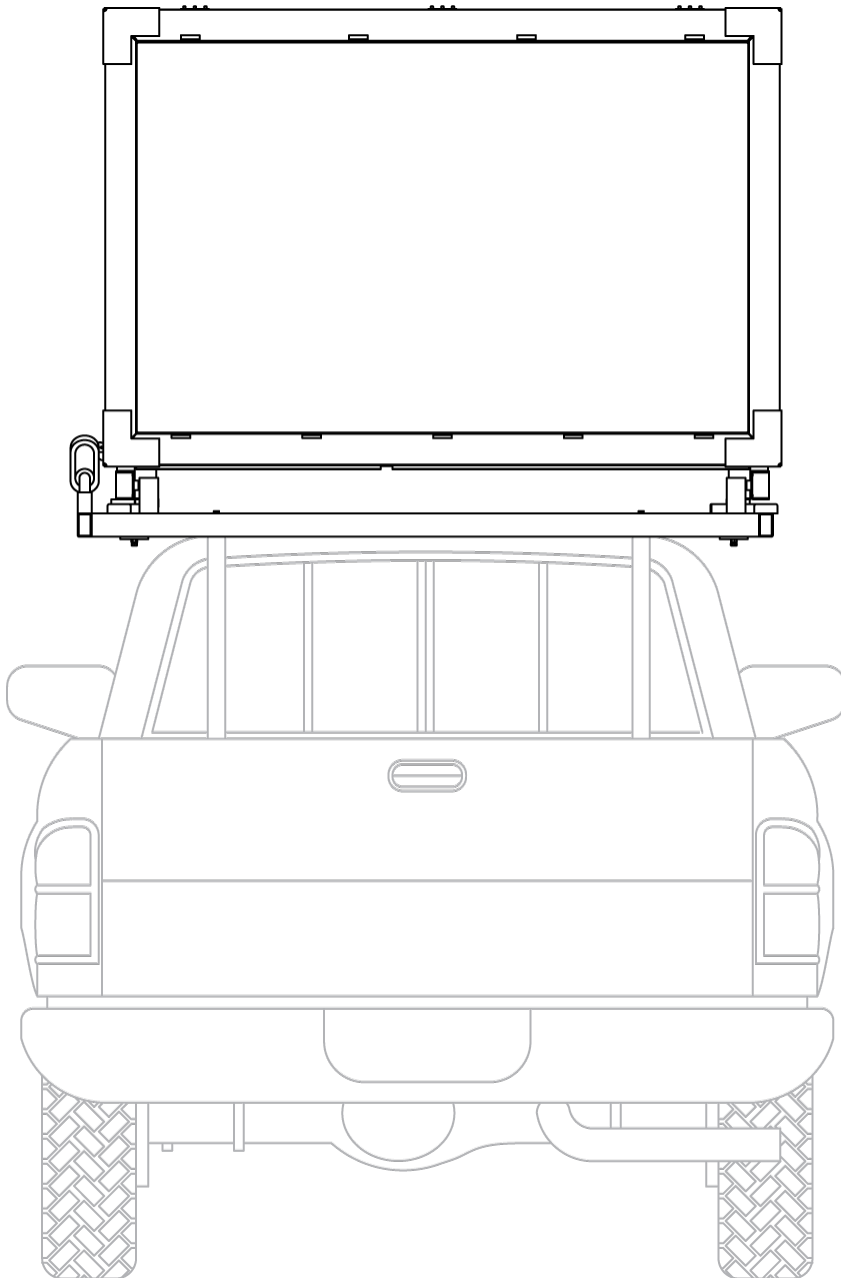




# TRUCK-MOUNT MESSAGE SIGNS

MODEL WVMB  
PRODUCT SPECIFICATIONS | FEBRUARY 2021



## 1. DESCRIPTION

- 1.1. Description
- Wanco truck-mount message signs feature a full matrix of LEDs for displaying highly legible messages from a moving or parked vehicle. The vehicle can move with a convoy while displaying the same detailed information that a stationary trailer or overhead changeable message sign would provide.
- These signs feature Wanco’s high-efficiency LEDs for reduced energy consumption, superior performance, and outstanding legibility. The full-matrix display can present messages as text, graphics, or a combination of both. Preprogrammed messages and graphics include a selection of bold arrow patterns. Creating custom messages is easy.
- An integrated low-profile tilt-frame is operated from inside the vehicle. When raised to vertical, the sign displays messages to motorists. When lowered to horizontal, the sign and frame are just 12 inches in height.
- The sign’s computer box and touchscreen controller are installed inside the truck cab. The controller is easy to use, and continuously shows the message displayed on the sign. A laptop or external controller is unnecessary, but a laptop can be connected if desired.
- Power is provided by the truck’s alternator system.
- 1.2. Models
- 1.2.1. WVMB-3LP Truck-mount matrix message sign with large display
- 1.2.2. WVMB-2LP Truck-mount matrix message sign with small display

## 2. FEATURES

- 2.1. Installation
- Sign with integrated tilt-frame installed as a single unit
  - Can be installed in a truck bed or over the cab
  - Wiring harnesses for simple cable connections
- 2.2. Operation
- Full-matrix display shows text, graphics or both
  - Preprogrammed extra-bold arrow patterns
  - Preprogrammed text messages, symbols and graphics
  - Multiple alphanumeric fonts
  - High-efficiency LED characters are bright, clear and legible
  - Optical lenses and sunshades increase visibility and improve performance
  - Energy-efficient operation reduces strain on vehicle batteries
  - Sign and tilt-frame operated from inside vehicle cab
  - Built-in RF immunity ensures reliable performance
  - Full-color touchscreen controller with high-resolution display installed inside cab
  - Continuous message preview on controller
  - Multi-level password protection restricts access to control software
  - NTCIP compliant

- 2.3. Maintenance
- Controller provides access to diagnostic information
  - Display cabinet door props open for servicing
  - Individual display modules can be replaced easily
  - Durable powder-coat finish resists the elements
- 2.4. Application
- Vehicle-mount signs are ideal for the following applications:
- Road striping convoys
  - Snow removal convoys
  - Road sweeping convoys
  - Pothole repairs
  - Crash cushion (TMA) trucks

### 3. DISPLAY

#### 3.1. Cabinet

- 3.1.1. Description
- Weather-resistant cabinet contains display modules and related electronics. Hinged door with full-size display window protects electronics and provides access for maintenance. Clasps hold door closed during operation and the door can be locked with user-supplied padlock.
- 3.1.2. Size
- |               |   |
|---------------|---|
| Large display | 73" x 49" x 6" (185 x 124 x 15cm) W x H x D |
| Small display | 73" x 37" x 6" (185 x 94 x 15cm) W x H x D  |
- 3.1.3. Material
- Aluminum sheet, 5052-H32, 0.062" (1.575mm) thick
- 3.1.4. Construction
- Panels are riveted together, with internal ribs to add lateral strength
- 3.1.5. Door
- Cabinet door is aluminum extruded frame with sheet metal corner brackets. Stainless steel butt hinges are bolted to top of cabinet and door.
- Window is anti-glare Lexan® solar-grade polycarbonate, 0.150" (3.81mm) thick. Bulb-type weather seal ensures tight fit and seal between window and door frame.
- When sign is in upright position, door fully opens to service the sign cabinet interior. Telescoping prop-slides, one on each side of the cabinet, hold door open.
- 3.1.6. Finish
- Cabinet and door are coated with oven-baked, powder-coat finish to ensure durability and corrosion protection. Cabinet is coated white on the outside, flat black on the inside; door is flat black. Assemblies are high-pressure phosphate-washed prior to finish coat.
- 3.1.7. Wiring
- Cable from display cabinet to computer box routed inside weatherproof flexible conduit
- 3.1.8. Storage
- When fully lowered for storage and transport, display cabinet is held stable and secure

### 3.2. Display matrix

3.2.1. Description The display matrix is comprised of a series of display modules laid out in a grid across the inside of the display cabinet. Each module has a matrix of LEDs installed on its face, which light up to show a portion of the configured message. Each module features the necessary electronics and coatings to ensure outstanding performance and durability.

#### 3.2.2. 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.
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

#### 3.2.3. Pixels

	Two LEDs form a "pixel"
Pixel size	0.75" x 0.75" (19 x 19mm)
Full matrix	Large sign: 48 pixels wide by 30 pixels high, 1440 pixels total  Small sign: 48 pixels wide by 20 pixels high, 960 pixels total
Display module	12 pixels wide by 10 high, 120 pixels total
Pixel pitch	34mm, horizontal and vertical

3.2.4.	LEDs	Technology	AllnGaP II (aluminum indium gallium phosphide) technology, T-1¼ 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)
3.2.5.	Lenses and visors		<p>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.</p> <p>With lenses and visors, display is always bright and readable in all lighting conditions.</p> <p>These enhancements enable the message sign to operate with approximately half the power consumption of other message signs. As a result, the system is fully functional using less power.</p>
3.2.6.	Viewing angle		Total viewing area with optical lenses, 50 degrees
3.2.7.	Brightness		Factory preset for optimal viewing and power consumption
3.2.8.	Auto dimming		<p>Two photocells detect ambient light on the message sign; the message sign computer adjusts the brightness of the LEDs accordingly, dimming display brightness in darkness, increasing to full brightness in daylight</p> <p>Photocells are mounted inside the sign cabinet, one facing rear and one facing front</p>
3.2.9.	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, preventing the message from shifting due to an individual module failure.
		Pixel test	Each module is equipped with individual pixel failure notification
3.2.10.	Fonts		<p>12 fonts</p> <p>See Exhibit A for font samples and additional font information</p>
		Default size	5 x 9 pixels (W x H), 6.80" x 12.15" (173 x 309mm) Large sign: 3 lines of 8 characters per line, maximum Small sign: 2 lines of 8 characters per line, maximum
		Smallest size	4 x 5 pixels (W x H)
		Largest size	Large sign: 11 x 23 pixels (W x H) Small sign: 9 x 14 pixels (W x H)
		Other sizes	See Exhibit A

### 3.3. Tilt-frame

- 3.3.1. Description Low-profile tit-frame is integrated with display cabinet, designed for installation on rigid support above vehicle cab or on truck bed
- Electrically operated, the tilt-frame allows the sign to be lowered into a horizontal (flat) position when not in use, for transport and storage; and raised to a vertical (upright) position when in use
- 3.3.2. Material All welded structural steel
- 3.3.3. Finish Frame is coated with oven-baked, flat black powder-coat finish to ensure durability and corrosion protection. Assembly is high-pressure phosphate washed prior to finish coat.
- 3.3.4. Actuator Electric actuator operates tilt-frame, allowing sign display to be raised and lowered  
Capacity, 1000 lbs. (453.6kg)

## 4. CONTROL SYSTEM

### 4.1. Computer

- 4.1.1. Description Self-contained computer comprises main motherboard and power control board, controls sign functions
- 4.1.2. Housing
- |                 |   |
|-----------------|---|
| Material        | 18ga steel  |
| Size            | 11.5" x 9.50" x 3.75" (29.1 x 24.1 x 9.5cm) W x H x D   |
| Finish          | Oven-baked, flat-black, powder-coat finish to ensure durability and corrosion protection; high-pressure phosphate-washed prior to finish coat. All parts powder-coated before assembly. |
| Mounting        | Welded mounting flanges; typically installed behind the seat inside vehicle cab   |
| Internal access | Top panel is bolted in place and can be removed for access to internal components   |
- 4.1.3. Temperature limits -40 to 176°F (-40 to 80°C)
- 4.1.4. Wiring
- One CPC connector for communications cable from message sign
- One CPC connector for power cable from vehicle alternator system  
(for wiring overview, see Exhibit C)
- 4.1.5. Ports
- One USB power/communication port for connection to controller
- One Ethernet communications port for optional connection to laptop computer or modem
- Two DB9 serial ports for connection to auxiliary devices

## 4.2. Controller

4.2.1.	Description	Touchscreen interface, connected to computer for programming and running sign display No laptop computer required, but a laptop with Wanco software can be connected in place of controller if desired	
4.2.2.	Touchscreen	Display	Full color, backlit, 7-inch display 800 x 480 pixels Display automatically shuts off after 10 minutes of inactivity
		Interface	Menu-based structure, accessed with virtual buttons on the touchscreen display, provides access to all sign functions including programming messages Virtual keyboard appears when required for text entry Multi-level password protection restricts access Day/night virtual button, changes contrast for use in bright or dim lighting conditions Message on sign is always shown while interface is active
4.2.3.	Housing	Backplate	Internal components mounted to aluminum backplate for rigidity
		Cover	Injection-molded PC/ABS
		Size	8.0" x 5.5" x 1.6" (20.3 x 14.0 x 4.1cm) W x H x D
4.2.4.	Mounting bracket	Designed for installation inside vehicle cab; typically installed under the dashboard Adjustable tilt and rotation allows user to face controller where desired	
4.2.5.	Wiring	Connected to computer with Ethernet cable	
4.2.6.	Power	Power supplied from vehicle alternator system (for wiring overview, see Exhibit C) Push-button on bottom of housing provides manual on/off control and interface activation after timeout Controller shuts down when vehicle power is switched off	
4.2.7.	Weight	1.6 lbs. (0.73kg)	
4.2.8.	Temperature limits	-4 to 158°F (-20 to 70°C)	
4.3.	Sign-tilt switch	Heavy-duty momentary toggle switch controls actuator for raising and lowering sign Integrated with controller mounting bracket Wired to actuator and vehicle alternator system (for wiring overview, see Exhibit C)	

- 4.4. PC boards
  - 4.4.1. Data ports 1 serial port, 2 USB ports, 1 Ethernet port
  - 4.4.2. Coating 100% coated with military-spec, low-VOC, silicone conformal coating to provide long-term protection against moisture and other atmospheric contaminants. Resists corrosion and shorts due to high humidity.
  - 4.4.3. Temperature limits -4 to 176°F (-20 to 80°C)
  - 4.4.4. Humidity limits Conformal coating rated to 95% relative humidity
- 4.5. Controller software
  - 4.5.1. Standards Fully NTCIP compliant
  - 4.5.2. Security Three levels of password protection
  - 4.5.3. Message programming Instant access to program new messages  
Extremely easy to program
  - 4.5.4. Message types
    - Quick-messages Easy quick-message activation
    - Permanent Over 90 preprogrammed permanent messages, including arrows and FHWA standards
    - Changeable 250 changeable messages stored in NV flash
    - Temporary 10 temporary or volatile messages, for ITS systems
    - Blank Easy sign blanking/power off
  - 4.5.5. Interface display WYSIWYG (What You See Is What You Get) while programming
  - 4.5.6. Text alignment Selectable: left, center, or right; and top, middle, or bottom
  - 4.5.7. Fonts Selectable: see Exhibit A
  - 4.5.8. Blinking
    - Each character can individually blink
    - Individual lines of a multi-line message can blink
    - The entire message can blink
    - Adjustable timing and duty cycle
  - 4.5.9. Message pages Maximum 10 sequential “pages” per message, sequencing speed from 0.1 to 25.5 sec.
  - 4.5.10. Scheduling Real-time clock and calendar with DST control



4.5.11. Arrow board functions Sign can display any of the following 12 full-size arrow functions

- Modes
- Flashing left or right arrow
  - Flashing double arrow
  - Flashing four-corner warning
  - Flashing caution-bar warning
  - Sequencing left or right stem arrow
  - Sequencing left or right walking arrow
  - Sequencing left or right chevron arrows
  - Alternating diamonds
- (for samples, see Exhibit B)

Bold graphics Each arrow and bar is 5 pixels wide

4.6. Troubleshooting Status and diagnostic menus provide message sign information to assist in troubleshooting

## 5. POWER SUPPLY

5.1. Description Computer, message display, controller, and actuator are powered by vehicle power system

5.2. Load Typical 8.4A @ 13.6Vdc  
Maximum 24.6A @ 13.6Vdc

5.3. Voltage Minimum 11.0Vdc  
Maximum 18.0Vdc

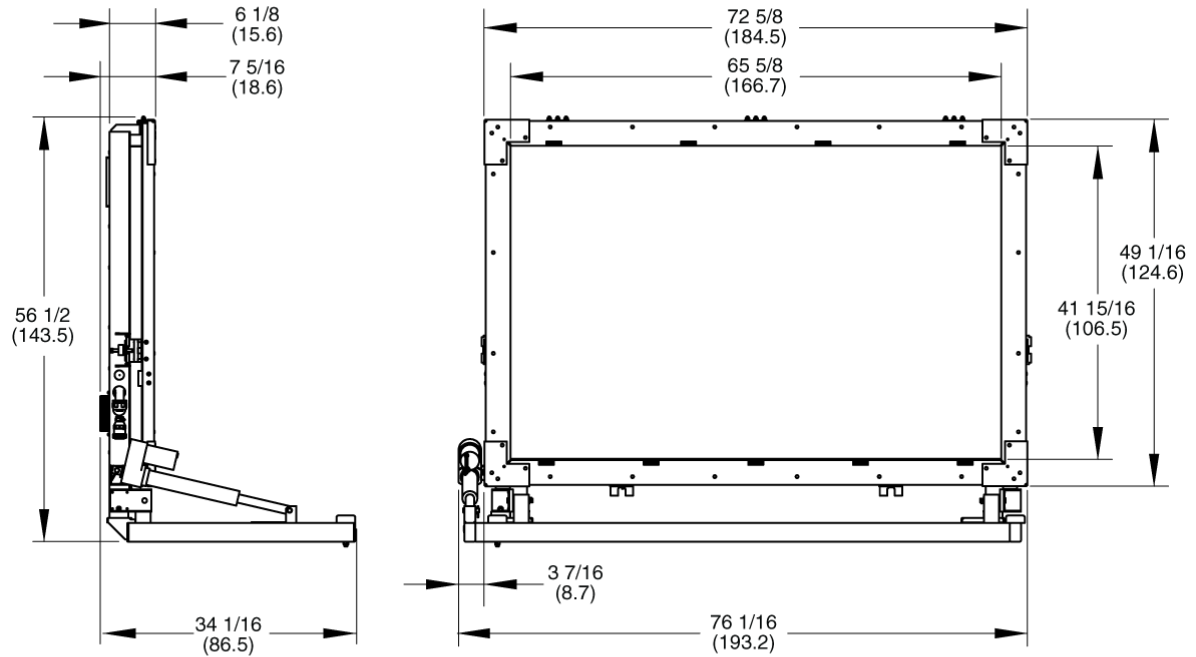
## 6. DIMENSIONS & WEIGHT

### 6.1. Dimensions

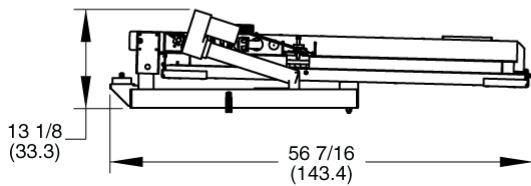
#### 6.1.1. Large sign

*inches*  
*(cm)*

##### Deployed



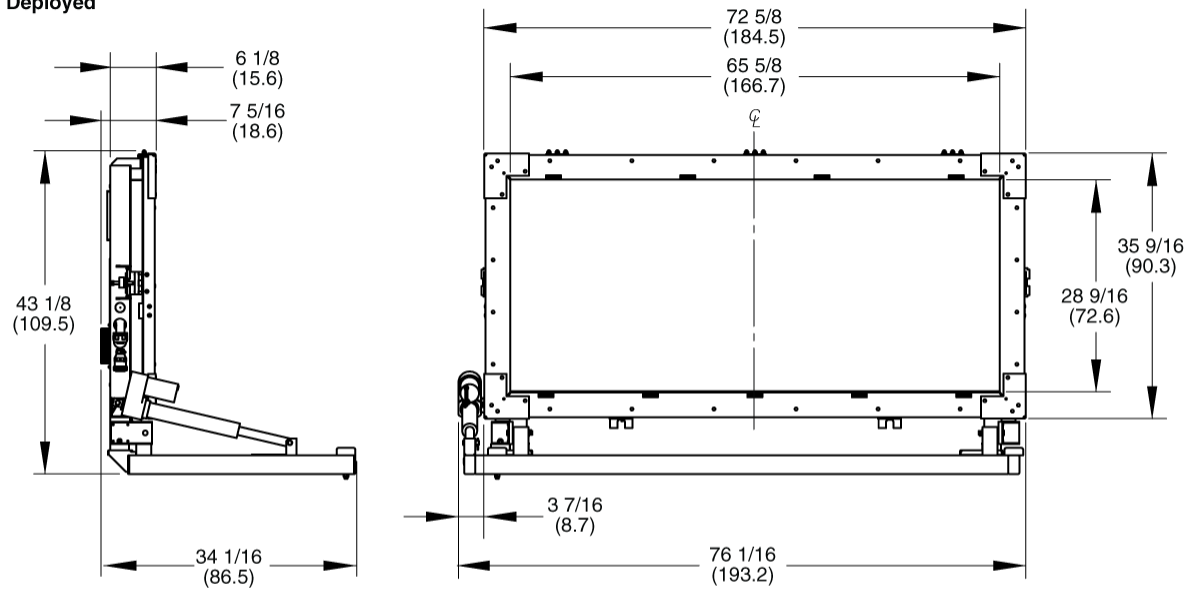
##### Travel position



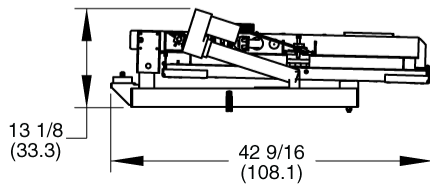
6.1.2. Small sign

inches  
(cm)

Deployed



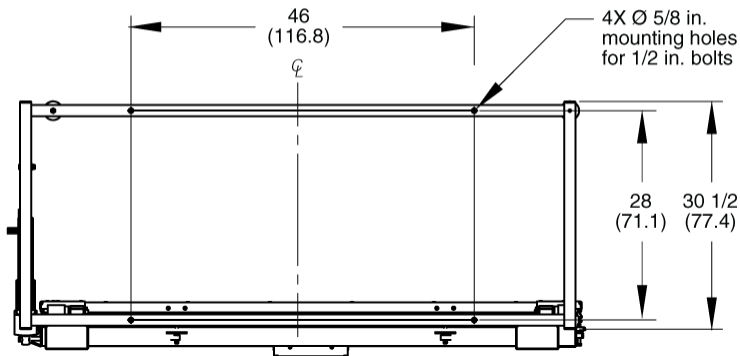
Travel Position



6.1.3. Mounting

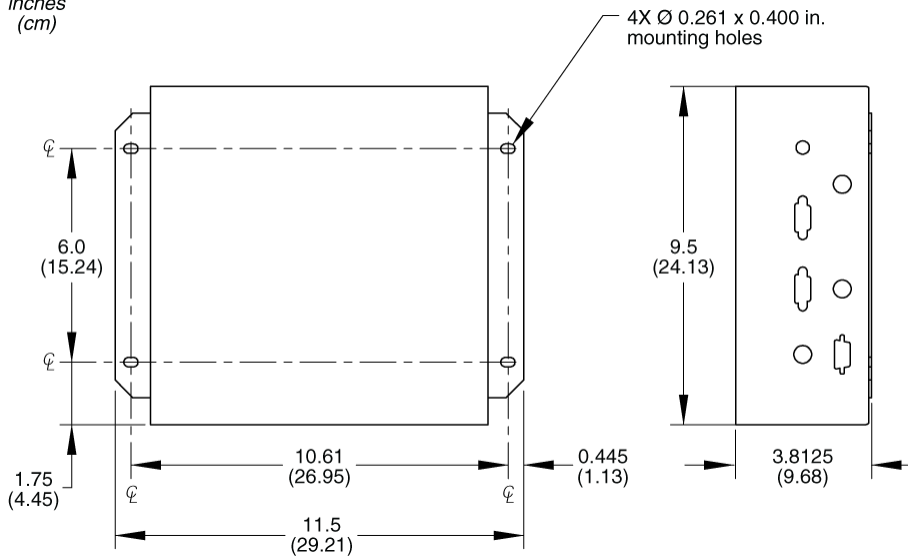
inches  
(cm)

Mounting holes



6.1.4. Computer box

inches  
(cm)



6.2. Weight

6.2.1. Large sign                      Approx. 265 lbs. (120kg) with integral tilt-frame

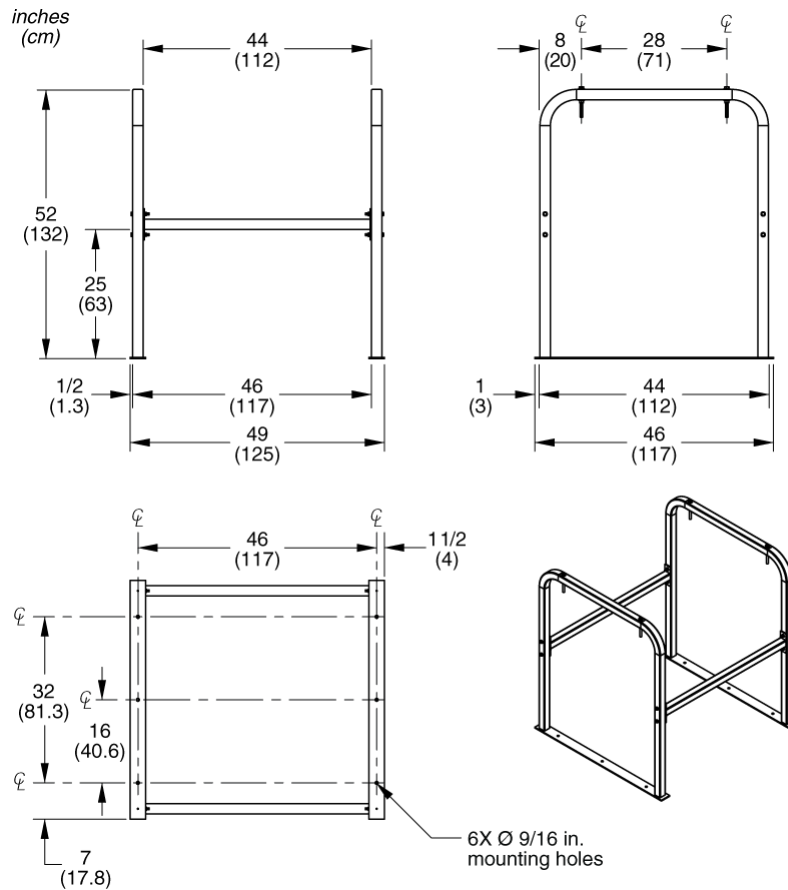
6.2.2. Small sign                        Approx. 220 lbs. (100kg) with integral tilt-frame

## 7. OPTIONS AND OPTIONAL EQUIPMENT

### 7.1. Tall mounting frame

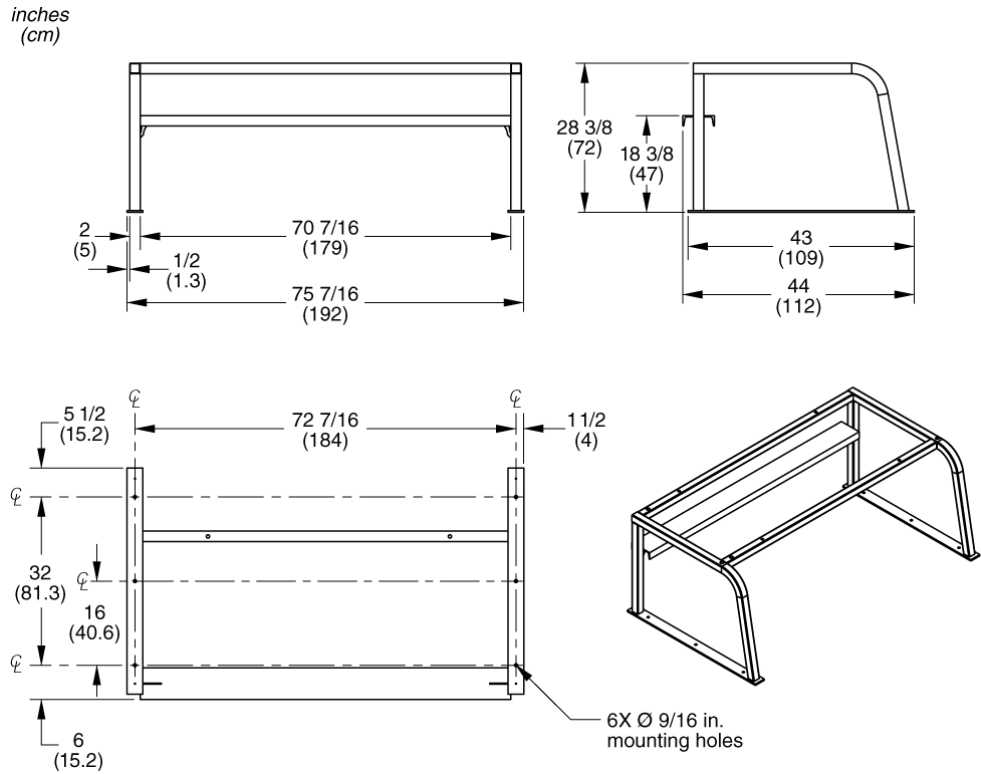
- 7.1.1. Description For use with pickup trucks, mounting frame raises message sign off truck bed.
- 7.1.2. Material Structural steel frame with flat bar steel base for mounting
- 7.1.3. Construction All welded tubing; sides and crossbars bolted together for final assembly
- 7.1.4. Finish Frame is coated with oven-baked, flat black powder-coat finish to ensure durability and corrosion protection. Assembly is high-pressure phosphate washed prior to finish coat.

#### 7.1.5. Dimensions



**7.2. Low mounting frame**

- 7.2.1. Description            Mounting frame raises message sign off service truck bed and includes C-channel for installing user-supplied light bar.
- 7.2.2. Material                Structural steel frame with flat bar steel base for mounting
- 7.2.3. Construction         All welded
- 7.2.4. Finish                 Frame is coated with oven-baked, flat black powder-coat finish to ensure durability and corrosion protection. Assembly is high-pressure phosphate washed prior to finish coat.
- 7.2.5. Dimensions           *inches*  
*(cm)*



**7.3. RemoteUI control software**

- 7.3.1. Description            The Wanco RemoteUI program allows operators to control the message board using a laptop computer or touchscreen device. The computer must be connected to the message sign; wireless access is not recommended.
- 7.3.2. Fleet limits             Connects to one sign at a time; maximum number of signs is unlimited
- 7.3.3. Security                Multi-level password protection
- 7.3.4. System requirements    Microsoft® Windows® (most versions) or Unix® operating system

## EXHIBIT A: MESSAGE FONTS

### Large sign



#### Font 1

5 x 9 pixels

Equivalent size: 6.80" x 12.15" (173 x 309mm)

Physical size: 6.10" x 11.46" (155 x 291mm)

Standard fixed-width font with lower-case letters

3 lines of 8 characters, maximum



#### Font 2

5 x 9 pixels

Equivalent size: 6.80" x 12.15" (173 x 309mm)

Physical size: 6.10" x 11.46" (155 x 291mm)

Standard fixed-width font with lower-case letters and increased horizontal spacing

3 lines of 6 characters, maximum



#### Font 3

6 x 9 pixels

Equivalent size: 8.14" x 12.15" (207 x 309mm)

Physical size: 7.44" x 11.46" (189 x 291mm)

Bold proportional font with 4x9-pixel capitals for lower-case letters

3 lines of 7 characters, typical



#### Font 4

6 x 11 pixels

Equivalent size: 8.14" x 14.83" (207 x 377mm)

Physical size: 7.44" x 14.14" (189 x 359mm)

Bold proportional font with lower-case letters and accented characters

2 lines of 6 characters, typical



#### Font 5

6 x 11 pixels

Equivalent size: 8.14" x 14.83" (207 x 377mm)

Physical size: 7.44" x 14.14" (189 x 359mm)

Bold proportional font with lower-case letters, accented characters, and increased spacing

2 lines of 6 characters, typical



#### Font 6

5 x 14 pixels

Equivalent size: 6.80" x 18.85" (173 x 479mm)

Physical size: 6.10" x 18.15" (155 x 461mm)

Tall fixed-width font with 5x8-pixel capitals for lower-case letters

2 lines of 8 characters, maximum

Large sign (continued)



**Font 7**

7 x 12 pixels

Equivalent size: 9.48" x 16.17" (241 x 411mm)

Physical size: 8.78" x 15.47" (223 x 393mm)

Bold fixed-width font with 6x8-pixel capitals for lower-case letters

2 lines of 6 characters, maximum



**Font 8**

7 x 23 pixels

Equivalent size: 9.48" x 30.89" (241 x 785mm)

Physical size: 8.78" x 30.20" (223 x 767mm)

Large fixed-width font with 6x14-pixel capitals for lower-case letters

1 line of 6 characters, maximum



**Font 9**

11 x 23 pixels

Equivalent size: 14.83" x 30.89" (377 x 785mm)

Physical size: 14.14" x 30.20" (359 x 767mm)

Large bold fixed-width font, capitals only (no lower-case letters)

1 line of 4 characters, maximum



**Font 10**

4 x 5 pixels

Equivalent size: 5.46" x 6.80" (139 x 173mm)

Physical size: 4.77" x 6.10" (121 x 155mm)

Mini proportional font with limited lower-case

4 lines of 9 characters, typical

10 characters per line, maximum



**Font 11**

7 x 10 pixels

Equivalent size: 9.48" x 13.49" (241 x 343mm)

Physical size: 8.78" x 12.80" (223 x 325mm)

Large fixed-width font, capitals only (no lower-case letters)

2 lines of 5 characters, maximum



**Font 12**

9 x 14 pixels

Equivalent size: 12.15" x 18.85" (309 x 479mm)

Physical size: 11.46" x 18.15" (291 x 461mm)

Large bold fixed-width font, capitals only (no lower-case letters)

2 lines of 3 characters, maximum



Small sign



**Font 1**  
5 x 9 pixels  
Equivalent size: 6.80" x 12.15" (173 x 309mm)  
Physical size: 6.10" x 11.46" (155 x 291mm)  
Standard fixed-width font with lower-case letters  
2 lines of 8 characters, maximum



**Font 2**  
5 x 9 pixels  
Equivalent size: 6.80" x 12.15" (173 x 309mm)  
Physical size: 6.10" x 11.46" (155 x 291mm)  
Standard fixed-width font with lower-case letters and increased horizontal spacing  
2 lines of 6 characters, maximum



**Font 3**  
6 x 9 pixels  
Equivalent size: 8.14" x 12.15" (207 x 309mm)  
Physical size: 7.44" x 11.46" (189 x 291mm)  
Bold proportional font with 4x9-pixel capitals for lower-case letters  
2 lines of 7 characters, typical



**Font 4**  
6 x 11 pixels  
Equivalent size: 8.14" x 14.83" (207 x 377mm)  
Physical size: 7.44" x 14.14" (189 x 359mm)  
Bold proportional font with lower-case letters and accented characters  
1 line of 6 characters, typical



**Font 5**  
6 x 11 pixels  
Equivalent size: 8.14" x 14.83" (207 x 377mm)  
Physical size: 7.44" x 14.14" (189 x 359mm)  
Bold proportional font with lower-case letters, accented characters, and increased spacing  
1 line of 6 characters, typical



**Font 6**  
5 x 14 pixels  
Equivalent size: 6.80" x 18.85" (173 x 479mm)  
Physical size: 6.10" x 18.15" (155 x 461mm)  
Tall fixed-width font with 5x8-pixel capitals for lower-case letters  
1 line of 8 characters, maximum

Small sign (continued)



**Font 7**

7 x 12 pixels

Equivalent size: 9.48" x 16.17" (241 x 411mm)

Physical size: 8.78" x 15.47" (223 x 393mm)

Bold fixed-width font with 6x8-pixel capitals for lower-case letters

1 line of 6 characters, maximum



**Font 8**

7 x 23 pixels

Does not fit on sign

**Font 9**

11 x 23 pixels

Does not fit on sign



**Font 10**

4 x 5 pixels

Equivalent size: 5.46" x 6.80" (139 x 173mm)

Physical size: 4.77" x 6.10" (121 x 155mm)

Mini proportional font with limited lower-case

3 lines of 9 characters, typical



**Font 11**

7 x 10 pixels

Equivalent size: 9.48" x 13.49" (241 x 343mm)

Physical size: 8.78" x 12.80" (223 x 325mm)

Large fixed-width font, capitals only (no lower-case letters)

1 line of 5 characters, maximum



**Font 12**

9 x 14 pixels

Equivalent size: 12.15" x 18.85" (309 x 479mm)

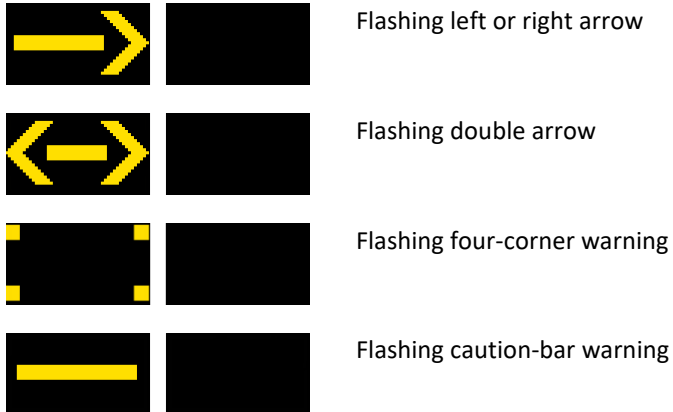
Physical size: 11.46" x 18.15" (291 x 461mm)

Large bold fixed-width font, capitals only (no lower-case letters)

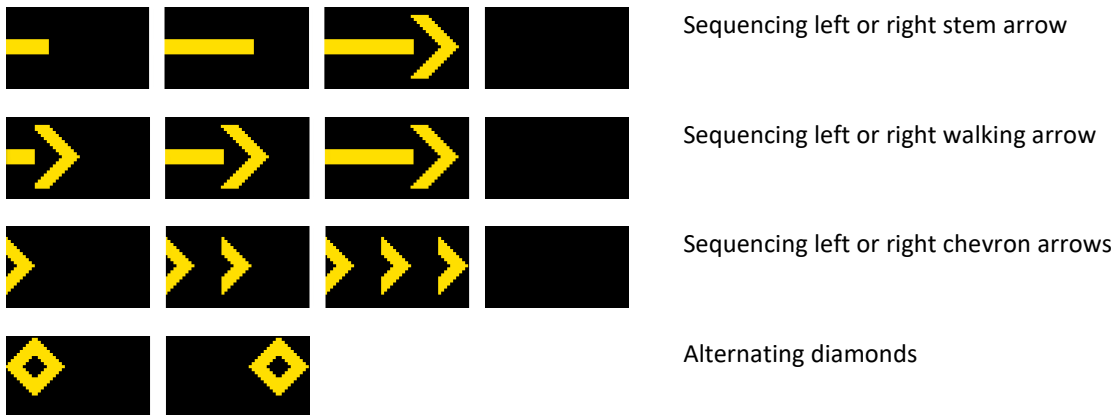
1 line of 3 characters, maximum

## EXHIBIT B: ARROW BOARD FUNCTIONS

### Flashing patterns



### Sequential patterns



**EXHIBIT C: SYSTEM WIRING OVERVIEW**

