Sensormatic®

BIS-4170
IVS People Counter
Installation and Planning Guide

For Mounting Heights: 2.4–4.3m (8–14ft)

To the Installer

⚠️ **WARNING!** Install the people counter IVS device in an air space not used for environmental air. DO NOT install the IVS device in a plenum or other environmental air-handling space.

For indoor use only.

Cables placed in environmental airspace must be plenum rated unless the cables are in raceways.

Contents

About the People Counter

Mounted at ceiling heights up to 4.3m (14ft), the IVS People Counter device (Figure 1) tracks the paths of people within its field-of-view (Figure 2). The IVS device can cover an entrance up to 2.4m (8ft). The IVS device is also capable of reporting counts to a remote location through one of the following dedicated communication interfaces:

- Ethernet
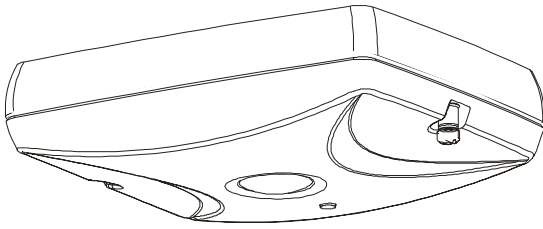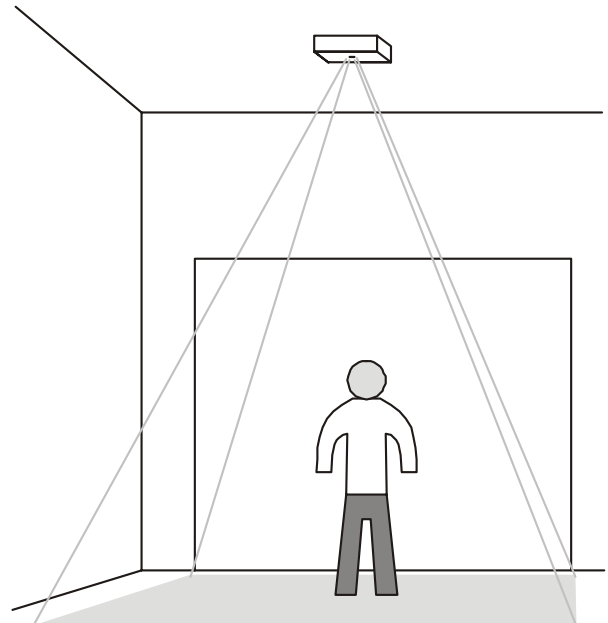- LDM II via RS-485
- Bluetooth.

Figure 1. IVS device

Figure 2. IVS device field-of-view

Coverage

Ceiling-mounted up to a height of 4.3m (14ft), the IVS device can cover a doorway or opening up to 2.4m (8ft) wide.

The IVS device is powered by a 48Vdc Power over the Ethernet (PoE) device.

Tracking

A floor-facing camera in the IVS device is used to determine the height of a desired target (adults), and thus to distinguish them from undesired targets such as shopping carts, pets, and children.

- A count line is projected across the entrance. The line is a virtual trip wire you draw on the video image where the "feet" of the person tracked are to be counted.

- The count line can be set to trigger the count from a person crossing it while entering an area.

- A person entering an area is counted as one "enter". A person exiting an area is counted as one "exit".

- A personal computer is used to setup the IVS device and view what it detects. Downloaded or web-based setup software displays the camera image.

Figure 3. IVS device orientation
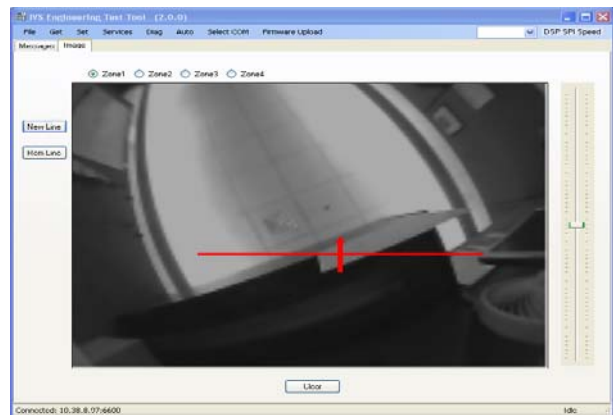
Hardware Features

Mounting Considerations

Perform a site survey (Appendix A) while observing the installation site for the following considerations.

Ceiling Considerations

- **Composition:** Sheet rock, plaster, suspended ceiling.

  The IVS device can attach to any 1/4-20 thread-per-inch bolt of a customer mounting bracket.

- **Height:** The IVS device can be mounted up to a height of 4.3m (14ft).

  ⚠️ **CAUTION:** The tilt of the IVS device should follow the slope of the floor. The setup software can adjust IVS device settings for unavoidable tilt, as long as it is less than 10 degrees of the floor slope (placeholder, TBD).

  CAUTION: Mounting over stairs or highly sloped floors is not recommended (placeholder, TBD).

- **Access:** Check for in-ceiling obstacles such as ceiling vents and fire sprinklers.

- **Location:** Mount the IVS device in such a way that its field-of-view is centered over the entry/exit corridor. Also, do not mount the IVS device to capture people through glass or other translucent surfaces (placeholder, TBD).

Traffic Corral Points

Check for walls, displays and anti-theft pedestals that help corral traffic. Ideally, the traffic path should be elongated as much as possible under the IVS device.
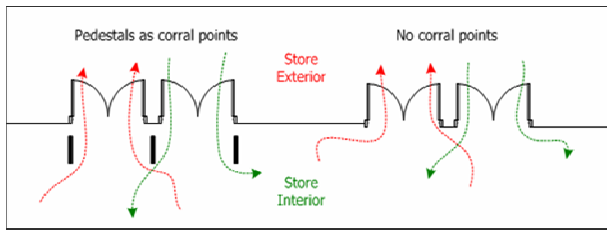
PoE Device

The PoE device supplied with the IVS device is typically placed in computer wiring room or next to the IVS device near a convenient power outlet. The PoE comes with a 1.8m (6ft) power cable.

Other Considerations

- **24-hour or timed power available.**

- **Cable distance from IVS device to computer wiring room:** DO NOT exceed a maximum of 100m (330ft).

- **Network switch type and ports available.**

Installation Procedure

Parts Required

- DVR for verification testing (The DVR records video data "seen" by the IVS device.)
- Cat5 cable
- IVS device
- ¼-20 threaded rod
- ¼-20 nuts (2)

Optional Parts*

?

Running the Cables

Run a Cat5 cable from the installation site for the IVS device to the installation site for the PoE. Run another cable from the PoE to the store's computer wiring room.

Note: Cat5 cable runs cannot exceed 100m (330ft) without using a repeater. Terminate cables following **Error! Reference source not found.** below.

- Use plenum / non-plenum cable per local requirements.
- Use pre-manufactured patch cables when available.
- Leave a sufficient service loop at end of each home run.
- Test all cables. Most on-site issues are cable related.

Table 1. Ethernet cable pin assignments

Pin	Wire Color
1	WHT / ORG
2	ORG
3	WHT / GRN
4	BLU
5	WHT / BLU
6	GRN
7	WHT / BRN
8	BRN

Note: Male plug pin assignments are according to the T-568B standard. All connections are "straight through" from plug to plug, that is: pin 1 to pin 1, pin 2 to pin 2, and so on.

Mounting the IVS Device

The IVS device can be installed at heights up to 4.3m (14ft) using one of the following methods: surface mounting bracket or recessed mounting bracket.

⚠ **WARNING!** Install the IVS device in an air space not used for environmental air. DO NOT install in a plenum or other environmental air-handling space.

⚠ **WARNING!** The ceiling must support up to 5.1kg (11.2 lbs). If the ceiling cannot support the IVS device, ask building maintenance to install additional ceiling supports

⚠ **WARNING!** The IVS device can mount to wood or drywall ceilings with minimal disturbance to the ceiling. It can also mount to grid ceiling structure but not to the removable tile itself

Tested to IEC 60950-1.

⚠ **CAUTION:** Double check all IVS device locations before drilling or cutting ceiling. This is especially important for multiple IVS devices

Parts Supplied

Customer to supply 1/4-20 threaded rod, two 1/4-20 nuts, 2x4 wood brace, and tile hold-down clips.

To a Ceiling Tile

1. Do the following to prepare the tile (Figure):
   - Remove the ceiling tile and drill a ¼-inch hole in its center.
   - Cut a 2.5ft piece of wood 2x4 and drill a ¼-inch hole in its center.
   - Center the 2x4 above the tile structure. Then place the ¼-20 threaded rod though the hole and secure it from above and below with two ¼-20 nuts. Ensure the rod extends only about ¼-inch below the tile.
   - Reinsert the ceiling tile with the threaded rod protruding through the hole in the tile.
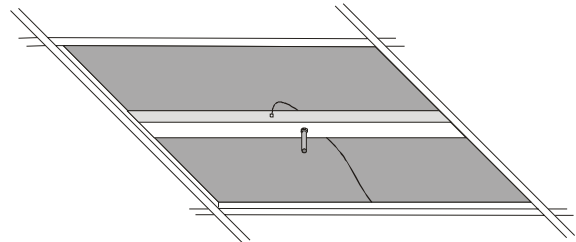
2. Do the following to attach the IVS device (Figure):
   - Loosen the two bottom screws in the IVS device and remove its top shell.
   - Thread the top shell to the threaded rod until it is secure against the tile.
   - From the underside of the tile, punch a cable access hole in the tile above the opening(s) in the top shell.

Cable Access

Traffic Direction
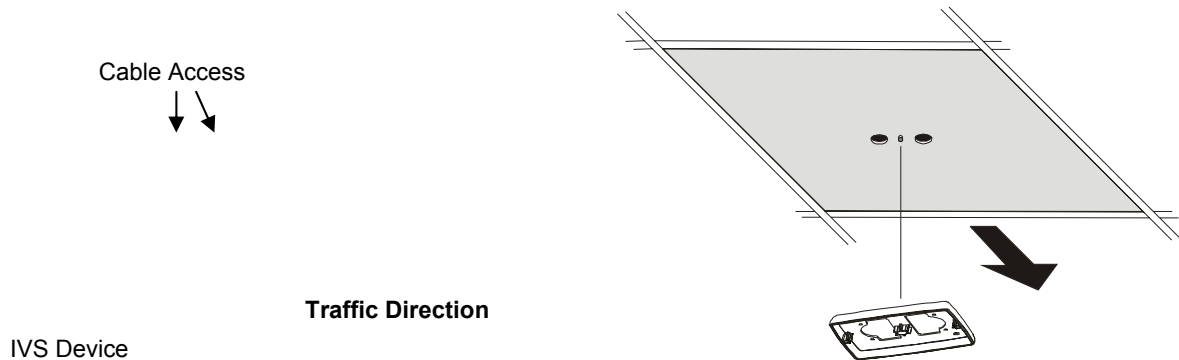
IVS Device

3. Run the video cable from the DVR, above the tile ceiling, and through the opening in the top shell.

4. Push the end of the Cat5 and pigtail cables down through the openings in the top shell.

To a Ceiling T-Bar

Mounting brackets enable the IVS device to mount to a suspended ceiling T-bar.
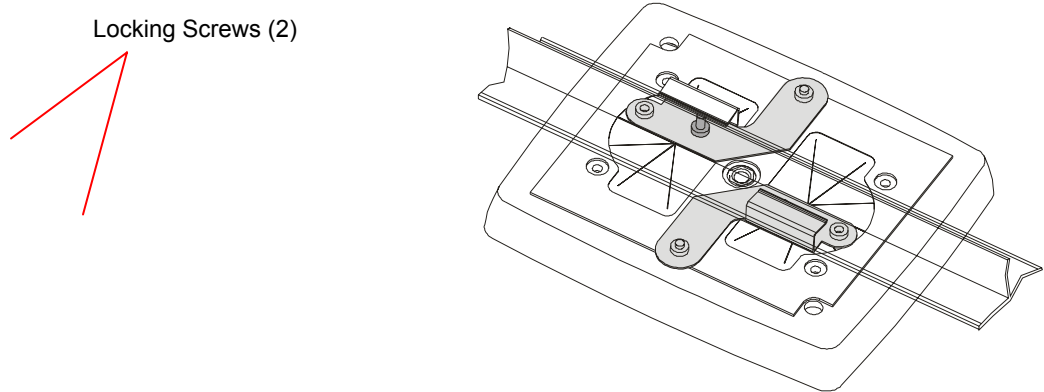
Additional Parts Required
- Mounting Brackets (2): 0500-7193-01
- Screws, Pan head, M3x8 (2): 5801-1051-120

Procedure
1. Loosen the two bottom screws in the IVS device and remove its top shell.

2. Cut a triangular piece off of the rubber flap to keep it from interfering with the locking screw. Repeat for the other locking screw (Figure).

3. Attach two mounting brackets to the outside of the top shell with two screws as shown.

4. Maneuver the brackets into place, then tighten the two locking crews from below to secure the top shell to the T-bar.

Locking Screws (2)

To a Wall

The RHIUCM wall mounting bracket enables the IVS device to mount to a wall.

Additional Parts Required

RHIUCM wall mounting bracket (1)

1. Loosen the two bottom screws in the IVS device and remove its top shell.

2. Mount the RHIUCM wall mount bracket supplied to the wall surface (see instructions supplied with the bracket).

3. Place the top shell against the bracket.

4. Screws and nuts are provided for attachment. Place the top shell against the bracket and, from underneath, insert the two screws through the holes and secure them with the nuts.
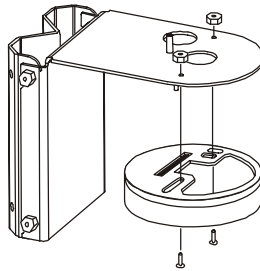
5. Run the Cat5 cable through the hole in the top of the bracket.
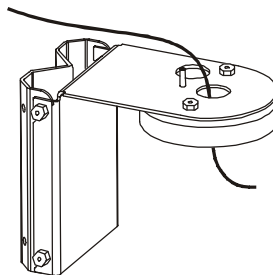
6. Attach the cover to the bracket/counter assembly.
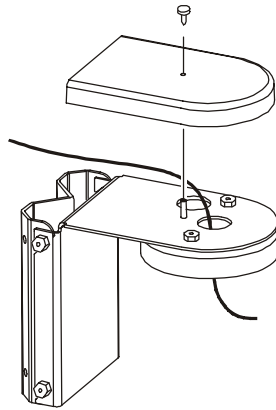
To Wood or Sheetrock Ceilings

(TBD)

Connecting Video, Communications, and Power to the IVS Device

The PoE can be placed in the computer room (where power is readily accessible) as long as cable length from the PoE to the IVS Device does not exceed 100m (330ft). The minimum cable length is 0.5m.

1. Connect the following cables (Figure 4):

   a. Connect a Cat5 cable between the host computer and the LAN input on the PoE.

   b. Connect a Cat5 cable between the PoE Injector "LAN+DC" port (power and communications) and the Ethernet connector J1 in the IVS device.

Figure 4. Connecting the PoE to the IVS Device

AC in

LAN + DC
(to IVS)

Power/Status LED

LAN
(to Host)

Video Out E1, E2

Ethernet Port J1
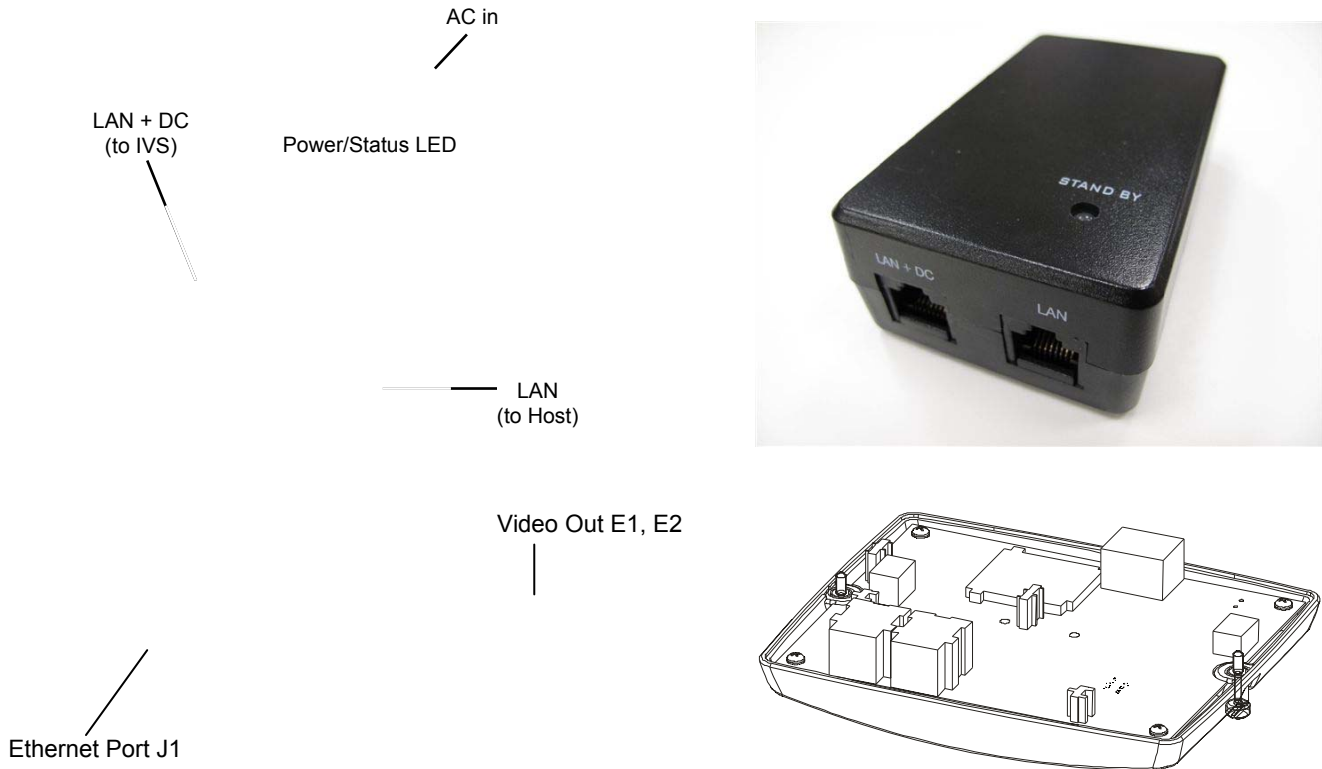
2. For Video to the DVR, plug the pigtail connector of the DVR video cable to connectors E1 and E2 inside the IVS Device.

3. Attach the bottom shell to the top shell. Tighten both screws securely.
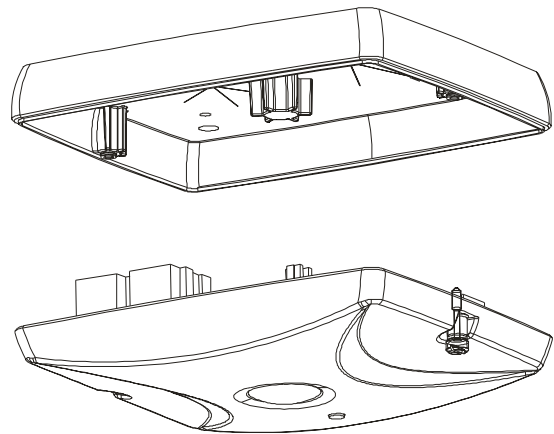
4. Once the PoE injector into a 24-hour outlet, the IVS device will begin its boot up process. This process takes about 40 seconds, where the Power/Status LED on the PoE module momentarily turns yellow (stand by), then green indicating that the PoE has successfully identified the IVS as a PoE compliant device.

Verification Test

1. Check out the entire 'IVS Engineering Test Tool Setup' folder from StarTeam. Locate the 'IVS Engineering Test Tool' icon on the desktop of your laptop.

   The Test Tool is used to perform initial installation of the IVS and can be used to verify count information obtained from the IVS Device. Communications will occur via one of two communications media: Ethernet or Bluetooth (selectable via a pull down menu).

   The IVS Engineering Test Tool can:

   • Display the static video image "seen" by the IVS Device

   • Be used to draw count lines

   • Transmit count lines to the DSP

   • Be used to set and maintain time

   • Display and storing count data.

2. On your laptop, click the icon to open the IVS Engineering Test Tool.
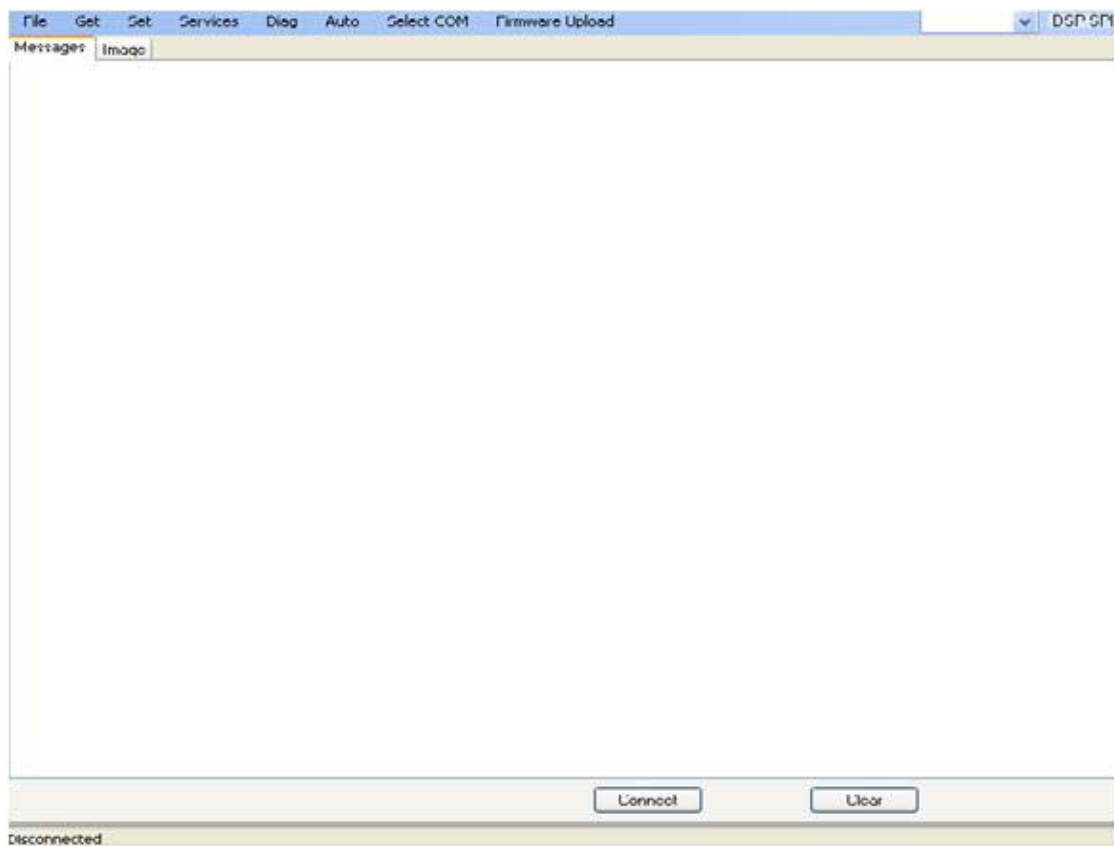
3. From the pull down menu 'Select COM', select 'Configure' to
    invoke the following 'Input Requested' dialog box. Enter the
    IP address for the IVS Device and click OK.
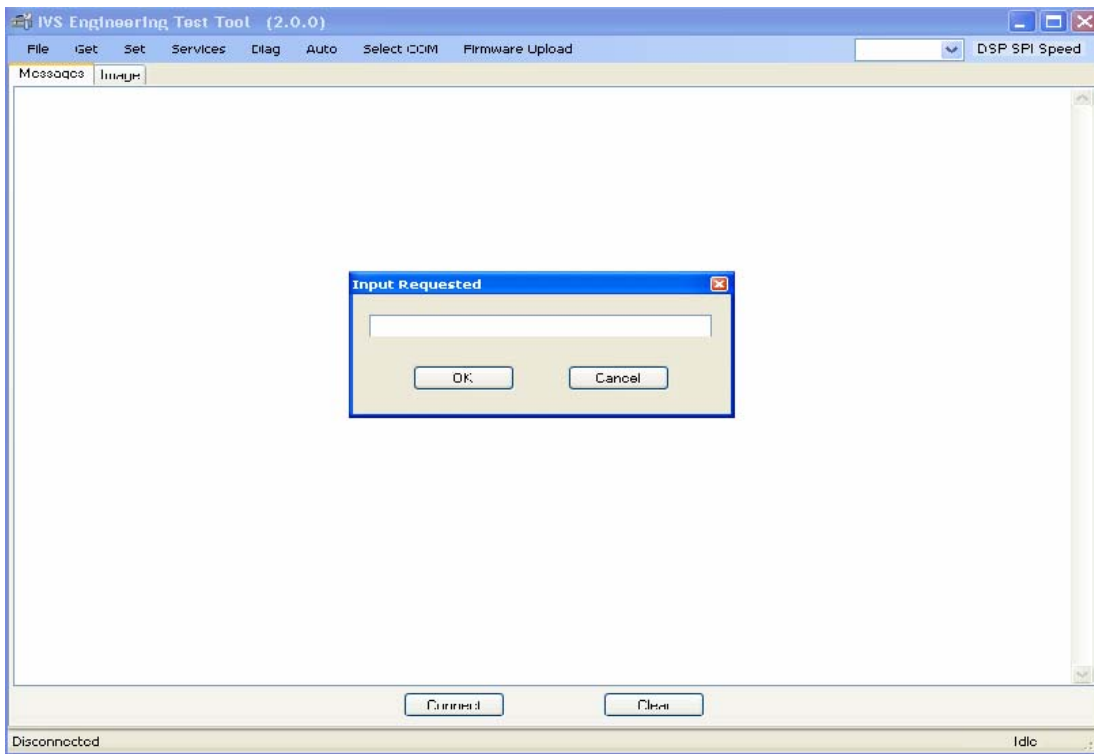
4. Connect a Cat5 cable from the PoE Injector "LAN" port to the
    Ethernet port on your laptop.

5. From the 'Select COM' pull down menu, select 'TCP/IP'. At
    the bottom of the screen, click 'Connect'.

6. Verify that the addressed IVS Device is 'Connected' to the
    IVS Engineering Test Tool.

7. On the side panel of the Test Tool, select the 'Image' tab. Then from the 'Get' pull down menu, select 'Image'. Verify on the DVR screen that the IVS Device is capturing and processing the video image.
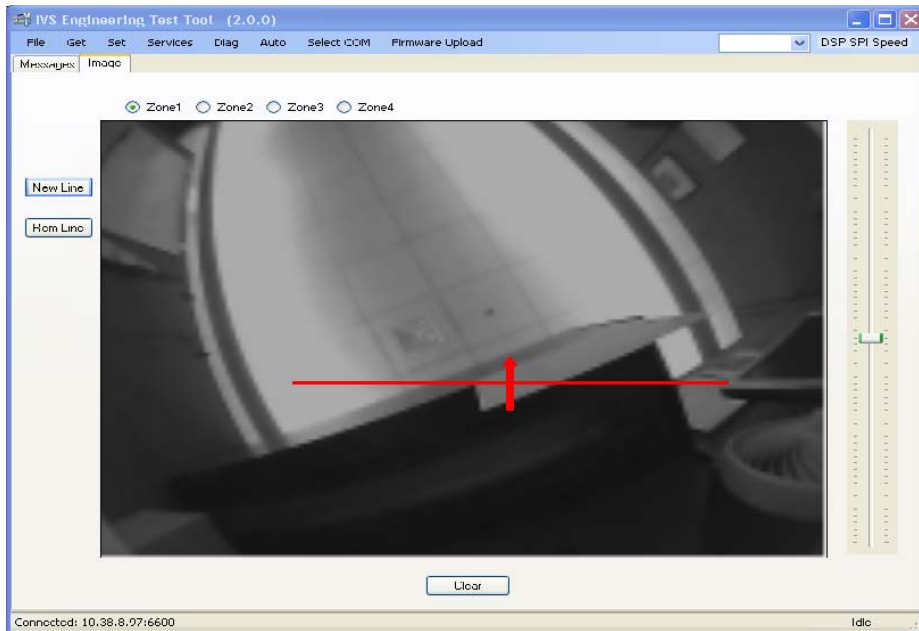
8. Verify that the image on your display corresponds to the image "seen" by the IVS device.

9. Select 'New Line' from the side panel of the Test Tool. Select the line color from color palette and click OK.

10. Using the mouse, position the cursor to indicate the start of the line, drag it to the desired destination point, then click the cursor again. An arrow indicates the traffic direction.

   • Dragging the line left to right produces an UP arrow.

   • Dragging the line right to left produces a DOWN arrow.

   • Traffic crossing the line in the direction of the arrow would trigger 'IN' counts.

   • Traffic crossing the line in the direction opposite the arrow would trigger "OUT" counts.

11. From the 'Diag' pull down menu, select 'Verification Test' to invoke an 'Open' dialog box to save the count data to a .txt file. Name and save file for later retrieval.

   Note: A 'Test In Progress' indication at the bottom right of the Test Tool appears as shown below.

12. After the prescribed count intervals, terminate the verification test by clicking 'Disconnect' at the bottom of the Test Tool.

13. Retrieve .txt file for count verification against the DVR captured events.

Adjusting the Count Line

The IVS device automatically sets the count line at the middle of its field-of-view. However, in certain situations, the line may have to be moved forward or backward.
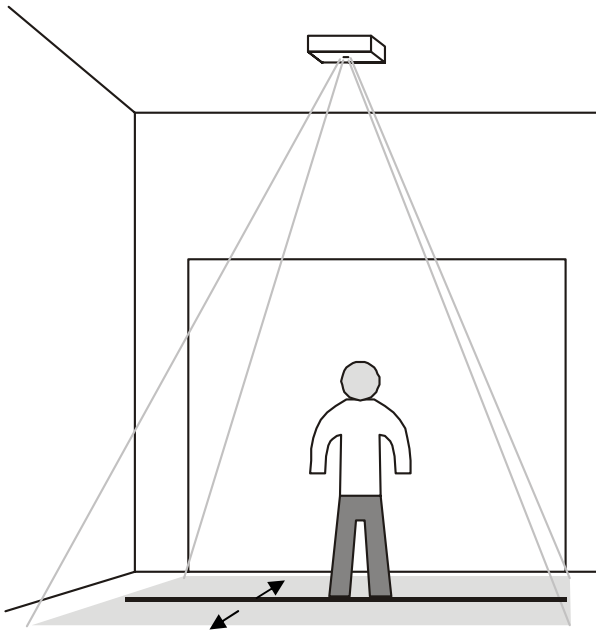
To move the count line, do the following:

Setting the IP Address for the IVS Device

Auto addressing

Each IVS Device is automatically assigned a Static IP address of 198.168.0.1.

The best method is to disconnect all network connections from your laptop, manually assign it an IP address (such as 192.168.1.10), and then connect it directly to the IVS Device. Then each IVS Device can be assigned a unique address such as 192.168.1.7 for IVS Device 1, 192.168.1.8 for IVS Device 2, and 192.168.1.9 for IVS Device 3.

In this section, you will:

- Set a static IP address on your laptop
- Connect a IVS Device to your laptop
- Set the IP address for the IVS Device.

Laptop Requirements

The following is required to run IVS software.

- Use Microsoft® IE6+ or Mozilla® Firefox® 3+ web browser.
- Java Runtime JRE 1.6 update 10 (http://www.java.com). Required to view live video.

Set a Static IP Address on Your Laptop

⚠️ **IMPORTANT!** Set the static IP address on your computer BEFORE connecting the IVS Device to it.

⚠️ **IMPORTANT!** Disconnect the Ethernet (Cat5) cable from your laptop and disable any wireless connections. No other network connections can be active during this process.

1. Disconnect the Ethernet (Cat5) cable from your laptop and disable any wireless connections.

2. From your computer desktop, click **Start** and select **Control Panel**. The Control Panel opens.
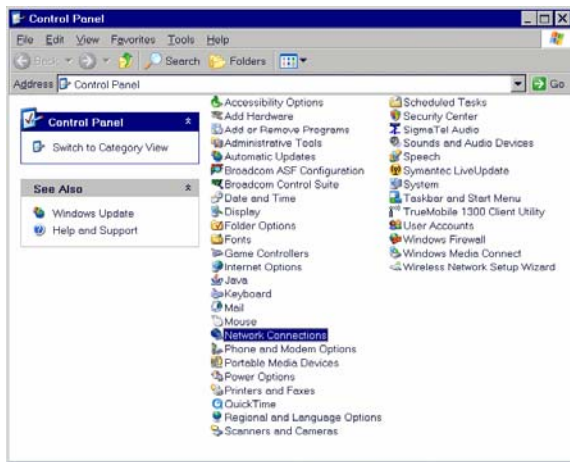
3. Double-click **Network Connections**. The Network Connections window appears.

    Note: The network cable connection my have a different name in some systems such as "Laptop ethernet port".
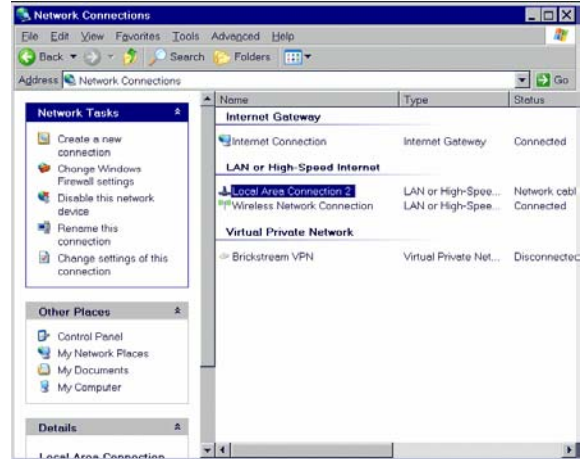
4. Double-click **Local Area Connection**. The Local Area Connection Properties dialog box appears.
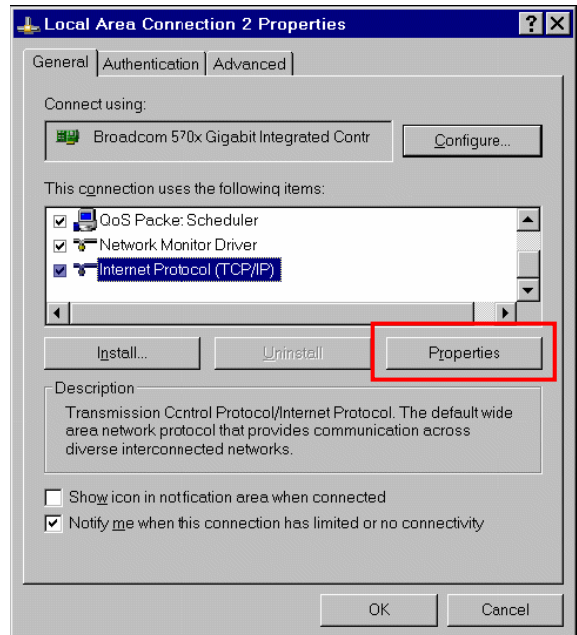
5. Select **Internet Protocol (TCP/IP)** and click **Properties**. The Internet Protocol (TCP/IP) Properties dialog box appears.

⚠ **IMPORTANT!** Write down the current settings in Internet Protocol (TCP/IP) Properties dialog box so that you can re-establish them after you set the network parameters on the IVS Device.

- Select **Use the following IP address** and type an IP address for your computer to use. For example: 192.168.1.10.
- Type 255.255.255.0 in the Subnet Mask field.
- Click **OK**.
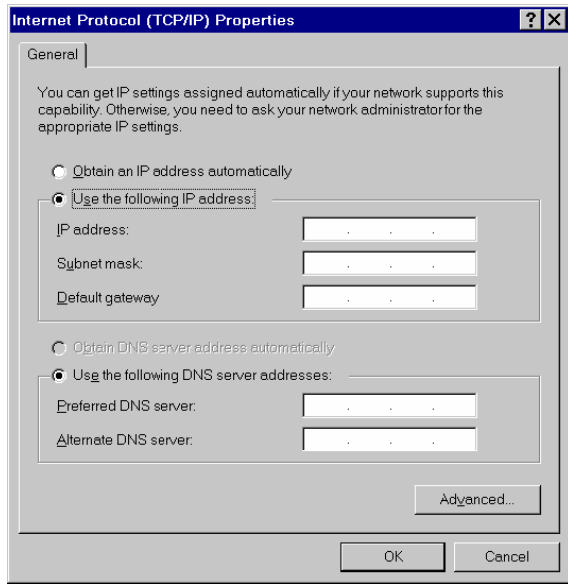
6. On the **Internet Protocol (TCP/IP)** box, click **OK**. Then click the X in the top-right corner to close the window.
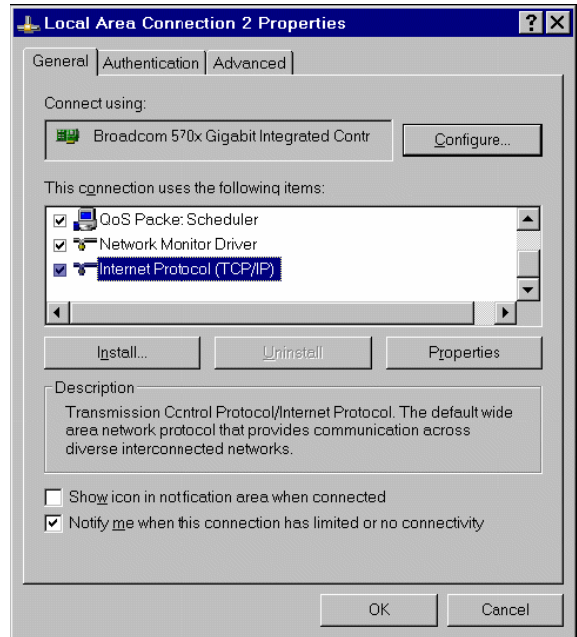
Set the IP Address of the IVS Device

Once you have set the IP address on your PC and have connected the IVS Device and PoE injector to your PC, you are ready to set the IP address of the IVS Device.

Complete the following steps to set the IP address of the IVS Device:

1. Re-connect your laptop to Wi-Fi.

2. Open a web browser and in the address bar type http://192.168.1.7. Press **Enter**. The CLARITY Basic Configuration screen appears.

3. Assign the IVS Device a fixed IP address by selecting **No** from the DHCP Enabled field.

4. The network administrator may assign the IP address for the IVS Device. Type the IP address the IVS Device will use on your network in the IP Address field.

5. Type the Network Mask, Default Gateway, and DNS Server (optional) addresses for the network used by the IVS device.
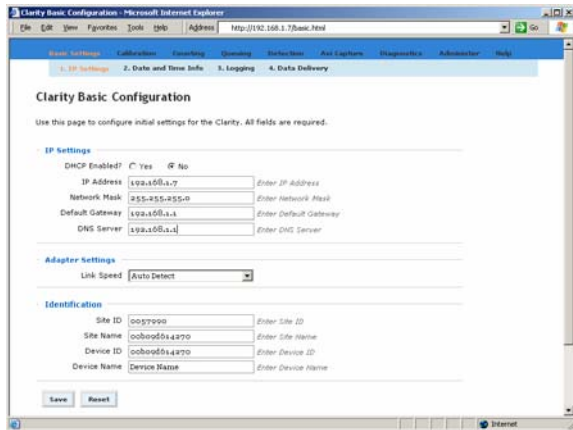
6. Click the Link Speed drop-down arrow and select a network speed for the IVS device. If you have not been told to set the Link Speed, leave the speed set to **Auto Detect**.

7. If you have any of the identification information (Site ID, Site name, Device ID, Device Name), type the information into the appropriate fields.

8. To save your changes, click **Save**.

⚠️ **CAUTION:** If you change the IP address on a IVS Device and click **Save**, you will lose access to that IVS device for several seconds while the IVS device sets itself with the new IP Address. You will have to type the new IP address into the address bar of the browser and press enter to reload the application.

⚠️ **CAUTION:** If you are assigning the IP to a new subnet, you will lose access to the IVS device until you connect the IVS device to the assigned subnet or until you modify the PC Network settings to include the new subnet.

The IVS device is now ready to be connected to the network using its new IP address and network configuration. Disconnect all cables from the IVS device and laptop.

Complete the steps in this section for each additional IVS device to be installed.

When done, set your laptop's network configuration back to its original settings.

Specifications

Electrical

Primary Input 48Vdc, 0.5A

Power consumption .... 14W Max

Certified Limited Power Source

Network

Cabling ....Category 5e

Ethernet .... Dual channel 100Mb Ethernet switch

Power .... IEEE 802.3af Power

Addressing..DHCP or Static IP

Environmental

Operating Temperature: ....0° to 45°C (32° to 113°F)

Enclosure..IP20 Nema 1

Mechanical

Dimensions.............................. 64mm x 155mm x 33mm
(2.5in x 6.1in x 1.3in)

Lens..2.0mm

Enclosure material ....Plastic

Weight ....0.23kg (0.5 lbs.)

Declarations

Regulatory Compliance

$C \in$

EMC .... 47 CFR, Part 15

FCC COMPLIANCE: This equipment complies with Part 15 of the FCC rules for Class A digital devices when installed and used in accordance with the instruction manual. Following these rules provides reasonable protection against harmful interference from equipment operated in a commercial area. This equipment should not be installed in a residential area as it can radiate radio frequency energy that could interfere with radio communications, a situation the user would have to fix at their own expense.

CANADIAN COMPLIANCE: This Class A digital apparatus complies with Canadian ICES-003. Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

EQUIPMENT MODIFICATION CAUTION: Equipment changes or modifications not expressly approved by Sensormatic Electronics Corporation, the party responsible for FCC compliance, could void the user's authority to operate the equipment and could create a hazardous condition.

Other Declarations

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MDR 2/2010

Appendix A: Site Survey Form

General Information

Customer Name	
Site Name and Number	
Site Address	
Site Telephone Number	

Hours Of Operation	Mon		Tue		Wed	
	Thu	Fri		Sat		Sun

Local Contact Name	
Contact Telephone	
Survey Performed By	
Survey Date and Time	

Ceiling Information

Ceiling Height		IVS Device Mounting Height	
Ceiling Composition		Ceiling Slope	
Ceiling Access			
Additional Considerations			

Door Information

Door Width		Door Type	
Pedestals (yes/no)			
Additional Considerations			

Other Information

Floor Slope		Distance to Head End	
Head-End Power?		Ceiling Power?	
Network Switch Type		Num. Ports Available	

Sketch