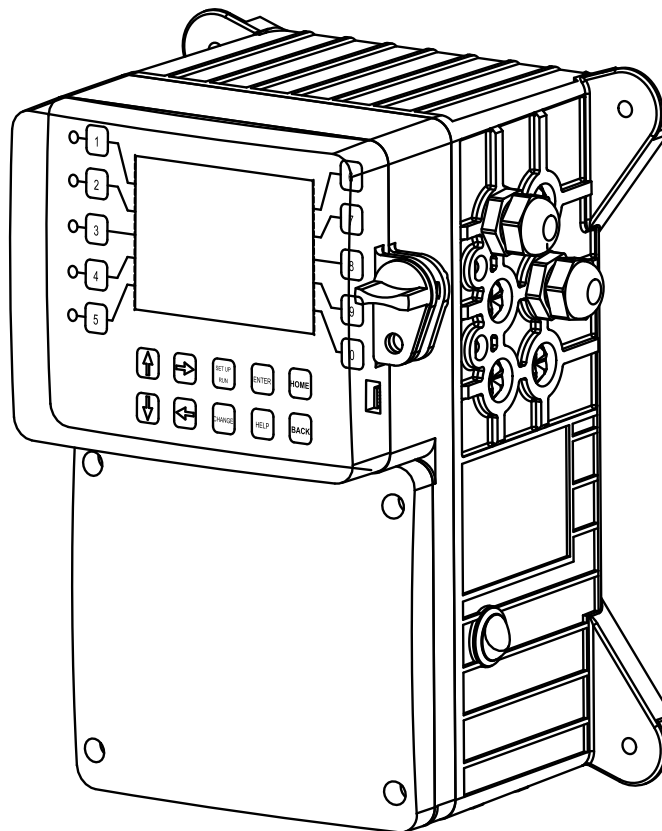


MarleyGard CD controller

INSTALLATION - OPERATION - MAINTENANCE

Z1069146 ISSUED 4/2018

READ AND UNDERSTAND THIS MANUAL PRIOR TO OPERATING OR SERVICING THIS PRODUCT.



contents

Note

This manual contains vital information for the proper installation and operation of the MarleyGard CD controller. Carefully read the manual before installation or operation and follow all instructions. Save this manual for future reference.

| | |
|--|----|
| Control Functions | 3 |
| Chemical Feed Timers | 3 |
| Electrical Wiring | 4 |
| Pre-Wired..... | 5 |
| Conduit..... | 5 |
| Relay Card Wiring..... | 6 |
| Motherboard Connections..... | 6 |
| System Card Connections | 7 |
| 420 mA Output Card Connections..... | 7 |
| 420 mA Input Card Connections..... | 8 |
| Mounting Instructions..... | 8 |
| Electrode Installation..... | 9 |
| Front Panel Description..... | 10 |
| Startup Instruction | 11 |
| Menu Navigation | 12 |
| USB Functions | 33 |
| Maintenance..... | 39 |
| Troubleshooting..... | 40 |
| Additional Wiring Schematics..... | 41 |
| Web Connectivity via Cell ROUTER-3 Internet..... | 43 |
| Cell Router Troubleshooting..... | 45 |

The following defined terms are used throughout this manual to bring attention to the presence of hazards of various risk levels, or to important information concerning the life of the product.

Warning

Indicates presence of a hazard which can cause severe personal injury, death or substantial property damage if ignored.

Caution

Indicates presence of a hazard which will or can cause personal injury or property damage if ignored.

Note

Indicates special instructions on installation, operation or maintenance which are important but not related to personal injury hazards.

introduction

Description

These instructions are intended to assure that field connections are completed properly and the MarleyGard CD chemical delivery system operates for the maximum time possible. Since product warranty may depend on your actions, please read these instructions thoroughly prior to operation.

If you have questions about the operation and/or maintenance of this system and you do not find the answers in this manual, please contact your Marley sales representative.

The MarleyGard CD microprocessor based controllers are designed to provide a wide range of control functions for recirculating cooling water treatment systems. The controller is programmed through a front panel keypad and can be configured to provide a customized control system for your application.

Control Functions

Each of these control functions are based on an analog input from a probe and will include user settable relay control settings along with a High and Low Alarm setting and Limit Timer. Each control function will include a control relay output. When the reading reaches the Set Point the control relay is activated until the reading changes by the Differential amount.

1. **System Conductivity** – The conductivity function of the controller is designed to monitor and control Total Dissolved Solids (TDS) in the cooling tower recirculating system in terms of electrical conductivity measured in MicroSiemens/cm. This control function is also referred to as Bleed.
2. **Make-up or Miscellaneous Conductivity** – This conductivity with the probe installed in the fresh make-up water line can be used to control the conductivity of the tower in terms of cycles of concentration by calculating the difference between the make-up water's conductivity and the system's conductivity. It can also be used to monitor another conductivity with no feed timers associated with it.
3. **pH** – The pH function monitors and controls pH on a scale of 0-14 pH units.
4. **ORP** – The ORP function monitors and controls ORP on a scale of +/- 1000 mV.

Chemical Feed Timers

Chemical feed timers are designed to automate the addition of various chemicals by activating a relay output. Multiple timers can be supplied depending upon the model number and each timer will include a relay output. All timers can be programmed to be one of the following types.



installation

1. **Pulse Time** -- Accepts pulses from a make-up water meter (supplied separately). It can accumulate 1-9999 gallons before activating the timer to run.
2. **Feed with Bleed** -- Activates the relay output simultaneously with the bleed and limits the amount of time the relay output will be on during the bleed cycle.
3. **Feed after Bleed** -- Activates the relay output based on a user defined percentage of time based on the bleed off, another timer or digital input. The relay is activated after a bleed cycle and runs for the set percentage of that bleed cycle.
4. **Recycle** -- The relay is continuously repeating a defined OFF cycle time and a user defined ON cycle time.
5. **28 Day** -- The timer is based on a 28 day cycle with four independent programmable feed cycles with prebleed and bleed lockout settings.

Electrical Wiring

The MarleyGard CD controller has an internal regulated fused power supply that will operate off of 90 to 250 VAC at 47 to 63 Hz on the incoming wiring. Each output relay is individually protected with a replaceable fuse. Relay outputs will equal incoming line voltage.

Warning

The controller should be connected to its own isolated circuit breaker, and for best results, the ground should be a true earth ground, not shared. Wiring must be done according to all applicable local codes.

Power (line voltage) must be disconnected while making any connections. If power is supplied to the unit, line voltage will be present on the relay cards located in the lower section of the enclosure, even with the power (ON/OFF) switch off.

Low voltage signal wires (probes, flow switch, water meter, etc.) should never be run in conduit with high voltage (like 115VAC) wires.

Units should be ordered with the appropriate option to provide powered relays designed for the incoming/outgoing power.

Note

Liquid tight fittings and some labeled signal leads are provided for all signal (low voltage) connections for both pre-wired and conduit units.

installation

Pre-Wired

Pre-wired units are supplied with a 16 AWG cable(s) with 3-wire grounded USA 115 volt plug for incoming power and 3-wire grounded receptacle cords for all control relay outputs also 16 AWG.

Conduit

Conduit units are predrilled at the factory and supplied with conduit knockouts for easy hard wiring to supplied detachable connectors on the relay card(s) located in the lower section of the controller. Remove the screws of the lower panel for access.

Note

Do not drill holes in upper section of enclosure.

- All relays provide a N.O. and N.C. output.
- The control function that activates each relay output is pre-configured at the factory based on the options selected. To change relay activation, see on page 25.
- See page 40 for common bleed / blowdown valve wiring.
- Refer to label inside lower panel cover for specific relay board configuration supplied.
- Relays configured as “dry contact” should only have D.C. voltage ran through them. The GND connection point replaces the NEU when configured for dry contact. (Example: Use GND and N.O. for a normally open dry contact relay output.)

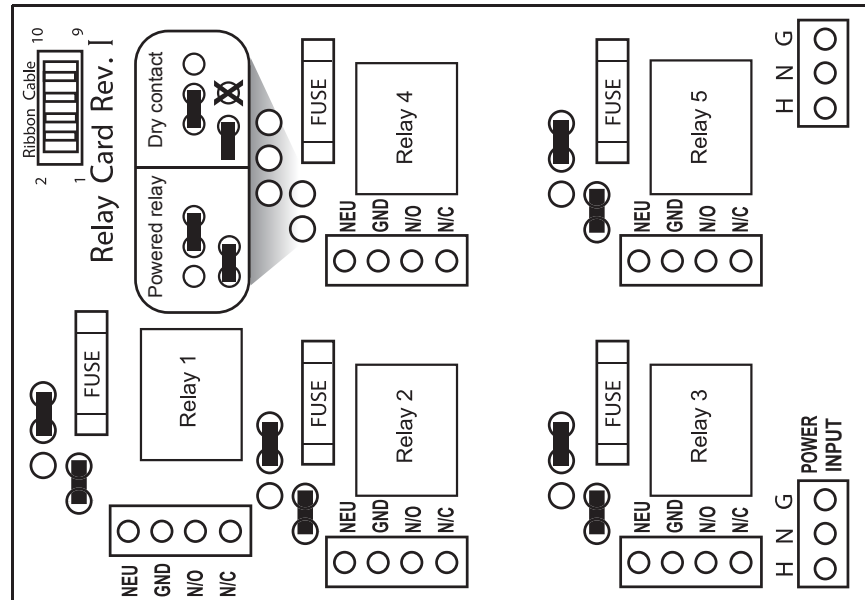
Warning

If jumpers are not configured for dry contact, line voltage will be supplied.

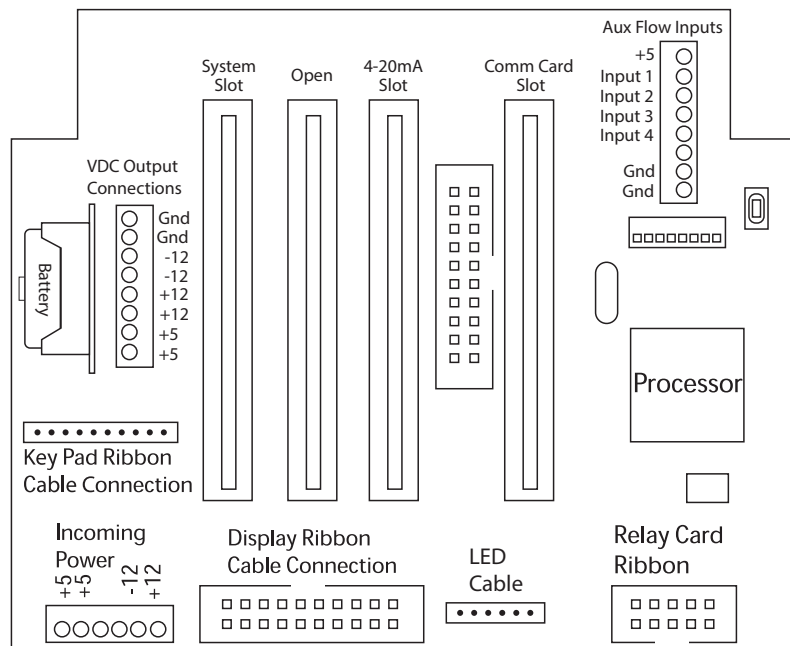
installation

Relay Card Wiring

Drawing rotated to match orientation inside controller.

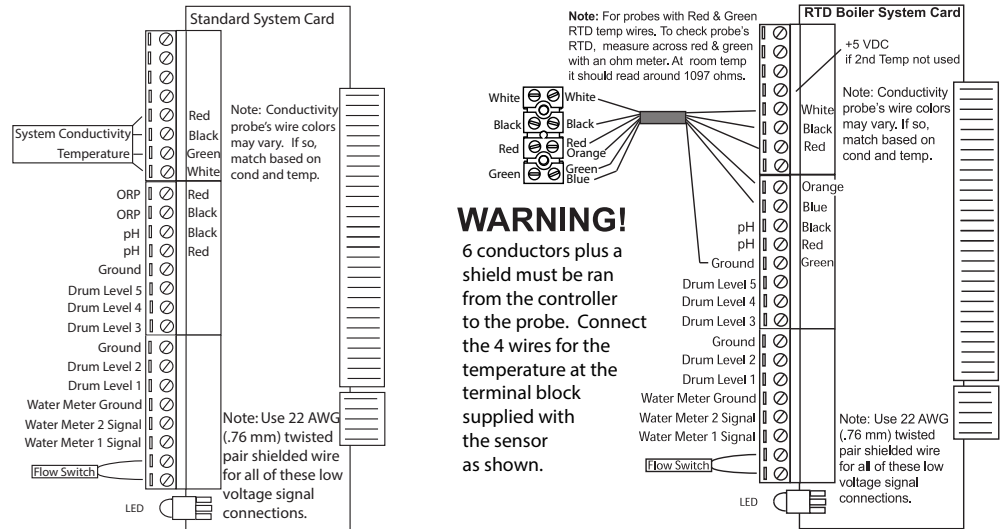


Motherboard Connections



installation

System Card Connections



4-20mA Output Card Wiring

Isolated Configuration For isolated 4-20mA outputs an external power source for the loop must be supplied. JP4 and JP5 on the board must be jumpered for isolated with an external power source supplied to the external VDC input. The external power source must not exceed 24 volts DC.

Non-isolated Configuration For non-isolated 4-20mA outputs the controller will supply the power for the loop. JP4 and JP5 must be jumpered for non-isolated and no connections are made to the external VDC points.

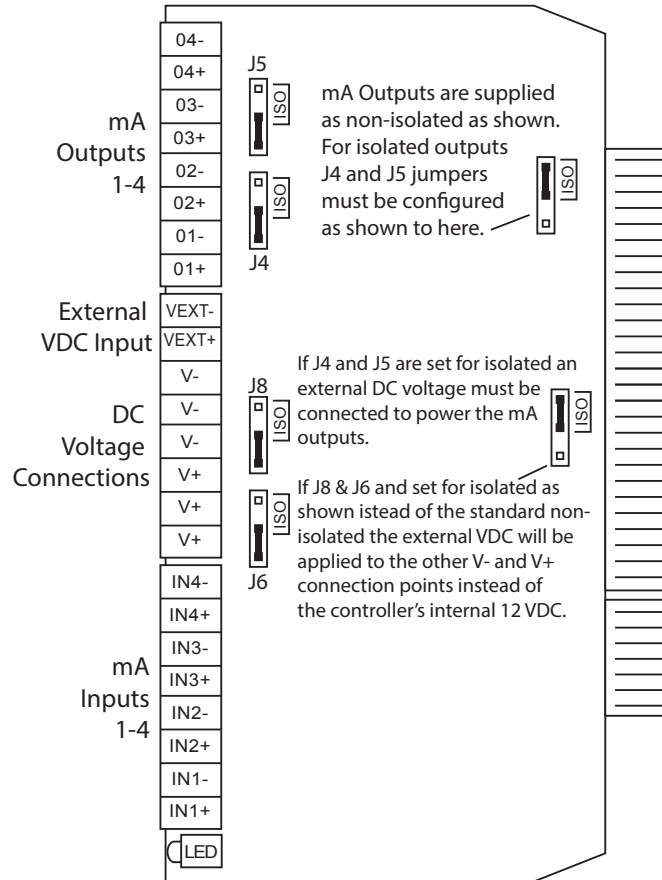
Note

*If multiple outputs are being connected to a single energy management system the negatives or commons **MUST** remain isolated from each other.*

installation

4-20mA Input Card Wiring

The 4-20mA input card requires that the external device sending the 4-20mA input signal(s) supply the power for the loop. The external power source must not exceed 24 volts DC.



Mounting Instructions

Select a mounting location that provides the operator easy access to the unit and a clear view of the controls through the cover of the controller. The location should be convenient to grounded electrical connections, the needed sample line plumbing, and should be on a stable vertical surface.

⚠ Caution

Avoid locations that expose the controller to direct sunlight, vapors, vibration, liquid spills or extreme temperatures; less than 0°F (-17.8°C) or greater than 120°F (50°C). EMI (electromagnetic interference) from radio transmissions and electric motors can also cause damage or interference and should be avoided.

installation

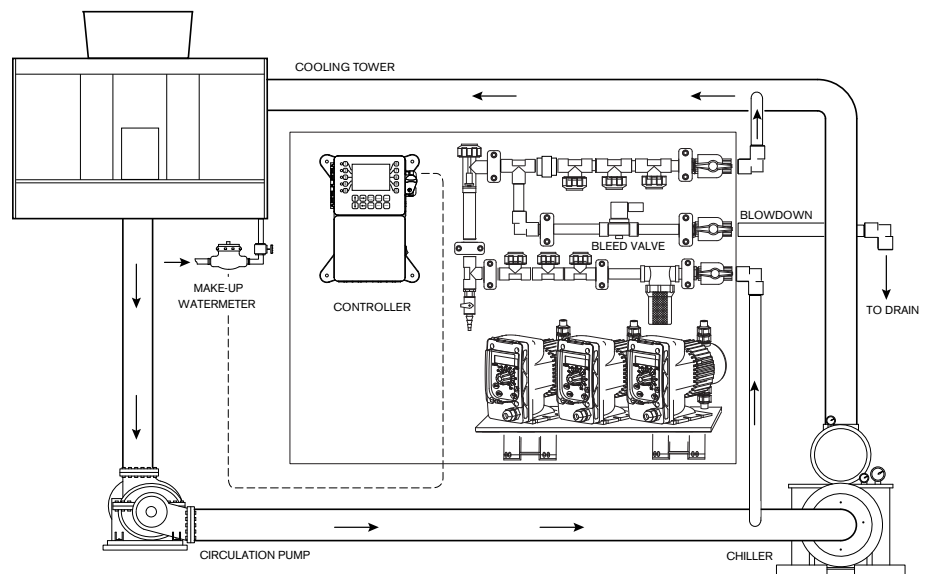
Electrode Installation

The standard probe(s) and/or flow assembly for cooling tower installations is constructed of schedule 80 PVC and supplied with 3/4" slip fittings. To insure proper operation the sample line must have a flow rate of 3-10 gpm. Inlet pressure must be higher than outlet pressure in order for water to flow past the electrode(s) to achieve the required rate. The probes are temperature compensated for increased accuracy.

1. An isolation valve is installed on either side of the flow assembly so electrodes can be easily isolated for removal and cleaning.
2. A line strainer is recommended upstream from the probes to protect against fouling and damage.
3. Systems with a flow switch require 2-3 gpm flow rate to operate outputs.

Caution

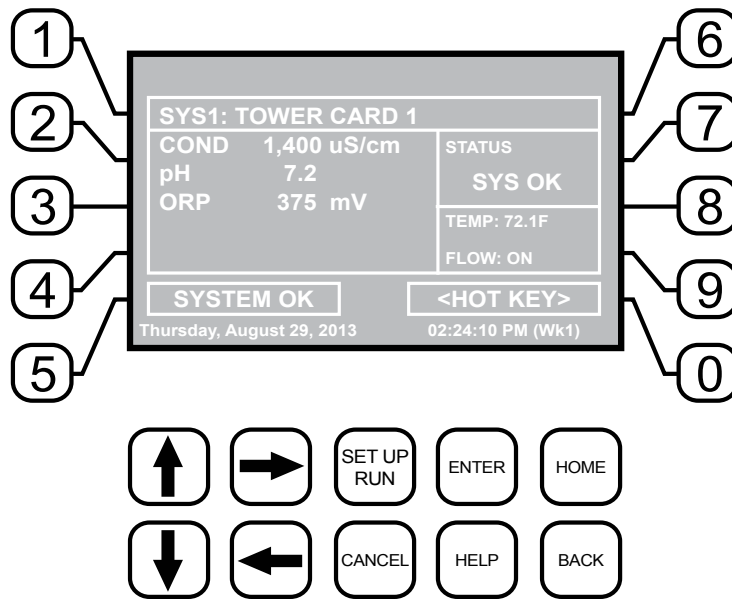
- *Electrodes are O-ring sealed, which if damaged will cause a leak.*
- *Do not allow pH sensor tips to dry out, damage will occur.*
- *Do not exceed a water temperature range of 32°F to 140°F.*
- *Do not exceed a maximum pressure of 125 psi.*



Installation Diagram

operation

Front Panel Description



NUMBER Keys Used to enter new values in the SET UP mode and to access desired sub menus.

UP/DOWN Used to cycle through text options to find desired setting.

LEFT/RIGHT Used to cycle through text or setting options to find desired setting.

SET UP/RUN System initializes into RUN mode. Press this key to put the controller in SET UP Mode and see HOME menu page.

ENTER Used to log a changed value into program.

HOME Used to go back to the HOME menu page.

CANCEL Used to cancel a pop-up screen if no change is desired.

HELP Used to access help screens.

BACK Used to go back to last menu screen viewed or clear values keyed in that are not wanted.

The bottom right box in the RUN screen mode is a hot key that will take you directly to a particular menu screen. The default is the RELAY status menu but this can be changed by navigating to the desired screen and pressing the HELP button. Follow the on-screen instructions to set the new hot key location.

operation

MarleyGard CD controllers have two modes of operation, RUN and SET-UP.

RUN – This mode is for normal operation. In the RUN mode the display will show each system's parameters. If an alarm is present, the ALARM box will flash how many alarms are activated. No settings may be entered or changed in the RUN mode. Readings are updated every 6 seconds on the screen while in the RUN mode.

SET-UP – This mode is used to make adjustments to settings and readings on the controller. To access the SET UP mode from the RUN screen, press the SETUP/RUN key.

Start Up Instructions

Complete all installation steps before beginning this procedure. Ensure that all controlled devices (pumps, solenoid valves, etc.) are operational and connected to the controller. Open the isolation valves to allow water to pass through the sample stream assembly. Before beginning the start up procedure, familiarize yourself with the programming and operation of the system by reviewing the menus available. Use the keys of the controller to skim through all your options.

All MarleyGard CD controllers are factory calibrated for temperature, conductivity, pH and ORP. All units are shipped with the date preset, and the clock set to your current time. These readings and settings should be verified for accuracy, and adjusted as per the instructions listed below.

Conductivity – To calibrate the conductivity reading, remove the electrode from the line and wipe the flat surface with a clean cloth. Re-install the electrode and open the isolation valves to allow a sample across the probe. Be sure to allow the reading to stabilize for one minute. Select SYSTEM COND from the CALIBRATION menu. Then key in the corrected conductivity value. Press ENTER to log in that reading.

pH – Under normal operating conditions, pH calibration is achieved using the following steps. From the CALIBRATION menu, select SYSTEM PH. Enter the correct pH value. Press ENTER to log in the new reading.

ORP – To calibrate ORP, from the CALIBRATION menu, select SYSTEM ORP. Compare the displayed reading to the actual system ORP. If these readings do not match, key in the correct ORP value, and push ENTER.

There are limits to how much the calibration can be adjusted. The instrument will only accept new conductivity values which are from 1/3 to 8x the present reading. Any entry outside this range will cause a default to the original reading. If this happens, contact you Marley sales representative for technical assistance.

operation

Menu Navigation

To access the menus press the Set Up / Run key on the front panel. This takes you to the Home menu. MarleyGard CD controller's menus are easily navigated by pressing the associated number key next to a menu box on the screen. Once you have stepped through the sub-menus to reach a point at which a value or selection is made a pop-up window will appear prompting you to enter a desired value or selection.

Note

When entering new numeric values, enter all available digits (characters).

1 Home Menu

| >HOME SETUP< | |
|--------------|-------------|
| SETPOINTS | DATE/TIME |
| CALIBRATION | CONFIGURE |
| TIMERS | HISTORY |
| CUSTOMIZE | WATER METER |
| ALARMS | RELAYS |

From the **HOME** menu select the desired menu.

The menu name explains what parameters can be programmed in the menu.

| | |
|--------------------|---|
| SET POINTS | Setting control set points for conductivity, temperature, pH and ORP. |
| CALIBRATION | Calibrating conductivity, temperature, pH and ORP if present. |
| TIMERS | Menu for selecting type and settings for all present feed timers. |
| CUSTOMIZE | Giving the controller, each system and all relays a user defined name. |
| ALARMS | View current alarms. |
| DAY/TIME | Menu for setting date and time. |
| CONFIGURE | Menus for configuring passwords, relay activations, setting history interval, flow switch, contrast, temperature scale. |
| HISTORY | Allows for view history on board in a graph form. |
| WATER METER | Menu for configuring water meter totalizing. |
| RELAYS | Menu for resetting accumulated "ON" times and manual relay activation. |

operation

2 Set Points

The same basic format is used for defining each available analog probe input's control parameters.

| | |
|-----------------------|------------|
| >SYSTEM 1 SET POINTS< | |
| SYSTEM COND | mA OUT |
| SYSTEM TEMP | mA IN |
| SYSTEM pH | AUX INPUTS |
| SYSTEM ORP | |

SET POINTS - For setting the relay set points for the available analog probe readings such as conductivity, pH, ORP, or temperature.

Note

In the Setpoint pop-up screen the direction (Rising or Falling) of the setpoint can also be set. Rising setpoints will activate the control relay when the particular probe reading rises above the setpoint and will stay activated until the reading comes down by the amount of the differential. If set for Falling the relay is activated when the probe reading falls below the setpoint and stays on until the probe reading comes back up by the amount of the differential.

2-1 Set Points Options

| | |
|--------------------------|---------------------------|
| >SYSTEM 1 COND SETPOINT< | |
| SET POINT | 2 nd SET POINT |
| DIFFERENTIAL | |
| HIGH ALARM | |
| LOW ALARM | |
| LIMIT TIME | |

- | | |
|----------------------|--|
| SET POINT | What reading turns the relay on |
| DIFFERENTIAL | Amount reading changes by before the relay is turned off |
| HIGH ALARM | What reading generates a High alarm. |
| LOW ALARM | What reading generates a Low alarm. |
| LIMIT TIMER | What amount of continuous bleeding will generate a time alarm notice. The bleed is not locked-out by this alarm. |
| 2nd SET POINT | This valve is used if drum level one (D1) is in alarm. |

Note

Each alarm value can also be set-up to be displayed or not on the front screen as well as remotely notified or not if connected to the Web Advantage server.

operation

2.2 Make-up or Miscellaneous Conductivity

Cooling tower systems with this option have an additional menu on the review page labeled SAMPLE METHOD. The sample method pop-up screen allows the user to select continuous or cycles control. With cycles selected under Settings a best and worst cycles value is attached to a best and worst make-up conductivity value. The controller will control the cycles proportionally between the two cycles values as the make up conductivity changes between the two identified values.

| >SYSTEM 1 COND SETPOINT< | |
|--------------------------|--------------|
| | BEST MAKEUP |
| DIFFERENTIAL | BEST CYCLES |
| HIGH ALARM | WORST MAKEUP |
| LOW ALARM | WORST CYCLES |
| LIMIT TIME | SYSTEM MAX |

BEST MAKEUP Conductivity of best expected makeup water.

BEST CYCLES Cycles desired with best water.

WORST MAKEUP Worst expected water.

WORST CYCLES Cycles with worst water.

SYSTEM MAX A fixed conductivity set point that overrides the cycles setpoint if reached.

Note

If continuous is selected the standard settings are used for system conductivity and the miscellaneous conductivity (labeled M COND) is the set points menus.

2.3 pH and ORP

The pH and ORP set point settings follow the same format as shown in Set Point Option section.

| >SYSTEM 1 pH SETPOINT< | |
|------------------------|-------------|
| SET POINT | INTERRUPT |
| DIFFERENTIAL | SET POINT 2 |
| HIGH ALARM | |
| LOW ALARM | |
| LIMIT TIME | |

INTERRUPT Only applies to pH settings and allows the Interruption of pH control during bleed, other chemical feed or both.

operation

| | |
|------------------------|--|
| pH SET POINT 2 | Is only present on systems with Dual pH control option. It is a second set point for applications when an acid and caustic are required. Set Point 1 will be for feeding acid and Set Point 2 for feeding caustic. |
| ORP SET POINT 2 | If a 28-day timer is interlocked to ORP, the ORP control will go off of SET POINT 2 during the 28-day timer's run time. |

Note

When the Limit Time value is met it will force off the control relay being driven by pH or ORP. To reset the limit timer and get the control relay active again, enter a new Limit Timer value.

2.4 Conductivity

Conductivity on can be configured for Timed Sampling, Sample and Hold or Continuous for the conductivity sampling method.

Timed sampling incorporates a sample timer which allows the cooling tower to be sampled at periodic intervals. Sample intervals are adjustable from 1 minute to 99 hours, 59 min. Sample duration (on-time) is adjustable from 1 second to 99 minutes, 59 seconds.

Sample and hold uses a sample timer for periodic sampling intervals. The unit will sample for its duration and then hold the blowdown valve closed for a settable period (hold time). The conductivity is checked at the end of the hold period, if additional blowdown is required the blowdown valve is held open for a preset amount of time (blowdown time). Then sample cycle is repeated.

Continuous sample has a sample of condensate water go past the probe continuously. If the reading is above the set point, blowdown will continue until the set point has been satisfied.

| >SYSTEM 1 COND SETPOINT< | |
|--------------------------|------------|
| SET POINT | SAMPLE INT |
| DIFFERENTIAL | SAMPLE DUR |
| HIGH ALARM | HOLD TIME |
| LOW ALARM | BLOWDOWN |

| | |
|---------------------|--|
| SET POINT | What reading turns the relay on |
| DIFFERENTIAL | Amount reading changes by before the relay is turned off |
| HIGH ALARM | What reading generates a High alarm notification. |
| LOW ALARM | What reading generates a Low alarm notification. |
| SAMPLE INT | Period between samples. |



operation

SAMPLE DUR How long a sample lasts.

HOLD TIME How long a hold lasts.

BLOWDOWN How long to blowdown if reading is above the set point after the hold. Hold repeated after BLOWDOWN time.

2.5 Aux Inputs

Auxiliary inputs are the digital inputs for optional Flow Switch and other digital inputs such as low drum level alarms. From these menus the user can set if they want each of the alarms Displayed, Remote Notification, both or none.

| >SYSTEM 1 DIGITAL INPUTS ALARM< | |
|---------------------------------|-----------|
| ALARM NOTIFICATION | DIGITAL 1 |
| FLOW SW = DISPLAY | DIGITAL 2 |
| DIGITAL 1 = DISPLAY | DIGITAL 3 |
| | DIGITAL 4 |
| FLOW ALARM | DIGITAL 5 |

Note

Digital inputs can have the direction selected between OPEN or CLOSED as the alarm polarity. If set for CLOSED the input will be in alarm when it sees a closed contact.

2.6 4-20mA Out

Units with a 4-20mA output option will have a menu for setting up the 4-20mA output. The 4mA and 20mA values can be defined by giving the output proportioning capability. i.e. 4mA = a pH of 6.0 and 20mA = a pH of 8.0.

| >OUT 1 SETUP< | |
|---------------|--|
| SIGNAL SOURCE | |
| 4mA VALUE | |
| 20mA VALUE | |

SIGNAL SOURCE Select which probe reading the mA will use as its reading source.

4 mA VALUE What the 4mA signal equals

20mA VALUE What the 20mA signal equals on the assigned signal sources scale.

operation

2.7 4-20mA Input

```
>mA INPUT 1 SETPOINT<
SET POINT
DIFFERENTIAL
HIGH ALARM
LOW ALARM
```

SET POINT What reading turns the relay on

DIFFERENTIAL Amount reading changes by before the relay is turned off

HIGH ALARM What reading generates a High alarm notification.

LOW ALARM What reading generates a Low alarm notification.

3 Calibration

Calibration is for adjusting the displayed value of a probes reading to match your tester or known solution. Pick the system or mA input first. From a particular system pick the probe to calibrate.

```
>SYSTEM 1 CALIBRATION<
SYSTEM COND
SYSTEM TEMP
SYSTEM pH
SYSTEM ORP
```

For adjusting the actual reading values of the available analog probe inputs, such as conductivity, pH, ORP or temperature.

3.1 Conductivity Calibration

```
>SYSTEM 1 COND CALIBRATION<
CALIBRATE          Cal Factor 1.10
RESET ZERO
```

CALIBRATE With a clean probe on-line seeing the system's water enter the known (tested from a calibrated hand held tester) value.

RESET ZERO With the probe out of solution and dry enter a new zero point.
Probe must be dry!

Note

In the calibration pop-up window the raw analog to digital (A/D) value will be displayed. A new calibration value should only be entered when the probe is sensing a stable A/D value. The A/D reading has a range of 0 to 32,767. If it is at one end of the range or the other when trying to calibrate something is wrong with the probe or wire run.

operation

3.2 pH and ORP Calibration

```
>SYSTEM 1 pH CALIBRATION<
1 POINT CAL
2 POINT CAL
```

- 1 POINT** With a clean probe on-line seeing the system's water enter the known (tested from a calibrated hand held tester) value.
- 2 POINT** Enter a known Low value with a clean probe in a buffer solution. Then enter a known High value with the clean probe in a buffer.

Note

- *Probes must be rinsed between buffers when doing a 2 Point calibration and given at least 30 seconds in solution to adjust to the buffer.*
- *There must be at least 2 full pH points between buffer solutions. Using a buffer of 4 and 10 is the best procedure. ORP buffers should be at least 200 points apart.*

3.3 4-20mA Output Calibration

```
>CURRENT LOOP CALIBRATION<
OUTPUT 1
OUTPUT 2
```

4-20mA outputs can be calibrated to insure that the output generated by the controller and received by the

external device match. With a volt meter connected across the out and return wires (see page 7) of the 4-20mA output channel to be calibrated go into the output's Low or High calibration.

```
>mA OUTPUT 1 CALIBRATION<
HIGH 4030
LOW 800
```

The number displayed in the Calibration dialog box can range from 0-4095 with 800 equal to 0 mA output and 4030 equal to

20 mA. This number range of 0-4095 is the raw digital to analog (D/A) values and is strictly used for a reference. The D/A numbers you get will vary based on your installation conditions.

```
>mA OUTPUT 1 CALIBRATION<
OUTPUT 1 CAL HIGH
4000
Use Up/Down arrows to change
Use Enter to save value
```

While in the High or Low calibration pop-up screen use the up and down arrows to change the output value being read with the volt meter. Adjust the High value for the 20 mA reading and the Low value for the 4 mA value.

operation

3.4 4-20mA Input Calibration

4-20mA inputs can be calibrated to insure that the input seen by the controller from the external device match. It also allows for setting the 4-20mA input into a number range that relates to the value being read.

| | |
|----------------------------|--|
| >CURRENT LOOP CALIBRATION< | |
| INPUT 1 | |
| INPUT 2 | |

Select the Input to be calibrated.

| | |
|--------------------------|--------------|
| >mA INPUT 1 CALIBRATION< | |
| 20mA | 5500 |
| 4mA | 1100 |
| MAX | 200 |
| LOW | 0 |
| OFFSET | FACTORY DEF. |

The **20mA** and **4mA** values are where the controller's raw analog to digital value is adjusted to match a 20mA (full scale) and 4mA (bottom of scale) signal from the external device inputting the 4-20mA input. The external device must be connected to the controller and showing either full scale or bottom of scale when calibrating each. The number shown along with either the 20mA or 4mA while calibrating is the raw A/D value and is only a reference. A 20mA input should be around 5500 and 4mA around 1100. If the A/D numbers are not in this range check input device.

The **MAX** and **LOW** calibration inputs are for telling the controller what to display for a 20mA input and a 4mA input. For example if the input is a drum level sensor monitoring a 55 gallon drum the value for MAX should be 55 and LOW should be 0. The controller then displays a number automatically ranging between 55 and 0 based on the input value. The units of measure (gallons for example) is set in the Customize menu from the Home page.

OFFSET Changes the current displayed value of the 4-20mA input reading to allow for a manual 1pt calibration of the displayed value.

FACTORY DEF If the 20mA or 4mA calibration has been incorrectly set (not at 4 or 20) this will reset the settings back to a factory value for 4 and 20.

operation

4 Timers

A unit may have up to 5 selectable timers for each system on a controller. All timers are associated with their system, so for a % of post bleed timer looks at the bleed of that system.

```
>SYSTEM 1 TIMERS<
TIMER 1
TIMER 2
TIMER 3
TIMER 4
TIMER 5
```

Select the type (28-day, pulse, limit, percent or percent of post blowdown) as well as the run times of each timer available per system.

4.1 Timer Type Selection

```
>SYSTEM 1 TIMER 1 SET UP<
  >SET TIMER TYPE (PULSE)<
    -> PULSE
    USE UP/DOWN KEYS TO CHANGE
    PRESS ENTER TO ACCEPT
SET UP                                TIMER TYPE
```

A pop-up screen lets you scroll through the various timer types available.

| | |
|---------------------------|---|
| PULSE | A water meter activated timer |
| LIMIT | Feed with bleed with a maximum run time or limit for one bleed cycle. |
| RECYCLE | A continuous recycle timer with ON and OFF settings. |
| PERCENT POST BLEED | For feed after bleed for a settable percentage of the bleed time with a maximum run time. |
| 28-DAY | A biocide or event timer. |

4.2 Timer Set Up

```
>SYSTEM 1 TIMER 1 SET UP<
TIMER TYPE:  PULSE
              GALLONS: 10
RUN TIME     (MM:SS): 01:00
INPUT:       WATER METER 1
SET UP                                TIMER TYPE
```

Each timer type selected will have its own unique Set Up sub menu with additional selections specific to the type of timer selected. The page displayed before entering the Set Up menu of a timer provides an overall review of the timers current settings.

operation

4.3 Pulse Timer

```
>SYSTEM 1 TIMER 1 CHANGE<
ACCUMULATE
RUN TIME
METER INPUT          BLEED INTR
```

ACCUMULATE The number of gallons or liters from water meter to count before activating timer.

RUN TIME The amount of time for the timer to run METER INPUT - Select water meter 1 or 2 for the timer's activation. Water meter 1 + 2 can be selected only if the meters have the same contact value.

BLEED INTR Allows the pulse timer to be interrupted during conductivity bleed. While interrupted, you can also define the maximum number of timer run cycles (1-9) to store for playback.

4.4 Recycle Timer

```
>SYSTEM 1 TIMER 1 CHANGE<
ON CYCLE (HH:MM)
OFF CYCLE (HH:MM)
OFF TIMER (HH:MM:SS) : 0:10:40
```

ON CYCLE The amount of the defined time that the timer is to be on.

OFF CYCLE The amount of time that the cycle will be off.

ON/OFF TIMER This is the displayed count down of time for the cycle the timer is in.

4.5 Post Bleed Timer

```
>SYSTEM 1 TIMER 1 CHANGE<
% OF BLEED
LIMIT TIME
SOURCE
```

% of BLEED The % of the post bleed time or other source time that you want the timer to run.

LIMIT TIME The limit timer is a safety feature that limits a single feed cycle to the amount of time set regardless of the calculated post feed %.

SOURCE Select between cond. bleed, another timer or digital input as the time source.

operation

4.6 With Bleed Timer

| |
|---|
| <p>>SYSTEM 1 TIMER 1 CHANGE< LIMIT TIME</p> |
|---|

LIMIT TIME This timer starts when the conductivity bleed starts and turns off when the bleed stops or until the limit time has been reached. The time can be set in MM:SS.

4.7 28-Day Timer

| | | |
|---------------------------|-------|------|
| >SYSTEM 1 TIMER 1 CHANGE< | | |
| WEEKS | MIN | COND |
| DAYS | FEED | LOCK |
| START TIME | BLEED | LOCK |
| RUN TIME | FLOW | LOCK |
| PREBLEED | ORP | LOCK |

Each 28-day timer has Program 1-4 for programming the various feed times. While the programming steps for four programs are the same each can have it's own independent settings.

- WEEKS** The week(s) that the timer is to feed.
- DAYS** The day(s) that the timer is to feed.
- START** The time of day for the timer to start.
- RUN** How long the timer is to run.
- PREBLEED** How long the controller is to bleed down before feeding in chemical. **The prebleed starts at the START time programmed above.**
- MIN COND** The minimum conductivity that the unit will prebleed down to.
- FEED LOCK** Which other system timer to lockout during this timer's run time.
- BLEED LOCK** How long to lock out the bleed function after the timer's run time starts.
- FLOW LOCK** 3 selections if a system has a flow switch:
- Only With Flow – If there is no flow at the start time no feed occurs.
 - With or Without Flow – Feed occurs regardless of flow condition..
 - Flow Only/Store1 – If there is no flow at the start time, one run cycle will occur when flow does come on. Only one run will occur regardless of how many more than 1 are missed due to no flow.

Note

ORP lock is only for systems with the ORP function. If interlocked the ORP set point will switch to the 2nd setpoint for control during the timer's programmed RUN time. The feed device must be connected to a relay activated by the ORP setpoint/control function.

operation

5 Customize

| >CUSTOMIZE< | |
|---------------|------------|
| UNIT NAMES | |
| RELAY NAMES | NOTEPAD |
| SYSTEM 1 NAME | pH INDEX |
| | mA IN |
| | RUN SCREEN |

This menu allows the user to define the on-screen name of the unit plus the name of each system and relay. The user can also setup the Notepad for each system and 4-20mA Input's name and unit of measurement.

RUN SCREEN Allows the user to select what will be shown on the screen while the controller is in the RUN mode. Like displaying temperature readings, water meter totals for a particular system or the conductivity units of measure.

Note

When entering values for custom names use the numerical keys for numbers and the up / down arrows to scroll through all the characters of a key board. Press the right arrow to advance the cursor after setting a desired value. Press the Help button to place the last entered character into the new cursor space to speed up the process. The Help button will also jump advance through the characters.

5.1 Notepad

| >NOTEPAD SYS 1 NOTE 1< | |
|------------------------|--|
| NAME | |
| NUMBER | |
| UNITS | |
| ALARMS | |

The Notepad function allows the user to set up a customized manually entered data field for each system with ten notepad items. The NOTEPAD is ideal for

setting up and storing into the controller's history the items typically tested for reporting a service call. The Notepad items come with no names but when an individual note is selected a menu for setting it appears. Also can be used as a Reminder Timer with or without flow.

NAME Pick from a list of defined names or customize your own.

NUMBER Set the number range.

UNITS Set the units of measurement.

ALARMS Set Hi/Low alarm points and how frequently a new value is expected to be manually enter via the History menu.

operation

5.2 mA Inputs

| |
|--|
| <p style="text-align: center;">>mA INPUT 1 CUSTOMIZE<</p> <p>NAME UNITS NUMBER</p> |
|--|

NAME Name the input.

UNITS Set the units of measurement.

NUMBER Set the number range.

5.3 pH Index

If the controller has the pH index option (must have pH control) user can select LSI or RSI indexing. The controller will automatically set some Notepad entries for manually inputting needed data to perform the calculation which will be displayed in the RUN screens.

5.4 Run Screen

| |
|--|
| <p style="text-align: center;">>RUN SCREEN<</p> <p>MAIN SCREEN SCREENS SHOWN CYCLE TIME COND UNITS</p> |
|--|

This lets you customize various aspects of the RUN screen.

MAIN SCREEN Customize what is displayed on the RUN screen.

SCREENS SHOWN Pick if the mA input & Aux Flow screens are scrolled.

CYCLE TIME The amount of time between screen scrolls.

COND UNITS Select the units of measure to be displayed with the conductivity reading.

6 Alarms

| |
|---|
| <p style="text-align: center;">>ALARMS<</p> <p>SYS 1 ALARMS</p> |
|---|

Shows any current alarms.

operation

7 Date and Time Set Up

```
>SET DATE AND TIMES<
SET DATE
SET TIME
SET DAY
SET WEEK
Friday May 14, 2018 03:04:56
```

For setting the date, time, day and week on the controller.

8 Configure

```
>CONFIGURE<
PASSWORD          CONTRAST
RELAYS            TEMP SCALE
                  NETWORK
HISTORY           SYS INFO
FLOW SW           FACTORY
```

Provides access to menus to set-up passwords, relay activation, temp scale, display contrast, flow switch, inputs, history time stamps, factory set-up and system information.

CONTRAST This screen allows for adjusting the display contrast.

FLOW SW Defines a flow switch to be open or closed with flow.

FACTORY A factory only menu

TEMP SCAL Set Celsius or Fahrenheit

HISTORY Sets the history time stamp interval.

SYS INFO Tells unit software specifics.

8.1 Password

```
>CONFIGURE PASSWORDS<
ADMIN PASSWORD
USER PASSWORD
USER SET UP
```

ADMIN PASSWORD The administrator password gives access to all menus except factory set up.

USER PASSWORD The user password allows the user to access HOME menus that are made available in USER SET UP.

operation

8.2 Relays

| >RELAY 1 SETUP< | |
|-----------------|-----------|
| MAIN ACTION | DISABLE 1 |
| ACTIVATOR 2 | DISABLE 2 |
| ACTIVATOR 3 | DISABLE 3 |
| ACTIVATOR 4 | DISABLE 4 |
| DELAY | DAILY MAX |

This menu lets you choose a Main Action or function (timer 1, conductivity, alarms etc...) to activate a relay. A pop-up screen appears with a list of all available activation functions to arrow through.

Additional relay logic is available with up to 3 additional Activators and up to 4 Disablers allowing multiple functions to activate the same relay and multiple functions to prevent the relay from coming on. There is also a Daily Max amount of time that a relay can be on. If a relay is on for the max amount, it does not let the relay come on anymore that day. (A 24 hour clock is used for the day with midnight being the start of the day). The Delay setting is the amount of time a control function must come on before the relay will react and activate. This is to prevent a relay from chattering on/off if a reading is bouncing around the set point or alarm.

8.3 History

| >CONFIGURE HISTORY< | |
|---------------------|--|
| INTERVAL | |
| W/M HOUR | |
| ALARM DELAY | |
| SAVE FORMAT | |

This menu is used to set the history "time stamp" interval, the water meter daily history starting hour, the alarm delay period and the USB history save format.

| | |
|--------------------|---|
| INTERVAL | The amount of time between each history time stamp for probe readings. |
| W/M HOUR | The time of day that the daily water meter history cycle is to start. |
| ALARM DELAY | The amount of time an alarm has to be on before it is recognized as an alarm. |
| SAVE FORMAT | The USB history save format. |

8.4 Flow Switch

This menu allows the user to select if a flow switch signal will represent a flowing condition when a "closed" or "open" signal is seen for each systems flow switch input. User can also select if timers can work always or only with flow.

8.5 Contrast

This menu is used to adjust the contrast of the display.

operation

8.6 Temperature Scale

This menu is used to select the type of temperature scale to display.

8.7 Network

| >CONFIGURE NETWORK< | |
|---------------------|-------------|
| IP ADDRESS | HTTP REMOTE |
| IP MASK | FTP |
| GATEWAY | RESET |
| SERVER | |
| HTTP LOCAL | |

The Network menu is used when a controller is being remotely communicated with either a local network connection or over the internet on the Web Advantage server.

This menu is used for setting up the remote WebAdvantage communications and is covered in a separate manual Z1069152.

Note

The Network card must be RESET after making any changes to Network setting in order to save changes and reset communications.

8.8 System Information

System information will identify the version of firmware installed in the controller along with the controller's serial number.

9 History

The onboard history allows for viewing the history of the probe readings, relay activations, key-pad activity, calibrations, water meter hourly and daily logs and alarms for each system present. It is also where Notepad data is entered and reviewed. An initial overview page is displayed showing your current sample interval, the calculated number of days the unit can keep probe history for before losing the oldest. The number of sensor samples and relay/alarm events and Notepad entries currently stored is also displayed.

| >HOME REVIEW< | |
|---------------|--|
| SYSTEM 1 | Sample Time: 5 MIN (Length 164.62 days) |
| | Sensor Samples 882 |
| | Relay/Alarm Events 323 |
| | Notepad Entries |

Note

The history can be reset by going to the configure menu and entering a different sample interval. After the new sample interval has been set the onboard history is reset.

operation

9.1 Viewing History

```
>HISTORY<
RELAY LOGS          WATER METER
ALARM LOGS
SENSOR HISTORY
EVENT LOG
NOTEPAD
```

RELAY LOGS Relay activations displayed in a log form. Arrow up to advance through the log.

ALARM LOG Alarm activations in log form. **SENSOR HISTORY** For selecting the parameters and viewing of a given probe reading's history in log or graph form.

EVENT LOG Displays various activities.

9.2 Notepad Entries

```
>NOTEPAD: SYS 1 NOTE 1<
ENTER VALUE          Total Hardness
LOG                  8 Entries
GRAPH
                    517.2 Hrs to Alarm
```

The Notepad section under History is where the user goes to enter new values for the customized notepad items. Each individual notepad item's manually entered entries are

stored in the units history and can be reviewed in log or graph form after 4 or more values have been entered.

9.3 Water Meter History

The water meter history allows the user to review both water meter one and two of a particular system in both an hourly format (for the past 24 hours) or a daily format for the past 60 days. If an evaporation calculation is being kept, a daily history of this value is also available.

operation

10 Water Meters / Totalizers

| | | |
|----------------------|-----------|-------------|
| >SYS1 WATER METER 1< | | |
| TOTAL VALUE: | 0280500.0 | GALLONS |
| FLOW RATE: | 000.0 | GALLONS/MIN |
| CONTACT VALUE: | 0010.0 | GAL/CONTACT |
| CONTACT VALUE | | DEBOUNCE |
| CONTACT UNIT | | |
| RESET TOTAL | | EVAP CALC |

Each system with a timer on it will have 2 water meter inputs. Each of these can have the incoming contact defined allowing the controller to keep track of water usage. If desired the controller can calculate evaporation loss

by subtracting the difference between a systems 2 water meter inputs.

CONTACT VALUE Defines the numerical value for a contact; i.e. 10.

CONTACT UNIT Defines the units of measurement for a contact; i.e. Gallons / Contact

RESET TOTAL Resets the totalizer count.

EVAP CALC Defines which way to subtract the 2 water meter inputs for an evaporation value.

DEBOUNCE An additional amount of time the input will wait before accepting another water meter contact to reduce false contacts from a chattering read switch.

10.1 Totalizers

MarleyGard CD controllers may have 1 to 4 auxiliary flowmeter inputs. These additional inputs are for tracking various flow meter devices (additional water meters or flowmeters in a metering pump's discharge tubing). They can also be linked to a system's water meter input for additional tracking and alarm capabilities including: bleed flow/no flow, exceeding too much flow in a 12 or 24 hour period. Units with Auxiliary Flow meter inputs have a Home menu selection for Totalizers. The Totalizer menu has selections for each of the System Water Meters plus one named Aux Meters.

| | |
|---------------------|--|
| >TOTALIZERS< | |
| SYS 1 WATER METER 1 | |
| SYS 1 WATER METER 2 | |
| AUX METERS | |

Select the system water meter to set-up or go to Aux Meters to set-up the auxiliary flow meters.

operation

10.2 Aux Meters

A unit may have 1 to 4 Aux Meters. These additional inputs are for tracking various flow meter devices. They can also be linked to a system's water meter input for additional tracking and alarm capabilities.

>FLOW METER<

FM01: AUX METER A

FM02: AUX METER B

FM03: AUX METER C

FM04: AUX METER D

Select the Aux Flow Meter to set-up or review.

10.2a Aux Meter Review

A review screen of the current settings is provided with a selection for the Tracking method and also the Settings.

>FLOW METER 1<

TOTAL VALUE: 9966.0 ML

FLOW RATE: 0.0 ML/MIN

CONTACT VALUE: 0.33 ML/CONTACT

LAST RESET ON: 08/25/2006

VOLUME ALARM: 1000 LITERS (24 HOURS)

ALARM NOTIFY: (DISPLAY)

VOLUME: 0.0 LITERS

VERIFY ALARM: 100 SEC (DISPLAY)

RELAY LINK: SYS1 TIMER3

SETTINGS

TRACKING

SETTINGS

Access the various settings for the flow meter.

TRACKING

Provides a pop-up screen to select either FloTracker or Rate and Volume tracking.

Note

Select FloTracker if the aux meter is a FloTracker. Select Rate and Volume if tracking a water meter or other batch flow device.

operation

10.2b Aux Meter Settings

| | |
|----------------------|--------------|
| >FLOW METER 1 SETUP< | |
| PULSE VALUE | VOLUME ALARM |
| UNITS | RESET VOLUME |
| RESET TOTAL | |
| VERIFY ALARM | |
| RELAY LINK | METER LINK |

| | |
|---------------------|--|
| PULSE VALUE | Defines the numerical value for a contact, i.e. 225. |
| UNITS | Defines the units of measure for a contact, i.e. Pulses / Ounce. |
| RESET TOTAL | Resets the totalized count of the meter. |
| VERIFY ALARM | If a flow meter is linked to a control relay the controller will give an alarm if it does not receive a contact or pulse from the aux meter within the amount of time defined or if it gets a contact when the relay is not on. |
| RELAY LINK | The relay link informs the particular aux meter input is relevant to the control function that the selected relay is being driven by. For example, if the aux flow meter is a metering pump's FloTracker then it should be linked to the relay that is driven by the feed timer that pump will be controlled by. If the aux meter is going to be linked to a water meter in a bleed of line then it should be linked to the relay that is controlling the bleed off valve. |
| VOLUME ALARM | If FloTracker has been selected as the Tracking method, an alarm will occur when the defined VOLUME USED has passed through the flow device. |

Note

If Rate and Volume tracking has been selected an alarm will occur if the defined MAX VOLUME amount is measured within the defined TIME CYCLE which can be a 12 or 24 hour period.

| | |
|---------------------|---|
| RESET VOLUME | Resets the Volume Alarm totalizer. |
| METER LINK | This selection only shows if the tracking method is Rate and Volume and tells the auxiliary flowmeter input to get its signals from one of the system water meters already wired to the controller's water meter inputs. If this is selected no wiring to the auxiliary input is required and the PULSE VALUE and UNITS settings are auto populated from the particular water meter's settings. |

operation

11 Relays

| >RELAYS< | |
|----------|--|
| STATUS | |
| RESET | |
| FORCE | |

STATUS Allows for viewing accumulated relay ON times, temporary forcing relays ON or OFF or seeing which relay is on.

RESET Allows the accumulated run time of a particular relay to be reset to zero.

FORCE Allows a relay to be manually forced ON for a single event from 0-99 minutes. When the event is over the relay goes back to its normal automatic control.

| >RELAY STATUS< | | |
|----------------|-------------|-----------|
| R01: | ON | 006:30:30 |
| SYS1 | COND BLEED | |
| R02: | OFF | 008:56:35 |
| SYS1 | pH | |
| R03: | OFF-T | 011:00:10 |
| SYS1 | TIMER1 INH | |
| R04: | OFF | 007:00:00 |
| SYS1 | TIMER2 BIO1 | |
| R05: | OFF | 008:10:30 |
| SYS1 | TIMER3 BIO2 | |

In the STATUS view the accumulated ON time is shown along with the main activator, custom name and current status:

ON = Relay on by relay activators

OFF = Relay off by normal logic

OFF-T = Relay off for daily max

OFF-D = Relay off for relay disabler

ON-A = Relay activated by activator other than mainaction

H-ON = Relay manually forced on

H-OFF = Relay manually forced off

operation

MarleyGard CD Controller - USB Functions

The CD controller is capable of transferring information using a FAT formatted USB drive. The controller has three main USB functions as detailed in the following sections:

1. Exporting log data
2. Upgrading firmware
3. Cloning user settings for other units

Getting Started

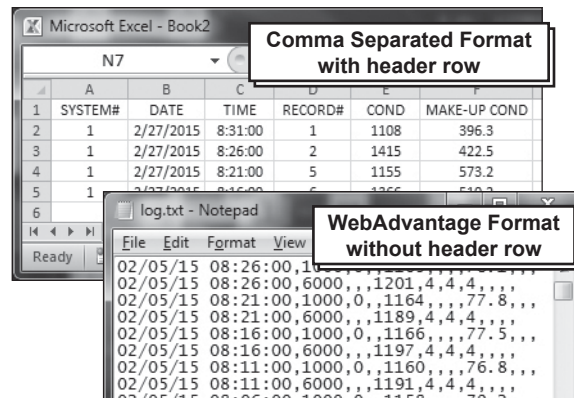
With the controller powered up, plug the USB drive into the USB port. The USB DRIVE DETECTED pop-up window will appear.

Note

- *You may be required to enter a password.*
- *USB drives must be FAT formatted.*
- *Not all customized names will be saved.*

Exporting Log Data

History from a MarleyGard controller can be saved to a USB drive in one of two file formats: WebAdvantage or generic comma separated (default).



Sample Log Data "log.txt" files

To change formats, see Step 2.

operation

Step 1:

To transfer the contents of the MarleyGard CD history logs to the USB drive, select → History → USB by using the Arrow buttons. Then press ENTER.

| CD Controller | | |
|---|--------|----------|
| USB DRIVE DETECTED | | |
| --> History --> USB | | |
| PRESS UP/DOWN KEYS TO CHANGE PRESS ENTER TO ACCEPT | | |
| ORP: | 548 mV | FLOW: ON |
| 3 ALARMS! <u>DR</u> RELAYS | | |
| Friday, February 6, 2018 15:50:47 Wk1 | | |

Status will be displayed on the screen to show the percent completed of each log record type. Once the log is completely stored, the pop-up window will close. If only a small amount of data is available the screen may disappear quickly. The USB drive will now contain a file name: example "LOG_AB-1234.TXT". The AB-1234 will be the unit's serial number.

Step 2: Changing the File Format

This is the RUN Screen.

| CD Controller | | |
|---------------------------------------|---------|-------------|
| SYS1: Towers 1-4 | | |
| COND: | 0 uS/cm | TEMP1: 68°F |
| | | WM1: 0.0 |
| | | WM2: 0.0 |
| pH: | 3.2 | |
| ORP: | 548 mV | FLOW: ON |
| 3 ALARMS! <u>DR</u> RELAYS | | |
| Friday, February 6, 2015 15:50:47 Wk1 | | |

Step 3:

Push the SET UP RUN button to get this screen. From here push CONFIGURE (Button 7) to go to the next screen.

| >HOME SETUP< | |
|--------------|------------------|
| SETPOINTS | DATE/TIME |
| CALIBRATION | CONFIGURE |
| TIMERS | HISTORY |
| CUSTOMIZE | WATER METER |
| ALARMS | RELAYS |

operation

Step 4:

This is the Configure Screen. From here push HISTORY (Button 4) to go to the next screen.

```
>CONFIGURE<
PASSWORD          CONTRAST
RELAYS            TEMP SCALE
                  NETWORK
HISTORY           SYS INFO
FLOW SW          FACTORY
```

Step 5:

This is the Configure History Screen. From here push SAVE FORMAT (Button 4) to go to the next screen.

```
>CONFIGURE HISTORY<
INTERVAL
W/M HOUR
DELAY
SAVE FORMAT
```

Step 6:

Set the value of the HISTORY SAVE FORMAT by using the arrow keys. Then press ENTER to confirm and go to the previous screen.

```
>CONFIGURE HISTORY<
INT HISTORY SAVE FORMAT
W/M --> WEB ADVANTAGE
DEL PRESS UP/DOWN KEYS TO CHANGE
SAV PRESS ENTER TO ACCEPT
```

Note

WebAdvantage format is required for uploading history to WebAdvantage for cloud storage and graphing. Change to Comma Separated format if using a database software like Excel.

Press SET UP RUN to return to the RUN screen.

Step 7:

Remove USB drive and re-insert to initiate the USB DRIVE DETECTED pop-up window. Repeat Step 1 from section Exporting Log Data.

operation

Uploading data to WebAdvantage

If the controller does not have a communications card, there will be a one-time fee per controller to allow the history to be stored on WebAdvantage for using custom graphing and multiple user internet access. Contact your Marley sales representative with your unit's serial number to learn more.

After an CD controller is set-up for cloud storage, follow these steps:

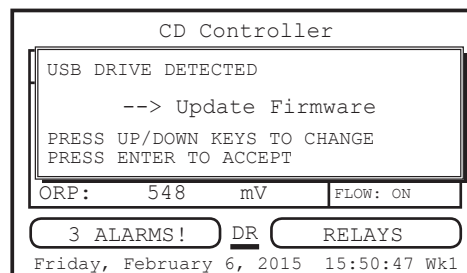
1. Login to the secure web server: <https://webadvantage.online>
2. Locate the controller you have data for and click Reports
3. Click History Upload on the left
4. Click Choose File and select the file you exported.
5. Click Submit and the data will upload
6. You will now be able to view reports and history data once completed.

Upgrading Firmware

To upgrade the firmware on your CD, copy the updated software version to a USB drive. The file name should be "firmware.bin" With the controller powered up, plug the USB drive into the CD USB port. The USB DRIVE DETECTED pop-up window will appear. If a password is in the unit, the USB will ask for it. Select → Update Firmware by using the Arrow buttons. Then press ENTER.

Caution

Do not remove power or USB during updating. It may take a few minutes



to complete. Once the first update is complete, power off and remove USB. Wait 20-30 seconds to power back on and reinstall the USB after the RUN screen appears and load the firmware a second time.

operation

After second update is complete, power down and remove USB. Power back on (after 20 seconds) and go to the Configure menu.

```
>HOME SETUP<
SETPOINTS          DATE/TIME
CALIBRATION        CONFIGURE
TIMERS             HISTORY
CUSTOMIZE          WATER METER
ALARMS            RELAYS
```

From here push SYS INFO (Button 9) and confirm that the unit now has the new version and that the CARD version is also current (consult factory for current).

```
SYSTEM INFORMATION:
XS MEGATRON CONTROLLER
ADVANTAGE CONTROLS INC.
FRMWARE REV : KA.08.06 Nov 21 2016
S/N: SERIAL#
CARD VER : 5

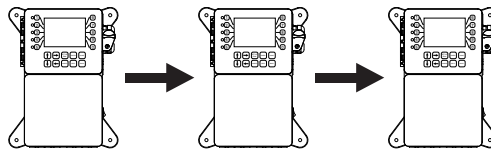
HISTORY          SYS INFO
FLOW SW          FACTORY
```

⚠ Caution

If the card revision has not updated to the newer version, the sensor function will not work correctly. A few power cycles may be needed to get the system card updated. The mA input and communications card (if present) may need to be removed with the power off and a power cycle performed. Once the system card version is updated, power back down and reinstall the mA and communications cards.

Cloning User Settings for other CD Controller Units

The CD controller has the ability to copy the User Settings from one CD controller to another. This process is referred to as cloning.



Step 1:

With the controller powered up, plug the USB drive into the CD USB port. The USB DRIVE DETECTED pop-up window will appear. Select --> Config --> USB (Config to USB) by using the Arrow buttons. Then press ENTER.

```
CD Controller
USB DRIVE DETECTED
--> Config --> USB
PRESS UP/DOWN KEYS TO CHANGE
PRESS ENTER TO ACCEPT
ORP: 548 mV FLOW: ON
3 ALARMS! DR RELAYS
Friday, February 6, 2018 15:50:47 Wk1
```

operation

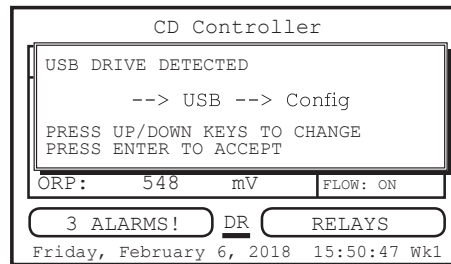
The User settings will be saved to the USB drive under the file name "CONFIG.BIN". The pop-up window will close when the copy is completed.

Step 2:

Plug the USB drive into the CD that you would like to copy the User Settings to. The USB DRIVE DETECTED pop-up window will appear. Select --> USB --> Config (USB to Config) by using the Arrow buttons. Then press ENTER.

Caution

Do not choose --> Config --> USB again or you will save over your USB contained CONFIG.BIN file.



The User Data will be loaded into the CD Controller from the USB drive. Once the pop-up window closes, cloning has been completed.

Note

- *Not all customized names will be cloned.*
- *If you have trouble reading clone files, insure that the CD you are cloning has current firmware.*

maintenance

The only required maintenance for normal uninterrupted operation of your MarleyGard CD controller is cleaning of the electrode(s). After initial start up, it is a good idea to clean the electrode frequently until a schedule based on need has been developed. Since each application is unique, it is difficult to estimate the required frequency of cleaning. The first cleaning should take place after about one week of the system being on line.

To determine the required cleaning frequency, record the reading on the controller before the electrode is removed for cleaning. After cleaning, record the new reading. If a change is observed in the two readings, the electrode was dirty. The more significant the change, the dirtier the electrode. If no change occurs, cleaning needs to be done less often.

Conductivity Electrode Cleaning Procedure

1. Record the current conductivity reading.
2. Turn off water flow through the electrode loop, bleed pressure from the line and remove electrode.
3. Use a clean cloth and a mild cleaning solution to remove loose dirt etc., from the flat surface of the electrode.
4. If the electrode has deposits such as scale attached to the electrode surface a more aggressive cleaning approach will be needed. There are several ways to do this, the preferred method being the one that is easiest for the user.
 - a. Use a mild acid solution to dissolve deposits.
 - b. Lay a piece of sandpaper (200 grit or finer) on a flat surface such as a bench top. "Sand" electrode to remove stubborn deposits. (Do not wipe surface with your finger.) Oil from your skin will foul carbon tips.
5. Reinstall the electrode in the system. After the reading stabilizes, calibrate the unit to a reliable test reading.

Many times an electrode can appear to be clean, but the unit still cannot be calibrated. If this is the case, use one of the more aggressive electrode cleaning procedures listed in step 4 above.

Recheck the calibration after completion of this procedure. If no change was observed in the reading, replace the electrode. If a change occurred but the unit still will not calibrate, repeat procedure as many times as necessary.

maintenance

pH and ORP Electrode Cleaning Procedure

1. Remove the pH electrode from the system.
2. Spray with water and/or detergent, using a soft brush to dislodge any fouling.
3. Visually inspect the electrode for signs of damage.
4. Calibrate the electrode while it is in a known solution.

Slow response or non-reproducible measurements are signs that the electrode has become coated or clogged. The pH glass is susceptible to mounting by many substances. The speed of response, normally 95% of the reading in less than 10 seconds, is dramatically degraded when the pH glass is coated.

To restore the speed of response for a pH electrode, clean the bulb with a high quality detergent, methyl alcohol or other suitable solvent using a "Q-tip". Rinse well with distilled water and retest. If the electrode now responds, but erratically, soak the sensor in 0.1 Molar HCl for 5 minutes. Remove and rinse with water and place in 0.1 Molar NaOH for 5 minutes. Remove, rinse again and then place the sensor in pH 4. buffer for 10 minutes before use.

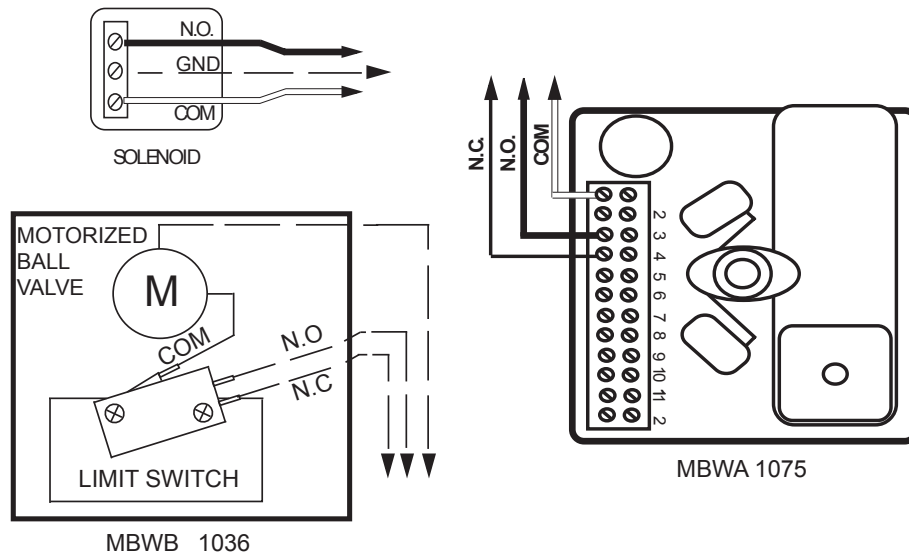
Troubleshooting

The MarleyGard CD controller is designed for many years of trouble free operation. Should a problem occur, refer to the following chart to help identify the problem. If replacement is required, contact your Marley sales representative.

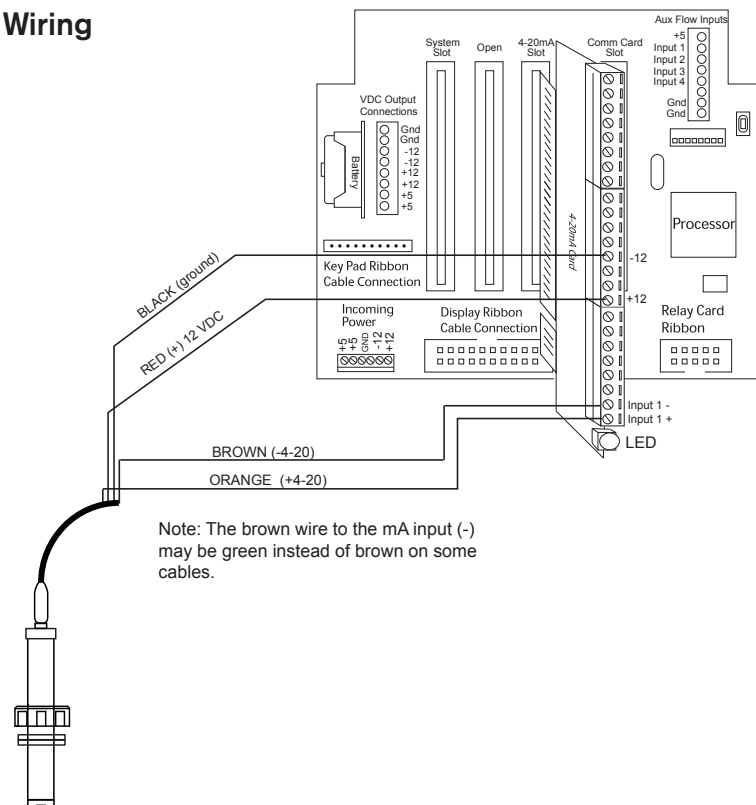
| Symptom | Possible Cause | Solution |
|----------------------------|----------------------------|--|
| False Reading | Bad or dirty electrode | Clean, as needed |
| | Out of calibration | Calibrate unit |
| Will not calibrate | Dirty electrode | Clean electrode |
| | Faulty electrode | Replace electrode if needed |
| | Faulty wiring to electrode | Replace wiring if needed |
| No system power | Check power source | Plug into different receptacle |
| | Check fuse | Replace as needed |
| | Check connections | Make sure ribbon cables are secure |
| Pulse timer not activating | Check wiring | Repair as needed |
| | Check external device | Repair/replace as needed |
| Outputs not energized | No flow | Check sample line for clogged pipes or strainers |
| | Check fuse | Replace as needed |

schematics

Blowdown Valve Wiring

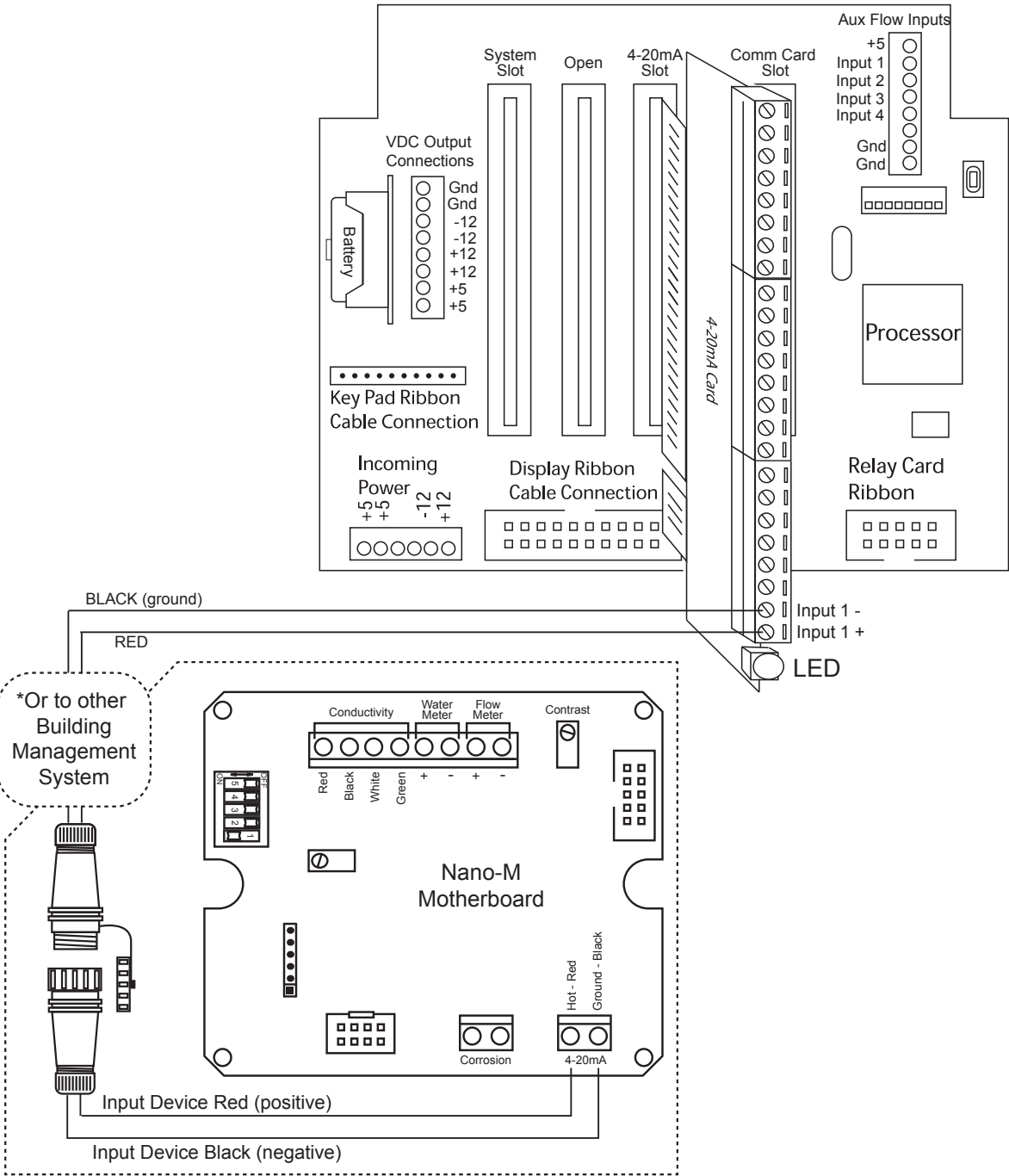


LD2 Inline Fluorometer Wiring



schematics

Corrosion Monitor Wiring



operation

Web Connectivity via Cell ROUTER-3 Internet

The cell router package is a plug and play setup. The controller CAT5 is connected to the ROUTER-3 CAT5 via a coupler. Then plug in the power cord.

Step 1:

This is the RUN Screen. When the controller is communicating with our network correctly, there will be a steady DR code displayed. If the code alternates DR/DL this usually means that the cellular signal is not strong enough. The ROUTER-3 box and antenna may need to be relocated to an area of regular cell reception. CAT5 cable run over 328 ft requires a repeater or switching appliance.

| | |
|------------------|-------------|
| SYS1: Towers 1-4 | |
| COND: 0 uS/cm | TEMP1: 68°F |
| | WM1: 0.0 |
| pH: 3.2 | WM2: 0.0 |
| ORP: 548 mV | FLOW: ON |

3 ALARMS! **DR** RELAYS

Other codes that may be present:

NC = Talking to ICM but not connected

Diagnostics; only shows on startup/boot.

DR = DHCP Remote Connection

DL = DHCP Local Connection

SR = Static Remote Connection

Controller assigned a static IP (DHCP:Off) and is not needed. Enable DHCP as directed in Steps 2 through 4.

SL = Static Local Connection

Controller assigned a static IP (DHCP:Off) and is not needed. Enable DHCP as directed in Steps 2 through 4.

FL = DHCP Failed Local Connection

No network detected or CAT5 cable not plugged in.

CS = No communication card detected

If a card is present and you are getting CS, check that the comm card is properly seated into the carrier board. This may loosen in shipment. Make sure the board is seated in all the way (with power off).

operation

Step 2:

Push the SET UP RUN button to get this screen. From here push CONFIGURE (Button 7) to go to the next screen.

| >HOME SETUP< | |
|--------------|-------------|
| SETPOINTS | DATE/TIME |
| CALIBRATION | CONFIGURE |
| TIMERS | HISTORY |
| CUSTOMIZE | WATER METER |
| ALARMS | RELAYS |

Step 3:

This is the Configure Screen. From here push NETWORK (Button 8) to go to the next screen.

| >CONFIGURE< | |
|-------------|------------|
| PASSWORD | CONTRAST |
| RELAYS | TEMP SCALE |
| | NETWORK |
| HISTORY | SYS INFO |
| FLOW SW | FACTORY |

Step 4

This is the Network Summary Screen. This screen is a summary of the currently assigned controller network settings. When connected to the cellular modem, these numbers will auto populate. Note: Any changes beyond this point require RESET (Button 0) to be pressed and a 60 second restart countdown will begin.

| >NETWORK< | |
|--------------|-----------------------------|
| IP ADDR: | 192.168.1.76 |
| SUBNET MASK: | 255.255.255.0 |
| GATEWAY: | 192.168.1.240 |
| DOMAIN: | DynamiCUniversal Rabbit BIO |
| ACI SERVER: | web80.advantagecontrols.com |
| HOST: | mycontroller |
| MAC: | 00:90:c2:d9:ea:7c |
| DHCP: | On |
| Local Mode: | On |
| Remote Mode: | On |
| | DHCP |
| SETTINGS | RESET |

Note

If you are getting a DR and cannot see the controller on the WebAdvantage summary screen, please check with us to see if you have submitted the connection sheet correctly. If you have not filled out the connection sheet, you can do so online at... http://www.advantagecontrols.com/request_webadv_connect.php.

operation

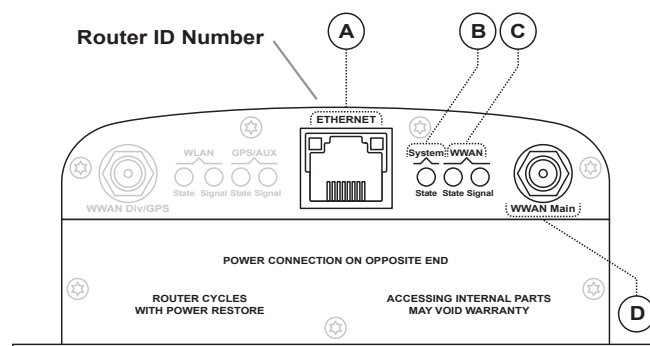
Router Troubleshooting

Open front panel of ROUTER-3 to reveal connections and LED lights.

| LED | Description | Indicates |
|---------------|--|--|
| A - Ethernet | Green LED Indicates activity and connection to controller. | Solid = Valid Link Blink = Data Traffic Off = Not Connected |
| B - System | State LED *Indicates successful power on and device readiness. | Off = No Power Orange = Booting Red = Error Green = On |
| C - WWAN | State LED Indicates WWAN or 3G interface availability and use. Allow up to 5 minutes for the connections to WebAdvantage and the cellular network to be established. | Off = No Power Orange = On, Not Connected Red = WWAN error, possible lack of cellular service plan. Green = On, Connected Green Flashing = Data Traffic |
| | Signal LED Indicates WWAN or 3G interface signal strength. | Off = No Power Orange = On, Not Connected Red = Bad Signal Strength Green = Good Signal Strength |
| General | Description | |
| D - WWAN Main | Antenna Connection WWAN Div/GPS not used. WLAN and GPS/AUX not used. Antenna wire length approximately 9 ft. | <ul style="list-style-type: none">- Ensure cable is properly threaded.- Check for frayed or damaged wire.- Move to location optimal for cell reception.- Do not splice antenna wire to extend length. Instead, extend CAT5 up to 328 ft max |

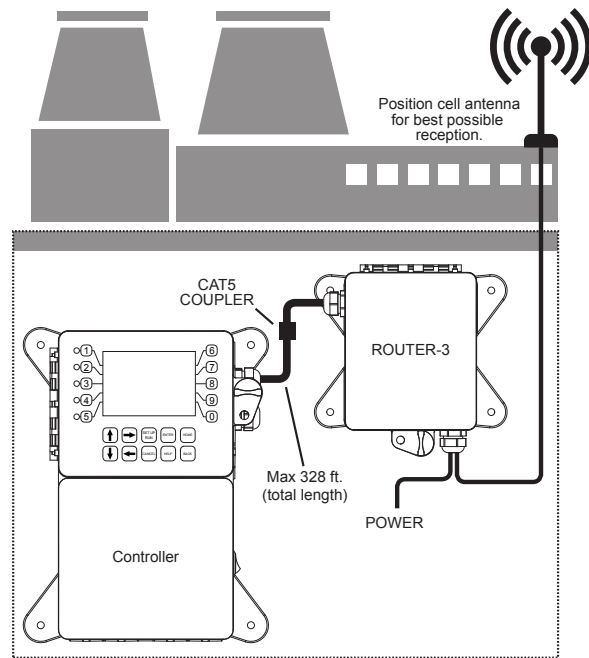
Note

Please have ID number available when calling in for troubleshooting. This allows us to identify the specific line and carrier.



operation

Cell Antenna



MarleyGard CD controller

USER MANUAL

SPX COOLING TECHNOLOGIES, INC.

7401 WEST 129 STREET
OVERLAND PARK, KS 66213 USA
913 664 7400 | spxcooling@spx.com
spxcooling.com

Z1069146 | ISSUED 4/2018

© 2018 SPX COOLING TECHNOLOGIES, INC | ALL RIGHTS RESERVED

In the interest of technological progress, all products are subject to design and/or material change without notice.

