TORO Count on it.

Lynx Smart Satellite
User's Guide

- 16 to 64 stations in 16-station increments

- Field programmable for future upgrades

- Operates as a stand-alone controller or under the management of a central computer

- Supports wireline or radio communications with the central computer

- Supports hybrid communication (wireline and radio) for increased flexibility and cost effectiveness

- 64 irrigation programs

- Multi-Manual, Program Start and Syringe manual operations

- Operates up to 32 stations simultaneously

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Radio Specifications

Equipment Type – Digital Data radio

Frequency Band – UHF

RF Output Power – 0.5 to 5.0 watts, Programmable

Current Consumption:

Standby (Muted) – < 65 mA

Transmit 2 watts RF power – < 1.0A

FCC License: FCC ID# Pending

Fuse & Circuit Breaker Specifications

Power Supply:

1.5A On/Off Switch/Circuit Breaker – Main Power Input

3.2A Fuse (Slow-Blow) – Field Output

4.0A Circuit Breaker – Control Functions (Faceplate)

Output Board : 3A Fuse

Communication Board :

0.5A Fuse – Communication Line Protection

8A Fuse – Common Line Protection

0.5A Fuse – Pump Line Protection

Pump/Common & Communication Surge Protection Module (optional): 1A Fuse

Satellite Controller Specifications

Line Voltage: 115-120 or 230-240 VAC 50/60 Hz (switchable), 130 VA or 100/200 VAC 50/60 Hz

Current Draw (no load): 0.21A @ 115-120 VAC, 60 Hz or 0.10A @ 230-240 VAC, 50 Hz

Current Draw (no load): 0.46A @ 100 VAC, 50 Hz or 0.23A @ 200 VAC, 50 Hz

Current Draw (maximum load): 0.91A @ 115-120 VAC, 60 Hz or 0.45A @ 230-240 VAC, 50 Hz

Current Draw (maximum load): 0.99A @ 100 VAC, 50 Hz or 0.51A @ 200 VAC, 50 Hz

Current Load (based on available 24 VAC)
    Maximum Current Available for Load: 3.0A (72 VA)
    Maximum Load Per Station: 0.75A (18 VA)
    Maximum Load Per Pump/Master Valve: 1A (24 VA)

Operating Temperature: -10°C to +60°C (14°F to 140°F)

Storage Temperature: -30°C to +65°C (-22°F to 149°F)

Introduction

The Toro Lynx Smart Satellite combines modular flexibility, ease of use and increased programmability in a single controller.

Modularity means flexibility. The Lynx Smart Satellite is available from 16 to 64 stations, and can expand in 16-station increments to meet your needs. Station switch capability and optional surge protection provide simple operation and added security.

The intuitive Lynx Smart Satellite user interface is easy to use and includes a backlight for improved visibility in low-light conditions, yet it is completely viewable in direct sunlight. The faceplate's combination of menu keys, navigation arrows and input dial allows for easy menu navigation as well as establishing settings quickly.

With 64 irrigation programs, the Lynx Smart Satellite allows programming to the station level. Discrete local and central modes make stand-alone and central controlled operations independent from one another, while the ability to run up to 32 stations simultaneously lets you deliver more water, quicker than ever before.

Modes of Operation

The Lynx Smart Satellite can be placed in three operating modes: Central mode, Local mode and Off mode. In all three modes, the satellite will accept communications from Lynx or SitePro Central Controller. Select the mode of operation by pressing the **Satellite Settings** 📱 and selecting **Comm Mode**. Select from the three modes using the Input Dial ⌒₊.

Central Mode - When placed in Central Mode, the satellite will allow Lynx or SitePro Central Controller to download irrigation programs, edit time and date and modify the satellite's operation mode. If communication between central and satellite is interrupted for more than one hour, the Central Mode LED indicator will start flashing until communication is reestablished.

Local Mode - When placed in Local mode, the satellite will execute previously downloaded or locally configured irrigation programs. In this mode, the satellite will allow the central to edit time, date and operation mode but will not allow modification of settings affecting irrigation programs.

Off Mode - When placed in Off mode, the satellite will not execute any watering operation whether it is programmed or manually initiated. Any watering operation will terminate once the satellite is placed in Off mode. Watering operations will resume once the satellite is placed back to Central or Local mode. In this mode, the satellite will allow the central to edit time, date and operation mode but will not allow modification of settings affecting irrigation programs.

General Editing

Pressing a menu key on the Lynx Smart Satellite will display menu items. Items with fields containing values that can be edited are referred to as entry fields. Use the arrow keys ◆ ◆ ◆ ◆ to navigate through the menus and entry fields. Modify any selected value by scrolling through the selection using the **Input Dial** ⌒₊ . Values will be saved automatically when you exit an entry field or press another menu key. Pressing **HOME** 🏠 will also save any modification and revert back to home display.

Additionally, if no keypad activity is detected within five minutes, the satellite will automatically save any modifications and revert back to Home display.

Menu Symbols

▯ Program Symbol	🌱 Station Symbol	✋ Multi-Manual Symbol	⚬ Switch Symbol
🚫 Disable Symbol	✲ Soak Symbol	🗐 Stacked Symbol	❚❚ Paused Symbol
▶ Start Symbol	■ Stop Symbol	◉ Hold Symbol	✳ Asterisk Symbol
┈┊ Cycle Symbol	↙┐ Repeat Symbol	⚘ Syringe Symbol	☰ List Symbol

Faceplate Components

1 ◆ ◆ **Left and Right** keys allow you to select the next entry field within the same menu line. Any changes will be saved after you exit each entry field.

2 ◆ ◆ **Up and Down** keys allow you to scroll up and down through the menu items.

3 **Operation Mode LED Display** will indicate the current satellite operation mode.

4 **LCD Panel** can display six 20-character lines. It allows the Lynx Smart Satellite to display more information and menu items without constantly scrolling to see the hidden menus.

5 ⌐‾‾+ **Input Dial** allows you to scroll through the value selection within the selected entry field.

6 🏠 **Home Key** allows you to exit from any function menu and return the satellite to normal operation. After pressing the Home Key, all modifications to the settings will be saved.

7 ✋ **Manual Watering Menu Key** allows you to activate station(s) or program(s) manually.

8 ☺ **Scheduled Watering Menu Key** allows you to view, create or modify an irrigation program schedule. Use this function to assign the program start times, end times, delay times, stations, runtimes, repeats and maximum simultaneous stations per program.

9 ⅃Ⅹ **Diagnostics Menu Key** allows you to view the satellite information as well as perform advance functions.

10 ⌐⊰ **Station Settings Menu Key** allows you to modify station parameters. Within this setting, you can specify each station's percent adjust, disable the station from any activity, hold station watering for a specific number of days, set the station type to a switch, create or edit the station description/name and current sensing parameters .

11 ☀ **Percent Adjust Menu Key** allows you to adjust watering to a specific percentage range. The user can specify percentage adjustment for satellite, programs and stations.

12 ▶ **Start Key** will execute selected program or manual operation.

13 ❚❚ **Pause/Resume Key** will pause currently activated program(s). Press the key while in pause and select Resume to continue operation.

14 ■ **Stop Key** will cancel currently running program(s) or station(s).

15 ⌐🗎 **Satellite Settings Menu Key** allows the user to modify the satellite parameters. Users can specify the satellite communication mode, hold duration for satellite's activity, the language, clock settings, date, day change, CSG address, satellite address, station delay, maximum number of stations to run simultaneously, units and display contrast, and set a password to edit settings. Within this menu, the user can also reset all programs, reset the station parameters and reset all disables.

Front Internal Parts

Back Internal Parts

Relay Board
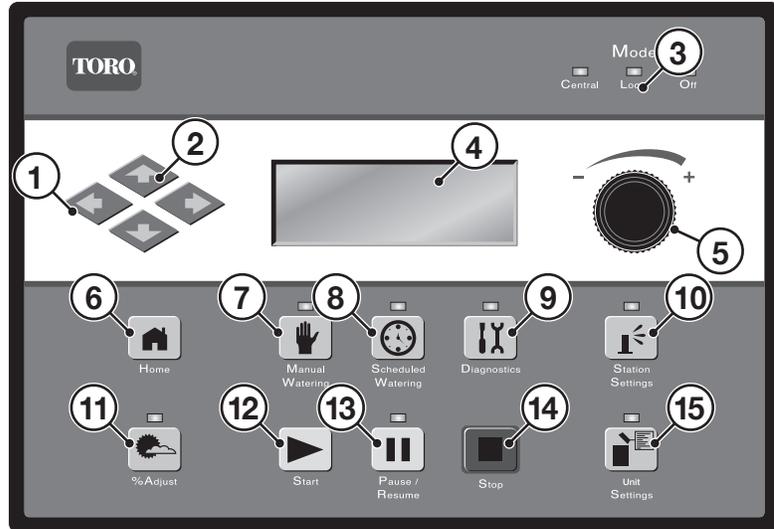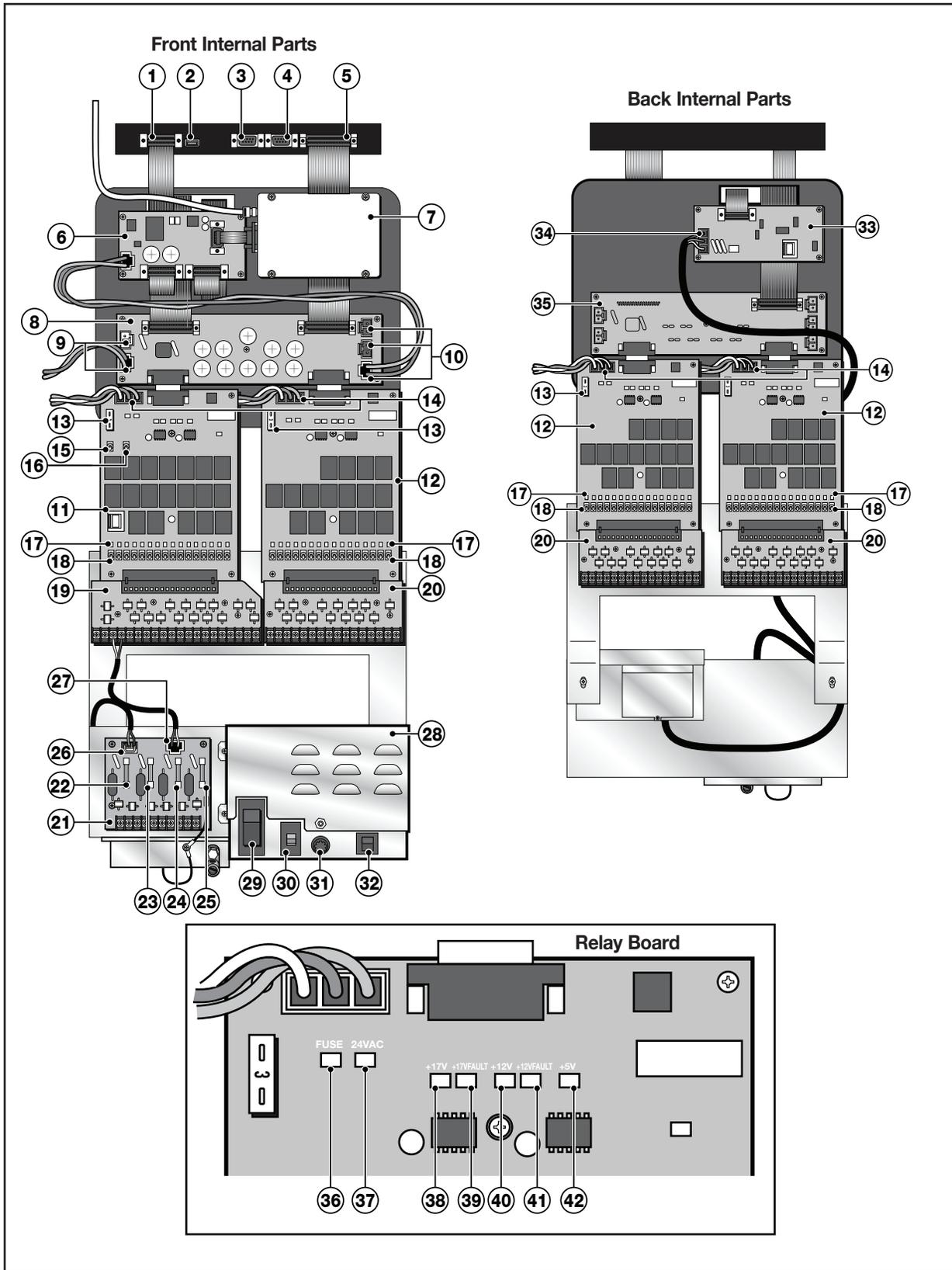
1 **Faceplate to Radio/Modem Port** - Interface the Radio Adapter Board to the faceplate. If the Satellite is not equipped with a Radio Adapter Board, it can be used to interface with the Modem Board.

2 **USB Port** - Service port to update Smart Satellite's firmware.

3 **Serial Communication Port** - Used by authorized service personnel for satellite diagnostics.

4 **Auxiliary/Service Port** - Used for in-field service and diagnostic.

5 **Faceplate to Distribution Port** - Interface the front Distribution Board with the faceplate.

6 **Radio Adapter Board** - Optional equipment for wireless operation using radio communication.

7 **Digital Radio** - Optional equipment for receiving wireless radio commands.

8 **Distribution Board (Front)** - Provide various rectified power levels to various satellite components including the relay boards.

9 **13 VAC Power Connections** - 13 VAC Power source for optional Toro add-on devices.

10 **17 VDC Power Connections** - 17 VAC Power source for optional Toro add-on devices.

11 **Relay Board with Pump Common** - Install only on the left Relay Board interface of the distribution board.

12 **Relay Board** - Provides power to the output terminals.

13 **3 Amp Fuse** - Provides protection from current draw coming out of the output terminals.

14 **24 VAC** - 24 VAC Red Connector from the power supply.

15 **Pump Terminal Toggle Switch** - Place to **ON** to activate its corresponding terminal. Place to **OFF** to deactivate its corresponding terminal. Place the switch to **AUTO** to allow Manual, Programming and Radio activations.

16 **COMMON Terminal Toggle Switch** - Place to **ON** to activate its corresponding terminal. Place to **OFF** to deactivate its corresponding terminal. Place the switch to **AUTO** to allow Manual, Programming and Radio activations.

17 **Output Terminal LEDs** - Each output terminal has a designated LED indicator for visual verification when activated.

18 **Output Terminals Toggle Switches** - Place to **ON** to activate its corresponding terminal. Place to **OFF** to deactivate its corresponding terminal. Place the switch to **AUTO** to allow Manual, Programming and Radio activations.

19 **Surge Output Board w/ Pump Common** - Used only with **Item 11**. Provides surge protection to the satellite from power surges coming from the external sources that are connected to the output boards.

20 **Surge Output Board** - Provides surge protection to the satellite from power surges coming from the external sources that are connected to the output boards.

21 **Pump/Communication Surge Board** - Protects the satellite from power surges coming from the external sources that are connected to the communication data wires, as well as the pump and common terminals.

22 **0.5A Fuse** - Communication Line Protection

23 **0.5A Fuse** - Communication Line Protection

24 **8A Fuse** - Common Line Protection

25 **0.5A Fuse** - Pump Line Protection

26 **Communication Data Socket** - Faceplate Interface

27 **Power Supply Socket** - Connect to the **PUMP** and **COM** terminals of the Surge Output Board.

28 **Power Supply Assembly**

29 **Main Power ON/OFF Switch**

30 **Input Voltage Selector Switch** - Place the switch to the proper setting before you place the Main Power switch to ON. Select 115 for supply voltage of 110 through 115 VAC. Select 230 for supply voltage of 210 through 230 VAC.

31 **3.2A Slow Blow Fuse** - Protects the controller from a short circuit on the 24 VAC field common wire or from excessive simultaneous activation of solenoids.

32 **4.0A Circuit Breaker** - Protects the logic circuit boards such as the faceplate and distribution board from a short circuit failure.

33 **Modem Board** - Optional equipment needed for two-wire communication between the satellite and Lynx or SitePro Central Controller.

34 **Communication Interface** - Two-wire communication data interface between the satellite and the central computer system.

35 **Distribution Board (Rear)** - Provide power to the rear relay boards. Does not provide additional rectified voltages to other components.

36 **FUSE LED Indicator** - Visual indicator that the 3 Amp fuse on the relay board is functional. The red LED indicates that the fuse is in good standing. The 3 Amp fuse needs replacing when the red LED is not lit.

37 **24V LED Indicator** - Indicates that a proper 24 volts is supplied to the relay board.

38 **17V LED Indicator** - Indicates that a proper 17 volts is supplied to the relay board.

39 **17V FAULT LED Indicator** - Indicates that the 17 volts being supplied to the relay board is under tolerance.

40 **12V LED Indicator** - Indicates that a proper 12 volts being regulated within the relay board.

41 **12V FAULT LED Indicator** - Indicates that the 12 volts being regulated within relay board is under tolerance.

42 **5V LED Indicator** - Indicates that a proper 5 volts being regulated within the relay board.

Power-Up Diagnostics

Upon power-up, the satellite will display:

```
Lynx Smart Satellite
       Booting
```

The Lynx Smart Satellite will automatically initiate a diagnostic test during power-up. This function will take approximately ten seconds and it can not be bypassed. If a problem is detected during the test, it will be indicated on the display. This status information can not be edited. The information is as follows:

Example:

```
Rev: 1.00  04/01/16 ◄──────── Lynx Smart Satellite Firmware Version and Revision Date
Detect: 64sta, 00sen◄──────── Detect: [xx station, yy senseors] (xx = number of stations detected,
PD - 05/15/16 06:24pm            yy = number of sensors detected)
                 ▲
                 └──────────── Date and Time of the Last Power Downtime
```

The default Home display will follow after the diagnostic display has timed-out.

Home display example:

```
Sun 5/15/16  02:31 pm
Sat# 001-001 Sec: 57

Day Change:  12:00am

▶Lynx Smart Satellite
```

Home Key

Press **Home** 🏠 to revert to the default display. When editing irrigation programs, Station or Satellite settings, pressing **Home** 🏠 will save any changes in the settings.

Home display examples:

```
Sun 5/15/16  02:31 pm      Typical home display with no active scheduled program
Sat# 001-001 Sec: 57

Next start:  03:00am
Day Change:  12:00am
▶Lynx Smart Satellite
```

```
Sun 5/15/16  02:31 pm
Sat# 001-001 Sec: 57       Home display with two active scheduled programs

Day Change:  12:00am       Press Down ◆ to access hidden display lines on the screen
Running 02 programs
▶P01 Sta01  00:09:46
 P01 Sta02  00:09:46
 P05 Sta25  00:19:51
```

If the current day is an active watering day but nothing is running, the next scheduled start time (**Next Start: HH:MM**) will be displayed. If the satellite is running one or more programs, **Running XX programs** will be displayed to indicate the number of active programs.

If the satellite has an active running program, the display will read:

```
Sun 5/15/16  02:31 pm
Sat# 001-001 Sec: 57

Day Change:  12:00am
Running 01 programs
P01   Sta01  00:09:46 ◄──────  Indicates Station 01 of Program 01 is active with 9 mins and 46 secs of runtime.
P02   Sta02 %00:05:00 ◄──────  The % symbol indicates that station 02 has been percent adjusted.
P03   Sta03D 00:05:00 ◄──────  The "D" symbol indicates that station 03 is disabled.
P04   Sta10P 00:12:00 ◄──────  The "P" symbol indicates that station 10 is paused.
P05   Soak12 00:01:32 ◄──────  "Soak" indicates that station 12 of program 5 is active and in soak transition.
Man   Sta21  00:10:00 ◄──────  "Man" indicates that station 21 was manually activated.
Man   Sta22S 00:10:00 ◄──────  The "S" symbol indicates that station 22 is stacked.
```

Note: Program stacking occurs when the satellite is running a program where the maximum simultaneous station limit is surpassed. Additional scheduled programs will be stacked (delayed) until an available station can be activated.

Start Key

Press **Start** ▶ to execute a manual function. Use the **Input Dial** ‿₊ to select **M-Manual, Syringe, Start Prog**. Press **Up** or **Down** ◆ ◆ to navigate between parameters. Use **Input Dial** ‿₊ to select the correct values to each parameters. Press **Start** ▶ to activate.

Note: Pressing the Start key while the satellite is idle will prompt the Manual Watering menu.

Multi-Manual Start Display

```
▶Manual: M-Manual
 Sta#: 01-02  00:05:00
 Sta#: -----  --:--:--
 Simult: 03
 Press ▶ to water
```
```
      Multi-Manual
       Starting
         03
  Press ■ to cancel
```

Manual Syringe Start Display

```
▶Manual: Syringe
 Runtime: 02 min
 Program: 03
 Press ▶ to water
```
```
   Syringe Starting
     Program 01
         03
  Press ■ to cancel
```

Manual Start Program Display

```
▶Manual: Start Prog
 Program: 16
 Press ▶ to water
```
```
     Program 01
      Starting
         03
  Press ■ to cancel
```

Pause / Resume Key

Press **Pause** ⏸ to suspend an active program or manual irrigation. Pressing pause also allows you to specify the pause duration. Programs can be paused up to 4 hours and 59 minutes.

Pause / Resume Function Directions

Pause function example: Program 01 has been manually activated. Pause program 01 operation for 30 minutes.
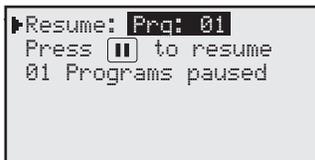
1. Press **Pause** ⏸.

2. Use the **Input Dial** ⌐⌐⌐⌐ to select **All**, **M-Man** or **Prg:XX** (XX = the program number). If multiple programs are active, press **Right** ◆ to navigate to the program number field and use the **Input Dial** ⌐⌐⌐⌐ to select the desired program number. For this example, select **Prg: 01**.

3. Press **Down** ◆ to navigate to the **for:** field. Use the **Input Dial** ⌐⌐⌐⌐ and **Right** ◆ to select the pause duration in hours and minutes. For this example, set the pause duration to **00 hr 30 min**.

```
 Pause: Prg: 01
▶for:   00 hr 30 min
 Press ⏸ to pause
 00 Programs paused
```
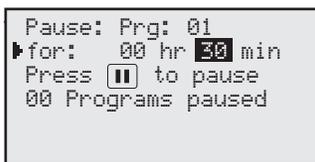
4. Press **Pause** ⏸ to initiate the pause function.

Resume satellite activity example: Reactivate Program 01.

1. Press **Pause** ⏸.

2. Use the **Input Dial** ⌐⌐⌐⌐ to select the correct program or multi-manual operation. For this example, select **Resume: Prg: 01**.

```
▶Resume: Prg: 01
 Press ⏸ to resume
 01 Programs paused
```

3. Press **Pause** ⏸ to reactivate.

Pause Function	Satellite Action
Pause Program XX	Pauses the selected program but allows other programs, multi-manuals and syringe to start. If the start time of the paused program occur's again while still on Pause, that runtime will be stacked (delayed until the first occurrence is completed).
	If Program XX is already on Pause or Pause All is in effect, the new pause time-out will override the remaining pause time for program XX.
Pause Multi-Manual	Pauses the active multi-manual operation but allows any program or syringe to activate. If the 1st multi-manual is Paused and a second multi-manual is started, the 1st multi-manual (Paused) will resume and the second multi-manual that was sent will be stacked.
	If a Multi-Manual is already paused and **Pause All** is activated, the new pause duration will override the remaining pause time for the multi-manual.
Pause Syringe	Allows any program or manual start. If a new syringe is activated for the same paused syringed program, the pause will be cancelled and activity will resume with the new runtime.
	If a syringed program is on Pause All, activating a new pause for the same syringe program will overwrite the remaining pause time.

Pause All	All currently running programs, multi-manual and syringe will be suspended until the pause time expires.
	New start is allowed only for Manual functions.
	Additional programs that are scheduled to start while Pause All is in effect will be stacked until the pause time expires.
Pause All Timed out	All activity delayed by Pause All function will resume. Programs and Manual functions that were paused after the Pause All function will resume when their pause time expires.
Resume Program XX	Resumes program XX activity.
Resume Multi-Manual	Resumes multi-manual activity.
Resume Syringe	Resumes syringe activity.
Resume All	Resumes all irrigation activity.
Cancel (Stop) Program XX	If Program XX is paused, the pause status will be cancelled and activity terminated. If the same program is stacked, it will also be terminated.
Cancel (Stop) Manual	If Manual activity is paused, the pause status will be cancelled and the manual activity is terminated.
Cancel (Stop) All	All paused activities will be cancelled and all watering will be terminated.

Stop Key

Press **Stop** [■] to cancel an active program or manual irrigation. If the Lynx Smart Satellite has no current activity, pressing **Stop** [■] will have no effect.

Stop Function Directions

Stop Function Example: Program 01 is activated automatically. Cancel watering for program 01.

1. Press **Stop** [■].

2. Use the **Input Dial** _⌒+ until the desired program or station to be cancelled is displayed.
   For this example, select **Cancel: Prg: 01**.
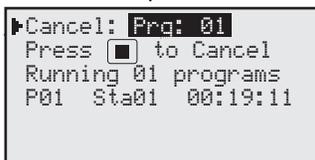
   ```
   ▶Cancel: Prg: 01
    Press ■  to Cancel
    Running 01 programs
    P01  Sta01  00:19:11
   ```

3. Press **Stop** [■] to finalize the program cancelation.

   When finished, the display should read:

   ```
        Canceling P01
          Watering
             03
     Press ■  to Escape
   ```

Unit Settings

Unit Settings allows you to set satellite parameters such as Time, Date and Language.

Press **Up** or **Down** to navigate through the menus.

Press **Left** or **Right** to navigate to the next entry field.

Use the **Input Dial** to select values when editing.

```
▶Comm Mode  : Central
 Hold All   : None
 Hold Rain  : None
 Reset Prg's : No
 Reset Sta's : No
 Reset Unit  : No
 Enabl Sta's : No
 Reset Amps  : No
```

Comm Mode: –   Select the satellite mode of operation between Central, Local or Off mode.

Hold All: –   Suspends all scheduled watering for all stations and switches. You can select the duration of suspension for **Today–30** days, **Permanent** or **None** using the **Input Dial**.

Hold Rain: –   Suspends all scheduled watering for all stations. Output terminals assigned as switches are not affected by the suspension. You can select the duration of suspension for **Today–30** days, **Permanent** or **None** using the **Input Dial**.

Reset Prg's: –   Resets all satellite irrigation program by selecting Yes. Use the **Input Dial** to select **Yes**, then press **Up** or **Down** to activate. The following will display:

```
  Reset All Programs
     to defaults
         05
  Press ■ to escape
```

All program data will be erased after a successful reset.

Reset Sta's: –   Resets all station settings by selecting Yes. Use the **Input Dial** to select **Yes**, then press **Up** or **Down** to activate. The following will display:

```
  Reset All Stations
     to defaults
         05
  Press ■ to escape
```

All station settings will be erased after a successful reset.

Reset Unit: –   Resets the satellite settings by selecting Yes. Use the **Input Dial** to select **Yes**, then press **Up** or **Down** to activate. The following will display:

```
     Reset Unit
     to defaults
         10
  Press ■ to escape
```

After the 10-second countdown, the satellite will reboot.

Resetting the unit will erase all user-defined program data and configuration values in the satellite's memory.

Reset Amps: –   Resets all the station's nominal current (Amp) to 0.00. The Lynx Smart Satellite measures the current draw for each stations during the initial activation or by performing a **Setup Amps** function. The satellite will save these values as the nominal values. The satellite will compare the current during activation to the nominal values to determine if an under or over current event occurred.

Setup Amps: –   Sets the nominal current for each stations. When activated, the Lynx Smart Satellite will momentarily activate each station and measure the current draw. The satellite will the save these values as the nominal values. The satellite will compare the current during activation to the nominal values to determine if an under or over current event occurred.

Set Amp Tol: – Sets current (Amps) tolerance. The Lynx Smart Satellite will use this value to determine if an under or over current event.

OvrAmpsStaDis: – (Over Amperage Station Disable) When set to **Yes**, Lynx Smart Satellite will disable the offending station from activating during an over current event. You must clear the alarm to reactivate the offending station. To clear alarm, press **Station Settings** ⬚, then press **Down** to select **Clr Alarm**. Use the **Input Dial** ⟋₊ to select **Yes**, the press **Up** or **Down** ◆ ◆ to activate.

```
▶Set Amp Tol : No
 OvrAmpStaDis: Yes
 Language ▛ : English
 Clock Set  : 8:45am
 Clock Mode : Am/Pm
 Date Mode  : MMDDYY
 Date: 01/08/12 Sat
 Day Change : 12 am
 CSG Address : 001
 Sat Address : 001
 Sta Delay  : 01 Sec
 Max Sim Sta : 06
 Meas Units : English
 Set Passwrd : ****
 Display Adj : ▬▬▬
```

Enable Sta's: – Resets all disabled stations with one execution. This function will also clear all station alarms related to under/over current conditions. Select **Yes All** using the Input Dial ⟋₊ and press **Up** or **Down** ◆ ◆ to activate. Select **No** to cancel. Individual stations can be enabled/disabled by using the Disable function within the Station Settings menu.

Language: – The default language is English. Use this function to select your preferred language from English, Spanish, French, Italian, Chinese, Japanese and Korean.

Clock Set: – Sets the current time. Press **Left** or **Right** ◆ ◆ to select between the Hours and Minutes fields, then use the **Input Dial** ⟋₊ to modify the values.

Clock Mode: – Select the clock mode from either **Am/Pm** (12-Hour) or **24-Hour** format.

Date Mode: – Select the date mode from either Month-Day-Year (**MMDDYY**) or Day-Month-Year (**DDMMYY**) format.

Date: – Sets the current date. Press **Left** or **Right** ◆ ◆ to select between the Month, Date and Year fields, then use the **Input Dial** ⟋₊ to modify the values.

Day Change: – Sets the "day change" time. The "day change" is the specified time that the satellite will advance the date. The default day change is 12:00 am. Day change is used to determine the active days when running programs as well as recording station activity for course reports.

CSG Address: – Sets the CSG (Central Satellite Group) address. Lynx and SitePro Central Controller use this address to identify different satellite groups.

Identify all satellites that can be grouped together and assign them with the same CSG address. When Lynx or SitePro Central Controller sends out a command to that CSG address, all the satellites within that group will receive and execute the command.

Sat Address: – Sets the satellite address. Each satellite must be given a unique satellite address. Lynx and SitePro Central Controller use this address to identify individual satellites when sending satellite specific commands.

Sta Delay: – Sets the satellite's station delay. The station delay determines the wait time before the next station is activated after a station has concluded its watering cycle. This time delay is used to allow the system to normalize between station activations.

Max Sim Sta: – Sets the maximum number of simultaneously operating stations. This threshold will be applied to all programs and manual irrigation functions. Each program can then be set with a lower limitation if necessary.

Note: Simultaneous setting in the Watering Schedule can not exceed the Satellite Settings.

Example: The Smart Satellite's maximum simultaneous stations setting is set to **7**, which means the satellite will not allow more than 7 stations to turn on at the same time. All programs in the satellite will adhere to the 7 maximum active stations and each can be adjusted with a lower limit (6, 5, 4, etc.).

Meas Units: – Sets the satellite's units to English (U.S. Standard) or Metric units.

Set Passwrd: – Sets a 4-digit password. When set, the password needs to be entered every time the station and satellite settings are modified. To deactivate, set the password to 0000.

Display Adj: – Adjusts the contrast of the LCD screen. Use the **Input Dial** ⟋₊ to darken or lighten the text display.
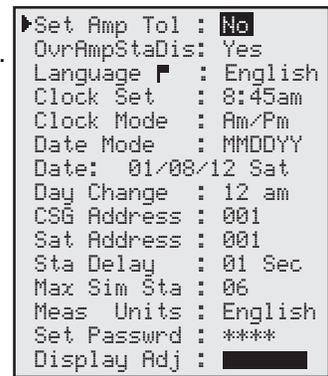
Station Settings

Station ↕ Settings allows you to set parameters specific to each station.

Press **Up** or **Down** ⬥ ⬥ to navigate through the menus.

Press **Left** or **Right** ⬥ ⬥ to navigate to the next entry field.

Use the **Input Dial** ⌣ to select values when editing.

```
▶S01   100%
 Sched today None
 Water today None
 Water yestr None
 Disable :  No
 Hold Sta : None
 Is Switch: No
 Cycles  :  01 times
 Edit name: No name
 Last on :  0.218 Amp
 Nominal :  0.218 Amp
 Tol +/- :  0.040 Amp
 No alarm events
 Pump Nomn: 0.000 Amp
```

S01 – Select the station you want to edit in this field. Choose from Station 01 through the satellite maximum station count of 64 and GMM (Group Multi-Manual).

100% – If weather or some other condition requires irrigation program modification, it can be easily adjusted by changing the percent adjustment. Station operation can be reduced to 000% (Off) or increased up to 900%. 100% represents standard operation.

Sched Today – Displays the total scheduled runtime for the current day, which is determined by the day change time.

Water Today – Displays the actual watering duration for the current day, which is determined by the day change time

Water Yestr – Displays the actual watering duration for the previous day.

Disable – Disable station operation by selecting Yes from the menu. Disabled stations time out if they are active, but do not activate the terminals. Resume station operation by selecting No from the menu. Enabling a station (disable = no) will clear corresponding station alarms that resulted from over/under current conditions.

Hold Sta: – Station holds do not allow scheduled stations to start, but will allow stations to start manually. Placing a station on hold will not cancel its activity. Select the hold duration from 01–30 days, Permanent or None. This option is useful when a specific station needs to be deactivated without affecting any of the programs.

Is Switch: – Assigns the selected station to a switch. When the switch (station) is activated, the Master Valve or Pump will not actuate. The output will remain at 24 VAC

Cycles: – Cycles will automatically divide the corresponding station runtime by the number of cycles and execute each resulting cycles after satisfying the program soak duration. Select from **01** (normal operation) through **04** cycles or you can select **Autocycle.** When selecting Autocycle, the Max Cycle duration and Auto Soak duration must be entered. Autocycle will then run the station up to the Max Cycle duration, wait for the Auto Soak duration to expire, then initiate another cycle until the total station runtime is completed.

Edit Name: – Assign a name description to the station. The naming format is XX-AA-YY, where XX represents the golf course hole number, AA represents the area description acronym and YY represents the sprinkler number within the area. By following the naming format, you can easily figure out where and what area the station is watering.

Area Description Acronym Examples
GR = Greens   **DR** = Driving Range   **TE** = Tee   **CH** = Club House   **FW** = Fairways
LA = Landscape   **RF** = Rough   **PG** = Putting Green   **AP** = Approaches   **MS** = Misc.

Last On – Displays the station current draw from the last activation.

Nominal – Displays the recorded nominal current value. This is the value that the Lynx Smart Satellite uses to determine an over current or undercurrent condition during station operation.

Tol +/– – Displays the current tolerance value. When the station's current reaches above the nominal value plus the tolerance, it is considered an over current condition. When the station's current reaches below the nominal value minus the tolerance, it is considered an undercurrent condition. The tolerance can be modified by using the **Input Dial** ⌣ to increase or decrease the value. Tolerance may be set to 0.04 amps up to 0.9 amps.

Over tol – Displays the over current value during over current condition. It also displays the time and date it has occurred.
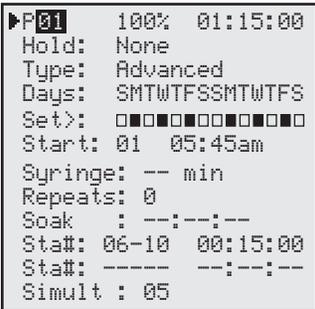
Scheduled Watering

⊕ The Lynx Smart Satellite features 64 fully-independent resident programs.

- **Irrigation Program** will activate a station or group of stations with up to 24 start times. The 2-week calendar scheduling can be varied from All (daily), Alternate, Weekdays only, Weekends only, None (Off) or specific days dictated by you. Percent adjust and the number of simultaneous active stations can be specified in this program.

- **Station Based Flow Management** - The Lynx Smart Satellite supports station based flow management as downloaded by Lynx or SitePro Central Controller. When station based flow management is utilized, the downloaded station activity list can be viewed between **P64** and **P01** within the **Scheduled Watering** menu. The station activity list cannot be edited at the satellite. Upon receipt, the satellite automatically creates traditional programs (P01 to P64) from the information contained in the station activity list. Traditional programs created from the station activity list are intended for manual irrigation and therefore do not include a start time. Placing a start time on any traditional program will disable the station activity list and prevent it from executing.

The configuration parameters are as follows:

```
▶P01    100%   01:15:00
 Hold:  None
 Type:  Advanced
 Days:  SMTWTFSSMTWTFS
 Set>:  □■□■□■□□■□■□■□
 Start: 01   05:45am

 Syringe: -- min
 Repeats: 0
 Soak   : --:--:--
 Sta#: 06-10  00:15:00
 Sta#: -----  --:--:--
 Simult : 05
```

P01 –	Select the program number being created or modified. Lynx Smart Satellite can have up to 64 programs and GMM (Group Multi-Manual).
100% –	Percent adjustment parameter - Adjust the percentage according to the proper weather or season changes. You can adjust the program's watering from 10% – 250%.
Hold –	Activate **Hold** to suspend program activity. Select from **NONE**, **TODAY–30** Days and **PERMANENT**.
Type –	**Basic** schedule will activate a station or group of stations with one start time on a daily basis. Each station will water for the duration specified in hours, minutes and seconds. Percent adjust and maximum number of simultaneous activate stations per program can be specified in this program.
	Advanced schedule will activate a station or group of stations with up to 24 start times. The 2-week calendar scheduling can be varied from All (daily), Alternate, Weekdays only, Weekends only, None (Off) or specific days dictated by you. Percent adjust and the number of simultaneous active stations can be specified in this program.
	Grow-In schedule will activate a station or group of stations for the length of their runtime. The program will repeat the cycle after the specified delay time expires and will repeat continuously between the set Start and End times. Percent adjust and the simultaneous activate stations can be specified in this program.
Start time: –	Enter the time to start the program cycle. Advanced programs can have up to 24 starts.
Days: –	Select the program's active day schedule which can range from watering everyday (01) to every 30 days. You can also choose Days-of-the-Week to select specific days to irrigate.
set>: –	When selecting **Days-of-the-Week** to irrigate, you can activate or deactivate individual days within a two-week schedule.
Today's Day: –	Select the current day's designation within the interval watering schedule. Example: When setting your program to water every 4th day and you want the cycle to start tomorrow, set 03 for Today. The TODAY number is increased at every Day Change until the interval number (Water Every: XX) is met.
Sta#: –	Enter the stations and their runtimes that the program will activate.
Syringe: –	Regardless of the programmed runtimes, if the syringe duration is set with a value from 01 through 99 minutes, all stations in that program will activate for that duration during each start time. Disable **Syringe** by assigning a **00** min syringe value.
Repeats: –	Program repeats can be set from **0–3** times. The program's total runtime will be multiplied by the number of repeats. Program repeat will activate immediately after the program soak duration is satisfied.
Soak: –	**Soak** is the delay time that the program will wait before executing a station cycle or program repeat. **Soak** is valuable to allow time for water to penetrate the soil before continuing with the cycle. Without soak time, the soil will reach saturation resulting in water run off. Soak time can range from 00:00 (no delay) to 11:59 (Hours:Minutes).
Simult: –	Enter the maximum number of stations that can simultaneously operate in the program. This parameter can not be greater than the **Max Sim Sta** (Maximum Simultaneous Stations) in the Satellite Settings.

Basic Schedule Setting

Basic Irrigation Program example: Create Program 01 with stations 1–5 for 25 minutes each and stations 11–20 for 15 minutes each with a program adjustment of 110%. Set the start time at 6:30 am with five maximum simultaneous active station.

```
▶P01    110% %05:02:30 ◀────── The % symbol indicates that the total runtime is
 Hold:  None                    adjusted to 5 hours, 2 minutes and 30 seconds.
 Type:  Basic
 Start time:  06:30am
 Sta#:  01-05 00:25:00
 Sta#:  11-20 00:15:00
 Sta#:  ----- --:--:--
 Simult : 05
```

1. Press the **Scheduled Watering** Key ⊙. The cursor is initially located at the program selection field. Use the **Input Dial** to select the program (P01–P64) you want to create or modify. For this example, select program 01.

2. Press **Right** to navigate to the percent adjustment field. Normally this setting will be 100% unless weather or other conditions suggest that less or more irrigation is needed. Use the **Input Dial** to adjust the setting. For this example, set to 110%.

3. Press **Down** to navigate to the **Hold:** field. Use this option to suspend program operation. Select from **None**, **Today**, **02–30** days or **Permanent**. For this example, select **None**.

4. Press **Down** to navigate to the **Start time:** field. Press **Left** or **Right** to navigate between the Hours and Minutes field. Use the **Input Dial** to set the desired start time.
   For this example, set the start time at **06:30am**.

5. Press **Down** to navigate to the **Sta#:** field. Use the **Input Dial** to select the value of the first station being irrigated. For this example, select station **01**.

6. Press **Right** to navigate to the next station value. This value will indicate the last station of the range. If irrigating only one station, this value should be the same as the first value. Use the **Input Dial** to set the range. For this example, select station **05**.

7. Press **Right** to navigate to the runtime field. This entry field will indicate the runtime in hours, minutes and seconds (HH:MM:SS). Use the **Input Dial** and **Right** arrow to select the appropriate runtime value. For this example, set the value to **00:25:00**.

8. Repeat steps 5–7 for group station 11–20 with 15 minutes of runtime.

9. Press **Down** to navigate to the **Simult:** field. Use the **Input Dial** to set the maximum number of stations that can be activated simultaneously. For this example, set the value to **05**.

Advanced Schedule Setting

Irrigation Program example: Create program 2 that will activate stations 6–10 with a runtime of 15 minutes each and watering adjustment (100%). Set the start time 01 at 5:45 am every Monday, Wednesday and Friday only. Set the maximum simultaneous active station to 5.

```
▶P02    100%  01:15:00     Syringe: -- min
 Hold:  None               Repeats: 0
 Type:  Advanced           Soak   : --:--:--
 Days:  SMTWTFSSMTWTFS      Sta#: 06-10  00:15:00
 Set>:  □■□■□■□□■□■□■□      Sta#: ----- --:--:--
 Start: 01  05:45am        Simult : 05
```

1. Press the **Scheduled Watering** Key ⊕. The cursor is initially located at the program selection field. Use the **Input Dial** ⌐‾‾⌐₊ to select the program (P01–P64) you want to create or modify. For this example, select program 02.

2. Press **Right** ◆ to navigate to the percent adjustment field. Normally this setting will be 100% unless weather or other condition suggest that less or more irrigation is needed. Use the **Input Dial** ⌐‾‾⌐₊ to adjust the setting. For this example, no adjustment is needed (remains at 100%).

3. Press **Down** ◆ to navigate to the **Hold:** field. Use this option to suspend program operation. Select from **None**, **Today**, **02–30** days or **Permanent**. For this example, select **None**.

4. Press **Down** ◆ to navigate to the **Days:** field. Use the **Input Dial** ⌐‾‾⌐₊ to set the program activation interval from 01–30 days. Select 01 for everyday, 02 for every other day, 03 for every third day and so on. The example does not call for a set interval. Leave the **Days:** setting to **SMTWTFS**.

5. Press **Down** ◆ to navigate to the **Set:** field. Use the **Input Dial** ⌐‾‾⌐₊ to select from any of the preset intervals (All, Alternate days, Weekdays only, Weekends only, None or User set). To create your own program activation interval, select **Set:**. Press **Right** ◆ to select the day of the week you want to irrigate and se the **Input Dial** ⌐‾‾⌐₊ to activate (X) or deactivate (blank) the selection. For this example, activate M (Monday), W (Wednesday) and F (Friday) only. MWF of the 1st and 2nd week should have an **X** mark under while the rest are blank.

6. Press **Down** ◆ to navigate to the **Start:** field. The first entry field will indicate the start time number. Each program can have up to 24 start times. Use the **Input Dial** ⌐‾‾⌐₊ to select the start time being created or modified. Press **Right** ◆ to navigate to the time entry field. Use the **Input Dial** ⌐‾‾⌐₊ to set the start time in hours and minutes (HH:MM). Repeat Step 6 for additional start times. For this example, set start time **01** to **05:45am**.

7. Press **Down** ◆ to navigate to the **Syringe:** field. Use the **Input Dial** ⌐‾‾⌐₊ to activate Syringe by entering a syringe runtime. When activated, the program will run all stations for the specified duration regardless of the stations' runtimes. Leave the syringe runtime at **00** min.

8. Press **Down** ◆ to navigate to the **Repeats:** field. Use the **Input Dial** ⌐‾‾⌐₊ to set the number of times the schedule will be repeated after the first activation. Leave the Repeat value to **0**.

9. Press **Down** ◆ to navigate to the **Soak:** field. Use the **Input Dial** ⌐‾‾⌐₊ to set the soak time. The soak time will indicate the delay before the program will repeat or cycle again. Leave the soak time blank (– – : – – : – –) for no soak delay.

10. Press **Down** ◆ to navigate to the **Sta#:** field. Use the **Input Dial** ⌐‾‾⌐₊ to select the value of the first station being irrigated. For this example, select station **06**.

11. Press **Right** ◆ to navigate to the next station value. This value will indicate the last station of the range. If irrigating only one station, this value should be the same as the first value. Use the **Input Dial** ⌐‾‾⌐₊ to set the range. For this example, select station **10**.

12. Press **Right** ◆ to navigate to the next entry field. This entry field will indicate the runtime in hours, minutes and seconds (HH:MM:SS). Use the **Input Dial** ⌐‾‾⌐₊ and **Right** ◆ arrow to select the appropriate runtime value. For this example, set the value to **00:15:00**.

13. Press **Down** ◆ to navigate to the **Simult:** field. Use the **Input Dial** ⌐‾‾⌐₊ to set the maximum number of stations that can be activated simultaneously. For this example, set the value to **05**.

Grow In Schedule Setting

Grow In Irrigation Program example: Create program 3 with stations 21–30 for 5 minutes each with no percent adjustment. Set the start time at 6:30 am and the end time at 4:00 pm. Set the delay for 2 hours and 15 minutes and the maximum simultaneous active station to 5.

```
▶P03     100%  00:50:00
 Hold:   None
 Type:   Grow In
 Start:  06:30am
 End  :  4:00pm
 Delay:  2:15(hr:min)
 Sta#:   21-30 00:05:00
 Sta#:   ----- --:--:--
 Simult: 05
```

1. Press the **Scheduled Watering** Key ⊕. The cursor is initially located at the program selection field. Use the **Input Dial** ⁻‿‿₊ to select the program (P01–P64) you want to create or modify. For this example, select program 03.

2. Press **Right** ◄►. to navigate to the percent adjustment field. Normally this setting will be 100% unless weather or other condition suggest that less or more irrigation is needed. Use the **Input Dial** ⁻‿‿₊ to adjust the setting. For this example, no adjustment is needed (remains at 100%).

3. Press **Down** ◄► to navigate to the **Hold:** field. Use this option to suspend program operation. Select from **None**, **Today**, **02**–**30** days or **Permanent**. For this example, select **None**.

4. Press **Right** ◄► to navigate to the **Type:** field. Use the **Input Dial** ⁻‿‿₊ to select **Grow In**.

5. Press **Down** ◄► to navigate to the **Start:** field. Press **Left** ◄► or **Right** ◄► to navigate between the Hours and Minutes field. Use the **Input Dial** ⁻‿‿₊ to set the desired start time. For this example, set the start time at **06:30am**.

6. Press **Down** ◄► to navigate to the **End:** field. Press **Left** ◄► or **Right** ◄► to navigate between the Hours and Minutes field. Use the **Input Dial** ⁻‿‿₊ to set the desired end time. For this example, set the start time at **04:00pm**.

7. Press **Down** ◄► to navigate to the **Delay:** field. Delay is the wait duration before the next cycle will begin. Press **Left** ◄► or **Right** ◄► to navigate between the Hours and Minutes field. Use the **Input Dial** ⁻‿‿₊ to set the desired delay time. For this example, set delay to **02:15**.

8. Press **Down** ◄► to navigate to the **Sta#:** field. Use the **Input Dial** ⁻‿‿₊ to select the value of the first station being irrigated. For this example, select station **21**.

9. Press **Right** ◄► to navigate to the next station value. This value will indicate the last station of the range. If irrigating only one station, this value should be the same as the first value. Use the **Input Dial** ⁻‿‿₊ to set the range. For this example, select station **30**.

10. Press **Right** ◄► to navigate to the next entry field. This entry field will indicate the runtime in hours, minutes and seconds (HH:MM:SS). Use the **Input Dial** ⁻‿‿₊ and **Right** ◄► arrow to select the appropriate runtime value. For this example, set the value to **00:05:00**. Repeat steps 10–12 for additional station(s).

11. Press **Down** ◄► to navigate to the **Simult:** field. Use the **Input Dial** ⁻‿‿₊ to set the maximum number of stations that can be activated simultaneously. For this example, set the value to **05**.

GMM (Group Multi-Manual) Setting

Create Group Multi-Manual with two sequences. Sequence 1 will have stations 1, 5, 7 and 9 with a runtime of 15 minutes per station. Sequence 2 will have stations 2, 3, 4, 11, 12 and 13 with a runtime of 20 minutes per station. The GMM will have two start times, one at 3 am and the other at 9 pm. GMM shall run only on Sundays, Tuesdays, Thursdays and Saturdays.

```
▶GMM SMTWTFS   00:35:00      ▶GMM SMTWTFS   00:35:00
 Set X-X-X-X  Act days        Set X-X-X-X  Act days
 Start: 01    03:00am         Start: 02    09:00pm
 Seq#   01    00:15:00        Seq#   02    00:20:00
 St 01 05 07 09 -- --         St 02 03 04 11 12 13
 Clear GMM:   No              Clear GMM:   No
```

1. Press the **Scheduled Watering** Key ⊙. The cursor is initially located at the program selection field. Use the **Input Dial** ‿ to select **GMM**. GMM is located before P01 and after P64.

2. Press **Down** ◆ to navigate to the **Set:** field. Press **Left** ◆ or **Right** ◆ to navigate to any weekday you want to irrigate and use the **Input Dial** ‿ to activate (X) or deactivate (–). Repeat to activate additional irrigation days. Activate Sunday, Tuesday, Thursday and Saturday by setting (X) under their corresponding initials.

3. Press **Down** ◆ to navigate to the **Start:** field. GMM can be set with as many as 24 start times. Press **Left** ◆ or **Right** ◆ to navigate to the Hours and Minutes fields and use the **Input Dial** ‿ to set the proper start time. For this example, set start time **01** to **03:00am** and start time **02** to **09:00pm**.

4. Press **Down** ◆ to navigate to the **Seq#** field. A sequence is a 6-station group with independent runtime. GMM can have up to 32 independent sequences. While the sequence number is selected, use the **Input Dial** ‿ to select the sequence number. Press **Left** ◆ or **Right** ◆ to navigate between the Hours and Minutes field. Use the **Input Dial** ‿ to set the desired runtime. Set sequence **01** with **00:15:00** of runtime.

5. Press **Down** ◆ to navigate to the **Sta:** field. Use the **Input Dial** ‿ to set the station number you want to activate. Press **Left** ◆ or **Right** ◆ to navigate between the station number fields. Set stations **01**, **05**, **07** and **09** to sequence **01**.

    Repeat steps 4 and 5 to set additional sequences. Set a 20-minute station runtime to sequence **02**. Set stations **02**, **03**, **04**, **11**, **12** and **13** to sequence **02**.

    Note: Lynx Smart Satellite will allow you to set a station that is already assigned to another sequence but it will delete that station number from the sequence it was previously assigned.

6. To clear GMM, press **Down** ◆ to navigate to the **Clear GMM:** field. Use the **Input Dial** ‿ to select **Yes**, then press **Up** ◆ to clear the parameters.

Station Based Flow Management

The SBF (Station Based Flow) screen can be accessed from the Scheduled Watering menu.
Follow the steps to access.

```
▶SBF List Event 001  ◀──── Indicates the Event Number
 Start 12:00am  S22  ◀──── Indicates the Start Time followed by the Station Number
 Run  00:10:00  P26  ◀──── Indicates the Runtime [Hrs:Min:Sec] followed by the Program Number
 Program Start  (80) ◀──── Indicates Miscellaneous Function Code
```

1. Press the **Scheduled Watering** Key ⊙. The cursor is initially located at the program selection field. Use the **Input Dial** ⌒ to select **SBF List** which is located before P01 and after P64.

    Note: The SBF List is only available after a successful download from Lynx or SitePro Central Controller.

2. Press **Right** ◆ to navigate to the event number.

3. Use the **Input Dial** ⌒ to select the event number you want to review.

    Note: Editing the SBF List is not allowed in the satellite level. SBF modifications must be made in Lynx or SitePro Central Controller and downloaded back to the satellite to update.

Manual Watering

✋ The Manual Watering functions are used for additional watering if the irrigation program is not sufficient. They can also be used to troubleshoot each station for proper operation. Pressing the Manual Watering Key will access three manual irrigation functions; Multi-Manual, Syringe and Program.

M-Manual

Select M-Manual to activate a station or group of stations with a specified runtime.

Manual station activation example: Activate stations 1–12 with a runtime of 5 minutes each and limit watering to 3 stations simultaneously.

```
▶Manual: M-Manual
 Sta#: 01-12  00:05:00
 Sta#: -----  --:--:--
 Simult: 03
 Press ▶ to water
```

Note: The Multi-Manual function is limited to the maximum simultaneous station settings of the satellite. In cases where a program is running and a multi-manual activated, the satellite will activate all stations specified in the multi-manual in addition to the currently activated stations. Thus, the multi-manual will allow the satellite to exceed the maximum simultaneous station settings.

1. Press the **Manual Watering** key ✋.

2. Use the **Input Dial** ⌒ to select **M-Manual**.

3. Press **Down** ◆ to navigate to the **Sta#:** field. Use the **Input Dial** ⌒ to select the value of the first station being irrigated. For this example, select station **01**.

4. Press **Right** ◆ to navigate to the next station value. This value will indicate the last station of the range. If irrigating only one station, this value should be the same as the first value. Use the **Input Dial** ⌒ to set the range. For this example, select station **12**.

5. Press **Right** ◆ to advance the cursor to the runtime field. Use the **Input Dial** ⌒ to set the desired runtime. For this example, set the value to **00:05:00**.

6. Press **Down** ◆ to navigate to the next entry field. Notice that a new Sta: line was created. Fill this line only if irrigating multiple ranges of stations, otherwise, leave this line blank.

7. Press **Down** ◆ to navigate to the **Simult:** field. Use the **Input Dial** ⌒₊ to set the maximum number of stations that can be activated simultaneously. For this example, set the value to **03**.

8. Press **Start** ▶ to activate or press **Home** 🏠 to cancel and revert back to the default display.

   Note: Pressing the Home Key will save the entered values.

   When reviewing the Multi-Manual program by pressing the Manual Watering button, the display will deduct the stations that watered or currently watering to the list.

   Modifying the Multi-manual will append the added stations to the currently running manual. Currently running stations will not be affected. The Lynx Smart Satellite will run the stations in sequential order disregarding the order it was entered.

Syringe

Choose Syringe to activate all the stations in a selected irrigation program for a specified runtime.

Note: The Maximum number of simultaneous stations set in the program still applies.

Syringe activation example: Manually activate all the stations in Program 3 for 2 minutes each.

```
▶Manual:  Syringe
 Runtime: 02 min
 Program: 03
 Press ▶ to water
```
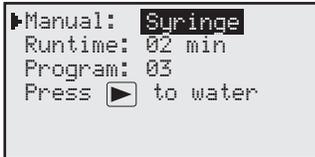
Note: An irrigation program must be configured to activate Manual Syringe.

1. Press the **Manual Watering** Key ✋.

2. Use the **Input Dial** ⌒₊ to select **Syringe**.

3. Press **Down** ◆ to navigate to the **Runtime:** field. Use the **Input Dial** ⌒₊ to set the desired runtime in minutes. This runtime will be used by all the stations in the program during the Syringe operation only. For this example, set the runtime value to **02** minutes.

   Note: The runtime setting in Syringe will not affect the actual runtime in the program.

4. Press **Down** ◆ to navigate to the **Program:** field. Use the **Input Dial** ⌒₊ to select the correct program to syringe. For this example, select program **03**.

5. Press **Start** ▶ to activate or press **Home** 🏠 to cancel and revert back to the default display.

   Note: Pressing the Home Key will save the entered values.

Start Program

Select Start Prog to activate a watering program regardless of its set start time.

Start Program example: Manually activate Program 16.

```
▶Manual:  Start Prog
 Program: 16
 Press ▶ to water
```

Note: An irrigation program must be configured to activate Manual Program. A program on hold can still be manually activated.

1. Press the **Manual Watering** Key ✋.

2. Use the **Input Dial** ⌇ to select **Start Prog**.

3. Press **Down** ◆ to navigate to the **Program:** field. Use the **Input Dial** ⌇ to select the correct program to activate. For this example, select program **16**.

   Note: If **GMM** (Group Multi-Manual) is set, it can be manually started under **Start Program**.

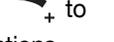4. Press **Start** ▶ to activate or press **Home** 🏠 to cancel and revert back to the default display.

   Note: Pressing the Home Key will save the entered values.

% (Percent) Adjust

🐦 The percent adjust function allows you to fine tune irrigation programs. With weather conditions changing constantly, Percent Adjust allows you to tune your system easily without changing all the values in the program.

% Adjust Directions

```
 Percent Adjust. . .
▶Satellite       100%
 Program:    P01 100%
 Station:    S01 100%
```
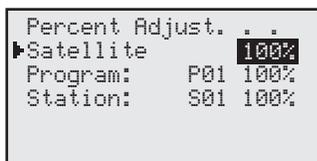
1. Press the **% Adjust** Key 🐦.

2. Use the **Input Dial** ⌇ to adjust the smart satellite's watering up to 900% or down to 1%.
   Note: Satellite adjustment will affect all stations and programs universally. Do not adjust the satellite % settings if the adjustment is station or program specific.

3. Press **Down** ◆ to navigate to the **Program:** field. Use the **Input Dial** ⌇ to select the program being adjusted. Press **Right** ◆ to navigate to the percent adjustment field. Use the **Input Dial** ⌇ to adjust the program watering up to 250% or down to 10%. Repeat step 3 to adjust additional programs.
   Note: Do not adjust the program % setting if adjustment is station specific.

4. Press **Down** ◆ to navigate to the **Station:** field. Use the **Input Dial** ⌇ to select the station being adjusted. Press **Right** ◆ to navigate to the percent adjustment field. Use the **Input Dial** ⌇ to adjust the station's watering up to 900% or down to 000%. Repeat step 4 to adjust additional stations.
   Note: Adjusting the station's watering to 000% will prevent it from running within a program. Multi-Manual and Syringe are not affected by the % Adjustment.

Diagnostic and Radio Settings

⚎ The Diagnostics function of the Lynx Smart Satellite allows for easy system troubleshooting. Within this function, the user can monitor the satellite's internal voltages as well as check the satellite's firmware version.

Use the Input Dial – ⌒ + to navigate through the menus while in the **Menu:** field.

Menu: Link Monitor –

```
▶Menu: Link Monitor
 Sta#: 001-001


 Naks: 000 Msg#: 000
 FE:   000 Other:000
```

Monitors the satellite's communication traffic.

Menu: System Monitor –

```
▶Menu: System Monitor
 Sta#: 000-000
```

Monitors all the network's communication traffic.

Menu: Revision –

```
▶Menu: Revision

 Revision: 1.00p29
 Rev date: 06/07/16
 VP bl ver 1.00 10/04/12
 TM Hardware Ver: 3
```

Displays the satellite firmware version, creation date and faceplate hardware version.

Menu: Power-Up Detect –

```
▶Menu: PowerUp Detect

 Detect: 32sta, 00sen
 PD 05/03/16 15:00:00
 PU 05/03/16 15:16:07
 Slot 1 card: Output
 I2C Events:  000 000
 Reset type:  11
 Wire line found:  No
 Radio Anlg Enble: Yes
```

Displays the number of detected stations, number of detected sensors. It will also display the date and time of the last power-down (PD) and power-up (PU). Press the Down arrow ⬍ to scroll down the informations.

Menu: Seq Stations –

```
▶Menu: Seq Stations

 On each for: .5 sec
 Press ▶ to start

 End Station: 32
```

Activates all the stations sequentially. Use the Input Dial – ⌒ + to set the time duration from 0.01 sec, 0.1 sec, 0.5 sec, 1 sec, 5 sec, 10 sec, 1 min or 5 min. The user can observe the operation of each station when troubleshooting the system using this option.

Menu: Station Test –

```
▶Menu: Station Test
 Sta:  Pump 0.000 Amp

 Press ▶ to start
```

Test individual stations. Press the Down arrow ⬍ to access the station number field. Select the station you want to test and press START key ▶. You can step to the next or previous station number by using the Input Dial – ⌒ +.

Station Amps –

```
▶Menu: Station Amps
 Sta 01  :   0.218 Amp
 Nominal :   0.210 Amp
 Tol +/-  :   0.040 Amp
 No alarm events
 Pump Nomn:  0.212 Amp
 Disable :   No
```

Displays the station's current output. Press **Down** to navigate to the **Sta 01:** field, then use the **Input Dial** to select the station you want to monitor.

Reset Nominal Current - Press **Down** to navigate to the **Nominal:** field. Use the **Input Dial** to select **Reset**. Press **Down** to reset.

Modify Tolerance - Press **Down** to navigate to the **Tol+/–:** field. Use the **Input Dial** to set the desired tolerance from 0.040–0.900 amps.

Send Ctrl Code –

```
▶Menu: Send Ctrl Code
 Code: --

 Press START to send
```

Send controller code to the Lynx or SitePro Central Controller. The two-digit commands are set in the Lynx or SitePro Central Controller to do a specific task. To send a controller code, press **Down** to navigate to the **Code:** field. Use the **Input Dial** to enter the code number. Press **Start** to send.

Menu: VA Monitor –

```
▶Menu: VA Monitor
 Amp: 0.000   AD: 000
 12V: 12.3    BV: 2.4
 17V: 17.3    9V: 0.0
 LCD: 26C     VL:-05.2V
```

Monitors the satellite's amperage, voltages and temperature in real-time. This allows you to troubleshoot the satellite's internal circuit voltages.

Menu: Event Codes –

```
▶Menu: Event Codes
 Clear log: No
```

Displays the satellite's Event Code log. You can clear the log from this option. Press **Down** to navigate to the **Clear log:** field. Use the **Input Dial** to select **Yes**, then press **Down** to activate.

Radio Tx Chars –

```
▶Menu: Radio Tx Chars
 Press ▶ to start
```

The Satellite can be put in a mode that will transmit characters every five seconds. This should only be used for diagnostic reasons because it will step on other transmissions at the same frequency. It transmits ASCII sequential values 0 through 9. The mode can last five minutes before the transmissions automatically ends and the screen returns to the home screen.

Radio Ping –

```
▶Menu: Radio Ping
 Radio addr: ----


 Resp:
```

The M7 radios can ping another M7 radio if they are set to Digital(Dig). It requires the user to input the radio address that is being pinged. The ping response from the other radio will show on the screen. The screen is only shown when the radio is set to use the digital mode.

Radio Info –

```
▶Menu: Radio Info
 Model#        RV-M7
 Version       E28
 Serial#       8276891
 Last RSSI     -66dB
 Get more:     No
 Serial#       8276891
 Temperature   30C
 Input Volts   12.2V
 Current Draw  100mA
```

(Radio info menu is not available if Radio is set to "None") Information from the radio is read at power up and shown. It shows the radio model number, serial number, the last RSSI if enabled, and other information. To update the other information select "Get more: Yes". When doing this, though, it's possible that the satellite miss a message from the central if it receives it at the same moment as the satellite is getting more information from the radio.

Radio Settings –

```
▶Menu: Radio Settings
 Radio Power: 040%
 Radio Addr:  1023
 RSSI Enable: No
 Set Radio Dflts: No
```

The radio transmission power may be changed here if desired. The M7 radio is a five watt radio. The default power setting is 40%, which is 2 Watts. The radio address does not affect communication and does not usually need to be changed. The radio should only be operated under licensed frequencies and power settings. The address is automatically set to the format GAAA, where G refers to the Group setting and A refers to the three digit satellite address. This should make it easier to ping a radio for diagnostic purposes.

The RSSI setting is the same as in the Link Setting menu previously described.

The last line in the menu is used to set the radio defaults. It is not common that the defaults in the radio need to be set. The example shows the radio set to 2 watts and its address set for satellite group 1, address 023. RSSI will not be recorded.

Radio Freq's –

```
▶Menu: Radio Freq's
 Channel: 1

 Rx Freq1 463.6125MHz
 Tx Freq1 463.6125MHz
```

The radio frequencies may be changed by changing the channel, or by changing each digit of the frequency. There are six channels with unique default frequencies. If the desired frequency is not set at one of the channels, you can change the frequency digit by digit to the desired frequency on the selected channel. The screen shows the frequency the radio is using. If you scroll through the other channels to view the other preprogrammed frequencies, make sure to place the channel back to the desired frequency. The radio should only be operated under licensed frequencies and power settings.

The default channel frequencies are:
Channel 1: 463.6125
Channel 2: 462.4375
Channel 3: 467.2125
Channel 4: 467.4375
Channel 5: 457.5500
Channel 6: 465.7000

Message Log –

```
▶Menu: Message Log
 Clear History: No
 06/13 12:00:27 G001 -71db
 06/13 12:00:27 G104 -69db
 06/13 12:00:27 G180 -72db
 06/13 12:00:27 G180 -70db
```

```
▶Menu: Message Log
 Clear History: No
 000 bytes[c0]02
 000 bytes[c0]02
 000 bytes[c0]02
 000 bytes[c0]00
```

The message log will show the last 100 messages the satellite received, excluding consecutive poll messages. The second line gives the option to clear the log. The messages are shown with most recent event at the top. It shows the date and time the message was received, the message number, and the received signal strength (RSSI) if enabled. The smart satellite will beep when receiving a message while on this screen.

Pressing **Right** ◆ when the cursor is on a message line will display more information for that messages. It's similar to revealing the hidden parts of the message that cannot be displayed because of the screen width limitation. Pressing **Right** ◆ again reverts back to the previous screen. The screen shows the number of data bytes received and other information that can be used by Toro to diagnose a communication problem.

Menu: Link Settings –

```
▶Menu: Link Settings
 Lead (On) : 750ms
 Hang (Off): 020ms
 Baud Rate : 1200
 Radio:  Digital(Dig)
 RSSI Enable: Yes
```

The **Link Setting** menu items will depend upon the kind of radio that is installed in the system. The **Digital(Dig)** setting refers to a digital radio in the digital mode, and the **Digital(Anlg)** setting refers to a digital radio set to the analog mode. The **Digital(Dig)** mode is desired, but the **Digital(Anlg)** mode must be used if an analog radio such as a Maxon radio is used in the same network. This includes the radio in the FIU. The setting **None** means that the satellite does not have a digital radio.

If there are analog radios on the same network, then the radio setting at the satellite with an M7 should be **Digital(Anlg)**. If not, then the setting should be **Digital(Dig)**. If there is no digital radio at the satellite, then the radio type should be **None**. When all radios are digital, the **RSSI** can be enabled, which detects and saves the received signal strength when receiving messages. The saved RSSI values can be viewed in the **Message Log** in the **Diagnostics** menu.

RSSI
If a radio is moved from a satellite to an FIU or into a satellite that does not have the radio menu, make sure the **RSSI Enabled** is set to **No**. The FIU radio is currently not RSSI capable .
If a satellite is eqipped with radio and a modem (hybrid communication), set the **RSSI ENABLE** value (**Yes** or **No**) of any wireline-connected satellites to the same value as the radio-equipped satellite.

Radio: Digital(Dig) – use when all radios in the system are M7's, including the FIU radio
**Radio: Digital(Anlg)** – use when at least one of the radios in the system are analog (Maxon)
Radio: None – no radio is connected directly to the satellite (also called "None/Analog")

Power Transformer

AC Power Terminals

Relay Board
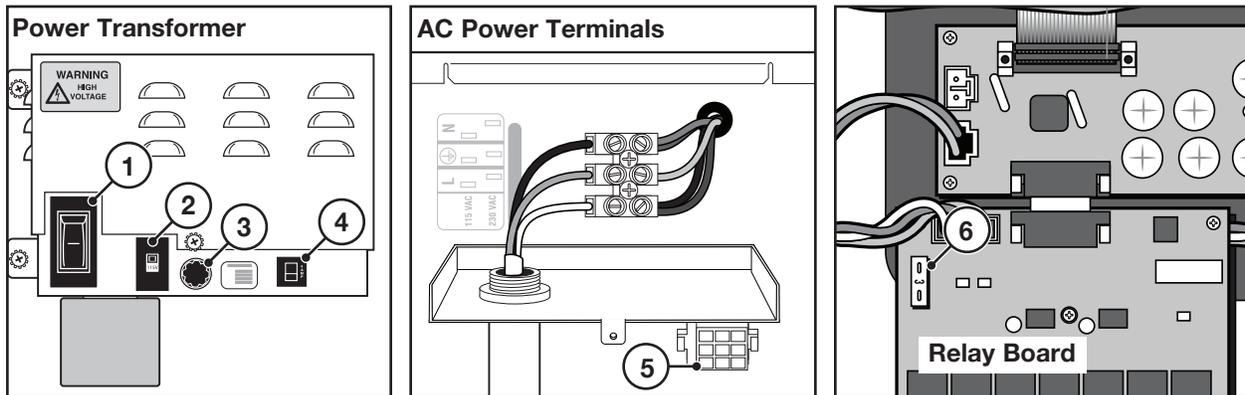
Electrical Protection

1 - **Main Power Switch / 1.5A Circuit Breaker** - Protects the controller from a short circuit on the incoming power line.

2 - **Input Voltage Select Switch** - Set the input power supply to 115 VAC or 230 VAC

3 - **3.2A Slow Blow Fuse** - Protects the controller from a short circuit on the 24 VAC field common wire or from excessive simultaneous activated solenoids.

4 - **4.0A Circuit Breaker** - Protects logic circuit boards, such as the faceplate and distribution board from a short circuit.

5 - **Distribution Board Power Socket** - Power supply connection to the Distribution Board and the 24 VAC.

6 - **3.0A Fast Blow Fuse** - Protects the individual 16-station output boards from a 24 VAC field wiring short circuit, shorted solenoid or excessive simultaneous activated solenoids.
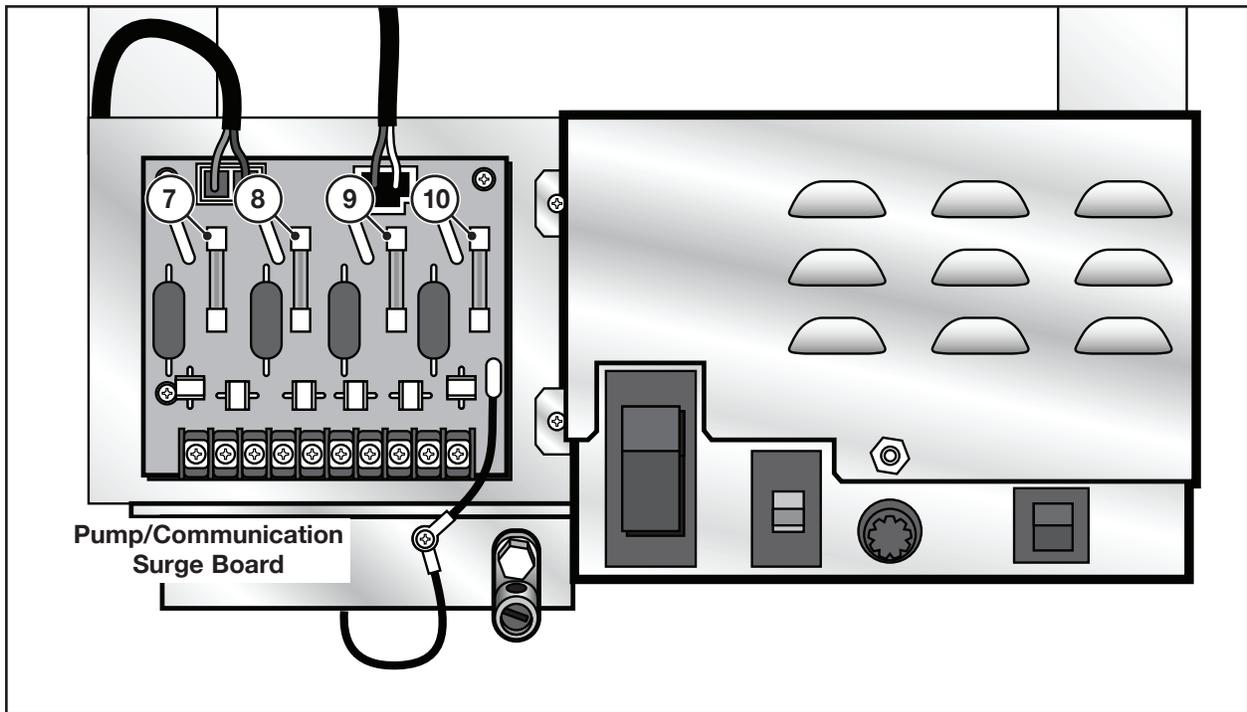
Pump/Communication Surge Board

7 - **0.5A Fuse** - Communication Line Protection

8 - **0.5A Fuse** - Communication Line Protection

9 - **8.0A Fuse** - Common Line Protection

10 - **0.5A Fuse** - Pump Line Protection

# Lithium Battery Replacement Procedure

> ⚠️ **WARNING! DANGER OF EXPLOSION IF BATTERY IS INSTALLED INCORRECTLY. REPLACE ONLY WITH THE SAME OR EQUIVALENT TYPE OF BATTERY. ALWAYS DISPOSE OF USED BATTERIES ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS.**

A 3.0V Lithium battery (P/N 363-8154) is installed behind the faceplate circuit board to sustain the controller's time and date for approximately 10 years without any additional power.

1. Place the controller's power switch to the OFF position.

2. Remove the faceplate from the cabinet by unscrewing the two retaining screws that secure it. See first figure below.

3. Disconnect the ribbon cable that connects the faceplate to the distribution board.

4. Remove the back cover from the faceplate by unscrewing the four retaining screws. See second figure below.

5. Remove the PCB to access the battery compartment by unscrewing the center retaining screw.

6. Replace the old Lithium battery and secure a new battery.

7. Reattach the circuit board and ribbon cable into the faceplate. Replace the back cover.

8. Reinstall the faceplate into the controller and place the power switch to the ON position.

Notes

Notes
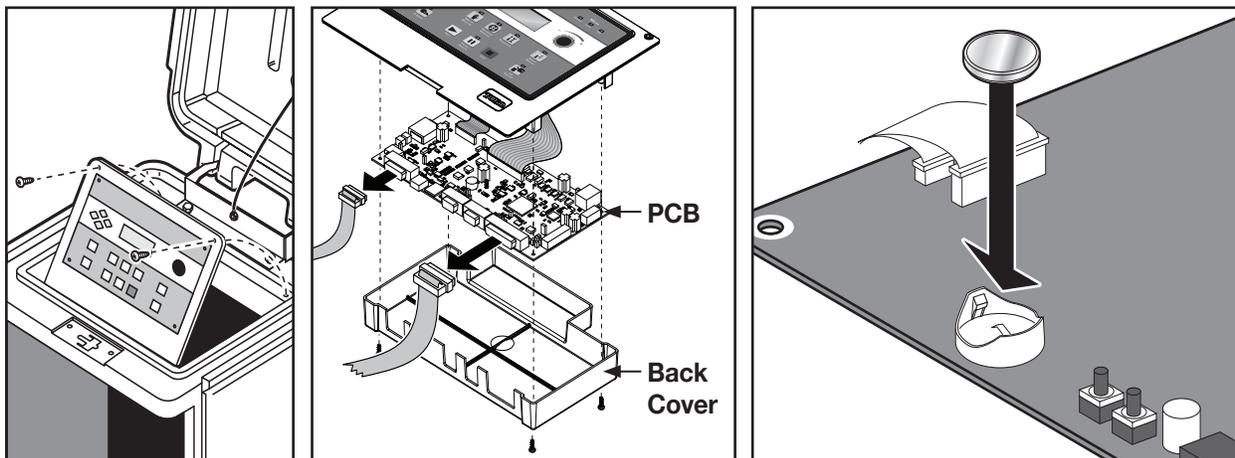
Electromagnetic Compatibility

Radio complies with FCC Part 22 and Part 90 of the FCC Rules

Domestic: This equipment has been tested and found to comply with the limits for a FCC Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. The equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to the radio communications. Operation in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.