



5870 Tennyson St  
Arvada, CO 80003-6903

Phone: (303) 427-5700  
Fax: (303) 427-5725  
Email: info@wanco.com

## FULL-MATRIX VARIABLE MESSAGE SIGN MODEL WTMMB-CAN SOLAR-ASSISTED TRAILER

### TECHNICAL SPECIFICATIONS

(Last revised October 31, 2012)

The Wanco WTMMB-CAN portable variable message sign is capable of displaying symbols, and text messages utilizing five different colors. The model WTMMB-CAN message sign uses state-of-the-art technology to achieve the best visibility and the least power consumption of any portable variable message sign. It has a telescoping tower assembly that rotates 360 degrees along with an independent solar panel tray that tilts and rotates allowing for optimal panel positioning.

#### 1. DISPLAY CABINET

- |             |                      |   |
|-------------|----------------------|---|
| 1.1.        | Cabinet size         | 146.2" (371,35cm) wide x 82.1" (208,53cm) high x 6.6" (16,76cm) deep<br>Display cabinet uses a frosted screen to reduce glare.                        |
| 1.2.        | Display matrix       | Full-matrix, 56 pixels wide x 30 pixels high, 1680 pixels total   |
| 1.3.        | Characters           | Standard size: 8x10 pixels, 15.5" high (39,37cm)  |
| 1.4.        | Storage              | Sign cabinet stores parallel with the trailer length in two cradles, no pins required   |
| <b>1.5.</b> | <b>Construction</b>  |   |
| 1.5.1.      | Cabinet material     | Aluminum sheet, 5052-H32, 0.062" (1,575mm) thick  |
| 1.5.2.      | Cabinet construction | All panels riveted together, cabinet has internal ribs to add lateral strength  |
| 1.5.3.      | Cabinet coating      | Interior and exterior has flat black powder-coating, exterior has safety orange powder-coating, oven-baked for added durability and corrosion         |
| 1.5.4.      | Door                 | Single-piece construction, hinged at top for easier servicing of sign   |
| 1.5.5.      | Door material        | Aluminum extruded frame with sheet metal corner brackets  |
| 1.5.6.      | Door coating         | Flat black powder-coating, oven-baked for added durability and corrosion  |
| 1.5.7.      | Window               | Lexan <sup>®</sup> solar-grade polycarbonate, 0.150" (3,81mm) thick<br>Bulb-type weather seal ensures tight fit and seal between window and extrusion |
| 1.5.8.      | Serviceability       | When sign is in stored position, door fully opens for servicing the sign cabinet  |
| <b>1.6.</b> | <b>Hardware</b>      |   |
| 1.6.1.      | Hinges               | Stainless steel butt hinges, bolted to top of cabinet and door assembly   |
| 1.6.2.      | Door supports        | Sides of door have telescoping prop slides to hold door open for servicing  |

1.6.3.	Cooling system	<p>Two cooling fans, located at top of cabinet, circulate air through the cabinet to keep electronic components from overheating; duct at top of cabinet ensures even airflow</p> <p>Temperature sensor mounted on photocell board controls fans; each fan has different thermal settings, which can be adjusted (so it will not waste battery power) using the onboard computer</p> <p>It is proven that electronic components, including LEDs, degrade in extreme heat conditions. Without the cooling fans the message board cabinet interior can reach more than 200 degrees Fahrenheit.</p>
<b>1.7. Wiring</b>		
1.7.1.	Type	All harnesses are modularized for ease of servicing; all wiring terminates at a single terminal strip inside sign cabinet
1.7.2.	Display cards	All character boards have quick-connect connectors for easy service
1.7.3.	Certification	All connectors and procedures are per CSA standards
1.7.4.	Protection	Wiring service loop from computer box to sign is routed inside liquid-tight loom and P-clamped to trailer frame; service loop length designed for 360-degree sign rotation
<b>2. DISPLAY CARDS</b>		
<b>2.1. Physical characteristics</b>		
2.1.1.	Character size	Nominal 19.63" (49,86cm) wide x 24.63" (62,56cm) high
2.1.2.	Pixel type	4 LEDs per pixel
2.1.3.	Number of pixels	On each display card: 8 pixels wide x 10 pixels high; 80 pixels total
2.1.4.	Pixel size	15/16" (2,38cm) Square
2.1.5.	Material	FR4 material, 0.093" (2,362mm) thk., double-sided, black solder mask with white silkscreen, copper size 2 oz. (56,7g)
2.1.6.	Coating	100% coated with Dow Corning 1-2577 Low-VOC mil-spec silicone conformal coating, 1 to 2 mil thick, to protect against corrosion and shorts due to high humidity
2.1.7.	Temperature limits	Operating: -40 to 176°F (-40 to 80°C)
2.1.8.	Humidity limits	Conformal coating rated up to 95% relative humidity
2.1.9.	Vibration mounts	Each display card (character board) is mounted to inside of sign cabinet with four rubber vibration isolators, which decreases physical shock to each character board during transport and isolates characters from chassis ground
<b>2.1.10.</b>	Program chip	A program chip is reprogrammable to allow for software revisions
<b>2.2. Photocell dimming</b>		
2.2.1.	Purpose	Two photocells track the level of ambient light on the message sign and, in conjunction with the computer, adjust the brightness to the LEDs: the brighter the ambient light, the brighter the LEDs, and vice versa.
2.2.2.	Location	Photocells are mounted inside the sign cabinet, one facing rear and one facing front
<b>2.3. Software design</b>		
2.3.1.	Addressing	Each display card address is selected through a software command and does not change until reprogrammed; no dipswitches are used. This

		approach prevents the message from shifting due to an individual character failure.
2.3.2.	Pixel test	Each character is equipped with individual pixel failure notification
<b>3.</b>	<b>CONTROL CONSOLE</b>	
3.1.	Computer	Self-contained onboard computer for programming and running sign display; no laptop computer required to program or run displays.
3.2.	Location	Centered on front of trailer frame
<b>3.3.</b>	<b>Control interface</b>	
3.3.1.	Operation	Easy-to-follow i
3.3.2.	LCD Display	
	Type	Dot matrix, 160 wide by 128 high
	Backlighting	Yellow-green LED
	Contrast adjustment	adjustable rotary switch
	Power button	push button to power on/off
	Activation	A toggle switch activated the LED display and Keyboard
<b>3.4.</b>	<b>PC boards</b>	
3.4.1.	Master computer board	
	Type	High efficiency micro-controller
	Size	8.75" (22.23cm) wide x 6.25" (15.88cm) high
	Connectors	Keyed and labeled for easy serviceability
	Protections	Reverse polarity and over current protected
	Memory capacity	256MB NAND flash memory; 64 MB SDRAM
	Construction	Multilayer PC board with surface-mounted components
	Ports	5 serial ports; 2 USB
	Keyboard port	ISA 101 keyboard USB
	Real time clock	Battery backed with 20-year battery
	Reset indicator	Amber LED
	Active indicator	Green LED
	Power Fault	Red LED
	Coating	100% coated with mil-spec conformal coating to protect against corrosion and shorts due to high humidity; rated for 95% relative humidity
	Temperature rating	-4 to 176°F (-20 to 80°C)
3.4.2.	Power board	
	Function	Monitors and controls environmental parameters of message sign; slave to master computer board
	Type	High-efficiency microcontroller with analog conversion
	Size	8.50" (21.59cm) wide x 3.13" (7.95cm) high
	Connectors	Keyed and labeled for easy serviceability

	Board protection	Reverse polarity, over-current protected, overvoltage/overcurrent protected
	System protection	Replaceable automotive-style fuses for battery and solar panel circuits
	Current monitoring	Monitors the solar panel charging current as well as sign output current
	Construction	Multi-layer PCB with surface-mounted solid-state circuitry; no mechanical relays
	Coating	100% coated with mil-spec conformal coating to protect against corrosion and shorts due to high humidity; rated for 95% relative humidity
	Temperature rating	-4 to 176°F (-20 to 80°C)
3.4.3.	Switch board	
	Function	Auxiliary interface and status indicator board, eliminates excessive wiring
	Size	3.38" (8.59cm) wide x 3.00" (7.62cm) high
	Connectors	Keyed and labeled for easy serviceability
	LED indicators	Indicates "ON" conditions (i.e., battery saver shutdown, sign powered, radar powered, schedule program activated); actual LEDs depend on selected options
	Protection	Over-current replaceable fuse
	Coating	100% coated with mil-spec conformal coating to protect against corrosion and shorts due to high humidity; rated for 95% relative humidity

#### 4. CONTROLLER SOFTWARE

4.1.	Type	Fully NTCIP compliant
4.2.	Password protection	Three levels of password protection
4.3.	Messaging	
4.3.1.	Quick messaging	Instant new quick message programming, extremely easy to program a message Rapid message selection from groups of preprogrammed messages One-touch sign blanking/power off
4.3.2.	Permanent messages	Over 90 preprogrammed permanent messages, including arrows and FHWA standards
4.3.3.	Changeable messages	150 changeable messages stored in NV flash
4.3.4.	Temporary messages	10 temporary or volatile messages, for ITS systems
4.3.5.	Frames	Maximum 10 frames per sequence
4.3.6.	Fonts	Standard MTO-2 font
4.3.7.	Arrow board functions	Sign can display the following full size arrow functions
	Number of modes	12
	Type	Single flashing left or right arrow Sequencing left or right arrow Sequencing stem left or right arrow Chevron left or right arrows Four-corner caution warning

		Caution bar warning Alternating diamonds
	Bold graphics	Each arrow and bar is 5 pixels wide
4.3.8.	Message preview	LCD shows operator a preview of new message before sending it to sign

## 5. TRAILER CONSTRUCTION

5.1.	Frame material	Rectangular steel tubing, 2" x 3", 11ga wall thickness
5.2.	Tie-down loops	5 provided to aid in shipping
5.3.	Axle assembly	52000 lb. capacity with a 6 on 5.5" B.C. idler hub.
5.4.	Tires	ST205/75D15 trailer tires, (15" diameter)
5.5.	Fenders	"Jeep" style, full wheel coverage with inner splash panel on each fender. Fenders are bolted to trailer frame
5.6.	Material	16ga steel
5.7.	Coating	Powder-coated and oven-baked for added durability and corrosion
5.8.	Taillight cable	Sealed molded cable assembly plugs drawbar wiring into trailer wiring

### 5.9. Stabilizer legs

5.9.1.	Standard jacks	Four 2000 lb. (907kg) capacity swivel jacks with foot pad, located on each corner of the trailer
5.10.	Lights	The trailer is equipped with lights and reflectors in accordance with special provision No. 685S06  A lighted license plate light and holder is mounted on the battery box
5.11.	Reflective tape	Rear trailer frame has red/white reflective conspicuity tape for increased visibility
5.12.	Reflectors	Two amber reflectors on each side near the front; two red reflectors on each side near the rear

### 5.13. Drawbar assembly

5.13.1.	Coupler	hydraulic surge brake with 3" (7.6cm) pintle ring
5.13.2.	Jack	side-wind swivel with caster wheel, 1200 lb. (544kg) capacity

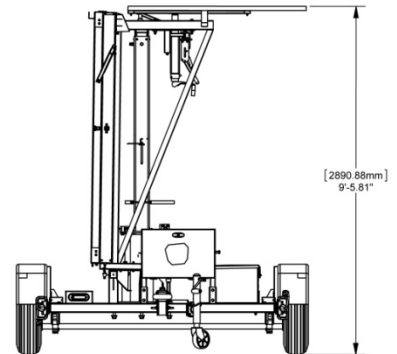
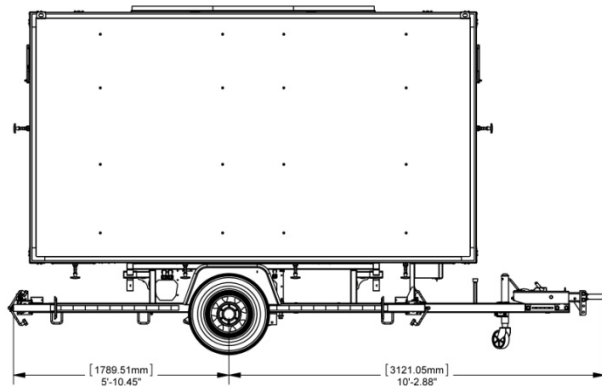
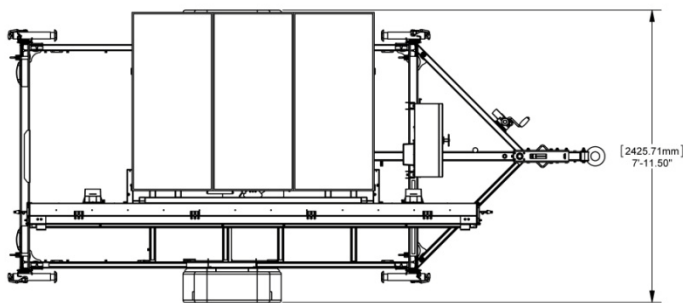
## 6. TOWER ASSEMBLY

6.1.	Type	A hydraulic cylinder raises the message sign; the sign can rotate 360 degrees
6.2.	Telescoping height	Sign can be telescoped upward to 7 feet (2.13m) from bottom of sign to ground;
6.3.	Sign rotation	Tower rotates 360 degrees and can be locked in any position using its brake mechanism, a mechanical friction brake caliper; tension on caliper is adjustable for maximum clamping force
6.4.	Tower material	Tower made from square steel tubing with zinc-plated inner section
6.5.	Sight tube	A sight tube for aiming the message sign to desired location is located on the tower mast
6.6.	Locking pin	A manually inserted pin locks the inner tower section in the up position, preventing the tower from falling.

- 6.7. Hydraulic cylinder      A hydraulic cylinder raises and lowers the sign case and solar panel tray
- 6.7.1. Brake                      Safety friction brake prevent message sign from falling should operator loose grip on winch handle

**7. DIMENSIONS AND WEIGHTS**

- 7.1. Approximate weight      3800 lbs. (1723kg)



**8. POWER / CHARGING SYSTEM**

- 8.1. Type                              The message board unit operates from a 12VDC power system
- 8.2. **Battery box**
- 8.2.1. Type                              Riveted all-steel construction, all parts powder coated before assembling
- 8.2.2. Location                              Left side of trailer centered over axle

8.2.3.	Latches	Dual latches secure lid closed, lockable with padlocks
8.2.4.	Ventilation	Sides of the battery box are louvered for cross ventilation; batteries may be charged with lid closed and locked
8.2.5.	Standard batteries	
	Type	4D AGM
	Number	four
	Voltage	12VDC
	Wet weight	130 lb each
	Bank capacity	800 Ah
<b>8.3.</b>	<b>Remote Charger</b>	
8.3.1.	Location	Inside battery box on divider opposite batteries
8.3.2.	Output volts	13.4VDC
8.3.3.	Output capacity	75A
8.3.4.	Watts (output)	1000W continuous
8.3.5.	Input voltage	108VAC to 132VAC
8.3.6.	Frequency	50/60 Hz
8.3.7.	Cooling	Fan cooled when charger temperature reaches 35°C
8.3.8.	Protection	Automotive style replaceable fuses; four-stage smart charging circuit will not overcharge batteries
<b>8.4.</b>	<b>Solar panels</b>	
8.4.1.	Type	High-efficiency multi-crystal photovoltaic module
8.4.2.	Number of modules	3
8.4.3.	Location	Behind message sign, over tower; array lies flat, rises with message sign, tilts and rotates independently of sign message sign; no shadowing affect of any trailer component
8.4.4.	Max. system power	390W total power
8.4.5.	Max. system current	9.5A
8.4.6.	Max. voltage	17.9V
8.4.7.	Open short circuit current	10.3A
8.4.8.	Open short circuit voltage	21.8V
8.4.9.	Regulation	Solar panels regulated by message board controller power board.
8.4.10.	Security	Solar panel array bolted to cabinet frame with security screws and special security nut; tool nut for array mounted inside computer control console