

LEIT® X and XRC Controller Specifications

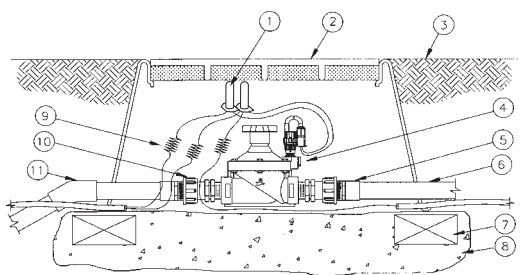
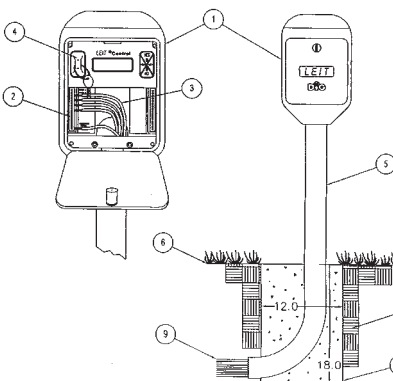
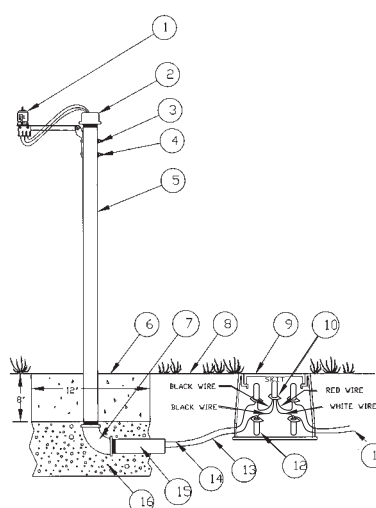
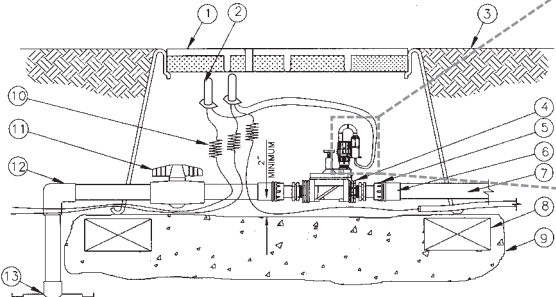
Section 02810

Part 1 Introduction

1.1 The LEIT X and XRC series irrigation controllers are an advanced water-management irrigation control system. The controller utilizes ambient light as the source of energy to operate up to 28 valves using a low voltage, high efficiency, watertight, 2-way magnetic solenoid actuator that operates at 5-volts alternating pulse. The LEIT X and XRC controllers have a menu-based program with straightforward features allowing for a wide range of irrigation applications. The LEIT X and XRC features includes 4 programs with 3 start times per program, run time up to 5 hours and 59 minutes per valve, budget, rain delay, status report, history reports and manual run. The controller's power comes from an advanced time-tested photo voltaic module, which harnesses light energy day and night, anytime, anyplace and in any weather conditions. The LEIT X and XRC controllers are commercial quality, heavy-duty water management controllers used for any type of environment.

Part 2 Typical Installation

2.1 Drawing File no.: LEIT X.exe

<p>160HE-150 1-1/2" and 160HE-200 2" REMOTE CONTROL VALVE FOR LEIT CONTROLLER ASSEMBLY</p>  <p>LEGEND</p> <ul style="list-style-type: none"> 1 DRY SPLICE WATERPROOF CONNECTORS 2 18" VALVE BOX WITH COVER 3 FINISH GRADE TOP 4 DIG REMOTE CONTROL VALVE WITH FLOW CONTROL AND LEIT DC SOLENOID MODEL: 160HE-150 1-1/2" MODEL: 160HE-200 2" 5 PVC SCH 40 MALE ADAPTER 6 PVC MAIN LINE 7 BRICK SUPPORT AT EACH CORNER 8 PEA GRAVEL SUMP MINIMUM 3" 9 CONTROL WIRE TO OTHER VALVE 10 SWIVEL FITTING FOR EASY CONNECTION MODEL: 23-152 1-1/2" MODEL: 23-202 2" 11 PVC SCH 40-45° ELL 	<p>LIGHT ENERGIZED IRRIGATION CONTROLLER LEIT CONTROL X AND XRC</p>  <p>LEGEND</p> <ul style="list-style-type: none"> 1 AMBIENT LIGHT POWERED IRRIGATION CONTROLLER. MODEL X: 10-28 STATIONS MODEL XRC WITH RADIO REMOTE: 4-28 STATIONS 2 TERMINAL STRIP 3 12 OR 14 GAUGE WIRE 4 PROGRAMMING KEY MODEL #LEIT KEY 5 35" STEEL MOUNTING COLUMN MODEL #MCOLXS (SHORT) OR 51" STEEL MOUNTING COLUMN MODEL #MCOLXL (LONG) 6 FINISH GRADE 7 6-1/2" OF BACKFILL SOIL 8 POURED CONCRETE BASE - 1-1/2" CU.FT. INSTALL PER MANUFACTURER'S INSTALL GUIDE 9 DIRECT BURIAL CONTROL WIRES TO CONTROL VALVES
<p>RAIN SENSOR ASSEMBLY COLUMN MOUNTED</p>  <p>LEGEND</p> <ul style="list-style-type: none"> 1 RAIN SENSOR 2 DIG PLASTIC PIPE CAP 1" PART #23-001 OR 1-1/2" #23-053 WITH HOLE FOR WIRES 3 DRILL TWO 3/16" HOLES IN PIPE FOR SENSOR BRACKET 4 (2) #8-32 MACHINE SCREWS WITH WASHER, LOCK WASHER AND NUT 5 1" OR 1-1/2" GALVANIZED PIPE 6-10 FEET HIGH 6 12" X 12" CONCRETE BASE, 8" DEEP MINIMUM 7 1" OR 1-1/2" PIPE BELOW 8 FINISH GRADE 9 6" ROUND VALVE BOX 10 SKIT ADAPTER PART #8821-4 USE WITH EACH SENSOR 11 TO CONTROLLER OR VALVE 12 (4) DRY SPLICE WATERPROOF CONNECT 13 NORMALLY CLOSED WIRE FROM SENSOR 14 COMMON WIRE FROM SENSOR 15 1" OR 1-1/2" NIPPLE 16 GRAVEL 	<p>160HE-075 3/4" AND 160HE-100 1" REMOTE CONTROL VALVE FOR LEIT CONTROLLER ASSEMBLY</p>  <p>LEGEND</p> <ul style="list-style-type: none"> 1 18" VALVE BOX WITH COVER 2 DRY SPLICE WATERPROOF CONNECTORS 3 FINISH GRADE TOP 4 DIG VALVE MODEL 3/4" 160HE-075 1" 160HE-100 5 SWIVEL FITTING DIG MODEL 3/4" 23-004, 1" 23-003 6 PVC SCH 40 MALE ADAPTER 7 PVC LATERAL LINE 8 BRICK SUPPORT AT EACH CORNER 9 PEA GRAVEL SUMP - MINIMUM 3" 10 12 OR 14 GAUGE WIRE 11 BACK-UP NPT PVC BALL VALVE 12 PVC SCH 40 90° ELL 13 SCH 40 TEE

Part 3 System Descriptions

3.1 Automatic Irrigation Controller [Light]

Irrigation controllers shall be single, solid-state independent controllers conforming to the following:

The LEIT automatic irrigation controllers shall come with four to twenty eight stations with master valve or pump start without AC power hookup, batteries or conventional solar panels. The LEIT controller's power shall be provided by an internal, ultrahigh efficiency photo voltaic module and microelectronic energy management system fueled by ambient light. The LEIT controller shall require a LEIT Key to enter, change or modify the controller programming. The LEIT controller shall be programmed using a self-guiding menu and four durable sealed buttons for navigation. Entering the program a password shall be used to eliminate potential user error. The password can be changed at any time during program setup activation. The LEIT controller shall have a non-volatile memory holding programs indefinitely without batteries or AC power. The LEIT controller shall operate in a temperature range of 14-140°F (-10-60°C).

3.1.1 Controller Features

- a. Controller model X shall operate 10, 12, 16, 20, 24, 28 stations and a master valve.
- b. Controller model XRC with a 2-way radio shall operate 4, 6, 8, 10, 12, 16, 20, 24, 28 stations and a master valve.
- c. The controllers shall operate and use a micro-powered solenoid actuator with globe valve or a micro-powered solenoid actuator with the correct adapter to be mounted on any other valve.
- d. Controller shall have bilingual software in English and Spanish.
- e. The controller LCD screen shall be activated with a special key powered by a 9-volt alkaline battery to provide access and security to a simple 4-button programming pad, the LCD shall display all the schedule information.
- f. The controller shall have 4 independent programs with 3 start times per station.
- g. The controller shall allow custom grouping, allowing the controller to operate any number of stations within a group sequentially (if hydraulic limitations are not exceeded).
- h. Ability to program in one minute increments up to 5 hours and 59 minutes with a separate setting for hours and minutes.
- i. The LEIT XRC controller shall have a 2-way radio capability using the ISM band 900-928 MHz to communicate with a LEIT Link radio from a distance of up to 800' line of sight.
- j. A programmable watering calendar with a choice of a 1-39 day interval, odd/even days or any day(s) of the week.
- k. A feature that shall include password protection for added security.
- l. Rain stop from 1-99 days with automatic restart.
- m. A 12 month budget adjustment from 10% to 200% in 10% increments.
- n. A manual feature that allows a single desired station to cycle start for any preset with preferred duration.
- o. The controller shall have the option to operate automatic, semi-automatic and manual cycle via the controller.
- p. The controller shall have a monthly off feature that enables turning off any month of the year.
- q. Status and history reports to review controller functions and the amount of watering time applied during current and previous month.
- r. The controller shall have the option to assign any switch type rain sensor, moisture sensor or freeze sensor to an individual valve or to the entire system using a SKIT adapter. (Rain sensor is recommended)
- s. The controller shall activate the micro-powered solenoid actuator LEMA 1600HE to a distance of up to 7500' (2270m) using NFPA 70 copper conductor 12-gauge (1.6 mm) irrigation wire type UF.
- t. The controller shall be capable of operating pump start relay or a master valve using a RKIT 8810S relay interface
- u. The XRC controller shall use a 2-way radio remote handset that can operate in the ISM band 900-928 MHz. To use a 2-way radio communication in the ISM band 900-928 MHz, the controller shall use a LEIT Link 2-way Radio Remote Handset
- v. The controller shall have lightning protection to fully isolate the controller from electrical ground, and offer virtual immunity to ground currents from overhead power lines and/or close proximity lightning strikes.
- w. The controller shall have a full 3-year repair or replacement warranty, prorated from in-service date.
- x. The controller shall have a lifetime lightning warranty.
- y. The controller and its components shall be manufactured by DIG Corporation, Vista, CA.

3.1.2 Controller Components Descriptions

- a. Mounting Column – The LEIT controller shall be mounted on a galvanized mounting column with a length of either 35" or 51" with curved sweep at the bottom to permit ease of wire pull.
- b. Micro-Powered Solenoid Actuator
 - b1. Micro-Powered Solenoid Actuator with Globe Valve – The remote control valve shall be a globe type, normally closed using 5-volts alternating pulse micro-powered solenoid actuator with electronic control built in. The valve shall be pressure rated up to 150 PSI and have balanced opening and closing. The valve's body shall be constructed of weather resistant, high impact glass-reinforced nylon and a stainless steel spring (303). The valve's one-piece diaphragm shall be nylon fabric reinforced natural rubber (NR). The valve shall have a flow control and internal manual bleed within the solenoid and allow for manual operation by turning the manual bleed handle a ¼ turn. The valve shall provide easy access for removing all parts from the top of the valve without disturbing normal valve installation. The remote control valve shall have a 3/4" FNPT inlet and outlet connection and shall be manufactured by DIG Corporation.
 - b2. Micro-Powered Solenoid Actuator only – The LEIT controller shall use a micro-powered solenoid actuator with electronic control built in. The micro-powered actuator shall use a bipolar pulse and operate at 5-volts alternating pulse. The plunger and spring shall be encapsulated for reliable operation. The micro-powered solenoid actuator shall have an 11/16"-12 UN thread connection and connect to any globe valve via one of the solenoid adapters. The micro-powered solenoid shall use 1 of the 7 DIG valve adapters compatible with the following valves:

- a. Model 30-920 use with BERMAD series 200, HIT series 500, DOROT series 80, GRISWOLD series 2000, DW and BUCKNER series VB valves
 - b. Model 30-921 use with RAIN BIRD DV, DVF, PGA, PEB (3/4" and 1" only), GB, EFB-CP, BPE, PESB (3/4" and 1" only) and ASVF valves
 - c. Model 30-922 use with HUNTER series ASV, HPV, ICV, PGV, SRV, IBV and ASVF valves
 - d. Model 30-923 use with WEATHERMATIC series 12000, 21000 valves
 - e. Model 30-924 use with IRRITROL series 100, 200B, 205, 217B, 700, 2400, 2500, 2600 and TORO series 220, P220 valves
 - f. Model 30-925 use with SUPERIOR series 950, HUNTER HBV and TORO series 252 valves (1.5" and larger)
 - g. Model 30-926 use with RAIN BIRD series PEB and PESB (1 1/2" and 2" only) valves
- c. LEIT Key – The controller shall be activated using a special LEIT Key powered by a 9-volt alkaline battery to provide access and security to a simple 4-button programming pad and an LCD that shall display all the scheduled information.

3.1.3 Controller System Accessories Descriptions

- a. Stainless Steel Enclosure – The LEIT controller shall use a (304) stainless steel vandal resistant enclosure with strip perforations on top, allowing light to enter the controller, plus a lockable-hinged door (lock included) for added protection.
- b. Sensor Adapter – The LEIT controller or the micro-powered solenoid actuator shall have an option to connect to all types of switch type sensors via the SKIT sensor adapter. The SKIT adapter shall be used as an interface between the controller and a compatible rain, moisture or freeze protection sensor.
- c. MV/P Relay Interface Adapter – The LEIT controller shall have an option to switch on/off an AC or DC circuit via the RKIT relay interface adapter. The RKIT adapter shall be used as an interface between the controller and AC switch device.
- d. Swivel Fittings Connection – The globe valve shall use two swivel fittings, on each side as a union to allow, in case of repair, the valve to be brought to the surface to be serviced without removing the irrigation box or cutting the pipe. The swivel fitting shall be constructed of injected molded polypropylene, UV resistant. The swivel fitting shall feature high impact strength plastic and be highly chemical resistant. The swivel fitting shall have a large swivel (FNPT) with an encapsulated nitric rubber O-ring to allow quick and easy tightening to a PVC male adapter without tools or Teflon tape. The swivel fitting operating pressure shall not exceed 150 PSI.

Part 4 Submittals

The following items shall be submitted by filling in the appropriate number of units and submitting (QTY) with a copy of catalog and instruction manual.

- a. The LEIT X Powered Irrigation Controller shall be _____ each of: LEIT [X10] ten-station, [X12] twelve-station, [X16] sixteen-station, [X20] twenty-station, [X24] twenty four-station and [x28] twenty eight-station; manufactured by DIG.
OR
The LEIT XRC Powered Irrigation Controller with 2-way radio shall be _____ each of: LEIT [XRC04] four-station, [XRC06] six-station, [XRC08] eight-station, [XRC10] ten-station, [XRC12] twelve-station, [XRC16] sixteen-station, [XRC20] twenty-station, [XRC24] twenty four-station and [XRC28] twenty eight-station; manufactured by DIG.
- b. The two-way data communication, micro-powered solenoid actuator with valves shall be _____ each of: [160HE-075] for 3/4", [160HE-100] for 1", [160HE-150] for 1 1/2" and [160HE-200] for 2"; manufactured by DIG.
If the micro-powered solenoid actuator is selected, use the micro-powered solenoid actuator model LEMA 1600HE with the correct adapter to match the valve in use. (see below for adapter compatibility)
The number of two-way data communication, micro-powered solenoid actuators shall be _____ each of: [1600HE] micro-powered solenoid actuator with 11/16"-12 UN thread connection, and _____ each of: adapters [30-920] for BERMAD series 200, HIT series 500, DOROT series 80, GRISWOLD series 2000, DW and BUCKNER series VB, [30-921] for RAIN BIRD DV, DVF, PGA, PEB (3/4" and 1" only), GB, EFB-CP, BPE, PESB (3/4" and 1" only) and ASVF, [30-922] for HUNTER series ASV, HPV, ICV, PGV, SRV, IBV and ASVF, [30-923] for WEATHERMATIC series 12000, 21000, [30-924] for IRRITROL series 100, 200B, 205, 217B, 700, 2400, 2500, 2600 and TORO series 220, P220, [30-925] for SUPERIOR series 950, HUNTER HBV and TORO series 252 valves (1.5" and larger), [30-926] for RAIN BIRD series PEB and PESB (1 1/2" and 2" only); manufactured by DIG.
- c. The light powered irrigation controller shall require _____ each of: [LEIT Key] for programming and to enter the system. The same key can be used with any LEIT controller; manufactured by DIG.
- d. Each irrigation controller shall require one mounting column and shall have _____ each of: [MCOLXS] (35") short or [MCOLXL] (51") long mounting column and column kit; manufactured by DIG.
- e. The controller or the micro-power solenoid actuator shall require if applicable _____ each of: [SKIT sensor adaptor], used as interface between the controller and compatible rain, moisture and/or freeze protection sensors.
- f. The controller shall require, if applicable, _____ each of: [RKIT 8810S] relay interface adapter, used as an interface between the controller and pump switch; manufactured by DIG.
- g. The LEIT Link two-way remote control can operate via a radio frequency of 900-928 MHz and shall be _____ each of: [LEIT Link Multi-Pro] radio handset with charger. LEIT Link Multi-Pro can communicate with up to 99 controllers, or _____ each of: [LEIT Link Master] radio handset with charger to operate with up to 99 groups of controllers, each group with up to 99 controllers; manufactured by DIG.
- h. The 1", 1 1/2" and 2" valves shall use MNPT x FNPT swivel adapters as a union with 2 per valve. The number of swivel adapters shall be _____ each of: [23-003] for 1", [23-152] for 1 1/2" or [23-202] for 2" swivel adapter; manufactured by DIG.
- i. The light powered irrigation controller shall require _____ each of: [ENCL X] stainless steel enclosures and locks if required, for extra protection against vandalism and theft; manufactured by DIG.

Part 5 Installation

Install irrigation wires at least six inches below finish grade and lay to the side and below main line.

- a. Control wire for LEIT operated valve with LEMA 1600HE shall be NFPA 70 copper conductor, 14-gauge [1.8 mm] irrigation wire, type UF and shall be used for station wire with length up to 4500' (1360 m). NFPA 70 copper conductor 12 gauge [1.6 mm] irrigation wire, type UF, shall be used for station wire with runs up to 7500' (2270 m).
- b. **ELECTRICAL SPLICES SHALL BE WATERPROOF** and shall be located inside the valve box.
- c. An expansion curl shall be provided so that in case of repairs the valve may be brought to the surface to be serviced without disconnecting the control valve.

LEIT® X and XRC Radio Series Controllers System



Features

- Series X operates 10, 12, 16, 20, 24 and 28 stations plus a master valve or pump start without AC power hookup, batteries or conventional solar panels
- Series XRC using 900-928 MHz, 2-way radio operates 4, 6, 8, 10, 12, 16, 20, 24 and 28 stations plus a master valve or pump start without AC power hookup, batteries or conventional solar panels
- Bilingual software in English and Spanish
- Controller functions and operations are 100% tested
- Controller waterproofing is 100% tested
- Built to the highest quality control standard (ISO 9002)
- Non-volatile memory holds programs indefinitely without batteries
- Functions day or night and in any weather in most outdoor locations
- All power is provided by an internal, ultrahigh efficiency photovoltaic module and microelectronic energy management system fueled by ambient light
- Can replace any LEIT 8000 or Solatrol controller with 1500S or 1500E actuator or older
- Compatible with most brands, styles and sizes of valves (refer to LEMA 1500HE series actuator specification sheet)
- LEIT XRC has remote programming and management capability separate from LEIT Link remote controller handset
- LEIT XRC 2-way radio frequency module operates in the ISM band 900-928 MHz
- Programming is easy, using a self-guiding menu and 4 durable sealed buttons
- Assign rain, moisture or freeze sensors to an individual valve or to the entire system using the SKIT 8821-4 adaptor
- Liquid crystal display is easy to read under almost any daylight condition
- Simple to install, easy access wire connector accommodates standard irrigation wire up to 12 gauge
- Terminal strip can handle 28 hot wire stations, 2 MV/P wires and 2 common wires

- Lightning protection, the controller is fully isolated from electrical ground, offering virtual immunity to ground currents from overhead power lines and/or close proximity lightning strikes
- Manual watering or semi-automatic cycle by station with quick override

Programming Features

- 4 independent programs per valve and 3-start times per program allow for mixed irrigation applications
- Duration's from 1 minute to 5 hours and 59 minutes to operate drip or sprinkler systems
- Custom programming with 7-day calendar or interval of 1 to 39 days in odd/even or every day rotation
- Individual monthly water budgeting from 10% to 200% in 10% increments
- Rain delay up to 99 days with auto-restart
- History report for each valve verifies actual watering time for the last and current months
- Station custom grouping allows the controller to operate more than one group and any number of stations per group together (if hydraulic limitations are not exceeded)

Ordering Information

Model X10 10-stations plus MV/P
 Model X12 12-stations plus MV/P
 Model X16 16-stations plus MV/P
 Model X20 20-stations plus MV/P
 Model X24 24-stations plus MV/P
 Model X28 28-stations plus MV/P

Model XRC04 4-stations plus MV/P
 Model XRC06 6-stations plus MV/P
 Model XRC08 8-stations plus MV/P
 Model XRC10 10-stations plus MV/P
 Model XRC12 12-stations plus MV/P
 Model XRC16 16-stations plus MV/P
 Model XRC20 20-stations plus MV/P
 Model XRC24 24-stations plus MV/P
 Model XRC28 28-stations plus MV/P

LEIT Link Handset

LEIT Multi-Pro Remote with up to 99 controllers

LEIT Link Master Remote with up to 99 groups, 99 controllers per group

Valves

160HE-075 3/4" plastic valve with flow control
 160HE-100 1" plastic valve with flow control
 160HE-150 1 1/2" plastic valve with flow control
 160HE-200 2" plastic valve with flow control

Actuator

LEMA 1600HE solenoid actuator

Valve Adapters

DIG valve adapters are compatible with the following valves:

300-920 BERMAD series 200, HIT series 500, DOROT series 80, GRISWOLD series 2000, DW and BUCKNER series VB valves
 300-921 RAIN BIRD DV, DVF, PGA, PEB (3/4" and 1" only), GB, EFB-CP, BPE, PESB (3/4" and 1" only) and ASVF valves
 300-922 HUNTER series ASV, HPV, ICV, PGV, SRV, IBV and ASVF valves
 300-923 WEATHERMATIC series 12000, 21000 valves
 300-924 IRRITROL series 100, 200B, 205, 217B, 700, 2400, 2500, 2600 and TORO series 220, P220 valves
 300-925 SUPERIOR series 950, HUNTER HBV and TORO series 252 valves (1.5" and larger)
 300-926 RAIN BIRD series PEB and PESB (1 1/2" and 2" only) valves

