



**CENTRALBIDDING**  
FROM CENTRAL AUCTION HOUSE

**5000126547 ONE TIME PURCHASE OF LCD SIGNAL MONITORS FOR THE  
JEFFERSON PARISH TRAFFIC ENGINEERING DEPARTMENT**  
Jefferson Parish Government

Project documents obtained from [www.CentralBidding.com](http://www.CentralBidding.com)  
16-May-2019 08:11:02 AM



**BID #50-126547**

**ONE TIME PURCHASE OF LCD SIGNAL MONITORS FOR THE  
JEFFERSON PARISH TRAFFIC ENGINEERING DEPARTMENT**

**MAY 17, 2019 @ 11:00 A.M.-2ND RE-BID**

**ATTENTION VENDORS!!!**

**Please review all pages and respond accordingly, complying with all provisions in the technical specifications and Jefferson Parish Instructions for Bidders and General Terms and Conditions. All bids must be received in the Purchasing Department by the bid due date and time.**

**Jefferson Parish Purchasing Department  
200 Derbigny Street-Suite 4400  
Gretna, LA 70053**

**Buyer Name: SHANNA FOLSE  
Buyer Email: SFOLSE@JEFFPARISH.NET  
Buyer Phone: 504-364-2680**



# JEFFERSON PARISH

Department of Purchasing

Michael S. Yenni  
Parish President

Renny Simno  
Director

April 24, 2019

## CHANGES FOR THE JEFFERSON PARISH PURCHASING DEPARTMENT

- **Purchasing will be moving back to the General Government Building the week of May 6, 2019.**
- **All Public Bid Openings (2 pm response time) after the week of May 6, 2019 will be held in Jefferson Parish Purchasing Department, 200 Derbigny Street, Suite 4400, Gretna, LA, 70053.**
- **All advertised bid submissions (2 pm) and all non-advertised bid submissions (11 am) are due at the 200 Derbigny Street, Suite 4400 address or via on-line through Central Bidding until the date and time the bid is to open. For convenience, the bid submission can be delivered to our satellite office in the Yenni Bldg, 1221 Elmwood Park Blvd, Suite 404, Jefferson, LA, 70123 until the day before the bid opening date and time.**
- **Always refer to the Invitation to Bid instructions for pre-bid information (if applicable).** Bidders should reference the "Additional Requirements" section of the bid instructions and/or the "Important Notice to Bidders" included in the bid package for specific requirements to respond accordingly.
- **Proof of insurance in the form of a current certificate evidencing coverages is required with bid submission from all bidders.** Bidders must read the insurance requirement attachment included in each bid package for specific instructions. Upon contract execution, successful bidder must produce final insurance certificates in accordance with Jefferson Parish insurance requirements.

For more information, please call Jefferson Parish Purchasing at 504-364-2678.

Joseph S. Yenni Building – 1221 Elmwood Park Blvd., Ste. 404, Jefferson, LA 70123

Office 504.364.2678

General Government Bldg. – 200 Derbigny St – Suite 4400 - Gretna, LA 70053

Office 504.364.2678

Email: [Purchasing@jeffparish.net](mailto:Purchasing@jeffparish.net) Website: [www.jeffparish.net](http://www.jeffparish.net)



DATE: 5/13/2019

INVITATION TO BID  
THIS IS NOT AN ORDER

Page: 1

BID NO.: 50-00126547

**JEFFERSON PARISH**  
PURCHASING DEPARTMENT  
P.O. BOX 9  
GRETN, LA. 70054-0009  
504-364-2678

VENDOR:

BUYER: SFOLSE@jeffparish.net

Bids will be received until 11:00 AM, 5/17/2019 via online at [www.jeffparishbids.net](http://www.jeffparishbids.net) or by hand delivery, USPS mail or other courier service to Purchasing Department, 200 Derbigny Street (General Government Building), Suite 4400, Gretna, LA 70053. For convenience, bidders may also submit bids in the East Bank Purchasing Department, Suite 404, Jefferson Parish Joseph S. Yenni Building, 1221 Elmwood Park Blvd., Jefferson LA 70123. However, if submitting bids on the day of bid opening, bidders must submit at the West Bank location only.

All bids submitted are subject to these instructions and general conditions and any special conditions and specifications contained herein, all of which are made part of this bid proposal reference. By submitting a bid, vendor agrees to comply with all provisions of Louisiana Law, as well be in compliance with the Jefferson Parish Code of Ordinances, Louisiana Code of Ethics, applicable Jefferson Parish ethical standards and Jefferson Parish Resolution No. 113646 and/or Resolution No. 113647. A copy of these resolutions may be obtained from the Office of the Parish Clerk, Suite 6700, Jefferson Parish General Government Building, 200 Derbigny Street, Gretna, LA 70053. You may also obtain a copy by visiting the Purchasing Department webpage at [purchasing.jeffparish.net](http://purchasing.jeffparish.net) and clicking on On-line forms.

All vendors submitting bids should register as a Jefferson Parish vendor if not already yet registered. Registration forms may be downloaded from <http://purchasing.jeffparish.net> and by clicking on Vendor Information. Current W-9 forms with respective Tax Identification numbers and vendor applications may be submitted at any time; however, if your company is not registered and/or a current W-9 form is not on file, vendor registration is mandatory. Further, a current W-9 form and respective Tax Identification number must be supplied upon contract execution, should you be awarded a contract and/or issued purchase order. Failure to do so may result in delay of payment.

As per LSA-RS 47:301 et seq., all governmental bodies are excluded from payment of sales taxes to any Louisiana taxing body. Quotations shall be based on F.O.B. Delivered, anywhere within the Parish as designated by the Purchasing Department. JEFFERSON PARISH WILL ACCEPT ONE BID ONLY FROM EACH VENDOR. Items bid must meet specifications. JEFFERSON PARISH will accept one price for each item unless otherwise indicated. Two or more prices for one item will result in bid rejection. Bidders are required to complete, sign and return the bid form and/or complete and return the associated line item pricing forms as indicated. The price quoted for work shall be stated in figures. In the event there is a difference in unit prices and totals, the unit prices shall prevail.

JEFFERSON PARISH reserves the right to award contracts or place orders on a lump sum or individual item basis, or such combination, as shall in its judgment be in the best interest of JEFFERSON PARISH. Every contract or order shall be awarded to the LOWEST RESPONSIVE and RESPONSIBLE BIDDER, taking into consideration the CONFORMITY WITH THE SPECIFICATIONS and the DELIVERY AND/OR COMPLETION DATE

PROTESTS: Only those vendors that submitted a bid in response to this solicitation may submit a protest in writing to the Director of the Purchasing within 48 hours of bid opening. The Purchasing Director will review it in connection with the Parish Attorney's Office as appropriate and a written response will be provided as soon as possible.

JEFFERSON PARISH reserves the right to cancel all or any part of an order if not shipped promptly. No charges will be allowed for parking or cartage unless specified in the quotation. The order must not be filled at a higher price than quoted. JEFFERSON PARISH reserves the right to cancel at any time and for any reason by issuing a THIRTY (30) day written notice to the contractor.

JEFFERSON PARISH requires all products to be new (current) and all work must be performed according to standard practices for the project. Unless otherwise specified, no aftermarket parts will be accepted. Unless otherwise specified, all workmanship and materials must have at least one (1) year guaranty, in writing, from the date of delivery and/or acceptance of the project. Any deviations or alteration from the specifications must be indicated on the bid form for each item and upon request, product data for same must be submitted by the time specified by the Purchasing Department.

If this bid requires a pre-bid conference (see Additional Requirements section), bidders are advised that such conference will be held to allow bidders the opportunity to identify any discrepancies in the bid specifications and seek further clarification regarding instructions. The Purchasing Department will issue a written response to bidders' questions in the form of an Addendum.

All formal Addenda require written acknowledgment on the bid form by the bidder. Failure to acknowledge an Addendum on the bid form shall cause the bid to be rejected; JEFFERSON PARISH reserves the right to award bid to next lowest responsive and responsible bidder in this event.

USE OF BRAND NAMES AND STOCK NUMBERS: Where brand names and stock numbers are specified, it is for the purpose of establishing certain minimum standards of quality. Bids may be submitted for products of equal quality, provided brand names and stock numbers are specified. Complete product data may be required prior to award.

Quantities listed are for bidding purposes only. Actual requirements may be more or less than quantities listed.

Bidders are not to exclude from participation in, deny the benefits of, or subject to discrimination under any program or activity, any person in the United States on the grounds of race, color, national origin, or sex; nor discriminate on the basis of age under the Age Discrimination Act of 1975, or with respect to an otherwise qualified handicapped individual as provided in Section 504 of the Rehabilitation Act of 1973, or on the basis of religion, except that any exemption from such prohibition against discrimination on the basis of religion as provided in the Civil Rights Act of 1964, or Title VI and VII of the Act of April 11, 1968, shall also apply. This assurance includes compliance with the administrative requirements of the Revenue Sharing final handicapped discrimination provisions contained in Section 51.55 (c), (d), (e), and (k)(5) of the Regulations. New construction or renovation projects must comply with Section 504 of the 1973 Rehabilitation Act, as amended, in accordance with the American National Standard Institute's specifications (ANSI A17.1-1961).

Jefferson Parish and its partners as the recipients of federal funds are fully committed to awarding a contract(s) to firm(s) that will provide high quality services and that are dedicated to diversity and to containing costs. Thus, Jefferson Parish strongly encourages the involvement of minority and/or woman-owned business enterprises (DBE's, including MBE's, WBE's and SBE's) to stimulate participation in procurement and assistance programs.



## INSTRUCTIONS FOR BIDDERS AND GENERAL CONDITIONS

### IN ACCORDANCE WITH STATE REGULATIONS JEFFERSON PARISH OFFERS ELECTRONIC PROCUREMENT TO ALL VENDORS

This electronic procurement system allows vendors the convenience of reviewing and submitting bids online. This is a secure site and authorized personnel have limited read access only. Bidders are encouraged to submit electronically using this free service; while the website accepts various file types, one single PDF file containing all appropriate and required bid documents is preferred. Bidders submitting uploaded images of bid responses are solely responsible for clarity. If uploaded images/documents are not legible, then bidder's submission will be rejected. Please note all requirements contained in this bid package for electronic bid submission.

Please visit our E-Procurement Page at [www.jeffparishbids.net](http://www.jeffparishbids.net) to register and view Jefferson Parish solicitations. For more information, please visit the Purchasing Department page at <http://purchasing.jeffparish.net>.

### ADDITIONAL REQUIREMENTS FOR THIS BID

PLEASE MATCH THE NUMBERS PRINTED IN THIS BOX WITH THE CORRESPONDING INSTRUCTIONS BELOW.

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1. All bidders must attend the MANDATORY pre-bid conference and will be required to sign in and out as evidence of attendance. In accordance with LSA R.S. 38:2212(I), all prospective bidders shall be present at the beginning of the MANDATORY pre-bid conference and shall remain in attendance for the duration of the conference. Any prospective bidder who fails to attend the conference or remain for the duration shall be prohibited from submitting a bid for the project.
2. Attendance to this pre-bid conference is optional. However, failure to attend the pre-bid conference shall not relieve the bidder of responsibility for information discussed at the conference. Furthermore, failure to attend the pre-bid conference and inspection does not relieve the successful bidder from the necessity of furnishing materials or performing any work that may be required to complete the work in accordance with the specification with no additional cost to the owner.
3. Contractor must hold current applicable JEFFERSON PARISH licenses with the Department of Inspection and Code Enforcement. Contractor shall obtain any and all permits required by the JEFFERSON PARISH Department of Inspection and Code Enforcement. The contractor shall be responsible for the payment of these permits. All permits must be obtained prior to the start of the project. Contractor must also hold any and all applicable Federal and State licenses. Contractor shall be responsible for the payment of these permits and shall obtain them prior to the start of the project.
4. A LA State Contractor's License will be required in accordance with LSA R.S. 37-2150 et. seq. and such license number will be shown on the outside of the bid envelope. Failure to comply will cause the bid to be rejected. Additionally if submitting the bid electronically, then the license number must be entered in the appropriate field in the Electronic Procurement system. Failure to comply will cause the bid to be rejected.
5. It is the bidder's responsibility to visit the job site and evaluate the job before submitting a bid.
6. Job site must be clean and free of all litter and debris daily and upon completion of the contract. Passageways must be kept clean and free of material, equipment, and debris at all times. Flammable material must be removed from the job site daily because storage will not be permitted on the premises. Precautions must be exercised at all times to safeguard the welfare of JEFFERSON PARISH and the general public.



## INSTRUCTIONS FOR BIDDERS AND GENERAL CONDITIONS

7. PUBLIC WORKS BIDS: All awards for public works in excess of \$5,000.00 will be reduced to a formal contract which shall be recorded at the contractor's expense with the Clerk of Court and Ex-Officio Recorder of Mortgages for the Parish of Jefferson. A price list of recordation costs may be obtained from the Clerk of Court and Ex-Officio Recorder of Mortgages for the Parish of Jefferson. All awards in excess of \$25,000.00 will require both a performance and a payment bond. Unless otherwise stated in the bid specifications, the performance bond requirements shall be 100% of the contract price. Unless otherwise state in the bid specifications, the payment bond requirements shall be 100% of the contract price. Both bonds shall be supplied at the signing of the contract.
8. NON-PUBLIC WORKS BIDS: A performance bond will be required for this bid. The amount of the bond will be 100% of the contract price unless otherwise indicated in the specifications. The performance bond shall be supplied at the signing of the contract.
9. NON-PUBLIC WORKS BIDS: A payment bond will be required for this bid. The amount of the bond will be 100% of the contract price unless otherwise indicated in the specifications. The payment bond shall be supplied at the signing of the contract.
10. All bidders must comply with the requirements stated in the attached "Standard Insurance Requirements" sheet attached to this bid solicitation. Prior to contract executions/purchase order issuance, the successful bidder will be required to provide final insurance certificates which shall name Jefferson Parish as an additional insured in accordance with the instructions in the aforementioned "Standard Insurance Requirements" sheet.
11. A bid bond will be required with bid submission in the amount of 5% of the total bid, unless otherwise stated in the bid specifications. Acceptable forms shall be limited to cashier's check, certified check, or surety bid bond. All sureties must be in original format (no copies). If submitting a bid online, vendors must submit an electronic bid bond through the respective online clearinghouse bond management system(s) as indicated in the electronic bid solicitation on Central Auction House. No scanned paper copies of any bid bond will be accepted as part of the electronic bid submission.
12. This is a requirements contract to be provided on an as needed basis. JEFFERSON PARISH makes no representations on warranties with regard to minimum guaranteed quantities unless otherwise stated in the bid specifications.
13. Freight charges should be included in total cost when quoting. If not quoted FOB DELIVERED, freight must be quoted as a separate item. Bid may be rejected if not quoted FOB DELIVERED or if freight charges are not indicated on bid form.
14. PUBLIC WORKS BIDS - Completed, Signed and Properly Notarized Affidavits Required; This applies to all solicitations for construction, alteration or demolition of public buildings or projects, in conformity with the provisions contained in LSA-RS 38:2212.9, LSA-RS 38:2212.10, LSA-RS 38:2224, and Sec 2-923.1 of the Jefferson Parish Code of Ordinances. For bidding purposes, all bidders must submit with bid submission COMPLETED, SIGNED and PROPERLY NOTARIZED Affidavits, including: Non-Conviction Affidavit, Non-Collusion Affidavit, Campaign Contribution Affidavit, Debt Disclosures Affidavit and E-Verify Affidavit. For the convenience of vendors, all affidavits have been combined into one form entitled PUBLIC WORKS BID AFFIDAVIT. This affidavit must be submitted in its original format, and without material alteration, in order to be compliant and for the bid to be considered responsive. A scanned copy of the completed, signed and properly notarized affidavit may be submitted with the bid, however, the successful bidder must submit the original affidavit in its original format and without material alteration upon contract execution. Failure to comply will result in the bid submission being rejected as non-responsive. The Parish reserves the right to award bid to the next lowest responsive and responsible bidder in this event.
15. NON PUBLIC WORK BIDS - Completed, Signed and Properly Notarized Affidavits Required in conformity with the provisions contained in LSA – RS 38:2224 and Sec 2-923.1 of the Jefferson Parish Code of Ordinances. For bidding purposes, all bidders must submit with bid submission COMPLETED, SIGNED and PROPERLY NOTARIZED Affidavits, including: Non-Collusion Affidavit, Debt Disclosures Affidavit and Campaign Contribution Affidavit. For the convenience of vendors, all affidavits have been combined into one form entitled NON PUBLIC WORKS BID AFFIDAVIT. This affidavit must be submitted in its original format, and without material alteration, in order to be compliant and for the bid to be considered responsive. A scanned copy of the completed, signed and properly notarized affidavit may be submitted with the bid, however, the successful bidder must submit the original affidavit in its original format and without material alteration upon contract execution. Failure to comply will result in the bid submission being rejected as non-responsive. The Parish reserves the right to award bid to the next lowest responsive and responsible bidder in this event.
16. The ensuing contract for this bid solicitation may be eligible for FEMA reimbursement and/or Federal funding/reimbursement. As such, the referenced appendix will be applicable accordingly and shall be considered a part of the bid documents. All applicable certifications must be duly completed, signed and submitted with bid submission. Failure to submit applicable certifications with bid submission will result in bid rejection.

It shall be the duty of every parish officer, employee, department, agency, special district, board, and commission: and the duty of every contractor, subcontractor, and licensee of the parish, and the duty of every applicant for certification of eligibility for a parish contract or program, to cooperate with the Inspector General in any investigation, audit, inspection, performance review, or hearing pursuant to Jefferson Parish Code of Ordinances Section 2-155.10(19). By submitting a bid, vendor acknowledges this and will abide by all provisions of the referenced Jefferson Parish Code of Ordinances.

DATE: 5/13/2019

INVITATION TO BID  
THIS IS NOT AN ORDER

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BID NO.: 50-00126547

**JEFFERSON PARISH**

PURCHASING DEPARTMENT  
P.O. BOX 9  
GRETN, LA. 70054-0009  
504-364-2678

VENDOR: Traffic Parts Inc

BUYER: SFOLSE

As per LSA-RS 47:301 et seq., all governmental bodies are excluded from payment of sales taxes to any Louisiana taxing body. Quotations shall be based on F.O.B. Agency warehouse or jobsite, anywhere within the Parish as designated by the Purchasing Department.

JEFFERSON PARISH reserves the right to cancel all or any part of an order if not shipped promptly. No charges will be allowed for parking or cartage unless specified in quotation. The order must not be filled at a higher price than quoted. JEFFERSON PARISH reserves the right to cancel at any time and for any reason by issuing a THIRTY (30) day written notice to the contractor.

JEFFERSON PARISH is expecting all products to be new and all work to be done in workman-like manner, according to standard practices. Any deviations or alteration from the specifications must be indicated on the bid form for each item and upon request, product data for same must be submitted by the time specified by the Purchasing Department.

**DELIVERY: FOB JEFFERSON PARISH**

INDICATE DELIVERY DATE ON EQUIPMENT AND SUPPLIES \_\_\_\_\_

INDICATE STARTING TIME (IN DAYS) FOR CONSTRUCTION WORK \_\_\_\_\_

INDICATE COMPLETION TIME (IN DAYS) FOR CONSTRUCTION WORK \_\_\_\_\_

In the event that addenda are issued with this bid, bidders MUST acknowledge all addenda on the bid form. Bidder must acknowledge receipt of an addendum on the bid form as indicated. Failure to acknowledge any addendum on the bid form will result in bid rejection.

Acknowledge Receipt of Addenda: NUMBER: \_\_\_\_\_

NUMBER: \_\_\_\_\_

NUMBER: \_\_\_\_\_

NUMBER: \_\_\_\_\_

LOUISIANA CONTRACTOR'S LICENSE NO.: (if applicable) \_\_\_\_\_

**\*\*\* ALL BIDDERS MUST COMPLETE SECTION BELOW \*\*\***

FIRM NAME: Traffic Parts inc

SIGNATURE: *Jason Reed*  
(Must be signed here)

TITLE: Regional Sales Manager

PRINT OR TYPE NAME: Jason Reed

ADDRESS: 27895 Robinson Rd

CITY, STATE: Conroe, Tx

ZIP: 77385

TELEPHONE: (800 ) 345-6329

FAX: ( 713 ) 490-0755

EMAIL ADDRESS: jason@trafficparts.com

TOTAL PRICE OF ALL BID ITEMS: \$ 8091.72

## INVITATION TO BID FROM JEFFERSON PARISH - continued

BID NO.: 50-00126547

SEALED BID

ITEM NUMBER	QUANTITY	U/M	DESCRIPTION OF ARTICLES	UNIT PRICE QUOTED	TOTALS
1	12.00	EA	ONE TIME PURCHASE OF LCD SIGNAL MONITORS FOR THE JEFFERSON PARISH TRAFFIC ENGINEERING DEPARTMENT.  0010- SIGNAL MONITOR, 12 CHANNEL NEMA LCD ENHANCED WITH BUILT-IN PRINTER PORT  MODEL # SSM12LE  TO BE DELIVERED TO: TRAFFIC ENGINEERING 2100 DICKORY AVE HARAHAN, LA 70123  ***PLEASE SEE ATTACHED SPECIFICATIONS***	\$674.31	\$8091.72



**NEMA TS-1  
Enhanced 6 and 12 Channel  
LCD Signal Monitor  
Procurement Specifications  
-----  
Model SSM-LE and SSM-LEip Series  
Signal Monitor**

December 2010

**EBERLE DESIGN INC.**

3819 East La Salle Street      Tel (480) 988-8407  
Phoenix, AZ 85040 USA      Fax (602) 437-1996  
[www.EDIttraffic.com](http://www.EDIttraffic.com)



## **NEMA TS1 Enhanced LCD Signal Monitor Specification**

### **Section 1 INTRODUCTION**

This specification sets forth the minimum requirements for a shelf-mountable, six, twelve, and eighteen channel, solid-state Signal Monitor for a NEMA TS-1 Traffic Cabinet Assembly. At a minimum, the Signal Monitor shall comply with all specifications outlined in Section 6 of NEMA STANDARD TS-1 1989 (Conflict Monitors). The unit shall also include the enhanced monitoring functions described in Section 1.1, hardware functions described in Section 1.11, and diagnostic functions described in Section 3.

The Signal Monitor shall be capable of monitoring six or twelve channels consisting of a Walk input, Green input, Yellow input, and Red input for each channel.

#### **1.1 MONITOR FUNCTIONS**

All fault timing shall be computed for each channel individually except for Conflict faults.

#### **1.2 CONFLICT MONITORING**

The Signal Monitor shall be able to detect the presence of conflicting Green or Yellow or Walk signal voltages on the AC field terminals between two or more non-compatible channels. A Conflict fault (CONFLICT) shall be a latching fault.

##### **1.2.1 CONFLICT RECOGNITION TIME**

The Signal Monitor shall trigger when voltages on any conflicting channels are present for more than 450 ms. The Signal Monitor shall not trigger when voltages on any conflicting channels are present for less than 200 ms. Conflicting signals sensed for more than 200 ms and less than 450 ms may or may not trigger the unit.

#### **1.3 RED FAIL MONITORING**

The Signal Monitor shall be able to detect the absence of active signal voltages on the Red and Green and Yellow and Walk AC field terminals. A Red Fail fault (RED FAIL) shall be a latching fault. The Red Fail monitoring function shall be disabled for all selected channels when the Red Enable input is not active.

##### **1.3.1 RED FAIL RECOGNITION TIME**

The Signal Monitor shall trigger when active voltages on all inputs of a channel channels are absent for more than 1000 ms. The Signal Monitor shall not trigger when active voltages on all inputs of a channel channels are absent for less than 700 ms.

##### **1.3.2 WALK DISABLE OPTION**

A Walk Disable function shall be provided which will modify operation of Red Fail and Dual Indication monitoring. If this function is enabled via a front panel DIP switch labeled "WALK DISABLE", the unit shall trigger if it senses the absence of active Green, Yellow, and Red inputs of a channel regardless of the state of the Walk input. Dual Indication faults of Red + Walk shall not trigger the unit.

#### **1.4 VOLTAGE MONITORING**

##### **1.4.1 24VDC MONITORING**

The Signal Monitor shall be able to detect that the cabinet +24 Vdc supply has fallen below 18 Vdc. A 24V Monitor function shall be provided which will sense an improper voltage level at either of the +24V Monitor inputs and cause the unit to trigger.



## **NEMA TS1 Enhanced LCD Signal Monitor Specification**

### **1.4.1.1 24VDC RECOGNITION TIME**

The Signal Monitor shall trigger when the voltage on the +24V input is below 18 Vdc for more than 200 ms. The Signal Monitor shall not trigger when the voltage on the +24V input is below 18 Vdc for less than 100 ms. A voltage level of +22 Vdc shall be required to prevent the unit from triggering.

### **1.4.1.2 24VDC LATCH**

If the 24V Latch function is enabled via a front panel DIP switch, restoration of the proper voltage levels will not reset the unit. Only a manual reset or external reset will reset the unit.

### **1.4.2 CONTROLLER VOLTAGE MONITOR (CVM)**

The Signal Monitor shall trigger when the CVM input level goes False. A CVM Monitor function shall be provided which will sense a CVM fault and cause the unit to trigger.

#### **1.4.2.1 CONTROLLER VOLTAGE MONITOR RECOGNITION TIME**

The Signal Monitor shall trigger when the voltage on the CVM input is False for more than 200 ms. The Signal Monitor shall not trigger when the voltage on the CVM input is False for less than 100 ms.

#### **1.4.2.2 CVM LATCH**

If the CVM Latch function is enabled via a front panel DIP switch, restoration of the CVM input to the True voltage level will not reset the unit. Only a manual reset or external reset will reset the unit.

#### **1.4.2.3 CONTROLLER VOLTAGE MONITOR LOG DISABLE**

The Signal Monitor shall provide a front panel DIP switch labeled "CVM LOG DISABLE" which prevents CVM events from being entered into the Previous Fail log.

### **1.5 AC LINE BROWNOUT RECOGNITION**

The Signal Monitor shall be able to detect that the AC Line has fallen below  $92 \pm 2$  Vac for greater than  $475 \pm 25$  ms. This shall force the Output and Start Delay Relay to the de-energized "fault" state and cause the POWER LED to flash at a 2 Hz rate. The unit shall maintain this state until the AC Line voltage rises above  $96 \pm 2$  Vac for greater than  $120 \pm 25$  ms.

### **1.6 DUAL INDICATION MONITORING**

The Signal Monitor shall be able to detect the presence of active voltage on any combination of field signal inputs of a channel except Green and Walk. A Dual Indication fault shall be a latching fault. This function shall be enabled on a per channel basis using DIP switches mounted on the front panel labeled "SSM". The Dual Indication monitoring function shall be disabled for all selected channels when the Red Enable input is not active.

#### **1.6.1 GY DUAL INDICATION MONITORING**

The Signal Monitor shall be able to detect the presence of active voltage on the Yellow and Green field signal inputs of a channel. A GY Dual Indication fault shall be a latching fault. This function shall be enabled with a DIP switch on the front panel labeled "GY ENABLE". When the switch is in the ON position, all channels shall be monitored for simultaneous active Green and Yellow inputs on a channel.

#### **1.6.2 DUAL INDICATION RECOGNITION TIME**

The Signal Monitor shall trigger when multiple inputs are active on a channel for more than 500 ms. The Signal Monitor shall not trigger when multiple inputs are active on a channel for less than 250 ms. Channels with multiple voltages active for more than 250 ms and less than 500 ms may or may not trigger the unit.

## NEMA TS1 Enhanced LCD Signal Monitor Specification

### 1.6.3 WALK DISABLE OPTION

A Walk Disable function shall be provided which will modify operation of Red Fail and Dual Indication monitoring. If this function is enabled via a front panel DIP switch labeled "WALK DISABLE", the unit shall not trigger if it senses the Red and Walk signals active.

### 1.7 CLEARANCE (SHORT OR ABSENT YELLOW) MONITORING

The Signal Monitor shall be able to detect that a channel has not provided an adequate Yellow Clearance interval during a Green to Yellow to Red sequence. A Clearance failure shall be a latching fault. This function shall be enabled on a per channel basis using DIP switches mounted on the front panel labeled "SSM". The Clearance monitoring function shall be disabled for all selected channels when the Red Enable input is not active.

#### 1.7.1 CLEARANCE RECOGNITION TIME

The Yellow Clearance interval shall be 2.7 seconds  $\pm$  0.1 seconds.

### 1.8 RECURRENT PULSE MONITORING

The Signal Monitor shall detect Conflict, Red Fail, and Dual Indication faults that result from intermittent or flickering field signal inputs. These recurring pulses shall result in a latching fault with the RP STATUS indicator illuminated along with the resulting Conflict, Red Fail, or Dual Indication indicator.

### 1.9 EXTERNAL WATCHDOG MONITORING

Absence of a logic input transition from the cabinet controller watchdog circuitry for 1500 msec ( $\pm$  100 msec) shall cause the unit to trigger. The monitor shall remain in the fault mode until the unit is reset by the Reset button or the External Reset input. A Power Failure shall also reset the CVM/WD fault state of the monitor. This function shall be enabled via a front panel DIP switch labeled "WD ENABLE". The EXTERNAL WATCHDOG input shall be wired to connector MSB-S (12 Channel) or MSA-q (6 Channel).

### 1.10 PROGRAM CARD AJAR

When the Programming Card is removed or not seated properly, the Signal Monitor shall force the Output Relay to the de-energized fault state and illuminate the PROGRAM CARD indicator. A reset command from the front panel Reset switch or External Reset input shall be required once the Program Card is in place.

### 1.11 FLASHING YELLOW ARROW PPLT SUPPORT

The Signal Monitor shall be designed to monitor an intersection with up to four approaches using the four section Flashing Yellow Arrow (FYA) movement outlined by the NCHRP Research Project 3-54 on Protected/Permissive signal displays with Flashing Yellow Arrows. Two cabinet configurations shall be supported depending on the number of load switches provided and the capabilities of the Controller Unit. In both modes the Signal Monitor shall be designed to provide the same fault coverage for the FYA approaches as it does for conventional protected left turn phases including Conflict, Red Fail, Dual Indication, and Minimum Yellow Clearance monitoring.

### 1.12 LED SIGNAL THRESHOLD ADJUST (LEDGUARD)

The MMU shall provide the capability to sense field inputs signals with the following thresholds:

Conflict, Dual Indication Low Threshold Signal Inputs (Green, Yellow, and Red)

No Detect.....less than 15 Vrms

Detect.....greater than 25 Vrms

Red Fail High Threshold Signal Inputs (Green, Yellow, and Red)

No Detect.....less than 50 Vrms

Detect.....greater than 70 Vrms



## NEMA TS1 Enhanced LCD Signal Monitor Specification

### Section 2 HARDWARE

#### 2.1 LED INDICATORS

All LED display indicators shall be mounted on the front panel of the Signal Monitor and shall be water clear, T-1 package, Super Bright type LEDs. All LEDs shall be labeled as follows:

- 1) POWER: The POWER indicator shall flash at a rate of 2 Hz when the unit has detected a low voltage condition as described in Section 1.4.2.3. It shall illuminate when the AC Line voltage level is restored above the brownout level. The indicator shall extinguish when the AC Line voltage is less than 75 Vrms.
- 2) DIAGNOSTIC: The DIAGNOSTIC indicator shall illuminate when an internal diagnostic test has failed. This indicator is intended to inform the service technician of a monitor hardware or firmware failure.
- 3) FAULT: The FAULT indicator shall illuminate when the unit has responded to a fault condition and has transferred the Output relay.

#### 2.2 LCD INDICATORS

- 1) CONFLICT: The CONFLICT indicator shall illuminate when a conflicting proceed signal fault is detected.
- 2) RED FAIL: The RED FAIL indicator shall illuminate when an absence of signal is detected on a channel(s). If the Red Enable input is not active, the RE OFF indicator shall illuminate.
- 3) CVM / WD: The CVM /WD indicator shall illuminate when a Controller Voltage Monitor fault or External Watchdog fault is detected.
- 4) 24V-2: The 24V-2 indicator shall illuminate when a 24VDC fault condition on the 24V Monitor input #2 is detected.
- 5) 24V-1: The 24V-1 indicator shall illuminate when a 24VDC fault condition on the 24V Monitor input #1 is detected.
- 6) RP STATUS: The RP STATUS indicator shall illuminate when a recurrent pulse Conflict, Dual Indication or Red Fail fault is detected on a channel(s).
- 7) DUAL INDICATION: The DUAL INDICATION indicator shall illuminate when a Dual Indication or GY Dual Indication fault is detected on a channel(s).
- 8) CLEARANCE: The CLEARANCE indicator shall illuminate when the minimum Yellow Clearance time has not been met on a channel(s).
- 9) Rx: The Rx indicator shall illuminate when the RS-232 port has received a character.
- 10) Tx: The Tx indicator shall illuminate when the RS-232 port has transmitted a character.
- 11) CHANNEL STATUS: A separate indicator for each input of each channel shall display all active signals simultaneously. Additionally, one indicator per channel shall be provided which identifies a channel as being involved in an error condition that has triggered the unit.

#### 2.3 FRONT PANEL CONTROL

- 1) RESET Button: A momentary SPST Control switch labeled RESET shall be provided on the unit front panel to reset the monitor circuitry to a non-failed state. A reset command issued

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from either the front panel button or External Reset input shall be a one-time reset input to prevent the unit from constant reset due to a switch failure or constant external input, and shall cause all LED and LCD indicators to illuminate for 500ms.

- 2) MODE Button: A momentary SPST Control switch labeled MODE shall be provided on the unit front panel to control the display mode.
- 3) INC Button: A momentary SPST Control switch labeled INC shall be provided on the unit front panel to modify the selected display mode.

### 2.4 ELECTRONICS

#### 2.4.1 INTERNAL MPU WATCHDOG

A microprocessor shall be used for all timing and control functions. Continuing operation of the microprocessor shall be verified by an independent monitor circuit, which shall force the OUTPUT RELAY to the de-energized "fault" state and illuminate the DIAGNOSTIC indicator if a pulse is not received from the microprocessor within a defined period not to exceed 500 ms. This shall be programmable as a latching function and will require a power-down cycle to clear.

#### 2.4.2 AC INPUT SAMPLING

High speed sampling techniques shall be used to determine the true RMS value of the AC field inputs. Each AC input shall be sampled at least 32 times per line cycle. The RMS voltage measurement shall be insensitive to phase, frequency, and waveform distortion.

#### 2.4.3 SOCKETS

In the interest of reliability, no sockets shall be allowed for ICs. All embedded programming shall be accomplished using in-circuit techniques or via the front panel communications port.

#### 2.4.4 INTERNAL POWER SUPPLY

A built-in, high-efficiency switching power supply shall generate all required internal voltages. Failure of the internal power supply to provide proper operating voltages shall force the Output Relay to the de-energized "fault" state and illuminate the DIAGNOSTIC indicator. A user replaceable slow blow fuse shall be provided for the AC Line input. The unit shall be operational over the AC Line voltage range of 75 Vrms to 135 Vrms.

#### 2.4.5 CONFIGURATION PARAMETERS

All user programmed configuration settings shall be stored in an electrically erasable programmable read-only memory (EEPROM) or front panel DIP switches. Designs using a battery to maintain configuration data shall not be acceptable.

#### 2.4.6 FIELD TERMINAL INPUTS

All 120 Vac field terminal inputs shall provide an input impedance of 150K  $\pm$  50K ohms and be terminated with a discrete resistor having a power dissipation rating of 0.5 Watts or greater. In the interest of reliability and repair ability, the front panel MS connectors shall not be directly mounted to the printed circuit board. A wire harness of 22 gauge minimum stranded wire shall be used.

#### 2.4.7 COMMUNICATIONS PORTS

The unit shall be provided with either an EIA-232 port or an Ethernet port.

##### 2.4.7.1 EIA-232 COMMUNICATIONS PORT (SSM-LE)

The monitor unit shall have an EIA-232 serial communications port to provide a means of transferring all monitor status, configuration data, and event log data to a PC. The EIA-232 port shall be totally electrically isolated from the monitor unit except for the chassis connection. The connector shall be an AMP 9721A or equivalent 9 pin metal shell D subminiature type with female contacts. Pin assignments shall be as shown in the following table:



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PIN	FUNCTION
1	DCD*
2	TX DATA
3	RX DATA
4	DTR (Data Terminal Ready)
5	SIGNAL GROUND
6	DSR*
7	DSR*
8	CTS*
9	NC

\*Jumper options shall be provided to allow the connection of Pin #4 to be made with Pin #7, and the connection of Pin #8 to be made with Pin #1 and or Pin #6.

### 2.4.7.2 ETHERNET PORT (SSM-LEIP)

An optional port capable of a minimum 10 Mbps operation shall be provided on the front panel. The Ethernet port shall be electrically isolated from the monitor electronics and shall provide a minimum of 1500 Vrms isolation. The connector shall be an RJ-45 eight pin connector.

#### 2.4.7.2.1 WAN NETWORK DISCOVERY (2010ECLIP)

The communications software running on the PC shall be able to search the network and display a list of IP addresses and Monitor IDs of monitors responding on the network. The communications software shall also be capable of making changes to the monitor network parameters such as IP address and subnet mask.

#### 2.4.7.2.2 ETHERNET PORT HTML INTERFACE

An HTML based capability shall be provided in the monitor to configure the network parameters of the Ethernet port using a standard HTML browser.

### 2.4.8 COMPONENT SPECIFICATIONS

All electrical components used in the unit shall be rated by the component manufacturer to operate beyond the full unit operating temperature range of -34°C to +74°C including the Liquid Crystal displays (LCD).

### 2.4.9 PRINTED CIRCUIT BOARDS

All printed circuit boards shall meet the requirements of the NEMA STANDARD TS-1 1989, plus the following requirements to enhance reliability:

- 1) All plated-through holes and exposed circuit traces shall be plated with solder.
- 2) Both sides of the printed circuit board shall be covered with a solder mask material.
- 3) The circuit reference designation for all components and the polarity of all capacitors and diodes shall be clearly marked adjacent to the component. Pin #1 for all integrated circuit packages shall be designated on both sides of all printed circuit boards.
- 4) All electrical mating surfaces shall be gold plated.
- 5) All printed circuit board assemblies shall be coated on both sides with a clear moisture-proof and fungus-proof sealant.
- 6) All components and wire harnesses shall be mounted to the PCB using plated holes. "Piggy back" connections or jumper wires shall not be acceptable.

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### Section 3 EVENT LOGGING FUNCTIONS

In addition to the normal display mode, it shall be possible to review the previous failure (PF) and AC Line (AC) event logs, Program Card permissive programming, SSM switch programming, and set the Real time clock and calendar using the front panel display.

The Signal Monitor shall be capable of storing in non-volatile memory a minimum of 100 events. Each event shall be marked with the time and date of the event. These events shall consist of fault events, AC Line events, reset events, and configuration change events. The capability to assign a four digit identification number and 30 character description to the unit shall be provided. The event logs shall be uploaded to a PC using the serial port of the Signal Monitor and Windows based software provided by the manufacturer.

Each event log report shall contain the following information:

- a) Monitor ID#: a four digit (0000-9999) ID number and 30 character description assigned to the monitor.
- b) Time and Date: time and date of occurrence.
- c) Event Number: identifies the record number in the log. Event #1 shall be the most recent event.

#### 3.1 CURRENT STATUS REPORT (CS)

The Current Status report shall contain the following information:

- a) Fault Type: the fault type description.
- b) Field Status: the current GYRW field status and field RMS voltages if the monitor is not in the fault state, or the latched field status and field RMS voltages and fault channel status at the time of the fault.
- c) Cabinet Temperature: the current temperature if the monitor is not in the fault state, or the latched temperature at the time of the fault.
- d) AC Line Voltage: the current AC Line voltage and frequency if the monitor is not in the fault state, or the AC Line voltage and frequency at the time of the fault.
- e) Control Input Status: the current state and RMS voltage of the Red Enable input if the monitor is not in the fault state, or the status latched at the time of the fault.

#### 3.2 PREVIOUS FAULT REPORT (PF)

The Previous Fault log shall contain the following information:

- a) Fault Type: the fault type description.
- b) Field Status: the latched field status with RMS voltages, fault channel status, and RP Detect status at the time of the fault.
- c) Cabinet Temperature: the latched temperature at the time of the fault.
- d) AC Line Voltage: the AC Line voltage and frequency at the time of the fault.
- e) Control Input Status: the latched state with RMS voltage of the Red Enable input at the time of the fault.

#### 3.3 AC LINE EVENT REPORT (AC)

The AC Line log shall contain the following information:



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- a) Event Type: describes the type of AC Line event that occurred.
  - Power-up - AC on, monitor performed a cold start
  - Interrupt - AC Line < Brownout level
  - Restore - AC restored from AC brown-out or AC interruption, no cold start
- b) AC Line Voltage: the AC Line voltage & frequency at the time of the event.

### 3.4 MONITOR RESET REPORT (MR)

The Monitor Reset log shall contain the following information:

- a) The monitor was reset from a fault by the front panel Reset button, or External Reset input, or a non-latched event clear.

### 3.5 CONFIGURATION CHANGE REPORT (CF)

The Configuration Change log shall contain the following information:

- a) The status of all configuration programming including the contents of the Program Card, all configuration DIP switches and option switches.
- b) Any configuration programming inputs such as 24V Inhibit.
- c) Configuration Check Value: A unique CRC value which is based on the configuration of items #a and #b above.

The log shall also indicate which items have been changed since the last log entry.

### 3.6 SIGNAL SEQUENCE HISTORY REPORT (SSQ)

At a minimum five logs shall be provided that graphically display all field signal and Red Enable states for up to 30 seconds prior to the current fault trigger event. The resolution of the display shall be at least 50 milliseconds.