



REQUEST FOR BID

Installation of TORO Sentinel Irrigation Controllers

Project Number: 211511-630101

**A PRE-BID CONFERENCE WILL BE CONDUCTED
VIRTUALLY AT 8:00 AM, TUESDAY, DECEMBER 17, 2024.**

Meeting link enclosed. See 'Invitation to Bid'

**BIDS WILL BE ACCEPTED UNTIL
JANUARY 6, 2025, AT 3:00 PM**

Note: Proposals should be submitted electronically, via email to the
enclosed Parks & Recreation Department Contacts

**City of Louisville | Parks, Recreation & Open Space
749 Main Street Louisville, CO 80027
PH: (303) 335-4735 www.louisvilleco.gov**

INVITATION TO BID

The City of Louisville (City) Department of Parks, Recreation and Open Space is inviting bids from highly qualified contractors (Respondents) to perform **Installation of up to 30 TORO Sentinel Irrigation controllers**. Work will include controller installation (to manufacturer and City specifications) with both wall mount and pedestal applications. Respondents are requested to provide a comprehensive bid which includes all aspects of the work.

Digital copies of the Bidding Documents will be available after **December 13, 2024** through the department office, on-line via the Rocky Mountain Bid System and on the City's website:
<https://www.louisvilleco.gov/doing-business/bidding-opportunities-requests-for-proposals>

A recommended pre-bid meeting will be held virtually on **December 17, 2024, at 8:00am** using Microsoft Teams: https://teams.microsoft.com/l/meetup-join/19%3ameeting_NWl4YzkwNjctODcwNy00OWFjLTkxZDAtZmQzODk4ODkxMjg3%40thread.v2/0?context=%7b%22Tid%22%3a%22bdc34c2-e919-4b54-b6ba-01080ac35832%22%2c%22Oid%22%3a%22bc1966ff-9eb2-48d1-b866-e77a0c0b36f2%22%7d
Meeting ID: 214 866 360 829 Passcode: kb2hd9R2

Bids will be accepted electronically by the department until 3pm MST on January 6, 2025.
See contact information for email addresses. The City of Louisville is an Equal Opportunity Employer.

PROJECT SUMMARY

This project will install TORO Sentential controllers (including both wall mount and pedestal applications) throughout the City of Louisville. The designated areas can be found in **Exhibit C**.

SCOPE OF WORK

The Scope of Work shall include but is not limited to the following:

- Installation of up to 30 TORO Sentinel Irrigation Controllers to be installed at locations designated by the City adhering to manufacturers and City irrigation specifications found in EXHIBIT D. The final quantity will be determined once installation prices are obtained and the total project cost is known and aligned with available budget.
- The contractor is required to call for utility locates at designated locations where digging is required for the controller wall mount (uni-strut) or pedestal (concrete pad) installations.
- Installation of controllers to be performed to minimize impact to residents and adjacent properties.
- The selected contractor will be responsible for ground repair at each location, restoring to City specifications as outlined in EXHIBIT D.
- The contractor will be responsible for securing locations until location has been reviewed and accepted by City representative.
- Contractor will be responsible for coordinating with City representative and CPS Distributors on final certification of each controller to align with TORO warranty requirements.
- To ensure uniform bidding, please use the enclosed bid form.
- The following items will be provided by the City and do not need to be included in unit pricing on the cost proposal form: TORO Sentinel Controllers (as designated by manufacturer location EXHIBIT D), controller cabinets, pedestals (where indicated), antennas, assistance with removal of existing cabinets and clocks at designated locations.

- The following items will **not** be provided by the City and **should** be included in unit pricing on the cost proposal form: uni-strut for wall mounts, concrete pad (as determined), grounding rods, valve box for grounding rods or wire junction/ splices (as determined), removal of existing controllers in conjunction with City staff, and all other materials not specifically listed above.

ANTICIPATED SCHEDULE / KEY DATES

Daily Camera Submission	3:00 p.m December 06
First Publication	December 11
Rocky Mountain E- Purchasing	December 13
Second Publication	December 15
Pre-Proposal Meeting (Virtual)	8:00am MST December 17
Inquiry Deadline.....	3:00pm MST December 18
Inquiry Response Deadline	December 20
Proposals Due	3:00 pm MST January 6
Bid Opening & Department Review	January 7
City Council Review	January 10
City Council Meeting	January 21
Notice of Award.....	January 22
Notice to Proceed, Bonds, Insurance, etc.	January 27
Construction/Installation/Site Restoration - Substantial Completion	April 4
Final Project Completion	April 25

SELECTION PROCESS AND CRITERIA

The following criteria will be used to evaluate all proposals:

- The contractor's interest in the services which are the subject of this RFB, as well as their understanding of the scope of such services and the specific requirements of the City of Louisville.
- The reputation, experience, and efficiency of the contractor.
- The ability of the contractor to provide quality services within time and funding constraints.
- The general organization of the proposal: Special consideration will be given to submittals which are appropriate, address the goals; and provide the requested information in a clear and concise format.
- Such other factors as the City determines are relevant to consideration of the best interests of the City.

PERIOD OF SERVICE

The Respondent's team should be available to begin work per the above scheduled dates upon approval of their proposal. Any foreseen limitations and/or conflicts impacting the proposed project schedule should be noted as a part of the respondent's submission.

BUDGET, COMPENSATION & PAYMENT

Payment for the Respondent's services will be based on a lump sum proposal to include the scope of services identified in this request. The lump sum proposal shall include costs for all overhead, profit, deliverables, travel and other expenses incidental to the project. Payments will be made on a monthly basis upon receipt and acceptance of an invoice indicating the services for which payment is due. Hourly rate and unit pricing schedules shall be included in the contract for possible additions

or deletions to the services. The selected Respondent will be required to enter into an agreement with the City. The City's standard independent contractor agreement is attached for reference.

STANDARD TERMS AND CONDITIONS

Respondents should be aware of the following terms and conditions what have been established by the City of Louisville:

- The request for bid is not an offer of contract. The provisions in the RFB and any purchasing policies or procedures of the City are solely for the fiscal responsibility of the City, and confer no rights, duties or entitlements to any party submitting proposals.
- The City of Louisville reserves the right to reject any and all proposals, to consider alternatives, to waive any informalities and irregularities, and to re-solicit proposals.
- The City of Louisville reserves the right to conduct such investigations of and discussions with those who have submitted proposals or other entities as they deem necessary or appropriate to assist in the evaluation of any proposal or to secure maximum clarification and completeness of any proposal.
- The City of Louisville assumes no responsibility for payment of any expenses incurred by any proponent as part of the RFB process.
- All submittals become the property of the City, a matter of public record and will not be returned. Proprietary information included in submittals must be clearly identified and will be protected, if possible. Unit pricing and total cost information will not be considered proprietary.
- The City has the right to use any or all ideas presented in response to this invitation to bid. Disqualification of the respondent does not eliminate this right. The City reserves the right to select the proposal that is most advantageous to the City, even if it is not the least expensive.
- No Bid may be withdrawn within a period of sixty (60) days after proposal submission deadline.
- The successful proposer shall be required to sign a contract with the City in a form provided by and acceptable to the City. The contractor shall be an independent contractor of the City. A sample contract is enclosed.

REQUIRED SUBMITTALS

One digital copy (single PDF file preferred) should be submitted to the enclosed contacts prior to the Proposal Deadline. Proposals should include the following, and in the order given:

1. Letter of Interest
 - a. Provide a letter of introduction stating the Respondent's interest and reflecting an understanding of the proposed scope of services. The letter must be signed by an authorized agent for the Respondent.
2. Capabilities & Experience
 - a. Provide a review of your qualifications and include three (3) examples of past or present work which best demonstrate your ability to successfully complete the proposed services. Focus, to the greatest extent possible, on projects similar to the scope of services herein.
 - b. Please provide photos to illustrate examples of past/present work.
3. References
 - a. Provide three (3) Client references (including contact person and phone number) for projects of similar size/scope which reflect your ability to successfully execute the proposed services.
4. Fee Proposal & Schedule
 - a. The proposed total, not-to-exceed fee for services per the bid form (Exhibit B)
 - b. Provide a proposed project schedule including start and finish dates, along with applicable milestones.
5. Required Forms
 - a. Signed Form - Disclosure Statement (Exhibit A)
 - b. Signed Form – Bid Form (Exhibit B)
 - i. Cost Proposal
 - ii. Bid Bond
 - iii. Schedule of Subcontractors

BONDING

The successful BIDDER will be required to furnish a performance bond and a labor and material payment bond to the City of Louisville each in an amount at least equal to the Contract Price guaranteeing faithful performance and the payment of all bills and obligations arising from the performance of the Contract.

INQUIRIES

Prospective respondents may make written inquiries by email prior to the inquiry deadline. Inquiries will also be accepted at the pre-proposal meeting. An addendum will be released to all pre-bid meeting attendees with any required clarifications, revisions and/or associated documents prior to the inquiry response deadline. Inquiries should be sent via email to the contacts listed below.

SUBMISSIONS & CONTACT INFORMATION

Proposals will be accepted until **3pm MST** on the Proposal Deadline listed above. Late proposals will not be accepted. *Please keep submissions to 10mb or less.*

Proposals shall be submitted electronically via email to the contacts below:

Abby McNeal, CSFM CPRP
Parks Superintendent | Parks, Forestry, Athletic Fields & Cemetery
amcneal@louisvilleco.gov

AND

Kayla Corcelli
Administrative Assistant | Parks and Open Space
KCorcelli@louisvilleco.gov

EXHIBIT A
Disclosure Statement

Vendor must disclose any possible conflict of interest with the City of Louisville including, but not limited to, any relationship with any City of Louisville elected official or employee.

Your response must disclose if a known relationship exists between any principal of your firm and any City of Louisville elected official or employee. If, to your knowledge, no relationship exists, this should also be stated in your response.

Failure to disclose such a relationship may result in cancellation of a contract as a result of your response. This form must be completed and returned in order for your proposal to be eligible for consideration.

- ☐ NO KNOWN RELATIONSHIPS EXIST
- ☐ RELATIONSHIP EXISTS (Please explain relationship)

I CERTIFY THAT:

1. I, as an officer of this organization, or per the attached letter of authorization, am duly authorized to certify the information provided herein are accurate and true as of the date; and
2. My organization shall comply with all State and Federal Equal Opportunity and Non-Discrimination requirements and conditions of employment.

Printed or Typed Name

Title

EXHIBIT B
BID FORM

PROJECT: Irrigation Controller Installation
PROJECT NUMBER: 211511-630101
OWNER: CITY OF LOUISVILLE, COLORADO

THIS BID IS SUBMITTED TO: THE CITY OF LOUISVILLE, COLORADO

1. The undersigned BIDDER proposes and agrees, if this Bid is accepted, to enter into an Agreement with OWNER in the form included in the Contract Documents to perform and furnish all Work as specified or indicated in the Contract Documents for the Contract Price and within the Contract Time indicated in this Bid and in accordance with the other terms and conditions of the Contract Documents.
2. BIDDER accepts all of the terms and conditions of the Invitation to Bid and Instructions to Bidders, including without limitation those dealing with the disposition of Bid Security. This Bid will remain subject to acceptance for sixty days after the day of Bid opening. BIDDER will sign and submit the Agreement with the Bonds and other documents required by the Bidding Requirements within ten days after the date of OWNER's Notice of Award.
3. In submitting this Bid, BIDDER represents, as more fully set forth in the Agreement, that:

- (a) BIDDER has examined copies of all the Bidding Documents and of the following Addenda receipt of all which is hereby acknowledged: (List Addenda by Addendum Number and Date):

Date	Number
_____	_____
_____	_____

- (b) BIDDER has familiarized itself with the nature and extent of the Contract Documents, Work, site, locality, and all local conditions and Laws and Regulations that in any manner may affect cost, progress, performance or furnishing of the Work.
 - (c) BIDDER is responsible for examining and determining for themselves the location and nature of the proposed Work, the amount and character of the labor and materials required therefor, and the difficulties which may be encountered including existing underground and/or overhead facilities. BIDDER's may not rely on oral, written or graphic representations made by the OWNER and by submitting a Bid, each BIDDER waives all liability for any error in any representation made by the OWNER to the BIDDER. BIDDER's shall inspect the site and its surroundings and notify OWNER in writing of any supplemental examinations, investigations, and/or tests concerning conditions at or contiguous to the site (including surface, and subsurface) which may affect cost, progress, performance, or furnishing of the Work or which relate to any aspect of the means, methods, techniques, sequences, or procedures of construction to be employed by BIDDER and safety precautions and programs incident thereto for performing the Work in accordance with the Contract Documents. By failing to make such an inspection and notification, the BIDDER waives all rights to claim extra payment or time extensions due to unexpected conditions, which could have been determined had the site been reasonably inspected. If concealed or unknown conditions differ materially from those ordinarily encountered and generally recognized as inherent in the Work, or differ materially from the conditions indicated in the Contract Documents, then an equitable adjustment in the Contract Price or in the Contract Time will be allowed by change order as provided in the Contract Documents.

- (d) BIDDER has given OWNER written notice of all conflicts, errors, ambiguities or discrepancies that BIDDER has discovered in the Contract Documents and the written resolution thereof by OWNER is acceptable to BIDDER, and the Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performing and furnishing the Work for which this Bid is submitted.
 - (e) This Bid is genuine and not made in the interest of or on behalf of any undisclosed person, firm or corporation and is not submitted in conformity with any agreement or rules of any group, association, organization or corporation; BIDDER has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid; BIDDER has not solicited or induced any person, firm or corporation to refrain from bidding; and BIDDER has not sought by collusion to obtain for himself any advantage over any other Bidder or over OWNER.
4. BIDDER will complete the Work in accordance with Contract Documents for the price(s) shown below in the Schedule of Unit Prices. Each unit price will be deemed to include an amount considered by BIDDER to be adequate to cover BIDDER's overhead and profit for each separately identified item. BIDDER acknowledges that quantities are not guaranteed and final payment will be based on actual quantities determined as provided in the Contract Documents.
5. The following documents are enclosed and made a condition of this Bid:
- (a) Cost Proposal Form
 - (b) Schedule of Subcontractors (Any persons and organizations proposed to perform the Work are required to be identified submitted in this Bid)
 - (c) If BIDDER is a partnership, a list of all partners, their addresses, and their interest and role in the partnership business.
7. Communications concerning this Bid shall be addressed to:

Name: _____ Telephone No. _____

Email: _____

Address: _____

SUBMITTED on _____, 2024.

If BIDDER is:

An Individual

By: _____
(Individual's Name)

(SEAL)

Doing business as: _____

Business address: _____

Phone No.: _____

A Partnership

By: _____
(Firm Name)

(SEAL)

(General Partner)

Business address: _____

Phone No.: _____

A Corporation

By _____
(Corporation Name)

(State of incorporation)

By _____ Title _____
(Name of person authorized to sign)

(CORPORATE SEAL)

Attest _____
(Secretary)

Business address: _____

Phone No.: _____

Date of Qualification to do business: _____

A Joint Venture

By _____
(Name)

(Address)

By _____
(Name)

(Address)

Phone Number and Address for receipt of official communications

(Each joint venturer must sign. The manner of signing for each individual, partnership and corporation that is a party to the joint venture should be in the manner indicated above.)

COST PROPOSAL FORM

PROJECT: Irrigation Controller Installation
PROJECT NUMBER: 211511-630101
OWNER: CITY OF LOUISVILLE, COLORADO

- 2) Notes: Refer to Exhibit C for list of locations as identified by the City. The City requires that proposals be received in unit cost pricing as quantities may vary over time.
- 3) All pricing is to include installation (EXHIBIT D), associated materials, removal, and restoration unless otherwise noted. Review scope of work for items to be provided by City, including controllers.
- 4) Abbreviations: LS = Lump Sum EA= Each LF= Linear Feet

Pricing Schedule (Example)

Line	DESCRIPTION	Unit	Quantity	Unit Price	PRICE
1	Mobilization	LS	1		\$
2	Wall Mount	EA	10		\$
3	Pedestal	EA	15		\$
4	Installation of Antenna WOBE	EA	2		\$
5					\$
6	Other:				\$
				Total:	\$

SCHEDULE OF SUBCONTRACTORS

This Bid is based on subcontracting certain portions of the work to subcontractors as listed below.

Name: _____ Telephone No. _____
Address: _____
City: _____ State: _____ Zip Code: _____
Services/equipment to be provided: _____

Name: _____ Telephone No. _____
Address: _____
City: _____ State: _____ Zip Code: _____
Services/equipment to be provided: _____

Name: _____ Telephone No. _____
Address: _____
City: _____ State: _____ Zip Code: _____
Services/equipment to be provided: _____

Name: _____ Telephone No. _____
Address: _____
City: _____ State: _____ Zip Code: _____
Services/equipment to be provided: _____

Name: _____ Telephone No. _____
Address: _____
City: _____ State: _____ Zip Code: _____
Services/equipment to be provided: _____

Name: _____ Telephone No. _____
Address: _____
City: _____ State: _____ Zip Code: _____
Services/equipment to be provide _____

EXHIBIT C
Controller Location Overview Bid Sheets

**Contractor to field verify locations to understand scope of installation.*

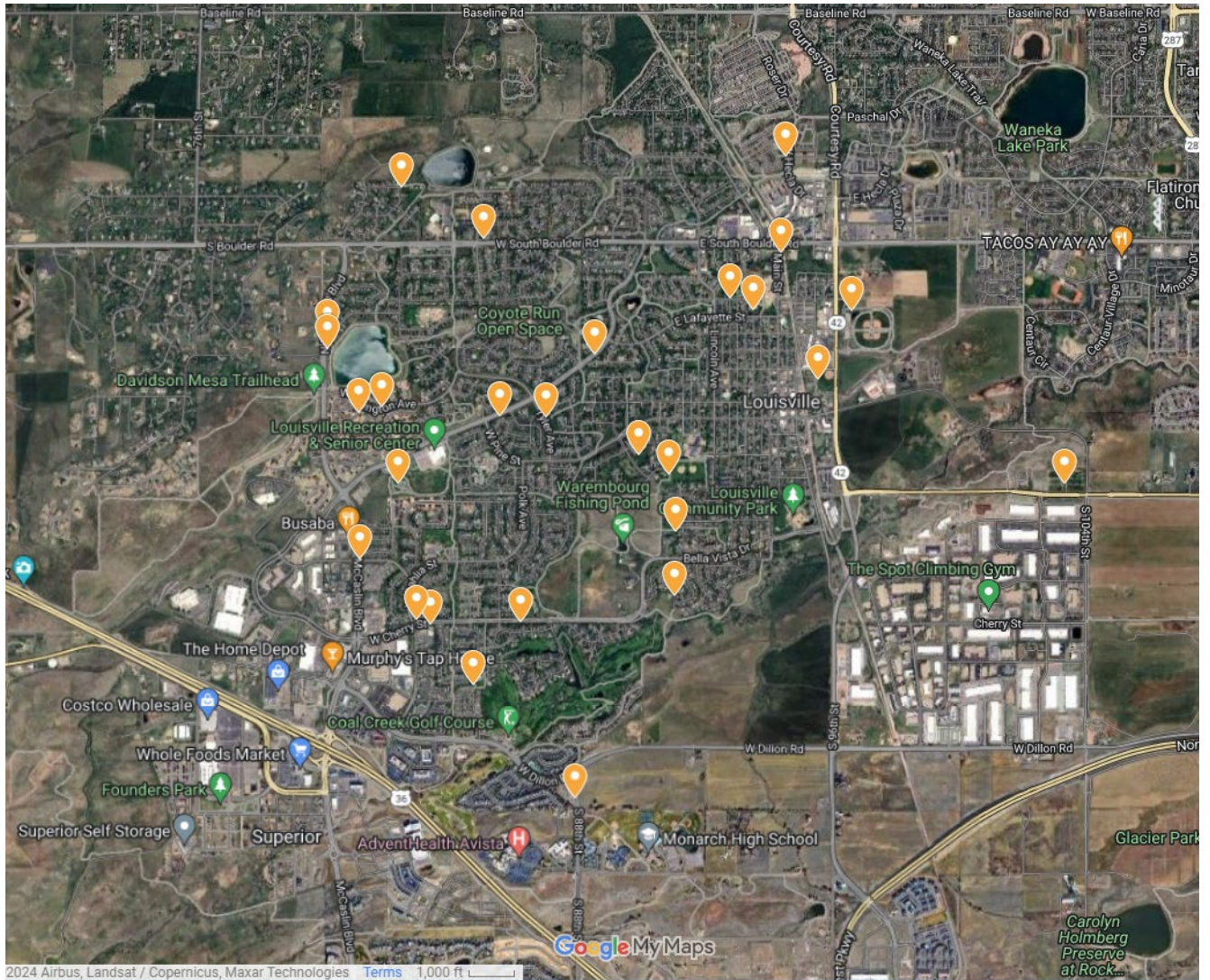
Irrigation Controller				
Locations				
Location	Cabinet	Notes		
88th Street Median	Small SS-SB-LD165W			
Alder & McCaslin	SB-16SW			
Annette Brand	Ped SS	Re-use existing cabinet		
Arboretum	Wall- SS-SB16SW			
Cemetery	Wall-SB16sw			
Coal Creek Ranch 2	Wall-SB16SW			
Cherry St Median (Orchid)	Small SS	Re-use existing cabinet		
Cherrywood 1	SB16SW Wall Mount			
Cherrywood 2	SB16SW Wall Mount			
Cleo Mudrock Detention	WOBEE			
Cowboy Park	Ped-SS-SB16SS/Riser			
Dutch Creek -Elephant	Small SS-SB16SW			
Enrietto Park	Ped SB16SS w/ riser			
Hoover Park	SB-16SW			
McCaslin North	Wall-SS-SB16SW	Worm Unit		
Meadows Park	Ped-SS-PS1			

Miners Field	Small-SS-SB16sw	
Mission Greens	Small-SS-SB16SW	
Pirates Park	Small-SS-SB 16SW	
South and Main	Small-SS-SB16SW	
Sunflower Park	WOBEE	WOBE Antenna
South Shore	Wall SB-16SW	
Sports Complex	Wall-SB16SW	
Tyler Park	Wall-SB16SW	
Via Appia Median 1	Small SS-SB16SW	
Via Appia Median 3	Small SS-SB16SW	
Washington Park	Wall-SB16SW	

**Contractor to field verify locations to understand scope of installation.*

Park Location and General proximity of controller can be found:

<https://www.google.com/maps/d/edit?mid=1pkuX5xdspKmbeClzyCzR6QP8pSCXtD0&usp=sharing>



**Contractor to field verify locations to understand scope of installation.*

EXHIBIT D

Installation Specifications

All controllers to be installed per manufactures specifications, guidelines and in adherence to the City of Louisville's Specification, as stated below.

City of Louisville Irrigation Controller Installation Specifications:

AUTOMATIC CONTROL SYSTEM

A. Electrical Control Wiring:

1. Electrical Panels and meters must be approved by City Project Manager. A basic, two-bracket, galvanized system does not meet the City's aesthetic expectations. Electrical panel and meter shall match the color-scheme and overall design intent of buildings or amenities on-site.

2. Two Wire Systems:

a. Two-Wire Decoder Cable – Two (2), #12 or #14 AWG UL. parallel wires each with single, solid copper conductors with polyethylene insulation. Wires shall be contained within separate polyethylene jacket. Cable shall be Regency Maxi Cable with red jacket (NO SUBSTITUTIONS).

i. 14 AWG for up to 2500 feet.

ii. 12 AWG for over 2,500 feet.

b. Two-wire single station decoders Toro SB-DAC-1 to be installed in each valve box, one per valve. Decoders shall have a serial number engraved on each decoder for future identification.

c. Two-wire decoder cable shall have surge arrestors Toro SB-BLA installed every five hundred (500) ft. along two-wire path or every eight decoders whichever is the shortest distance. Surge arrestors are to be place in valve box containing automatic control valve or in separate Rain Bird VB10RNDH, round body valve box with locking cover. Surge arrestor grounding shall be installed per manufacturer's recommendations.

d. Copper wire shall be six (6) gauge bare solid copper wire connected to the ground rod using a Cadweld GR1161GPLUS "Plus One Shot" welding kit.

e. Two-Wire Splice Box: Rain Bird VB10RNDH, round body valve box with locking cover.

3. Conventional Wire Systems:

a. Electrical Control Wire for 24VAC Solenoid: Golf Course Sprinkler Wire - #12 to #14 AWG UL approved direct burial solid conductor copper wiring with polyethylene insulation 0.045-inch thickness.

b. Electrical Common Wire: Golf Course Sprinkler Wire - #12 AWG UL approved direct burial solid conductor copper wiring with polyethylene insulation 0.045-inch thickness.

c. Wire Colors: Match existing color system throughout.

d. Miscellaneous control wiring materials:

1. Materials for both standard and two wire systems.

- a. Data Wires: Paige 7171D-A direct burial shielded and armored signal cable with polyethylene jacket (NO SUBSTITUTIONS)
 - i. Data Wire connections and splices shall be made with Ranger Servi-Seal.
- b. Control Wire and Two-Wire Decoder Cable connections and splices shall be made with 3M DBR/Y-6M direct bury splice, or approved equal, UL listed dry splice methods.
- c. Spare Wire and wire ends shall be capped with 3M DBR/Y.
- d. Splice Box: Rain Bird VB10RNDH, round body valve box with locking cover.
 - i. Data Wire connections and splices shall be made with Ranger Servi-Seal.

EXECUTION and PREPARATION

A. Utility Locates: Contact Utility Notification Center of Colorado at or 8-1-1 or 1-800-922-1987 prior to any excavation, for the marking of underground member utilities. The indication of utilities on the Contract Drawings does not relieve the Contractor of the responsibility for utility location. The Contractor is responsible for potholing all utility locations to verify the depth and locations. Potholing related to irrigation installation shall be considered incidental to irrigation

B . Control Wiring:

1. Two-wire control wiring:

- a. Bury two-wire decoder cable between Automatic Irrigation Controller and electric valves in pressure supply line trenches, strung as close as possible to mainline with such cable to be consistently located to one side of pipe, or in separate trenches.
- b. Make wire/cable splices at electric control valve connections as follows:
 - 1) Two-wire cable to two-wire cable - watertight connectors.
 - 2) Two-wire cable to electric valve solenoid wires - watertight connectors.
 - 3) Install all two-wire decoder cable splices not occurring at control valve in a separate Rain Bird VB10RNDH, round body valve box with locking cover.

2. Standard Low Voltage Control Wire:

- a. Install one control wire for each control valve on standard low voltage wire systems.
- b. On standard low voltage wire systems install a total of five spare fourteen (#14) AWG UFUL control wires and one spare common wire from Automatic Irrigation Controller pedestal to the end of each leg of mainline. Label spare wires at Automatic Irrigation Controller and wire splice box.
- c. Make all splices and electric control valve connections using 3M DBR/Y connectors

3. Install all control wire splices not occurring at the control valve in a

separate wire splice valve box, Rain Bird VB10RNDH, round body valve box with locking cover.

4. Wire Testing:

- a. Existing wiring indicated to remain on documents is to be ohm-tested for continuity prior to construction. The Contractor shall produce the report and copy the Project Manager of the results of such testing.
- b. New wiring: All new wiring to be tested for proper resistance prior to connection to valves and controller(s) for continuity. The Contractor shall produce the report and copy the Project Manager of the results of such testing.

COMPLETION INSPECTION

- A. Arrange for the Designated City of Louisville Park employee to be present. Provide a minimum of forty-eight (48) hours of notice in advance of walk-through.
- B. Entire system shall be completely installed and operational and trenches shall be finish graded and sod and/or seed in place prior to scheduling of walk-through.
- C. Electrically operate each zone in its entirety for the Project Manager the time of walk-through.
- D. A project inspection walk through shall include but is not limited to the following:
 - 1. Contractor shall provide documentation that resistance tests for all spare common and hot wires and tracer wire has been performed and the results for ohms reading on each wire tested.
 - 2. Inspect concrete size and elevation of controller enclosure pads. Confirm quality of concrete, finishes, access to the Irrigation Controller and spare conduit/sleeving as required for wiring.
 - 3. Review related excavation repair including backfill, compaction, fine grade, seed, and sod installation.
 - 4. Generate a punch list of items to be corrected, prior to Substantial Completion.
 - 5. Furnish all materials and perform all work required to correct all inadequacies of coverage due to deviations from Contract Documents.

CLEANING

- A. Maintain continuous cleaning operation throughout duration of Work. Dispose of, all trash, waste materials, debris and excess soil generated by installation of irrigation system, off-site, at no additional cost to the City. Contractor shall clear all debris, including, soil, from all paths, walks, roads, and other hard surface areas.

PROTECTION

- A. The Contractor shall repair any damage that occurs from construction operations at no additional cost to the City.
- B. Restrict vehicular and pedestrian traffic from areas where irrigation has been installed. Erect temporary fencing or barricades and install warning signs as required or directed by the Project Manager at no additional cost to the City.



DXi

INSTALLATION GUIDE



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Introduction

Congratulations on purchasing Toro's DXi controller, a next generation, weather-hardened, solid state irrigation controller. Whether you have purchased a pedestal or wall-mount controller, you will find the DXi has been redesigned to be easier than ever to program, operate, and maximize your productivity and flexibility, fulfilling all of your irrigation needs.

The DXi user interface is easy to use and includes a large, backlit LED display for improved visibility in low-light conditions, yet it is completely viewable in direct sunlight. The faceplate's combination of menu buttons, navigation arrows and input dial allows for easy and quick menu navigation.

The DXi comes in six versions:

- stainless steel pedestal (SPED or PSB)
- double-wide stainless steel pedestal
- plastic pedestal
- wall-mount cabinet (powder-coated or stainless)

The DXi controller pedestal is designed for installation on a substantial concrete foundation with imbedded conduit of various diameters to enable power, field, ground and communication wiring to be routed into the pedestal for connection. A mounting bolt positioner and basic mounting hardware components are included with each controller. A material list can be compiled by reading through the instructions completely prior to starting the installation.



CAUTION: For your protection and the safety of the product user, comply with all Caution and Warning statements within this document. All installation practices must comply with all applicable national and/or local electrical and construction codes.

About This Manual

This installation manual is divided into 7 sections.

1. Cabinet Installation
2. Power Installation
3. Earth Ground Installation
4. Field Wiring Installation
5. Master Valve and Pump Installation
6. Decoder Installation
7. Sensor Installation

Icons Explained



A note to clarify.



Important

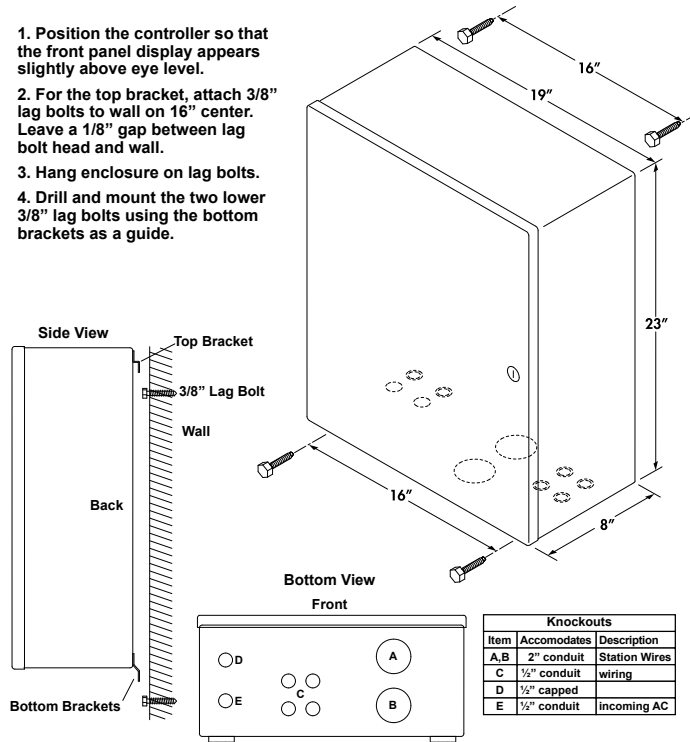


Warning! Risk of electric shock

Cabinets

DXi Painted Steel Wall-Mount Installation

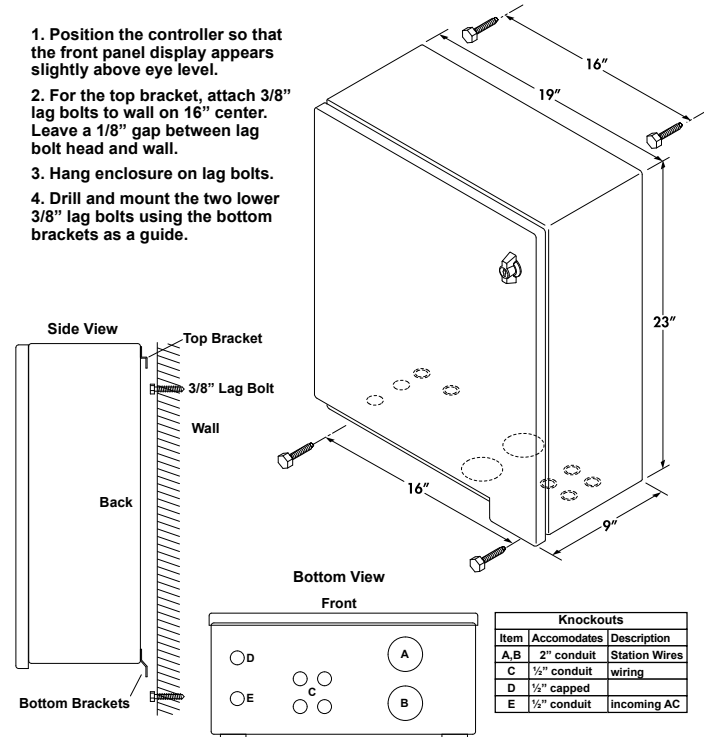
1. Position the controller so that the front panel display appears slightly above eye level.
2. For the top bracket, attach 3/8" lag bolts to wall on 16" center. Leave a 1/8" gap between lag bolt head and wall.
3. Hang enclosure on lag bolts.
4. Drill and mount the two lower 3/8" lag bolts using the bottom brackets as a guide.



RMS Part No.500505 Rev. A

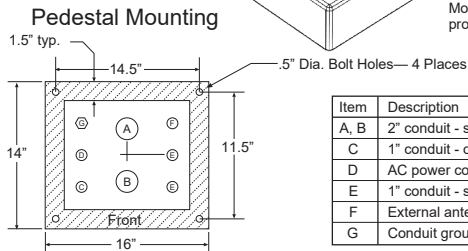
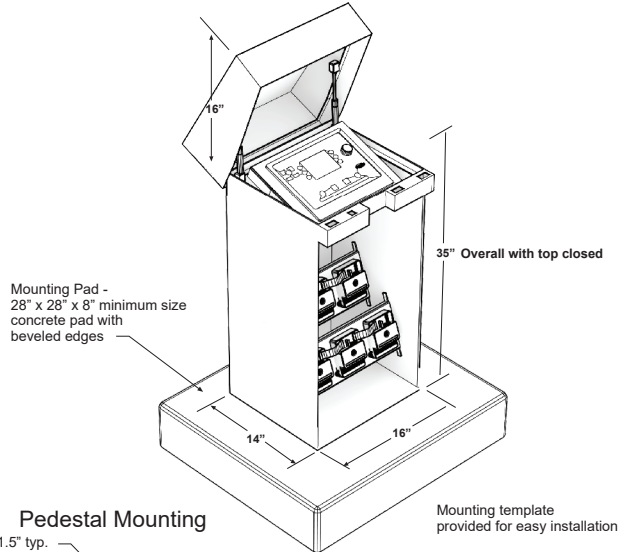
Vandal-Resistant Stainless Steel DXi Wall-Mount Installation

1. Position the controller so that the front panel display appears slightly above eye level.
2. For the top bracket, attach 3/8" lag bolts to wall on 16" center. Leave a 1/8" gap between lag bolt head and wall.
3. Hang enclosure on lag bolts.
4. Drill and mount the two lower 3/8" lag bolts using the bottom brackets as a guide.



RMS Part No.500506 Rev. A

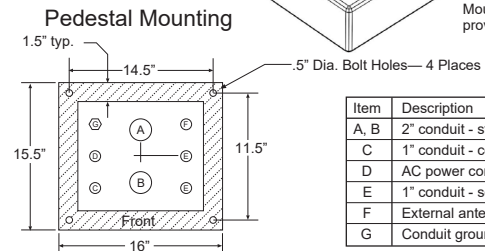
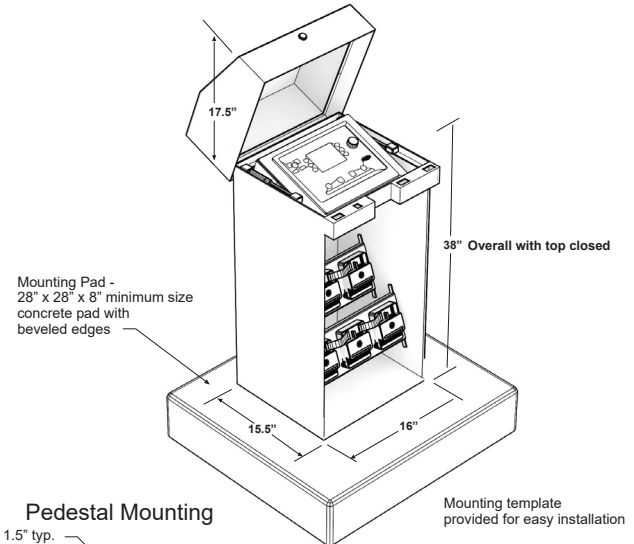
DXi SPED Stainless Steel Pedestal Installation



Bolt and Conduit Layout

RMIS Part No. 500501 Rev. D

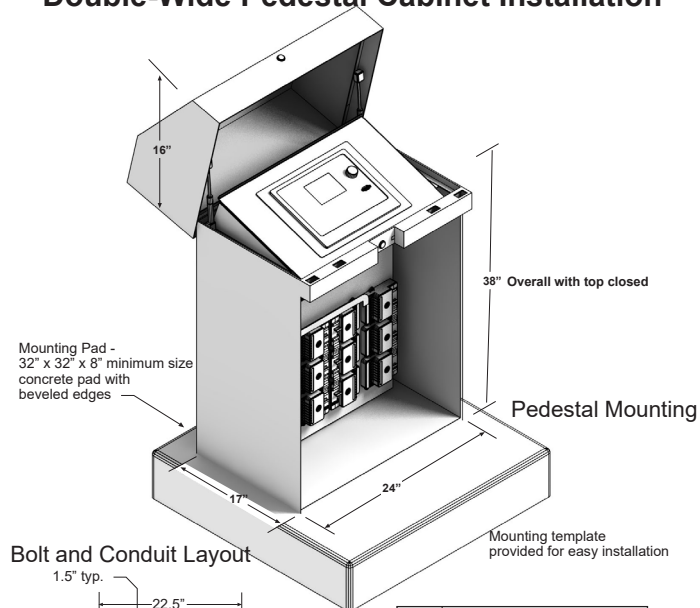
DXi PSB Stainless Steel Pedestal Installation



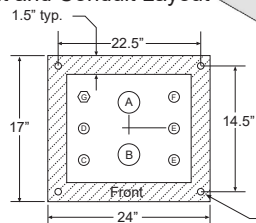
Bolt and Conduit Layout

RMIS Part No. 500503 Rev. D

DXi Stainless Steel Double-Wide Pedestal Cabinet Installation

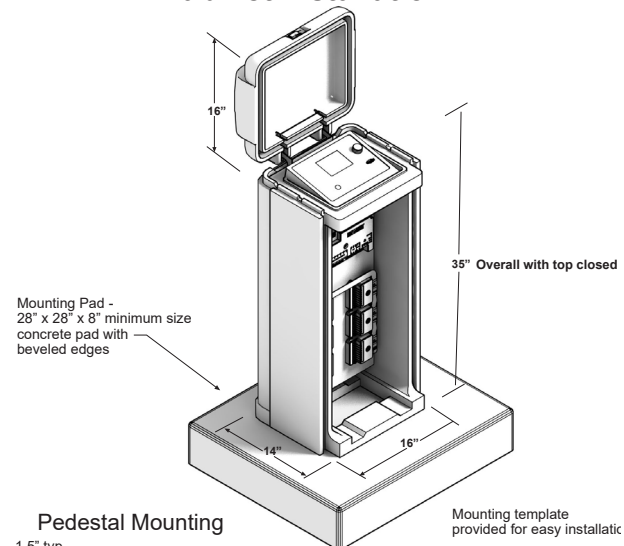


Bolt and Conduit Layout

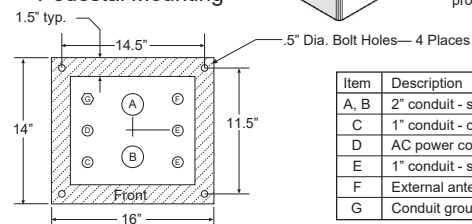


Item	Description
A, B	2" conduit - station wiring
C	1" conduit - communication
D	AC power conduit
E	1" conduit - sensor wiring
F	External antenna
G	Conduit ground rod

DXi Plastic Pedestal Cabinet Installation



Pedestal Mounting



Item	Description
A, B	2" conduit - station wiring
C	1" conduit - communication
D	AC power conduit
E	1" conduit - sensor wiring
F	External antenna
G	Conduit ground rod

Bolt and Conduit Layout

Power



WARNING!

AC POWER WIRING MUST BE INSTALLED AND CONNECTED BY QUALIFIED PERSONNEL ONLY.

ALL ELECTRICAL COMPONENTS AND INSTALLATION PROCEDURES MUST COMPLY WITH ALL APPLICABLE LOCAL AND NATIONAL ELECTRICAL CODES. SOME CODES MAY REQUIRE A MEANS OF DISCONNECTION FROM THE AC POWER SOURCE, INSTALLED IN THE FIXED WIRING, HAVING A CONTACT SEPARATION OF AT LEAST 3mm IN THE LINE AND NEUTRAL POLES.

ENSURE THE AC POWER SOURCE IS OFF PRIOR TO SERVICING. FAILURE TO COMPLY MAY RESULT IN SERIOUS INJURY DUE TO ELECTRICAL SHOCK HAZARD.

Electrical Conduit

The pedestal and wallmount cabinet's power cable access hole can accommodate a 1" (25mm) conduit fitting. If conduit is required:

1. Turn off the power at the power source location.
Place the controller's power switch to OFF.
2. Install a section of flex metal conduit or rigid conduit 1" (25mm) from the power source junction box to the pedestal's access hole. (See **Figure 3**, opposite.)

Power Source

Steps:

1. *Confirm that the AC power source is either off or physically disconnected from power prior to connecting wires!*
2. Place the controller's power switch to OFF.
3. Route the AC power and equipment ground wires through electrical and body conduit into the controller.
4. The DXi controller has three wires from its power transformer: hot (black), neutral (white), and ground (green). Following local and national electrical codes, connect the line, neutral, and ground wires to the line, neutral, and ground wires from the power source (see **Figure 3**). Secure with wire nuts within the body conduit.
5. For international wiring, reference **Table 1** for the appropriate type of power connection.

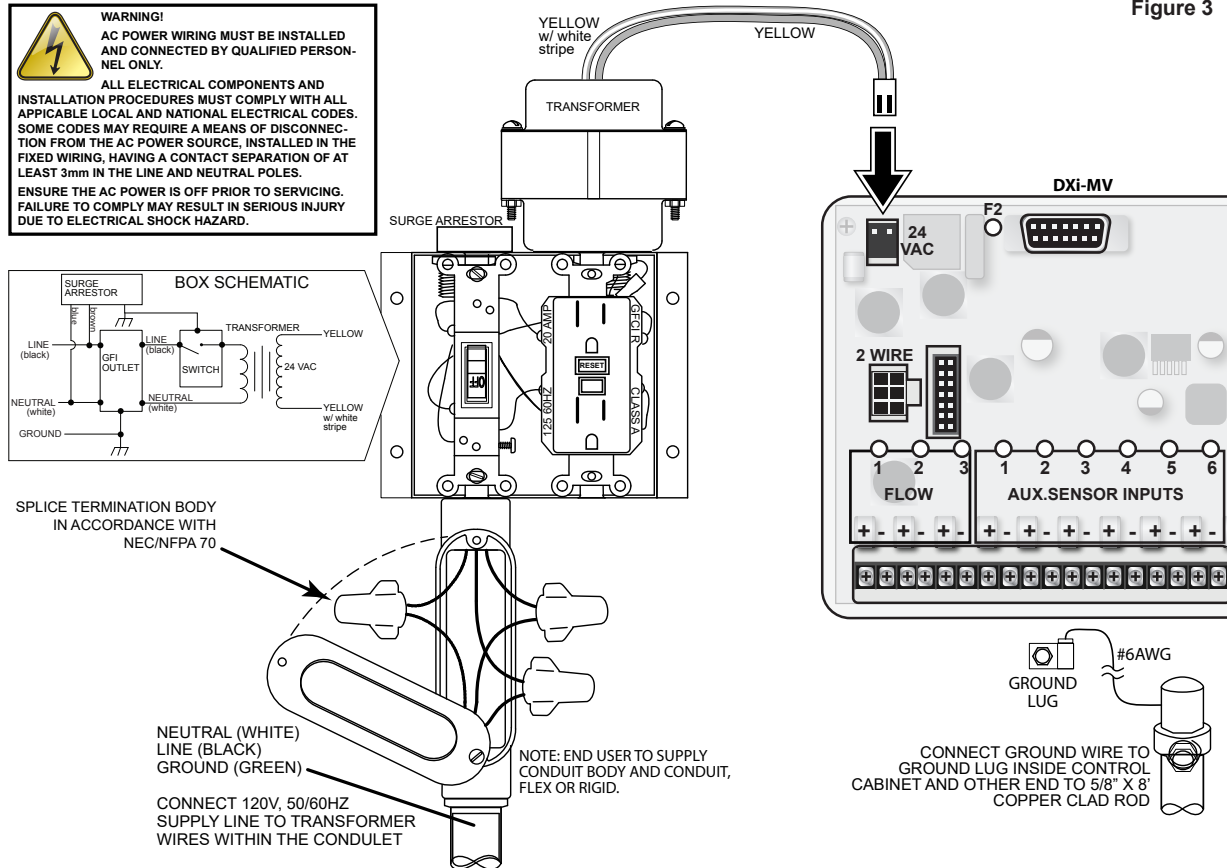


Do not apply power to the controller until all remaining installation procedures have been completed.

Table 1

AC Service Type	Line	Neutral	Equipment Ground
100 - 120 VAC (domestic)	Hot (Black)	Neutral (White)	Green
220 - 240 VAC (international)	Hot (Brown)	Neutral (Blue)	Green / Yellow

Figure 3



Grounding the DXi Controller

Earth Ground

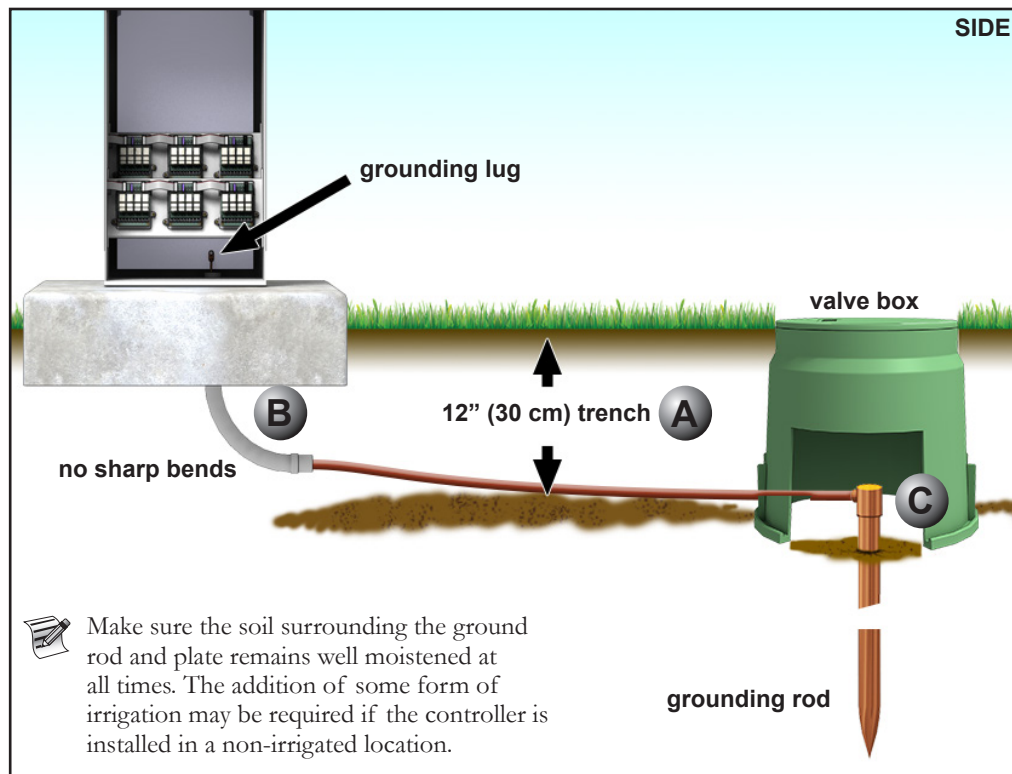


IMPORTANT! The DXi controller surge protection components cannot properly function unless an efficient pathway to earth ground is provided. The ground path must be as direct as possible, without sharp bends and must not exceed 10 Ohm resistance (when measured with an earth ground resistance device). All electrical components throughout the irrigation system should be grounded similarly to provide the same ground potential.

The following instructions depict one of several acceptable earth grounding methods. Due to variables in soil composition and terrain, the method shown may not be suitable for your installation site. Contact your local Toro distributor for assistance and availability of the required earth ground resistance test instrument. Recommended ground testers are: AEMC Instruments, model 3710 clamp-on tester, or Biddle Megger, model 250260 (or equivalent).

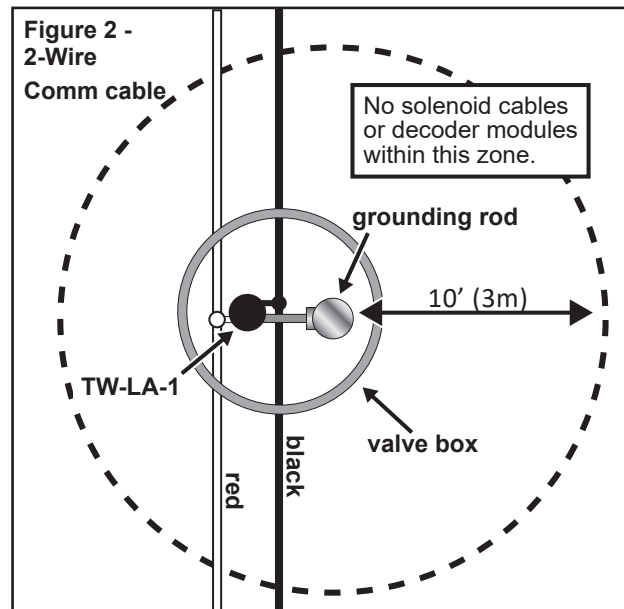
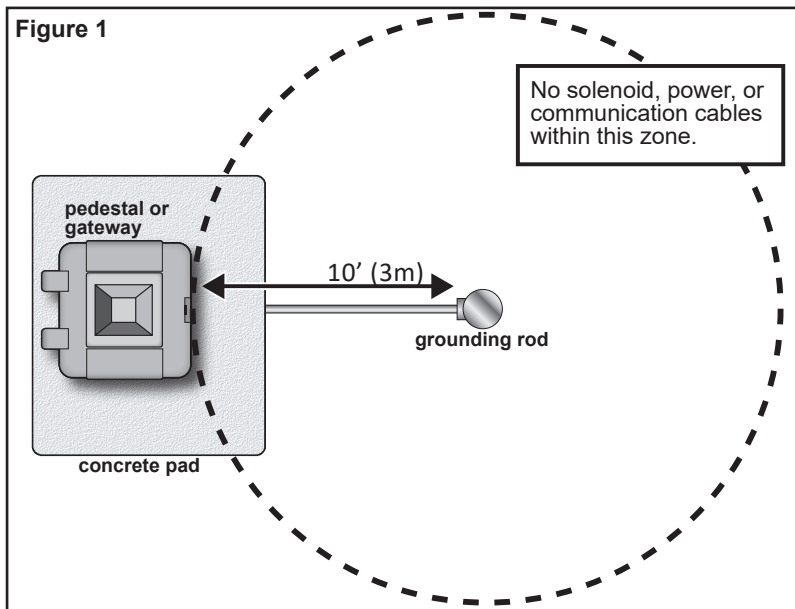
Steps

1. Drive a 5/8" by 10' (17mm x 3m) copper-clad steel rod into well-moistened soil, not less than 10' (3 m) or more than 12' (3.7 m) from the controller. The top of the ground rod should be buried approximately 12" (30.5cm) below grade (A).
2. Route a 6 AWG (13,0mm²) solid copper wire connected to the earth ground device into the controller cabinet through the access hole provided below the copper ground lug. Insert and secure the copper wire to the ground lug. To provide the most efficient path to earth ground, route the ground wire between the ground rod and controller with the least amount of bending possible. There should be no tight radius bends, nicks, or deep scratches the entire length of the wire (B).
3. For optimum connectivity, secure the ground wire to the ground rod using a Cad-Weld™ (or equivalent) metal-fusion connection method (C).
4. Using an earth-ground resistance tester; i.e., Meggor® or equivalent, confirm the resistance reading between the controller and ground rod is 10 ohms or less. Contact your local Toro distributor for assistance in obtaining the earth ground-resistance test device. Periodically retest the earth ground connection to confirm that resistance remains at 10 ohms or less.



Spacing

Figures 1 and 2 below show minimum distances of controller to grounding rod. Note that all other electrical equipment, such as solenoids and power and communication cables, must *not* be within a 10' radius of the grounding rod.



Communication Cable Ground

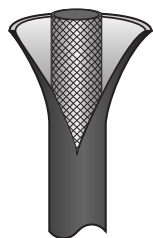
The first pages of this section covered grounding the DXi chassis.

For the Laguna DXi controller, proper grounding of the DXi communication cable is essential too.

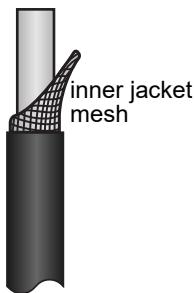
The cable connecting each DX3 / DXi controller (part number EV-CAB-COMM) contains one twisted pair and one mesh outer shield. By exposing the twisting the mesh shield (see **Prepping the Communications Cable**, it can serve as the ground connection between controllers. The ground connection can be attached to:

- the GND input on the DX Comm board (Method 1 - one ground wire only)
- grounding screw/s mounted in the chassis (Methods 2 and 3).

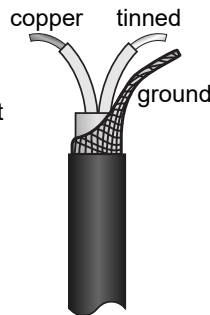
Prepping the Communications Cable



1) Slice outer jacket of COM wire to reveal wire mesh.

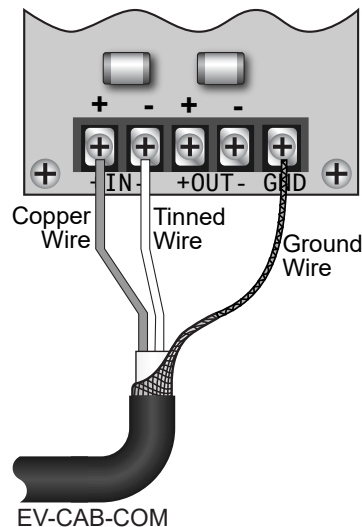


2) Trim away outer layer. Twist mesh to form ground wire.



3) Trim inner jacket to expose copper and tinned wires.

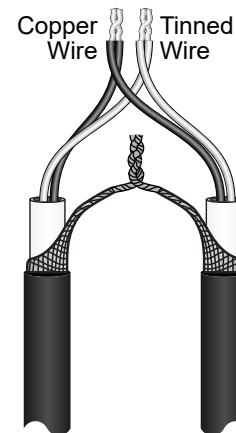
Method 1 - Ground to Comm Board



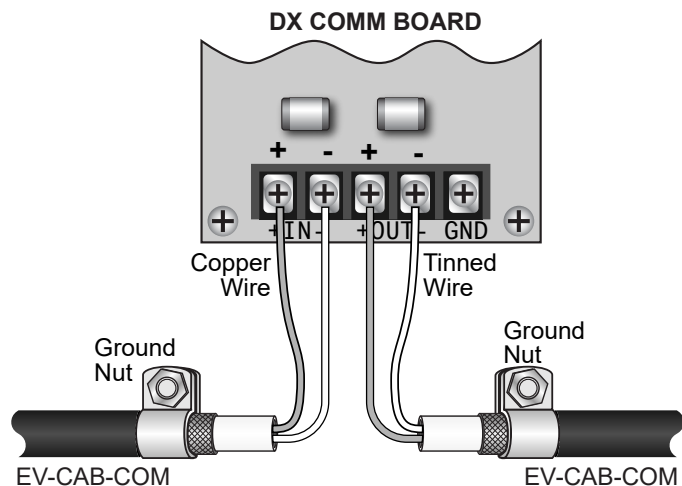
Splicing COM Ground Wires

It is possible to splice two COM wires together. Be sure to splice the ground wires together as well.

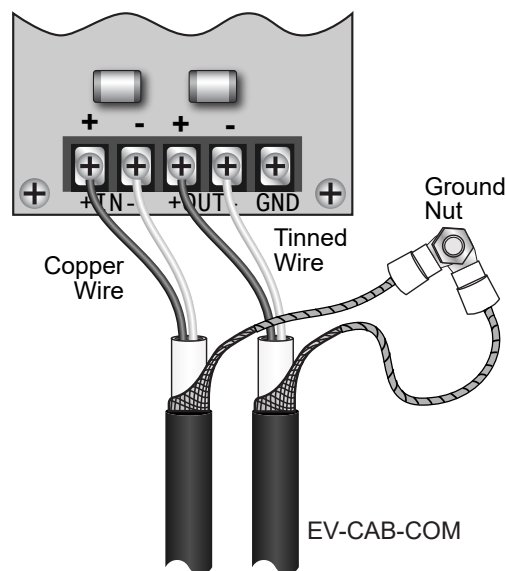
Spliced ground wires can be terminated in a ground nut.



Method 2 - Ground to Ground Screw



Method 3 - Two COM wires ground to Ground Screw



NOTE: For methods 2 and 3, ground nut screws might have to be added by drilling holes in the controller chassis. See "Prepping the Chassis", page 14, for complete instructions.

Prepping the Chassis

Methods 2 and 3 might require installing a ground nut into the controller chassis. Follow these directions carefully to ensure grounding and chassis water rating are not compromised.

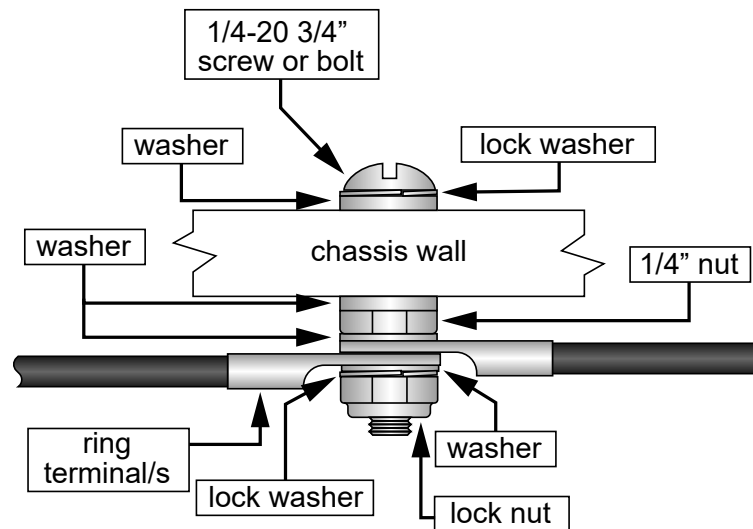
1. Drill hole location. The ground nut should be installed within 12 cm of the terminal blocks of the DX output board. On the interior, the drill hole should be as unobstructed and clear of interior cards and cables as possible.
2. Drill a 1/4" hole. Have on hand a stainless-steel flathead machine screw (1/4-20) x 3/4" that engages at least two full threads.
3. Use the diagram, right, to install the screw and the various washers, lock washers, ring terminals, and nuts.

To crimp the ground wires into the ring terminals, follow **Ring Terminal** instructions, right.



Be sure that washers are installed on both sides of the chassis wall to ensure water cannot ingress.

4. Secure ring terminals with washer, lock washer, and lock nut.



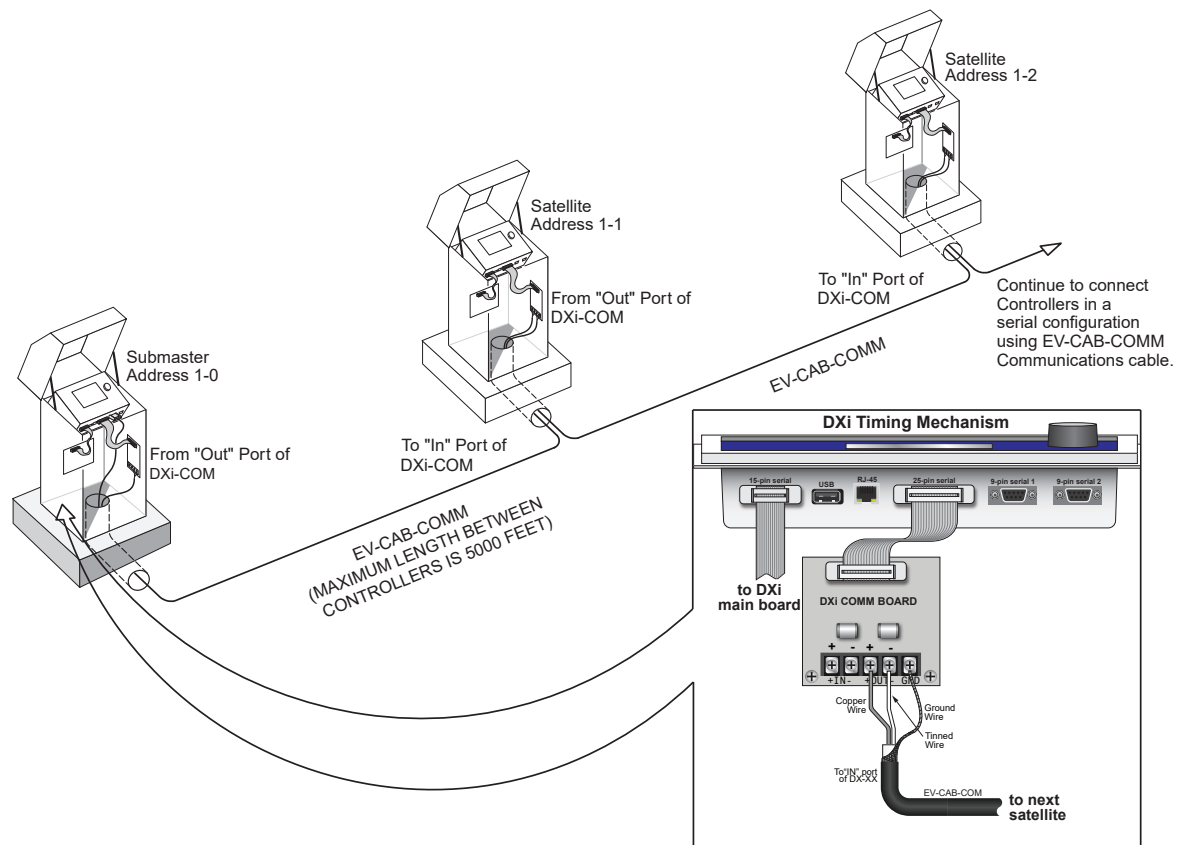
Ring Terminal Specifications

Part number: 415-0210: MPN 711K818

Crimping Instructions:

1. Mount the terminal on a threaded screw or stud for a secure connection.
2. Use a wire crimper (McMaster part 7289K1 or similar) to fasten ground leads to wire. Place crimp end into the die of the tool with ground leads passing through. Apply pressure on the crimp until ground leads are securely fastened into the crimping end of the terminal.

DXi HARDWARE COMMUNICATIONS AND GROUNDING



Field Wiring



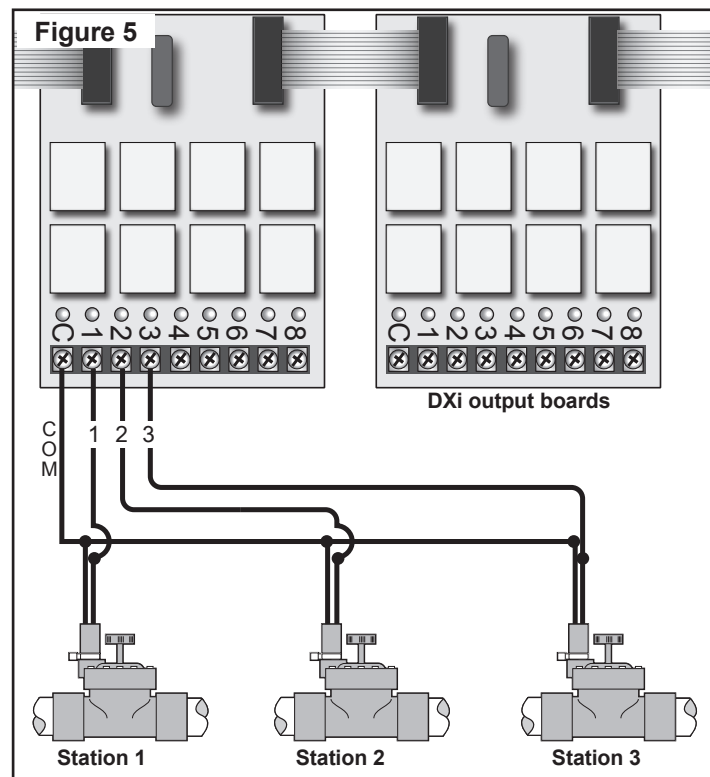
IMPORTANT! The DXi controller is powered by a 24VAC, 100VA transformer. The controller can be programmed to operate multiple programs concurrently in addition to up to three master valves and up to two pump relays. Each individual station output is rated up to 2.5A @ 140°F (60°C). Ensure the total current draw on all station outputs, master valves and pumps does not exceed 2.75A. The controller will automatically detect excessive current load and generate appropriate alert(s).

Connecting Station Valves

Use waterproof connectors on all field wire splices to prevent corrosion and possible short circuit.

Ensure all exposed wiring inside the controller cabinet is taped back and properly insulated.

1. Route a separate control wire from each station output terminal (1, 2, 3...) to the corresponding valve location. Using a waterproof wire splice connector, attach the control wire to either valve solenoid lead (see **Figure 5**).
2. Route the field common wire(s) from the output board's common (C) terminal to interconnect the remaining lead of each valve solenoid to the field common circuit.



Master Valve, Pump, and Flow Sensor Wiring

The cover on the DX1 main board shows all inputs and terminal polarity (see **Figure 6**).

Master Valve

1. Route the control wire from the **MV1** terminal to the master valve location. Using a waterproof wire splice connector, attach the control wire to the master valve solenoid lead.
2. Route the field common wire(s) from one of the controller's multiple **COM** terminals to interconnect the remaining lead of the master valve solenoid to the field common circuit.

Pump

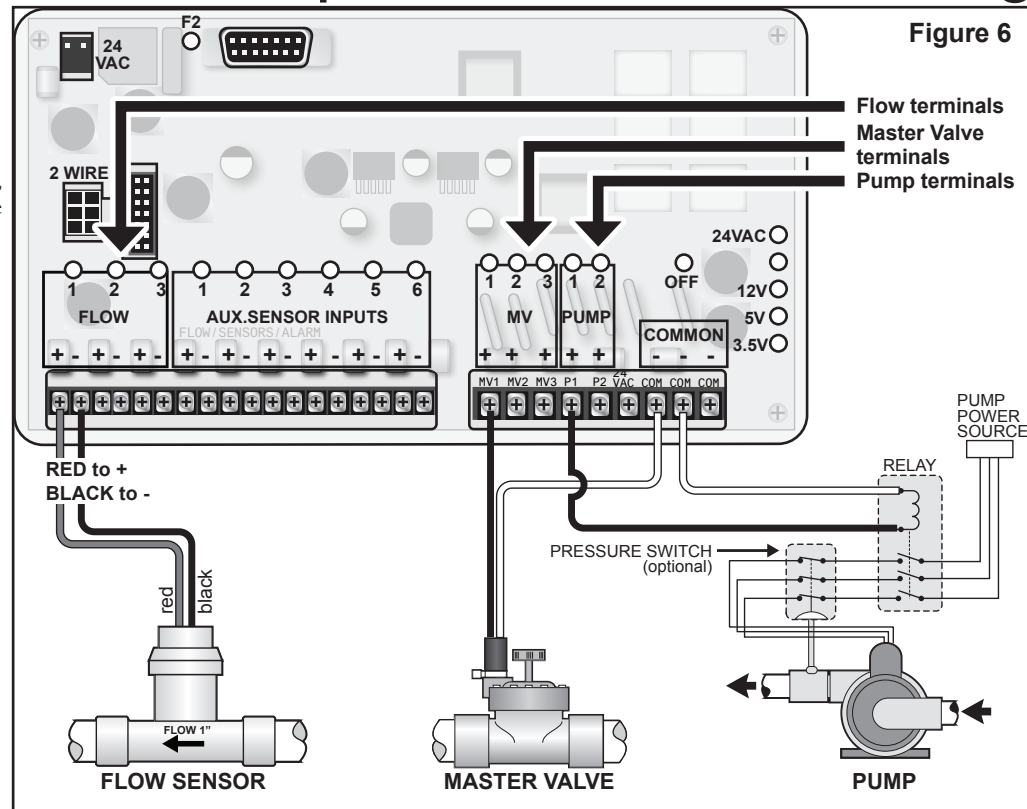
Do the same for the pump, routing the control wire from the **P1** terminal to the pump relay and the common wire from the **COM** terminal to the relay.

Flow Sensor

The DXi controller can manage up to three flow sensors: Flow 1, Flow 2, and Flow 3.

To install a Irritrol or Toro flow sensor, connect the red and black wires as shown.

See the DXi User Guide to configure the flow sensor.



Auxiliary Sensors

The DXi controller provides five auxiliary sensor inputs for a variety of sensors. The first three input pairs (1, 2, and 3) are for a rain bucket, a wind sensor, and an ET input, in that order.

Input pairs 4 and 5 are reserved for normally-open sensors such as a rain sensor (see Figure 7) or a freeze sensor.

To install a normally open sensor (such as an Irritrol or Toro rain sensor) into any one of those terminals, connect the red and black wires as shown.

When closed, auxiliary input 4 or 5 halts irrigation programs and displays a different message on the DXi screen, “Rain Aux4” or “Freeze Aux5”.

Sensor input 6 is a 4-20mA sensor that reads current when connected. To connect a 4-20mA sensor to these terminals, connect the red wire from the sensor to the 12V terminal. Connect the sensor's black wire to terminal of Input 6. Finally, connect a third wire between the - terminal and COM. This additional wire is not provided but it could be an 18-gauge insulated wire with exposed copper ends about 6" long.

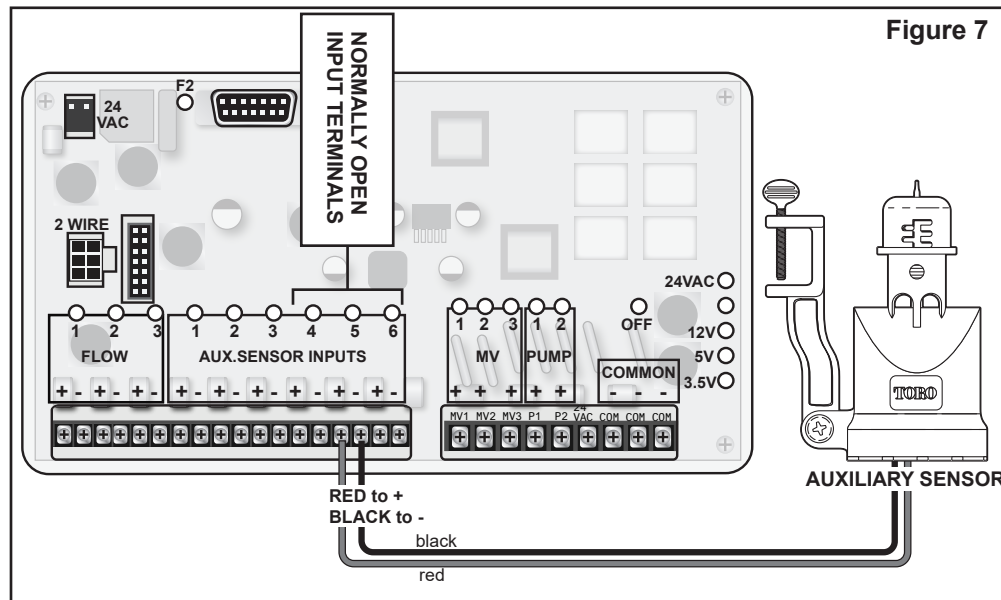


Figure 7

The 24VAC Output Terminal

Between the PUMP and COMMON output terminals (Figure 7), you will see a single 24VAC output terminal. It is there to power accessories such as pumps or sensors. An example is the Irritrol wireless rain sensor, which needs 24VAC to power the receiver.

2-Wire Decoders

Programming the Decoders

Toro decoders are configured in 1-, 2-, and 4-station models, and as shipped from the factory, have no pre-defined station assignments. In order to be recognized by the DXi controller, each station must be defined as either a station number from 1 to 200, a Master Valve control, or a Pump control. To facilitate decoder programming, a quick-connect programming port is provided on the Two-Wire Decoder module board (see **Figure 8**).

The DXi enables the decoders to be temporarily connected and programmed without disconnecting power.

1. Insert the red and black decoder wires into the corresponding terminal block positions as illustrated.
2. Apply power to the DXi controller. After it completes booting up, go to the Setup menu, select **Program Decoder**.
3. Change the New Address field.
4. Be sure to mark the decoder with its new address.

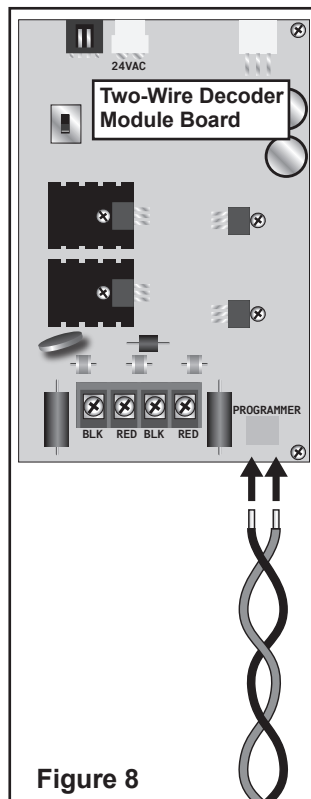


Figure 8

Two-wire Decoder System Specifications

Decoder Cable

Toro communication cable, TW-CAB-14, is recommended. Twisted-pair, polyethylene-jacketed communication cable, and PVC-insulated, single-core “irrigation” wire is not proven to be reliable for Toro decoder system application, and is NOT recommended.

- Two-conductor, 14-gauge, solid-core copper wire, double-jacketed insulation manufactured of high-density, sunlight-resistant polyethylene or UF-B UL PVC with a minimum wall thickness of .060” (1.5mm). A protective outer sheath must be manufactured of polyethylene or PVC material conforming to ICEA S-GL-402 or NEMA WC5, with a minimum wall thickness of .045” (1.2mm) and approved for direct burial installation.
- All wire insulation and conductors must be fully intact and free of nicks or cuts.
- A minimum wire size of 14-gauge (2mm²) is required for straight-line cable installation; i.e., wire distance to the furthest decoder not on a loop.

Decoder Cable Configuration

To provide the optimum power and communication for system operation, the recommended wire path configuration is a continuous loop beginning and ending at the controller, and is often routed generally following the main water lines. The loop configuration provides a redundant path for decoder operation, allowing the system to continue operation even in the event of a damaged cable.

Other supported decoder cable path configurations include: straight line, looped, grid, or a combination of these methods. Separate branch paths can be tapped from the main loop, and are not required to feed back to the main trunk line. A branch path can be configured as a loop or a single line. The Toro decoder system will function with most wiring configurations when the correct wire type, size, and length of run are within specification.

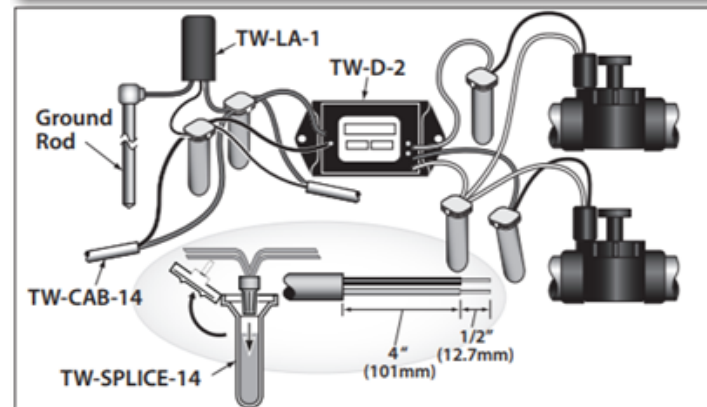
Installing the Decoders

Installing a decoder system requires a different approach to field installation compared to a conventional multi-wire irrigation control system. The main differences include:

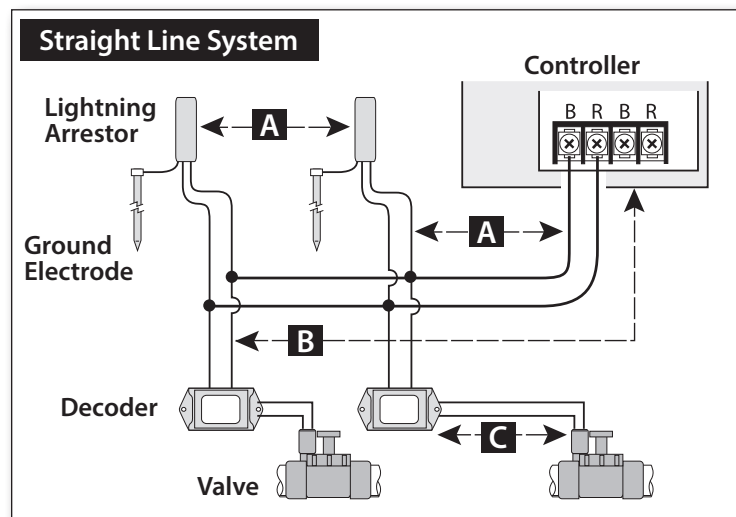
- A two-wire cable provides power and communication signals from the controller to up to 205 decoders for individual control (Stations 1 to 200, 3 Master Valves and 2 Pumps).
- The two-wire cable system can be configured in one of three methods: straight line, grid or loop, as illustrated in Appendix I.
- TW-LA-1 lightning arrestors must be connected throughout the two-wire path at intervals of 600' (183m) or less. The same grounding requirements as specified for the controller are required for each lightning arrestor.
- The cable wire path from the furthest decoder to the controller cannot exceed 5000' (1.54km).
- The cable wire length from the decoder to the valve (or pump) must not exceed 100' (30m).
- TW-CAB-14 – 14-gauge, two-wire direct-burial communication cable (or equivalent) is required for decoder connection.
- Two-wire cable wire color polarity must be maintained throughout the system and connected to the corresponding controller terminals.

- All wire splices and field connections must be insulated using TW-SPLICE-14 waterproof wire connectors (or equivalent).
- It is recommended that the decoders are installed in an approved valve box to provide easy access to the wiring.

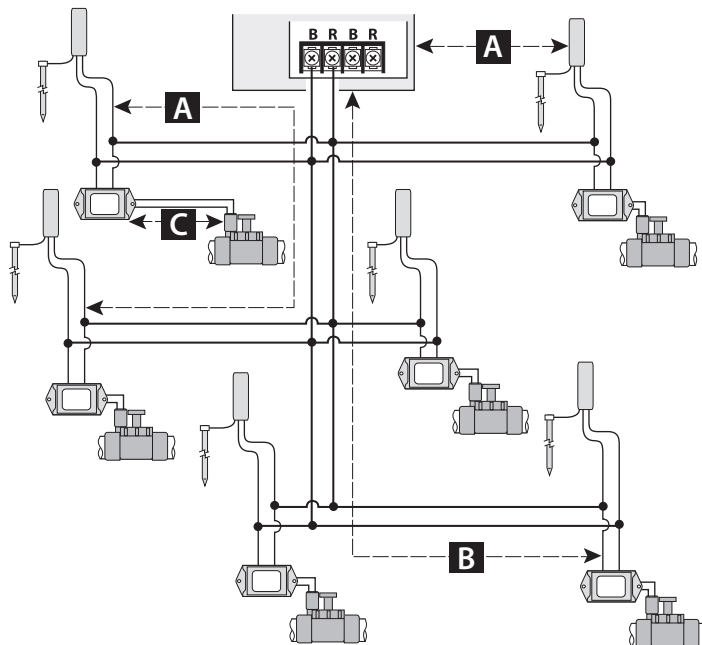
Part No. — Description	Part No. — Description
TW-D-1 Single Valve Decoder	TW-SPLICE-14 Waterproof Wire Splice
TW-D-2 Dual Valve Decoder	TW-CAB-14 14-Gauge, 2-Wire, Direct-Burial Cable
TW-D-4 Quad Valve Decoder	
TW-LA-1 Lightning Arrestor	



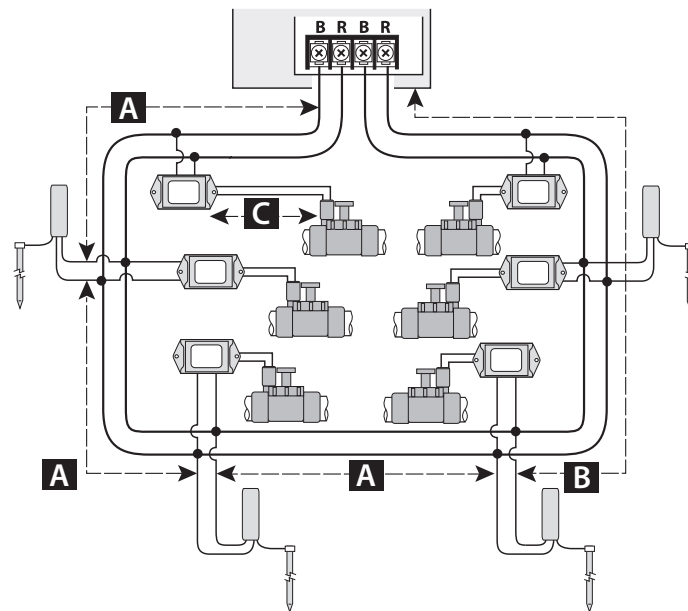
Appendix I: 2-Wire Layouts



Grid System



Loop System



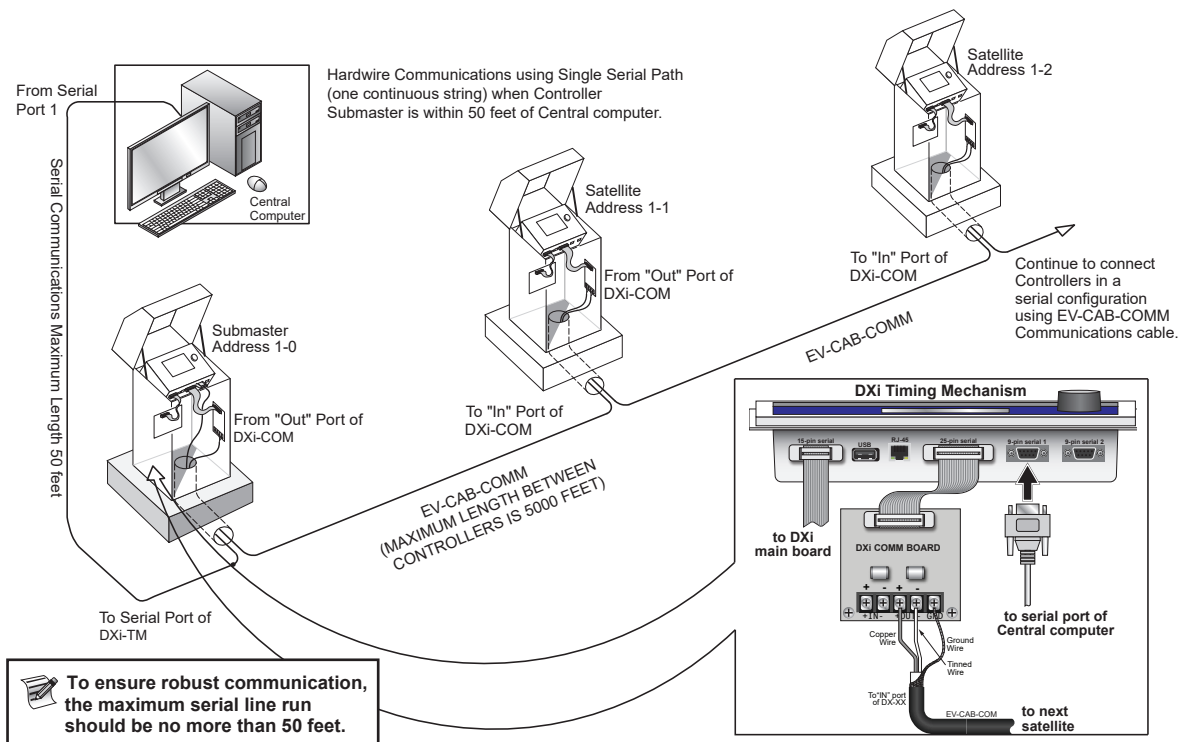
Appendix II: Central to Submaster Communication

There are multiple ways to establish communication between a computer running Laguna or WMS software and a DXi controller:

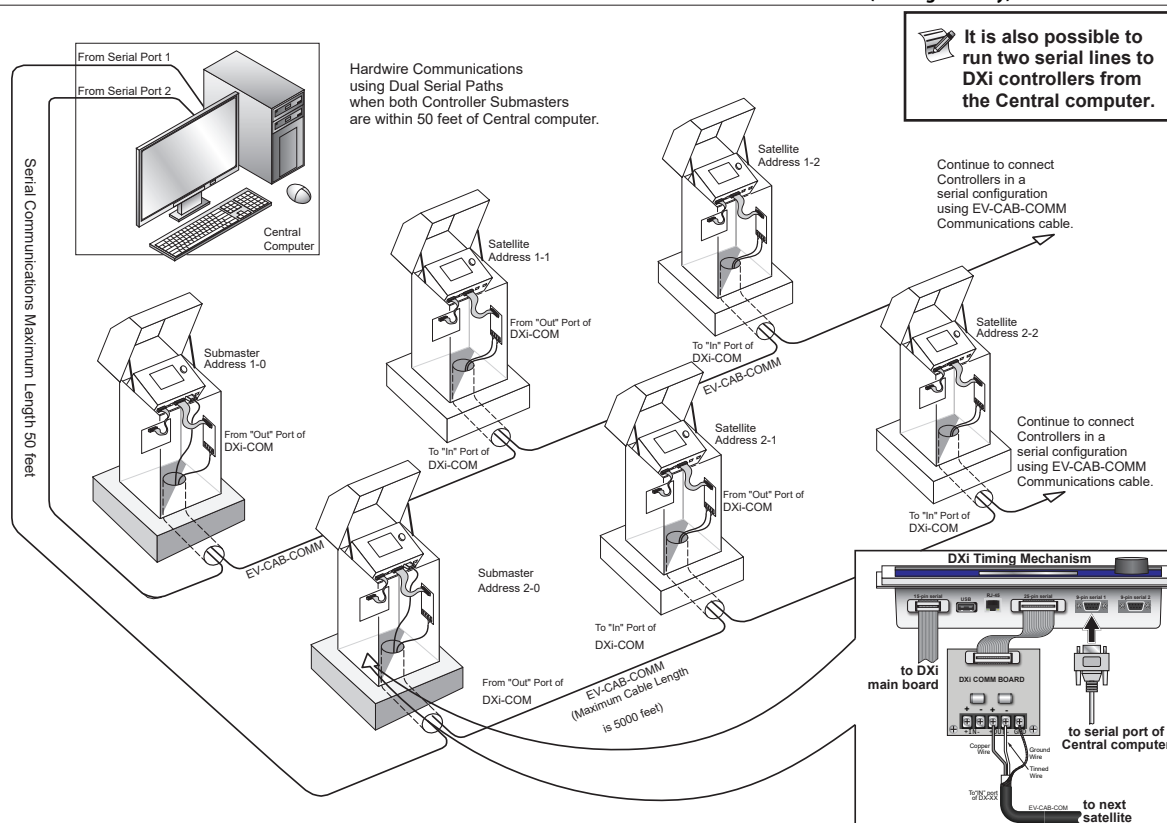
- Serial (Laguna only)
- Ethernet
- UHF radio
- WiFi
- Cellular

The illustrations that follow show the various cable connections.

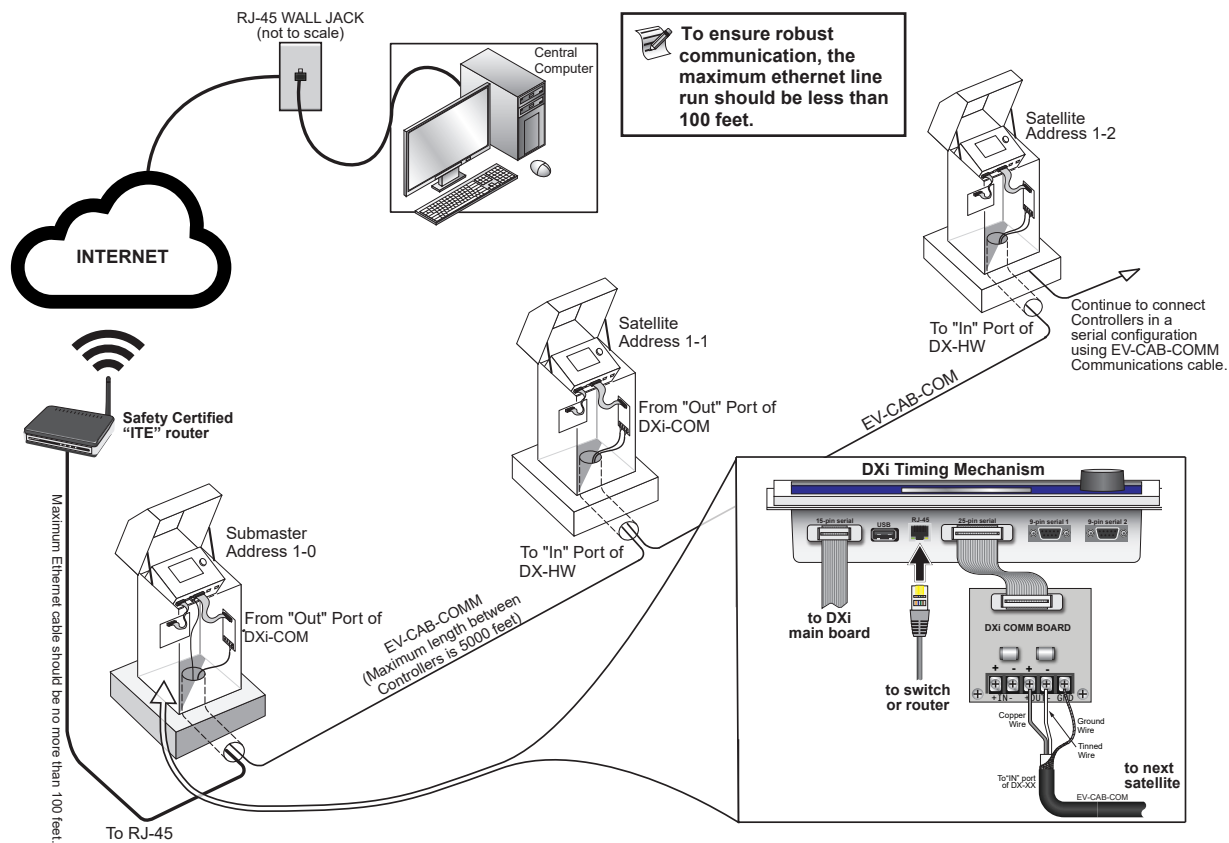
DXi HARDWARE COMMUNICATIONS • SINGLE SERIAL PATH LESS THAN 50 FEET (DXi Laguna only)



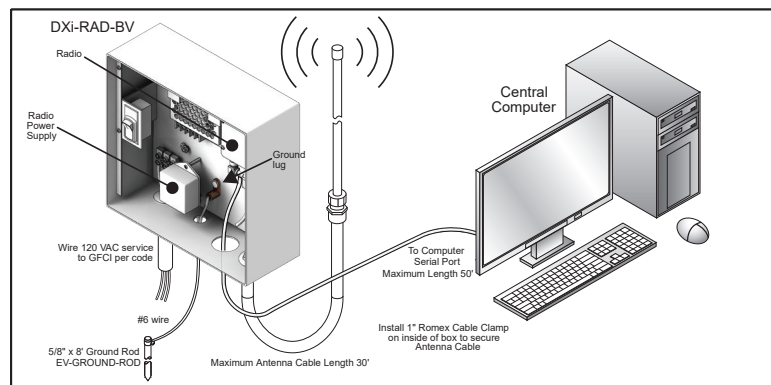
DXi HARDWARE COMMUNICATIONS - DUAL SERIES PATH LESS THAN 50 FEET (DXi Laguna only)



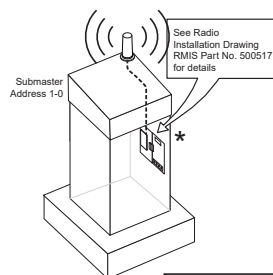
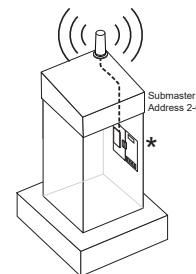
DXi ETHERNET COMMUNICATIONS INTERFACE



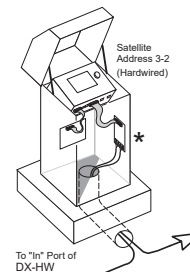
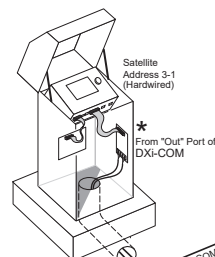
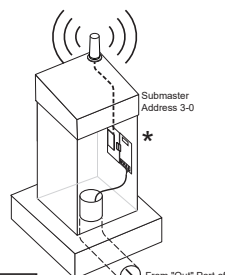
DXi RADIO COMMUNICATIONS OVERVIEW



 **An FCC license is required to operate on any given UHF frequency. Contact your local Toro distributor for more information.**



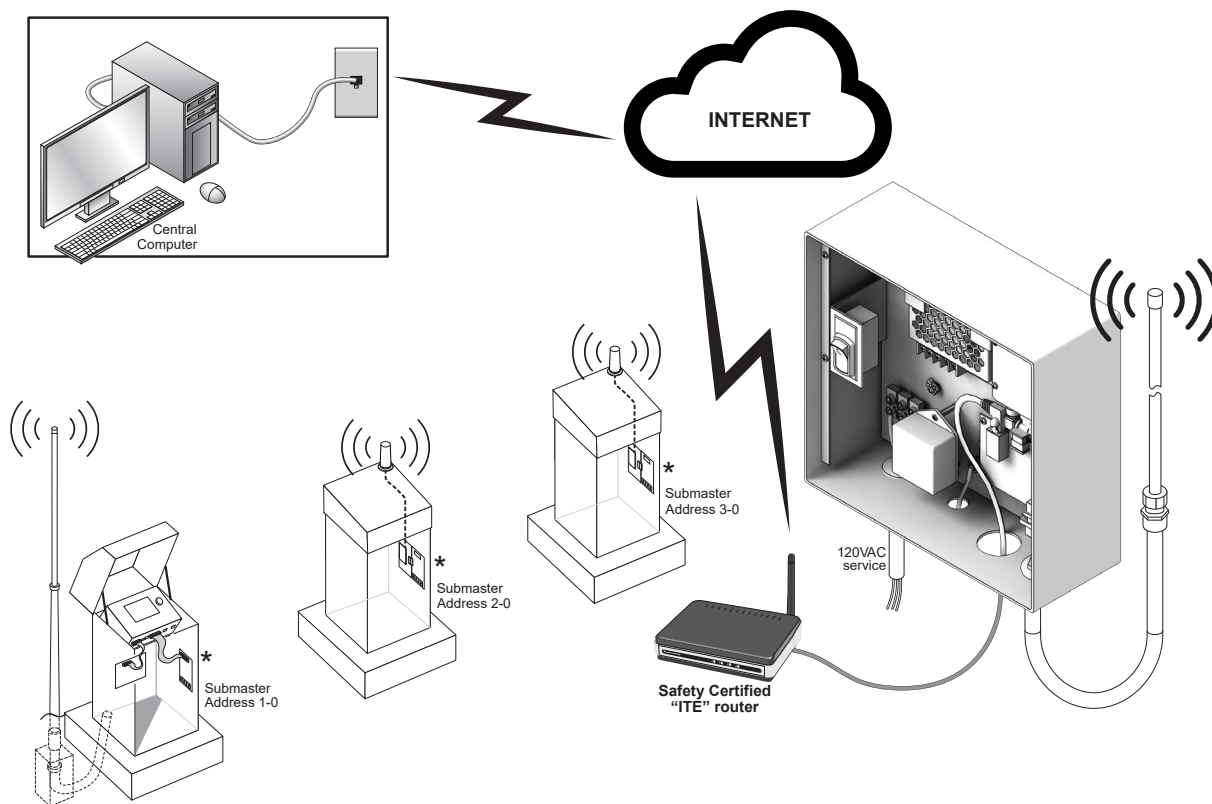
* DXi-COM and radio antenna will connect on side of satellite.



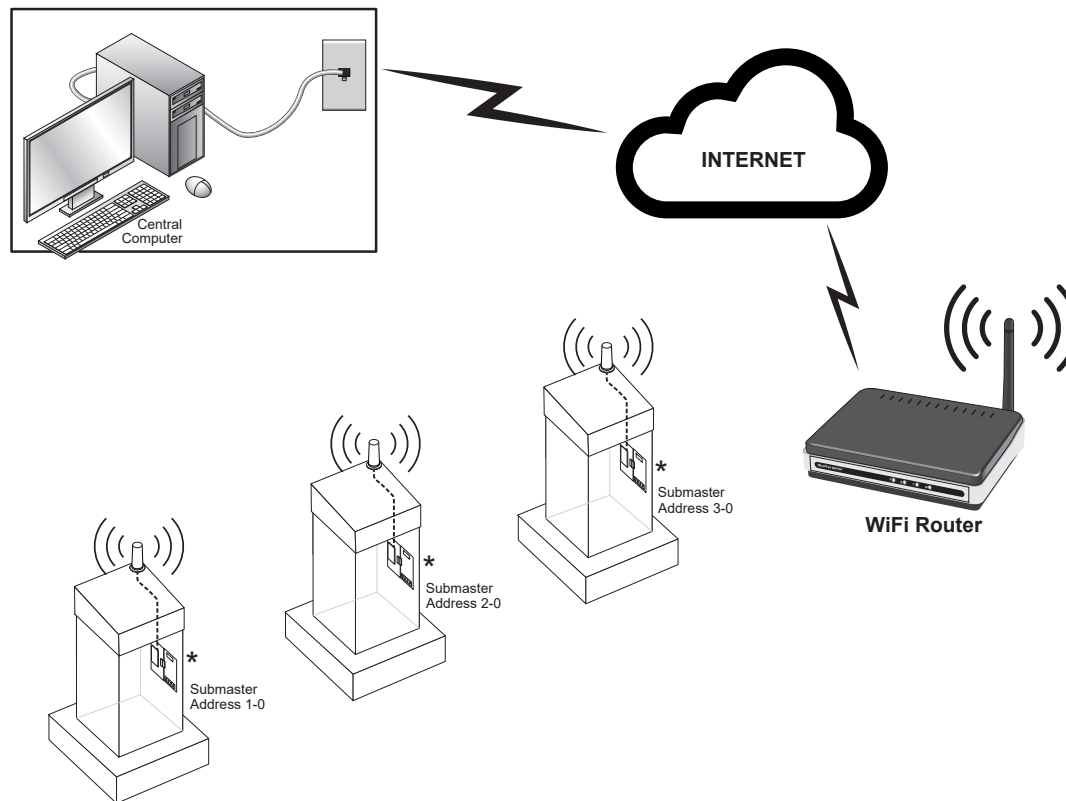
Continue to connect Controllers in a serial configuration using EV-CAB-COMM Communications cable.

EV-CAB-COMM
(Maximum Cable Length is 5000 feet)

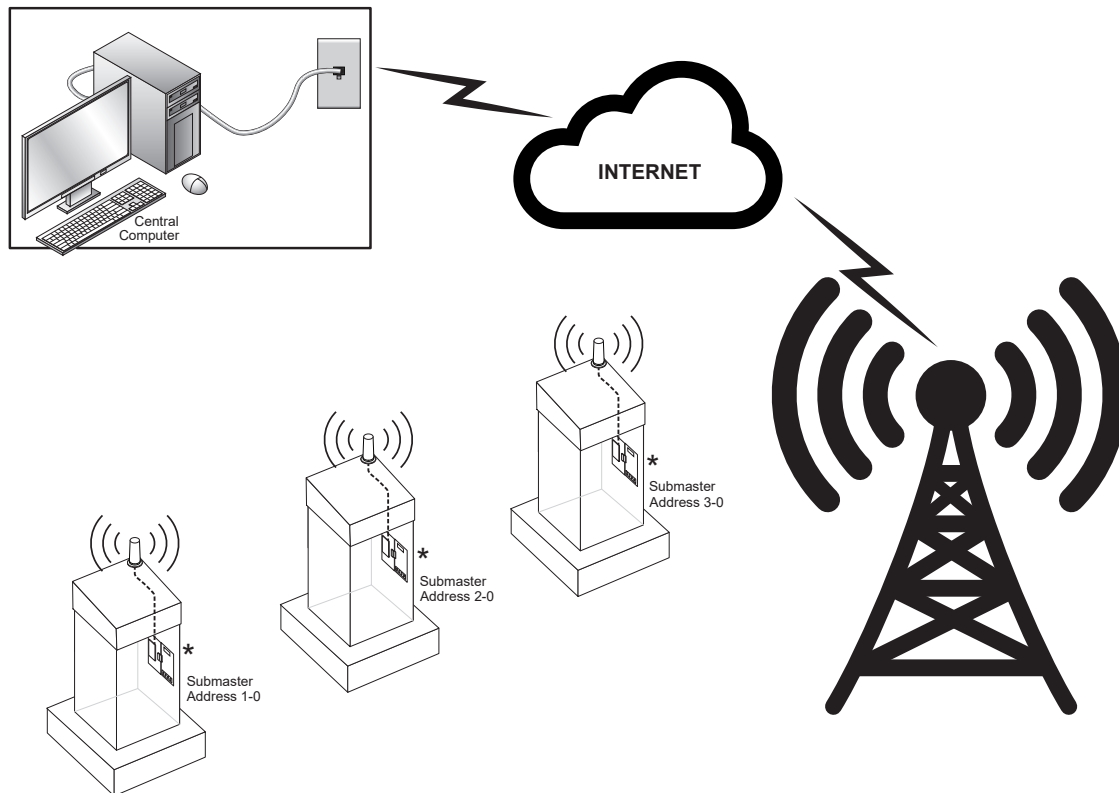
DXi ETHERNET RADIO REPEATER OVERVIEW (AKA CTM)



DXi ETHERNET WIFI OVERVIEW



DXi ETHERNET CELLULAR OVERVIEW



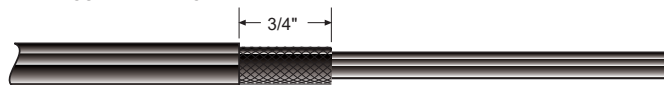
DXi HARDWIRE CABLE INSTALLATION

PREPARE EV-CAB-COMM CABLE

1. REMOVE OUTER INSULATION



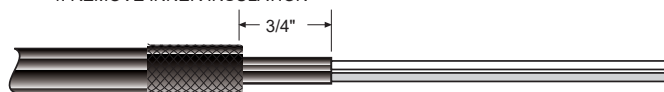
2. CUT BRAID BACK



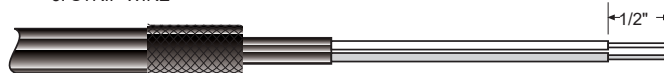
3. FOLD BRAID BACK OVER OUTER JACKET



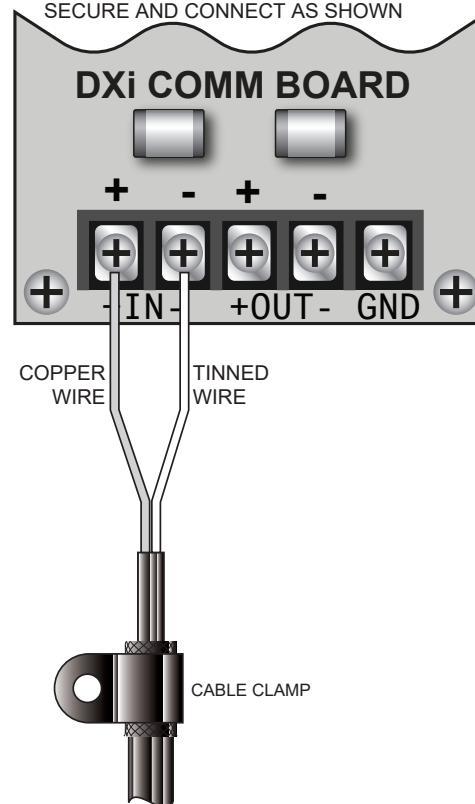
4. REMOVE INNER INSULATION



5. STRIP WIRE



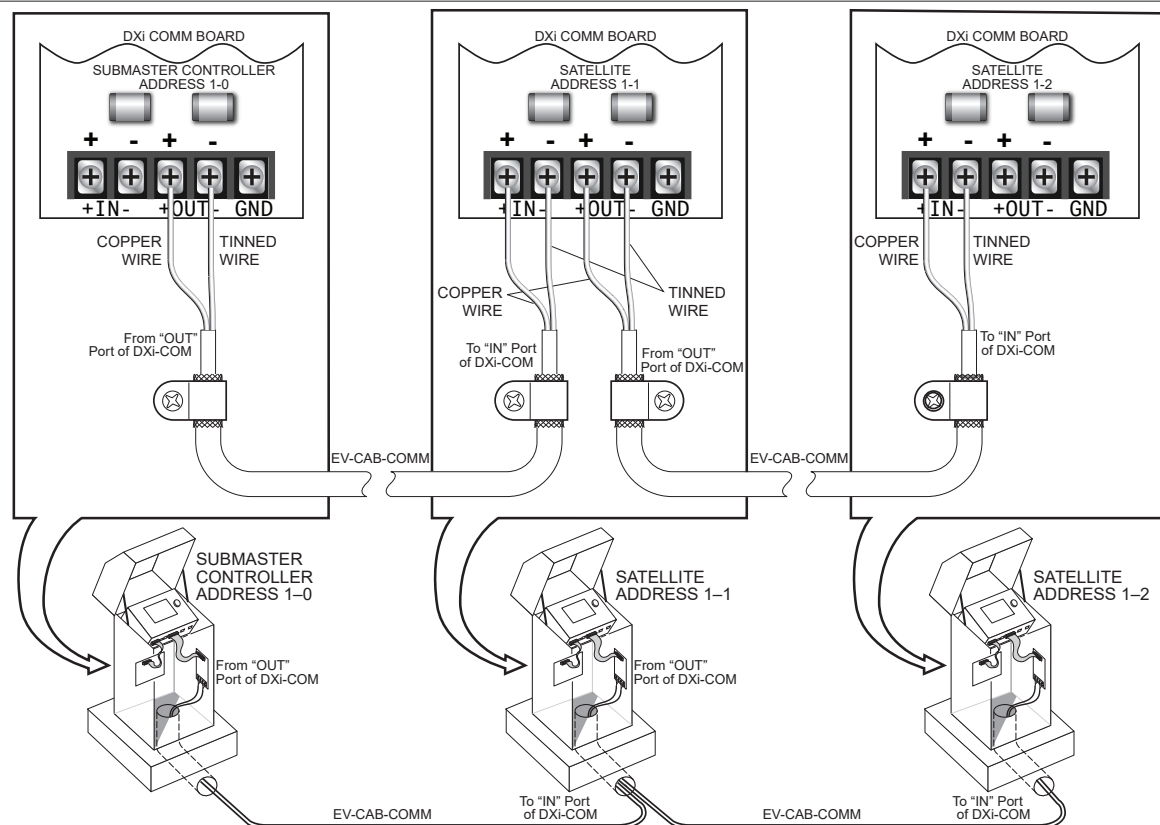
SECURE AND CONNECT AS SHOWN



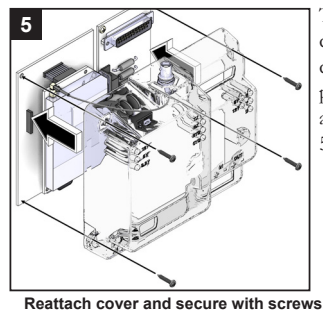
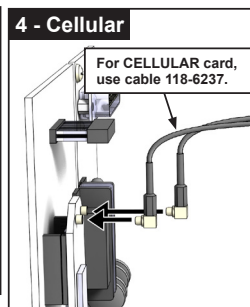
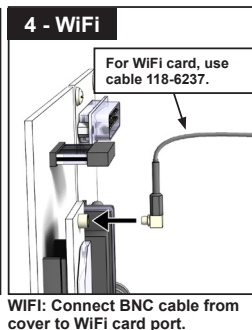
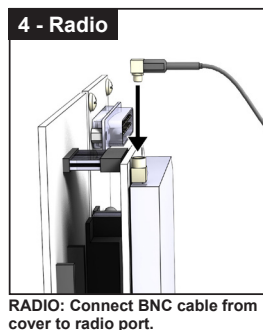
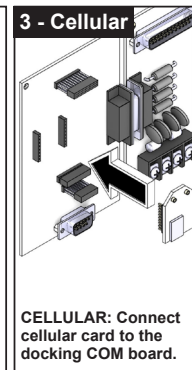
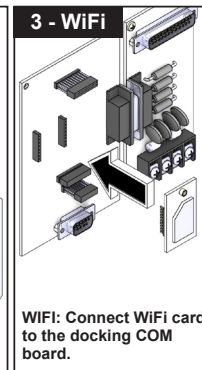
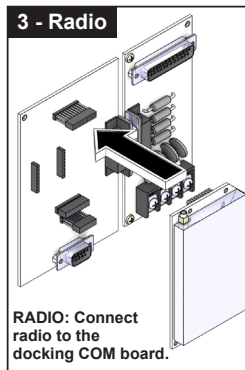
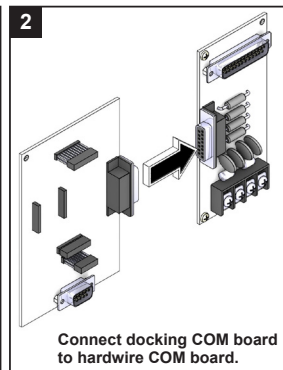
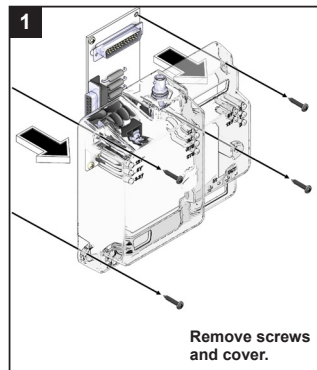
The illustrations above show multiple satellites “daisy-chained” together, necessary to take advantage of DXi’s Flow Max capability. The following two illustrations show how to connect DXi satellite together.

The GND terminals should also be connected following the procedure in pages 11 & 12, “Communication Cable Ground”.

DXi HARDWARE CONNECTIONS



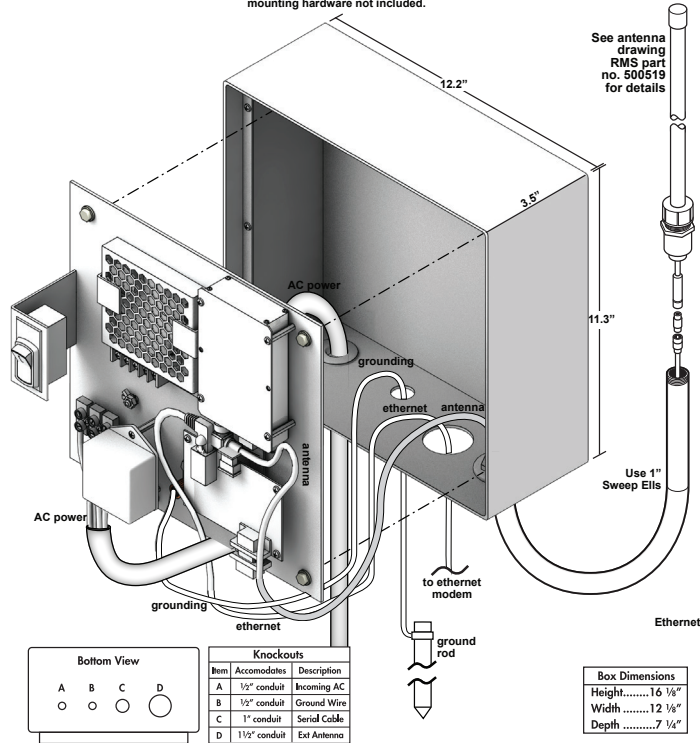
DXi Wireless Communication Installation



To connect the comm board cover's BNC port to the antenna, see 500520.

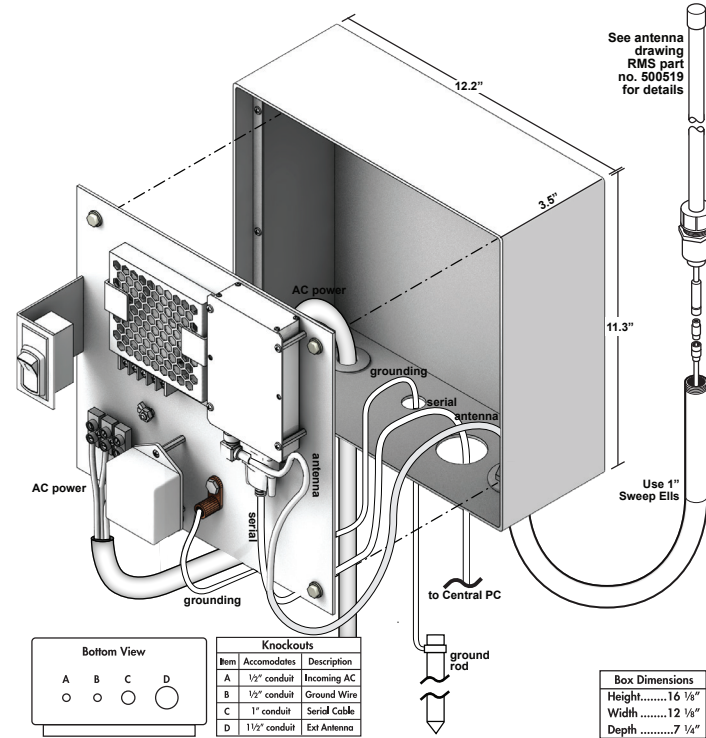
DXi Ethernet Radio Repeater (AKA CTM)

Note: DXi-ETHER-RF-RPTR includes all components within the enclosure as well as 30 feet of antenna coax cable 417-1002. Antenna EV-ANT-1 and mounting hardware not included.



DXi Serial Base Radio

Note: DXi-RAD-BV includes all components within the enclosure, 30 feet of antenna coax cable 417-1002, and antenna EV-ANT-1. (Mounting hardware is not included.)



DXi Radio Antenna Installation

EV-ANT-KIT5 INCLUDES:

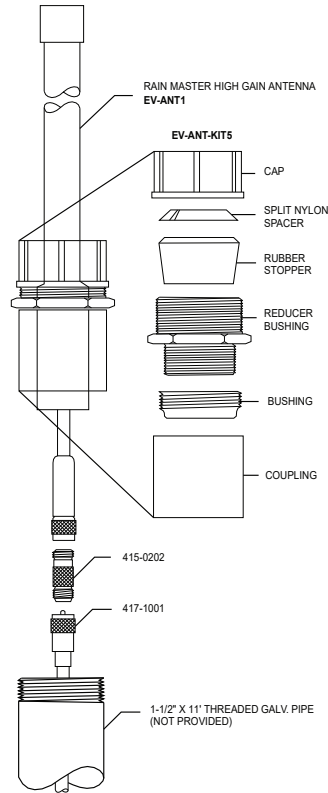
1. 705-0104 CAP, SPACER, STOPPER, REDUCER
2. 705-0103 BUSHING
3. 705-0102 COUPLING

EV-ANT-F INCLUDES:

1. EV-ANT1 5DB ANTENNA
2. 415-0202 FEM N TO UHF ADAPTER
3. 417-1001 20' COAX CABLE
4. 415-0207 UHF/BNC ADAPTER (NOT SHOWN)

ASSEMBLY INSTRUCTIONS

1. FEED THE COAX CABLE PIN 417-1001 TO THE TOP OF THE GALVENIZED PIPE.
2. CONNECT EV-ANT1 TO MATING CONNECTOR 415-0202.
3. THREAD BUSHING INTO 1 1/2" COUPLING.
4. THREAD REDUCER BUSHING INTO COUPLER, BUSHING ASSEMBLY.
5. SLIP ASSEMBLY OVER TOP OF ANTENNA UNTIL IT STOPS AT ANTENNA BASE.
6. SLIDE RUBBER STOPPER WITH SMALL END DOWN OVER TOP OF ANTENNA.
7. EXPAND SPLIT NYLON SPACER ABOVE COUPLING ASSEMBLY.
8. SLIDE CAP OVER TOP OF ANTENNA (DO NOT TIGHTEN CAP).
9. THREAD PARTIALLY COMPLETED ASSEMBLY ONTO THE GALVENIZED PIPE.
10. TIGHTEN CAP TO COMPRESS RUBBER AROUND ANTENNA.
11. ROUTE BOTTOM OF ANTENNA CABLE THROUGH CONDUIT TO CONTROLLER.



Support

TORO LIMITED WARRANTY

Excluding software and products formerly produced under the Toro® brand name, Toro® offers the following coverage to its trade customers:

Toro offers a 5-year manufacturer's warranty on all purchased controllers.

For the first year, from the date of original sale to the trade customer, product may be exchanged "hassle-free" over-the-counter, should it have original manufacturing defects. For years two through five from the date of original sale to the trade customer, all parts which are found to have original manufacturing defects, shall be repaired or replaced (Toro's choice), provided the product is returned to the original place of purchase or sent to the Toro Controller repair facility at 5825 Jasmine St, Riverside CA 92504, postage paid.

All Toro parts & accessories have a 2-year warranty, unless otherwise noted.

Toro Laguna Software has a 90-day warranty. All computer hardware purchased from Toro in conjunction with its PC-related software is NOT covered by any Toro warranty. Computer hardware and the installed operating system(s) is specifically covered by the hardware manufacturer's warranty as provided by the hardware manufacturer.

This warranty does not apply to loss or damage to the product due to improper installation, abuse, alteration, mishandling, accident, or if the product has been serviced by other than Toro or its authorized service centers. This warranty is not a consumer warranty and does not extend to anyone other than those trade customers who purchase Toro products.

NOTE: Toro is not liable for (i) failure of products not manufactured by Toro even though such products may be sold or used in conjunction with Toro products; (ii) indirect, incidental or consequential damages, including but not limited to vegetation loss during periods of malfunction or resulting non-use; (iii) any loss or damage (e.g., property damage) resulting from an installer's negligence; or (iv) implied warranties of merchantability or fitness for a particular purpose. Some states do not allow the exclusion of incidental or consequential damages, so the above exclusion may not apply to you.

In no event shall Toro be liable or in any way responsible, for any damages or defects in the product which were caused by repairs or attempted repairs performed by anyone other than an authorized Toro / Toro Service dealer or center.

This warranty supersedes all previous warranties and shall be the sole and exclusive warranty granted by Toro and shall be the sole and exclusive remedy available to the trade customer. Correction of defects, in the manner and period of time described herein, shall constitute complete fulfillment of all liabilities and responsibilities of Toro to the trade customer with respect to the product, and shall constitute full satisfaction of all claims, whether based on contract, negligence, strict liability or otherwise.

NOTE: The user is cautioned that changes and modifications made to the equipment without the express written consent of the manufacturer will void this warranty.

FCC Notice - Electromagnetic Compatibility

This equipment generates and uses radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio and television reception. It has been type tested and found to comply with the limits for a FCC Class A computing device in accordance with the specifications in Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient the receiving antenna.
- Relocate the irrigation controller with respect to the receiver.
- Move the irrigation controller away from the receiver.
- Plug the irrigation controller into a different outlet so the irrigation controller and receiver are on different branch circuits.

If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commission helpful:

"How to Identify and Resolve Radio-TV Interference Problems". This booklet is available from the U.S. Government Printing Office, Washington, DC 20402. Stock No. 004-000-00345-4.

Getting Help

Toro strives to build safe, durable, and easy to use product. If, however, you encounter a problem that referring to this manual cannot resolve, please contact an authorized Toro product expert for assistance via phone or email.

U.S./Canada:

Phone: 1-800-777-1477 (7:30 am–4 pm, M–F, PT)

E-mail: irrigationsupport@toro.com



Notes



WARNING: Cancer and Reproductive harm – www.P65Warnings.ca.gov.
For more information, please visit www.toro.com/CAProp65.

Patent: www.ttcopats.com



**5825 Jasmine St.
Riverside, CA 92504-1183
Toro support: 800.777.1477
irrigationsupport@toro.com
www.toro.com/dxi**

We reserve the right to improve our products and make changes in the specifications and designs without notice and without incurring obligation. Products depicted in this brochure are for demonstration purposes only. Actual products offered for sale may vary in design and features.

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P/N: 373-1063 Rev. A

EXHIBIT E Sample Contractor Agreement

AN AGREEMENT BY AND BETWEEN THE CITY OF LOUISVILLE AND
CONTRACTOR NAME FOR IRRIGATION CONTROLLER INSTALLATION

1).0 PARTIES

This AGREEMENT FOR **Irrigation Controller Installation** (this "Agreement") is made and entered into this DATE day of [REDACTED] (the "Effective Date"), by and between the **City of Louisville**, a Colorado home rule municipal corporation, hereinafter referred to as the "City", and **CONTRACTOR NAME**, hereinafter referred to as the "Contractor."

2).0 RECITALS AND PURPOSE

- a) The City desires to engage the Contractor for the purpose of providing **Irrigation Controller Installation** as further set forth in the Contractor's Scope of Services (which services are hereinafter referred to as the "Services" or "Work").
- b) The Contractor represents that it has the special expertise, qualifications and background necessary to complete the Services.

3).0 SCOPE OF SERVICES

The Contractor agrees to provide the City with the specific Services and to perform the specific tasks, duties and responsibilities set forth in Scope of Services attached hereto as Exhibit "A" and incorporated herein by reference.

4).0 COMPENSATION

- a) The City shall pay the Contractor for Services under this Agreement a total not to exceed the amounts set forth in Exhibit "B" attached hereto and incorporated herein by this reference. For Services compensated at per unit rates or on a per-task basis, such rates or costs per unit or task shall not exceed the amounts set forth in Exhibit "B." The City shall not pay mileage and other reimbursable expenses (such as meals, parking, travel expenses, necessary memberships, etc.), unless such expenses are (1) clearly set forth in the Scope of Services, and (2) necessary for performance of the Services ("Pre-Approved Expenses"). The foregoing amounts of compensation shall be inclusive of all costs of whatsoever nature associated with the Contractor's efforts, including but not limited to salaries, benefits, overhead, administration, profits, expenses, and outside consultant fees. The Scope of Services and payment therefor shall only be changed by a properly authorized amendment to this Agreement. No City employee has the authority to bind the City with regard to any payment for any services which exceeds the amount payable under the terms of this Agreement.
- b) The Contractor shall submit monthly an invoice to the City for Services rendered and a detailed expense report for Pre-Approved Expenses incurred during the previous month. The invoice shall document the Services provided during the preceding month, identifying by work category and subcategory the work and tasks performed and such other information as may be required by the

City. The Contractor shall provide such additional backup documentation as may be required by the City. The City shall pay the invoice within thirty (30) days of receipt unless the Services or the documentation therefor are unsatisfactory. Payments made after thirty (30) days may be assessed an interest charge of one percent (1%) per month unless the delay in payment resulted from unsatisfactory work or documentation therefor.

5).0 PROJECT REPRESENTATION

- a) The City designates Parks Superintendent, Abby McNeal as the responsible City staff to provide direction to the Contractor during the conduct of the Services. The Contractor shall comply with the directions given by Abby McNeal and such person's designees.
- b) The Contractor designates _____ as its project manager and as the principal in charge who shall be providing the Services under this Agreement. Should any of the representatives be replaced, particularly _____, and should such replacement require the City or the Contractor to undertake additional reevaluations, coordination, orientations, etc., the Contractor shall be fully responsible for all such additional costs and services.

6).0 TERM

- 6.1 The term of this Agreement shall be from the Effective Date to _____ (end of calendar year) unless sooner terminated pursuant to Section 13, below. The Contractor's Services under this Agreement shall commence on the Effective Date and Contractor shall proceed with diligence and promptness so that the Services are completed consistent with the City's requirements by no later than _____.
- 6.2 Nothing in this Agreement is intended or shall be deemed or construed as creating any multiple-fiscal year direct or indirect debt or financial obligation on the part of the City within the meaning of Colorado Constitution Article X, Section 20 or any other constitutional or statutory provision. All financial obligations of the City under this Agreement are subject to annual budgeting and appropriation by the Louisville City Council, in its sole discretion. Notwithstanding anything in this Agreement to the contrary, in the event of non-appropriation, this Agreement shall terminate effective December 31 of the then-current fiscal year.

7).0 INSURANCE

- a) The Contractor agrees to procure and maintain, at its own cost, the policies of insurance set forth in Subsections 7.1.1 through 7.1.3. The Contractor shall not be relieved of any liability, claims, demands, or other obligations assumed pursuant to this Agreement by reason of its failure to procure or maintain insurance, or by reason of its failure to procure or maintain insurance in sufficient amounts, durations, or types. The coverages required below shall be procured and maintained with forms and insurers acceptable to the City. All coverages shall be continuously maintained from the date of commencement of services hereunder. The required coverages are:

7.1.1 Workers' Compensation insurance as required by the Labor Code of the State of Colorado and Employers Liability Insurance. Evidence of qualified self-insured status may be substituted.

- 7.1.2 General Liability insurance with minimum combined single limits of ONE MILLION DOLLARS (\$1,000,000) each occurrence and TWO MILLION DOLLARS (\$2,000,000) aggregate. The policy shall include the City of Louisville, its officers and its employees, as additional insureds, with primary coverage as respects the City of Louisville, its officers and its employees, and shall contain a severability of interests provision.
- 7.1.3 Comprehensive Automobile Liability insurance with minimum combined single limits for bodily injury and property damage of not less than FOUR HUNDRED THOUSAND DOLLARS (\$400,000) per person in any one occurrence and ONE MILLION DOLLARS (\$1,000,000) for two or more persons in any one occurrence, and auto property damage insurance of at least FIFTY THOUSAND DOLLARS (\$50,000) per occurrence, with respect to each of Contractor's owned, hired or non-owned vehicles assigned to or used in performance of the services. The policy shall contain a severability of interests provision. If the Contractor has no owned automobiles, the requirements of this paragraph shall be met by each employee of the Contractor providing services to the City of Louisville under this Agreement.
- 7.2 The Contractor's general liability insurance and automobile liability and physical damage insurance shall be endorsed to include the City, and its elected and appointed officers and employees, as additional insureds, unless the City in its sole discretion waives such requirement. Every policy required above shall be primary insurance, and any insurance carried by the City, its officers, or its employees, shall be excess and not contributory insurance to that provided by the Contractor. Such policies shall contain a severability of interests provision. The Contractor shall be solely responsible for any deductible losses under each of the policies required above.
- 7.3 Certificates of insurance shall be provided by the Contractor as evidence that policies providing the required coverages, conditions, and minimum limits are in full force and effect, and shall be subject to review and approval by the City. No required coverage shall be cancelled, terminated or materially changed until at least 30 days' prior written notice has been given to the City. The City reserves the right to request and receive a certified copy of any policy and any endorsement thereto.
- 7.4 Failure on the part of the Contractor to procure or maintain policies providing the required coverages, conditions, and minimum limits shall constitute a material breach of contract upon which the City may immediately terminate this Agreement, or at its discretion may procure or renew any such policy or any extended reporting period thereto and may pay any and all premiums in connection therewith, and all monies so paid by the City shall be repaid by Contractor to the City upon demand, or the City may offset the cost of the premiums against any monies due to the Contractor from the City.
- 7.5 The parties understand and agree that the City is relying on, and does not waive or intend to waive by any provision of this Agreement, the monetary limitations or any other rights, immunities, and protections provided by the Colorado Governmental Immunity Act, § 24-10-101 et seq., C.R.S., as from time to time amended, or otherwise available to the City, its officers, or its employees.

8).0 INDEMNIFICATION

To the fullest extent permitted by law, the Contractor agrees to indemnify and hold harmless the City, and its elected and appointed officers and its employees, from and against all liability, claims, and demands, on

account of any injury, loss, or damage, which arise out of or are connected with the services hereunder, if and to the extent such injury, loss, or damage is caused by the negligent act, omission, or other fault of the Contractor or any subcontractor of the Contractor, or any officer, employee, or agent of the Contractor or any subcontractor, or any other person for whom Contractor is responsible. The Contractor shall investigate, handle, respond to, and provide defense for and defend against any such liability, claims, and demands. The Contractor shall further bear all other costs and expenses incurred by the City or Contractor and related to any such liability, claims and demands, including but not limited to court costs, expert witness fees and attorneys' fees if the court determines that these incurred costs and expenses are related to such negligent acts, errors, and omissions or other fault of the Contractor. The City shall be entitled to its costs and attorneys' fees incurred in any action to enforce the provisions of this Section 8.0. The Contractor's indemnification obligation shall not be construed to extend to any injury, loss, or damage which is caused by the act, omission, or other fault of the City.

9).0 CONTRACTOR OBLIGATIONS AND WARRANTIES

- 9.1 Contractor's services shall be in accordance with the prevailing standard of practice normally exercised in the performance of services of a similar nature in the Denver metropolitan area.
- 9.2 It is assumed that Contractor is familiar with all laws, codes, ordinances, and regulations which in any manner affect those engaged or employed in the Work or the material or equipment used in or upon the site, or in any way affect the Work. No pleas or claims of misunderstanding or ignorance by Contractor shall in any way serve to modify the provisions of the Agreement. Contractor shall at all times observe and comply with all federal, state, county, local, and municipal laws, codes, ordinances, and regulations in any manner affecting the conduct of the Work.
- 9.3 Until the final acceptance of the Work by the City in writing, Contractor shall have the charge and care thereof, and shall take every necessary precaution against injury or damage to any part thereof by the effects of the elements or from any other cause. Contractor, at its own expense, shall rebuild, repair, restore, and correct all injuries or damages to any portion of the Work occasioned by any causes before its completion and final acceptance. In case of suspension of Work from any cause whatsoever, Contractor shall be responsible for all materials and shall properly store same, if necessary, and shall provide suitable drainage, barricades, and warning signs where necessary. Contractor shall correct or replace, at its own expense and as required by City, any material which may be destroyed, lost, damaged, or in any way made useless for the purpose and use intended prior to final acceptance of the Work, or portions thereof. Contractor shall be relieved of the responsibilities provided in this Section upon final acceptance of the Work by City, except no such relief shall apply to damages or injuries caused by or related to actions of Contractor or its subcontractors.
- 9.3 Contractor shall provide City with written evidence that all persons who have done and portion of the Work or have furnished material under this Agreement and are entitled to liens therefor under any laws of the State of Colorado have been fully paid or are not entitled to such liens. Final payment shall not be made to Contractor until the City is reasonably satisfied that all claims or liens have been satisfied by Contractor. The Work will be considered complete when all Work has been finished, the final inspection made, and the Work accepted by City in writing, and all claims for payment of labor, materials, or services of any kind used in connection with the Work thereof have been paid or settled by Contractor.

- 9.4 Contractor agrees to guarantee all Work under this Agreement for a period of one (1) year from the date of final acceptance by the City. If any unsatisfactory condition or damage develops within the time of this guaranty due to materials or workmanship that are defective, inferior, or not in accordance with the Agreement, as reasonably determined by City, then the Contractor shall, when notified by City, immediately place such guaranteed Work in a condition satisfactory to City. The City shall have all available remedies to enforce such guaranty, except that City shall not have any work performed independently to fulfill such guaranty and require Contractor to pay City such sums as were expended by the City for such work, unless the City has first given notice to the Contractor of the deficiency and given the Contractor a reasonable opportunity to cure the same.

10).0 INDEPENDENT CONTRACTOR

It is the expressed intent of the parties that the Contractor is an independent contractor and not the agent, employee or servant of the City, and that:

- 10.1. **Contractor** shall satisfy all tax and other governmentally imposed responsibilities including but not limited to, payment of state, federal, and social security taxes, unemployment taxes, worker's compensation and self-employment taxes. No state, federal or local taxes of any kind shall be withheld or paid by the City.
- 10.2. **Contractor is not entitled to worker's compensation benefits except as may be provided by the Contractor nor to unemployment insurance benefits unless unemployment compensation coverage is provided by the Contractor or some entity other than the City.**
- 10.3. Contractor does not have the authority to act for the City, or to bind the City in any respect whatsoever, or to incur any debts or liabilities in the name of or on behalf of the City.
- 10.4. Contractor has and retains control of and supervision over the performance of Contractor's obligations hereunder and control over any persons employed by Contractor for performing the Services hereunder.
- 10.5. The City will not provide training or instruction to Contractor or any of its employees regarding the performance of the Services hereunder.
- 10.6. Neither the Contractor nor any of its officers or employees will receive benefits of any type from the City.
- 10.7. Contractor represents that it is engaged in providing similar services to other clients and/or the general public and is not required to work exclusively for the City.
- 10.8. All Services are to be performed solely at the risk of Contractor and Contractor shall take all precautions necessary for the proper and sole performance thereof.
- 10.9. Contractor will not combine its business operations in any way with the City's business operations and each party shall maintain their operations as separate and distinct.

11).0 ASSIGNMENT

Except as provided in section 22.0 hereof, Contractor shall not assign or delegate this Agreement or any portion thereof, or any monies due or to become due hereunder without the City's prior written consent.

12).0 DEFAULT

Each and every term and condition hereof shall be deemed to be a material element of this Agreement. In the event either party should fail or refuse to perform according to the terms of this Agreement, such party may be declared in default.

13).0 TERMINATION

- a) This Agreement may be terminated by either party for material breach or default of this Agreement by the other party not caused by any action or omission of the other party by giving the other party written notice at least thirty (30) days in advance of the termination date. Termination pursuant to this subsection shall not prevent either party from exercising any other legal remedies which may be available to it.
- b) In addition to the foregoing, this Agreement may be terminated by the City for its convenience and without cause of any nature by giving written notice at least fifteen (15) days in advance of the termination date. In the event of such termination, the Contractor will be paid for the reasonable value of the services rendered to the date of termination, not to exceed a pro-rated daily rate, for the services rendered to the date of termination, and upon such payment, all obligations of the City to the Contractor under this Agreement will cease. Termination pursuant to this subsection shall not prevent either party from exercising any other legal remedies which may be available to it.

14).0 INSPECTION AND AUDIT

The City and its duly authorized representatives shall have access to any books, documents, papers, and records of the Contractor that are related to this Agreement for the purpose of making audits, examinations, excerpts, and transcriptions.

15).0 DOCUMENTS

All computer input and output, analyses, plans, documents photographic images, tests, maps, surveys, electronic files and written material of any kind generated in the performance of this Agreement or developed for the City in performance of the Services are and shall remain the sole and exclusive property of the City. All such materials shall be promptly provided to the City upon request therefor and at the time of termination of this Agreement, without further charge or expense to the City. Contractor shall not provide copies of any such material to any other party without the prior written consent of the City.

16).0 ENFORCEMENT

- a) In the event that suit is brought upon this Agreement to enforce its terms, the prevailing party shall be entitled to its reasonable attorneys' fees and related court costs.
- b) This Agreement shall be deemed entered into in Boulder County, Colorado, and shall be governed by and interpreted under the laws of the State of Colorado. Any action arising out of, in connection with, or relating to this Agreement shall be filed in the District Court of Boulder County of the State

of Colorado, and in no other court. Contractor hereby waives its right to challenge the personal jurisdiction of the District Court of Boulder County of the State of Colorado over it.

17).0 COMPLIANCE WITH LAWS

- 17.1 Contractor shall be solely responsible for compliance with all applicable federal, state, and local laws, including the ordinances, resolutions, rules, and regulations of the City; for payment of all applicable taxes; and obtaining and keeping in force all applicable permits and approvals.
- 17.2 Contractor acknowledges that the City of Louisville Code of Ethics provides that independent contractors who perform official actions on behalf of the City which involve the use of discretionary authority shall not receive any gifts seeking to influence their official actions on behalf of the City, and that City officers and employees similarly shall not receive such gifts. Contractor agrees to abide by the gift restrictions of the City's Code of Ethics.

18).0 INTEGRATION AND AMENDMENT

This Agreement represents the entire Agreement between the parties and there are no oral or collateral agreements or understandings. This Agreement may be amended only by an instrument in writing signed by the parties.

19).0 NOTICES

All notices required or permitted under this Agreement shall be in writing and shall be given by hand delivery, by United States first class mail, postage prepaid, registered or certified, return receipt requested, by national overnight carrier, or by facsimile transmission, addressed to the party for whom it is intended at the following address:

If to the City:

City of Louisville
Attn: City Manager
749 Main Street
Louisville, Colorado 80027
Telephone: (303) 335-4533
Fax: (303) 335-4550

If to the Contractor:

Company Name _____
Attn: Name _____
Address _____
Telephone: _____

Any such notice or other communication shall be effective when received as indicated on the delivery receipt, if by hand delivery or overnight carrier; on the United States mail return receipt, if by United States mail; or on facsimile transmission receipt. Either party may by similar notice given, change the address to which future notices or other communications shall be sent.

20).0 EQUAL OPPORTUNITY EMPLOYER

- a) Contractor will not discriminate against any employee or applicant for employment because of race, color, religion, age, sex, disability or national origin. Contractor will take affirmative action to ensure that applicants are employed and that employees are treated during employment without regard to their race, color, religion, age, sex, disability, or national origin. Such action shall include but not be limited to the following: employment, upgrading, demotion or transfer, recruitment or recruitment advertising, layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notice to be provided by an agency of the federal government, setting forth the provisions of the Equal Opportunity Laws.
- b) Contractor shall be in compliance with the applicable provisions of the American with Disabilities Act of 1990 as enacted and from time to time amended and any other applicable federal, state, or local laws and regulations. A signed, written certificate stating compliance with the Americans with Disabilities Act may be requested at any time during the life of this Agreement or any renewal thereof.

21.0 NO THIRD PARTY BENEFICIARIES

It is expressly understood and agreed that enforcement of the terms and conditions of this Agreement, and all rights of action relating to such enforcement, shall be strictly reserved to City and Contractor, and nothing contained in this Agreement shall give or allow any such claim or right of action by any other third party on such Agreement. It is the express intention of the parties that any person other than City or Contractor receiving services or benefits under this Agreement shall be deemed to be an incidental beneficiary only.

22.0 SUBCONTRACTORS

Contractor may utilize subcontractors identified in its qualifications submittal to assist with non-specialized works as necessary to complete projects. Contractor will submit any proposed subcontractor and the description of its services to the City for approval. The City will not work directly with subcontractors.

23.0 AUTHORITY TO BIND

Each of the persons signing below on behalf of any party hereby represents and warrants that such person is signing with full and complete authority to bind the party on whose behalf of whom such person is signing, to each and every term of this Agreement.

In witness whereof, the parties have executed this Agreement to be effective on the date first above written.

CITY OF LOUISVILLE,
a Colorado Municipal Corporation

By: _____
Samma Fox, Interim City Manager

Attest: _____
Genny Kline , Interim City Clerk

CONTRACTOR:
CONTRACTOR NAME

By: _____

Title: _____