in seconds, to delay setting the output to ON after a vehicle enters an empty zone.

For example, when a vehicle enters an empty zone, the output would normally be set to ON indicating detection; however, when Delay ON Red is set, the output will remain OFF for the length of time specified.

With the zone occupied, once the delay has timed out, the zone will turn ON, placing the call to the controller. If the vehicle leaves the zone before the start of GREEN (and the zone becomes empty), the next vehicle entering the zone will start the delay time over again. Once the phase goes GREEN, no delay is timed until the next RED.

The most common use of this feature is to prevent a vehicle from placing an unnecessary call when it has left the zone by making a right turn on RED.

Signal Head Label Overlays

The OptiVu Processor is able to receive inputs from the Controller and can display the phase colors of the Controller channels on a signal head label.

Signal head labels are added through the Video Overlays section on the Device Setup screen (see "Video Overlays" on page 5-57). The color displayed on the label is associated with the signal received from the Controller channels, which may, in some instances, be different than the color being displayed on the actual traffic signal. For example, when not following standard phase controller settings or not using a three phase signal.

Failsafe Operations

Failsafe is the mode of operation that the OptiVu Camera enters when it determines it is not able to perform detection. When failsafe occurs, the OptiVu Processor puts all of the outputs that are configured in all call mode.

When in failsafe mode, the outline color of the zones will be red.

When the camera detects a contrast level that falls below a certain threshold, the camera goes into failsafe mode if contrast is lost at any time during daytime hours. If it is still poor at the end of daytime, failsafe is extended through nighttime until contrast rises above the threshold.

For global contrast loss, the entire scene is used and the threshold is defined by the system.

Low visibility contrast loss detects situations like fog or heavy snow, where visibility is reduced. The image is evaluated for loss of detail in the top region of the image (further away from the camera), which indicates low visibility conditions. In this situation, the sensor is put into failsafe. Once the condition has been resolved, the sensor comes out of failsafe. Failsafe from low visibility contrast loss failsafe when it switches to night, it will stay in failsafe until the morning.

For **local contrast loss**, conditions are such that there is a partial occlusion (such as snow build-up on the lens) that could affect detection and that global contrast loss and contrast loss are not designed to detect. Regions of the image are evaluated for loss of texture, and if a large enough region is flagged as having no features, then the sensor comes out of failsafe. Failsafe from local contrast loss can only be entered into during the day. A local contrast loss failsafe can persist throughout the night, although it is possible for a sensor to come out of local contrast loss at night. However, a sensor will not enter into a local contrast failsafe at night.

When coming out of failsafe for contrast, the operation will be as follow:

- If the detection state is ON (identified by the ON color of the zone), then the output will continue to place a call to the controller indefinitely until a new state is detected.
- If the detection state is OFF (identified by the OFF color of the zone), then the output will continue to place a call to the controller for a maximum of five minutes or until a new state is detected, whichever occurs first.

Examples of when failsafe mode may be initiated for a camera include:

- The camera detects a loss contrast (recall options can be set in the Enable Output Options in the "Actions Explorer" on page 5-52).
- During a device reboot (outputs are set to All Call) Internal camera failure (outputs are set to All Call).
- Calibration and/or zone configuration not valid (outputs set to All Call).

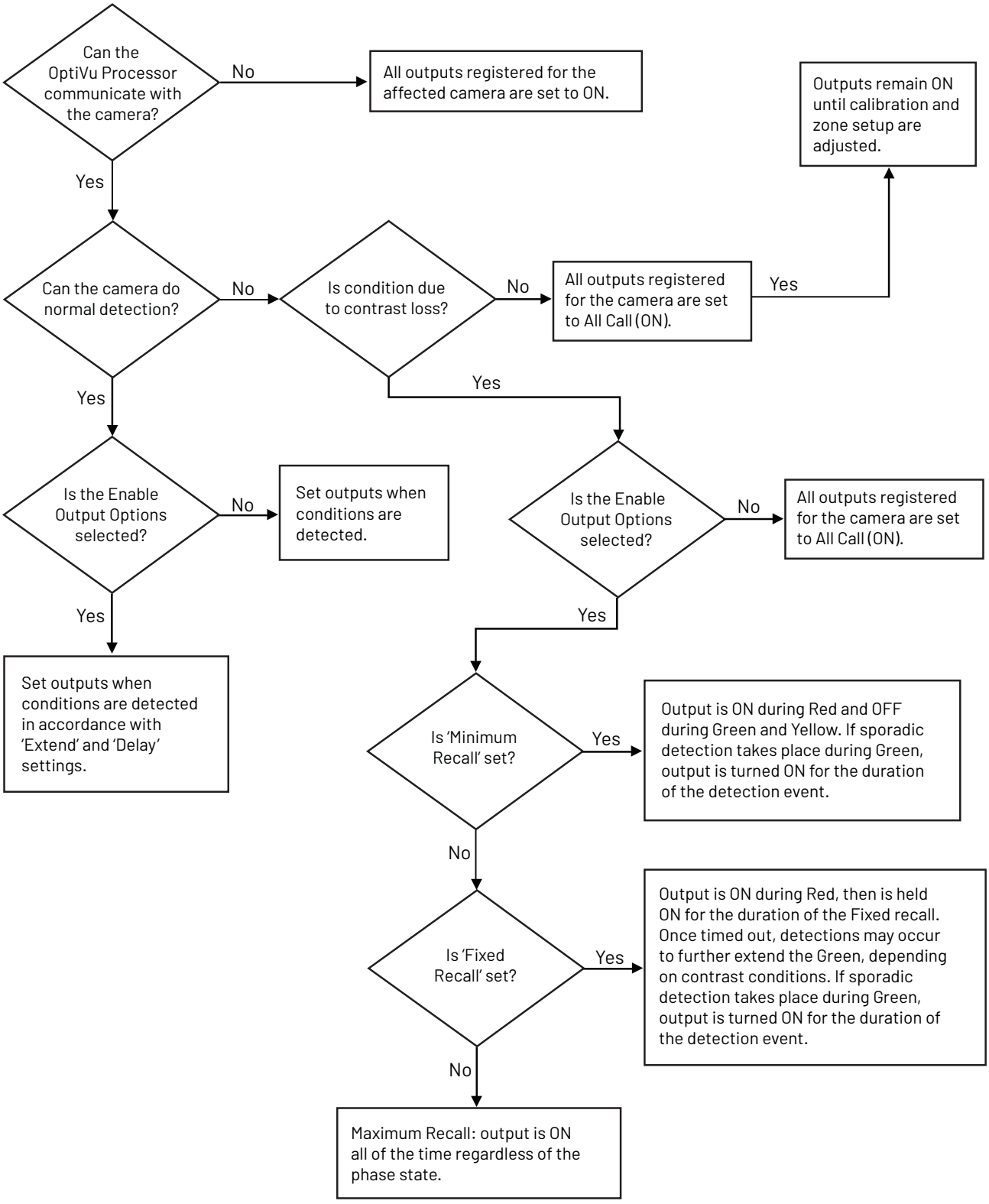


Figure 6-3: Failsafe Flowchart

Port Forwarding

Port forwarding is the method used when the Supervisor needs to communicate with a OptiVu Processor that is connected to a router or a cell modem.

In order for port forwarding to work, the router/cell modem to which the OptiVu Processor is connected must be set up to allow forwarding and must allocate 10 consecutive port numbers for each OptiVu Processor connected. Additionally, ports must also be allocated for the following:

- A port must be established in order for the RTSP video stream to work with either the Supervisor or a third party program (e.g., VLC, etc.).

A port for the Webserver must also be established in order to install firmware over a cell modem.

Type	Ports
OptiVu communication traffic	30000-30010
Webserver	443
Video streaming	554

For information on setting up the router or cell phone modem, consult the manufacturers documentation.

When doing port forwarding, the OptiVu Processor should be configured with a static IP address that is on the same LAN network as the router/cell modem. In addition, the starting port number in the sequence must be specified in the Communications Port area on the OptiVu Processor Settings screen.

Restart Device

This command is initiated from either the Home or Device screen, and is used to restart one or more selected devices.

NOTE: Restarting an OptiVu Processor does not restart all OptiVu Cameras connected to it.

1. On the Home screen, select the device(s) to be restarted.

   Use the Shift or Ctrl keys to select multiple devices. To select all devices, select any device then press **Ctrl+A**.

2. In the Commands section, click **RESTART DEVICES**.

   The Status column will indicate that a restart is in progress and the communications icon will indicate no connection.

3. Wait for the status message to disappear and for the communications icon to indicate that a connection has been re-established.

Set Time

The time setting is defined for the OptiVu Processor. The setting specifies the source used for clock synchronization and which time zone the device is installed.

NOTE: OptiVu Cameras show the time of the OptiVu Processor when the time is shown on the video overlay.

The method for setting the time is determined by the selection for Time Source on the Device Settings screen (see "OptiVu Processor Setup" on page 5-7).

- **Manual** - This selection synchronizes the clock in the OptiVu Processor to the connected computer. After the selection is applied, the Set Time command must be initiated in the Commands section of the Device or Home screen.
- **TS2** - This selection is used if the OptiVu Processor's clock is set up TS2 time set commands. The OptiVu Processor monitors the TS2 time every minute and if the difference between the two is greater than two seconds, the TS2 time is applied to the OptiVu Processor.
- **NTP** - This selection synchronizes the clock to an NTP server. At least one (and up to four) NTP servers must be added. If more than one is entered, the first is used as the primary.

Streaming Video From Third Party Applications

The URL string required to stream video using a third party application such as VLC, MPC, or MS Media Player uses the device name cam1, cam2, cam3, cam4, or quad to select streaming from OptiVu Cameras 1 through 4 or the OptiVu Processor, respectively.

The format for the string is as follows:

rtsp://ipaddr:port/name

where: rtsp:// = mandatory entry

ipaddr = OptiVu Processors WAN IP address of the router or cell modem if port forwarding

port = 554

name = cam1, cam2, cam3, cam4 or quad

Example: rtsp://192.186.1.1:554/cam1

USB Video Recording Service

The USB Video Recording is for collecting unsupervised video clips from Autoscope cameras attached to an Autoscope processor.

The USB Recording can be reached from the Device screen. To see the list of the USB Recording field descriptions, see Table 6-11.

NOTE: Video can be recorded from a maximum of two cameras at a time.

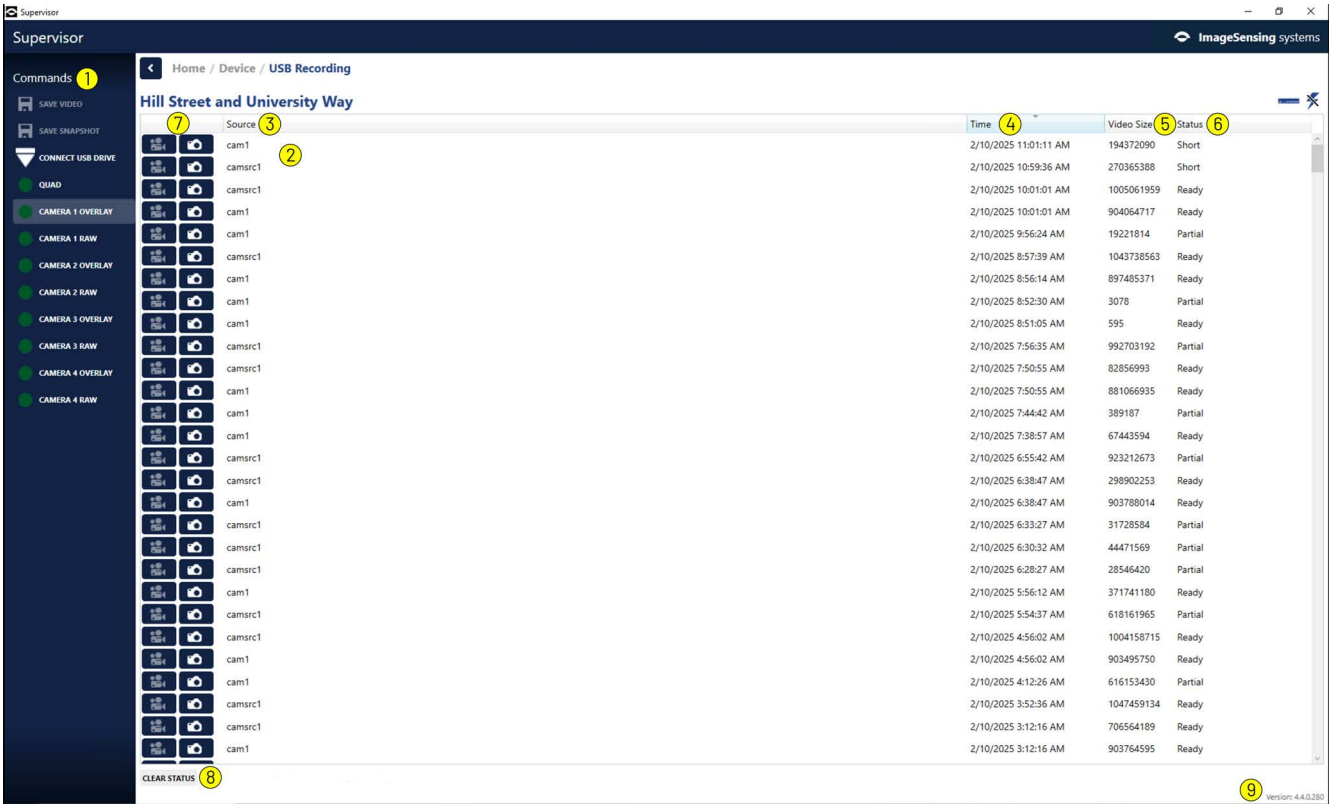


Table 6-11: USB Recording Screen Field Descriptions

Item	Description
1	Commands that can be executed: • Save Video - saves the selected video to the computer connected to Supervisor • Save Snapshot - saves a quad image snapshot to the computer connected to Supervisor • Eject USB Drive - unmount the USB drive from the processor • Connect USB Drive - mount the USB drive to the processor • Camera list is dynamic to the number of cameras connected to the processor. Quad - recording the quad view of all cameras. Camera X Overlay - record camera number with overlays Camera X Raw - record camera number without overlays Green circle - start recording White square - stop recording
2	List of recordings available to download or view.
3	Source - camera number of the recording.
4	Time - date and time the recording started.
5	Video Size - file size of the video recording.
6	Status - The status of the video recording. • Ready - full hour video clip • Partial - device rebooted or the drive was pulled from the processor **Note:** This is a corrupt file and will not play. • Short -the video was manually stopped via the stop recording button • Recording - video is recording **Note:** A video cannot be downloaded while recording.
7	Video and snapshot image icons:  Video icon - The video icon to view the video. **Note:** The icon will be grayed out until a video has been saved to the computer. Once the video has been downloaded to the computer, the icon will change from gray to white. The white icon allows the video to be viewed.  Snapshot icon - The snapshot icon to view a quad view snapshot at the start of a recording.
8	Shows device status messages.
9	Version of Supervisor software currently running on computer.

Required Equipment

A USB storage device that has a minimum of 32GB or greater. When recording is taking place, 16GB of free space will be maintained by the system. When there is only 16GB of free space available, the system will delete the oldest video clips to make room for newer ones.

Configuring the USB Storage Device

To prepare and configure the USB storage device for recording, follow the instructions below.

NOTE: The volume must have at least 16GB free at configuration time.

1. Connect the USB storage device to a computer.
2. Format the volume: Partition the USB storage device to a single **ExFat** volume.
3. Create the following subdirectory at the root directory level of the storage device: **/VideoClips/**
4. Create one or two of the following configuration subdirectories under VideoClips: **/configure/xxxx/**
   - xxxx = specifies the camera (cam1, cam2, cam3, cam4, or quad) to record **with overlays**

     OR

   - camscrx = specifies the camera (camsrc1, camsrc2, camsrc3, or camsrc4) to record the raw video **without overlays**
5. Safely remove the drive from the computer.

Start Video Collection

NOTE:

- Each video clip will record for a maximum of one hour. After one hour, a new video clip is started for each camera. The files for each camera are distinguished by the timestamp in the file name.
- The system will maintain 16GB of free space on the storage device. When there is only 16GB of free space available, the system will delete the oldest video clips to make rooms for newer ones.

IMPORTANT: Once inserted, **DO NOT** remove the USB storage device from the OptiVu processor without first performing the procedure described in the section Stop Video Collection.

To begin collecting video connect the USB storage device to the Blue USB port on the front of the OptiVu processor. The activity LED on the USB storage device will begin blinking.

1. Once the drive is inserted, the recording should automatically begin recording.
2. If it does not connect, Click **CONNECT USB DRIVE**.
3. Click the green circle to select the cameras to record.

NOTE: Video can be recorded from a maximum of two cameras at a time.

4. The recording will start.

File Names

The video file names have the following format:

wwww_yyyy_VideoClip_zzz.mp4

wwww = device indicator: cam1, cam2, cam3, or cam4

yyyy = device ID

zzzz = timestamp of when the video collection began. The timestamp is displayed as the local timestamp, UTC timestamp then is followed by the Unix EPOCH date in nanoseconds.

Example:

cam1_user_1424221014767_VideoClip__2022_7_25_20_23_7_25_15_23__165878
0601822575386.mp4

Stop Video Collection

To stop the collection of videos, do the following.

1. Click the white square next to the camera you are recording.
2. The video stops recording.

NOTE: The status for the video recording will state Short. If there are two cameras recording, one camera can be stopped and another camera can start recording.

Save and View Video

To save and view any of the recorded video(s), do the following.

1. Select a camera from the camera list.
2. Click **SAVE VIDEO** button in the Commands section.
3. A pop-up window will appear asking where the video should be saved. Select the folder where the video should be saved.
4. Click **OK**.
5. The video will start downloading to the selected folder.
6. Once the video is done saving, the video icon in the camera list will appear to be white. Click on the white video icon to view the video.

Save Snapshot

To save a snapshot, do the following.

1. Select the camera from the camera list.
2. Click save snapshot button in the Commands section.
3. A pop-up window will appear asking where the snapshot should be saved. Select the folder where the snapshot should be saved.
4. Click **OK**.

Changing Storage Drive

To change the USB storage drive, do the following.

1. Click the white square next to all the cameras currently recording.
2. Click **EJECT USB DRIVE**.
3. Pull the drive from the USB slot on the processor.

Video Operations

The video operations enable the user to play and/or record live video from a OptiVu Camera.

Table 6-12: Video Control Operations

Control	Description
	This control refreshes the image displayed on the screen.
	This control starts live video from the OptiVu Camera. To halt the video and return to a static image, click the Stop control. The bit rate of the video is determined by the Bitrate setting on the Device Settings screen (see "Camera Device Settings" on page 5-11).
	This control causes live video to be recorded. When clicked, the Save As window appears. Select the location where the file is to be saved, then enter a name for the video capture. The name cannot contain the following special characters: • Asterisk (*) • Back slash (\) • Closed brace (}) • Dollar sign ($) • Forward slash (/) • Greater than (>) • Less than (<) • Percent (%) • Pipe (|) • Question mark (?) Click **SAVE** to begin playing and recording live video. Click the stop control to stop recording and return to a static image.
	This control stops the play and record operations.

Chapter 7: Troubleshooting

Error Messages

The following are messages that may be displayed in a pop-up during Supervisor operations.

Message:	**Firmware Install: Error incompatible install file.**
Description:	The selected file was not intended for the selected device.
Suggested Action:	Verify that the correct file is being used and retry the operation. If the problem persists, contact Technical Support.
Message:	**Invalid setup: All set output actions must have an assigned output.**
Description:	You are trying to apply changes on the Zone Setup screen without having specified an output for one or more selected conditions (vehicle, pedestrian, or bicycle presence).
Suggested Action:	Click **OK**. If you want to keep the changes made, select an output for each active condition or de-select the conditions for each zone.
Message:	**Invalid setup: All set output actions must have an assigned output. Leaving will abandon changes. Do you wish to leave?**
Description:	You are trying to leave the Zone Setup screen without specifying an output for one or more selected conditions (vehicle, pedestrian, or bicycle presence).
Suggested Action:	To leave the screen, click **YES**. Any changes that were made to the configuration will be discarded. To add outputs, click **NO** and select an output for each configured condition.
Message:	**The following issue(s) was found while restoring an archive:** **Archive model *xxx* does not match target model *yyy*. Please select an archive with a model that matches the target model.**
Description:	The archive file selected for the restore operation is for a different device type (e.g., the selected file is for a OptiVu Processor but the selected device is a OptiVu Camera).
Suggested Action:	Click **OK**, then select the correct archive file and retry the operation.

Message: **The following issue(s) was found in the detection configuration:**

Failed to reserve xxx on I/O Server yyy because it is already reserved by another device. Go to Zone Setup page to reserve another output.

Description: The output xxx is already reserved on OptiVu Processor yyy by another OptiVu Camera. If the conflict is not resolved, the camera will still do detection; however, it will not be able to transmit any I/O state to the OptiVu Processor.

Suggested Action: Click **OK**. Go to the Zone Setup screen in the Supervisor and select a different output. If a new output is not selected, additional messages will appear indicating that the setup is invalid.

Message: **The following issue(s) was found in the detection configuration:**

Failed to reserve xxx on I/O Server yyy because I/O card was not found. Go to Zone Setup page to reserve another output.

Description: The output xxx could not be reserved for the camera because the associated OptiVu Processor (yyy) could not be found. It is possible that the camera was started before the OptiVu Processor or that the OptiVu Processor is not active. If the conflict is not resolved, the camera will still do detection; however, it will not be able to transmit any I/O state to the OptiVu Processor.

Suggested Action: Do the following.

1. Click **OK**.
2. Verify that the OptiVu Processor to which the camera is connected is active.
3. If the current OptiVu Processor is different than the one the camera was originally connected to, go to the Zone Setup screen in the Supervisor and select a different output. If a new output is not selected, additional messages will appear indicating that the setup is invalid.

Status Messages

The following are messages that may appear in the Status column on the Supervisor Home screen.

Message:	**Firmware Install: Timed out**
Probable Cause:	Connection to the unit was lost.
Suggested Action:	Check the connection and try again once the connection issue is corrected.
Message:	**Set User Descriptions or other operations: Timed out**
Probable Cause:	Slow connection.
Suggested Action:	Try again with a faster connection or through the maintenance port at the intersection.
Message:	**The following command(s) is still in process:** **Device xxxxxxx - yyyyyyy** **Do you want to exit anyways?**
Description:	An attempt is being made to exit the Supervisor; however, one or more commands (yyyyyyy) are still being processed by the Supervisor for Device (xxxxxxx).
Suggested Action:	Click **YES** to terminate the command(s) and exit the Supervisor immediately. Click **NO** to allow time for the Supervisor to complete the process.

Symptoms

The following describe symptoms that may occur during Supervisor operations.

Symptom: **Add device by IP does not work**

Probable Cause: There are several possibilities.

a) The wrong IP address was entered. The address must be of the WAN port of the OptiVu Processor.

b) The device is not connected to a routed network or is connected to a network that uses port forwarding, which is not supported.

c) The device is not active.

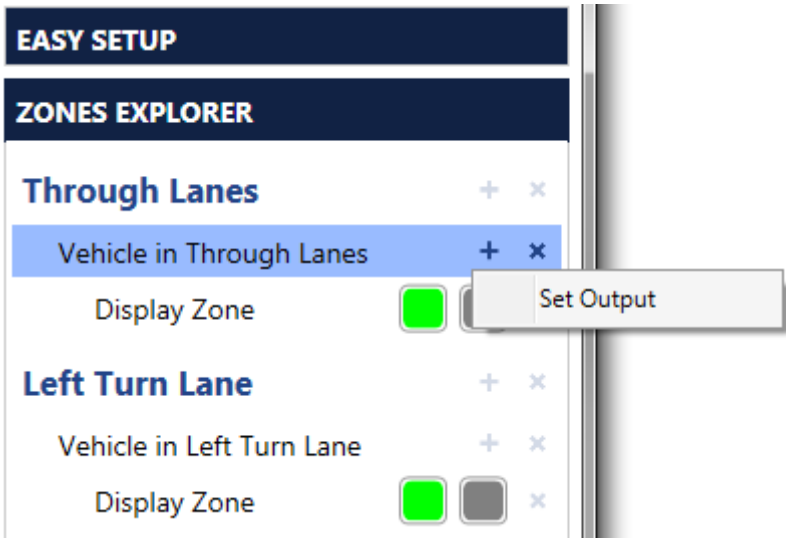
Suggested Action: Do the following.

1. Verify that the IP address is correct.
2. Verify that the device is connected to the routed network and that it is active.
3. If the problem persists, contact Technical Support.

Symptom: **Cannot set output in Easy Setup**

Probable Cause: The Set Output action has not been activated for the condition or the USB cable is unplugged.

Suggested Action: In the Zone Explorer section, click the plus sign (+) to the right of the condition and select Set Output.



Symptom: **OptiVu Processor does not display image from all cameras**

Probable Cause: Not all of the cameras are active.

Suggested Action: Do the following.

1. Verify that the PoE light on the PoE switch associated with the camera is green.
2. Unplug the camera from the PoE switch and wait 10 seconds. Plug it back in.
3. If the problem persists, contact Technical Support.

Symptom: **OptiVu Processor Power LED not lit**

Probable Cause: There is no power to the OptiVu Processor. Either the breaker for the controller cabinet is off, or the power cable has not been connected to the OptiVu Processor.

Suggested Action: Do the following.

1. Verify that the cabinet circuit breaker is on and that the power cable is connected to the OptiVu Processor.

Symptom: **OptiVu Processor Ready LED is red**

Probable Cause: When the OptiVu Processor is first started, the LED will show red for a second or two before turning green. However, if the LED remains red, this indicates a failure in the OptiVu Processor.

Suggested Action: Power cycle the OptiVu Processor. If the condition persists, contact Technical Support.

Symptom: **OptiVu Processor Status LED is not green**

Probable Cause: The OptiVu Processor is either booting up or the firmware is not functional.

Suggested Action: Do the following.

1. Wait for a minute to see if the LED comes on and turns green.
2. Install the latest firmware version onto the OptiVu Processor.
3. If the problem persists, contact Technical Support.

Symptom: **Device does not appear in the device list on the Home screen**

Probable Cause: The device has never been learned by the Supervisor or it may be on a routed network.

Suggested Action: Do the following.

1. Learn the network.
2. Try adding the device manually (see "Failsafe Operations" on page 6-30).
3. Verify that all devices are connected and active. Retry the Learn.
4. If the problem persists, contact Technical Support.

Symptom:	**Output stays ON**
Probable Cause:	This indicates that the camera has gone into failsafe mode (see "Failsafe Operations" on page 6-30).
Suggested Action:	No action is required. However, if the condition persists try the following. 1. Check that the camera is still aimed correctly. 2. Check that the camera's view is not obstructed or that the lens is not dirty. 3. Zoom the camera out to include more background features with strong edges (see "Camera Setup" on page 5-13). 4. If the condition still persists, contact Technical Support.

Appendix A: Cleaning the Lens

Cleaning the Lens

The OptiVu Camera has a coating on its glass cover to help keep it clean. If cleaning is necessary, use the method described below.

NOTE: Do NOT use cleaning solutions with ammonia or alcohol.

Prepare for cleaning lenses by gathering the following materials:

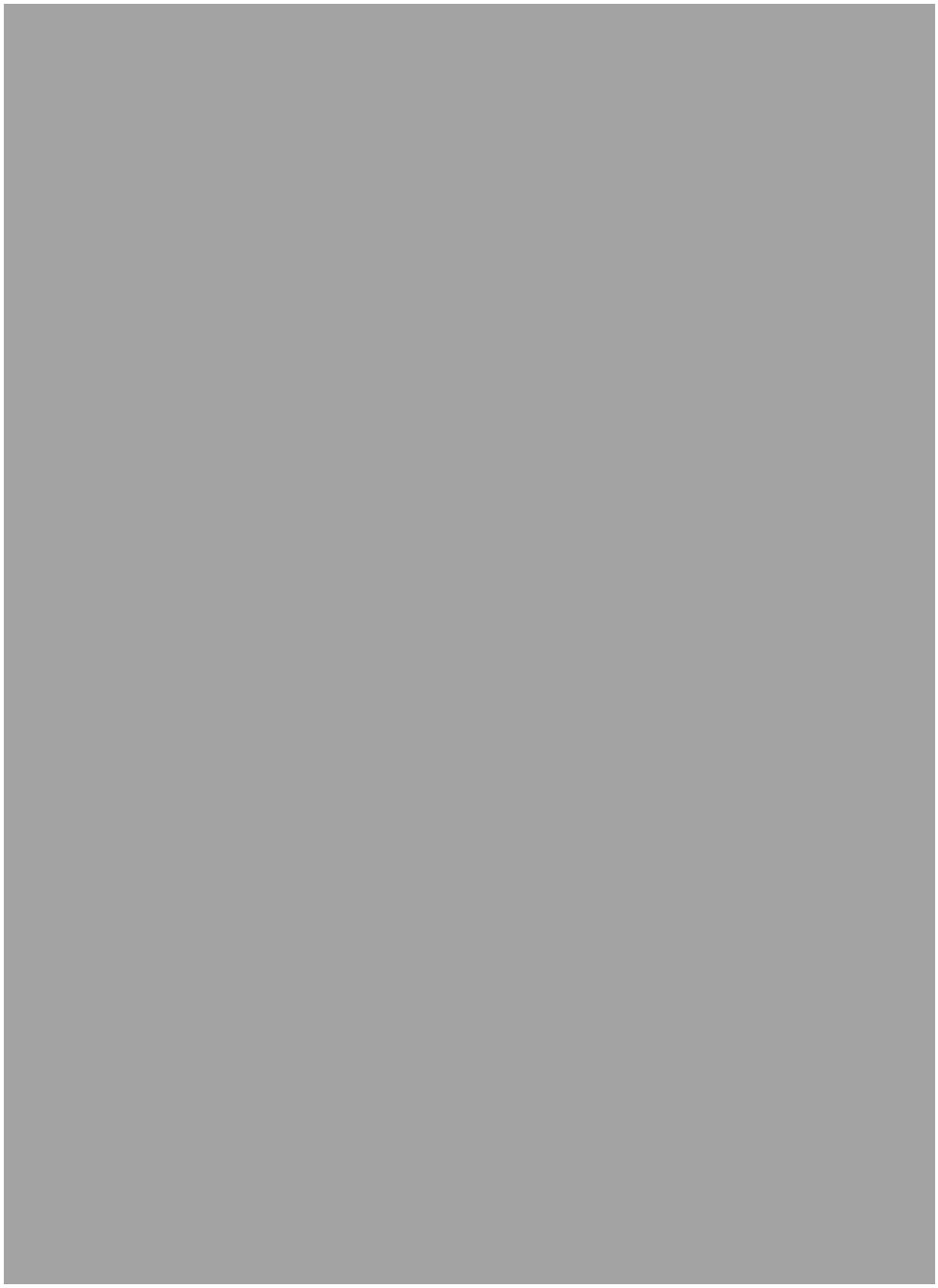
- A spray bottle with water.
- A spray bottle with a weak solution of dish detergent and water.
- A soft cotton cloth for wiping the wet lens.
- A soft cotton cloth for drying.

To clean the lens:

1. Spray the lens with the detergent solution, and wait a few seconds.
2. Spray the lens with water and rinse thoroughly.
3. Wipe with the wet cloth.
4. Finish with the dry cloth.

Appendix B: Optional Wireless Access Point

Wireless Access Point



Connecting the Wireless Access

Step 1: Firmly grasp the rear of the interface cover and pull it downward.

Step 2: Use a Cat5e or better Ethernet cable of length less than 100 m to connect to the LAN port.

Step 3: Attach the waterproof rubber insert to the groove at the underside of the device for waterproofing. Move the Ethernet cable to the hole of the waterproof rubber insert. Flatten the waterproof rubber insert until it gets parallel to the device. Replace the cover until it firmly locks into place.

Step 4: Connect the other end of the Ethernet cable to the PoE port of the passive PoE adapter.

Connect a second Ethernet Cat5e or better cable to the LAN port of the passive PoE adapter. Connect the other end of this cable to the MAINT (maintenance) port of the Autoscope OptiVu device.

Connect the power of the passive PoE adapter to an appropriate power source (110-240 VAC, 50/60 Hz).

Setting up the Wireless Connection

Step 1: Using wireless-capable device, connect to the wireless connection **TP-Link_2.4GHz_xxxxxx** printed on the inside of the product.

Step 2: Launch the web browser and enter **http://tplinkeap.net** in the address bar.

Use **admin** for both the username and password to log in.

Step 3: Enter a new username and password. Click **NEXT**.

Step 4: If desired, enter a new SSID and password for the wireless connection to the EAP110-Outdoor device. Click **SAVE** to accept changes, or click **SKIP** to retain default settings.

Step 5: Connect to the newly defined wireless connection, if necessary, then check the box that you are connected and click **FINISH**. You may close the web browser.

Step 6:

The Autoscope OptiVu Processor may now be discovered wirelessly via the EAP110-Outdoor device, as long as the device running Supervisor is connected to the EAP110-Outdoor wireless network.

For additional information, refer to the EAP110-Outdoor user documentation: https://www.tp-link.com/us/support/download/eap110-outdoor/

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