

**OKLAHOMA DEPARTMENT OF TRANSPORTATION
CONTRACT FOR TRAFFIC SIGNAL PARTS, ACCESSORIES, AND REPAIR
AGENCY CONTRACT AC-0016I**

PARTIES TO THE CONTRACT

This contract is made and entered into by and between the Oklahoma Department of Transportation, hereinafter referred to as the “DEPARTMENT,” and Wavetronix LLC, hereinafter referred to as the “CONTRACTOR”.

SECTION 1. PURPOSE OF THE CONTRACT

This agency contract is for traffic signal parts, accessories, and repair. This Contract may be used by any entity within the Transportation Cabinet. This contract may also be utilized by other governmental entities if allowed for by that entities purchasing guidelines. upon approval by ODOT.

SECTION 2. SPECIFICATIONS

This work shall be in accordance with the response submitted by the CONTRACTOR on January 27, 2026, to the DEPARTMENT.

SECTION 3. TERM OF CONTRACT

This contract is for a twelve (12) month period, commencing on February 1, 2026, and extending through January 31, 2027. Upon mutual agreement by the DEPARTMENT and CONTRACTOR, this contract may be renewed for three (3) consecutive one-year periods.

This contract will include, by reference and incorporation, the contract bid proposal, instructions to bidders, Specifications, and all other documents contained in the bid packet for RFP# AC-0016. All actions, duties, and obligations required by the CONTRACTOR apply to the CONTRACTOR’S agents and employees. All legal protections offered to the State of Oklahoma shall also be extended to the Oklahoma Department of Transportation and any other state entity involved with this contract

SECTION 4. COMPENSATION

4.1) The DEPARTMENT agrees to pay, and the CONTRACTOR agrees to accept, in full consideration for the performance of the CONTRACTOR’s obligations, compensation based on the CONTRACTOR’s bid (Solicitation # AC0016) for the various pay items (See Attachment 1).

Total compensation for services rendered under this contract will be a maximum not to exceed the amount of TWO HUNDRED THOUSAND DOLLARS (\$200,000.00).

4.2) Bills for fees or other compensation for services and expenses shall be submitted to DEPARTMENT in detail sufficient for a proper pre-audit and post-audit thereof. Billing shall be submitted to the address listed on the Purchase Order issued as a result of the contract.

Each invoice shall include the following information on each purchase:

- Purchase Order Number
- Agency Contract No. "AC-0016I"
- Cost of Product & Delivery
- Description of Supplies Provided
- Employer Identification Number
- Vendor's name, remit to address, telephone number, and date of invoice

4.3) If payment is made more than 45 days after submitting a proper invoice, the CONTRACTOR may be entitled to claim interest in the maximum amount permitted by law, until the invoice is paid in full.

SECTION 5. TRAVEL

No reimbursable travel is contemplated under the terms of the contract.

SECTION 6. DISPUTE RESOLUTION

Any dispute concerning the question of fact in connection with the work, not disposed of by the contract between the parties hereto, shall be referred to the state agency that initially awarded this contract (e.g., Department of Central Services). The decision of the administrator of said agency, or his/her duly authorized representatives, shall be final and conclusive on the parties to this contract.

SECTION 7. TERMINATION

This Contract may be terminated, without recourse, in the following circumstances:

7.1) For Convenience - The DEPARTMENT or CONTRACTOR may terminate this Contract by giving thirty (30) days written notice.

7.2) For Cause - The DEPARTMENT may, by written notice to the CONTRACTOR, terminate this Contract for any of the following reasons:

7.2.1) The CONTRACTOR discontinues providing services as required by the Contract.

7.2.2) The CONTRACTOR takes any action pertaining to this Contract without the approval of the DEPARTMENT and which, under the conditions set by this Contract, would have required the approval of the DEPARTMENT.

7.2.3) The commencement, execution or timely completion by the CONTRACTOR is, for any reason, rendered improbable, impossible, or illegal.

7.2.4) The CONTRACTOR shall be in default under any provision of this Contract.

7.3) Mutual Agreement - By mutual agreement and consent of the parties hereto, this Contract may be terminated upon sixty (60) days' written notification.

Should this Contract be terminated for any of the reasons specified above, the DEPARTMENT shall be liable to the CONTRACTOR, or CONTRACTOR's successors in interest, only for the reasonable value of services and work satisfactorily performed, up to and including the date of notice of termination.

SECTION 8. GOVERNING RULES AND REGULATIONS

The CONTRACTOR and its subcontractors, if any, shall comply with all federal, state, and local laws, statutes, ordinances, rules and regulations, and the orders and decrees of any court or administrative bodies or tribunals in any nature affecting the performance of this Contract, including workers' compensation laws, minimum and maximum salary and wage statutes and regulations. When required, the CONTRACTOR shall furnish the DEPARTMENT with satisfactory proof of its compliance therewith.

SECTION 9. COVENANT AGAINST CONTINGENT FEES

The CONTRACTOR warrants that it has not employed or retained any company or person specifically to solicit or secure this Contract, and that it has not paid or agreed to pay any fee, commission, percentage, brokerage fee, gifts, or any other consideration, contingent upon or resulting from the award or making of this Contract. For breach or violation of this warranty, the DEPARTMENT shall have the right to annul this Contract without liability, or at its discretion, to deduct from the Contract price or consideration, or otherwise recover, the full amount of such fee, commission, percentage brokerage fee, gift, or contingent fee.

SECTION 10. EQUAL EMPLOYMENT OPPORTUNITY

In connection with the execution of this Contract, the CONSULTANT shall not discriminate against any employee or applicant for employment because of race, religion, color, sex, age, or national origin. The CONSULTANT shall take affirmative action to ensure that applicants are employed and that employees are treated during employment without regard to their race, color, religion, sex, age, or national origin. Such actions shall include, but are not limited to, the following: employment, upgrading, demotion or transfer, recruitment or advertising, layoff or termination, rates of pay or other forms of compensation, and selection for training, including apprenticeship. The CONSULTANT further agrees to insert a similar revision in all subcontracts, except subcontracts for standard commercial supplies or raw materials.

SECTION 11. TITLE VI - CIVIL RIGHTS ACT OF 1964

The CONTRACTOR shall comply with all the requirements imposed by Title VI of the Civil Rights Act of 1964 (P.L. 88-352), the Regulations of Department of Transportation issued thereunder (CFR Title 49, Subtitle A, Part 21), and the assurance by the CONTRACTOR pursuant thereto.

During the performance of this Contract, the CONTRACTOR, for itself, its assignees and successors in interest, agrees as follows:

- (a) Compliance with Regulations: The CONTRACTOR shall comply with the regulations relative to nondiscrimination in federally-assisted programs of the U.S. Department of Transportation (hereinafter, "U.S. DOT") Title 49, Code of Federal Regulations, Part 21, as they may be amended from time to time (hereinafter referred to as the Regulations), which are herein incorporated by reference and made a part of this Contract.
- (b) Nondiscrimination: The CONTRACTOR, with regard to the work performed by it during this Contract, shall not discriminate on the grounds of race, religion, color, sex, age, or national origin in the selection and retention of subcontractors, including procurement of materials and leases of equipment. The CONTRACTOR shall not participate either directly or indirectly in the discrimination prohibited in Section 21.5 of the Regulations, including employment practices when the contract covers a program set forth in Appendix B of the Regulations.
- (c) Solicitations for Subcontracts: In all solicitations either by competitive bidding or negotiation made by the CONTRACTOR for work to be performed under a subcontract, if such subcontracting is approved by the DEPARTMENT, including procurement of materials or leases of equipment, each potential subcontractor or supplier shall be notified by the CONTRACTOR of the CONTRACTOR'S obligations under this Contract and the Regulations relative to nondiscrimination on the grounds of race, religion, color, sex, age or national origin.
- (d) Information and Reports: The CONTRACTOR shall provide all information and reports required by the Regulations or directives issued pursuant thereto, and shall permit access to its books, records, accounts, other sources of information, and its facilities as may be determined by the DEPARTMENT to be pertinent to ascertain compliance with such regulations, orders, and instructions. Where any information is required or a contractor is in the exclusive possession of another who fails or refuses to furnish this information, the CONTRACTOR shall so certify to the DEPARTMENT, as appropriate, and shall set forth what efforts it has made to obtain the information.
- (e) Sanctions for Noncompliance: In the event of the CONTRACTOR'S

noncompliance with the nondiscrimination provisions of this Contract, the DEPARTMENT shall impose such contract sanctions as it may determine to be appropriate, including, but not limited to:

- (1) Withholding of payments to the CONTRACTOR under the Contract until the CONTRACTOR complies, and/or
- (2) Cancellation, termination, or suspension of the Contract, in whole or in part.

(f) Incorporation of Provisions: The CONTRACTOR shall include the provisions of Paragraph (a) through (f) of this section in every subcontract, including procurement of materials and leases of equipment, unless exempt by the Regulations, or directives issued pursuant thereto. The CONTRACTOR shall take such action with respect to any subcontract or procurement as the DEPARTMENT may direct as a means of enforcing such provisions including sanctions for noncompliance: Provided, however, that, in the event the CONTRACTOR becomes involved in, or is threatened with, litigation with a subcontractor or supplier as a result of such direction, the CONTRACTOR may request the DEPARTMENT to enter into such litigation to protect the interest of the DEPARTMENT.

SECTION 12. BINDING EFFECT

This Contract shall be binding upon and inure to the benefit of the DEPARTMENT and the CONTRACTOR and shall be binding upon their successors and assigns, subject to the limitations of Oklahoma law.

SECTION 13. HOLD HARMLESS CLAUSE

The CONTRACTOR shall indemnify and save harmless the DEPARTMENT, their respective officers, employees and agents from all claims, suits, or actions of every kind and character made upon or brought against the DEPARTMENT, their respective officers, employees and agents, for or on account of any injuries or damages received or sustained by any party or parties by or from acts of said CONTRACTOR or its servants, agents and subcontractors, in doing the work and rendered the services Contracted for, or by or consequence of any negligence in operations or any improper material or equipment used, or by or on account of any act or omission of said CONTRACTOR or his or its servants, agents and subcontractors. This hold harmless and indemnity obligation shall include attorney fees, court costs, and all other expenses incurred in the investigation and defense of any claim or suit.

SECTION 14. PRIOR UNDERSTANDINGS

This contract incorporates and reduces to writing all prior understandings, promises, agreements, commitments, covenants, or conditions, and constitutes the full and complete understanding and contractual relationship of the parties.

SECTION 15. INSURANCE/LICENSES

CONTRACTOR shall maintain at all times during the term of this contract, with an insurance carrier reasonably acceptable to the DEPARTMENT and authorized to conduct business in the State of Oklahoma, insurance coverage as set forth in this Article:

1) Workers' Compensation Insurance as required by the statutes of the State of Oklahoma, and adequate (but in no event less than \$100,000) Employer's Liability Insurance.

2) Public Liability and Property Damage Insurance covering all operations and activities hereunder in the following minimum limits (but in no event less than the statutory limits found at 51 Oklahoma Statutes, Section 151 et. seq. or successor or amendatory statutes):

- a) Bodily Injury Liability in the amount of not less than \$100,000 for injuries, including accidental death and products liability, to any one person, and subject to the same limit for each person, in an amount not less than \$1,000,000 for one occurrence.
- b) Property Damage Liability in the amount of not less than \$100,000 for any one accident including products liability and an aggregate limit of \$1,000,000 per occurrence.
- c) Combined aggregate liability coverage shall not be less than \$2,000,000 (two million) for bodily injury, death, and property damage.

3) A Comprehensive Business Auto policy with a minimum limit of not less than One Million Dollar (\$1,000,000) combined single limit for bodily injury and property damage, providing coverage for at least any and all leased, owned, hired or non-owned vehicles used in any of CONTRACTOR's activities pursuant to this agreement, with any self-insured retention not exceeding One Hundred Thousand Dollars (\$100,000). Any and all mobile equipment which is not covered under this Comprehensive Business Auto policy shall have said coverage provided for under the Comprehensive General Liability policy.

CONTRACTOR shall furnish the DEPARTMENT with a certificate evidencing the existence of all such insurance coverage, and the certificates evidencing the existence of the insurance coverage specified in these specifications. Said insurance coverage shall provide that the DEPARTMENT is an additional named insured under said policy or policies and that said policy or policies cannot be canceled or materially modified except upon thirty (30) days' advance written notice to the DEPARTMENT. The foregoing provision regarding additional named insured shall not create or be deemed to create any liability on the part of said additional named insured which would not otherwise exist under the laws of the State of Oklahoma.

SECTION 16. AMENDMENTS OR MODIFICATION OF CONTRACT

No changes, revisions, amendments, or alterations in the manner, scope, or type of work or compensation to be paid by the DEPARTMENT shall be effective unless reduced to writing and executed by the parties with the same formalities as are observed in the execution of this contract.

SECTION 17. GOVERNING LAW AND VENUE

Any claims, disputes, or litigation relating to the solicitation, execution, interpretation, performance, or enforcement of this Contract shall be governed by the laws of the State of Oklahoma and the applicable rules, regulations, policies, and procedures of the Oklahoma Transportation Commission. Venue for any action, claim, dispute, or litigation, mediation, or arbitration shall be in Oklahoma County, Oklahoma.

SECTION 18. RECORDS

The CONTRACTOR and any subcontractor shall maintain all books, documents, papers, accounting records, and other evidence pertaining to costs incurred under this contract, and shall make all such materials available to the DEPARTMENT or any of its duly authorized representatives and the State Auditor and Inspector at any reasonable time during the term of work on the contract, and for seven (7) years from date of final payment to the CONTRACTOR by DEPARTMENT for work performed hereunder.

SECTION 19. HEADINGS

Article headings used in the contract are inserted for convenience of reference only and shall not be deemed a part of this contract for any purpose.

SECTION 20. ASSIGNMENT

The CONTRACTOR shall NOT sublet, sell, transfer, assign, or otherwise dispose of the contract or contracts or any portion thereof, or of his right, title, or interest therein, without written consent of the DEPARTMENT. In the event such consent is given, the CONTRACTOR will be permitted to sublet a portion thereof, but shall perform the work with their own organization, amounting to not less than 50% of the total contract cost. Requests for permission to sublet, assign, or otherwise dispose of any portion of the contract must be in writing and accompanied by a statement demonstrating that the organization performing the work is particularly experienced and equipped for such work. No sub-contracts, or transfer of contract, shall in any case release the CONTRACTOR of his liability under the contract and bonds.

SECTION 21. NOTICES

All notices, demands, requests, or other communications which may be or are required to be given, served, or sent by either party to the other pursuant to the Contract shall be in writing and shall be deemed to have been properly given or sent:

- (a) If intended for the DEPARTMENT, by mailing by first-class mail or, if the sender prefers, by registered or certified mail, return receipt requested, with postage prepaid, addressed to DEPARTMENT as:

Oklahoma Department of Transportation
Traffic Division
Attn: Cody Hamblin
200 NE 21st Street
Oklahoma City, OK 73105

- (b) If intended for CONTRACTOR, by mailing by first-class mail or, if the sender prefers, by registered or certified mail, return receipt requested, with postage prepaid, to an address supplied by the CONTRACTOR upon award of this Contract.

Wavetronix LLC
ATTN: Robert C. Joyner
663 Wavetronix Dr.
Springville, UT 84663
801) 734-5071

SECTION 22. SEVERABILITY

If any provision, clause, or paragraph of this contract or any document incorporated by reference shall be determined invalid by a court of competent jurisdiction, such determination shall not affect the other provisions, clauses, or paragraphs of this contract which are not affected by the determination. The provisions, clauses, or paragraphs and any documents incorporated by reference are declared severable.

SECTION 23. PAYMENT OF CLAIMS

The CONTRACTOR shall pay all just claims due for the payment of all employees and mechanics for labor that will be performed, as well as for the payment of all materials and equipment rental that are actually used or rented in the performance of the contract.

SECTION 24. BREACH OF CONTRACT

Failure to perform any and all of the terms and conditions of this contract shall be deemed a substantial breach thereof and give the DEPARTMENT cause to cancel this contract on seven (7) days' written notice to the CONTRACTOR. The DEPARTMENT then reserves the right to re-award the contract to the next lowest responsible available bidder -OR- should this contract be awarded to multiple vendors, the DEPARTMENT may utilize those vendors. In the event of cancellation of this contract, the CONTRACTOR shall not be entitled to damages and agrees not to sue the DEPARTMENT for damages thereof. After notice of cancellation, the CONTRACTOR agrees to perform the terms and conditions of this contract up to and including date of cancellation, as though no cancellation had been made and notwithstanding other legal remedies which may be available to the DEPARTMENT because of the cancellation, agrees to indemnify the DEPARTMENT for its costs in procuring the services of a new CONTRACTOR.

SECTION 25. COUNTERPARTS

This Contract may be executed in counterparts, including by means of facsimile or electronic signature pages, any of which need not contain the signature of more than one party and each of which shall be deemed an original, but all of which together shall constitute one and the same instrument.

This contract is awarded pursuant to Oklahoma Statute, Title 74, Chapter 4, Section 85.12.B.3.

THIS SPACE INTENTIONALLY LEFT BLANK

IN WITNESS WHEREOF: This Contract is executed by the CONTRACTOR on the
12 _____ day of February _____, 2026; and the DEPARTMENT on
the 13th _____ day of February _____, 2026.

CONTRACTOR:
Wavetronix LLC

Robert C Joyner 02/12/2026
Robert C Joyner (Feb 12, 2026 16:06:19 MST)
Authorized Signature Date

Recommend for Approval:

Laura M. B. 02/13/2026
Procurement Division Date

Kendal Theisen 02/13/2026
Traffic Engineering Date

Approved as to Form and Legality:

David Allen Miley 02/13/2026
General Counsel Date

For Department:

I certify that no Department employee involved in any manner with this contract has any financial or personal interest in this contract in compliance with 74 OS §85.42(B).

T.J. Sill 02/13/2026
TJ Dill (Feb 13, 2026 14:59:41 CST)
Chief Engineer Date

STATUTORY CERTIFICATION

The undersigned hereby certifies to the following statutory requirements:

A. Pursuant to Title 74 O.S. § 85.22, I certify:

1. I am the duly authorized agent of the contractor, for the purpose of certifying facts pertaining to the existence of collusion among and between bidders and suppliers and state officials or employees, as well as facts pertaining to the giving or offering of things of value to government personnel in return for special consideration in connection with the prospective acquisition;
2. I am fully aware of the facts and circumstances surrounding the acquisition or making of the bid to which this statement relates and have been personally and directly involved in events leading to the acquisition or submission of such bid; and
3. Neither the business entity that I represent in this certification nor anyone subject to the business entity's direction or control has been a party:
 - a. to any collusion among bidders or suppliers in restraint of freedom of competition by agreement to bid or contract at a fixed price or to refrain from bidding or contracting,
 - b. to any collusion with any state official or employee as to quantity, quality, or price in the prospective contract, or as to any other terms of such prospective contract, nor
 - c. to any discussions between bidders or suppliers and any state official concerning exchange of money or other thing of value for special consideration in connection with the prospective contract.

B. I certify pursuant to 74 OS §85.22, if awarded the contract, whether competitively bid or not, neither the business entity I represent nor anyone subject to the business entity's direction or control has paid, given or donated or agreed to pay, give or donate to any officer or employee of this state any money or other thing of value, either directly or indirectly, in procuring the contract to which this statement relates.

C. I certify pursuant to Title 74 O.S. § 85.42, that no person who has been involved in any manner in the development of this Agreement while employed by the State of Oklahoma shall be employed to fulfill any of the services provided under this contract.

D. That, to the best of my knowledge and belief, the contractor has not previously entered into a contract with the Oklahoma Department of Transportation or any other agency of the State of Oklahoma, which could result in a substantial duplication of the services required by this contract, and is not currently debarred or suspended from contracting with the State of Oklahoma.

E. That the contractor has registered and fully participates in the Status Verification System, as required by Title 25 O.S. § 1313(B)(1), to verify the work eligibility status of all new employees of the contractor.

F. In full compliance with Title 74 O.S. § 582, the contractor certifies that the contractor is not currently engaged in a boycott of goods or services from Israel.

G. I certify pursuant to Title 74 O.S. §12005 that the contractor does not boycott energy companies and will not boycott energy companies during the term of this contract.

Certified by the contractor's authorized representative, DATED: 02/12/2026

Robert C Joyner
Robert C Joyner (Feb 12, 2026 16:06:19 MST)

CERTIFIER

ACORDTM**CERTIFICATE OF LIABILITY INSURANCE**

DATE (MM/DD/YYYY)

01/23/2026

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer any rights to the certificate holder in lieu of such endorsement(s).

PRODUCER Moreton & Company P.O. Box 58139 Salt Lake City, UT 84158-0139 801 531-1234	CONTACT NAME: JaNae Loveless PHONE (A/C, No, Ext): 801 531-1234 FAX (A/C, No): 801-531-6117 E-MAIL ADDRESS: jloveless@moreton.com	
	INSURER(S) AFFORDING COVERAGE INSURER A: Atlantic Specialty Insurance Company INSURER B: OBI National Insurance Company INSURER C: INSURER D: INSURER E: INSURER F:	
INSURED Wavetronix LLC 663 Wavetronix Dr. Springville, UT 84664	NAIC # 27154 14190	

COVERAGES**CERTIFICATE NUMBER:****REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL SUBR INSR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS
A	☒ COMMERCIAL GENERAL LIABILITY ☐ CLAIMS-MADE ☒ OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: ☐ POLICY ☐ PROJECT ☐ LOC OTHER:		711018436	04/01/2025	04/01/2026	EACH OCCURRENCE \$1,000,000 DAMAGE TO RENTED PREMISES (Ea occurrence) \$1,000,000 MED EXP (Any one person) \$15,000 PERSONAL & ADV INJURY \$1,000,000 GENERAL AGGREGATE \$2,000,000 PRODUCTS - COMP/OP AGG \$2,000,000 \$
A	AUTOMOBILE LIABILITY ☒ ANY AUTO OWNED AUTOS ONLY ☒ HIRED AUTOS ONLY ☐ SCHEDULED AUTOS NON-OWNED AUTOS ONLY		711018436	04/01/2025	04/01/2026	COMBINED SINGLE LIMIT (Ea accident) \$1,000,000 BODILY INJURY (Per person) \$ BODILY INJURY (Per accident) \$ PROPERTY DAMAGE (Per accident) \$ \$
A	☒ UMBRELLA LIAB ☒ OCCUR ☐ EXCESS LIAB ☐ CLAIMS-MADE DED ☒ RETENTION \$0		711018436	04/01/2025	04/01/2026	EACH OCCURRENCE \$8,000,000 AGGREGATE \$8,000,000 \$
B	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below	Y/N N	406049877	07/01/2025	07/01/2026	☒ PER STATUTE ☐ OTHER E.L. EACH ACCIDENT \$1,000,000 E.L. DISEASE - EA EMPLOYEE \$1,000,000 E.L. DISEASE - POLICY LIMIT \$1,000,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

Oklahoma Department of Transportation is added as Additional Insured with respect to General Liability when required by written contract.

CERTIFICATE HOLDER**CANCELLATION**

Oklahoma Department of Transportation 200 NE 21st Street Oklahoma City, OK 73105	SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS. AUTHORIZED REPRESENTATIVE 
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January 23, 2026

State of Oklahoma
Department of Transportation
Procurement Division

To whom it may concern,

Attached you will find the products Wavetronix is submitting for Solicitation AC0016. Please note that the pricing provided is for product only and does not include installation. We will only be bidding on the following Item Categories listed on Exhibit A - AC0016 SUPPLEMENTAL:

- RADAR DETECTION SYSTEMS (includes all parts to bring online)
- RADAR DETECTION SYSTEMS REPLACEMENT PARTS

As the manufacturer, we do not offer installation services. Installation should be performed by a certified installer, and we can provide certification training for any contractor who has not yet been trained, as well as for Department of Transportation personnel as needed. A list of certified contractors can be provided upon request.

If you have any questions or need additional information regarding the submittal, installation, or training, please feel free to contact me at 405-441-4890 or via email at oklahoma@wavetronix.com.

Thank you,

A handwritten signature in black ink, appearing to read 'John Ford', written over a light blue horizontal line.

John Ford
Regional Sales Manager



QUOTATION

663 Wavetronix Drive Springville, UT 84663

Date

1/23/2026

Details:

Solicitation #: AC0016

AC0016 - RADAR DETECTION SYSTEMS (includes all parts to bring online)

Special Terms:

Payment Terms: Net 45

Shipping Terms: EXW Wavetronix' Loading Dock

Shipping Method: Best Way

Customer:

Oklahoma Department of Transportation
200 NE 21st Street
Oklahoma City, OK 73105
USA

Bid Item	Part #	Description	QTY	Unit Price	UoM	Ext Price
		Radar Detection Intersection System: 4 Matrix	1	\$31,040.00	Each	\$31,040.00
	SS-225	SmartSensor Matrix	4			
	SS-611	SmartSensor Mount	4			
	102-0453	Sensor Cable Junction Box Mini	4			
	SS-704-060	Cable, 60ft, 12-8 pin, 6 conductor	4			
	102-0594	Arc6	1			
	102-0562	SmartSensor Surge v2	4			
	310-0413	Cable, 4', Male Male Female, SDLC Y-Cable	1			
	SS-705-001	SmartSensor 6 conductor cable, 1000' spool	1			
		Radar Detection Intersection System: 4 Matrix & 2 Advance	1	\$45,080.00	Each	\$45,080.00
	SS-225	SmartSensor Matrix	4			
	SS-200E	SmartSensor Advance Extended Range	2			
	SS-611	SmartSensor Mount	6			
	102-0453	Sensor Cable Junction Box Mini	6			
	SS-704-060	Cable, 60ft, 12-8 pin, 6 conductor	4			
	SS-704-080	Cable, 80ft, 12-8 pin, 6 conductor	2			
	102-0594	Arc6	1			
	102-0562	SmartSensor Surge v2	6			
	310-0413	Cable, 4', Male Male Female, SDLC Y-Cable	1			
	101-0558	SmartSensor 6-conductor Cable - 1500 ft	1			
		Radar Detection Intersection System: 4 Matrix & 4 Advance	1	\$63,800.00	Each	\$63,800.00
	SS-225	SmartSensor Matrix	4			
	SS-200E	SmartSensor Advance Extended Range	4			
	SS-611	SmartSensor Mount	8			
	102-0453	Sensor Cable Junction Box Mini	8			
	SS-704-060	Cable, 60ft, 12-8 pin, 6 conductor	4			
	SS-704-080	Cable, 80ft, 12-8 pin, 6 conductor	4			
	102-0594	Arc6	2			
	102-0562	SmartSensor Surge v2	8			
	310-0413	Cable, 4', Male Male Female, SDLC Y-Cable	2			
	SS-705-001	SmartSensor 6 conductor cable, 1000' spool	2			
		Radar Detection Intersection System: XP-21	1	\$14,700.00	Each	\$14,700.00

663 Wavetronix Drive Springville, UT 84663

	101-0479	XP21	1			
	102-0597	Arc2	1			
	102-0564	Arc Surge v2	1			
	310-0413	Cable, 4', Male Male Female, SDLC Y-Cable	1			
	101-0496	Expanse Link Cable - 100 ft	1			
		Radar Detection Intersection System with Timing Guide: XP-21	1	\$20,795.00	Each	\$20,795.00
	101-0479	XP21	1			
	102-0597	Arc2	1			
	102-0564	Arc Surge v2	1			
	310-0413	Cable, 4', Male Male Female, SDLC Y-Cable	1			
	101-0496	Expanse Link Cable - 100 ft	1			
	103-0432	TimingGuide Five Year License - with an XP21 and Arc included on the sales order	1			
		Radar Detection Intersection System: XP-20	1	\$10,065.00	Each	\$10,065.00
	101-0451	XP20	1			
	101-0457	Expanse, XP20 Sensor Mount	1			
	102-0597	Arc2	1			
	102-0614	ARC Surge EL2 v2	1			
	101-0496	Expanse Link Cable - 100 ft	1			
		Radar Detection Intersection System: XP-20 - Qty 2	1	\$16,340.00	Each	\$16,340.00
	101-0451	XP20	2			
	101-0457	Expanse, XP20 Sensor Mount	2			
	102-0597	Arc2	1			
	102-0614	ARC Surge EL2 v2	2			
	101-0497	Expanse Link Cable - 200 ft	1			

Notes:

PRICING IS FOR PRODUCT ONLY. INSTALLATION NOT INCLUDED. INSTALLATION TO BE PERFORMED BY A CERTIFIED INSTALLER.

If this project is tax-exempt, Wavetronix must receive a valid sales tax exemption certificate prior to processing the purchase order and scheduling with production. Please provide the certificate when you send your purchase order.

Date:

1/23/2020

Name:

Robert C. Joyner

Title:

Unit Executive

Signature:



AC0016 - WAVETRONIX REPLACEMENT PRICE LIST

ExpansE			
Part Number	Description	Unit	Bid \$
ExpansE Sensors			
101-0451	XP20 Motorway Radar Sensor	each	\$5,270
101-0479	XP21 4-Approach single intersection Radar Sensor	each	\$9,960
ExpansE Arcs			
102-0597	Arc2	each	\$3,785
102-0598	Arc2 DC	each	\$3,785
102-0594	Arc6	each	\$4,650
ExpansE Surge			
101-0483	XP21 Surge	each	\$270
102-0617	XP21 Surge EL2 v2	each	\$270
102-0564	Arc Surge v2 (for use Arc2, Arc6)	each	\$270
102-0614	Arc Surge EL2 v2 (NOTE - pairs with XP20 v2 EL2, 101-0451)	each	\$270
102-0481	Arc Surge Slot Cover	each	\$12
102-0615	XP20 Surge EL2 v2	each	\$270
102-0562	SmartSensor Surge v2 (for use Arc2, Arc6)	each	\$270
102-0537	Arc FRS ExpansE Link spring cage connector kit	each	\$27
ExpansE Mounts			
101-0457	XP20 Sensor Mounting Bracket	each	\$445
101-0461	ExpansE, 36" sensor mount	each	\$635
ExpansE Cable & Connector			
101-0466	ExpansE Link S Cable - 200 ft.	each	\$800
101-0496	ExpansE Link Cable - 100 ft.	each	\$295
SmartSensor			
Sensors			
SS-200E	SmartSensor Advance Extended Range	each	\$5,350
SS-225	SmartSensor Matrix	each	\$4,980
SmartSensor SDLC Support			
310-0413	4' SDLC Y Cable	each	\$390
SmartSensor Mounts			
101-0437	SmartSensor Mount, 36" pipe	each	\$375
360-0129	Misc Mech, bracket, aluminum, knuckle	each	\$59
360-0283	SmartSensor Advance Viewfinder	each	\$24
SS-611	SmartSensor Mount	each	\$235
102-0453	Sensor Cable Junction Box Mini	each	\$170
SmartSensor Cable			
101-0448	Bulk 6-Conductor Cable Spool 500'	each	\$1,330
SmartSensor Matrix and Advance Cable Options			
SS-704-060	SmartSensor 6-Conductor Cable - 60'	each	\$305
SS-704-080	SmartSensor 6-Conductor Cable - 80'	each	\$365
101-0558	SmartSensor 6-conductor Cable - 1500 ft	each	\$3,420
SS-705-001	Bulk 6-Conductor Cable Spool 1000'	each	\$2,160

Date:

1/27/2020

Name:

Robert C. Joyner

Title:

Unit Executive

Signature:



Submittal Package

Project: OK - ODOT - AC0016 - Traffic Signal Parts

Prepared on January 26, 2026

by: Nalani Bird

Inside Sales Coordinator

Office: 801-734-7298

Cell: 801-734-5071

Material List:

- SmartSensor Matrix
- SmartSensor Mount
- Sensor Cable Junction Box Mini
- Cable, 60ft, 12-8 pin, 6 conductor
- Arc6
- SmartSensor Surge v2
- Cable, 4', Male Male Female, SDLC Y-Cable
- SmartSensor 6 conductor cable, 1000' spool
- SmartSensor Advance Extended Range
- Cable, 80ft, 12-8 pin, 6 conductor
- SmartSensor 6-conductor Cable - 1500 ft
- XP21
- Arc2
- Arc Surge v2
- Expanse Link Cable - 100 ft
- TimingGuide Five Year License - with an XP21 and Arc included on the sales order

Material list continues on next page...

Material list (continued)

- XP20
- Expanse, XP20 Sensor Mount
- ARC Surge EL2 v2
- Expanse Link Cable - 200 ft
- DC Arc2
- XP21 Surge
- XP21 Surge EL2 v2
- Arc Slot Cover
- XP20 Surge EL2 v2
- Arc FRS Expanse Link spring cage connector kit
- Expanse, 36" sensor mount
- Expanse Link S Cable - 200 ft
- SmartSensor Mount, 36" pipe
- Misc Mech, bracket, aluminum, knuckle
- SmartSensor Advance Viewfinder
- SmartSensor 6-conductor cable, 500' spool

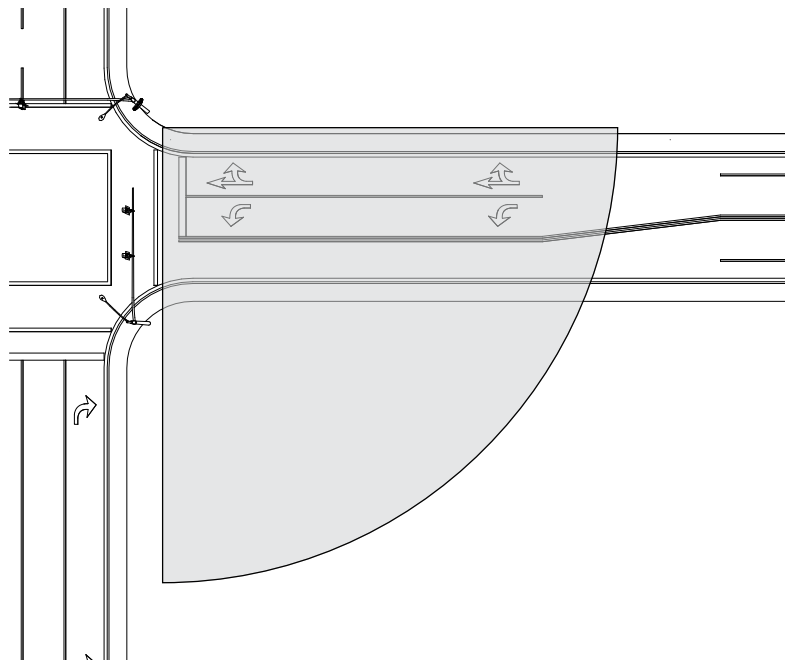
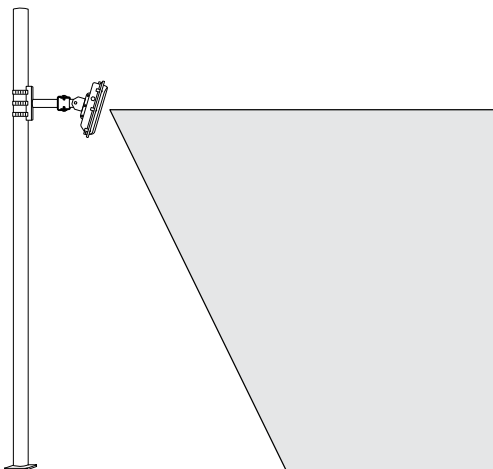
Qty	Part Number	Description
	SS-225	SmartSensor Matrix
	SS-611	SmartSensor Mount
	102-0453	Sensor Cable Junction Box Mini
	SS-704-060	Cable, 60ft, 12-8 pin, 6 conductor
	102-0594	Arc6
	102-0562	SmartSensor Surge v2
	310-0413	Cable, 4', Male Male Female, SDLC Y-Cable
	SS-705-001	SmartSensor 6 conductor cable, 1000' spool
	SS-200E	SmartSensor Advance Extended Range
	SS-704-080	Cable, 80ft, 12-8 pin, 6 conductor
	101-0558	SmartSensor 6-conductor Cable - 1500 ft
	101-0479	XP21
	102-0597	Arc2
	102-0564	Arc Surge v2
	101-0496	Expanse Link Cable - 100 ft
	103-0432	TimingGuide Five Year License - with an XP21 and Arc included on the sales order
	101-0451	XP20
	101-0457	Expanse, XP20 Sensor Mount
	102-0614	ARC Surge EL2 v2
	101-0497	Expanse Link Cable - 200 ft
	102-0598	DC Arc2
	101-0483	XP21 Surge
	102-0617	XP21 Surge EL2 v2
	102-0481	Arc Slot Cover
	102-0615	XP20 Surge EL2 v2
	102-0537	Arc FRS Expanse Link spring cage connector kit
	101-0461	Expanse, 36" sensor mount
	101-0466	Expanse Link S Cable - 200 ft
	101-0437	SmartSensor Mount, 36" pipe
	360-0129	Misc Mech, bracket, aluminum, knuckle
	360-0283	SmartSensor Advance Viewfinder
	101-0448	SmartSensor 6-conductor cable, 500' spool

16-beam intersection stop bar sensor

The SmartSensor Matrix is a radar-based, stop bar presence detector designed specifically for signalized intersections. By leveraging the proven reliability of radar technology, it enhances safety and streamlines traffic management, ensuring accurate vehicle detection and improved intersection performance.



- Matrix of 16 radars for two-dimensional coverage
- Tracks vehicles through a 90-degree field of view that extends out 140 ft. (42.7 m)
- Includes Radar Vision technology to detect and track in two dimensions
- Reports real-time presence of both moving and stopped vehicles
- Standard detector-rack contact-closure interface
- Easy to install and operate
- Supports curved and angled lanes
- Compatible with Arc cabinet interface devices
- Automated manufacturing process
- Patented auto-configuration process
- Patented Digital Wave Radar II technology
- Remote accessible for traffic monitoring and sensor management
- Flash upgradable
- Robust to changing temperature, light, and weather conditions



SmartSensor Matrix technical specifications

Physical properties

- Weight: 4.2 lb. (1.9 kg)
- Dimensions: 13.2 in. × 10.6 in. × 3.3 in. (33.5 cm × 26.9 cm × 8.4 cm)
- Enclosure:
 - Lexan EXL polycarbonate
 - Resistant to corrosion, fungus, moisture deterioration, and ultraviolet rays
 - Outdoor weatherable: UL 746C
 - Withstands 5-ft. (1.5-m) drop
 - Watertight by NEMA 250 standard
- Connector: MIL-C-26482
- Rotational backplate for 360° of roll

Radar design

- Type of radar: 16-beam
- Uses frequency modulated continuous wave (FMCW) radar
- Operating frequency: 24.0–24.25 GHz (K-band)
- Transmit bandwidth: 245 MHz
- Bandwidth stable within 1%
- Un-windowed resolution: 2 ft. (0.6 m)
- Antennas:
 - Printed circuit board antennas
 - Vertical 6 dB beam width (two-way pattern): 65°
 - Horizontal field of view: 90°
 - Two-way sidelobes: -40 dB
- RF channels: 8
- No manual tuning to circuitry
- No temperature-based compensation necessary
- Diagnostics mode for verifying system functionality
- Algorithms mitigate detections from wrong way or cross traffic

Detection area

- Detection range: 6 to 140 ft. (1.8 to 42.7 m)
- Field of view: 90°
- Number of lanes: Up to 10
- Flexible lane configuration support including:
 - Curved lanes
 - Islands
 - Medians

Measured quantities

- Real-time presence data across a 140-ft. (42.7-m) range
- Maximum number of channels: 16
- Maximum number of zones: 16

Ordering information

SmartSensor Matrix
SS-225

Optional accessories (sold separately)

102-0597 – Arc2

102-0594 – Arc6

102-0562 – SmartSensor Field-replaceable Surge v2

SS-704-xxx/705 – SmartSensor 6-conductor Cable

SS-611 – SmartSensor Mount

101-0462 – SmartSensor Span Wire Mount

CLK-112/114 – Click 112/114

SS-710 – SmartSensor Cable Junction Box

Contact us

801.734.7200

sales@wavetronix.com

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Power

- Power consumption: 9 W *
- Operating voltage: 10–28 VDC *
 - Recommended power supply voltage: 12–24 VDC
- Onboard surge protection

Communication

- Com ports:
 - Two half-duplex RS-485 COM
- User configurable:
 - Response delay
 - Push port
- Firmware upgradability over any COM port
- Fail-safe mode for contact closure outputs if communication is lost
- Dedicated detection communications
- Configuration, verification, or traffic display without disrupting detection communications

* While the system works with supply voltages of up to 28 VDC, 24 VDC supplies are recommended; the excess is designed to allow some tolerance on the output of the supply. To support 12 VDC battery systems, and if the cable is short enough, the sensor can accept a power supply as low as 10 VDC; however, this is dependent on cable length and wire gauge. Please consult the document SmartSensor Matrix Cable Length Recommendations (0309), for details.

Configuration

- Graphical user interface with traffic pattern display
- Auto-configuration of lanes, stop bars, and zones
- Manual configuration supported
- Four-sided zones of any shape and size
- Overlapping zones supported
- Lane boundary increment: 1 ft. (0.3 m)
- Sensor reconfiguration without detection disruption supported
- Channels supported:
 - Normal
 - Counting
 - Pulse
- Supported operating systems:
 - Windows 7
 - Windows 8
 - Windows 10
 - Windows 11 (Expense)
- Software-supported functionality:
 - TCP/IP connectivity
 - Sensor configuration backup and restore
 - Virtual sensor connections for demonstration and training
 - Real-time traffic visualization for performance verification and traffic display
 - Backed-up sensor configurations can be viewed and edited
 - Zone and channel actuation display
 - Local or remote sensor firmware upgradability
 - User-selectable zone to channel mapping
 - Self-test for verifying hardware functionality
 - AND logic triggers the channel when all the selected zones are active
 - OR logic used to combine multiple zones to a channel output
 - Channel output extend and delay functionality

Manufacturing

- Manufactured in the USA
- Surface mount and wave solder assembly
- Operational testing:
 - Sub-assembly test
 - 48-hour unit level burn-in
 - Final unit test
- Unit test results available
- IPC-A-610C Class 2—compliant

Testing

- NEMA:
 - NEMA TS 2-2003
- FCC:
 - 47 CFR Part 15, Section 15.245
 - FCC regulation-compliant for life of the sensor
 - FCC certification on product label

- CE:
 - Safety (IEC 60950-1:2006)
 - Radiated RF Emissions (EN 300 440-2 v1.4.1 (2010-08))
 - Declaration of Conformity (BS EN ISO/IEC 17050-1:2004)
 - Conducted and Low Frequency Emissions and Immunity (ETSI EN 301 489-3)
- Testing documentation available upon request

Operating conditions

- Ambient operating temperature: -29.2°F to 165°F (-34°C to 74°C)
- Humidity: Up to 95% RH (non-condensing)
- Accurate performance in:
 - Rain up to 1 in. (2.5 cm) per hour
 - Freezing rain
 - Dry and moist snowfall
 - Wind
 - Dust
 - Fog
 - Changing temperature
 - Changing lighting (even direct light on sensor at dawn and dusk)
 - Ice and dry snow buildup up to 0.2 in. (0.5 cm) on sensor front

Maintenance

- No cleaning or adjustment necessary
- No battery replacement necessary
- No recalibration necessary
- Mean time between failures: 10 years (estimated based on manufacturing techniques)

Support

- Training and tech support available
- Training includes:
 - Knowledgeable trainers
 - Presentation materials
 - Classroom and in-field instruction
 - Installation and configuration instruction to ensure accurate performance
 - Instruction in use of computer and other necessary equipment
 - Virtual configuration
- Technical support includes:
 - Technical representatives available for installation and configuration
 - Ongoing troubleshooting and maintenance support
- Documentation:
 - Comprehensive installation guide
 - Configuration guide
 - Quick start guide

Warranty

- Two-year warranty against material and workmanship defects
(see SmartSensor Warranty datasheet for complete details)

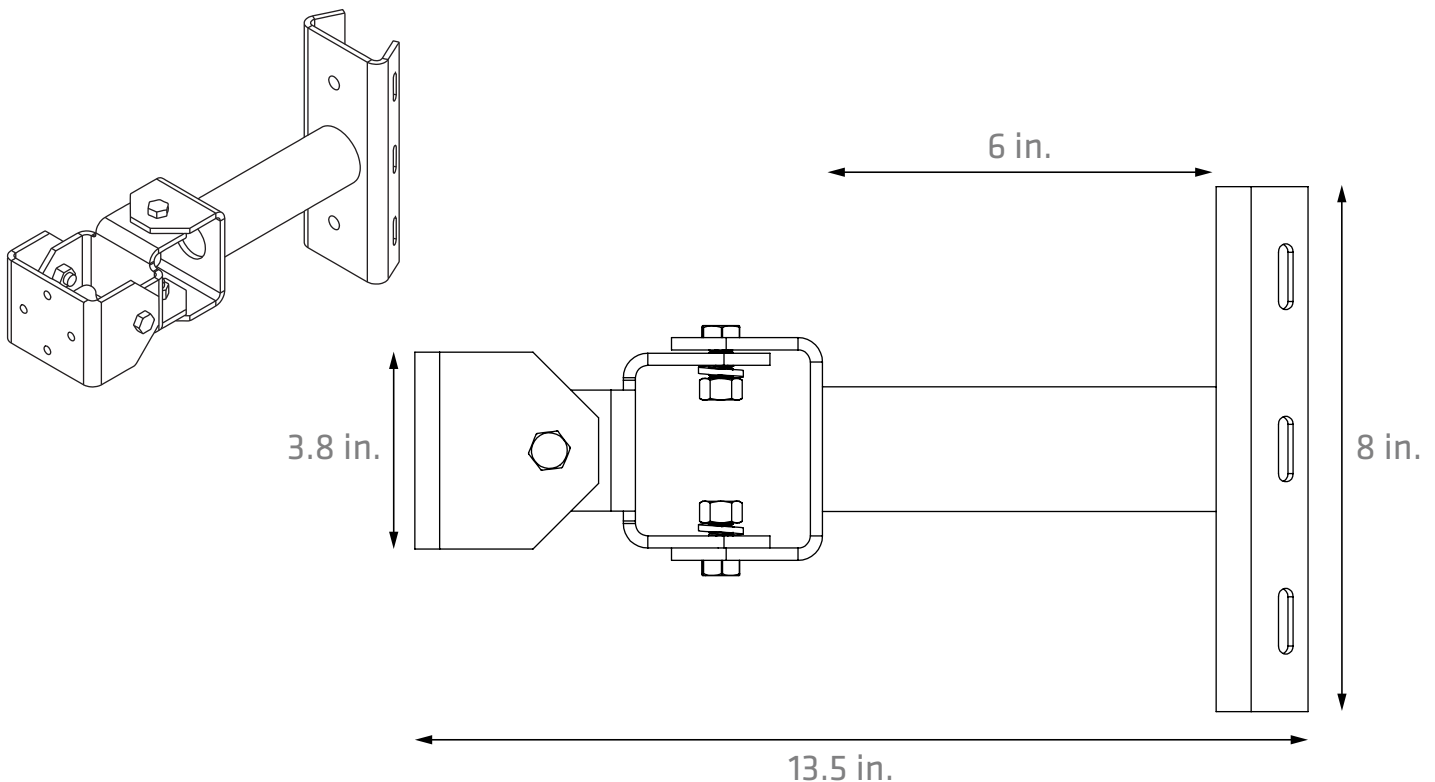
The advertised detection accuracy of the company's sensors is based on both external and internal testing, as outlined in each product's specification document. Although our sensors are very accurate by industry standards, like all other sensor manufacturers we cannot guarantee perfection or assure that no errors will ever occur in any particular applications of our technology. Therefore, beyond the express Limited Warranty that accompanies each sensor sold by the company, we offer no additional representations, warranties, guarantees, or remedies to our customers. It is recommended that purchasers and integrators evaluate the accuracy of each sensor to determine the acceptable margin of error for each application within their particular system(s).

Pole mount for SmartSensors

The SmartSensor mount makes installation quick and easy by helping you securely mount any of the Wavetronix SmartSensors. Sturdily built of powder-coated aluminum for durability and weather-resistance, this mount can withstand whatever the elements throw at it.



- Two axes of rotation for horizontal and vertical positioning
- Supports a 20-lb. (9.1-kg) load
- Mates with fixed and rotational backplates on the SmartSensor V, HD, Advance, and Matrix
- Symmetric hole pattern for flexibility in sensor attachment
- Two contact points for attachment to circular or non-circular poles
- On circular poles, another axis of rotation around the pole is available
- Accepts 3/4" banding
- Heavy duty aluminum construction makes mount sturdy and long-lasting
- Powder coated for oxidization resistance, allowing mount to withstand the harshest weather conditions



SmartSensor Mount technical specifications

Physical properties

- Weight: 3 lb. (1.4 kg)
- Dimensions: 8 in. × 13.6 in. × 3.8 in. (20.3 cm × 34.6 cm × 9.6 cm)
- Constructed of aluminum 0.2 in. (0.5 cm) thick
- Powder coated
- 316 Stainless steel hardware

Mounting

- Rotational axes: 2
 - NOTE: SmartSensor Advance and SmartSensor Matrix are shipped with rotational backplate for third axis of rotation. SmartSensor V and SmartSensor HD can be ordered with rotational backplate if third axis is required.
- Additional degree of movement achieved by using the 360-0129
- Maximum load: 20 lb. (9.1 kg)
- Contact points with pole: 2
- Slotted for ¾-in. (1.9-cm) banding
- Symmetric hole pattern that mates with fixed and rotational SmartSensor backplates

Support

- Extended support options available; contact a Wavetronix representative for more information
- Comprehensive user guide

Warranty

- Five-year warranty against material and workmanship defect

Ordering information

SmartSensor Mount
SS-611

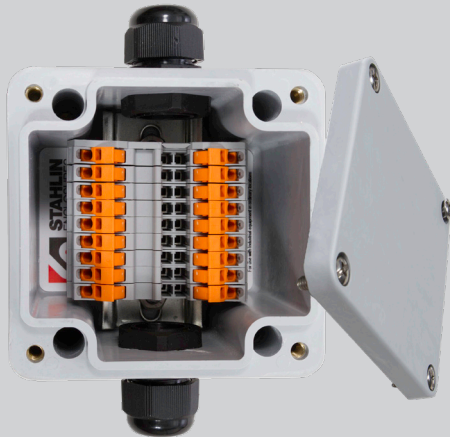
Optional accessories (sold separately)
360-0129 – SmartSensor Mount Knuckle

Contact us

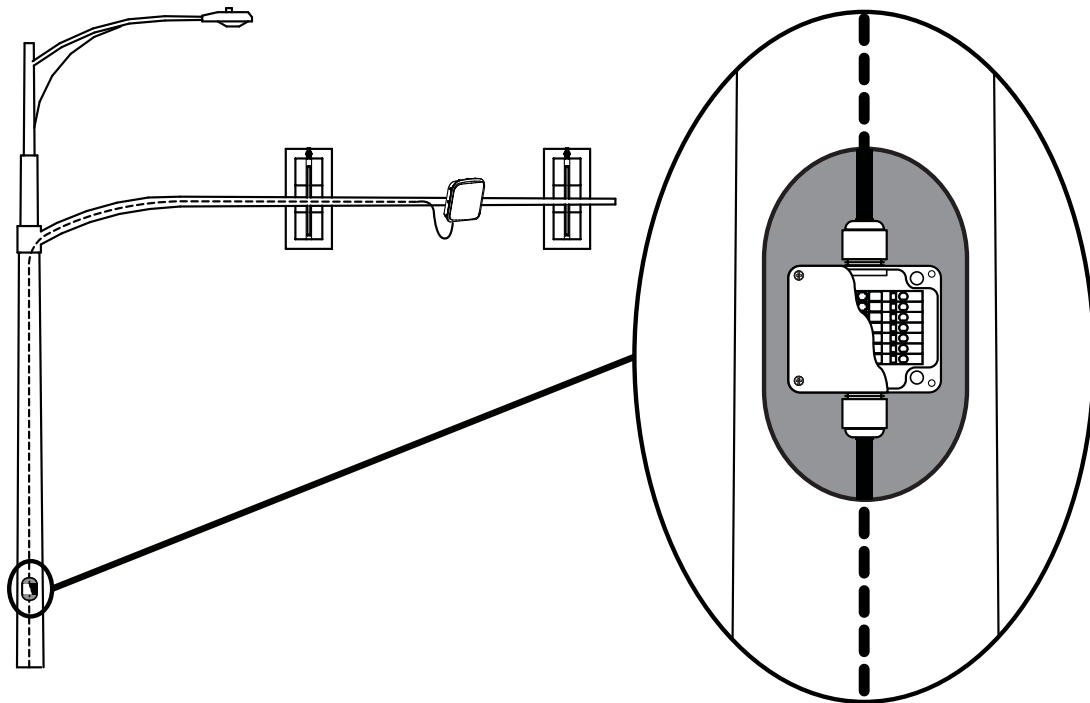
801.734.7200
sales@wavetronix.com
www.wavetronix.com

Mini junction box for splicing cables

The SmartSensor Cable Junction Box Mini provides connection between the sensor's pigtail cable and the homerun cable to the cabinet. The design is slimmer than the original Sensor Cable Junction Box, allowing the box to be used with narrower poles.



- Nine terminal blocks means that the box can be used with cables with nine or fewer conductors and drains, namely the Wavetronix SmartSensor 6-conductor Cable and the 8-conductor Cable
- IP 66-rated enclosure, providing a degree of protection against falling dirt, windblown dust, water and ice
- Insulation displacement terminal blocks for quick wiring
- Small form factor for placement in traffic pole hand hole
- Cable grips for water resistance
- Slim design with cable grips on either side allows for use of box in narrow poles



SmartSensor Cable Junction Box Mini technical specifications

Physical properties

- Dimensions: 3.7 in. × 3.6 in. × 3.0 in. (9.4 cm × 9 cm × 8 cm)
- Cable grip cable diameter: 0.3 in.–0.5 in. (6.4 mm–11.9 mm)
- Designed to meet IP 66 ratings
- Material: fiberglass

Connections

- Connections: insulation displacement
- 9 terminal blocks
- Wire: 24–16 AWG

Power

- Nominal current IN: 17.5 A
- Nominal voltage UN: 500 V
- Maximum load current: 17.5 A

Testing

- Designed to meet IP & NEMA 250 type 1, 3R, 4X, 6P, and 12 ratings
- Passes manufacturer's mechanical, electrical, and material tests

Support

- Extended support options available; contact a Wavetronix representative for more information

Ordering information

SmartSensor Cable Junction Box Mini
102-0453

Optional accessories (sold separately)

SS-704 – SmartSensor 6-conductor Cable

SS-706 – SmartSensor 8-conductor Cable

Contact us

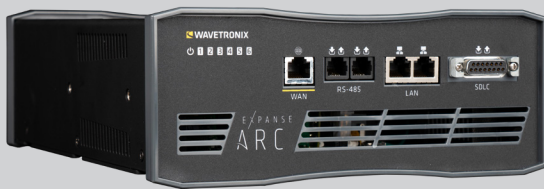
801.734.7200

sales@wavetronix.com

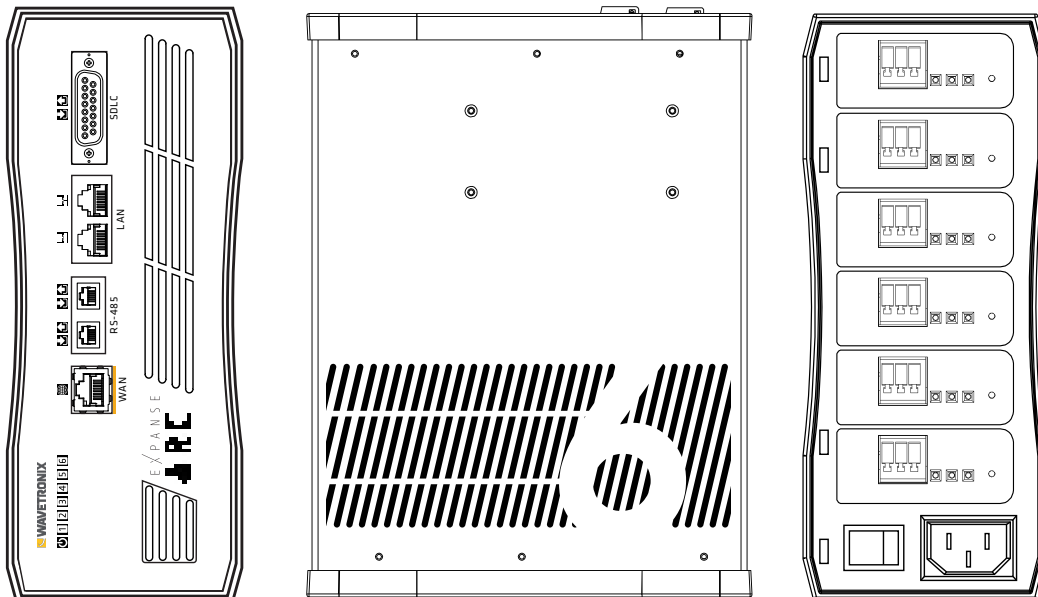
www.wavetronix.com

6-sensor cabinet interface device

Part of the Expanse system, the Arc6 is all about convenience—providing power, surge protection, and communications for up to six sensors. Multiple Arc6 units can be placed on a single Ethernet network so that, through the Expanse software, you can configure all sensors in your system right from your computer.



- Puts all connected Expanse or SmartSensor sensors on your Ethernet network, letting you access them from any connected computer via Expanse software
- SDLC port for communicating with compatible controllers
- RS-485 and Ethernet connections for on-site configuration and connection to other cabinet devices
- Accepts AC power, and passes that power on to up to six sensors
- Protects cabinets from surges on the sensor cable
- Arc Replaceable Surge cards allow you to quickly get the device back in top condition after a surge event
- Can be set on a shelf or mounted on a cabinet wall or 19-in. rack



Arc6 technical specifications

Physical properties

- Weight: 4.9 lb. (2.2 kg)
- Dimensions: 8.7 in. × 3.4 in. × 10.7 in. (22.1 cm × 8.6 cm × 27.2 cm)

Operating conditions

- Ambient operating temperature: -29°F to 165°F (-34°C to 74°C)
- Humidity: up to 95% RH

Mounting

- Shelf-mount
- Mounting brackets available for purchase
 - 19-in. rack mount bracket (2U height)
 - Side-mount strut channel bracket
 - Top/bottom-mount bracket

Connections

- Power and surge
 - AC input: IEC AC input
 - Power switch on back of device turns off power to device
 - Field-replaceable Arc Surge cards protect the device from surges coming in on the sensor cable
- Ethernet
 - 2 RJ-45 10/100 jacks on the front of the device for wired Ethernet communications to other Wavetronix devices, or for on-site configuration
 - 1 RJ-45 10/100 jack on the front of the device for wired Ethernet communications to customer network
- SDLC
 - 1 SDLC port on the front of the device for connecting to SDLC-compatible controllers
- Serial
 - 2 RJ-11 jacks on the front of the device for RS-485 communications
- Connections to sensor
 - Six slots on back of device for plugging in field-replaceable surge cards
 - Field-replaceable surge cards provide a spot for termination of sensor cables, as well as protecting the device from surges on that cable

Power

- AC power supply voltage: 120 VAC
- AC frequency: 50–60 Hz
- Max AC current: 6 A
- Supports 6 sensors (up to 25 W each)

Configuration

- Illuminated indicators show when data is being transmitted and received on the Ethernet, serial, SDLC and sensor ports
- ±5ppm real-time clock with super capacitor backup
- Supports time synchronization from GPS, NTP, or real-time clock

Ordering information

Arc6
102-0594

Included components

- 310-0400** – Arc Power Cable
- 310-0416** – 5-ft. CAT5 Ethernet cable
- 102-0481** – Arc Slot Cover

Optional accessories (sold separately)

- 102-0564** – Arc Field-replaceable Surge v2
- 102-0562** – SmartSensor Field-replaceable Surge v2
- 150-0512** – Arc Field-replaceable Surge IDC Connector
- 102-0486** – Arc Rack Mount Bracket
- 102-0487** – Arc Diamond Bracket
- 102-0485** – Arc Side Mount Bracket
- 101-0463** – Expanse Link S Cable (5000-ft. spool)
- 101-0464** – Expanse Link S Cable (1000-ft. spool)
- 101-0465** – Expanse Link S Cable (500-ft. spool)

Contact us

801.734.7200
sales@wavetronix.com
www.wavetronix.com

Surge protection

- AC input surge immunity: IEC/EN 61000-4-5 level 3
- Sensor ports surge immunity: IEC/EN 61000-4-5 level 4; must be obtained by purchasing an FRS card (102-0480)

Testing

- Tested under FCC CFR 47, Part 15, Subpart B & ICES-003, Issue 6 + A1
- FCC certification on product label
- FCC regulation-compliant for life of the sensor
- Complies with the applicable standards stated in the NEMA TS 2-2021 Standard
- Passes manufacturer's test before shipping

- Equipment labeling found on the bottom of the unit

Support

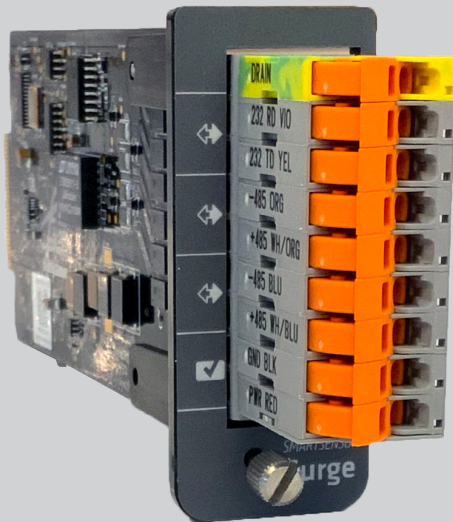
- Extended support options available; contact a Wavetronix representative for more information
- Comprehensive user guide

Warranty

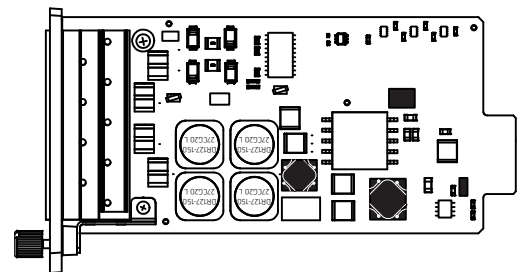
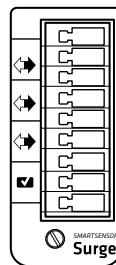
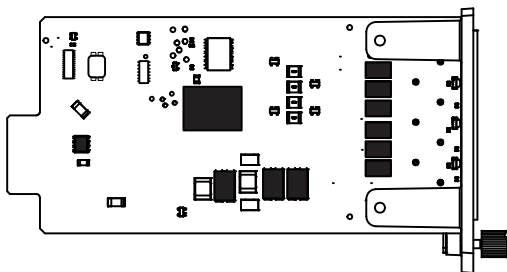
- Five-year warranty against material and workmanship defect

Replaceable surge for Arc/legacy sensor connection

The SmartSensor Field-replaceable Surge v2 card allows you to protect the Arc from surges when using a SmartSensor. Easy to install and remove in the field, the card is secured directly into the back of the Arc. It provides a convenient place to terminate the sensor cable while at the same time protecting from surges on that cable. If a surge occurs, don't replace the whole Arc—just replace the card!



- Designed for use with the Arc in an installation with a SmartSensor Matrix, Advance, or HD
- Protects the Arc and other cabinet equipment against surges on the sensor cable
- In the event of a surge, the card can be easily replaced, negating the need to replace the whole Arc or send the Arc in for repairs
- Quick and easy installation in the field requires only a slotted screwdriver
- Comes with terminal block plug needed to terminate sensor cable into card
- Multi-stage surge protection for data and DC power
- FCC-compliant
- Complies with NEMA TS2-2003 environmental testing
- Surge immunity complies with IEC 61000-4-5 level 4 standard



SmartSensor Field-replaceable Surge v2 technical specifications

Physical properties

- Dimensions: 4.8 in. × 2.7 in. × 1.1 in. (12.1 cm × 6.8 cm × 2.9 cm)
- Weight: 0.3 lbs (0.11 kg)

Operating conditions

- Ambient operating temperature: -29°F to 165°F (-34°C to 74°C)
- Humidity: up to 95% RH

Connections

- Port for pluggable terminal blocks, with included insulation displacement (IDC) terminal block plug

Surge protection

- DC power clamping voltage: 28 VDC
- RS-485 clamping voltage: 5 VDC
- RS-232 clamping voltage: 12 VDC
- Surge immunity sensor ports: IEC/EN 61000-4-5 level 4

Testing

- Complies with the applicable standards stated in the NEMA TS2-2003 standard
- Shock pulses of 10 g, 11 ms half sine wave
- Vibration of 0.5 Grms up to 30 Hz
- 300 V positive/negative pulses applied at one pulse per second
- Stored at -49°F (-45°C) for 24 hours
- Stored at 185°F (85°C) for 24 hours
- Operation at -29.2°F (-34°C)
- Operation at 165.2°F (74°C)
- FCC-compliant
- Passes manufacturer's test before shipping

Support

- Extended support options available; contact a Wavetronix representative for more information
- Comprehensive user guide

Warranty

- Five-year warranty against material and workmanship defect

Ordering information

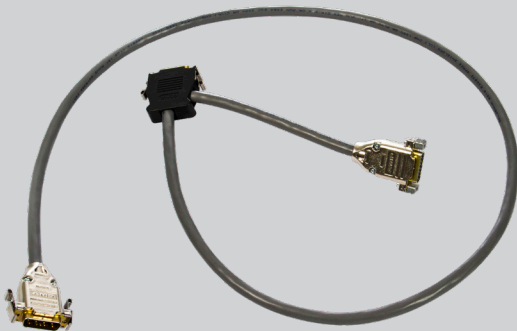
SmartSensor Field-replaceable Surge v2
102-0562

Contact us

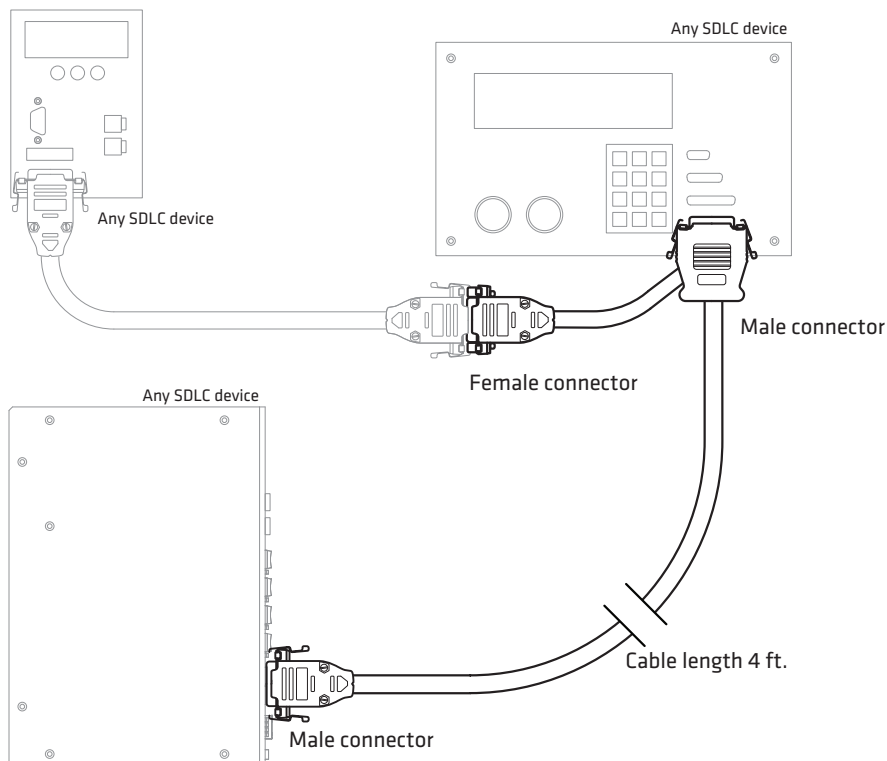
801.734.7200
sales@wavetronix.com
www.wavetronix.com

4-ft. male-male-female SDLC cable

The SDLC Y cable can be used in traffic cabinets that utilize an SDLC bus but don't have enough SDLC connectors to add any additional devices. Inserting one of these cables between an existing SDLC cable and SDLC device provides you with an extra connector for adding devices to the SDLC bus.



- Main cable is four feet in length; shorter arm is eight inches in length.
- Cable forks at one end, for a total of three connectors.
 - Two male connectors (15 pin)
 - One female connector (15 pin)
- Can be used to provide an extra SDLC connector in a NEMA TS-2 cabinet, for adding an additional device to the SDLC bus.
- Cable is NEMA-compliant:
 - Cable rated to 300V RMS and 105°C
 - Contacts at least 15 millionths of an inch gold plated
 - Connectors feature latching blocks



SDLC Y Cable technical specifications

Physical properties

- Cable length: 4 ft. (1.2 m)
- Shorter cable arm length: 8 in. (20.3 cm)
- PVC jacket and insulation
- Overall foil shielded with drain
- Three (15-pin) SDLC connectors:
 - Two male
 - One female

Operating conditions

- Ambient operating temperature: -30°C to 105°C

Connections

- 4 pairs 22 AWG stranded tinned copper conductors

Testing

- Complies with the following NEMA specifications:
 - Rated to 300V RMS
 - Rated to 105°C
 - Connectors feature latching blocks
 - Contacts at least 15 millionths of an inch gold plated

Support

- Extended support options available; contact a Wavetronix representative for more information

Ordering information

SDLC Y Cable
310-0413

Contact us

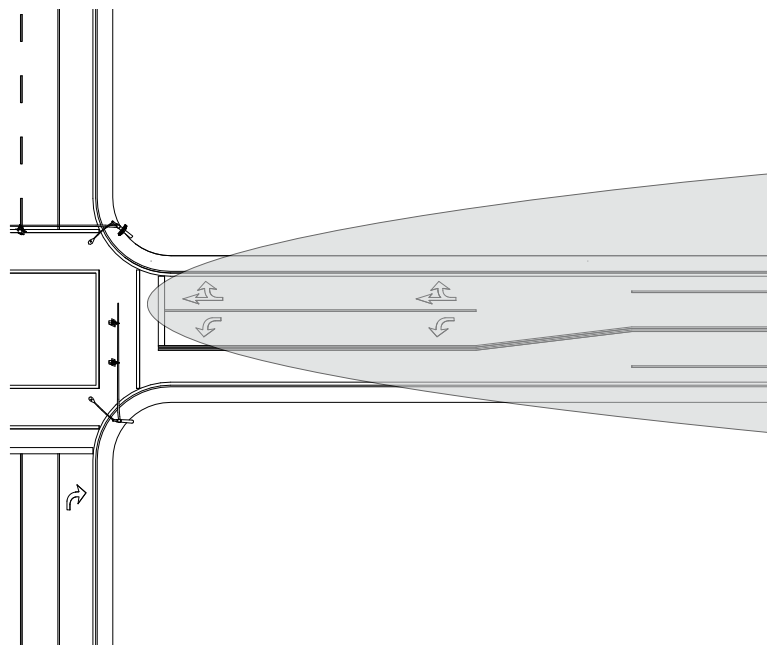
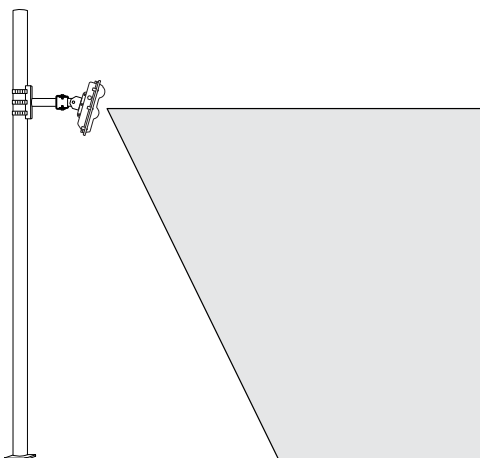
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Forward-fire, extended-range intersection advance sensor

SmartSensor Advance Extended Range is the first traffic device to use advance detection to provide enhanced dilemma zone protection for trucks and other high profile vehicles. The sensor boosts detection of these vehicles out to 900 ft., and protects both cars and trucks with innovative SafeArrival technology.



- Advance detection at signalized intersections
- Patented Digital Wave Radar
- Patented SafeArrival technology provides protection to individual cars and trucks
- Dynamic ETA Tracking over the entire detection area
- Easy integration with the SmartSensor Matrix into the same Arc cabinet interface device
- Non-intrusive, aboveground position makes sensor easy to install
- Dilemma zone protection for high-profile vehicles based on vehicle discovery range
- Advanced techniques boost truck detections out to 900 ft. and car detections out to 600 ft. or more
- The additional 300-ft. range (compared to SmartSensor Advance) makes overhead/straightforward mast arm installation more effective on high-speed approaches
- Benefits include reduced risk of hazardous load spills; reduced truck crash and fatalities rates; reduced emissions; fewer truck start-up delays; and improved corridor delivery times



SmartSensor Advance Extended Range technical specifications

Physical properties

- Weight: 3.8 lb. (1.7 kg)
- Dimensions: 13.2 in. × 10.6 in. × 3.8 in. (33.5 cm × 26.9 cm × 9.7 cm)
- Enclosure:
 - Lexan EXL polycarbonate
 - Resistant to corrosion, fungus, moisture deterioration and ultraviolet rays
 - Outdoor weatherable: UL 746C
 - Withstands 5-ft. (1.5-m) drop
 - Watertight by NEMA 250 standard
- Connector: MIL-C-26482
- Rotational backplate for 360° of roll

Radar design

- Type of radar: Single-beam
- Uses frequency modulated continuous wave (FMCW) radar
- Operating frequency: 10.5–10.55 GHz (X-band)
- Transmit bandwidth: 45 MHz
- Bandwidth stable within 1%
- Un-windowed resolution: 11 ft. (3.4 m)
- Antennas:
 - Printed circuit board antennas
 - Vertical 6 dB beam width (two-way pattern): 65°
 - Horizontal 6 dB beam width (two-way pattern): 10.5°
 - Two-way sidelobes -40 dB
- RF channels: 8
- No manual tuning to circuitry
- No temperature-based compensation necessary

Detection area

- Detection area: 50 to 900 ft. (15.2 m to 274.3 m)
- Discovery range threshold from 100 ft. (30.5 m) to 900 ft. (274.3 m)
- Maximum mounting height: 40 ft. (12.2 m)
- Maximum mounting distance from center of lanes: 50 ft. (15.2 m)

Measured quantities

- Per-vehicle data:
 - Range
 - Speed
 - ETA
- Number of channels: 8
- Channel outputs: 8
 - Alerts per channel: 4 (32 total)
 - Zones per alert: 4 (128 total)

Ordering information

SmartSensor Advance Extended Range
SS-200E

Optional accessories (sold separately)

102-0597 – Arc2

102-0594 – Arc6

102-0525 – SmartSensor Field-replaceable Surge

102-0562 – SmartSensor Field-replaceable Surge v2

SS-704-xxx/705 – SmartSensor 6-conductor Cable

SS-611 – SmartSensor Mount

101-0462 – SmartSensor Span Wire Mount

CLK-112/114 – Click 112/114

SS-710 – SmartSensor Cable Junction Box

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- Number of simultaneous vehicle detections: 25
- Priority channels: 3
- Dynamic density (a measure of instantaneous roadway efficiency)

Power

- Power consumption: 3.2 W @ 12 VDC
- Operating voltage: 10–28 VDC *
 - Recommended power supply voltage: 12–24 VDC *
- Onboard surge protection

Communication

- Com ports:
 - Two half-duplex RS-485 COM
- User configurable:
 - Baud rate
 - Response delay

** While the system works with supply voltages of up to 28 VDC, 24 VDC supplies are recommended; the excess is designed to allow some tolerance on the output of the supply. To support 12 VDC battery systems, and if the cable is short enough, the sensor can accept a power supply as low as 10 VDC; however, this is dependent on cable length and wire gauge. Please consult the document SmartSensor Advance Cable Length Recommendations 0381 for details.*

- ☐ Contact closure data output frequency
- Supported baud rates:
 - ☐ 9600
 - ☐ 19200
 - ☐ 38400
 - ☐ 57600
 - ☐ 115200
- Contact closure data output frequency:
 - ☐ Minimum: 10 ms
 - ☐ Default: 130 ms
- Contact closure data latency (varies with baud rate and output frequency):
 - ☐ Minimum: 55 ms (this is achieved using 57600 bps baud rate and 50 ms output frequency)
 - ☐ Default: 142 ms (this is achieved using 9600 bps baud rate and 130 ms output frequency)
- Firmware upgradability over any COM port
- Dedicated detection communications
- Configuration, verification, or traffic display without disrupting detection communications
- Detection data available via serial communications

Configuration

- Graphical user interface with traffic representation
- Automatic and manual configuration of detection sensitivity in 7.5-ft. (2.29-m) increments
- Manual configuration supported
- Zone size increment: 5 ft. (1.5 m)
- Maximum detection zone size: 850 ft. (251.9 m)
- High speed and low speed detection filters:
 - ☐ Speed filter increment: 1 mph (1.6 kph)
- Upper and lower ETA filters
 - ☐ ETA filter increment: 0.1 seconds
- Upper and lower count filters
 - ☐ Count filter increment: 1
- Display of configured alerts and their actuation
- Vehicle track file logging
- Supported operating systems:
 - ☐ Windows 7
 - ☐ Windows 8
 - ☐ Windows 10
 - ☐ Windows 11 (Expense)
- Software supported functionality:
 - ☐ TCP/IP connectivity
 - ☐ Auto-find baud rate
 - ☐ Auto-find serial port
 - ☐ Virtual sensor connections
 - ☐ Sensor configuration backup and restore
 - ☐ Dynamic stop-bar ETA tracking adjusted as vehicles change speeds
 - ☐ Channel output from multiple alerts

- ☐ Delay and extend settings used for channel outputs
- ☐ Combinational logic applied to zone outputs for alert output
- ☐ Logic filters for zone output
- ☐ Latched channel output controlled by alerts and timer
- ☐ Pulse channel outputs for intersection arrival-time information
- ☐ Priority level (based on discovery range for high-profile vehicles)
- ☐ Two priority level alerts: level 1 = high priority, level 2 = normal priority
- ☐ Queue clearance alert

Manufacturing

- Manufactured in the USA
- Surface mount and wave solder assembly
- IPC-A-610C Class 2—compliant
- Operational testing:
 - ☐ Sub-assembly test
 - ☐ 48-hour unit level burn-in
 - ☐ Final unit test
- Unit test results available

Testing

- NEMA:
 - ☐ NEMA TS 2-2003
 - ☐ NEMA 250 type 4X-compliant
- FCC:
 - ☐ CFR 47 Part 15
 - ☐ FCC regulation—compliant for life of the sensor
 - ☐ FCC certification on product label
- CE:
 - ☐ Tested under IEC 61000-4-5 class 4 (lightning surge protection)

Operating conditions

- Ambient operating temp: -29.2°F to 165°F (-34°C to 74°C)
- Humidity: up to 95% RH (non-condensing)
- Accurate performance in:
 - ☐ Rain up to 2 in. (5.08 cm) per hour
 - ☐ Freezing rain
 - ☐ Dry and moist snowfall
 - ☐ Wind
 - ☐ Dust
 - ☐ Fog
 - ☐ Changing temperature
 - ☐ Changing lighting (even direct light on sensor at dawn and dusk)
 - ☐ Ice and dry snow buildup up to 0.2 in. (0.5 cm) on sensor front

Performance

- Detection accuracy: large vehicles 98%; all motor vehicles 95%
- Range accuracy: ±10 ft. (3 m) for 90% of measurements

- Speed accuracy: ± 5 mph (8 kph) for 90% of measurements
- ETA accuracy: ± 1 sec. for 85% of measurements
- Percentage of vehicles detected before 450 ft. (137.2 m): all motor vehicles 90%
- Percentage of vehicles detected before 700 ft. (213.4m): high-profile trucks, buses, and other large vehicles 90%

Maintenance

- No cleaning or adjustment necessary
- No battery replacement necessary
- No recalibration necessary
- Mean time between failures: 10 years (estimated based on manufacturing techniques)

Support

- Training and tech support available
- Training includes:
 - Knowledgeable trainers
 - Presentation materials
 - Classroom and in-field instruction
 - Installation and configuration instruction to ensure accurate performance
 - Instruction in use of computer and other necessary equipment
 - Virtual configuration
- Technical support includes:
 - Technical representatives available for installation and configuration
 - Ongoing troubleshooting and maintenance support
- Documentation:
 - Installation guide
 - Configuration guide
 - Quick start guide
- Documentation available upon request:
 - Detection accuracy
 - Range accuracy
 - Earliest range of detection
 - Speed accuracy
 - ETA accuracy

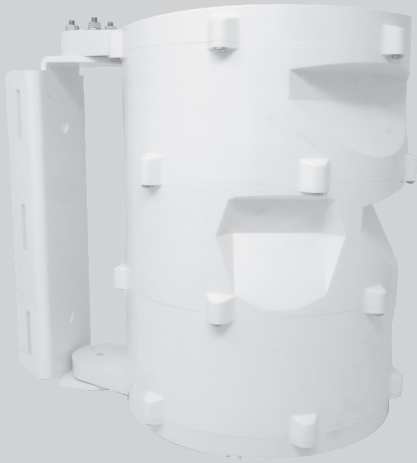
Warranty

- Two-year warranty against material and workmanship defect (see SmartSensor Warranty datasheet for complete details)

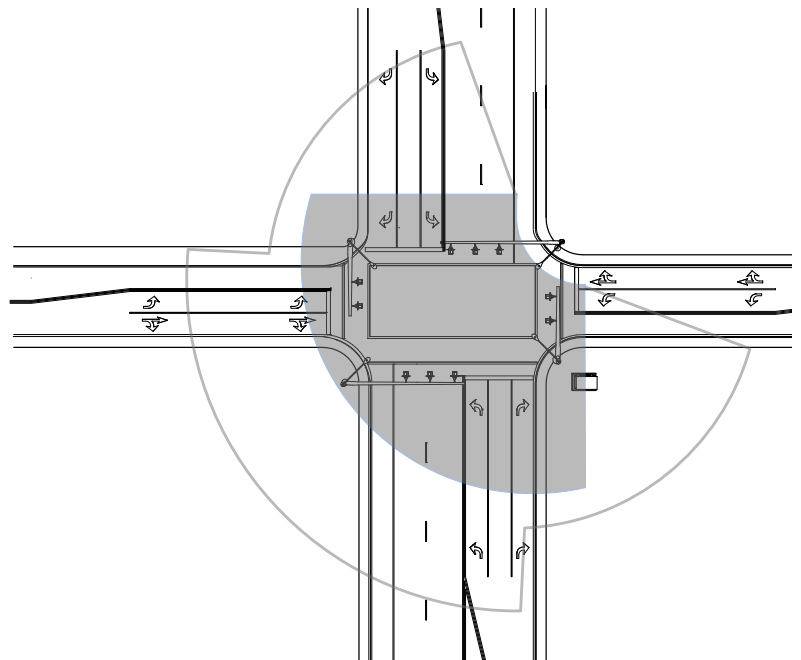
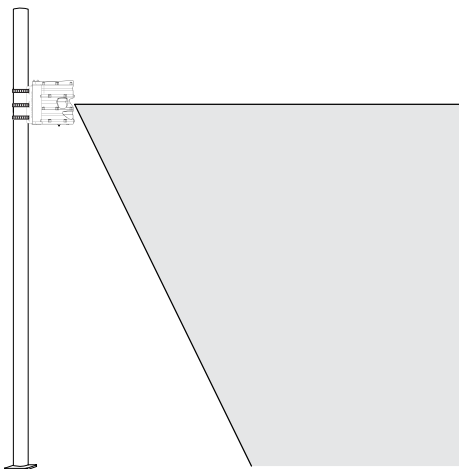
The advertised detection accuracy of the company's sensors is based on both external and internal testing, as outlined in each product's specification document. Although our sensors are very accurate by industry standards, like all other sensor manufacturers we cannot guarantee perfection or assure that no errors will ever occur in any particular applications of our technology. Therefore, beyond the express Limited Warranty that accompanies each sensor sold by the company, we offer no additional representations, warranties, guarantees, or remedies to our customers. It is recommended that purchasers and integrators evaluate the accuracy of each sensor to determine the acceptable margin of error for each application within their particular system(s).

SMALL intersection sensor

The XP21 is a first-of-its-kind stop bar detector capable of detecting traffic in an entire small intersection by itself. It can detect stopped vehicles at four approaches, with three lanes per approach. When used with the Arc and Expanse software, the XP21 allows you to configure and view detection zones from your computer.



- Uses radar to get the most accurate stop bar data for an entire intersection
- Part of the Expanse system: connect it to an Arc and use the Expanse software to take advantage of all the great system features
- Native IP device: put it on your network and use the software to interact with sensors on your system
- Field-replaceable surge card means you can easily replace the surge protection in the field after a surge event
- Employs Wavetronix' industry-leading radar technology for the highest quality high-definition detection
- Features a GPS receiver for geo-referencing the sensor
- All-weather, all-condition performance
- Built-in heater prevents snow from blinding the sensor



XP21 technical specifications

Physical properties

- Weight: 9.4 lb. (4.3 kg)
- Dimensions: 12.2 in. (31.1 cm) high × 9 in. (22.9 cm) diameter
- Enclosure:
 - Lexan EXL polycarbonate
 - Resistant to corrosion, fungus, moisture deterioration, and ultraviolet rays
 - Outdoor weatherable: UL 746C
 - Withstands 5-ft. (1.5-m) drop
 - Housing withstands wind loads exceeding 120 mph
 - Watertight by NEMA 250 standard
 - Connector: M12 T-code male connector
- GPS receiver for georeferencing/locating sensor

Detection area

- Detection range:
 - Max range of 120 ft. (36.6 m) for stop bar placement
 - Max range of 150 ft. (45.7 m) for stop bar detection
 - Max range of 179 ft. (54.6 m) for tracking vehicles into the stop bar detection area
- Number of approaches: 4
- Number of lanes: 3 per approach
- Field of view: 230 degrees for tracking vehicles into intersection and 120 degrees for stop bar placement
- Any lane spacing is supported
- Detection over barriers is supported
- Flexible lane configuration support including:
 - Curved lanes
 - Islands
 - Medians

Measured quantities

- Real-time presence data across a 120-ft. (30.4-m) range
- Maximum number of lanes: 12
- Maximum number of channels: 12

Power

- Power consumption: 15–20 W (without heater)
- Power consumption: 50 W (with heater)
- Operating voltage: 37.2–60 VDC
- Onboard, field-replaceable surge protection
- Resumes vehicle detection automatically after resumption of power

Communication

- Native IP device
- Ethernet speed: 10/100 Mbps
- In-field and remote upgradable

Ordering information

XP21
101-0479

Included components

- 101-0486 – Expanse Sensor Connector
- 101-0480 – XP21 Sensor Mount
- 101-0483 – XP21 Field-replaceable Surge

Optional accessories (sold separately)

- 102-0597 – Arc2
- 102-0564 – Arc Field-replaceable Surge v2
- 101-0483 – XP21 Field-replaceable Surge
- 102-0555 – Expanse Junction Box
- 101-0468 – Expanse Link Cable (500-ft. (12.7-m) spool)
- 101-0469 – Expanse Link Cable (1000-ft. (25.4-m) spool)
- 101-0470 – Expanse Link Cable (5000-ft. (127-m) spool)
- 101-0465 – Expanse Link S Cable (500-ft. (12.7-m) spool)
- 101-0464 – Expanse Link S Cable (1000-ft. (25.4-m) spool)
- 101-0463 – Expanse Link S Cable (5000-ft. (127-m) spool)

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- Fail-safe mode for outputs if communication is lost
- Configuration and verification without disrupting detection communications
- Communicates to cabinet via Ethernet over single twisted pair

Cable

- Shielded single twisted pair

- 120-ohm characteristic impedance
- Supported cable lengths:
 - Expanse Link Cable (300 V, 22 AWG): 600 ft. (182.9 m)
 - Expanse Link S Cable (600 V, 16 AWG): 1,500 ft. (457.2 m)

Configuration

- Graphical user interface with traffic pattern display
- Sensor reconfiguration without detection disruption supported
- Supported operating systems:
 - Windows 10
 - Windows 11
- Software-supported functionality:
 - TCP/IP connectivity
 - Sensor configuration backup and restore
 - Virtual sensor connections for demonstration and training
 - Sensor configuration backups can be viewed and edited
 - Local or remote sensor firmware upgradability
 - User-selectable stop bar mapping

Manufacturing

- Manufactured in the USA
- Surface mount and wave solder assembly
- Operational testing:
 - Sub-assembly test
 - 48-hour unit level burn-in
 - Final unit test
- Unit test results available
- IPC-A-610C Class 2–compliant

Operating conditions

- Ambient operating temp: -29.2°F to 165°F (-34°C to 74°C)
- Humidity: up to 95% RH (non-condensing)
- Accurate performance in:
 - Rain up to 1 in. (2.5 cm) per hour
 - Freezing rain
 - Dry snowfall and moist snowfall
 - Wind
 - Dust
 - Fog
 - Changing temperature
 - Changing lighting (even direct light on sensor at dawn and dusk)
 - Ice and dry snow buildup up to 0.2 in. (0.5 cm) on sensor front

Maintenance

- No cleaning or adjustment necessary
- No battery replacement necessary
- No recalibration necessary
- Mean time between failures: 10 years (estimated based on manufacturing techniques)

Support

- Training and tech support available
- Wavetronix training includes:
 - Knowledgeable trainers offering classroom and in-field instruction
 - Use of presentation materials
 - Installation and configuration instruction to ensure accurate performance
 - Instruction in use of computer and other necessary equipment
 - Virtual configuration
- Technical support includes:
 - Technical representatives available for installation and configuration
 - Ongoing troubleshooting and maintenance support
- Documentation:
 - Comprehensive user guide
 - Quick start guide
- Documentation available upon request:
 - Certification documentation

Warranty

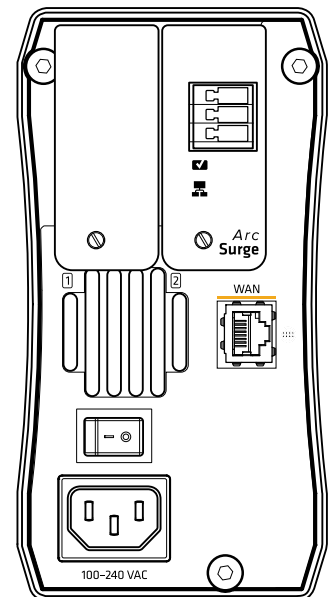
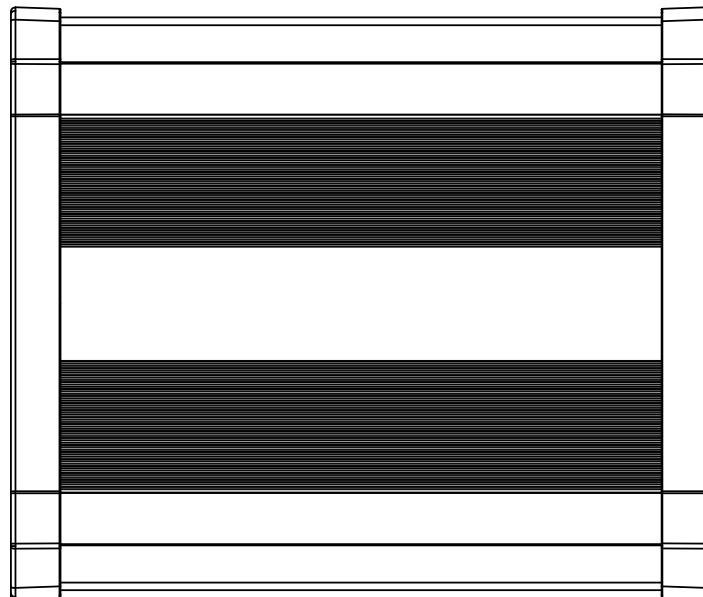
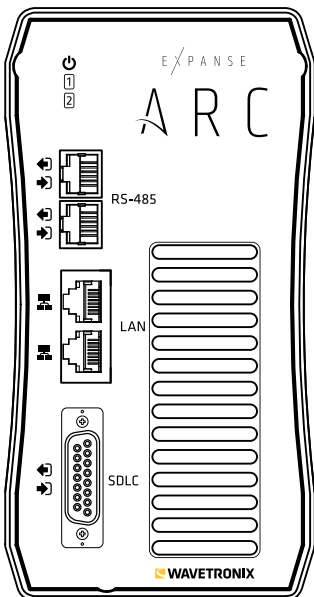
- Two-year warranty against material and workmanship defect

2-sensor cabinet interface device

Part of the Expanse system, the Arc2 is all about convenience—providing power, surge protection, and communications for up to two sensors. Multiple Arc2s can be placed on a single Ethernet network so that, through the Expanse software, you can configure all sensors in your system right from your computer.



- Puts all connected sensors on your Ethernet network, letting you access them from any connected computer via the Expanse software
- SDLC port for communicating with compatible controllers
- RS-485 and Ethernet connections for on-site configuration and connection to other cabinet devices
- Accepts AC power and passes that power on to up to two sensors
- Protects cabinets from surges on the sensor cable
- Arc Replaceable Surge cards allow you to quickly get the device back in top condition after a surge event
- Can be set on a shelf or mounted on a cabinet wall or 19-in. rack



Arc2 technical specifications

Physical properties

- Weight: 3.9 lb. (1.8 kg)
- Dimensions: 8 in. × 3.4 in. × 6.5 in. (20.3 cm × 8.6 cm × 16.5 cm)

Operating conditions

- Ambient operating temperature: -29°F to 165°F (-34°C to 74°C)
- Humidity: up to 95% RH

Mounting

- Shelf-mount
- Mounting brackets available for purchase
 - 19-in. Rack Bracket (2U height)
 - NEMA Side-mount Bracket
 - Diamond Bracket

Connections

- Power and surge
 - AC input: IEC AC input
 - Power switch on back of device turns off power to device
 - Field-replaceable Arc Surge cards protect the device from surges coming in on the sensor cable
- Ethernet
 - 2 RJ-45 10/100 jacks on the front of the device for wired Ethernet communications to other Wavetronix devices, or for on-site configuration
 - 1 RJ-45 10/100 jack on the back of the device for wired Ethernet communications to customer network
- SDLC
 - 1 SDLC port on the front of the device for connecting to SDLC-compatible controllers
- Serial
 - 2 RJ-11 jacks on the front of the device for RS-485 communications
- Connections to sensor
 - Two slots on back of device for plugging in field-replaceable surge cards
 - Field-replaceable surge cards provide a spot for termination of sensor cables, as well as protecting the device from surges on that cable

Power

- AC power supply voltage: 100–240 VAC
- AC frequency: 50–60 Hz
- Max AC current: 1 A
- Supports 2 sensors (up to 25 W each)

Configuration

- Illuminated indicators show when data is being transmitted and received on the Ethernet, serial, wireless, SDLC and sensor ports
- ±5ppm real-time clock with super capacitor backup
- Supports time synchronization from GPS, NTP, or real-time clock

Ordering information

Arc2
102-0597

Included components

- 310-0400** – Arc Power Cable
- 310-0416** – 5-ft. CAT5 Ethernet cable
- 102-0481** – Arc Slot Cover

Optional accessories (sold separately)

- 102-0564** – Arc Field-replaceable Surge v2
- 102-0562** – SmartSensor Field-replaceable Surge v2
- 102-0537** – Arc Field-replaceable Surge SC Connector
- 102-0486** – Arc Rack Mount Bracket
- 102-0487** – Arc Diamond Bracket
- 102-0485** – Arc Side Mount Bracket
- 101-0463** – Expanse Link S Cable (5000-ft. spool)
- 101-0464** – Expanse Link S Cable (1000-ft. spool)
- 101-0465** – Expanse Link S Cable (500-ft. spool)

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Surge protection

- AC input surge immunity: IEC/EN 61000-4-5 level 3
- Sensor ports surge immunity: IEC/EN 61000-4-5 level 4; must be obtained by purchasing an FRS card (102-0480)

Testing

- Tested under FCC CFR 47, Part 15, Subpart B & ICES-003, Issue 6 + A1
- FCC certification on product label
- FCC regulation-compliant for life of the sensor
- Complies with the applicable standards stated in the NEMA TS2-2016 Standard
- Passes manufacturer's test before shipping
- Equipment labeling found on the bottom of the unit

Support

- Extended support options available; contact a Wavetronix representative for more information
- Comprehensive user guide

Warranty

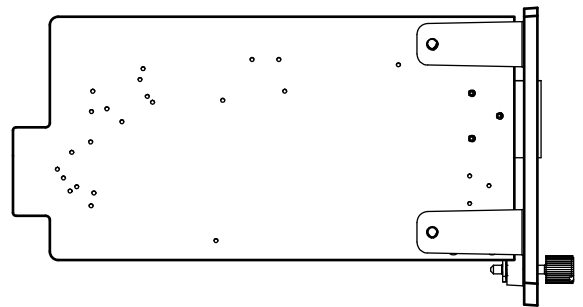
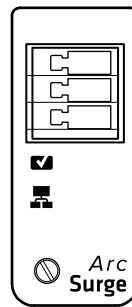
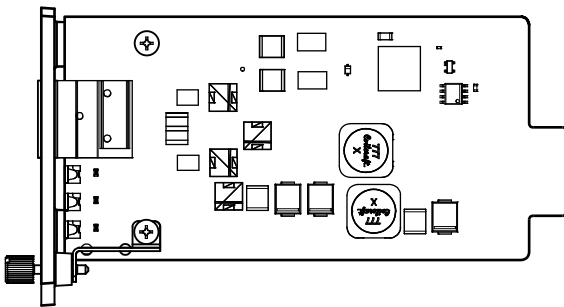
- Five-year warranty against material and workmanship defect

Field-replaceable surge protection for Arc cabinet interface device

The Arc Replaceable Surge is a step forward in surge protection. Easy to install and remove in the field, the card is secured directly into the back of the Arc, providing a convenient place to terminate the sensor cable while protecting from surges on that cable. If a surge occurs, don't replace the whole Arc—just replace the card!



- Designed for use with the Arc in an installation with an XP20 or XP21 sensor
- Protects the Arc and other cabinet equipment against surges on the sensor cable
- In the event of a surge, the card can be easily replaced, negating the need to replace the whole Arc or send the Arc in for repairs
- Quick and easy installation in the field requires only a slotted screwdriver
- Comes with terminal block plug needed to terminate sensor cable into card
- Multi-stage surge protection for data and DC power
- FCC-compliant
- Complies with NEMA TS2-2003 environmental testing
- Surge immunity complies with IEC 61000-4-5 level 4 standard



Arc Field-replaceable Surge v2 technical specifications

Physical properties

- Dimensions: 4.7 in. × 2.7 in. × 1.1 in. (11.9 cm × 6.9 cm × 2.8 cm)
- Weight: 0.3 lbs. (0.1 kg)

Operating conditions

- Ambient operating temperature: -29°F to 165°F (-34°C to 74°C)
- Humidity: up to 95% RH

Connections

- Port for pluggable terminal blocks, with included insulation displacement terminal block plug

Surge protection

- DC power clamping voltage: 60 VDC
- Data clamping voltage: 5 VDC
- Surge immunity sensor ports: IEC/EN 61000-4-5 level 4

Testing

- Complies with the applicable standards stated in the NEMA TS2-2003 standard
- FCC regulation-compliant
- Passes manufacturer's test before shipping

Support

- Extended support options available; contact a Wavetronix representative for more information
- Comprehensive user guide

Warranty

- Five-year warranty against material and workmanship defect

Ordering information

Arc Field-replaceable Surge v2
102-0564

Optional accessories (sold separately)

102-0537 – Arc Field-replaceable Surge SC Connector

(This option is required when using cable with conductors 18 AWG or larger.)

Contact us

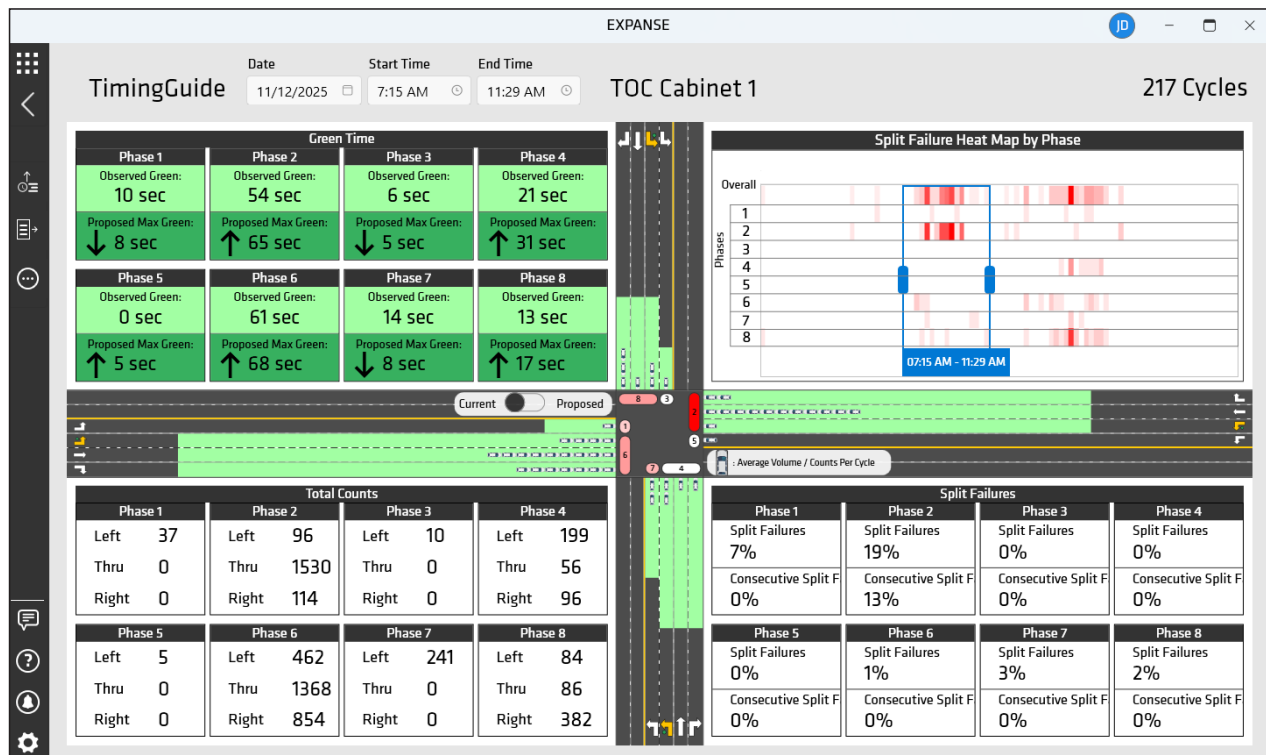
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Intelligent retiming solution for independent signalized intersections

The TimingGuide traffic application augments the SMALL (Smart Multi-Approach Limited Lane) system, enhancing the XP21 and Arc to create a permanent count station that continuously evaluates intersection performance. TimingGuide also automates the creation of retiming proposals, working with the CrossRoads traffic simulator software to dynamically analyze operational adjustments to the intersection.



- Continuously audits your collection of intersections using split failure monitoring dashboards.
- Helps reliably diagnose the root cause of emerging problems using through, left, and right dynamic turn move count data from the permanent count station.
- Creates intelligent retiming proposals automatically, allowing quick action to maintain operational performance.
- Post-validates deployed changes with built-in performance reports.
- Simplifies installation using server-less architecture that does not need a back end system to host.
- Includes CrossRoads Dynamic Analyzer to assess and improve intersection operation:
 - Allows import of data from TimingGuide for graphical display and conversion of data into a tabular format.
 - Evaluates the potential for efficiency gains achievable through dynamic max operation on selected phases.
 - Breaks down the expected economic benefits of proposed retiming in terms of time, fuel, and CO2 savings using the Benefit Calculator.



TimingGuide technical specifications

Software features

- Split failure monitoring
 - Collects signal light and stop bar presence data at 10 Hz rate to detect consecutive and non-consecutive split failures.
 - Stores split failure 15-minute interval data on the Arc for one year.
 - Displays daily split failure summary data in an intersection list view.
 - Displays daily heat map dashboards for standard 8-phase intersections showing all 96, 15-minute intervals of the day.
- Permanent count station
 - Detects left, right, and through turn move counts with greater than 90% accuracy on signalized intersections with three or fewer lanes per approach.
 - Stores count data for 15-minute intervals on the Arc for over 10 years.
 - Displays count data totals for standard 8-phase intersections based on a selected time window, from 15 minutes to 24 hours.
 - Displays turn move count data using time-series graph windows, showing multiple days of data side-by-side.
- Automatic retiming proposals
 - Provides suggested maximum green times for standard 8-phase intersections proposed from observed turn move counts, split failures, and signal light phase data for a user-selected time period with 15-minute granularity.
 - Presents the operational context of proposals, including historical green times, split failure summaries, and expected average queue lengths.
 - Displays visualization of proposals in the road view using dequeue zone representations overlaid with queue representations.
 - Accommodates intersection operations with omitted phases and split phasing.
- Performance reports
 - Evaluates deployed timing proposals and other improvements or adjustments to intersection operations using data from before and after split failure monitoring.
- Serverless architecture
 - Links TimingGuide license directly with the Arc.
 - Stores all operational performance data on the Arc.
 - Preserves onboard data after expiration or removal of TimingGuide license.
- Dynamic analyzer (included with CrossRoads Premium license)
 - Provides option to import dynamic 15-minute interval turn move count data into CrossRoads for modeling new signal timing before deployment in the field and for evaluating dynamic max operation compared to normal operations.
 - Provides Benefit Calculator to give a breakdown of the expected benefits of proposed retiming in terms of time, fuel, and CO² savings.

Ordering information

TimingGuide 5-year Origin License
103-0432

TimingGuide 5-year Add-on License
103-0433

TimingGuide 1-year Add-on License
103-0434

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- Performs statistical tests with random seeds on a single saved animation with up to 40 test runs, graphically displaying the percent time savings using a performance monitor.
- Integrates dynamic analysis of max operation with other static and dynamic improvements.
- Provides animated visualization of fully-actuated signal control operations, as well as other operational analysis tools such as the Coordination Manager.

Outputs

- Dynamic turn move count data in 15-minute intervals, exportable in multiple text formats. Text format convertible to tabular format displaying all 12 turn moves on a single line, based on directional information entered in CrossRoads
- Timing proposals exportable to PDF format
- Performance reports with split failure data exportable to PDF format
- Benefit reports exportable to PDF format
- Benefit spreadsheets exportable to CSV format
- CrossRoads custom intersection and benefit animations exportable to shareable ZIP format

Recommended hardware

- Processor: Intel I7 Core equivalent or better
- Operating system: Windows 10 or 11
- Memory: 16 GB RAM or more
- Networking: 1000 Mbps Ethernet card or 802.11g/n/ac/ax WiFi card

Support

- Digital traffic lab training
- Comprehensive user guide

Warranty

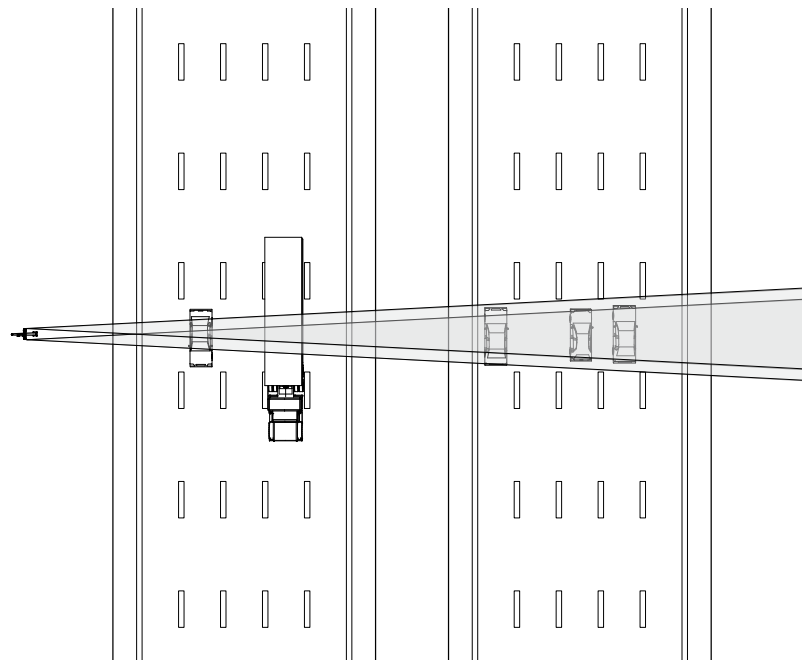
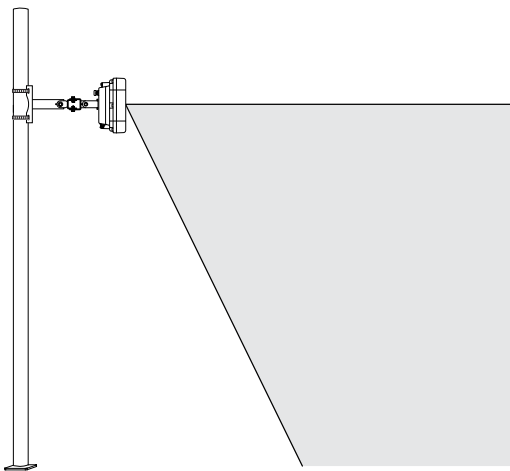
- Multi-year warranty of Expanse software based on term of license
- Multi-year warranty of authentication support for CrossRoads based on term of license

Dual-beam ITS sensor

The XP20 is a whole new way to look at radar detection. Pairing the sensor with the Arc and Expanse software allows you to see and configure all your sensors right from your computer. New applications, released periodically, help you get the most from your data.



- Part of the Expanse system: connect it to an Arc and use the Expanse software to take advantage of all system features
- Native IP device: put it on your network and use the software to interact with all the sensors on your system
- Uses dual-beam radar to get the most accurate speed, presence, and length data
- XP20 Field-replaceable Surge card means you can easily replace the surge protection in the field after a surge event
- Employs industry-leading radar technology for the highest quality high-definition detection
- The patented auto-configuration process makes setup easy
- Detects traffic, including lane-changing vehicles, in up to 22 lanes
- Features a GPS receiver for georeferencing the sensor
- All-weather, all-condition performance



XP20 technical specifications

Physical properties

- Weight: 3.0 lb. (1.6 kg)
- Dimensions: 13.3 in. × 5.9 in. × 3.2 in. (33.8 cm × 15 cm × 8.1 cm)
- Enclosure:
 - Lexan EXL polycarbonate
 - Resistant to corrosion, fungus, moisture deterioration, and ultraviolet rays
 - Outdoor weatherable: UL 746C rated
 - Withstands 5-ft. (1.5-m) drop
 - Housing withstands wind loads exceeding 120 mph
 - Watertight by NEMA 250 standard
 - Connector: M12 T-code male connector
- Accelerometer detects abnormalities in sensor position and mounting
- GPS receiver for georeferencing/locating sensor
- Magnetometer for sensor direction

Radar design

- Type of radar: Dual-beam
- No manual tuning to circuitry
- Uses frequency modulated continuous wave (FMCW) radar
- Operating frequency: 24.0–24.25 GHz (K-band)
- Transmit bandwidth: 245 MHz
- Bandwidth stable within 1%
- Un-windowed resolution: 2 ft. (0.6 m)
- Antennas:
 - Printed circuit board antennas
 - Vertical 6 dB beam width (two-way pattern): 65°
 - Horizontal 6 dB beam width (two-way pattern): 6°
 - Two-way sidelobes: -40 dB
 - Gain: 14 dB
 - EIRP: 15.1 dBm
- RF channels: 4
- No temperature-based compensation necessary

Detection area

- Detection range: 6 to 250 ft. (1.8 m to 76.2 m)
- Number of lanes: up to 22
- Any lane spacing is supported
- Detection over barriers is supported

Measured quantities

- Per-lane interval data:
 - Volume
 - Average speed
 - Occupancy
 - Classification counts
 - 85th percentile speed

Ordering information

XP20
101-0451

Included components

101-0486 – Expanse Sensor Connector
102-0482 – XP20 Field-replaceable Surge v1 EL1

Optional accessories (sold separately)

102-0597 – Arc2
102-0564 – Arc Field-replaceable Surge v2
101-0457 – XP20 Sensor Mount
101-0461 – XP20 36-in. Sensor Mount
102-0555 – Expanse Junction Box
101-0468 – Expanse Link Cable (500-ft. (12.7-m) spool)
101-0469 – Expanse Link Cable (1000-ft. (25.4-m) spool)
101-0470 – Expanse Link Cable (5000-ft. (127-m) spool)
101-0465 – Expanse Link S Cable (500-ft. (12.7-m) spool)
101-0464 – Expanse Link S Cable (1000-ft. (25.4-m) spool)
101-0463 – Expanse Link S Cable (5000-ft. (127-m) spool)

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- Average headway
- Average gap
- Speed bin counts
- Direction counts
- Per-vehicle data:
 - Speed
 - Length

- Class
 - Lane assignment
 - Range
- Presence data in 22 lanes
- Classification bins: 8
- Interval speed bins: 15

Data protocols

- Protocol support for:
 - Interval data
 - Event data
 - Presence data
- Interval data for each lane:
 - Station ID
 - Timestamp
 - Volume
 - Average speed
 - Occupancy
 - Classification counts
 - Speed bin counts
 - Direction counts
 - Average headway
 - Average gap
 - 85th percentile speed
- Event data for each detection:
 - Station ID
 - Timestamp
 - Lane assignment
 - Speed
 - Length
 - Class
 - Range
- Presence data for each lane:
 - Sensor ID
 - Per-lane presence
- Data protocol document available free of charge

Power

- Power consumption: 9 W (at maximum cable length), 8 W (typical)
- Operating voltage: 37.2–60 VDC
- Onboard, field-replaceable surge protection

Communication

- Ethernet speed: 10/100 Mbps
- Communicates to cabinet via Ethernet over single twisted pair
- Firmware upgradability over the Ethernet port

Cable

- Shielded single twisted pair

- 120-ohm characteristic impedance
- Supported cable lengths:
 - Expanse Link Cable (300 V, 22 AWG): 2,000 ft. (609.6 m)
 - Expanse Link S Cable (600 V, 16 AWG): 2,000 ft. (609.6 m)

Configuration

- Graphical user interface with traffic pattern display
- Auto-configuration of lanes/detection zones:
 - Internal to the sensor
 - Uses positions of the vehicles
 - Based on probability density function estimation
- Manual configuration supported
- Lane boundary increment: 1 ft. (0.3 m)
- Pointing assistant for horizontal alignment
- Supported operating systems:
 - Windows 10
 - Windows 11
- Software-supported functionality:
 - TCP/IP connectivity
 - Sensor configuration back-up and restore
 - Virtual sensor connections

Data buffering

- Intervals timestamped using NTP synchronized clock

Manufacturing

- Manufactured in the USA
- Surface mount and wave solder assembly
- Operational testing:
 - Sub-assembly test
 - 48-hour unit level burn-in
 - Final unit test (unit test results available)
- IPC-A-610C Class 2–compliant

Testing

- NEMA:
 - NEMA TS 2-2016
 - NEMA 250 type 4X-compliant
- FCC:
 - Part 15, Subpart B (47 CFR15)
 - 47 CFR Part 15 Subpart C 15.249
 - ISSED RSS-210
 - FCC regulation—compliant for life of the sensor
 - FCC certification on product label
- CE:
 - EN 55032:2015
 - AS/NZS CISPR 32:2015
 - IEC 62368-1:2018
 - ETSI EN 300 400 V2.2.1 (2018-07)
- Testing documentation available upon request

Operating conditions

- Ambient operating temperature: -29.2°F to 165°F (-34°C to 74°C)
- Humidity: up to 95% RH (non-condensing)
- Accurate performance in:
 - Rain up to 2 in. (5.1 cm) per hour
 - Freezing rain
 - Dry and moist snowfall
 - Wind
 - Dust
 - Fog
 - Changing temperature
 - Changing lighting (even direct light on sensor at dawn and dusk)
 - Ice and dry snow buildup up to 0.2 in. (0.5 cm) on sensor front
- Resumes vehicle detection automatically after resumption of power

Performance

- Per-direction volume accuracy:
 - Typical: 98%–99%
 - Minimum: 95%
- Per-lane volume accuracy:
 - Typical: 98%–99%
 - Minimum: 90%
- Classification accuracy:
 - Typical: 90%
 - Minimum: 80%
- Percentage of vehicles generating per-vehicle speed measurements:
 - Typical: 98%
 - Minimum: 95%
- Per-direction average speed accuracy: ± 3 mph (5 kph)
- Per-lane average speed accuracy: ± 3 mph (5 kph)
- Per-vehicle speed measurement accuracy: ± 3 mph (5 kph) for 90% of measurements
- Method of speed measurement: dual radar speed trap
- Per-direction occupancy accuracy: $\pm 10\%$
- Per-lane occupancy accuracy: $\pm 20\%$
- Minimum separation between two vehicles: 5.5 ft. (1.7 m)

Maintenance

- No cleaning or adjustment necessary
- No battery replacement necessary
- No recalibration necessary

- Mean time between failures: 10 years (estimated based on manufacturing techniques)

Support

- Training and tech support available
- Training includes:
 - Knowledgeable trainers
 - Presentation materials
 - Classroom and in-field instruction
 - Installation and configuration instruction to ensure accurate performance
 - Instruction in use of computer and other necessary equipment
 - Virtual configuration
- Tech support includes:
 - Technical representatives available for installation and configuration
 - Ongoing troubleshooting and maintenance support
- Documentation:
 - Installation guide
 - Configuration guide
 - Quick start guide

Warranty

- Five-year warranty against material and workmanship defect

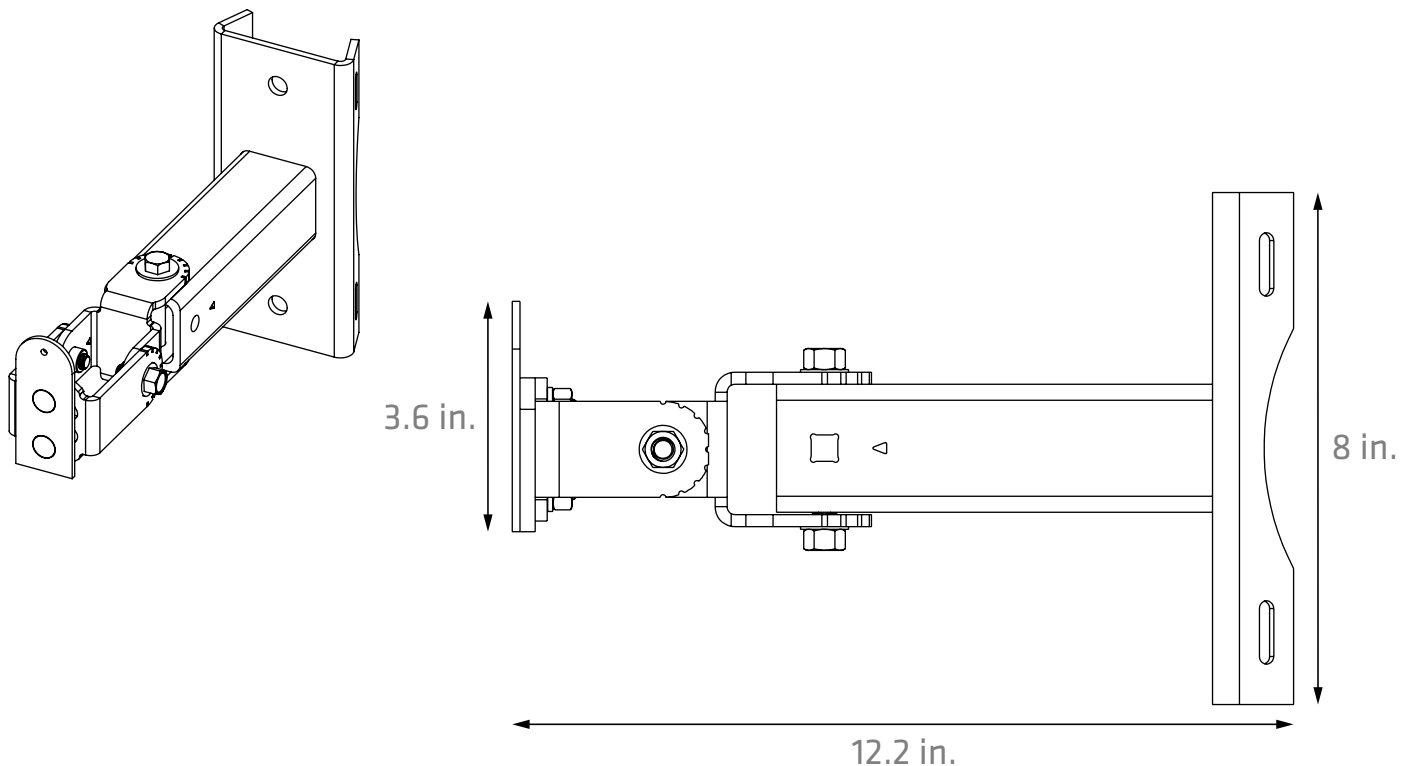
The advertised detection accuracy of the company's sensors is based on both external and internal testing, as outlined in each product's specification document. Although our sensors are very accurate by industry standards, like all other sensor manufacturers we cannot guarantee perfection or assure that no errors will ever occur in any particular applications of our technology. Therefore, beyond the express Limited Warranty that accompanies each sensor sold by the company, we offer no additional representations, warranties, guarantees or remedies to our customers. It is recommended that purchasers and integrators evaluate the accuracy of each sensor to determine the acceptable margin of error for each application within their particular system(s).

Pole mount for XP20 sensors

Mount your XP20 sensor quickly and easily using the durable and flexible XP20 Sensor Mount. With three axes of rotation and a slide-on sensor mounting feature, you'll have no trouble getting your XP20 to the angle and position you need.



- Three axes of rotation for getting the sensor into any necessary position and angle
- For even more flexibility, knuckles can be detached and reattached at a 90-degree angle
- Mount bolts can easily be loosened or tightened using a single wrench
- Attach the sensor quickly and easily by simply sliding it over the mounting tongue; for added stability, use the thumb screw to attach the sensor even more firmly
- Supports a 20-lb. (6.8-kg) load
- Rotating end piece means no rotating backplate is needed
- Heavy duty aluminum construction and powder coating make the mount sturdy and long-lasting
- Two contact points for attachment to circular or non-circular poles
- Accepts 3/4-in. banding



XP20 Sensor Mount technical specifications

Physical properties

- Weight: 3 lb. (1.36 kg)
- Dimensions: 8 in. × 15.5 in. × 3.6 in. (20.3 cm × 39.4 cm × 9.2 cm)
- Constructed of aluminum 0.2 in. (0.5 cm) thick
- Powder coated
- Stainless steel hardware

Mounting

- Rotational axes: 3
- Maximum recommended load at farthest point from pole: 20 lb. (9.1 kg)
- Slotted for ¾-in. (1.9-cm) banding
- Contact points with pole: 2
- Easy slide-on sensor mounting, with thumb screw for added stability

Support

- Extended support options available; contact a Wavetronix representative for more information.
- Comprehensive user guide

Warranty

- Five-year warranty against material and workmanship defect

Ordering information

XP20 Sensor Mount
101-0457

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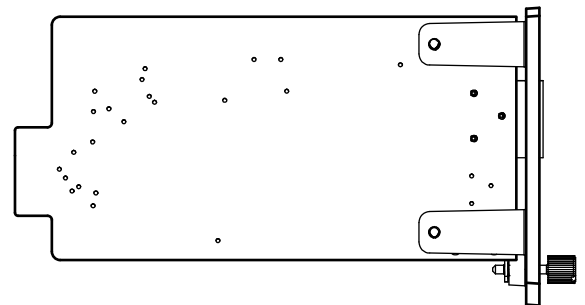
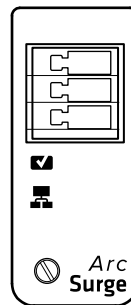
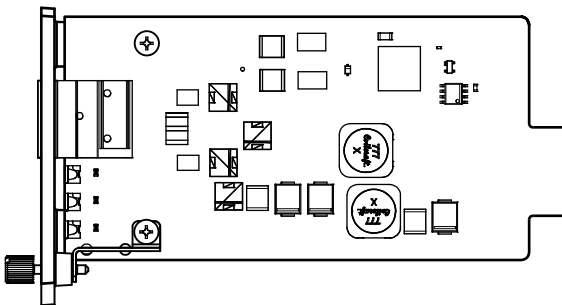
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Field-replaceable surge protection for Arc with enhanced communication

The Arc Replaceable Surge is a step forward in surge protection. Easy to install and remove in the field, the card is secured directly into the back of the Arc, providing a convenient place to terminate the sensor cable while protecting from surges on that cable. If a surge occurs, don't replace the whole Arc—just replace the card!



- Designed for use with the Arc in an installation with an XP20 or XP21 sensor
- Protects the Arc and other cabinet equipment against surges on the sensor cable
- In the event of a surge, the card can be easily replaced, negating the need to replace the whole Arc or send the Arc in for repairs
- Quick and easy installation in the field requires only a slotted screwdriver
- Comes with terminal block plug needed to terminate sensor cable into card
- Multi-stage surge protection for data and DC power
- FCC-compliant
- Complies with NEMA TS2-2003 environmental testing
- Surge immunity complies with IEC 61000-4-5 level 4 standard
- EL2 supports enhanced communication from the XP20 and XP21 over the Expanse Link Cable



Arc Field-replaceable Surge v2 EL2 technical specifications

Physical properties

- Dimensions: 4.7 in. × 2.7 in. × 1.1 in. (11.9 cm × 6.9 cm × 2.8 cm)
- Weight: 0.3 lbs. (0.1 kg)

Operating conditions

- Ambient operating temperature: -29°F to 165°F (-34°C to 74°C)
- Humidity: up to 95% RH

Connections

- Port for pluggable terminal blocks, with included lever push-in terminal block connector

Surge protection

- DC power clamping voltage: 60 VDC
- Data clamping voltage: 5 VDC
- Surge immunity sensor ports: IEC/EN 61000-4-5 level 4

Testing

- Complies with the applicable standards stated in the NEMA TS2-2003 standard
- FCC regulation-compliant
- Passes manufacturer's test before shipping

Support

- Extended support options available; contact a Wavetronix representative for more information
- Comprehensive user guide

Warranty

- Five-year warranty against material and workmanship defect

Ordering information

Arc Field-replaceable Surge v2 EL2
102-0614

Compatible with

101-0451 – XP20

101-0479 – XP21

102-0615 – XP20 Field-replaceable Surge v2 EL2

102-0617 – XP21 Field-replaceable Surge v2 EL2

102-0597 – Arc2

102-0598 – Arc2 DC

102-0594 – Arc6

Optional accessories (sold separately)

102-0537 – Arc Field-replaceable Surge SC Connector

(This option is required when using cable with conductors 18 AWG or larger.)

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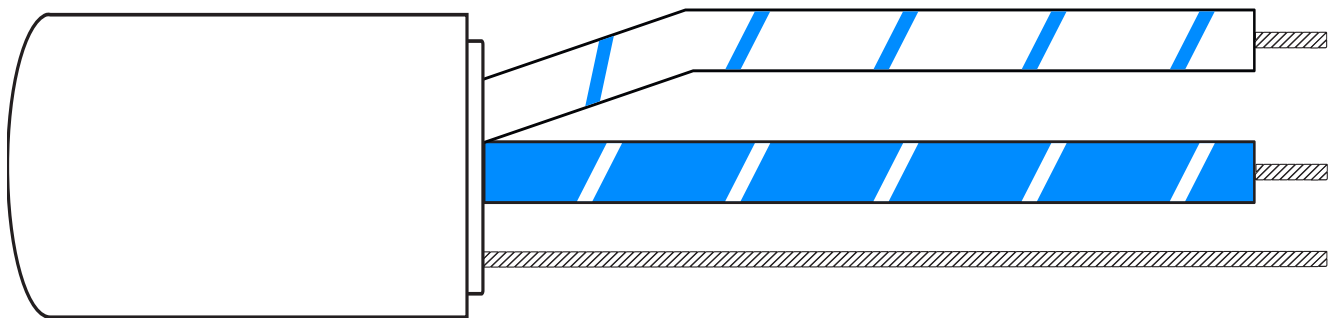
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22 AWG, 1-pair cable

The Expanse Link Cable provides a high-speed, secure, IP-based link between the XP20/XP21 sensor and the Arc cabinet interface device. Cost-efficient and convenient, this cable can be bought in bulk and cut to length. Its slim profile also makes it easy to pull through a crowded conduit.



- Provides power and IP communications between sensor and cabinet in an Expanse sensor installation
- Conductors are a single twisted pair
- Conductors are shielded with an aluminum/mylar shield, a tinned copper braid and a drain wire
- Conductors are color-coded for quick and easy wiring to terminal blocks
- Can be purchased in bulk: 100', 200', 500', 1000', 2000', or 5000' spools
- Has UL Type PLTC approval
- RoHS-compliant
- UV and oil resistant
- Rated for CSA FT1 flammability



Expanse Link Cable technical specifications

Physical properties

- Outer diameter: $< .236 \text{ in.} \times < .43 \text{ in.}$ ($< 6 \text{ mm} \times < 11 \text{ mm}$)
- Jacket: black PVC
- Wire gauges: 22-AWG stranded (7/30)
- Blue (striped) and white (striped)
- Cable shielded with aluminum/polyester shield
- Foamed high-density polyethylene insulation
- Pull tension: 25 lb.

Connections

- 1 twisted pair
- One tinned copper drain wire

Power

- Conductors: twisted pair with nominal DC resistance of $< 18.5 \text{ ohms/1000 ft.}$
- 120-ohm characteristic impedance $\pm 10\%$
- Shield DC resistance: $< 4.7 \text{ ohms/1000 ft.}$
- Attenuation: $0.5 \text{ dB/100 ft. @ } 1 \text{ MHz}$
- Voltage rating: 300 V RMS (NEC type PLTC)

Communication

- Capacitance: $11 \text{ pF/ft. mutual/conductor-to-conductor}$ and $20.9 \text{ pF/ft. conductor-to-shield}$

Testing

- UL type PLTC
- RoHS-compliant
- UV-resistant
- Oil-resistant
- Flammability rating: CSA FT1 flammability

Support

- Extended support options available; contact a Wavetronix representative for more information
- Comprehensive user guide

Ordering information

Expanse Link Cable (100-ft. (30.4 m) spool)
101-0496

Expanse Link Cable (200-ft. (60.9 m) spool)
101-0497

Expanse Link Cable (500-ft. (152.4 m) spool)
101-0468

Expanse Link Cable (1000-ft. (304.8 m) spool)
101-0469

Expanse Link Cable (2000-ft. (609.6 m) spool)
101-0498

Expanse Link Cable (5000-ft. (1524 m) spool)
101-0470

Third-party ordering information

Alpha Wire

6453 BK002 – Expanse Link Cable (500-ft. spool)

6453 BK001 – Expanse Link Cable (1000-ft. spool)

6453 BK013 – Expanse Link Cable (5000-ft. spool)

Belden

3105A 010500 – Expanse Link Cable (500-ft. spool)

3105A 0101000 – Expanse Link Cable (1000-ft. spool)

3105A 0105000 – Expanse Link Cable (5000-ft. spool)

Lake Cable

BT222STFPBRD – Expanse Link Cable (500-ft. spool)

BT222STFPBRD – Expanse Link Cable (1000-ft. spool)

BT222STFPBRD – Expanse Link Cable (5000-ft. spool)

Optional accessories (sold separately)

101-0486 – Expanse Sensor Connector

102-0555 – Expanse Junction Box

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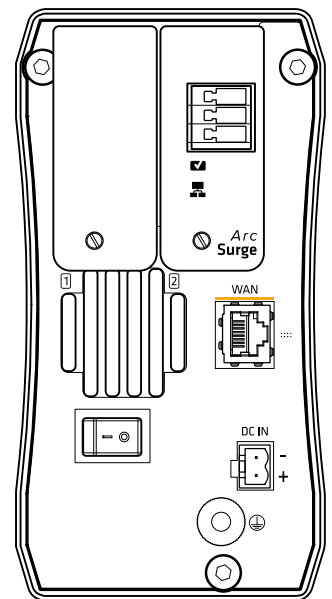
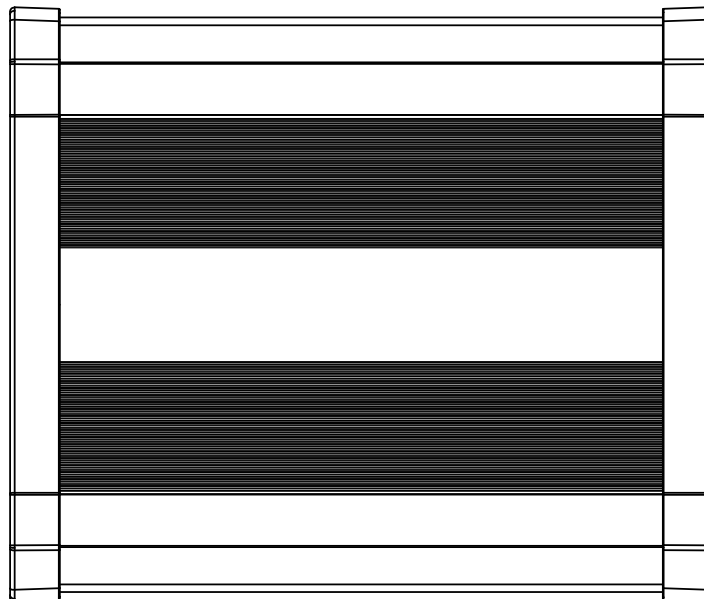
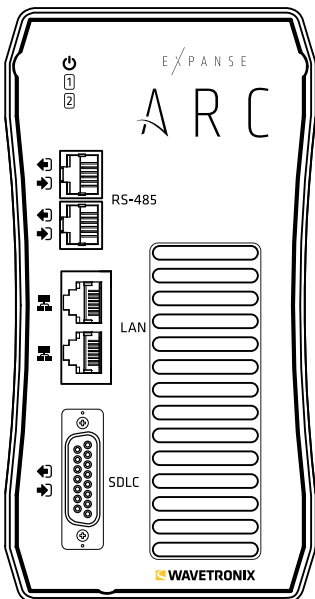
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2-sensor DC cabinet interface device

The Arc2 DC is all about convenience—providing DC power, surge protection, and communications for up to two sensors. Multiple Arc2 DCs can be placed on a single Ethernet network so that, through the Expanse software, you can configure all sensors in your system right from your computer.



- Puts all connected sensors on your Ethernet network, letting you access them from any connected computer via the Expanse software
- SDLC port for communicating with compatible controllers
- RS-485 and Ethernet connections for on-site configuration and connection to other cabinet devices
- Accepts DC power and passes that power on to up to two sensors
- Protects cabinets from surges on the sensor cable
- Arc Field-replaceable Surge cards allow you to quickly get the device back in top condition after a surge event
- Can be set on a shelf or mounted on a cabinet wall or 19-in. rack



Arc2 DC technical specifications

Physical properties

- Weight: 3.9 lb. (1.8 kg)
- Dimensions: 8 in. × 3.4 in. × 6.5 in. (20.3 cm × 8.6 cm × 16.5 cm)

Operating conditions

- Ambient operating temperature: -29°F to 165°F (-34°C to 74°C)
- Humidity: up to 95% RH

Mounting

- Shelf-mount
- Mounting brackets available for purchase
 - 19-in. Rack Bracket (2U height)
 - NEMA Side-mount Bracket
 - Diamond Bracket

Connections

- Power and surge
 - DC input terminal block
 - Power switch on back of device turns off power to device
 - Surge ground lug on back of device for connecting to earth ground
 - Field-replaceable Arc Surge cards protect the device from surges coming in on the sensor cable
- Ethernet
 - 2 RJ-45 10/100 jacks on the front of the device for wired Ethernet communications to other Wavetronix devices, or for on-site configuration
 - 1 RJ-45 10/100 jack on the back of the device for wired Ethernet communications to customer network
- SDLC
 - 1 SDLC port on the front of the device for connecting to SDLC-compatible controllers
- Serial
 - 2 RJ-11 jacks on the front of the device for RS-485 communications
- Connections to sensor
 - Two slots on back of device for plugging in field-replaceable surge cards
 - Field-replaceable surge cards provide a spot for termination of sensor cables, as well as protecting the device from surges on that cable

Power

- DC power supply voltage: 10–28 VDC *
- Max DC current: 8.5 A
- Supports 2 sensors (up to 25 W each)

Ordering information

Arc2 DC
102-0598

Included components

- 310-0416** – 5-ft. CAT5 Ethernet cable
102-0481 – Arc Slot Cover

Optional accessories (sold separately)

- 102-0564** – Arc Field-replaceable Surge v2
102-0562 – SmartSensor Field-replaceable Surge v2
102-0537 – Arc Field-replaceable Surge SC Connector
102-0486 – Arc Rack Mount Bracket
102-0487 – Arc Diamond Bracket
102-0485 – Arc Side Mount Bracket
101-0463 – Expanse Link S Cable (5000-ft. spool)
101-0464 – Expanse Link S Cable (1000-ft. spool)
101-0465 – Expanse Link S Cable (500-ft. spool)

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Configuration

- Illuminated indicators show when data is being transmitted and received on the Ethernet, serial, wireless, SDLC and sensor ports
- ±5ppm real-time clock with super capacitor backup
- Supports time synchronization from GPS, NTP, or real-time clock

Surge protection

- Sensor ports surge immunity: IEC/EN 61000-4-5 level 4; must be obtained by purchasing an FRS card (102-0480)

* While the system works with supply voltages of up to 28 VDC, 24 VDC supplies are recommended; the excess is designed to allow some tolerance on the output of the supply.

Testing

- Tested under FCC CFR 47, Part 15, Subpart B & ICES-003, Issue 6 + A1
- FCC certification on product label
- FCC regulation-compliant for life of the sensor
- Complies with the applicable standards stated in the NEMA TS2-2016 Standard
- Passes manufacturer's test before shipping
- Equipment labeling found on the bottom of the unit

Support

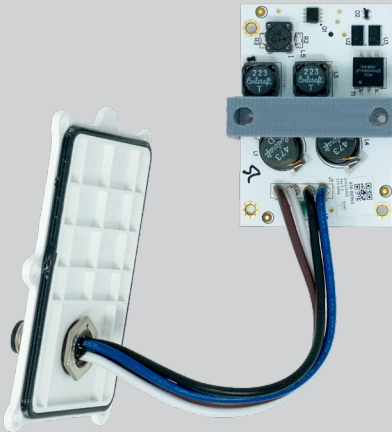
- Extended support options available; contact a Wavetronix representative for more information
- Comprehensive user guide

Warranty

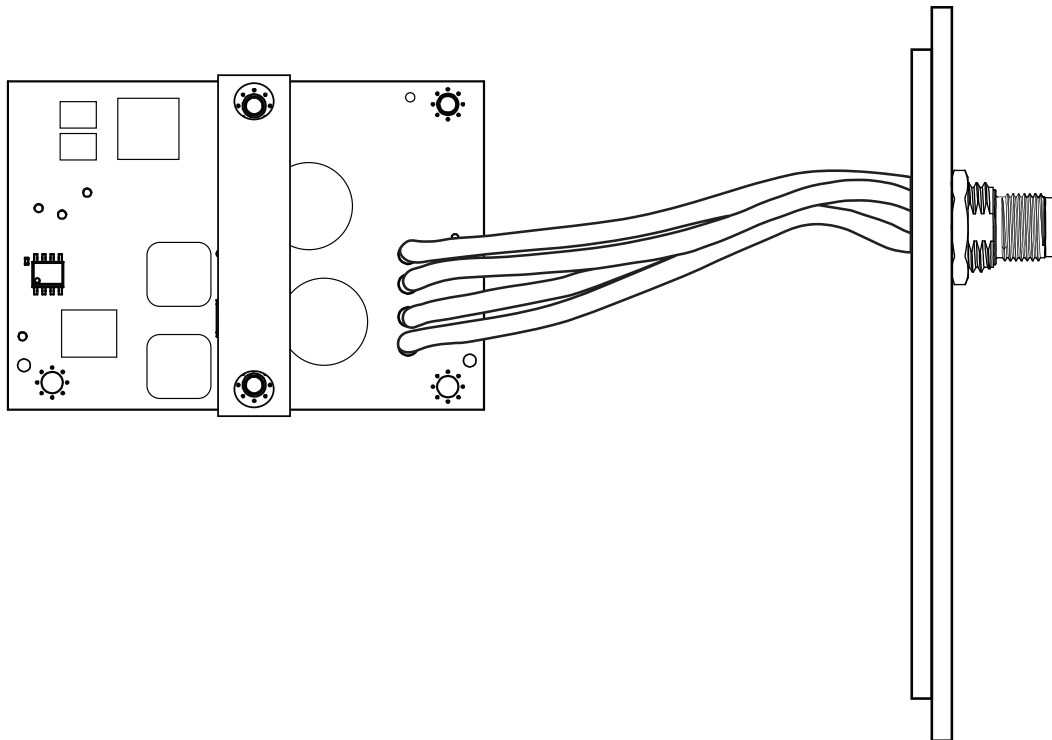
- Five-year warranty against material and workmanship defect

Field-replaceable surge protection for the XP21 sensor

Surge protection for your sensors is an important part of your Expanse installation. The XP21 Replaceable Surge card comes installed in every XP21 sensor. Should the card be blown out by a surge, simply use a screwdriver to swap it quickly and easily in the field with one of these replacement cards.



- Designed for use with the XP21, in an installation with Arc cabinet interface devices
- Protects the sensor against surges on the sensor cable
- In case of surge, card can be easily replaced, negating the need to replace the whole XP21 sensor or send the sensor in for repairs
- Quick and easy installation in the field requires only a slotted screwdriver
- Includes M12 T-coded male cable connector for terminating sensor cable
- Allows you to test functionality in the field easily using a multimeter
- Multi-stage surge protection for data and DC power
- FCC-compliant
- Complies with NEMA TS2-2003 environmental testing
- Surge immunity complies with IEC 61000-4-5 level 4 standard
- Conformal coated



XP21 Field-replaceable Surge technical specifications

Physical properties

- Dimensions (surge card): 2.9 in. × 2 in. (7.3 cm × 5.1 cm)
- Dimensions (sensor hatch): 3.8 in. × 2.6 in. (9.5 cm × 6.7 cm)
- Weight: 0.2 lb. (0.08 kg)

Operating conditions

- Ambient operating temperature: -29°F to 165°F (-34°C to 74°C)
- Humidity: up to 95% RH

Connections

- M12 T-coded male cable connector

Surge protection

- DC power
 - Clamping voltage: 60 VDC
- Data
 - Clamping voltage: 5 VDC
- Surge immunity sensor ports: IEC/EN 61000-4-5 level 4

Testing

- NEMA 250 type 4X-compliant (when properly assembled) for:
 - External icing (clause 5.6)
 - Hose down (clause 5.7)
 - Corrosion protection (clause 5.10)
 - Gasket (clause 5.14)
- Complies with the applicable standards stated in the NEMA TS2-2003 standard.
- FCC-compliant
- Passes manufacturer's test before shipping

Support

- Extended support options available; contact a Wavetronix representative for more information
- Comprehensive user guide

Warranty

- Five-year warranty against material and workmanship defect

Ordering information

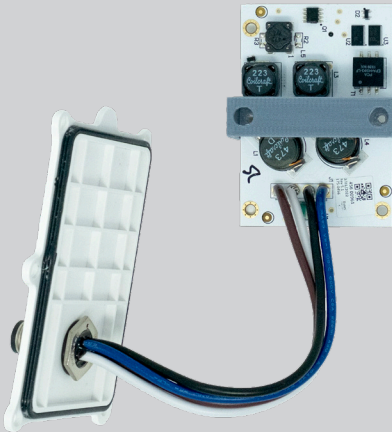
XP21 Field-replaceable Surge
101-0483

Contact us

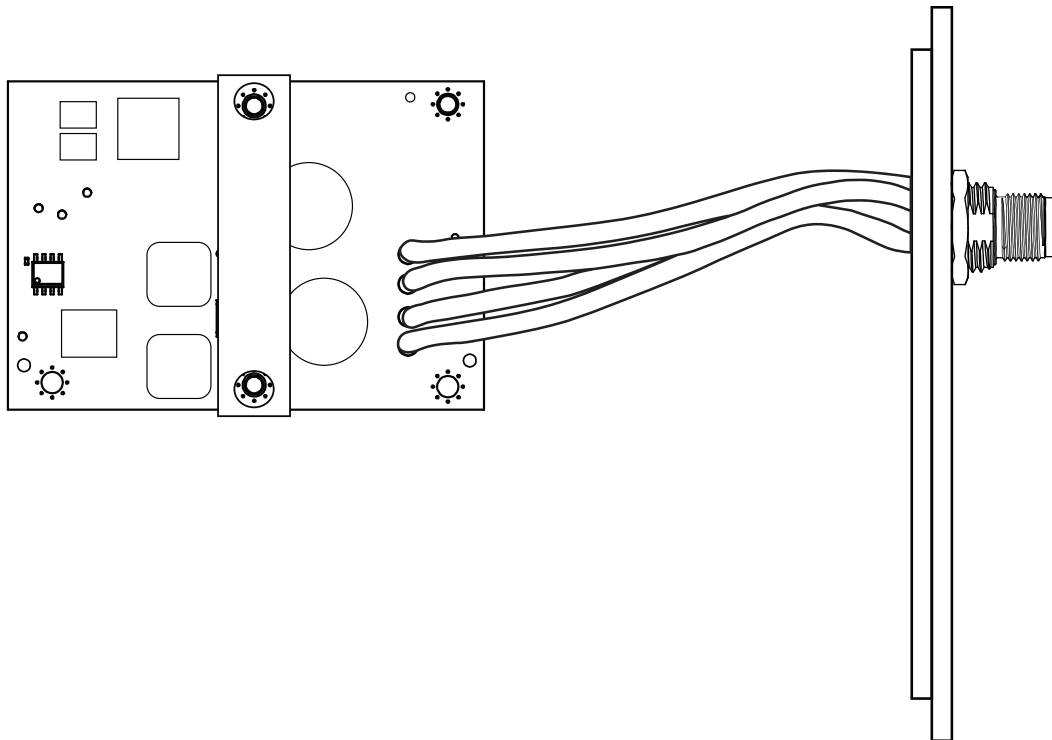
801.734.7200
sales@wavetronix.com
www.wavetronix.com

Field-replaceable surge protection for the XP21 sensor

Surge protection for your sensors is an important part of your Expanse installation. The XP21 Replaceable Surge card comes installed in every XP21 sensor. Should the card be blown out by a surge, simply use a screwdriver to swap it quickly and easily in the field with one of these replacement cards.



- Designed for use with the XP21, in an installation with Arc cabinet interface devices
- Protects the sensor against surges on the sensor cable
- In case of surge, card can be easily replaced, negating the need to replace the whole XP21 sensor or send the sensor in for repairs
- Quick and easy installation in the field requires only a slotted screwdriver
- Includes M12 T-coded male cable connector for terminating sensor cable
- Allows you to test functionality in the field easily using a multimeter
- Multi-stage surge protection for data and DC power
- FCC-compliant
- Complies with NEMA TS2-2003 environmental testing
- Surge immunity complies with IEC 61000-4-5 level 4 standard
- Conformal coated



XP21 Field-replaceable Surge v2 EL2 technical specifications

Physical properties

- Dimensions (surge card): 2.9 in. × 2 in. (7.3 cm × 5.1 cm)
- Dimensions (sensor hatch): 3.8 in. × 2.6 in. (9.5 cm × 6.7 cm)
- Weight: 0.2 lb. (0.08 kg)

Operating conditions

- Ambient operating temperature: -29°F to 165°F (-34°C to 74°C)
- Humidity: up to 95% RH

Connections

- M12 T-coded male cable connector

Surge protection

- DC power
 - Clamping voltage: 60 VDC
- Data
 - Clamping voltage: 5 VDC
- Surge immunity sensor ports: IEC/EN 61000-4-5 level 4

Testing

- NEMA 250 type 4X-compliant (when properly assembled) for:
 - External icing (clause 5.6)
 - Hose down (clause 5.7)
 - Corrosion protection (clause 5.10)
 - Gasket (clause 5.14)
- Complies with the applicable standards stated in the NEMA TS2-2003 standard.
- FCC-compliant
- Passes manufacturer's test before shipping

Support

- Extended support options available; contact a Wavetronix representative for more information
- Comprehensive user guide

Warranty

- Five-year warranty against material and workmanship defect

Ordering information

XP21 Field-replaceable Surge v2 EL2
102-0617

Contact us

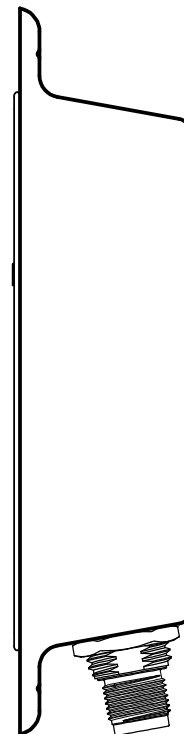
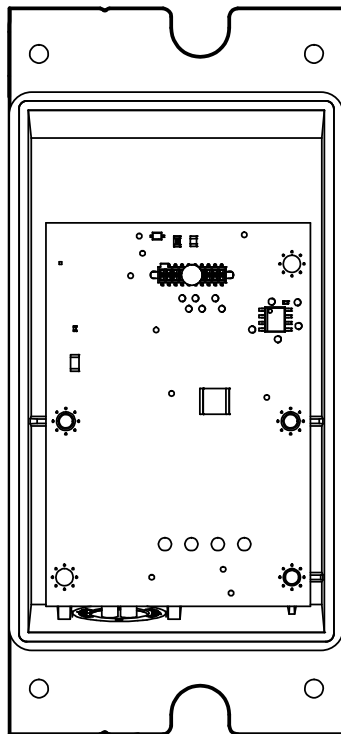
801.734.7200
sales@wavetronix.com
www.wavetronix.com

Field-replaceable surge protection for the XP20 sensor

Surge protection for your sensors is an important part of your Expanse installation. The XP20 Field-replaceable Surge card comes installed in every XP20 sensor. Should the card be blown out by a surge, simply use a screwdriver to swap it quickly and easily in the field with a replacement card.



- Designed for use with the XP20, in an installation with Arc cabinet interface devices
- Protects the sensor against surges on the sensor cable
- In case of surge, card can be easily replaced, negating the need to replace the whole XP20 sensor or send the sensor in for repairs
- Quick and easy installation in the field requires only a slotted screwdriver
- Includes M12 T-coded male cable connector for terminating sensor cable
- Allows you to test functionality in the field easily using a multimeter
- Multi-stage surge protection for data and DC power
- FCC-compliant
- Complies with NEMA TS2-2003 environmental testing
- Surge immunity complies with IEC 61000-4-5 level 4 standard
- Conformal coated



XP20 Field-replaceable Surge v2 EL2 technical specifications

Physical properties

- Dimensions: 5.5 in. × 2.5 in. × 1.4 in. (14 cm × 6.4 cm × 3.5 cm)
- Weight: 0.3 lb. (0.15 kg)

Operating conditions

- Ambient operating temperature: -29°F to 165°F (-34°C to 74°C)
- Humidity: up to 95% RH

Connections

- M12 T-coded male cable connector

Surge protection

- DC power
 - Clamping voltage: 60 VDC
- Data
 - Clamping voltage: 5 VDC
- Surge immunity sensor ports: IEC/EN 61000-4-5 level 4

Testing

- NEMA 250 type 4X-compliant (when properly assembled) for:
 - External icing (clause 5.6)
 - Hose down (clause 5.7)
 - Corrosion protection (clause 5.10)
 - Gasket (clause 5.14)
- Complies with the applicable standards stated in the NEMA TS2-2003 standard.
- FCC-compliant
- Passes manufacturer's test before shipping

Support

- Extended support options available; contact a Wavetronix representative for more information
- Comprehensive user guide

Warranty

- Five-year warranty against material and workmanship defect

Ordering information

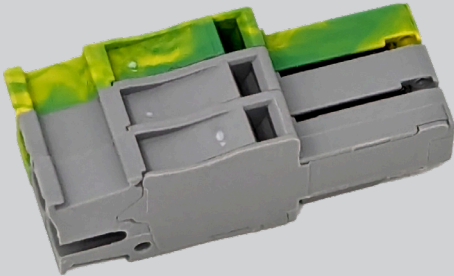
XP20 Field-replaceable Surge v2 EL2
102-0615

Contact us

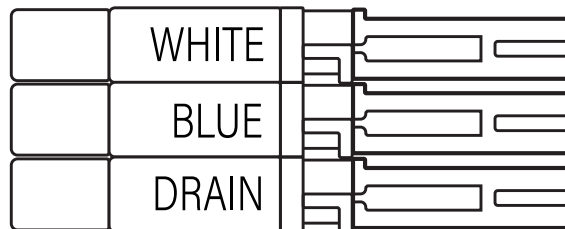
801.734.7200
sales@wavetronix.com
www.wavetronix.com

Spring Cage connector for Arc Field-replaceable Surge

This terminal block allows you to connect the Expanse cable to the Arc Replaceable Surge card. The card is then inserted into an Arc cabinet unit, which allows connection to an Expanse system. The removable plug with spring cage technology allows you to pre-wire outside of the cabinet.



- Connects to an Arc Replaceable Surge card for quick and easy installation
- Fast conductor connection results in reduced wiring time
- Resistant to vibration
- Corrosion-free
- Removable plug can be wired outside of cabinet



Arc Field-replaceable Surge SC Connector technical specifications

Physical properties

- Dimensions: 1.6 in. × 0.8 in. (4.1 cm × 2 cm)
- Insulating material: PA
- Insulating material group: I
- Matching end covers protect exposed conductors

Operating conditions

- Ambient operating temperature: -67°F to 212°F (-55°C to 100°C)

Mounting

- Mounts into Arc Replaceable Surge card

Connections

- Number of connections: 3
- Spring cage
- Wire: 24–16 AWG
- Removable plug

Power

- Nominal current IN: 17.5 A
- Nominal voltage UN: 500 V
- Maximum load current: 17.5 A

Surge protection

- Rated surge voltage: 6 kV
- Surge voltage category: III

Testing

- Flammability: UL 94 V0
- Pollution degree: 3
- Connection in acc. with standard: IEC 61984
- Passed manufacturer's mechanical, electrical, and material tests

Support

- Extended support options available; contact a Wavetronix representative for more information

Warranty

- Five-year warranty against material and workmanship defect

Ordering information

Arc Field-replaceable Surge SC Connector
102-0537

(This option is required when using cable with conductors 18 AWG or larger.)

Contact us

801.734.7200

sales@wavetronix.com

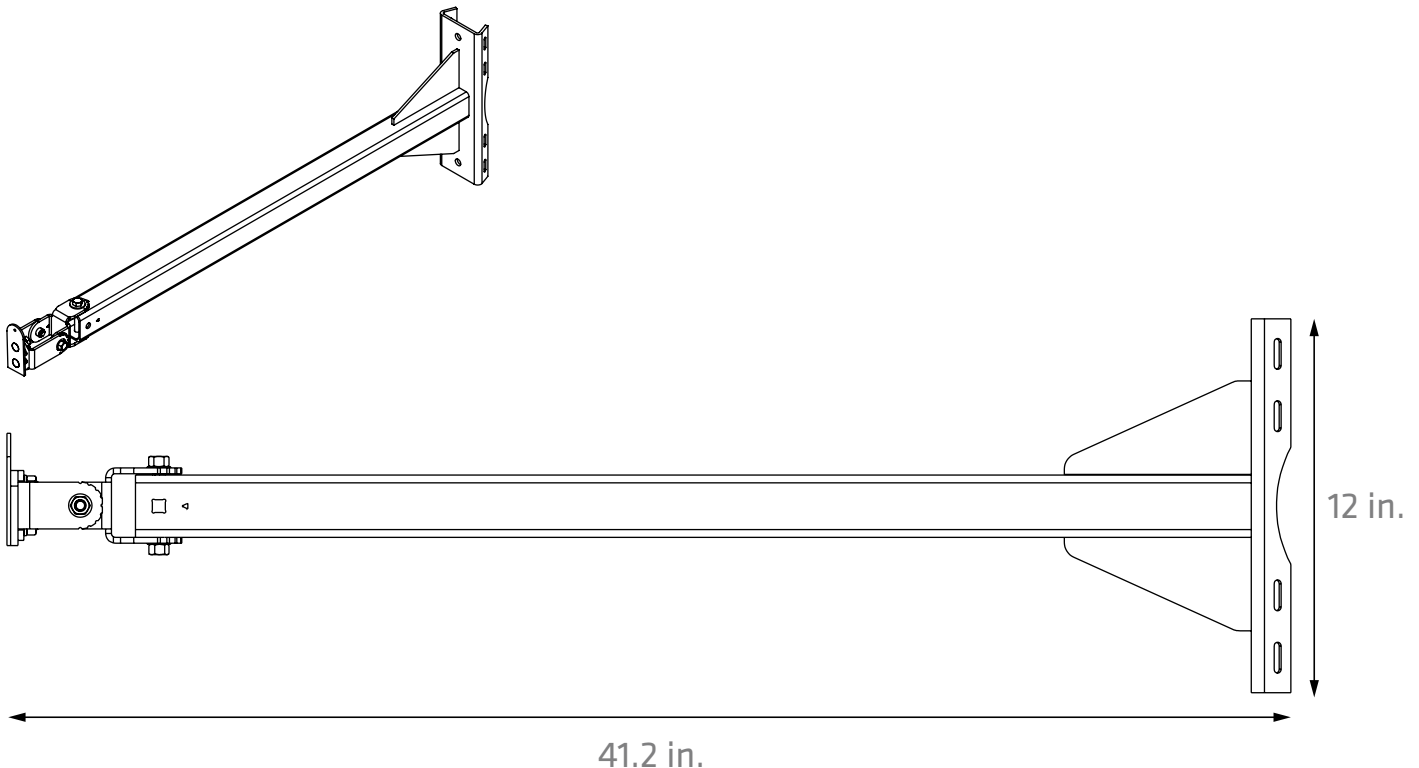
www.wavetronix.com

Extended pole mount for XP20 sensors

The XP20 36-in. Sensor Mount allows you to install the XP20 in locations that might typically be problematic. With three axes of rotation and a slide-on sensor mounting feature, you'll have no trouble getting your XP20 to the angle and position you need.



- Allows you to mount away from structures that might cause interference
- Provides more offset by angling the bracket back and away from the roadway
- Allows you to mount closer to the lanes of interest
- Three axes of rotation for getting the sensor into any necessary position and angle
- Attach the sensor quickly and easily by simply sliding it over the mounting tongue; for added stability, use the thumb screw to attach the sensor even more firmly
- Supports a 20-lb. (6.8-kg) load
- Rotating end piece means no rotating backplate is needed
- Heavy duty aluminum construction makes mount sturdy and long-lasting
- Two contact points for attachment to circular or non-circular poles
- Powder coated for oxidization resistance, allowing mount to withstand the harshest weather conditions
- Accepts 3/4-in. banding



XP20 36-in. Sensor Mount technical specifications

Physical properties

- Weight: 5.6 lb. (2.5 kg)
- Dimensions: 12 in. × 42 in. × 3.6 in. (30.5 cm × 106.8 cm × 9.2 cm)
- Constructed of aluminum 0.2 in. (0.5 cm) thick
- Powder coated
- Stainless steel hardware

Mounting

- Rotational axes: 3
- Maximum load: 20 lb. (9.1 kg)
- Slotted for ¾-in. (1.9-cm) banding
- Contact points with pole: 2

Support

- Extended support options available; contact a Wavetronix representative for more information.
- Comprehensive user guide

Warranty

- Five-year warranty against material and workmanship defect

Ordering information

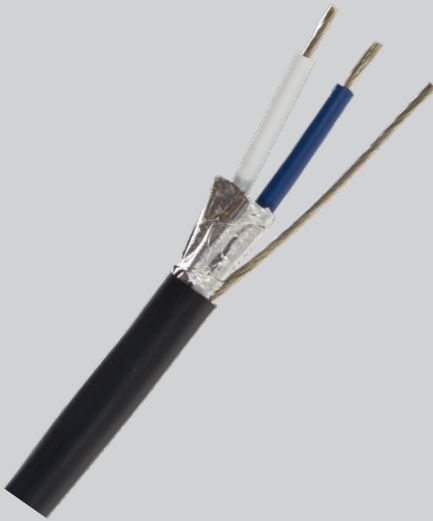
XP20 36-in. Sensor Mount
101-0461

Contact us

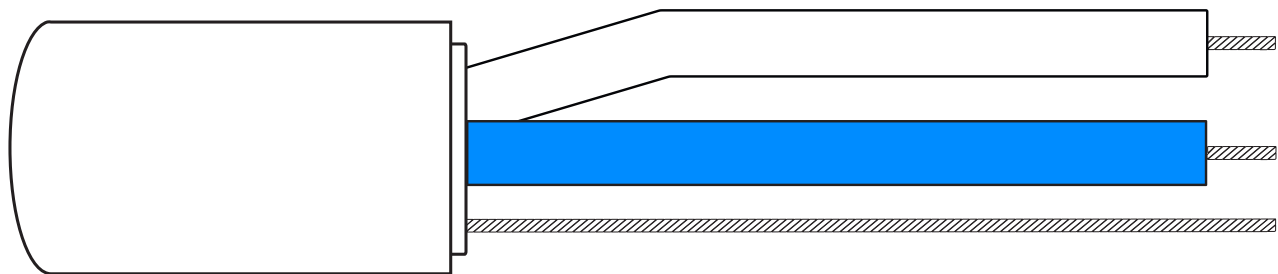
801.734.7200
sales@wavetronix.com
www.wavetronix.com

16 AWG, 1-pair cable

The Expanse Link S Cable provides a high-speed, secure, IP-based link between the XP20/XP21 sensor and the Arc cabinet interface device. This 600 V TC-ER-rated cable is ideal for running in conduit with power cables, and can be bought in bulk and cut to length for easy installation.



- Provides power and IP communications between sensor and cabinet in an Expanse sensor installation
- Conductors are a single twisted pair
- Conductors are shielded with an aluminum/mylar shield, a tinned copper braid and a drain wire
- Conductors are color-coded for quick and easy wiring to terminal blocks
- Can be purchased in bulk: 200', 500', 1000', or 5000' spools
- 600V TC-ER rated: can be run in a tray with power cables
- RoHS-compliant
- UV and oil resistant
- Rated for CSA FT4 flammability



Expanse Link S Cable technical specifications

Physical properties

- Overall diameter: $< 0.392 \pm 0.04$ in. ($1 \text{ cm} \pm 0.1 \text{ cm}$)
- Jacket: black PVC
- Wire gauges: 16-AWG stranded (19/29)
- Blue and white
- Cable shielded with aluminum/polyester shield
- Cross-linked polyethylene insulation
- Pull tension: 40 lb.

Connections

- 1 twisted pair
- One tinned copper drain wire

Power

- Conductors: twisted pair with nominal DC resistance of < 4.35 ohms/1000 ft.
- 110-ohm characteristic impedance $\pm 10\%$
- Shield DC resistance: < 4.3 ohms/1000 ft.
- Voltage rating: 600 V RMS

Communication

- Capacitance: 15 pF/ft. conductor-to-conductor

Testing

- UL type TC-ER
- Direct burial
- RoHS-compliant
- UV-resistant
- Flammability rating: CSA FT4 flammability

Support

- Extended support options available; contact a Wavetronix representative for more information
- Comprehensive user guide

Ordering information

Expanse Link S Cable (200-ft. (60.9 m) spool)
101-0466

Expanse Link S Cable (500-ft. (152.4 m) spool)
101-0465

Expanse Link S Cable (1000-ft. (304.8 m) spool)
101-0464

Expanse Link S Cable (5000-ft. (1524 m) spool)
101-0463

Third-party ordering information

Lake Cable

SVX1625-485-WAV-200 – Expanse Link S Cable
(200-ft. (60.9 m) spool)

SVX1625-485-WAV-500 – Expanse Link S Cable
(500-ft. (152.4 m) spool)

SVX1625-485-WAV-1000 – Expanse Link S Cable
(1000-ft. (304.8 m) spool)

SVX1625-485-WAV – Expanse Link S Cable
(5000-ft. (1524 m) spool)

Required accessories (sold separately)

102-0537 – Arc Field-replaceable Surge SC Connector

Optional accessories (sold separately)

101-0486 – Expanse Sensor Connector

102-0555 – Expanse Junction Box

Contact us

801.734.7200

sales@wavetronix.com

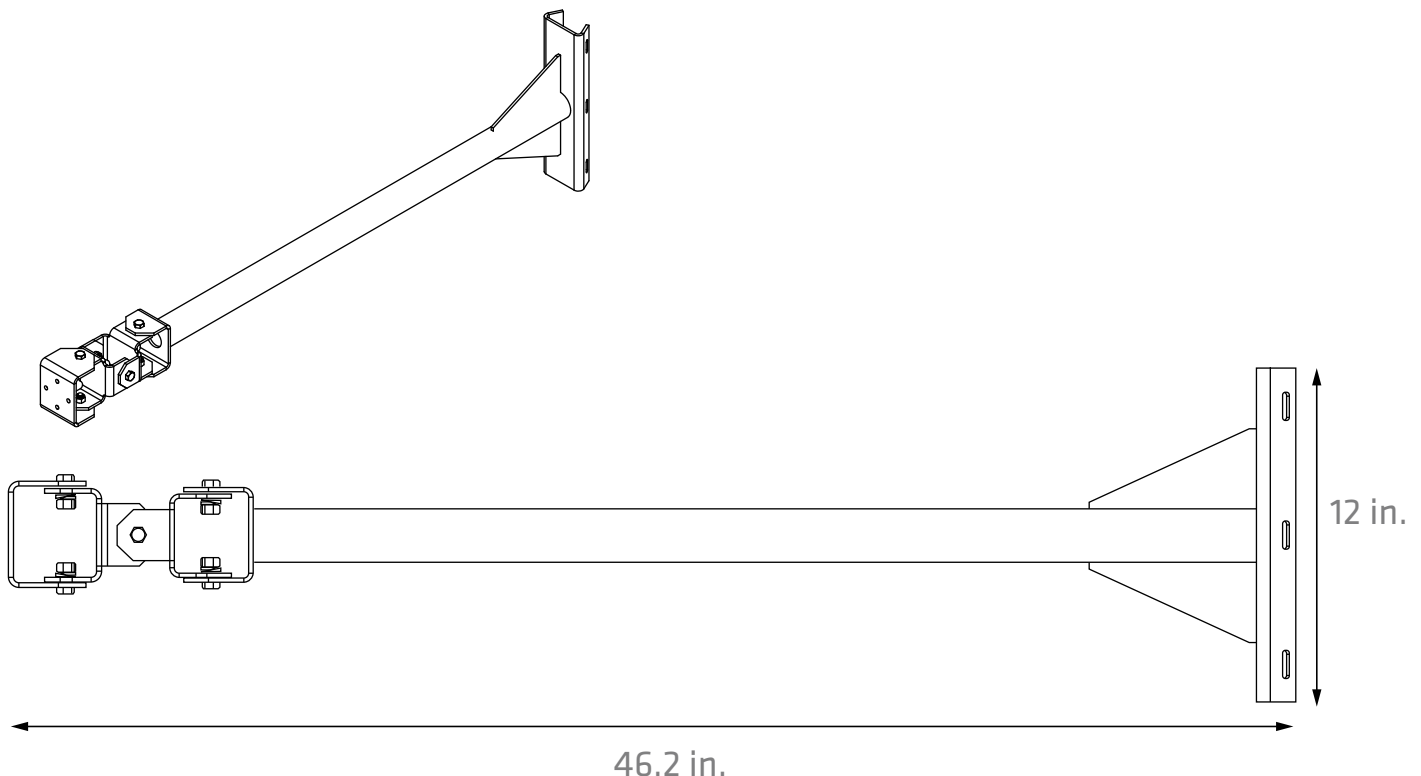
www.wavetronix.com

Extended pole mount for SmartSensors

The SmartSensor 36-in. Mount allows you to install the sensor in locations that might typically be problematic. Sturdily built of powder-coated aluminum for durability and weather-resistance, this mount can withstand whatever the elements throw at it.



- Allows you to mount away from structures that might cause interference
- Provides more offset by angling the bracket back and away from the roadway
- Allows you to mount closer to the lanes of interest
- Three axes of rotation for horizontal and vertical positioning
- Mates with fixed and rotational backplates on the SmartSensor V, SmartSensor HD, SmartSensor Advance, and SmartSensor Matrix
- Symmetric hole pattern for flexibility in sensor attachment
- Two contact points for attachment to circular or non-circular poles
- On circular poles, another axis of rotation around the pole is available
- Supports a 20-lb. (6.8-kg) load
- Heavy duty aluminum construction makes mount sturdy and long-lasting
- Powder coated for oxidization resistance, allowing mount to withstand the harshest weather conditions
- Accepts 3/4" banding



SmartSensor 36-in. Mount technical specifications

Physical properties

- Weight: 6.7 lb. (3.0 kg)
- Dimensions: 12 in. × 46.2 in. × 3.8 in. (30.5 cm × 117.4 cm × 9.6 cm)
- Constructed of aluminum 0.2 in. (0.5 cm) thick
- Powder coated
- 316 Stainless steel hardware

Mounting

- Rotational axes: 3
 - NOTE: SmartSensor Advance and SmartSensor Matrix are shipped with rotational backplate for third axis of rotation. SmartSensor V and SmartSensor HD can be ordered with rotational backplate if third axis is required.
- Maximum load: 20 lb. (9.1 kg)
- Slotted for ¾-in. (1.9-cm) banding
- Contact points with pole: 2
- Symmetric hole pattern that mates with fixed and rotational SmartSensor backplates

Support

- Extended support options available; contact a Wavetronix representative for more information
- Comprehensive user guide

Warranty

- Five-year warranty against material and workmanship defect

Ordering information

SmartSensor 36-in. Mount
101-0437

Contact us

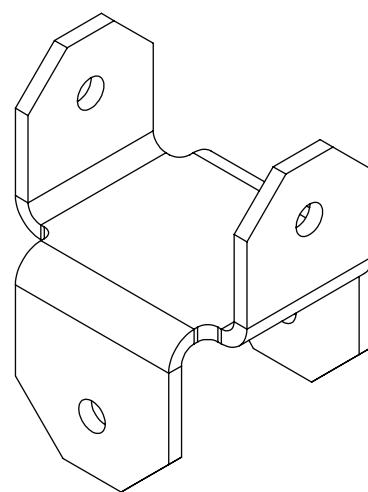
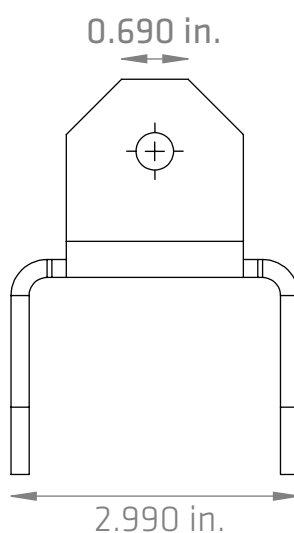
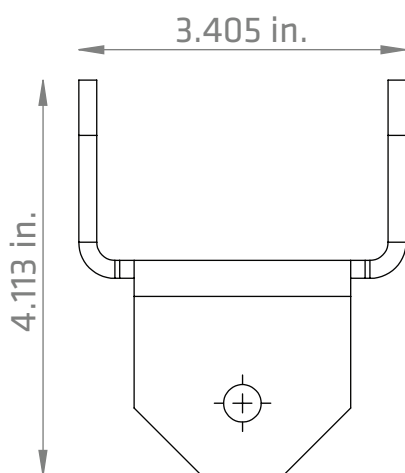
801.734.7200
sales@wavetronix.com
www.wavetronix.com

Additional knuckle for SmartSensor mounts

The SmartSensor Mount Knuckle attaches to a SmartSensor mount and allows you to aim the sensor with another degree of rotation. Sturdily built of powder-coated aluminum for durability and weather resistance, this mount knuckle perfectly enhances your SmartSensor installation.



- Allows another axis of rotation for sensor positioning
- Two contact points for attachment to all SmartSensor mounts
- Mates with mounts for the SmartSensor V, SmartSensor HD, SmartSensor Advance, and SmartSensor Matrix
- Supports a 20-lb. (6.8-kg) load
- Heavy duty aluminum construction makes mount sturdy and long-lasting
- Powder coated for oxidization resistance, allowing mount to withstand the harshest weather conditions
- Ships with $\frac{3}{8}$ -in. bolts, nuts, and washers



SmartSensor Mount Knuckle technical specifications

Physical properties

- Weight: 0.5 lb. (0.2 kg)
- Dimensions: 3.4 in. × 4.1 in. (8.6 cm × 10.4 cm)
- Constructed of aluminum 0.2 in. (0.5 cm) thick
- Powder coated
- 316 stainless steel hardware

Mounting

- Maximum load: 20 lb. (9.1 kg)
- Includes two 3/8-in.-16 bolts, two 3/8-in.-16 nuts, and two lock washers
- Symmetric hole pattern that mates with SmartSensor mounts

Support

- Extended support options available; contact a Wavetronix representative for more information
- Comprehensive user guide

Warranty

- Five-year warranty against material and workmanship defect

Ordering information

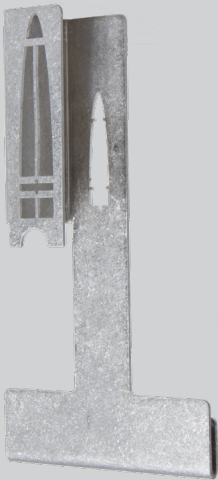
SmartSensor Mount Knuckle
360-0129

Contact us

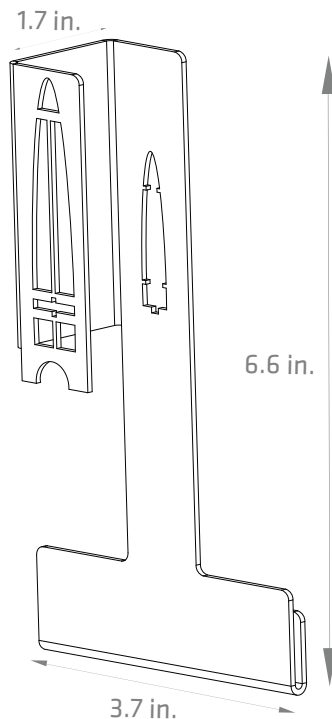
801.734.7200
sales@wavetronix.com
www.wavetronix.com

Advance aiming tool

The SmartSensor Advance Viewfinder is a visual sighting instrument used to quickly and effectively align the sensor to the roadway. The viewfinder mounts securely to the top of a SmartSensor Advance and is a solid aluminum tool with precise, laser-cut features.



- Target crossbars to determine sensor pan and tilt
- Visual cues (tabs and notches) to verify viewpoint toward target
- Visual cues (framed archways) to verify viewpoint to upstream detection area
- Center-boss overlay arch and backplate insert tab for simple and secure attachment to sensor
- Elliptical window outline for visualizing coverage
- Designed for use with installer eye relief of approximately 1 ft. (30.5 cm) or at less than 1 in. (2.5 cm) using digital camera capture
- Long narrow cross bar to determine sensor roll



SmartSensor Advance Viewfinder technical specifications

Physical properties

- Constructed of aluminum 0.06 in. (0.2 cm) thick
- Dimensions: 6.6 in. × 3.7 in. × 1.7 in. (16.8 cm × 9.4 cm × 4.3 cm)
- Target cross bars
 - Separation from visual cue tabs 1.5 in. (3.8 cm)
 - View angle: bore sight
- Framed archways
 - Separation 1.8 in. (4.6 cm)
 - View angle: 35 degrees above bore sight
- Long narrow alignment bar
 - Length: 1.8 in. (3.8 cm)
- Center-boss overlay arch radius: 0.2 in. (0.6 cm)
- Elliptical windows correspond to elliptical beam width:
 - Elevation angle: 70 degrees
 - Azimuth angle: 10.5 degrees

Manufacturing

- Manufactured in the USA

Ordering information

SmartSensor Advance Viewfinder
360-0283

Contact us

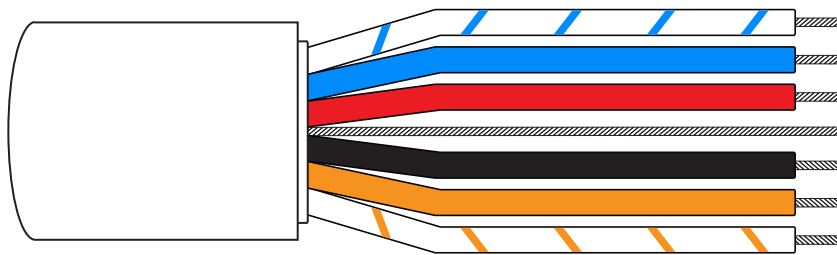
801.734.7200
sales@wavetronix.com
www.wavetronix.com

Power and dual-RS-485 sensor cable

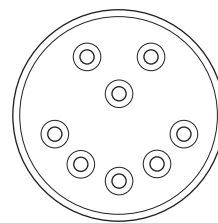
The SmartSensor 6-conductor Cable is used with the SmartSensor Matrix and SmartSensor Advance to provide power and communication connectivity to the sensors. Heavy-duty and weather-resistant, this custom cable is ideal for cable runs from the sensor to the cabinet.



- 6-conductor cable that attaches to an 8-pin connector
- Provides power and RS-485 communications between sensor and cabinet
- Connector is keyed to ensure proper connection
- Color-coded for quick and easy wiring to terminal blocks and Click modules
- RS-485 and power conductors are twisted pairs
- Cable assembly is shielded with aluminum/mylar shield and a tinned copper drain wire
- RoHS compliant
- Cable end connector backshell is environmentally sealed, offering excellent immersion capability
- Connector backshell supports cable slack under extreme weather conditions



6-conductor cable



8-pin connector

SmartSensor 6-conductor Cable technical specifications

Physical properties

- Cable diameter: 0.41 in. (1.04 cm)
- Jacket: 0.053-in. (1.3-mm) gray PVC
- Wire gauges:
 - Power wires: 20 AWG
 - Comms wires: 22 AWG
- Cable assembly shielded with aluminum/polyester shield
- Pull tension: 35 lb.
- Connector:
 - Meets MIL-C-26482 specification
 - Backshell is environmentally sealed
 - Backshell offers excellent immersion capability
 - All conductors that interface with the connector are encased in a single jacket
 - Backshell has a strain relief with enough strength to support the cable slack under extreme weather conditions.

Operating conditions

- Ambient operating temperature: up to 221°F (105°C) dry / 167°F (75°C) wet

Connections

- RS-485 conductors: 2 twisted pairs
- Power conductors: twisted pair
- One tinned copper drain wire

Power

- Power conductors: twisted pair with nominal conductor DC resistance of less than 11 ohms/1000 ft. (304.8 m) at 20°C

Communication

- RS-485 conductor nominal capacitance, conductor to conductor: less than 40 pF/ft. at 1 kHz
- RS-485 conductor nominal conductor DC resistance: less than 16.7 ohms/1000 ft. (304.8 m) at 20°C

Testing

- RoHS compliant
- Approvals: UL/cUL Type CMG
- Flammability rating: FT4
- UV resistant: Yes (per UL 720 Hour Sunlight Resistance Test)
- 600 Volt AWM style 2587

Support

- Extended support options available; contact a Wavetronix representative for more information
- Comprehensive user guide

Ordering information

SmartSensor 6-conductor Cable (set length, connectorized)

SS-704 – custom cable length

SS-704-006 – (6-ft. (15.2 m) cable)

SS-704-020 – (20-ft. (50.8 m) cable)

SS-704-040 – (40-ft. (101.6 m) cable)

SS-704-060 – (60-ft. (152.4 m) cable)

SS-704-080 – (80-ft. (203.2 m) cable)

SS-704-100 – (100-ft. (254 m) cable)

SmartSensor 6-conductor Cable (bulk spool, non-connectorized)

SS-705 – custom cable length (sold in 100-ft. (254 m) increments)

101-0448 – (500-ft. (152.4-m) spool)

SS-705-001 – (1000-ft. (304.8-m) spool)

101-0558 – (1500-ft. (457.2-m) spool)

SS-705-002 – (5000-ft. (1524-m) spool)

Contact us

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