ZOOM Nitro®
with
Video Detection

INSTALLATION GUIDE

IMPORTANT SAFETY INFORMATION, PLEASE READ FIRST

SAFETY NOTICE

CAUTION: Wear eye, hearing, and body protection when grinding, drilling, or working with tools. Follow the manufacturer's safety information and operational instructions for tools and materials.

Part of this installation involves accessing the rooftop of the building to mount the camera. Rooftop equipment and tools should be carried in a backpack or in a way that frees both hands to hold onto the ladder or guard rails as you climb. Use caution on the roof, as some rooftops use electrified fencing or railings to deter birds from landing. Be aware of your surroundings and watch out for loose electrical wiring, cables, plumbing, drains, vents, and HVAC ducts as you move about. Be especially careful when mounting the camera on a ledge. Some ledges may be for decorative purposes only and may not be structurally sound or able to support the weight of a person, so don't stand, sit, kneel, lie, or lean on them. Some uneven or sloped roof structures may require you to use a safety harness to prevent slippage or falls. Please be careful and comply with all safety protocols and warnings!

Failure to heed such precautions can cause property damage, injury, or death.

HYGIENE, HEALTH, AND SAFETY

Part of this installation requires working within a restaurant/store where food is prepared and customers dine. Please consult the restaurant/store manager, standard operating procedures, and any additional restaurant safety/advisory protocols available before beginning work within the restaurant/store. Follow the instructions and guidelines provided.

BATTERY DISPOSAL

HME cares about the environment. If this product uses batteries, please consult the laws and regulations within your municipality regarding the proper disposal of expired or damaged batteries.

DISCLAIMER

HM Electronics, Inc. is not responsible for equipment malfunctions due to erroneous translation of its publications from their original English version. Illustrations in this publication are approximate representations of the actual equipment and may not be exactly as the equipment appears. They are also subject to change without notice.

KOREAN STATEMENT

사 용 자 안 내 문

이 기기는 업무용 환경에서 사용할 목적으로 적합성평가를 받은 기기로서 가정용 환경에서 사용하는 경우 전파간섭의 우려가 있습니다.

TABLE OF CONTENTS

- Video Processing Unit (hereafter VPU) with power adapter
- 5-port PoE Switch(s) (hereafter PoE switch) with power adapter
- Camera(s)
- Mounting Bracket(s) (with hardware)
- Ethernet Cables (CAT6): including 10 ft (3.05 m) cables, and long outdoor-rated 150 ft (30.5 or 45.7 m) cable(s)

> **NOTE:** The box contents and quantities may vary depending on order.

TOOLS/EQUIPMENT NEEDED:

- Standard Hand tools, screws drivers (Phillips and slotted), pliers, cutters, wire strippers, etc.
- Drill with drill bit set (with at least a 5/8" (16 mm) bit required for Ethernet cable)
- Cable ties (including mounting cable ties) and electrical tape
- Fish sticks/fish tape for routing/pulling cables
- Specialty hardware required for mounting camera bracket that may not be included with standard hardware (this may consist of sheet metal screws/masonry screws, etc.)
- Ladder (if not present on the premises)
- Laptop/PC system requirements:
    Running Windows 7 or newer.
    Ethernet port or own Ethernet adapter (for connecting to the network switch)
    Two browsers required: Microsoft Internet Explorer 11 or newer (used for Camera Setup) and Google Chrome (used for Video Setup Tool).
    A free network scanner app like Zenmap installed (Nmap is supported on Windows 7 and newer. For other versions visit https://nmap.org/book/inst-windows.html). For Apple Mac OS visit: https://nmap.org/book/inst-macosx.html

> **NOTE:** *No private or sensitive data should be on the laptop because Technical Support/Engineering may need to access the laptop to help troubleshoot.*

- Ethernet cable (medium length for connecting laptop to network switch)
- A USB mouse (for connecting to the ZOOM Nitro CU (to configure the Dashboard)
- Torx/Allen Wrench (this is included with the Camera hardware kit for adjusting camera angle and rotation)

Materials
- Cable ties (for bundling any cable slack, available at most hardware/home improvement stores).
- Hardware (while general hardware is provided for mounting system components, there may be situations when specialty hardware is required, such as masonry screws for brick/concrete walls).
- Electrical tape, twist caps.
- Waterproof sealant or equivalent (for sealing the entry point of the Ethernet cable into the building).

Safety Equipment
- Safety Glasses
- Safety harness if working a sloped or uneven roof or roof without a parapet.

SYSTEM OVERVIEW

The Video Detection option for ZOOM Nitro® provides an alternative way to detect and track vehicles in a drive-thru lane environment and/or at designated curbside/mobile pickup/pull-forward areas. It utilizes AI to analyze video frame-by-frame within a region of interest defined by the user. Using a combination of detection methods, vehicles can be detected and tracked through the entire store premises, from pre-order to final delivery.

What's required before you begin:
- A Video Detection Installation Site Survey was completed and approved before beginning the installation.
- The store is already equipped with a ZOOM Nitro timer system (running version 5.0 or later).
- The store has a fixed Internet/HME CLOUD connection (do not use a portable hotspot).
- Completed HME Network & Systems Requirements document attached to the installer's work order. Also see "Network Requirements" on page 35.

INSTALLATION OVERVIEW/WIRING DIAGRAM

Wiring Configuration D
(Store Router doesn't support PoE, Each Camera must use a separate port)

Note 1: Components are not drawn to scale and are only representations (may differ to actual components)
Note 2: This setup is for a 2-camera setup, use also for a 1-camera setup (ignore additional camera and PoE switch)

Fig. 1.1

© 2022 HM Electronics, Inc. All rights reserved.
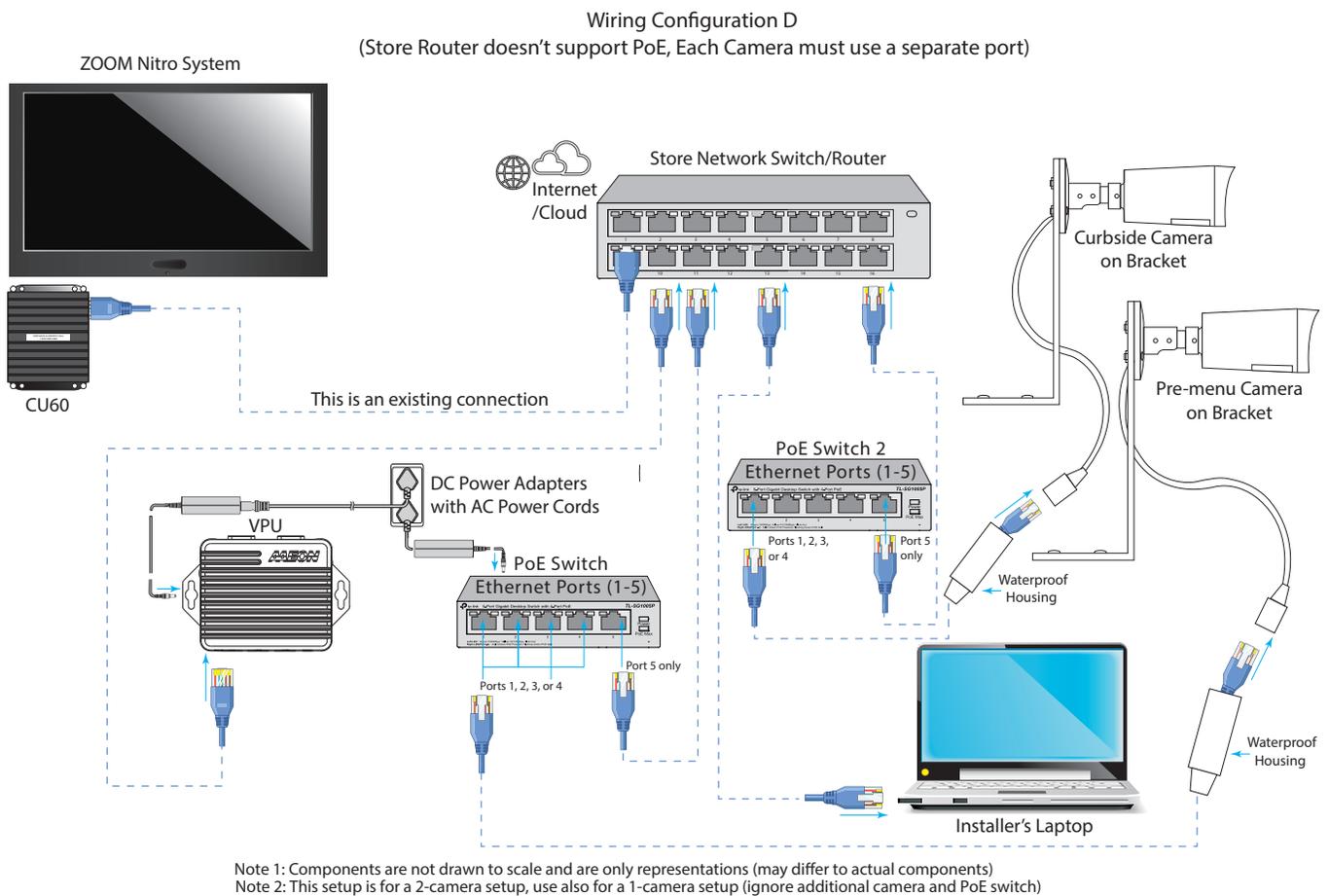
INSTALLATION

BEFORE YOU BEGIN

Determine where all components will be mounted and the location of the devices they are connecting to.
- The VPU and PoE switch should be close to the store's network switch and have access to at least two vacant power outlets.
- Determine the routing path of the cable from the camera to the PoE switch or store's network switch.
- Determine the routing path of the cables from the VPU and PoE switch to the store's network switch (the provided Ethernet cables are 10 feet so they should be within this distance).
- Make a note of the MAC address for each device (Camera, VPU, and ZOOM Nitro). The MAC address is found on device labels. You can record these in Table 3.1, see "Getting IP Addresses" on page 7. MAC addresses might be required to retrieve IP addresses.
- Use Fig. 1.1 as a visual reference for wiring connections during the installation process. Fig. 1.1 is Wiring configuration Type D which is the most commonly used configuration for two cameras. However, wiring configurations may differ from store to store, so please consult Wiring Configurations Type A, B, and C if Type D does not work. See "Appendix A and B- Wiring Configurations for one camera and two camera setups on page 37. One of these examples should suffice.
  - o Use Wiring Configuration A or C if the store's network switch does not support PoE.
  - o Use Wiring Configuration B if the store's network switch only allows one IP address per port.
  - o Use Wiring Configuration C if the store's network switch has fewer than three ports available.
  - o Use Wiring Configuration D for two cameras if the network switch does not support PoE.
  - o Otherwise, any Wiring Configuration can be used depending on convenience.
- A laptop is needed to configure this system. In the event the store's IT personnel does not provide the IP addresses for the ports designated for the hardware, make sure you have a free network scanner such as Zenmap or equivalent downloaded (See Tools/Equipment Needed on page 1). You will need it to locate the IP addresses for the devices once they are installed.

RUNNING CABLES

This installation will require working on the roof of a store. Please follow store and safety protocols. Read the "Safety Notice" on page iii. Take into consideration the following precautions when running cables from the rooftop.
- DO NOT penetrate the roof directly
  - o You CAN use existing conduits
  - o You CAN use existing HVAC vents
  - o DO NOT use Rain drains or sewer vents
  - o You CAN use the side of the building if other rooftop options are not available.
    - Secure cable along the ledge of the roof
    - Run straight down to penetration point
    - DO NOT run along the ground
- If the cable is too short, use the waterproof coupler (included) to extend with another cable.
- Excess cable should be coiled in the ceiling
  - o DO NOT leave excess on the roof or coiled on the wall
- Seal penetration point after pulling cable. Use an external roof/waterproof sealant.
- Tape end of power connector on camera to cover unused port and zip tie to Ethernet connector so it won't dangle.
- Verify the Ethernet cable to camera has the waterproof housing installed (steps 9-11).
- Seal the notch on the camera base where the cable exits if it is pointing upward when mounted.

Camera Mounting and Positioning

Wiring Configuration type D (Fig. 1.1 on page 2) is used for this installation procedure. However, the installation process is the same for all wiring configurations with the exception of the Ethernet connections. Before beginning this section, please read the "Safety Notice" on page iii.

> **NOTE:** *Repeat this procedure for each camera.*

1. Refer to the installation work order for the suggested camera placement and zone definitions.
2. Access the store roof but before mounting the camera, keep in mind:
   - The camera's field of view needs to cover an area called the Region of Interest (hereafter ROI). Point the camera towards the ROI. Later, you will define zones within this area. See "Zone Drawing" on page 15 for more information on zones.
   - Ideally, the camera should look down on the ROI at a distance of 13 to 23 feet.
   - Center the camera's view to capture the ROI while ignoring everything else outside of the ROI.
   - Ideally, vehicles driving through the ROI in the camera's field of view should be along a 30° to 50° diagonal.
   - The horizon should also be as close to a flat horizontal line as possible (if sloped or curved, the camera can be rotated to level the horizon).
3. Take a photo of or record the MAC address on the camera's label (you will need it later, Table 3.1).
4. Use the mounting holes in the black mounting bracket as a template to mark the tentative mounting location on the roof (keep in mind that the camera, once mounted, will need to be physically adjusted to capture the ROI, so this mounting location should allow for such adjustments). Drill a single mounting hole to begin with (using a single screw will allow you to pivot the bracket laterally when adjusting the camera position). Once the camera's correct field of view is established later, you will return to secure the bracket with three additional screws.
5. Use the hardware package that came with the mounting bracket to attach each camera to a mounting bracket, see Fig 2.1. Use a wrench to secure the nylon-insert lock nuts as you tighten the screws.


Screw (x3)
3rd screw hidden from view

Lock Nut (x3)
3rd nut hidden from view

Rotate base so that cable exits on the bottom to prevent water ingress

Camera
(Use camera hardware to mount bracket)

Mounting Bracket
(use bracket hardware to attach camera)
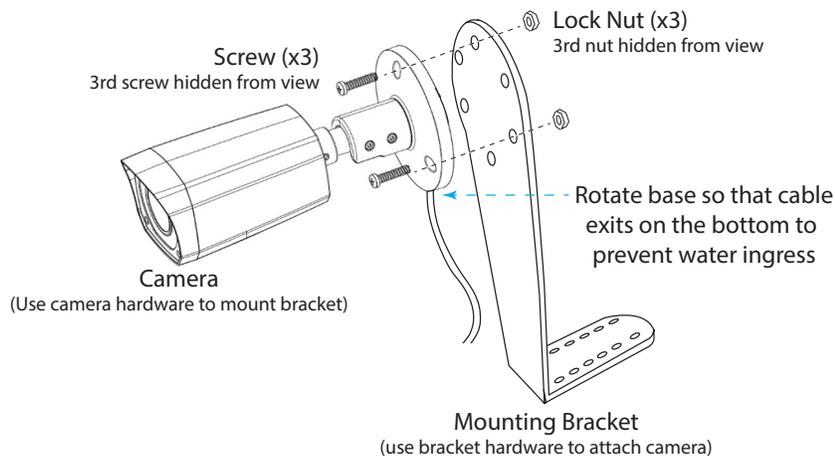
Fig. 2.1

> **NOTE:** The camera should be mounted with the Honeywell logo right-side up.
> Also, before attaching the camera to the mounting bracket, observe the orientation of the cable exit notch on the camera base and adjust as necessary. In outdoor installations, the notch should point downward to prevent water from entering the camera housing.

6. Mount the bracket to the rooftop ledge using just one screw to begin with. See Fig 2.2.

Mounted Camera

Mount initially with 1 screw (secure with 3 more after it is correctly positioned)

Edge of Rooftop

Rooftop Ledge
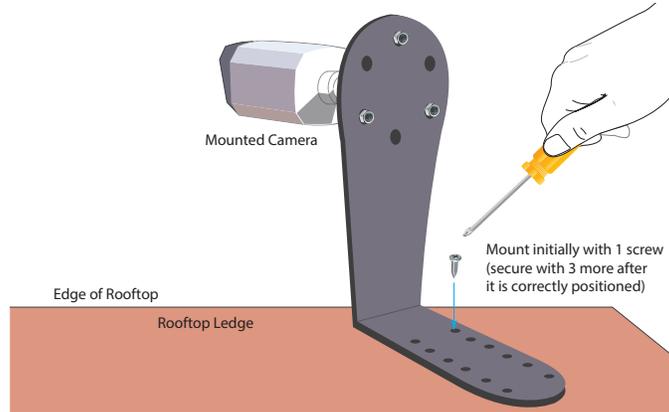
Fig. 2.2

7. Before connecting the long outdoor Ethernet cable to the camera, pull the strain relief boot back from the RJ45 plug and slide it away to make room for the waterproof housing. , see Fig. 2.3

> **NOTE:**   Most commercial Ethernet cables use a molded strain relief that cannot be separated from the RJ45 plug, so only use the outdoor cable provided.

Ethernet Cable

Pull back strain relief boot
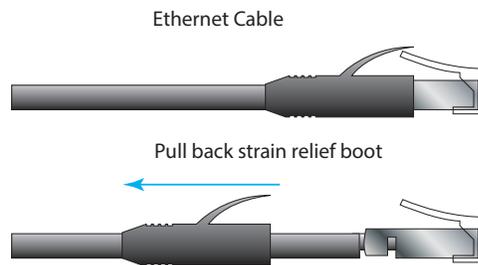
Fig. 2.3

8. Install the four-piece waterproof housing kit that came with the camera. Three pieces (1, 2, and 3) are installed over the Ethernet cable, while the fourth piece, the thin washer (4), is inserted over the RJ45 port of the camera cable, see Fig. 2.4.

Ethernet Cable   Waterproof RJ45 Housing (4 parts)   Camera Cable/RJ45 port

Ethernet Cable   Waterproof RJ45 Housing (4 parts)   Camera Cable/RJ45 port
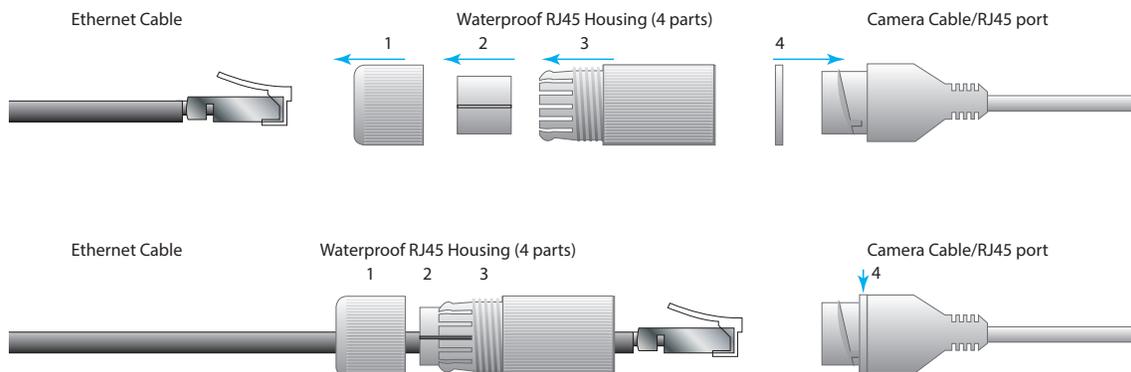
Fig. 2.4

9. Connect the Ethernet cable to the RJ45 port on the camera cable.

10. Assemble the plastic waterproof housing together to seal the connection, see Fig. 2.5.

Waterproof RJ45 Housing assembled

Ethernet Cable

Camera Cable/RJ45 port

Fig. 2.5

11. Wrap the end of the unused camera cable with electrical tape to seal it from the elements.
12. Adjust the camera until the correct position is established (pointing at the ROI). You can pivot the mounting bracket around the one screw holding it in place. The set screws on the camera neck also allow it to be adjusted up, down, or rotated, see Fig. 2.6.

> ⚠️ **Caution**: If you cannot adjust the camera without leaning over the ledge, remove the single mounting screw. Adjust the camera angle away from the ledge, and then remount it.

Loosen this screw to Rotate
Clockwise or Counter Clockwise

Loosen this screw to
Hinge Up or Down

Torx Driver
(included with camera)
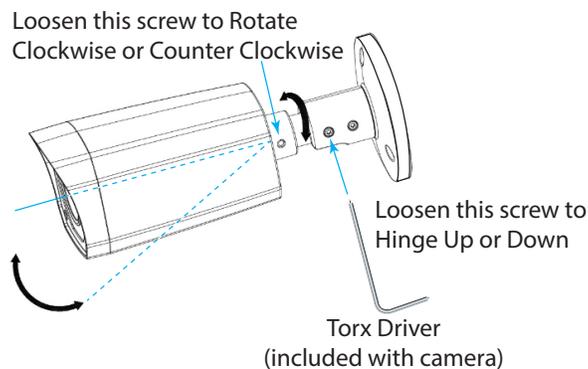
Fig. 2.6

> **NOTE:** Make sure the Torx driver is fully inserted to prevent rounding out the set-screw head.

13. With the camera now positioned correctly, secure the mounting bracket to the roof using three additional screws/bolts (and anchors if needed).
14. Route the Ethernet cable from the roof to where the PoE switch will be mounted (or the store's network switch is located if using a different configuration).

> **NOTE:** Please review "Running Cables" on page 3 before performing this step.

15. Back inside the store, mount the VPU to the wall and connect its power adapter to an outlet (the VPU mounting holes can be used as a template to mark the wall before drilling).
16. Mount the PoE switch on the wall close to the VPU and its power adapter to an outlet. The distance between the PoE switch mounting holes is 1.54" (39 mm). Also see "POE switch template for wall mounting" on page 42.
17. Connect the short Ethernet cable from the LAN/RJ45 port on the VPU to a vacant port on the store's network switch/router (or PoE switch if using a different wiring configuration Type).
18. Connect the short Ethernet cable from the fifth RJ45 Port (5) on the PoE switch to a vacant port on the store's network switch.
19. Connect the long Ethernet cable from the camera to any of the vacant ports (1-4) on the PoE switch.
20. Use an Ethernet cable to connect a laptop to the store's network switch. Disable WiFi.

GETTING IP ADDRESSES

1. Record the MAC address for each device in Table. 3.1 and provide them to the store's IT personnel if requested (the MAC address is located on the label of each device).

2. Normally, the store's IT personnel will then provide you with the IP addresses for these devices. These will be required to configure the system (or reference the installation work order for this information). Record the IP addresses here in Table. 3.1.

Note: The ZOOM Nitro (CU) IP address can be found by connecting a mouse to the CU. With the Dashboard visible on the store monitor, click on the ☰ (menu) icon in the upper left corner of the Dashboard. Log in as the installer. Navigate to the Network page and locate it under the Local Network tab.

Device	MAC Address (found on device label)	IP Address
Laptop (see step 3 below)	N/A	
ZOOM Nitro (CU), see "Note"		
VPU		
Camera 1		
Camera 2 (if applicable)		

Table. 3.1

In the event you are not provided with the IP addresses, they can be found using a free network scanner like Zenmap. If this is the case, follow these instructions.

1. Download Zenmap from here: https://nmap.org/download.html
   - The current Mac version can be found here: https://nmap.org/dist/nmap-7.91.dmg
   - The current Windows version can be found here: https://nmap.org/dist/nmap-7.91-setup.exe
2. Install Zenmap and launch it
3. Locate the IP address of your laptop. On Windows, this can be found in the Properties section under Network Status/Connections. Locate and copy the IPv4 address.
4. Type "nmap -sn" into the "Command" field on Zenmap followed by the IP address of your laptop followed by: "/24." The full string should look like this (except your IP address will be different than the one shown here): "nmap -sn 192.168.86.46/24"
   Note: Do not fill out the "Target:" field. That self populates.
5. Tap or click on the "Scan" button. The "Nmap Output" window will populate with every device on your network (if the store blocks the scan, you'll need to work with the store's IT person).
6. Locate the devices in the Nmap scan report. See example in Fig. 3.1. Use Table 3.1 to record the IP addresses for the text strings that contain the following descriptions:
   - MAC address … (Jetway Information) … in the address line [This is the ZOOM Nitro timer]
   - MAC address … (Nvidia) … in the address line [This is the VPU]
   - MAC address … (Honeywell International) … in the address line [This is the camera]

```
MAC Address: 10:02:23:43:70:40 (Hewlett Packard)
Nmap scan report for zoom-nitro-52Y03517.HMB.COM (10.5.32.43)
Host is up (0.00020s latency).
MAC Address: 00:30:18:00:7F:03 (Jetway Information)
Nmap scan report for aaeon-desktop.HMB.COM (10.5.32.44)
Host is up (0.0017s latency).
MAC Address: 00:04:4B:EA:40:75 (Nvidia)
Nmap scan report for Honeywell390.HMB.COM (10.5.32.45)
Host is up (0.00039s latency).
MAC Address: 00:40:84:F4:52:0A (Honeywell International HPS)
```

Fig. 3.1

CAMERA SETUP

This section assumes all system connections are made and your laptop is connected. The laptop you will use in this section should also have the following browser loaded:
- Internet Explorer for Windows (Only Microsoft Internet Explorer 11 or newer is supported).

NOTE:	*Repeat this procedure for each camera.*

1. With your IE browser open, enter the camera's IP address (from Table 3.1) into the URL field, see Fig. 4.1. The IP address used here is only an example and will differ to the actual one used.
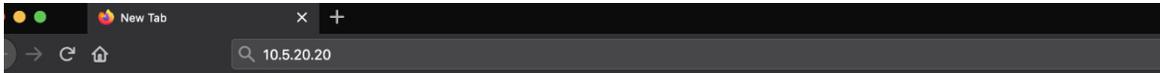
Fig. 4.1

Click on "More information," see Fig. 4.2 (if the Honeywell portal (Fig. 4.6) appears instead of this screen, skip the following steps and go directly to step 6).

Fig. 4.2

2. Click on "Go on to the webpage," see Fig. 4.3.
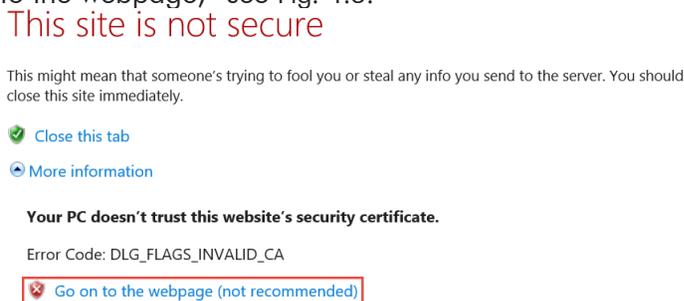
Fig. 4.3

3. If you are asked if you want to install a plug-in, click on "Run." See Fig. 4.4 and Fig. 4.5. If not, go to Step 6.
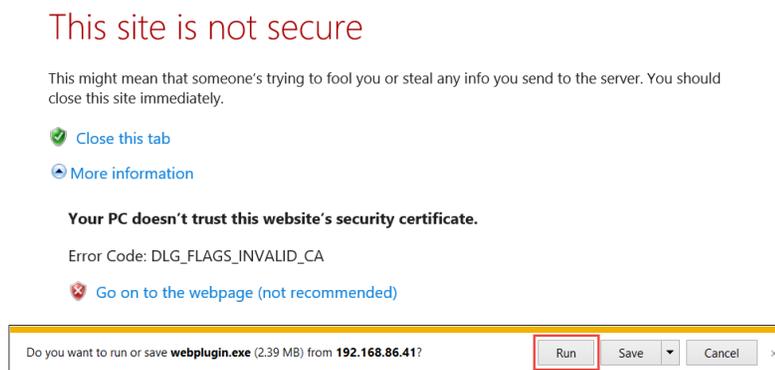
Fig. 4.4
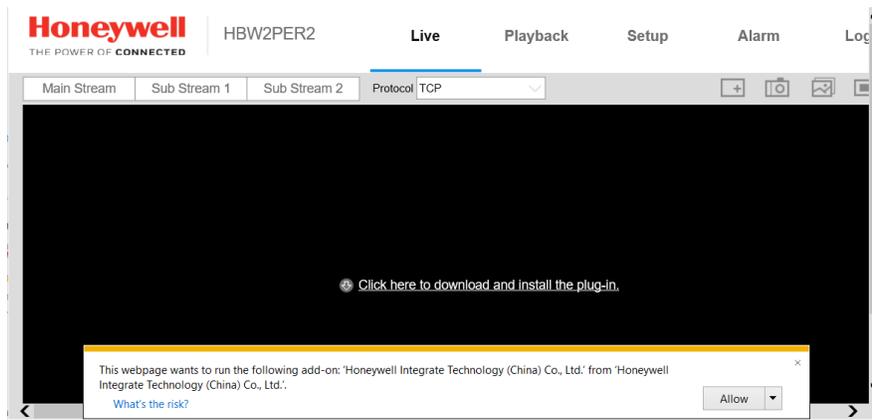
Fig. 4.5

4. You will be requested to log in again. See Fig. 4.6.
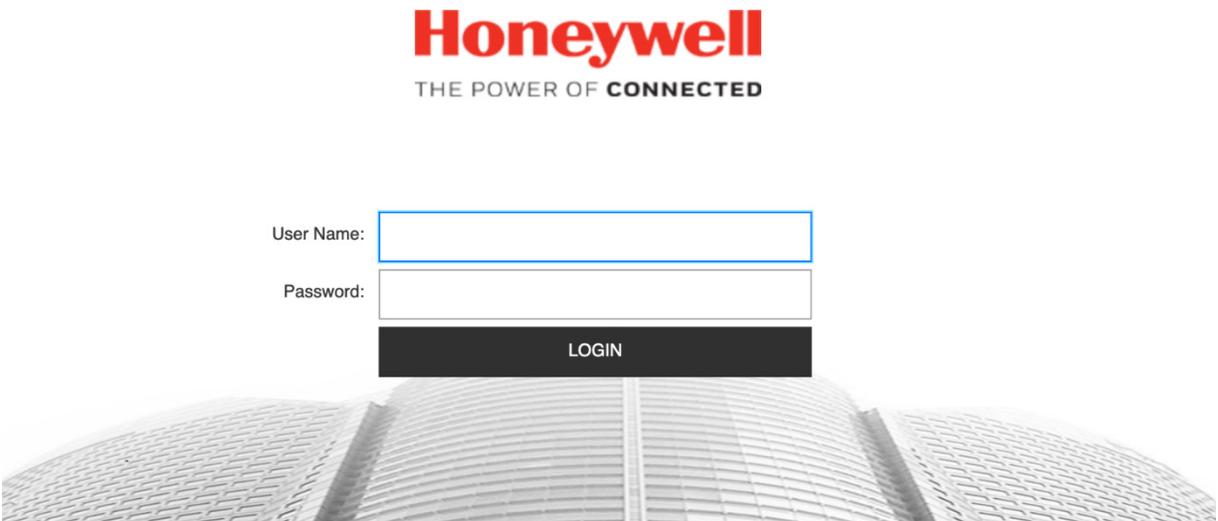
Fig. 4.6

5. Log in to the portal using the following default credentials (these credentials are case-sensitive):
   User Name: admin
   Password: 1234
   When prompted to do so change the password to:
   User Name: admin
   Password: evdHME2020!

NOTE:	Please only change the password to the one listed here as HME requires it for future access.

6. If the security prompt appears, click "Allow," see Fig. 4.7. You may have to repeat this several times.
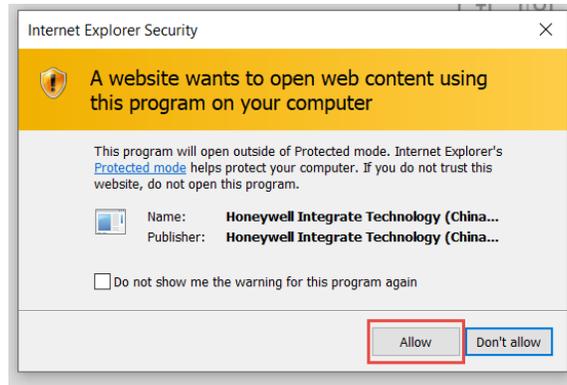
Fig. 4.7

7. In the camera's portal, click "Setup" in the options on the top right side of the screen. See Fig. 4.8.

Fig. 4.8

8. Then select "Camera Setup" from the sidebar menu and then "Video." See Fig. 4.9.
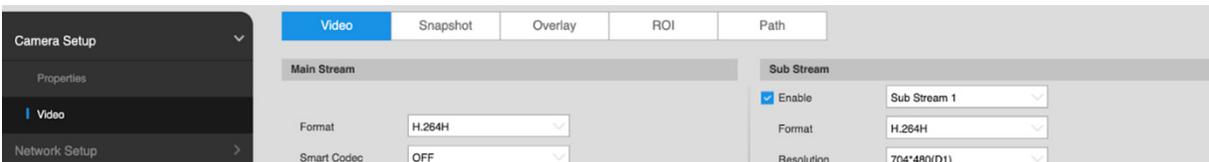
Fig. 4.9

9. Select the following parameters from the drop-down list of each field (see Fig. 4.10):
   • In the Frame Rate (FPS) field: 20
   • Deselect "Watermark Settings"
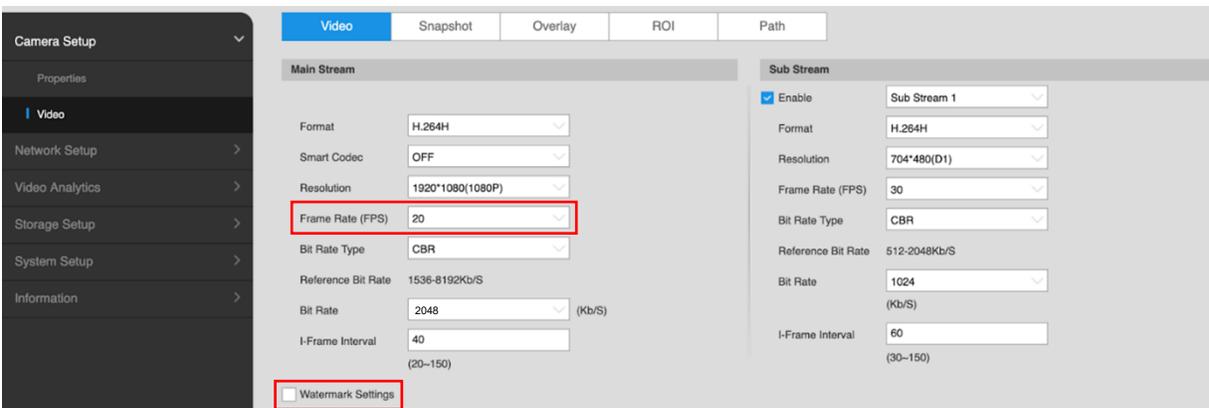
Fig. 4.10

10. Click "Save," see Fig. 4.11

Fig. 4.11

11. While still on the Camera Setup page, select "Properties" located on the sidebar menu, see Fig. 4.12.
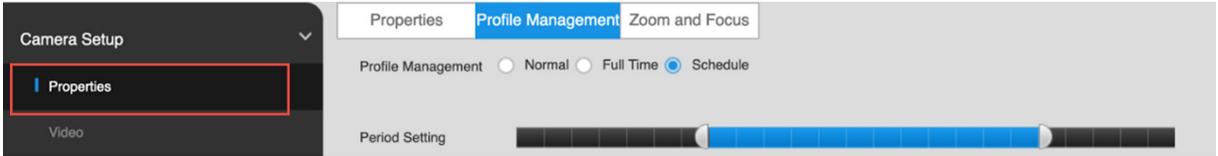
Fig. 4.12

12. Select the "Profile Management" tab and then check the "Schedule" option, see Fig. 4.13.
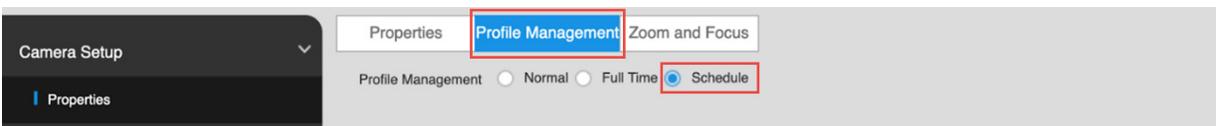
Fig. 4.13

13. Use the blue slider bar (Day) to configure the "Period Setting" time covering 7:00 hours to 19:00 hours, see Fig. 4.14. Save your settings.
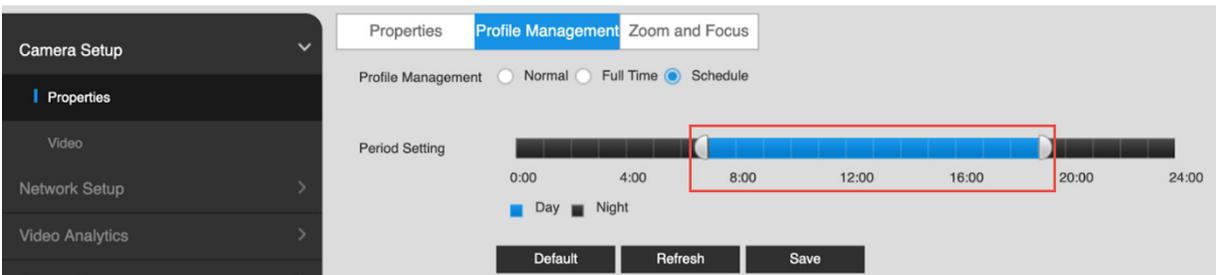
Fig. 4.14

Day Settings

14. From the menu options to the right of the black window, select: "Lighting Compensation." If the preview window blocks this option, make your browser window smaller and then use the scroll bar to access.
    • Select "Day" from the **Profile** field drop-down list.
    • Select "WDR" from **Mode** field drop-down list.
    • Adjust the slider bar beneath the field to 25. See Fig. 4.15
    • Save your settings.

11
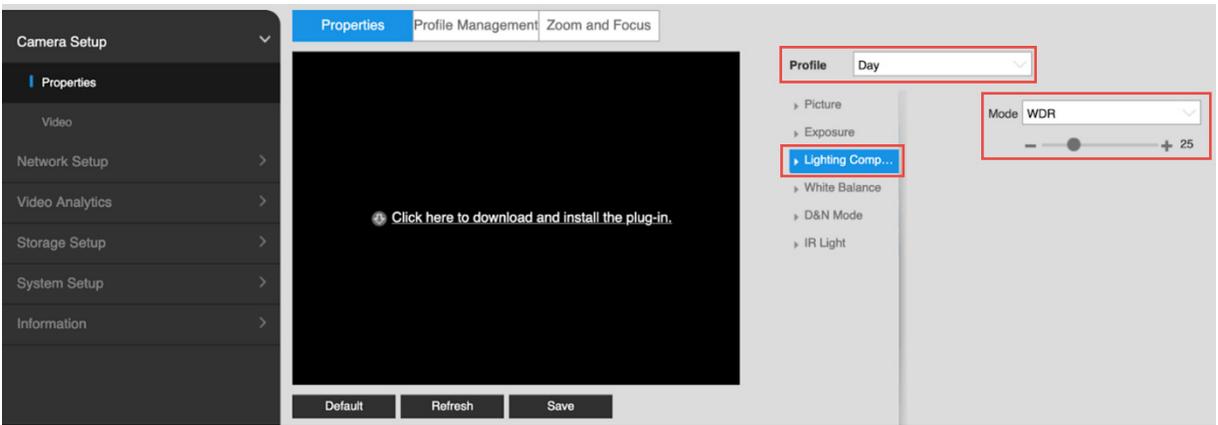
Fig. 4.15

Night Settings

15. Next, select the "Properties" tab, see Fig. 4.16.
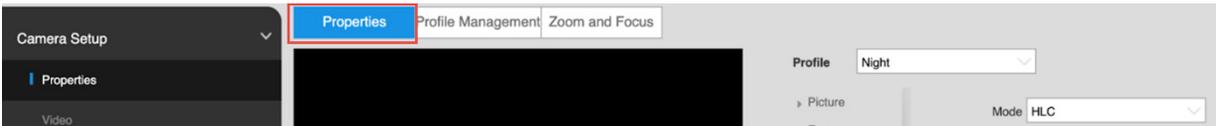
Fig. 4.16

16. From the menu options to the right of the video preview window, select: "Lighting Compensation."
    If the preview window blocks this option, make your browser window smaller and then use the scroll
    bar to access.
    - Select "Night" from the **Profile** field drop-down list.
    - Select "HLC" from **Mode** field drop-down list.
    - Adjust the slider bar beneath the field to 40. See Fig. 4.17
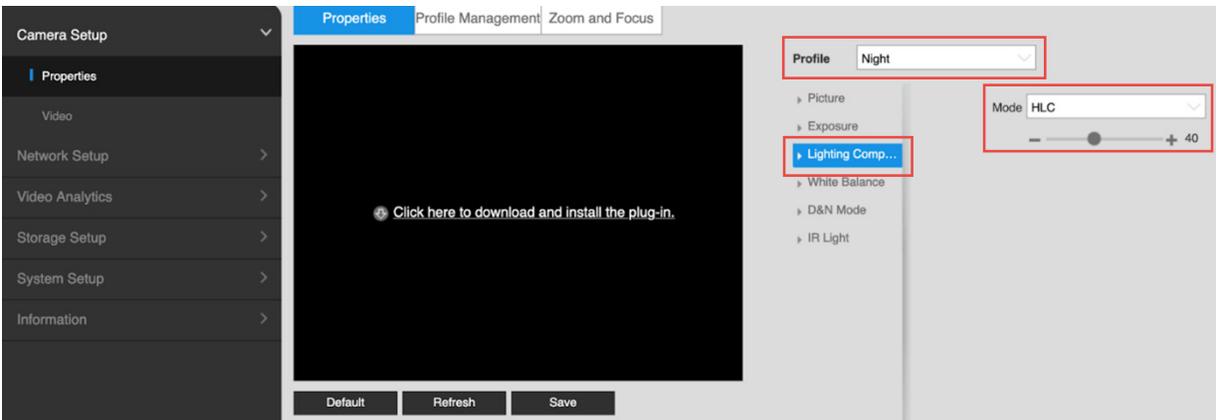
Fig. 4.17

17. Next, from the menu options to the right of the video preview window, select: "D&N Mode." If the
    preview window blocks this option, make your browser window smaller and then use the scroll bar to
    access.
    - Select "Color" from **Mode** field drop-down list. See Fig. 4.18

- Save your settings.
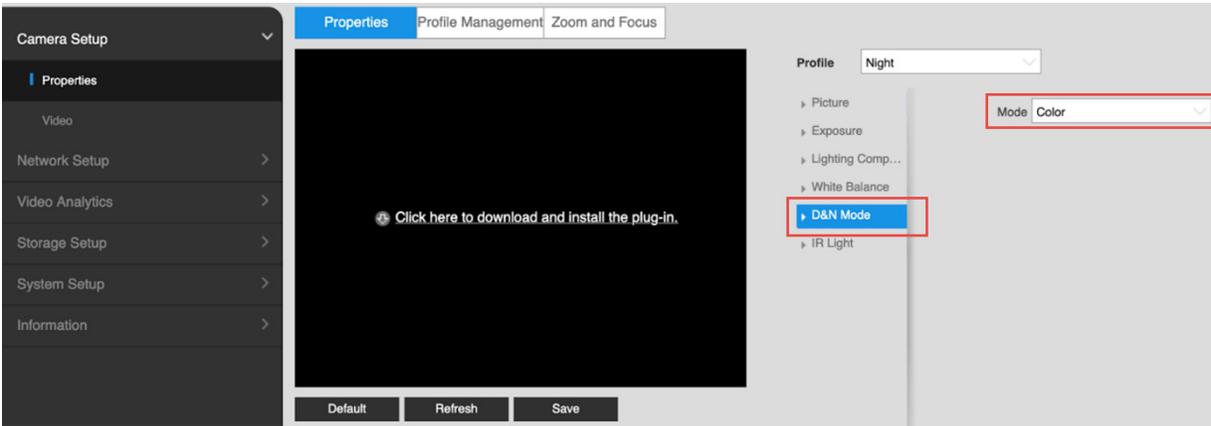
Fig. 4.18

Date and Time Settings

18. Select "System Setup" from the sidebar menu and then "General" (from the sidebar menu). With the "Date & Time" tab selected, press the "Sync PC" to the right of the "Current Time" field (this assumes your laptop has the correct date and time). See Fig. 4.19. Save your settings.
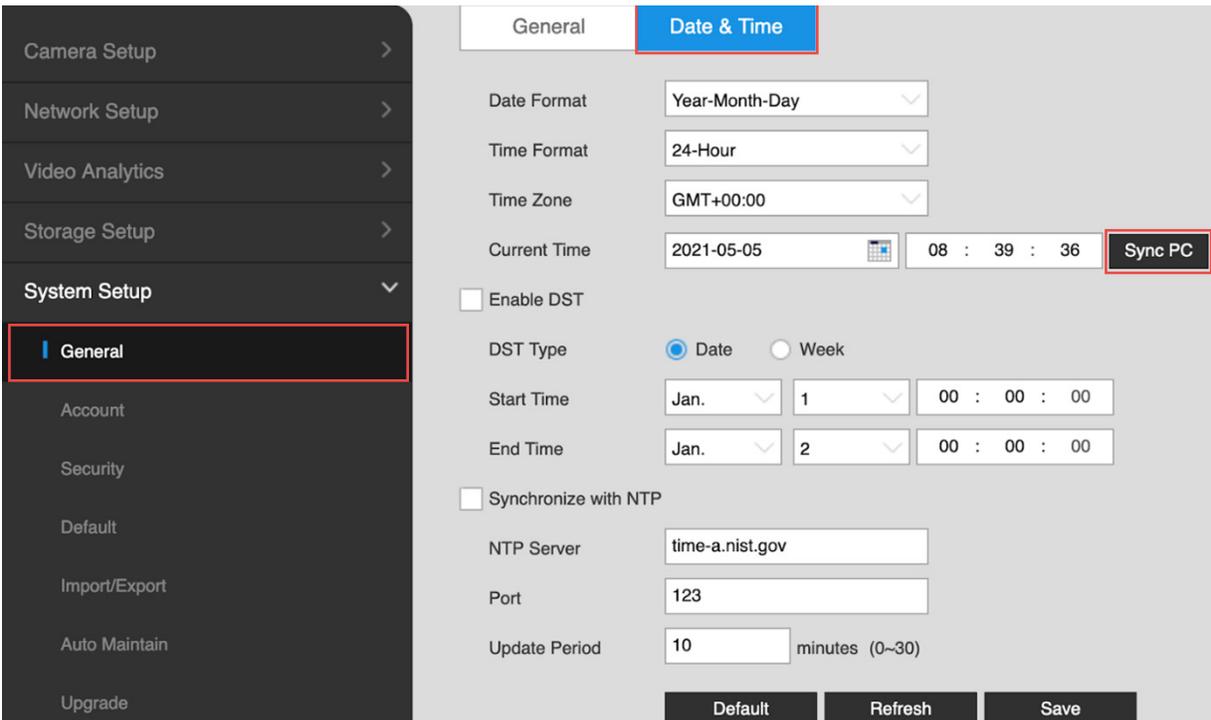
Fig. 4.19

CONFIGURING THE ZOOM NITRO VIDEO SETUP TOOL

NOTE:	Repeat this procedure for each camera.

1. Open the Google Chrome browser (do not use IE as your browser). Enter the IP of the VPU into the URL field (see Table 3.1 under "Getting IP Addresses" on page 7). This will open the ZOOM Nitro Video Setup Tool.
2. Log in as an Installer (same password used to access the ZOOM Nitro timer).
3. Go to the NETWORK page (see Fig. 5.1) and type the IP address of the CU (from Table 3.1 on page 7) into the ZOOM Nitro CU field. (If a different fixed IP address has been assigned, see "How-To" section beginning on page 33.)
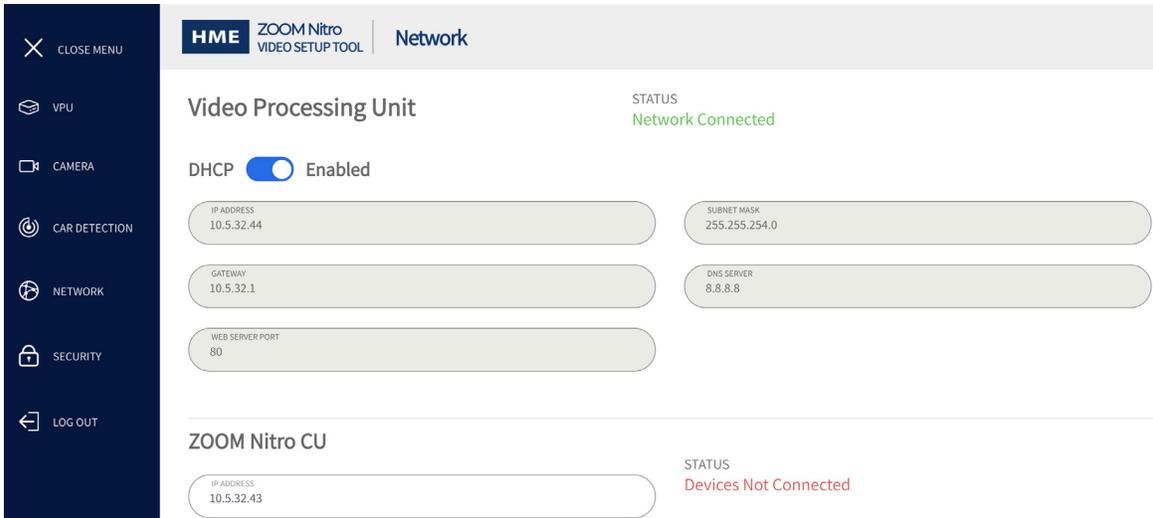
Fig. 5.1

4. Click "Save" and the STATUS field will change to "Connected."
5. Click "Test All Connections," all connections should change to "Passed." If any fail, contact HME Technical Support. They will work with the Store's IT personnel to resolve the network issue.
6. Go to the CAMERA page and confirm that Camera Status is "Connected." The system will display the Camera Settings as shown in Fig. 5.2, verify or set the following fields to match those under Value/ Description in Table 5.1 (however, the IP address will vary). The Camera Name can be changed but it is recommended that no other fields are changed unless the camera is not auto-detected.
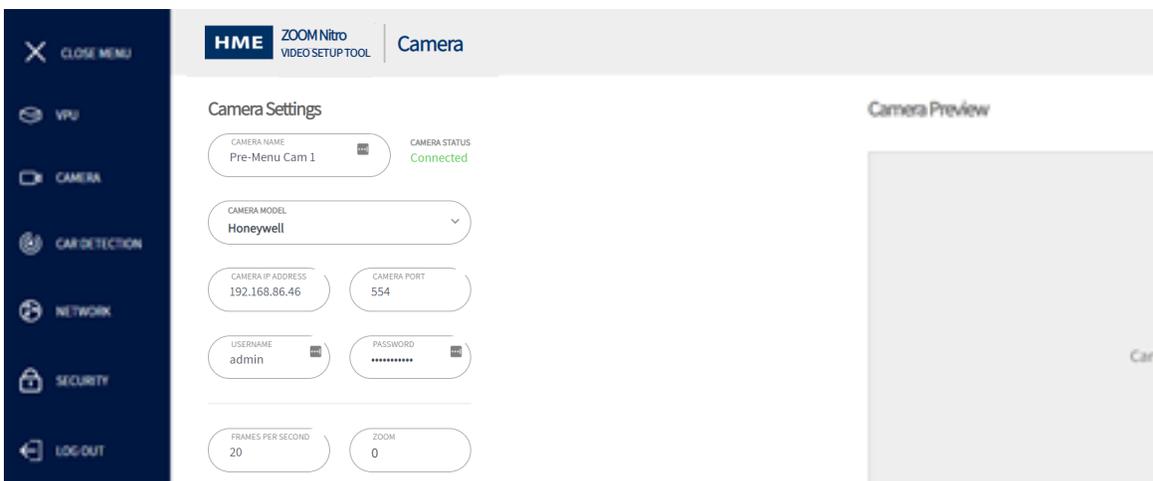
Fig. 5.2

Field	Value/Description
Camera Name	Default: "Pre-Menu Cam 1," (You can edit this name.)
Camera Model	Default: Honeywell is selected
Camera IP Address	Normally auto-detected
Camera Port	Normally auto-detected
Username	Normally "admin"
Password	Normally "evdHME2020!"
Frames Per Second	Default: 20
Zoom	Default: 0 (Positive integer range is 0 - 100. Examples: 0, 20, 60, and 75). We recommend beginning with a nominal value like 20 and adjusting from there.

Table 5.1

7. Once all the fields are populated, press Save. The Camera Preview window shows the camera's view, see example in Fig. 5.3.
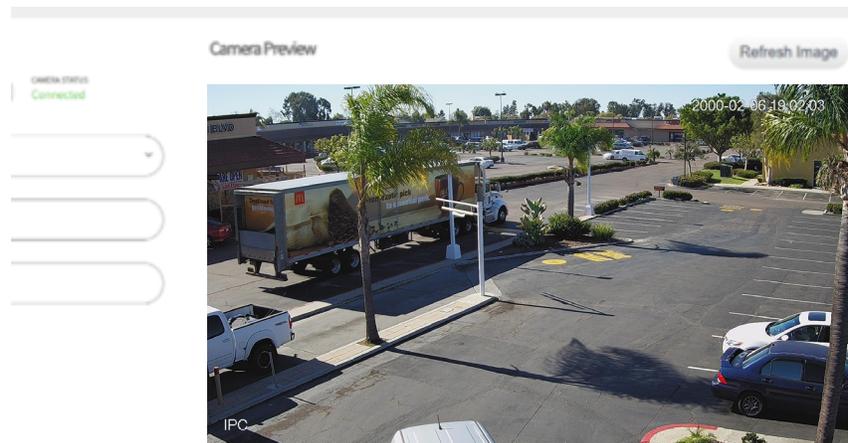

Fig. 5.3

8. If the field of view displayed does not contain the complete ROI, you may have to return to the rooftop to manually adjust the camera.
9. The zoom on the camera should only be adjusted if the onscreen area widely exceeds the ROI, which is the first zone to be defined using the Video Setup Tool.

ZONE DRAWING OVERVIEW

The Car Detection window of the Video Setup Tool now requires you to define zones within the field of view. The wheels and front windshield are the main parts of a vehicle used by Video Detection to identify and track the vehicle. All zones are color-coded by the system which helps identify each at a glance. The following is a quick overview of Zone Definitions:

- **Region of Interest (ROI)**: This is the selected area within the camera's field of view that the system is concerned about. This region defines the overall region of interest which includes the Danger and Pre-Menu Zone(s) and/or Mobile/Pull-forward Zone(s). Fig. 6.1 defines the Region of Interest for a Y-Lane configuration. The green boundary line indicates this region.
- **Danger Zone (DZ)**: This is an area of the drive-thru where cars get in line to join the queue for the drive-thru, but still have the ability to drive off without placing an order. Vehicles will some-times do this if the wait time is too long or they simply decide they don't want to order anything. In Fig. 6.1, the red area (DZ) defines the Danger Zone.
- **Pre-Menu Zone(s) (PM)**: This is an area approaching the menu board where vehicles are captive or bound in by the lane. Vehicles at this point have already passed through the Danger Zone and cannot easily drive off. In Fig. 6.1, the blue (PM1) and orange (PM2) areas define the Pre-Menu Zones.
- **Mobile/Pull-Forward Zone(s)**: These are parking stalls designated by the restaurant for curbside, pull-forward, or mobile pickup customers (i.e., it does not have a combined danger zone and pre-menu zone). See Fig. 6.6 to 6.8 for an example of these zones.
- **Occlusion(s)**: These are objects such as signs or vegetation blocking the camera's view of vehi-cle movement within the ROI. Occlusions within the ROI blocking the wheels or windshield of the moving vehicle should be identified so the system can account for them.

Important: Danger and Pre-Menu Zones cannot overlap, and these zones cannot overlap the ROI boundary line. As you define your zones in the following instructions, the system will prompt you when zones are overlapping (see step 5).

> **NOTE:** Also see "Zone Definition - Positive and Negative examples:" on page 28
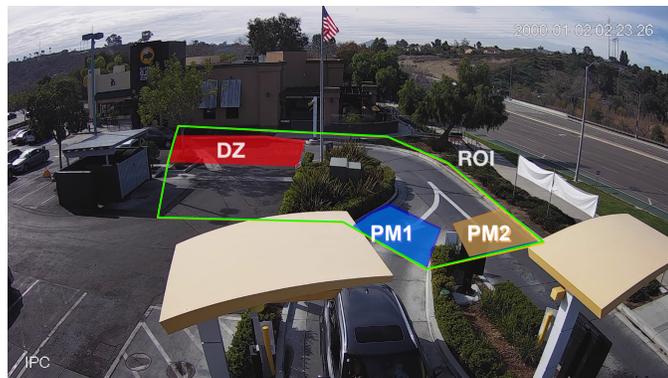

Fig. 6.1

Zone Drawing

1. On the Video Setup Tool, select CAR DETECTION from the sidebar menu. Choose the appropriate Lane Configuration (Lane Configuration must match the Lane Configuration used on the ZOOM Nitro timer system, the example used in this section is a Single-Lane configuration). The first zone to be defined is the ROI. Within the ROI are other zones that must also be defined such as danger zone and pre-menu(s).

2. In the Camera Preview window, the image will appear with a green bounding box in the middle. This box represents your ROI. You will now need to adjust the size and shape to define the ROI you wish the camera to focus on in the image. See Fig. 6.2
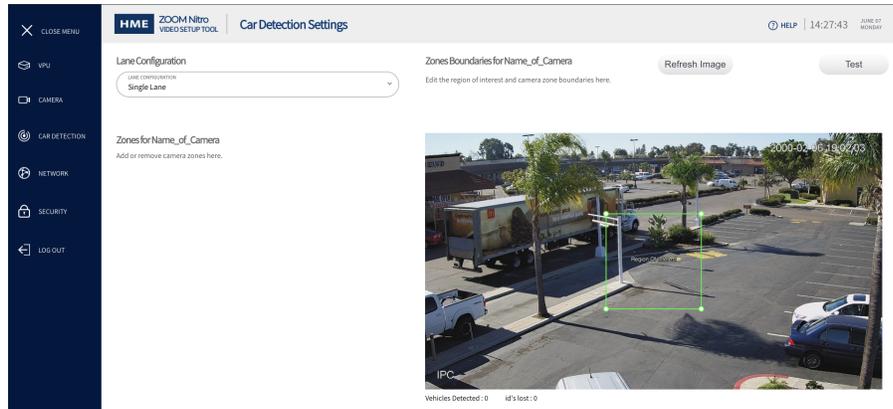

Fig. 6.2

3. Each corner has a anchor point (indicated by a dot) which can be grabbed using your cursor and moved independently to a desired location within your field of view. Use these anchor points to define the ROI, (see new boundary lines in Fig. 6.3).You can also insert additional anchor points to create more complex shapes or delete anchor points to simplify. Fig. 6.3 has three more anchor points added to create this new ROI boundary.

   - To add an anchor point: Click anywhere along any line segment of the displayed box to insert another anchor point at that location.
   - To delete an anchor point: Click on the anchor point to select it (the dot fill changes from white to green). Then, press the "Delete" key to remove it.
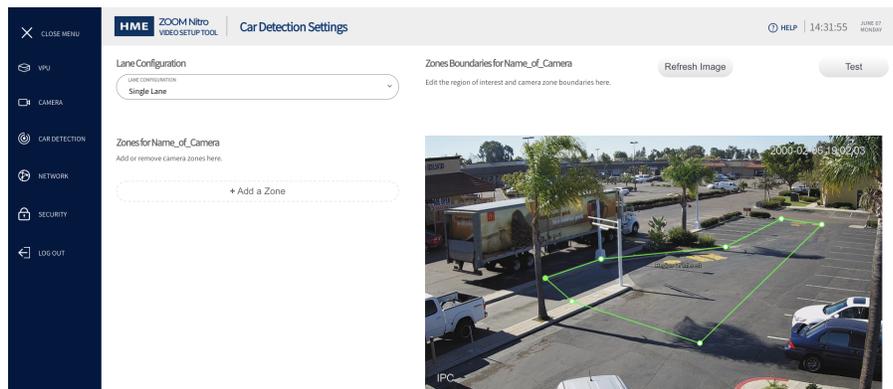

Fig. 6.3

> **NOTE:** The ROI should not be any larger than it needs to be. Pay special attention to excluding areas of traffic movement outside of the Danger Zone and Pre-Menu Zone(s).

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4. After you draw the ROI, click Save (the "+ Add a Zone" button appears), see Fig. 6.3.
5. Click on "+ Add a Zone" and the Pre-Menu Zone appears with a new bounding box (blue) in the image (the box will be yellow if it overlaps the ROI). Adjust the size and shape of this box as you did with the ROI to define this zone and click Save when you are finished. See Fig. 6.4.

> **NOTE:** When a zone extends beyond the boundary line of another zone, a red prompt like this: ⚠ All zones should be inside the Region of Interest will appear advising you to adjust the new zone to within the ROI boundary.
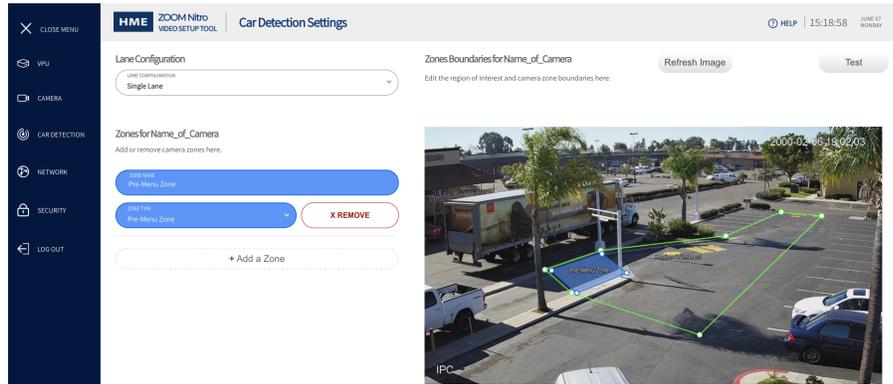

Fig. 6.4

6. Finally click + Add a Zone button again, the Danger Zone appears with a new bounding box (red) in the image (the box will be yellow if it overlaps another zone). Adjust the size and shape of this box to define this zone and click Save when you are finished. You should now have three zones in your image, one ROI zone (green boundary line), one Pre-Menu zone (blue area), and one Danger zone (red area), see Fig. 6.5. This completes the Zone Drawing section.
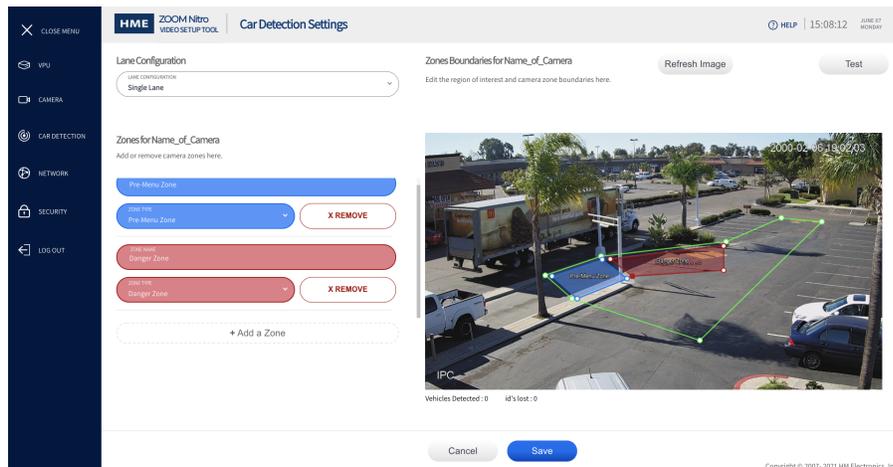

Fig. 6.5

> **NOTE:** If this was a Y-Lane Configuration, step 6 would become a repetition of step 5. After clicking the "+ Add a Zone" button in step 6, the system would automatically know to add a second Pre-Menu Zone (2) instead of the Danger Zone. Then, once the second Pre-Menu Zone (orange) was defined and saved, clicking the "+ Add a Zone" button again would then add the Danger Zone as the last zone.

Curbside/Mobile and Pull-Forward Zone Drawing example:

Fig. 6.6 shows a designated area in the parking lot of a QSR. Four stalls are reserved, two Pull-Forward wait areas and two Mobile Pick-up areas.

Fig. 6.6

Fig. 6.7 shows how these zones will look when drawn on the Car Detection Settings page. These zones are created in the same way as described in step 3.
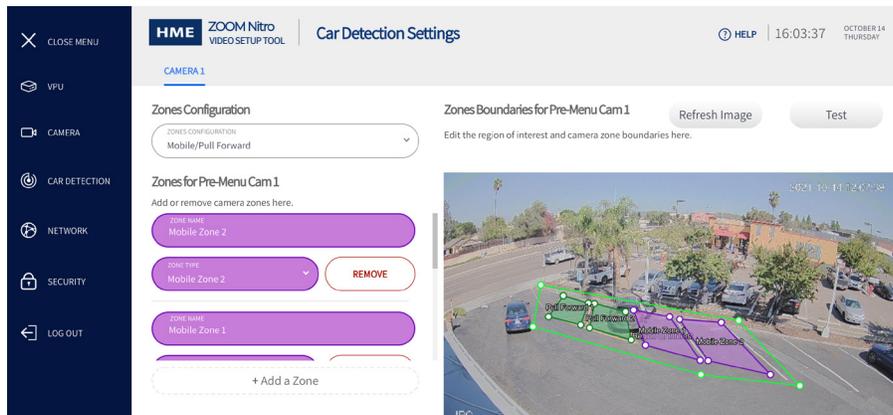

Fig. 6.7

Fig. 6.8 shows a closer view of the zones specified in Fig. 6.7. Note that there is a ROI around four individual parking zones but no preceding danger zones as in a drive-thru lane environment.
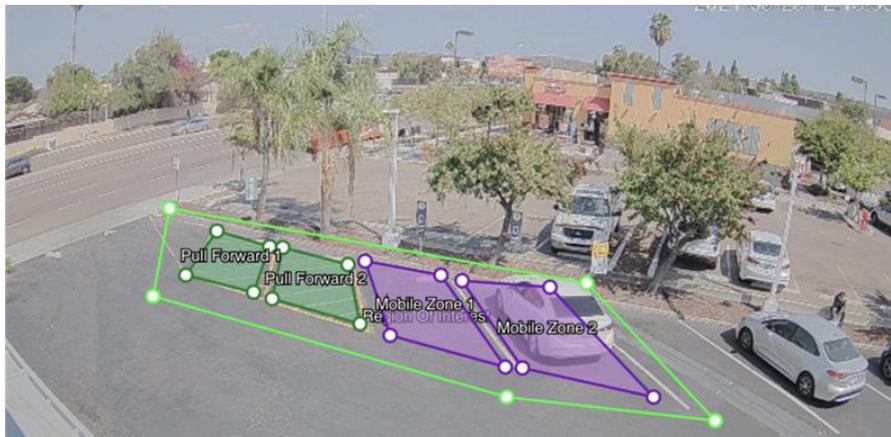

Fig. 6.8

Video Detection Mapping on ZOOM Nitro

The following example is for a store with a Y-Lane configuration using a single camera for the drive-thru area (Danger Zone/Pre-menu Zone). The actual layout will vary from store to store.

1. Take a photo of the ZOOM Nitro Dashboard before you begin configuring it.
2. Connect a mouse to a vacant USB port on the CU60.
3. With the Dashboard visible on the store monitor, click on the ☰ (menu) icon in the upper left corner of the Dashboard.
4. Log in as an Installer using the installer password, see Fig. 7.1.
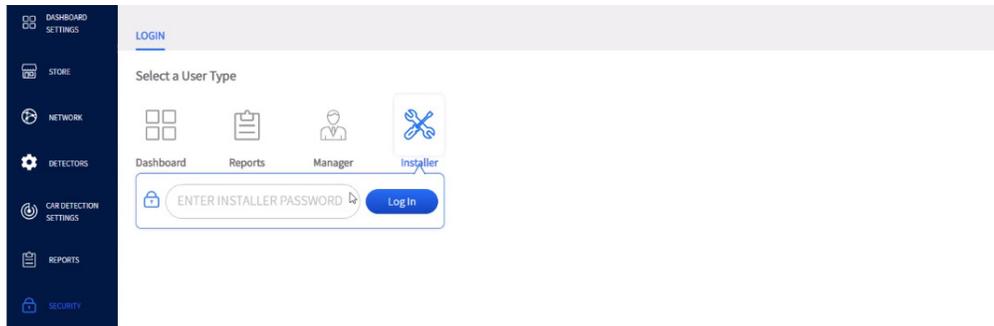
Fig. 7.1

5. Select DETECTORS from the sidebar menu, and then select CAMERA tab to open the CAMERA page. Toggle the Enable switch to connect to the Video Processing Unit. Click the Save button to save your change. See Fig. 7.2.


Fig. 7.2

6. Select CAR DETECTION SETTINGS from the sidebar menu. Under Add/Remove Detection Types, expand the PRE-MENU option and click Add to add detectors. See Fig. 7.3.
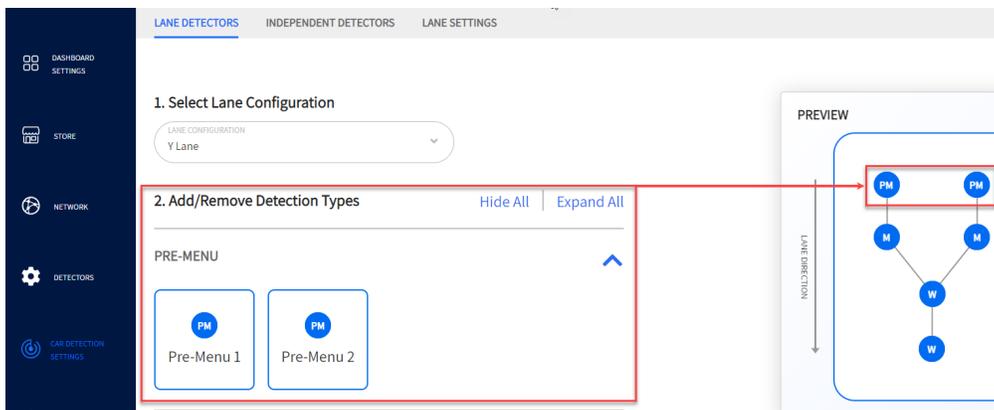

Fig. 7.3

7. The PREVIEW graphic is dynamic and reflects the store's lane layout as soon as changes are made. (If in a store with an existing Timer system, the layout should be the same as it was previously was but with a new PM dot (solid blue) added to the beginning of the graphic, as shown in Fig. 7.4.
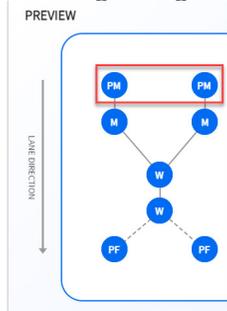

Fig.7.4

8. Scroll down to Configure Detector Mappings. You will see the Pre-Menu EVD detectors included. See top two rows of Fig. 7.5. Click the Save button to save your change.
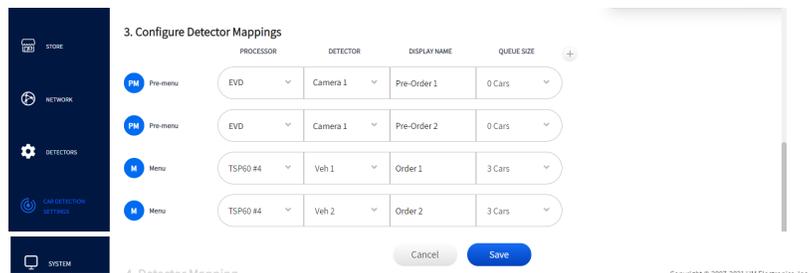

Fig. 7.5

Displaying Lane Totals on the Dashboard

Please note that the user also has the ability to configure one of the Dashboard panes to include Pre-Menu info such as a Total Experience Time (TET). Select the Lane Settings tab. The example shown in Fig. 7.6 changes the Start Total field of Lane Total 2 to Pre-Menu. The lane total will now include Pre-Menu queue times up until the vehicle departs from the last lane detector (Service in this example). Click the Save button to save your changes.

> **NOTE:** Lane Total or Lane Total 2 can be used depending on how the user wishes to visually display the information on the Dashboard. Lane Total directly impacts the cars visually displayed on the dashboard lane. However, Lane Total 2 is a metric that can be configured within one of the dashboard sections/panes.
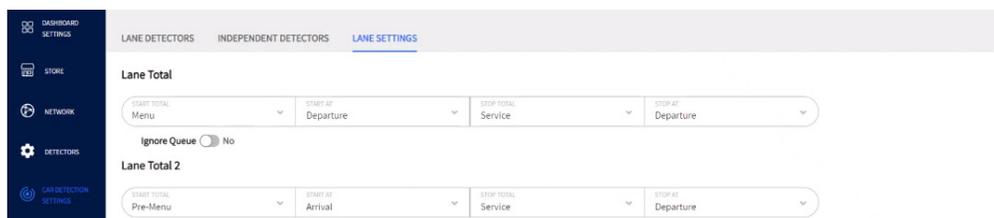

Fig. 7.6

To display lane totals on the dashboard.

1. Select DASHBOARD SETTINGS in the sidebar menu to open the page. Click on the dashboard section/ pane you wish to change (Section 5 in this example, lower middle pane), and under the Dashboard Template, choose the option from the drop-down menu of the second field "Metric." In this example, it's Lane Total 2. See Fig. 7.7.
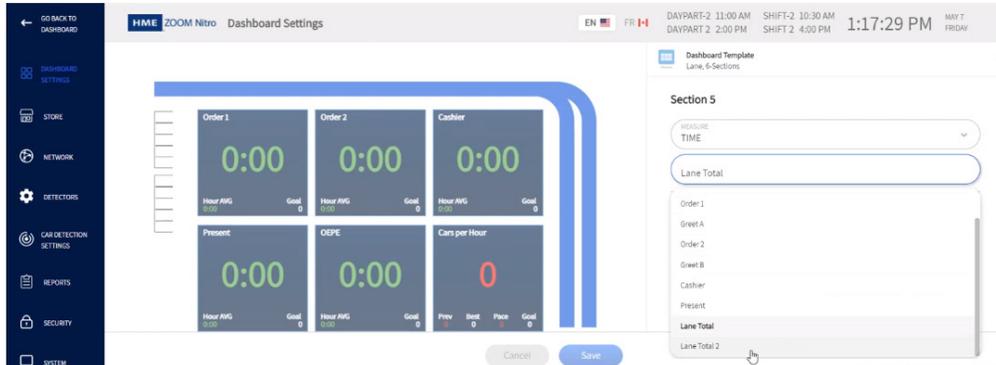

Fig. 7.7

2. In the third field, add a new Title, in this example, it is Total Experience Time (TET). Click the Save button to save your change. See Fig. 7.8.
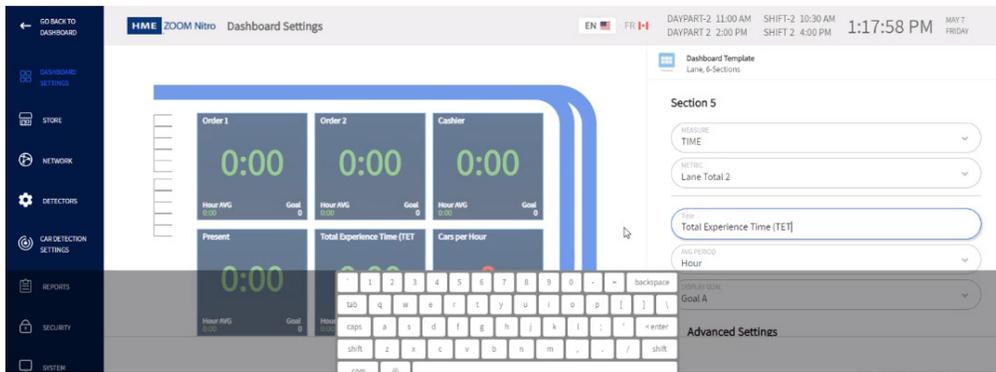

Fig. 7.8

3. Return to the Dashboard to see affected change. See Fig. 7.9. (lower middle pane).
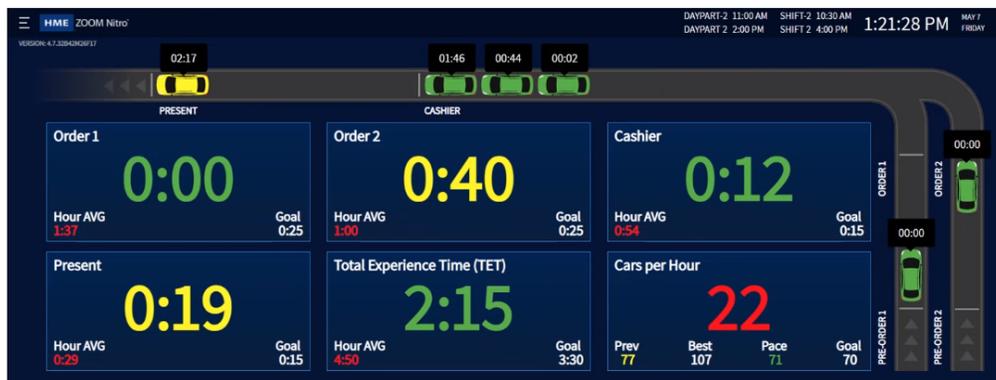
Fig. 7.9

Displaying Pre-Menu Danger Zone Drive Offs on the Dashboard

Drive offs occur when a customer decides to drive off before placing an order. Video detection allows you to configure and track drive offs on your dashboard.

> **NOTE:** A drive off is a lane event, so this feature is only applicable when the camera is used in a drive-thru lane environment (i.e., not for a Pull-Forward/Mobile settings).
> The Video Processing Unit must be Enabled to configure these settings, see Fig. 7.2

To enable Drive Off Counter and Notification prompts at bottom of Dashboard:
1. Select DASHBOARD SETTINGS in the sidebar menu to open the page.
2. Toggle all three Drive Off buttons to enable the counter and notifications, see Fig. 7.10
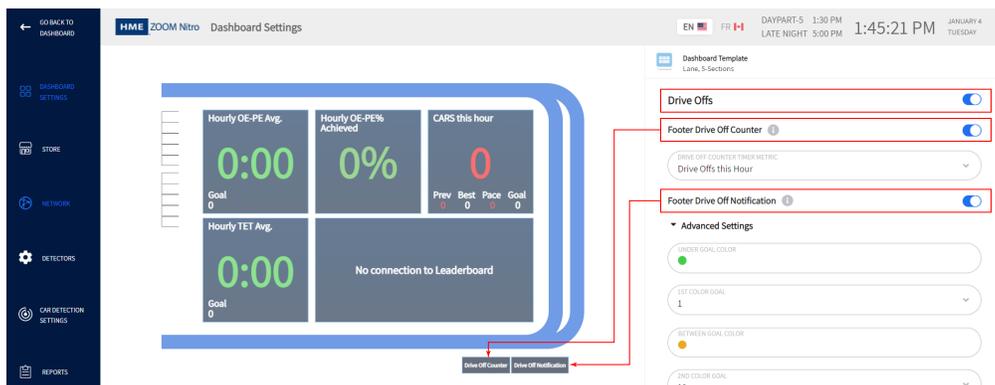
Fig. 7.10

To configure a data section to display Drive Off metrics:
1. Select DASHBOARD SETTINGS in the sidebar menu to open the page.
2. Click on the dashboard section/pane you wish to change (Section 3 in this example, upper right pane).
3. Under the Dashboard Template, choose DRIVE OFFS from the drop-down menu of the first field "MEASURE." Then give your section a Title, and finally choose a metric from the drop-down menu of the third field. In this example, it's "Drive Offs this Hour." See Fig. 7.11. Click the Save button to save your change.
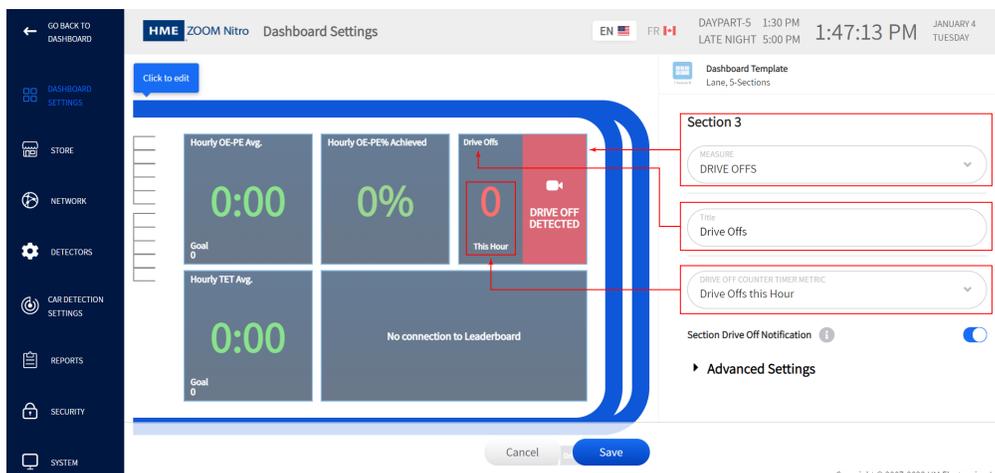

Fig. 7.11

Pull-Forward Zones

The following is an example of the ZOOM Nitro setup for when the camera is used for a Pull-Forward zone. The example in Fig. 7.12 shows the LANE DETECTORS page with two Pull-Forward detectors added. The update is automatically reflected in the PREVIEW graphic.
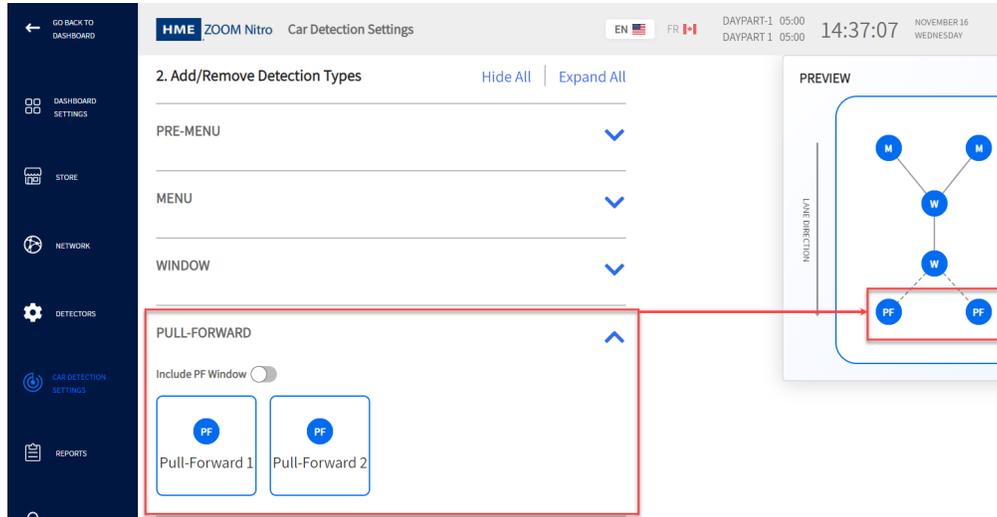
Fig. 7.12

Under "**3. Configure Detector Mappings**" select VPU from the PROCESSOR drop-down menu and then a label from the DETECTOR drop-down menu. The user can create a unique descriptive DISPLAY NAME. See Fig. 7.13.
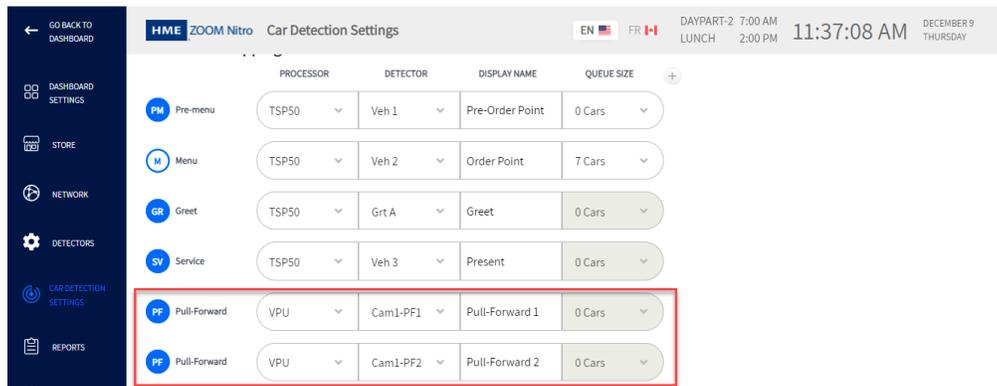

Fig. 7.13

NOTE: Only Pull-Forward spots off the drive-thru lane are supported using video detection. Pull-Forward windows are not currently supported using this technology.

Curbside/Mobile Zones

The following is an example of the ZOOM Nitro setup for when the camera is used for a Curbside/Mobile zone.

Curbside/Mobile detectors are configured under INDEPENDENT DETECTORS, see Fig. 7.14.
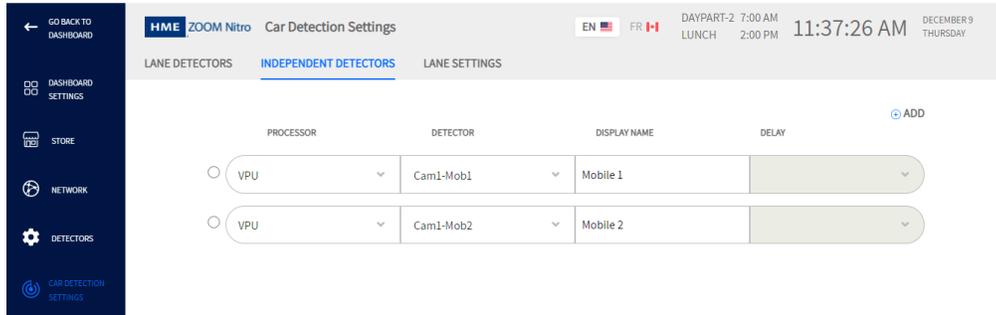
Fig. 7.14

As with LANE DETECTORS, select VPU from the PROCESSOR drop-down menu and then a detector label from the DETECTOR drop-down menu. The user can create a descriptive DISPLAY NAME, see Fig. 7.15.

Fig. 7.15

> **NOTE:** The labels used in the DETECTOR drop-down menu are auto-generated based on the following convention Cam<camera number><detector type><detector number> and are configured in the Video Setup Tool. For example, the screenshot below from the Video Setup Tool will yield the label Cam2-Mob2 and will appear in the DETECTOR drop-down menu under INDEPENDENT DETECTORS.
>
>
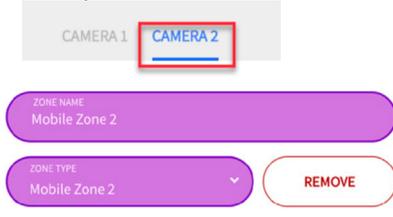
INSTALLING A SECOND CAMERA

If the store has ordered a two-camera system, follow the same installation instructions outlined in this guide for a single camera. Also consult Appendix B for more wiring configurations using two cameras.

The ZOOM Nitro Video Setup Tool

A second camera is configured the same way as the first camera, see "Configuring the ZOOM Nitro Video Setup Tool" on page 14 for more details.

1. Navigate to the ZOOM Nitro Video Setup Tool.
2. Select CAMERA from the sidebar menu and then, tap on "+ Add a Camera," see Fig. 8.1.
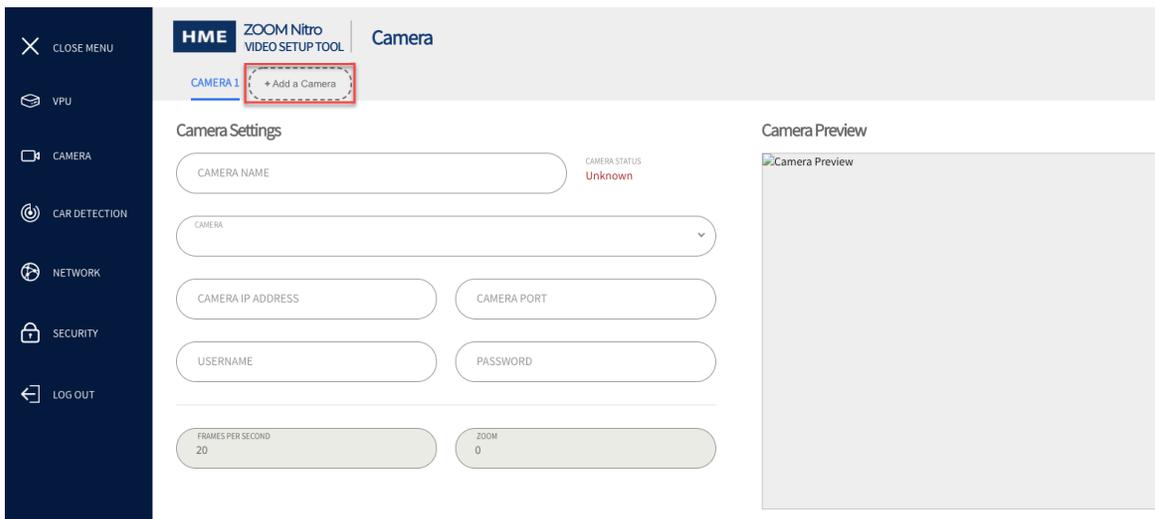
Fig. 8.1

3. The "+ Add a Camera" tab changes to Camera 2, and if the camera is connected to the system the Camera Status will indicate "Connected."
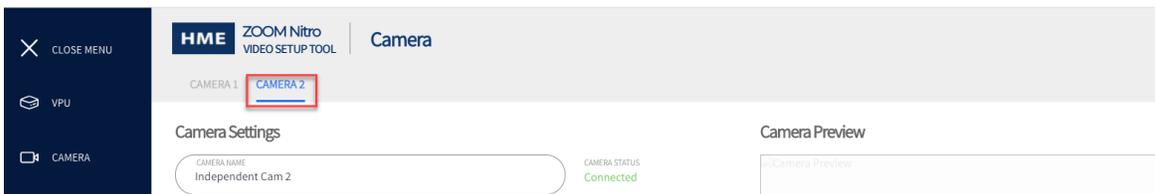
Fig. 8.2

4. Fill in the fields under Camera Settings as in Table 5.1 (see "Configuring the ZOOM Nitro Video Setup Tool" on page 14).

5. On the sidebar menu, select CAR DETECTION to open the Car Detection Settings page and choose Mobile/Pull Forward from the Zones Configuration drop-down list, see Fig. 8.3.
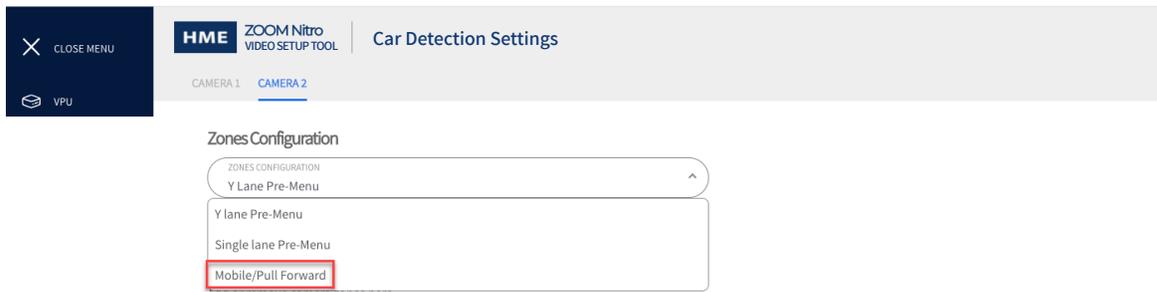
Fig. 8.3

6. In the Camera Preview window of the **Car Detection Settings** page, define the ROI and other zones (see the "Zone Drawing" section on page 17).

Good Example #1 of Zone Definition:
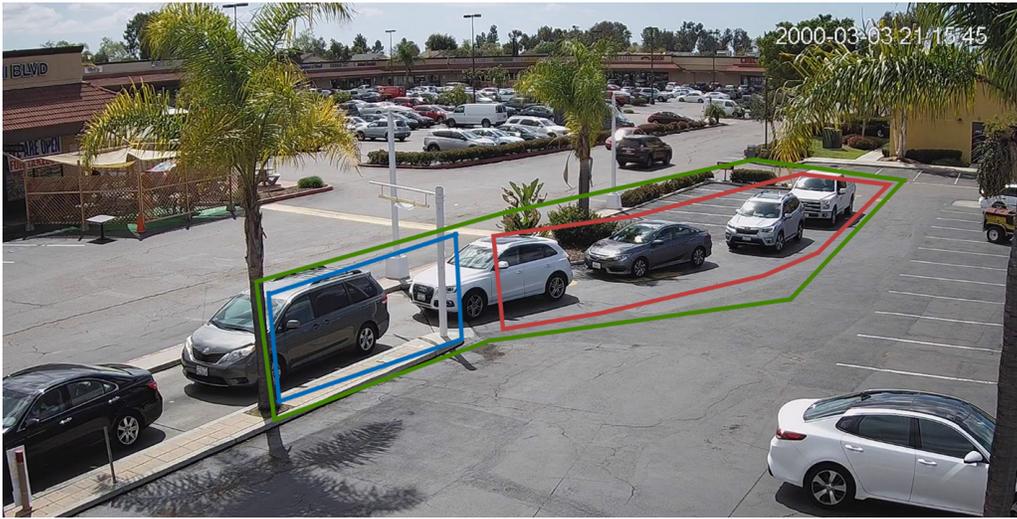
- The ROI (green outline) is drawn tightly around the region of interest zones, this excludes and pre-vents cars on the outside road and in the parking lot from being accidentally counted. However, the inclusion area still allows cars in queue passing through the parking lot to be counted and timed.
- The Danger Zone (red outline) cuts through but does not include parking lot spaces. This prevents parked cars in these areas from being accidentally included in the danger zone queue of cars.
- The Pre-Menu Zone (blue outline) is terminated just before a static occlusion (the palm tree). At this point the car is now hemmed in the drive-thru lane as indicated by the curb beginning at the white pole. There is still plenty of room behind it to detect cars in queue and also define a danger zone. Tip: Notice how the top of the blue and red zones extend above the road so that the car windows and tires are included in those zones. This improves vehicle tracking.

Poor Example #1 of Zone Definition:
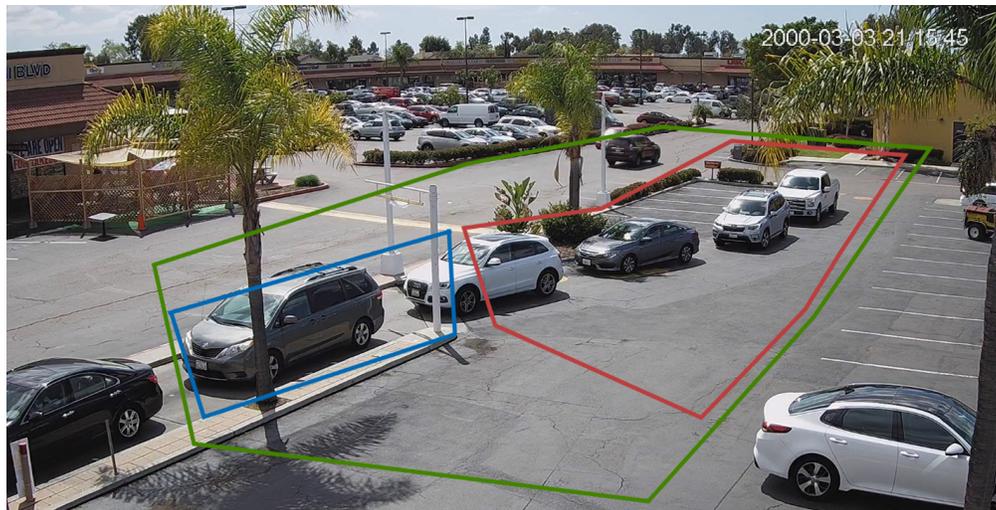
- Both the ROI (green outline) and Danger Zone (red outline) are too big. The first one (green out-line) includes too much area outside of the region of interest zone. Cars on the outside road or in the parking lot will be included causing inaccuracies. The red Danger Zone includes parking lot spaces. This can also lead to the detection and inclusion of parked cars not a part of the drive-thru traffic. This, will also result in inaccuracies.

- The Pre-Menu Zone (in blue) includes a palm tree that occludes or blocks the car passing behind it and can cause tracking problems. If you draw the zone shorter (just up to the palm tree but not including it), you can easily avoid these issues.

Good Example #2 of Zone Definition:

- The ROI (green outline) is drawn tightly around the zones of interest, avoiding unwanted detections.
- The Danger Zone (red outline) is drawn just up until the path is closed by curbs and bushes, since cars can no longer pull out after that.
- Pre-Menu Zones (blue and orange outlines) are two separate zones used to detect a car in either one lane or the other lane of this Y-Lane configuration once the Y branches into two lanes.
  Notice how the top of green and blue zones extend above the lane so that the car windows and tires are included in those zones. This must be done for optimum vehicle tracking.

Poor Example #2 of Zone Definition:

- The ROI (green outline) covers too large an area outside of the region of interest. This will cause cars driving on the highway beyond the store to be included in vehicle detection resulting in inaccuracies.
- The Danger Zone (red outline) includes a lamp post and shrubbery, which can block the car and

result in tracking problems. It also incorrectly extends into the Pre-Menu Zone (the area cars can no longer pull away from).

- The Pre-Menu Zone 2 (blue outline) extends too far back (from the Y into a single lane, the point before a car decides which lane to use). This can cause a car to be detected as two separate cars depending on which lane it chooses.

Good Example #3 of Zone Definition:

- The Pre-Menu Zone 2 (blue outline) is terminated before the pole, to avoid tracking problems.
- The ROI (green outline) is drawn tightly around the zones of interest.
  On earlier examples, we extended the top boundary of the green ROI zone higher to include the car windshield, but doing so here includes the brick trash enclosure and signage, which could be incorrectly identified as a vehicle.

Poor Example #3 of Zone Definition:
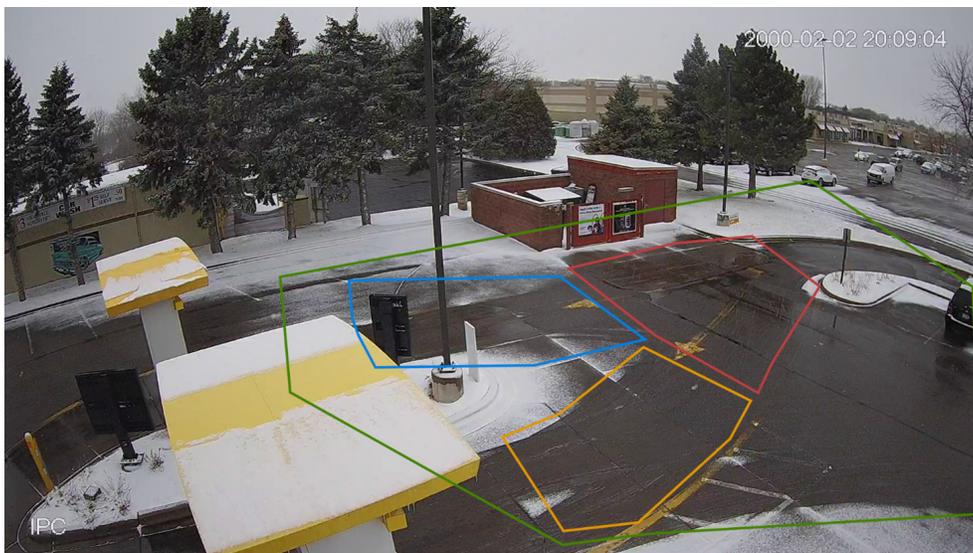
- The Pre-Menu Zone 2 (in blue) includes an occlusion (pole), which will cause tracking problems.
- The ROI (in green) is too loose around the zones of interest.

CU: Control Unit/CU60, Part of the Timer system used with a Timer/TSP. It receives and processes lane event data from the TSP, and then outputs this data to be displayed in a visual format on the system monitor.

Detector: Part of the Timer system. A sensor used to sense the presence of a vehicle. These detectors can be wired or wireless. The TSP is connected to and receives data from the detectors.

DHCP: Dynamic Host Configuration Protocol is a network management protocol used on UDP/IP networks. A DHCP server dynamically assigns an IP address and other configuration parameters to each device on a network so they can communicate with other IP networks.

DNS Server: Domain Name Server is a directory of domain names with translated IP addresses.

Drive Off: This is when a vehicle is in line to order (pre-menu) but then decides to leave or drive off before placing an order. This can be due to long wait times or a change of mind.

EVD: Enhanced Video Detection is a vehicle detection method which utilizes cameras and proprietary AI firmware to identify and track vehicles in a drive-thru lane or store parking lot environment.

EVD Accuracy Metrics: A definition of terms used in Video Detection metrics
- **Good Tracks**: Vehicle ID'd and tracked through entire Pre-Menu zone
- **Undetected**: Vehicle not detected in Pre-Menu zone
- **ID Transfer**: Vehicle assigned an ID, but ID is transferred to another vehicle due to an occlusion
- **ID Loss**: Vehicle assigned an ID which is lost
- **Occlusion Related**: Error related to an item blocking the camera view of the vehicle
- **False Positives**: System detects a vehicle when one is not present

Gateway: A device (usually a router) that connects a computer(s) on a network to other networks or the internet.

HME CLOUD: This is a remote server used by your system. It allows your system to access and store data via the internet. It also provides access to other systems in your network connected to the HME CLOUD.

IP Address: Internet Protocol Address. A unique computer address that some electronic devices (such as computers or routers) use to identify and communicate with each other on a network.

MAC Address: Is a unique identifier assigned to a network interface controller (NIC) for use as a network address in communications within a network segment.

NTP: Network Time Protocol is a networking protocol for clock synchronization between computer systems and is intended to synchronize all participating systems to within a few milliseconds of local standard time or Coordinated Universal Time (UTC)

PoE: Power over Ethernet describes several standards that allows a single cable (twisted pair Ethernet cabling) to provide both data connection and electric power to devices such as Wireless Access Points, IP cameras, and Voice over IP phones, etc.

QSR: Quick Service Restaurant, is a restaurant specializing in the quick preparation and service of food, which generally includes the use of an external ordering system in a drive-thru lane environment.

Subnet Mask: Splits the network into a series of subgroups or subnets to speed up the delivery of data by the routers.

Timer/TSP: Timer Signal Processor. Part of the Timer system used to receive and sort data from peripheral detectors. It forwards this data to the CU for processing.

VPU: Video Processing Unit, this device processes video data input from the camera(s) intended for output to a display device.

Web Server Port: This is the unique network port number used by NEXEO to communicate over the network it is connected to.

Whitelist - The practice of explicitly allowing some identified entities access to a particular privilege. For Local Area Networks, this is to control who and what is allowed on a protected network. In this case it permits hardware to access necessary ports and URLs over a store's secure network.

Zones - These are specific areas of a drive-thru environment or parking lot targeted for Video Detection and defined on the VPU Setup page. Zones include:
- **Danger Zone (DZ):** This is a defined area within the ROI of the drive-thru where cars get in line to join the queue for the drive-thru, but still have the ability to pull out of the lane and leave without continuing and ordering.
- **Mobile/Pull Forward Zone:** A designated parking space/area assigned by the store outside of the drive-thru lane. These can be parking spaces reserved for mobile-pickups, or wait areas such as pull-forward spaces, etc.
- **Region of Interest (ROI):** When cameras are used as detectors, the detection zone is defined within a camera's field of view. It is used in a drive-thru lane or store parking lot environment to establish an area in which vehicles can be identified and tracked. It is used to maximize business efficiency. Danger Zones and Pre-Menu Zones are then defined within this ROI. Mobile/Pull-Forward Zones are also defined within an ROI.
- **Pre-Menu Zone (PM):** This is a defined area within the ROI of the drive-thru. At this point vehicles have passed through the Danger Zone and are now confined within the drive-thru and cannot easily pull out and leave before ordering.

How-To

- How to weatherproof outdoor cables:

  Follow the installation instructions provided with the waterproof coupler or see steps 5 - 8 of "Camera Mounting and Positioning" on page 4

- How to access camera setup portal using Chrome:

  We recommend using Window's IE, but if Chrome is the only option, user's will first need to download a plug-in.

For Chrome browsers only

After logging in, if you are using Chrome as the browser, you will be prompted to install NACL Web Plug-in.

When this link is clicked, the NACL Web Plug-in prompt is displayed, see Fig. 4.4
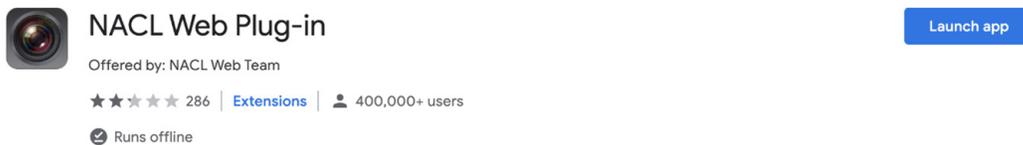
Download the plug-in and click on the Launch app button.
Another web browser open, enter the IP address for the camera following the steps under "Camera Setup" on page 8 and continue with the setup of the camera.

> **NOTE:** You can still configure the camera's settings without downloading the plug-in. However, video feedback will not be available without using the plug-in.

- How to reset camera to factory default:

  Log in to the Honeywell portal
  Go to Setup>System Setup>Default
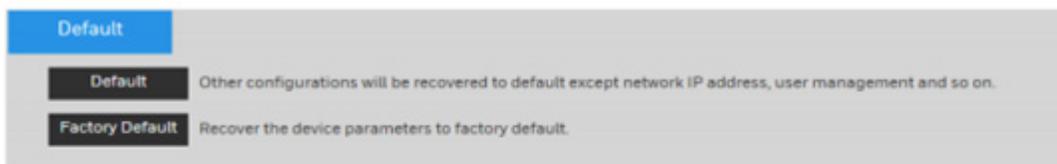
To reset the camera, click:

- **Default** – Recover configurations to default except network IP address and user management.

- **Factory Default** – Completely recover device parameters to factory default.

A confirmation message appears. Click **OK** to continue. The camera reboots automatically and reverts to its factory default settings.

- How to configure the ZOOM Nitro Video Setup Tool when fixed IP addresses are provided:
  1. Connect the VPU to the local network.
  2. Go to the ZOOM Nitro Video Setup Tool and log in.
  3. Select **NETWORK** from the sidebar menu to open the Network page.
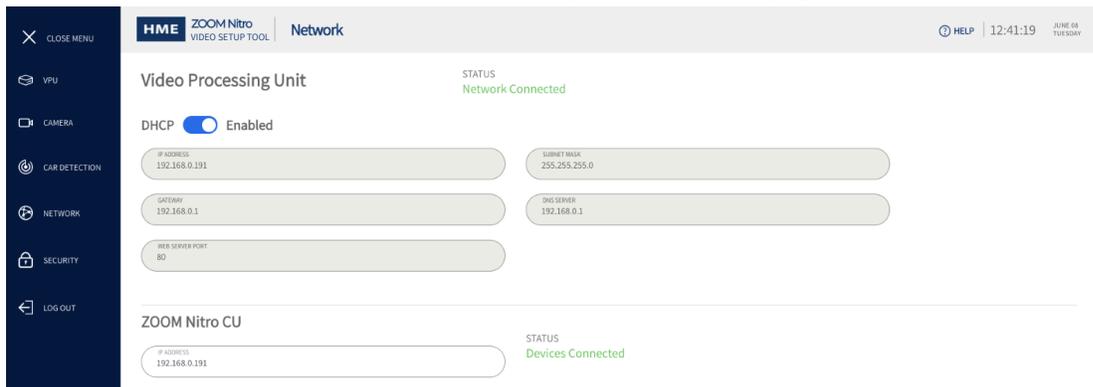
4. Click on **DHCP** toggle button (but don't press the Save button).
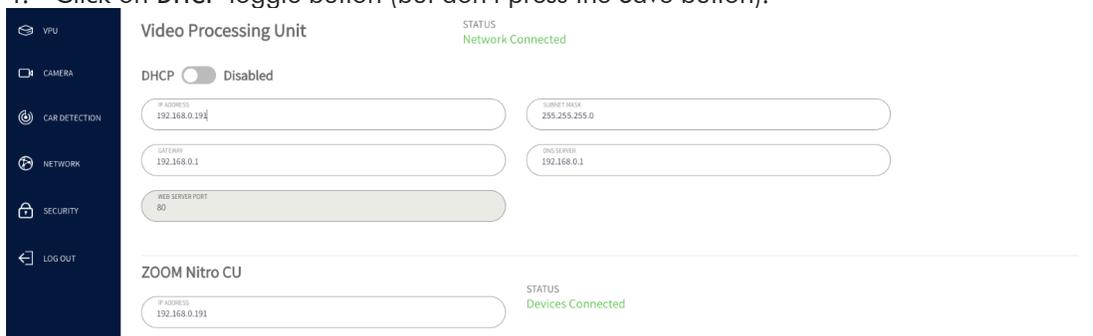
5. Fill in every field, set the DNS Server field as 8.8.8.8 unless you were provided with a different DNS Server entry by the store's IT personnel. Set the IP Address with the required one. Then, click the Save button.
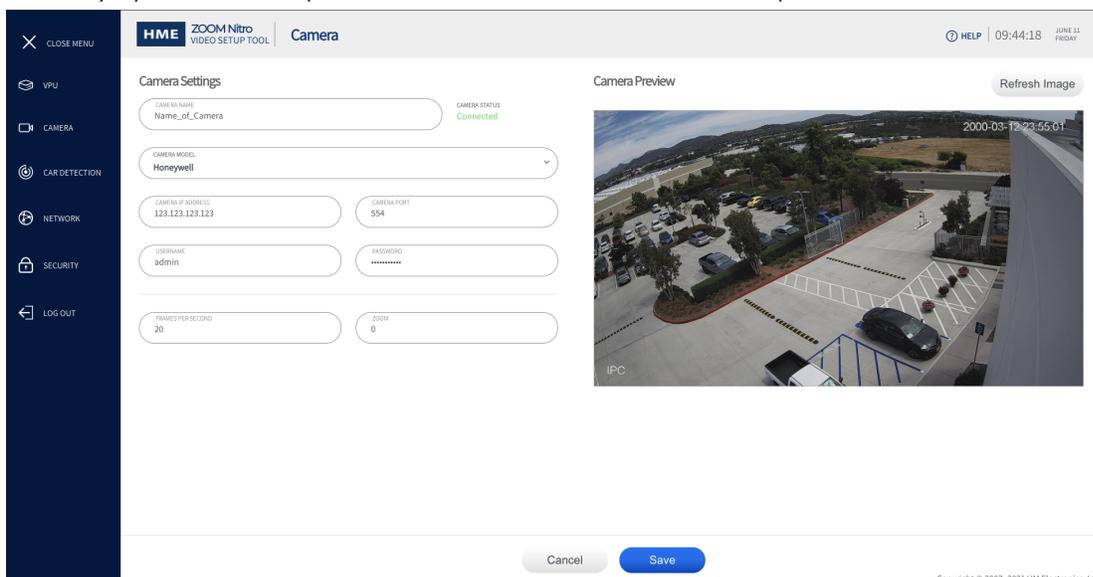
Network Requirements

The following table outlines the standard network requirements. For a more comprehensive list of network requirements, please see the "**HME Devices Pre-Installation Network & System Requirements**" document online at HME.com.

	Destination Domains	Network Ports
Connecting ZOOM Nitro® Timer to HME CLOUD® and Drive-Thru Leaderboard™		
To enable the ZOOM Nitro Timer (including Enhanced Video Detection [EVD] hardware) to connect to HME CLOUD and Drive-Thru Leaderboard, it must be connected to the store's network and the following network firewall rules must be allowed:	▪ hmedtcloud.com	▪ Outbound, 19000, TCP
	▪ *.hmecloud.com ▪ hme-live-namespace.servicebus.windows.net ▪ hme-live2-leaderboard.azurewebsites.net	▪ Outbound, 443, (HTTPS), TCP ▪ Outbound, 80, (HTTP), TCP
Connecting EVD to ZOOM Nitro Timer (optional)		
EVD kit supplies a PoE switch if only 1 port is available, however, that port must supply 3 IP addresses, including the CU port. The following network firewall rules must be allowed:	▪ *.azure-devices.net ▪ *.azurecr.io ▪ *.blob.core.windows.net ▪ global.azure-devices-provisioning.net	▪ Outbound, 443, (HTTPS), TCP

TROUBLESHOOTING

Problem	Solution
Cannot connect to VPU	If you receive an error prompt like "Request header does not contain ModuleID" or certificate error, reboot laptop.
NACL browser plug-in for Honeywell camera won't load	Check what browser you are using. Google Chrome will sometimes display a screen like this: We recommend using Microsoft Internet Explorer (Explorer 11 or later).
Issue with video feed blocking menu options on Camera Setup>Properties page	This will sometimes occur when using the plug-in (in Camera Setup> step 18 when trying to select "Lighting Compensation.") Try resizing your browser window, making it smaller will force a layout change so that the scroll bar can be used to access the hidden options.
The '+ Add a Zone' button does not appear on the Car Detection Settings screen	Drag the edges of the green Region of Interest and click the Save button.
The Save button doesn't work after increasing the size of the ROI so it is larger than the Pre-menu Zone.	You must move at least one of the points on the Pre-Menu zone in order for the Save button to become active.
No time on animated cars in pre-menu area	Some QSR chains have their Lane Total configuration set up to where the total time does not begin calculating until the customer departs the menu point because they don't feel they have "control" over the amount of time it takes for customers to decipher their menu. For other customers, this will not occur because they will not be excluding the menu time from their total time calculations. So as long as the configuration of total time is set up to start total at the arrival of pre-menu and stop total at the departure of window, you will see times populate above the car as soon as they enter the lane. The timer also has a Lane Total 2 calculation, which is a secondary customizable total time calculation that can be used to include the pre-menu time in the case where a customer wants to purchase Video Detection but still continue to calculate the aforementioned Lane Total as well.

Wiring Configuration A
(Store Router doesn't support PoE, PoE switch used for Camera)
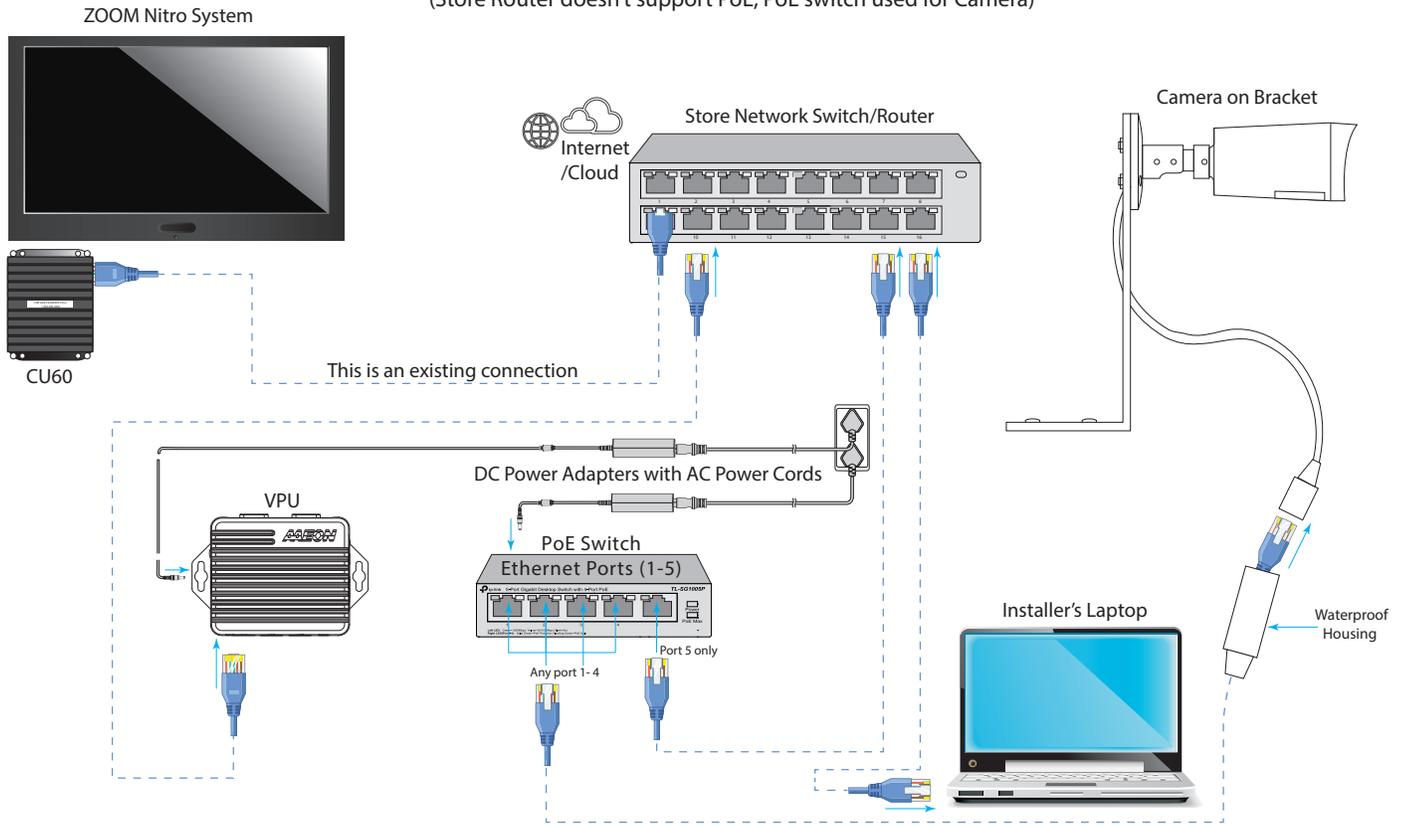
ZOOM Nitro System

Internet /Cloud

Store Network Switch/Router

Camera on Bracket

CU60

This is an existing connection

DC Power Adapters with AC Power Cords

VPU

PoE Switch
Ethernet Ports (1-5)

Port 5 only

Any port 1- 4

Installer's Laptop

Waterproof Housing

Note: Components are not drawn to scale and are only representations (may differ to actual components)

Wiring Configuration B
(No PoE switch, all connections to a Store Router that supports PoE)
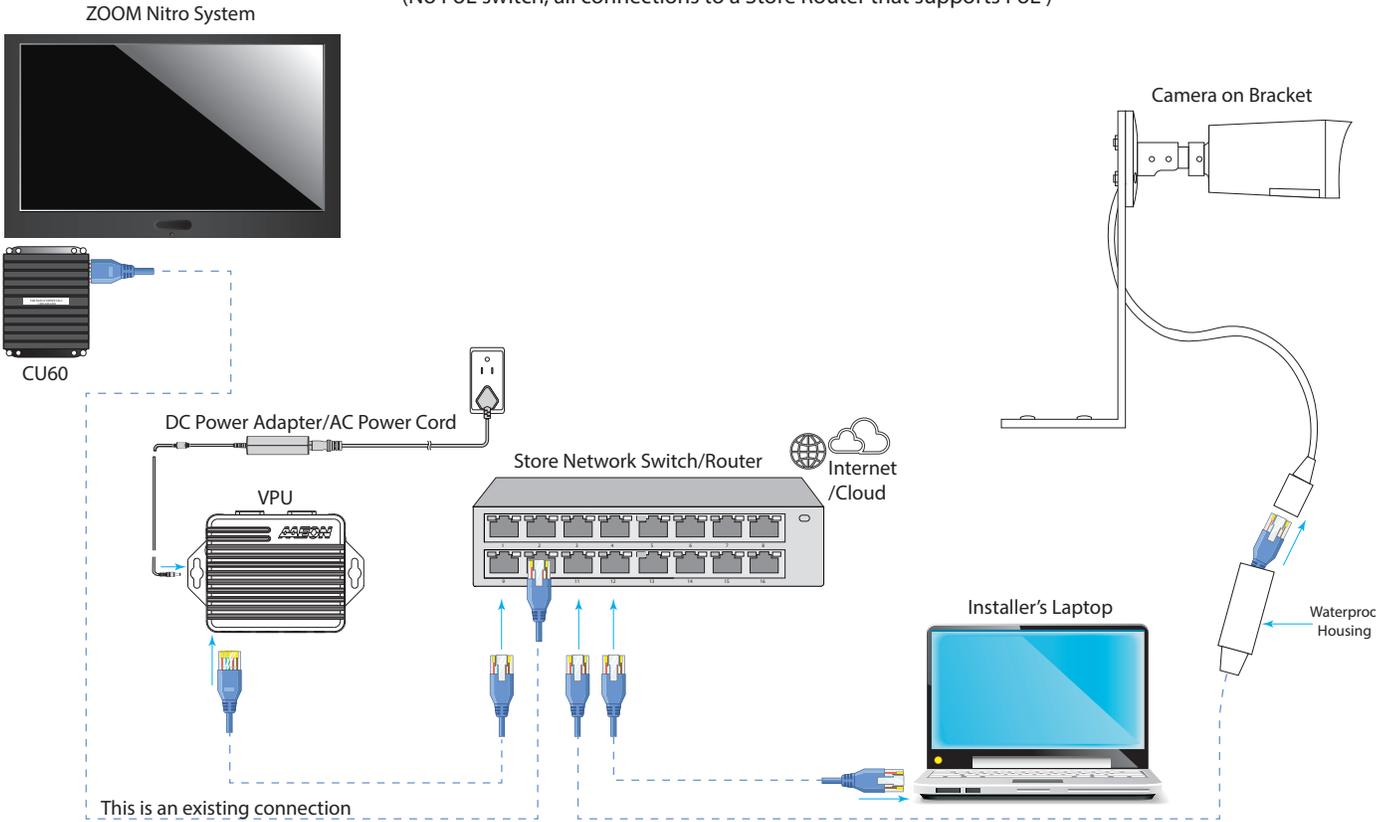
ZOOM Nitro System

CU60

Camera on Bracket

DC Power Adapter/AC Power Cord

VPU

Store Network Switch/Router

Internet /Cloud

Installer's Laptop

Waterproof Housing

This is an existing connection

Note: Components are not drawn to scale and are only representations (may differ to actual components)

Wiring Configuration C
(if Store Router only has one available port)
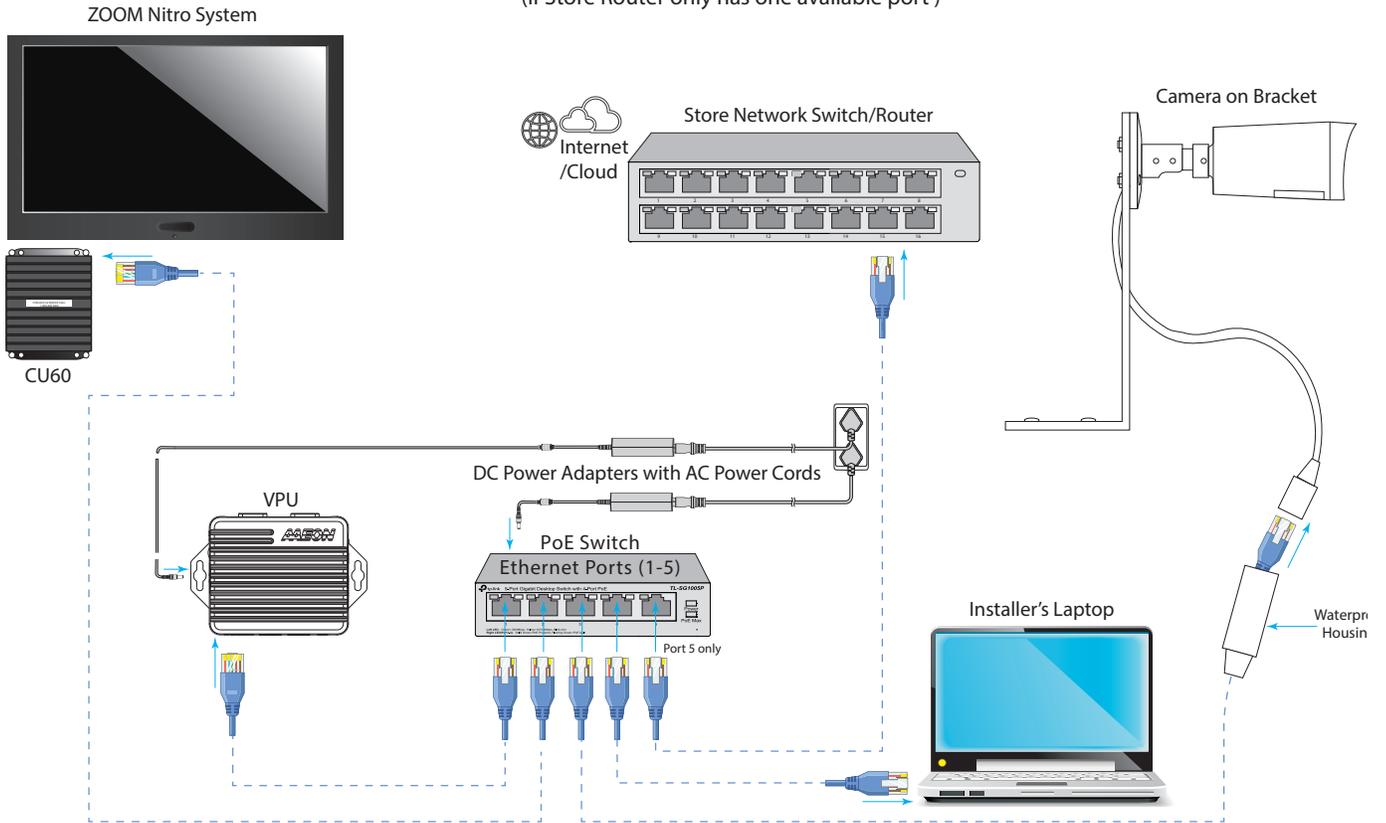
ZOOM Nitro System

CU60

Internet
/Cloud

Store Network Switch/Router

Camera on Bracket

VPU

DC Power Adapters with AC Power Cords

PoE Switch
Ethernet Ports (1-5)

Port 5 only

Installer's Laptop

Waterpro
Housin

Note: Components are not drawn to scale and are only representations (may differ to actual components)

Wiring Configuration A for two Cameras
(Store Router doesn't support PoE, PoE switch used for Camera)
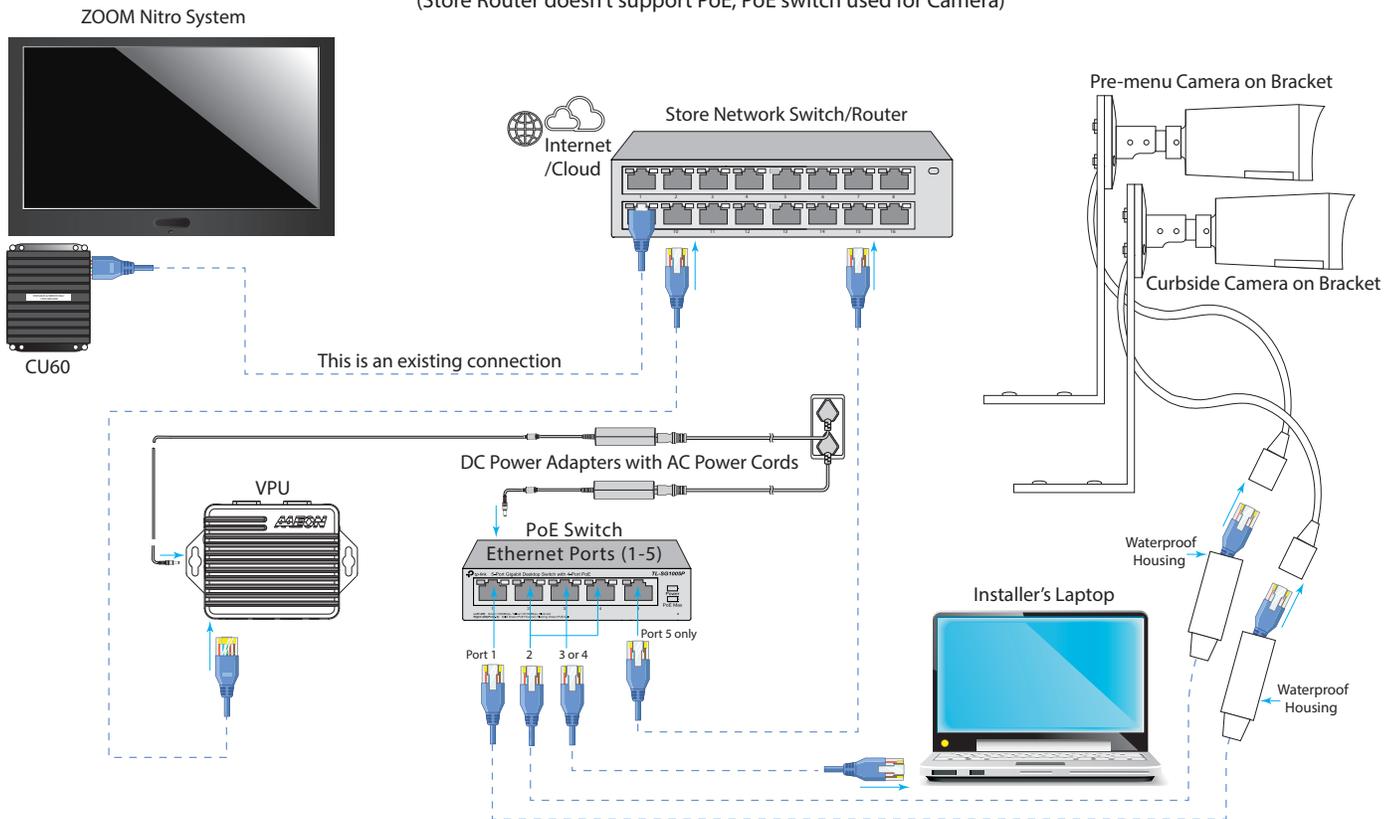
ZOOM Nitro System

CU60

Internet/Cloud

Store Network Switch/Router

Pre-menu Camera on Bracket

Curbside Camera on Bracket

This is an existing connection

DC Power Adapters with AC Power Cords

VPU

PoE Switch
Ethernet Ports (1-5)

Port 1   2   3 or 4   Port 5 only

Installer's Laptop

Waterproof Housing

Waterproof Housing

Note: Components are not drawn to scale and are only representations (may differ to actual components)

Wiring Configuration B for two cameras
(No PoE switch, all connections to a Store Router that supports PoE)
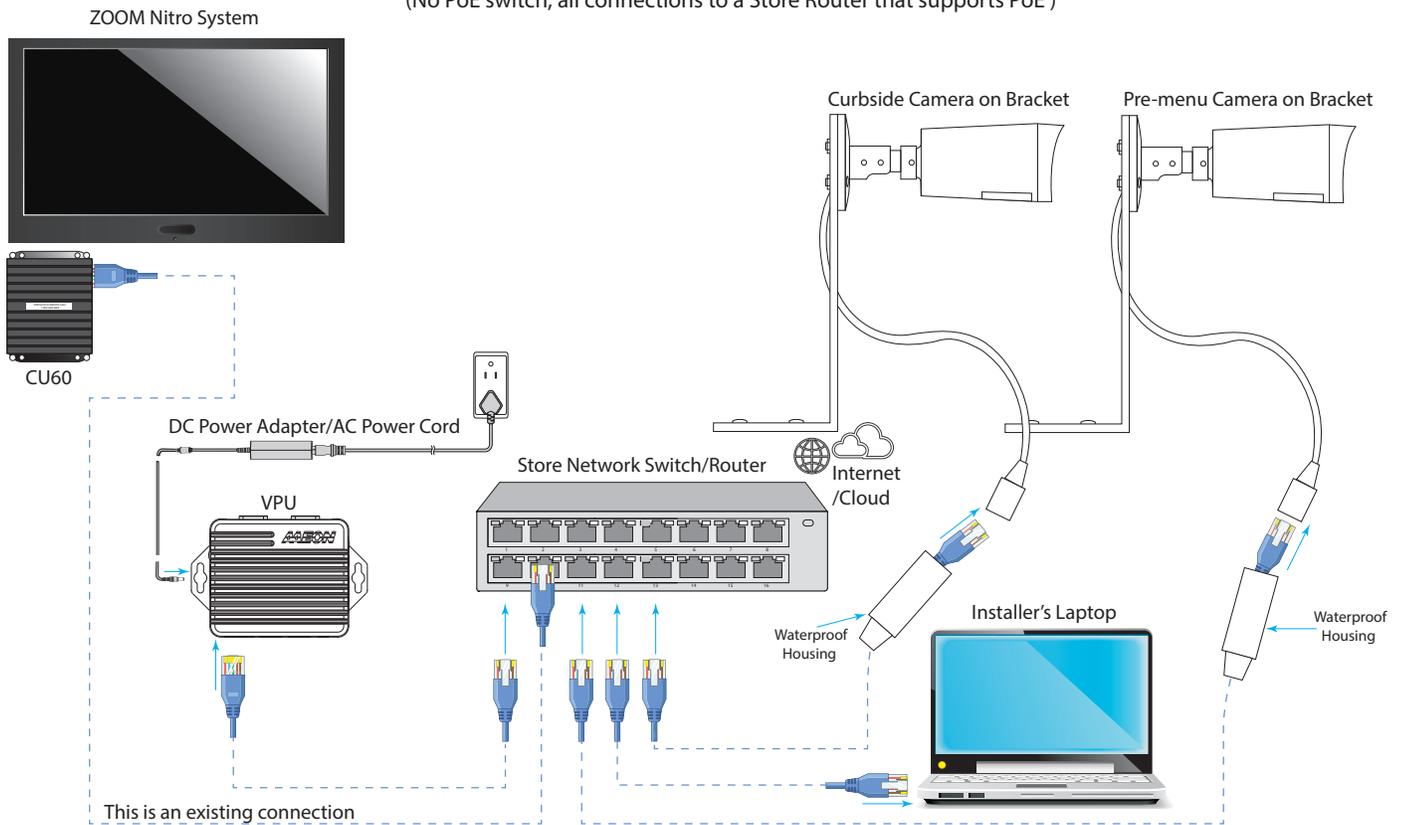
ZOOM Nitro System

Curbside Camera on Bracket

Pre-menu Camera on Bracket

CU60

DC Power Adapter/AC Power Cord

Store Network Switch/Router

Internet
/Cloud

VPU

Waterproof
Housing

Installer's Laptop

Waterproof
Housing

Waterproof
Housing

This is an existing connection

Note: Components are not drawn to scale and are only representations (may differ to actual components)

POE SWITCH TEMPLATE FOR WALL MOUNTING

When this page of the PDF is printed (to **actual size**), this template can help with the hardware placement (measure the distance between the mounting holes on the paper to confirm actual size, it should be 1.54" (39 mm)).
1. Place sheet against wall.
2. Use a punch, pencil or other pointed marker to punch through the cross-hairs on the paper to mark the wall for the screw positions.
3. Drill holes and insert screws (and anchors if necessary), but leave enough of a gap between the screw heads and wall so that the PoE switch can be mounted over the screw heads (approximate gap 0.125" (3.2 mm)).
4. Mount the PoE switch over screw heads until flush against wall and slide the PoE switch down until it is seated on the screw shanks to secure it in place.

PoE Switch Rear
Mounting holes

1.54" (39 mm)

NOTES
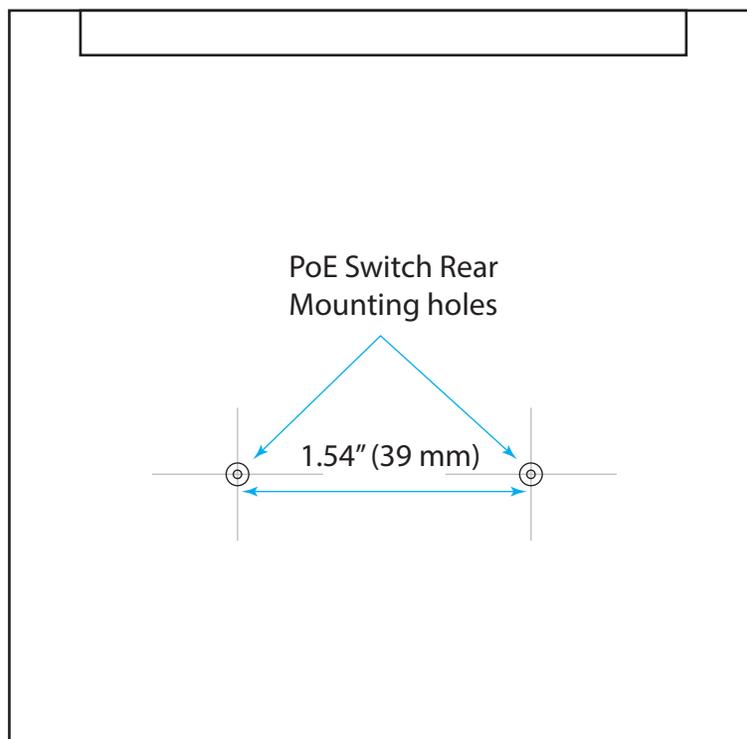
A copy of this guide and much more can be found under ZOOM Nitro by scanning this QR code or going to:
https://www.hme.com/qsr/drive-thru-user-manuals/