



# WWD 580 - Wrong Way Driver Detection Module Installation and Operation Manual

Includes Cabinet Installation Instructions and Component Interfaces

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Revision: -

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## HISTORY OF REVISIONS

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REVISION No.	DATE	DESCRIPTION
-	MAR 2018	Initial Release

## IMPORTANT NOTES

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### DISPOSAL

The WWD 580 Wrong Way Driver Detection Module is designed to have a long service life and contains state-of-the-art technology. As with all electronic products, future technological developments can create a need/desire to replace/upgrade equipment. When the time comes to replace, upgrade, or dispose your Viion WWD 580 Wrong Way Driver Detection Module, please dispose of it properly at a certified electronics recycling/disposal center.

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## NOTES

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# 1 INTRODUCTION

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## 1.1 ABOUT THIS MANUAL

This manual describes the installation and operation of the WWD 580 Wrong Way Driver Detection Module. It is intended for use by persons suitably qualified and experienced in the installation, operation and maintenance of sensitive electronic equipment in regulated environments ie. road ways, railways, airports, etc.

It is the responsibility of the customer, contractor, and installer to ensure all applicable usage, regulatory, environmental, and safety requirements for the system and installation area are met.

## 1.2 SAFETY CONSIDERATIONS

While installing the WWD 580 Wrong Way Driver Detection Module, the customer/contractor must consider and take the appropriate safety precautions while working alone and/or at heights as applicable to the installation. Further, the customer/contractor must take appropriate safety precautions while working on or around roadways, airports/aircraft, railways, etc. as applicable to the installation.

**DO NOT** attempt to install any electronic equipment on or around tall metal structures during weather events where there is a risk of a lightning strike.

**DO NOT** install any electronic equipment in wet weather and always take appropriate precautions to avoid electric shock.

## 1.3 PRODUCT INTRODUCTION – CONTENTS AND DESCRIPTION

The WWD 580 Wrong Way Driver Detection Module uses powerful on-board analytics to detect and assess wrong way vehicle traffic. The design includes a rack-mounted cabinet module with simple electrical connections.

Working in conjunction with Viion's TC400GC TrafficCam and a radar detection device, the WWD 580 detects vehicles travelling in the wrong direction, activates local warning beacons, collects time-stamped video of the event, and sends an alert to the Traffic Management Center (TMC) with images of the offending vehicle.

On-board hardware includes a TS2 rated Bus Interface Unit (BIU) employing a Quad-Core ARM CPU. The hardware is mounted within a standard Caltrans 334 19 inch rack-mount enclosure.

### 1.3.1 Unpacking the Equipment

Carefully unpack the equipment. Visually inspect the package contents for any evidence of shipping damage. Retain all shipping containers and packaging materials in case re-shipment is necessary.

Begin by opening the box from the top, taking care not to cut deeply into the package as doing so could damage the module inside. Carefully remove the module.

Inspect all items for damage sustained during shipping. Confirm all components are included in the box as listed in Section 1.3.2 below. If any items are damaged or missing, contact your sales associate immediately.

### 1.3.2 Package Contents

The WWD 580 Wrong Way Driver Detection Module package includes the following components:

Item	Quantity
WWD 580 Wrong Way Driver Module	1
110VAC to 24VDC power supply (optional)	1

## 1.4 PRODUCT FEATURES/APPLICATIONS

### 1.4.1 System Design

The WWD 580 Wrong Way Driver Detection Module is designed to detect wrong-way driving events and enable local warning beacons and to generate alarms. A typical system configuration is shown below consisting of a WWD580 module, a radar unit, two confirmation cameras, and a Traffic Management Center Workstation.

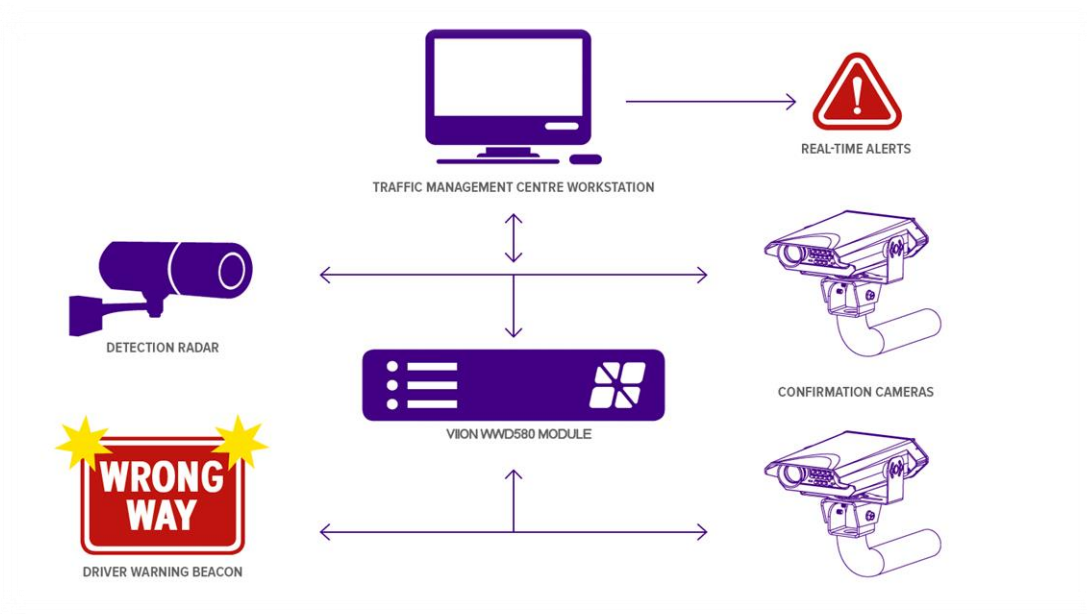


Figure 1-1: Wrong Way Driver - System Diagram.

### 1.4.2 Interfaces

The WWD580 module front panel features all required Ethernet connections for easy access along with basic diagnostic test buttons and indication LEDs; shown below in Figure 1-2:

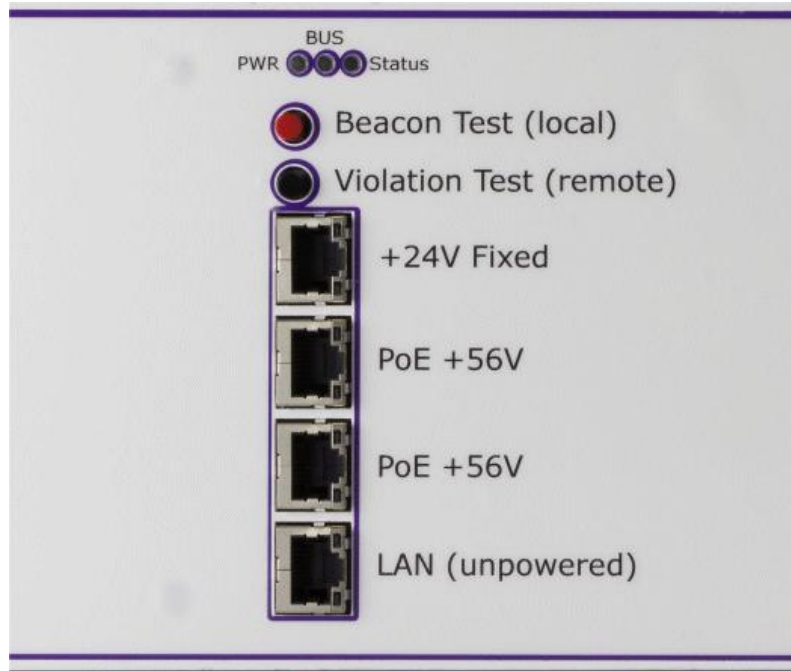


Figure 1-2: Front panel of WWD580 Module

### 1.4.3 Power Over Ethernet (POE) Connections

Each WWD580 module has an integrated network switch providing three (3) POE connections which can be used to power up to 2 TrafficCam devices, and a single radar unit.

- The upper-most POE port (labelled +24 Fixed) is configured to function with a specific radar detector called the “Intersector” Microwave Sensor manufactured by MSSedco (<http://mssedco.com/>).

Intersector Microwave Sensor Product Manual: <http://mssedco.com/wp-content/uploads/2015/11/TC-CK1-SBE-1.9U-IM-092717.pdf>

**Note - The Intersector Microwave Sensor employs a non-standard POE configuration. It is important that the port labelled +24V Fixed only be used for the Intersector unit, and that it not be plugged into any other ports. Other Radar Detectors may be supported by Viion. Contact your sales representative for more information.**

- The two (2) ports labeled PoE +56V are standard 802.3af POE ports and are typically used to power one or two Viion TrafficCam units.
- The lower port labeled LAN (unpowered) is a standard non-POE Ethernet port which is typically used to connect the module to a Local Area Network (LAN).

A laptop is required to perform in-field set-up and configuration. This normally requires connecting the WWD580 module to the LAN in order to send data to the Central WWD Application. **It is recommended an external network switch is used during configuration and set-up to connect the WWD580 to the LAN while also providing temporary access for laptops.**

#### 1.4.4 Status LEDs

There are 3 status LEDs on the WWD580 module front panel labeled as shown below:



Figure 1-3: Status LEDs

**PWR** – Illuminated green when the unit is powered.

**BUS** – Normally blue/green.

**Status** – Refer to Table 1-1 below:






Status LED Colour	Status Description
	Solid Purple Power On – Normal First Status
	Flashing Blue System Operating – No Internet Connection
	Flashing Green System Operating – Has Internet Connection
	Flashing Red Wrong Way Driver event detected OR Test Button is pressed
	Solid Red Hardware or Software Fault

Table 1-1: Status Light Colour/Description

#### 1.4.5 Test Buttons

There are two (2) test buttons on the front of the WWD580 used for performing system tests. Beacon Test (red) and Violation Test (black) as shown in Figure 1-4 below:

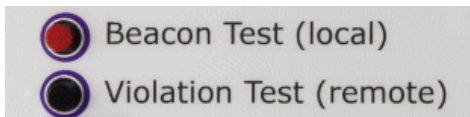


Figure 1-4: Test buttons

- Beacon Test is used to test the beacon operation and when pressed closes a dry contact within the module for approximately ½ second. This is typically used to trigger beacon devices such as Rectangular Rapid Flashing Beacons RRFBs.
- Violation Test is used to generate an artificial wrong-way driver alarm message. This is typically used to trigger the cameras to capture video and send event data to a Traffic Management Center (TMC) or other server configured to receive alarms.

When either button is pressed the Status LED will flash red for 2-5 seconds.

#### 1.4.6 Processing

Each module contains a Quad-Core ARM processor running proprietary software which implements wrong-way driver detection analytics. Data from the radar unit is analysed within the WWD580 module which implements two levels of notification based on a set of rules. The first notification level activates a set of local beacons using two relays within the module. The second level sends a message to the local TrafficCam unit(s) which record video before and after the event. Once the video has been recorded, an evidence package containing data such as location, date, time, and images/video clips of the event are sent to a user specified URL location such as a Traffic Management Center (TMC) where a server application is running.

Detecting Wrong Way Driving events is done by defining detection zones within the Radar unit. Refer to the MSSedco Intersector unit manual to configure up to 8 detection zones:

<http://mssedco.com/wp-content/uploads/2015/11/TC-CK1-SBE-1.9U-IM-092717.pdf>).

When a vehicle enters a detection zone and is travelling in the wrong direction, the radar unit will generate an output which is detected on the WWD580 module. Referred to as “opto-outputs”, they are numbered 1 through 8 and correspond to detection zones. Detection zones are established with zone 1 (Z1) farthest from the radar unit. Zone numbers increase incrementally moving towards the radar unit. The choice of how many zones to use depends on criteria specific to each unique installation. Criteria such as local road geometry, existing signage, lighting, barriers and other features in and adjacent to the road-way can play a factor. It is recommended at least 3 zones are used to achieve reliable operation and reduce the number of false positive (phantom) activations.

An example of a four (4) radar detection zone (Z1-Z4) configuration is shown in Figure 1-5 below. A vehicle driving in the wrong direction will cross the zones starting at Z1 and ending with Z4. Depending on the number of zones activated, the system will start to activate RRFBs and TrafficCams as specified through parameters configured in the Web Interface.

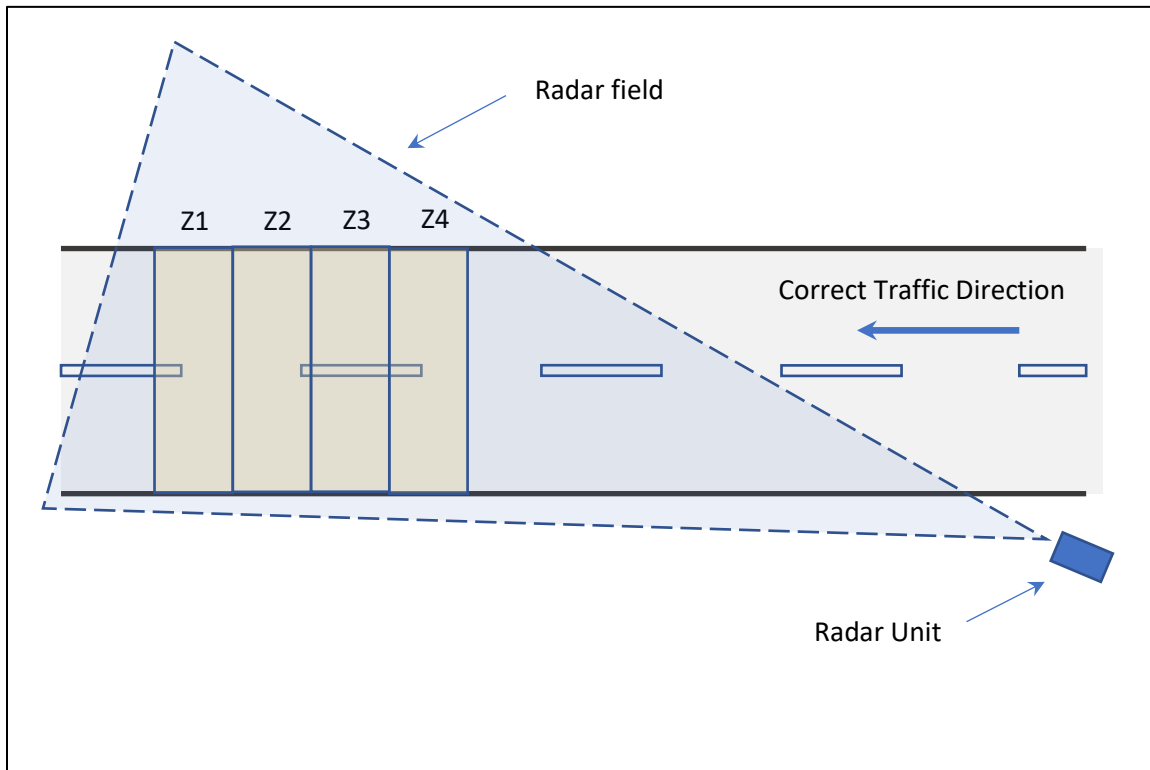


Figure 1-5: Radar Field and detection zones Z1-Z4

#### 1.4.7 Serial No. and MAC Address

Each WWD580 module has a unique mac address associated with the internal processor. Each module is also assigned a four-digit serial number. Both of these label appear on the front face of the module in the upper-left hand corner.

### 1.5 ACCESSORIES/REQUIREMENTS NOT SUPPLIED

The WWD 580 Wrong Way Driver Detection Module is intended for use with standard Cat6 cabling and equipment. The following not supplied items are required for typical installations:

- Cat6 Cabling
- Zip ties/cable clamps
- Hardware for rack-mounting
- Power supply and beacon trigger cabling (18 AWG).

## 1.6 SPECIAL TOOLS REQUIRED

The following tools are required to install the WWD 580 Wrong Way Driver Detection Module:

- #2 Phillips Screw Driver
- Medium Flathead Screw Driver

Note - Refer to TrafficCam manual DM-TC400GC and Intersector Microwave Sensor Product Manual for additional installation requirements and tools not supplied.

# 2 INSTALLATION

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This section describes the installation of the WWD 580 Wrong Way Driver Detection Module including mounting and electrical connections. A post installation check list is included in Section 2.7

## 2.1 SAFETY CONSIDERATIONS

While installing the WWD 580 Wrong Way Driver Detection Module take appropriate safety precautions while working alone and/or at heights as applicable to the installation. Further take appropriate safety precautions while working on or around roadways, airports/aircraft, railways, etc. as applicable to the installation.

**DO NOT** attempt to install any electronic equipment on or around tall metal structures during weather events where there is a risk of a lightning strike.

**DO NOT** install any electronic equipment in wet weather and always take appropriate precautions to avoid electric shock.

## 2.2 PRE-INSTALLATION INFORMATION

Always follow good electrical installation practices and carry out the installation using a suitable qualified and experienced contractor familiar with the applicable building codes and regulations in your area. Follow the installation procedure in this section as it is presented for a successful installation. Read the entire section before beginning the installation. Perform the post-installation check before closing out the work area.

## 2.3 INSTALLATION OVERVIEW

Install the WWD inside a nearby electrical cabinet designed to accommodate a 19-inch rack mount unit. The cable run from the WWD580 to the cameras and radar units should be no more than 50m (160 ft).

### 2.3.1 Operating Conditions

The WWD 580 Wrong Way Driver Detection Module is designed to function within certain environmental/installation parameters. Failure to meet the recommended operating conditions may result in reduced performance and/or reduced operational lifetime of the product. For effective operation, the product must be installed and operated according to the conditions below:

Item	Value / Description	Units
Operating Temperature	-40 to +60	°C
Maximum Cable Length (customer supplied)	≤ 50	m

Note – In some areas it may be necessary to install a ventilated or temperature controlled cabinet in order to ensure max/min temperature requirements are met.

## 2.4 EQUIPMENT MOUNTING

There are four (4) fasteners required to secure the face-mount WWD580 module to the rack mount within the cabinet.

Inspect all cables for damage and all routes for sharp edges which could chaff or damage the cables

Ensure all cables are installed in a relaxed manner, with service loops, and secured using zip ties or cable clamps as required by local electrical codes.

Refer to the Viion TrafficCam user manual **DM-TC400GC** for installation and mounting instructions.

Refer to Carmanah **SC315 AC LED RRFB USER MANUAL** for typical RRFB installation and mounting instructions.

Refer to MSSedco Intersector Product Manual (product manual: <http://mssedco.com/wp-content/uploads/2015/11/TC-CK1-SBE-1.9U-IM-092717.pdf>) for Radar Detector installation and mounting instructions.

## 2.5 ELECTRICAL CONNECTIONS

The WWD 580 Wrong Way Driver Detection Module does not include any installation cabling. A typical installation connection diagram is shown in Appendix B – WWD System Diagram.

Ethernet connections to the front of the unit are explained above in Section 1.4.3. These include connections with the MSSedco Intersector radar unit, up to two (2) Viion TrafficCams, and the Local Area Network (LAN). All required Ethernet connections are standard RJ45 connectors.



**Note – To ensure correct system performance, it is important to ensure the maximum cable length limits listed in Section 2.3.1 are not exceeded in any network cable runs.**

2.5.1 Screw Terminals

The WWD 580 Wrong Way Driver Detection Module requires a 24 VDC power supply, and connections for this are found on the rear side of the unit as shown below in Figure 2-1. The green screw-terminal strip is used to connect to a 24 VDC power supply and for connecting switched beacons.

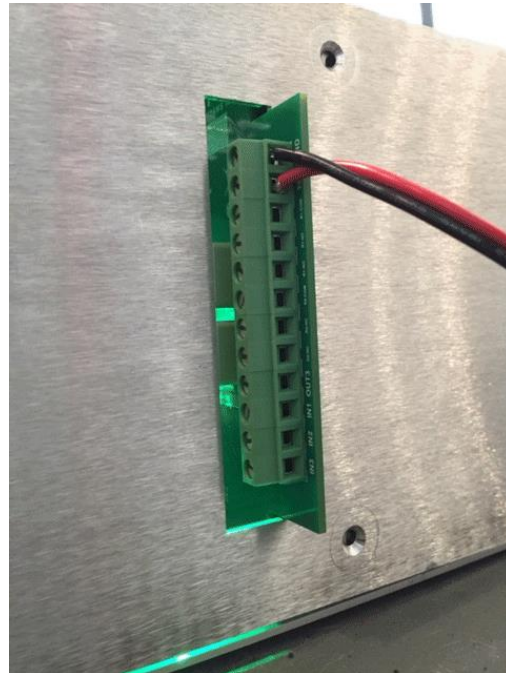


Figure 2-1: Rear terminal strip

**Note: the label on screw terminal 2 indicates 12V but is incorrectly labeled for this application. The input voltage is 24 V.**

A complete top down listing of I/O connections is given below where connection 1 is the top-most terminal:

Connection	Designation
1	Ground (GND)
2	+24 VDC
3	Relay 1 - Common
4	Relay 1 – Normally Closed
5	Relay 1 – Normally Open
6	Relay 2 - Common

7	Relay 2 – Normally Closed
8	Relay 2 – Normally Open
9	OUT3 – not used
10	IN1 – not used
11	IN2 – not used
12	IN3 – not used

Table 2-1: Connection list

### 2.5.2 Beacons

Warning beacons are switched on when a wrong way driver event is detected. Typical beacon types include Rectangular Rapid Flashing Beacons (RRFBs). Most models can be programmed to control parameters such as duration, frequency, flashing pattern etc. Refer to the manufacturer’s documentation to determine how best to configure a given unit. Flashing beacon units can typically be triggered by providing a short contact closure such as the one provided by the WWD580 which has duration of 0.2 sec.

A single relay (Relay 1) is configured to operate the wrong way detection system beacons. The following connections are used to trigger a single beacon with a short duration contact closure. Other configurations using a normally closed configuration are also possible (contact Viion for more information).

Connection	Designation
3	Relay 1 - Common
5	Relay 1 – Normally Open

One popular beacon device that can be used in the application is the Carmanah SC315 RRFB unit that employs a programmable controller. The following illustrations show how the screw terminal connections 3 and 5 would be connected to the Carmanah SC315 Controller. The right-hand screw terminals (labeled 1-4) are used to connect with WWD580 module as shown in Figure 2-3.

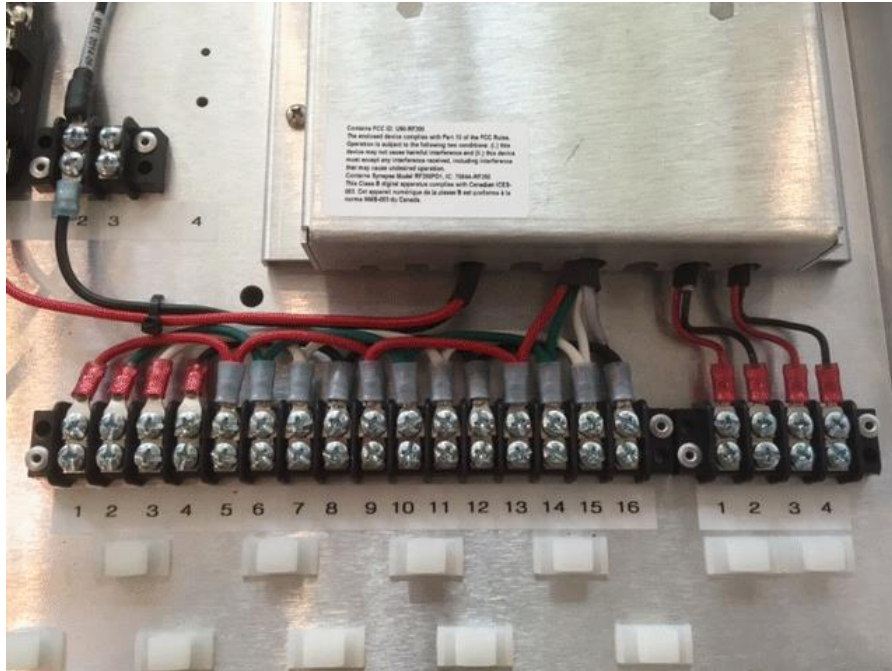


Figure 2-2: Screw terminals inside Carmanah SC315 controller unit.

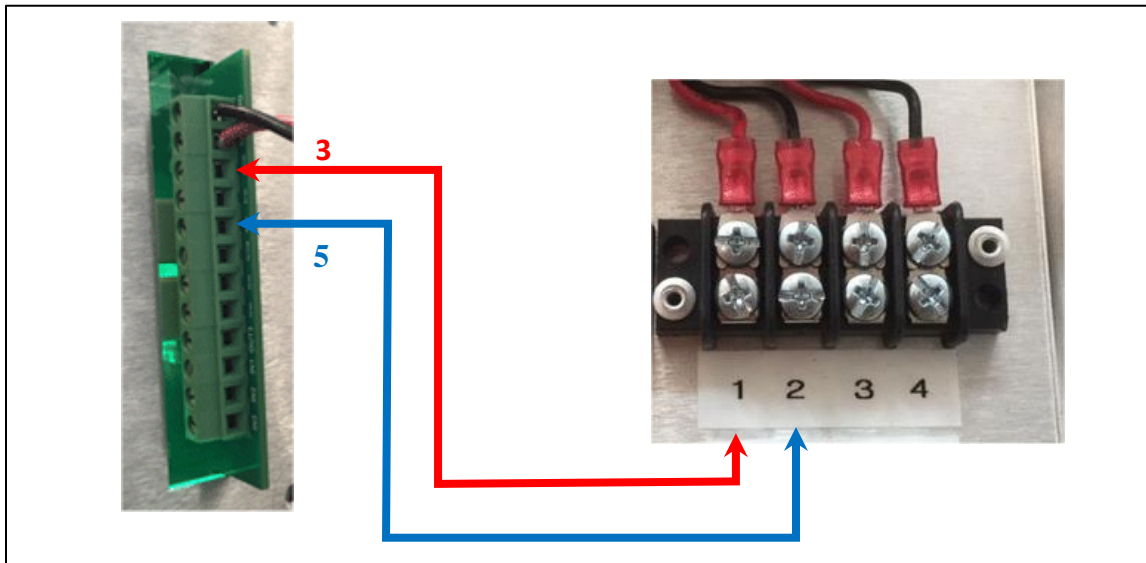


Figure 2-3: The WWD580 screw terminals 3 and 5 connect to SC315 screw terminals 1 and 2.

## 2.6 USING WEB INTERFACE – SYSTEM CONFIGURATION

Google Chrome is the recommended internet browser for use with the Viion Web Interface. The following instructions refer to system setup and configuration for a computer running Windows 7 operating system or later. The power and LAN Ethernet connection described in the preceding sections must be connected prior to proceeding with the following network installation.

It is recommended, when configuring with a new device, to initially connect the WWD580 on a network featuring a Dynamic Host Configuration Protocol (DHCP) server. This will automatically assign the WWD580 module an IP address and is the most straight-forward method to detect and configure the system through the web interface.

### 2.6.1 Device Detection

Begin by launching Windows Explorer and open Network (typically listed under Desktop). You will see a list of detected devices as in the example below in Figure 2-4. In the right-hand column a Viion WWD580 device is listed with Mac address f8:dc:7a:15:a0:0b.

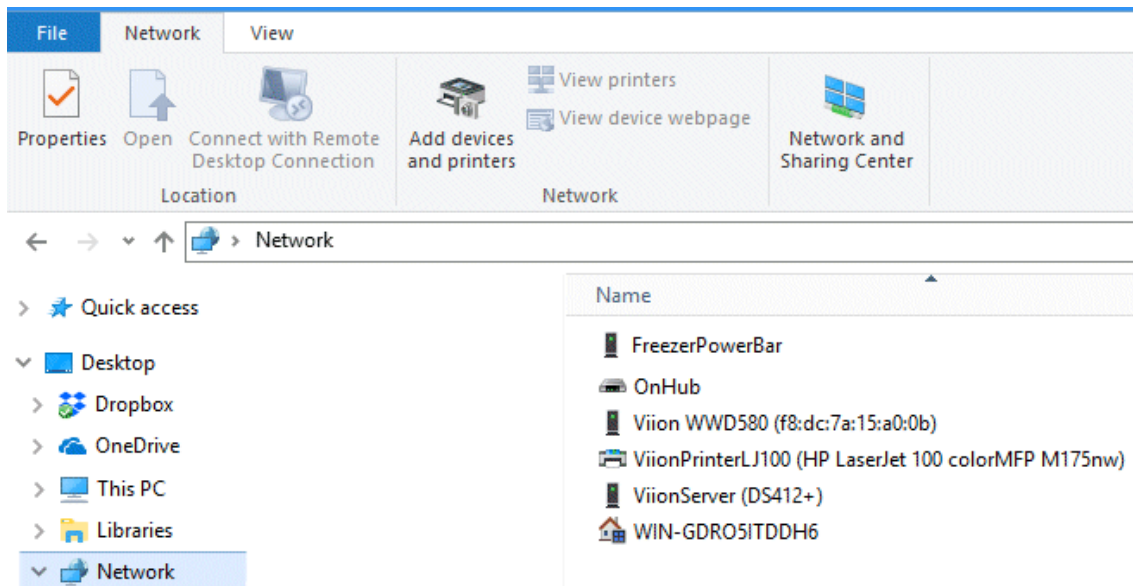


Figure 2-4: Network Devices

Each WWD580 module on the network will appear in the list with a unique Mac address. By double-clicking on these links, an internet browser will launch displaying the web interface page as shown below.

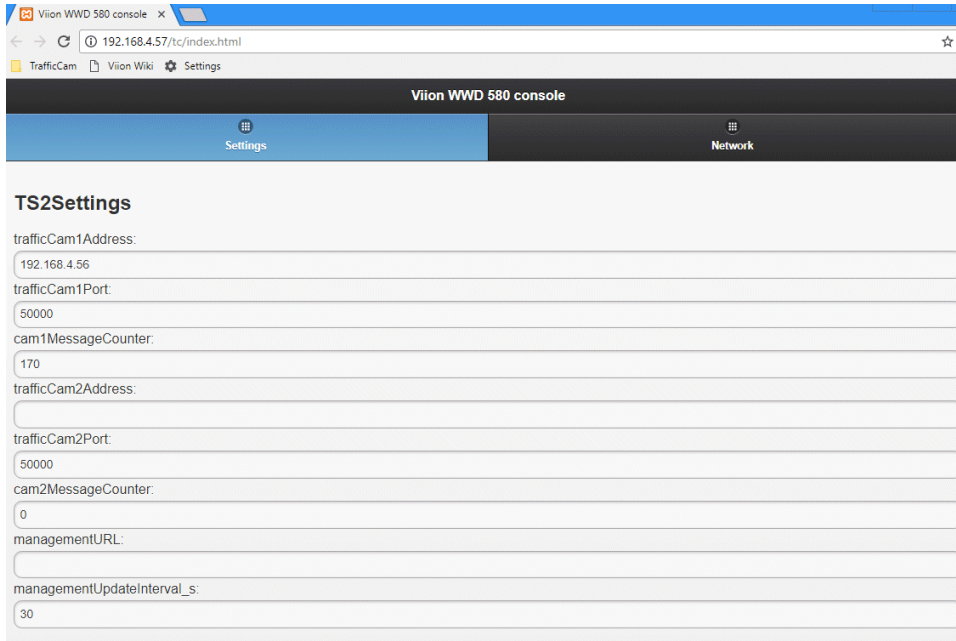


Figure 2-5: WWD580 Web Interface page

There are two tabs on the web interface labelled ‘Settings’ and ‘Network’ which contain a group of display (read-only) and user-input fields. A detailed description for each field is listed below.

### 2.6.2 Settings Tab

The fields listed under settings control the operation of the Wrong-Way Driver (WWD) system. There are two sub-sections within this tab – ‘TS2Settings’ and ‘Intersector Settings’ as outlined below:

#### 2.6.2.1 TS2Settings

These parameters are used to configure the system for triggering one or two Viion TrafficCams, and for sending messages to a management server. The parameters are explained in Table 2-2 below:

Parameter name	Description
trafficCam1Address	The fixed IP address for the first TrafficCam that gets triggered when there is a WWD event.
trafficCam1Port	The TCP port that is used when communicating with the first TrafficCam.
cam1MessageCounted	Each time a message is received from the first TrafficCam this value is incremented. It is used to confirm a successful connection with the first TrafficCam.
trafficCam2Address	The fixed IP address for the second TrafficCam that gets triggered when there is a WWD event.
trafficCam2Port	The TCP port that is used when communicating with the second TrafficCam.

cam2MessageCounted	Each time a message is received from the second TrafficCam this value is incremented. It is used to confirm a successful connection with the first TrafficCam.
managementURL	This URL is where a diagnostic packet is sent periodically so that the health status of the WWD580 unit may be monitored through Viion’s Central WWD application.
managementUpdateInterval_s	The interval in seconds at which diagnostic messages are sent to the managementURL.

Table 2-2: TS2Settings

### 2.6.2.2 IntersectorSettings

These parameters are used to configure how data from the MSSecdo Intersector radar unit is used to detect wrong way driver events. The parameters appear in the web interface as follows.

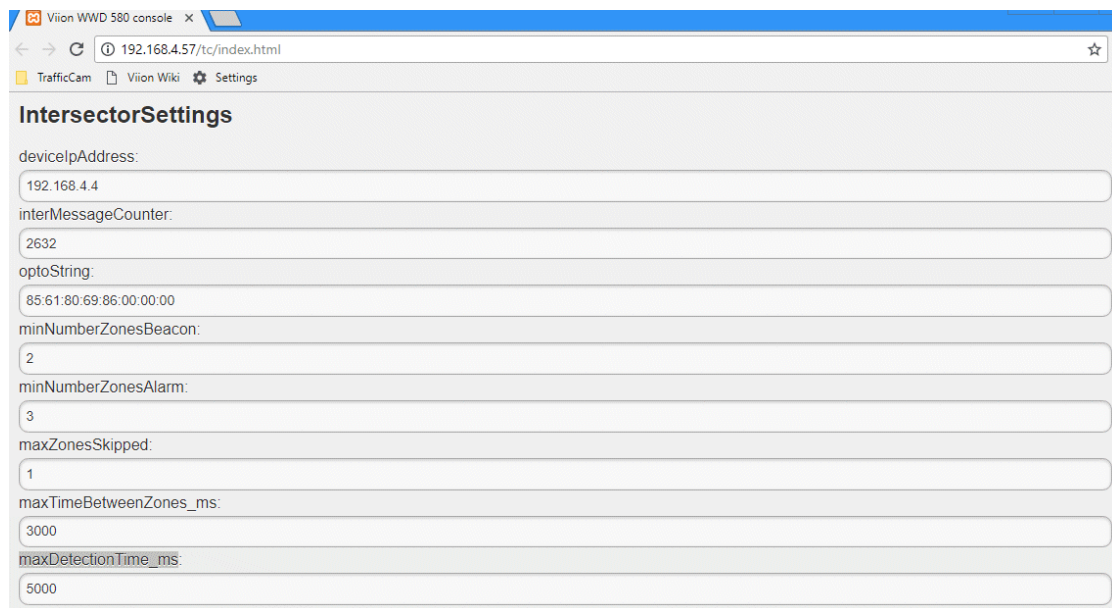


Figure 2-6: Intersector settings in Web Interface.

The parameters associated with the Intersector settings are explained in detail below.

Parameter name	Description
deviceIpAddress	The fixed IP address for the Intersector unit that is connected to the current WWD580 unit.
interMessageCounter	Each time a message is received from the Intersector this value is incremented. It is used to confirm a successful connection with the Intersector.
optoString	This displays an accumulated event count for all 8 Intersector opto-outputs (see MSSecdo Intersector Product manual). It is used to validate that outputs are getting triggered, and the values roll over at 100.

minNumberZonesBeacon	This defines the minimum number of zones that must be crossed before the warning beacons are triggered (see section 1.4.6). Default value is 2.
minNumberZonesAlarm	This defines the minimum number of zones that must be crossed before an alarm is raised indicating that a WWD event has occurred (see section 1.4.6). When an alarm is raised, the TrafficCam units get triggered and record information from before and after the triggering event time. Default value is 3.
maxZonesSkipped	When tracking a vehicle moving through consecutive zones, the system can be configured to not require that all zones be visited. Consider the example shown in Figure 1-5 with maxZonesSkipped = 1. If a vehicle is detected crossing zone 1 followed by zones 3 then 4, it has skipped over zone 2. This would be considered as a potential valid wrong-way violation. Default value is 1.
maxTimeBetweenZones_ms	This defines the maximum time that a vehicle can take in a given zone before it transitions to the next zone. The choice of this parameter will depend upon minimum anticipated vehicle speed and the depth of the deepest zone (see section 1.4.6).
maxDetectionTime_ms	This defines the maximum time a vehicle will spend crossing all defined zones. The choice of this parameter will depend upon minimum anticipated vehicle speed, and the total depth of all zones combined (see section 1.4.6).

Table 2-3: Intersector Settings

### 2.6.3 Network Tab

The network tab lists parameters which control the Ethernet configuration for the WWD580 module. The parameters appear in the web interface as follows.

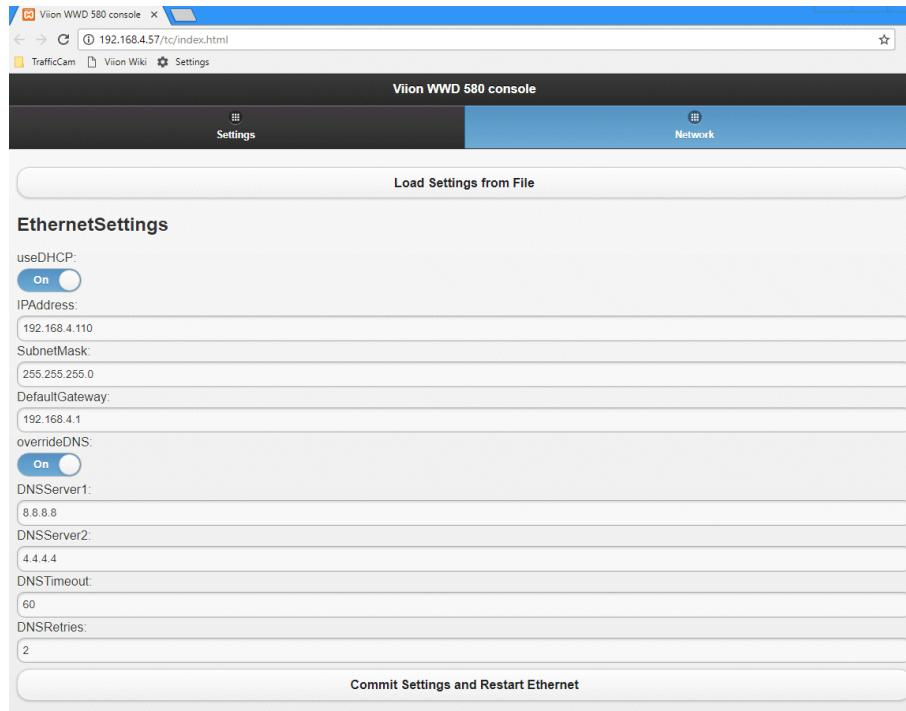


Figure 2-7: Ethernet Settings

The parameters associated with Ethernet settings are explained in detail below:

Parameter/Button name	Description
Load Settings from File	This button is used to load the current set of Ethernet parameters from the configuration file used in Linux (/etc/network/interfaces).
useDHCP	If set to ON, this will configure the device so that it gets an assigned IP address from a DHCP server on the network. Default is ON.
IPAddress	If useDHCP is set to off, this value is used to specify a fixed IP address that will be used to communicate with the unit.
subnetMask	If useDHCP is set to off, this value is used to specify a fixed subnet mask that will be used when communicating with the unit.
defaultGateway	If useDHCP is set to off, this value is used to specify a default gateway that will permit Internet access.
overrideDNS	This is used to allow the user to fix the address of one or two Domain Name System (DNS) servers. If the value is Off the default DNS server found on the network will be used. If this value is On, then DNSServer1 and DNSServer2 will be used as DNS servers.
Commit Settings and Restart Ethernet	This button is used to commit settings once changes on this page have been made. <b>It is important that you double check all values, since an error in specifying an IPAddress or SubnetMask could result in failure to communicate with the unit.</b>

Table 2-4: Ethernet Settings



## 2.7 POST-INSTALLATION CHECK

- **Mounting Check** – Ensure the module is securely mounted in the cabinet and all fasteners are tight.
- **Wiring Installation Check** – Verify all cables are properly secured within the cabinet and connectors are properly installed in each port
- **Camera Check** – Confirm the camera is operating properly – refer to DM-TC400GC
- **Communications Check** – Confirm the Status light is flashing blue or green several minutes after power-up.
- **Web Interface Check** - Confirm the Web Interface launches properly and validate that the message counter for the Radar unit as well as for the one or two TrafficCams are incrementing over time. This may require refreshing the web interface.

## 3 TYPICAL WRONG WAY DRIVER CONFIGURATION

Setting up a typical wrong-way driver system involves configuring both the WWD580 module along with the associated Radar and TrafficCam units. A typical installation includes two (2) TrafficCams and a radar unit mounted to the same pole adjacent to the roadway. The radar unit is mounted to detect wrong-way driving vehicles as early as possible. One of the cameras is configured to monitor vehicles travelling toward the radar unit, while the other is pointed in the opposite direction (see Figure 3-1 and Figure 3-2 below). A radar unit is mounted along with 2 TrafficCam units. The radar unit is pointing in the direction for earliest detection of wrong way drivers.

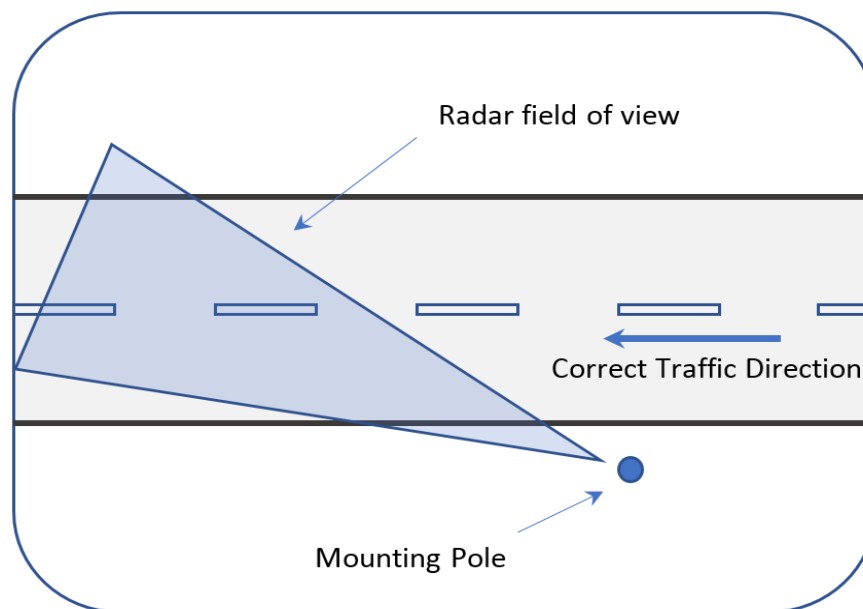


Figure 3-1: View from above the road showing a single pole location.

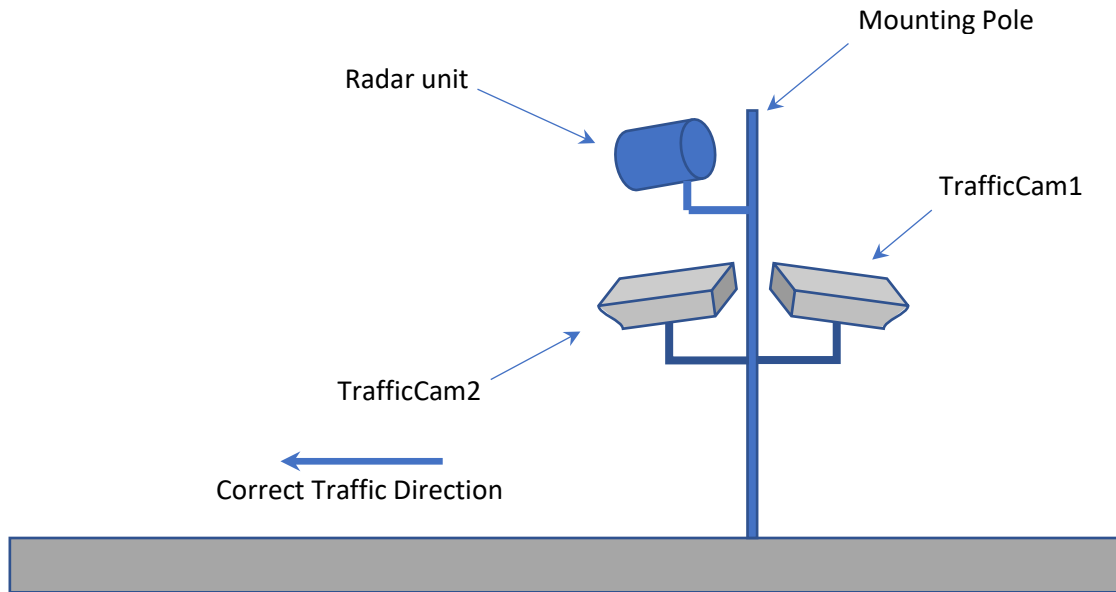


Figure 3-2: View of pole from ground level

In Figure 3-2 the radar unit and TrafficCam2 are aligned with the direction of travel, and TrafficCam1 is directed against the direction of travel.

### 3.1 FIXED IP ADDRESSES

In many cases it is convenient to assign fixed IP addresses for all units at a given install location.

Care must be taken when assigning a fixed IP address - see Section 3.3.1. Carefully check that all values have been correctly entered and that you have a record of the address assigned to a given unit. If a unit is accidentally misconfigured, it may be necessary to return the WWD module to Viion to perform a factory firmware re-installation.

When re-connecting to a device after a fixed IP address has been set, enter the new (fixed) IP address into your Chrome browser window as shown below:

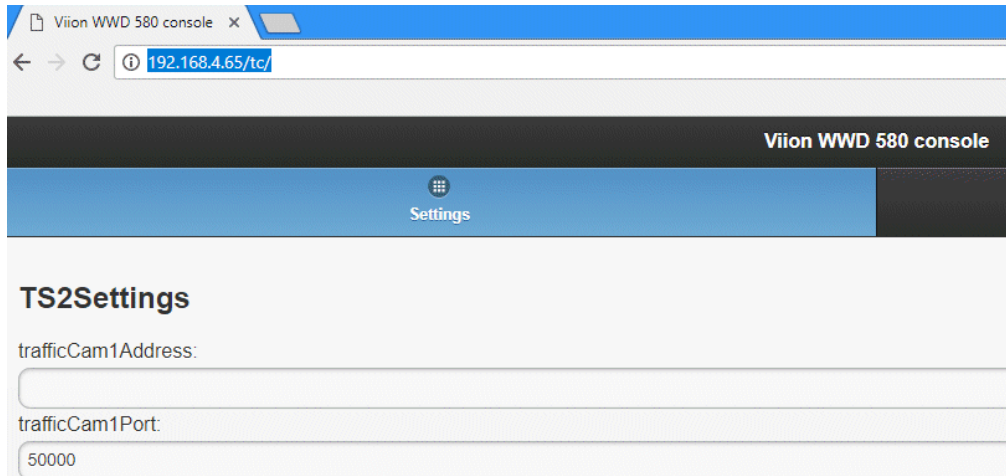


Figure 3-3: Connecting at a WWD580 module having a known (fixed) IP address.

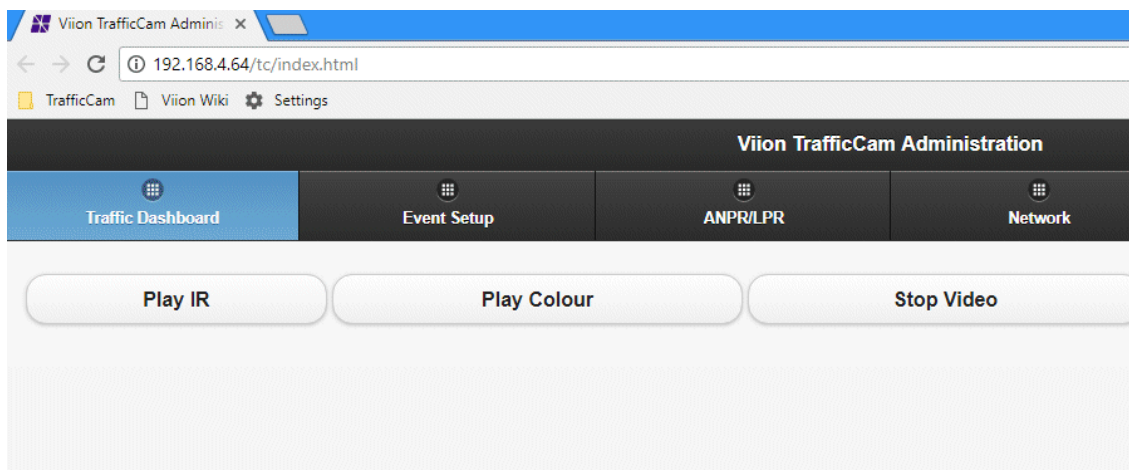


Figure 3-4: Connecting at a TrafficCam unit having a known (fixed) IP address.

## 3.2 CONNECTIONS

Both cameras and the Radar unit are powered via POE from the WWD580 module. It is important to connect the units into the correct ports on the front of the WWD580. The following diagram shows appropriate connection locations for devices.

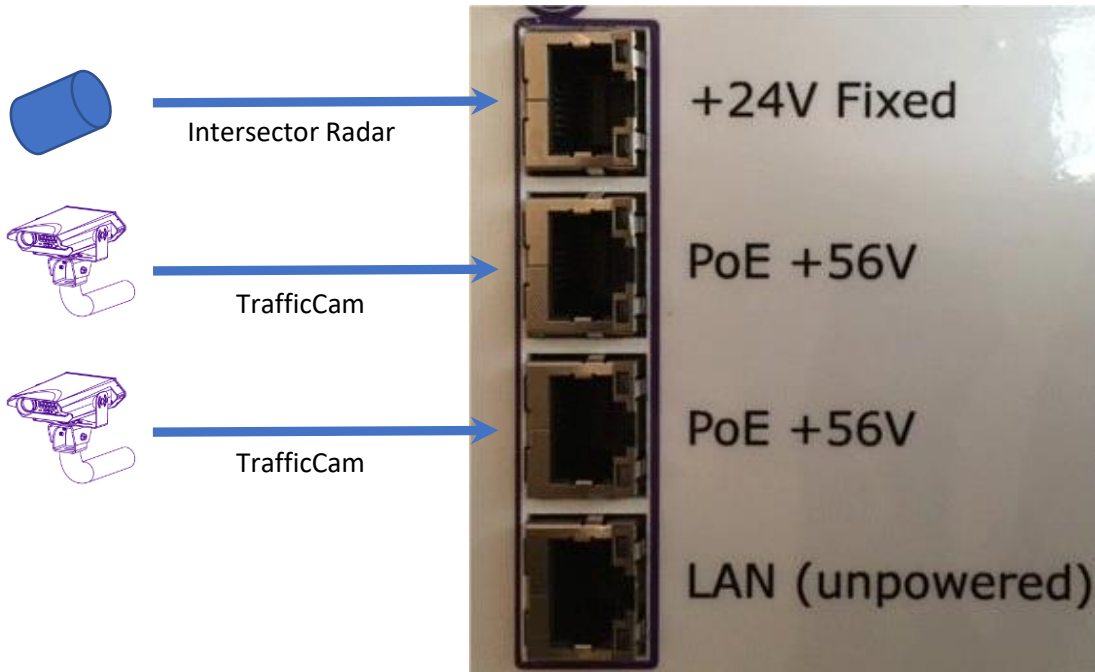


Figure 3-5: Network connections for POE devices

### 3.3 SETUP STEPS

Steps for configuring a system are given below. Components powered from the WWD580 module (TrafficCams and Radar unit) may remain connected to the device during configuration.

#### 3.3.1 TrafficCams fixed IP address

Configure TrafficCams 1 and 2 to have a fixed IP address (see TrafficCam Installation and Operation Manual **DM-TC400GC**)

#### 3.3.2 TrafficCams Web Interface

Re-connect to each unit using the fixed IP address, and using the TrafficCam web interface, configure as follows:

Interface Tab	Group	Setting name	Value
Event Setup	SpeedEventSettings	writeColorVideoFile	On
Event Setup	SpeedEventSettings	videoLength_frames	600
Event Setup	SpeedEventSettings	videoPreroll_frames	300
Event Setup	SpeedEventSettings	uploadURL	See notes below
Event Setup	SpeedEventSettings	speedThreshold	500
Event Setup	SpeedEventSettings	pollWebDirector	On
Event Setup	SpeedEventSettings	pollingURL	See notes below
Event Setup	TriggerInterfaceSettings	enableExternalTriggering	On

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**Notes:**

**videoLength\_frames** specifies the total number of frames that will be captured for each WWD event, and **videoPreroll\_frames** specifies the number of frames that will be captured from before the triggering event. By using a value **videoLength\_frames**, the total length of video will be between 25 and 30 seconds, and by selecting **videoPreroll\_frames**, the WWD event will be recorded approximately close to the middle of the video file (between playback seconds 12 and 15). These values can be adjusted based on the specific requirements at a given location. For example it may be appropriate to reduce the **videoPreroll\_frames** value so that the event happens earlier in the video file.

**uploadURL** – this is the URL where all recorded wrong way driver event data gets pushed. In most cases it will be an address of a workstation in the TMC where Viion’s Central WWD Application is running.

**speedThreshold** – this value is used when the camera is configured for speed enforcement. By selecting value of 500 the camera will not be detecting speed violations.

**pollingURL** – this is the URL where the Viion Central WWD Application is installed. All cameras and WWD580 units should be configured to push diagnostic data to this location.

### 3.3.3 MSSedco Fixed IP Address

Configure MSSedco Intersector to have a fixed IP address (see product manual <http://mssedco.com/wp-content/uploads/2015/11/TC-CK1-SBE-1.9U-IM-092717.pdf>)

### 3.3.4 MSSedco Intersector Zone Definitions and Alignment

Re-connect to unit based on the fixed IP address, and once mounted and appropriately aligned, use the MSSedco configuration tool to assign detection zones based on the locale road geometry (see section 1.4.6 and MSSedco product manual). Ensure that at least 2 zones are configured and that each one has been set to detect wrong way driving.

### 3.3.5 WWD580 Fixed IP address

Configure the WWD580 device to have a fixed IP address.

### 3.3.6 WWD580 Configuration

Re-connect to the device with the new address and use the web interface to configure the following.

Interface Tab	Group	Setting name	Value
Settings	TS2Settings	trafficCam1Address	See notes below
Settings	TS2Settings	trafficCam1Port	50000
Settings	TS2Settings	trafficCam2Address	See notes below
Settings	TS2Settings	trafficCam2Port	50000
Settings	TS2Settings	managementURL	See notes below
Settings	IntersectorSettings	deviceIpAddress	See notes below

**Notes:**

**trafficCam1Address** – use the fixed IP address that was assigned to TrafficCam1.

**trafficCam2Address** – use the fixed IP address that was assigned to TrafficCam2.

**managementURL** – this is the URL where the Viion central WWD Application is installed. All cameras and WWD580 units should be configured to push data to this location.

**deviceIpAddress** – this is the fixed IP address that was assigned to the MSSedco Intersector unit.

**Other parameters** – **minNumberZonesBeacon, minNumberZonesAlarm, maxTimeBetweenZones, maxDetectionTime\_ms**. Usually, default values will work but there may be instances where some adjustments are required. Refer to Section 2.6.2.2 for further details.

3.3.7 **Connection Validation**

Following configuration, correct operation of the TrafficCam and Radar units may be validated by referring to messageCounter values on the WWD580 web interface (see Section 2.6.2).

3.3.8 **Beacon Connections**

Connect the beacon trigger cables to the rear of the WWD580 as outlined in section 2.5.2.

3.3.9 **Beacon Validation**

Validate beacon operation by pressing the upper (red) test button on the front panel. The beacons should remain lit for the period of time as configured through the beacon manufacturer’s instructions.

3.3.10 **Alarm Validation**

Validate alarm packets are sent to and received by Viion’s central WWD application by pressing the lower (black) test button on the front panel. If two TrafficCam units are employed, two packets should be received on the server each time the button is pressed.

### 3.3.11 System Validation

Drive a vehicle past the wrong way driver installation in both the correct and wrong-way directions and confirm the system is detecting WWD events and that regular traffic flow is not causing false alarms. Each time an alarm is raised the Status LED will flash red for 2-5 seconds.

## 4 SUPPORT, MAINTENANCE AND CALIBRATION

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### 4.1 MAINTENANCE PROCEDURES

Periodic maintenance of the TrafficCam units is required to ensure that the front glass is kept free of debris. For other maintenance steps please refer to the Viion TrafficCam and MSSedco Intersector manuals referred to in Section 2.4

The WWD580 is designed to operate maintenance free. However, it is recommended regular cabinet inspections are made to ensure all connections, cables, and securing devices are in good condition, and also to ensure adequate ventilation is maintained.

### 4.2 CALIBRATION

Calibrating and aiming devices connected to the WWD580 is critical for correct system operation. Please refer to the respective product manuals:

**Intersector:** <http://mssedco.com/wp-content/uploads/2015/11/TC-CK1-SBE-1.9U-IM-092717.pdf>

**TrafficCam:** TC400GC TrafficCam Installation and Operation Manual (DM-TC400GC)

### 4.3 OVER-THE-AIR (OTA) FIRMWARE UPDATING

From time to time Viion may need to update the module firmware to add new features or to correct for bugs. This can be done automatically over Internet provided the device has a connection as indicated by a flashing green Status light (see Section 1.4.4). Viion may contact users to schedule updates or the user may contact Viion to arrange/ confirm if updates are available for their products and to arrange for an Internet connection if not already provided.

## 5 SPECIFICATIONS AND COMPLIANCE

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### 5.1 PRODUCT SPECIFICATIONS

Item	Value / Description
Power Supply	9-14 VDC
Typical Power Consumption	5W
Weight	1.5 kg (3.3 lbs)
Length	45 cm (17.7 in)
Width	22.5 cm (8.8 in)
Height	13.5 cm (5.3 in)
Processor	Quad-Core ARM
Operating System	Linux 3.14
Ethernet	4 Ports, 1000 baseT
POE ports	2 X 802.3af , 1 X 24 V (non-standard)
Built-in-System Test (BIST)	2 buttons (beacon and alarm tests)
Configuration interface	Web (http)
Operating temperature	-40° to +60° C (-40° to +140° F)
Storage temperature	-45° to +85° C (49° to +185° F)
Mounting	Caltrans 334 19 inch cabinet

### 5.2 REGULATORY COMPLIANCE INFORMATION

All components are ROHS compliant.



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## 8 APPENDIX A – TROUBLESHOOTING

The following list provides steps to resolve frequently occurring issues during installation and use of the WWD580 wrong way driver system:

Symptom	Corrective Action
Front indicator lights are not illuminated	Validate power supply voltage level on the rear terminal strip.
Pressing “Beacon Test” button does not activate the Beacon.	When the button is pressed, ensure that the Status light turns flashing red and you hear a relay click. If this is the case, then the issue will be with the connection between the beacon and the WWD580 unit, and you should validate operation of the beacon unit on its own.
Status light remains flashing red	This could indicate that one of the test buttons is stuck in a pressed position. Validate that this is not the case.
Pressing the “Violation Test” button does not generate any violation records on the server	Connect a laptop to the network and validate that you can “ping” the server. If the server is visible, double check the uploadURL value (see 3.3.2) for both TrafficCam units.
messageCounter values for TrafficCams are not changing	Validate the correct IP address is being used. Attempt to ping this address from a laptop. Check for a flashing green or blue light at the front of each camera unit. Absence of a flashing light could indicate a loss of power to that unit.
messageCounter values for Intersector are not changing	Validate the correct IP address is being used. Attempt to ping this address from a laptop. If the units is not detected, it may be necessary to power-cycle the Intersector which may be done by un-plugging, then re-plugging the top RJ45 connector.

In cases where the above actions do not correct the issue, you may also try power-cycling the unit by briefly interrupting the 24 VDC power supply. If power cycling along with any of the above actions does not correct the problem, you should contact Viion’s local integrator or representative.

## 9 APPENDIX B – WWD SYSTEM DIAGRAM

