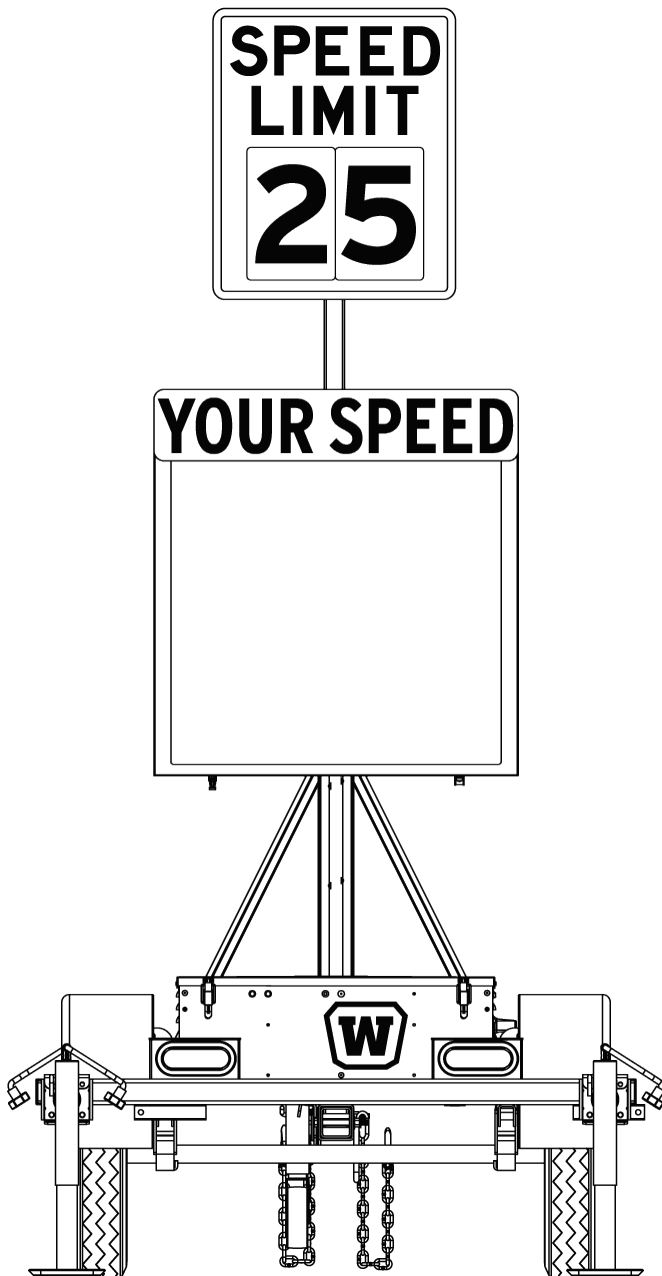




WSD-1020  
07 2014

## RADAR-SPEED TRAILERS

MODEL WSDT3  
PRODUCT SPECIFICATIONS | JULY 2014



## 1. DESCRIPTION

1.1. Description Wanco speed trailers provide vehicle speed detection and display, in a portable platform that does not require permanent installation or wiring.

Using built-in radar, the speed trailer detects the speed of an oncoming vehicle, then displays that speed on its full-matrix LED display panel, informing drivers of their actual speed. Formal studies have proven that speeding drivers respond by slowing down to legal limits when their actual speed is displayed on an electronic sign.

Studies also indicate that some drivers “test” radar-based speed displays by driving very fast. To address this danger, Wanco speed signs do not display excessive speed, but instead employ their full-matrix display to flash a message or symbol at drivers, to indicate they are going much too fast.

1.2. Models

1.2.1. WSDT3-S Wanco radar-speed trailer with full-matrix display

1.2.2. WSDT3-SPD Wanco radar-speed trailer with full-matrix display and blue-and-white color scheme for law enforcement agencies

## 2. FEATURES

2.1. Operation

- Extra-large electronic speed display with full matrix of LEDs
- Visors and shades over LEDs produce superior visibility
- Display visible over standard Jersey barrier traffic divider
- Display flashes when a vehicle exceeds speed limit
- Selectable speed limit setting
- Configurable, flashing excessive-speed message
- One or two digits displayed in mph, up to three digits for km/h
- See-through design puts pedestrians in view
- Regulatory speed-limit sign with easily changeable speed numbers
- Approach-only K-band radar
- Compact and easily portable
- Battery powered & solar charging
- Integral control box with tamper-resistant cover that locks (with key) when latched

2.2. Power system

- Energy-efficient operation results in long run times
- Solar panels charge batteries automatically without intervention
- System shuts down solar-panel charging system when batteries are fully charged, preventing damage
- Power system allows battery charging with solar panels or commercial power
- Cooling fans protect battery charger from overheating
- Battery box can be locked to prevent unauthorized access

- 2.3. Maintenance
- Individual display modules can be replaced easily
  - Standard trailer tires
  - Heavy-duty bolt-on steel fenders can be replaced if damaged
  - Durable powder-coat finish resists the elements

- 2.4. Application
- Common applications include:
- School zones
  - Residential streets
  - Roadwork zones
  - Rural roads
  - Highways
  - Public events

### 3. DISPLAY

- 3.1. Display behavior
- |                                  |  |
|----------------------------------|--|
| 0 to 50% of speed limit setting  | Display is blank                                   |
| > 50% to 100% of speed setting   | Display shows vehicle speed                        |
| > 100% to ~130% of speed setting | Display flashes vehicle speed                      |
| > ~130% of speed setting         | Display flashes configured excessive-speed message |

See Exhibit A for precise display activation speeds

- 3.1.1. Speed display
- One or two digits display mph; one to three digits display km/h  
 One bold font, 26" (66cm) high, characters vary in width

- 3.1.2. Excessive-speed messages
- Selectable with DIP switches on systems board, located inside display cabinet  
 Can be viewed in Preview operating mode using speed limit switch on control panel  
 Default: SLOW DOWN (text) message

Blank (no message)

SLOW  
DOWN

Slow down (text) message



Frowning face symbol



Alert symbol (exclamation point in triangle)



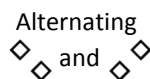
Diamond symbol



Bar symbol



Four corners symbol



Wig-wag (alternating double diamonds) symbols

### 3.2. Cabinet

- 3.2.1. Description           Dust- and weather-proof, contains all electronics and controls.
- Hinged display window in front provides access to display characters and electronics. Clasps hold window closed during operation and can be locked with user-supplied padlock.
- Hinged control console door on back provides access to controls and includes integrated lock.
- 3.2.2. Size                   36" x 36" x 4.75" (91 x 91 x 12 cm), W x H x D
- 3.2.3. Material               Aluminum alloy sheet, 0.062" (1.57mm) thick
- 3.2.4. Construction         Forms wrap around top, sides, back and bottom
- 3.2.5. Door                  Rigid door frame, hinged at top and latched at bottom, stays opens for easy maintenance; latches accept user-supplied padlocks
- 3.2.6. Finish                Oven-baked white powder-coat
- 3.2.7. Window               Clear polycarbonate resin thermoplastic window, anti-glare, 0.150" thick, installed in hinged door frame that opens for easy electronics servicing
- 3.2.8. Location             Mounted to welded steel frame on tower, below speed limit sign
- 3.2.9. Height                49" (125cm) from ground to bottom of cabinet

### 3.3. Display matrix

- 3.3.1. Display modules    Modular design           Allows any display module to be installed in any position in the matrix without repositioning DIP switches
- Wiring                    Modules have quick-connect electrical connectors for easy servicing. All wiring terminates at a single terminal strip inside the display cabinet.
- Replacement             Each module can be exchanged in less than two minutes. The only tool needed is a 5/16-inch nut driver socket or slotted screwdriver
- After a new module is installed, a one-step initialization process causes each module to sense its position in the full-matrix display. Initialization is accomplished using the sign's controller.
- Firmware                 A program chip is socket replaceable for easy firmware upgrades
- Size                        16.0" (40.6cm) wide by 13.13" (33.3cm) high, nominal

	Material	FR4 glass-reinforced epoxy laminate, double-sided, black solder mask with white silkscreen  Board thickness, 0.094" (2.388mm)  Copper size, 1 oz. (28.4g)
	Coating	5-mil, military-spec, low-VOC, silicone conformal coating (Dow Corning 1-2577) provides long-term protection against moisture and other atmospheric contaminants, resists corrosion and shorts due to high humidity
	Vibration mounts	All display modules are mounted on rubber vibration-isolation mounts, decreasing risk of physical shock during transport and isolating characters from chassis ground
	Temperature limits	-40 to 176°F (-40 to 80°C)
	Humidity limits	Conformal coating rated to 95% relative humidity
3.3.2.	Pixels	Two amber LEDs form a "pixel"  Pixel size 0.5" x 0.5" (12.7 x 12.7mm)  Full matrix 24 pixels wide by 20 pixels high, 480 pixels total  Display module 12 pixels wide by 10 high, 120 pixels total  Pixel pitch 34.3mm, horizontal and vertical
3.3.3.	LEDs	Technology AllInGaP II (aluminum indium gallium phosphide) technology, T-1 $\frac{3}{4}$ size, through-hole auto-insertion  Color range Amber, 589.5 to 592.0 nm  Current 100 mA peak-pulsed forward current  Temperature limits Operating temperature, -40 to 212°F (-40 to 100°C)
3.3.4.	Lenses and visors	Each pixel has a snap-in optical lens over the LEDs, enhancing the brightness and angularity of each pixel while reducing power consumption.  A polycarbonate visor shades each row of pixels to eliminate glare caused by direct sun exposure. The sunshades snap onto the display module without tools. The lenses snap into the sunshades.  These enhancements enable the speed display to operate with high efficiency and conserve power.
3.3.5.	Legibility	> 1/4 mile (402m)
3.3.6.	Visibility	> 1/2 mile (805m)

- 3.3.7. Viewing angle            Total viewing area with optical lenses, 50 degrees
- 3.3.8. Brightness              Factory preset for optimal viewing and power consumption
- 3.3.9. Auto dimming            Two photocells detect ambient light on the speed display; the system automatically adjusts the brightness of the LEDs accordingly, dimming display brightness in darkness, increasing to full brightness in daylight  
  
 Photocells are mounted inside the display cabinet, one facing rear and one facing front
- 3.3.10. Software design        Driver                            LEDs controlled through 30mA pulse-width modulation design  
  
 Addressing                    Each display module address is selected through a software command; no DIP switches are used. The address does not change until reprogrammed.  
  
 Pixel test                      Each module is equipped with individual pixel failure notification

#### 4. CONTROL CONSOLE

- 4.1. Location                    Back of speed display box, inside weatherproof compartment, behind a locked, hinged control console door
- 4.2. Controls                    Two rotary switches for selecting operating mode and speed limit  
  
 A 3-digit LED display indicates operating mode, speed shown on the full-matrix display, error codes and more, depending on the operating mode and other factors  
  
 Green, orange, and red LED indicators signify power is on, the solar charging system is active, activated alarms need checking, battery charge is low, and power failure  
  
 To conserve power, the LED display and LED status indicators power off automatically after a few seconds, reactivated with a momentary push-button switch
- 4.2.1. Operating modes        A rotary switch allows selection of operating mode:
  - Off                                Radar and matrix display are off  
 All auxiliary devices are off  
 Status display shows "OFF" or error codes (if any)  
 Solar charging system is active
  - Run                                Normal operating mode  
 Radar and matrix display are on  
 All auxiliary devices are on  
 Solar charging system is active  
 Status display shows selected speed limit or error codes (if any)  
 Solar charging system is active
  - Run & beacons                Used with optional flashing beacons, which are not offered with these speed-trailer models

Data Collector only	Used with optional Traffic Data Collector, when traffic data collection is desired without displaying speed Radar and matrix display are off Data Collector is on All other auxiliary devices are off Status display shows "CLA" or, if communication with the Data Collector fails, "Err" Solar charging system is active
Data Collector & beacons	Used with optional flashing beacons, which are not offered with these speed-trailer models
Schedule	Used with optional scheduler/controller for automated control Run mode and speed limit are controlled by scheduling software; speed limit selector has no effect Matrix display, radar, and all optional auxiliary devices are controlled by scheduling software Status display shows "Sch" Solar charging system is active
Demo	Used for ensuring matrix display is performing correctly Matrix display consecutively shows 1-, 2-, and 3-digit speeds, SLOW DOWN message, and frowning face symbol If installed, red-and-blue "police" flasher is active during excessive-speed message Radar is off Data Collector is on All other auxiliary devices are off Status display shows "[d]" Solar charging system is active
Preview	Used for viewing available excessive-speed messages and other test patterns, one at a time, regardless of the excessive-speed message that has been configured with DIP switches on the systems board Matrix display shows one excessive-speed message, which can be changed by rotating the speed limit selector (when the speed limit selector is in the "0" position, the display is blank) Radar is active Data Collector is on All other auxiliary devices are off Status display shows "[P]" Solar charging system is active

Radar setup	<p>Continuous speed mode</p> <p>Used when replacing or testing radar, aligning trailer to traffic, or when traffic calming is not desired</p> <p>Matrix display shows actual speed regardless of speed limit</p> <p>Data Collector is on</p> <p>All other auxiliary devices are off</p> <p>Status display shows actual speed</p> <p>Solar charging system is active</p>
Power test	<p>Power, auxiliary devices, matrix LEDs, and battery load test mode</p> <p>Used for verifying all matrix-display pixels are functioning, for testing any auxiliary device after replacement, or to fully load the battery and verify it holds a charge</p> <p>Matrix display has all LEDs lit, at fixed brightness</p> <p>Radar is off</p> <p>Data Collector is on</p> <p>All other auxiliary devices are off</p> <p>Status display shows “[P]”</p> <p>Solar charging system is active</p>
Status	<p>System status mode</p> <p>Used for diagnostics and troubleshooting</p> <p>Speed Limit rotary switch selects sensor (voltage, current, temperature, etc.)</p> <p>Matrix display shows individual sensor readings with labels and extra decimals</p> <p>Radar is active</p> <p>Data Collector is on</p> <p>All other auxiliary devices are off</p> <p>Status display shows sensor reading</p> <p>Solar charging system is active</p>
Service	<p>Display board initialization mode</p> <p>Used when installing character panels in matrix display, and when uploading new software</p> <p>Matrix display shows alphabet characters</p> <p>Data Collector is on</p> <p>All other auxiliary devices are off</p> <p>Status display shows “[S]”</p> <p>Solar charging system is active</p>



- 4.2.2. Speed settings      Units factory configured based on user-specifications, miles per hour (mph) or kilometers per hour (km/h); selectable with DIP switches on the systems board
- Choose speed limit with rotary switch:  
10 to 75 mph in 5 mph increments  
20 to 130 km/h in 10 km/h increments
- 4.3. Technology      State-of-the-art, solid-state electronics
- 4.4. PCB coating      5-mil, military-spec, silicone conformal coating provides long-term protection against moisture and other atmospheric contaminants
- 4.5. Voltage regulator      In addition to controlling sign behavior, the control PC board regulates the charge from the solar panel; no external regulator is necessary

## 5. RADAR

- 5.1. Description      Approach-only radar senses the largest, nearest mass moving toward it
- 5.2. Band      K-band transmitter
- 5.3. Location      Radar head located inside the display cabinet, centered at top of matrix display
- Antenna head centered on trailer for maximum effectiveness regardless of which side of road the trailer is being used
- 5.4. Distance range      1000 ft. (305 m)
- 5.5. Speed range      10 to 99 mph (16 to 160 km/h)
- 5.6. Protection      Fused and reverse-polarity protected
- 5.7. Standards      CE compliant  
FCC approved
- 5.8. Calibration      Calibration not required
- A tuning fork for verifying radar is operating correctly is attached inside the control cabinet door; when struck and held in front of the radar head, the tuning fork vibrations simulate 55 mph

## 6. REGULATORY SIGN

- 6.1. Description      Regulatory speed limit sign has threaded mounting studs for attaching interchangeable speed limit numbers, which are supplied by the factory and stored in the trailer's battery box
- 6.2. Size      24" x 30" (61 x 76cm), W x H
- See "Options and Optional Equipment" for sign options

- 6.3. Height 93" (236cm) from ground to bottom of sign
- 6.4. Material Aluminum sheet, 0.080" (2mm) thick, with high-intensity reflective coating
- 6.5. Location Mounted to welded steel frame on tower; extends above electronic matrix display when raised  
In transport position, regulatory sign is in front of and partially covers electronic display

## 7. TRAILER

- 7.1. Frame All welded structural steel
- 7.2. Tie-downs One tie-down loop centered at front of trailer frame
- 7.3. Fenders Full coverage, rounded bolt-on fenders with inner splash panel
- 7.4. Finish
  - 7.4.1. Prewash Assemblies are run through a five-stage, high-pressure phosphate-wash prior to finish coat
  - 7.4.2. Coating Frame is coated with oven-baked, safety-orange powder-coat finish to ensure durability and corrosion protection  
See "Options and Optional Equipment" for color options
  - 7.4.3. Salt spray resistance 1000 hours (ASTM Method B117) with <1/8" (<3.18mm) creep from scribe
  - 7.4.4. QUV exposure 500 hours QUV-B (ASTM Method D4587-05) >75% gloss retention
- 7.5. Axle assembly 2000 lb. (907kg) capacity, 5 on 4.5" B.C. idler hub
- 7.6. Springs Double-eye leaf springs
- 7.7. Tires ST205/75D15 steel-belted trailer tires, load rating B
- 7.8. Drawbar
  - 7.8.1. Construction Telescopes inside receiver sleeve welded under trailer frame. Removable for shipping and for added theft protection if needed. Secures with two 1/2-inch diameter bolts.
  - 7.8.2. Material 3" (7.62cm) square steel tubing, 3/16" (0.476cm) wall
  - 7.8.3. Jack Top-wind swivel, 2000-lb. (907kg) capacity, steel footpad, 10" (25cm) total travel
  - 7.8.4. Tow hitch Standard 2-inch ball coupler tow-hitch, SAE Class 2, 3500-lb. (1588kg) capacity. Bolts to drawbar, removable and replaceable.  
See "Options and Optional Equipment" for tow-hitch options.

- 7.8.5. Tow chains Two high-test proof coil chain assemblies, with “latching” S-hooks for towing. Chains attached to drawbar with quick connectors.
- Material diameter 0.406" (10.3mm)
- Working load limit 5400 lbs. (2450kg)
- Breaking force 16,200 lbs. (72kN)
- 7.9. Stabilizer jacks Four swivel jacks, each with 2000-lb. (907kg) capacity, one on each corner of trailer frame
- 7.10. Wiring
- 7.10.1. Description Wiring to connect tow vehicle and trailer for trailer taillights is installed inside drawbar, with pigtails and connectors at both ends; no crimping required
- 7.10.2. Trailer plug A sealed, molded, 4-square connector plugs into harness under trailer
- 7.10.3. Tow-vehicle plug Two-piece assembly with 4-flat molded connector on harness plugs into tow vehicle  
Meets SAE J1239  
See “Options and Optional Equipment” for tow-vehicle plug options
- 7.10.4. Protection All trailer wiring encased in UV protective loom, and attached with P-clamp riveted to trailer frame; no exposed wires
- 7.11. Taillights
- 7.11.1. Type Two oval-shaped, sealed, combination stop, turn and taillights
- 7.11.2. Location Mounted to top of trailer deck behind fenders
- 7.11.3. Mounting No screws used for mounting; bracket is welded to trailer frame; each light held in place and sealed with snap-in rubber grommet
- 7.12. License plate License plate mounts on battery box rear panel
- 7.13. Reflectors Two amber reflectors, one on each side of trailer  
Two red reflectors on rear trailer frame  
See “Options and Optional Equipment” for reflective tape
- 7.14. Tower assembly
- 7.14.1. Function Regulatory sign is raised and lowered on a rotating, telescoping tower. Electronic speed display is installed at a fixed height on lower portion of tower .
- 7.14.2. Tower construction Two sections of square steel tubing with the inner section telescoping inside the outer section. The inner section is zinc plated to prevent corrosion.  
Nylon guide blocks keep the sections tight, eliminating the need for greasing the tower and preventing dirt from building up on the inner tower section. Dirt would cause performance problems and maintenance issues.

- 7.14.3. Swivel base                    A steel assembly (the “swivel base”) is welded to the trailer frame and holds the tower. The outer tower section rotates on a thrust bearing and washers inside the swivel base, reducing rotating friction.
- 7.14.4. Height lock                    Spring-loaded locking pin prevents tower from falling if the winch or cable were to fail. Also locks tower when fully lowered into travel position.
- 7.14.5. Winch assembly
- |          |  |
|----------|--|
| Function | Hand-operated winch raises and lowers sign cabinet   |
| Capacity | 1500 lbs. (680kg)  |
| Brake    | Safety friction-brake prevents display cabinet from falling if operator loses grip on winch handle |
| Cable    | 1/4" (6.35mm) diameter galvanized aircraft cable   |
- 7.14.6. Rotation                    Tower rotates by hand, pivoting 90 degrees to face traffic or for storage and transport
- 7.14.7. Rotation lock                    Sign rotation is locked with the same spring-loaded locking pin that locks the tower height. A draw latch further minimizes movement during transport.

## 8. POWER SYSTEM

- 8.1. Description                    Electronics powered by batteries, which are charged automatically with integrated solar charging system
- 8.2. Battery box
- 8.2.1. Function                    Holds batteries, remote charger, and spare numbers for speed limit sign  
See “Options and Optional Equipment” for heavy-duty secure battery box
- 8.2.2. Construction                    Riveted all-steel construction  
All parts powder-coated before assembly  
Divider panel inside box separates batteries from electronics  
Louvers provide ventilation  
Latches keep cover closed and can accept user-supplied padlocks
- 8.2.3. Location                    Centered over axle between fenders, bolted to trailer frame
- 8.3. Batteries
- 8.3.1. Description                    Two Group 24 deep-cycle batteries, wired in parallel and series for a 12-volt system  
See “Options and Optional Equipment” for battery options
- 8.3.2. Voltage                    6Vdc each
- 8.3.3. Weight                    Approx. 60 lbs. (26kg) each
- 8.3.4. Capacity                    215 Ah total capacity @ 12Vdc

8.4. Remote charger

8.4.1. Function Plugs into a standard commercial power source to recharge batteries if battery voltage drops due to lack of sun for automated solar charging system

8.4.2. Type 12-volt battery charger

8.4.3. Location Inside battery box, mounted to divider panel on opposite side from batteries

8.4.4. Output capacity 15A  
See "Options and Optional Equipment" for charger options

8.4.5. Output voltage 13.2Vdc range "float" mode  
13.6Vdc range "absorption" mode  
14.2Vdc range "bulk" mode

8.4.6. Input voltage 105 to 135Vac, standard three-prong plug

8.4.7. Input frequency 50 to 60 Hz

8.4.8. Cooling Fan cooled when charger temperature reaches 95°F (35°C)

8.4.9. Protection Automotive-style replaceable fuses

8.5. Solar

8.5.1. Panel One high-efficiency multi-crystal photovoltaic solar module

8.5.2. Location Behind regulatory sign, over tower. No shadowing effect on any trailer component. Solar panel lies flat for continuous charging regardless of folding frame position; rises and rotates with signs.

8.5.3. Power output 65W  
See "Options and Optional Equipment" for solar options

8.5.4. Current 3.76A max. system current  
4.18A open short-circuit current

8.5.5. Voltage 17.3Vdc max.  
21.6Vdc open short-circuit voltage

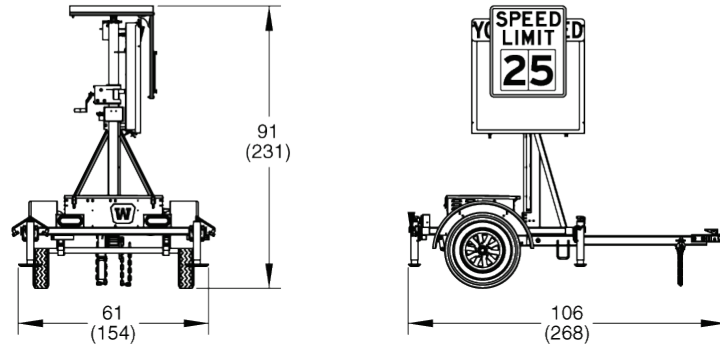
8.5.6. Regulation Solar panel regulated by systems board

8.5.7. Security Solar panel bolted to mounting frame with security screws and special security nut

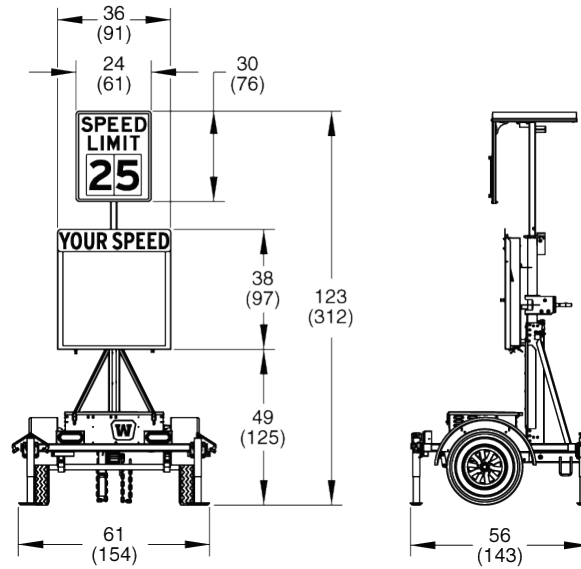
**9. DIMENSIONS & WEIGHT**

9.1. Dimensions *inches (cm)*

**Travel position**



**Deployed**



9.2. Weight **Approx. 870 lbs. (395 kg)**

## 10. OPTIONS AND OPTIONAL EQUIPMENT

- 10.1. Flashers** Two flashing lights, located in electronic display cabinet below speed display, flash alternately when vehicles exceed “extreme speed”; lights are LEDs  
Options include red-and-blue “police” flashers or white flashers
- 10.2. Regulatory sign** Replace standard speed limit sign with larger sign; contact factory for details
- 10.3. Tow hitch**
- 10.3.1. Combo hitch Combo-hitch for 2-inch ball and 2 1/2-inch ID x 1-inch cross-section pintle hook
- 10.3.2. Lunette ring Options Standard ring for 2 1/2-inch ID x 1-inch cross-section pintle hook  
Heavy-duty ring for 3-inch ID x 1 5/8-inch cross-section pintle hook
- 10.4. Tow-vehicle plug** Many types of plugs available, prewired at the factory; contact factory for details
- 10.5. Power**
- 10.5.1. Additional batteries For geographic locations with less solar charging potential or colder weather, and for applications that require year-round charging, add batteries for greater capacity  
Add two Group 24 deep-cycle batteries in large battery box, 215Ah additional capacity
- 10.5.2. AGM batteries Replace deep-cycle batteries with top-of-the-line absorbed glass mat (AGM) batteries
- Features 100% maintenance-free  
Sealed and spill-proof  
Faster recharge and greater freeze resistance than conventional batteries  
Contains less lead than conventional batteries
- Options One 4D AGM 12Vdc batteries in standard battery box, 200Ah total capacity  
Two 4D AGM 12Vdc batteries in large battery box, 400Ah total capacity
- Weight Approx. 160 lbs. (72kg) each
- 10.5.3. Charger When required for faster battery charging, replace standard remote charger with higher amperage, 12-volt, 45-amp charger
- 10.5.4. Solar For geographic locations with less solar charging potential or colder weather, and for applications that require year-round charging, additional solar power is available  
Options include 85W and 130W solar panels; contact factory for details

- 10.6. Large battery box and license plate holder** Large battery box is required when the speed trailer has more than two standard batteries or more than one AGM battery  
Replaces standard battery box  
Centered over trailer axle, bolted to trailer frame  
Same construction as standard battery box  
License plate holder is added when the speed trailer uses the large battery box; mounted under rear trailer frame
- 10.7. Secure battery box**
- 10.7.1. Battery box High-security battery box features heavy-gauge steel lid, hidden hinges, and heavy-duty hidden-shackle padlocks. Replaces standard battery box.  
License plate holder is added when the speed trailer uses the secure battery box; mounted under rear trailer frame
- 10.7.2. Crossbar Optional heavy-duty, lockable crossbar fits over top of secure battery box, preventing lid from opening
- 10.8. Reflective tape** Reflective red-and-white conspicuity tape across rear trailer frame for increased visibility
- 10.9. Finish color** Specify power-coat color and, if applicable, color scheme
- 10.10. Traffic Data Classifier System**
- 10.10.1. Design Radar-based, nonintrusive, does not require loops or hoses, no disturbance of traffic flow during installation or use
- 10.10.2. Direction Registers both approaching and receding vehicles
- 10.10.3. Traffic lanes Most effective for 2-lane roads
- 10.10.4. Traffic count Can record data for more than 1 million vehicles in internal memory
- 10.10.5. Data format Speed, date, time, direction, length for each vehicle
- 10.10.6. Units English or metric
- 10.10.7. Time stamp Yr,Mo,Dy,Hr,Min,Sec.
- 10.10.8. Speed range 5 to 138 mph (8 to 222 km/h)
- 10.10.9. Sensor Microwave K-band 24.125 GHz
- 10.10.10. Power Uses radar-speed sign power supply
- 10.10.11. Power output 20 dbm (EIRP)
- 10.10.12. Current 110 mA
- 10.10.13. Temperature Operating limits: -40 to 185 °F (-40 to 85 °C)
- 10.10.14. Internal memory 1MB (1,048,576 bytes)



10.10.15. Baud rate	9600, 8 bit, no parity
10.10.16. Calibration	Self-calibrating
10.10.17. Installation	Mounted below electronic speed display in adjustable bracket

**EXHIBIT A: DISPLAY ACTIVATION SPEEDS**

**Miles per hour (mph)**

User-Set Speed Limit	Vehicle Speed Triggered	Flashing Vehicle Speed Triggered	Excessive-Speed Message Triggered
10	5	11	13
15	8	16	20
20	10	21	25
25	15	26	30
30	20	31	37
35	29	36	45
40	34	41	50
45	39	46	55
50	44	51	60
55	49	56	65
65	59	66	75
75	69	76	85

**Kilometers per hour (km/h)**

User-Set Speed Limit	Vehicle Speed Triggered	Flashing Vehicle Speed Triggered	Excessive-Speed Message Triggered
20	10	21	24
30	16	31	38
40	24	41	48
50	34	51	61
60	50	61	76
70	60	71	86
80	69	81	96
90	79	91	106
100	90	101	116
110	100	111	126
120	109	121	136
130	119	131	146