# Instruction Manual for Operating the Sensys System for Temporary Traffic Counts

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#### **Abbreviations:**

**AP: Access Point** 

FTP: File Transfer Protocol

RF: Radio Frequency

#### **Notations:**

Hyperlinks, or selectable buttons and tabs will be in bold italics (e.g. *Hyperlink*).

Labels on web pages or in software will be in italics (e.g. Labels).

Data to be entered into a field on a web page or in software will be in Lucida Console font (e.g. 192. 168. 2. 99).

## 1. Introduction

This Instruction Manual provides information and the procedures for using the Sensys System, which was initially designed to operate in a server controlled network, for temporary traffic counts.

The instructions will allow the user to fully understand the Sensys Networks Vehicle Detection System, properly configure the Sensys access point (AP) for the traffic count site, and retrieve the traffic count data from the access point.

The instructions provided here are to accomplish the following tasks:

- 1. System Components and Requirements
- 2. Configuration of Field Laptop Computer
- 3. Configuration of the Sensors
- 4. Initial set up of Access Point
- 5. Backup and Restore of Access Point for multiple site application
- 6. Downloading Statistical Data & Exiting TrafficDOT Application

#### Notes:

- Some of the contents have been summarized from the Sensys Online Reference Manual. If more clarification will be needed, view the Sensys Online Reference Manual at <u>www.sensysnetworks.com</u> in the Dealer Login section or the Sensys Reference Guide in the Technical Docs section..
- 2. These instructions are applicable to the Windows XP operating system.

## 2. System Components and Requirements

The implementation of the Sensys system for temporary traffic counts requires the following components for its basic operation:

Sensys Wireless Sensors

These are pavement mounted magnetometers equipped with wireless radio transmitters to detect the presence and movement of vehicles.

Sensys Access Point

This is an intelligent device that establishes overall time synchronization of the system, transmits configuration commands and message acknowledgements and receives and processes data from the sensors. For the statistics –processing purpose of this project, the version of access point to be used should be AP240 including the upgraded S version such as the AP240US or AP240ES. Any other S-version could be used as well.

TrafficDOT Software

This is monitoring application software from Sensys network that provides graphical user interface (GUI) to the components of Sensys Traffic count system. (Installation will be explained in Section 2).

Laptop Computer with an Ethernet port.

The instructions on this manual are based on Windows XP Operating System. The Mac, Unix, Linux or other Windows can also be used based on a different instruction set. Minimum requirements are: 40GB HDD, 1.8GHz CPU, 1024MB Memory, and the Mozilla Firefox web browser.

Ethernet Cable

Use a Cat 5 or a better Ethernet cable that is at least 1.5m long terminated with male RJ 45 connectors on both ends.

# 3. Configuration of the Field Laptop Computer

The laptop computer used to communicate with the Sensys access point must meet the following requirements:

- 1. Laptop must be configured to a fixed IP address.
- 2. Laptop must have TrafficDOT application software installed

#### 3.1 Configuring the Laptop to a Fixed IP Address

The IP Address is found under Network Connections.

➤ On the laptop computer click on *Start* menu→ *My Network Places* and then click on the link *View Network Connections* which is on the left side of *My Network Places* window.

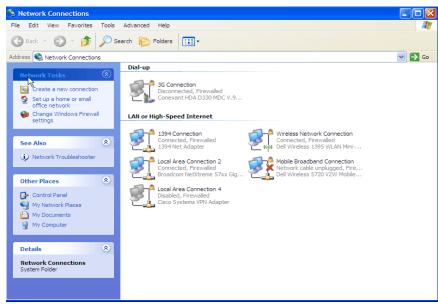


Figure 3.1: Network Connection Window

> Right click on the desired Local Area Connection (LAN) and select *Properties* (see Figure 3.1).

🕂 Local Area Connection 2 Properties 🛛 ? 🗙
General Advanced
Connect using:
Broadcom NetXtreme 57xx Gigabit C Configure
This connection uses the following items:
B Deterministic Network Enhancer     B File and Printer Sharing for Microsoft Networks     G S Packet Scheduler
Internet Protocol (TCP/IP)
Install Uninstall Properties
Allows your computer to access resources on a Microsoft network.
Show icon in notification area when connected Notify me when this connection has limited or no connectivity
OK Cancel

Figure 3.2: Local Area Connection Properties Window

> Double Click on *Internet Protocol (TCP/IP)* (see Figure 3.2).

Internet Protocol (TCP/IP) Proper	rties ?	×
General Alternate Configuration		
If this computer is used on more than on settings below.	ne network, enter the alternate IP	
O Automatic private IP address		
User configured		
IP address:	192.168.2.99	
Subnet mask:	255 . 255 . 255 . 0	
Default gateway:		
Preferred DNS server:		
Alternate DNS server:		
Preferred WINS server:		
Alternate WINS server:		
	OK Cancel	

Figure 3.3: Internet Protocol Properties Window

If the Alternate Configuration (see Figure 3.3) tab is available, select User Configured, and fill out the IP Address and the Subnet mask as shown. Click Ok.

This will enable you to connect up at any time without needing to reconfigure the IP port in the future.

If the Alternate Configuration is not available, then you will need to change the *IP address* as shown Figure 3.4. Note the original settings prior to making any changes.

	tomatically if your network supports to ask your network administrator for
◯ Obtain an IP address automati	cally
• Use the following IP address:	
IP address:	192 . 168 . 2 . 99
Subnet mask:	255 . 255 . 255 . 0
Default gateway:	
Obtain DNS server address au	tomatically
<ul> <li>Use the following DNS server</li> </ul>	addresses:
Preferred DNS server:	
Alternate DNS server:	
	Advanced

Figure 3.4: Internet Protocol Properties/General Window

You will need to perform this step (and reverse it back after completing use of TrafficDOT) every time you use the laptop with the system.

#### **3.2 Installation Procedure for TrafficDOT Application Software**

> Put the TrafficDOT software media (CD) for windows version in the CD drive of the laptop.

Note: The Software can also be downloaded from the Dealer's page on Sensys website.

() TrafficDOT-1.8.4-7 : 06/30/09	
<b>License Agreement</b> Please review the license terms before installing TrafficDOT-1.8.4-7.	
Press Page Down to see the rest of the agreement.	
COPYRIGHT (C) 2006, 2007, SENSYS NETWORKS, INC. ALL RIGHTS RESERVED	^
CAREFULLY READ THE FOLLOWING TERMS AND CONDITIONS BEFORE USING THE PROGRAMS. USE OF THE PROGRAMS INDICATES YOUR ACKNOWLEDGEMENT THAT YOU HAVE READ THIS LICENSE, UNDERSTAND IT, AND AGREE TO BE BOUND BY ITS TERMS AND CONDITIONS. IF YOU DO NOT AGREE TO THESE TERMS AND CONDITIONS, PROMPTLY RETURN THE PROGRAMS AND USER MANUALS TO THE PLACE OF PURCHASE AND YOUR PURCHASE PRICE WILL BE REFUNDED. YOU AGREE THAT YOUR USE OF THE PROGRAM ACKNOWLEDGES THAT YOU HAVE READ THIS LICENSE,	
If you accept the terms of the agreement, click I Agree to continue. You must acce agreement to install TrafficDOT-1.8.4-7.	ept the
Sensys Networks, Inc. —	Cancel

Figure 3.5: Installation License Agreement

- Continue by clicking on the *I Agree* button (see Figure 3.5).
- Install all components of TrafficDOT by checking all the boxes in the *Choose Components* screen (see Figure 3.6).

TrafficDOT-1.8.4-7 : 06	/30/09	
	noose Components hoose which features of TrafficDC	)T-1.8.4-7 you want to install.
Check the components you war install, Click Next to continue,	nt to install and uncheck the comp	onents you don't want to
Select components to install:	<ul> <li>TrafficDOT 1.8.4-7 Progr</li> <li>Start Menu Shortcuts</li> <li>Desktop Menu Shortcuts</li> <li>Install Java Runtime 1.6</li> </ul>	Description Position your mouse over a component to see its description.
Space required: 22,3MB		
Sensys Networks, Inc. ————	< <u>B</u> ack	Next > Cancel

Figure 3.6: Choose Installable Components Windows

- ➢ Click the *Next* button.
- If desired, change the *Destination Folder* for the software on the *Choose Install Location* window (see Figure 3.7).

🕲 TrafficDOT-1.8.4-7 : 06/30/09
<b>Choose Install Location</b> Choose the folder in which to install TrafficDOT-1.8.4-7.
Setup will install TrafficDOT-1.8.4-7 in the following folder. To install in a different folder, click Browse and select another folder. Click Install to start the installation.
Destination Folder           C:\Program Files\Sensys Networks\TrafficDOT-1.8.4-7         Browse
Space required: 22.3MB Space available: 201.5GB Sensys Networks, Inc

Figure 3.7: Choose Install Location Window

- > Click the *Install* button to begin the installation.
- > The progress of the installation will be reported on the *Installing* window (see Figure 3.8).

🕲 TrafficDOT-1.8.4-7 : 06/30/09
<b>Installing</b> Please wait while TrafficDOT-1.8.4-7 is being installed.
Execute: "C:\Program Files\Sensys Networks\TrafficDOT-1.8.4-7\jre-6u6-windows-i586-p.exe
Extract: mail.jar 100% Extract: spring.jar 100% Output folder: C:\Program Files\Sensys Networks\TrafficDOT-1.8.4-7\libexec Output folder: C:\Program Files\Sensys Networks\TrafficDOT-1.8.4-7 Extract: icon.ico 100%
Created uninstaller: C:\Program Files\Sensys Networks\TrafficDOT-1.8.4-7\uninstall Create folder: C:\Documents and Settings\jlesika\Start Menu\Programs\Sensys Netw Create shortcut: C:\Documents and Settings\jlesika\Start Menu\Programs\Sensys Net Create shortcut: C:\Documents and Settings\jlesika\Desktop\TrafficDOT-1.8.4-7.lnk Execute: "C:\Program Files\Sensys Networks\TrafficDOT-1.8.4-7\jre-6u6-windows-i5
Sensys Networks, Inc

Figure 3.8: Installation Status Window

Note: If the Java Runtime Environment is required, a separate installation process occurs. Accept the Terms and Conditions to continue. Wait for the installation to complete. Click on the *Finish* button.

> The results of the installation will appear on the installation window (see Figure 3.9).

0	TrafficDOT-1.8.4-7 : 06/30/09
	Installation Complete Setup was completed successfully.
(	Completed
	Extract: spring.jar 100% Output folder: C:\Program Files\Sensys Networks\TrafficDOT-1.8.4-7\libexec Output folder: C:\Program Files\Sensys Networks\TrafficDOT-1.8.4-7 Extract: icon.ico 100% Created uninstaller: C:\Program Files\Sensys Networks\TrafficDOT-1.8.4-7\uninstall
	Create folder: C:\Documents and Settings\jlesika\Start Menu\Programs\Sensys Networks\TrafficD Create shortcut: C:\Documents and Settings\jlesika\Start Menu\Programs\Sensys Ne Create shortcut: C:\Documents and Settings\jlesika\Desktop\TrafficDOT-1.8.4-7.lnk Execute: "C:\Program Files\Sensys Networks\TrafficDOT-1.8.4-7\jre-6u6-windows-i5 Completed
Sen	sys Networks, Inc

Figure 3.9: Installation Completion Window

> Complete the TrafficDOT software setup wizard by clicking on the *Close* button.

## 4. Configuring the Sensors Using the TrafficDOT Application Software

Sensors ship with a factory default configuration for count applications. In most cases, the configuration is modified to fit the specific needs of an installation. However, once set, a sensor's configuration typically requires no further changes.

Sensor configuration involves selecting values for the following parameters:

- Operating mode
- Radio Frequency Channel

From the main TrafficDOT window, select the *Configure* menu and click *Sensors* (see Figure 4.1).

<b>Connect</b>	Configure	Control	Tools
Sensor	Access P	oint	F
021E	Sensors		)-62(
0C50	Repeat Co	ofici re Sc	ansore
09DF			p-70
012A	Controll <u>e</u> r	Cards	3-81 (

Figure 4.1: Configure Sensors Window

The Sensor Configuration window appears (see Figure 4.2).

Sensor Configuration
Configure Sensor
Refresh Available List
Available Selected OB 13 OB 15 OB 5F OB 79 OB 9F OB DA V
Sensor ID: Add New
Mode: B (Count)
Time Slot: 6 V P
RF Channel: 1
Recalibration: 1
Apply all checked parameters
Blink LED Reset (Kcep RF) Hard Reset
Download Firmware

Figure 4.2: Sensor Configuration Window

Click *Refresh Available List* button and all the available sensors will be displayed.

#### 4.1 Selecting Sensors to Configure

Sensors are selected by moving their IDs from the Available list to the Selected list as follows:

From the *Available* list, click one or more sensor IDs. (Note: On Windows platforms hold down the SHIFT key while clicking to select multiple entries in series.)

 $\triangleright$  Click the button labeled *Add* >>. The sensor ID(s) appear in the *Selected* list.

To remove IDs from the *Selected* list, do the following:

- From the *Selected* list, click one or more sensor IDs.
- Click << *Remove*. The sensor IDs are removed from the *Selected* list and appear in the *Available list*.

#### 4.2 Setting a Sensor's Operating Mode

The sensor's operating mode defines the type of detection data it transmits. To set the operating mode, do the following after selecting the sensors to be configured:

- Fill the check box to the left of the label *Mode* by clicking it.
   (The entries on the *Mode* drop-down list are the operating modes available for sensors.)
- Select an entry from the list by clicking it.
   (Select *Count* (B), for the statistical count application).

#### 4.3 Setting a Sensor's RF Channel

All sensors associated with an Access Point must use the same frequency as the Access Point. To set the RF channel, do the following:

- Fill the check-box to the left of the label *RF Channel* by clicking it.
- The entries in the *RF Channel* drop-down list correspond to the 16 frequencies available for use. Select an entry from the list by clicking it. Note: The factory default channel is zero.
- Click Apply all checked parameters.

#### 4.4 Managing Sensor Tables and Lane Names

Access Points store information describing sensor locations and relative positions in two databases. The databases are:

- Sensor Table also referred to as the "dots" configuration table. This database stores an entry for each sensor in the network including its lane position.
- Sensor-Pair Table also referred to as the "dot pairs" configuration table. This database includes one entry for each sensor-to-sensor relationship forming a speed pair (pair of sensors used to measure vehicle speed).

#### 4.4.1 Adding a Dot (Sensor Table) Configuration Entry

To add a new entry, do the following:

From the *Configure* menu, navigate to *Sensors* and then click on the *Dot Table* in order to display the table (see Figure 4.3).

- Position the cursor in the *DotId16* column on a blank row. Type the 4-character HEX Id (hexadecimal identification number) of the sensor.
- If the sensor is used with a traffic controller, supply the card address in the column Address 170. If the sensor is not used with a signal controller, type a zero into the field.
- > Type into the *Lane* field a short text description of the lane in which the sensor resides.
- Type into the *Position* field an integer between 0 and 2 that indicates the sensor's relative position in the lane.

Note: Positions are determined by counting up from zero in the direction of the traffic's travel. That is, a vehicle will first drive over sensor zero, then sensor one and then sensor two. There is a maximum of three sensors per lane. The sensor in position zero must be defined before the sensor in position one, and position one must be defined before position two.

- The check box at the left edge of the row designates the sensor as being included (or ignored) by statistical or other applications. The check box is filled by default which indicates the sensor will be included hence do not uncheck.)
- Click *Apply* from the *Operations* menu to add the entry.

pera	tions						
2	Dot ld 16	Address 170	Lane	Position	CC Extension	Description	
	009D		lane1	0		Lane 1 Leading	
	1515		lane1	1		Lane 1 Trailing	
2	14BB		lane2	0		Lane 2 Leading	- 1
	14DD		lane2	1		Lane 2 Trailing	
			2021000			Care contraining to	
1							
51							
-11							-
-							-1
4-							-
-							-
							-
4.							-
							_
		1					
31				1			
11							
-							
-16							

Figure 4.3: Sensor Table (Dots Configuration table)

#### 4.4.2 Adding a DotPairs (Sensor-Pair Table) Configuration Entry

The data contained in this table gives value added information from the detection events. For instance, speed, length gap and other values can be derived only by knowing the relative position and distance between two sensors. To add a new entry, do the following:

- From the *Configure* menu, navigate to *Sensors* and then *Dot Pair Table* (see Figure 4.4).
- Fill the check-box to the left of the *DotPairs Configuration* table.
- Position the cursor in the Leading Dot Id column on a blank row. Type the 4-character HEX Id of a sensor.

Note: A leading sensor is the sensor that a vehicle first passes over when traveling in the direction of normal traffic flow.

> Type into the *Trailing Dot Id* field the 4-character HEX Id of a sensor.

Note: A trailing sensor is the sensor that a vehicle passes over second when traveling in the direction of normal traffic flow.

> Type into the *Separation* field a decimal value (in millimeters) specifying the physical distance between the leading and trailing sensors.

	DotPairs Config	guration						
perations								
2	Leading Dot Id	Trailing Dot Id	Separation					
<	06C2	06C3	6096 4					
	06C3	06C5	6096					
/	0656	067F	6096					
	067F	06C1	6096					
-	04A4	0497	6096					
	0497	0653	6096					
-	049A	04A0	6020					
	04A0	04A1	6045					
-	0452	045B	6045					
	045B	048A	6020					
-	0401	0404	5994					
	0404	0446	6020					
1	05D7	06C9	6096					
	06C9	06C8	6045					
~	0660	0650	6071					
	0650	0643	6071					
	0671	0670	6096					
	0670	066F	6096					
-	06B5	06AC	6096					
	06AC	0672	6096					
~	0756	0804	6071					

Successfully retrieved 28 rows from AP Figure 4.4 - DotPairs Configuration Window

> Click *Apply* from the *Operations* menu to add the entry.

## 5. Initial Set up of the Access Point

The Access Point has to be correctly configured so as to be able to perform the statistics count application.

#### 5.1. Connecting the Laptop to the Access Box

Before you can set up/configure an Access Point, a connection between the laptop computer and the access point (AP) must be established.

- $\succ$  Turn on the laptop.
- Plug one end of the Ethernet cable to the Ethernet -port of the laptop and the other end to the Ethernet port of Access Box (See Figure 5.1).

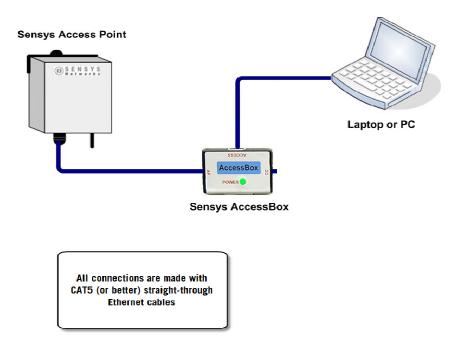


Figure 5.1: Connecting an IP Device (Laptop) to a Sensys Access Box

#### 5.2. Connecting to the Access Point via TrafficDOT Appucation

- > Double-click on the TrafficDOT icon on the desktop (shortcut).
- Type the access point's *IP Address* and *TCP Port* (See Figure 5.2). Default IP address: 192. 168. 2. 100 Default TCP port: 10000

Note: It is recommended to use the default IP address and port number.

@ Connect		
ТСРЛР		
IP Address	192.168.2.100	
TCP Port	10000	
Col	nnect Discover	
1		

Figure 5.2: TrafficDOT Application Connection Window

Click the *Connect* button.

Note: If the IP address of the access point is not known, click on *Discover* button. The *Discover* button queries the local network and opens a window that lists All the Access points on the network. Make a note of the IP address of the access point you wish to connect to. Click on *Dismiss* button to close the window and return to connect window.

#### 5.3 Configuring the Access Point

To configure an Access Point, access the *Configure* menu and click *Access Point* (See Figure 5.3).

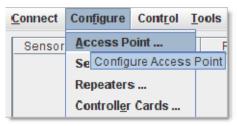


Figure 5.3: Configure Access Point Menu

The Access Point Configuration window appears with the current configuration data loaded into its tabular display (See Figure 5.4).

Radio Event	Detection Information				
RF Channel	6	•			
Radio Id	unknown				
L <mark>NA Ga</mark> in	0 dB				
PA Max. Power	0 dBm				
PA Attenuation	0 dB	-			

Figure 5.4: Access Point Configuration Window

## 5.3.1 Setting the RF Channel

To set the RF channel, do the following:

- The entries in the *RF Channel* drop-down list correspond to the 16 frequencies available for use. Select an entry from the list by clicking it. Note that the factory default channel is zero. The value set on this section should correspond to the value set on the sensors' configuration in Section 3.
- Click Apply from the Operations menu to apply the change or continue configuring the Access Point.

## 5.3.2 Setting User ID and Password for FTP Services Hosted by the Access Point

Access points contain a local ftp server to provide a means of file transfer and disk access to authorized users. The *Access Point* tab collects the user identifier and password string for the ftp user.

> From the *Configure* menu, click *Preference* (See Figure 5.5).

Configure	Control I				
Access Point					
Sensors .	.				
Repeaters	š				
Controll <u>e</u> r	Cards				
Dot Table					
Dot <u>P</u> air T	able				
<u>P</u> reference	:e				
\$340	7				

Figure 5.5: TrafficDOT Configure / Preference Menu

Click on the *Access Point* tab (See Figure 5.6).

Preference Access Point Ftp User Id root Ftp User Password ••••	) Preference		
Ftp User Id root	perations		
	Preference Acces	s Point	
Ftp User Password	Ftp User Id	root	
	Ftp User Password	••••	

Figure 5.6: User ID and Password

- Set the desired *User ID* and *Password*.
- Go to *Operations* then click *Save*.

#### 5.3.3 Setting Up the Configuration for Bin Data Collection

After all the connections and set ups for the sensors have been completed, the configurations for bin data collection can then be performed. From the main window of TrafficDOT go to the *System -> Configuration* menu and perform the following:

- Go to the *Push* tab (see Figure 5.7).
   Push refers to movement of processed sensor statistical data from one host to another initiated by an access point.
- Enter the *1st Destination IP*. Enter the fixed IP address of the laptop as configured in Section 3 "Configuration of the Field Laptop Computer." The IP address used was 192. 168. 2. 99.
- Specify the Destination Port (required) (typically 10250 however any other port above 10000 can be used).

Ø System Configura	System Configuration								
Operations									
Colleges DA Dall			and Other						
Caltrans D4 Poll Network	Marksman I VPN	Poli Adv Push	anced Othe	rs Caltrans D3 Po					
1st Destination Ser	ver (required)		192.168.2.99						
Destination Port (re			10250						
Buffer Reports			<b>V</b>						
Stay Connected			<b>*</b>						
Use Acknowledged	Message Pa	ssing	<b>V</b>						
1st Acknowledgem	ent Timeout (	s)							
2nd Destination Ser	rver								
Destination Port									
Buffer Reports			<b>V</b>						
Stay Connected			×						
Use Acknowledged	Message Pa	ssing							
2nd Acknowledgen	nent Timeout (	(s)							
Units			Imperial		-				
Individual Car Repo	rts		Disabled		-				
Report Interval			15 minutes		-				
Maximum File Size			100000						
Average Speed					-				

Figure 5.7: System Configuration Window

- > Verify that the following options are checked:
  - Buffer Reports
  - Stay Connected
  - Use Acknowledged Message Passing
- > The following entries should be left blank:
  - 1<sup>st</sup> Acknowledgement Timeout (s)
  - 2<sup>nd</sup> Destination Server
  - Destination Port
  - 2<sup>nd</sup> Acknowledgement Timeout (s)
- Uncheck Average Speed.
- Set the *Units* to *Imperial*.
- > Verify that the *Individual Car Reports* entry is set to *Disabled*.
- Set the *Report Interval* for bin collection to 15 minutes.
- Set the *Maximum file size* to 300kB by entering 300000. Note: Maximum file can be set up to 500kB. File size is determined by the number of lanes and the length of time to be recorded.
- > While still on the *System Configuration* window, click on the *Poll* Tab (see Figure 5.8).
- Set the *TCP Port (required)* to 1050.
- Set the *Operating Mode* as *Connection-based Polls* using the dropdown menu.
- Set the *Units* to *Imperial*
- Set the *Report Interval* to 15 minutes.
- Set the *Individual Car Reports*, the *Speed Histogram*, and the *Length Histogram* to Disable.
- Set the *Timestamp Option* to *End of Interval*.
- Set the *Maximum file size* to 300kB by entering 300000.
   Note: Maximum file can be set up to 500kB. File size is determined by the number of lanes and the length of time to be recorded.
- > Verify that the following are unchecked:
  - Average Speed
  - Use Diagnostic to correct Averages
  - Display Diagnostics

# O System Configuratio

O System	Configura	tion								
Operations										
		v								
	s D4 Poll	Marksman	2		iers					
Net	work	VPN	Push	Poll		Caltrans D3 Poll				
Note: Va	Note: Valid AP-E License required									
Sensys F	oll Server	:								
TCP Port	(required)			10250						
Operatin	g Mode			Connection-ba	ased Poll	s	-			
Units				Imperial			<b>_</b>			
Onica				Imperial						
Individua	l Car Repo	rts		Disabled			-			
Report In	terval			15 minutes						
Maximur	n File Size			100000						
Average	Speed									
Speed H	stogram			Disable			-			
Length H	istogram			Disable 🗸						
Timesta	Timestamp Option				End of Interval					
Use Diag	nostic to C	Correct Avera	ges							
Display D	)iagnostics	5								

Figure 5.8: System Configuration Window

## 5.3.4 Setting the Date via TrafficDOT

Click on the *Others* tab (see Figure 5.9) and do the following:

- Specify *Free running* in the *Time Synchronization* drop down menu.
- Set the correct time zone.

#### Set *Serial Mode* to *RS485*.

Note: RS485 sets the port for communications with traffic signal control equipment via a contact closure card from Sensys Networks. This setting is mandatory for using the access point with signal controllers.

O System Configurat	ion				
Operations					
/					
Caltrans D4 Poll Network	Marksman VPN	Poll Advan Push	ced Others Poll	Caltrans D3 Poll	
Network	VPN	Pusii	Poli	Califians DJ Poli	
Master 170 Enable	~				
Master 170 Logging	Leve	el O			-
Note: Valid AP-E Lice Event Port (required)		d to run Event	Ргоху		
Adaptive Holdover	Off				-
Time Synchronizatio	n Free	Running			•
Time Zone (required	) EST	5EDT			-
		25			
Serial Mode	RS4	85			

Figure 5.9: System Configuration Window->Others

#### 5.3.5 Saving the Configurations

- Click on *Operations*.
- Click on *Save*.
- Click on *Dismiss* when finished saving (see Figure 5.10).



Figure 5.10: Successfully Saved Configuration Window

#### 5.3.6 Rebooting the Access Point.

After all the configurations have been made to the access point, it has to be rebooted so as the changes to take effect. This is very important and it is done via TrafficDOT's *Control* menu (see Figure 5.11).

Click on *Control* from main window and then select *Reboot*.

s	Sensor ID	Vers	Ru	n	v	Idle	#Detection	s R	RSSI	LQI	PER	Present	Mode	Slot#	Repeater	Channel	Adv Settings
	8EDD	53.3	De	heat	V	(			-66	95			В	18	Direct	10	Z&X
	8AB9	53.3	пе	noor	1	1	2	8 -	-82	94		<b>A</b>	В	42	Direct	10	Z&X
	8E25	53.3	.3	3.63	V		2 2	- 9	-76	95		1	В	9	Direct	10	Z&X
	8C4F	53.3	.3	3.63	V		7 3	1 -	-66	95			В	38	Direct	10	Z&X
											1	<u>1.</u> L.					

Figure 5.11: System Control Window

#### 5.3.7 Setting Date and Time via Telnet

- Reconnect the access point via TrafficDOT Application.
- Click on windows *Start* button and then click *Run*.
- Type tel net 192. 168. 2. 100 into the *Open* dialog box (see Figure 5.12) and then click *OK*. This should open a new DOS window with prompt to log in (see Figure 5.13).

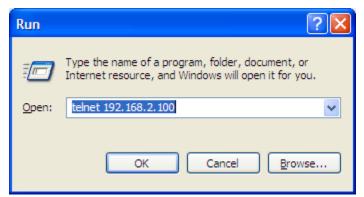


Figure 5.12: Performing a Telnet Connection in the Run Window

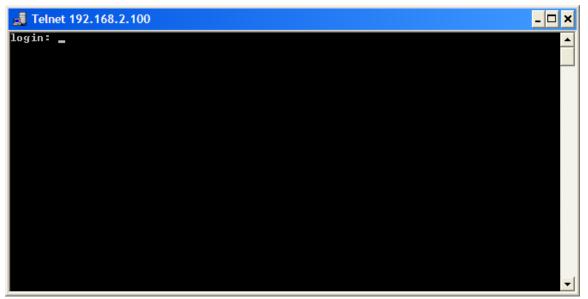


Figure 5.13: Telnet Login Window 1

- > Type the username (default login username is root) and then press ENTER on the keyboard.
- > Type the correct password (see Figure 5.14).

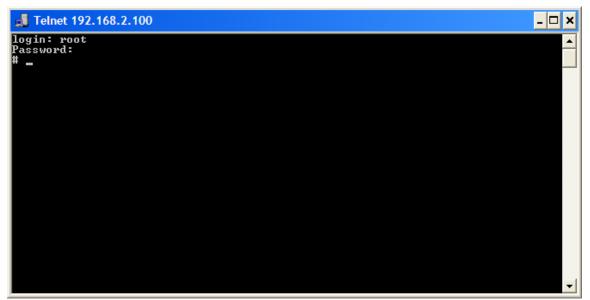


Figure 5.14: Telnet Login Window 2

To set the date and time type "date-s YYYY.MM.DD-HH.MM" substituting YYYY, MM, DD, HH and MM with the correct year, month, day, hour (24 hour clock) and minute, respectively. The time entered should be in Greenwich Mean Time (GMT). For example, to set the date and time to October 13, 2009 at 3:15PM EDT (Eastern Daylight Savings Time), type date-s 2009. 10. 13-19: 15 at the prompt (see Figure 5.15).

To adjust eastern time zone to GMT use the following:

- 1. For EST, add 5 hours (1 PM EST is 18:00)
- 2. For EDT, add 4 hours (1 PM EDT is 17:00)

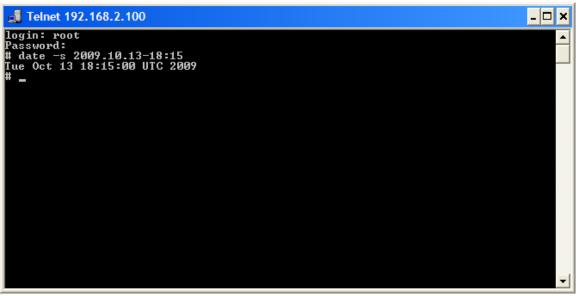


Figure 5.15: Telnet Window for Date and Time Set Up

# 6. Backing Up and Restoring the Access Point for Multiple Sites

This section is very important as it will enable the user to be able to store (back-up) a site configuration to use the access point at another site. When returning to the original site, the user can restore the configuration of the original site without having to repeat the lengthy setup. This can be extended to storing the configurations for multiple temporary traffic count sites by using a naming convention that allows the user to identify the back-up files from each traffic count site.

#### 6.1 Backup of the Access Point Configuration

Backup activities are initiated from the *System* menu. Once the settings for a certain location have been backed up, they can be retrieved next time when collecting data from that particular backed up site. *Note:* Always perform back up for every first time site visit. To backup the current access point configuration, do the following:

<b>@</b> 1	92.168.2.	100:1000	00								
Con	nect Con <u>f</u>	gure Con	nt <u>r</u> ol <u>T</u> ools	System Log Help							
	Sensor ID	Version	Battery	Configuration	PER	Present	Mode	Slot#	Repeater	Channel	Adv Settings
0	8E25	53.3.3	3.63V	Backup			В	9	Direct	10	Z&X
9	8C4F	53.3.3	3.59V			1	В	38	Direct	10	Z&X
9	8EDD	53.3.3	3.67V	<u>R</u> estore		1	В	18	Direct	10	Z&X
9	8AB9	53.3.3	3.67V	Save <u>D</u> iagnostic			В	42	Direct	10	Z&X
				Update <u>F</u> irmware							
				License							
				List processes running on AP AP command line interface							
								Discover: On	Chann	el: 10 Device	es: 4 01:57:35

➢ Go to the TrafficDOT main window and select System -> Backup (see Figure 6.1).

Figure 6.1: TrafficDOT's System Menu

The *Backup VDS240* window will appear (see Figure 6.2).

- Name the file by typing the site name on the *File Name* text box. A good choice of file name should identify the data collection site such as AP\_site\_3041. Optionally, store the file to a different folder than the default.
- > Click *Save* to backup the access point configuration to the file.

Backup VDS2	240
Select a l	local tar file to save the current Access Point Configuration.
Save in:	192.168.2.100.10000 <b>•</b> 🗟 🖨 🖻 🗄
appalache	e_site.tar
test.tar	
File <u>N</u> ame:	site_3041
Files of <u>Type</u> :	tar files 💌
	Save Cancel

Figure 6.2: Back-up VDS window

Wait for back up to complete and click Dismiss (see Figure 6.3).

Ø		
	Backup Completed.	
	Dismiss	

Figure 6.3: Back-up Completion Window

Note: The same procedure will be followed when backing up the configurations for all other temporary traffic count sites. Using unique filenames including the site number will simplify identifying the correct file to restore when the access point is again used at each site.

#### **6.2 Restoring the Configurations**

The restore function in TrafficDOT can be used to quickly restore an access point to a site configuration that has been saved using the backup function. To restore a previously saved site configuration, connect to the access point using TrafficDOT and perform the following steps:

Click *Restore* from the *System* menu. The *Restore VDS240* window appears (see Figure 6.4).

1232213.1	/D5240	<b>&gt;</b>
Select a tar t	file to restore the Access Point con after the Restore oper	
Look in:	192.168.2.92.10000	▼ <b>6</b> C 885
File <u>N</u> ame:		

Figure 6.4: Restore VDS240 Window

- Select the file that contains the backup that will serve as the source for the restore. Optionally, navigate to a different folder than the default.
- Click *Open* to restore the Access Point from the file.
- > Reboot the access point by clicking on *Control* from main window and then selecting *Reboot*.

# 7. Downloading Statistical Data and Exiting TrafficDOT

The Statistical data collected by the access point can be downloaded for the analysis via the web browser using ftp connection between the laptop computer and the Access point.

#### 7.1 Downloading Data

➢ Go to your Web browser (Recommended: Mozilla Firefox web browser).

*Note*: Microsoft Internet explorer could also be used. Prior to using the Microsoft Internet Explorer for downloading the data, perform the following:

• Open Internet Explorer. Select *Tools* > *Internet Options* from the menu bar (see Figure 7.1).



Figure 7.1: Internet Options

- Click on the *Advanced* tab. Uncheck the *Enable folder view for FTP sites* option. Click the *OK* button (see Figure 7.2).
- Close Internet Explorer.
- Re-open Internet Explorer to apply the changes.

Internet Options ? 🗙
General Security Privacy Content Connections Programs Advanced
<u>S</u> ettings:
<ul> <li>Browsing</li> <li>Always send URLs as UTF-8 (requires restart)</li> <li>Automatically check for Internet Explorer updates</li> <li>Close unused folders in History and Favorites (requires restart)</li> <li>Disable script debugging</li> <li>Display a notification about every script error</li> <li>Enable folder view for FTP sites</li> <li>Enable Install On Demand (Internet Explorer)</li> <li>Enable Install On Demand (Other)</li> <li>Enable offline items to be synchronized on a schedule</li> <li>Enable page transitions</li> <li>Enable Personalized Favorites Menu</li> <li>Enable third-party browser extensions (requires restart)</li> <li>Force offscreen compositing even under Terminal Server (required items for launching shortcuts</li> </ul>
<u>R</u> estore Defaults
OK Cancel Apply

Figure 7.2: *Enable folder view for FTP Sites* option.

- On the web browser address bar, type "ftp://<username>@<ip address>" substituting <username> with the username configured for the access point and <ip address> with the configured IP address of the access point. For example, if the default IP address and username were configured in the access point then type "ftp://root@192.168.2.100" into the address bar.
- A pop up window asking for password should appear (see Figure 7.3).

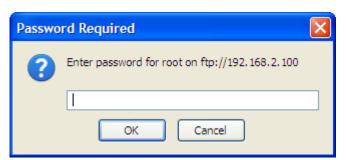


Figure 7.3: Password Request Pop up Window

- > Type the correct password and click **OK**. A list of folders will be displayed (see Figure 7.4).
- Navigate to *var/apstat\_poll\_tcp*. A list of files will be available labeled using date format, double click a file to open.
- Select all the text in the file by pressing Ctrl+A on the keyboard, and then copy the text by pressing Ctrl+C on the keyboard.

Index of ftp://root@192.168.2.100/ - Mozilla Firefox		đ
<u>E</u> ile <u>E</u> dit <u>V</u> iew Hi <u>s</u> tory <u>B</u> ookmarks <u>T</u> ools <u>H</u> elp		
C X 🟠 📜 ftp://192.168.2.100/	☆ • Google	Ļ
🙍 Most Visited 💷 Blackboard 🗋 Customize Links 🌀 ECE Overrides 📋 FSU eSUSSAI 🗋 FSU fyi	] FSU IEP Assessment 🚞 News 📔 OMNI 📋 OurFAMU 🚞 Radio Links 🚞 Weather	
Index of ftp://root@192.168.2.100/		
Up to higher level directory		
Name	Size Last Modified	
	12/13/2008 12:00:00 AM	
boot	12/13/2008 12:00:00 AM	
dev	12/13/2008 12:00:00 AM	
etc 🔁	12/13/2008 12:00:00 AM	
and home	12/13/2008 12:00:00 AM	
📄 lib	12/13/2008 12:00:00 AM	
🧰 mnt	12/13/2008 12:00:00 AM	
proc	11/30/1999 12:00:00 AM	
sbin	12/13/2008 12:00:00 AM	
tmp	12/13/2008 12:00:00 AM 12/13/2008 12:00:00 AM	
var	11/30/1999 12:00:00 AM	
Done		
Done -		_

Figure 7.4: Available Folders List Window

- > Open a new file using notepad or Microsoft Word
- > Paste the text into the file by pressing Ctrl+V on the keyboard.
- Save the file and close it.

*Note*: The files should be saved one after the other according to the dates they were created.

## 7.2 Exiting TraffficDOT

To end TrafficDOT session, do the following:

- From the *Connect* menu on the TrafficDOT main window, click *Disconnect*.
- > Then click *Exit*.

Alternatively, you can close TrafficDOT by clicking the close window control in the upper right-hand corner of the *Access Point Control Center* window.