

**SUBJECT: RESOLUTION NO. 74, SERIES 2025 – A RESOLUTION
AUTHORIZING PURCHASES IN CONNECTION WITH THE
TRAFFIC SIGNAL TECHNOLOGY GRANT PROJECT**

DATE: OCTOBER 07, 2025

PREPARED BY: CAMERON FOWLKES, CITY ENGINEER

PRESENTED BY: KURT KOWAR, DIRECTOR OF PUBLIC WORKS AND UTILITIES

SUMMARY:

Staff recommend the award of proposals for the Traffic Signal Technology Grant Project as follows:

1. Econolite Control Products, Inc. for cabinets, controllers, and battery backup systems (\$222,682.30);
2. AM Signal LLC for Miovision video detection systems and Opticom EVP detectors (\$443,224.00);
3. Approval of a Change Order to Lighthouse Traffic Group in the amount of \$305,287.00 for installation services; and
4. Approval of a \$25,000 contingency for the installation services.

The project total is \$982,429.30.

BACKGROUND / PRIOR DISCUSSIONS:

The City of Louisville's traffic signals require regular maintenance to ensure efficient and safe operation. However, many traffic signal components are outdated and no longer supported. Replacing this equipment will improve safety, reduce emergency response times, reduce congestion, optimize intersection timing, and enhance regional coordination.

In 2023, staff applied for and received a Denver Regional Council of Governments (DRCOG) Technology Grant in the amount of \$658,292 to fund the procurement of upgraded traffic signal equipment. The grant application included the following:

- Replace approximately seven (7) outdated and unsupported traffic signal cabinets.
- Replace approximately seven (7) obsolete controllers.
- Install battery backup systems at approximately seven (7) intersections for operational continuity. The selected locations will supplement the existing critical intersections with battery backup ensuring all critical locations will have battery backup.
- Replace aging vehicle detection systems at approximately eleven (11) intersections.
- Install emergency vehicle preemption systems at two (2) critical intersections.

On [April 15, 2025](#), City Council approved resolution No. 25, series 2025 approving an IGA with the Colorado Department of Transportation (CDOT) for the Traffic Signal Technology Grant, which provides funding to upgrade outdated traffic signal equipment. The grant for the procurement of equipment totals up to \$658,292, broken down as follows: \$545,000 (82.79%) of Federal Funding and \$113,292 of City Match (17.21%). Any procurement costs above this amount would be considered City Overmatch funded with 100% of City funds. The installation of the equipment by the City's traffic signal maintenance contractor was estimated to be approximately \$200,000, which is 100% paid for by the City.

ANALYSIS:

Staff advertised the Traffic Signal Technology Grant Project on May 28, 2025, and June 4, 2025. The grant application and IGA recommended the quantities and items selected based on the Traffic Signal Management Plan with the goal to better align the City's signal technology to improve safety, reduce emergency response time, reduce congestion, optimize signal timing, and enhance regional coordination.

Bids were received on June 26, 2025 as follows:

Contractor	Traffic Signal Cabinets (QTY-7)	Traffic Signal Controller (QTY-7)	Video Detection (QTY-11)	Emergency Preemption (QTY-2)	Battery Backup (QTY-7)
AM Signal LLC	\$139,881.00	No Bid	<u>\$214,247.00*</u>	<u>\$9,820.00*</u>	\$31,024.00
Altitude Signal LLC	No Bid	No Bid	\$157,819.97	No Bid	No Bid
Traffic Signal Controls Inc	\$146,748.00	No Bid	No Bid	\$5,906.00	\$35,413.00
Econolite Control Products Inc	<u>\$111,852.30</u>	<u>\$20,090.00</u>	No Bid	No Bid	<u>\$32,970.00**</u>
ITS Plus Inc	No Bid	No Bid	\$176,000.00	No Bid	No Bid

* Staff recommends the award to AM Signal LLC for the video detection and emergency preemption systems as they will remain consistent with already installed equipment (Miovision). This will allow staff to view/edit the video detection on a single software platform in lieu of multiple systems and software and allowing for consistent maintenance in the future. This will also allow staff the potential to integrate corridor-wide adaptive timings in the future and utilize one software platform to monitor signals.

** Staff recommends the award to Econolite to keep the cabinet, controller and battery backup systems consistent for each install. This was based on Econolite being the lowest bidder for all three items in total and the only bidder on the Controller.

The unit prices for the bids received were better than anticipated. To maximize the grant and federal funding, staff reviewed the conditions of existing traffic signal technology and

existing equipment at each intersection and recommend increasing quantities of bid items as shown below. This will optimize the signal network and maximize the value of the grant and federal funding while staying within the City's budget for the project as a whole.

RECOMMENDED QUANTITIES

Contractor	Original QTY	Additional QTY	Revised Total	Unit Price	Total
Traffic Signal Cabinet	7	0	7	\$ 15,978.90	\$ 111,852.30
Traffic Signal Controller	7	7	14	\$ 2,870.00	\$ 40,180.00
Video Detection	11	11	22	\$ 19,477.00	\$ 428,494.00
Emergency Preemption	2	1	3	\$ 4,910.00	\$ 14,730.00
Battery Backup System	7	8	15	\$ 4,710.00	\$ 70,650.00
Equipment Total					\$ 665,906.30

As previously communicated, the City is fully funding the installation and will use the City's current Traffic Signal Maintenance Contractor, Lighthouse Traffic Group, to perform this installation using their existing contract. Staff received a quote from Lighthouse Traffic Group for the installation of the equipment in the amount of \$305,287.00. While this amount is greater than the estimate provided in the April 15, 2025, communication, the City is installing more equipment than was anticipated at that time. The quote also includes the installation of rewiring up to five (5) intersections. Over time wires can corrode and deteriorate and cause connection issues inside of the cabinet, at the controllers, at the pedestrian push buttons, and traffic signal heads. Replacing wires while the contractor is on-site with traffic control in place is more economical than waiting for failure. See attachment 2 for the installation proposal. Lighthouse is currently under a multiyear contract as the City's traffic signal maintenance contractor and was awarded the contract through a competitive bid in 2024. A purchase order change order will be processed upon approval of contract award as outlined in the Fiscal Impact section below.

Staff recommends awarding contracts as follows:

- AM Signal LLC – Miovision Video Detection Systems and Opticom EVP Detectors
- Econolite Control Products, Inc. – Cabinets, Controllers, Battery Backup Systems
- Lighthouse Traffic Group – Installation Services

This approach maintains consistency with Louisville's existing Centracs traffic management system, which is configured for Econolite controllers and cabinets, and leverages existing deployments of Miovision detection and Opticom EVP systems.

2025 COUNCIL WORK PLAN:

The proposed project aligns with the core priority of Traffic Safety identified in the Council Work Plan for 2025.

FISCAL IMPACT:

Budgeted?: **Yes**

The costs of the Project are accounted for in the following fund:

Projected Funding

Description	Account	Budget Amount
Traffic Signals	301312-660074	\$1,094,500

Projected Expenses (Traffic Signals) 301312-660074

Description	Amount
AM Signal LLC Award	(\$443,224.00)
Econolite Control Products, Inc	(\$222,682.30)
Lighthouse Installation	(\$305,287.00)
Contingency (Lighthouse)	(\$25,000.00)
Total Expenses:	(\$996,193.30)
Remaining Funds	\$98,306.70

ALTERNATIVE(S):

1. Award the installation per the original bid. However, this is not recommended as the majority of the savings would be to federal funding and the project as recommended is within budget.
2. Do not award the purchase of equipment and installation. Staff does not recommend this option as the City has been awarded a grant for a large portion of the work and the recommendation is within the allotted budget.

RECOMMENDATION:

Staff recommends the award of proposals for the Traffic Signal Technology Grant Project as follows: (1) Econolite Control Products, Inc. for cabinets, controllers, and battery backup systems (\$222,682.30); (2) to AM Signal LLC for Miovision video detection systems and Opticom EVP detectors (\$443,224.00); (3) approval of a Change Order to Lighthouse Traffic Group in the amount of \$305,287.00 for installation services; and (4) approval of a \$25,000 contingency for a total project cost of \$996,193.30 and authorize the

SUBJECT: RESOLUTION NO. 74, SERIES 2025

DATE: OCTOBER 07, 2025

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Mayor, City Manager, Public Works Director, and City Clerk to sign and execute the documents on behalf of the City.

ATTACHMENT(S):

1. Resolution No. 74, Series 2025
2. Lighthouse Installation Proposal
3. Tech Grant Improvement by Intersection - Map of Installation Locations
4. Bid Proposals
5. Executed State of Colorado Subaward Agreement

**RESOLUTION NO. 74
SERIES 2025**

**A RESOLUTION AUTHORIZING PURCHASES IN CONNECTION WITH THE
TRAFFIC SIGNAL TECHNOLOGY GRANT PROJECT**

WHEREAS, the City received a CDOT grant for its Traffic Signal Technology Grant Project ("Project"); and

WHEREAS, by this resolution the City Council desires to approve purchases in connection with the Project.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF LOUISVILLE, COLORADO:

Section 1. The City Council hereby approves the following purchases in connection with the Project: (1) Econolite Control Products, Inc. for cabinets, controllers, and battery backup systems in the amount of \$222,682.30; (2) AM Signal LLC for Miovision video detection systems and Opticom EVP detectors in the amount of \$443,224.00; and (3) Lighthouse Traffic Group in the amount of \$305,287.00 for installation services.

Section 2. The City Council hereby approves contingency in the amount of \$25,000 for the Project for a total not-to-exceed amount of \$996,193.30.

Section 3. The Mayor, City Manager, Public Works Director, and/or the City Clerk are hereby authorized to execute purchase orders, change orders, and other documents on behalf of the City for the Project.

PASSED AND ADOPTED this 7th day of October 2025.

Christopher M. Leh, Mayor

ATTEST:

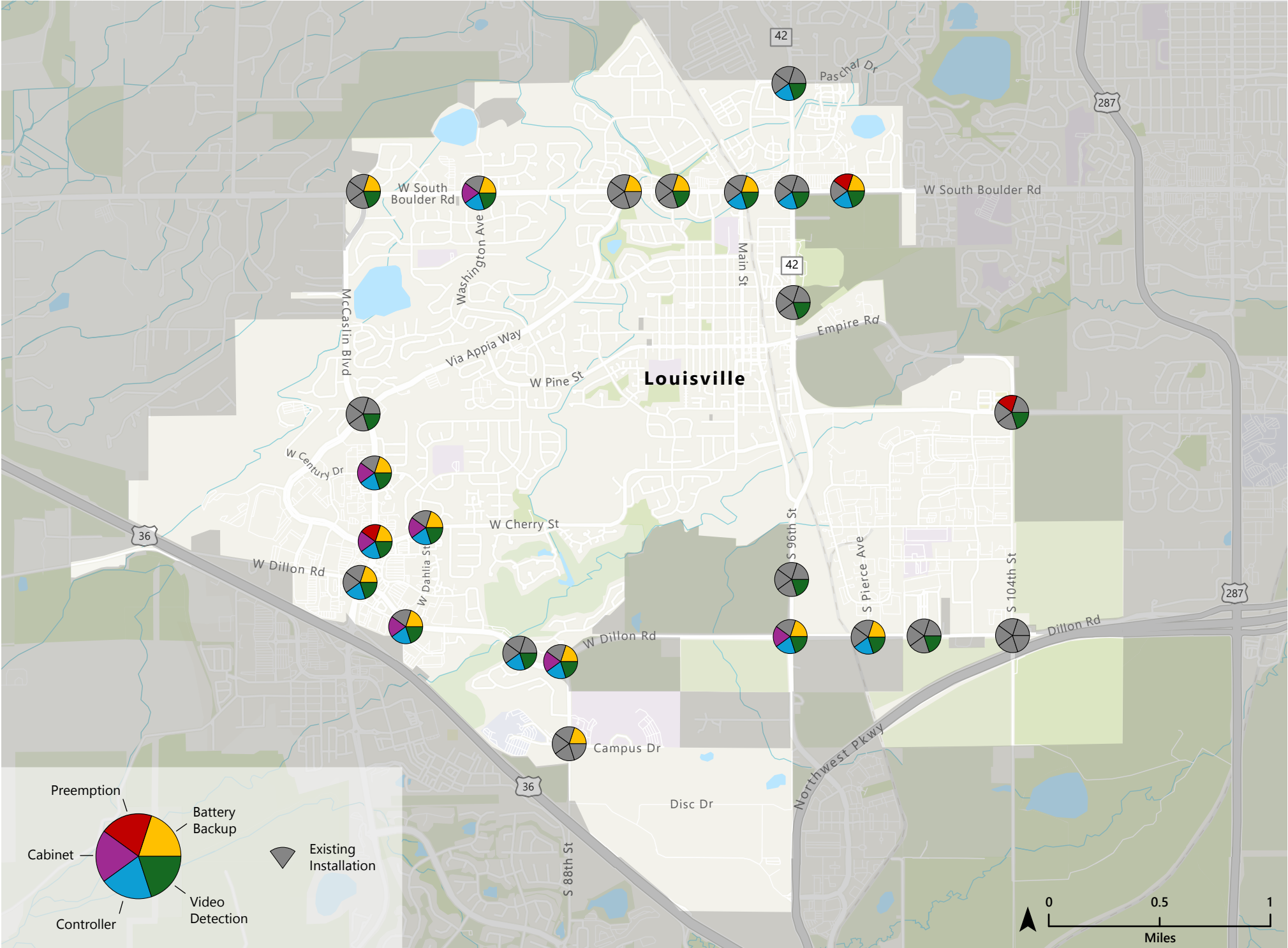
Genny Kline, Interim City Clerk



11861 Bradburn Blvd, Westminster, CO 80031
(303) 390-0210 | estimating@lighthouseetg.org

Prepared By: John Behan

Tech Grant Improvements by Intersection





COLORADO • SINCE 1878

**2025 TRAFFIC SIGNAL
TECHNOLOGY EQUIPMENT
PROCUREMENT PROJECT**

**CDOT CONTRACT # 25-HTD-ZL-00189
(26912)**

LOUISVILLE # 301312-660074

**PREPARED BY:
CITY OF LOUISVILLE**

June 2025

REQUEST FOR PROPOSALS

City of Louisville
Traffic Signal Technology Project
CDOT CONTRACT # 25-HTD-ZL-00189
(26912)
THE “UDBE” GOAL ESTABLISHED BY CDOT IS
0% THE “OJT” GOAL ESTABLISHED BY CDOT IS
0 HOURS

The City of Louisville is requesting proposals from entities (Submitters) interested in submitting bids for the procurement of the City of Louisville’s Traffic Signal Technology Project. Sealed bids will be received at the office of the City Engineer, 749 Main Street, Louisville, Colorado 80027, until **02:00 PM Mountain Time (MT), June 18, 2025**, at which time proposals will be publicly opened.

Digital copies of the Proposal Documents will be available after May 30, 2025, online through Rocky Mountain Bid System located at <https://www.bidnetdirect.com/>.

The City of Louisville is an Equal Opportunity Employer.

City of Louisville, Colorado
City Engineer

1st Publication: May 30, 2025
2nd Publication: June 06, 2025

REQUEST FOR PROPOSAL CITY OF LOUISVILLE, COLORADO
Traffic Signal Technology Project

CDOT CONTRACT # 25-HTD-ZL-00189
(26912)

INTRODUCTION

The City of Louisville is requesting bids from vendors for the procurement of traffic signal equipment as part of the City's Traffic Signal Technology Project.

NOTICE IS HEREBY GIVEN, bids should be prepared and submitted using the provided forms which address the needs outlined herein.

The City will use a single-phase process to select the bid to provide the equipment. Proposals shall be clearly marked and submitted in a sealed envelope and labeled "City of Louisville – Traffic Signal Technology Project #25-HTD-ZL-00189 (26912)".

Proposals will be accepted until 02:00 PM Mountain Time on **June 18, 2025**. Late proposals will not be accepted.

Sealed proposals shall be delivered to:

Cameron Fowlkes
City Engineer
City of Louisville
749 Main Street
Louisville, CO 80027

Digital copies of the Proposal Documents will be available after May 30, 2025, online through Rocky Mountain Bid System located at <https://www.bidnetdirect.com/>.

OBJECTIVE

The Vendor will provide traffic signal equipment and associated management software to the City of Louisville. **This RFP is for the procurement of the requested equipment (furnish only).** The City's own resources will complete the installation. The project is funded through a Federal grant obtained by the City of Louisville through the Colorado Department of Transportation and Denver Regional Council of Governments.

It is the desire of the City that the equipment be received within 6-months from the date of execution of a Professional Services Agreement with the selected firm. If this timeline cannot be met, please describe in the Cover Letter the expected delivery dates and lead times.

SCOPE

The City of Louisville seeks proposals from vendors to provide traffic signal technology equipment meeting the requirements outlined in this RFP.

Louisville Signal Technology Procurement:

In 2023, the City of Louisville received a Denver Regional Council of Governments (DRCOG) Technology Grant to fund the procurement of the following upgraded traffic signal equipment:

- (7) Traffic Signal Cabinets (TS 2P)
- (7) Traffic Signal Controllers
- (11) Video Vehicle Detection Systems
- (2) Emergency Vehicle Preemptions Systems
- (7) Cabinet Battery Backup Systems

The equipment will be installed by the City's traffic signal contractor and is not part of this RFP.

SERVICES

The vendor will work closely with the project manager and traffic signal contractor to perform the work necessary to procure the equipment.

1. Attend Initial Project Meeting
 - Discuss project schedule, approach, and budget with project team members.
 - Prepare email summarizing meeting and procurement details and distribute to all attendees.
2. Provide hardware and software following industry standards.
 - Submit three sets of product documents to the City including one electronic copy in PDF format.
 - The installation will be provided by the City.
3. Warranty and Technical Support.
 - Vendor shall submit the terms of its warranty to include: items included in the warranty, items excluded from the warranty, the duration of the warranty period and the initiation of the warranty period.

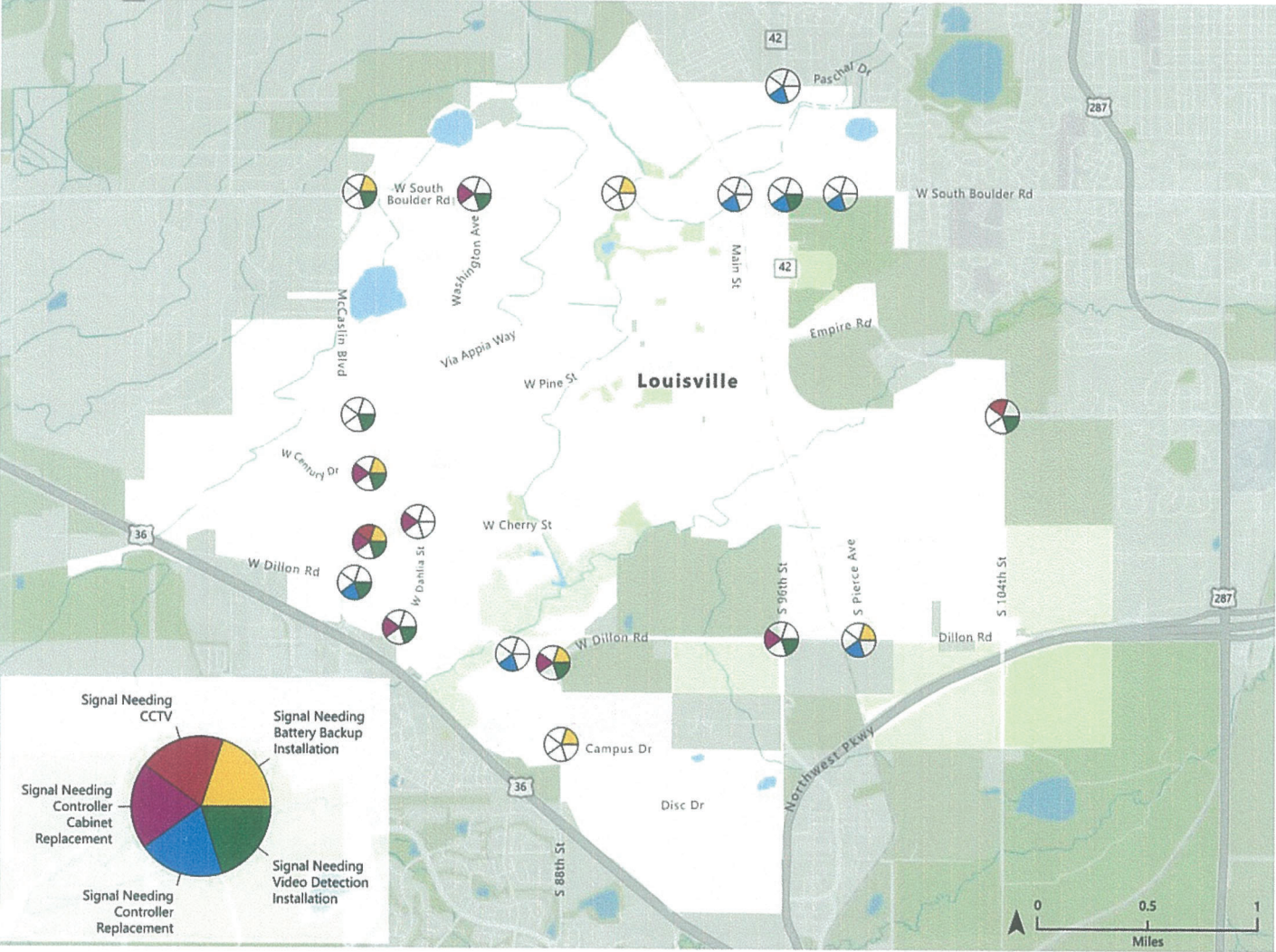
BACKGROUND – TRAFFIC SIGNAL TECHNOLOGY SPECIFICATIONS TRAFFIC SIGNAL TECHNOLOGY SPECIFICATIONS

The City of Louisville conducted a comprehensive evaluation of the City's traffic signal network. Following this, a Traffic Signals Management Plan was developed to prioritize the replacement of obsolete equipment, starting with:

- Seven (7) traffic signal cabinets.
- Seven (7) controllers
- Seven (7) battery backup systems at cabinet locations
- Eleven (11) vehicle detection systems
- Two (2) emergency vehicle preemption systems

Please refer to the attached map for the proposed replacement locations.

Planned Improvements by Intersection



HARDWARE SPECIFICATIONS

Traffic Signal Cabinets

Traffic signal controller cabinets shall conform to the latest version of NEMA TS 2 Specifications and have nominal dimensions for a Type P Cabinet.

Traffic Signal Controllers

Solid state traffic actuated controller units shall comply with latest version of NEMA TS 2 Specifications for a Type 1 Traffic Signal Controller. The controller shall meet the most current ATC 5201 Advanced Transportation Controller (ATC) Standard (currently v06A.35). The controller shall be able to communicate with the city's existing Econolite Centrac system, and have NCTIP level 2 compliance. The controller shall also provide high-resolution data logging, allowing for logging of controller events with a tenth-of-a-second resolution timestamp, and storing the logs in temporary data files on the controller. The controller shall be an Econolite Cobalt TS-2 Type 1 controller, or equivalent approved by the city.

Video Vehicle Detection Systems

A multimodal detection system shall be provided that can accurately detect automobiles, bicyclists and motorcyclists, and be able to differentiate between those modes, and provide unique detection inputs to the controller, on a per-lane basis. It shall be demonstrated to provide accurate detection in all weather environments including fog and snow.

The system shall be video based, or a hybrid system depending on the size of the intersection and speed of oncoming traffic. The system shall be capable of detecting multiple intersection approaches from a single camera and function with existing detection cameras installed in the City's intelligent signal environment. The detection camera shall be Miovision, or equivalent approved by the city.

Emergency Vehicle Preemption Systems

Emergency Vehicle Preemption (EVP) systems shall be provided for all directions at all new traffic signals in the city, and at other locations as directed by the city. The preemption system shall be compatible with the city's existing EVP system (Miovision/GTT Infrared Opticom). A detector shall be placed on the traffic signal mast arm, in the middle of the approach, aimed as needed to detect and react to an emergency vehicle in a timely manner. The system shall include a detector and phase discriminator. The system shall consist of Opticom Detectors (Model 721 or equivalent), Cable (Model 138 or equivalent), Card Rack (Model 760 or equivalent), Phase Selectors (764 or 762 as needed) and an interface panel (Model 768 or equivalent) if needed.

Cabinet Battery Backup Systems

The battery backup system (BBS) shall be of a make and model approved by the city, and that has existing installations in the city. It shall be housed in a cabinet that is attached to the controller cabinet, or separately in the service pedestal. The BBS shall be provided with the following capabilities:

- Remote monitoring via an Ethernet SNMP Interface, which shall be connected to an Ethernet switch in the traffic signal controller cabinet.
- Be capable of operating a signalized intersection up to 700W for 4 hours of full run time, then in flash mode for an additional 2 hours minimum.
- Shall include ability to power the batteries or module using a standard 20-amp, 120-volt, Type B electrical receptacle.
- Shall otherwise comply with CDOT Special Provisions for Traffic Uninterruptible Power Supply, which revise Section 614 of the Standard Specifications.

PROPOSAL FORMAT

Sealed proposals must be received by the City no later than the time described above. Please mark your sealed RFP envelope with the Project Name, Date and Time of bid opening.

The Vendor is encouraged to follow the outline and page distribution indicated below. Difficulty in finding desired information may be considered as non-responsive with a corresponding score. Brevity and clarity in explaining / responding to the information required and explaining your key concepts are encouraged.

- Proposal should contain the following elements:
- Cover or Introductory Letter (two (2) page limit – 8½ x 11 inch paper)
- Vendor Information (two (2) page limit – 8 ½ x 11 paper)
- Complete Appendix A – Traffic Signal Technology Pricing Proposal

SUBMITTED PROPOSAL CONTENT

The following is a general description to aid you in preparing the proposal. The general outline and content should be followed. However, the discussion of the specific elements should be determined by your interpretation of the specific project. The listed elements are presented to help you determine the discussion content. The selection committee will evaluate your interpretation of the most important factors to address for this project within the page limits to arrive at its rating.

1. Cover Letter

- Include the project title.
- Include a certification that the information and data submitted is true and complete to the best knowledge of the individual signing the letter.
- Include the name, email address, telephone and fax number of the individual to contact regarding their proposal.
- City of Louisville requires an original signature by a representative of the firm fully authorized to submit proposals and sign contracts on the firm's behalf. The letter shall include a statement to that effect.
- Estimated hardware delivery dates and lead times
- Any requests for changes in specifications

2. Vendor Information

- Identify your staff that will provide contract management, procurement assistance, product support/troubleshooting and training.
- Present a brief discussion of the firm's size, qualifications, special training or certifications, and experience related to this project.
- Include a list of up to three current and past projects completed in the United States. Include a name, telephone number, and email address of the owner's Project Manager for every project listed and describe your firm's role for all the projects listed. Additional project information shall include:
 - i. Number of deployed locations
 - ii. Hardware type
 - iii. Project name

iv. Estimated hardware delivery times

3. Appendix A – Pricing Proposal

- Provide breakdown of costs including all insurances, labor and incidentals required to complete the work.
-

4. Proposal Evaluation Criteria

- Proposals that are considered competitive will be evaluated by an evaluation team. **The City reserves the right to select the proposal that is most advantageous to the City.** Proposal Evaluation criteria shall be as follows:

	Points
Vendor Information	
Qualifications and experience and ability firm	
Pricing Proposal	
Total bid price	
Warranty	
TOTAL SCORE	
Scoring for each criteria	
5-Superior	
4-Satisfactory Plus	
3-Satisfactory	
2-Satisfactory minus	
1-Unsatisfactory	

No Proposal may be withdrawn within a period of sixty (60) days after the proposal deadline.

The City reserves the right to award the contract by sections, to reject any or all proposals, and to waive any informalities and irregularities therein.

Submit one (1) SEALED copy.

In addition to the written proposal, the City reserves the right to request an interview with some or all of the proposers.

All costs incurred in preparing for, printing, and delivering a submittal, along with any costs associated with travel or time spent in interviews or negotiation with the City are solely the responsibility of the submitter. The City is not liable for any costs incurred prior to issuance of a legally executed contract and/or purchase order.

All submittals become the property of the City, a matter of public record, and will not be returned. Proprietary Information included in submittals must be clearly identified and will be protected if possible. Unit pricing and total cost information will not be considered proprietary.

All material submitted regarding this RFP becomes the property of the City of Louisville and will only be returned to the proposer at the City's option. The City of Louisville has the right to use any or all ideas presented in reply to this RFP. Disqualification of proposer does not eliminate this right.

TIMELINE

The City reserves the right to modify the proposal submittal and acceptance timeline at any time at its sole discretion.

Proposal Submittal and Acceptance:

First Online Publication	May 30, 2025
Second Online Publication	June 06, 2025
Inquiry deadline	June 05, 2025 @ 5:00pm
Final Response to Inquiries	June 06, 2025 @ 4:00pm
Proposals due deadline	June 18, 2025 @ 2:00pm

CONTRACT

A sample copy of the Agreement and exhibits is included with the proposal documents. In addition, the following documents must be submitted with the proposal:

1. Schedule of Subcontractors/consultants (if any)
2. CDOT Form 606 Anti-Collusions Affidavit

Note: Within five calendar days of selection the contractor will be required to submit CDOT Form 605 Contractor's Performance Capability Statement and CDOT Form 621 Assignment of Antitrust Claims.

INQUIRIES

Prospective submitters may make written inquiries by e-mail before the inquiry deadline concerning this Request for Proposal. An addendum will be released with any required clarifications or revisions to this request or the associated construction documents within one day of the Inquiry Deadline. Prospective proposers are advised to contact Cameron Fowlkes prior to the inquiry deadline to ensure they are included in any addendum posting.

Inquires may be e-mailed to:

Cameron Fowlkes

City Engineer

Email address: cfowlkes@louisvilleco.gov

**ATTACHMENTS REQUEST FOR PROPOSAL
CITY OF LOUISVILLE, COLORADO
Traffic Signal Technology
Project # 25-HTD-ZL-00189 (26912)**

1. *Sample Agreement*
2. *Appendix A – Traffic Signal Technology Pricing Proposal*
3. *CDOT Form 606*

AGREEMENT FOR PROFESSIONAL SERVICES

EXHIBIT A
TRAFFIC SIGNAL TECHNOLOGY PRICING PROPOSAL
Project # 25-HTD-ZL-00189 (26912)

The following is the bid details for the purchase of the traffic signal technology equipment. The vendor's proposed equipment will be evaluated with the submitted unit prices to determine the selected awardee.

The quantity of equipment on the bid documents is the City's best estimate of technology needed. The City does not guarantee that the final purchase order will be the estimated quantity. The City may purchase more or less units. There will be no price adjustment for any variation in quantities.

Signal Technology Procurement Project

ACTIVITY & COST				
DESCRIPTION	ESTIMATED QUANTITY	MAKE, MODEL, AND WARRANTY	COST EACH	TOTAL COST
Traffic Signal Cabinet (TS 2P) – Furnish Only	7	Econolite, CAB19011	\$15,978.90	\$111,852.30
Traffic Signal Controller – Furnish Only	7	Econolite Cobalt TS2-T1 G-Series	\$2,870.00	\$20,090.00
Video Detection – Furnish Only	11	N/A	No Bid	
Emergency Preemption – Furnish Only	2	N/A	No Bid	
Battery Backup System – Furnish Only	7	Econolite, DBLMX800	\$4,710.00	\$32,970.00
			TOTAL	\$164,912.30

Product Lead Times:
Traffic Signal Cabinets 10-12 Weeks
Traffic Signal Controllers Stock- 8 Weeks
Battery Backup System 16-20 Weeks

Warranty:
Please see submitted product data sheets & warranty card.

**COLORADO DEPARTMENT OF TRANSPORTATION
ANTI-COLLUSION AFFIDAVIT**

PROJECT NO.

LOCATION

I hereby attest that I am the person responsible within my firm for the final decision as to the price(s) and amount of this bid or, if not, that I have written authorization, enclosed herewith, from that person to make the statements set out below on his or her behalf and on behalf of my firm.

I further attest that:

1. The price(s) and amount of this bid have been arrived at independently, without consultation, communication or agreement for the purpose or with the effect of restricting competition with any other firm or person who is a bidder or potential prime bidder.

2A. Neither the price(s) nor the amount of this bid have been disclosed to any other firm or person who is a bidder or potential prime bidder on this project, and will not be so disclosed prior to bid opening.

2B. Neither the prices nor the amount of the bid of any other firm or person who is a bidder or potential prime bidder on this project have been disclosed to me or my firm.

3A. No attempt has been made to solicit, cause or induce any firm or person who is a bidder or potential prime bidder to refrain from bidding on this project, or to submit a bid higher than the bid of this firm, or any intentionally high or non-competitive bid or other form of complementary bid.

3B. No agreement has been promised or solicited for any other firm or person who is a bidder or potential prime bidder on this project to submit an intentionally high, noncompetitive or other form of complementary bid on this project.

4. The bid of my firm is made in good faith and not pursuant to any consultation, communication, agreement or discussion with, or inducement or solicitation by or from any firm or person to submit any intentionally high, noncompetitive or other form of complementary bid.

5. My firm has not offered or entered into a subcontract or agreement regarding the purchase or sale of materials or services from any firm or person, or offered, promised or paid cash or anything of value to any firm or person, whether in connection with this or any other project, in consideration for an agreement or promise by any firm or person to refrain from bidding or to submit any intentionally high, noncompetitive or other form of complementary bid or agreeing or promising to do so on this project.

6. My firm has not accepted or been promised any subcontract or agreement regarding the sale of materials or services to any firm or person, and has not been promised or paid cash or anything of value by any firm or person, whether in connection with this or any other project, in consideration for my firm's submitting any intentionally high, noncompetitive or other form of complementary bid, or agreeing or promising to do so, on this project.

7. I have made a diligent inquiry of all members, officers, employees, and agents of my firm with responsibilities relating to the preparation, approval or submission of my firm's bid on this project and have been advised by each of them that he or she has not participated in any communication, consultation, discussion, agreement, collusion, or other conduct inconsistent with any of the statements and representations made in this affidavit.

8. I understand and my firm understands that any misstatement in this affidavit is and shall be treated as a fraudulent concealment from the Colorado Department of Transportation, of the true facts relating to submission of bids for this contract.

I DECLARE UNDER PENALTY OF PERJURY IN THE SECOND DEGREE, AND ANY OTHER APPLICABLE STATE OR FEDERAL LAWS, THAT THE STATEMENTS MADE ON THIS DOCUMENT ARE TRUE AND COMPLETE TO THE BEST OF MY KNOWLEDGE.

Contractor's firm or company name

Econolite Control Products,

By

Title

Account Executive

Date

6-24-25

2nd contractor's firm or company name. (If joint venture.)

N/A

By

Title

Account Manager

Date

Sworn to before me this 24th day of, June 20 25

Notary Public

My commission expires

09-05-2028

NOTE: This document must be signed in ink.

EMMA SOPHIA HOLT
NOTARY PUBLIC
STATE OF COLORADO
NOTARY ID 20244033453
MY COMMISSION EXPIRES 09/05/2028

CDOT Form #606 1/02



COVER LETTER

June 16, 2025

Mr. Cameron Fowlkes

City of Louisville

Subject: City of Louisville – Traffic Signal Technology Project #25-HTD-ZL-00189 (26912)”

Members of the Evaluation Committee:

Econolite Control Products, Inc. (Econolite) is pleased to submit the enclosed proposal to the City of Louisville to provide the city with our state-of-the-art **ATC Cobalt®** traffic signal controllers, Traffic Signal Cabinets, & Tech Power UPS for their traffic signal cabinet equipment.

Econolite has led the traffic management industry for more than eight decades through its innovative approach and commitment to its customers by applying the most state-of-the-art technologies. Today, Econolite is the leader in One-Stop-Shop traffic management solutions, providing everything from discrete traffic management hardware and software components to turnkey advanced traffic management and communications solutions. Econolite is fully qualified to perform the work required by this RFP.

For this project, we are proposing a local support team led by Mr. Jerry Strong and Mr. Rick Fernandez to provide the city with superior training, ongoing technical and warranty support, and all new firmware releases, patches, and upgrades.

I am duly authorized to commit Econolite to this project and certify that the data submitted in our proposal are true and complete. Please contact our local Account Manager, Mr. David Tenkely, at (970) 408-8955 or dtenkely@econolite.com, with any questions you may have regarding our proposal.

Sincerely,

Econolite Control Products, Inc.

A handwritten signature in black ink that reads "David Tenkely". The signature is stylized with a large, flowing "D" and a cursive "Tenkely".

Project Organization Chart

The success of a project, such as the one being proposed, depends upon building a strong relationship with the team involved. To support its commitment to the city and the success of the project, Econolite proposes Mr. David Tenkely as the lead contact for Econolite. Well-known by City staff, Mr. Tenkely will act as the City's extended staff to manage and support procurement of traffic signal equipment, and schedule Econolite technical staff for system integration support and training for City personnel. Mr. Tenkely will be backed by a team of Econolite support personnel who are well-versed in Controller deployment and troubleshooting. **Figure 1** illustrates our proposed staff organization for the project.

Figure 1 - Project Organization



Key Staff Bios

David Tenkely, Territory Account Manager

Mr. Tenkely serves as the Territory Account Manager for Econolite Control Products, Inc. for the Colorado region. He specializes in providing agencies with daily customer service that includes technical expertise, solution presentation, project estimating and procurement. Mr. Tenkely has over 1 years of transportation solution sales & support experience, including practical experience in, and solid understanding of, a range of traffic management applications. Mr. Tenkely holds an IMSA level II Field Technician certification and is responsible for the total quality assurance for Colorado and Wyoming Econolite clients.

Email: dtenkely@econolite.com Phone: (970) 408-8955

Tracy Cope, District Sales Manager

Ms. Cope serves as a District Sales Manager for Econolite Control Products, Inc. She specializes in providing agencies with daily customer service that includes the coordination of field support, technical expertise, solution presentation, and procurement. Ms. Cope is a seasoned professional with over 24 years of government account management, including practical experience in, and a solid understanding of, a diverse range of traffic management applications. She is responsible for the total quality assurance for Econolite clients in the Colorado region. Email: tcope@econolite.com Phone: (719) 216-2493

Jerry Strong, Field Service Representative

Mr. Strong has 28 years of experience that includes initial setup establishment for field testing and final configuration of all traffic-related equipment. This involves installation, maintenance, and repairs on all types of detection, traffic signal controllers and cabinets. His experience includes maintenance supervision, scheduling, 24-hour on-call assistance provision, quality assurance, communication troubleshooting, and serving as an IMSA trainer for all levels of technicians. He holds the following

mail strong@econolite.com phone 71

Ricky Fernandez, Field Service Technician

Mr. Fernandez has 30 years of experience and includes work with video detection and traffic signal controllers as well as assembly, inspection, testing, supervising, and developing new traffic cabinets. He has also been responsible for monitoring and implementing quality control procedures and guidelines; conducting training and product demonstration, both formal and informal; assisting with technical installations and troubleshooting repair, sales, test, and installation of traffic and communication equipment. Email: Rfernandez@econolitre.com phone: (719) 217-5786

Addendum Acknowledgment

We did receive both addendum 1 on June 12th & addendum 2 on June 17th posted by City of Louisville . Please accept this as the acknowledgment. *DT*

Bid Cabinets Clarification

The original Cabinet bid before the Addendum 2 was released, is the City of Louisville's Super P44 cabinet with the built-in BBS housing on the side.

Addendum 2 Cabinet bid is the the layout requested (Brighton Double door, no BBS cabinet) but it does include a full length shelf at the bottom for the BBS batteries to be placed. Cabinet will also include a generator panel & plug (Not Shown in Layout)

This Certificate of Registration Acknowledges

Econolite Control Products, Inc.
(Central Function)

1250 North Tustin Avenue
Anaheim, CA 92807
United States

is Registered in Recognition of a Multiple Site Quality Management System
Demonstrated in Conformance with

ISO 9001:2015

Scope of Registration:

Design, manufacture, and repair of transportation management systems and
equipment




Edward Maschmeier
Vice President of PRI Certification

Number: 21935
Issued: 13-July-2024
Re-issued: 31-May-2024
Expires: 12-July-2027

PRISM Certification
PERFORMANCE REVIEW INSTITUTE

Econolite Control Products, Inc.
(Central Function)
1250 North Tustin Avenue
Anaheim, CA 92807
United States

Scope: QMS, Management, Design and
Development Center, and Assembly

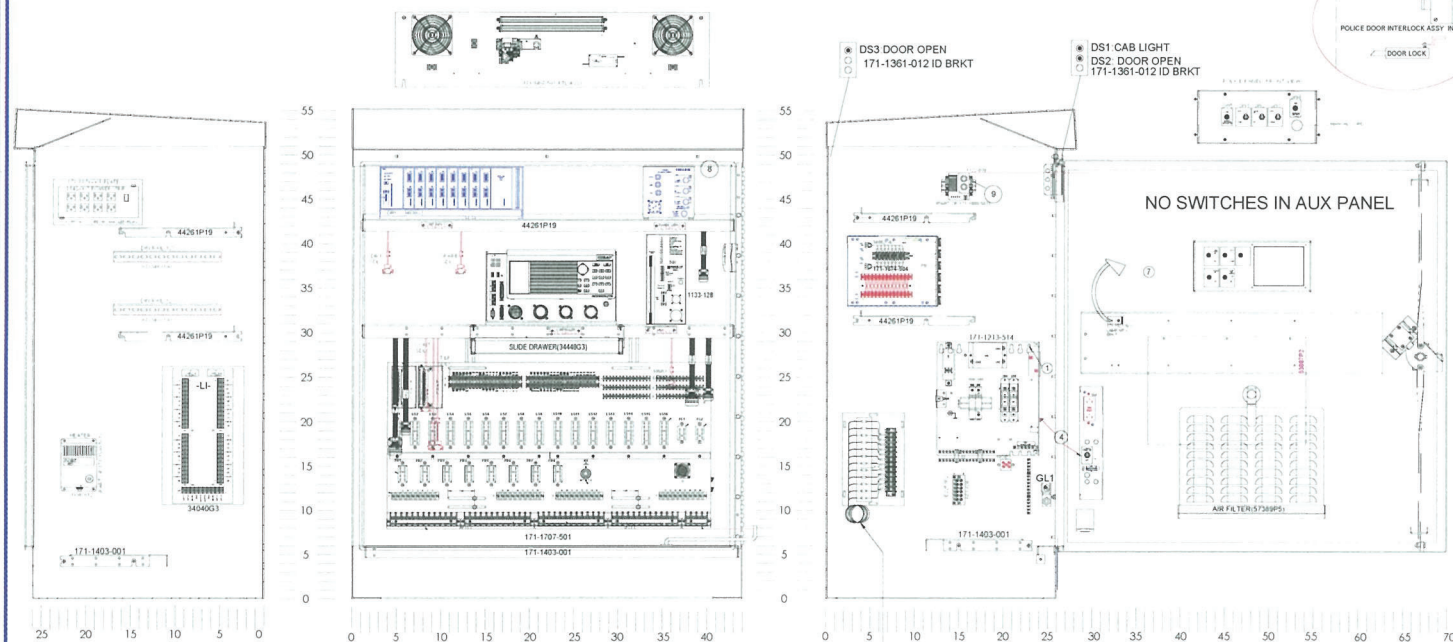
Arroyo Holdings de Mexico
Blvd. Encino #30012 Int D1
Parque Industrial Tecate, CP 21430
Tecate, B.C.
México

Scope: Metal Fabrication & Assembly



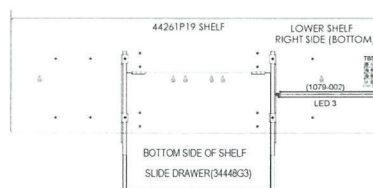
Edward Maschmeier
Vice President of PRI Certification

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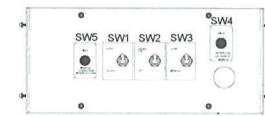


1. INSTALL CP 171-1213-514 PER LAY-OUT
2. MUST USE ONLY NUT RAIL SPRING #10 (57385P4)
3. INSTALL COMPUTER DRAWER (34448G3) IN THE MIDDLE OF SHELF WITH (2X) N84P16008B ONLY
4. PER SPEC, PANEL MUST BE MOUNTED AT THIS LOCATION
5. PER SPEC, NO SWITCHES IN AUX PANEL, MODIFIED POLICE ASSY PER MOD SHEET
6. ZIP AND TIE CABLE INSIDE SHELVES AND OUT IN FRONT OF DESTINATIONS NO HANGING LOOSE CABLES AROUND
7. DRILL HOLES 5/16 PER DIMENSION AS SHOWN TO INSTALL ID PLATES
171-1403-014 171-1403-016 171-1403-017 AND 171-1403-018 USING N84P9008C & N238P9B - 2.97"
8. INSTALL PER ESTIMATING EMAIL
9. MOUNT HYGROTHERM (1122-009) USING DIN RAIL (013471B33X-00) AND END WITH TERMINAL BLOCKS (2) (1148-058) WIRE PER DIAGRAM

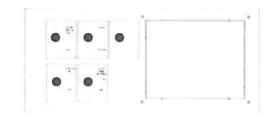
NOTES



POLICE PANEL



AUXILIARY PANEL



DOOR SWITCHES

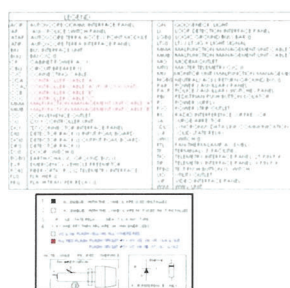
- DS1: CAB. LIGHT
DS2: DOOR OPEN
DS3: DOOR OPEN

METAL LABELS

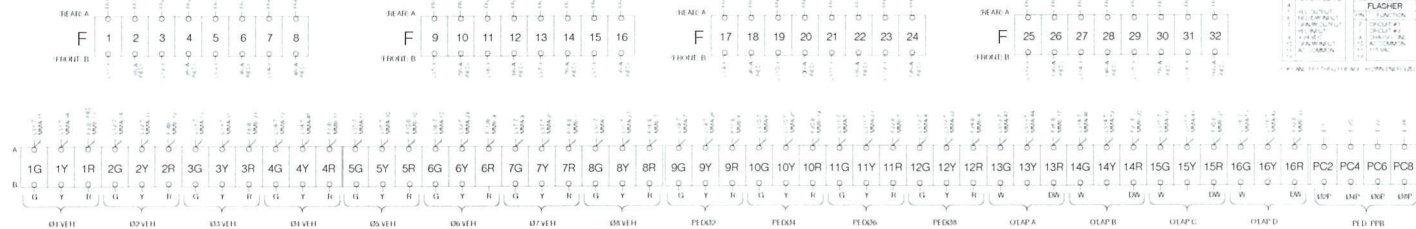
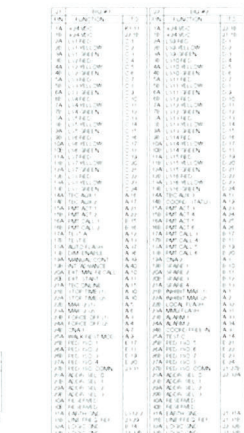
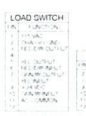
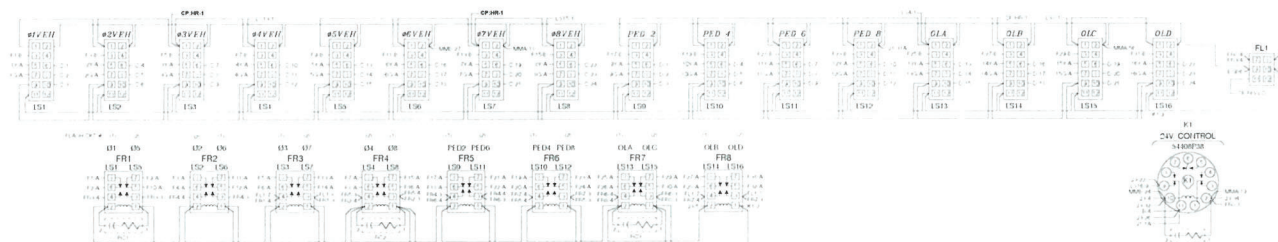
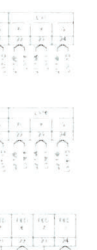
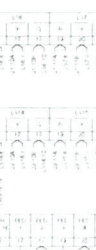
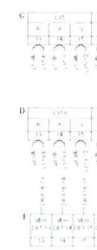
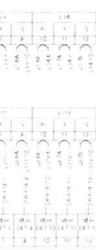
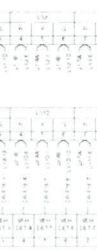
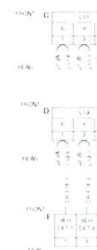
- X 171-1403-014 - DET RACK 1
- 171-1403-015 - DET RACK 2
- X 171-1403-016 - MMU
- X 171-1403-017 - POWER SUPPLY
- X 171-1403-018 - CONTROLLER
- 171-1403-022 - BBS

UPDATED WITH NEW LAYOUT FORM		9/19/19	M. C.
A	REPLACE GOONENECK LAMP WITH 171-1921-503 PER ECO 29887	4/9/19	M. C.
TOLERANCE UNLESS OTHERWISE SPECIFIED		ECONOLITE	
03 015 30		TS2 TYPE 1 CAB 55" DOUBLE DOOR ASSY 170-1020-515-2 CITY OF LOUISVILLE	
DRILLED HOLE		STATE OF COLORADO	
1:1		19011-LY	

EXPANDED OUTPUTS		
☐ 3291G81 C/C		
PN	FUNCTION	TQ
17	PMT A OUT	11 B.17
18	PMT B OUT	11 B.18
19	PMT C OUT	11 B.19
20	PMT D OUT	11 B.20



FROM (L1)	EXPANSION OUTPUTS TOWARD L2	TERM
1	DET 1 OUT	1
2	DET 2 OUT	2
3	DET 3 OUT	3
4	DET 4 OUT	4
5	DET 5 OUT	5
6	DET 6 OUT	6
7	DET 7 OUT	7
8	DET 8 OUT	8
9	DET 9 OUT	9
10	DET 10 OUT	10
11	DET 11 OUT	11
12	DET 12 OUT	12
13	DET 13 OUT	13
14	DET 14 OUT	14
15	DET 15 OUT	15
16	DET 16 OUT	16
17	DET 17 AMP 1 OUT	17
18	DET 18 AMP 2 OUT	18
19	AMP 1 OUT	19
20	AMP 2 OUT	20



REVISION C	DESCRIPTION UPDATED WITH NEW WIRING DIAGRAM FORM	DATE 9/19/19	NAME M. CAMACHO
REVISION B	DESCRIPTION REPLACE GOODFIRE LAMP WITH 171-1021-563 PER LECO 27082	DATE 4/9/19	NAME M. CAMACHO
REVISION A	DESCRIPTION UPDATED WITH NEW WHITE PAPER CIRCUIT SHEET	DATE 10/26/18	NAME M. CAMACHO

[illegible]



T&F 1	T&F 2	T&F 3	T&F 4
-------	-------	-------	-------

(*) PE(x) = PREEMPTION (X) CONFIRMATION STROBE CONNECTION

DETECTION SET UP



Traffic Cabinet Components and Accessories

BIU

What, exactly, is a BIU?

The Bus Interface Unite (BIU) is a rack module that interfaces 24V logic I/O signals to the Synchronous Data Link Control (SDLC) serial bus of TS2 Type-1 traffic cabinets. The BIU is required in all TS2 Type-1 cabinets and in TS2 Type-2 cabinets when controller I/O interface is through the SDLC bus.

About BIU

It is required in all TS2 Type-1 cabinets and in TS2 Type-2 cabinets when controller I/O interface is through the SDLC bus, not via TS1 MS-A, B, and C connectors.

Physically, the BIU-64 consists of a circuit board and a front panel. A male 64-pin DIN 41612 Type-B series connector provides the connection to the backplane of the rack. A female 15-pin metal shell D subminiature connector with latching blocks provides the connection to the SDLC cable. The front panel provides separate indicator lights for Power, Transmit, and Valid Data. It also provides a handle for easy removal of the unit from the rack. A separate TS2 cabinet power supply provides the required 24 VDC power plus a 60 Hz line-timing reference.





Traffic Cabinet Components and Accessories

MMU2-16LE SmartMonitor™

MMU2-16LEip

SmartMonitor™

What, exactly, is a MMU?

MMU, or Malfunction Management Unit, is used to detect and respond to conflicting or malfunctioning signals and operating voltages. The MMU manages any malfunction affecting traffic signal operations of the traffic cabinet. It is designed to display the real-time status of the intersection, ensuring safe traffic control operations.

Why do agencies use a MMU?

Econolite's family of MMUs meet or exceed all specifications, including NEMA, 170/179, and MMU2 where applicable. We have an MMU for virtually any traffic cabinet and controller application, and intersection type. Traffic cabinet monitoring, including event logs and full intersection displays are available.

How does a MMU benefit the driving public?

Econolite's MMU offerings monitor up to 16 traffic signal channels, helping ensure proper traffic signal operations, which enhance intersection safety.



Traffic Cabinet Components and Accessories

PS-250 TS2 Power Supply

Econolite's PS Series of power supply units supplies regulated DC power, unregulated AC power, and a line frequency reference for the detector rack, Bus Interface Units (BIUs), load switches, and other auxiliary equipment. The PS Series meets all requirements and NEMA standards. All TS-2 Type 1 cabinets and TS-2 Type 2 cabinets that utilize a BIU require a PS unit.

The PS-250 cabinet power supply is a shelf-mounted unit, which supplies regulated DC power, unregulated AC power, and a line frequency reference for the detector rack, BIUs, load switches, and other auxiliary equipment. The PS-250 meets all requirements of the NEMA TS2-2003 standard.

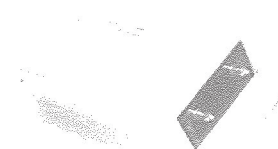
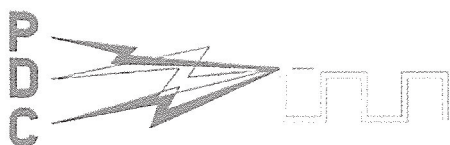
All TS-2 Type 1 cabinet assemblies require the use of this unit, as well as any TS-2 Type 2 cabinet assemblies that utilize Bus Interface Units (BIUs).

Each PS-250 cabinet power supply is put through a rigorous quality program and tested under the extreme environmental conditions experienced on the street.

Key Features

- TS2-compliant
- Upgraded output, 24VDC at three amps, 12VDC at five amps, 12 VAC at 0.25 amps
- Easy access voltage test points





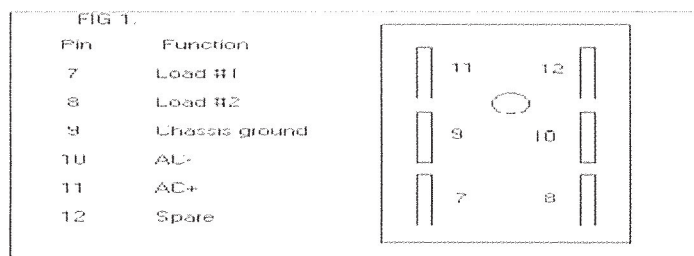
DATA SHEET SSF-86-3

Solid State Flasher:

Description:

The PDC model SSF-86 solid state flasher is a dual circuit flasher designed for the Traffic Control Industry. This unit is conservatively rated up to 20 A per circuit. The flash rate is 56.25 flashes per minute and does not vary due to voltage or temperature variations. With the zero voltage switching design, there are no contacts to wear out or deteriorate due to arcing or corrosion. Also, extended life of the bulbs can be expected as well as reduced Radio Frequency Interference (RFI). The extruded aluminum heatsink provides more than adequate heat dissipation.

Connector Pin out:



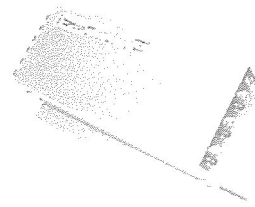
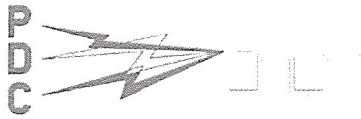
Mates with a Beau P-5406-LAB or equivalent

Electrical Characteristics:

Zero voltage turn on-----	0V $\pm$ 5 degrees
Zero voltage turn off-----	0A $\pm$ 5 degrees
Tungsten Lamp or Gas Tubing Transformer load-	Up to 20 A max.
Operating Voltage-----	60-135 VAC
Mechanical-----	Length.....8.40 inches
	Width.....1.70 inches
	Height.....4.18 inches
	Weight.....1.135 lbs

Operating Temperature: Full load from -35 to $+74$ degrees C

Guarantee: The flasher is fully guaranteed against all failures due to manufacturing defects for two years.



DATA SHEET SSS-87IO

Solid State Loadswitch:

Description:

The PDC SSS-87I/O Loadswitch series is a tri-pack, modular, solid state relay designed specifically to meet NEMA specifications, as well as California and New York "Model 200" specifications. Each loadswitch contains 3 individually replaceable modules that are enclosed in a dust resistant, metal enclosure providing mechanical protection and excellent heat sinking for the modules. The modules are easily accessible with the use of a screwdriver. Each loadswitch also features a L.E.D. indicator on each output circuit.

Installation:

The switchpac inter mates with any standard NEMA loadbay or with the model 332 cabinet output file as well as with any NEMA loadbay. It is easily installed or removed by grasping the handle. Connector P1 pin outs are shown in FIG 1. The connector mates with a PDC BCS-12 or equal.

PIN	FUNCTION
1	+115VAC, 60 Hz
2	Chassis Ground
3	A Output (Red, Don't Walk)
4	Not Assigned
5	B Output (Yellow)
6	A Input (Red, Don't Walk)
7	C Output (Green, Walk)
8	B Input (Yellow)
9	+24 VDC
10	C Input (Green, Walk)
11	AC-
12	Not Assigned

P1
(P1 as viewed from the outside of the product looking directly at the connector)

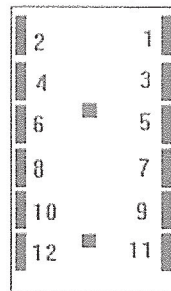


FIG 1.

General Characteristics:

Model	SSS-87I/O Series
Uses Module #	SSR-87
Meets Specs for	Nema, Caltrans, NY (model 200)
Load	voltage.....120 VAC current (max).....15.0 Amps (Tungsten Filament Load)
Control Signal	voltage.....+24VDC current20.0 MA (max)
Switching	1st alternation after.....±10 Degrees of line voltage at the zero signal is applied. crossover point. Succeeding alterations.....±5 Degrees of line voltage at the zero crossover point.
Off State	dv/dt.....100 V per microsecond line to load resistance.....15 K Ohms Min leakage current.....less than 20 MA
Isolation	voltage.....2500 VDC Min resistance.....10 Meg Ohms Min
Surge Current	one cycle.....175 Amps RMS Min one second.....40 Amps RMS Min
Life	operations.....30 million Min
Mechanical	length.....8.40 inches width.....1.74 inches height.....4.185 inches weight.....1.135 LBS

Guarantee: The SSS-87I/O series is fully guaranteed against all failures due to manufacturing defects for two years.



Shelfmount Controllers

The Next Generation in Advanced Transportation Controller (ATC)

Cobalt is Econolite's next-generation ATC specifically designed for the mobile computing environment. Fully meeting ATC standards, Cobalt features a breakthrough hardened seven-inch touchscreen Graphical User Interface (GUI) matched with Linux-based OS that makes programming and access to functions the easiest in the industry.

Cobalt Shelfmount controllers are designed to support Connected and Automated Vehicle (CAV) programs. An optional Connected Vehicle Co-Processor (CVCP) module can be installed to support advanced Vehicle-to-Infrastructure (V2I) processing for CAV applications.

Helping to ensure safety, traffic signal controllers represent one of the most important intelligent technology and communication components of a signalized intersection. The Cobalt series of controllers are designed to increase safety and traffic signal operations for years to come.



Key features

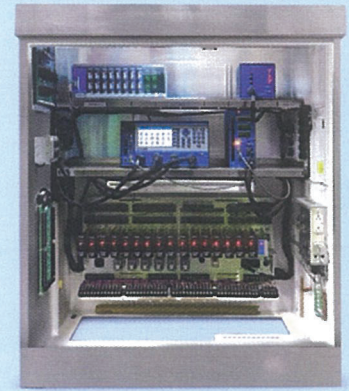
- Large seven-inch color Thin Film Transistor Liquid Crystal Display (TFT LCD)
- Touch-screen display for intuitive, graphical programming
- High brightness and contrast display for better outdoor readability; not available with than any other controller on the market
- Linux, open architecture real-time multitasking operating system
- Web-based user interface for remote programming and status observation
- Meets or exceeds the requirements of the ATC 5201 standard

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Cobalt Shelfmount: Hardware description

Cobalts Shelfmount ATC controllers may be configured with Econolite's highly capable EOS software, with optional Cobalt touch graphical interface, or other prequalified ATC/Linux application software meeting current ATC standards. OS software upgrades can be made easily by USB memory stick, SD card, Ethernet via remote installer software, or through the Centrac's® Advanced Transportation Management System (ATMS).

Cobalt Shelfmount ATC controllers include a high-power, Linux-based engine board that conforms to the ATC 5201 standard. It also includes connectors that support integration into NEMA TS2 Type-1 or Type-2 cabinets, four Ethernet ports, two USB ports, and an SD card slot. Additionally, Cobalt's seven-inch color, high brightness TFT LCD module with optional touchscreen capabilities is readable in direct sunlight, can be operated with gloved hands, and is not affected by condensation or water drops.



Hardware features

- ATC engine board:
 - Conforms to the ATC 5201 Standard
 - 266MHz PowerQUICC II Pro-processor that provides 10 times more processing power than our previous generation controller processor
 - 128MB of DDR2 DRAM memory for application and OS program execution
 - 64MB of FLASH for storage of OS Software and user applications
 - 2MB of SRAM memory for non-volatile parameter storage
- Two integral Ethernet switches for two networks, ENET1 and ENET2
- Advanced Graphics Controller (optional):
 - Enables Cobalts enhanced GUI
 - Touch screen capability means the keyboard never has to be used
 - Replaces traditional text menu selection with graphical selections
- Two USB 2.0 ports used to:
 - Update Linux or application software
 - Upload or download configuration
 - Upload logged data
- Datakey socket for an optional 3.3V datakey, 2 through 32MB
- SD memory card socket
- CPU active LED
- Three communications ports standard:
 - NEMA-ATC SDLC serial port 1
 - 25-pin NEMA serial port 2
 - 9-pin C50S console serial port
- Built in speaker for enhanced audio controller feedback
- Integral carrying handle in back of controller
- Power supply:
 - External 24VDC protected by a self-resetting electronic fuse
- Operating system:
 - Linux 3.12 or later kernel and Board Support Package (BSP)
 - Meets all requirements of the ATC 5201 standard

Hardware options

- Two user interface options:
 - Advanced display with graphics and touch-screen (optional)
 - Basic display with textual menus only; no touch or graphics (standard)
- Two models:
 - TS2 Type-2 connectors
 - TS2 Type-1 connector
- Communications module options:
 - FSK Module that can be configured for RS232 operation
 - 2070 TEES 2009 standard 6A, 6B, and 7A plug-in modules
- Datakey 3.3V, 2 through 32MB

Cobalt Shelfmount: Software description

Control features

- 16 phases, eight configurable concurrent groups in four timing rings
- 16 pedestrian phases that can be configured as pedestrian overlaps
- Dynamic max operation
- Extendable walk and pedestrian clearance
- Advanced Walk
- Bike input and green timing
- Adaptive red clearance

Coordination features

- 120 coordination patterns, each with its own cycle, offsets and split plan selection
- 120 split plans, each with its own coordinated phases, vehicle and pedestrian recall and phase omits
- Offset and split entries displayed in percent or seconds
- Automatic permissive periods
- Fixed or floating force-off
- Crossing arterial coordination
- Quick-sync feature

Preemption features

- Ten preemption sequences; each may be configured as priority, first-come-first-serve, or bus preemption operation
- ECPI interlock to provide added monitoring
- Railroad gate-down input and timing
- Conditional delay when entering preemption
- Multiple exit preemption options

Time-based features

- 200 schedule programs, configurable for any combination of months, days of the week, and days of the month
- Fixed or floating exception day programs that override the day plan event on a specific day
- 16-day plan events that can use any of the 100 action plans

Status display features

Keyboard selection of detailed dynamic status displays for each of the main controller unit functions including controllers, coordinators, preemptors, time base, detectors, and MMUs.

Detector features

- 64 vehicle detectors
- 16 system or speed detectors
- Unique detector types and operation
- Individually assignable to phase and functions
- Lock/non-lock function by detector
- Four detector plans
- Four detector diagnostic plans
- Four pedestrian diagnostic plans
- Individually assignable to phase and functions
- Logging of volume and/or occupancy assignable by detector

Logging features

- Separate buffers for detector activity, detector failures, controller events, and MMU events
- Logged data can be:
 - Viewed on front panel
 - Retrieved via a RS-232 terminal port, USB flash drive, or SD Card
 - Transferred via telemetry to a traffic management center

Cobalt Touch: Software

(Requires Cobalt ATC hardware including the Advanced Graphics Controller)



Includes all ASC/3-LX software features in addition to the following:

- Full-color graphic interface with touch-screen capability
- Provides menu selection using touch selections
- Programming uses touch data entry allowing touch gestures to select yes/no, select enable/disable, pull-down list selections and more
- Screen can be swiped to advance to another screen

General features

- Allows for an agency-specific default database
- Automatic backup of controller database to optional datakey or manual back up to USB flash drive
- Context sensitive help
- Hyperlink feature allows jumping from a status field to the screen where data is defined
- 100-statement logic processor to test inputs, outputs or timers and take actions based on the results



Connected Vehicle Co-Processor (CVCP)

Cobalt ATC is designed to support the CVCP module. The CVCP module is intended to allow third-party-developed and processor-intensive CV applications, including leveraging SAE J2735 messaging, to be used with Cobalt or any other properly equipped ATC-compliant traffic controller.

ATMS compatibility

- NTCIP 1201, 1202
- Supports Econolite's Centracs® or other NTCIP-based management system

Specifications	Cobalt Shelfmount Controller
Dimensions	14.84 in L x 8.50 in H x 6.13 in W (376.9 mm L x 215.9 mm H x 155.7 W mm)
Power Supply	• 110VAC @ 50/60 HZ or optional 220/240 VAC @ 50/60 HZ • Fuse protection for either 110 or 220/240V • Protection for the 24VDC supply is provided by a resettable electronic fuse
Temperature	-34.6°F to +165°F (-37°C to +74°C)

econolite.com

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Industry Leading Traffic Signal Controller Software

EOS is Econolite's revolutionary Advanced Transportation Controller (ATC) software designed to power Econolite's Cobalt® and 2070 series, and other standard ATC controllers. EOS provides improved core traffic controller operation, enhanced features, and improved usability, helping prepare transportation agencies, cities, MPOs, and others for support of a variety of ITS applications including adaptive, signal priority, Connected and Automated Vehicles (CAV), and Smart City applications.

EOS provides a user interface that has been designed to maximize usability on traditional displays, as well as incorporating a web-based user interface. EOS has improved real-time decision-making, allowing dynamic changes to nearly all features and timing on-the-fly. It also includes localized adaptive splits, providing operational benefits of adaptive control without the need for a separate adaptive system.



Key features

- Advanced coordinator design, enabling immediate coordination decisions
- Local adaptive split balancing
- Support for graphical touch screen display
- Simple configuration of advanced features such as Flashing Yellow Arrows (FYA) and HAWK pedestrian crossings
- Robust support for signal priority and preemption
- Microsimulation capability within PTV Vissim

Software description

EOS can be accessed via a network interface, which can be local or remote, wired or wireless, and allows monitoring or programming of the controller through any web-enabled device, including smart phone, tablet, laptop, or desktop computer. EOS also offers a web-based user interface that includes a virtual suitcase tester.

EOS supports the configuration of phase and overlap timing in predefined tables that can be swapped to meet immediate needs. Dynamic sequencing is achieved by updating prior phase-next selections at the end of a red clearance and even allows phase-sequence swaps in the middle of active phase timing.



EOS features a revolutionary coordinator design, enabling immediate coordination decisions rather than awaiting a cycle endpoint. This coordinator includes adaptive split balancing using the Purdue GOR/ROR5 metric for phase failure. This feature brings many of the operational benefits of adaptive control, without the need for a separate adaptive control system.

Coordination features

- 120 event plans, each with its own cycle, offsets, and splits, coordinated phases, vehicle and pedestrian recall, and phase omits
- Offset and split entries displayed in percent or seconds
- Automatic or manual permissive periods
- Fixed or floating force-off selection
- Crossing arterial coordination
- Adjustable transition recovery

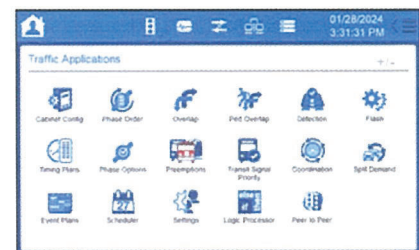


Preemption features

- 16 preemption sequences; each may be configured as priority, first-come-first-serve, or bus preemption operation
- Railroad gate-down input and timing, and gate fault detection
- Conditional delay when entering preemption
- Multiple exit preemption options
- Cabinet interlock feature to protect and verify critical preemption configuration

Priority features

- NTCIP 1211-based Signal Control Priority (SCP) for 10 classes of priority vehicles
- Handles multiple concurrent requests with different priority service levels based on vehicle class
- Logging of priority requests



Enhanced traffic control capabilities

The robust traffic control capabilities of EOS, combined with its ease-of-use, helps ensure that transportation agencies can provide the safest and most efficient intersections for its driving public. It is also designed with the future in mind, supporting the demands of Smart City and CAV applications for the next level in intersection safety.

Time-based features

- 200 schedule programs, configurable for any combination of months, days of the week, and days of the month
- Fixed or floating exception day programs that override the day plan event on a specific day
- 16-day plans that can use any of the 120 event plans

Display features

- Textual and Graphical user interface options
- Powerful web-based user interface with graphical coordination dial and virtual suitcase tester features
- Context-sensitive online help

Detector features

- 64 vehicle detectors, any of which can be configured as bicycle detectors
- 16 system or speed detectors
- Lock/non-lock function by detector
- Four detector plans
- Four detector diagnostic plans
- Four pedestrian diagnostic plans
- Individually assignable to phase and functions
- Logging of volume and/or occupancy assignable by detector
- Red Extend support for red light running safety applications

Logging features

- Separate log buffers for detector activity, detector failures, controller events, and MMU events
- Full, high-resolution Measures of Effectiveness (MOE) logging with tenth second resolution

ATMS features

- NTCIP 1201, 1202
- Supports Econolite's Centracs® or other NTCIP-based management systems
- Remote software update without putting intersection in flash



Security features

- 50 unique user accounts
- Configurable credentials and permissions
- Support for remote management of security credentials and settings

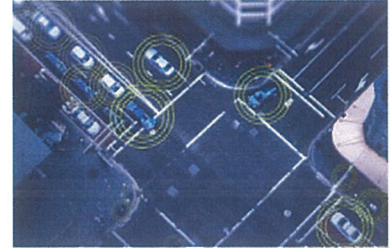
Support of CAV and Smart City applications



EOS provides to the core traffic controller operation, enhanced features, and improved usability, helps prepare transportation agencies, cities, MPOs, and others for support of CAV and Smart City applications. EOS supports Signal Phase and Timing (SPaT), MAP (intersection geometry), Signal Request Message (SRM), and wSignal Status Message (SSM) per the SAE J2735 standards.

Connected Vehicles

- SAE J2735 SPaT and MAP messaging support for current CAV devices
- ICD-2009 (TSCBM) messaging support for legacy CAV devices
- Simultaneous messaging to up to 16 Smart City devices
- Optional support for Signal Request Messaging for connected transit and emergency vehicles



Microsimulation capability within PTV Vissim

EOS is integrated as a virtual controller into the PTV Vissim microsimulation model, and can be used to operate the signals within the simulated network. All EOS features can be precisely modeled and evaluated in VISSIM, allowing you to evaluate and optimize the performance of the transportation infrastructure more accurately than ever before. The virtual EOS controllers behave exactly the same as real physical controllers, and share the same database file format.





Traffic Cabinet Components and Accessories

DBL MX Series LED UPS

What, exactly, is the DBL MX Series UPS?

The DBL MX Series UPS (Uninterruptible Power System) is a double conversion uninterruptible power supply system that plays a vital role in day-to-day intersection operations. In the event of a power loss or brownout below 65 VAC, the DBL MX UPS instantaneously switches from AC line to battery, allowing the intersection to continue operating until utility power is restored. The DBL MX UPS is available in 800, 1000, or 1400 watts output.

Why do agencies use the DBL MX Series?

The DBL MX UPS provides continuous (24/7) AC power to the cabinet and field signal assets. The use of double-conversion technology also provides continuous power conditioning to remove the effects of dirty power or to fluctuate AC line frequency.

How does the DBL MX Series benefit the driving public?

Uninterruptible power systems help ensure signalized intersections continue to function properly during utility power disruptions. The DBL MX UPS ensures safety for the driving public during power outages.





Rating

- 800MX - 800W
- 1000MX - 1000W
- 1400MX - 1400W

Input

- 800/1000/1400MX - 120VAC

Output

- 800/1000/1400MX - 120-220/240VAC

Regulation

- 800/1000/1400MX - +/- 1%

Frequency

- 800/1000/1400MX - 50/60Hz

Output Wave Form

- 800/1000/1400MX - Pure sine wave

Harmonic Distortion

- 800/1000/1400MX - Less than 3%

Power Factor

- 800/1000/1400MX - 1

Topology

- 800/1000/1400MX - DOUBLE conversion

Transfer to Battery

- 800/1000/1400MX - 0 ms

Communications

- Full duplex, RS 232 PORT-9 pin for programming or Ethernet SNMP (optional), USB

LED/LCD Indicators

- 800/1000/1400MX
 - LED - AC input normal, AC to the load normal, AC to dial timer normal, ups internal bypass circuit normal, and ups fault
 - LCD - AC Voltage In, AC Frequency In, AC Voltage Out, AC Frequency Out, % of Max Load, Battery Voltage, UPS temperature (°C)

Protection

- 800/1000/1400MX - Electronic circuit and fuse

Relay Outputs

- 800/1000/1400MX - UPS fail, AC fail, on battery, and low battery

Overload

- 800/1000/1400MX - 125% for 10 minutes then the UPS goes to bypass

Emergency Power Off (EPO)

- In the event of the cabinet/UPS getting turned over, all output power is disconnected

Options

- External bypass switch
- SNMP card
- Extended warranty
- ABM-200 external charger

Basic Specifications

- Temperature: -34.6°F to 165.2°F (-37°C to + 74°C)
- Humidity: 10% to 90% non-condensing
- Weight: 800/1000/1400MX - 15lb
- Dimensions: 800/1000/1400MX - 15" W x 11" D x 5-1/2" H
- When not running on utility AC, the UPS system will provide AC outputs as long as there is either sufficient battery voltage/capacity or other alternate AC (generator, solar, etc.) Battery run time will vary based on load and battery capacity deployed.



HSU 1500 Series Bypass Switches



- Failsafe Bypass Switch with LED status indicators
- Indicators for UPS available, Line Available, UPS on line, Generator & Bypass.
- Auto and Bypass positions
- Allows the Hot Swap of **any** UPS system
- Quick Anderson Power Pole Load and Line connectors
- Rated for 250V @ 30amps 50/60Hz
- Failsafe Break Before Make in 12ms to line power
- One touch button transfer to Bypass or UPS or Generator.
- Anodized Steel enclosure construction
- Input, Generator and UPS source voltage monitoring circuit
- Back-Feed protection circuit
- Resettable Circuit Breaker
- Compact design

Specifications

	HSU-1500	HSU-1500-R	HSU-1500-Dual	HSU-1500Dual-R
VAC Rating	120VAC	120VAC	120VAC	120VAC
VAC Range	70 to 150	70 to 150	70 to 150	70 to 150
Connector Rating	30 Amps	30 Amps	30 Amps	30 Amps
Circuit Breaker	30 Amps	30 Amps	2 x 30 Amps	2 x 30 Amps
LED Indicators	*Line Available *Bypass *UPS on Line *UPS Available	*Line Available *Bypass *UPS on Line *UPS Available	*Line Available *Gen OnLine *Bypass *Bypass Gen *Auto * Auto *UPS Available *Gen Avail	*Line Available. *Gen OnLine *Bypass *Bypass *Gen *Auto * Auto *UPS Available * Gen Avail
Controls	Single Button	Single Button	Dual Buttons	Dual Buttons
Transfer Speed	12ms	12ms	12ms	12ms
Monitoring Circuits	UPS/Line/Bypass AutoBypass/Bypass	UPS/Line/Bypass AutoBypass/Bypass	UPS/Latch to Line /Bypass AutoBypass/Bypass	UPS/Latch to Line /Bypass AutoBypass/Bypass
Relay Type	2 x 250V 30Amp	2 x 250V 30Amp	4 x 250V 30Amp	4 x 250V 30Amp
Connections	Anderson Power Power 6 position Latching. Molex 6 Position.	Anderson Power Power 6 position Latching. Molex 6 Position.	Anderson Power Power 6 position Latching. Molex 9 Position.	Anderson Power Power 6 position Latching. Molex 9 Position.
Mechanical Dimensions	4.75 x 7.5 x 2.5 120x 190 x 63.5	19 x 3.375 x1.75 482 x 85.72 x44.45	7.5 x 2.5 x 7.5 190 x 63.5 x190	19 x 3.375 x1.75 482 x 85.72 x44.45
Weight	2lbs/0.9 Kg	2.5lbs/1.13Kg	4.2 lbs/1.9 Kg	5Lbs/2.21 Kg

TechPower Developments Inc.

3750A Suite 16 Laird Road, Mississauga, Ontario L5L0A6

Tel (905) 337 8232 Fax (905) 337 9050 www.techpowerdevelopmentsinc.com

8A24 HEI

SPECIFICATIONS

Nominal Voltage (V)	12V
Capacity at C/100	91 Ah
Capacity at C/20	79 Ah
Capacity at C/5	69.2 Ah
Weight	53 lbs. (24 kg)
Plate Alloy	Lead Calcium
Post Seal	Epoxy-Sealed
Container/Cover	Polypropylene
Operating Temperature Range	-40°F (-40°C) - 140°F (60°C)
Caltrans BBS temperature clause will be supported. Temperature and battery age effect runtime.	
Charge Voltage @ 77°F (25°C)	
Charge / Absorption / Equalize	2.30 - 2.43 VPC
Float / Standby	2.23 - 2.26 VPC
Vent	Self-sealing
Terminal	C (Insert w/ 1/4" - 20 round hole)



Rated non-spillable by ICAO, IATA and DOT

Made in the U.S.A. by East Penn Manufacturing Co., Inc.

Distributed by:

Valve-Regulated, Absorbed Glass Mat Technology

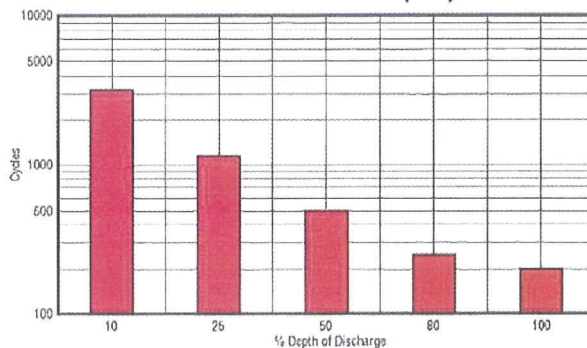


DIMENSIONS

Inches (mm)

Length	10.90 (260 mm) including handle
Width	6.80 (173 mm)
Height	8.24 (209 mm)

AGM Cycle Life vs Depth of Discharge at +25°C (77°F)
Based on BCI 2-hour Capacity



MK Battery

1631 South Sinclair Street • Anaheim, California 92806

Toll Free: 800-372-9253 • Fax: 714-937-0818 • E-mail: sales@mkbattery.com



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WARRANTY

Econolite Control Products, Inc. (Econolite) warrants the products listed to the original purchasing agency (Purchaser) for a period of **one (1) year** from date of shipment, to be free from defects in material or workmanship and to be of the kind and quality designated or specified in the contract. If Econolite installs the equipment or supplies technical direction or installation by contract, the warranty period shall run from the completion of installation, provided same is not unreasonably delayed by the Purchaser. Econolite is not responsible for damage caused by negligence, acts of God, or use of equipment in a manner not originally intended.

If the equipment delivered hereunder does not meet the above warranty, and if the Purchaser promptly notifies Econolite, Econolite shall thereupon correct any defect, including non-conformance with specifications, either (at its option) by repairing any defective or damaged parts of the equipment or by making available at Econolite's plant necessary repaired or replacement parts. The liability of Econolite under this warranty, for any loss or damage to the equipment whether the claim is based on contract or negligence, shall not in any case exceed the cost of correcting defects in the equipment as herein provided and, upon the expiration of the warranty period, all such liability shall terminate. The foregoing shall constitute the exclusive remedy of the Purchaser and the exclusive liability of Econolite.

THE EXPRESS WARRANTY SET FORTH IS A LIMITED WARRANTY AND IS THE ONLY WARRANTY MADE BY ECONOLITE. ECONOLITE MAKES AND PURCHASER RECEIVES NO OTHER EXPRESS WARRANTY AND NO IMPLIED WARRANTIES. ALL WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE EXPRESSLY EXCLUDED. THE STATED EXPRESS WARRANTY IS IN LIEU OF ALL LIABILITIES OR OBLIGATIONS OF ECONOLITE FOR DAMAGES ARISING OUT OF OR IN CONNECTION WITH THE SALE, DELIVERY, OPERATION, OR USE OF THE GOODS.

The warranties set forth herein shall be void if the goods have been (1) repaired or altered outside of Econolite's facilities, (2) subjected to misuse, negligence, accident, or operated in other than normal and proper use and service, or (3) connected, installed, or adjusted in a manner not in accordance with Econolite's instructions. This warranty does not extend to products not manufactured by Econolite. Econolite has the sole right to determine whether or not an item is covered under our warranty policy.

To obtain service under this warranty, the following steps are required:

- ✓ Obtain a Return Authorization (RA) via email from repairs@econolite.com or by calling 855-575-5776
- ✓ Pack in original (or equivalent) shipping container
- ✓ List on packing sheet inside shipping container, the RA number, your purchase order number, and description of the problem
- ✓ Insure the package (or assume the risk of loss/damage during shipment)
- ✓ Ship to the address provided by the Repair Department

PRODUCTS COVERED UNDER THIS WARRANTY INCLUDE:

NEMA WIRED CABINET ASSEMBLIES, VEHICLE DETECTOR AMPLIFIERS

ALUMINUM SIGNALS AND POLYCARBONATE SIGNALS

SAFETRAN BRAND: 3XX WIRED CABINET ASSEMBLIES, ATCC CABINET ASSEMBLIES, ATC2070 CONTROLLERS



Would you recommend us? feedback.econolite.com

1-Year Warranty
Doc# C10062
Jun 2019 Rev K
683-10576-0518

June 17th, 2025

Cameron Fowlkes
City Engineer
City of Louisville
749 Main Street
Louisville, CO 80027

Offering Supplier: Altitude Signal, LLC
489 N Denver Ave Loveland, CO 80537
FEIN: 83-1927222
Phone: 888.342.9748 | No Fax
Contracting Contact: Katie Robinson
Direct: 970.461.4922
krobinson@altitudesignal.com

**RE: RFP 2025-0000388877 - 2025 TRAFFIC SIGNAL TECHNOLOGY EQUIPMENT
PROCUREMENT PROJECT**

Dear Mr. Fowlkes:

Altitude Signal, LLC (Altitude Signal) appreciates the opportunity to submit this proposal to the City of Louisville for 11 Single Camera Video Vehicle Detection Systems for their *2025 Traffic Signal Technology Equipment Procurement Project*. We acknowledge Addendum 1, and this letter certifies that the information and data submitted are true and complete to the best of my knowledge.

Altitude Signal is an Intelligent Transportation Systems (ITS) distributor based in Loveland, Colorado, boasting decades of combined experience in supporting traffic signal systems, including cabinets, controllers, detection, networking, pedestrian safety equipment, and more across the Mountain West. For detection systems, our team has thoroughly vetted, tested, and partnered with Cubic Transportation Systems' Gridsmart system. We are proposing this system to the City of Louisville as an equivalent single-camera detection system to the City's specified Miovision camera.

Cubic Transportation Systems designs, develops, and manufactures Gridsmart, the most user-friendly, powerful, and reliable single-camera intersection detection system. Introduced in 2006, Gridsmart was the world's first single-camera intersection detection system and has since been adopted by thousands of agencies across the United States. The Gridsmart machine learning algorithm tracks all road users, including vehicles, bicycles, and pedestrians, as they enter, travel through, and exit the intersection, extending clearance times to accommodate each traveler's unique needs. Select examples of recent new installations (within the past year) of Gridsmart systems across the Mountain West are included in *Appendix C* of our response.

This project will implement single-camera detection systems at 11 intersections throughout the City of Louisville to enhance and upgrade the City's traffic signal technology, along with other equipment. The Gridsmart System meets all detection specification requirements specified by the City of Louisville, and is the most widely adopted single-camera detection system throughout Colorado – proven through numerous agencies and hundreds of deployments. Gridsmart has been trusted by CDOT as the only single-camera detection system with an active CDOT procurement contract (no. 311002446).

For the City of Louisville's project, the following is a complete list of the products and technical services included in our offering:

- 1) Eleven Gridsmart detection systems, including all mounting hardware and CAT5e camera connectivity cable to provide stopbar detection and actuation, as well as vehicle, bicycle, and motorcycle differentiation.
- 2) Installation assistance provided to the City of Louisville and the City's installing contractor for onsite assistance in the system setup and programming. This service is provided by Altitude Signal and/or Cubic IMSA Field Level II/III technicians, each factory certified by Gridsmart.
- 3) One day of classroom product training at the City of Louisville facilities by the Cubic and Altitude combined teams, with lunch provided. Additional training may be provided at no extra charge if needed.
- 4) Ongoing technical support of the Gridsmart systems through Altitude Signal and/or Cubic for the life of the product.

All Gridsmart systems operate seamlessly with Louisville's TS2 traffic signal cabinets and Econolite Cobalt (or ASC-3) controllers, and can be mounted to both traditional round-pole luminaires as well as the City's modular poles. Gridsmart has been installed in all cabinet and controller types, operating in Colorado. Individual site surveys for each intersection are included with our response under *Appendix B*. All major traffic signal contractors currently operating in the Denver metro have staff with experience installing the Gridsmart detection system.

By partnering with Altitude Signal, the City of Louisville staff also gain access to a comprehensive support team comprised of three IMSA-certified technicians based in Colorado, each with years of experience supporting hundreds of Gridsmart systems. Abbreviated resumes for two of these team members are included with our response. At our Loveland, CO, warehouse, we regularly stock all equipment required for this deployment. Due to this commitment, the estimated material lead time for this project is expected to be less than one month.

Lastly, both Cubic Corporation and Altitude Signal, LLC are owned and operated within the United States, supporting US employment, in contrast with Miovision. All Gridsmart systems are designed, engineered, and assembled in Tennessee, and Gridsmart manufacturing fully complies with both Buy America and BABA federal regulations.

As a local business, maximizing Colorado's transportation infrastructure is extremely important to our organization, and in that regard, we are pleased to present this solution. I, Katie Robinson, am authorized to submit proposals and sign contracts on the firm's behalf. Feel free to contact me at the info above with any questions regarding our response.

Sincerely,



Katie Robinson, Chief Operating Officer
Altitude Signal, LLC



Company Information and Experience

Altitude Signal

Altitude Signal is a Colorado-headquartered distribution company with a satellite office in Carson City, Nevada. With over 100 years of combined experience, our team of six specializes in traffic signal and intelligent transportation systems (ITS). Between the Rockies and the



Sierra Nevada, our team services transportation systems across the Mountain West, covering six states: Colorado, Idaho, Montana, Nevada, Utah, and Wyoming. Altitude Signal has been an exclusive distributor for Cubic (the manufacturer of Gridsmart Detection Systems) since our company's inception and has installed hundreds of Gridsmart systems across dozens of agencies within Colorado alone. Altitude Signal is a locally-owned small business.

Headquartered in Loveland, CO, and with over half of our staff living along the Front Range, we are exceptionally dedicated to our Colorado customers and our home state's transportation infrastructure. Cubic ITS also has a field technician based in the Denver Metro area who specializes in servicing Gridsmart customers.

Altitude Signal will dedicate two lead personnel to the City of Louisville for installation best practices, training, and product support for this project. They each are IMSA certified and factory certified to install and support Gridsmart systems as distributor partners. They, along with a Cubic technician, will comprise our project delivery team. Abbreviated resumes for our team are below:

Dominick Tufano, Account Manager

Relevant Certifications: IMSA Field Level III

Dominick Tufano is Altitude Signal's Account Manager for Colorado and Wyoming. He manages customer accounts and provides technical services for our systems throughout the region. Dominick will assist Louisville with contract management and procurement, lead product support/troubleshooting, programming, and training.

Dominick has over 20 years of experience in the ITS industry, starting in construction at Sturgeon Electric. He worked for the City and County of Denver for 15 years working in their transportation and ITS departments, concluding his time as a Transportation Project Coordinator. Most recently prior to joining our team, Dominick served as a Manager of Field Services at Cubic Corporation, during which he deployed Gridsmart detection systems across 15 states, including in Colorado, for three years.

Tim Livingston, Field Applications Engineer

Certifications: IMSA Field Technician – Level II, Construction – Level II

Tim Livingston is the Field Applications Engineer at Altitude Signal in Colorado. He will be available to the City of Louisville for technical support, troubleshooting, training, or installation assistance.

Tim has over eleven years of experience in the ITS industry. He began his career at WL Contractors (now Lumin8) before moving on to work at the City of Longmont, CO. Since joining Altitude Signal in 2021, Tim has taken the lead on thousands of product deployments for our team, specializing in our Gridsmart detection systems, EtherWAN switches and radios, and Avelled RRFB systems. Tim has managed the support of hundreds of Gridsmart detection systems throughout his time with our team and will assist Dominick in supporting Louisville.



References

We have selected three agency references that have had 2025 projects in similar size/scope as Louisville's – having procured approximately the same quantity of Gridsmart detection systems in 2025. Each have chosen to expand their detection deployments in 2025 projects using Gridsmart detection systems and have staff with experience using both Gridsmart and Miovision.

Colorado Department of Transportation

Heath Evans

CDOT Region II Traffic

(o) 719.248.5715

Heath.evans@state.co.us

Deployed Locations: 10

Hardware Type: 10 GS3 Processors, 6 Cat5e Cameras, 8 Fiber Cameras

Project Name: CDOT Region II 2025 Traffic Signal Detection Upgrades

Current Status: Equipment delivered in 30 days, deployment ongoing

Summary

Altitude Signal maintains an open contract with Colorado DOT to supply Gridsmart to the various traffic signal departments across the state. Each year, our company supplies and supports hundreds of thousands of dollars' worth of Gridsmart cameras to CDOT under this contract. Many other local agencies in Colorado purchase through this contract and prefer to work with Altitude because of our outstanding product lines and support team.

City of Lone Tree, Colorado

Steve Fletcher

Public Works Operations Manager

Phone: 303.662.8112

Steve.fletcher@cityoflonetree.com

Deployed Locations: 9

Hardware Type: 9 GS3 Processors, 18 Fiber Cameras

Project Name: 2025 Park Meadows Drive Adaptive Corridor

Current Status: Equipment delivered within 30 days, with installation planned for late June / early July 2025

Summary

In April 2025, Altitude Signal was awarded a contract to deploy a traffic signal adaptive corridor for Park Meadows Drive. The project included nine Gridsmart dual-camera systems for detection along the corridor due to zone placement requirements. We were contracted to supply, program, and assist with installation, ensuring seamless operation across the City's network. Lone Tree's operations and engineering teams can attest to our firm's ability to manage contracting, equipment delivery, programming, and support, as well as the Gridsmart system's ease of use and troubleshooting.

Ada County Highway District (ACHD), Idaho

Brock Love

Signal Crew Chief

Office: 208.387.6199

bllove@achdidaho.org

Deployed Locations: 16

Hardware: 16 GS3 Processors, 33 Cat5e Cameras

Project Name: Traffic Signal Materials - 2025

Current Status: Equipment delivered, deployment ongoing

Summary

Altitude Signal was awarded a contract for detection using Gridsmart in 2024 which was extended in 2025 after ACHD tested both Miovision and Gridsmart. This contract was renewed in January 2025 and expanded in May. ACHD purchased a combined 16 GS3 processors and 33 FE3 cameras in 2025. All materials have been delivered within 30 days, and Altitude Signal has been regularly available and on-site for product support and various installations.

EXHIBIT A
TRAFFIC SIGNAL TECHNOLOGY PRICING PROPOSAL
Project # 25-HTD-ZL-00189 (26912)

The following is the bid details for the purchase of the traffic signal technology equipment. The vendor's proposed equipment will be evaluated with the submitted unit prices to determine the selected awardee.

The quantity of equipment on the bid documents is the City's best estimate of technology needed. The City does not guarantee that the final purchase order will be the estimated quantity. The City may purchase more or less units. There will be no price adjustment for any variation in quantities.

Signal Technology Procurement Project

ACTIVITY & COST				
DESCRIPTION	ESTIMATED QUANTITY	MAKE, MODEL, AND WARRANTY	COST EACH	TOTAL COST
Traffic Signal Cabinet (TS 2P) – Furnish Only	7		No Bid	
Traffic Signal Controller – Furnish Only	7		No Bid	
Video Detection – Furnish Only	11	Gridsmart GS3 3 Years, +90 Days	\$ 14,347.27	\$ 159,920.00
Emergency Preemption – Furnish Only	2		No Bid	
Battery Backup System – Furnish Only	7		No Bid	
			TOTAL	\$ 159,920.00



Altitude Signal
A handwritten signature in black ink, appearing to be 'R' followed by a flourish.

Colorado Department of Transportation

Anti Collusion Affidavit – Form 606

Instructions: Form to be completed by an authorized agent or Officer for the bidder/Contractor submitting a bid for the Colorado Department of Transportation Project identified below.

Project Number: 25-HTD-ZL-00189

I hereby attest that I am the person responsible within my firm for the final decision as to the price(s) and amount of this bid or, if not, that I have written authorization, enclosed herewith, from that person to make the statements set out below on their behalf and on behalf of my firm. I further attest that:

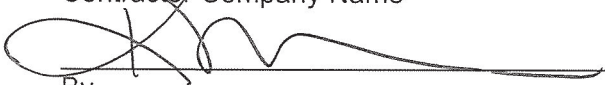
1. The price(s) and amount of this bid have been arrived at independently, without consultation, communication, or agreement for the purpose or with the effect of restricting competition with any other firm or person who is a bidder or potential prime bidder.
2. Neither the price(s) nor the amount of this bid have been disclosed to any other firm or person who is a bidder or potential prime bidder on this project and will not be so disclosed prior to bid opening.
3. Neither the prices nor the amount of the bid of any other firm or person who is a bidder or potential prime bidder on this project have been disclosed to me or my firm.
4. No attempt has been made to solicit, cause, or induce any firm or person who is a bidder or potential prime bidder to refrain from bidding on this project, or to submit a bid higher than the bid of this firm, or any intentionally high or noncompetitive bid or other form of complementary bid.
5. No agreement has been promised or solicited for any other firm or person who is a bidder or potential prime bidder on this project to submit an intentionally high, noncompetitive, or other form of complementary bid on this project.
6. The bid of my firm is made in good faith and not pursuant to any consultation, communication, agreement or discussion with, or inducement or solicitation by or from any firm or person to submit any intentionally high, noncompetitive, or other form of complementary bid.
7. My firm has not offered or entered into a subcontract or agreement regarding the purchase or sale of materials or services from any firm or person, or offered, promised or paid cash or anything of value to any firm or person, whether in connection with this or any other project, in consideration for an agreement or promise by any firm or person to refrain from bidding or to submit any intentionally high, noncompetitive or other form of complementary bid or agreeing or promising to do so on this project.
8. My firm has not accepted or been promised any subcontract or agreement regarding the sale of materials or services to any firm or person and has not been promised or paid cash or anything of value by any firm or person, whether in connection with this or any other project, in consideration for my firm's submitting any intentionally high, noncompetitive, or other form of complementary bid, or agreeing or promising to do so, on this project.
9. I have made a diligent inquiry of all members, officers, employees, and agents of my firm with responsibilities relating to the preparation, approval or submission of my firm's bid on this project and have been advised by each of them that he or she has not participated in any communication, consultation, discussion, agreement, collusion, or other conduct inconsistent with any of the statements and representations made in this affidavit.
10. I understand and my firm understands that any misstatement in this affidavit is and shall be treated as a fraudulent concealment from the Colorado Department of Transportation, of the true facts relating to submission of bids for this contract.

Signature Declaration: I declare under penalty of perjury in the second degree, and any other applicable state or federal laws, that the statements made on this document are true and complete to the best of my knowledge.

Altitude Signal, LLC

Contractor Company Name

Second Company Name if Joint Venture

By 

By

Katie Robinson, COO

Title

Title

6/17/2025

Date

Date



Appendix B: Gridsmart Site Surveys

Before an installation, our team creates a custom site survey for each deployment. The objective of site surveys is to take time before product installation to analyze agency objectives and intersection topography to optimize the equipment provided. Our technicians determine ideal camera mounting locations and total cable lengths needed for each potential installation to ensure proper operation.

Site Survey General Notes:

1. These diagrams assume conduit is available where shown. Altitude Signal can not know real-world conduit conditions/locations at each intersection, so City staff must verify conduit availability before installation.
2. Our equipment recommendations utilize CAT5e cable, which is the same type of cable used by Miovision for their connectivity.
3. Single bell cameras have been recommended at each location. A second camera may be added to processors if requested. That said, each intersection is within Gridsmart specifications for single-camera operations.
4. We have reduced the image sizes to fit in our response. Full-sized images and Google Maps files may be provided to the City in a separate file at project kickoff or prior upon request.

W South Boulder Rd & Washington Ave

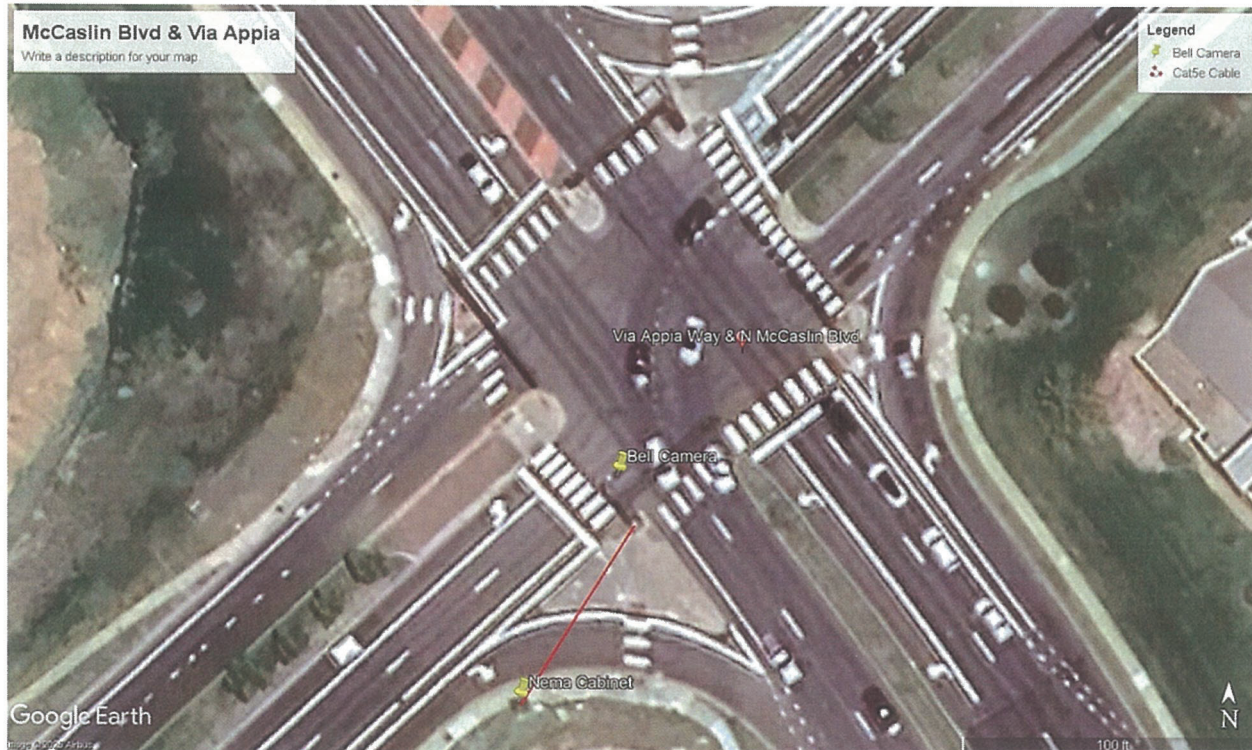




South Boulder Rd & N McCaslin Blvd



N McCaslin Blvd & Via Appia Way/Centennial

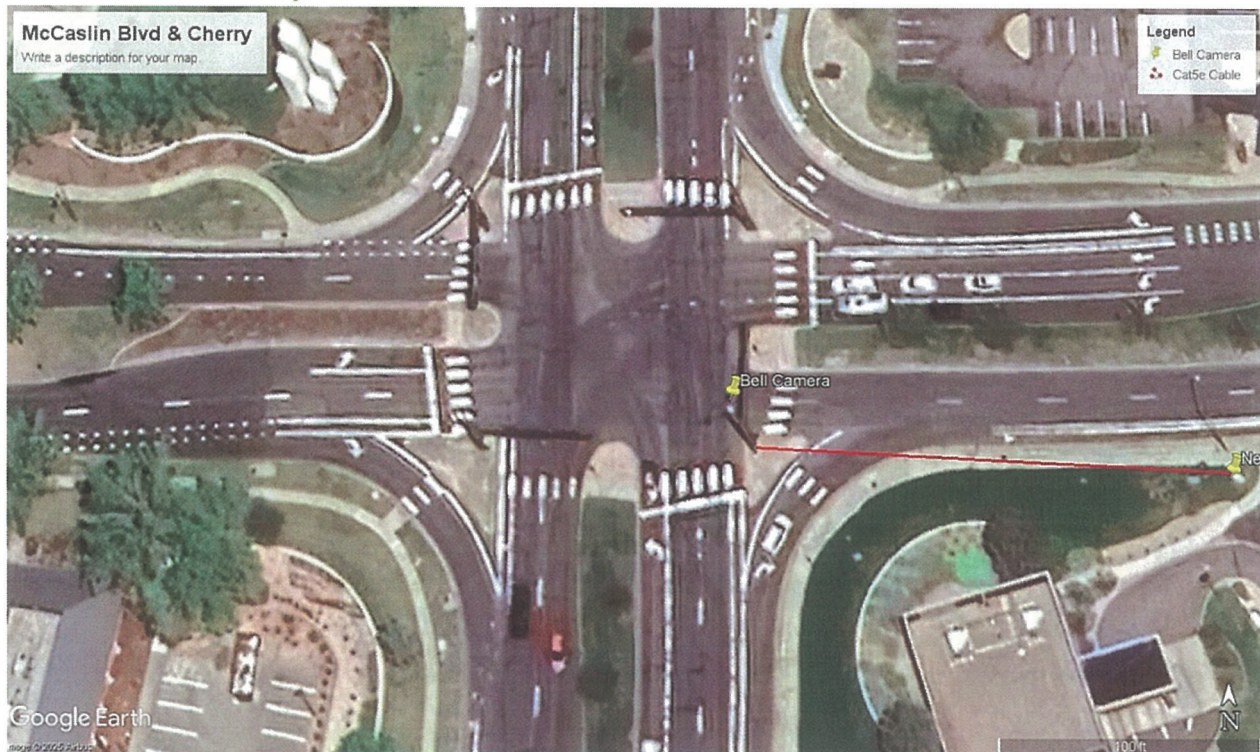




W McCaslin Blvd & Century Rd

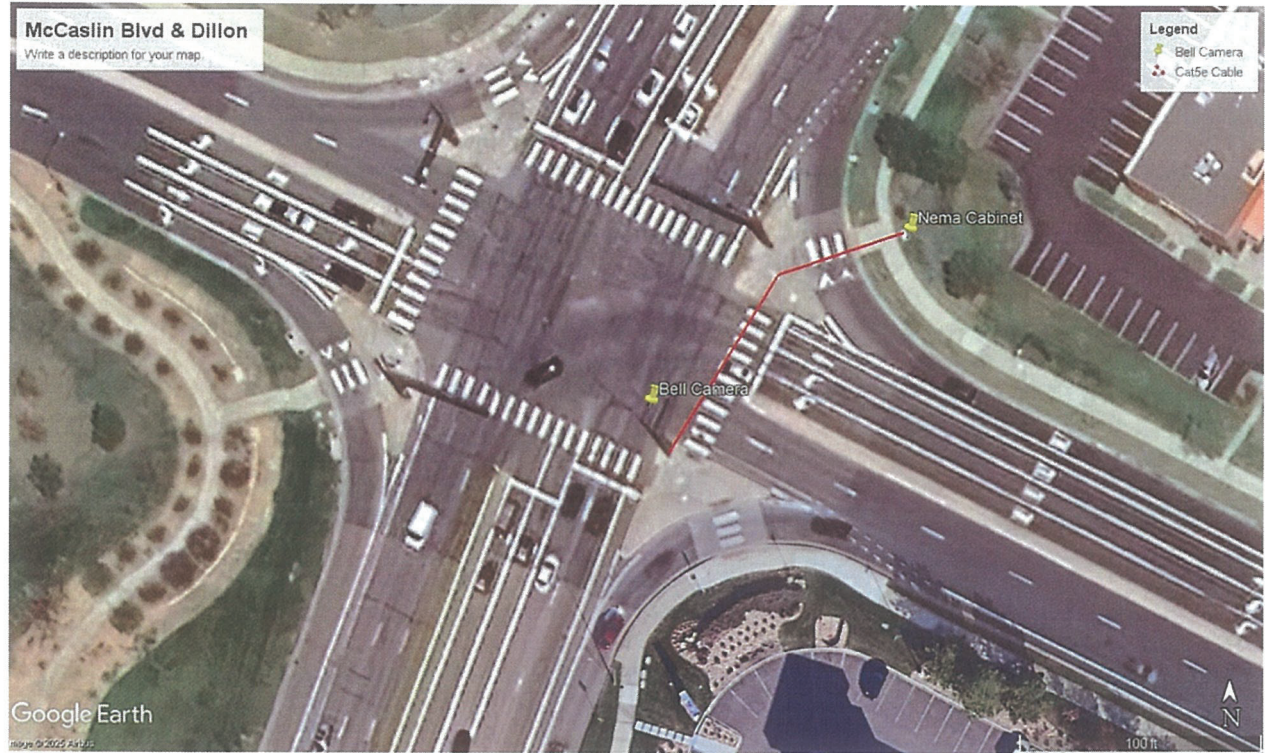


McCaslin Blvd & Cherry Rd





McCaslin Blvd & Dillon Rd



Dillon Rd & Dahlia

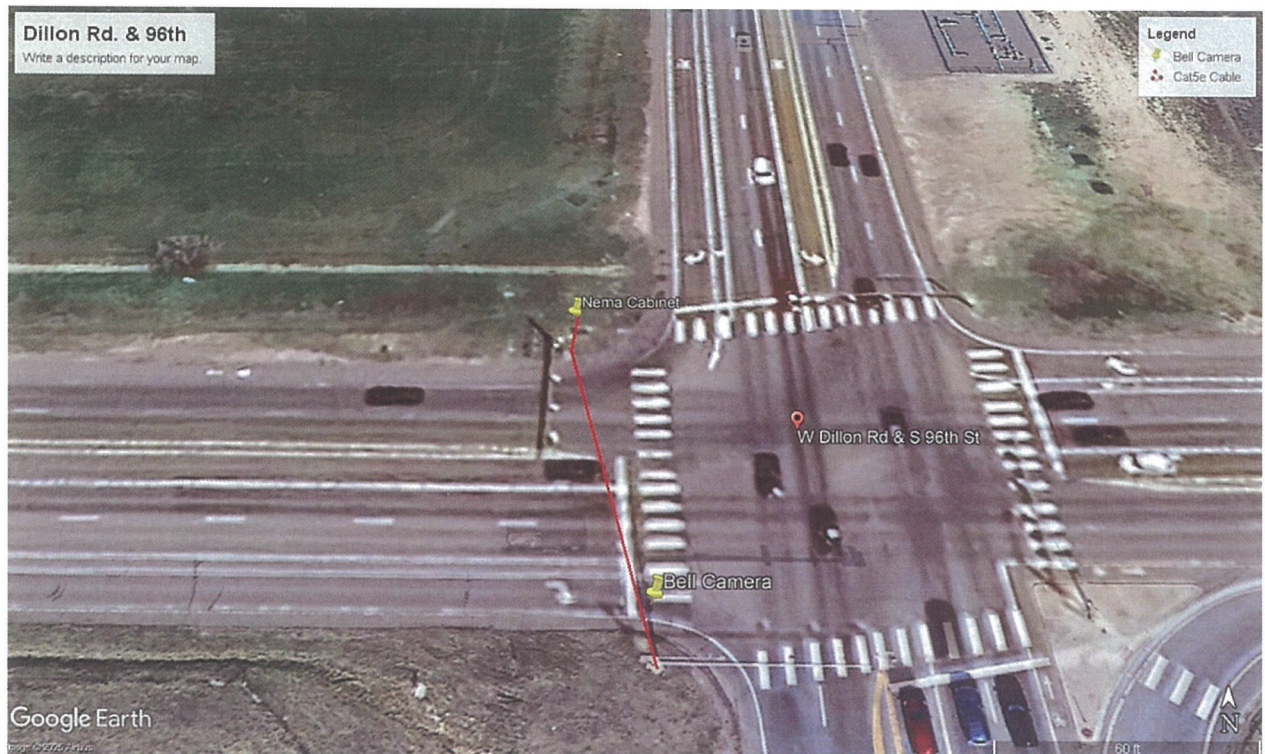




Dillon Rd & 88th St

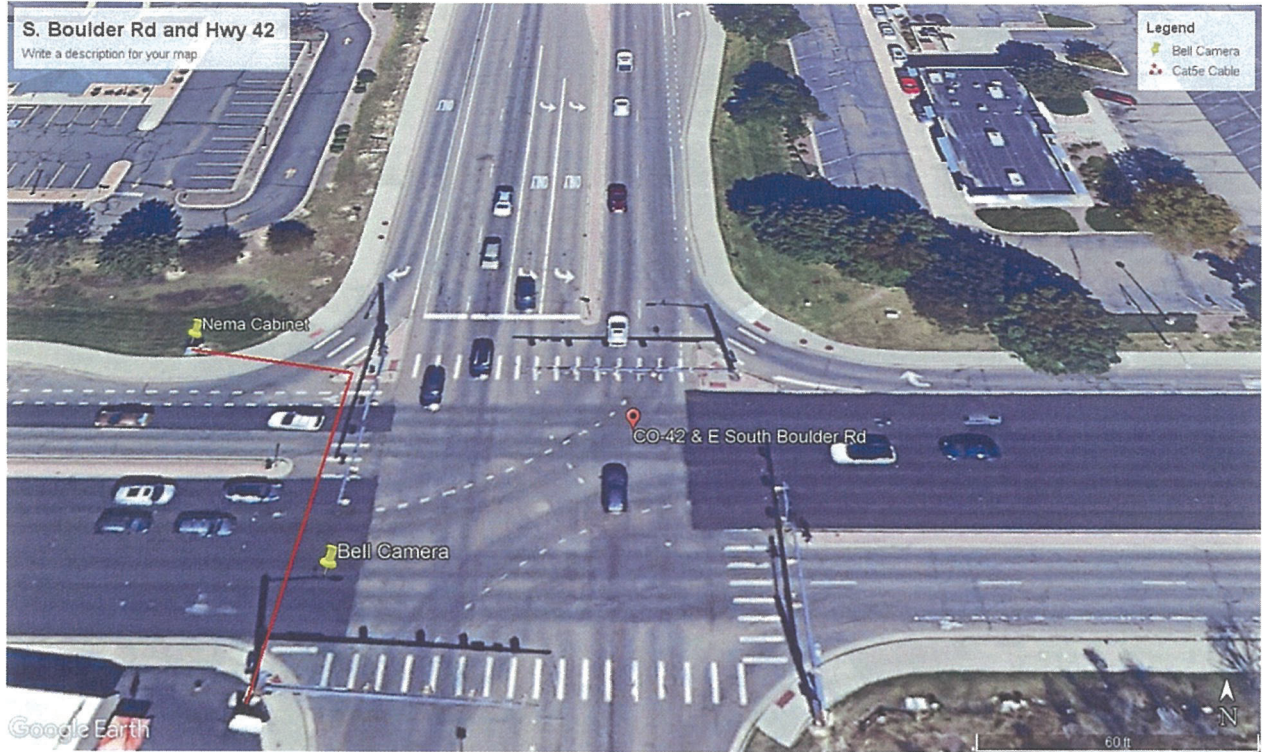


Dillon Rd & 96th St





S Boulder Rd & Hwy 42



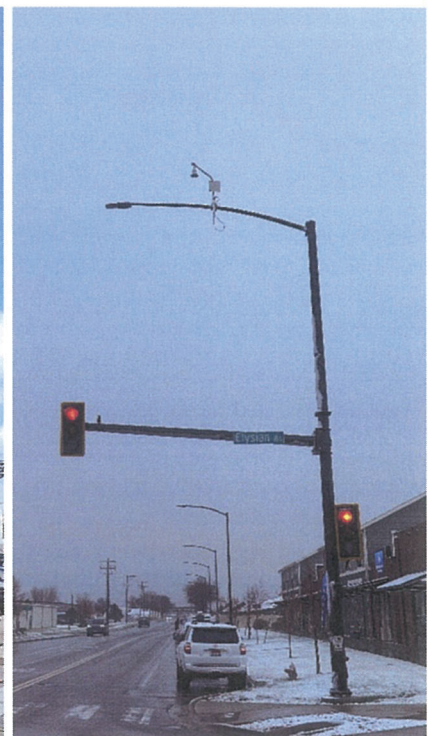
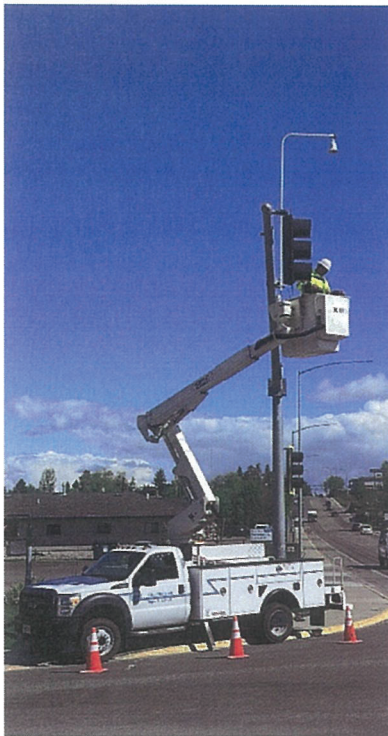
CO Hwy 42 & S 104th St





Appendix C: Recent Gridsmart Installation Photos

Below are five photos of Gridsmart installations at various locations within the past year.





Example of a Basic single camera Gridsmart intersection setup



Example of a Gridsmart operating with Bike lane and Bike Box Differentiation

A nighttime photograph of a city skyline with several tall buildings illuminated with blue and white lights. In the foreground, a multi-lane highway shows long, bright white and blue light trails from moving vehicles, indicating a long-exposure shot. The sky is dark, and the overall scene conveys a sense of urban activity and modern infrastructure.

CITY OF LOUISVILLE

RFP: #25-HTD-ZL-00189 (26912)

**Project Name: City of Louisville Traffic
Signal Technology Project**

Bid Opening: June 26, 2025 2:00 p.m.

AM SIGNAL, LLC

8100 Southpark Way, Unit A-10
Littleton, CO 80120

Phone: 720-348-6925

www.amsignal.com





8100 Southpark Way, Unit A10 - Littleton, CO 80120

Tel: 720-348-6925 Fax: 720-348-6950

www.amsignal.com

June 24, 2025

Cameron Fowlkes
City Engineer
City of Louisville
749 Main Street
Louisville, CO 80027

Dear Mr. Fowlkes,

SUBJECT: Proposal ##25-HTD-ZL-00189 (26912); City of Louisville Traffic Signal Technology Project

Thank you for the opportunity to respond to your Traffic Signal Technology Project request for proposal and to support the City of Louisville in the upgrade of their traffic signal equipment. AM Signal is pleased to submit our response to the City featuring SWARCO McCain cabinets, Opticom preemption, Miovision vehicle detection, and APC Schneider uninterruptible power supplies.

As an authorized distributor of these manufacturers, AM Signal is confident in our ability to not only meet but exceed the City's expectations. We are proposing one minor change to the cabinet configuration: instead of providing a separate standalone cabinet for the UPS, we recommend a single integrated SWARCO McCain traffic signal cabinet that will house all components, including the UPS. The advantages of this design include:

- Reduced footprint and right-of-way impact
- Simplified installation and lower labor costs
- Improved aesthetics and reduced maintenance complexity

AM Signal will use its past experience to build a realistic and mutually agreeable schedule. We are committed to delivering materials as quickly as possible and will collaborate with the City to ensure timely deployment. Current lead times are as follows:

- SWARCO McCain Cabinet (with integrated UPS) – 165 days
- Miovision Video Detection System – 30 days
- Opticom Preemption System – 30 days
- APC Schneider UPS – 75 days

Thank you for considering AM Signal. We look forward to the possibility of partnering with Louisville on this exciting project. Our goal is to deliver a reliable solution that meets the RFP's scope and requirements.

For questions and clarifications regarding this proposal, the principle contact for this RFP will be Brooke Hageny. Brooke's contact information is provided below.



Principal Contact:	Brooke Hageny
Title:	Dir. of Inside Sales & Estimating
Email Address:	brooke@amsignal.com
Phone Number:	720-231-2641
Fax Number:	720-348-6950

AM Signal acknowledges receipt of Addendum #1 and #2.

By signing, I, Brooke Hageny, certify that the information is true and complete to the best of my knowledge. I am fully authorized by AM Signal, LLC to submit proposals and sign contracts.

Regards,

Brooke Hageny

Director of Inside Sales & Estimating
AM Signal, LLC

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2. VENDOR INFORMATION

COMPANY OVERVIEW

Founded in 2001, AM Signal has established itself as a leader in the distribution of traffic signal control devices and Intelligent Transportation Systems (ITS) in the Rocky Mountain Region. As a full-service, stocking distributor for numerous product lines, AM Signal offers comprehensive support from design to technical assistance. With extensive experience in supplying ITS devices and providing ongoing technical support, AM Signal systematically partners with leading technological manufacturers worldwide to meet both current and future needs.

Company Name	AM Signal, LLC.
Principle Location	8100 Southpark Way, Unit A-10 Littleton, CO 80120
Phone Number	720-348-6925
Fax Number	720-348-6950
Year of Incorporation	2001
Size of Firm	35 Employees
Website	www.amsignal.com

AM Signal's mission is to deliver superior service, quality products in a timely manner. With a dedicated team of engineers, IMSA certified technicians, and esteemed technology partners, we ensure that all project obligations are not only met but exceeded.

KEY QUALIFICATIONS

- Proven Expertise:** With over two decades of experience in the traffic industry, our team members have successfully delivered solutions for numerous projects. This extensive experience equips us to understand and address the needs and challenges faced by the City of Louisville.
- Local Presence:** With our local office in Colorado, and our team's familiarity with the region, this allows us to provide localized support and insight, ensuring a seamless collaboration. *Plus, with Louisville just a short hour's drive away, we are perfectly situated to address your needs swiftly and effectively.*
- Technical Expertise:** Our technical team, including IMSA Level III Traffic Technicians and engineers, possesses specialized knowledge and certifications that enhance our capabilities in designing, implementing, and managing traffic solutions.
- Customer-Centric Approach:** We prioritize customer satisfaction and ensure all products are not only delivered successfully but also *backed by technical support* to guarantee their long-term performance.
- Government Contracts:** AM Signal has successfully obtained and fulfilled many contracts from Federal, State and Local Government entities throughout our territory. Our track record demonstrates exceptional performance, as we have consistently met our obligations without any defaults.

PROJECT PERSONNEL

The Team is excited to present our highly qualified personnel for this project who are experts in the traffic and ITS industry. In the following pages, we have included key staff bios and our team organization chart.

Kelly Dunkel – Project Manager, AM Signal, LLC.

Since joining AM Signal in 2021, Kelly Dunkel has played a vital role in our purchasing department, becoming the go-to for product details, lead times, and vendor coordination. Her deep knowledge of parts and logistics, along with her ability to manage timelines and communicate effectively, makes her a natural fit for her new role as Project Manager. Kelly will provide contract management and project management for this project, including attending the Initial Project Meeting to discuss schedule, approach, and budget.

Adam Burger – Regional Sales Manager, AM Signal, LLC.

With 20 years in the traffic industry and 12 years at AM Signal, Adam brings extensive technical expertise and hands-on experience. Based in Colorado, he supports out-of-state vendors with integration, testing, and problem-solving. Adam holds an IMSA Field & Construction Technician Level II certification and will provide local support for this project through procurement assistance, product support, training, and more as needed.

Chris Beery – Technician, AM Signal, LLC.

Chris Beery brings over 25 years of electrical industry experience, including design, troubleshooting, repair, and project management. His work with ITS and traffic control systems spans agency, contractor, and distributor roles, giving him a well-rounded perspective. Known for his adaptability and communication skills, Chris is a valuable asset to any project team. He will provide product support, troubleshooting, and training.

PAST PROJECTS

City of Aurora		
AM Signal provided (20) Miovision Detection Systems, ensuring seamless integration into their traffic management infrastructure. The AM Signal team managed the procurement and delivery of all materials while also providing technical support and training to city staff. Materials were delivered in just over 30 days.		
DESCRIPTION & DELIVERY TIMES		
PMNAME	PHONE	EMAIL
Brian Carbone	303-301-5758	bcarbone@auroragov.org
Aurora Stock - Materials are deployed all over Aurora at 172 locations	Miovision Core DCM, 360 Camera, Detection Plus License	Miovision Detection System
DEPLOYED LOCATIONS	HARDWARE TYPE	PROJECTNAME

City of Lakewood		
The City of Lakewood purchased (3) intersections of Miovision Detection off a cooperative contract. All material was delivered within 30 days.		
DESCRIPTION & DELIVERY TIMES		
PMNAME	PHONE	EMAIL
Doyle Velasquez	303-589-2113	doyvel@lakewood.org
Jewell Ave & S. Kipling St (Old Kipling St), Morrison Rd & S. Kipling St (Old Kipling St), 12th Ave /Collins Ave & Simms St	Miovision Core DCM, 360 Camera, Detection License	Video Upgrades - Kipling, & Simms
DEPLOYED LOCATIONS	HARDWARE TYPE	PROJECTNAME

City of Scottsdale		
In 2024, the City of Scottsdale awarded AMS a (1)year contract, with (4)optional renewals, for Traffic Signal Detection Upgrades. The most recent order was for (8)intersections and lead-time was 30 days.		
DESCRIPTION & DELIVERY TIMES		
PMNAME	PHONE	EMAIL
John Hoang	480-312-7935	jhoang@scottsdaleaz.gov
Scottsdale/ FLW, Scottsdale/Thomas, Scottsdale/ Camelback/ Haydon/ Thomas, Haydon/ Indian School, FLW/ Thompson Peak, and FLW/ Via Linda	Miovision Core DCM, 360 Cameras, Advanced detection, Detection License, Traffopp	Scottsdale Traffic Signal Equip Detection Upgrade
DEPLOYED LOCATIONS	HARDWARE TYPE	PROJECTNAME

3. APPENDIX A. – PRICING PROPOSAL

EXHIBIT A
TRAFFIC SIGNAL TECHNOLOGY PRICING PROPOSAL
Project # 25-HTD-ZL-00189 (26912)

The following is the bid details for the purchase of the traffic signal technology equipment. The vendor's proposed equipment will be evaluated with the submitted unit prices to determine the selected awardee.

The quantity of equipment on the bid documents is the City's best estimate of technology needed. The City does not guarantee that the final purchase order will be the estimated quantity. The City may purchase more or less units. There will be no price adjustment for any variation in quantities.

Signal Technology Procurement Project

ACTIVITY & COST				
DESCRIPTION	ESTIMATED QUANTITY	MAKE, MODEL, AND WARRANTY	COST EACH	TOTAL COST
Traffic Signal Cabinet (TS 2P) – Furnish Only	7	McCain 6S Cabinet 2 yr warranty	\$19,983.00	\$139,881.00
Traffic Signal Controller – Furnish Only	7	n/a	no bid	no bid
Video Detection – Furnish Only	11	Miovision Detection 3 yr warranty	\$19,477.00	\$214,247.00
Emergency Preemption – Furnish Only	2	Miovision Opticom 5yr warranty & 6-10yr limited	\$4,910.00	\$9,820.00
Battery Backup System – Furnish Only	7	Schneider APC UPS 18 Month warranty	\$4,432.00	\$31,024.00
			TOTAL	\$394,972.00

McCain 6S Cabinet fully loaded includes:

- 1 McCain Size 6S Cabinet W/
- 1 EDI PS250 Edi
- 1 Mmu2-16Leip (S)
- 6 PDC SSS-86 I/O
- 1 PDC SSF-86-3
- 6 RENO TR-200

Miovision Detection System includes:

- 1 MIO SmartView 360 Camera V1.1 Heated Bell & 300' Catv-5e Cable
- 1 MIO Core DCM (NA) – Non-Discrete
- 1 SKY Candy Cane Mount
- 1 MIO Detection (GTM)

Miovision Opticom Preemption System includes:

- 1 MIO Opti 721 (S)
- 1 SKY SB42-MM-075
- 1 MIO Opti 138-250 FT
- 1 MIO Opti 760 (S)
- 1 MIO Opti 764 (S)
- 1 MIO Opti 768 (S)

Schneider APC UPS Battery Backup System includes:

- 1 APC SECURE UPS 1300VA / 1300W (S)
- 1 APC SECURE UPS Battery Harness 12FT
- 1 APC SECURE UPS SVC Bypass
- 4 APC SECURE UPS Battery 50AH

**COLORADO DEPARTMENT OF TRANSPORTATION
ANTI-COLLUSION AFFIDAVIT**

PROJECT NO

LOCATION

I hereby attest that I am the person responsible within my firm for the final decision as to the price(s) and amount of this bid or, if not, that I have written authorization, enclosed herewith, from that person to make the statements set out below on his or her behalf and on behalf of my firm.

I further attest that:

1. The price(s) and amount of this bid have been arrived at independently, without consultation, communication or agreement for the purpose or with the effect of restricting competition with any other firm or person who is a bidder or potential prime bidder.
- 2A. Neither the price(s) nor the amount of this bid have been disclosed to any other firm or person who is a bidder or potential prime bidder on this project, and will not be so disclosed prior to bid opening.
- 2B. Neither the prices nor the amount of the bid of any other firm or person who is a bidder or potential prime bidder on this project have been disclosed to me or my firm.
- 3A. No attempt has been made to solicit, cause or induce any firm or person who is a bidder or potential prime bidder to refrain from bidding on this project, or to submit a bid higher than the bid of this firm, or any intentionally high or non-competitive bid or other form of complementary bid.
- 3B. No agreement has been promised or solicited for any other firm or person who is a bidder or potential prime bidder on this project to submit an intentionally high, noncompetitive or other form of complementary bid on this project.
4. The bid of my firm is made in good faith and not pursuant to any consultation, communication, agreement or discussion with, or inducement or solicitation by or from any firm or person to submit any intentionally high, noncompetitive or other form of complementary bid.
5. My firm has not offered or entered into a subcontract or agreement regarding the purchase or sale of materials or services from any firm or person, or offered, promised or paid cash or anything of value to any firm or person, whether in connection with this or any other project, in consideration for an agreement or promise by any firm or person to refrain from bidding or to submit any intentionally high, noncompetitive or other form of complementary bid or agreeing or promising to do so on this project.
6. My firm has not accepted or been promised any subcontract or agreement regarding the sale of materials or services to any firm or person, and has not been promised or paid cash or anything of value by any firm or person, whether in connection with this or any other project, in consideration for my firm's submitting any intentionally high, noncompetitive or other form of complementary bid, or agreeing or promising to do so, on this project.
7. I have made a diligent inquiry of all members, officers, employees, and agents of my firm with responsibilities relating to the preparation, approval or submission of my firm's bid on this project and have been advised by each of them that he or she has not participated in any communication, consultation, discussion, agreement, collusion, or other conduct inconsistent with any of the statements and representations made in this affidavit.
8. I understand and my firm understands that any misstatement in this affidavit is and shall be treated as a fraudulent concealment from the Colorado Department of Transportation, of the true facts relating to submission of bids for this contract.

I DECLARE UNDER PENALTY OF PERJURY IN THE SECOND DEGREE, AND ANY OTHER APPLICABLE STATE OR FEDERAL LAWS, THAT THE STATEMENTS MADE ON THIS DOCUMENT ARE TRUE AND COMPLETE TO THE BEST OF MY KNOWLEDGE.

Contractor's firm or company name

AM Signal, LLC

By

Alex Ondzic

Date

6/16/25

Title

Alex Ondzic, Director of Operations

2nd contractor's firm or company name. (If joint venture.)

By

Date

Title

Sworn to before me this

16 day of, June

2025

Notary Public

Anne Foster

My commission expires

1-25-2027

NOTE: This document must be signed in ink.

ANNA FOSTER

NOTARY PUBLIC - STATE OF COLORADO

Notary ID #20114003660

My Commission Expires 1/25/2027

CDOT Form #806 1/02

4. APPENDIX B. – WARRANTY & CUTSHEETS

AM Signal offers free technical support during the life of all products we represent. Direct technical support will be available between 8:00am to 5:00pm Monday through Friday Mountain Standard Time via phone and email.

Expected response times:

- Reply: 24 Hours

Expected Critical response times:

- Reply: 2-4 Hours

Hours of response:

- Reply: Monday through Friday from 8:00am to 5:00pm MST



SWARCO McCain cabinets are covered by a (2) two-year limited warranty from the date of purchase. SWARCO McCain warrants its products to be free of defects in workmanship and/or material. SWARCO McCain will repair or replace any units found to be defective within the first (24) twenty-four months from the date of delivery.

SWARCO McCain's warranty will cover full replacement of defective products for the first (12) twelve months. After the first (12) twelve months it is up to SWARCO McCain's discretion whether the material will be replaced or repaired at no cost to the customer. Full warranty below.



Opticom

Years 1-5 Should an Opticom component* fail within the first five years after purchase, GTT will repair or replace (at GTT's discretion) the product at no charge to the end-user Customer.

Years 6-10 Should an Opticom component fail within years 6-10 after purchase, GTT will repair or replace (at GTT's discretion) the product for a fee of 25% of the then current list price. All repairs carry a one-year warranty.



MIOVISION LIMITED WARRANTY FOR PRODUCTS AND FIRMWARE.

Miovision warrants that, for three (3) years from the date of installation of the Products in End User's traffic intersection (the "Limited Warranty Period"), the Products shall be free of problems due to workmanship and component defects and function substantially in accordance with Miovision's then-current written documentation for the Products, if any (the "Limited Warranty"). For the purposes of this policy, the term "installation" means that the Hardware has been physically installed at an intersection and there is connectivity to the Hardware.



APC Schneider Products manufactured by SE under its own brands and supplied by SE as part of the Purchase Order, if any, against defects in material and workmanship of those Products arising under normal use for a period of 12 months from the date of commissioning or 18 months from the date of shipment from SE, whichever occurs first.

Traffic Controller and Cabinet Warranty

SWARCO McCain controllers and cabinets are covered by a (2) two-year limited warranty from the date of purchase. SWARCO McCain warrants its products to be free of defects in workmanship and/or material. SWARCO McCain will repair or replace any units found to be defective within the first (24) twenty-four months from the date of delivery.

SWARCO McCain's warranty will cover full replacement of defective products for the first (12) twelve months. After the first (12) twelve months it is up to SWARCO McCain's discretion whether the material will be replaced or repaired at no cost to the customer.

Before returning any products, the customer must call their SWARCO McCain Representative or Account Manager @ 760-727-8100. The SWARCO McCain representative will at that time record the date, description of problem, issue the RMA #, and then make the appropriate arrangements for the return of the product. The purchaser must prepay all freight, insurance and other transportation charges to send the product to SWARCO McCain for warranty-coverage verification, repair or replacement, and, if found to be defective, SWARCO McCain will return replacement / repaired product to the purchaser freight paid. SWARCO McCain retains all replaced parts or products.

This warranty does not cover (1) product advice or assistance that SWARCO McCain furnishes as a courtesy, (2) removal or reinstallation of products, (3) defects or damage as a result of accident, modification, misuse, improper service or repair, abuse or abnormal use including, without limitation, improper storage and incorrect installation, (4) acts of God or nature, exposure to casualty of elements. In all such cases the warranty is immediately null and void. In no event shall this warranty run to OEM or component part buyers. All replacement products are warranted only for the remainder of the original warranty of the product replaced. Replacement products will be equivalent in function, but not necessarily identical to the replaced product.

This warranty is exclusive of all other warranties, expressed or implied, and SWARCO McCain hereby specifically disclaims all other warranty claims of any type; including without limitation, a warranty of merchantability of any unit or its fitness for any particular use or purpose. In no event shall SWARCO McCain be liable for interruption of business loss, profits or indirect or consequential damages, injury to person or damage to property from any cause whatsoever.

© SWARCO McCain, Inc. Updated 06/12/23. SWARCO McCain reserves the right to change product warranties without notice. For the most up-to-date information, please contact SWARCO McCain.

To protect the purchases made by its valued customers and as demonstration of the superb quality of its Opticom products, Global Traffic Technologies, LLC ("GTT") offers a robust warranty program with its Opticom product line, pursuant to the terms and conditions herein. This warranty is made for the exclusive benefit of the original end user customer and shall not accrue to the benefit of any other user, third party or dealer, unless otherwise required by law.

The Opticom warranty includes all Opticom hardware products sold to an end user customer, with coverages as follows:

Years 1-5

Should an Opticom component* fail within the first five years after purchase, GTT will repair or replace (at GTT's discretion) the product at no charge to the end-user Customer.

Years 6-10

Should an Opticom component fail within years 6-10 after purchase, GTT will repair or replace (at GTT's discretion) the product for a fee of 25% of the then current list price. All repairs carry a one-year warranty.

Extended Warranty

For an up-front fee of 15% of the original purchase price, any end-user customer may elect to extend the "Years 1-5" warranty to a ten year warranty, meaning should an Opticom component fail within the first ten years after purchase, GTT will repair or replace (at GTT's discretion) the product at no charge to the end-user customer.

*Excludes 4000 series vehicle computers and 400 series GPS/radios.

Note: Opticom 795 emitters are excluded from the "Years 6-10" and "Extended Warranty" sections of this warranty program. Extended warranties for 4000 series vehicles computers and 400 series GPS/radios are available. Consult your local GTT representative or dealer for specifics.

Exclusive Limited Warranty

GTT warrants that, during the warranty period described above, its Opticom system will deliver the same level of system operability and functionality as defined in the published GTT specifications applicable to the version of components purchased.

Warranty Exclusions: This warranty shall not apply to (A) incandescent lamps (confirmation lamps) or (B) to any defect or impairment of operability or functionality resulting from or caused by: (1) alteration, misuse, incorrect installation, neglect of the system or damage due to an accident; (2) repair or modification of the system by persons not authorized by GTT; (3) extreme atmospheric or weather conditions; (4) events or use outside the normal or anticipated course; or (5) improper packaging or damage during shipment by the

end-user customer or party other than GTT. In addition, the Opticom system integrates an array of matched components. GTT has designed, developed and tested Opticom system components as part of a matched component system. To ensure system integrity and optimal performance, the emitters, detectors, radios/GPS components, detector cables, phase selectors/discriminators and system software must all be GTT components. The use or integration of any GTT system with any non-GTT component shall void all GTT warranties with respect to such GTT system.

Sale and use of the Opticom system is expressly restricted to authorized agencies of government customers, within their specific jurisdictions. However, because the signal generated by the Opticom system is not exclusive, GTT does not warrant exclusive activation by purchaser. Authorized users desiring to use or coordinate use of the Opticom system with that of other jurisdictions must first obtain the prior written approval of each authorized user in the jurisdiction where use is sought.

Warranty Claim Process: Contact your authorized Opticom dealer, or contact Miovision customer care at 800-258-4610 x 1, or submit a service and repair request form at help.miovision.com. Outside of North America, please contact our general inquiries line at 1-877-646-8476.



Miovision limited warranty for hardware and firmware

This Miovision Limited Warranty applies only to the original end-customer ("End User") who purchased the genuine Miovision Scout™ hardware ("Scout Product"); Miovision TrafficLink™ hardware ("TrafficLink Product"); and/or software products developed by Miovision for use with Miovision hardware ("Firmware"). In this Miovision Limited Warranty, the defined term "Product(s)" shall refer to Scout Product(s), TrafficLink Product(s), and/or Firmware, or a combination of any of the foregoing. For clarity, this Miovision Limited Warranty does not apply to any other Miovision goods, software, subscription services, data processing services, support, documentation, parts, deliverables, or any other goods or services of any kind whatsoever.

This Miovision Limited Warranty applies only to the End User who purchased the genuine Miovision Product(s). In the event the End User purchased the Product(s) through a Miovision distribution partner ("Partner"), the Partner shall transfer, and shall be deemed to have transferred, this Miovision Limited Warranty to the End User upon the End User's purchase of the Product(s). Neither the Partner nor the End User has any right to transfer this Miovision Limited Warranty to any other person or entity.

LIMITED WARRANTY FOR PRODUCTS AND FIRMWARE. Miovision warrants that, for three (3) years from the date of installation of the Products in End User's traffic intersection (the "Limited Warranty Period"), the Products shall be free of problems due to workmanship and component defects and function substantially in accordance with Miovision's then-current written documentation for the Products, if any (the "Limited Warranty"). For the purposes of this policy, the term "installation" means that the Hardware has been physically installed at an intersection and there is connectivity to the Hardware.

EXTENDED WARRANTY. At any time within the applicable Limited Warranty Period, the End User may purchase one further 2-year extension (the "Extended Warranty Period") to the Limited Warranty Period for the Products (the "Extended Warranty"). The cost of this Extended Warranty shall be set forth in an applicable Miovision quotation.

EVIDENCE OF PURCHASE. End User must provide a proof of purchase of the applicable Products in the form of a bill of sale or receipted invoice, together with confirmation of date of installation, as evidence that the applicable Products are within the applicable warranty period in order to obtain a warranty service under the applicable warranty.

WARRANTY SERVICES. End Users who require warranty service under this Miovision Limited Warranty and who purchased the applicable Product from a Partner, should contact the Partner as the first point of contact for warranty service. End Users who require warranty service under this Miovision Limited Warranty and who purchased the applicable Product from Miovision may contact Miovision for warranty service. The End User shall provide sufficient detail to Partner or to Miovision, as applicable, such that Partner or Miovision, as applicable, can provide reasonable support in relation to the problem. The Partner or Miovision, as applicable, will investigate and determine whether this Miovision Limited Warranty applies to the malfunction and whether the applicable Product is validly within the applicable

warranty period as set out in this Miovision Limited Warranty. If the Product is determined by the Partner or Miovision, as applicable, to be defective per the applicable warranty during the valid warranty period applicable to that Product, the Partner or Miovision, as applicable, will repair or replace the defective Product, at its option, and at no charge to the End User. This Miovision Limited Warranty shall be invalid if the factory-applied serial number has been altered or removed from the applicable Product.

ADVANCED REPLACEMENT. During the applicable warranty period, if the cause of the malfunction cannot be determined or resolved by the Partner or Miovision, as applicable, over telephone or email with the End User and a replacement is required for a defective Product, the Partner or Miovision, as applicable, may send the End User a replacement Product in advance of receiving the defective Product back from the End User or Partner, as applicable. If Partner elects to do the advanced replacement for the End User itself, the Partner shall be responsible for all costs, expenses and inventory related to same and Miovision shall have no responsibility or liability therefor and shall have no obligation to reimburse Partner for the costs of the defective Product, shipping, or the replacement Product. If Partner elects instead to submit a request to Miovision to do the advanced replacement for the End User, Partner shall promptly notify Miovision of same by email at support@miovision.com or by phone at 877-646-8476 and provide evidence and findings from the Partner's investigation of the warranty claim. Miovision may, in its discretion, send the End User a replacement Product in advance of receiving the defective Product back from the End User or Partner. In the event Miovision sends the End User a replacement Product in advance of receiving the defective Product back from the End User or Partner, as the case may be, the End User shall return the defective Product to Partner or Miovision, as applicable, within thirty (30) days of End User receiving the advanced replacement, failing which the End User shall be responsible to pay Partner or Miovision, as applicable, for the full purchase price of the advanced replacement Product provided to the End User.

WARRANTY FOR REPAIRED/REPLACED PRODUCTS. If Partner or Miovision, as applicable, repairs or replaces any Product during the applicable warranty period, the warranty on the repaired or replaced Product shall expire at the end of the applicable warranty period for the original Product that became defective. Miovision may use refurbished parts and materials in repair or replacement of Products, provided that such parts and materials are of equal value and functionality, as determined by Miovision in its sole discretion.

NON-WARRANTY/OUT-OF-WARRANTY SERVICES. If Partner or Miovision, as applicable, determines that the Product is defective due to a cause not covered by this Miovision Limited Warranty (or the Extended Warranty, as the case may be) (including, without limitation, due to one of the exclusions set out in Section 8 (Exclusions to Warranty) below), the Limited Warranty (or Extended Warranty, as the case may be) will not apply. Partner or Miovision, as applicable, will notify End User that the Miovision Limited Warranty (or Extended Warranty, as the case may be) is not applicable to End User's claim. Should the End User wish to proceed with out-of-warranty services for the out-of-warranty Product, Miovision will provide the End User a quote for the maximum possible repair or replacement cost, plus shipping, for such out-of-warranty Product. Prior to Miovision commencing any out-of-warranty services, the End User must: (i) confirm to Miovision, in writing, End User's acceptance of the quote for the out-of-warranty services; and (ii) deliver the out-of-warranty Product, at End User's cost, in either its original packaging or packaging affording an equal degree of protection as the original packaging, to Miovision. If Miovision is able to repair the out-of-warranty Product for an amount less than quoted,

Miovision shall only invoice the End User for the actual cost of the repair and the return shipping costs to send the repaired out-of-warranty Product to the End User. In the event that Miovision, in its sole discretion, chooses to provide End User with an advanced replacement Product rather than repair the out-of-warranty Product, the End User will be billed and become liable for the purchase price of the advanced replacement Product, and all shipping costs to send the advanced replacement Product to the End User.

EXCLUSIONS TO WARRANTY. This Miovision Limited Warranty does not include, and Miovision shall have no liability whatsoever with respect to, cosmetic damage, or damage resulting from:

- (i) Partner's or End User's failure to follow Miovision's instructions for installation, use, operation, or maintenance of the Product;
- (ii) alteration, modification, or misuse of the Product in any way;
- (iii) the combination, operation, or use of the Product with any materials, parts, equipment, or devices not manufactured or approved by Miovision;
- (iv) any other improper installation, operation, or use;
- (v) attempted repair by anyone other than Miovision or other facility authorized by Miovision to service the Product; or
- (vi) accident, abuse, negligence, the connection to an improper voltage supply, acts of God.

This Miovision Limited Warranty does not apply to: (a) Products that are provided on an "AS IS" or "WITH ALL FAULTS" basis; (b) any Products provided for trial, demo, or evaluation; (c) any antenna; and (d) any consumables including, but not limited to, any batteries for the Product.

Miovision does not warrant:

- (a) the functions of, or contained in, the Products will meet any Partner or End User requirements or specifications;
- (b) the operation of the Products will be free from defects or viruses or be secure;
- (c) the Products will appear or operate precisely as described in any documentation, or that all errors will be corrected;
- (d) the Products will operate without interruption or error-free or at particular performance levels;
- (e) the quality, completeness, accuracy, usefulness, or integrity of any information resulting from the use of the Products; or
- (f) that the Products will not give rise to, or cause errors, bugs, or other defects that can impact on all or any of the foregoing.

EXCLUSIVE REMEDY. THE PROVISIONS OF THIS MIOVISION LIMITED WARRANTY STATE MIOVISION'S SOLE AND EXCLUSIVE RESPONSIBILITY AND LIABILITY TO END USER, AND END USER'S SOLE AND EXCLUSIVE REMEDY, WITH RESPECT TO ANY BREACH OF ANY WARRANTY REGARDING MIOVISION'S PRODUCTS. EXCEPT AS EXPRESSLY SET FORTH IN THIS MIOVISION LIMITED WARRANTY, MIOVISION'S PRODUCTS, SUBSCRIPTION SERVICES, DOCUMENTATION, DELIVERABLES, SUPPORT, PARTS AND ANY OTHER GOODS OR SERVICES ARE PROVIDED "AS-IS" AND WITHOUT ANY WARRANTY OF ANY KIND. MIOVISION, ON BEHALF OF ITSELF AND ITS AFFILIATES AND THEIR RESPECTIVE SUPPLIERS AND LICENSORS, HEREBY EXPRESSLY DISCLAIMS ALL OTHER WARRANTIES, WHETHER EXPRESS, IMPLIED, STATUTORY OR OTHERWISE IN LAW OR FROM A COURSE OF DEALING OR USAGE OF TRADE) REGARDING OR RELATING TO MIOVISION'S PRODUCTS, SUBSCRIPTION SERVICES, DOCUMENTATION, DELIVERABLES, SUPPORT, PARTS, OR ANY OTHER GOODS OR SERVICES. THE EXPRESS WARRANTIES SET FORTH ABOVE IN THIS MIOVISION LIMITED WARRANTY ARE EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES OR CONDITIONS, WHETHER EXPRESS, IMPLIED OR STATUTORY, FOR ALL OF MIOVISION'S PRODUCTS, SUBSCRIPTION SERVICES, DOCUMENTATION, DELIVERABLES, SUPPORT, PARTS, AND OTHER GOODS OR SERVICES, INCLUDING THE IMPLIED WARRANTIES AND CONDITIONS OF MERCHANTABILITY, MERCHANTABILITY QUALITY AND FITNESS FOR ANY PURPOSE (PARTICULAR, SPECIFIC OR OTHERWISE), TITLE AND NON-INFRINGEMENT OF INTELLECTUAL PROPERTY RIGHTS. MIOVISION SPECIFICALLY DISCLAIMS ALL IMPLIED WARRANTIES OF MERCHANTABILITY, MERCHANTABILITY QUALITY AND FITNESS FOR ANY PURPOSE (PARTICULAR, SPECIFIC OR OTHERWISE) WITH RESPECT TO MIOVISION'S PRODUCTS, SUBSCRIPTION SERVICES, DOCUMENTATION, DELIVERABLES, SUPPORT, PARTS, AND OTHER GOODS OR SERVICES, AND WITH RESPECT TO THE USE OF ANY OF THE FOREGOING.

Schneider Electric -

11. Standard Warranty

SE warrants:

(a) Products manufactured by SE under its own brands and supplied by SE as part of the Purchase Order, if any, against defects in material and workmanship of those Products arising under normal use for a period of 12 months from the date of commissioning or 18 months from the date of shipment from SE, whichever occurs first. (b) Services performed by SE's personnel as part of the Purchase Order, if any, will be performed by qualified personnel with care, skill and diligence, in accordance with the applicable generally accepted standards recognized by the industry for a period of 12 months from the date of invoice.

Exclusive Warranty Remedies: In the event of any warranty covered defects or deficiencies in Products in subsections:

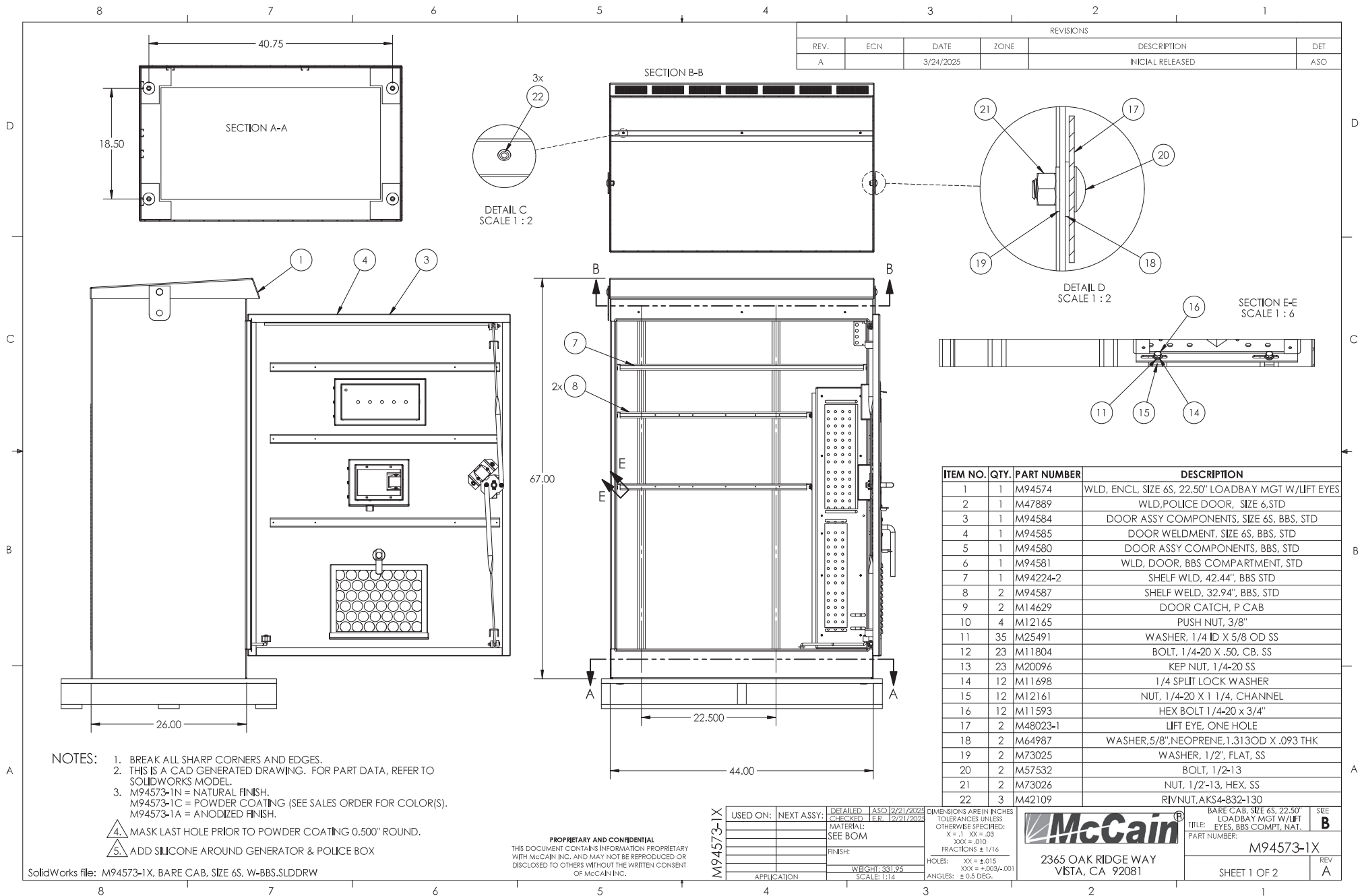
(a) above, or Services in subs. (b) above, the sole and exclusive obligation of SE shall be to re-perform the Services, or repair or replace the defective Products or part of the Products, at SE's sole discretion. Such warranty coverage is contingent on Purchaser providing prompt notification to SE once such defect or deficiency is reasonably apparent to Purchaser.

Exclusions AND Limitations:

This warranty shall not apply (a) to Products not manufactured by SE, (b) Services not provided directly by SE, (c) to Products or Services that has been repaired or altered by anyone other than SE so as, in SE's judgment, affects the same adversely, (d) Seller's conformance with Buyer's design of the Products or Software, or (e) to Products or Services that appear to be subjected to negligence, accident, or damage by circumstances beyond SE's control, or improper any non-SE operation, maintenance or storage, or to other than normal use or service. The foregoing warranties do not cover reimbursement for labor, transportation, removal, installation, temporary power, or any other expenses that may be incurred in connection with repair or replacement.

THESE WARRANTIES, CONDITIONS, AND EXCLUSIONS ARE EXCLUSIVE AND IN LIEU OF ALL OTHER EXPRESS OR IMPLIED WARRANTIES, CONDITIONS, REPRESENTATIONS AND GUARANTEES (EXCEPT WARRANTIES OF TITLE), INCLUDING, BUT NOT LIMITED, TO IMPLIED WARRANTIES OF MERCHANTABILITY, MERCHANTABLE QUALITY, AND FITNESS FOR A PARTICULAR PURPOSE. EXCEPT AS MAY BE PROVIDED IN WRITING BY SE, SE SHALL NOT BE SUBJECT TO ANY OTHER OBLIGATIONS OR LIABILITIES WHATSOEVER THAN AS STATED ABOVE WITH REGARD TO PRODUCTS AND SERVICES SOLD BY SE TO PURCHASER.

Non-SE Products or Services: With respect to Products not manufactured by SE, or Services provided by non-SE providers, the warranty obligations of SE shall in all respects conform and be limited to the warranty actually extended to SE by such non-SE supplier.



Complies With The New
NEMA MMU2 Standard and
MUTCD Requirements



SmartMonitor

MMU2-16LE SERIES

NEMA LCD MALFUNCTION MANAGEMENT UNIT

- **MMU2-16LEip** with Ethernet Port
- **MMU2-16LE** with EIA-232 Port

Whether you're a **NOVICE** or **EXPERT** Signal Technician, wouldn't it be great if you could:

- ☐ Use a built-in **SETUP WIZARD** to **quickly and accurately configure** the Signal Monitor to the exact requirements of the cabinet and intersection?
- ☐ Use a **MENU DRIVEN LCD** interface to **view** vital cabinet operational details such as field signal voltages, historical event logs, and monitor configuration data?
- ☐ Use a built-in **DIAGNOSTIC WIZARD** to **automatically diagnose** cabinet malfunctions and **pinpoint** faulty signals?

If your answer is Yes, the **MMU2-16LE SmartMonitor®** is for YOU!

NEW MMU2-16LE SmartMonitor® ENHANCED FEATURES

NEMA TS-2003 (R2008) Standard Including Amendment #4:	The MMU2-16LE SmartMonitor® meets all specifications of the NEMA Standard TS2-2003 (R2008) for the MMU2 configuration while maintaining compatibility with NEMA TS1-1989 Assemblies.
NEMA Standard Flashing Yellow Arrow PPLT:	The MMU2-16LE SmartMonitor® supports MUTCD Flashing Yellow Arrow PPLT operation and meets / exceeds the NEMA Standard MMU2 requirements of TS-2 Amendment #4-2012, providing modes for both TS-2 or TS-1 cabinet configurations.
Standardized Communications:	Real-time SDLC communications with the Controller Unit exchanges field input status, Controller Unit output status, fault status, MMU programming, and time and date.
Full Intersection & Status Display:	Two high contrast, large area Liquid Crystal Displays (LCD) continuously show full RYG(W) intersection status. A separate graphic LCD provides a menu driven user interface to status, signal voltages, configuration, event logs, and the Help system.
Event Logging:	A time-stamped nonvolatile event log records the complete intersection status as well as AC Line events, configuration changes, monitor resets, temperature and true RMS voltages.
Setup Wizard:	Use the built-in Setup Wizard to configure the Nema Enhanced settings of the SmartMonitor® by answering a short series of questions regarding intersection design and operation.
Diagnostic Wizard and Help System	The Diagnostic Wizard <i>automatically pinpoints</i> faulty signals and offers trouble-shooting guidance. The integrated Help System provides context sensitive operational assistance.
TS-1 Type 12 with SDLC Mode:	The MMU2-16LE SmartMonitor® can be configured to operate with the Port 1 SDLC function and Diagnostic Wizard enabled in a TS-1 twelve channel cabinet with no cabinet wiring changes.
Program Card Memory:	Enhanced settings of the MMU2-16LE SmartMonitor® are stored in nonvolatile memory on the EDI Program Card. Moving the Program Card to another MMU2-16LE automatically transfers all settings.
Signal Sequence History Log:	The five Signal Sequence History logs stored in nonvolatile memory graphically display up to 30 seconds of signal status prior to each fault event.
LEDguard®:	This EDI innovative signal threshold technique can be used to increase the level of monitoring protection when using LED based signal heads.
EDI RMS-Engine:	A DSP coprocessor converts AC input measurements to True RMS voltages, virtually eliminating false sensing due to changes in frequency, phase, or sine wave distortion.
ECcom PC Software:	Access to the MMU2-16LE data is provided by the industry standard EDI ECcom Windows based software for status, event log retrieval, configuration, and data archival.

EBERLE DESIGN INC.

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Fax (602) 437-1996





PS-250

Heavy Duty Cabinet Power Supply

The ideal power source when using high current devices such as video detection cards.

The PS-250 Cabinet Power Supply is a shelf mounted unit which supplies regulated DC power, unregulated AC power, and a line frequency reference for the Detector Rack, BIUs, load switches, and other auxiliary equipment. The PS-250 meets and/or exceeds all requirements of the NEMA TS2-2016 Standard.

All TS-2 Type 1 cabinet assemblies require the use of this unit as well as any TS-2 Type 2 cabinet assemblies that utilize Bus Interface Units (BIU).

Each EDI PS-250 Cabinet Power Supply is put through a rigorous three part Total Quality Assurance program and tested under the extreme environmental conditions experienced on the street. It is this commitment to quality and performance that EDI products are known for, providing years of trouble free operation.

PS-250 OPERATIONAL FEATURES

Basic Functions: The PS-250 provides four outputs rated over the full -30°F to 165°F (-34°C to +74°C) Nema operating temperature range:

- ☒ +12 VDC rated at 5 Amps
- ☒ +24 VDC rated at 3 Amps
- ☒ 12 VAC rated at 0.25 Amps
- ☒ 60 Hz Line Frequency Reference rated at 50 mAmps
- ☒ Input Voltage Operating Range is 89 Vac to 135 Vac at 50/60 Hz
- ☒ Power Factor Corrected

Display Indicators: A separate LED indicator is provided to display output status and fuse integrity for the four supply outputs. The Line Frequency Reference LED indicator pulses to show 60 Hz activity.

Input / Output Pins:	Pin	Function
	A	AC Neutral
	B	Line Frequency Reference Output
	C	AC Line Input
	D	+12 VDC Output
	E	+24 VDC Output
	F	Reserved
	G	Logic Ground
	H	Earth Ground
	I	12 VAC Output
	J	Reserved

Test Points: Individual test jacks are provided for the +12 VDC output, +24 VDC output, and Logic Ground reference.

Output Protection: The +12 VDC, +24VDC, and 12 VAC outputs are fused for over-current protection. Each output is protected against voltage transients by a 1500 Watt suppressor.

Dimensions: **Compact Size:** 6.0 inches High x 4.0 inches Wide x 8.4 inches Deep

Distributed by:
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DATA SHEET

SSS-86I/O



Solid State Loadswitch with Output Indicators:

Description:

The PDC SSS-86I/O Solid State Loadswitch is a tri-pack solid state relay package designed specifically for the Traffic Control Industry. This unit meets NEMA specification TS1-1983, section 5, and has indicators for both the input and output signals.

Each switch will turn it's rated load ON or OFF within 10 deg. of the first zero cross-over point & within 5 deg. on succeeding alterations randomly timed input command signal.

The electronics are enclosed in a dust resistant, metal enclosure providing mechanical protection and excellent heat sinking for the heat generating components in the circuit. The electronic components are easily accessible by removing the cover with a screwdriver.

Installation:

The switchpac inter mates with any standard NEMA loadbay or with the model 332 cabinet output file. It is easily installed or removed by grasping the handle. Connector P1 pin outs are shown in FIG 1. The connector mates with a PDC BCS-12 or equal.

PIN	FUNCTION	P1
1	+115VAC, 60 Hz	(P1 as viewed from the outside of the product looking directly at the connector)
2	Chassis Ground	
3	A Output (Red, Don't Walk)	
4	Not Assigned	
5	B Output	
6	A Input (Red, Don't Walk)	
7	C Output (Green, Walk)	
8	B Input (Yellow)	
9	+24 VDC	
10	C Input (Green, Walk)	
11	-115 VAC, 60 Hz	
12	Not Assigned	

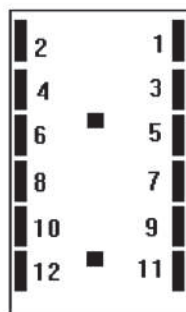


FIG 1.

General Characteristics:

Load	voltage.....120 VAC
	current (max)..... 15.0 Amps
(Tungsten Filament Load)	
Control Signal	voltage..... +24VDC
	current 20.0 MA (max)
Switching	1st alternation after.....+10 Degrees of line voltage at the zero signal is applied. crossover point.
	Succeeding alterations.....+5 Degrees of line voltage at the zero crossover point.
Off State	dv/dt.....100 V per microsecond
	line to load resistance.....15 K Ohms Min
	leakage current.....less than 20 MA
Isolation	voltage.....2500 VDC Min
	resistance.....10 Meg Ohms Min
Surge Current	one cycle.....175 Amps RMS Min
	one second.....40 Amps RMS Min
Life	operations.....30 million Min
Mechanical	length.....8.40 inches
	width.....1.74 inches
	height.....4.185 inches
	weight.....1.135 LBS

Guarantee: The SSS-86I/O is fully guaranteed against all failures due to manufacturing defects for two years.

Adjustments: The switchpac has no adjustments



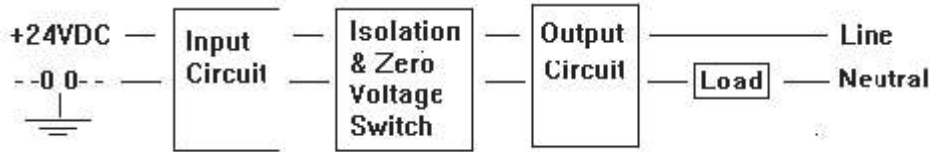
DATA SHEET

SSS-86I/O

Theory of operation:

General - The switchpac is an AC zero voltage switch which can be broken down into three (3) sperate functions. The functions are illustrated in Fig 2.

Input - The input circuit is analogous to the coil of an electromechanical relay. CR1 is a reverse voltage protection diode. CR2,



CR3, CR4, R1, R5, & R10 provide the proper voltage range for switch turn on.

Isolation & Zero Voltage Switch - Isolation and zero voltage switching is performed by IC1, IC2, & IC3 which are optically isolated zero voltage turn on triacs.

Output - The output circuit consists of a triac and the load circuit. The triac is a simple bi-directional switch whose on - off state is controlled by the zero voltage switch circuit.

Detailed Description of Circuit Operation

See above "Theory of Operation"

Maintenance:

If the switchpac does not function properly, follow the outline I and II to isolate the problem.

I. Perform the following preliminary checks:

- Check for 115VAC and 24 VDC at the input of switchpac.
- Check the control signal input circuit (which is part of the traffic control system)
- Check switchpac wiring external to P1.
- Check for burned out load lamp.
- check for broken component leads inside the switchpac.

II. If steps A through E of outline I are normal, the problem is within the switchpac. Select either problems 1 or 2 depending on the fault condition present. For example purposes, the isolation procedures shown in problem 1 assumes that the load A section of the switchpac is faulty.

A. Problem 1.

Switchpac stays on all the time, even in absence of a control signal.

Probable Cause - Either IC1 or TR1 is shorted.

Isolation Procedure- Remove one side of R3. If switchpac is still shorted change TR1. If not , change IC1.

B. Problem 2.

Switchpac does not turn on when signal is applied.

Probable cause - I1,CR2,IC1,or TR1 is open. If TR1 is open, R2 would be burnt.

Isolation Procedure-

- Lift one side of R1 and put ammeter in series. Switchpac should draw approximately 20MA. If current measures approximately 20MA, change IC1.
- If no current, then jumper CR2. If current flow is over 20MA, change CR2.
- Jumper I1. If current flow of 20MA or more , change I1.
- Measure resistance of R1. If it is not 510 ohms, change R1

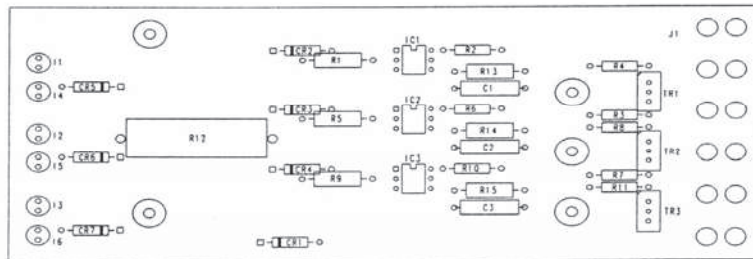
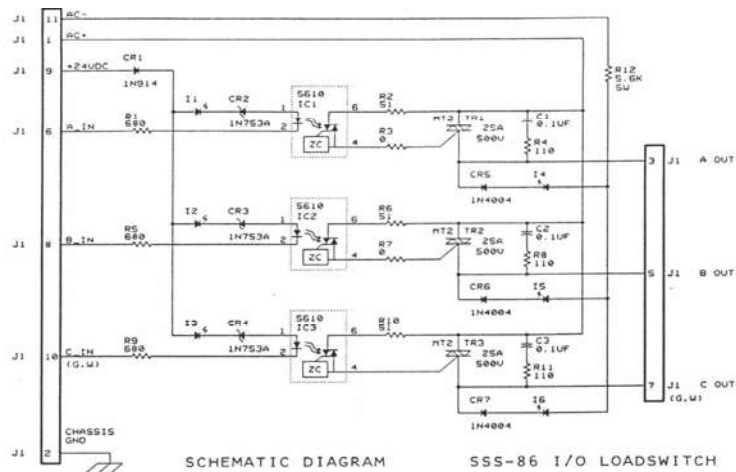


DATA SHEET

SSS-86I/O

SSS-86I/O Partslist

Item No.	QTY	DESC.	PDC PN	MFG	MFG PN	REF DES
1	1	Label,S/N	00043	PDC	00043	
2	1	Chassis	00204	PDC	00204	
3	1	Cover	00206	PDC	00206	
4	1	Bar,Triac	00212	PDC	00212	
5	1	Label,Front	00214-8	PDC	00214-1	
6	1	PC Board	00419	PDC	00237	
7	3	Cap .1uf 400v	CO003	Thomson	MC104K4G	C1,2,3
8	3	Diode, Power 1N4004	CR0001	Fairchild	1N4004	CR5,6,7
9	3	Diode,1N753A,Zener	CR0005	Fairchild	1N753A	CR2,3,4
10	1	Diode,1N914	CR0007	Fairchild	1N914	CR1
11	2	Spacer	H0015			
12	3	Nut,6-32	H0038			
13	4	Screw,#6x3/8	H0063			
14	2	Screw,6-32x3/8	H0041			
15	3	Screw,6-32x15/16,Fill	H0042			
16	2	Screw,6-32x1 3/16	H0043			
17	3	Opto Triac	IC0023	Sharp	S21MD4	IC1,2,3
18	1	Conn, 12 pin	J0002	Beau	P5412-S	J1
19	3	L.E.D. Clear Red	LD0004	G.I.	MV5020	I1,2,3
20	3	L.E.D. Difused Red	LD0005	Litronics	RL2000	I4,5,6
21	3	Res,680 ohm 1/2W	R0004	Dale		R1,4,7
22	3	Res, 110 ohm 1/4W	R0046	Dale		R3,6,9
23	3	Res,51 ohm 1/4W	R0051	Dale		R2,5,8
24	1	Res., 5.6K 3W	R0060	TRW	PW3-5.6K	R12
25	3	Triac,500V,25Amp	TR0012	Teccor	Q5025LX	TR1,2,3



DATA SHEET: SSF-86-3 Flasher Data Sheet



Solid State Flasher:

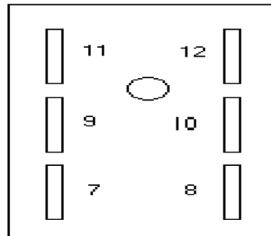
Description:

The PDC model SSF-86 solid state flasher is a dual circuit flasher designed for the Traffic Control Industry. This unit is conservatively rated up to 20 A per circuit. The flash rate is 56.25 flashes per minute and does not vary due to voltage or temperature variations. With the zero voltage switching design, there are no contacts to wear out or deteriorate due to arcing or corrosion. Also, extended life of the bulbs can be expected as well as reduced Radio Frequency Interference (RFI). The extruded aluminum heatsink provides more than adequate heat dissipation.

Connector Pinout:

FIG 1.

Pin	Function
7	Load #1
8	Load #2
9	Chassis ground
10	AC-
11	AC+
12	Spare



Mates with a Beau P-5406-LAB or equivalent

Electrical Characteristics:

Zero voltage turn on-----	0V +-5 degrees
Zero voltage turn off-----	0A +-5 degrees
Tungsten Lamp or Gas Tubing Transformer load-	Up to 20 A max.
Operating Voltage-----	60-135 VAC
Mechanical-----	Length.....8.40 inches
	Width.....1.70 inches
	Height.....4.18 inches
	Weight.....1.135 lbs

Operating Temperature : Full load from -35 to +74 degrees C

Guarantee: The flasher is fully guaranteed against all failures due to manufacturing defects for two years.

Item	Qty	Description	PDC P/N	Mfg	Mfg P/N	Ref Des
1	1	Label, S/N	00043	PDC	00043	
2	1	Chassis	00204	PDC	00240	
3	1	Cover	00206	PDC	00206	
4	1	Bar, Triac Mount	00212	PDC	00212	
5	1	Label, Front Panel	00214-6	PDC	00214-6	
6	1	P.C. Board Fab.	00247	PDC	00247	
7	1	Cap. 47uf 16V	C0001	Panasonic	ECE-A-16V47	C1
8	1	Cap. 5000pf	C0002	Allied	CCD-472	C2
9	2	Cap. .1uf 400V	C0003	Thomson CSF	MC104K4G	C3,4
10	1	Diode, Power 1N4004	CR0001	Fairchild	1N4004	CR1
11	4	Nut, Keps 6-32	H0038			
12	4	Screw, PH Pan HD #5 x 3/8	H0040			
13	2	Screw, PH Pan HD 6-32 x 3/8	H0041			
14	2	Screw, PH Fil HD 6-32 x 15/16	H0042			
15	2	Screw, PH Pan HD 5-63 x 1 3/16	H0043			
16	1	I.C. CMOS 4024	IC0002	RCA	CD4024BE	IC1
17	1	Connector, 6 Pin	J0001	Beau-Vernitron	P5406S	J1
18	2	Lamp, Neon	L0001	Chicago Min.	CA2	I1,2
19	2	Res. 510 ohm 1/4W	R0004	Dale		R5
20	1	Res. 12K 1/4W	R0014	Dale		R4
21	4	Res. 56K 1/4W	R0018	Dale		R3,8,10,14
22	1	Res. 150K 1/4W	R0020	Dale		R2
23	1	Res. 2.5K 5W	R0036	TRW	PW5-2.5K	R1
24	3	Res. 110 ohm 1/4W	R0046	Dale		R6,11,12
25	2	Res. 5.6K 5W	R0048	TRW	PW5-5.6K	R9,15
26	2	Res. 22 ohm 1/4W	R0055	Dale		R7,13
27	3	Transistor, 2N4401	Q0004	G.E.	2N4401	Q1,2,3
28	2	Triac .8A 500V	TR0010	Teccor	Q501E3	TR1,3
29	2	Triac 25A 500V	TR0012	Teccor	Q5025LX	TR2,4

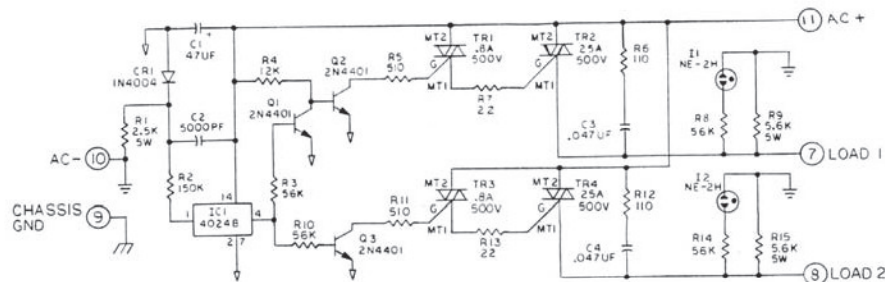


FIG. 2

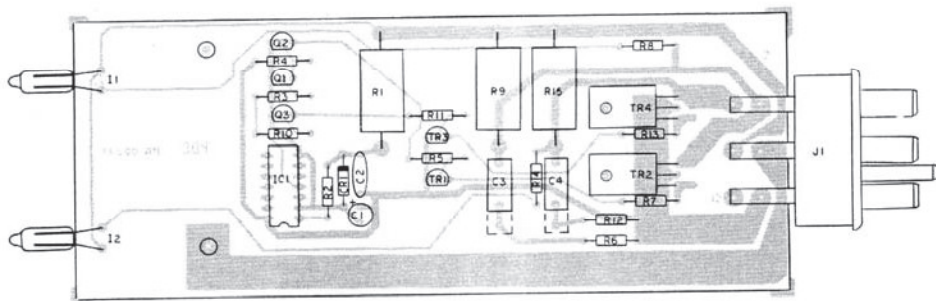


FIG. 3

Model TR-200

FLASH TRANSFER RELAY



- Operating voltage range: 89 to 135 VAC RMS
47 to 63 Hz
- Operating temperature range: -40° to +180° F
(-40° to 82° C)
- Operating humidity range: 5% to 95%
(non-condensing)
- Coil specifications:
Maximum pull-in voltage: 85 VAC
Minimum dropout voltage: 25 VAC
Nominal power: 4 VA at 120 VAC
- Contact material: Silver alloy
- Contact ratings:
30 Amps resistive at 120 / 240 VAC
20 Amps resistive at 28 VDC
10 Amps tungsten at 120 VAC
175 Amps one cycle surge RMS at 120 VAC
100,000 operations at rated load
- Dielectric strength:
Across open contacts: 600V RMS
Contact to coil: 1500 V RMS
Contact to frame: 1500 V RMS
Leakage current: ≤ 1 mA
- LED provides visual indication of coil voltage
- Solid polarizing pin
- Dimensions: 2.47 inches (6.27 cm) high x 1.85 inches (4.70 cm) wide x 3.90 (9.91 cm) deep
(including connector)

Overview:

The Model TR-200 Flash Transfer Relay is designed to meet or exceed NEMA Standard TS 2-2003. Model TR-200 Flash Transfer Relays are constructed with a transient suppressed full wave rectified coil to provide chatter free operation in brownout conditions down to 89 VAC. The rectified coil provides lower power consumption than conventional AC coils. A rear mounted eight pin polarized connector mates with a Cinch-Jones 2408SB socket.



Reno A & E

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OPTICOM™ 711/721/722 Detectors

DESCRIPTION

The Opticom 700 Series Detectors transform the optical energy detected from an approaching, vehicle-mounted Opticom Emitter to an electrical signal. The electrical signal is transmitted along a cable to the Opticom Phase Selector or Opticom Discriminator for processing.

Opticom 700 series detectors are mounted at or near the intersection that permits a direct, unobstructed line-of-sight to vehicle approaches. Opticom detectors may be mounted on span wire, mast arm or other appropriate structures.

Opticom 711, 721 and 722 Detectors offer significant advances and flexibility for specific intersection applications.

The Opticom detectors are designed for common applications in three configurations: one direction—the single channel Opticom 711; the single channel, dual detection Opticom 721; and two direction, two output detection—the dual channel Opticom 722.

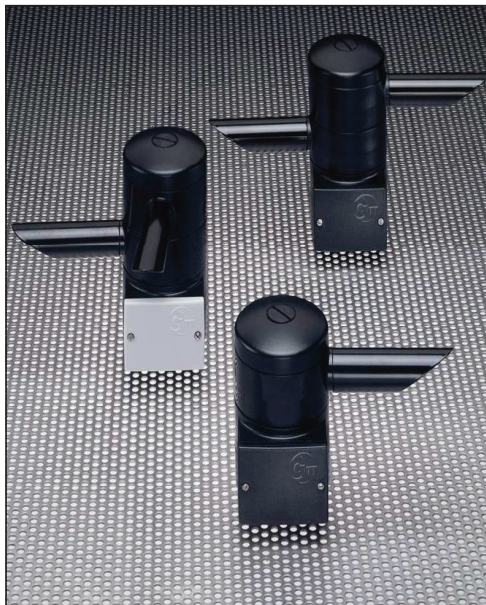
All Opticom 700 series detectors greatly reduce installation and life cycle costs through their modular design, adjustable tubes, and compatibility with existing Opticom Infrared System intersection and vehicle equipment.

FEATURES

- Advanced electrical transient immunity
- Modular design
- Adjustable turret configuration: accommodates skewed approaches
- Lightweight, durable, high-impact polycarbonate enclosure
- Simplified installation: span wire or mast arm
- Gray door identification of Opticom 722 detector

ACCESSORIES

- Opticom Span Wire Clamp
- Opticom 138 Detector Cable



OPERATING PARAMETERS

- Reception Range: 200 ft. (60 m) adjustable up to 2,500 ft. (760 m)
- Electrical: 24 to 28 VDC, 50 MA minimum
- Temperature Range: -30° F (-34° C) to 165° F (74° C)
- Humidity: 5% to 95% relative

PHYSICAL DIMENSIONS

Opticom 711 Detector

Length: 12.0 in. (30.5 cm)
Width: 4.75 in. (12.1 cm)
Height: 5.63 in. (14.3 cm)
Weight: 0.88 lbs. (400 g)

Opticom 721 and 722 Detectors

Length: 12.0 in. (30.5 cm)
Width: 4.75 in. (12.1 cm)
Height: 7.13 in. (18.1 cm)
Weight: 1.12 lbs. (508 g)



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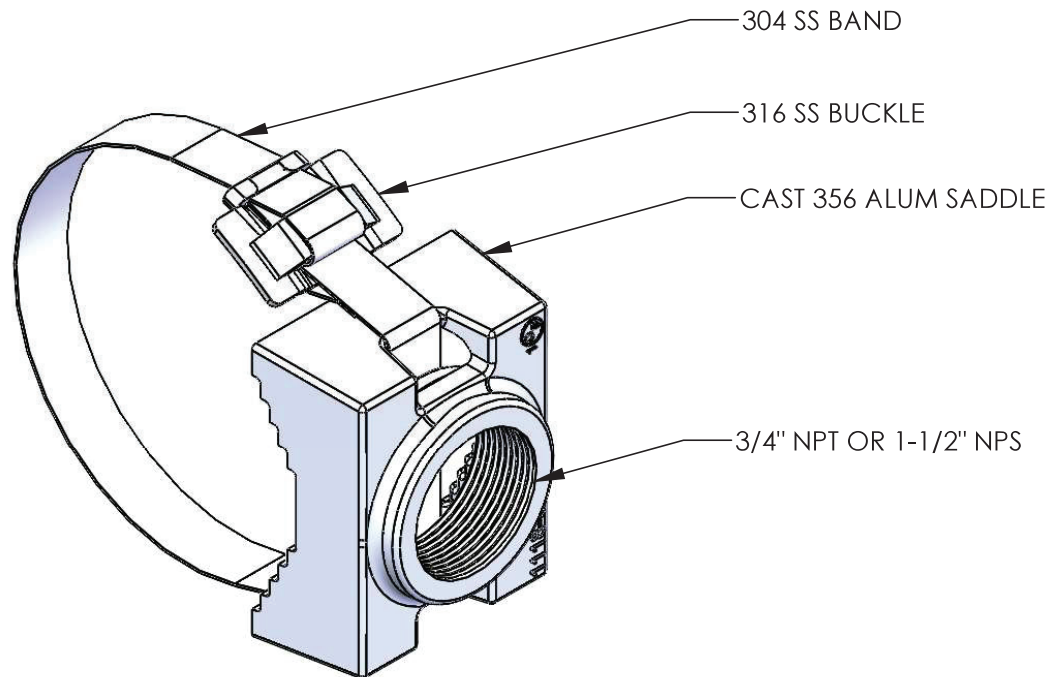
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PORT SIZE	
075	3/4 NPT
150	1-1/2 NPS

BAND LENGTH	MAST ARM DIA.
29"	3" - 7"
42"	7" - 11"
59"	12" - 15"
70"	18" - 21"

PART NUMBER EXAMPLE
SB42-MM-075

BAND LENGTH
PORT SIZE

NOTES:
1. AVAILABLE WITH CABLE STYLE CLAMP.

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APPROVALS	BY	DATE
DRAWN	RR BAUER	2019-01-04
SALES		
ENGINEERING		

DO NOT SCALE DRAWING



TITLE
MINI MOUNT (BAND CLAMP)

SIZE	DWG. NO.	REV
A	SB29-MM-075	-
SCALE: NTS CAD FILE: SB29-MM-075		SHEET 1 OF 1

OPTICOM™ 764 Phase Selector

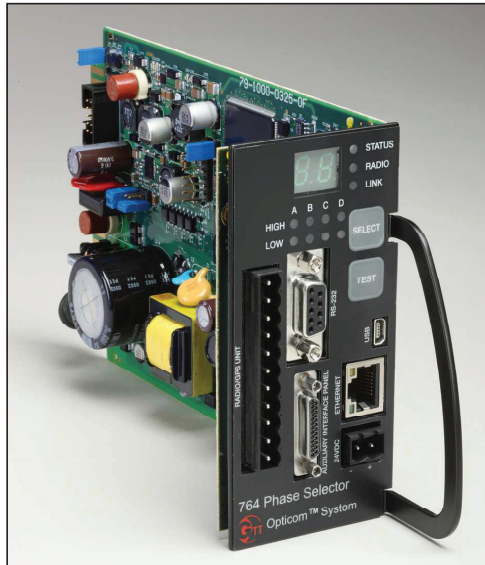
DESCRIPTION

The Opticom 764 Multimode Phase Selector is a plug-in, four-channel, dual-priority, multimode encoded signal device designed for use with both Opticom infrared system (IR) emitters and detectors and Opticom GPS radio/GPS intersection units and vehicle equipment. It can be installed directly into the input files of Type 170 traffic controllers equipped with priority phase selection software and in virtually any other traffic controller equipped with priority phase selection inputs and related software. Phase selectors are powered from AC mains or 24 VDC and contain their own internal power supply to support Opticom IR detectors and Opticom GPS radio/GPS units.

The Opticom 764 Multimode Phase Selector may be used in IR only applications, GPS only applications, or IR and GPS applications simultaneously.

The Opticom 760 Card Rack is required when input file space is not available. When used in GPS only mode, the Opticom 1040 Card Rack may also be used.

Opticom 764 Multimode Phase Selector recognizes and discriminates among three distinct Opticom IR emitter frequency rates via Opticom detectors: high priority, low priority and probe priority. Within each of these three frequency rates, the phase selectors further discriminate among 10 classes of vehicle identification codes, with 1,000 individual vehicle codes per class — 10,000 total per frequency rate. The Opticom 764 Multimode Phase Selector also recognizes three different priority levels transmitted by Opticom GPS vehicle equipment: high priority, low priority and probe priority. Within each of these three priority levels, the phase selectors further discriminate among 254 agency IDs, 15 classes of vehicle identification codes, with 10,000 individual vehicle codes per class — for more than 38 million total per priority level.



Opticom 764 Multimode Phase Selector internally records each system activation. Each entry contains:

- Intersection name
- Date and time of the activity
- Vehicle class code of the activating vehicle
- Activating vehicle's ID number
- Agency ID (GPS only)
- Channel called
- Priority of the activity
- Final green signal indications displayed at the end of the call
- Time spent in the final greens
- Duration of the activation
- If preempt has been requested and reason if not
- Turn signal status at the end of the call (GPS only)
- Entry, exit and average speed (GPS only)
- Relative priority level
- Conditional priority level



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GLOBAL TRAFFIC TECHNOLOGIES

OPTICOM™ 764 Phase Selector

FEATURES

IR only operation, GPS only operation, or simultaneous IR and GPS operation

- Four channels of detection
- Two auxiliary detectors per channel (IR)
- Records green signal displayed at end of preemption
- Compatible with encoded signal and non-encoded signal Opticom IR Emitters
- High and low priority as well as probe frequency discrimination
- Conditional priority for Transit Signal Priority (TSP) (when used with compatible AVL and/or passenger counter)
- "First-come, first-served" priority within each priority level
- Priority-by-class setting via the interface software
- Priority-by-direction setting via the interface software
- Direct installation into CA/NY Type 170 input files
- Automatic range setting using an encoded emitter (IR)
- Call bridging for both IR and GPS calls including mixed mode
- Low-priority output may be configured for first-come, first-served or all-channel active
- User-adjustable range setting up to 2,500 feet of operation
- Compatible with most traffic controllers
- 10/100Mb Ethernet communication on the front panel
- USB 2.0 communication on the front panel
- RS232 communications front port, and rear backplane and Auxiliary Interface Panel
- User-selected communications baud rate of 1,200 to 230,400 bits per second
- Customizable ID code validation

- Flexible programming options for priority control parameters
- Detailed current Opticom System parameter information
- History log of most recent Opticom infrared and GPS system activities (10,000 entries)
- 30,000 frequency/class/vehicle code ID combinations (IR)
- More than 38 million agency/class/vehicle code combinations (GPS)
- Front panel switches and diagnostic indicators for testing
- Accurate infrared signal recognition circuitry
- Precise output pulse
- Definitive call verification
- Regulated detector power supply (IR)
- Optically isolated outputs
- Two character display and keypad to enable diagnostics and test calls to each channel
- Display LED Indicators
 - High- and low-priority test calls
 - Reset to default parameters
 - Range setting
- User-settable range setting by ETA and/or distance (GPS only)
- Varied outputs depending on turn signal status of requesting vehicle (GPS only)
- IR detector inputs may be mapped to any channel
- Diagnostic test
- Advanced built-in diagnostics and testing
- Tested to NEMA environmental and electrical test specifications

ACCESSORIES

Opticom On-site Interface software package

- Opticom 768 Auxiliary Interface Panel
- Opticom 755 Four-Channel Adapter Card (optional)
- Opticom 760 Card Rack

OPERATING PARAMETERS

Four dual-priority and probe frequency channels

- "First-come, first-served" for vehicles with the same priority level (high or low)
- Priority override: always higher over lower
- Opticom GPS Radio/GPS Unit input
- Opticom Infrared System Detector input(s): one per channel on the card edge connector and two auxiliary per channel through the Opticom 768 Auxiliary Interface Panel
- Optional interface software for flexible programming options and call history
- LED indicators
 - Status
 - Radio (GPS mode)
 - Link (GPS mode)
 - High signal/call per channel
 - Low signal/call per channel
 - Two-digit status display
- Two character display and keypad to enable diagnostics and test calls to each channel
- Voltage: 89 to 135 VAC, 60 Hz at up to 500mA or 24 VDC at up to 1 Amp
- Temperature: -37°C to +74°C (-34.6°F to +165.2°F)
- Humidity: 5% to 95% relative
- CE certified
- NEMA TS-2 compliance
- FCC compliance

PHYSICAL DIMENSIONS

Length: 7.0 in. (17.8 cm) x 8.2 in. (20.8 cm) including handle

Width: 2.3 in. (5.8 cm)

Height: 4.5 in. (11.4 cm)

Weight: 0.60 lbs. (272 g)



OPTICOM™ 138 IR Detector Cable

DESCRIPTION

Opticom 138 Detector Cable is designed and manufactured explicitly for use with Opticom Detectors. Opticom 138 cable has three color-coded conductors, a conductive shield and drain, and a black PVC jacket.

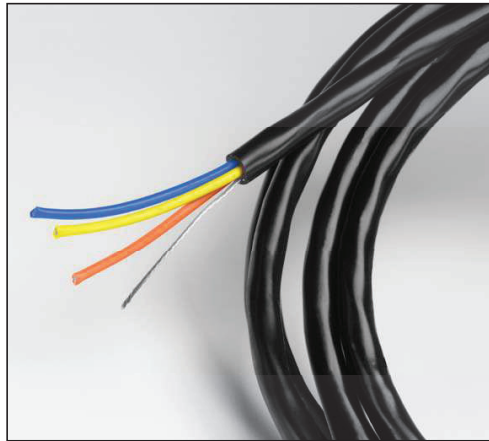
This durable, high-quality cable carries the appropriate power to the detector from the Opticom Phase Selector and delivers the necessary quality signal to the phase selector discriminator circuitry up to 1,000 feet (305 m).

FEATURES AND BENEFITS

- Optimized to interface Opticom detectors to Opticom phase selectors or Opticom Discriminators
- Ensures effective range of 2,500 feet (760 m) with Opticom Infrared System components
- Durable construction
 - Suitable for direct burial
 - Suitable for conduit and mast arm pull
 - Suitable for exposed overhead installation*

OPERATING PARAMETERS

- 600 volt rating
- 75° C (167° F) temperature range
- Three-conductor AWG #20 (7x28) stranded, individually tinned copper: yellow, blue and orange
- Aluminized polyester shield with 20% overlap
- Drain AWG #20 (7x28) stranded, individually tinned copper
- Controlled electrical characteristics



PHYSICAL DIMENSIONS

- Outside diameter: 0.3 in. (7.62 mm)
- Weight: 0.04 lbs./ft. (65.5 g/m)
- Available in: 500 ft., 1,000 ft., 2,500 ft. and 5,000 ft. (152 m, 305 m, 760 m and 15,200 m) spools

*Separate messenger wire required



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GLOBAL TRAFFIC TECHNOLOGIES

OPTICOM™ 760 Card Rack

DESCRIPTION

The Opticom 760 Card Rack facilitates easy Opticom Infrared System Phase Selector and Discriminator installation.

It can be used in traffic control cabinets without card slots for Opticom Infrared System components.

The Opticom 760 consists of a metal enclosure with a dedicated card slot for one Opticom phase selector or discriminator. Either two- or four-channel units may be used.

The front panel of the Opticom 760 includes a terminal strip for connecting the optical detectors, as well as a 9-pin circular connector and harness to connect the

Opticom infrared system phase selector's or discriminator's outputs and 120 VAC to power the phase selector or discriminator.

FEATURES

- Conveniently located connections and harnessing (in the front)
- Rugged construction
- Stable "on-shelf" mounting
- Easy-to-read terminal designations
- Easy installation

TB1 TERMINAL BLOCK CONNECTIONS

The terminal block on the front of the Opticom 760 Card Rack, TB1, is intended for primary optical detector connections for channels A, B, C and D. It is located on the left side of the Opticom 760 Card Rack.

Pin Function

- 1: Channel A (1) primary detector signal input
- 2: Channel B (2) primary detector signal input
- 3: Channel C (3) primary detector signal input
- 4: Channel D (4) primary detector signal input
- 5: Detector power
- 6: Detector power
- 7: Detector ground
- 8: Detector ground



J1 CONNECTOR

The J1 connector is intended to provide all the signals needed to connect Opticom Phase Selectors directly to a NEMA controller.

It is located next to TB1.

Pin Function

- 1: 115 VAC (AC+)
- 2: AC return (AC-)
- 3: Chassis ground
- 4: Not used
- 5: Channel A priority control output
- 6: Channel B priority control output
- 7: Channel C priority control output
- 8: Channel D priority control output
- 9: Logic ground

PHYSICAL DIMENSIONS

Length: 8.5 in. (21.6 cm)
Width: 5.25 in. (13.3 cm)
Height: 5.25 in. (13.3 cm)
Weight: 1.37 lbs. (620 g)



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OPTICOM™ 768 Auxiliary Interface Panel

DESCRIPTION

Opticom 768 Auxiliary Interface Panel (AIP) provides a convenient method to interconnect Opticom 762 and 764 Phase Selectors with terminals inside a traffic cabinet. The 768 AIP is designed specifically for use with the Opticom 762 and 764 phase selectors. It is not intended to be used with other phase selectors.

The Opticom 768 contains terminal blocks for wiring to the traffic cabinet signals, two DB-9 RS-232 communication ports, and a 44-pin connector for connecting legacy auxiliary interface panels and auxiliary harnesses. A twelve foot cable is included which connects the AIP to the Opticom 762 or 764 Phase Selector.

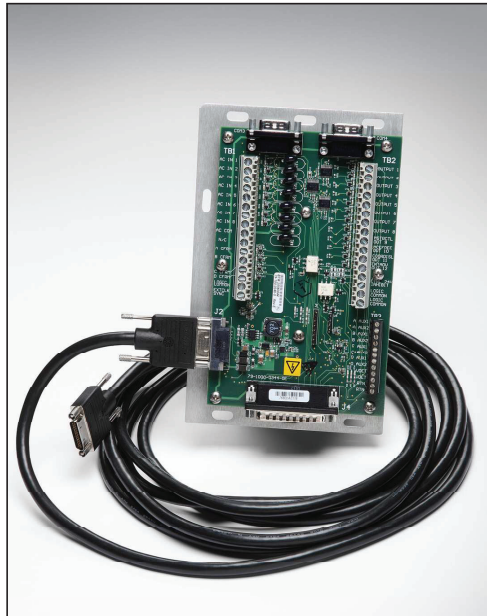
FEATURES

- Accessible interconnections to cabinet wiring along the edge of card
- Rugged construction - circuit card affixed to 16 AWG aluminum mounting plate
- Connectors for auxiliary detector inputs and power can accommodate 16 to 28 AWG wires
- Connectors for all other inputs and outputs can accommodate 16 to 22 AWG wires
- Easy-to-read terminal designations

APPLICATIONS

The Opticom 768 AIP is used when any of the following features and/or capabilities is needed:

- Green sensing or green light verification
- Auxiliary infrared detector inputs
- Additional preempt outputs
 - Turn signal dependent operation (For 764 in GPS operation)
 - Separate outputs for high and low priority
- Clock sync input (In IR operation)
- Clock sync output (For 764 in GPS operation)
- Confirmation light outputs
- Disable outputs
- Two additional RS-232 COM ports
 - GPS data input (In IR operation)
 - GPS data output (For 764 in GPS operation)
 - Additional Serial COM port



The Opticom 768 AIP includes a connector for connecting an existing auxiliary harness or auxiliary interface panel to green sense and/or auxiliary detectors. Simply remove the old AIP or harness and connect it directly to the 768. If the existing harness or AIP is being used for other functions, it will be necessary to move the wires to the 768 AIP.

PHYSICAL DIMENSIONS

Length: 7.25 in. (18.4 cm)

Width: 4.5 in. (11.4 cm)

Height: 1.0 in. (2.5 cm)

Weight (with cable): 1.4 lbs. (635 g)

Cable: 12 ft (3.6M)



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GLOBAL TRAFFIC TECHNOLOGIES

Miovision SmartView 360

Hardware Specifications



The Miovision® SmartView 360 is a bell camera that is used to capture video at your intersection. Designed for robust operation in all weather conditions, the SmartView 360 is equipped with a 4K 9MP 360° lens with a 180° field of view delivers high-resolution video streams to your Miovision Core DCM so you can remotely manage and analyze your intersections.

Contents

Kit contents	1 x Miovision SmartView 360 Camera
	1 x Pole Mount
	1 x Power Supply

Device weight (not including cables)

Miovision® SmartView Approach	1.9 lbs (860 g) when using attachment plate 2.87 lbs (1.3 kg) when using base bracket
-------------------------------	--

Power

Power adapter	PoE DC 48 V: 270 mA/ Approx. 12.95 W (Class 0 device)
Power consumption	Approx 10.6 W

Operating conditions

Operating temp	-29°F to 165°F (-34°C to 74°C)
Humidity	5% - 95% RH non-condensing

Lens

Focal length	1.4 mm (1/16 inches)
Angular field of view	Horizontal : 183° Vertical : 183°
Maximum aperture ratio	1 : 1.9
Digital (electronic) zoom	Choose from 3 levels of x1, x2, x4
Focus range	0.5 m (19-11/16 inches) - infinity

Camera

Image sensor	1/2 type MOS image sensor, built-in primary color filter
Effective pixels	9 megapixel
Minimum illumination	Color : 0.4 lx {0.02787 footcandle} (F1.9, Maximum shutter: Off (1/30 s), AGC: 11) 0.03 lx {0.00186 footcandle} (F1.9, Maximum shutter: max. 16/30 s, AGC: 11)* BW : 0.05 lx {0.0372 footcandle} (F1.9, Maximum shutter: Off (1/30 s), AGC: 11) 0.004 lx {0.00023 footcandle} (F1.9, Maximum shutter: max. 16/30 s, AGC: 11)* * Converted value
Image Settings	Gain (AGC), White balance
Image Compensation	Adaptive black stretch, Back light compensation (BLC), Fog compensation, High light compensation (HLC), Digital noise reduction
Maximum shutter	Max.16/30s to Max. 1/10000s
Wide dynamic range	On/Off
Adaptive Black Stretch	On/Off (only when Wide Dynamic range: Off)
Super Dynamic*2	On / Off, the level can be set in the range of 0 to 31
Day & Night (ICR)	Off/On / Auto1(Normal)
Back focus	Auto back focus/ Focus/ Adjusting method (Auto/ Preset/ Fix)

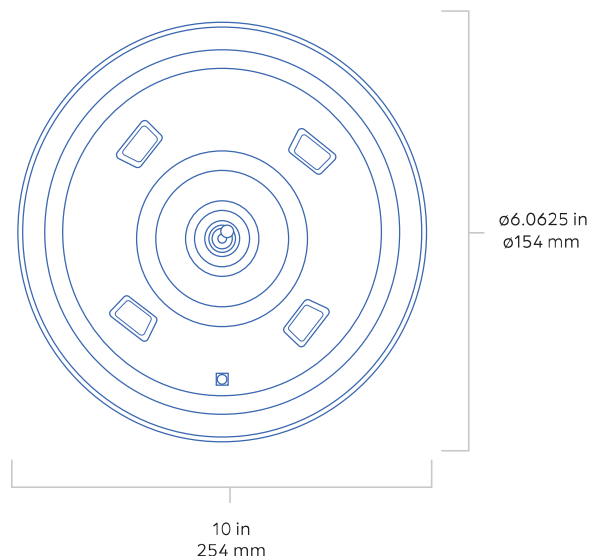
Network

Network IF	10Base-T / 100Base-TX, RJ45 connector
Resolution	H.264, H.265, MJPEG Fisheye mode (max.30 fps): 2992×2992 / 2192×2192 / 1280×1280 / 640×640 / 320×320
Transmission mode	Constant bit rate / VBR / Frame rate / Best effort / Advanced VBR
Supported protocol	IPv6 : TCP/IP, UDP/IP, HTTP, HTTPS, FTP, SMTP, DNS, NTP, SNMP, DHCPv6, RTP, MLD, ICMP, ARP, IEEE 802.1X, DiffServ IPv4 : TCP/IP, UDP/IP, HTTP, HTTPS, RTSP, RTP, RTP/RTCP, FTP, SMTP, DHCP, DNS, DDNS, NTP, SNMP, UPnP, IGMP, ICMP, ARP, IEEE 802.1X, DiffServ

General

Mounting method	Pole mount and mast arm
Safety	UL (UL60950-1), C-UL (CAN/CSA C22.2 No.60950-1), CE, IEC60950-1
EMC	FCC (Part15 ClassA), ICES003 ClassA, EN55022 ClassB, EN55024, ECE-R10, EN50498 compliant, EN50121
Ambient operating temperature	-29°F to 165°F (-34°C to +74°C)
Ambient operating humidity	10% to 90% (non-condensing)
Water and dust resistance '6	IP66, IEC60529 measuring standard compatible, Type 4X(UL50), NEMA 4X compliant
Shock resistance	Compliant with 50 J (IEC 60068-2-75 / IK10 (IEC 62262), NEMA 2.2.9 Compliant (10g pulse)
Dimensions	When using the attachment plate: 154 mm × 60.5 mm (H) {6-1/16 inches × 2-3/8 inches (H)} Dome radius 35 mm {1-3/8 inches} When using the base bracket: 164 mm × 96.5 mm (H) {6-15/32 inches × 3-13/16 inches (H)} Dome radius 35 mm {1-3/8 inches}
Finish	Main body: Aluminum die cast, light gray Dome section: Clear polycarbonate resin
Camera Heater	Thermostatically controlled. Operates with standard PoE

Dimensions



For more information, visit help.miovision.com,
email us at support@miovision.com,
or call us NA Toll-free at 1-855-360-7752

Miovision Core[®]

DCM Hardware Specifications



The Miovision Core[®] DCM is a full-stack ITS solution for managing and analyzing your intersections. The open and secure platform provides wireless connectivity and communications so you can access your cabinets from anywhere. The improved modular design optimizes performance and reliability in all environments and can be easily upgraded to expand functionality to manage your traffic today and evolve with the development of your network.

The high-performance NVIDIA Volta™ GPU enables you to process detection and count data at the source with industry-leading precision and accuracy giving you the power to make real-time decisions with accurate and complete data.

Contents

Kit contents	1 x Miovision Core with DCM
	1 x Cable Kit
	1 x Power Supply
	1 x Antenna

Device Weight (not including cables)

Miovision Core [®] DCM	6.7 lbs (3 kg)
---------------------------------	----------------

Power

Power supply	Input: 89 to 240 VAC, 47 to 63 Hz uninterrupted (non-GFCI required). Standard NEMA 5-15R or terminal block wiring supported.
	Output: 48 VDC at 135W
	UL and cUL certified
Power consumption	Max: 129W (includes 3 cameras) Typical: 114W (includes 2 cameras)
Dimensions	7.9 x 2.6 x 1.8 in 200 x 65 x 45 mm
Hold up	Minimum 1 second hold up for power loss events (NEMA TS-2 compliant)

Operating Conditions

Operating temp	-30°F to 165°F -34°C to 74°C
Humidity	5% – 95% RH non-condensing

Processor

Core NVIDIA Processor	CPU: Quad-core ARM [®] A57 @ 1.43 GHz GPU: 128-core Maxwell
DCM NVIDIA Processor	CPU: 8-core NVIDIA Carmel ARM [®] 64-bit GPU: 512-core NVIDIA Volta™ GPU with 64 Tensor Cores

Security

Trusted Platform Module (TPM)	RSA Key Generation 2048 Bits
	RSA Signature and Encryption
	ECC 256
	AES 128
	SHA 256

Storage

Mass storage	Built-in 240GB solid state drive Optional upgrade to 960GB available
--------------	---

Wireless Connectivity

Cellular	LTE Cat 4
	Supported bands:
	• LTE FDD: B2/B4/B5/B12/B13/B14/B66/B71 • WCDMA: B2/B4/B5
Location services	GPS, GLONASS

5-in-1 Antenna

Antenna specs	2 x MIMO LTE 2 x MIMO Wi-Fi 1 x GPS, GLONASS
Enclosure	8.5 x 3.6 x 1.1 in 216 x 93 x 30 mm Permanent Screw Mount IP67 rated

Inputs and Outputs

Ethernet ports	1 x 10/100/1000 Ethernet WAN port
	2 x 10/100/1000 Ethernet LAN ports
	3 x 10/100/1000 Ethernet LAN ports with PoE (support for 802.3af PoE and 802.3at PoE+ to a maximum of 50W across all three ports)
	Includes transient surge protection (IEC 61000-4-4 class 2)
	Includes lightning surge protection (IEC 61000-4-5 class 4)
SDLC port	1 x SDLC port (proprietary connector to DB15 cable included)
Serial ports	2 x EIA RS-232 over RJ45 interface (cable included)
General Purpose I/O	4 x +5V open drain I/Os
Priority Control I/O	8 x NEMA compliant I/Os

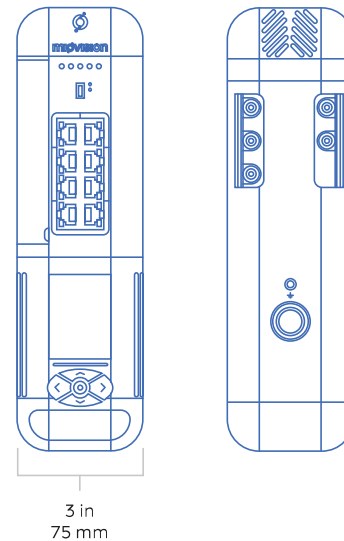
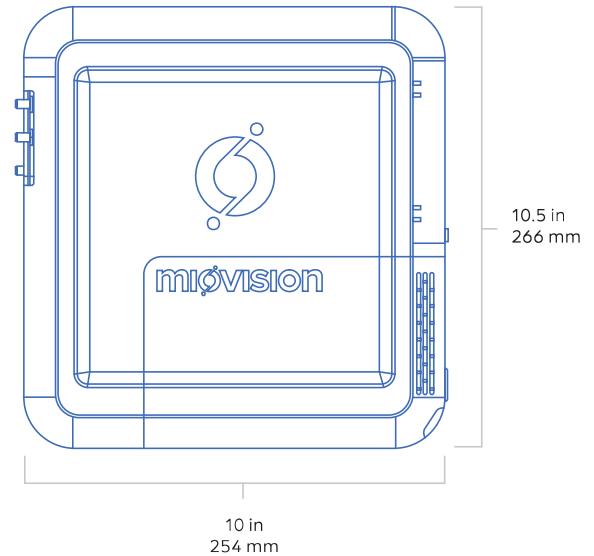
Certifications

NEMA	Compliant to NEMA TS-2 Environmental Requirements
FCC	FCC Part 15, Subpart B, Class A
PTCRB	PTCRB compliant

Material Composition

Core DCM housing	Aluminum
Core DCM center structure	PC/ABS (Polycarbonate-ABS)

Dimensions



For more information, visit help.miovision.com,
email us at support@miovision.com,
or call us NA Toll-free at 1-855-360-7752

Miovision Detection

Move traffic through your network quickly and safely

Understand demand at your intersection so you can safely and efficiently move traffic through your city.

With reliable, accurate presence and pulse detection you can control and optimize traffic flow, identify and handle demand, and reduce the number of opportunities for traffic incidents to occur.

Easy to install and maintain

Non-invasive installation minimizes disruption to your traffic network saving you time and resources.

- Above ground installation is easy to install and troubleshoot with minimal downtime
- Remote and roadside access allows you to configure devices to fit your workflow
- Supports up to six cameras and customize detection zones across all lanes of traffic at the intersection or as vehicles approach

Reliable in all conditions

Hardware and algorithms designed to provide reliable performance in all environments.

- Rugged commercial-grade components ensure maximum product life
- Accurate consistent results with algorithms that can adapt to inclement weather
- Optimized design means fewer issues at the intersection and fewer citizen complaints

Complete, accurate data

Make informed decision with data you can trust from the industry leaders in computer vision.

- Metrics for occupancy ratios, phase intervals, and arrivals on red and green
- Available rolling 90-day count data for vehicles, bicycles, and pedestrians
- Optional advance detection data for vehicles approaching the intersection



Features

The Miovision Detection solution meets the needs of today's traffic teams with:

Detection Features		Detection
Detection zones	Unlimited presence and pulse detection zones	•
Turning Movement Counts (TMCs)	Rolling 90-day count (CSV) (vehicles, pedestrians, bicycles)	
Detection metrics	Occupancy ratios, arrivals on red, arrivals on green, and phase interval	
Usability Features		
Cameras	Connect up to three cameras for each Core DCM, or up to six with an additional switch (sold separately)	•
Advance detection	Detect vehicles as they approach from 500 ft away (requires SmartView Approach)	•
Remote configuration and validation	Configure and validate detection performance without a truck roll	•
Local configuration and data access	Connect directly via Ethernet or existing fiber to perform local configurations, access available data, and manage MQTT APIs and RTSP interfaces	•
Actuation Channels		
SDLC	64	•
GPIO header block	16 x I/O pins for actuation (fail active)	•



APC SecureUPS On-line

1300VA | 2000VA

High performance ruggedized UPS for field cabinet applications



Designed to operate in harsh environments with minimal derating, the APC SecureUPS provides high-density, double-conversion online power protection and advanced management for connected electronics. When used with external batteries, the models also ensure back-up time during power outages. Ideal for intelligent traffic system and industrial applications, the SecureUPS is a perfect solution for field cabinets that require clean, regulated power.

Key Advantages

Double Conversion On Line

AC topology provides superior voltage and frequency regulation.

Best-in-class power density

Unity power factor (maximum real power in watts).

Unmatched Security

SNMPv3 and IPv6 protocols offer extended security layer for improved security of the network.

Ruggedized Design

Wide temperature operating range suitable for use in unconditioned field cabinets. Conformal coated electronics to improve humidity and pollution tolerance.

Remote and Local Manageability

Monitoring and control of the UPS and the environment via Ethernet connection through embedded network management card and locally through an intuitive graphical display.

Li-Ion Battery Combability

Allows the use of Li-Ion batteries, which guarantee higher life expectancy, efficiency at higher ambient temperatures, and lower Total Cost of Ownership.

Oversized charger

Robust battery charger for fast recovery after a power failure.

Service and Maintenance

- Local power quality event logging
- USB setup and service
- LCD display with color backlight
- Visual and audible status indicators
- Easy to remove and replace fan and filters

Optional 1200W Solar Power Charger

Add a solar charge now or in the future offset power consumption, extend run time, or minimize dependence on the grid.

APC SecureUPS On-line 1300VA & 2000VA Product Overview

3
years
warranty



- 1 Easily Replaceable Filter
- 2 Easily Replaceable Fan Assembly
- 3 Serial port to communicate with the SecureUPS
- 4 External Battery Circuit Breaker to connects/disconnect battery power
- 5 USB Port
- 6 Universal I/O Port to connect optional environmental monitoring accessories
- 7 Reset Button to restart the Network Management Interface
- 8 Ethernet Port for network communication
- 9 Status LEDs
- 10 LCD for real-time status updates and UPS control
- 11 Li-Ion Battery Communication Connector
- 12 External bypass box interface (RS485 and +24 VDC power)
- 13 Input AC Circuit Breaker to connects/disconnects AC power
- 14 AC Input Connector
- 15 AC Output Connector
- 16 Relay Input Connector
- 17 Battery Test Points
- 18 Relay Output Connector
- 19 Battery Temperature Sensor Connector (Sensor cable and mating connector are supplied with the battery harness kit)
- 20 High Current DC Output Connector (Cables are not provided along with the UPS.)

LCD Display Features



LCD display screen

Accurately provides real-time status updates in your choice of basic or advanced menus

UPS status (scrolling)

- Output voltage
- Input voltage
- Output frequency
- Runtime
- Load
- Battery health

Control

- UPS and outlet group settings
- Bypass control

Configuration

- Output voltage, frequency
- Language, brightness, contrast
- Alarm volume
- IP address

Test and diagnostics

- Initiate battery and runtime calibration tests

About

- UPS serial number, battery part number
- Battery install and suggested replacement dates

Accessories

Battery harness kit

XHXXS7A4F - Battery Harness SBS75
Cabinet Accessory 4-Ft

XHXXS7A8F - Battery Harness SBS75
Cabinet Accessory 12-Ft

Extended Temperature Batteries

Long backup times available with up to eight 100 Ah lead-acid batteries. Extend temperature with batteries best suited for harsh environments.

Part numbers:

XB102XX1XS - Battery 100Ah 12Vdc

XB050XX1XS - Battery 50Ah 12Vdc

Battery heater mat

Allows battery use in extreme temperatures – 2 sizes available: 256 and 365 sq. ft.

Part numbers:

XM050DXXXA - Battery Heater Mat 256 Sq In. 120Vac

XM102DXXXA - Battery Heater Mat 365 Sq In. 120Vac

Li-Ion Batteries

Part numbers:

XBP48RM1U-LI - Smart-UPS On-Line Li-Ion Battery Pack

Environmental Monitoring Accessories

Optional accessories to increase environmental control through sensors.

Part numbers:

AP9335TH - Temperature/humidity sensor

AP9810 - Relay input/output connector - supports two input contacts and one output relay



APC SecureUPS On-line

Main applications

Intelligent Traffic System (ITS)

- ✓ Traffic signals (Signalized Intersections)
- ✓ Ramp metering
- ✓ Roadside monitoring systems (cameras for enforcement, safety, and congestion; radar, in-road / near-road sensors, weather and air quality sensors)
- ✓ Dynamic Message Signs
- ✓ Public transportation field controls
- ✓ Tolling systems
- ✓ Tunnel control systems
- ✓ Rail crossings signals

Industrial Applications

- ✓ Telecommunications
- ✓ Distributed Antenna Systems
- ✓ Water/Waste Water
- ✓ Mining/Metals/Minerals
- ✓ Biotech / Pharmaceutical
- ✓ Transportation
- ✓ Chemical
- ✓ Food & Beverage
- ✓ Semiconductor
- ✓ Automotive
- ✓ Oil/Gas

Highly efficient power protection in harsh environments



Technical Specifications



Product Feature	XU1K3LLXXRCC		SKU 2000VA?
Output			
Output Topology	Double Conversion On-Line		
Nominal Output Voltage	120 Vac		
Output Power Rating	1300 W, 1300 VA	2000 W, 2000 VA	
Output Voltage Regulation (static)	± 1%		
Output Frequency (nominal)	50/60 Hz ± 3 Hz		
Output Waveform	True Sine Wave		
Input			
Nominal Input Voltage	120 Vac		
Input Voltage Range	100% load = 85 Vac - 155 Vac ± 2 Vac		
Input Frequency	45 Hz - 65 Hz ± 5 Hz		
Input Connection	Single phase, 3 wire (Line, Neutral and Ground)		
Communication and Management			
Interface Ports	USB, and Embedded Network Management Card (NMC)		
Control Panel and Audible Alarms	High-resolution graphical LCD display; alarm on battery, distinctive low battery alarm and configurable delays		
Environment - Operating & Storage			
Temperature - Operation	-40° C to 74° C (-40° F to 165° F)		
Temperature - Storage (without batteries)	-40° C to 85° C (-40° F to 185° F)		
Maximum Elevation - Operating	0 m - 3,000 m (0 ft - 10,000 ft)		
Maximum Elevation - Storage	0 m - 15,000 m (0 ft - 50,000 ft)		
Humidity	0% to 95% relative humidity, non-condensing		
Physical			
Unit dimensions without packaging Width x Depth x Height	434 mm x 260 mm x 88 mm (17.1 in x 10.3 in x 3.5 in)		
Unit dimensions with packaging Width x Depth x Height	535 mm x 370 mm x 186 mm (21.1 in x 14.6 in x 7.3 in)		
Conformance			
Warranty	3 years		
Optional External Batteries			
Battery	XB050XX1XS	XB102XX1XS	XBP48RM1U-LI
Battery Type	Maintenance-free sealed lead-acid battery with suspended electrolyte; leak proof		Lithium-Ion
Typical Backup Time at Varying Load Conditions	Please refer to www.apc.com for runtime charts		

Technical Specifications – Service Bypass Unit



Product SKU	XS30ALLXR2G	XS30ALLXR2
Output		
Nominal Output Voltage	120 Vac	
# of Outlets	1	
Outlets Connection type	4 pole PP45 power pole connector	
Overload protection	No	
Input		
Nominal Input Voltage	120 Vac	
Current Rating	30A Max	
Input Frequency	50 to 60 Hz	
Recommended Input circuit Breaker	30A ,Dual pole branch rated	
Generator Input	120 Vac	N/A
Environment		
Temperature - Operation	-40 to 74° C (-40 to 165° F)	
Temperature - Storage (without batteries)	-40 to 85° C (-40 to 185° F)	
Maximum Elevation - Operating	0 to 3,000 m (0 to10,000 ft)	
Maximum Elevation - Storage	0 to 15,000 m (0 to 50,000 ft)	
Humidity	0% to 95% relative humidity	
Protection Class	IP20	
Physical		
Unit Weight without Packaging	2.2 kg (4.9 lb)	1.25 kg (2.8 lb)
Unit Weight with Packaging	5.7 kg (12.6 lb)	4.5 kg (9.9 lb)
Unit Dimensions without Packaging Width x Depth x Height	432 mm x 100 mm x 88 mm (17 in x 3.93 in x 3.5 in)	280 mm x 72 mm x 88 mm (11 in x 2.8 in x 3.5 in)
Unit Dimensions with Packaging Width x Depth x Height	535 mm x 370 mm x 186 mm (21.1 in x 14.6 in x 7.3 in)	460 mm x 295 mm x 190 mm (18.1 in x 11.6 in x 5.9 in)
Conformance		
Safety	UL-1778 (CSA 107.3 for Canada)	
CALTRANS	Caltrans Specification (TEES) March 12 , 2009 version	
Warranty	3-year factory warranty	

ITS Plus, Inc.

Project Title: 2025 Traffic Signal Technology Equipment Procurement Project (Louisville, CO)

CDOT Contract # 25-HTD-ZL-00189 (26912) / Louisville #301312-660074

Certification that the information and data submitted is true and complete to the best of our knowledge:

Zack Mueller Staci Ingram

Proposal Contact: Zack Mueller- Technical Sales Representative

Phone Number: (469)-995-1179

Email: zack.mueller@itsplus3.com

Fax Number: (972)-370-2440

Authorized Representative: Staci Ingram- President

Phone Number: (817)-404-9287

Email: staci.ingram@itsplus3.com

Fax Number: (972)-370-2440

Authorized Representative Signature: *Staci Ingram*

Estimated hardware delivery dates and lead times: Stock to 30 Days

***No requests for changes in specifications- ITS Plus is bidding as equivalent of Miovision**

Vendor Information

Contract Management Contacts:

-Zack Mueller- Technical Sales Representative, (469)-995-1179, zack.mueller@itsplus3.com

-Staci Ingram- President, (817)-404-9287, staci.ingram@itsplus3.com

Procurement Assistance Contact:

-Rhannon Brookwell- Order Processing Manager, (562)-360-4762, shipping@itsplus3.com

Product Support/Trouble-Shooting Contacts:

-Zack Mueller- Technical Sales Representative, (469)-995-1179, zack.mueller@itsplus3.com

-James Novak- Technical Sales and Advanced Support, (405)-612-2436, james.novak@itsplus3.com

-Joe Winton- Dev. & Advanced Technical Support, (619)-773-5017, joe.winton@itsplus3.com

Training Contacts:

-Zack Mueller- Technical Sales Representative, (469)-995-1179, zack.mueller@itsplus3.com

-James Novak- Technical Sales and Advanced Support, (405)-612-2436, james.novak@itsplus3.com

Brief Discussion on ITS Plus:

ITS Plus is a vehicle detection and data collection company that has been offering VIVDS solutions for the past 20 years. Our new Thunder detection system has been operating twice as long as any other machine-learned vehicle detection system - 12 years. This means we can work with almost any sensor (20-year-old analog cameras, newer digital cameras, 360 single cameras, thermal cameras, etc.). We can upgrade almost any intersection with existing cameras in about 4 minutes and cost under \$16K/intersection. Our Detection performance is 100%, 99% counts accuracy, and we have 17 different classifications (automobiles, bicycles, motorcycles, scooters, light vs. heavy trucks, pedestrians, etc.). ITS Plus is a small firm located in Plano, TX. We are qualified for this project because we have been supplying VIVDS solutions for the past 20 years and we have completed many projects similar in scope to this one (or larger). Our Thunder detection system can accurately detect many different road users (and differentiate them), provide unique detection inputs to the controller (lane-by-lane), and we provide accurate detection in any weather condition (rain, fog, sleet, snow, etc.). Our system is video-based and is capable of detecting multiple intersection approaches from a single camera and also interoperable with existing detection cameras. Our certifications include that we have 3 members of our

current staff that are IMSA Level II Signal Technicians (or higher) and we have multiple staff members that have been providing vehicle detection solutions the past 10-15 years. There is no special training required for our Thunder system- just a basic training on setting up detection + setting up data (counts, etc.).

Three Projects Completed in the United States:

1.) Anne Arundel County, MD

- Contact (Project Manager): Wes Sudd, (443)-714-6830, pwsudd13@aacounty.org
- Our Firm's Role: Furnished Vehicle Detection Systems and worked in unison with the city to install these systems. Provided/continue to provide complimentary training & support on Thunder System.
- Number of Deployed Locations: 20 Thunder Systems.
- Hardware Type: Thunder System.
- Project Name: County-Wide Vehicle Detection Upgrades for Legacy Video Equipment.
- Estimated Hardware Delivery Times: 1-2 weeks from when orders were placed for different phases of project.

2.) Virginia Beach, VA

- Contact (Project Manager): Steve Bender, (757)-755-6067, sbender@vbgov.com
- Our Firm's Role: Furnished Vehicle Detection Systems and worked in unison with the city to install these systems. Provided/continue to provide complimentary training & support on both our Thunder and Lightning Detection Systems.
- Number of Deployed Locations: 4 Thunder Systems Installed + 4 in Stock waiting to be installed (8 total). The city of Virginia Beach also has over 100 intersections of our analog "Lightning" detection system.
- Hardware Type: Thunder System & Lightning System.
- Project Name: City-Wide Vehicle Detection Upgrades.
- Estimated Hardware Delivery Times: 1-2 weeks from when orders were placed for different phases of project.

3.) Austin TXDOT

- Contact (Project Manager): Robert Bolin, (816)-803-2643, Robert.Bolin@txdot.gov
- Our Firm's Role: Furnished Vehicle Detection Systems and worked in unison with TXDOT to install these systems. Provided/continue to provide complimentary training & support on our Thunder System.
- Number of Deployed Locations: 5 Thunder Systems Installed + 5 in Stock waiting to be installed (10 total).
- Hardware Type: Thunder System.
- Project Name: TxDOT Analog Video Upgrades.
- Estimated Hardware Delivery Times: 1-2 weeks from when orders were placed for different phases of project.

Pricing Proposal

***See Appendix A for Pricing Proposal Table**

ITS Plus will only be bidding on "Video Detection- Furnish Only" for 11 systems.

No Bid for the following Items:

- Traffic Signal Cabinet (TS 2P)- Furnish Only
- Traffic Signal Controller- Furnish Only
- Emergency Preemption- Furnish Only
- Battery Backup System- Furnish Only

Complete Cost for (11) Video Detection Systems: \$176,000

Cost of Detection System Per-Intersection: \$16,000

***ITS Plus is willing to offer this pricing for either setup. We offer a 1-camera solution or we can provide 4 cameras per intersection (1 per approach)**

***Software is complimentary- we do not have any ongoing subscriptions or fees. All of the data is stored on each individual device and can be pulled remotely via agency's remote connection (switch), etc.**

EXHIBIT A
TRAFFIC SIGNAL TECHNOLOGY PRICING PROPOSAL
Project # 25-HTD-ZL-00189 (26912)

The following is the bid details for the purchase of the traffic signal technology equipment. The vendor's proposed equipment will be evaluated with the submitted unit prices to determine the selected awardee.

The quantity of equipment on the bid documents is the City's best estimate of technology needed. The City does not guarantee that the final purchase order will be the estimated quantity. The City may purchase more or less units. There will be no price adjustment for any variation in quantities.

Signal Technology Procurement Project

ACTIVITY & COST				
DESCRIPTION	ESTIMATED QUANTITY	MAKE, MODEL, AND WARRANTY	COST EACH	TOTAL COST
Traffic Signal Cabinet (TS 2P) – Furnish Only	7	No Bid	No Bid	No Bid
Traffic Signal Controller – Furnish Only	7	No Bid	No Bid	No Bid
Video Detection – Furnish Only	11	ITS PLUS, ITSP-PM POE-A1-4, 2 year warranty	\$16,000	\$176,000
Emergency Preemption – Furnish Only	2	No Bid	No Bid	No Bid
Battery Backup System – Furnish Only	7	No Bid	No Bid	No Bid
			TOTAL	\$176,000

Acknowledgement of Addendum No. 1: Yak Muehler

Acknowledgement of Addendum No. 2: Yak Muehler

**COLORADO DEPARTMENT OF TRANSPORTATION
ANTI-COLLUSION AFFIDAVIT**

PROJECT NO.

LOCATION

I hereby attest that I am the person responsible within my firm for the final decision as to the price(s) and amount of this bid or, if not, that I have written authorization, enclosed herewith, from that person to make the statements set out below on his or her behalf and on behalf of my firm.

I further attest that:

1. The price(s) and amount of this bid have been arrived at independently, without consultation, communication or agreement for the purpose or with the effect of restricting competition with any other firm or person who is a bidder or potential prime bidder.
- 2A. Neither the price(s) nor the amount of this bid have been disclosed to any other firm or person who is a bidder or potential prime bidder on this project, and will not be so disclosed prior to bid opening.
- 2B. Neither the prices nor the amount of the bid of any other firm or person who is a bidder or potential prime bidder on this project have been disclosed to me or my firm.
- 3A. No attempt has been made to solicit, cause or induce any firm or person who is a bidder or potential prime bidder to refrain from bidding on this project, or to submit a bid higher than the bid of this firm, or any intentionally high or non-competitive bid or other form of complementary bid.
- 3B. No agreement has been promised or solicited for any other firm or person who is a bidder or potential prime bidder on this project to submit an intentionally high, noncompetitive or other form of complementary bid on this project.
4. The bid of my firm is made in good faith and not pursuant to any consultation, communication, agreement or discussion with, or inducement or solicitation by or from any firm or person to submit any intentionally high, noncompetitive or other form of complementary bid.
5. My firm has not offered or entered into a subcontract or agreement regarding the purchase or sale of materials or services from any firm or person, or offered, promised or paid cash or anything of value to any firm or person, whether in connection with this or any other project, in consideration for an agreement or promise by any firm or person to refrain from bidding or to submit any intentionally high, noncompetitive or other form of complementary bid or agreeing or promising to do so on this project.
6. My firm has not accepted or been promised any subcontract or agreement regarding the sale of materials or services to any firm or person, and has not been promised or paid cash or anything of value by any firm or person, whether in connection with this or any other project, in consideration for my firm's submitting any intentionally high, noncompetitive or other form of complementary bid, or agreeing or promising to do so, on this project.
7. I have made a diligent inquiry of all members, officers, employees, and agents of my firm with responsibilities relating to the preparation, approval or submission of my firm's bid on this project and have been advised by each of them that he or she has not participated in any communication, consultation, discussion, agreement, collusion, or other conduct inconsistent with any of the statements and representations made in this affidavit.
8. I understand and my firm understands that any misstatement in this affidavit is and shall be treated as a fraudulent concealment from the Colorado Department of Transportation, of the true facts relating to submission of bids for this contract.

I DECLARE UNDER PENALTY OF PERJURY IN THE SECOND DEGREE, AND ANY OTHER APPLICABLE STATE OR FEDERAL LAWS, THAT THE STATEMENTS MADE ON THIS DOCUMENT ARE TRUE AND COMPLETE TO THE BEST OF MY KNOWLEDGE.

ITS PLUS, Inc.

Contractor's firm or company name

ITS PLUS, Inc.

By

Zack Mueller

Date

6/11/2025

Title

Technical Sales Representative

2nd contractor's firm or company name. (If joint venture.)

N/A

By

N/A

Date

N/A

Title

N/A

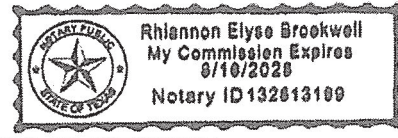
Sworn to before me this **13th** day of, **June**

20 25

Notary Public



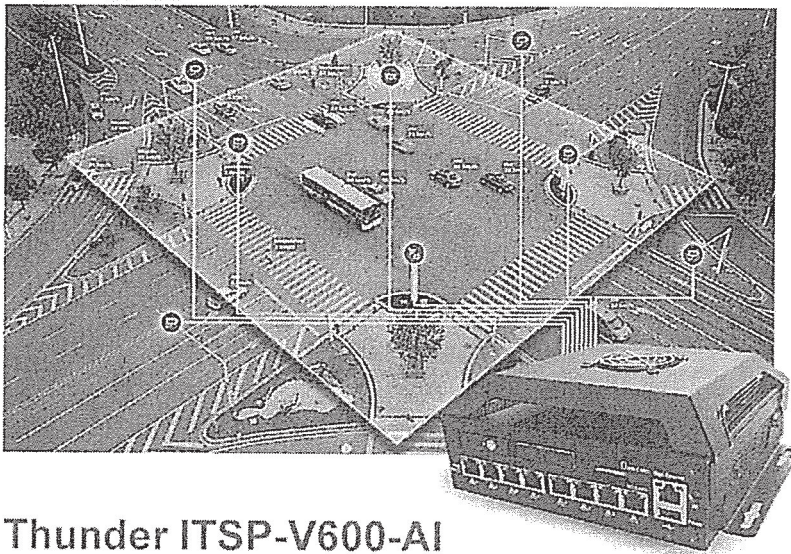
My commission expires	9/10/2028
NOTE: This document must be signed in ink.	



Warranty Information

Cameras: All ITS Plus Cameras have a 2-year warranty. If the cameras need to be repaired/replaced after 2 years we offer replacement cameras for a 50% discount (ex. If camera costs \$1,000 then we will repair/replace for \$500)

All Other Items (Cabinet Components): For any item other than our cameras (ex. Thunder Processor, Surge Suppression Panel, etc.) we have a 1-year warranty.



Thunder ITSP-V600-AI

ITS Plus Thunder is a video AI based processor designed for near perfect classification, vehicle detection, turning counts and so much more. The system generates years of stored count data you own. Thunder requires no subscription – ever.

Input can be your analog or digital camera. Thunder has an industrial NVIDIA processor, the Jetson NX that runs the AI-based detection and tracking algorithm which turns any video stream into high quality trajectory data about each road user. The system is powerful enough to analyze data from up to 6 connected cameras in real-time with an operating range up to 900 feet. The highly optimized and fully configurable trajectory processing engine can evaluate dozens of detection tasks in each camera view in parallel.

The configuration of detection tasks is performed using the visual programming language called FLOW. This is done specifically by parallel or serial connection of spatial, temporal or attribution filters, or other operators. For example, the emulation of an inductive loop at any location in the camera view is a matter of just a few clicks. It is the same for more complex scenarios such as U-turn detection, blocking vehicle detection, queue detection, or average speed measuring. The system is fully interactive and responds to new setting configurations live.

The system is also able to provide statistical data about the events in different aggregation modes such as whole history, time blocks, floating window and defined time interval. This data can be visualized on a user defined dashboard using interactive widgets for heatmap data, tables, trajectories, statistical values etc. The historical data together with the real-time detected events are available via open APIs for 3rd parties or can be exported in various formats.

The unit has multiple connectivity options with traffic controllers including NTCIP, data communication (UDP/REST/webhook), relay or SDLC. The actions/outputs are scriptable and can react to any single detected event in the video or user-defined performance metrics. The unit is small and easy to install into the traffic cabinet on DIN rail. The system supports remote configuration.

ITS Plus Thunder is a multifunction traffic analyzer prepared for the new era of dynamic traffic control.

Dynamic control

- Vehicle presence
- Speed data, level of service
- Queue length & occupancy
- Distances - time & space

Traffic violations

- U-turn detection
- Wrong-way detection
- Illegal lane change
- Red-light violation
- Bus lane violation
- Stopped vehicle

Vulnerable road user protection

- Pedestrian/cyclist presence
- Conflict detections
- Jaywalking

Powered by FLOW, the most powerful traffic framework

FLOW is a fully interactive video analytical traffic framework designed for real-time driven applications. It is the fastest and the most efficient way to transform any video stream into a stream of actionable insights. The first tool ever which visualizes traffic data and communicates with the other parts of your smart infrastructure using open APIs. FLOW is built for all imaginable traffic scenarios thanks to the powerful AI-based image processing.

Video detection features

FLOW is powered by a proprietary developed and globally trusted video analytical engine utilizing deep learning. This engine can detect and track hundreds of objects in multi-camera environments simultaneously.

Interactive data visualization

FLOW visualizes, extracts, and analyzes information using interactive widgets on customizable dashboards.

Traffic analysis functions

FLOW supports various traffic analytic functions and operators that can be combined into a comprehensive traffic analysis running in real-time. Thanks to the unique visual traffic programming language, you will be a designer of a monitoring solution tailored to your specific needs.

Data interfaces

FLOW provides integration with other parts of smart infrastructure. Extracted traffic insights can be continuously delivered to 3rd party systems using an open API.

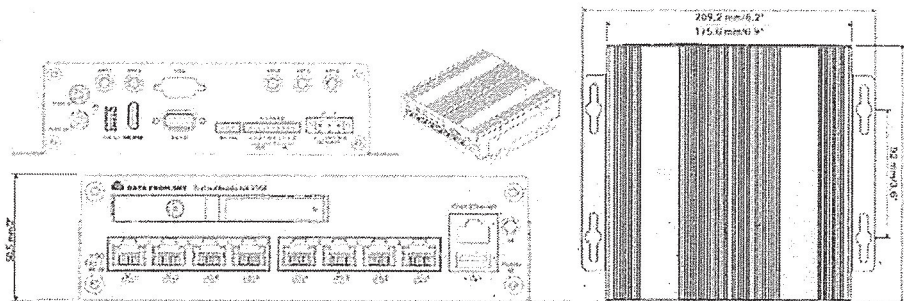


Model

Thunder ITSP-V600-AI

Description

Unit for installation into the traffic control cabinet.



General properties	
Processor	NVIDIA Jetson NX
Memory	8 GB 128-bit LPDDR4x, 16 GB eMMC 5.1
Expansion slots	Internal HDD bay 1x2.5" SATA, Mini PCIe x 2 (full-size USB2.0 x 1, half-size USB2.0 x 1)
Ethernet	GbE port x1, PoE ports (10/100 MbE, total 75W); SKU1 x 8 PoE / 802.3 at and af
Video output	1x HDMI 2.0 a/b maximum 3840 x 2160; VGA x 1 (optional)
Power supply and consumption	DC 9 - 36 V, max 150 W (includes PoE devices)
Dimensions	W175.6 x D183.3 x H50.5mm / 6.9" x 7.2" x 2" (without bracket)
Gross weight	1.8 kg
Operating / storage temperature	-40 °C ~ +65 °C (-4 °F ~ 149 °F) / -40 °C ~ +85 °C (-4 °F ~ 185 °F)
Storage humidity	95% @ 40 °C (non-condensing)
Certification	MIL-STD-810G, CE, FCC, E-Mark, EN50155, MIL-STD-810G
Designed for installation	traffic control cabinet / outdoor cabinet / DIN rail
Video analytics	
Video analytic engine	exact object traces, 7 categories, in-built ALPR for LP with alphanumeric characters, traffic light state recognition, dynamic and static anonymization, geo-registration, detection masks
Processing power in FPS (B/B+A/B+LP/B+LP+A)	@544x320: 151/112/64/58; @704x419: 100/83/53/48 (B = basic detection, A = add-ons img. processing modules, LP = license plate recognition)
Camera support	IP cameras with H.264 or H.265 codec and RTSP or ONVIF cameras / capable of processing at least 6 cameras in the real time / supporting narrow and wide-angle cameras and cameras with motorized lens / detection range of almost 900 feet
Traffic analytics	
Multifunctional engine	fully configurable trajectory processing pipeline via visual programming language FLOW / ability to evaluate multiple detection tasks in parallel (100+)
Available filters	zone, gate, movement, duration, time of occurrence, class, LP, color (without a limit on the number)
Other operators	level or services, union, intersection, complement, volume
Data statistics	incremental / whole history, time blocks, floating window, fixed interval
Outputs	events, actions / commands, statistics, tables, histograms, images
Possible tasks	presence detection, u-turn detection, blocking vehicle detection, red light violation, average speed, detection of specific traffic events, OD matrix, conflict detection, traffic data collection
Interfaces	
Data interfaces	NTCIP, UDP, REST, WEBHOOK, MJPEG, XProtect (VMS-Milestone), MJPEG
HW interfaces	support for IO expanders (relay outputs), SDLC expanders, V2X RSUs
Visual	fully configurable dashboards with interactive widgets

Accessories

- SDLC - 64 channels
- IO expander - 4/8/16 relays

Other features

- NTP time synchronization
- User management - admin, analyst, viewer
- Optical remote updates - over-the-air
- Data reduction profiles for remote configuration

**CITY OF LOUISVILLE
2025 Traffic Signal Technology Equipment Procurement Project
ADDENDUM NO. 1 – June 12, 2025**

To all plan holders of the 2025 Traffic Signal Technology Equipment Procurement Project contract Documents.

Please acknowledge receipt of this Addendum No. 1, dated June 10, 2025, on the quote.

The following revisions are hereby made to the Contract Documents.

Inquiries and Answers

1. Is the city looking for empty cabinets or fully loaded cabinets with plugs-ins, MMU, BIUs, etc? If so, what items are required to be in the cabinet and how many of each?
 - a. Controller cabinets shall be fully loaded and meet CDOT's latest Standard Specifications for Road and Bridge Construction.
2. Where should vendors include detailed product information and supporting materials?
 - a. An appendix with this information may be provided
3. Would it be acceptable to include these materials as attachments or appendices referenced in the Vendor Information or Pricing sections?
 - a. Yes, attachments or appendices including this information is acceptable
4. We are looking to see if you have more information on your TS 2P cabinet specifications.
 - a. Table 614-1 in CDOT's standard specs includes the quantities of transfer relays, load switches, amplifiers, etc.
5. Do you have a drawing or specification of the cabinet showing all load bays, wiring, sizing, etc?
 - a. Louisville has been using the P44 NEMA cabinet. Table 614-1 in CDOT's standard specs includes the quantities of transfer relays, load switches, amplifiers, etc.

[Faint, illegible stamp or signature]

6. Will the cabinets require an MMU, BIUs, Loadswitch Flashers etc?
 - a. Yes. Table 614-1 in CDOT's standard specs includes the quantities of transfer relays, load switches, amplifiers, etc.
7. On the video detection it states Miovision or equivalent approved by the City. Will the city accept NoTraffic, <https://www.notraffic.com/> as an alternate?
 - a. This appears to be a totally different product with 4 cameras and base station. We are moving towards Miovision or other single camera systems.
8. The size of a battery backup cabinet makes a difference in pricing. Which is preferred, base mount or cabinet mount? Do you have specification or a drawing of what is required?
 - a. Cabinet mount. Typically, we would defer to CDOT specifications for this.

END OF ADDENDUM

**CITY OF LOUISVILLE
2025 Traffic Signal Technology Equipment Procurement Project
ADDENDUM NO. 2 – June 17, 2025**

To all plan holders of the 2025 Traffic Signal Technology Equipment Procurement Project contract Documents.

Please acknowledge receipt of this Addendum No. 2, dated June 17, 2025, on the quote.

The following revisions are hereby made to the Contract Documents.

BID DUE DATE

The bid due date and time is hereby revised to **02:00 PM Mountain Time (MT), June 26, 2025.**

HARDWARE SPECIFICATIONS

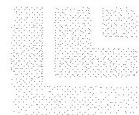
The **Traffic Signal Cabinets** is hereby revised to the

“Traffic signal controller cabinets shall conform to the latest version of NEMA TS 2 Specifications and have nominal dimensions for a Type P Cabinet. Minimum requirements include:

- Cabinet w/ all plug-ins, including:
- 1 flasher
- 6 FTRs
- 16 load switches
- 1 MMU2-16LEIP
- 1 Power Supply

Optional equipment within the cabinet:

- Generator transfer switch and plug
- Battery racks
- Double door cabinet”



Please see the 2 attached examples from other jurisdictions that meet these requirements. Or equal cabinets can be submitted but need to meet the above requirements and the 2 attached drawings.

Inquiries and Answers

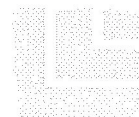
1. What if I already submitted a bid?
 - a. Companies that already submitted a bid can submit a revised bid on the new due date. Please clearly indicate “REVISED BID per addendum 2” or UPDATED BID per addendum 2” on the cover of the bid.
2. What about Addendum 1 cabinet specifications that were given?
 - a. Update all specs and information per Addendum 2.

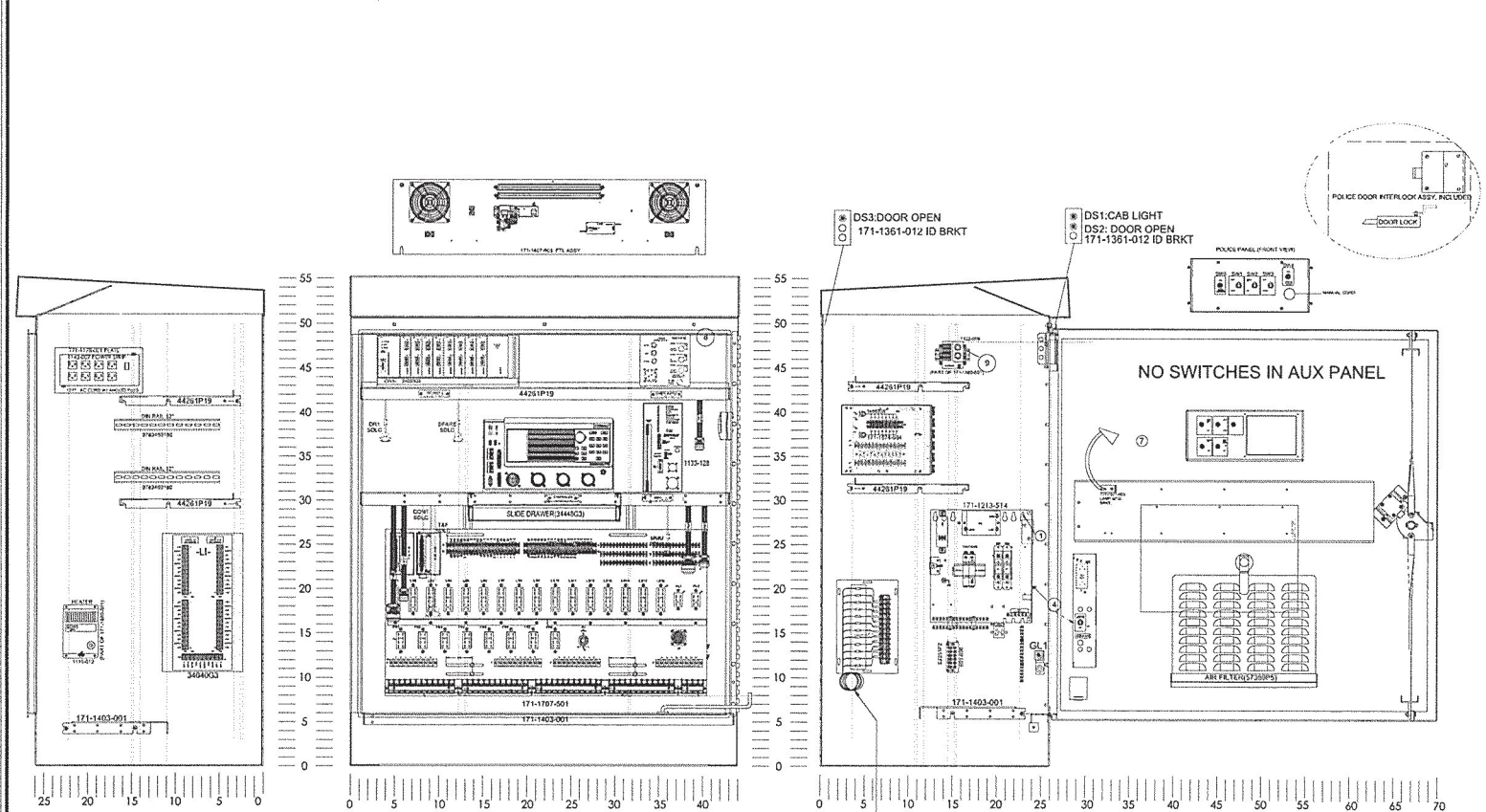
Attachments –

Example Cabinet drawing

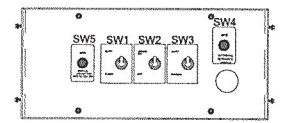
Example Cabinet Specifications

END OF ADDENDUM

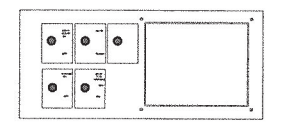




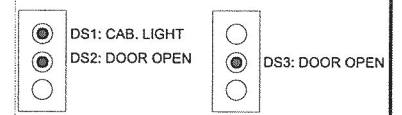
POLICE PANEL



AUXILIARY PANEL



DOOR SWITCHES

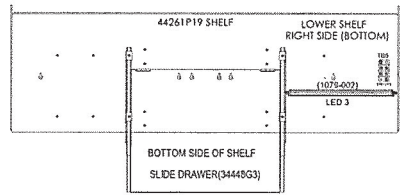


METAL LABELS

- X 171-1403-014 - DET RACK 1
- 171-1403-015 - DET RACK 2
- X 171-1403-016 - MMU
- X 171-1403-017 - POWER SUPPLY
- X 171-1403-018 - CONTROLLER
- 171-1403-022 - BBS

1. INSTALL CP 171-1213-514 PER LAY-OUT
2. MUST USE ONLY NUT RAIL SPRING #10. (57385P4).
3. INSTALL COMPUTER DRAWER (34446G3) IN THE MIDDLE OF SHELF WITH (2X) N84P16008B ONLY.
4. PER SPEC, PANEL MUST BE MOUNTED AT THIS LOCATION.
5. PER SPEC, NO SWITCHES IN AUX PANEL, MODIFIED POLICE ASSY PER MOD SHEET.
6. ZIP AND TIE CABLE INSIDE SHELVES AND OUT IN FRONT OF DESTINATIONS. NO HANGING LOOSE CABLES AROUND.
7. DRILL HOLES 0.15 PER DIMENSION AS SHOWN TO INSTALL ID PLATES
171-1403-014, 171-1403-016, 171-1403-017 AND 171-1403-018 USING N84P9006C & N238P9B - 2.97
8. INSTALL PER ESTIMATING EMAIL.
9. MOUNT HYGROTHERM (1122-009) USING DIN RAIL (013471B33X-00) AND END WITH TERMINAL BLOCKS (2) (1148-058) WIRE PER DIAGRAM

NOTES



B		UPDATED WITH NEW LAYOUT FORM		9/19/19	M. C.
A		REPLACE GOONENECK LAMP WITH 171-1921-503 PER ECO 29087		4/9/19	M. C.
TOLERANCES UNLESS OTHERWISE SPECIFIED					
DRAWN BY		TAN LUYONG		8/2/18	
CHECKED BY		JAL CAMACHO		8/3/18	
APPROVED BY		M. MARTINEZ		8/3/18	
SCALE		1:1		17680-LY	
SHEET		1 OF 1		B	

PURCHASE SPECIFICATIONS

REQUEST FOR BID- TRAFFIC SIGNAL NEMA TS2 TYPE 1 MODULAR CABINET ASSEMBLY CABINET.

CONTENTS

- 1. INTRODUCTION**
- 2. CABINET DESIGN & CONSTRUCTION**
- 3. TERMINALS & FACILITIES/MAIN PANEL DESIGN & CONSTRUCTION**
- 4. POWER PANEL DESIGN & CONSTRUCTION**
- 5. POWER BUS ASSEMBLY**
- 6. AUXILIARY CABINET EQUIPMENT**
- 7. VEHICLE DETECTION**
- 8. CABINET TEST SWITCHES & POLICE SWITCH PANEL**
- 9. AUXILIARY DEVICES**
- 10. TESTING & WARRANTY**

1. INTRODUCTION

This specification sets forth the minimum requirements for a TS2 Type 1 Traffic Control Cabinet Assembly. The cabinet assembly shall meet, as a minimum, all applicable sections of the NEMA TS2 Standard. The manufacturer shall be ISO 9001-2008 Registered and have been certified in the IPC "Class II" Electronics standard and training for all manufacturing staff to ensure manufacturing quality, documentation, and proper ongoing/continuing employee training for manufacturing processes by IPC Certified Trainers. The cabinet supplied under this specification shall be compatible with Econolite Cobalt, ASC/3 and ASC/2 controllers to ensure matched component system testing. Where differences occur, this specification shall govern.

CABINET ASSEMBLY PROFILE DETAIL:

Each TS2-1 PNG Westminster cabinet assembly shall include only the following as per outlined in the specification:

- 1 – P65 PAINTED ALUMINUM CABINET HOUSING; PAINTED WHITE INSIDE ONLY (REAR DOOR IS OPTIONAL IF REQUESTED)
- 2 – CAB LIFTING TABS
- 2 – CORBIN DT9 (New York) DEADBOLT LOCKS
- 1 – DUAL FAN PANEL ASSEMBLY
- 3 – LED LIGHT STRIPS, 2 IN TOP ON FAN PANEL AND 1 UNDER BOTTOM SHELF
- 2 – FULL WIDTH CABINET SHELVES
- 1 – POWER AUXILIARY PANEL W/SHA-1210 SURRESTOR, LINE FILTER, SSR, 1-40A CB, 2-15A CB, GFCI, EXTRA NEUTRAL AND GND BUS.
- 1 – 16 POSITION VERTICAL PNG MAIN PANEL ASSEMBLY
- 1 – POWER BUSS ASSEMBLY W/ 6 PNG POWER CONNECTORS
- 1 – 8-POSITION SDLC HUB ASSEMBLY W/ 6 SDLC CABLES, SCREW DOWN CABLES ON HUB END
- 1 – ALUMINUM WASHABLE CABINET AIR FILTER
- 1 – 8-CHANNEL DETECTOR RACK AND INTERFACE PANEL W/EVP INTERFACE CABLE
- 1 – POLICE/AUXILIARY SWITCH ASSEMBLY W/AUTO MANUAL AND POLICE CORD
- 1 – 6-POSITION POWER STRIP WIRED TO 4 POSITION TB ON LEFT SIDE, FILTERED POWER.
- 1 – 13" WIDE UNDER SHELF DOCUMENT DRAWER AND LAPTOP SHELF
- 1 – 8 POSITION LOAD RESISTOR PANEL ASSY
- 10 – RED JUMPERS FOR UNUSED PHASES
- 1 – CCA2 CONTROLLER POWER CABLE
- 1 – FLASHER
- 6 – FLASH TRANSFER RELAYS
- 16 – LOAD SWITCHES W/DUAL INPUT/OUTPUT INDICATORS
- 1 – MODEL MMU2-16LEIP MALFUNCTION MANAGEMENT UNIT (MMU)
- 1 – MODEL EDI PS200 CABINET POWER SUPPLY
- 3 – BUS INTERFACE UNITS (BIU)
- 1 – HYGROTHERM HUMIDITY SENSOR AND HEATER (**P CABINET ONLY**)
- 1 – GENERATOR TRANSFER SWITCH W/ WIRED HIGH INTENSITY RED LED GPI CONFIRMATION LIGHT (**P CABINET ONLY**)
- 1 - TWO (2) EXTRA GROUND AND NEUTRAL BUS ASSEMBLIES SHALL BE MOUNTED BELOW THE SIGNAL TERMINATION PANELS (**P CABINET ONLY**)
- 1 - GENERATOR TRANSFER SWITCH ASSEMBLY WITH HIGH INTENSITY GPI CONFIRMATION LIGHT (**P CABINET ONLY**)
- 1 - 30A GENERATOR PLUG (**P CABINET ONLY**)

2. CABINET DESIGN & CONSTRUCTION

2.1 CABINET HOUSING

- 2.1.1 The cabinet shall be constructed from type 5052-H32 aluminum with a minimum thickness of 0.125 inches.
- 2.1.2 The cabinet shall be designed and manufactured with materials that shall allow rigid mounting, whether intended for pole, base, or pedestal mounting. The cabinet shall not flex on its mount.
- 2.1.3 A rain channel shall be incorporated into the design of the main door opening to prevent liquids from entering the enclosure. The cabinet door opening shall be a minimum of 80 percent of the front surface of the cabinet. A stiffener plate shall be welded across the inside of the main door to prevent flexing.
- 2.1.4 The top of the cabinet shall incorporate a minimum of 1-inch slope toward the rear to prevent rain accumulation.
- 2.1.5 Unless otherwise specified, the cabinet shall be supplied with a natural aluminum finish. Sufficient care shall be taken in handling to ensure that scratches are minimized. All surfaces shall be free from weld flash. Welds shall be smooth, neatly formed, free from cracks, blowholes, and other irregularities. All sharp edges shall be ground smooth.
- 2.1.6 Where painted cabinets are specified, the exterior shall be degreased and primed with a spray applied iron phosphate coat – equivalent to a four-stage iron phosphate coat, prior to painting. The final coat shall consist of a powder-coat paint (TGIC or equivalent) applied with a minimum thickness of 2 mils. The cabinet shall be painted inside only – White.
- 2.1.7 All seams shall be continuous welded.
- 2.1.8 The lower section of the cabinet shall be equipped with a louvered air entrance. The air inlet shall be large enough to allow sufficient air flow per the rated fan capacity. Louvers shall satisfy the NEMA rod entry test for 3R ventilated enclosures. A non-corrosive, removable aluminum air filter shall be secured to the air entrance. The filter shall fit snugly against the cabinet door wall.
- 2.1.9 The roof of the cabinet shall incorporate an exhaust plenum with a vent screen. Perforations in the vent screen shall not exceed 0.125 inches in diameter

2.2 CABINET DOORS

- 2.2.1 The main door and the police door-in-door shall close against a weather-proof, dust-proof, closed-cell neoprene gasket seal. The gasket material for the main door shall be a minimum of 0.250 inches thick by 0.500 inches wide. The gaskets shall be permanently bonded to the cabinet.
- 2.2.2 The handle on the main door of the cabinet shall be manufactured from cast aluminum or stainless steel. The handle shall include a hasp for the attachment of an optional padlock. The cabinet door handle shall rotate counter-clockwise to open. The handle shall be positioned so that the

- handle shall not cause any interference with the key when opening the cabinet door.
- 2.2.4 The main door hinge shall be a one-piece, continuous piano hinge with a stainless-steel pin running the entire length of the door. The hinge shall be attached in such a manner that no rivets or bolts are exposed.
 - 2.2.5 The main door shall include a mechanism capable of holding the door open at approximately 90, 145, and 165 degrees under windy conditions. The cabinet shall be provided with a single front door. As an option, two (2) doors (front door and a rear door) shall be provided on request.
 - 2.2.6 The front and rear cabinet doors shall be equipped with a Corbin tumbler lock DT9 or exact equivalent, with a minimum of two keys provided.
 - 2.2.7 The police door-in-door shall be provided with a treasury type lock, Corbin No. R357SGS or exact equivalent, with a minimum of one key provided.
 - 2.2.8 The main cabinet front door shall incorporate a shroud to cover the filtered louvered openings as appropriate for the design. The assembly is secured on the interior of the door over the filtered louvers. The shroud is louvered downward and matches the door louvers.

2.3 EQUIPMENT MOUNTING RAILS

- 2.3.1 A minimum of one set of vertical "C" channels shall be mounted on each interior wall of the cabinet for the purpose of mounting the cabinet components. The channels shall accommodate spring-mounted nuts or studs. All mounting rails shall extend to within three (3) inches of the top and bottom of the cabinet. Rear-wall rail spacing shall be 18.50 inches center-to-center.
- 2.3.2 For size 6 or larger cabinets, each sidewall shall have two (2) sets of equipment mounting rails. Each rail set shall be spaced 7.88 inches center-to-center. All channel nuts used to install equipment on the rails shall be the spring-loaded type.

2.4 EQUIPMENT SHELVES

- 2.4.1 All cabinets shall be supplied with two removable shelves manufactured from 5052-H32 aluminum. The shelf shall be a minimum of 10 inches deep and have ledges at the backs with a minimum height of 2".
- 2.4.2 The shelf shall have horizontal slots at the rear and vertical slots at the front of the turned down side flange. The shelf shall be installed by first inserting the rear edge of the shelf on the cabinet rear sidewall mounting studs, then lowering the shelf on the front sidewall mounting studs. The shelf shall be held in place by a nylon tie-wrap inserted through the holes on the front edge of the shelf and around the front sidewall mounting studs.
- 2.4.3 The front edge of the shelf shall have holes punched every 6 inches to accommodate tie-wrapping of cables/harnesses.

2.5 CABINET MOUNTING

- 2.5.1 All base mounted cabinets require anchor bolts to properly secure the cabinet to its base. The cabinet flange for securing the anchor bolts shall not protrude outward from the bottom of the cabinet. Four (4) anchor bolts shall be required for proper installation.

2.6 CABINET SIZES

- 2.6.1 The cabinet shall be of sufficient size to accommodate all equipment. The minimal cabinet size is:
- 65" H x 44" W x 26" D

2.7 UL LISTED CERTIFICATION

- 2.7.1 All enclosures shall be constructed, approved and marked in accordance with the requirements for Type 1 Industrial Control Panel Enclosures contained in UL 508A, the Standard for Industrial Control Panels. The enclosure shall meet NEMA 3R rating requirements and be marked with a UL approval sticker.

3. TERMINALS & FACILITIES/MAIN PANEL DESIGN & CONSTRUCTION

3.1 TERMINALS & FACILITIES

- 3.1.1 The terminals & facilities shall be supplied as a minimum in the following NEMA configuration:
- *NEMA Configuration #4* – Sixteen (16) load switch sockets; six (6) flash transfer relay sockets; one (1) flasher socket; two (2) BIU sockets; one (1) 16-channel detector rack with one (1) BIU; one (1) Type-16 MMU
- 3.1.2 All terminals & facilities configurations shall be provided with BIU wiring assignments consistent with the current NEMA TS2 Standard.
- 3.1.3 All terminals & facilities configurations shall be provided with sufficient RS-485 Port 1 communication cables to allow for the intended operation of that cabinet. Each communication cable connector shall be a 15-pin meal shell D subminiature type. The cable shall be a shielded cable suitable for RS-485 communications.
- 3.1.4 The grounding system in the cabinet shall be divided into three (3) separate circuits:
AC Neutral; Earth Ground; Logic Ground. These ground circuits shall be connected together at a single point as outlined in the current NEMA TS2 Standard.

3.2 MAIN PANEL DESIGN & CONSTRUCTION

- 3.2.1 The main panel shall be constructed from 5052-H32 brushed aluminum of 0.125 inches minimum thickness and installed so as to minimize flexing when plug-in components are installed.

- 3.2.2 The 16-position main panels are provided with a mounting mechanism which allows easy access to all wiring on the rear of the panel. Lowering of the main panel shall be accomplished without the use of hand tools. Complete removal shall be accomplished by the use of simple hand tools.
- 3.2.3 All load switch and flash transfer relay sockets reference designators shall be silkscreen labeled on the front and rear of the main panel to match drawing designations. Socket pins shall be marked for reference on the rear of the panel.
- 3.2.4 Main panel load switch sockets should be positioned in two rows of eight.
- 3.2.5 All load switches shall be supported by a bracket, extending at least half the length of the load switch.
- 3.2.6 The sixteen (16) load switch position main panels should have all field wires contained on two (2) rows of horizontally mounted terminal blocks. The upper row shall be wired for the pedestrian and overlap field terminations.
- 3.2.8 The field output circuits shall be terminated on a non-fused barrier type terminal block with a minimum rating of 10 amps.
- 3.2.10 The field input/output (I/O) terminals shall be identified by permanent alphanumeric labels. All labels shall use standard nomenclature per the NEMA TS2 Standard.
- 3.2.11 It shall be possible to flash either the yellow or red indication on any vehicle movement and to change from one color indication to the other by use of a screwdriver.
- 3.2.12 Field terminal blocks shall be wired to use four (4) positions per vehicle or overlap phase (green; yellow; and red flash). It shall not be necessary to de-bus field terminal blocks for flash programming.
- 3.2.13 The main panel shall contain at least one (1) flasher socket (silkscreen labeled) capable of operating a 15-amp, 2-pole, NEMA solid state flasher. The flasher shall be supported by a bracket, extending at least half its length.
- 3.2.14 One (1) RC network shall be wired in parallel with each group of three flash transfer relays and any other relay coils.
- 3.2.15 All logic-level, NEMA controller and Malfunction Management Unit input and output terminations on the main panel shall be permanently labeled. Cabinet prints shall identify the function of each terminal position.
- 3.2.16 At a minimum, three (3) 20-position terminal blocks shall be provided at the top of the main panel to provide access to the controller unit's programmable and non-programmable I/O. Terminal blocks for DC signal interfacing shall have a number 6-32 x 7/32 inch screw as a minimum.
- 3.2.17 All main panel wiring shall conform to the following wire size and color:
- Green/Walk load switch output – brown wire – 14 gauge
 - Yellow load switch output – yellow wire – 14 gauge

- Red/Don't Walk load switch output – red wire – 14 gauge
- MMU (other than AC power) – violet wire – 22 gauge
- Controller I/O – blue wire – 22 gauge
- AC Line (power panel to black wire main panel) – 8/10 gauge
- AC Line (main panel) – black wire – 10 gauge
- AC Neutral (power panel to white wire main panel) – 8/10 gauge
- AC Neutral (main panel) – white wire – 10 gauge
- Earth Ground (power panel) – green wire – 8 gauge
- Logic Ground – gray wire – 22 gauge
- Flash Programming – Orange wire – various gauge sizes
- Flasher Terminal – Black wire, red or yellow field terminal – 14 gauge

- 3.2.18 All wiring, 14 AWG and smaller, shall conform to MIL-W-16878/1, type B/N, 600V, 19-strand tinned copper. The wire shall have a minimum of 0.010 inches thick PVC insulation with clear nylon jacket and rated to 105 degrees Celsius. All 12 AWG and larger wire shall have UL listed THHN/THWN 90 degrees Celsius, 600V, 0.020 inches thick PVC insulation and a clear nylon jacket.
- 3.2.19 Connecting cables shall be sleeved in a braided nylon mesh or poly-jacketed. The use of exposed tie-wraps or interwoven cables is not acceptable.
- 3.2.20 All main panels shall be pre-wired for a Type-16 Malfunction Management Unit.
- 3.2.21 All wiring shall be neat in appearance. All cabinet wiring shall be continuous from its point of origin to its termination point. Butt type connections/splices are not acceptable.
- 3.2.22 All connecting cables and wire runs shall be secured by mechanical clamps. Stick-on type clamps are not acceptable.
- 3.2.23 The main panel shall incorporate a relay, designated as K1, to remove +24 VDC from the common side of the load switches when the intersection is placed into mechanical flash. The relay shall have a momentary pushbutton to apply power to the load switch inputs for ease of troubleshooting.
- 3.2.24 All pedestrian pushbutton inputs from the field to the controller shall be opto-isolated through the BIU and operate at 12 VAC.
- 3.2.25 All wire (size 16 AWG or smaller) at solder joints shall be hooked or looped around the eyelet or terminal block post prior to soldering to ensure circuit integrity. Lap joint soldering is not acceptable.
- 3.2.26 The main panel connections for power and all cabinet switch interfacing shall be via a 37-pin plastic shell MS connector with an incorporated twist lock as part of the Plug N Go cabinet system wiring.
- 3.2.27 A six (6) position power strip assembly shall be installed on the upper left-hand rails in the cabinet assembly. This power strip shall receive filtered

power from the power auxiliary panel via a 4-position terminal block, located near the power strip on the left side of the cabinet.

4. POWER PANEL DESIGN & CONSTRUCTION

- 4.1 The power panel shall interface with the main panel and be located on the lower right portion of the cabinet. The power panel shall be wired to provide the necessary filtered power to the load switches, flasher(s), and power bus assembly. The technicians shall be protected from the power panel components with a removable Plexiglas front cover. The design shall allow a technician to access the main and auxiliary breakers without removing the protective front cover.
- 4.2 The power panel portion of the main panel shall include the following components:
- One (1) 40-amp main circuit breaker. This breaker shall supply power to the controller, MMU, signals, cabinet power supply and auxiliary panels. Breakers shall be at a minimum, a thermal magnetic type, UL listed for HACR service, with a minimum of 10,000 amp interrupting capacity.
 - One (1) 15-amp auxiliary breaker shall supply power to the fan, light and GFI utility outlet.
 - One (1) 15-amp circuit breaker shall supply filtered power to the power strip located elsewhere in the cabinet assembly. The circuit breaker shall be wired to the 4-position terminal block, located on the upper left side of the cabinet.
 - An EDCO/HESCO model SHA-1210 or exact approved equivalent surge arrester.
 - A 50-amp, 125 VAC radio interference line filter.
 - A normally-open, 75-amp, solid state signal bus relay. The SSR shall be a Crydom Model# HA4875H or approved equivalent.
 - A minimum of one (1) 8-position neutral bus bar capable of connecting three (3) #12 wires per position.
 - A minimum of one (1) 6-position ground bus bar capable of connecting three (3) #12 wires per position.
 - A minimum of one (1) NEMA type 5-15R GFI utility outlet.

5. POWER BUS ASSEMBLY – SDLC HUB ASSEMBLY

- 5.1 The power bus assembly shall be manufactured from 0.090", 5052-H32 aluminum. It shall provide filtered power for the controller, MMU, cabinet power supply, and all auxiliary equipment.
- 5.2 The power bus assembly shall house the following components:
- A minimum of three (3) and a maximum of six (6) power connectors.
 - Two (2) terminal strips to hardwire the power connections.

- 5.3 All cabinet equipment requiring filtered power to operate shall be connected to the power bus assembly by a fourteen (14) pin plastic MS circular connector with a twist lock connection, or hardwired directly to the supplied terminal blocks.
- 5.4 SDLC connections shall be made via an eight (8) position SDLC Hub Assembly. The SDLC Hub assembly shall have provisions for the SDLC cable connectors to be tightened down the hub assembly by two screws. Six (6) SDLC cables shall be supplied with each cabinet.

6. AUXILIARY CABINET EQUIPMENT

6.1 CABINET VENTILATION SYSTEM

- 6.1.1 The cabinet shall be provided with two (2) thermostatically controlled (adjustable between 55-160 degrees Fahrenheit) ventilation fans in the top of the cabinet plenum. The fan plate shall be removable with the use of simple hand tools for serviceability. A minimum of two (2) exhaust fans shall be provided. The fans shall be a ball-bearing type fan and shall be capable of drawing a minimum of 100 cubic feet of air per minute each. The Fan/Thermostat assembly shall be connected to the power panel by means of a 4-position plug-in cable.
- 6.1.2 An LED cabinet lighting system shall be used to illuminate the internal structure of the cabinet assembly. Two (2) LED cabinet lighting strips shall be mounted on the fan panel assembly in the top of the cabinet. The fan panel shall also incorporate the LED light power supply. The LED light strips shall be Califla Model P3100-C-S or approved equal. The lamp shall be wired to a door activated switch mounted near the top of the door. A third LED light strip shall be mounted under the bottom shelf to illuminate the lower portion of the cabinet, specifically the field terminals.

6.2 MISCELLANEOUS ITEMS

- 6.2.1 A document drawer shall be mounted to the underside of the bottom shelf to store the cabinet documents. The document drawer shall be a minimum of 13" wide.
- 6.2.2 A minimum of two (2) sets of complete and accurate cabinet drawings shall be supplied with each cabinet.

7. VEHICLE DETECTION

- 7.1 One (1) loop detector rack shall be provided in each cabinet. The Detector rack shall be available in the following NEMA configuration.
- *NEMA Configuration #2* – Shall support up to eight (8) channels of loop detection (either eight (4) 2-channel detectors or four (2) 4-channel detectors), two (2) preemption devices, and one (1) BIU.
- 7.2 Detector rack BIU mounting shall be an integral part of the detector rack.

- 7.3 All BIU rack connectors shall have jumper address pins corresponding to the requirements of the NEMA TS2 Standard. The jumpers may be moved to change the address of any individual rack. The address pins shall control the BIU mode of operation. BIUs shall be capable of being interchanged with no additional programming.
- 7.4 Each cabinet shall contain detector interface panels for the purpose of connecting field loops and loop detector racks. The panels shall be manufactured from FR4 G10 fiberglass, 0.062 inches thick, with a minimum of 2 oz. of copper for all traces.
- 7.5 One (1) 8-position interface panel shall be provided for a 8-channel rack cabinet. The interface panel shall be secured to a mounting plate and attached to the left wall of the cabinet.
- 7.6 Each interface panel shall allow for the connection of eight (8) independent field loops. A ground bus terminal shall be provided between each loop pair terminal to provide a termination for the loop lead-in cable ground wire.
- 7.7 Each interface panel shall provide a 10-position terminal block to terminate the field wires for up to two (2) 2-channel preemption devices.
- 7.8 Lightning protection device mounting holes shall be provided to accommodate an EDCO SRA-16C or EDCO SRA-6 or EDCO LCA-6, or a varistor lightning protection device. Lightning protection devices shall not be provided unless specified.
- 7.9 A cable consisting of 20 AWG twisted pair wires shall be provided to enable connection to and from the panel to a detector rack. The twisted pair wires shall be color-coded red and white wire.
- 7.10 All termination points shall be identified by a unique number and silkscreened on the panel.
- 7.11 Each detector rack shall accommodate rack-mountable emergency vehicle preemption (EVP) devices such as Opticom.
- 7.12 Each detector rack shall be powered by the cabinet power supply and be connected to the power bus assembly by means of a 14-pin plastic MS circular connector with a twist lock connection.

8. CABINET TEST SWITCH PANEL & POLICE SWITCH PANEL

8.1 CABINET TEST SWITCH PANEL

- 8.1.2 A test switch panel shall be mounted on the inside of the main door. The test switch panel shall provide as a minimum the following:
- **AUTO/FLASH SWITCH** – In the FLASH position, power shall be maintained to the controller and the intersection shall be placed in flash. The controller shall not be stop-timed when in flash. Wired according to the current NEMA TS2 Standard, the MMU forces the controller to initiate the start-up sequence when exiting flash.

- STOP-TIME SWITCH – In the STOP-TIME position, the controller shall be stop-timed in the current interval.
- CONTROL EQUIPMENT POWER ON/OFF – This switch shall control the controller, MMU, and cabinet power supply AC power. Momentary test pushbuttons for all vehicle and pedestrian inputs to the controller are not required. The TS2 controller to be provided with the cabinet assembly shall provide vehicular and pedestrian call inputs from its keyboard while in the standard status display.

8.2 POLICE SWITCH PANEL

- 8.2.1 A police switch panel shall be mounted inside the police access compartment located on the exterior of the cabinet door. The police switch panel shall contain the following:
- SIGNALS ON/OFF SWITCH – In the OFF position, power shall be removed from signal heads in the intersection. The controller shall continue to operate. When in the OFF position, the MMU shall not conflict or require reset.
 - AUTO/FLASH SWITCH – In the FLASH position, power shall be maintained to the controller, and the intersection shall be placed in flash. The controller shall be stop-timed when in flash. Wired according to the current NEMA TS2 Standard, the MMU forces the controller to initiate the start-up sequence when exiting flash.
 - AUTO/MANUAL SWITCH – Cabinet wiring shall include provisions for an AUTO/MANUAL switch and a momentary pushbutton or hand cord. The AUTO/MANUAL switch and pushbutton or hand cord shall be in each cabinet assembly.

8.3 SWITCH & WIRING REQUIREMENTS

- 8.3.1 All toggle switches shall be heavy duty and rated 15-amps minimum. Single- or double-pole switches may be provided, as required.
- 8.3.2 Any exposed terminals or switch solder points shall be covered with a non-flexible shield to prevent accidental contact.
- 8.3.3 All switch functions shall be permanently and clearly labeled.
- 8.3.4 All wire routed to the police door-in-door and test switch pushbutton panel shall be adequately protected against damage from repetitive opening and closing of the main door.
- 8.3.5 All test switch panel wiring shall be connected to the main panel via a 24-pin plastic MS circular connector with a twist lock connection.
- 8.3.6 All wiring from the main panel to the test switch panel shall be connected to the test switch panel via a 24-pin plastic MS circular connector with a twist lock connection.

- 8.3.7 An eight (8) position resistor panel assembly shall be installed on the right lower side of the cabinet and wired to the odd Vehicle phase red on the main panel.

9. AUXILIARY DEVICES

9.1 LOAD SWITCH

- 9.1.1 Load switches shall be solid state and shall conform to the requirements of the NEMA TS2 Standard.
- 9.1.2 Signal load switches shall have a minimum rating of 10 amperes at 120 VAC for an incandescent lamp load.
- 9.1.3 The front of the load switch shall be provided with three indicators to show the input signal from the controller to the load switch.
- 9.1.4 Load switches shall be dedicated per phase. The use of load switches for other partial phases is not acceptable.
- 9.1.5 A full complement of load switches shall be supplied with each cabinet to allow for maximum phase utilization for which the cabinet is designed.

9.2 FLASHER

- 9.2.1 The flasher shall be solid state and shall conform to the requirements of the NEMA TS2 Standard.
- 9.2.2 Flashing of field circuits for the purpose of intersection flash shall be accomplished by a separate flasher.
- 9.2.3 The flasher shall be rated at 15 amperes, double-pole with a nominal flash rate of 60 FPM.

9.3 FLASH TRANSFER RELAY

- 9.3.1 All flash transfer relays shall meet the requirements of the NEMA TS2 Standard.
- 9.3.2 The coil of the flash transfer relay shall be de-energized for flash operation.
- 9.3.3 A full complement of flash transfer relays shall be supplied with each cabinet to allow maximum phase utilization for which the cabinet is designed.

9.4 MALFUNCTION MANAGEMENT UNIT (MMU)

- 9.4.1 Each cabinet assembly shall be supplied with one (1) MMU as defined by the requirements of the NEMA TS2 Standard.
- 9.4.2 Malfunction Management Units shall be a Type-16. The MMU shall be Econolite Model 1133-128 (EDI Model MMU2-16LEip) or approved equivalent.

9.5 BUS INTERFACE UNIT (BIU)

- 9.5.1 All BIUs shall meet the requirements of the NEMA TS2 Standard.
- 9.5.2 A full complement of Bus Interface Units shall be supplied with each cabinet to allow for maximum phase and function utilization for which the cabinet is designed (Econolite or EDI preferred).
- 9.5.3 Each BIU shall include power on, transmit and valid data LED-type indicators.

9.6 CABINET POWER SUPPLY

- 9.6.1 The cabinet power supply shall meet the requirements of the NEMA TS2 Standard.
- 9.6.2 The cabinet power supply shall provide LED indicators for the line frequency, 12 VDC, 12 VAC, and 24 VDC outputs.
- 9.6.3 The cabinet power supply shall provide (on the front panel) jack plugs for access to the +24 VDC for test purposes.
- 9.6.4 One (1) cabinet power supply shall be supplied with each cabinet assembly and shall be wired directly to the Power Bus Assembly via a fourteen (14) pin plastic MS circular connector with a twist lock connection. (Econolite or EDI preferred or approved equal.)

AUXILIARY CABINET DEVICES - TO BE PROVIDED PER CUSTOMER REQUEST

- Two (2) battery shelves and covers shall be provided and installed on the lower left side of the cabinet for housing three (3) batteries.

10. TESTING & WARRANTY

10.1 TESTING

- 10.1.1 Each controller and cabinet assembly shall be tested as a complete entity under signal load for a minimum of 48 hours.
- 10.1.2 Each assembly shall be delivered with a signed document detailing the cabinet final tests performed.
- 10.1.3 The cabinet shall be assembled and tested by the controller manufacturer or an authorized local distributor to ensure proper component integration and operation.

10.2 WARRANTY

- 10.2.1 The controller and Malfunction Management Unit shall be warranted by the manufacturer against mechanical and electrical defects for a period of two (2) years from date of shipment. The manufacturer's warranty shall be supplied in writing with each cabinet and controller. Second party extended warranties are not acceptable.
- 10.2.2 The cabinet assembly and all other components shall be warranted for a period of one (1) year from date of shipment.
- 10.2.3 Any defects shall be corrected by the manufacturer or supplier at no cost to the owner.



June 18, 2025

Cameron Fowlkes
City Engineer
City of Louisville
749 Main Street
Louisville, CO 80027

Subject: Project #25-HTD-ZL-00189 (26912) Traffic Signal Technology Project

Traffic Signal Controls is pleased to submit the enclosed Request for Pricing (RFP) with confidence that we can meet the City's expressed Scope of Work in an efficient, cost-effective manner.

Traffic Signal Controls, Inc. was established as a privately held corporation in 1985. We provide city planners, electrical contractors, traffic engineers and governmental agencies with timely, professional service and a complete line of "state of the art" traffic control systems and equipment. Our team partners along with customers and consulting groups to solve difficult problems while providing cost-effective options.

Forty years of experience and business in the industry have proven Traffic Signal Controls to be more than qualified to meet the requirements of this RFQ and we look forward to continuing to work with you as our partner.

The specific elements of the Traffic Signal Cabinets, Preemption System and Cabinet Battery Backup System are included as an attachment to Exhibit A.

Estimated hardware delivery dates for this project are 90-150 days from receipt of a purchase order which will be well within the timeline of six (6) months required in the RFQ.

We hereby certify, to the best of our knowledge, the aforementioned information as well as all other data submitted within this proposal to be true and complete.

Sincerely:

A handwritten signature in blue ink, appearing to read 'W. Towle'.

Walter C. Towle
President
Traffic Signal Controls, Inc.
Longmont, CO 80501
303-772-2781
Fax 303-776-1270
wtowle@trafsig.com



June 18, 2025

Cameron Fowlkes
City Engineer
City of Louisville
749 Main Street
Louisville, CO 80027

Subject: Project #25-HTD-ZL-00189 (26912) Traffic Signal Technology Project

Traffic Signal Controls, Inc. is a local, family-owned company with fifteen well-qualified personnel and supporting staff, including technicians who are IMSA certified. We provide 24/7/365 on-call service and troubleshooting as well as on-site training and support at no charge.

We are a regional distributor with customers in Colorado, Wyoming, Utah, Kansas, New Mexico and Arizona. Our technicians have more than twenty years' experience in the traffic industry. They are well versed and trained with certifications from all our supply vendors.

Our core business model is to train and educate our customers to ensure they have the tools to troubleshoot and install the equipment we provide.

Our technical staff providing support for this project include:

Tony Kerr

Tony has over Twenty-seven (37) years' experience in the Traffic Industry including the positions of LTC OPS II, Project Preconstruction Coordinator and Preconstruction Coordinator for the State of Colorado Region Two in Pueblo. Tony is a certified State of Colorado Master Electrician and has four (4) years' experience in ITS and Fiber Design.

Over the years of Tony's tenure with the Colorado Department of Transportation, he has had direct on-site and remote involvement with Fort Carson to help in solving complicated traffic solutions. Tony is well versed with the entire McCain and MsSedco products and was responsible for the deployment all Swarco/McCain Traffic Cabinets, Controllers and Controller software throughout Region II in Pueblo.

Travis Hanks

Travis has over seventeen (17) years' experience in the Traffic Industry including the positions of Senior Lead for Douglas County Colorado and Assistant Traffic Signal Supervisor for El Paso County. He is a certified IMSA Senior Field Technician (Levels I, II and II), an IMSA Certified Bench Technician (Level II) and has been qualified as an IMSA Signal Inspector.

Current and past projects include:

City and County of Denver

Provided and supported 450+ P44 Cabinets
Master Purchase Order 0155A0115

Michael Comstock

720-865-4066

Michaelcomstock@denvergov.org

Colorado Department of Transportation

Provided and supported 100+ deployment throughout the State for Caltrans Style Cabinets and Clary UPS
Battery Backup Systems
Award # IFB 24-026JR
Currently in year two (2) of a five (5) year award

Jeremy Roth

303-757-9618

Jeremy.Roth@state.co.us

Again, our forty years of experience and business in the industry have proven Traffic Signal Controls to be more than qualified to meet the requirements of this RFQ and we look forward to continuing to work with you as our partner.

Sincerely:



Walter C. Towle

President

Traffic Signal Controls, Inc.

Longmont, CO 80501

303-772-2781

Fax 303-776-1270

wtowle@trafsig.com

EXHIBIT A
TRAFFIC SIGNAL TECHNOLOGY PRICING PROPOSAL
Project # 25-HTD-ZL-00189 (26912)

The following is the bid details for the purchase of the traffic signal technology equipment. The vendor's proposed equipment will be evaluated with the submitted unit prices to determine the selected awardee.

The quantity of equipment on the bid documents is the City's best estimate of technology needed. The City does not guarantee that the final purchase order will be the estimated quantity. The City may purchase more or less units. There will be no price adjustment for any variation in quantities.

Signal Technology Procurement Project

ACTIVITY & COST				
DESCRIPTION	ESTIMATED QUANTITY	MAKE, MODEL, AND WARRANTY	COST EACH	TOTAL COST
Traffic Signal Cabinet (TS 2P) – Furnish Only	7	See Attached	\$ 20,964.00	\$ 146,748.00
Traffic Signal Controller – Furnish Only	7	No Bid		
Video Detection – Furnish Only	11	No Bid		
Emergency Preemption – Furnish Only	2	See Attached	\$ 2,953.00	\$ 5,906.00
Battery Backup System – Furnish Only	7	See Attached	\$ 5,059.00	\$ 35,413.00
			TOTAL	\$ 188,067.00

**COLORADO DEPARTMENT OF TRANSPORTATION
ANTI-COLLUSION AFFIDAVIT**

PROJECT NO.

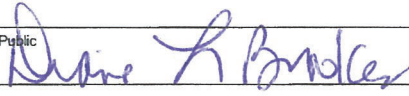
LOCATION

I hereby attest that I am the person responsible within my firm for the final decision as to the price(s) and amount of this bid or, if not, that I have written authorization, enclosed herewith, from that person to make the statements set out below on his or her behalf and on behalf of my firm.

I further attest that:

1. The price(s) and amount of this bid have been arrived at independently, without consultation, communication or agreement for the purpose or with the effect of restricting competition with any other firm or person who is a bidder or potential prime bidder.
- 2A. Neither the price(s) nor the amount of this bid have been disclosed to any other firm or person who is a bidder or potential prime bidder on this project, and will not be so disclosed prior to bid opening.
- 2B. Neither the prices nor the amount of the bid of any other firm or person who is a bidder or potential prime bidder on this project have been disclosed to me or my firm.
- 3A. No attempt has been made to solicit, cause or induce any firm or person who is a bidder or potential prime bidder to refrain from bidding on this project, or to submit a bid higher than the bid of this firm, or any intentionally high or non-competitive bid or other form of complementary bid.
- 3B. No agreement has been promised or solicited for any other firm or person who is a bidder or potential prime bidder on this project to submit an intentionally high, noncompetitive or other form of complementary bid on this project.
4. The bid of my firm is made in good faith and not pursuant to any consultation, communication, agreement or discussion with, or inducement or solicitation by or from any firm or person to submit any intentionally high, noncompetitive or other form of complementary bid.
5. My firm has not offered or entered into a subcontract or agreement regarding the purchase or sale of materials or services from any firm or person, or offered, promised or paid cash or anything of value to any firm or person, whether in connection with this or any other project, in consideration for an agreement or promise by any firm or person to refrain from bidding or to submit any intentionally high, noncompetitive or other form of complementary bid or agreeing or promising to do so on this project.
6. My firm has not accepted or been promised any subcontract or agreement regarding the sale of materials or services to any firm or person, and has not been promised or paid cash or anything of value by any firm or person, whether in connection with this or any other project, in consideration for my firm's submitting any intentionally high, noncompetitive or other form of complementary bid, or agreeing or promising to do so, on this project.
7. I have made a diligent inquiry of all members, officers, employees, and agents of my firm with responsibilities relating to the preparation, approval or submission of my firm's bid on this project and have been advised by each of them that he or she has not participated in any communication, consultation, discussion, agreement, collusion, or other conduct inconsistent with any of the statements and representations made in this affidavit.
8. I understand and my firm understands that any misstatement in this affidavit is and shall be treated as a fraudulent concealment from the Colorado Department of Transportation, of the true facts relating to submission of bids for this contract.

I DECLARE UNDER PENALTY OF PERJURY IN THE SECOND DEGREE, AND ANY OTHER APPLICABLE STATE OR FEDERAL LAWS, THAT THE STATEMENTS MADE ON THIS DOCUMENT ARE TRUE AND COMPLETE TO THE BEST OF MY KNOWLEDGE.

Contractor's firm or company name Traffic Signal Controls, Inc	By  Walter C Towle	Date 06/18/2025
	Title President	
2nd contractor's firm or company name. (If joint venture.)	By	Date
	Title	
Sworn to before me this 18th day of, June 2025		
Notary Public 		

My commission expires

10-05-2028

NOTE: This document must be signed in ink.

DIANE L BROOKES
Notary Public
State of Colorado
Notary ID # 20164038194
My Commission Expires 10-05-2028

CDOT Form #606 1/02



Traffic Controller and Cabinet Warranty

McCain controllers and cabinets are covered by a (2) two year limited warranty from the date of purchase. McCain warrants its products to be free of defects in workmanship and/or material. McCain will repair or replace any units found to be defective within the first (24) twenty-four months from the date of delivery.

McCain's warranty will cover full replacement of defective products for the first (12) twelve months. After the first (12) twelve months it is up to McCain's discretion whether the material will be replaced or repaired at no cost to the customer.

Before returning any products, the customer must call their McCain Representative or Account Manager @ 760-727-8100. The McCain representative will at that time record the date, description of problem, issue the RMA #, and then make the appropriate arrangements for the return of the product. The purchaser must prepay all freight, insurance and other transportation charges to send the product to McCain for warranty-coverage verification, repair or replacement, and, if found to be defective, McCain will return replacement / repaired product to the purchaser freight paid. McCain retains all replaced parts or products.

This warranty does not cover (1) product advice or assistance that McCain furnishes as a courtesy, (2) removal or reinstallation of products, (3) defects or damage as a result of accident, modification, misuse, improper service or repair, abuse or abnormal use including, without limitation, improper storage and incorrect installation, (4) acts of God or nature, exposure to casualty of elements. In all such cases the warranty is immediately null and void.

In no event shall this warranty run to OEM or component part buyers. All replacement products are warranted only for the remainder of the original warranty of the product replaced. Replacement products will be equivalent in function, but not necessarily identical to the replaced product.

This warranty is exclusive of all other warranties, expressed or implied, and McCain hereby specifically disclaims all other warranty claims of any type; including without limitation, a warranty of merchantability of any unit or its fitness for any particular use or purpose. In no event shall McCain be liable for interruption of business loss, profits or indirect or consequential damages, injury to person or damage to property from any cause whatsoever.

© McCain Inc. Updated 04/22/09. McCain reserves the right to change product warranties without notice.
For the most up-to-date information, please contact McCain

Phone 760-727-8100

Fax 760-727-8184

www.mccain-inc.com

2365 Oak Ridge Way // Vista, California 92081 // USA

PURCHASE SPECIFICATIONS

REQUEST FOR BID- TRAFFIC SIGNAL NEMA TS2 TYPE 1 MODULAR CABINET ASSEMBLY CABINET.

CONTENTS

- 1. INTRODUCTION**
- 2. CABINET DESIGN & CONSTRUCTION**
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- 5. POWER BUS ASSEMBLY**
- 6. AUXILIARY CABINET EQUIPMENT**
- 7. VEHICLE DETECTION**
- 8. CABINET TEST SWITCHES & POLICE SWITCH PANEL**
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- 10. TESTING & WARRANTY**

1. INTRODUCTION

This specification sets forth the minimum requirements for a TS2 Type 1 Traffic Control Cabinet Assembly. The cabinet assembly shall meet, as a minimum, all applicable sections of the NEMA TS2 Standard. The manufacturer shall be ISO 9001-2008 Registered and have been certified in the IPC "Class II" Electronics standard and training for all manufacturing staff to ensure manufacturing quality, documentation, and proper ongoing/continuing employee training for manufacturing processes by IPC Certified Trainers. The cabinet supplied under this specification shall be compatible with Econolite Cobalt, ASC/3 and ASC/2 controllers to ensure matched component system testing. Where differences occur, this specification shall govern.

CABINET ASSEMBLY PROFILE DETAIL:

Each TS2-1 PNG Westminster cabinet assembly shall include only the following as per outlined in the specification:

- 1 – P65 PAINTED ALUMINUM CABINET HOUSING; PAINTED WHITE INSIDE ONLY (REAR DOOR IS OPTIONAL IF REQUESTED)
- 2 – CAB LIFTING TABS
- 2 – CORBIN DT9 (New York) DEADBOLT LOCKS
- 1 – DUAL FAN PANEL ASSEMBLY
- 3 – LED LIGHT STRIPS, 2 IN TOP ON FAN PANEL AND 1 UNDER BOTTOM SHELF
- 2 – FULL WIDTH CABINET SHELVES
- 1 – POWER AUXILIARY PANEL W/SHA-1210 SURRESTOR, LINE FILTER, SSR, 1-40A CB, 2-15A CB, GFCI, EXTRA NEUTRAL AND GND BUS.
- 1 – 16 POSITION VERTICAL PNG MAIN PANEL ASSEMBLY
- 1 – POWER BUSS ASSEMBLY W/ 6 PNG POWER CONNECTORS
- 1 – 8-POSITION SDLC HUB ASSEMBLY W/ 6 SDLC CABLES, SCREW DOWN CABLES ON HUB END
- 1 – ALUMINUM WASHABLE CABINET AIR FILTER
- 1 – 8-CHANNEL DETECTOR RACK AND INTERFACE PANEL W/EVP INTERFACE CABLE
- 1 – POLICE/AUXILIARY SWITCH ASSEMBLY W/AUTO MANUAL AND POLICE CORD
- 1 – 6-POSITION POWER STRIP WIRED TO 4 POSITION TB ON LEFT SIDE, FILTERED POWER.
- 1 – 13" WIDE UNDER SHELF DOCUMENT DRAWER AND LAPTOP SHELF
- 1 – 8 POSITION LOAD RESISTOR PANEL ASSY
- 10 – RED JUMPERS FOR UNUSED PHASES
- 1 – CCA2 CONTROLLER POWER CABLE
- 1 – FLASHER
- 6 – FLASH TRANSFER RELAYS
- 16 – LOAD SWITCHES W/DUAL INPUT/OUTPUT INDICATORS
- 1 – MODEL MMU2-16LEIP MALFUNCTION MANAGEMENT UNIT (MMU)
- 1 – MODEL EDI PS200 CABINET POWER SUPPLY
- 3 – BUS INTERFACE UNITS (BIU)
- 1 – HYGROTERM HUMIDITY SENSOR AND HEATER (**P CABINET ONLY**)
- 1 – GENERATOR TRANSFER SWITCH W/ WIRED HIGH INTENSITY RED LED GPI CONFIRMATION LIGHT (**P CABINET ONLY**)
- 1 - TWO (2) EXTRA GROUND AND NEUTRAL BUS ASSEMBLIES SHALL BE MOUNTED BELOW THE SIGNAL TERMINATION PANELS (**P CABINET ONLY**)
- 1 - GENERATOR TRANSFER SWITCH ASSEMBLY WITH HIGH INTENSITY GPI CONFIRMATION LIGHT (**P CABINET ONLY**)
- 1 - 30A GENERATOR PLUG (**P CABINET ONLY**)

2. CABINET DESIGN & CONSTRUCTION

2.1 CABINET HOUSING

- 2.1.1 The cabinet shall be constructed from type 5052-H32 aluminum with a minimum thickness of 0.125 inches.
- 2.1.2 The cabinet shall be designed and manufactured with materials that shall allow rigid mounting, whether intended for pole, base, or pedestal mounting. The cabinet shall not flex on its mount.
- 2.1.3 A rain channel shall be incorporated into the design of the main door opening to prevent liquids from entering the enclosure. The cabinet door opening shall be a minimum of 80 percent of the front surface of the cabinet. A stiffener plate shall be welded across the inside of the main door to prevent flexing.
- 2.1.4 The top of the cabinet shall incorporate a minimum of 1-inch slope toward the rear to prevent rain accumulation.
- 2.1.5 Unless otherwise specified, the cabinet shall be supplied with a natural aluminum finish. Sufficient care shall be taken in handling to ensure that scratches are minimized. All surfaces shall be free from weld flash. Welds shall be smooth, neatly formed, free from cracks, blowholes, and other irregularities. All sharp edges shall be ground smooth.
- 2.1.6 Where painted cabinets are specified, the exterior shall be degreased and primed with a spray applied iron phosphate coat – equivalent to a four-stage iron phosphate coat, prior to painting. The final coat shall consist of a powder-coat paint (TGIC or equivalent) applied with a minimum thickness of 2 mils. The cabinet shall be painted inside only – White.
- 2.1.7 All seams shall be continuous welded.
- 2.1.8 The lower section of the cabinet shall be equipped with a louvered air entrance. The air inlet shall be large enough to allow sufficient air flow per the rated fan capacity. Louvers shall satisfy the NEMA rod entry test for 3R ventilated enclosures. A non-corrosive, removable aluminum air filter shall be secured to the air entrance. The filter shall fit snugly against the cabinet door wall.
- 2.1.9 The roof of the cabinet shall incorporate an exhaust plenum with a vent screen. Perforations in the vent screen shall not exceed 0.125 inches in diameter

2.2 CABINET DOORS

- 2.2.1 The main door and the police door-in-door shall close against a weather-proof, dust-proof, closed-cell neoprene gasket seal. The gasket material for the main door shall be a minimum of 0.250 inches thick by 0.500 inches wide. The gaskets shall be permanently bonded to the cabinet.
- 2.2.2 The handle on the main door of the cabinet shall be manufactured from cast aluminum or stainless steel. The handle shall include a hasp for the attachment of an optional padlock. The cabinet door handle shall rotate counter-clockwise to open. The handle shall be positioned so that the

- handle shall not cause any interference with the key when opening the cabinet door.
- 2.2.4 The main door hinge shall be a one-piece, continuous piano hinge with a stainless-steel pin running the entire length of the door. The hinge shall be attached in such a manner that no rivets or bolts are exposed.
 - 2.2.5 The main door shall include a mechanism capable of holding the door open at approximately 90, 145, and 165 degrees under windy conditions. The cabinet shall be provided with a single front door. As an option, two (2) doors (front door and a rear door) shall be provided on request.
 - 2.2.6 The front and rear cabinet doors shall be equipped with a Corbin tumbler lock DT9 or exact equivalent, with a minimum of two keys provided.
 - 2.2.7 The police door-in-door shall be provided with a treasury type lock, Corbin No. R357SGS or exact equivalent, with a minimum of one key provided.
 - 2.2.8 The main cabinet front door shall incorporate a shroud to cover the filtered louvered openings as appropriate for the design. The assembly is secured on the interior of the door over the filtered louvers. The shroud is louvered downward and matches the door louvers.

2.3 EQUIPMENT MOUNTING RAILS

- 2.3.1 A minimum of one set of vertical "C" channels shall be mounted on each interior wall of the cabinet for the purpose of mounting the cabinet components. The channels shall accommodate spring-mounted nuts or studs. All mounting rails shall extend to within three (3) inches of the top and bottom of the cabinet. Rear-wall rail spacing shall be 18.50 inches center-to-center.
- 2.3.2 For size 6 or larger cabinets, each sidewall shall have two (2) sets of equipment mounting rails. Each rail set shall be spaced 7.88 inches center-to-center. All channel nuts used to install equipment on the rails shall be the spring-loaded type.

2.4 EQUIPMENT SHELVES

- 2.4.1 All cabinets shall be supplied with two removable shelves manufactured from 5052-H32 aluminum. The shelf shall be a minimum of 10 inches deep and have ledges at the backs with a minimum height of 2".
- 2.4.2 The shelf shall have horizontal slots at the rear and vertical slots at the front of the turned down side flange. The shelf shall be installed by first inserting the rear edge of the shelf on the cabinet rear sidewall mounting studs, then lowering the shelf on the front sidewall mounting studs. The shelf shall be held in place by a nylon tie-wrap inserted through the holes on the front edge of the shelf and around the front sidewall mounting studs.
- 2.4.3 The front edge of the shelf shall have holes punched every 6 inches to accommodate tie-wrapping of cables/harnesses.

2.5 CABINET MOUNTING

- 2.5.1 All base mounted cabinets require anchor bolts to properly secure the cabinet to its base. The cabinet flange for securing the anchor bolts shall not protrude outward from the bottom of the cabinet. Four (4) anchor bolts shall be required for proper installation.

2.6 CABINET SIZES

- 2.6.1 The cabinet shall be of sufficient size to accommodate all equipment. The minimal cabinet size is:
- 65" H x 44" W x 26" D

2.7 UL LISTED CERTIFICATION

- 2.7.1 All enclosures shall be constructed, approved and marked in accordance with the requirements for Type 1 Industrial Control Panel Enclosures contained in UL 508A, the Standard for Industrial Control Panels. The enclosure shall meet NEMA 3R rating requirements and be marked with a UL approval sticker.

3. TERMINALS & FACILITIES/MAIN PANEL DESIGN & CONSTRUCTION

3.1 TERMINALS & FACILITIES

- 3.1.1 The terminals & facilities shall be supplied as a minimum in the following NEMA configuration:
- *NEMA Configuration #4* – Sixteen (16) load switch sockets; six (6) flash transfer relay sockets; one (1) flasher socket; two (2) BIU sockets; one (1) 16-channel detector rack with one (1) BIU; one (1) Type-16 MMU
- 3.1.2 All terminals & facilities configurations shall be provided with BIU wiring assignments consistent with the current NEMA TS2 Standard.
- 3.1.3 All terminals & facilities configurations shall be provided with sufficient RS-485 Port 1 communication cables to allow for the intended operation of that cabinet. Each communication cable connector shall be a 15-pin meal shell D subminiature type. The cable shall be a shielded cable suitable for RS-485 communications.
- 3.1.4 The grounding system in the cabinet shall be divided into three (3) separate circuits:
AC Neutral; Earth Ground; Logic Ground. These ground circuits shall be connected together at a single point as outlined in the current NEMA TS2 Standard.

3.2 MAIN PANEL DESIGN & CONSTRUCTION

- 3.2.1 The main panel shall be constructed from 5052-H32 brushed aluminum of 0.125 inches minimum thickness and installed so as to minimize flexing when plug-in components are installed.

- 3.2.2 The 16-position main panels are provided with a mounting mechanism which allows easy access to all wiring on the rear of the panel. Lowering of the main panel shall be accomplished without the use of hand tools. Complete removal shall be accomplished by the use of simple hand tools.
- 3.2.3 All load switch and flash transfer relay sockets reference designators shall be silkscreen labeled on the front and rear of the main panel to match drawing designations. Socket pins shall be marked for reference on the rear of the panel.
- 3.2.4 Main panel load switch sockets should be positioned in two rows of eight.
- 3.2.5 All load switches shall be supported by a bracket, extending at least half the length of the load switch.
- 3.2.6 The sixteen (16) load switch position main panels should have all field wires contained on two (2) rows of horizontally mounted terminal blocks. The upper row shall be wired for the pedestrian and overlap field terminations.
- 3.2.8 The field output circuits shall be terminated on a non-fused barrier type terminal block with a minimum rating of 10 amps.
- 3.2.10 The field input/output (I/O) terminals shall be identified by permanent alphanumeric labels. All labels shall use standard nomenclature per the NEMA TS2 Standard.
- 3.2.11 It shall be possible to flash either the yellow or red indication on any vehicle movement and to change from one color indication to the other by use of a screwdriver.
- 3.2.12 Field terminal blocks shall be wired to use four (4) positions per vehicle or overlap phase (green; yellow; and red flash). It shall not be necessary to de-bus field terminal blocks for flash programming.
- 3.2.13 The main panel shall contain at least one (1) flasher socket (silkscreen labeled) capable of operating a 15-amp, 2-pole, NEMA solid state flasher. The flasher shall be supported by a bracket, extending at least half its length.
- 3.2.14 One (1) RC network shall be wired in parallel with each group of three flash transfer relays and any other relay coils.
- 3.2.15 All logic-level, NEMA controller and Malfunction Management Unit input and output terminations on the main panel shall be permanently labeled. Cabinet prints shall identify the function of each terminal position.
- 3.2.16 At a minimum, three (3) 20-position terminal blocks shall be provided at the top of the main panel to provide access to the controller unit's programmable and non-programmable I/O. Terminal blocks for DC signal interfacing shall have a number 6-32 x 7/32 inch screw as a minimum.
- 3.2.17 All main panel wiring shall conform to the following wire size and color:
- Green/Walk load switch output – brown wire – 14 gauge
 - Yellow load switch output – yellow wire – 14 gauge

- Red/Don't Walk load switch output – red wire – 14 gauge
- MMU (other than AC power) – violet wire – 22 gauge
- Controller I/O – blue wire – 22 gauge
- AC Line (power panel to black wire main panel) – 8/10 gauge
- AC Line (main panel) – black wire – 10 gauge
- AC Neutral (power panel to white wire main panel) – 8/10 gauge
- AC Neutral (main panel) – white wire – 10 gauge
- Earth Ground (power panel) – green wire – 8 gauge
- Logic Ground – gray wire – 22 gauge
- Flash Programming – Orange wire – various gauge sizes
- Flasher Terminal – Black wire, red or yellow field terminal – 14 gauge

- 3.2.18 All wiring, 14 AWG and smaller, shall conform to MIL-W-16878/1, type B/N, 600V, 19-strand tinned copper. The wire shall have a minimum of 0.010 inches thick PVC insulation with clear nylon jacket and rated to 105 degrees Celsius. All 12 AWG and larger wire shall have UL listed THHN/THWN 90 degrees Celsius, 600V, 0.020 inches thick PVC insulation and a clear nylon jacket.
- 3.2.19 Connecting cables shall be sleeved in a braided nylon mesh or poly-jacketed. The use of exposed tie-wraps or interwoven cables is not acceptable.
- 3.2.20 All main panels shall be pre-wired for a Type-16 Malfunction Management Unit.
- 3.2.21 All wiring shall be neat in appearance. All cabinet wiring shall be continuous from its point of origin to its termination point. Butt type connections/splices are not acceptable.
- 3.2.22 All connecting cables and wire runs shall be secured by mechanical clamps. Stick-on type clamps are not acceptable.
- 3.2.23 The main panel shall incorporate a relay, designated as K1, to remove +24 VDC from the common side of the load switches when the intersection is placed into mechanical flash. The relay shall have a momentary pushbutton to apply power to the load switch inputs for ease of troubleshooting.
- 3.2.24 All pedestrian pushbutton inputs from the field to the controller shall be opto-isolated through the BIU and operate at 12 VAC.
- 3.2.25 All wire (size 16 AWG or smaller) at solder joints shall be hooked or looped around the eyelet or terminal block post prior to soldering to ensure circuit integrity. Lap joint soldering is not acceptable.
- 3.2.26 The main panel connections for power and all cabinet switch interfacing shall be via a 37-pin plastic shell MS connector with an incorporated twist lock as part of the Plug N Go cabinet system wiring.
- 3.2.27 A six (6) position power strip assembly shall be installed on the upper left-hand rails in the cabinet assembly. This power strip shall receive filtered

power from the power auxiliary panel via a 4-position terminal block, located near the power strip on the left side of the cabinet.

4. POWER PANEL DESIGN & CONSTRUCTION

- 4.1 The power panel shall interface with the main panel and be located on the lower right portion of the cabinet. The power panel shall be wired to provide the necessary filtered power to the load switches, flasher(s), and power bus assembly. The technicians shall be protected from the power panel components with a removable Plexiglas front cover. The design shall allow a technician to access the main and auxiliary breakers without removing the protective front cover.
- 4.2 The power panel portion of the main panel shall include the following components:
- One (1) 40-amp main circuit breaker. This breaker shall supply power to the controller, MMU, signals, cabinet power supply and auxiliary panels. Breakers shall be at a minimum, a thermal magnetic type, UL listed for HACR service, with a minimum of 10,000 amp interrupting capacity.
 - One (1) 15-amp auxiliary breaker shall supply power to the fan, light and GFI utility outlet.
 - One (1) 15-amp circuit breaker shall supply filtered power to the power strip located elsewhere in the cabinet assembly. The circuit breaker shall be wired to the 4-position terminal block, located on the upper left side of the cabinet.
 - An EDCO/HESCO model SHA-1210 or exact approved equivalent surge arrester.
 - A 50-amp, 125 VAC radio interference line filter.
 - A normally-open, 75-amp, solid state signal bus relay. The SSR shall be a Crydom Model# HA4875H or approved equivalent.
 - A minimum of one (1) 8-position neutral bus bar capable of connecting three (3) #12 wires per position.
 - A minimum of one (1) 6-position ground bus bar capable of connecting three (3) #12 wires per position.
 - A minimum of one (1) NEMA type 5-15R GFI utility outlet.

5. POWER BUS ASSEMBLY – SDLC HUB ASSEMBLY

- 5.1 The power bus assembly shall be manufactured from 0.090", 5052-H32 aluminum. It shall provide filtered power for the controller, MMU, cabinet power supply, and all auxiliary equipment.
- 5.2 The power bus assembly shall house the following components:
- A minimum of three (3) and a maximum of six (6) power connectors.
 - Two (2) terminal strips to hardwire the power connections.

- 5.3 All cabinet equipment requiring filtered power to operate shall be connected to the power bus assembly by a fourteen (14) pin plastic MS circular connector with a twist lock connection, or hardwired directly to the supplied terminal blocks.
- 5.4 SDLC connections shall be made via an eight (8) position SDLC Hub Assembly. The SDLC Hub assembly shall have provisions for the SDLC cable connectors to be tightened down the hub assembly by two screws. Six (6) SDLC cables shall be supplied with each cabinet.

6. AUXILIARY CABINET EQUIPMENT

6.1 CABINET VENTILATION SYSTEM

- 6.1.1 The cabinet shall be provided with two (2) thermostatically controlled (adjustable between 55-160 degrees Fahrenheit) ventilation fans in the top of the cabinet plenum. The fan plate shall be removable with the use of simple hand tools for serviceability. A minimum of two (2) exhaust fans shall be provided. The fans shall be a ball-bearing type fan and shall be capable of drawing a minimum of 100 cubic feet of air per minute each. The Fan/Thermostat assembly shall be connected to the power panel by means of a 4-position plug-in cable.
- 6.1.2 An LED cabinet lighting system shall be used to illuminate the internal structure of the cabinet assembly. Two (2) LED cabinet lighting strips shall be mounted on the fan panel assembly in the top of the cabinet. The fan panel shall also incorporate the LED light power supply. The LED light strips shall be Califla Model P3100-C-S or approved equal. The lamp shall be wired to a door activated switch mounted near the top of the door. A third LED light strip shall be mounted under the bottom shelf to illuminate the lower portion of the cabinet, specifically the field terminals.

6.2 MISCELLANEOUS ITEMS

- 6.2.1 A document drawer shall be mounted to the underside of the bottom shelf to store the cabinet documents. The document drawer shall be a minimum of 13" wide.
- 6.2.2 A minimum of two (2) sets of complete and accurate cabinet drawings shall be supplied with each cabinet.

7. VEHICLE DETECTION

- 7.1 One (1) loop detector rack shall be provided in each cabinet. The Detector rack shall be available in the following NEMA configuration.
- *NEMA Configuration #2* – Shall support up to eight (8) channels of loop detection (either eight (4) 2-channel detectors or four (2) 4-channel detectors), two (2) preemption devices, and one (1) BIU.
- 7.2 Detector rack BIU mounting shall be an integral part of the detector rack.

- 7.3 All BIU rack connectors shall have jumper address pins corresponding to the requirements of the NEMA TS2 Standard. The jumpers may be moved to change the address of any individual rack. The address pins shall control the BIU mode of operation. BIUs shall be capable of being interchanged with no additional programming.
- 7.4 Each cabinet shall contain detector interface panels for the purpose of connecting field loops and loop detector racks. The panels shall be manufactured from FR4 G10 fiberglass, 0.062 inches thick, with a minimum of 2 oz. of copper for all traces.
- 7.5 One (1) 8-position interface panel shall be provided for a 8-channel rack cabinet. The interface panel shall be secured to a mounting plate and attached to the left wall of the cabinet.
- 7.6 Each interface panel shall allow for the connection of eight (8) independent field loops. A ground bus terminal shall be provided between each loop pair terminal to provide a termination for the loop lead-in cable ground wire.
- 7.7 Each interface panel shall provide a 10-position terminal block to terminate the field wires for up to two (2) 2-channel preemption devices.
- 7.8 Lightning protection device mounting holes shall be provided to accommodate an EDCO SRA-16C or EDCO SRA-6 or EDCO LCA-6, or a varistor lightning protection device. Lightning protection devices shall not be provided unless specified.
- 7.9 A cable consisting of 20 AWG twisted pair wires shall be provided to enable connection to and from the panel to a detector rack. The twisted pair wires shall be color-coded red and white wire.
- 7.10 All termination points shall be identified by a unique number and silkscreened on the panel.
- 7.11 Each detector rack shall accommodate rack-mountable emergency vehicle preemption (EVP) devices such as Opticom.
- 7.12 Each detector rack shall be powered by the cabinet power supply and be connected to the power bus assembly by means of a 14-pin plastic MS circular connector with a twist lock connection.

8. CABINET TEST SWITCH PANEL & POLICE SWITCH PANEL

8.1 CABINET TEST SWITCH PANEL

- 8.1.2 A test switch panel shall be mounted on the inside of the main door. The test switch panel shall provide as a minimum the following:
- AUTO/FLASH SWITCH – In the FLASH position, power shall be maintained to the controller and the intersection shall be placed in flash. The controller shall not be stop-timed when in flash. Wired according to the current NEMA TS2 Standard, the MMU forces the controller to initiate the start-up sequence when exiting flash.

- STOP-TIME SWITCH – In the STOP-TIME position, the controller shall be stop-timed in the current interval.
- CONTROL EQUIPMENT POWER ON/OFF – This switch shall control the controller, MMU, and cabinet power supply AC power. Momentary test pushbuttons for all vehicle and pedestrian inputs to the controller are not required. The TS2 controller to be provided with the cabinet assembly shall provide vehicular and pedestrian call inputs from its keyboard while in the standard status display.

8.2 POLICE SWITCH PANEL

- 8.2.1 A police switch panel shall be mounted inside the police access compartment located on the exterior of the cabinet door. The police switch panel shall contain the following:
- SIGNALS ON/OFF SWITCH – In the OFF position, power shall be removed from signal heads in the intersection. The controller shall continue to operate. When in the OFF position, the MMU shall not conflict or require reset.
 - AUTO/FLASH SWITCH – In the FLASH position, power shall be maintained to the controller, and the intersection shall be placed in flash. The controller shall be stop-timed when in flash. Wired according to the current NEMA TS2 Standard, the MMU forces the controller to initiate the start-up sequence when exiting flash.
 - AUTO/MANUAL SWITCH – Cabinet wiring shall include provisions for an AUTO/MANUAL switch and a momentary pushbutton or hand cord. The AUTO/MANUAL switch and pushbutton or hand cord shall be in each cabinet assembly.

8.3 SWITCH & WIRING REQUIREMENTS

- 8.3.1 All toggle switches shall be heavy duty and rated 15-amps minimum. Single- or double-pole switches may be provided, as required.
- 8.3.2 Any exposed terminals or switch solder points shall be covered with a non-flexible shield to prevent accidental contact.
- 8.3.3 All switch functions shall be permanently and clearly labeled.
- 8.3.4 All wire routed to the police door-in-door and test switch pushbutton panel shall be adequately protected against damage from repetitive opening and closing of the main door.
- 8.3.5 All test switch panel wiring shall be connected to the main panel via a 24-pin plastic MS circular connector with a twist lock connection.
- 8.3.6 All wiring from the main panel to the test switch panel shall be connected to the test switch panel via a 24-pin plastic MS circular connector with a twist lock connection.

- 8.3.7 An eight (8) position resistor panel assembly shall be installed on the right lower side of the cabinet and wired to the odd Vehicle phase red on the main panel.

9. AUXILIARY DEVICES

9.1 LOAD SWITCH

- 9.1.1 Load switches shall be solid state and shall conform to the requirements of the NEMA TS2 Standard.
- 9.1.2 Signal load switches shall have a minimum rating of 10 amperes at 120 VAC for an incandescent lamp load.
- 9.1.3 The front of the load switch shall be provided with three indicators to show the input signal from the controller to the load switch.
- 9.1.4 Load switches shall be dedicated per phase. The use of load switches for other partial phases is not acceptable.
- 9.1.5 A full complement of load switches shall be supplied with each cabinet to allow for maximum phase utilization for which the cabinet is designed.

9.2 FLASHER

- 9.2.1 The flasher shall be solid state and shall conform to the requirements of the NEMA TS2 Standard.
- 9.2.2 Flashing of field circuits for the purpose of intersection flash shall be accomplished by a separate flasher.
- 9.2.3 The flasher shall be rated at 15 amperes, double-pole with a nominal flash rate of 60 FPM.

9.3 FLASH TRANSFER RELAY

- 9.3.1 All flash transfer relays shall meet the requirements of the NEMA TS2 Standard.
- 9.3.2 The coil of the flash transfer relay shall be de-energized for flash operation.
- 9.3.3 A full complement of flash transfer relays shall be supplied with each cabinet to allow maximum phase utilization for which the cabinet is designed.

9.4 MALFUNCTION MANAGEMENT UNIT (MMU)

- 9.4.1 Each cabinet assembly shall be supplied with one (1) MMU as defined by the requirements of the NEMA TS2 Standard.
- 9.4.2 Malfunction Management Units shall be a Type-16. The MMU shall be Econolite Model 1133-128 (EDI Model MMU2-16LEip) or approved equivalent.

9.5 BUS INTERFACE UNIT (BIU)

- 9.5.1 All BIUs shall meet the requirements of the NEMA TS2 Standard.
- 9.5.2 A full complement of Bus Interface Units shall be supplied with each cabinet to allow for maximum phase and function utilization for which the cabinet is designed (Econolite or EDI preferred).
- 9.5.3 Each BIU shall include power on, transmit and valid data LED-type indicators.

9.6 CABINET POWER SUPPLY

- 9.6.1 The cabinet power supply shall meet the requirements of the NEMA TS2 Standard.
- 9.6.2 The cabinet power supply shall provide LED indicators for the line frequency, 12 VDC, 12 VAC, and 24 VDC outputs.
- 9.6.3 The cabinet power supply shall provide (on the front panel) jack plugs for access to the +24 VDC for test purposes.
- 9.6.4 One (1) cabinet power supply shall be supplied with each cabinet assembly and shall be wired directly to the Power Bus Assembly via a fourteen (14) pin plastic MS circular connector with a twist lock connection. (Econolite or EDI preferred or approved equal.)

AUXILIARY CABINET DEVICES - TO BE PROVIDED PER CUSTOMER REQUEST

- Two (2) battery shelves and covers shall be provided and installed on the lower left side of the cabinet for housing three (3) batteries.

10. TESTING & WARRANTY

10.1 TESTING

- 10.1.1 Each controller and cabinet assembly shall be tested as a complete entity under signal load for a minimum of 48 hours.
- 10.1.2 Each assembly shall be delivered with a signed document detailing the cabinet final tests performed.
- 10.1.3 The cabinet shall be assembled and tested by the controller manufacturer or an authorized local distributor to ensure proper component integration and operation.

10.2 WARRANTY

- 10.2.1 The controller and Malfunction Management Unit shall be warranted by the manufacturer against mechanical and electrical defects for a period of two (2) years from date of shipment. The manufacturer's warranty shall be supplied in writing with each cabinet and controller. Second party extended warranties are not acceptable.
- 10.2.2 The cabinet assembly and all other components shall be warranted for a period of one (1) year from date of shipment.
- 10.2.3 Any defects shall be corrected by the manufacturer or supplier at no cost to the owner.

EBERLE DESIGN INC.

3819 East La Salle Street Tel (480) 968-6407
Phoenix, AZ 85040 USA Fax (602) 437-1996
www.EDIttraffic.com



PRODUCT LIMITED WARRANTY AND REPAIR POLICY

Eberle Design Inc. warrants all equipment to be free from defects in material or workmanship for a period of two (2) years from date of manufacture. Load Switches, Flashers and Power Supplies receive a one (1) year warranty period.

Eberle Design Inc. will perform any repair due to defects in material or workmanship during the warranty period. Repair service after the warranty period has expired will be available at the following rates:

1. Signal Monitors at the flat rate of \$55 USD.
 - a. For signal monitors manufactured prior to 1987, the repair charge is \$90 USD.
2. Load Switches and Flashers at the flat rate of \$12.50 USD.
3. Loop Detectors at the flat rate of \$25.00 USD.
4. Auxiliary equipment (BIUs, SIUs, Power Supplies, etc) at the flat rate of \$25.00 USD.

These rates are subject to change without notice. Repaired units are supplied with a one year extended warranty period from the date of repair.

Eberle Design Inc. reserves the right to supply new or replacement products at its discretion and has the sole right to determine whether or not any item is covered under our warranty policy. This warranty does not cover damage due to lightning, physical abuse, unauthorized attempts at repair, modifications, or mis-application of the unit. Lightning or high voltage damaged units, if repairable, will be returned with no warranty of any kind.

The date of manufacture can be determined from the nine-digit serial number. The nine digit number is composed with the first two digits being the year of manufacture, the next two digits are the month of manufacture, and the last five digits are an incrementing number for the month. For example, in the serial number example of 060812345, the digits 06 would represent the year 2006 and the digits 08 would represent the month of August.

SSM12LE	Rev:
345647	0162

060812345

EDI currently does not use an RMA system. Send the equipment to:

Eberle Design Inc.
Attention: Repair
3819 E La Salle Street
Phoenix, AZ 85040

Please include all contact information and any relevant test reports or failure descriptions available.



SmartMonitor

MMU-16LE SERIES

NEMA LCD MALFUNCTION MANAGEMENT UNIT

- MMU-16LE with EIA-232 Port
- MMU-16LEip with 10/100Mbps Ethernet Port

Whether you're a **NOVICE** or **EXPERT** Signal Technician, wouldn't it be great if you could:

- ☐ Use a built-in SETUP WIZARD to **quickly and accurately configure** the Signal Monitor to the exact requirements of the cabinet and intersection?
- ☐ Use a MENU DRIVEN LCD interface to **view** vital cabinet operational details such as field signal voltages, historical event logs, and monitor configuration data?
- ☐ Use a built-in DIAGNOSTIC WIZARD to **automatically diagnose** cabinet malfunctions and **pinpoint** faulty signals?

If your answer is Yes, the **MMU-16LE SmartMonitor™**, is for YOU!

MMU-16LE SmartMonitor ENHANCED FEATURES

- Nema TS2-2003 Standard:** The MMU-16LE SmartMonitor™ meets all specifications of the Nema Standard TS2-2003 while maintaining downward compatibility with existing Nema TS1-1989 Traffic Control Assemblies.
- Standardized Communications:** Real-time SDLC communications with the Controller Unit exchanges field input status, Controller Unit output status, fault status, MMU programming, and time and date.
- Full Intersection & Status Display:** Two high contrast, large area Liquid Crystal Displays (LCD) continuously show full RYG(W) intersection status. A separate graphic LCD provides a menu driven user interface to status, signal voltages, configuration, event logs, and the Help system.
- Event Logging:** A time-stamped nonvolatile event log records the complete intersection status as well as AC Line events, configuration changes, monitor resets, temperature and true RMS voltages.
- Setup Wizard:** Use the built-in Setup Wizard to configure the Nema Enhanced settings of the SmartMonitor™ by answering a short series of questions regarding intersection design and operation.
- Diagnostic Wizard and Help System:** The Diagnostic Wizard *automatically pinpoints* faulty signals and offers trouble-shooting guidance. The integrated Help System provides context sensitive operational assistance.
- TS-1 Type 12 with SDLC Mode:** The MMU-16LE can be configured to operate with the Port 1 SDLC function and Diagnostic Wizard enabled in a TS-1 twelve channel cabinet with no cabinet wiring changes.
- Program Card Memory:** Enhanced settings of the MMU-16LE are stored in nonvolatile memory on the EDI Program Card. Moving the Program Card to another MMU-16LE automatically transfers all settings.
- Signal Sequence History Log:** The five Signal Sequence History logs stored in nonvolatile memory graphically display up to 30 seconds of signal status prior to each fault event.
- LEDguard™:** This EDI innovative signal thresholding technique can be used to increase the level of monitoring protection when using LED based signal heads.
- EDI RMS-Engine™:** A DSP coprocessor converts AC input measurements to True RMS voltages, virtually eliminating false sensing due to changes in frequency, phase, or sine wave distortion.
- ECcom™ PC Software:** Access to the MMU-16LE data is provided by the industry standard EDI ECcom™ Windows based software for status, event log retrieval, configuration, and data archival.
- Flashing Yellow Arrow PPLT:** The SmartMonitor™ supports MUTCD Flashing Yellow Arrow PPLT operation with two different modes for either TS-2 or TS-1 cabinet configurations.

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Fax (602) 437-1996





PS-250

Heavy Duty Cabinet Power Supply

The ideal power source when using high current devices such as video detection cards.

The PS-250 Cabinet Power Supply is a shelf mounted unit which supplies regulated DC power, unregulated AC power, and a line frequency reference for the Detector Rack, BIUs, load switches, and other auxiliary equipment. The PS-250 meets and/or exceeds all requirements of the NEMA TS2-2003 Standard.

All TS-2 Type 1 cabinet assemblies require the use of this unit as well as any TS-2 Type 2 cabinet assemblies that utilize Bus Interface Units (BIU).

Each EDI PS-250 Cabinet Power Supply is put through a rigorous three part Total Quality Assurance program and tested under the extreme environmental conditions experienced on the street. It is this commitment to quality and performance that EDI products are known for, providing years of trouble free operation.

PS-250 OPERATIONAL FEATURES

Basic Functions: The PS-250 provides four outputs rated over the full -30°F to 165°F (-34°C to +74°C) Nema operating temperature range:

- ☒ +12 VDC rated at 5 Amps
- ☒ +24 VDC rated at 2 Amps
- ☒ 12 VAC rated at 0.25 Amps
- ☒ 60 Hz Line Frequency Reference rated at 50 mAmps
- ☒ Input Voltage Operating Range is 89 Vac to 135 Vac at 50 Hz

Display Indicators: A separate LED indicator is provided to display output status and fuse integrity for the three supply outputs. The Line Frequency Reference LED indicator pulses to show 60 Hz activity.

Input / Output Pins:	Pin	Function
	A	AC Neutral
	B	Line Frequency Reference Output
	C	AC Line Input
	D	+12 VDC Output
	E	+24 VDC Output
	F	Reserved
	G	Logic Ground
	H	Earth Ground
	I	12 VAC Output
	J	Reserved

Test Points: Individual test jacks are provided for the +12 VDC output, +24 VDC output, and Logic Ground reference.

Output Protection: The +12 VDC, +24VDC, and 12 VAC outputs are fused for over-current protection. Each output is protected against voltage transients by a 1500 Watt suppressor.

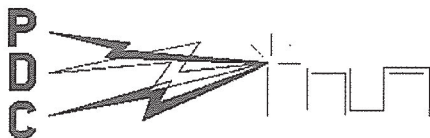
Dimensions: 8.2 inches High x 4 inches Wide x 8 inches Deep

EBERLE DESIGN INC.

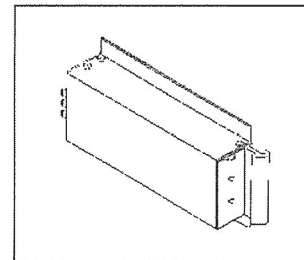
3819 East La Salle Street
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Tel (480) 968-6407
Fax (602) 437-1996





DATA SHEET: SSF-87 / 170 TYPE 204



Solid State Flasher With Replaceable

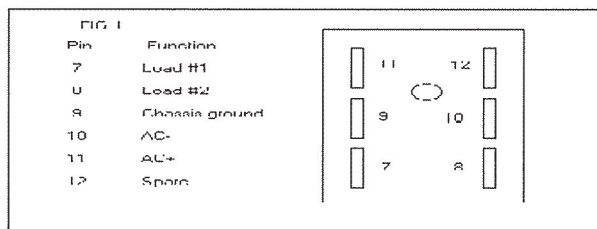
Modules:

General Description:

The PDC model SSF-87 is a dual pack, modular, solid state flasher designed specifically to meet NEMA specifications as well as New York "Model 204" specifications. Each flasher contains two individually replaceable modules that are enclosed in a dust resistant, metal enclosure, providing mechanical protection, and excellent heatsinking for the modules. The modules are easily accessible with the use of a crew driver.

Installation:

The flasher intermates with the model 332 cabinet as well as with any NEMA loadbay. It is easily installed or removed by grasping the extruded handle. Connector pinouts are shown in FIG 1. The connector mates with a Beau S-5406-LAB or equivalent.



General Characteristics:

Load

Voltage..... 120 VAC
Current (max).....25.0 Amps
(Tungsten filament load)

Off State

dv/dt..... 100V per microsecond
Line to load resistance... 15k Ohms min.
Leakage current.....less than 20 mA

Surge Current

One cycle..... 175 Amps RMS min.
One second..... 40 Amps RMS min..

Life

Operations.....30 million min.

Flash Rate

50-60 cycles (flashes) per minute.

Mechanical

Length..... 8.40 inches
Width..... 1.70 inches
Height..... 4.185 inches
Weight..... 1.50 Lbs.

Operating Temperature -35 to +74 degrees C

Adjustments: The model SSF-87 flasher has no adjustment controls.

Guaranteed : The flasher is fully guaranteed against all failures due to manufacturing defects for two years.

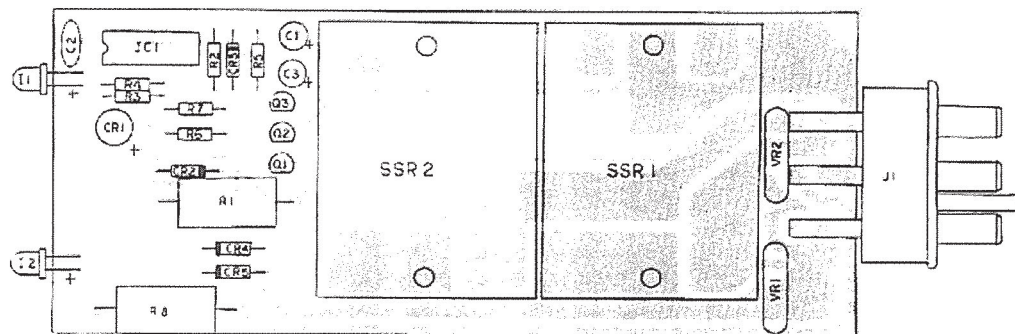


FIG. 2

CLARY CORPORATION
LIMITED WARRANTY
DEPOT REPAIR – SP Series UPS Systems – 9/1/2018

1 TIME AND SCOPE OF WARRANTY:

- 1.1 Clary Corporation, (hereafter referred to as Clary) hereby warrants newly manufactured UPS Systems and batteries shipped under this agreement to be free from defects in material and workmanship for a period of Three (3) Years following the date of delivery. This warranty is applicable only to the initial retail purchaser and is not transferable. This warranty is applicable to systems delivered after April 1, 2018. This warranty is applicable only to SP Series (models SP1250LX, SP2000LX, SP560, SP1250LE and SP1250DLE) sold for use in road-side traffic signal control applications or intelligent traffic systems applications.
- 1.2 Clary Outpost or Garrison batteries shall be considered part of the UPS System when purchased together for installation.
- 1.3 The date of delivery as used herein will be the date on the Bill of Lading. If no Bill of Lading is issued, the date of shipment shall be shown on seller's shipping document.
- 1.4 No provision of this warranty shall cover equipment which has been altered or modified from the original specifications to which same was manufactured or work performed by owner or third-party unless authorized in writing.
- 1.5 This limited warranty applies only to Clary Corporation equipment installed in the United States and Canada.
- 1.6 Accidental damage, misuse or normal wear shall not be construed as a defect. Batteries must be maintained during storage and operation in accordance with the technical manual, including proper temperature storage and charging.
- 1.7 Warranty coverage of batteries does not include failure due to breakage, transitory damage, freezing, abuse, neglect, fire, explosion, flood, case bulging cause by excessive/high temperatures, lack of temperature compensation, damage from electrical equipment, overcharge, undercharge, modifications or alterations to the battery, batteries requiring charging only, improperly sized batteries, use outside of intended applications, batteries not maintained in storage, batteries installed in strings of mismatched sizes/ages, premature failure due to high temperature operation, or any reason not directly related to material or manufacturing defect. Warranty coverage does not include battery disposal.
- 1.8 Where DOT acceptance is required per state contract, the warranty period for the UPS system and battery packs shall begin on the date of the final acceptance by the Department, provided such date does not exceed 180 days from the date of shipment. In absence of written notification of final acceptance, the warranty shall commence of the date of delivery.
- 1.9 This warranty may be extended in part for up to two years at additional cost at the time of original equipment purchase. Extended warranties exclude battery coverage.

2 LIMITS OF "IN-WARRANTY" SERVICE LIABILITY

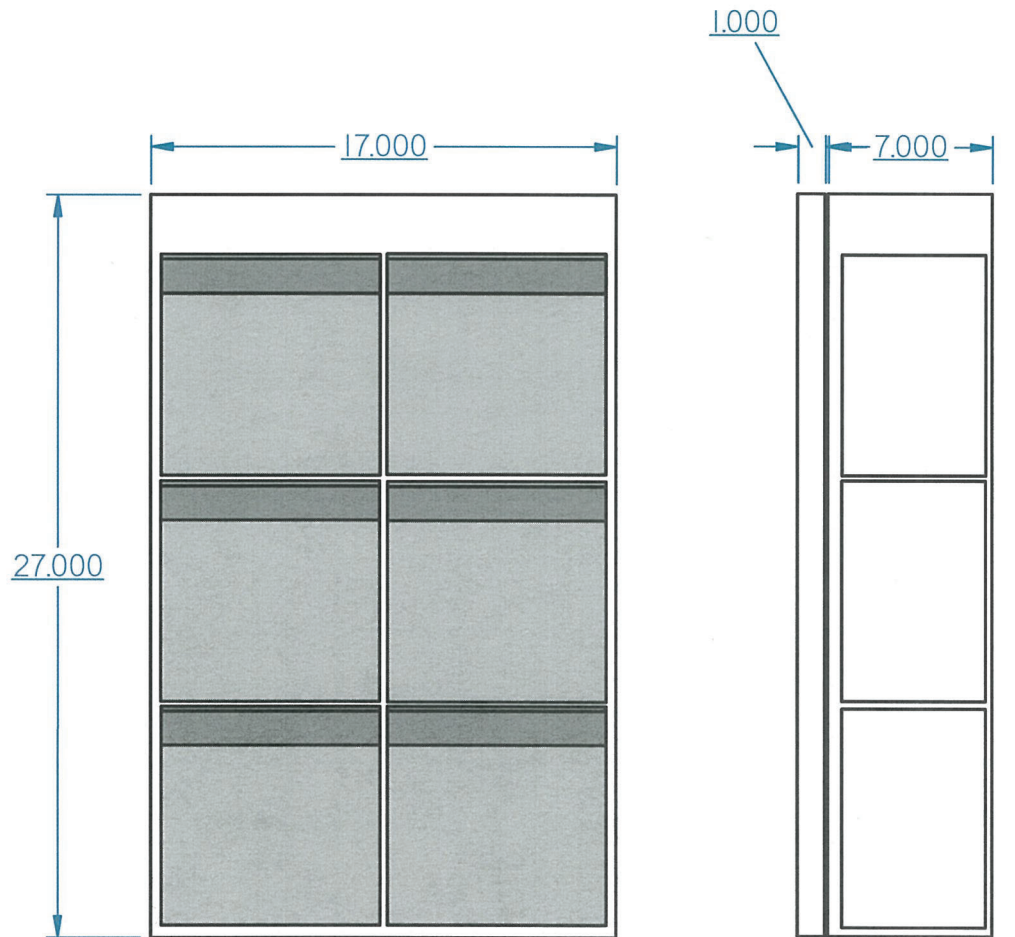
- 2.1 Clary is obligated during the in-warranty period to provide service and/or adjustments to the properly installed equipment for its intended use. Incorrectly installed and/or non-application use voids all stated warranties.
- 2.2 Equipment requiring warranty service must be returned to Clary Corporation, DEPOT REPAIR, 150 E. Huntington Drive, Monrovia, California 91016. Prior to return, a Return Material Authorization (RMA) shall be requested by calling (800)-42-CLARY. All transportation charges shall be prepaid by customer. Claims must include details of the original date of installation, equipment settings, installation location, and mode of failure. The equipment will be returned freight collect by Clary to the customer's location specified in the RMA via Clary's preferred carrier unless otherwise stated in customer's shipping instructions.
- 2.3 During the warranty period, no service charges should be payable by the buyer for service performed other than for service necessitated by accident, misuse, theft, abnormal line or source voltage fluctuations, abnormal conditions of operations, damage by the elements or damage resulting from adjustments, repairs, or modifications made by other than Clary authorized personnel, or the buyer's failure to reasonably maintain the equipment in accordance with industry best practices.

3 PRODUCT CHANGES

- 3.1 Clary reserves the right to make changes, additions, and/or improvements in its products without incurring any obligation to inform existing users or install them on its previously sold products.

TO THE EXTENT ALLOWED BY LAW, THE FORGOING WARRANTY IS EXCLUSIVE AND IS GIVEN AND ACCEPTED IN LIEU OF ANY AND ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING WITHOUT LIMITATION THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE REMEDIES OF BUYER SHALL BE LIMITED TO THOSE PROVIDED HEREIN. IN NO EVENT WILL SELLER BE LIABLE FOR COLLATERAL OR CONSEQUENTIAL DAMAGES BEYOND THE EXTENT ALLOWED BY LAW. CLARY SHALL NOT BE LIABLE FOR LOSS OF PROFITS, INJURIES TO PROPERTY OR LOSS OF USE OF PRODUCT OR ANY OTHER ASSOCIATED OR ATTACHED EQUIPMENT. No person is authorized to assume in behalf of Clary any obligation or liability in connection with the sale warranty or service policy of any products manufactured and/or marketed by Clary beyond the warranty description on the face hereof.

Battery Cabinet to hold 6 41Ah Outpost batteries
Using a hinged door with a No.2 Corbin Lock



Front View

Side View



Outpost™ Batteries

Designed for deep cycle, extreme temperature applications



Overview

The Outpost™ batteries are designed for deep cycle, extreme temperature applications. They have been field tested and used for years in the traffic and ITS market as well as the US military. Operational from -40°C to +74°C (-40°F to +165°F). Available in 41, 51 & 105 Ampere-Hour (AH) ratings. Outpost batteries are sealed lead acid batteries built using an advanced absorbed glass mat (AGM) construction with microporous spun glass separators. The result is a highly

reliable, non-spillable, maintenance-free battery usable in the most demanding applications. The casing is a copolymer polypropylene technology originally developed for military jet fighter applications where wide temperature range performance is demanded. Positive plates—special lead calcium. Includes models: OP72C-41, OP96C-41, OP72D-51, OP96D-51, OPB-1241, OPB-1251, OPB-12105.

Configurations

Model	Voltage (nominal)	AH Capacity (20 hr rate)	System Voltage	Estimated Runtime (hrs) at 25°C (77°F) Full Charge							Weight per Battery lb (kg)	Overall Dimensions		
				300 W	500 W	700 W	875 W	1000 W	1200 W	1400 W		Length in (mm)	Width in (mm)	Height in (mm)
OP48C (4 batteries)	12 VDC	41 Ah	48 VDC	4.3	2.5	1.5	1.1				29 (13.2)	7.71 (195.9)	4.96 (126)	8.05 (204.4)
OP72C (6 Batteries)			72 VDC	6.4	3.5	2.4	1.7							
OP96C (8 batteries)			96 VDC	8.8	5.2	3.5	2.8	2.5	1.9	1.6				
OP48D (4 batteries)	12 VDC	51 Ah	48 VDC	5	3.2	1.9	1.4				35 (15.9)	8.81 (224)	5.25 (133)	8.82 (224)
OP72D (6 batteries)			72 VDC	8.3	4.4	3	2.2							
OP96D (8 batteries)			96 VDC	11	6.5	4.4	3.5	3.2	2.4	2				
OP48E (4 batteries)	12 VDC	105 Ah	48 VDC	12	7.3	4.6	3.5				64 (29)	12.86 (326.8)	6.58 (167.2)	8.79 (223.1)
OP72E (6 batteries)			72 VDC	20.2	10.4	7.2	5.9							
OP96E (8 batteries)			96 VDC	26	17	10.8	8.5	7.6	5.9	5.4				



SP 1250LX

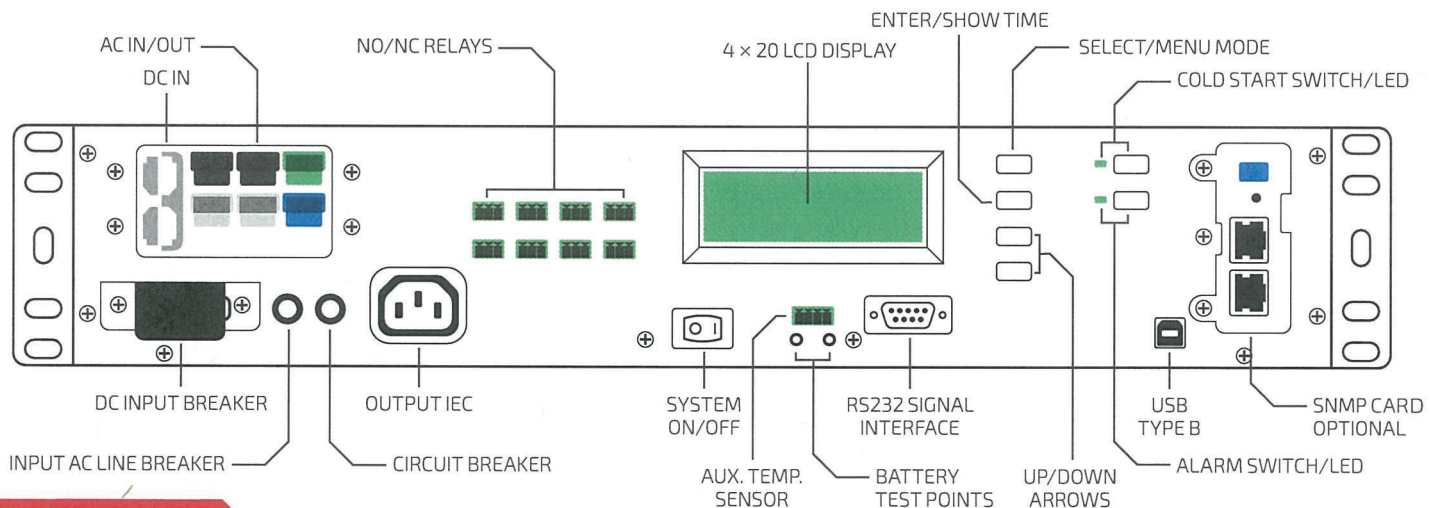
Online UPS with integrated PIM and programmable display



Overview

The SP 1250LX features an integrated Power Interface Module and programmable display. The LX Series are advanced UPS that provide clean, regulated dual conversion power for controllers and other sensitive equipment inside the traffic cabinet. Rated for 1250 VA/875 W, with operational temperature of -40°C to $+74^{\circ}\text{C}$ (-40°F to 165°F), the SP 1250LX has been independently tested and certified to comply with NEMA temperature standards as well as

NEMA standards for shock and vibration. Compatible with most existing traffic cabinets, the SP 1250LX can be rack or shelf mounted and can be configured with either front or rear power connectors. The SP 1250LX provides full operation in intersections with all LEDs. Advanced communication features allow monitoring, configuration and control of the system over RS232, modem or network connections. Available with battery bus voltages of 48 V or 72 V.



Features

- Space saving design: 2U vertical rack space
- On-line, conditioned, regenerated power for cabinet equipment protection
- Operates in extreme environments from -40°C to $+74^{\circ}\text{C}$ (-40°F to $+165^{\circ}\text{F}$)
- Power quality analytical data recorded and exportable to Excel in CSV format
- USB connectivity with monitoring center or other equipment
- Power factor corrected for reliable and safe power

CLARY®



Specifications

Electrical Input

Voltage	75 VAC to 155 VAC (before going to batteries)
Frequency	45 Hz to 65 Hz

Electrical Output

Voltage	120 VAC $\pm$ 3%
Frequency	50 Hz or 60 Hz
Current	10.4 A
Rating	1250 VA / 875 W
Crest Factor Ratio	• 50% load up to 4.8:1 • 75% load up to 3.2:1 • 100% load up to 2.4:1
THD	4.00% maximum
Dynamic Response	$\pm$ 4% for 100% step load change 0.5 ms recovery time
Overload	• 110% for 10 sec • 200% for 50 ms
UPS Protection	• Input and output short circuit • Input and output overload • Excessive battery discharge

Environmental

Temperature	-40°C to +74°C (-40°F to +165°F)
Humidity	0% to 95% non-condensing
Altitude	Sea level to 10,000 ft

Mechanical

Input	Hardwired to bypass box
Outputs	Hardwired to bypass box, with single 15 Amp receptacle
Dimensions (H x W x D)	3.5" x 19.0" x 10.0" (2U)
Weight	13 lb
Cooling	• Low velocity • Forced air

Design

Standard Features	• Power factor corrected input • Fully regenerative • True on-line continuous power • Low distortion sine wave output • Designed for non-linear loads • Extended brownout protection • EIA/RS232 data interface
Certifications	• IEEE 587/ANSI C62.4 • IEC 555 @ 120 VA • NEMA
Typical Recharge Time (to 85% capacity @ 100% load)	48-72 hrs (more time required with extended battery option)

Control and Indicators

Switches / Control Panel	• System power • Cold start • Test • Alarm silence • Four line LCD display panel
Alarms	• Utility interrupt • Inverter failure • Overload • Low battery • Self test
Intelligent Computer Interfaces	• Serial interface for EIA 232 • 1 each DB9-F (RS232 and signal interface pins) and 1 each USB • Full interactive remote computer monitoring and control of most features including load control (requires optional monitoring software) • NTCIP and TCP/IP ready
Contact Closures	• "D" connector • Open collector (see user manual for additional interface information)

Options

SNMP Interface	Allows full control and monitoring interface over network connection. Compatible with HP Openview™, IBM Netview™, CA Unicenter TNG™, and other major software offerings.
Battery Bus Voltage	48 V or 72 V

UPS MANAGEMENT HARDWARE

SNMP Adapter

SNMP/HTTP Adapter

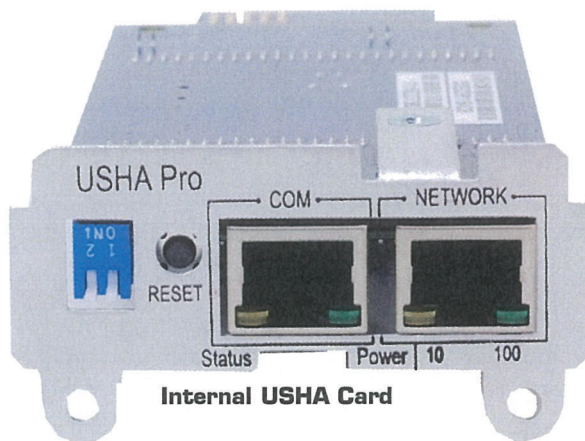
CT-09A1, DT-09A1, SP-09A2, SP-09G, SPD-09A2
or SPO-09A2 (Internal)
CT-09H, DT-09H or SP-09H (External)

Features:

SMART UPS SNMP HTTP ADAPTER
SNMP over UDP/IP HTTP over TCP/IP
ARP, RARP, TFTP and ICMP

The optional SNMP/HTTP card functions as an SNMP agent and includes an embedded HTTP server (web server). This means that one industry standard management tool can be used to monitor and control all your UPS systems from one central location, and power management can now be integrated into your existing network or building management strategy. Alarms ("traps") can be configured to ensure automatic notification of events such as low battery, power outage or overload. MIBs are included with the product for integration into your system management software.

Control and management functions are also available through any standard web browser (e.g. Internet Explorer, Netscape or Opera). Simply point your browser to the network address assigned to the card, and the embedded web server returns web pages providing access to monitor or control all system parameters. The easy-to-use browser interface with online help means that minimum training is required to enable staff to effectively manage the UPS and protected devices. A sophisticated Java applet provides full system monitoring in real time, along with comprehensive event and history logs.



FEATURES:

- ✓ Configurable from serial port or web browser
- ✓ Management from SNMP manager or web browser
- ✓ Supports standard UPS MIB
- ✓ Firmware upgrades by TFTP via serial port
- ✓ Full-featured GUI runs in web browser
- ✓ Accessible from any workstation on the network using SNMP/HTTP, regardless of OS via standard browser
- ✓ UPS Shutdown warning broadcast capability
- ✓ Realtime monitoring of all functions
- ✓ Full history logs
- ✓ Scheduling functions
- ✓ Supports: Linux, Novell, SCO Unix 5.x, SCO Unixware 7.x, Solaris (x86) and Windows 2000, Me, XP, HP-UX, IBM-AIX, FreeBSD and other Linux derived Operating Systems
- ✓ Supports Environmental Monitoring Device (EMD) that provides temperature and humidity sensing. Additional detection or sensing of motion, smoke, security devices, water sensor or vibration sensors is also supported.
- ✓ Certifications: CE, FCC Class B

Where Power is a way of life

Specifications subject to change without notice

UPS MANAGEMENT HARDWARE

CLARY

The Continuous Power Company™

industrial

commercial

SNMP Specifications

Power Input DC	8V USHA internal 15V USHA external, DC power Module
Power Consumption	3 watts
Operating Environment	Humidity: 10 to 80% Non-condensing Temperature: 0°C to 40°C
Regulatory Approval	FCC Class B, CE Class B
Warranty	2 Years



External USHA Pro II front/back views

SNMP Functional Information

Network Interface	One RJ-45 connector for 10Mb BASE-T Ethernet connection.
HTTP/HTTPS	Supports HTTP Protocol. Remotely monitor or manage UPS through Windows Internet Explorer or Netscape browsers.
SNMP	Supports SNMP Protocol. Centralized monitoring and management of the UPS can be accomplished by a Network Management System such as HP Openview.
Java Applet	Provides "Real Time" UPS status and data graphical format. Can be activated through selected browser for Real-time UPS status monitoring with graphical data.
TELNET	Provides alternative method for configuration of the UPS including automatic log-out function for additional security.
E-mail Notification	E-mail can be sent to the administrator or to pre-defined designated users based on mail configuration parameters.
Mobile Phone	With WAP support, administrator can either browse the UPS information or receive the UPS event short message (SMS) notification on users Cellular Phone.
PDA	Users can also browse UPS status and receive event status.
Language	Supports both English and simplified traditional Chinese.
Firmware Upgrades	Under the Windows environment, utilizing proprietary utility software, users can upgrade SNMP adapters internal firmware.
UPS Status Information	SNMP: Notify multiple hosts and pre-define the recipients for any warning messages. Java applet: Notify the administrator when there is a power event via pop-up dialog box at specified user terminals. Shutdown Daemon: Notifies of power event to those servers or workstations (maximum of 72 stations) of the power event and starts the shutdown procedure to those systems that have the appropriate shutdown software installed.
Intelligent Shutdown Services	Schedule: Ups can be shutdown on a pre-defined weekly schedule. Special day Schedule: UPS can be shutdown on a pre-defined date and time. Manual: Ups can be set to "Sleep" Mode or to "Turn off" the UPS. Unattended: When there is a utility power event, warnings/shutdown messages can be immediately sent to pre-defined users.

Specifications subject to change without notice.



The Continuous Power Company™

Clary Corporation

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• www.clary.com

P/N 520-SNMP

07/27/11 - Ver. 1.6



TOMAR WARRANTY

TOMAR Electronics, Inc. warrants most products described herein for a period of 2 years under normal use and service from the date of purchase as marked on the product, that the product will be free of defects in material and workmanship. This warranty does not cover ordinary wear and tear, abuse, misuse, overloading, altered products, or damage caused by the purchaser connecting the unit to wrong voltage or polarity. Xenon strobe lamps are warranted for 1 full year from date of purchase. For the following products the warranty period is extended to 5 years: Scorpion/Black Widow Series lightbars including lamps, controllers, wiring harnesses and structural components; 940L and 948 series siren controllers; Revolution series warning and illumination lamps; iLed series lamps; Rect13, 14 and 16 series lamps; Lstick series directional lightbars; RECT25 series lamps; 200 series light sticks; TRX/TRT/TRM light bars; Aspire scene lighting.

THERE IS NO WARRANTY OF MERCHANTABILITY. THERE ARE NO WARRANTIES THAT EXTEND BEYOND THE DESCRIPTION HEREIN. THERE ARE NO WARRANTIES EXPRESSED OR IMPLIED OR ANY AFFIRMATION OF FACT OR REPRESENTATION EXCEPT AS SET FORTH HEREIN.

REMEDY

TOMAR Electronics, Inc.'s sole responsibility and liability, and purchaser's exclusive remedy shall be limited to the repair or replacement at TOMAR Electronics, Inc.'s option, of a part or parts not conforming to the warranty. All products requiring warranty service shall be returned to TOMAR Electronics, Inc. within the warranted period, shipping prepaid. TOMAR Electronics, Inc. will return repaired or replaced products to the purchaser via prepaid ground transportation. In no event shall TOMAR Electronics, Inc. be liable for damages of any nature, including incidental or consequential damages, including but not limited to any damages resulting from non-conformity, defect in material or workmanship.

All material being returned for service must have an RMA number shown on the shipping label. Please email to sales@tomar.com or call 1 (800) 338-3133 to obtain the RMA number prior to sending the material for service.

WARRANTY DOCUMENTS

TOMAR WARRANTY

TOMAR StrobeCom II™ WARRANTY

TOMAR TRX WARRANTY

TOMAR ELECTRONICS INC.

Email: info@tomar.com

Phone: 800-338-3133





STROBECOM II

DETOC22

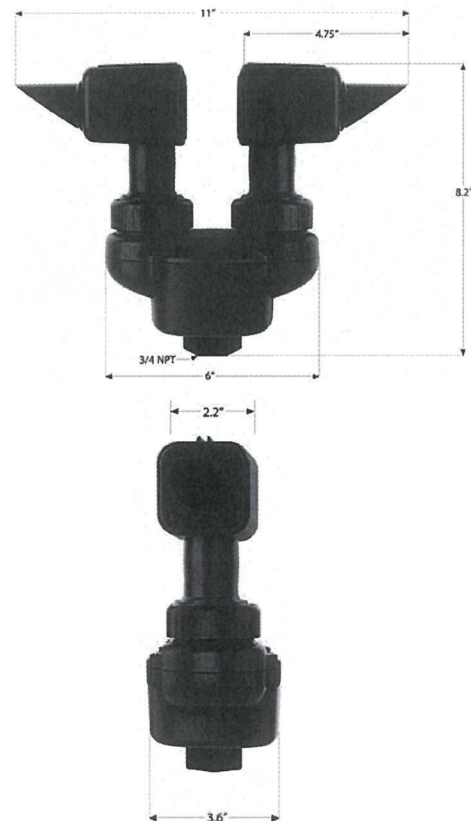
2-Head, 2- Direction, 2-Channel, Standard Detector
with TOMAR OSPOC Automatic Test

TOMAR's DETOC22 Strobecom II dual direction preemption detector with automatic detector testn includes two detector heads and two output channels.

The DETOC22 senses the optical pulses emitted by properly equipped emergency & transit vehicles. Mounted to observe an approach to an intersection, the DETOC22 is used with TOMAR OSPOCV2 Series optical signal processors to inform the traffic control system.



- Tool-less swivel of detector head makes aiming easy
- Sensor technology for sunlight rejection unmatched by any other system
- Fully encapsulated electronics for complete resistance to water, heat, and vibration
- Protected from mis-wiring and electrical transients
- Simple advance detector installation for detection around corners and over hills





STROBECOM II

Specifications

Item	Description
Maximum Detection Range	2500 feet minimum when used with OSPOCV2 series optical signal processor in clear atmospheric conditions
Maximum Cable Length	Up to 900 feet of TOMAR M913 preemption cable between optical signal processor and DETOC22
Field of View	13 degrees conical centered around viewport normal axis (typical)
Cable Type	TOMAR model M913 preemption detector cable 20 AWG 3-conductor shielded cable & bare
Operating Temperature	-40 to +75 degrees C
Physical Construction	The DETOC22 enclosure is black, glass filled, UV stabilized polyamide suitable for all weather use. All electronics circuitry is completely encapsulated in polyurethane for protection from shock, vibration, and moisture.
Mounting	The DETOC22 is easily mounted using standard hardware on either span wire or mast arm. The unit has a 3/4" female pipe mount hub and internal terminal block for connection to a 3/C shielded detector cable (TOMAR M913)

Ordering Info

Catalog Number	Description
DETOC22	Two head, two direction, two channel, with automatic test

TRUE 10 YEAR WARRANTY!

10 year warranty covers the DETOC Series and all STROBECOM II components. Unlike other manufacturers, TOMAR's ten year warranty has NO fees or charges for warranty repairs after five years.

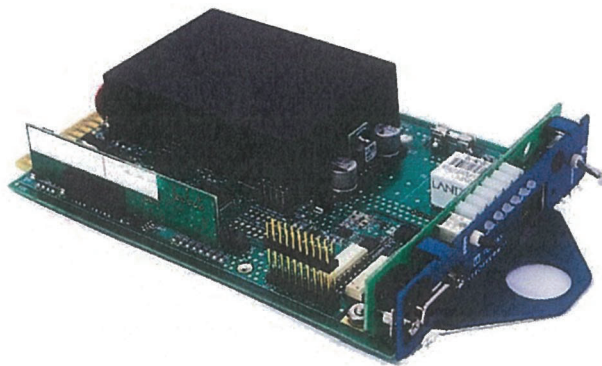
NOTICE: The sale of these items are restricted to state and local governments and to be authorized distributors only.



STROBECOM II

OSPOCV2-4

OSPOC Version 2, four channel, optical signal processor with Integrated Confirmation, event logging, and Ethernet port



- **INTEGRATED CONFIRMATION** technology powers IC enabled DETOC series TOMAR StrobeCom II detectors to be powered and controlled over the standard preemption detector cable. No additional power supplies, mounting, programming, or wiring required.

- **TRUE CONFIRMATION**, when combined with **INTEGRATED CONFIRMATION** is the only preemption system that provides real, closed-loop, visual feedback to vehicle drivers that the intersection is in preempt

- **Active Reflection Suppression** prevents cross street preemption due to reflected emitter energy. TOMAR's advanced digital signal processing eliminates this troublesome side effect making detector installation and setup far less critical.

- **PLUG-and-PLAY** firmware allows the addition of detectors and other accessories to the system without manual configuration. Buy only the equipment needed today and add more capability later saving precious funds.

- **Expansion Port** provides easy connection of the OSPOCV2-4 to other accessory modules

The model OSPOCV2-4 optical signal processor receives and decodes *GTT OPTICOM-brand coded emitter signals. Installed inside the traffic cabinet, the OSPOCV2-4 optical signal processor provides power for OSPOC series optical detectors, receives, decodes, and prioritizes emitter signals from the detectors, powers and activates Integrated Confirmation lights, logs preemption and priority control activity, and communicates with other traffic control devices.

Equipped with TOMAR's patented (US patent 8,742,946) **INTEGRATED CONFIRMATION** technology, the OSPOCV2-4 powers and controls the high intensity LED confirmation lights integrated into up to four DETOC series IC enabled detectors over standard preemption detector cable with no additional power supply, mounting, programming, or wiring. Integrated Confirmation equipped intersections provide visual feedback of intersection preemption to vehicle drivers and citizens for enhanced safety. When combined with TOMAR's True Confirmation feature the integrated LED confirmation lights provide real closed-loop visual feedback that the traffic controller is actually in preemption providing enhanced right-of-way.

The OSPOCV2-4 is delivered default programmed to respond on a first-come first-served basis to optical signals from vehicles within two signal bands. Emergency Band signals are typically emitted by emergency vehicles to effect a preemption of normal traffic control timing and are given the highest priority to allow rapid emergency vehicle response with enhanced safety. Transit Band signals are generally emitted by transit or other non-emergency municipal vehicles to effect a priority change for the vehicle's approach direction without necessarily interrupting traffic control timing. Up to 9,999 vehicles in each signal band can be individually identified and responded to.

Using a simple configuration program, the user can define up to 10 additional classes within each signal band with different priorities, detection ranges, and choices of actions, from simple vehicle logging to full traffic preemption and enhanced communication.

The onboard Ethernet port, and the ability to classify and announce multiple vehicles in real-time makes the OSPOCV2-4 an excellent intelligent vehicle sensor for ITS applications.

The OSPOCV2-4 OSP is compatible with NEMA TS-1, TS-2, and CA/NY 170 and 2070 controllers, and meets all NEMA and Caltrans environmental requirements. The OSPOCV2-4 plugs directly into standard preemption card slots and does not use internal 24VDC cabinet power. For controllers without a preemption card slot the TOMAR 1881 rack provides the necessary hardware and harnessing to allow simple connection to detectors and controller inputs.



STROBECOM II

Specifications

Item	Description
Signal	The OSPOCV2-4 shall be capable of receiving, decoding, and prioritizing OPTICOM-brand formatted Emergency and Transit priority signals transmitted by all TOMAR and competitive emitters. The OSPOCV2-4 shall be software configurable to accept or reject older non-identifying optical signals. Classes 0-9 and codes 0-999 in each signal band shall be individually identifiable.
Signal Acquisition Time	Typical signal acquisition time shall be approximately 2.5 seconds. Acquisition time will vary depending on the number of signals present simultaneously and on the density of optical noise.
Range	2500 feet maximum adjustable down to 200 feet in 255 steps for each signal band and each approach.
Priority Determination	The OSPOCV2-4 shall be delivered with default priority grouping, responding on a first-come, first-served basis to signals within each signal band. Signals in the Emergency signal band shall be given priority over signals in the transit signal band. The user shall be able to, optionally, define additional priority classes within each signal band. Up to 10 priority groups within each signal band shall be definable.
Event Logging	The OSPOCV2-4 shall log all valid and invalid preemption events including the time, date, and duration of the event. The logging capacity of the OSPOCV2-4 shall be 14,000 events minimum. When at capacity, the oldest events shall be discarded when newer events are received. The stored logs shall be downloadable via Ethernet port.
Output Signals	The OSPOCV2-4 shall provide four optically-isolated output channels for placing NEMA standard signal level calls on traffic controller preempt inputs.
Input Signals	The OSPOCV2-4 shall have four optically-isolated inputs for connecting to traffic controller preempt status outputs.
Control Timers	Each output channel shall be equipped with three control timers described as: MAX CALL: Sets the maximum time a preempt call is allowed to be active CALL EXTENTION: Sets the time a call remains placed after a valid optical signal terminates CALL DELAY: Sets the time a valid optical signal must be pending before the assertion of a preempt call to the controller.
Confirmation Lights	The OSPOCV2-4 shall be capable of powering and operating up to four TOMAR DETOC series Integrated Confirmation enabled detectors over up to 600' of preemption detector cable per IC enabled detector.
Maximum Detectors	Up to four DETOC series IC enabled detectors (maximum of four LED confirmation lights total) plus four additional non-IC enabled detectors
Electrical Requirements	120/240VAC 50/60Hz
Temperature Range	-40 to +75 degrees C
Transient Protection	Input power shall be MOV protected from AC mains transients. Detector inputs shall be TVS protected from electrical transients.
Fusing	A ½ amp fuse shall be included in the input power connection to protect cabinet wiring

Ordering Info

Catalog Number	Description
OSPOCV2-4	Four channel Optical Signal Processor with INTEGRATED CONFIRMATION, event logging, and Ethernet port.

TRUE 10 YEAR WARRANTY!

10 year warranty covers the OSPOC Series and all STROBECOM II components. Unlike other manufacturers, TOMAR's ten year warranty has NO fees or charges for warranty repairs after five years.

NOTICE: The sale of these items are restricted to state and local governments and to be authorized distributors only.

*OPTICOM® and GTT are trademarks of Global Traffic Technologies, LLC and are not affiliated with Tomar Electronics, Inc. or its products.

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f t in @tomarUSA

STATE OF COLORADO SUBAWARD AGREEMENT

COVER PAGE

State Agency Department of Transportation	Agreement Number/PO Number 25-HTD-ZL-00189 / 491003894
Subrecipient City of Louisville	Agreement Performance Beginning Date The Effective Date
Subaward Agreement Amount Federal Funds (82.79%) Local Funds Local Match Amount (17.21%) Agreement Total	Initial Agreement Expiration Date December 31, 2026 Fund Expenditure End Date December 31, 2026 Agreement Authority Authority to enter into this Agreement exists in CRS §§43-1-106, 43-1-110, 43-1-117, 43-1-701, 43-1-702 and 43-2-101(4)(c), appropriated and otherwise made available pursuant to the FAST ACT, MAP-21, SAFETEA_LU, 23 USC §104 and 23 USC §149.
Agreement Purpose Surface Transportation Block Grant program (STBG) promotes flexibility in State and local transportation decisions and provides flexible funding to best address State and local transportation needs.	
Exhibits and Order of Precedence The following Exhibits and attachments are included with this Agreement: 1. Exhibit A – Statement of Work and Budget. 2. Exhibit B – Sample Option Letter. 3. Exhibit C – Federal Provisions. 4. Exhibit D – Additional Program Requirements. 5. Exhibit E – Title VI-Civil Rights. In the event of a conflict or inconsistency between this Agreement and any Exhibit or attachment, such conflict or inconsistency shall be resolved by reference to the documents in the following order of priority: 1. Exhibit C – Federal Provisions, Exhibit D – Additional Program Requirements, and Exhibit E – Title VI-Civil Rights. 2. Colorado Special Provisions in §17 of the main body of this Agreement. 3. The provisions of the other sections of the main body of this Agreement. 4. Exhibit A – Statement of Work and Budget. 5. Executed Option Letters (if any).	
Principal Representatives For the State: Michael Snow Division of Transportation Development Colorado Dept. of Transportation 2829 W. Howard Place Denver, CO 80204 michael.snow@state.co.us For Subrecipient: Geoffrey Nettleton City of Louisville 749 Main Street Louisville, CO 80027 gnettleton@louisvillco.gov	

SIGNATURE PAGE**THE PARTIES HERETO HAVE EXECUTED THIS AGREEMENT**

Each person signing this Agreement represents and warrants that the signer is duly authorized to execute this Agreement and to bind the Party authorizing such signature.

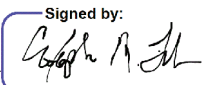
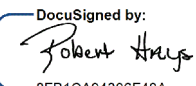
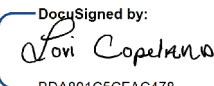
SUBRECIPIENT SIGNATURE City of Louisville By: <u></u> Signed by: BEB8C8DE36E0A4C8... Name: <u>Christopher M. Leh</u> Title: <u>Mayor</u> Date: <u>4/29/2025</u>	STATE OF COLORADO Jared S. Polis, Governor Department of Transportation Shoshana M. Lew, Executive Director By: <u></u> DocuSigned by: 8FB1CA94306F48A... Name: <u>Robert Hays</u> Title: <u>Deputy Chief Engineer</u> Date: <u>4/30/2025</u>
Second Subrecipient Signature, if needed By: <u></u> Signed by: 52E2565440FA40F... Name: <u>Genny Kline</u> Title: <u>Interim City Clerk</u> Date: <u>4/30/2025</u>	Third Subrecipient Signature, if needed By: _____ Name: _____ Title: _____ Date: _____
In accordance with §24-30-202, C.R.S., this Agreement is not valid until signed and dated below by the State Controller or an authorized delegate. STATE CONTROLLER Robert Jaros, CPA, MBA, JD By: Dep: <u></u> DocuSigned by: BDA801C5CFAC478... ion Effective Date: <u>4/30/2025</u>	

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1. PARTIES

This Agreement is entered into by and between Subrecipient named on the Cover Page for this Agreement (the “Subrecipient”), and the STATE OF COLORADO acting by and through the State agency named on the Cover Page for this Agreement (the “State”). Subrecipient and the State agree to the terms and conditions in this Agreement.

2. TERM AND EFFECTIVE DATE

A. Effective Date

This Agreement shall not be valid or enforceable until the Effective Date, and the Grant Funds shall be expended by the Fund Expenditure End Date shown on the Cover Page for this Agreement. The State shall not be bound by any provision of this Agreement before the Effective Date, and shall have no obligation to pay Subrecipient for any Work performed or expense incurred before the Effective Date, except as described in §5.D, or after the Fund Expenditure End Date.

B. Initial Term

The Parties’ respective performances under this Agreement shall commence on the Agreement Performance Beginning Date shown on the Cover Page for this Agreement and shall terminate on the Initial Agreement Expiration Date shown on the Cover Page for this Agreement (the “Initial Term”) unless sooner terminated or further extended in accordance with the terms of this Agreement.

C. Extension Terms - State’s Option

The State, at its discretion, shall have the option to extend the performance under this Agreement beyond the Initial Term for a period, or for successive periods, of one year or less at the same rates and under the same terms specified in this Agreement (each such period an “Extension Term”). In order to exercise this option, the State shall provide written notice to Subrecipient in a form substantially equivalent to the Sample Option Letter attached to this Agreement.

D. End of Term Extension

If this Agreement approaches the end of its Initial Term, or any Extension Term then in place, the State, at its discretion, upon written notice to Subrecipient in a form substantially equivalent to the Sample Option Letter attached to this Agreement, may unilaterally extend such Initial Term or Extension Term for a period not to exceed two months (an “End of Term Extension”), regardless of whether additional Extension Terms are available or not. The provisions of this Agreement in effect when such notice is given shall remain in effect during the End of Term Extension. The End of Term Extension shall automatically terminate upon execution of a replacement Agreement or modification extending the total term of this Agreement.

E. Early Termination in the Public Interest

The State is entering into this Agreement to serve the public interest of the State of Colorado as determined by its Governor, General Assembly, or Courts. If this Agreement ceases to further the public interest of the State, the State, in its discretion, may terminate this Agreement in whole or in part. A determination that this Agreement should be terminated in the public interest shall not be equivalent to a State right to terminate for convenience. This subsection shall not apply to a termination of this Agreement by the State for Breach of Agreement by Subrecipient, which shall be governed by **§12.A.i.**

i. Method and Content

The State shall notify Subrecipient of such termination in accordance with **§14**. The notice shall specify the effective date of the termination and whether it affects all or a portion of this Agreement, and shall include, to the extent practicable, the public interest justification for the termination.

ii. Obligations and Rights

Upon receipt of a termination notice for termination in the public interest, Subrecipient shall be subject to the rights and obligations set forth in **§12.A.i.a.**

iii. Payments

If the State terminates this Agreement in the public interest, the State shall pay Subrecipient an amount equal to the percentage of the total reimbursement payable under this Agreement that corresponds to the percentage of Work satisfactorily completed and accepted, as determined by the State, less payments previously made. Additionally, if this Agreement is less than 60% completed, as determined by the State, the State may reimburse Subrecipient for a portion of actual out-of-pocket expenses, not otherwise reimbursed under this Agreement, incurred by Subrecipient which are directly attributable to the uncompleted portion of Subrecipient's obligations, provided that the sum of any and all reimbursement shall not exceed the Subaward Maximum Amount payable to Subrecipient hereunder.

F. Subrecipient's Termination Under Federal Requirements

Subrecipient may request termination of this Agreement by sending notice to the State, or to the Federal Awarding Agency with a copy to the State, which includes the reasons for the termination and the effective date of the termination. If this Agreement is terminated in this manner, then Subrecipient shall return any advanced payments made for work that will not be performed prior to the effective date of the termination.

3. DEFINITIONS

The following terms shall be construed and interpreted as follows:

- A. **"Agreement"** means this subaward agreement, including all attached Exhibits, all documents incorporated by reference, all referenced statutes, rules and cited authorities, and any future modifications thereto.
- B. **"Award"** means an award by a Recipient to a Subrecipient funded in whole or in part by a Federal Award. The terms and conditions of the Federal Award flow down to the Award unless the terms and conditions of the Federal Award specifically indicate otherwise.
- C. **"Breach of Agreement"** means the failure of a Party to perform any of its obligations in accordance with this Agreement, in whole or in part or in a timely or satisfactory manner. The institution of proceedings under any bankruptcy, insolvency, reorganization or similar law, by or against Subrecipient, or the appointment of a receiver or similar officer for Subrecipient or any of its property, which is not vacated or fully stayed within 30 days after the institution of such proceeding, shall also constitute a breach. If Subrecipient is debarred or suspended under §24-109-105, C.R.S. at any time during the term of this Agreement, then such debarment or suspension shall constitute a breach.
- D. **"Budget"** means the budget for the Work described in Exhibit A.
- E. **"Business Day"** means any day other than Saturday, Sunday, or a legal holiday as listed in §24-11-101(1), C.R.S.
- F. **"CORA"** means the Colorado Open Records Act, §§24-72-200.1, *et. seq.*, C.R.S.
- G. **"Deliverable"** means the outcome to be achieved or output to be provided, in the form of a tangible or intangible Good or Service that is produced as a result of Subrecipient's Work that is intended to be delivered by Subrecipient.

- H. **“Effective Date”** means the date on which this Agreement is approved and signed by the Colorado State Controller or designee, as shown on the Signature Page for this Agreement.
- I. **“End of Term Extension”** means the time period defined in **§2.D**.
- J. **“Exhibits”** means the exhibits and attachments included with this Agreement as shown on the Cover Page for this Agreement.
- K. **“Extension Term”** means the time period defined in **§2.C**.
- L. **“Federal Award”** means an award of Federal financial assistance or a cost-reimbursement contract, under the Federal Acquisition Regulations or by a formula or block grant, by a Federal Awarding Agency to the Recipient. “Federal Award” also means an agreement setting forth the terms and conditions of the Federal Award. The term does not include payments to a Subrecipient or payments to an individual that is a beneficiary of a Federal program.
- M. **“Federal Awarding Agency”** means a Federal agency providing a Federal Award to a Recipient. Federal Highway Administration (FHWA) is the Federal Awarding Agency for the Federal Award which is the subject of this Agreement.
- N. **“FHWA”** means Federal Highway Administration.
- O. **“Goods”** means any movable material acquired, produced, or delivered by Subrecipient as set forth in this Agreement and shall include any movable material acquired, produced, or delivered by Subrecipient in connection with the Services.
- P. **“Grant Funds”** means the funds that have been appropriated, designated, encumbered, or otherwise made available for payment by the State under this Agreement.
- Q. **“Incident”** means any accidental or deliberate event that results in or constitutes an imminent threat of the unauthorized access, loss, disclosure, modification, disruption, or destruction of any communications or information resources of the State, which are included as part of the Work, as described in §§24-37.5-401, *et. seq.*, C.R.S. Incidents include, without limitation (i) successful attempts to gain unauthorized access to a State system or State Records regardless of where such information is located; (ii) unwanted disruption or denial of service; (iii) the unauthorized use of a State system for the processing or storage of data; or (iv) changes to State system hardware, firmware, or software characteristics without the State’s knowledge, instruction, or consent.
- R. **“Initial Term”** means the time period defined in **§2.B**.
- S. **“Matching Funds”** (Local Funds, or Local Match) means the funds provided by Subrecipient as a match required to receive the Grant Funds and includes in-kind contribution.
- T. **“Party”** means the State or Subrecipient, and “Parties” means both the State and Subrecipient.
- U. **“PII”** means personally identifiable information including, without limitation, any information maintained by the State about an individual that can be used to distinguish or trace an individual’s identity, such as name, social security number, date and place of birth, mother’s maiden name, or biometric records. PII includes, but is not limited to, all information defined as personally identifiable information in §§24-72-501 and 24-73-101, C.R.S.
- V. **“Recipient”** means the State agency shown on the Signature and Cover Pages of this Agreement, for the purposes of this Federal Award.
- W. **“Services”** means the services to be performed by Subrecipient as set forth in this Agreement and shall include any services to be rendered by Subrecipient in connection with the Goods.
- X. **“State Confidential Information”** means any and all State Records not subject to disclosure under CORA. State Confidential Information shall include but is not limited to PII and State personnel records not subject to disclosure under CORA. State Confidential Information shall not include information or data concerning individuals that is not deemed confidential but nevertheless belongs to the State, which has been communicated, furnished, or disclosed by the State to Subrecipient which (i) is subject to disclosure pursuant to CORA; (ii) is already known to Subrecipient without restrictions at the time of its disclosure to Subrecipient; (iii) is or subsequently becomes publicly available without breach of any obligation owed by Subrecipient to the State; (iv) is disclosed to Subrecipient, without confidentiality obligations, by a third party who has the right to disclose such information; or (v) was independently developed without reliance on any State Confidential Information.
- Y. **“State Fiscal Rules”** means the fiscal rules promulgated by the Colorado State Controller pursuant to §24-30-202(13)(a), C.R.S.

- Z. **“State Fiscal Year”** means a 12-month period beginning on July 1 of each calendar year and ending on June 30 of the following calendar year. If a single calendar year follows the term, then it means the State Fiscal Year ending in that calendar year.
- AA. **“State Records”** means any and all State data, information, and records, regardless of physical form.
- BB. **“Subaward Maximum Amount”** means an amount equal to the total of Grant Funds for this Agreement.
- CC. **“Subcontractor”** means any third party engaged by Subrecipient to aid in performance of the Work. “Subcontractor” also includes sub-recipients of Grant Funds.
- DD. **“Subrecipient”** means a non-Federal entity that receives a sub-award from a Recipient to carry out part of a Federal program but does not include an individual that is a beneficiary of such program. A Subrecipient may also be a recipient of other Federal Awards directly from a Federal Awarding Agency.
- EE. **“Uniform Guidance”** means the Office of Management and Budget Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards, 2 CFR Part 200, commonly known as the “Super Circular, which supersedes requirements from OMB Circulars A-21, A-87, A-110, A-122, A-89, A-102, and A-133, and the guidance in Circular A-50 on Single Audit Act follow-up.
- FF. **“Work”** means the Goods delivered and Services performed pursuant to this Agreement.
- GG. **“Work Product”** means the tangible and intangible results of the Work, whether finished or unfinished, including drafts. Work Product includes, but is not limited to, documents, text, software (including source code), research, reports, proposals, specifications, plans, notes, studies, data, images, photographs, negatives, pictures, drawings, designs, models, surveys, maps, materials, ideas, concepts, know-how, information, and any other results of the Work. “Work Product” does not include any material that was developed prior to the Effective Date that is used, without modification, in the performance of the Work.

Any other term used in this Agreement that is defined elsewhere in this Agreement or in an Exhibit shall be construed and interpreted as defined in that section.

4. STATEMENT OF WORK AND BUDGET

Subrecipient shall complete the Work as described in this Agreement and in accordance with the provisions of Exhibit A. The State shall have no liability to compensate Subrecipient for the delivery of any goods or the performance of any services that are not specifically set forth in this Agreement.

5. PAYMENTS TO SUBRECIPIENT

A. Subaward Maximum Amount

Payments to Subrecipient are limited to the unpaid, obligated balance of the Grant Funds. The State shall not pay Subrecipient any amount under this Agreement that exceeds the Subaward Maximum Amount shown on the Cover Page of this Agreement as “Federal Funds Maximum Amount”.

B. Payment Procedures

i. Invoices and Payment

- a. The State shall pay Subrecipient in the amounts and in accordance with the schedule and other conditions set forth in Exhibit A.
- b. Subrecipient shall initiate payment requests by invoice to the State, in a form and manner approved by the State.
- c. Any advance payment allowed under this Agreement, shall comply with State Fiscal Rules and be made in accordance with the provisions of this Agreement and its Exhibits. Eligibility and submission for advance payment is subject to State approval and must include approved documentation in the form and manner set forth and approved by the State.
- d. The State shall pay each invoice within 45 days following the State’s receipt of that invoice, so long as the amount invoiced correctly represents Work completed by Subrecipient and previously accepted by the State during the term that the invoice covers. If the State determines that the amount of any invoice is not correct, then Subrecipient shall make all changes necessary to correct that invoice.
- e. The acceptance of an invoice shall not constitute acceptance of any Work performed or Deliverables provided under this Agreement.

ii. Interest

Amounts not paid by the State within 45 days of the State's acceptance of the invoice shall bear interest on the unpaid balance beginning on the 45th day at the rate of 1% per month, as required by §24-30-202(24)(a), C.R.S., until paid in full; provided, however, that interest shall not accrue on unpaid amounts that the State disputes in writing. Subrecipient shall invoice the State separately for accrued interest on delinquent amounts, and the invoice shall reference the delinquent payment, the number of days' interest to be paid and the interest rate.

iii. Payment Disputes

If Subrecipient disputes any calculation, determination or amount of any payment, Subrecipient shall notify the State in writing of its dispute within 30 days following the earlier to occur of Subrecipient's receipt of the payment or notification of the determination or calculation of the payment by the State. The State will review the information presented by Subrecipient and may make changes to its determination based on this review. The calculation, determination or payment amount that results from the State's review shall not be subject to additional dispute under this subsection. No payment subject to a dispute under this subsection shall be due until after the State has concluded its review, and the State shall not pay any interest on any amount during the period it is subject to dispute under this subsection.

iv. Available Funds-Contingency-Termination.

The State is prohibited by law from making commitments beyond the term of the current State Fiscal Year. Payment to Subrecipient beyond the current State Fiscal Year is contingent on the appropriation and continuing availability of Grant Funds in any subsequent year (as provided in the Colorado Special Provisions). If federal funds or funds from any other non-State funds constitute all or some of the Grant Funds, the State's obligation to pay Subrecipient shall be contingent upon such non-State funding continuing to be made available for payment. Payments to be made pursuant to this Agreement shall be made only from Grant Funds, and the State's liability for such payments shall be limited to the amount remaining of such Grant Funds. If State, federal or other funds are not appropriated, or otherwise become unavailable to fund this Agreement, the State may, upon written notice, terminate this Agreement, in whole or in part, without incurring further liability. The State shall, however, remain obligated to pay for Services and Goods that are delivered and accepted prior to the effective date of notice of termination, and this termination shall otherwise be treated as if this Agreement were terminated in the public interest as described in §2.E.

v. Federal Recovery

The close-out of a Federal Award does not affect the right of the Federal Awarding Agency or the State to disallow costs and recover funds on the basis of a later audit or other review. Any cost disallowance recovery is to be made within the Record Retention Period, as defined below.

C. Matching Funds

Subrecipient shall provide Matching Funds as provided in Exhibit A. Subrecipient shall have raised the full amount of Matching Funds prior to the Effective Date and shall report to the State regarding the status of such funds upon request. Subrecipient's obligation to pay all or any part of any Matching Funds, whether direct or contingent, only extends to funds duly and lawfully appropriated for the purposes of this Agreement by the authorized representatives of Subrecipient and paid into Subrecipient's treasury or bank account. Subrecipient represents to the State that the amount designated "Subrecipient's Matching Funds" in Exhibit A has been legally appropriated for the purposes of this Agreement by its authorized representatives and paid into its treasury or bank account. Subrecipient does not by this Agreement irrevocably pledge present cash reserves for payments in future fiscal years, and this Agreement is not intended to create a multiple-fiscal year debt of Subrecipient. Subrecipient shall not pay or be liable for any claimed interest, late charges, fees, taxes or penalties of any nature, except as required by Subrecipient's laws or policies.

D. Reimbursement of Subrecipient Costs

- i. The State shall reimburse Subrecipient for the federal share of properly documented allowable costs related to the Work after review and approval thereof, subject to the provisions of §5, this Agreement and Exhibit A. However, any costs incurred by Subrecipient prior to the Effective Date shall not be reimbursed absent specific allowance of pre-award costs and indication that the Federal Award funding is retroactive. The State shall pay Subrecipient for costs or expenses incurred or performance by the Subrecipient prior to the Effective Date, only if (1) the Grant Funds involve federal funding and (2) federal laws, rules, and regulations applicable to the Work provide for such retroactive payments to the

- Subrecipient. Any such retroactive payments shall comply with State Fiscal Rules and be made in accordance with the provisions of this Agreement.
- ii. The State shall reimburse Subrecipient's allowable costs, not exceeding the Subaward Maximum Amount shown on the Cover Page of this Agreement and on Exhibit A for all allowable costs described in this Agreement and shown in Exhibit A. Except as provided in §5.E., Subrecipient may adjust the amounts between each line item of Exhibit A without formal modification to this Agreement as long as the Subrecipient provides notice to the State of the change, the change does not modify the Subaward Maximum Amount or the Subaward Maximum Amount for any federal fiscal year or State Fiscal Year, and the change does not modify any requirements of the Work.
 - iii. The State shall only reimburse allowable costs described in this Agreement and shown in the Budget if those costs are:
 - a. Reasonable and necessary to accomplish the Work and for the Goods and Services provided; and
 - b. Equal to the actual net cost to Subrecipient (i.e. the price paid minus any items of value received by Subrecipient that reduce the cost actually incurred).
 - iv. Subrecipient's costs for Work performed after the Fund Expenditure End Date shown on the Cover Page for this Agreement, or after any phase performance period end date for a respective phase of the Work, shall not be reimbursable. Subrecipient shall initiate any payment request by submitting invoices to the State in the form and manner set forth and approved by the State.
- E. Use of Funds, Budget Adjustments

Grant Funds shall be used only for eligible costs identified herein and/or in the Budget. Subrecipient may adjust budgeted expenditure amounts up to 10% between activities of said Budget without approval of the State. Budget adjustments to activities exceeding 10% but less than 24.99% must be submitted in advance of actual cost and receive written State approval, which approval may be transmitted informally by email or such other means that does not rise to the level of an amendment to this Agreement. A budget revision of **Exhibit A** will be issued by the State with any such adjustment. Adjustments in excess of 24.99% for any activity shall be authorized by the State in an amendment to this Agreement which may also require an amendment to **Exhibit A**. Budget adjustments shall not increase the State's total consideration beyond the Subaward Maximum Amount without an amendment to this Agreement.

F. Close-Out

Subrecipient shall close out this Award within 45 days after the Fund Expenditure End Date shown on the Cover Page for this Agreement. To complete close-out, Subrecipient shall submit to the State all Deliverables (including documentation) as defined in this Agreement and Subrecipient's final reimbursement request or invoice. The State will withhold 5% of allowable costs until all final documentation has been submitted and accepted by the State as substantially complete. If the Federal Awarding Agency has not closed this Federal Award within one year and 90 days after the Fund Expenditure End Date shown on the Cover Page for this Agreement due to Subrecipient's failure to submit required documentation, then Subrecipient may be prohibited from applying for new Federal Awards through the State until such documentation is submitted and accepted.

6. REPORTING - NOTIFICATION

A. Quarterly Reports

In addition to any reports required pursuant to any other Exhibit, for any Agreement having a term longer than three months, Subrecipient shall submit, on a quarterly basis, a written report specifying progress made for each specified performance measure and standard in this Agreement. Such progress report shall be in accordance with the procedures developed and prescribed by the State. Progress reports shall be submitted to the State not later than five Business Days following the end of each calendar quarter or at such time as otherwise specified by the State.

B. Litigation Reporting

If Subrecipient is served with a pleading or other document in connection with an action before a court or other administrative decision making body, and such pleading or document relates to this Agreement or may affect Subrecipient's ability to perform its obligations under this Agreement, Subrecipient shall, within 10 days after being served, notify the State of such action and deliver copies of such pleading or document to the State's Principal Representative identified on the Cover Page for this Agreement.

C. Performance and Final Status

Subrecipient shall submit all financial, performance and other reports to the State no later than 45 calendar days after the end of the Initial Term if no Extension Terms are exercised, or the final Extension Term exercised by the State, containing an evaluation and review of Subrecipient's performance and the final status of Subrecipient's obligations hereunder.

D. Violations Reporting

Subrecipient shall disclose, in a timely manner, in writing to the State and the Federal Awarding Agency, all violations of federal or State criminal law involving fraud, bribery, or gratuity violations potentially affecting the Federal Award. The State or the Federal Awarding Agency may impose any penalties for noncompliance allowed under 2 CFR Part 180 and 31 U.S.C. 3321, which may include, without limitation, suspension or debarment.

7. SUBRECIPIENT RECORDS

A. Maintenance

Subrecipient shall make, keep, maintain, and allow inspection and monitoring by the State of a complete file of all records, documents, communications, notes and other written materials, electronic media files, and communications, pertaining in any manner to the Work and the delivery of Services (including, but not limited to the operation of programs) or Goods hereunder (collectively, the "Subrecipient Records"). Subrecipient shall maintain such records for a period of three years following the date of submission to the State of the final expenditure report, or if this Award is renewed quarterly or annually, from the date of the submission of each quarterly or annual report, respectively (the "Record Retention Period"). If any litigation, claim, or audit related to this Award starts before expiration of the Record Retention Period, the Record Retention Period shall extend until all litigation, claims, or audit findings have been resolved and final action taken by the State or Federal Awarding Agency. The Federal Awarding Agency, a cognizant agency for audit, oversight or indirect costs, and the State, may notify Subrecipient in writing that the Record Retention Period shall be extended. For records for real property and equipment, the Record Retention Period shall extend three years following final disposition of such property.

B. Inspection

Subrecipient shall permit the State, the federal government, and any other duly authorized agent of a governmental agency to audit, inspect, examine, excerpt, copy and transcribe Subrecipient Records during the Record Retention Period. Subrecipient shall make Subrecipient Records available during normal business hours at Subrecipient's office or place of business, or at other mutually agreed upon times or locations, upon no fewer than two Business Days' notice from the State, unless the State determines that a shorter period of notice, or no notice, is necessary to protect the interests of the State.

C. Monitoring

The State, the federal government, and any other duly authorized agent of a governmental agency, in its discretion, may monitor Subrecipient's performance of its obligations under this Agreement using procedures as determined by the State or that governmental entity. Subrecipient shall allow the State to perform all monitoring required by the Uniform Guidance, based on the State's risk analysis of Subrecipient and this Agreement. The State shall have the right, in its sole discretion, to change its monitoring procedures and requirements at any time during the term of this Agreement. The State shall monitor Subrecipient's performance in a manner that does not unduly interfere with Subrecipient's performance of the Work.

D. Final Audit Report

Subrecipient shall promptly submit to the State a copy of any final audit report of an audit performed on Subrecipient's records that relates to or affects this Agreement or the Work, whether the audit is conducted by Subrecipient or a third party. Additionally, if Subrecipient is required to perform a single audit under 2 CFR 200.501, *et. seq.*, then Subrecipient shall submit a copy of the results of that audit to the State within the same timelines as the submission to the federal government.

8. CONFIDENTIAL INFORMATION - STATE RECORDS

A. Confidentiality

Subrecipient shall keep confidential, and cause all Subcontractors to keep confidential, all State Records, unless those State Records are publicly available. Subrecipient shall not, without prior written approval of

the State, use, publish, copy, disclose to any third party, or permit the use by any third party of any State Records, except as otherwise stated in this Agreement, permitted by law or approved in writing by the State. Subrecipient shall provide for the security of all State Confidential Information in accordance with all applicable laws, rules, policies, publications, and guidelines. Subrecipient shall immediately forward any request or demand for State Records to the State's Principal Representative identified on the Cover Page of this Agreement.

B. Other Entity Access and Nondisclosure Agreements

Subrecipient may provide State Records to its agents, employees, assigns and Subcontractors as necessary to perform the Work, but shall restrict access to State Confidential Information to those agents, employees, assigns and Subcontractors who require access to perform their obligations under this Agreement. Subrecipient shall ensure all such agents, employees, assigns, and Subcontractors sign agreements containing nondisclosure provisions at least as protective as those in this Agreement, and that the nondisclosure provisions are in force at all times the agent, employee, assign or Subcontractor has access to any State Confidential Information. Subrecipient shall provide copies of those signed nondisclosure provisions to the State upon execution of the nondisclosure provisions if requested by the State.

C. Use, Security, and Retention

Subrecipient shall use, hold and maintain State Confidential Information in compliance with any and all applicable laws and regulations only in facilities located within the United States, and shall maintain a secure environment that ensures confidentiality of all State Confidential Information. Subrecipient shall provide the State with access, subject to Subrecipient's reasonable security requirements, for purposes of inspecting and monitoring access and use of State Confidential Information and evaluating security control effectiveness. Upon the expiration or termination of this Agreement, Subrecipient shall return State Records provided to Subrecipient or destroy such State Records and certify to the State that it has done so, as directed by the State. If Subrecipient is prevented by law or regulation from returning or destroying State Confidential Information, Subrecipient warrants it will guarantee the confidentiality of, and cease to use, such State Confidential Information.

D. Incident Notice and Remediation

If Subrecipient becomes aware of any Incident, Subrecipient shall notify the State immediately and cooperate with the State regarding recovery, remediation, and the necessity to involve law enforcement, as determined by the State. Unless Subrecipient can establish that Subrecipient, and its agents, employees, and Subcontractors are not the cause or source of the Incident, Subrecipient shall be responsible for the cost of notifying each person who may have been impacted by the Incident. After an Incident, Subrecipient shall take steps to reduce the risk of incurring a similar type of Incident in the future as directed by the State, which may include, but is not limited to, developing and implementing a remediation plan that is approved by the State at no additional cost to the State. The State may adjust or direct modifications to this plan, in its sole discretion and Subrecipient shall make all modifications as directed by the State. If Subrecipient cannot produce its analysis and plan within the allotted time, the State, in its sole discretion, may perform such analysis and produce a remediation plan, and Subrecipient shall reimburse the State for the reasonable costs thereof. The State may, in its sole discretion and at Subrecipient's sole expense, require Subrecipient to engage the services of an independent, qualified, State-approved third party to conduct a security audit. Subrecipient shall provide the State with the results of such audit and evidence of Subrecipient's planned remediation in response to any negative findings.

E. Data Protection and Handling

Subrecipient shall ensure that all State Records and Work Product in the possession of Subrecipient or any Subcontractors are protected and handled in accordance with the requirements of this Agreement, including the requirements of any Exhibits hereto, at all times. As used in this section, the protections afforded Work Product only apply to Work Product that requires confidential treatment.

F. Safeguarding PII

If Subrecipient or any of its Subcontractors will or may receive PII under this Agreement, Subrecipient shall provide for the security of such PII, in a manner and form acceptable to the State, including, without limitation, State non-disclosure requirements, use of appropriate technology, security practices, computer access security, data access security, data storage encryption, data transmission encryption, security inspections, and audits. Subrecipient shall be a "Third-Party Service Provider" as defined in §24-73-

103(1)(i), C.R.S., and shall maintain security procedures and practices consistent with §§24-73-101, *et seq.*, C.R.S.

9. CONFLICTS OF INTEREST

A. Actual Conflicts of Interest

Subrecipient shall not engage in any business or activities or maintain any relationships that conflict in any way with the full performance of the obligations of Subrecipient under this Agreement. Such a conflict of interest would arise when a Subrecipient or Subcontractor's employee, officer or agent were to offer or provide any tangible personal benefit to an employee of the State, or any member of his or her immediate family or his or her partner, related to the award of, entry into or management or oversight of this Agreement.

B. Apparent Conflicts of Interest

Subrecipient acknowledges that, with respect to this Agreement, even the appearance of a conflict of interest shall be harmful to the State's interests. Absent the State's prior written approval, Subrecipient shall refrain from any practices, activities or relationships that reasonably appear to be in conflict with the full performance of Subrecipient's obligations under this Agreement.

C. Disclosure to the State

If a conflict or the appearance of a conflict arises, or if Subrecipient is uncertain whether a conflict or the appearance of a conflict has arisen, Subrecipient shall submit to the State a disclosure statement setting forth the relevant details for the State's consideration. Failure to promptly submit a disclosure statement or to follow the State's direction in regard to the actual or apparent conflict constitutes a breach of this Agreement.

D. Subrecipient acknowledges that all State employees are subject to the ethical principles described in §24-18-105, C.R.S. Subrecipient further acknowledges that State employees may be subject to the requirements of §24-18-105, C.R.S., with regard to this Agreement. For the avoidance of doubt, an actual or apparent conflict of interest shall exist if Subrecipient employs or contracts with any State employee, any former State employee within six months following such employee's termination of employment with the State, or any immediate family member of such current or former State employee. Subrecipient shall provide a disclosure statement as described in §9.C. no later than ten days following entry into a contractual or employment relationship as described in this section. Failure to timely submit a disclosure statement shall constitute a Breach of Agreement. Subrecipient may also be subject to such penalties as are allowed by law.

10. INSURANCE

Subrecipient shall obtain and maintain, and ensure that each Subcontractor shall obtain and maintain, insurance as specified in this section at all times during the term of this Agreement. All insurance policies required by this Agreement that are not provided through self-insurance shall be issued by insurance companies as approved by the State.

A. Workers' Compensation

Workers' compensation insurance as required by state statute, and employers' liability insurance covering all Subrecipient or Subcontractor employees acting within the course and scope of their employment.

B. General Liability

Commercial general liability insurance covering premises operations, fire damage, independent contractors, products and completed operations, blanket contractual liability, personal injury, and advertising liability with minimum limits as follows:

- i. \$1,000,000 each occurrence;
- ii. \$1,000,000 general aggregate;
- iii. \$1,000,000 products and completed operations aggregate; and
- iv. \$50,000 any 1 fire.

C. Automobile Liability

Automobile liability insurance covering any auto (including owned, hired and non-owned autos) with a minimum limit of \$1,000,000 each accident combined single limit.

D. Additional Insured

The State shall be named as additional insured on all commercial general liability policies (leases and construction contracts require additional insured coverage for completed operations) required of Subrecipient and Subcontractors.

E. Primacy of Coverage

Coverage required of Subrecipient and each Subcontractor shall be primary over any insurance or self-insurance program carried by Subrecipient or the State.

F. Cancellation

All insurance policies shall include provisions preventing cancellation or non-renewal, except for cancellation based on non-payment of premiums, without at least 30 days prior notice to Subrecipient and Subrecipient shall forward such notice to the State in accordance with §14 within seven days of Subrecipient's receipt of such notice.

G. Subrogation Waiver

All insurance policies secured or maintained by Subrecipient or its Subcontractors in relation to this Agreement shall include clauses stating that each carrier shall waive all rights of recovery under subrogation or otherwise against Subrecipient or the State, its agencies, institutions, organizations, officers, agents, employees, and volunteers.

H. Public Entities

If Subrecipient is a "public entity" within the meaning of the Colorado Governmental Immunity Act, §24-10-101, *et seq.*, C.R.S. (the "GIA"), Subrecipient shall maintain, in lieu of the liability insurance requirements stated above, at all times during the term of this Agreement such liability insurance, by commercial policy or self-insurance, as is necessary to meet its liabilities under the GIA. If a Subcontractor is a public entity within the meaning of the GIA, Subrecipient shall ensure that the Subcontractor maintain at all times during the terms of this Subrecipient, in lieu of the liability insurance requirements stated above, such liability insurance, by commercial policy or self-insurance, as is necessary to meet the Subcontractor's obligations under the GIA.

I. Certificates

For each insurance plan provided by Subrecipient under this Agreement, Subrecipient shall provide to the State certificates evidencing Subrecipient's insurance coverage required in this Agreement prior to the Effective Date. Subrecipient shall provide to the State certificates evidencing Subcontractor insurance coverage required under this Agreement prior to the Effective Date, except that, if Subrecipient's subcontract is not in effect as of the Effective Date, Subrecipient shall provide to the State certificates showing Subcontractor insurance coverage required under this Agreement within seven Business Days following Subrecipient's execution of the subcontract. No later than 15 days before the expiration date of Subrecipient's or any Subcontractor's coverage, Subrecipient shall deliver to the State certificates of insurance evidencing renewals of coverage. At any other time during the term of this Agreement, upon request by the State, Subrecipient shall, within seven Business Days following the request by the State, supply to the State evidence satisfactory to the State of compliance with the provisions of this section.

11. BREACH OF AGREEMENT

In the event of a Breach of Agreement, the aggrieved Party shall give written notice of breach to the other Party. If the notified Party does not cure the Breach of Agreement, at its sole expense, within 30 days after the delivery of written notice, the Party may exercise any of the remedies as described in §12 for that Party. Notwithstanding any provision of this Agreement to the contrary, the State, in its discretion, need not provide notice or a cure period and may immediately terminate this Agreement in whole or in part or institute any other remedy in this Agreement in order to protect the public interest of the State; or if Subrecipient is debarred or suspended under §24-109-105, C.R.S., the State, in its discretion, need not provide notice or cure period and may terminate this Agreement in whole or in part or institute any other remedy in this Agreement as of the date that the debarment or suspension takes effect.

12. REMEDIES

A. State's Remedies

If Subrecipient is in breach under any provision of this Agreement and fails to cure such breach, the State, following the notice and cure period set forth in §11, shall have all of the remedies listed in this section in addition to all other remedies set forth in this Agreement or at law. The State may exercise any or all of the remedies available to it, in its discretion, concurrently or consecutively.

i. Termination for Breach of Agreement

In the event of Subrecipient's uncured breach, the State may terminate this entire Agreement or any part of this Agreement. Additionally, if Subrecipient fails to comply with any terms of the Federal Award, then the State may, in its discretion or at the direction of a Federal Awarding Agency, terminate this entire Agreement or any part of this Agreement. Subrecipient shall continue performance of this Agreement to the extent not terminated, if any.

a. Obligations and Rights

To the extent specified in any termination notice, Subrecipient shall not incur further obligations or render further performance past the effective date of such notice, and shall terminate outstanding orders and subcontracts with third parties. However, Subrecipient shall complete and deliver to the State all Work not cancelled by the termination notice, and may incur obligations as necessary to do so within this Agreement's terms. At the request of the State, Subrecipient shall assign to the State all of Subrecipient's rights, title, and interest in and to such terminated orders or subcontracts. Upon termination, Subrecipient shall take timely, reasonable and necessary action to protect and preserve property in the possession of Subrecipient but in which the State has an interest. At the State's request, Subrecipient shall return materials owned by the State in Subrecipient's possession at the time of any termination. Subrecipient shall deliver all completed Work Product and all Work Product that was in the process of completion to the State at the State's request.

b. Payments

Notwithstanding anything to the contrary, the State shall only pay Subrecipient for accepted Work received as of the date of termination. If, after termination by the State, the State agrees that Subrecipient was not in breach or that Subrecipient's action or inaction was excusable, such termination shall be treated as a termination in the public interest, and the rights and obligations of the Parties shall be as if this Agreement had been terminated in the public interest under §2.E.

c. Damages and Withholding

Notwithstanding any other remedial action by the State, Subrecipient shall remain liable to the State for any damages sustained by the State in connection with any breach by Subrecipient, and the State may withhold payment to Subrecipient for the purpose of mitigating the State's damages until such time as the exact amount of damages due to the State from Subrecipient is determined. The State may withhold any amount that may be due Subrecipient as the State deems necessary to protect the State against loss including, without limitation, loss as a result of outstanding liens and excess costs incurred by the State in procuring from third parties replacement Work as cover.

ii. Remedies Not Involving Termination

The State, in its discretion, may exercise one or more of the following additional remedies:

a. Suspend Performance

Suspend Subrecipient's performance with respect to all or any portion of the Work pending corrective action as specified by the State without entitling Subrecipient to an adjustment in price or cost or an adjustment in the performance schedule. Subrecipient shall promptly cease performing Work and incurring costs in accordance with the State's directive, and the State shall not be liable for costs incurred by Subrecipient after the suspension of performance.

b. Withhold Payment

Withhold payment to Subrecipient until Subrecipient corrects its Work.

c. Deny Payment

Deny payment for Work not performed, or that due to Subrecipient's actions or inactions, cannot be performed or if they were performed are reasonably of no value to the state; provided, that any denial of payment shall be equal to the value of the obligations not performed.

d. Removal

Demand immediate removal of any of Subrecipient's employees, agents, or Subcontractors from the Work whom the State deems incompetent, careless, insubordinate, unsuitable, or otherwise unacceptable or whose continued relation to this Agreement is deemed by the State to be contrary to the public interest or the State's best interest.

e. Intellectual Property

If any Work infringes, or if the State in its sole discretion determines that any Work is likely to infringe, a patent, copyright, trademark, trade secret or other intellectual property right, Subrecipient shall, as approved by the State (i) secure that right to use such Work for the State and Subrecipient; (ii) replace the Work with noninfringing Work or modify the Work so that it becomes noninfringing; or, (iii) remove any infringing Work and refund the amount paid for such Work to the State.

B. Subrecipient's Remedies

If the State is in breach of any provision of this Agreement and does not cure such breach, Subrecipient, following the notice and cure period in §11 and the dispute resolution process in §13 shall have all remedies available at law and equity.

13. DISPUTE RESOLUTION

A. Initial Resolution

Except as herein specifically provided otherwise, disputes concerning the performance of this Agreement which cannot be resolved by the designated Agreement representatives shall be referred in writing to a senior departmental management staff member designated by the State and a senior manager designated by Subrecipient for resolution.

B. Resolution of Controversies

If the initial resolution described in §13.A fails to resolve the dispute within 10 Business Days, Subrecipient shall submit any alleged breach of this Agreement by the State to the Procurement Official of the State Agency named on the Cover Page of this Agreement as described in §24-101-301(30), C.R.S., for resolution following the same resolution of controversies process as described in §§24-106-109, and 24-109-101.1 through 24-109-505, C.R.S., (collectively, the "Resolution Statutes"), except that if Subrecipient wishes to challenge any decision rendered by the Procurement Official, Subrecipient's challenge shall be an appeal to the executive director of the Department of Personnel and Administration, or their delegate, in the same manner as described in the Resolution Statutes before Subrecipient pursues any further action. Except as otherwise stated in this Section, all requirements of the Resolution Statutes shall apply including, without limitation, time limitations regardless of whether the Colorado Procurement Code applies to this Agreement.

14. NOTICES and REPRESENTATIVES

Each individual identified as a Principal Representative on the Cover Page for this Agreement shall be the principal representative of the designating Party. All notices required or permitted to be given under this Agreement shall be in writing, and shall be delivered (A) by hand with receipt required, (B) by certified or registered mail to such Party's principal representative at the address set forth on the Cover Page for this Agreement or (C) as an email with read receipt requested to the principal representative at the email address, if any, set forth on the Cover Page for this Agreement. If a Party delivers a notice to another through email and the email is undeliverable, then, unless the Party has been provided with an alternate email contact, the Party delivering the notice shall deliver the notice by hand with receipt required or by certified or registered mail to such Party's principal representative at the address set forth on the Cover Page for this Agreement. Either Party may change its principal representative or principal representative contact information, or may designate specific other individuals to receive certain types of notices in addition to or in lieu of a principal representative, by notice submitted in accordance with this section without a formal amendment to this Agreement. Unless otherwise provided in this Agreement, notices shall be effective upon delivery of the written notice.

15. RIGHTS IN WORK PRODUCT AND OTHER INFORMATION

A. Work Product

Subrecipient agrees to provide to the State a royalty-free, non-exclusive and irrevocable license to reproduce publish or otherwise use and to authorize others to use the Work Product described herein, for the Federal Awarding Agency's and State's purposes. All Work Product shall be delivered to the State by Subrecipient upon completion or termination hereof.

B. Exclusive Property of the State

Except to the extent specifically provided elsewhere in this Agreement, all State Records, documents, text, software (including source code), research, reports, proposals, specifications, plans, notes, studies, data, images, photographs, negatives, pictures, drawings, designs, models, surveys, maps, materials, ideas, concepts, know-how, and information provided by or on behalf of the State to Subrecipient are the exclusive property of the State (collectively, "State Materials"). Subrecipient shall not use, willingly allow, cause or permit Work Product or State Materials to be used for any purpose other than the performance of Subrecipient's obligations in this Agreement without the prior written consent of the State. Upon termination of this Agreement for any reason, Subrecipient shall provide all Work Product and State Materials to the State in a form and manner as directed by the State.

C. Exclusive Property of Subrecipient

Subrecipient retains the exclusive rights, title, and ownership to any and all pre-existing materials owned or licensed to Subrecipient including, but not limited to, all pre-existing software, licensed products, associated source code, machine code, text images, audio and/or video, and third-party materials, delivered by Subrecipient under this Agreement, whether incorporated in a Deliverable or necessary to use a Deliverable (collectively, "Subrecipient Property"). Subrecipient Property shall be licensed to the State as set forth in this Agreement or a State approved license agreement: (i) entered into as exhibits to this Agreement, (ii) obtained by the State from the applicable third-party vendor, or (iii) in the case of open source software, the license terms set forth in the applicable open source license agreement.

16. GENERAL PROVISIONS

A. Assignment

Subrecipient's rights and obligations under this Agreement are personal and may not be transferred or assigned without the prior, written consent of the State. Any attempt at assignment or transfer without such consent shall be void. Any assignment or transfer of Subrecipient's rights and obligations approved by the State shall be subject to the provisions of this Agreement.

B. Subcontracts

Subrecipient shall not enter into any subaward or subcontract in connection with its obligations under this Agreement without the prior, written approval of the State. Subrecipient shall submit to the State a copy of each such subaward or subcontract upon request by the State. All subawards and subcontracts entered into by Subrecipient in connection with this Agreement shall comply with all applicable federal and state laws and regulations, shall provide that they are governed by the laws of the State of Colorado, and shall be subject to all provisions of this Agreement. If the entity with whom Subrecipient enters into a subcontract or subaward would also be considered a Subrecipient, then the subcontract or subaward entered into by Subrecipient shall also contain provisions permitting both Subrecipient and the State to perform all monitoring of that Subcontractor in accordance with the Uniform Guidance.

C. Binding Effect

Except as otherwise provided in **§16.A.**, all provisions of this Agreement, including the benefits and burdens, shall extend to and be binding upon the Parties' respective successors and assigns.

D. Authority

Each Party represents and warrants to the other that the execution and delivery of this Agreement and the performance of such Party's obligations have been duly authorized.

E. Captions and References

The captions and headings in this Agreement are for convenience of reference only, and shall not be used to interpret, define, or limit its provisions. All references in this Agreement to sections (whether spelled out or using the § symbol), subsections, exhibits or other attachments, are references to sections, subsections, exhibits or other attachments contained herein or incorporated as a part hereof, unless otherwise noted.

F. Counterparts

This Agreement may be executed in multiple, identical, original counterparts, each of which shall be deemed to be an original, but all of which, taken together, shall constitute one and the same agreement.

G. Entire Understanding

This Agreement represents the complete integration of all understandings between the Parties related to the Work, and all prior representations and understandings related to the Work, oral or written, are merged into this Agreement. Prior or contemporaneous additions, deletions, or other changes to this Agreement shall not have any force or effect whatsoever, unless embodied herein.

H. Digital Signatures

If any signatory signs this Agreement using a digital signature in accordance with the Colorado State Controller Contract, Grant and Purchase Order Policies regarding the use of digital signatures issued under the State Fiscal Rules, then any agreement or consent to use digital signatures within the electronic system through which that signatory signed shall be incorporated into this Agreement by reference.

I. Modification

Except as otherwise provided in this Agreement, any modification to this Agreement shall only be effective if agreed to in a formal amendment to this Agreement, properly executed and approved in accordance with applicable Colorado State law and State Fiscal Rules. Modifications permitted under this Agreement, other than Agreement amendments, shall conform to the policies issued by the Colorado State Controller.

J. Statutes, Regulations, Fiscal Rules, and Other Authority.

Any reference in this Agreement to a statute, regulation, State Fiscal Rule, fiscal policy or other authority shall be interpreted to refer to such authority then current, as may have been changed or amended since the Effective Date of this Agreement.

K. External Terms and Conditions

Notwithstanding anything to the contrary herein, the State shall not be subject to any provision included in any terms, conditions, or agreements appearing on Subrecipient's or a Subcontractor's website or any provision incorporated into any click-through or online agreements related to the Work unless that provision is specifically referenced in this Agreement.

L. Severability

The invalidity or unenforceability of any provision of this Agreement shall not affect the validity or enforceability of any other provision of this Agreement, which shall remain in full force and effect, provided that the Parties can continue to perform their obligations under this Agreement in accordance with the intent of this Agreement.

M. Survival of Certain Agreement Terms

Any provision of this Agreement that imposes an obligation on a Party after termination or expiration of this Agreement shall survive the termination or expiration of this Agreement and shall be enforceable by the other Party.

N. Taxes

The State is exempt from federal excise taxes under I.R.C. Chapter 32 (26 U.S.C., Subtitle D, Ch. 32) (Federal Excise Tax Exemption Certificate of Registry No. 84-730123K) and from State and local government sales and use taxes under §§39-26-704(1), *et seq.*, C.R.S. (Colorado Sales Tax Exemption Identification Number 98-02565). The State shall not be liable for the payment of any excise, sales, or use taxes, regardless of whether any political subdivision of the State imposes such taxes on Subrecipient. Subrecipient shall be solely responsible for any exemptions from the collection of excise, sales or use taxes that Subrecipient may wish to have in place in connection with this Agreement.

O. Third Party Beneficiaries

Except for the Parties' respective successors and assigns described in **§16.A.**, this Agreement does not and is not intended to confer any rights or remedies upon any person or entity other than the Parties. Enforcement of this Agreement and all rights and obligations hereunder are reserved solely to the Parties. Any services or benefits which third parties receive as a result of this Agreement are incidental to this Agreement, and do not create any rights for such third parties.

P. Waiver

A Party's failure or delay in exercising any right, power, or privilege under this Agreement, whether explicit or by lack of enforcement, shall not operate as a waiver, nor shall any single or partial exercise of any right, power, or privilege preclude any other or further exercise of such right, power, or privilege.

Q. CORA Disclosure

To the extent not prohibited by federal law, this Agreement and the performance measures and standards required under §24-106-107, C.R.S., if any, are subject to public release through the CORA.

R. Standard and Manner of Performance

Subrecipient shall perform its obligations under this Agreement in accordance with the highest standards of care, skill and diligence in Subrecipient's industry, trade, or profession.

S. Licenses, Permits, and Other Authorizations

- i. Subrecipient shall secure, prior to the Effective Date, and maintain at all times during the term of this Agreement, at its sole expense, all licenses, certifications, permits, and other authorizations required to perform its obligations under this Agreement, and shall ensure that all employees, agents and Subcontractors secure and maintain at all times during the term of their employment, agency or Subcontractor, all license, certifications, permits and other authorizations required to perform their obligations in relation to this Agreement.
- ii. Subrecipient, if a foreign corporation or other foreign entity transacting business in the State of Colorado, shall obtain prior to the Effective Date and maintain at all times during the term of this Agreement, at its sole expense, a certificate of authority to transact business in the State of Colorado and designate a registered agent in Colorado to accept service of process.

T. Federal Provisions

Subrecipient shall comply with all applicable requirements of Exhibits C, D, and E at all times during the term of this Agreement.

17. COLORADO SPECIAL PROVISIONS (COLORADO FISCAL RULE 3-3)

These Special Provisions apply to all agreements except where noted in italics.

A. Statutory Approvals. §24-30-202(1), C.R.S.

This Agreement shall not be valid until it has been approved by the Colorado State Controller or designee. If this Agreement is for a Major Information Technology Project, as defined in §24-37.5-102(2.6), C.R.S., then this Agreement shall not be valid until it has been approved by the State's Chief Information Officer or designee.

B. Fund Availability. §24-30-202(5.5), C.R.S.

Financial obligations of the State payable after the current State Fiscal Year are contingent upon funds for that purpose being appropriated, budgeted, and otherwise made available.

C. Governmental Immunity.

Liability for claims for injuries to persons or property arising from the negligence of the State, its departments, boards, commissions committees, bureaus, offices, employees and officials shall be controlled and limited by the provisions of the Colorado Governmental Immunity Act, §24-10-101, et seq., C.R.S.; the Federal Tort Claims Act, 28 U.S.C. Pt. VI, Ch. 171 and 28 U.S.C. 1346(b), and the State's risk management statutes, §§24-30-1501, et seq. C.R.S. No term or condition of this Agreement shall be construed or interpreted as a waiver, express or implied, of any of the immunities, rights, benefits, protections, or other provisions, contained in these statutes.

D. Independent Contractor.

Grantee shall perform its duties hereunder as an independent contractor and not as an employee. Neither Grantee nor any agent or employee of Grantee shall be deemed to be an agent or employee of the State. Grantee shall not have authorization, express or implied, to bind the State to any agreement, liability or understanding, except as expressly set forth herein. Grantee and its employees and agents are not entitled to unemployment insurance or workers compensation benefits through the State and the State shall not pay for or otherwise provide such coverage for Grantee or any of its agents or employees. Grantee shall pay when due all applicable employment taxes and income taxes and local head taxes incurred pursuant to this Agreement. Grantee shall (i) provide and keep in force workers' compensation and unemployment compensation insurance in the amounts required by law, (ii) provide proof thereof when requested by the State, and (iii) be solely responsible for its acts and those of its employees and agents.

E. Compliance with Law.

Grantee shall comply with all applicable federal and State laws, rules, and regulations in effect or hereafter established, including, without limitation, laws applicable to discrimination and unfair employment practices.

F. Choice of Law, Jurisdiction, and Venue.

Colorado law, and rules and regulations issued pursuant thereto, shall be applied in the interpretation, execution, and enforcement of this Agreement. Any provision included or incorporated herein by reference which conflicts with said laws, rules, and regulations shall be null and void. All suits or actions related to this Agreement shall be filed and proceedings held in the State of Colorado and exclusive venue shall be in the City and County of Denver.

G. Prohibited Terms.

Any term included in this Agreement that requires the State to indemnify or hold Grantee harmless; requires the State to agree to binding arbitration; limits Grantee's liability for damages resulting from death, bodily injury, or damage to tangible property; or that conflicts with this provision in any way shall be void ab initio. Nothing in this Agreement shall be construed as a waiver of any provision of §24-106-109, C.R.S.

H. Software Piracy Provisions.

State or other public funds payable under this Agreement shall not be used for the acquisition, operation, or maintenance of computer software in violation of federal copyright laws or applicable licensing restrictions. Grantee hereby certifies and warrants that, during the term of this Agreement and any extensions, Grantee has and shall maintain in place appropriate systems and controls to prevent such improper use of public funds. If the State determines that Grantee is in violation of this provision, the State may exercise any remedy available at law or in equity or under this Agreement, including, without limitation, immediate termination of this Agreement and any remedy consistent with federal copyright laws or applicable licensing restrictions.

I. Employee Financial Interest/Conflict of Interest §§24-18-201 and 24-50-507, C.R.S.

The signatories aver that to their knowledge, no employee of the State has any personal or beneficial interest whatsoever in the service or property described in this Agreement. Grantee has no interest and shall not acquire any interest, direct or indirect, that would conflict in any manner or degree with the performance of Grantee's services and Grantee shall not employ any person having such known interests.

J. Vendor Offset and Erroneous Payments §§24-30-202(1) and 24-30-202.4, C.R.S.

[Not applicable to intergovernmental agreements] Subject to §24-30-202.4(3.5), C.R.S., the State Controller may withhold payment under the State's vendor offset intercept system for debts owed to State agencies for: (i) unpaid child support debts or child support arrearages; (ii) unpaid balances of tax, accrued interest, or other charges specified in §§39-21-101, et seq., C.R.S.; (iii) unpaid loans due to the Student Loan Division of the Department of Higher Education; (iv) amounts required to be paid to the Unemployment Compensation Fund; and (v) other unpaid debts owing to the State as a result of final agency determination or judicial action. The State may also recover, at the State's discretion, payments made to Grantee in error for any reason, including, but not limited to, overpayments or improper payments, and unexpended or excess funds received by Grantee by deduction from subsequent payments under this Agreement, deduction from any payment due under any other contracts, grants or agreements between the State and Grantee, or by any other appropriate method for collecting debts owed to the State.

EXHIBIT A, STATEMENT OF WORK AND BUDGET

RTO&T Grant Subaward Louisville Signal Technology Upgrade

Federal award required identification.

- SAMS UEI: QWGUQ6YPC8Z8
- Subawardee Name (as listed in SAMS): City of Louisville
- Subawardee Address:
749 Main Street, Louisville, CO 80027
- Amount of Subaward (federal only): **\$545,000.00**
- Subawardee Principal Place of Performance: Boulder, CO
- CFDA number: 20.205
- Project Manager Name, Title, Address, Phone, email:

Geoffrey Nettleton, Civil Engineer III
749 Main Street, Louisville, CO 80027
303-335-4603
gnettleton@louisvillco.gov

- Anticipated Project timeline: **Spring 2025 – Fall 2026**

Scope of Work

This project seeks to add new or upgrade outdated hardware at multiple intersections throughout Louisville. Improvements proposed include upgrades of signal cabinets, battery backup, improvements to signal and advanced detection, and emergency pre-emption. The system will function like other modern traffic signal systems in the region, and Louisville will leverage its investment in signal management software to maximize the operational and safety benefits to be gained from these hardware upgrades. This project will create a great baseline of hardware and software that is able to easily implement newer technology and software solutions that can aid in regional collaboration.

Budget:

STBG – Urban (82.79%)	
FY25:	\$545,000.00
Local match funding (17.21%):	\$113,292.00
Grant Contract Total:	\$658,292.00
Overmatch – Local:	\$86,788.00
Project Total:	\$745,080.00

Product Cost Estimates:

City of Louisville DRCOG Technology Grant Cost Estimates			
Item	Qty	Cost	Total
TS1 to TS2 Signal Cabinets	7	\$30,000	\$210,000
Battery Backups	13	\$15,000	\$195,000
Camera Detection	9	\$24,000	\$216,000
Emergency Pre-Emption	16	\$7,050	\$112,800
Contingency/Misc Items	10%		\$11,280
		Total Cost	\$745,080

EXHIBIT B, SAMPLE OPTION LETTER

State Agency Department of Transportation	Option Letter Number Insert the Option Number (e.g. "1" for the first option)
Subrecipient Insert Subrecipient's Full Legal Name, including "Inc.", "LLC", etc...	Original Agreement Number Insert CMS number or Other Contract Number of the Original Contract
Subaward Agreement Amount Federal Funds \$0.00	Option Agreement Number Insert CMS number or Other Contract Number of this Option
	Agreement Performance Beginning Date The later of the Effective Date or Month, Day, Year
Agreement Total \$0.00	Current Agreement Expiration Date Month, Day, Year

1. OPTIONS:

- A. Option to extend for an Extension Term or End of Term Extension.

2. REQUIRED PROVISIONS:

- A. **For use with Option 1(A):** In accordance with Section(s) 2.B/2.C of the Original Agreement referenced above, the State hereby exercises its option for an additional term/end of term extension, beginning Insert start date and ending on the current agreement expiration date shown above, at the rates stated in the Original Agreement, as amended.

3. OPTION EFFECTIVE DATE:

- A. The effective date of this Option Letter is upon approval of the State Controller or ____, whichever is later.

STATE OF COLORADO Jared S. Polis, Governor Department of Transportation Shoshana M. Lew, Executive Director By: _____ Name: _____ Title: _____ Date: _____	In accordance with §24-30-202, C.R.S., this Option Letter is not valid until signed and dated below by the State Controller or an authorized delegate. STATE CONTROLLER Robert Jaros, CPA, MBA, JD By: _____ Department of Transportation Option Letter Effective Date: _____
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EXHIBIT C, FEDERAL PROVISIONS**1. APPLICABILITY OF PROVISIONS.**

- 1.1. The Grant to which these Federal Provisions are attached has been funded, in whole or in part, with an Award of Federal funds. In the event of a conflict between the provisions of these Federal Provisions, the Special Provisions, the body of the Grant, or any attachments or exhibits incorporated into and made a part of the Grant, the provisions of these Federal Provisions shall control.
- 1.2. The State of Colorado is accountable to Treasury for oversight of their subrecipients, including ensuring their subrecipients comply with federal statutes, Award Terms and Conditions, Treasury's Final Rule, and reporting requirements, as applicable.
- 1.3. Additionally, any subrecipient that issues a subaward to another entity (2nd tier subrecipient), must hold the 2nd tier subrecipient accountable to these provisions and adhere to reporting requirements.
- 1.4. These Federal Provisions are subject to the Award as defined in §2 of these Federal Provisions, as may be revised pursuant to ongoing guidance from the relevant Federal or State of Colorado agency or institutions of higher education.

2. DEFINITIONS.

- 2.1. For the purposes of these Federal Provisions, the following terms shall have the meanings ascribed to them below.
 - 2.1.1. "Award" means an award of Federal financial assistance, and the Grant setting forth the terms and conditions of that financial assistance, that a non-Federal Entity receives or administers.
 - 2.1.2. "Entity" means:
 - 2.1.2.1. a Non-Federal Entity;
 - 2.1.2.2. a foreign public entity;
 - 2.1.2.3. a foreign organization;
 - 2.1.2.4. a non-profit organization;
 - 2.1.2.5. a domestic for-profit organization (for 2 CFR parts 25 and 170 only);
 - 2.1.2.6. a foreign non-profit organization (only for 2 CFR part 170) only);
 - 2.1.2.7. a Federal agency, but only as a Subrecipient under an Award or Subaward to a non-Federal entity (or 2 CFR 200.1); or
 - 2.1.2.8. a foreign for-profit organization (for 2 CFR part 170 only).
 - 2.1.3. "Executive" means an officer, managing partner or any other employee in a management position.
 - 2.1.4. "Expenditure Category (EC)" means the category of eligible uses as defined by the US Department of Treasury in "Appendix 1 of the Compliance and Reporting Guidance, State and Local Fiscal Recovery Funds" report available at www.treasury.gov.
 - 2.1.5. "Federal Awarding Agency" means a Federal agency providing a Federal Award to a Recipient as described in 2 CFR 200.1

- 2.1.6. “Grant” means the Grant to which these Federal Provisions are attached.
- 2.1.7. “Grantee” means the party or parties identified as such in the Grant to which these Federal Provisions are attached.
- 2.1.8. “Non-Federal Entity” means a State, local government, Indian tribe, institution of higher education, or nonprofit organization that carries out a Federal Award as a Recipient or a Subrecipient.
- 2.1.9. “Nonprofit Organization” means any corporation, trust, association, cooperative, or other organization, not including IHEs, that:
- 2.1.9.1. Is operated primarily for scientific, educational, service, charitable, or similar purposes in the public interest;
 - 2.1.9.2. Is not organized primarily for profit; and
 - 2.1.9.3. Uses net proceeds to maintain, improve, or expand the operations of the organization.
- 2.1.10. “OMB” means the Executive Office of the President, Office of Management and Budget.
- 2.1.11. “Pass-through Entity” means a non-Federal Entity that provides a Subaward to a Subrecipient to carry out part of a Federal program.
- 2.1.12. “Prime Recipient” means the Colorado State agency or institution of higher education identified as the Grantor in the Grant to which these Federal Provisions are attached.
- 2.1.13. “Subaward” means an award by a Prime Recipient to a Subrecipient funded in whole or in part by a Federal Award. The terms and conditions of the Federal Award flow down to the Subaward unless the terms and conditions of the Federal Award specifically indicate otherwise in accordance with 2 CFR 200.101. The term does not include payments to a Contractor or payments to an individual that is a beneficiary of a Federal program.
- 2.1.14. “Subrecipient” or “Subgrantee” means a non-Federal Entity (or a Federal agency under an Award or Subaward to a non-Federal Entity) receiving Federal funds through a Prime Recipient to support the performance of the Federal project or program for which the Federal funds were awarded. A Subrecipient is subject to the terms and conditions of the Federal Award to the Prime Recipient, including program compliance requirements. The term does not include an individual who is a beneficiary of a federal program. For SLFRF Grants, a subrecipient relationship continues to exist for Expenditure Category 6.1 Revenue Replacement.
- 2.1.15. “System for Award Management (SAM)” means the Federal repository into which an Entity must enter the information required under the Transparency Act, which may be found at <http://www.sam.gov>. “Total Compensation” means the cash and noncash dollar value earned by an Executive during the Prime Recipient’s or Subrecipient’s preceding fiscal year (see 48 CFR 52.204-10, as prescribed in 48 CFR 4.1403(a)) and includes the following:
- 2.1.15.1. Salary and bonus;
 - 2.1.15.2. Awards of stock, stock options, and stock appreciation rights, using the dollar amount recognized for financial statement reporting purposes with

respect to the fiscal year in accordance with the Statement of Financial Accounting Standards No. 123 (Revised 2005) (FAS 123R), Shared Based Payments;

2.1.15.3. Earnings for services under non-equity incentive plans, not including group life, health, hospitalization or medical reimbursement plans that do not discriminate in favor of Executives and are available generally to all salaried employees;

2.1.15.4. Change in present value of defined benefit and actuarial pension plans;

2.1.15.5. Above-market earnings on deferred compensation which is not tax-qualified;

2.1.15.6. Other compensation, if the aggregate value of all such other compensation (e.g., severance, termination payments, value of life insurance paid on behalf of the employee, perquisites or property) for the Executive exceeds \$10,000.

2.1.16. "Transparency Act" means the Federal Funding Accountability and Transparency Act of 2006 (Public Law 109-282), as amended by §6202 of Public Law 110-252.

2.1.17. "Uniform Guidance" means the Office of Management and Budget Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards. The terms and conditions of the Uniform Guidance flow down to Awards to Subrecipients unless the Uniform Guidance or the terms and conditions of the Federal Award specifically indicate otherwise.

2.1.18. "Unique Entity ID Number" means the Unique Entity ID established by the federal government for a Grantee at <https://sam.gov/content/home>

3. COMPLIANCE.

3.1. Grantee shall comply with all applicable provisions of the Transparency Act and the regulations issued pursuant thereto, all provisions of the Uniform Guidance, and all applicable Federal Laws and regulations required by this Federal Award. Any revisions to such provisions or regulations shall automatically become a part of these Federal Provisions, without the necessity of either party executing any further instrument. The State of Colorado, at its discretion, may provide written notification to Grantee of such revisions, but such notice shall not be a condition precedent to the effectiveness of such revisions.

3.2. Per US Treasury Final Award requirements, grantee programs or services must not include terms or conditions that undermine efforts to stop COVID-19 or discourage compliance with recommendations and CDC guidelines.

4. SYSTEM FOR AWARD MANAGEMENT (SAM) AND UNIQUE ENTITY ID SYSTEM (UEI) REQUIREMENTS.

4.1. SAM. Grantee shall maintain the currency of its information in SAM until the Grantee submits the final financial report required under the Award or receives final payment, whichever is later. Grantee shall review and update SAM information at least annually.

4.2. UEI. Grantee shall provide its Unique Entity ID to its Prime Recipient, and shall update Grantee's information in SAM.gov at least annually.

5. TOTAL COMPENSATION.

5.1. Grantee shall include Total Compensation in SAM for each of its five most highly compensated Executives for the preceding fiscal year if:

5.1.1. The total Federal funding authorized to date under the Award is \$30,000 or more; and

5.1.2. In the preceding fiscal year, Grantee received:

5.1.2.1. 80% or more of its annual gross revenues from Federal procurement Agreements and Subcontractors and/or Federal financial assistance Awards or Subawards subject to the Transparency Act; and

5.1.2.2. \$30,000,000 or more in annual gross revenues from Federal procurement Agreements and Subcontractors and/or Federal financial assistance Awards or Subawards subject to the Transparency Act; and

5.1.2.3. 5.1.2.3 The public does not have access to information about the compensation of such Executives through periodic reports filed under section 13(a) or 15(d) of the Securities Exchange Act of 1934 (15 U.S.C. 78m(a), 78o(d) or § 6104 of the Internal Revenue Code of 1986.

6. REPORTING.

6.1. If Grantee is a Subrecipient of the Award pursuant to the Transparency Act, Grantee shall report data elements to SAM and to the Prime Recipient as required in this Exhibit. No direct payment shall be made to Grantee for providing any reports required under these Federal Provisions and the cost of producing such reports shall be included in the Grant price. The reporting requirements in this Exhibit are based on guidance from the OMB, and as such are subject to change at any time by OMB. Any such changes shall be automatically incorporated into this Grant and shall become part of Grantee's obligations under this Grant.

7. EFFECTIVE DATE AND DOLLAR THRESHOLD FOR FEDERAL REPORTING.

7.1. Reporting requirements in §8 below apply to new Awards as of October 1, 2010, if the initial award is \$30,000 or more. If the initial Award is below \$30,000 but subsequent Award modifications result in a total Award of \$30,000 or more, the Award is subject to the reporting requirements as of the date the Award exceeds \$30,000. If the initial Award is \$30,000 or more, but funding is subsequently de-obligated such that the total award amount falls below \$30,000, the Award shall continue to be subject to the reporting requirements. If the total award is below \$30,000 no reporting required; if more than \$30,000 and less than \$50,000 then FFATA reporting is required; and, \$50,000 and above SLFRF reporting is required.

7.2. The procurement standards in §9 below are applicable to new Awards made by Prime Recipient as of December 26, 2015. The standards set forth in §11 below are applicable to audits of fiscal years beginning on or after December 26, 2014.

8. SUBRECIPIENT REPORTING REQUIREMENTS. [INTENTIONALLY DELETED]

9. PROCUREMENT STANDARDS.

9.1. Procurement Procedures. A Subrecipient shall use its own documented procurement procedures which reflect applicable State, local, and Tribal laws and applicable regulations, provided that the procurements conform to applicable Federal law and the standards identified in the Uniform Guidance, including without limitation, 2 CFR 200.318 through 200.327 thereof.

- 9.2. Domestic preference for procurements (2 CFR 200.322). As appropriate and to the extent consistent with law, the non-Federal entity should, to the greatest extent practicable under a Federal award, provide a preference for the purchase, acquisition, or use of goods, products, or materials produced in the United States (including but not limited to iron, aluminum, steel, cement, and other manufactured products). The requirements of this section must be included in all subawards including all Agreements and purchase orders for work or products under this award.
- 9.3. Procurement of Recovered Materials. If a Subrecipient is a State Agency or an agency of a political subdivision of the State, its Contractors must comply with section 6002 of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act. The requirements of Section 6002 include procuring only items designated in guidelines of the Environmental Protection Agency (EPA) at 40 CFR part 247, that contain the highest percentage of recovered materials practicable, consistent with maintaining a satisfactory level of competition, where the purchase price of the item exceeds \$10,000 or the value of the quantity acquired during the preceding fiscal year exceeded \$10,000; procuring solid waste management services in a manner that maximizes energy and resource recovery; and establishing an affirmative procurement program for procurement of recovered materials identified in the EPA guidelines.

10. ACCESS TO RECORDS.

- 10.1. A Subrecipient shall permit Prime Recipient and its auditors to have access to Subrecipient's records and financial statements as necessary for Recipient to meet the requirements of 2 CFR 200.332 (Requirements for pass-through entities), 2 CFR 200.300 (Statutory and national policy requirements) through 2 CFR 200.309 (Period of performance), and Subpart F-Audit Requirements of the Uniform Guidance.

11. SINGLE AUDIT REQUIREMENTS.

- 11.1. If a Subrecipient expends \$750,000 or more in Federal Awards during the Subrecipient's fiscal year, the Subrecipient shall procure or arrange for a single or program-specific audit conducted for that year in accordance with the provisions of Subpart F-Audit Requirements of the Uniform Guidance, issued pursuant to the Single Audit Act Amendments of 1996, (31 U.S.C. 7501-7507). 2 CFR 200.501.
- 11.1.1. Election. A Subrecipient shall have a single audit conducted in accordance with Uniform Guidance 2 CFR 200.514 (Scope of audit), except when it elects to have a program-specific audit conducted in accordance with 2 CFR 200.507 (Program-specific audits). The Subrecipient may elect to have a program-specific audit if Subrecipient expends Federal Awards under only one Federal program (excluding research and development) and the Federal program's statutes, regulations, or the terms and conditions of the Federal award do not require a financial statement audit of Prime Recipient. A program-specific audit may not be elected for research and development unless all of the Federal Awards expended were received from Recipient and Recipient approves in advance a program-specific audit.
- 11.1.2. Exemption. If a Subrecipient expends less than \$750,000 in Federal Awards during its fiscal year, the Subrecipient shall be exempt from Federal audit requirements for that year, except as noted in 2 CFR 200.503 (Relation to other audit requirements), but records shall be available for review or audit by appropriate officials of the Federal agency, the State, and the Government Accountability Office.

- 11.1.3. Subrecipient Compliance Responsibility. A Subrecipient shall procure or otherwise arrange for the audit required by Subpart F of the Uniform Guidance and ensure it is properly performed and submitted when due in accordance with the Uniform Guidance. Subrecipient shall prepare appropriate financial statements, including the schedule of expenditures of Federal awards in accordance with 2 CFR 200.510 (Financial statements) and provide the auditor with access to personnel, accounts, books, records, supporting documentation, and other information as needed for the auditor to perform the audit required by Uniform Guidance Subpart F-Audit Requirements.

12. GRANT PROVISIONS FOR SUBRECIPIENT AGREEMENTS.

- 12.1. In addition to other provisions required by the Federal Awarding Agency or the Prime Recipient, Grantees that are Subrecipients shall comply with the following provisions. Subrecipients shall include all of the following applicable provisions in all Subcontractors entered into by it pursuant to this Grant.
- 12.1.1. [Applicable to federally assisted construction Agreements.] Equal Employment Opportunity. Except as otherwise provided under 41 CFR Part 60, all Agreements that meet the definition of “federally assisted construction Agreement” in 41 CFR Part 60-1.3 shall include the equal opportunity clause provided under 41 CFR 60-1.4(b), in accordance with Executive Order 11246, “Equal Employment Opportunity” (30 FR 12319, 12935, 3 CFR Part, 1964-1965 Comp., p. 339), as amended by Executive Order 11375, “Amending Executive Order 11246 Relating to Equal Employment Opportunity,” and implementing regulations at 41 CFR part 60, Office of Federal Agreement Compliance Programs, Equal Employment Opportunity, Department of Labor.
- 12.1.2. [Applicable to on-site employees working on government-funded construction, alteration and repair projects.] Davis-Bacon Act. Davis-Bacon Act, as amended (40 U.S.C. 3141-3148).
- 12.1.3. Rights to Inventions Made Under a grant or agreement. If the Federal Award meets the definition of “funding agreement” under 37 CFR 401.2 (a) and the Prime Recipient or Subrecipient wishes to enter into an Agreement with a small business firm or nonprofit organization regarding the substitution of parties, assignment or performance of experimental, developmental, or research work under that “funding agreement,” the Prime Recipient or Subrecipient must comply with the requirements of 37 CFR Part 401, “Rights to Inventions Made by Nonprofit Organizations and Small Business Firms Under Government Grants, Agreements and Cooperative Agreements,” and any implementing regulations issued by the Federal Awarding Agency.
- 12.1.4. Clean Air Act (42 U.S.C. 7401-7671q.) and the Federal Water Pollution Control Act (33 U.S.C. 1251-1387), as amended. Agreements and subgrants of amounts in excess of \$150,000 must contain a provision that requires the non-Federal awardees to agree to comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act (42 U.S.C. 7401-7671q) and the Federal Water Pollution Control Act as amended (33 U.S.C. 1251-1387). Violations must be reported to the Federal Awarding Agency and the Regional Office of the Environmental Protection Agency (EPA).

- 12.1.5. Debarment and Suspension (Executive Orders 12549 and 12689). A Agreement award (see 2 CFR 180.220) must not be made to parties listed on the government wide exclusions in SAM, in accordance with the OMB guidelines at 2 CFR 180 that implement Executive Orders 12549 (3 CFR part 1986 Comp., p. 189) and 12689 (3 CFR part 1989 Comp., p. 235), "Debarment and Suspension." SAM Exclusions contains the names of parties debarred, suspended, or otherwise excluded by agencies, as well as parties declared ineligible under statutory or regulatory authority other than Executive Order 12549.
- 12.1.6. Byrd Anti-Lobbying Amendment (31 U.S.C. 1352). Contractors that apply or bid for an award exceeding \$100,000 must file the required certification. Each tier certifies to the tier above that it will not and has not used Federal appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency, a member of Congress, officer or employee of Congress, or an employee of a member of Congress in connection with obtaining any Federal Agreement, grant or any other award covered by 31 U.S.C. 1352. Each tier must also disclose any lobbying with non-Federal funds that takes place in connection with obtaining any Federal award. Such disclosures are forwarded from tier to tier up to the non-Federal award.
- 12.1.7. Never Contract with the Enemy (2 CFR 200.215). Federal awarding agencies and recipients are subject to the regulations implementing "Never Contract with the Enemy" in 2 CFR part 183. The regulations in 2 CFR part 183 affect covered Agreements, grants and cooperative agreements that are expected to exceed \$50,000 within the period of performance, are performed outside the United States and its territories, and are in support of a contingency operation in which members of the Armed Forces are actively engaged in hostilities.
- 12.1.8. Prohibition on certain telecommunications and video surveillance services or equipment (2 CFR 200.216). Grantee is prohibited from obligating or expending loan or grant funds on certain telecommunications and video surveillance services or equipment pursuant to 2 CFR 200.216.
- 12.1.9. Title VI of the Civil Rights Act. The Subgrantee, Contractor, Subcontractor, transferee, and assignee shall comply with Title VI of the Civil Rights Act of 1964, which prohibits recipients of federal financial assistance from excluding from a program or activity, denying benefits of, or otherwise discriminating against a person on the basis of race, color, or national origin (42 U.S.C. § 2000d et seq.), as implemented by the Department of Treasury's Title VI regulations, 31 CFR Part 22, which are herein incorporated by reference and made a part of this Agreement (or agreement). Title VI also includes protection to persons with "Limited English Proficiency" in any program or activity receiving federal financial assistance, 42 U.S. C. § 2000d et seq., as implemented by the Department of the Treasury's Title VI regulations, 31 CRF Part 22, and herein incorporated by reference and made part of this Agreement or agreement.

13. CERTIFICATIONS.

- 13.1. Subrecipient Certification. Subrecipient shall sign a "State of Colorado Agreement with Recipient of Federal Recovery Funds" Certification Form in Exhibit E and submit to State Agency with signed grant agreement.

- 13.2. Unless prohibited by Federal statutes or regulations, Prime Recipient may require Subrecipient to submit certifications and representations required by Federal statutes or regulations on an annual basis. 2 CFR 200.208. Submission may be required more frequently if Subrecipient fails to meet a requirement of the Federal award. Subrecipient shall certify in writing to the State at the end of the Award that the project or activity was completed or the level of effort was expended. 2 CFR 200.201(3). If the required level of activity or effort was not carried out, the amount of the Award must be adjusted.

14. EXEMPTIONS.

- 14.1. These Federal Provisions do not apply to an individual who receives an Award as a natural person, unrelated to any business or non-profit organization he or she may own or operate in his or her name.
- 14.2. A Grantee with gross income from all sources of less than \$300,000 in the previous tax year is exempt from the requirements to report Subawards and the Total Compensation of its most highly compensated Executives.

15. EVENT OF DEFAULT AND TERMINATION.

- 15.1. Failure to comply with these Federal Provisions shall constitute an event of default under the Grant and the State of Colorado may terminate the Grant upon 30 days prior written notice if the default remains uncured five calendar days following the termination of the 30-day notice period. This remedy will be in addition to any other remedy available to the State of Colorado under the Grant, at law or in equity.
- 15.2. Termination (2 CFR 200.340). The Federal Award may be terminated in whole or in part as follows:
- 15.2.1. By the Federal Awarding Agency or Pass-through Entity, if a Non-Federal Entity fails to comply with the terms and conditions of a Federal Award;
 - 15.2.2. By the Federal awarding agency or Pass-through Entity, to the greatest extent authorized by law, if an award no longer effectuates the program goals or agency priorities;
 - 15.2.3. By the Federal awarding agency or Pass-through Entity with the consent of the Non-Federal Entity, in which case the two parties must agree upon the termination conditions, including the effective date and, in the case of partial termination, the portion to be terminated;
 - 15.2.4. By the Non-Federal Entity upon sending to the Federal Awarding Agency or Pass-through Entity written notification setting forth the reasons for such termination, the effective date, and, in the case of partial termination, the portion to be terminated. However, if the Federal Awarding Agency or Pass-through Entity determines in the case of partial termination that the reduced or modified portion of the Federal Award or Subaward will not accomplish the purposes for which the Federal Award was made, the Federal Awarding Agency or Pass-through Entity may terminate the Federal Award in its entirety; or
 - 15.2.5. By the Federal Awarding Agency or Pass-through Entity pursuant to termination provisions included in the Federal Award.

EXHIBIT D, ADDITIONAL PROGRAM REQUIREMENTS**A. Work**

Per 23 CFR 420.111, SUBRECIPIENT shall complete the Work and other obligations as described herein and Exhibit A. Work performed prior to the Effective Date or after the Termination date shall not be considered part of the Work. SUBRECIPIENT shall take all reasonable steps to carry out all activities described and identified in the Statement of Work. The Statement shall include an estimation of anticipated benefits from each program submitted, a Budget, the activity purpose, objectives, major tasks, timeline of expected completion, and an Evaluation process to determine the success of each activity stated in Exhibit A. In addition, SUBRECIPIENT shall be responsible for:

- 1.) The initial design and implementation of its congestion mitigation and air quality program as outlined in the current TIP;
- 2.) Monitoring and Evaluating the program effectiveness;
- 3.) The promotion of congestion mitigation and air quality program(s) by employers;
- 4.) Submittal of an annual report to CDOT; and,

B. Notice

SUBRECIPIENT shall not commence Work until the date specified by a written notice, which may be electronic, and shall complete the Work within the period specified in the Agreement unless the period or terms thereof are extended according to this Agreement.

C. Staff/Consultant Services

SUBRECIPIENT shall be responsible to select staff/consultant services in compliance with all applicable federal procurement requirements including 23 CFR 172 and 2 CFR 200. Any Request for Proposal (RFP) used by SUBRECIPIENT to secure consultant Services must be reviewed by CDOT before SUBRECIPIENT releases the RFP. CDOT shall have 15 calendar days from the date of receiving the RFP in which to return comments. Responses to CDOT's comments will be provided by SUBRECIPIENT within 15 calendar days of receipt of the comments. SUBRECIPIENT shall notify CDOT in writing before executing any Agreement for consultant Services which utilizes Grant funding.

D. Statement of Work and Budget Amendment

SUBRECIPIENT shall amend Exhibit A in accordance with the terms of this Agreement, when:

- 1.) Reallocating funds between budget line items in Exhibit A, as permitted pursuant to §5(E); and
- 2.) Adding or deleting activities listed in Exhibit A to reflect authorized budget line item reallocations permitted pursuant to §5(E).

If any changes to Exhibit A (i) require an increase or decrease to the maximum amount of this Subaward, (ii) change the term of the Agreement, or (iii) exceed the 24.99% threshold in §5(E) for any activity, the Parties must amend this Agreement prior to such change being effective.

E. Limited Availability of Funds

The amount of Federal Funds available to pay for the Work performed by Subrecipient in any one year is limited to the amount of the unused portion of the allocated funds, made available through 23 USC 104 (b)(3) and (f) as amended, and 49 USC 5303 as amended.

F. Additional Funds Use

Federal Funds shall be used only to reimburse Subrecipient for eligible allowable costs incurred and Subrecipient shall be solely responsible for all costs incurred that are either not allowable or which exceed the funds available in the Agreement as identified herein and/or in the Exhibit A.

G. Billing, Reimbursement, and Allowable Costs**1.) Reimbursement**

The Parties hereto expressly recognize that the Subrecipient is to be paid, reimbursed, or otherwise compensated with the funds provided to CDOT by the U.S. Department of Transportation for the purpose of completing the Work and therefore, the Subrecipient expressly understands and agrees that all its rights, demands, and claims to compensation arising under this Agreement are contingent upon receipt of such funds by CDOT.

2.) Allowable Costs

CDOT shall not be obligated to use State funds under this Agreement. CDOT's use of Federal Funds shall be to reimburse Subrecipient for allowable costs incurred by Subrecipient, as defined in this Agreement. Subrecipient shall be solely responsible for all costs incurred which are not allowable or which exceed the funds available in the Agreement.

H. Allowable and Indirect Costs

Allowable and indirect costs may include but are not limited to those listed in 2 CFR 200, or State Fiscal Rule 2-7: "Official Functions and Training Functions," whichever may apply. However, such costs shall be limited to those costs determined by the CDOT as necessary to directly carry out the Work for this Agreement. In determining the amount of allowable costs, CDOT will exclude:

- a) Any costs incurred by the Subrecipient before the execution of the Agreement.
- b) Any costs incurred by the Subrecipient that are not included in **Exhibit A**.
- c) Any cost incurred by the Subrecipient after the termination date of this Agreement as amended.
- d) Memberships, subscriptions, and professional activities, which do not meet the following requirements:
 - (1). Costs of membership in civic and community, social organizations are allowable as a direct cost with the approval of the federal-awarding agency;
 - (2). Costs of subscriptions to business, professional, and technical periodicals;
 - (3). Costs of meetings, conferences, and conventions where the primary purpose is the dissemination of technical information, including meals, transportation, rental of meeting facilities, and other incidental costs; or
 - (4). Costs of memberships in business, technical, and professional organizations. However, costs of membership in organizations substantially engaged in lobbying are not allowed and thus unallowable.
- e) Official Function Expenditures (as defined by Rule 2-7 of the Colorado State Fiscal Rules), which do not qualify as a meeting, conference, meal or other function that is hosted by the MPO or Subrecipient staff and attended by guests and/or other MPO or Subrecipient personnel and held for official MPO or Subrecipient business. Expenditures incurred for official functions shall be approved by the responsible MPO or Subrecipient official.

I. Disallow Costs

CDOT has the right to disallow any costs incurred by the Subrecipient, which are not consistent with this Agreement, or on any activity not in compliance with the authorized Work.

J. Reimbursement Waiver

Subrecipient agrees that reimbursement of any cost under this Agreement does not constitute a final CDOT decision about the allowability of the costs and does not constitute a waiver of any violation by Subrecipient of the terms of this Agreement.

K. Certification

Upon submitting request for reimbursement, the designated representative of the Subrecipient has certified that:

- a) The costs are allowable, and therefore reimbursable;
- b) The expenditure amount for that time period is correct;
- c) The agreed upon Work has been performed and/or Work Product has been produced;
- d) All Requests for Proposals and/or Requests for Qualifications have been forwarded to CDOT for review and comment; and
- e) Reimbursements are being requested in accordance with the terms of this Agreement.

L. Expenditures

Along with the form requesting reimbursement, the Subrecipient shall include expenditures of Federal Funds for Work. The information shall contain:

- i. Budgeted amount;
- ii. Expenditures for current billing cycle and year-to-date;
- iii. Unexpended balance after current cycle;
- iv. Percent expended year-to-date; and
- v. Copies of Subcontractors invoices, if applicable.

M. Invoice

CDOT shall pay the Subrecipient's voucher for expenditures incurred in performance of Work, up to the maximum amount described in §7, and elsewhere in this Agreement, subject to conditions specified herein, within 30 days of receipt.

N. Final Report

Within 30 days after the end of the Program period, SUBRECIPIENT will provide to CDOT a final accomplishment report of the activities performed under this Agreement for the completed fiscal year. It shall include, but not be limited to:

- 1.) Final accomplishments by activities; and

- 2.) Status of uncompleted products; and
- 3.) Accomplishment of performance measures; and
- 4.) Actual expenditures for the Program Period.

O. Reporting Guidance

Reporting made for the purpose of this Agreement and its activities shall be done in accordance with 23 CFR Part 420.117, 450 and 2 CFR 200, and any supporting sections or amendments. The provisions of this paragraph do not constitute a waiver of legal and administrative appeals available to SUBRECIPIENT or the State.

P. Monitoring

In accordance with 2 CFR 200 and other applicable standards, the State will monitor all the activities conducted by SUBRECIPIENT pursuant to the terms of this Agreement to assure that the Project is being performed consistent with supporting federal laws and regulations, as amended, to enable the preparation and submission of appropriate reports that will contain at a minimum:

- 1.) Comparison of actual performance with established goals during the program and once the program is complete;
- 2.) Progress in meeting schedules;
- 3.) Comparison of budgeted (approved) amounts and actual costs incurred;
- 4.) Cost variances to budget;
- 5.) Approved program revisions; and
- 6.) Other supporting data.

Q. Performance, Progress, Personnel, and Funds

In responding to these requirements, CDOT will utilize the following steps and procedures to ensure that assigned responsibilities are carried out:

1.) Monitoring Documents

CDOT will use the current Statement of Work, and supporting documents, in reviewing the progress being made by SUBRECIPIENT to meet the commitments in this Agreement. The Statement of Work must include all activities, deliverables, and performance measures, and Budgets committed to by SUBRECIPIENT.

2.) Monitoring Meetings

Meetings between CDOT and SUBRECIPIENT representatives will be conducted at CDOT's discretion for the purpose of reviewing progress, resource allocations, and billings.

3.) Progress and Financial Reports

CDOT will prepare and submit progress and financial reports to the appropriate federal agencies.

R. Noncompliance

Any Product that SUBRECIPIENT has committed to in the Statement of Work not produced and justification not provided in a timely manner in accordance with this agreement, may result in the delay of payment of funds and/or termination as provided under this Agreement. Along with the terms of this Agreement and in accordance with 2 CFR 200, the following steps will be implemented by CDOT:

- 1.) CDOT representative will meet with SUBRECIPIENT representative to discuss performance.
- 2.) The CDOT representative will report the progress to the Division of Transportation Development Director.
- 3.) The Director will issue a decision as to whether performance is satisfactory or unsatisfactory. If performance was determined to have been unsatisfactory, CDOT shall determine if a reduction in allocation is appropriate. SUBRECIPIENT will be notified of any decisions made by CDOT.

S. Additional Requirements for Rights in Data, Documents, and Computer Software

Whenever possible, published material shall acknowledge the financial participation of CDOT and/or the FHWA and other agencies contributing funding to the Work Product. Any published material acknowledging the contribution of the FHWA shall include the federal disclaimer statement: "FUNDED BY THE FHWA". Published materials include any non-internal documents, reports, maps, photographs, computer software, or like materials that are intended to be viewed by those outside of CDOT, and Subrecipient.

Patents: In addition to the standard patent rights clauses of 37 CFR §401 et. al, and other applicable laws and regulations, CDOT, Subrecipient, and either party's subrecipients are subject to the provisions of 37 CFR part 401, governing patents and inventions whereby "The Subcontractor or Subrecipient will retain all rights provided for the State in this clause, and the State will not, as part of the consideration for awarding the subaward or Agreement, obtain rights in the Subcontractor's or Subrecipient's subject inventions."

T. 2 CFR 200 Subpart F

In accordance with the provisions of 2 CFR 200: “Audits of States, Local Governments, and Nonprofit Organizations”, all nonfederal entities including state and local government and non-profit organizations, receiving more than \$750,000 from all federal financial assistance funding sources, shall comply with the audit requirements of 2 CFR 200. Compliance with 2 CFR 200 is required in the following manner:

- a) If the Subcontractor expends less than \$750,000 in Federal funds (all federal sources, not just Highway funds) in its fiscal year then this requirement does not apply.
- b) If the Subcontractor expends more than \$750,000 in Federal funds, but only received federal Highway funds (Catalog of Federal Domestic Assistance, CFDA 20.205) then a program specific audit shall be performed. This audit will examine the “financial” procedures and processes for this program area.
- c) If the Subcontractor expends more than \$750,000 in federal funds, and the federal funds are from multiple sources (FTA, HUD, NPS, etc.) then the Single Audit Act applies, which is an audit on the entire organization/entity.
- d) Single Audit can only be conducted by an independent auditor in accordance with generally accepted government auditing standards covering financial audits (2 CFR 200). An audit is an allowable direct or indirect cost.

U. Final Audit Report

If an audit is performed on Subrecipient’s records for any fiscal year covering a portion of the term of this Agreement, Subrecipient shall submit a copy of the final audit report to CDOT or its principal representative at the address specified herein.

EXHIBIT E, TITLE VI – CIVIL RIGHTS

Nondiscrimination Requirements

Subrecipient shall not exclude from participation in, deny the benefits of, or subject to discrimination any person in the United States on the ground of race, color, national origin, sex, age or disability.

Subrecipient shall abide by all applicable federal and state nondiscrimination laws and regulations, including but not limited to, Title VI of the Civil Rights Act of 1964, 42 U.S.C. § 2000d et seq.; The Civil Rights Restoration Act of 1987, Pub. L. No. 100-259, 102 Stat. 28; 49 CFR Part 21: Nondiscrimination in Federally-Assisted Programs of the Department of Transportation; 23 CFR Part 200: Title VI Program and Related Statutes - Implementation and Review Procedures; Title II of the Americans with Disabilities Act of 1990, 42 U.S.C §§12101 - 12213; Rehabilitation Act of 1973 § 504, 29 U.S.C § 794; 49 CFR Part 27: Nondiscrimination on the Basis of Disability in Programs or Activities Receiving Federal Assistance; 28 CFR Part 35: Nondiscrimination on the Basis of Disability in State and Local Government Services; 49 CFR Part 28: Enforcement of Nondiscrimination on the Basis of Handicap in Programs or Activities Conducted by the Department of Transportation.

As a condition of federal financial assistance, Subrecipient shall develop and maintain a Title VI Program in accordance with the “Requirements for FHWA Subrecipients” set forth in CDOT’s Title VI Program Plan. Subrecipient shall also facilitate compliance with Executive Order 12898 and DOT Order 5610.2(a) by incorporating the principles of environmental justice in planning, project development and public outreach in accordance with applicable CDOT and FHWA guidance.

In any contract utilizing federal funds, land, or other federal aid, Subrecipient shall require the federal-aid recipient or contractor to provide a statement of written assurance that they will comply with Section 504 and not discriminate on the basis of disability. Subrecipient shall develop and maintain an ADA Program in accordance with 28 CFR Part 35, Nondiscrimination on the Basis of Disability in State and Local Government Services and any other requirements established by CDOT for FHWA subrecipients.

Disadvantaged Business Enterprise Requirements

The requirements of 49 CFR Part 26 and CDOT’s DOT-approved DBE program are incorporated by reference into this agreement. Subrecipient shall not discriminate on the basis of race, color, national origin, or sex in the performance of this Agreement. Subrecipient shall carry out applicable requirements of 49 CFR Part 26 in the award and administration of this DOT-assisted Agreement. Failure by Subrecipient to carry out these requirements is a material breach of this Agreement, which may result in the termination of this Agreement or such other remedy as CDOT deems appropriate. Subrecipient must include this assurance in all DOT-assisted contracts.

Prompt Payment

Subrecipient shall require that all contractors pay subcontractors for satisfactory performance of work no later than 30 days after the receipt of payment for that work from the contractor. If Subrecipient allows contractors to withhold retainage from subcontractors, retainage shall be released within 30 days from the date the work is satisfactorily completed.