



State of West Virginia  
 Department of Administration  
 Purchasing Division  
 2019 Washington Street East  
 Post Office Box 50130  
 Charleston, WV 25305-0130

# Request for Quotation

RFQ NUMBER
708EC007

PAGE
1

ADDRESS CORRESPONDENCE TO ATTENTION OF
MICHAEL AUSTIN 304-558-2402

VENDOR

Precision Solar Controls  
 WORK AREA PROTECTION  
 1310 WILDWOOD DRIVE  
 WOOSTER OH 44691

SHIP TO

DIVISION OF HIGHWAYS  
 EQUIPMENT DIVISION  
 ROUTE 33  
 BRUSHY FORK ROAD  
 BUCKHANNON, WV  
 26201 304-472-1750

DATE PRINTED 12/20/2007	TERMS OF SALE NET 30	SHIP VIA Best way / Truck	F.O.B Destination	FREIGHT TERMS No Charge
BID OPENING DATE: 01/03/2008			BID OPENING TIME	01:30PM

LINE	QUANTITY	UOP	CAT NO	ITEM NUMBER	UNIT PRICE	AMOUNT
				ADDENDUM #5		
				THE ATTACHED REVISED SPECIFICATIONS REPLACES THE PREVIOUS SPECIFICATIONS INCLUDING ADDENDUM #3 IN ITS ENTIRETY.		
				BID OPENING DATE AND TIME CHANGED		
				FROM: 12/27/07 AT 1:30 P.M.		
				TO: 01/03/08 AT 1:30 P.M.		
				NO OTHER CHANGES		
0001	1	EA		550-96	\$18,895.00	\$18,895.00
				TRAILER MOUNTED SOLAR POWERED MESSAGE BOARD		
				***** THIS IS THE END OF RFQ 708EC007 ***** TOTAL:		\$18,895.00

SEE REVERSE SIDE FOR TERMS AND CONDITIONS		
SIGNATURE <i>M.E. Territory Mgr</i>	TELEPHONE 330-621-1678	DATE 01-02-2008
TITLE M.E. Territory Mgr	FEIN 752-31-2461	ADDRESS CHANGES TO BE NOTED ABOVE

WHEN RESPONDING TO RFQ, INSERT NAME AND ADDRESS IN SPACE ABOVE LABELED 'VENDOR'

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
EQUIPMENT DIVISION  
PROCUREMENT SPECIFICATIONS  
NO. 843-1-F

OPEN END CONTRACT

**FULL MATRIX  
TRAILER MOUNTED SOLAR POWERED MESSAGE BOARD**

1.0 PURPOSE

It is the purpose of these specifications to describe a Trailer Mounted Solar Powered Message Board – Full Matrix (hereinafter referred to as a “unit”) to be purchased for use by the West Virginia Division of Highways (DOH) on an Open End Contract basis.

2.0 BIDDING PROCEDURES

**The current purchasing procedures regarding bidding as established by the Department of Administration, Purchasing Division, shall apply.** Failure to submit the "Request for Quotation" forms, complete in its entirety and according to directions indicated, may subject the bidder to disqualification. **Each bid submitted shall also be accompanied by a Bidder's Evaluation Report completed in detail.** Addendums in order, along with exception sheets, should be with Bidder's Evaluation Report. **FAILURE TO SUBMIT THE BIDDER'S EVALUATION REPORT, COMPLETE IN ITS ENTIRETY, MAY RESULT IN AUTOMATIC DISQUALIFICATION.**

3.0 SPECIFICATIONS

The specifications named herein, mandatory and non-mandatory, establish the acceptable level of quality only and are not intended to reflect a preference or favor any particular brand or vendor.

3.1 EXCEPTIONS TO NON-MANDATORY SPECIFICATIONS

Exception to a non-mandatory unit specification may be made by the bidder, providing the exception is not available from the manufacturer. **Any such exception must be noted on the bidder's evaluation report and should be accompanied by supporting documentation/literature from the manufacturer. A summary of exceptions must be prepared by vendor on a separate attachment to the bidder's evaluation report labeled as "Exceptions to Specifications" and should be provided with the bid.** The state reserves the right to determine whether the stated exception does or does not reduce the quality and performance of the unit. Failure to provide information for any exceptions may be grounds for rejection of the bid. The state reserves the right to waive minor irregularities in bids or specifications in accordance with §148-1-4(f) of the WV Legislative Rules and Regulations.

### 3.2 MANDATORY SPECIFICATIONS

**All specifications preceded by "shall and/or must" or are stated as a "minimum and/or maximum" are mandatory. Any bid failing to meet any mandatory item shall be immediately disqualified.** Failure to respond in the appropriate evaluation section may also be grounds for immediate disqualification at the discretion of the State.

A mandatory pre-bid conference is scheduled for this equipment purchase as stated in the RFQ. Vendors having products with variations or exceptions in specified mandatory items are expected to address any such variations or exceptions during the pre-bid conference. The State shall review and consider any such variation or exception, and may at its sole discretion, issue an addendum to change mandatory specifications deemed to be in the State's best interest. **Bids from any vendor failing to attend the mandatory pre-bid shall be disqualified. Bids containing any variation or exception to a mandatory specification that was not addressed during the pre-bid conference and accepted by the issuance of an Addendum shall be disqualified.**

### 4.0 REPRESENTATIVE UNIT FOR TEST

**The successful vendor must (if specified) provide DOH one (1) completed representative unit to be observed and evaluated on each order to insure compliance with specification. If requested, the time period for testing and evaluation shall be seven (7) working days following receipt of the unit.** DOH will incur no obligation for deterioration of surfaces, finishes, seals, and mechanical or electrical parts on the unit resulting from operation and testing within the limits of these specifications; nor will DOH incur obligation for damage to the unit resulting from failure to meet specifications when due care and attention is given by DOH and testing is done within the limits of these specifications. **Failure of the pilot unit to satisfactorily meet specifications as bid shall be cause for cancellation of the purchase order, and return of the delivered unit along with all associated equipment to the vendor at the vendors expense.**

### 4.1 CONDITION OF UNIT(S) UPON DELIVERY

**All units must arrive at the prescribed delivery point having been completely preserviced with oil, lubricants, and coolant.** All prescribed precautions pertaining to first operations and break-in of the unit are to be posted conspicuously on the unit for ready observance by the operator.

### 4.2 DELIVERY

Delivery point of the completely assembled representative unit will be the DOH, Equipment Division, Route 33 at Brushy Fork Road, Buckhannon, West Virginia (26201).

The vendor is responsible for guaranteeing delivery of the completed units within the time specified and agreed to by the State. Delivery is preferred within 120 days. The vendor is responsible for establishing and coordinating delivery terms with allied manufacturers or suppliers. **Delivery terms shall be stated in the bid and the State reserves the right to accept or negotiate such terms.** Failure to reach an agreement may result in rejection of the bid. **The successful bidder shall provide their**

**manufacturer's confirmation of the order to the WVDOH contact person within seven (7) working days after receiving the approved purchase order.**

**A completed pilot model for inspection must be provided within 30 calendar days after the date of the purchase agreement by the successful vendor.**

Delivery is an integral part of this specification and failure to comply will be cause to initiate a D.O.T. Administrative Form WV-82, Vendor Performance Form. The WV-82 Form will provide a means of officially notifying the Purchasing Division and the vendor of unsatisfactory performance; such as late deliveries, poor service, inadequate parts supplies, etc.

The decision to initiate subject Form will be at the sole discretion of the D.O.H. Commissioner's established Equipment Review Board.

Issuance of the WV-82 Vendor Complaint Form on unsatisfactory delivery against any vendor will be cause to refuse to consider similar items from those vendors on future Request For Quotations.

(NOTE: Delivery time could be altered due to labor strikes, severe inclement weather conditions, etc.)

5.0 AWARD CRITERIA

5.1 DOH will recommend the award in accordance with the RFQ evaluation criteria described in the requisition. **The award shall be made to the lowest unit cost vendor that meets or exceeds the specifications.**

**Prices for the units shall be in quantities of 1-5, 6-10, 11 and over.** However, for evaluation purposes, we will use quantities 1-5. DOH reserves the right to place multiple orders in any quantity.

6.0 SPECIFICATIONS AND GUIDELINES - GENERAL

6.1 IDENTIFICATION OF THE UNIT BEING PROPOSED

**The bidder must identify the unit by manufacturer, model, series, and year of manufacture, in the bid to enable identification by DOH in the manufacturer's specifications of the proposed unit.** The bidder will submit complete descriptive literature of the proposed unit, to establish that the bid is the manufacturer's most current model, including latest engineering improvements, which have been, or will imminently be, regularly advertised and sold on the open market. The unit specified herein and offered to be manufactured after January 1, 2008 and be clearly identified and marked with date of manufacture.

6.2 OPERATING AND SERVICE MANUALS AND PARTS LISTS

**An operator's manual must be included with each unit upon delivery.** A "line sheet" (if applicable) and Equipment Preventative Maintenance Questionnaire (as shown in X6.2 of the Bidder's Evaluation Report) **must be with pilot unit upon delivery.** **In addition, there must be 12 service, shop, or maintenance manuals; ten (10) to be distributed to the Districts and two (2) for the Equipment Division. Also, there must be**

14 parts manuals; ten (10) to be distributed to the Districts and four (4) for Equipment Division use. CD ROM is preferred in lieu of parts manuals.

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\* **NOTE: MANUALS SHALL BE DELIVERED UPON COMPLETION OF DELIVERY OF TOTAL UNITS. FAILURE TO DO SO WILL DELAY PAYMENT.**

### 6.3 TRAINING:

Manufacturers and/or dealers will be required to stage a thorough seminar on the subjects of Preventative Maintenance, Operator and Mechanic Training. **In order to keep the operators and mechanics updated, the successful vendor shall conduct training with each purchase order against this open end contract.** Training is preferred within 2 working days after delivery of the pilot unit on the individual purchase order.

**Manufacturers and/or dealers shall be required to furnish the Training Academy with one (1) Operator's Manual to be shipped direct to Letha Lamb, WVDOH Training Academy, Post Office Box 610, Buckhannon, West Virginia 26201 prior to delivery of the pilot.**

The seminar to be held at the W. Va. Division of Highways, Equipment Division, Buckhannon, West Virginia.

### 6.4 PREVENTIVE MAINTENANCE AND OPERATOR PROCEDURES:

Manufacturers and/or dealers will be required to submit to the Equipment Division, in addition to the operating and service manuals, booklets and pamphlets explaining the Preventive Maintenance and Operator Procedures to be used by the operators of this equipment, **and must include such things as daily prestart inspection procedure, service schedule, and routine maintenance required, safety precautions, etc.**

**The successful vendor shall furnish all training aids; i.e., videos, projectors, etc. required in conducting the training.**

### 6.5 WARRANTY AND SERVICE POLICY

The Manufacturers warranty or service policy is to apply to the unit. Such warranty or service policy is to be recognized at any authorized unit dealer, representing manufacturer of proposed unit throughout the State of West Virginia. The applicable warranty or service policy will not be contingent upon obtaining routine service, lubrication, and servicing of the unit from factory authorized agencies. It will be the responsibility of the bidder to have available labor to repair or replace any defective replacement parts, components and materials, and to have available those replacement parts, components, and/or materials found to be defective during the terms of the warranty period. The bidder should state the labor rates, locations where parts will be stocked, availability of parts, and discounts offered for parts, when terms of the warranty offer a pro-rated cost for parts and labor. In addition, the successful bidder should offer field work to repair or replace defective parts, components, and materials found to be defective during the terms of the warranty and should provide mechanic's travel rates, mileage charges, field mechanic rates, and any surcharge for miscellaneous items, if

applicable, for field work during the warranty period. Submit to Division of Highways any technical or engineering improvements during the term of the warranty. **The unit must be accompanied upon delivery by the unit's manufacturer's executed warranty or service policy.**

**A mandatory minimum two (2) year bumper to bumper basic parts and labor warranty is required for this unit.**

**THE "WARRANTY AND SERVICE POLICY QUESTIONNAIRE" ATTACHED IN THE BIDDER'S EVALUATION REPORT MUST BE COMPLETED IN ITS ENTIRETY AND SUBMITTED WITH YOUR BID. (SEE SECTION X6.5 OF BIDDER'S EVALUATION REPORT).**

Parts and service facilities within three (3) hours of the F.O.B. delivery (Buckhannon).

#### 6.6 EVALUATION COMMITTEE REQUIREMENTS

Detailed component specifications, product literature, component models, required for specification compliance determination by the Evaluation Committee should be provided with each bid. Any information supplied that is contrary to/or conflicting with the specifications and/or attached Bidders Evaluation Report may be sufficient cause for rejection of bid.

#### 6.7 UNSPECIFIED ACCESSORIES & FEATURES

**All parts, equipment, accessories, material, design and performance characteristics not specified herein, but which are necessary to provide a complete unit, must be furnished with each unit and required to conform to strength, quality of material, and quality of workmanship to those which are advertised and provided to the market in general by the unit industry.**

**All parts and accessories advertised and regularly supplied as standard shall be included, except those which would represent duplication of these specified, and except those which, by specification, are not to be furnished. All standard safety features, required by Federal and State Law, shall be included.**

#### 7.0 SPECIFICATIONS OF THE QUOTED UNIT ARE AS FOLLOWS:

To be a trailer mounted Full – Matrix Variable Message Board consisting of an optically enhanced L.E.D.s. L.E.D.s shall have a minimum of a 30° vertical and 30° horizontal cone of visibility. The full-matrix panel shall be powered by a bank of batteries in order to convey bright, distinctive messages to the traveling public. All Full-Matrix Variable Message Boards shall be tested by AASHTO's National Transportation Product Evaluation Program (NTPEP).

#### 7.1 Batteries shall be automatically recharged by a group of solar panels located at the highest point on the unit.

7.1.1 **Unit shall be designed with sufficient energy backup to operate for a period of 30 days without any sun.**

7.1.2 The solar panel generator array should recharge the battery bank at a rate of approximately 2.5 hours sun to one (1) 24 hour period of usage. (Refer 7.5.3)

7.2 **Sign Panel Construction:**

7.2.1 To be of aluminum construction or fabricated with powder coated sheet metal and in a flat black finish. **All exposed panels and seams shall be corrosion proof for a minimum of ten (10) years. With construction, all panels/parts shall be assembled as to prevent corrosion or to prevent dissimilar metal reaction from occurring.**

7.2.2 **The sign panel frame to be a welded assembly constructed of aluminum alloy channel, or from steel panels powder coated in a corrosion proof manner for a minimum of ten (10) years.**

7.2.3 **Length of sign panel shall not exceed 140 inches.**

7.2.4 **Face of sign shall incorporate measures to prevent fading from UV light, such as a polycarbonate or lexan face with UV inhibitors incorporated. Other methods shall be subject to review and approval.**

7.2.5 **The sign face shall be of a sufficient size in order to display three (3) lines of eight (8) characters, with each character to be eighteen (18) inches tall by twelve (12) inches wide. Characters to be spaced a minimum of three (3) inches apart.**

7.2.6 Each character configuration to contain 54 L.E.D. lamp pixels in a six (6) element horizontal by nine (9) element vertical arrangement.

7.2.7 **Each pixel shall consist of a minimum of three (3) LEDs.**

7.2.8 Message color to be approximately 590 nanometers.

7.3 The sign to have capability to display up to six (6) messages in sequence, with variable timing in 1/4 second increments under computer control.

7.3.1 **As part of the manufacturer's pre-programmed message sequences, arrow display and flashing caution functions shall be included. All arrow and flashing caution displays described in the current MUTCD shall be provided.**

7.3.2. **All abbreviations used in pre-programmed messages shall be in compliance with the current MUTCD.**

7.3.3. Entire sign to have capability to change all lines of message copy in not more than 100 mili-seconds.

7.3.4. **The sign shall be clearly visible a minimum of 4500 feet.**

**7.3.5. The sign legend shall be legible from a minimum distance of 1,000 feet under daylight conditions as determined by NTPEP for two --non-traffic word message.**

**7.3.6. The sign legend shall be legible from a minimum distance of 900 feet under night-time conditions as determined by NTPEP for a two non-traffic word message.**

**7.3.7. Under variable light conditions, the unit shall automatically adjust light source so as to meet the visibility requirements, without being too bright or too dim.**

#### **7.4 Solar Message Board Support**

**7.4.1 Solar message board sign panel shall be supported on a telescoping upright member in order to permit raising the sign panel for operation and lowering the panel for transport. The upright must be capable of 360 degrees rotation and to lock into any position to which it is manually or electrically rotated.**

**7.4.2 Raise and lower travel to be approximately four (4) feet and shall be accomplished by a hydraulic power pack.**

**7.4.3 The bottom of the sign to be minimum of seven (7) feet above ground level when in the raised position.**

**7.4.4 In transport position, the sign shall orient to the longitudinal axis of the trailer in a manner that effectively reduces aerodynamic drag during towing.**

#### **7.5 Power and Miscellaneous Equipment:**

**7.5.1 Unit shall be designed to accept two (2) power sources; one (1) being a battery bank consisting of four (4) size 4-D, deep cycle, lead acid 12 volt DC batteries wired in parallel (or as designed to meet power/time requirements).**

**7.5.2 The second power supply to have the capability of the unit to accept existing 120 volt commercial electric service.**

**7.5.3 Batteries to be recharged by a solar panel array producing approximately 165 watts of power. (Refer 7.1.2)**

**7.5.4 Unit shall provide a built-in battery charger with a minimum 25 ampere per hour rating.**

**7.5.5 Battery bank shall be housed in lockable heavy duty weatherproof battery boxes.**

**7.5.6 The two (2) power sources to be enclosed in an appropriate protective housing.**

**7.5.7 Batteries to be capable of being recharged by a commercial 110 volt battery charger.**



## 7.6 Control Requirements:

- 7.6.1 **The unit shall be controlled in all functions by an on-board dedicated computer of solid state design and be removable.**
- 7.6.2 **Unit shall include a keyboard through which user originated messages may be entered for display or storage.**
- 7.6.3 Include an LCD display screen upon which messages can be reviewed before display on sign board.
- 7.6.4 **Computer shall store a minimum of 250 programmed messages for display when called upon by user through the keyboard.**
- 7.6.5 **Capability of storing a minimum of 100 message sequences.**
- 7.6.6 Unit to maintain stored message list.
- 7.6.7 Unit to provide password coding or key entry.
- 7.6.8 Provide control programming to present sequences messages under operator control through keyboard entry.
- 7.6.9 Provide control for moving arrow displays.

## 7.7 Solar Panel Control Unit

- 7.7.1 **The computer and power control unit shall be housed in a weather resistant, shock resistant lockable control box which includes lighting for night-time operation.**
- 7.7.2 Power control unit to contain two (2) current meters; one (1) to show amperage generated with the battery charge operating, and one (1) to indicate amperage generated from the solar panels to be stored in the battery bank.
- 7.7.3 **The power control unit shall incorporate a PV regulator with thermal compensation for variances in ambient temperature to regulate the charge rate to the battery bank.**
- 7.7.4 The unit to incorporate an automatic intensity control feature in order to keep L.E.D. lamp matrix intensity constant with a reduction in voltage.
- 7.7.5 **The message unit must provide a photocell in order to reduce the lamp intensity at night eliminating blinding.**

## 7.8 Trailer:

- 7.8.1 **Two (2) wheel trailer shall be structurally adequate to serve both platform for components.**

- 7.8.2 Fenders; Steel fenders to be provided and installed over each wheel.
- 7.8.3 Trailer to be equipped with a hydraulic brake actuator system.
- 7.8.4 Leveling Jacks: Four (4) crank type, heavy duty, industrial leveling jacks; one (1) at each corner of the trailer deck to be installed.

#### 7.9 Lighting:

7.9.1 **Unit shall include LED tail lights, stop lights, turn signals, license mount with light, and all necessary reflectors.**

7.9.2 Trailer electrical cable and connector (Cole Hersee Pt# 12081 male or equal) compatible with towing vehicles to be installed.

7.9.3 All trailer wiring to be encased in heavy duty hypalon type industrial wire looms clamped to underside of the trailer structural tubing.

7.9.4 **A two (2) inch ball type trailer hitch 6,000 pound capacity with double safety chains in accordance with SAE J684F shall be installed.**

#### 7.10 Hydraulic Power Pack:

7.10.1 **Shall be 12 volt DC motor, pump, valve, reservoir, manual hand pump or approved equal.**

#### 7.11 Message Cabinet Dimensions:

7.11.1 **Length: Maximum length of 140 inches.**

7.11.2 **Height: Maximum of 79 1/2 inches**

#### 7.12 Central Processing Unit – CPU Specifications (Minimum):

7.12.1 Microprocessor Based 27.1 MHz.

7.12.2 Power requirements: 175 mA DC at 12 volts DC.

7.12.3 **Screen Size: Minimum of Three (3) lines, with Eight (8) characters per line.**

7.12.4 Interfaces: (2) RS232 9 pin D connectors and documentation on port numbers and pins. **In addition, one USB port or one ETHERNET Port with USB adaptor shall be provided**

7.12.5 Code: Application source code to be delivered with unit or held in escrow and provided to WVDOH in case company goes out of business.

7.12.6 Documentation: Technical documentation for unit and for application programs.

- 7.12.7 **Unit shall include all other features considered as standard equipment but not specifically addressed previously.**
- 7.12.8 **Vendor must certify that must certify that unit offered will comply with Occupational Safety and Health Act of 1979 and subsequent amendments.**
- 7.12.9 **Paint; The complete unit to be painted with the manufacturers standard colors and materials.**
- 7.12.10 **Advertising: Manufacturer to attach a metal plate on the unit stating manufacturer, date of manufacture, serial number, model number, etc. No large decals or painted advertisements are permitted.**
- 7.12.11 **Preventive Maintenance and Operator Procedures: Manufacturers and or Dealers shall provide a preventive maintenance and operator orientation seminar at the Equipment Division, in Buckhannon, WV. All training aids i.e., videos, charts, manuals, etc., to furnished by successful vendor.**
- 7.13 **Communications:**
- 7.13.1 **Unit shall be guarded from any unwanted outside RF interference which would include but not be limited to VHF/FM receiver, 2 way radio receiver, cell phones, etc.**
- 7.13.2 **Each PVMS shall be controlled and monitored by its own sign controller directly from the control console inside the control cabinet on the trailer itself.**
- 7.13.3 **The PVMS sign controller shall be able to receive instructions from and provide information to a computer containing PVMS control software compliant using NTCIP compliant communications modes:**
- 7.13.4 **Remote Communications control via wireless communications with a remotely located computer. The system communications backbone, as well as all field modems or signal converters, shall provide the PVMS sign controller with an RS232 signal having a baud rate between 2,400 bps and 115,200 bps. Communications shall be static IP based with a static IP based modem installed on the trailer.**
- 7.13.5 **Local Communications control shall be accomplished via direct connection with a laptop computer that is connected directly to the sign control using a null modem connection and a baud rate between 2,400 bps and 115,200 bps.**
- 7.13.6 **Local Communications control shall be available via a keypad and LCD interface. Features shall include addition or removal of message or message (s) from the PVMS list of playing messages, adjustment of luminosity to manual or automatic, and the monitoring of miscellaneous data like battery voltage, photocells reading, etc.**

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
EQUIPMENT DIVISION

NOTE: Vendor should type  
Bidder's Evaluation Report

BIDDER'S EVALUATION REPORT

PROCUREMENT SPECIFICATIONS FOR OPEN END CONTRACT  
NO. 843-1-F

OPEN END CONTRACT  
FULL MATRIX  
TRAILER MOUNTED SOLAR POWERED MESSAGE BOARD

NOTE TO BIDDER: Procurement Specification No. 839-1-K, Paragraph 2.0 recommends the completion and submittal of this Report with your bid. Purpose of this Report is to enable the West Virginia Division of Highways Evaluation Committee to make full and fair evaluation of the bid. Addendums in order, along with a summary of exceptions as a separate attachment, should be with Bidder's Evaluation Report. FAILURE TO SUBMIT THIS REPORT, COMPLETE IN ITS ENTIRETY, MAY SUBJECT THE BIDDER TO DISQUALIFICATION.

Reference Requisition No.: 708EC007

Bidder's Name: Work Area Protection / Precision Solar Controls / SCE Products Inc

Address: 2985 Market St Garland TX 75041  
1310 Wildwood Dr Wooster OH 44691

Telephone Number: 330-621-1678, 800-686-7414 Fax 330-345-1852

Years Bidder has been registered to do business with the State of West Virginia: 10+ YRS.

Years Company has been an authorized dealer for proposed unit: 16+ YRS.

X3.2 Have you complied with all mandatory specifications? X YES      NO \* SEE addendum 1  
Addendum 2

X4.2 DELIVERY:

X4.2.1 Delivery date of completed representative unit: 30 ~~15~~ TAH Calendar Days After  
Receipt of Purchase Agreement

X4.2.2 Delivery date of balance of completed units: 30 Calendar Days After Receipt of  
Purchase Agreement

X5.0 AWARD CRITERIA;

X5.1 Prices for unit in quantities of

1-5	<u>\$18,895<sup>00</sup></u> per unit
6-10	<u>\$18,895<sup>00</sup></u> per unit
11 and over	<u>\$18,895<sup>00</sup></u> per unit

X6.0 SPECIFICATIONS - GENERAL

X6.1 Manufacturer, model, series, and date of manufacture of proposed unit:

Precision Solar Controls Inc., SMC 2000, HE-06, 2007 & 2008  
 Is descriptive literature, fully describing proposed unit attached to your bid?  YES  NO

If not, why? \_\_\_\_\_

X6.2 Will the required number of service manuals, and complete parts list be delivered to the Equipment Division at Buckhannon upon completion of delivery of total units?

YES  NO

Will the required Equipment Preventive Maintenance Form (Section X6.2 of Bidders Evaluation Report) be provided upon inspection of the pilot unit?

YES  NO

X6.2  
2-10-00

EQUIPMENT PREVENTATIVE MAINTENANCE QUESTIONNAIRE

THIS FORM MUST BE COMPLETED IN ITS ENTIRETY BY SUCCESSFUL BIDDER OR MANUFACTURER'S TECHNICAL REPRESENTATIVE PRIOR TO DELIVERY OF PILOT MODEL TO THE WVDOH.

DESCRIPTION: SMC 2000 Full Matrix MAKE: PSC

MODEL: HE-06 YEAR: 2007 <sup>3/6</sup> 2008 PURCHASE AMOUNT: \$18,895.00

ENGINE: MAKE: N/A MODEL: N/A FUEL TYPE: N/A

HORSEPOWER: N/A CYLINDER: N/A ENGINE SERIAL: N/A

COOLING SYSTEM CAPACITY: N/A

BELTS: DESCRIPTION: PART NUMBERS:  
N/A N/A

GVW: 2,700 lbs AXLE CAPACITY: FRONT: 3,500 lbs REAR: N/A

TIRES: FRONT MAKE & SIZE: 205/75 D-15 make varies based on availability.

REAR MAKE & SIZE: N/A Raised HT: 164"  
Lowered HT: 107"

DIMENSIONS OF UNIT: LENGTH: 194.5" WIDTH: 93" LENGTH:           

VENDOR CONTACT PERSON: Tim Hohman PHONE: 330-621-1678  
Fax 330-345-1852

PARTS:  
BATTERY MAKE: Continental MODEL: 4D Weight: 115 lbs  
TOP OR SIDE POST: Top Post DIMENSIONS: LENGTH            WIDTH            HEIGHT             
SPARK PLUGS OR FUEL INJECTORS MAKE: N/A PART #             
FUEL PUMP OR INJECTION PUMP MAKE: N/A MODEL:             
ALTERNATOR MAKE: N/A PART #:             
STARTER MAKE: N/A PART #:             
TURBO CHARGER MAKE: N/A PART #:             
TRANS. MAKE: N/A MODEL:            AUTO/MANUAL:             
HYDRAULIC PUMP MAKE:            MODEL:           

FILTERS	MAKE	PART NO.	LUBRICANT	MANUFACTURER TYPE
OIL	<u>N/A</u>	<u>          </u>	ENGINE	<u>N/A</u>
AIR INNER	<u>N/A</u>	<u>          </u>	TRANSMISSION	<u>N/A</u>
AIR OUTER	<u>N/A</u>	<u>          </u>	POWER STEERING	<u>N/A</u>
FUEL PRIMARY	<u>N/A</u>	<u>          </u>	HYDRAULIC	<u>NAPA/Valvoline Dexron 3</u>
FUEL SECONDARY	<u>N/A</u>	<u>          </u>	DIFFERENTIALS	<u>N/A</u>
COOLANT	<u>N/A</u>	<u>          </u>	BRAKE FLUID	<u>N/A</u>
HYDRAULIC	<u>N/A</u>	<u>          </u>	COOLANT	<u>N/A</u>
OTHER	<u>N/A</u>	<u>          </u>	OTHER	<u>N/A</u>

X6.3 TRAINING:

Will training seminar be conducted on Preventive Maintenance, Operator and Mechanic Training  YES  NO

Will you conduct training with each purchase order against this open end contract?  YES  NO

Will training be conducted within 2 working days from the delivery of the pilot unit on the individual purchase order?  YES  NO

If NO, explain time frame scheduling requires 2 week notice

Will an Operator's Manual be furnished directly to Letha Lamb, Training Academy prior to the delivery of the pilot?  YES  NO

X6.4 If you are the successful vendor, will you furnish all training aids, i.e., videos, projectors, required in conducting the training?  YES  NO

X6.4.1 Will all manuals, booklets, etc. explaining preventive maintenance, operator procedures, and service schedule be delivered with each unit?  YES  NO  
If NO, explain \_\_\_\_\_

X6.5 WARRANTY AND SERVICE POLICY

Will the warranty and service you provide comply with all areas as stated in Section 6.5 of specifications  YES  NO

Is warranty literature attached?  YES  NO

Is a minimum two (2) year bumper to bumper basic parts and labor warranty included?  YES  NO

Describe: PER SECTION 6.5. Excludes Due to neglect or Abuse or improper maintenance

Are parts and service facilities within three (3) hours F.O.B. delivery (Buckhannon)  YES  NO

THIS FORM MUST BE COMPLETED IN ITS ENTIRETY BY THE SUCCESSFUL BIDDER OR MANUFACTURERS TECHNICAL REPRESENTATIVE AND SUBMITTED WITH YOUR BID.

(If additional lines are needed, make copies of form.)

1. Define the terms of the standard warranty. If not offered, so state. (Attach copy)

Not offered

2. Define warranty service to be performed at DOH facilities and warranty service to be performed at manufacturer's representative facility. List name and location of manufacturer's representative.

All Service to be performed at DOH Facility.
Technical support & warranty Replacement of Parts
Tim Hohman 1310 Wildwood DR. Wooster OH 44691

3. List locations for parts inventories that are within the State of West Virginia. Also, list availability levels, if known.

Rock Branch Industrial Park 4 Craddock Way Poca, WV 25159

4. During the term of warranty, list the guarantee discount to manufacturer's published list price for parts that bidder will sell the parts to owner. \* At This time we publish no list Prices, only net Prices At Time of Inquiry.

- A. Terms: Net 30 Manufacturer's published list price less: 0 \$ % discount
B. Terms: Net 60 Manufacturer's published list price less: 0 \$ % discount
C. Terms: Net 90 Manufacturer's published list price less: 0 \$ % discount

5. During the term of warranty, will all manufacturers or engineering improvements be submitted to Division of Highways? X YES NO

6. During the term of warranty, list the guaranteed rates charged for repair to the unit.

- A. Shop Rate \$ \*\* per mechanic hour
B. Travel Time Charge \$ \*\* per mechanic hour; port to port
C. Mileage Charge \$ \*\* per vehicle mile; port to port
D. Field Mechanic Rate \$ \*\* per mechanic hour

E. Specify period of time that prices are in effect: 30 days for Parts From time of Inquiry.

F. Surcharge for miscellaneous items: 0 %



X6.6 EVALUATION COMMITTEE REQUIREMENTS

Is all component specifications, product literature, component models provided for Evaluation Committee bid determination?  YES  NO

X6.7 Will all parts, equipment, accessories, material, design and performance characteristics not specified herein, but which are necessary to provide a complete unit, be furnished with the unit and conform in strength, quality of material, and quality of workmanship to those which are advertised and provided to the market in general by the unit industry?  YES  NO

X6.7.1 Are all parts and accessories adequate and regularly supplied as standard to be included except those which may be duplications of specifications herein, and except these by specification are not to be furnished?  YES  NO

X6.7.2 Are all standard safety features that are required by Federal and State statutes of law included?  YES  NO

X7.0 SPECIFICATIONS OF THE QUOTED UNIT:

The bidder should complete the following schedule in order for the Division to compare the actual bid unit to the specifications. Should the bidder except a requirement, then such exception may be only on the basis that such feature is not offered by the manufacturer. The Division will have the sole discretion as to whether the bidder's substitution meets the requirements of the specification.

Manufacturer: Precision Solar Controls Inc. Model: SMC 2000 HE-06

Is unit a trailer mounted Full - Matrix Message Board consisting of an optically enhanced L.E.D.'s.  YES  NO

Are the L.E.D.s minimum of a 30° vertical and 30° horizontal cone of visibility.  YES  NO

Is the full matrix panel powered by a bank of batteries in order to convey bright, distinctive messages to the traveling public  YES  NO

Are full matrix variable message boards tested by AASHTO's National Transportation Product Evaluation Program (NTPEP). *\* see Addendum Page 2*  YES  NO

X7.1 Are batteries automatically recharged by a group of solar panels located at highest point on the unit?  YES  NO

X7.1.1 Is unit designed to have sufficient energy backup to operate for 30 days without any sun?  YES  NO

X7.1.2 Will solar panel generator recharge the battery bank at 2.5 hours sun to one (1) 24 hour period usage?  YES  NO

X7.2 Sign Panel Construction:

X7.2.1 Is sign panel aluminum constructed or fabricated with powder coated sheet metal and in a flat black finish  YES  NO

All exposed panels and seams are corrosion proof for a minimum of ten (10) years  YES  NO

With construction, are all panels/parts assembled as to prevent corrosion or to prevent dissimilar metal reaction for occurring  YES  NO

X7.2.2 Is sign panel frame a welded assembly and constructed of aluminum alloy channel or from steel panels powder coated in a corrosion proof manner for a minimum of ten (10) years  YES  NO

X7.2.3 What is length of sign panel 139" inches?

X7.2.4 Does face of sign incorporate measures to prevent fading from UV light, such as polycarbonate or lexan face with UV inhibitors incorporated  YES  NO

Is another method used?  YES  NO Has it been reviewed and approved?  YES  NO

X7.2.5 Does sign face have size to display three (3) separate lines of eight (8) characters  YES  NO

Size of characters: 18 inches tall and 12 inches wide?

Spacing of characters: 3" inches apart

X7.2.6 Does each character configuration contains 54 LED lamp pixels in six (6) element horizontal by nine (9) element vertical arrangement? \* SEE Addendum pg 1 7.2.6  YES  NO

X7.2.7 Each pixel consists of 4 LED'S

X7.2.8 Message color: 590 nanometers

X7.3 Does sign have capability to display six (6) messages in sequence, with variable timing in 1/4 second increments under computer control?  YES  NO

X7.3.1 Is arrow display and flashing caution functions included as part of the manufacturer's pre-programmed message sequences  YES  NO

Will all arrow and flashing caution displays described in the current MUTCD provided  YES  NO

- X7.3.2 Are all abbreviations used in pre-programmed messages in compliance with the current MUTCD  YES  NO
- X7.3.3 Does the entire sign have capability to change all lines of message copy in not more than 100 milliseconds  YES  NO
- X7.3.4 Will sign be clearly visible a minimum of 4500 feet  YES  NO
- X7.3.5 Will sign legend be legible from a minimum distance of 1,000 feet under daylight conditions as determined by NTPEP for two non-traffic word message.  YES  NO
- X7.3.6 Will sign legend be legible from a minimum distance of 900 feet under night-time conditions as determined by NTPEP for a two non-traffic word message  YES  NO
- X7.3.7 Under variable light conditions, will the unit automatically adjust light source so as to meet the visibility requirements, without being too bright or too dim  YES  NO

X7.4 Solar Message Board Support:

- X7.4.1 Will solar message board sign panel be supported on a telescoping upright member in order to permit raising the sign panel for operation and lowering for transport?  YES  NO

Is the upright capable of 360 degrees rotation and to lock into any position to which it manually or electrically rotated  YES  NO

- X7.4.2 Raise and lower travel: 57<sup>inches</sup> feet and accomplished by a hydraulic power pack  YES  NO

X7.4.3 Bottom of sign 7 feet above ground level when in raise position

- X7.4.4 When transporting, will sign orient to the longitudinal axis of the trailer in a manner that effectively reduces aerodynamic drag during towing?  YES  NO

X7.5 Power and Miscellaneous Equipment:

- X7.5.1 Is unit designed to accept two (2) power sources; one (1) being a battery bank consisting of four (4) size 4D, deep cycle, lead acid 12 volt DC batteries wired in parallel (or as designed to meet power/time requirements)  YES  NO

- X7.5.2 Does second power supply to have capability to accept existing 120 volt commercial electric service?  YES  NO

- X7.5.3 Batteries are recharged by a solar panel array producing 150 watts of power <sup>\* PER NTPEP TESTING AS TESTED UNIT SEE Addendum pg 2-</sup>

- X7.5.4 Does unit have a built-in battery charger with minimum 25 amp per hr rating?  YES  NO

- X7.5.5 Is battery bank housed in lockable heavy duty weatherproof battery boxes?  YES  NO

X7.5.6 Are the two (2) power sources enclosed in protective housing?  YES  NO 20

X7.5.7 Are batteries capable of being recharged by a commercial 110 volt battery charger?  
 YES  NO

X7.6 Control Requirements:

X7.6.1 Is unit controlled in all functions by an on-board dedicated computer of solid state design and removable?  YES  NO

X7.6.2 Does unit have keyboard which user originated messages may be entered for display or storage?  YES  NO

X7.6.3 Does unit have an LCD display screen, where messages are reviewed before being displayed?  YES  NO

X7.6.4 Computer stores 350 programmed messages for display when called upon by user through keyboard  YES  NO

X7.6.5 Capability of storing 100 message sequences

X7.6.6 Does unit maintain stored message list?  YES  NO

X7.6.7 Does unit provide password coding or key entry?  YES  NO

X7.6.8 Will unit provide control programming to present sequences messages under operator control through keyboard entry?  YES  NO

X7.6.9 Does unit provide control for moving arrow displays?  YES  NO

X7.7 Solar Panel Control Unit:

X7.7.1 Is computer and power control unit housed in weather resistant, shock resistant lockable control box including lighting for night time operation?  YES  NO

X7.7.2 Does power control unit contain two (2) current meters; One (1) shows amperage generated with battery charger operating and one (1) indicates amperage generated from the solar panels be stored in battery bank?  YES  NO

X7.7.3 Does power control unit incorporate a PV regulator with thermal compensation for variances in ambient temperature to regulate the charge rate to the battery bank?  YES  NO

X7.7.4 Does unit incorporate an automatic intensity control feature to keep L.E.D. lamp matrix intensity constant with a reduction in voltage?  YES  NO

X7.7.5 Does message unit provide a photocell to reduce lamp intensity at night eliminating blinding?  YES  NO

## X7.8 Trailer:

X7.8.1 Is two (2) wheel trailer structurally adequate to serve as both platform for components?  YES  NO

X7.8.2 Are fenders made of steel and installed over each wheel?  YES  NO

X7.8.3 Is trailer equipped with hydraulic brake actuator system?  YES  NO

X7.8.4 Is unit equipped with four (4) crank type, HD industrial leveling jacks; one (1) installed on each corner of the trailer deck?  YES  NO

## X7.9 Lighting:

X7.9.1 Does unit include LED taillights, stop lights, turn signals, license mount with light and all necessary reflectors?  YES  NO

X7.9.2 Are trailer electrical cable and connector (Cole Hersee Pt #12081 male or equal) compatible with towing vehicles installed?  YES  NO

X7.9.3 Is all trailer wiring encased in heavy duty hypalon type industrial wire looms clamped to underside of trailer structural tubing?  YES  NO

X7.9.4 Does unit have two (2) inch ball type trailer hitch 6,000 pound capacity with double safety chains in accordance with SAE J684F installed?  YES  NO

## X7.10 Hydraulic Power Pack:

X7.10.1 Does unit have 12 volt DC motor, pump, valve, reservoir, manual hand pump or approved equal?  YES  NO

## X7.11 Message Cabinet Dimensions: (approximate)

X7.11.1 Length: 139 inches

X7.11.2 Height: 76 inches

## X7.12 Central Processing Unit - CPU specifications (Minimum):

X7.12.1 Microprocessor Based 27.1 MHz  YES  NO

If No, you must specify \_\_\_\_\_.

X7.12.2 Power requirements: 175 mA DC at 12 volts DC

X7.12.3 Specify screen size: upto 6 character lines with upto 100 characters per line  
dependent on information requested for input

X7.12.4 Are interfaces (2) RS232 9 pin D connectors and documentation on port numbers and pins?  YES  NO

In addition, is one (1) USB port or one (1) ETHERNET Port with USB adaptor provided  YES  NO

X7.12.5 Will application source code be delivered with unit OR held in escrow  YES  NO and provided to WVDOT in case company goes out of business?  YES  NO

X7.12.6 Will technical documentation for unit and for application programs be provided?  YES  NO

X7.12.7 Features considered as standard equipment but not addressed:

NTCIP Compliant programming capability

Includes Cellular IP Modem static First Year cellular service is included

X7.12.8 Does unit comply with OSHA of 1979 and subsequent amendments?  YES  NO

X7.12.9 Will unit be painted manufacturers standard colors and materials  YES  NO

X7.12.10 Does unit meet guidelines for advertising? SEE Addendum pg 1  YES  NO

X7.12.11 Will Manufacturer or Dealer provide training and training aids as specified?  YES  NO

X7.13 Communications:

X7.13.1 Will unit be guarded from any unwanted outside RF interference which would include but not be limited to VHF/FM receiver, 2 way radio receiver, cell phones etc.  YES  NO

X7.13.2 Is each PVMS controlled and monitored by its own sign controller directly from the control console inside the control cabinet on the trailer itself  YES  NO

X7.13.3 Is the PVMS sign controller able to receive instructions from and provide information to a computer containing PVMS control software compliant using NTCIP compliant communications modes  YES  NO

X7.13.4 Remote Communications control via wireless communications with a remotely located computer  YES  NO

Does the system communications backbone, as well as all field modems or signal converters, provide the PVMS sign controller with a RS232 signal having a baud rate between 2,400 bps and 115,200 bps.  YES  NO

Is communications static IP based with a static IP based modem installed on the trailer  YES  NO

**X7.13.5** Is local communications control accomplished via direct connection with a laptop computer that is connected directly to the sign control using a null modem connection and baud rate between 2,400 bps and 115,200 bps.  YES  NO

**X7.13.6** Is local communications control available via a keypad and LCD interface  YES  NO

Are the features of additional or removal of message or message(s) from the PVMS list of playing messages, adjustment of luminosity to manual or automatic, and the monitoring of miscellaneous data like battery voltage, photocells reading, etc. included

YES  NO

STATE OF WEST VIRGINIA  
Purchasing Division

## PURCHASING AFFIDAVIT

**West Virginia Code §5A-3-10a states:** No contract or renewal of any contract may be awarded by the state or any of its political subdivisions to any vendor or prospective vendor when the vendor or prospective vendor or a related party to the vendor or prospective vendor is a debtor and the debt owed is an amount greater than one thousand dollars in the aggregate

### DEFINITIONS:

"Debt" means any assessment, premium, penalty, fine, tax or other amount of money owed to the state or any of its political subdivisions because of a judgment, fine, permit violation, license assessment, defaulted workers' compensation premium, penalty or other assessment presently delinquent or due and required to be paid to the state or any of its political subdivisions, including any interest or additional penalties accrued thereon.

"Debtor" means any individual, corporation, partnership, association, limited liability company or any other form or business association owing a debt to the state or any of its political subdivisions. "Political subdivision" means any county commission; municipality; county board of education; any instrumentality established by a county or municipality; any separate corporation or instrumentality established by one or more counties or municipalities, as permitted by law; or any public body charged by law with the performance of a government function or whose jurisdiction is coextensive with one or more counties or municipalities. "Related party" means a party, whether an individual, corporation, partnership, association, limited liability company or any other form or business association or other entity whatsoever, related to any vendor by blood, marriage, ownership or contract through which the party has a relationship of ownership or other interest with the vendor so that the party will actually or by effect receive or control a portion of the benefit, profit or other consideration from performance of a vendor contract with the party receiving an amount that meets or exceeds five percent of the total contract amount.

**EXCEPTION:** The prohibition of this section does not apply where a vendor has contested any tax administered pursuant to chapter eleven of this code, workers' compensation premium, permit fee or environmental fee or assessment and the matter has not become final or where the vendor has entered into a payment plan or agreement and the vendor is not in default of any of the provisions of such plan or agreement.

**LICENSING:** Vendors must be licensed and in good standing in accordance with any and all state and local laws and requirements by any state or local agency of West Virginia, including, but not limited to, the West Virginia Secretary of State's Office, the West Virginia Tax Department, West Virginia Insurance Commission, or any other state agencies or political subdivision. Furthermore, the vendor must provide all necessary releases to obtain information to enable the Director or spending unit to verify that the vendor is licensed and in good standing with the above entities.

**CONFIDENTIALITY:** The vendor agrees that he or she will not disclose to anyone, directly or indirectly, any such personally identifiable information or other confidential information gained from the agency, unless the individual who is the subject of the information consents to the disclosure in writing or the disclosure is made pursuant to the agency's policies, procedures and rules. Vendors should visit [www.state.wv.us/admin/purchase/privacy](http://www.state.wv.us/admin/purchase/privacy) for the Notice of Agency Confidentiality Policies.

Under penalty of law for false swearing (West Virginia Code, §61-5-3), it is hereby certified that the vendor acknowledges the information in this said affidavit and are in compliance with the requirements as stated.

Vendor's Name:

Tim Hohman Precision Solar Controls/Work Area Protection/SCJ Products

Authorized Signature:

Tim Hohman

Tim Hohman

Date: 01-02-2008



Addendum Page 1

RFQ Number: 708EC007

To: State Of West Virginia  
Department of Administration  
Purchasing Division  
2019 Washington St E.  
Charleston WV 25305-0130  
Attn: Michael Austin 304-558-2402

From: Work Area Protection/Precision Solar Controls/SCI Products Inc  
Tim Hohman Phone 330-621-1678 Fax 330-345-1852  
1310 Wildwood Dr  
Wooster OH 44691

7.2.6 Per MUTCD character configuration for a three (3) line message, as outlined in section 7.2.5, The SMC2000 by Precision Solar Controls is a five (5) element Horizontal by seven (7) element Vertical character containing 35 pixels with each pixel made up of four (4) individual LED's.

X7.12.10 Unit, per MUTCD is not to be used for Public advertising, it is only to relay messages concerning the road way to the motoring public. Other than this, we are unsure as to the intent of the question.

SCI Products  
 Precision Solar Controls  
 Addendum Pg 2  
 WVD0H RFQ 708EC007

NTPEP  
 PRODUCT  
 EVALUATIONS

Manufacturer	Product Name	Description	Date Tested	Reliability	Battery Bank Capacity	Durability	Solar Panel	Daytime			Nighttime		
								Visibility	Legibility	Angularity	Visibility	Legibility	Angularity
ADDCO	DH1000 ALS	24 character	2004	30	12-6volt 1350 amp hr	30	NA	4800	1023	18.6°	4800	769	28°
AMSIG	CMS-T331	24 character	2004	30	12-6volt 1290 amp hr	30	NA	4800	829	27.4°	4800	926	100.8°
AMSIG	CMS-T332	line matrix	2004	30	12-6volt 1290 amp hr	30	NA	4800	1041	22.4°	4800	915	81.6°
AMSIG	CMS-T333	full matrix	2004	25	12-6volt 1290 amp hr	30	NA	4800	851	45.4°	4800	916	99°
Crown	CMS80FM	full matrix	2004	28	12-6volt 1350 amp hr	30	NA	4800	701	31.6°	4800	782	99°
Daktronics	VP 1300	24 character	2005	30	16-6volt 1800 amp hr	30	NA	4800	963	51.5°	4800	660	65.3°
Daktronics	VP 1400	full matrix	2005	30	16-6volt 1800 amp hr	30	NA	4800	910	54.5°	4800	779	57°
Daktronics	VP 4000	full matrix	2007	10	8-6volt 880 amp hr	30	440 watts	4800	1028	44.2°	4800	872	87°
K&K	KKMB3L-240	24 character	2006	10	4-12volt 860 amp hr	30	240 watts	4800	886	20.8°	4800	982	41.2°
National Signal	Vu-pointe	24 character	2004	30	18-6volt 2025 amp hr	30	NA	4800	692	47.6°	4800	411	125°
Precision Solar Controls	SMC 2000 FM	full matrix	2007	46	4-12volt 800 amp hr	30	150 watts	4800	1055	20°	4800	990	85.6°
Precision Solar Controls	SMC 1000 HE	24 character	2007	31	3-12volt 600 amp hr	30	110 watts	4800	1107	22.6°	4800	920	81.6°
Solar Technology	Silent Messenger	full matrix	2004	25	16-6volt 1800 amp hr	30	NA	4800	817	23.6°	4800	820	101.8°
Solar Technology	MB-1548	full matrix	2006	12	4-6volt 450 amp hr	30	300 watts	4800	1398	24.4°	4800	1202	41.2°
Solar Technology	MB-3048	mini full matrix	2007	12	8-6volt 900 amp hr	30	300 watts	4800	770	43°	4800	640	102°
Solar Technology	MB-4048	full matrix	2007	14	8-6volt 900 amp hr	30	450 watts	4800	1035	48.2°	4800	904	114.8°
U.S. Traffic	Sunray 380	24 character	2004	30	8-12volt 1872 amp hr	30	NA	4800	856	29.8°	4800	705	63.2°
Vermac	PCMS-1500	full matrix	2004	30	16-6volt 1800 amp hr	30	NA	4800	872	24.6°	4800	841	97.4°
Vermac	PCMS-1210	line matrix	2004	30	16-6volt 1800 amp hr	30	NA	4800	849	23.2°	4800	692	101.8°
Vermac	WTMBS-QS	24 character	2004	30	8-6volt 900 amp hr	30	NA	4800	761	19.6°	4800	785	44.8°
Wanco	WTMBS-LLA	full matrix	2004	30	8-6volt 900 amp hr	30	NA	4800	906	31.8°	4800	685	97.4°
Wanco	WTMBS-LLA	24 character	2006	15	10-6volt 1125 amp hr	30	250 watts	4800	1349	41.2°	4800	1295	38°

AMTCD  
 5 pixel wide x 7 pixel high Character = 8 characters/line  
 Compiled from NTPEP website.  
 \* Amps is converted to 12 Volt.

\* See next page for definitions