



TRAFx Vehicle Counter Instructions

(For Generation 2, 3 and 4)

Key Info

- Counts one or two lanes
- Advanced microelectronic design
- Self-contained design, no external wires or tubes
- Install at roadside, above or below ground
- Ideal for rural, rugged and remote roads
- Use as permanent or portable counter
- Very small and easy to hide — reduces vandalism risk
- Long battery life (G4: up to 1.2 years)
- Large storage capacity (millions of counts)
- Built for outside: -40C (-40F) to +55C (131F)
- Low operating costs (G4: ~\$3/year for batteries)
- Field-proven, Generation 4 design (>10 year history)
- Used worldwide, from Iceland to New Zealand



A OVERVIEW..... 2

B INSTALLATION OPTIONS AND MODES..... 3

C SETTINGS..... 4

D SET UP IN FIELD – STEPS..... 5

E CHECKLISTS..... 6

F LIGHTS, BATTERIES, NOTES..... 7

G TESTING..... 8

H TROUBLESHOOTING, MAINTENANCE AND SUPPORT..... 9

APPENDIX 1 – Burying the counter.....10

APPENDIX 2 – Boxes, enclosures, PVC posts, etc.....10

A OVERVIEW

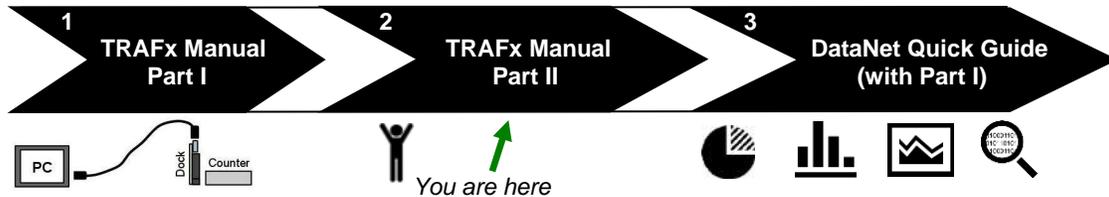
These instructions apply to Generation 2, 3 and 4 TRAFx Vehicle Counters (2005 – 2020+). CAREFULLY READ THESE INSTRUCTIONS BEFORE USING THE COUNTER.

 Featuring an aerospace-quality magnetometer, this counter detects moving objects that have ferrous metal content (e.g., vehicles). In essence, it's a sophisticated metal detector.



PREPARATION

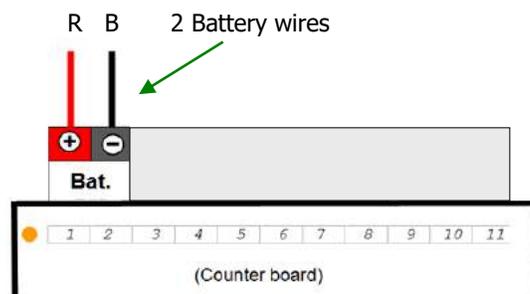
Finish TRAFx Manual – Part I first. Refer to its **Quick Guide** (p. 5) to understand the overall process. Download the latest version at trafx.net/support. Here is the sequence:



WIRE GUIDE

(Note: The counter ships assembled.)

Two battery wires connect to the counter's screw block, as shown below. Ensure wires are fully inserted and the screws are tight. Gently tug test each wire. Incorrectly connected wires could cause damage and void the warranty.



This counter can be converted to the TRAFx Infrared Trail Counter (counts people on trails) with an economical conversion kit. Learn more at trafx.net

STUDY DESIGN



Study design is beyond the scope of this document, but key questions include: Which roads? How many counters? How long? Is the sample size and study period sufficient statistically?



Turn your TRAFx Vehicle Counter into an OHV or mountain bike counter by changing the counter's mode (see p. 3). Download their instruction documents at trafx.net/support



OHV mode



Mountain Bike mode



B INSTALLATION OPTIONS AND MODES

Choose the installation option and corresponding mode below best suited to your application. Carefully note the specified distances and that the detection zone is spherical. The most popular mode is **VEH-4d** (new counters ship this way).

COUNTING A SINGLE LANE (only for roads <u>with</u> middle dividing line)		COUNTING TWO LANES (for roads with or without middle dividing line)	
INSTALLATION OPTIONS <p>3.0m (10ft.) to vehicle's near side</p>	MODES VEH-1s -only use if very wide, paved shoulder present (VEH-2s is more accurate) -install at 3m (10ft.) from the <u>near side</u> of passing vehicles -counts Lane 1	INSTALLATION OPTIONS <p>6m (20ft.)</p>	MODES VEH-4d -install <u>within 6m (20ft.)</u> of all passing vehicles (i.e., within 6m of <u>near side</u> of vehicles in Lane 2) -counts Lane 1 and Lane 2 together -best choice for gravel and other roads without a dividing line ★
<p>2.4m (8ft.) to vehicle's near side</p>	MODES VEH-2s -install at 2.4m (8ft.) from the <u>near side</u> of passing vehicles -counts Lane 1 -more accurate than VEH-1s	<p>(Note: Install counter as close to the road as possible for best results.)</p> <div style="border: 1px solid green; border-radius: 15px; padding: 5px;"> <p>G4 Counters only To detect vehicles up to 8m (26ft.) away use THRESHOLD 006 (see next page)</p> </div>	
<p>Key Vehicle Counter ■ Detection Zone ● (Not to scale)</p>			
<p>! If estimated <u>average</u> vehicle speed is above 50km/hr (30mph), use FAST (see next page).</p>			<div style="border: 1px solid black; border-radius: 50%; width: 40px; height: 40px; display: flex; align-items: center; justify-content: center; margin: 0 auto;">50</div> <p>30mph</p>

Change modes

Here are the main steps to change a counter's mode:

1. Confirm your dock is in **PC Mode**
2. Connect: PC---cable(s)---dock---counter
3. Open TRAFx Communicator and click GO!
4. Enter S to select mode.



See TRAFx Manual Part I, p. 9 for details. Download at trafx.net/support

i Because the detection zone is spherical, the counter can be installed under a bridge or cattleguard as long as the distances specified above are respected. Nearby stationary metal is normally fine.





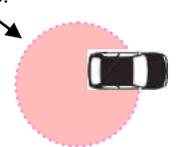
C SETTINGS



Each mode has default settings (see black area below). Normally, only change these if a star below applies to you.

Settings	Modes			Notes
	VEH-1s	VEH-2s	VEH-4d	
=TIME	--	--	--	=TIME - automatically set by a dock in Shuttle Mode.
=START	--	--	--	=START - automatically set by a dock in Shuttle Mode to:
PERIOD	001	001	001	<ul style="list-style-type: none"> top of the hour after Launch for hourly totals 5 minutes after Launch for timestamps
DELAY	008	008	008	
THRESHOLD	018	005	008	
RATE (FAST/SLOW)	S	S	S	

(The default settings are for G4 counters; however, they are also suitable for G2 and G3 counters.)

MODE SETTINGS																																					
PERIOD (1/24/0)	PERIOD refers to the data format: hourly totals, daily totals, or timestamps (all are records) <ul style="list-style-type: none"> 14 000 is the maximum number of records (lines of data) Totals are much more memory efficient and download much faster than timestamps 001 = Hourly totals (default; recommended); stores 19 months of data (448 million counts max.) 024 = Daily totals (rarely used); whole days only; counting starts and stops at mid-night 000 = Timestamps (seldom used); each event creates a timestamp (14 000 counts max.)																																				
	<table border="0"> <tr> <td>yy-mm-dd,hr:mm,total</td> <td>← Hourly totals (11 spans 11 to 12)</td> <td>yy-mm-dd,hr:mm:ss,diagnostic value</td> <td>← Timestamps</td> </tr> <tr> <td>21-05-28,10:00,00435</td> <td></td> <td>21-05-28,14:15:50,18</td> <td></td> </tr> <tr> <td>21-05-28,11:00,00473</td> <td></td> <td>21-05-28,14:15:56,42</td> <td></td> </tr> <tr> <td>21-05-28,12:00,00530</td> <td></td> <td>21-05-28,14:19:08,19</td> <td></td> </tr> <tr> <td>21-05-28,13:00,00481</td> <td></td> <td>21-05-28,14:19:22,31</td> <td></td> </tr> </table>	yy-mm-dd,hr:mm,total	← Hourly totals (11 spans 11 to 12)	yy-mm-dd,hr:mm:ss,diagnostic value	← Timestamps	21-05-28,10:00,00435		21-05-28,14:15:50,18		21-05-28,11:00,00473		21-05-28,14:15:56,42		21-05-28,12:00,00530		21-05-28,14:19:08,19		21-05-28,13:00,00481		21-05-28,14:19:22,31																	
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DELAY	DELAY refers to "delay after event" <ul style="list-style-type: none"> During DELAY, other events (triggers) are ignored DELAY values differ for SLOW and FAST rate <table border="1"> <thead> <tr> <th colspan="2">RATE - SLOW</th> <th colspan="2">RATE - FAST</th> </tr> <tr> <th>DELAY</th> <th>Seconds</th> <th>DELAY</th> <th>Seconds</th> </tr> </thead> <tbody> <tr> <td>004</td> <td>0.5</td> <td>008</td> <td>0.5</td> </tr> <tr> <td>008</td> <td>1</td> <td>016</td> <td>1</td> </tr> <tr> <td>016</td> <td>2</td> <td>032</td> <td>2</td> </tr> <tr> <td>024</td> <td>3</td> <td>048</td> <td>3</td> </tr> <tr> <td>032</td> <td>4</td> <td>064</td> <td>4</td> </tr> <tr> <td>064</td> <td>8</td> <td>128</td> <td>8</td> </tr> <tr> <td>120</td> <td>15</td> <td>240</td> <td>15</td> </tr> </tbody> </table> A count occurs in the detection zone. The DELAY prevents counting the same vehicle again, while it is still in the zone. 	RATE - SLOW		RATE - FAST		DELAY	Seconds	DELAY	Seconds	004	0.5	008	0.5	008	1	016	1	016	2	032	2	024	3	048	3	032	4	064	4	064	8	128	8	120	15	240	15
RATE - SLOW		RATE - FAST																																			
DELAY	Seconds	DELAY	Seconds																																		
004	0.5	008	0.5																																		
008	1	016	1																																		
016	2	032	2																																		
024	3	048	3																																		
032	4	064	4																																		
064	8	128	8																																		
120	15	240	15																																		
 	<ul style="list-style-type: none"> If there are many very long or very slow vehicles (<20km/hr or 12mph) use a two second DELAY value If traffic is dense (vehicles less than 2 seconds apart) use a half-second delay 																																				
THRESHOLD	THRESHOLD adjusts the counter's sensitivity <ul style="list-style-type: none"> Normally use the mode's default THRESHOLD and its specified installation distance (this is best) Decreasing the THRESHOLD increases sensitivity and hence detection distance (and vice versa) The other way to adjust a counter's sensitivity is simply to move it closer (increases sensitivity) or farther away (decreases sensitivity) from the road THRESHOLD adjustment ranges for the vehicle counter's three modes are typically: <ul style="list-style-type: none"> VEH-1s: 016 to 020 VEH-2s: 003 to 010 VEH-4d: 006 to 012 Note that VEH-1s and VEH-4d have a different THRESHOLD scale than does VEH-2s <ul style="list-style-type: none"> If using VEH-4d, and vehicles are up to 8m (26ft.) away, use THRESHOLD 006 (G4 counters only) 																																				
RATE (FAST/SLOW) 	S = SLOW; F = FAST; RATE refers to speed <ul style="list-style-type: none"> If estimated average vehicle speed is above 50km/hr (30mph), use FAST with a DELAY value of 008 or lower SLOW is more battery efficient than FAST (see p. 7) 																																				

Change settings

Here are the main steps to change settings:

1. Confirm your dock is in PC Mode
2. Connect: PC---cable(s)---dock---counter
3. Open TRAFx Communicator and click GO!
4. Enter C to configure a mode's settings



See TRAFx Manual Part I, p. 10 for details. Download at trafx.net/support



Counters yield estimates. They are rarely 100% accurate. This applies to all types and brands. Counter calibration is recommended when higher accuracy is desired. Calibration involves comparing counter totals with those observed by a person, ideally over several hours. It is also a good opportunity to collect additional data (people per vehicle, vehicle type, etc.). For detailed instructions, download "How to calibrate a counter" at trafx.net/support

D SET UP IN FIELD – STEPS

STEP 1 — PREPARATION

Before going to the field, decide whether you will (a) bury the counter or (b) install it at or above ground. Burying it is quick and simple, and reduces vandalism risk. At or above ground allows easier access.

Bury the counter	At or above ground options		
<p>If burying the counter, see Appendix 1 for important details.</p>  <ul style="list-style-type: none"> • rock for drainage • use sealable bags or container, too. 	<p>Key points include:</p> <ul style="list-style-type: none"> • Install the counter 0 to 1m (3ft.) above the ground • Don't use a steel box (wood, plastic and aluminum boxes are all fine) • Ensure strong winds don't shake the box or post (causes false counts) • Stationary metal near the counter is normally fine (lock, post, cattleguard, etc.) <div style="display: flex; justify-content: space-around;"> <div>  <p>Lockable plastic box</p> </div> <div>  <p>Low-cost valve box</p> </div> <div>  <p>PVC post</p> </div> </div> <p>★ See Appendix 2 for model, where to buy, cost, tips, details, etc.</p>		

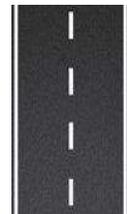
STEP 2 — SELECT SITE

1. Review p. 3 (modes and specified distances) and installation “do and don’t” on the next page before selecting a site to install the counter! Also, see the equipment checklist (next page).
2. Select a straight stretch of road where vehicles drive by without stopping.
3. Practice proper road safety (use hazard lights, pylons, bright vests, and other safety equipment).



STEP 3 — LAUNCH AND POSITION COUNTER

1. Launch the counter using your dock in Shuttle Mode. Use Shuttle Mode’s checklist (next page).
2. Add a fresh desiccant pack and close the counter’s case (ensure its lid seal stays perfectly clean).
3. Position the counter’s long axis perpendicular to the road, as shown at right. It must lie flat.
4. When resting in its final position, its Calibration LIGHT **C** must be OFF. If it is permanently ON, see p. 9 for advice.
5. Take 2 photos, close and far (for your DataNet account / technical support purposes).
6. Take GPS reading (to find the counter and for your DataNet map).
7. Mark location well. (Use a metal detector to find a lost, buried counter.)
8. If this is a new installation, return in about a week and download the counter’s data.
9. When downloading a counter always use the checklists on the next page.



USE DESICCANTS!

Without desiccants, damaging condensation (moisture) forms when the air inside the counter’s case cools.

Replace desiccant packs each time you open the counter’s case to download data.

- Store and transport in well sealed bag or container! (otherwise they expire in hours)
- Visit trafx.net/support regarding type, size and where to buy
- Use two in wet or humid climates





E CHECKLISTS



Field Equipment Checklist

- ✓ TRAFx Manual: Part I and II
 - ✓ Counters, dock, etc
 - ✓ Desiccant packs (in sealed bag); spare batteries for counter; Ziploc bags
 - ✓ Items you'll need for installation (enclosure, screws, screwdriver, lock, key etc.)
 - ✓ Tape measure, camera, GPS, shovel, toothbrush, umbrella, safety equipment, etc
- 
- ✓ Road safety equipment (pylons, strobes, signs, bright vests, etc)

Installation do and don't

Do:

- ✓ install where vehicles pass by without stopping
- ✓ install at proper distance (p. 3); use tape measure!
- ✓ place inside sealed bag, container or box (see p. 10)
- ✓ install perpendicular to road (p. 5)



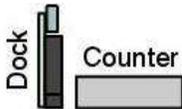
Don't install:

- ✗ at an intersection, gate or booth
- ✗ on a signpost that shakes in the wind
- ✗ near high-voltage powerlines (overhead or underground)
- ✗ inside a steel box
- ✗ where water pools or collects



Download, launch, etc. checklist

Dock in Shuttle Mode (recommended)



Use your dock in **Shuttle Mode** to Download / Launch a counter, without a PC.

- ✓ Before going to the field confirm:
 1. The dock's **TIME** is correct, (yy-mm-dd and 24 hr time).
 2. The dock's battery voltage is **3.4** or higher (if not, replace dock's batteries and reconfigure **TIME**).
 3. Erase old data stored in the dock's memory. Enter E.
- ✓ Go to a counter in the field
 1. Confirm dock is in **Shuttle Mode**.
 2. Connect to a counter.
 3. Do what the dock's **LIGHTs** indicate.
 - If the **Replace Counter's Batteries** LIGHT blinks, disconnect, replace the counter's batteries and then reconnect.
 - ★ 4. After disconnecting, the counter's **Status** LIGHT should be blinking rapidly; this confirms a successful launch. If not, repeat 2 and 3.
 5. Put a fresh desiccant pack inside the counter's case.

Go to the next counter. Repeat 1 to 5.

- ✓ Back in office
 - ✓ Open TRAFx Communicator and follow its instructions
 - ✓ Make sure you are in **Shuttle Mode**
 - ✓ Click on **Download+** to download and save Shuttle file
 - ✓ Upload Shuttle file to your DataNet account

See TRAFx Manual Part I, p. 13 to 15 for details.

Dock in PC Mode (not recommended)



Using a PC to Download / Launch counters is not recommended because it is slower and more prone to human error than Shuttle Mode.

However, these are the main steps:

1. Confirm dock is in **PC Mode**.
2. Open TRAFx Communicator and follow its instructions.
3. Click on **Download+** to download and save data.
4. Find saved data file and confirm successful download.

To continue to collect data, you must relaunch the counter by entering "L". Ensure that the counter's **TIME** is correct. When prompted, erase existing data. Data logging will begin at the **START** date/time. Also, don't forget to replace the desiccant pack.

- ★ After disconnecting, the counter's **Status** LIGHT should be blinking rapidly; this confirms a successful launch. If not, connect up and launch it again.

See TRAFx Manual Part I, p. 10 to 12 for details.

Back in office

- ✓ Upload file to your DataNet account

Maintenance reminder: keep the field case lid seal free of dirt and organic material, with a toothbrush. Otherwise, it might leak.





F LIGHTS, BATTERIES, NOTES

LIGHTS

Three small lights indicate which state a counter is in. There are four counter states.

State	Status LIGHT Red	Calibration LIGHT Orange	Detection LIGHT Green
1 Sleeping	2x/sec	na	2x/sec
2 Launched	4x/sec (rapid!)	on = calibrating* off = calibrated ✓	na
3 Counting	1x per 4 secs	na	blink = count
4 Not blinking	(a) counter is waiting to be launched, or (b) no battery power; it's <u>not</u> counting		

- 1 – *Sleeping* – counter is waiting to be launched; it is not counting; Status and Detection LIGHTs blink in unison 2x/sec
- 2 – *Launched* – counter was successfully launched; counting begins at START time/date (normally top of the hour)
- 3 – *Counting* – counting state; always follows #2; counter is counting; Detection LIGHT blinks when a count occurs

*If the Calibration LIGHT is permanently on see #5 on p. 9

BATTERIES

Battery Info		RATE-SLOW (Bat. life)	RATE-FAST (Bat. life)
Three 1.5V alkaline C cells <ul style="list-style-type: none"> cost approx. \$1/each; widely sold (Costco, Home Depot, etc.) use quality alkaline batteries (e.g., Energizer) rechargeables (not recommended) last 40% to 70% less than alkaline batteries RATE affects battery life (see right; see p. 4) in extremely cold climates (consistently below -20C / -2F) plan on 50% less battery life, or use one lithium 3.6V D cell (custom design). battery failure risk increases above 55C / 131F maximum total voltage: 5V 		G4 counters 13 to 15 months	G4 counters 8 to 9 months
		G2/G3 counters 12 to 14 months	G2/G3 counters 7 to 8 months

! Caution --- Never mix batteries (brands, types, or age)

To better secure the batteries, particularly if moving the counter, use duct tape.

- turn battery holder upside down
- tape from side to side as shown
- stretch tape tight
- press tape firmly on sides and on to the batteries as well

NOTES

- Limitations: (a) for mode VEH-4d, if two opposing vehicles pass at the same time, only one count might occur; (b) for modes VEH-1s and 2s, large vehicles (e.g., big trucks) in the far lane are sometimes counted.
- In direct, hot sun, on hot days (>35C / 95F), the temperature inside a closed box can exceed the counter's and batteries' maximum operating temperature (55C / 131F). If possible, use shade; if using a locking box (p. 10), add ventilation holes to it to create crossflow.
- Very cold temperatures (consistently below -20C / -2F) are hard on batteries. Because snow acts as an insulator, in very cold climates, if possible, bury counter underneath 20cm (1ft.) or more of snow, at ground level, where it is relatively warmer.
- Magnets near the counter (<1m or 3.3ft.) can cause problems. Do not put the counter near car audio-speakers, and as much as possible, use the counter outside and away from your vehicle.
- Installing your counter at a boat launch? Email us via our Support Hub at trafx.net/support for important tips.



G TESTING

Each TRAFx counter comes factory tested and ready to install. If installed according to instructions, paying careful attention to the specified distances and other details, it is not normally necessary to test it. However, if desired, there are several methods to test a counter.

1 WITH PC

With this method, counts immediately appear on your PC screen. This is useful when first learning about your counter indoors, and also at installation locations, with a laptop. See below.

1. Confirm dock is in **PC Mode**
2. Connect: PC---cable(s)---dock---counter
3. Open TRAFx Communicator and click GO!
4. Enter "T" for **TEST** and follow the prompts



As a vehicle passes within the detection zone, or as you move a ferrous metal object (pliers, hammer, stapler – but not a magnet or magnetic screwdriver) near the counter (approx. 10cm / 6in.), this should trigger a count which appears on the PC's screen. Try it. Ferrous metal objects (i.e., metals with iron content) distort the earth's magnetic field as they move through it, and this triggers a count. Pure aluminum (non-alloy aluminum) will not be detected.

Counts appear on screen

```

17-04-24, 13:46,
00001, 00000
00002, 00000
00003, 00000
00004, 00000

```

Moving the counter (i.e., pointing it in different compass directions, or tilting it, or jiggling or jolting it) will also cause counts to occur — try this. This is because the earth's magnetic field has different strengths for different directions and tilts, and the counter senses this.

If you move the counter too close to a computer or other electrical equipment, counts might also occur. This is because certain types of electrical equipment create changing electromagnetic fields, which the counter detects. It's also sensitive to very rapid temperature change (e.g., direct sun).

5. To end the **TEST**, enter **ZZZZ**
6. To **ERASE** the test counts from the counter's memory, enter "E"

2 WITHOUT PC

For this method, launch the counter and collect data for a few hours. Note that counting begins at **START** (normally top of the hour) and that you must wait a full hour after **START** to download data.

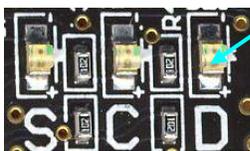
Example:

- 10:40 - Launched counter > **S**tatus LIGHT blinks rapidly until **START** is reached
- 11:00 - Top of the hour (**START**) > counting begins > **D**etection LIGHT blinks upon count
- 12:00 - Okay to download data now.

In short, wait at least a few hours before downloading data.

3 WATCH DETECTION LIGHT

This is a variation of Method 2. As mentioned above, counting begins at **START** (top of the hour). After **START**, the counter's **D**etection LIGHT blinks when a count occurs (two blinks means two counts).



 watch the blinks



H TROUBLESHOOTING, MAINTENANCE AND SUPPORT

TROUBLESHOOTING

The troubleshooting advice below is specific to settings and installation. If your problem is not addressed below, see Chapter 4, TRAFx Manual – Part I, or better yet, visit our Support Hub at trafx.net/support

1 Higher than expected counts



If counts are moderately higher than expected, do the following:

- Confirm **RATE** is appropriate for vehicle speed (see p. 4)
- Increase **DELAY** (see p. 4)

2 Lower than expected counts



If counts are moderately lower than expected, do the following:

- Confirm **RATE** is appropriate for vehicle speed (see p. 4)
- Confirm counter is not too far away (this is usually the problem; see p. 3)
- If “b” does not apply, then decrease **THRESHOLD** (see p.4)

3 Extremely high counts, even at night



If counts are extremely high, even at night when there is little traffic, increase **THRESHOLD** (p. 4) by about 50% (e.g., increase from 008 to 012). If the problem persists, see #4 below.

4 Implausible or strange counts



Causes include: wind gusts (counter shakes in the wind), nearby powerlines (overhead or buried), counter inside a steel box (reduces detection distance), moisture (see maintenance below).



wind



powerlines



steel box



moisture

5 Calibration light ON

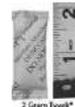


After Launch, if counter's **Calibration LIGHT** is permanently ON (i.e., solid), (a) rotate the counter 180 degrees; or (b) remove and reinsert all its batteries, and Download / Launch it again; or (c) move it farther away from large metal objects (e.g., large steel beam) or magnets.

MAINTENANCE

Control moisture

Replace the desiccants each time you open the counter's case to download, otherwise damaging condensation (moisture) forms when the air inside the counter's case cools. To dry a damp counter, remove batteries and use heat (car heater, hair dryer, lamp).



Remove finger grease

Remove possible finger grease on the counter's gold fingers with an alcohol pad---the combination of finger grease and moisture can cause problems (e.g., a counter stops counting early).



Keep lid seal clean

Use a toothbrush to remove dirt, grit and other material from the field case seal otherwise the case might leak, potentially damaging or destroying the counter. Make this part of your field protocol.



SUPPORT

All technical support begins at our **Support Hub** at trafx.net/support Information about replacement parts and repairs is available at the same location.

Limited warranty

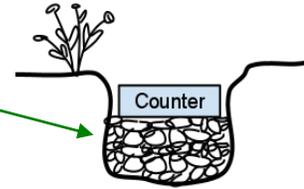
See TRAFx Manual, Part I p. 2 for details. In a nutshell, limited warranty period is normally 1 year and covers manufacturing defects.



APPENDIX 1 – Burying the counter

If feasible, hide the counter on the surface under some rocks or wood. If not, bury it.

1. Dig a hole deep enough to accommodate the counter and some drainage rocks.
2. Fill the bottom with 5 to 7cm (2 to 3in) of rocks.
3. Place counter case in hole, along with Option 1 or 2 (see below).
4. Cover with soil, rock, wood or other local material.
5. Mark location well.



Option 1	Option 2
<p>Ziploc-type bags (dry sites)</p> <p>-only use if ground won't become water saturated during rain, winter, flooding, etc. -put counter inside Ziploc-type bags (min. three) -keeps field case lid seal clean, and adds protection</p> <div style="display: flex; justify-content: space-around;">   </div>	<p>Second, sealed box (damp sites)</p> <p>-use if ground might become water saturated -also use if leaving counter unattended over winter -put counter case inside a water-tight second box -second box must have good seal</p> <div style="display: flex; justify-content: space-around;">   </div> <p>digikey.com or digikey.ca Part#: SE56, BK --9.5 x 5.8 x 2.8in.; ~\$25 US</p>

APPENDIX 2 – Boxes, enclosures, PVC posts, etc

For easier access, install the vehicle counter at or above ground level. Below are some ideas in this regard. Important: see p. 3 regarding installation distances. Height can be 0 to 1m (3ft.).

 <p>Lockable plastic box</p>	<p>An outdoor lockable enclosure can be mounted on the side or top of a wooden post to house the TRAFx Vehicle Counter.</p> <p>Buy at: automationdirect.com Part #: M606HPL ---hinged fiberglass-plastic box with lockable latch ---19.1 x 19.1 x 12.1cm (7.50 x 7.50 x 4.75in.) ---1.3kgs (2.8 lbs); grey; ~\$75 US</p> <p>Lower-cost alternative (~\$50 US): AMP664LF tequipment.com or solutionsdirectonline.com</p> <p><u>Notes:</u> ---latch accepts padlock ---optional accessories are not required ---mount on side or top of wooden post; <u>hinge side faces road</u> ---to make more secure, bolt to post from inside box</p> 
<div style="display: flex;">   </div> <div style="display: flex;">   </div> <p>Plastic valve box</p>	<p>Plastic valve boxes are used in irrigation systems, and are intended for burial. These low-cost enclosures can also be used to house a TRAFx Vehicle Counter. They look very inconspicuous because they are so common.</p> <p>Google: Orbit Model 53210 ---Orbit; Model 53210 (Deep Round Valve Box) ---6-1/2in. Dia. x 8-3/4in. ---green top; black base ---\$10 US</p> <p><u>Notes:</u> ---important: fill with coarse gravel (for drainage) ---use Ziploc-type bags for counter (see above) ---do not locate where water pools or collects ---add simple lock by drilling through side</p>



PVC Post Installation

Hagerman NWR uses plastic PVC pipe at the roadside to house their TRAFx Vehicle Counters. See p. 12 for details.



PVC junction box

Electrical junction boxes are made of sturdy grey PVC plastic. Four corner screws secure the lid. Although these boxes do not have a lock, they are common and boring-looking, and are unlikely to attract attention.

Mount on top or at side of a 6in. x 6in. wooden post, or partially bury so that only lid sticks up above ground level.

Sold at electrical supply stores or large stores such as HomeDepot, in the electrical section. (Bring counter's case to test for proper fit before buying.)
 ---grey PVC "junction box"; try 6 x 6 x 4in.
 ---lid seals with watertight gasket
 -----\$20 US
 ---Google: **6 x 6 x 4 PVC Junction Box**

Notes:

---to make more secure, bolt to post from inside box
 ---these can also be installed flush with ground (like valve box on previous page).



Custom boxes: aluminum and wood

Metro Vancouver in Canada uses custom-built, heavy-duty lockable aluminum boxes to house their TRAFx Vehicle Counters. These boxes are virtually indestructible, and are bolted to concrete pads. This is an effective but expensive solution.

Placing the boxes near sign posts minimizes the risk of grass mowers or snowplows hitting the box.

The Seedskadee National Wildlife Refuge in Wyoming uses false birdhouses, with hinged tops that screw closed.



PVC Pipe Installation

Hagerman National Wildlife Refuge uses PVC pipe at the roadside to house their TRAFx Vehicle Counters. Here's their clever design, courtesy of Bill Powell.

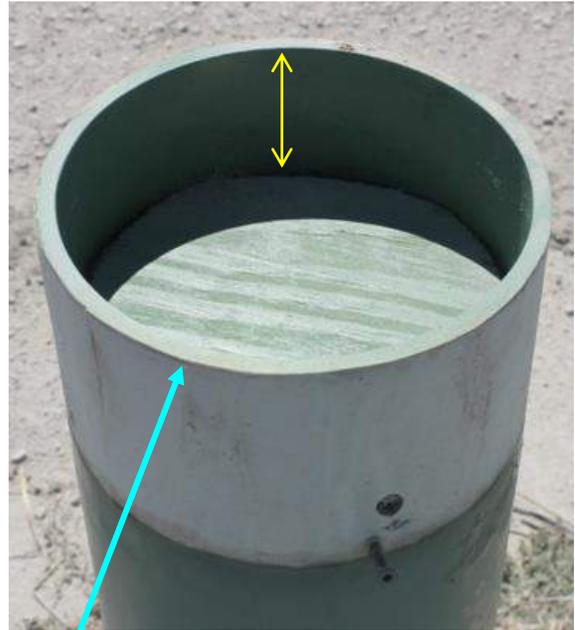
Pipe is 6" PVC SCH 40. 60" long; 42' above ground, 18" cemented under ground.

Note "Danger High Voltage" decal – helps keep inquisitive people away; serves as a theft deterrent.



Counter floor

Floor is 3/4" exterior plywood cut in circle to fit snugly in pipe 2" from top edge. Use three all-purpose screws, countersunk to hold floor securely in place. When the cap is in place, it will cover the floor screws.



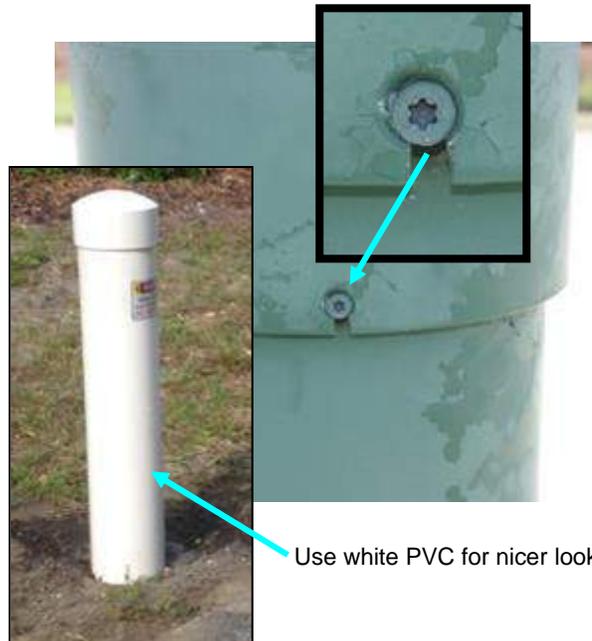
Remove enough PVC from pipe using belt sander so that the top cap slips on and off easily.

Secure cap

Use of a starhead screw to secure the cap, and facing it away from the road serves as a theft deterrent.

Drill 1/8" hole and countersink for bevel on screw head. Make 1/8" slot from cap edge to the 1/8" hole, this will allow removal of cap by merely backing screw out 1/2".

TRAFx Vehicle Counter in place



Use white PVC for nicer looks