U.S. ENVIRONMENTAL PROTECTION AGENCY
Office of Pesticide Programs
Antimicrobials Division (7510P)
1200 Pennsylvania Ave., N.W.
Washington, D.C. 20460

NOTICE OF PESTICIDE:
_X_ Registration
___ Reregistration
(under FIFRA, as amended)

EPA Reg. Number:	Date of Issuance:
89404-2	7/23/24

Term of Issuance:
Conditional

Name of Pesticide Product:
CRYPTOLYTE

Name and Address of Registrant (include ZIP Code):

Brian Hogan
Agent for Truox, Inc.
c/o KRK Consulting, LLC
Electronic Transmittal: brianhogan330@gmail.com

Note: Changes in labeling differing in substance from that accepted in connection with this registration must be submitted to and accepted by the Antimicrobials Division prior to use of the label in commerce. In any correspondence on this product always refer to the above EPA registration number.

On the basis of information furnished by the registrant, the above named pesticide is hereby registered under the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA).

Registration is in no way to be construed as an endorsement or recommendation of this product by the Agency. In order to protect health and the environment, the Administrator, on his motion, may at any time suspend or cancel the registration of a pesticide in accordance with the Act. The acceptance of any name in connection with the registration of a product under this Act is not to be construed as giving the registrant a right to exclusive use of the name or to its use if it has been covered by others.

This product is conditionally registered in accordance with FIFRA section 3(c)(7)(A). You must comply with the following conditions:

1. Submit and/or cite all data required for registration/reregistration/registration review of your product under FIFRA when the Agency requires all registrants of similar products to submit such data.

Signature of Approving Official:

Demson Fuller, Product Manager 32
Regulatory Management Branch 1
Antimicrobials Division (7510P)

Date:
7/23/24

EPA Form 8570-6

2. You are required to comply with the data requirements described in the DCI identified below:
    a. Sodium Chlorite GDCI-020502-1561

    You must comply with all of the data requirements within the established deadlines. If you have questions about the Generic DCI listed above, you may contact the Reevaluation Team Leader (Team 36): http://www2.epa.gov/pesticide-contacts/contacts-office-pesticide-programs-antimicrobial-division

3. Be aware that proposed data requirements have been identified in a DCI. For more information on these proposed data requirements, you may contact the Reevaluation Team Leader (Team 36): http://www2.epa.gov/pesticide-contacts/contacts-office-pesticide-programs-antimicrobial-division

4. Make the following label changes before you release the product for shipment:

    - Revise the EPA Registration Number to read, "EPA Reg. No. 89404-2."

5. Submit one copy of the final printed label for the record before you release the product for shipment.

Should you wish to add/retain a reference to the company's website on your label, then please be aware that the website becomes labeling under FIFRA and is subject to review by the Agency. See FIFRA section 2(p)(2). If the website is false or misleading, the product would be misbranded and unlawful to sell or distribute under FIFRA section 12(a)(1)(E). 40 CFR 156.10(a)(5) lists examples of statements EPA may consider false or misleading. In addition, regardless of whether a website is referenced on your product's label, claims made on the website may not substantially differ from those claims approved through the registration process, FIFRA section 12(a)(1)(B). Therefore, should the Agency find or if it is brought to our attention that a website contains false or misleading statements or claims substantially differing from the EPA approved registration, the website will be referred to the EPA's Office of Enforcement and Assurance.

If you fail to satisfy these data requirements, EPA will consider appropriate regulatory action including, among other things, cancellation under FIFRA section 6(e). Your release for shipment of the product constitutes acceptance of these conditions. A stamped copy of the label is enclosed for your records. Please also note that the record for this product currently contains the following CSFs:

- Basic CSF dated 05/30/2024

If you have any questions, please contact Michael Varco by phone at (202) 566-0667, or via email at Varco.Michael@epa.gov.

Sincerely,

Demson Fuller, Product Manager 32
Regulatory Management Branch I
Antimicrobials Division (7510P)
Office of Pesticide Programs

Enclosure: Product label

Throughout the label, text that appears in {braces} are notes to reviewer. Text that appearsin [brackets] is optional. Text that appears in (parenthesis) are required clarifiers or acronyms. X is a placeholder for any number or letter.

{In accordance with 40 CFR 156.68(d), all first aid statements will appear on page 1 of the product label.}

CRYPTOLYTE®

RWI Reduction Technology®

Cryptolyte® is used for the control of Cryptosporidium parvum in swimming pools, water parks, spas, feature pools, and lagoons. Cryptolyte® is used in conjunction with EPA-registered chlorine-based products (e.g. sodium hypochlorite, calcium hypochlorite) that are approved for pool treatment.

ACTIVE INGREDIENT:

Sodium Chlorite	25.0%
Other Ingredients	75.0%
Total	100.0%

DANGER

KEEP OUT OF REACH OF CHILDREN

Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle.
(If you do not understand the label, find someone to explain it to you in detail.)

EPA Reg. No. 89404-2
EPA Est. No. XXXXX-XX-X

Manufactured [by] [for]:
TRUOX, INC
P.O. Box 2989
Alpine, WY 83128

NET CONTENTS: X [lb] [kg]
LOT #:

This product is tested and certified by NSF against NSF/ANSI 60

FIRST AID	
If in eyes:	• Hold eye open and rinse slowly and gently with water for 1 5-20 minutes. • Remove contact lenses, if present, after the first 5 minutes. • Call a poison control center or doctor immediately for treatment advice.
If on skin or clothing	• Take off contaminated clothing. • Rinse skin immediately with plenty of water for 15- 20 minutes. • Call a poison control center or doctor for treatment advice.
If swallowed:	• Call a poison control center or doctor immediately for treatment advice. • Have person sip a glass of water if able to swallow. Do not induce vomiting unless told to by a poison control center or doctor. • Do not give anything by mouth to an unconscious person.
If inhaled:	• Move person to fresh air. • If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth if possible. • Call a poison control center or doctor for further treatment advice.
NOTE TO PHYSICIAN: Probable mucosal damage may contraindicate the use of gastric lavage.	
GENERAL INFORMATION: Have the product container or label with you when calling a poison control center or doctor or going for treatment. For non-emergency and general information on product use, etc., information pertaining to this product, call the National Pesticides Information Center (NPIC) at 1-800-858-7378, Monday – Friday, 8:00 am – 12:00 pm Pacific Time; email: npic@ace.orst.edu; or web site: http://npic.orst.edu/. You may also contact the Poison Control Center at 1-800-222-1222 for emergency medical treatment information.	

PRECAUTIONARY STATEMENTS

HAZARDS TO HUMANS & DOMESTIC ANIMALS

DANGER. Corrosive. Causes irreversible eye damage and skin burns. May be fatal if swallowed or inhaled. Harmful if absorbed through skin. Do not get in eyes, on skin, or on clothing. Do not breathe spray mist.

PERSONAL PROTECTIVE EQUIPMENT (PPE)

Mixers, loaders, applicators, and other handlers must wear long-sleeve shirt, long pants, shoes, and socks.

Applicators and other handlers must wear:
- Goggle or face shield,
- Coveralls over long-sleeved shirt and long pants,
- Socks and chemical resistant footwear
- Chemical-resistant gloves
- A minimum of a NIOSH-approved particulate filtering facepiece respirator with any N, R, or

P filter; OR a NIOSH-approved elastometric particulate respirator with any N, R, or P filter; OR a NIOSH-approved powdered air purifying respirator with a HE filters.

User Safety Requirements: Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables exist, use detergent and hot water. Keep and wash PPE separately from other laundry. Discard clothing and other absorbent materials that have been drenched or heavily contaminated with this product's concentrate. Do not re-use them.

User Safety Instructions: User must: (1) Wash thoroughly with soap and water after handling and before eating, drinking, and chewing gum, using tobacco, or using the toilet; (2) remove clothing/PPE immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing; and (3) remove PPE immediately after handling this product. As soon as possible, wash thoroughly and change into clean clothing.

ENVIRONMENTAL HAZARDS

This product is toxic to fish and aquatic organisms. Do not discharge effluent containing this product into lakes, streams, ponds, estuaries, oceans or other waters unless in accordance with the requirements of a National Pollutant Discharge Elimination System (NPDES) permit and the permitting authority has been notified in writing prior to the discharge. Do not discharge effluent containing this product to sewer systems without previously notifying the local sewage treatment plant authority. For guidance contact your State Water Board or Regional Office of the EPA.

PHYSICAL OR CHEMICAL HAZARDS

Dry sodium chlorite is a strong oxidizing agent. This product becomes a fire or explosive hazard if allowed to dry. Mix only into water. Contamination may start a chemical reaction with generation of heat, liberation of hazardous gases (chlorine dioxide a poisonous, explosive gas), and possible fire and explosion. Do not contaminate with garbage, dirt, organic matter, household products, chemicals, soap products, paint products, solvents, acids, vinegar, beverages, oils, pine oil, dirty rags, or any other foreign matter.

DIRECTIONS FOR USE

It is a violation of Federal law to use the product in a manner inconsistent with its labeling.

CRYPTOLYTE® IS ONLY APPLIED WHEN THE WATER BEING TREATED IS CLOSED TO THE PUBLIC AND NO BATHERS ARE IN THE WATER.

CRYPTOLYTE® IS APPLIED USING THE CRYPTOLYTE® CONTROL SYSTEM.

WATER BALANCE: For best product performance, swimmer comfort and crystal-clear water, maintain pH in the 7.2-7.6 range. Maintain total alkalinity in the 80-160 parts per million (ppm ranges). Maintain calcium hardness above 200 ppm. Use a reliable [brand] test kit that measures all these ranges.

ROUTINE MAINTENANCE

APPLICATION: Apply after dusk when the pool is closed to all swimmers/bathers.

Cryptolyte® is applied using the Cryptolyte® Controller to the filtered return water. One-tenth of a pound (0.1 lb) of this product per 10,000 gallons of water will provide 0.22 ppm as chlorite.

Maintain 0.2 to 2 ppm as chlorine dioxide until a Ct Value of 160 mg/l x min is achieved to provide >3-log reduction of Cryptosporidium parvum.

BEFORE REOPENING: Before reopening the pool test the water chemistry to ensure it meets the approved Health Department guidelines. DO NOT re-enter pool until the free available chlorine residual is between 1.0 to 4.0 ppm as determined by a test kit.

RECOVERY SHOCK

FECAL RELEASE: Close the pool to the public and remove any solid debris from the water.

Cryptolyte® is applied using the Cryptolyte® Controller to the filtered return water. One pound (1 lb) of this product will provide 2.22 ppm as chlorite. Maintain 1 to 5 ppm as chlorine dioxide until a Ct Value of 160 mg/l x min is achieved to provide >3-log reduction of Cryptosporidium parvum.

BEFORE REOPENING: Before reopening the pool test the water chemistry to ensure it meets the approved Health Department guidelines. DO NOT re-enter pool until the free available chlorine residual is between 1.0 to 4.0 ppm as determined by a test kit.

STORAGE AND DISPOSAL

STORAGE: Store and handle in accordance with all current regulations and standards. Keep container properly labeled and tightly closed. Store in a cool, dry area. Store in a well-ventilated area. Store below 212 F (100 C). Avoid exposure to sunlight or ultraviolet light. Keep separated from incompatible substances.

PESTICIDE DISPOSAL: Pesticide wastes are acutely hazardous. Improper disposal of excess pesticide, spray mixture or rinsate is a violation of Federal Law. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste Representative at the nearest EPA Regional Office for guidance.

{For Non-Refillable Containers 5 Gallons or smaller}
CONTAINER HANDLING: Nonrefillable container. Do not reuse or refill this container. Triple rinse as follows: Fill container 1/4 full with water and recap. Shake for 10 seconds. Drain for 10 seconds after the flow begins to drip. Follow Pesticide Disposal instructions for rinsate disposal. Repeat procedure two more times. Then offer for reconditioning if appropriate or puncture and dispose of in a sanitary landfill or by incineration.

{For Non-Refillable Containers larger than 5 Gallons}
CONTAINER HANDLING: Nonrefillable container. Do not reuse or refill this container. Triple Rinse as follows: Fill the container ¼ full with water. Replace and tighten closures. Tip container on its side and roll it back and forth, ensuring at least one complete revolution, for 30 seconds. Stand the container on its end and tip it back and forth several times. Turn the container over onto its other end and tip it back and forth several times. Follow Pesticide Disposal instructions for rinsate disposal. Repeat this procedure two more times. Then offer for reconditioning if appropriate or puncture and dispose of in a sanitary landfill or by incineration.

WARRANTY STATEMENT

DISCLAIMER: Problems resulting from misuse, and using methods of application other than those described on this label are not the responsibility of Truox®, Inc. or its affiliates.

OPTIONAL GRAPHICS

CRYPTOLYTE®

BECSys5

Operation Manual

NSF

Certified to NSF/ANSI/CAN 50

BECS TECHNOLOGY

CE

INTERTEK ETL LISTED c US

CRYPTOLYTE® CONTROL SYSTEM OPERATIONAL OVERVIEW

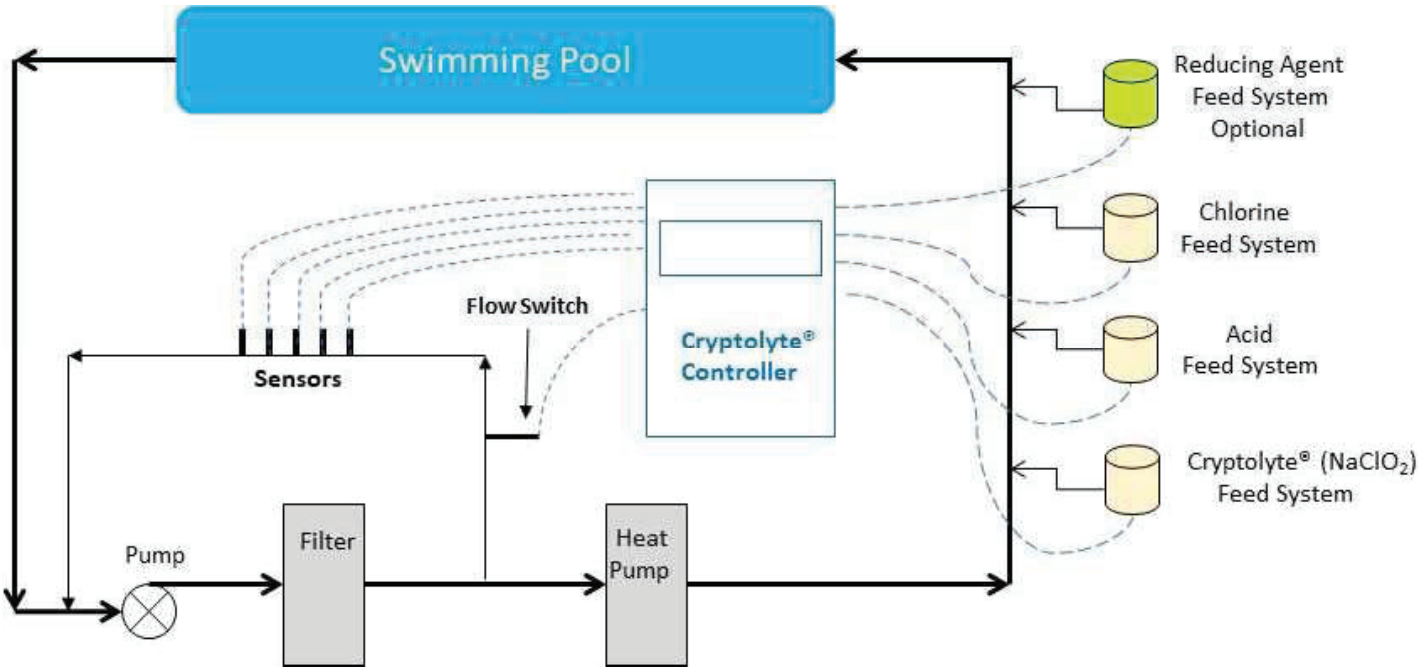
The **Cryptolyte® Control System** is an upgraded version of the **BEC's Swimming Pool Controller** that automatically controls the chlorine and pH while monitoring and recording all key parameters for proper control of the swimming pool water chemistry during **NORMAL swimming pool operations** (without addition of Cryptolyte®).

The Control System is interlocked with the swimming pool circulating system. In the event of loss of water flow (circulation pump off), the controller locks out all chemical feed systems.

During normal swimming pool operations, the Control System maintains control of the chlorine concentration and pH for proper sanitation, while monitoring and recording pertinent parameters (e.g. Cl_2, ORP, pH, temperature, flowrate etc.). Events logs record key events exemplified by: chemical feeds, high/low alarms and interruption in pool water flow.

CRYPTOLYTE® APPLICATION

Cryptolyte® is only applied when the swimming pool is vacated and not in use



Chemical Feed & Control Configuration

The **Cryptolyte® Control System** controls the feed of Cryptolyte® and hypochlorous acid to maximize the In-Situ activation of Cryptolyte® (chlorine dioxide generation) within the return piping of the circulating system for the inactivation of *Cryptosporidium parvum*.

Once the Cryptolyte® is activated to form chlorine dioxide, the chlorine dioxide is injected into the swimming pool through the return line injection ports as illustrated:

The **Cryptolyte® Control System** monitors the chlorine dioxide concentration, calculates and records the chlorine dioxide CT Value (mg/l x min) to achieve a ≥3-log reduction in viable *Cryptosporidium*.

CRYPTOLYTE® FEED METHODS

DAILY MAINTENANCE – Daily Maintenance is performed in the evening hours when the swimming pool is closed. This treatment method provides a low-dose of treatment to achieve a ≥3-log reduction of *Cryptosporidium* effectively remediating the swimming pool prior to reopening the next morning.

RAPID RECOVERY SHOCK – is performed when a known or suspected fecal release occurs. The Cryptolyte® Control System is activated by authorized personnel (password protected) after the swimming pool is vacated. The controller then implements the Shock treatment of Cryptolyte® to accelerate the inactivation of *Cryptosporidium* in the swimming pool water.

When the CT Value has been achieved, the Cryptolyte® control system can initiate a neutralization procedure to remove excess treatment from the pool water until the water chemistry is within the targeted parameters. The controller then notifies authorized personal so they can test the water chemistry prior to reopening the swimming pool to bathers.

CRYPTOLYTE® CONTROL SYSTEM FEATURES

- In-situ activation of Cryptolyte® (Chlorine Dioxide generation)
- Low-cost Daily Maintenance treatment
- Rapid Recovery Shock treatment
- Calculates and records CT Value (mg/l x min) to document 3-log reduction
- Provides Time-Proportioned control to optimize treatment to achieve the targeted CT Value
- Optional post-Shock neutralization of residual treatment
- Supervisor notifications

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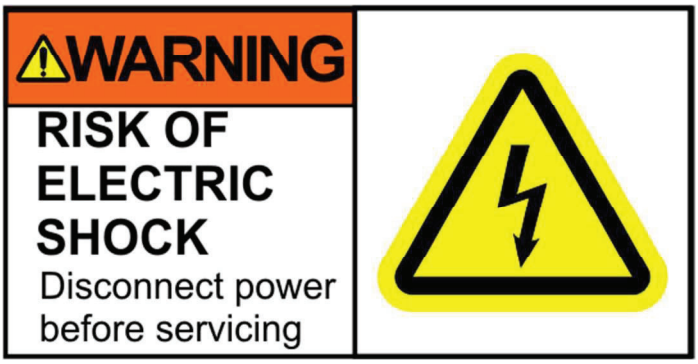
Warnings

Pay particular attention to the following warnings encountered while utilizing your BECSys5 Water Chemistry Controller:



Warning: Various other warning boxes may be found throughout the manual text.

Caution: Various caution boxes may be found throughout the manual text.

General Guidelines

Proper installation and use of the BECSys controller depends on the specific needs of the application. Read the manual completely before starting the installation and ensure all guidelines and recommendations are followed. All components should be mounted and the flow cell plumbing installed and pressure tested before wiring the controller. Ensure compliance with all applicable plumbing and electrical codes during the installation as well.

Caution: The BECSys controller should not be installed where it is accessible to the public.

Firmware Version

This manual was written for firmware v3.3x. If you received newer firmware but did not receive a copy of the manual covering that version of firmware, please contact your distributor.

Environmental Conditions

The BECSys5 is housed in a NEMA 4X (IP65) enclosure. It should not be used in explosive environments. The BECSys5 should be mounted so that adequate ventilation is provided around the enclosure, preventing general environmental specifications from being exceeded (see table below).

Environmental Specifications	
Specification	**Rating**
Storage Temperature	-40 to 85 Deg C
Ambient Operating Temperature	-18 to 50 Deg C
Ambient Humidity	95% non-condensing maximum humidity

Caution: After installation the enclosure must be completely sealed to preserve the NEMA rating, including sealing unused watertight cable glands. Failure to do so may result in a voided warranty.

Electrical Specifications

The BECSys5 may be ordered in either a 115VAC model or a 230VAC model. Following are the electrical specifications for each model:

Controller Ratings		
	115VAC Model	**230VAC Model**
Voltage:	115VAC 60Hz	230VAC 50Hz
Phase:	Single	Single
Current:	12.25 Amps Full Load	12.125 Amps Full Load
	(¼ Amp – Controller)	(⅛ Amp – Controller)
	(12 Amps – Relay Outputs: 3A X 4)	(12 Amps – Relay Outputs: 3A X 4)

Relay Output Ratings		
	115VAC Model	**230VAC Model**
Relay 1 (K1)	250VAC (max) – 3 Amps	250VAC (max) – 3 Amps
Relay 2 (K2)	250VAC (max) – 3 Amps	250VAC (max) – 3 Amps
Relay 3 (K3)	250VAC (max) – 3 Amps	250VAC (max) – 3 Amps
Relay 4 (K4)	250VAC (max) – 3 Amps	250VAC (max) – 3 Amps

Applicable Sensor Operating Ranges

Standard Sensors	
pH	0.0 pH to 14.0 pH
ORP	-1000mV to 1000mV
ClO_2	0 ppm to 10 ppm
Amperometric (Free Cl_2)	0 ppm to 20 ppm
Temperature	32°F to 212°F (0°C to 100°C)
Reed Flow Switch	Switch Point (On): 0.9 gpm
Rotary Flow Switch	Switch Point (On): 1.25 gpm
Flowmeter	0 – 655.35 Kgpm

1: Enable Chlorine Dioxide Sensor

Menu -> Inputs -> Reassign Inputs

Select the input the Chlorine Dioxide Sensor goes

2: Configure Chlorine Dioxide Sensor

Menu -> Inputs -> ClO_2

- **Decimal Places (Rep):** Configures the controller to display Chlorine Dioxide with 1 or 2 decimal places.
- **High Alarm (Op):** The high alarm will activate when the Chlorine Dioxide reading reaches or rises above this setting. You may disable this alarm by holding down the +/- key for 1 second.
- **Alarm Hysteresis (Mgr):** Sets the amount that the Chlorine Dioxide reading has to fall below the high alarm before the alarm will shut off.
- **Input Averaging (Rep):** Sets the number of samples used to get an average for the display of the Chlorine Dioxide reading.
- **Calibrate (Rep):** Allows a two-point calibration of the Chlorine Dioxide input.
- **Factory defaults (Rep):** Resets the controller back to factory defaults for the Chlorine Dioxide settings.

3: Assign Cryptolyte Relay

Menu -> Control Outputs -> Assign Relays -> Sanitization Feeds -> Cryptolyte

4: Configure Cryptolyte Relay

Menu -> Control Outputs -> Cryptolyte

- **Maint Start Time (Op):** Time to begin maintenance cycle.
- **Maint Duration (Op):** Feed duration for Cryptolyte during maintenance cycle.
- **Maint Timeout (Op):** Maximum allowed time to reach contact time before triggering alarm during maintenance cycle.
- **Maint CT Set Pnt (Op):** Contact time to reach during maintenance cycle.
- **Shock Duration (Op):** Feed duration for Cryptolyte during shock cycle
- **Shock Timeout (Op):** This sets the maximum allowed time to reach contact time before triggering alarm during shock cycle.
- **Shock CT Set Pnt (Op):** This sets the contact time to reach during shock cycle.
- **Lag Time (Op):** This sets the amount of time to delay alarms while chemical is dispersing after shock.
- **Factory defaults (Rep):** Resets the controller back to factory defaults for the Cryptolyte relay settings.

5: Assign Dechlor a Relay

Menu -> Control Outputs -> Assign Relays -> Sanitization Feeds -> Dechlor

Select an available relay.

6: Configure Dechlor Relay

With Cryptolyte some of the functions usually available for DeChlor are not present. There are also additional functions added for Cryptolyte.

- **4 Even 28 Day Timer (Op):** To program when the dechlorination should trigger, select 4Event 28Day Timer from the dechlorination menu:
  - Selecting Event1 will allow you to select the weekly interval to trigger the dechlorination. If the 1st, 2nd, 3rd, or 4th week is selected, the timer will only trigger on that week in the four-week cycle. The Odd Weeks selection will trigger on the 1st and 3rd weeks, the Even Weeks selection will trigger on the 2nd and 4th weeks, and Every Week triggers every week.
    - The week number and day of week for the current date is displayed on the bottom right side of these screens.
    - The first week is fixed to be the week of Sunday, January 2nd, 2000 and every four weeks afterwards.
  - Next you can select the day of the week (or every day) the event should be triggered on.

  Once you make your selection, you will be returned to the 4Event 28Day Timer menu where you will have a new menu item: Event 1 Start Time.
  - Select the Event1 Start Time from the 4Event 28Day Timer menu.

  This screen allows you to set the time to trigger the event on the programmed weeks/days. The event will trigger at the start time if the controller is running at that time. To toggle AM/PM, press the +/- key. Enter the desired time and press enter.
  - After setting the time, press the left arrow to return to dehlorination's main menu. Here you will notice the next scheduled dechlorination is displayed for you. The controller will also list the last super chlorination here once one has been completed.
- **Crypto Feed Factor (Op):** Determines DeChlor feed duration based on Cryptolyte feed duration.
- **Crypto Comp Factor (Op):** Factor to make minor adjustments to DeChlor feed duration.

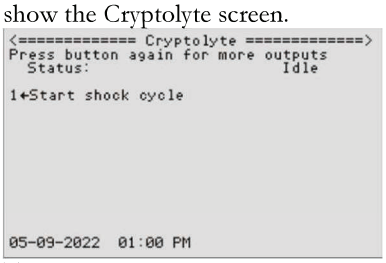
- **Output Inhibit (Rep):** Provides options to inhibit this feed based on other outputs. Up to three outputs can be used to inhibit this output.

⚠ Warning: The controller will not activate inhibited outputs for as long as the inhibiting condition is active, which could result in adverse water quality conditions.

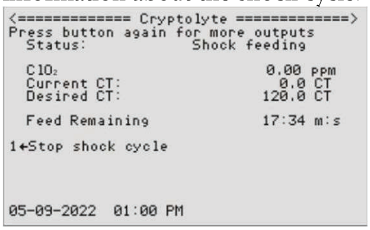
- **Factory Defaults (Rep):** Resets the controller back to the factory defaults for all of the dechlorination settings.

7: The Recirc/Relays Key

What you see when you press the Recirc/Relays key on the front face panel the first time depends on the configuration of the controller. You may see the Recirculation Pump screen or the local relays screen. If you see the Recirculation Pump screen, pressing the Recirc/Relays key again will take you to the Local Relays screen. Pressing the key one more time will show the Cryptolyte screen.



The Cryptolyte screen shows the current status and provides the ability to manually start a shock cycle. Once a shock cycle is started, the screen will display "Shock feeding" next to Status and will display other information about the shock cycle.



MODBUS Codes

Controller Firmware Version	V3.40 +	V3.40 +	V3.40 +	V3.40 +	V3.40 +	V3.40 +	V3.40 +	V3.40 +	V3.40 +	V3.40 +	V3.40 +
Interpretation and/or Units	Units are ppm. See ClO_2 decimal places 320506	Units are ppm. See ClO_2 decimal places 320506	Units are CT (ppm * min). Tenths precision.	Units are CT (ppm * min). Tenths precision.	Units are CT (ppm * min). Tenths precision.	1 = yes; 0 = no	1=alarm active; 0=alarm not active	1=alarm active; 0=alarm not active	1=alarm active; 0=alarm not active	1=alarm active; 0=alarm not active	1=relay active; 0=relay inactive
Format	unsigned, 1 or 2 decimals	unsigned, 1 or 2 decimals	unsigned, 1 implied decimal	unsigned, 1 implied decimal	unsigned, 1 implied decimal						
Size	16 bit	16 bit	16 bit	16 bit	16 bit	1 bit	1 bit	1 bit	1 bit	1 bit	1 bit
Type	input register	holding register	input register	input register	input register	discrete input	discrete input	discrete input	discrete input	discrete input	discrete input
RW	R	RW	R	R	R	R	R	R	R	R	R
MODBUS code	309241	409240	309241	309242	909243	113152	113153	113154	113155	320506	112593
Cryptolyte	ClO_2 reading	ClO_2 High Alarm Point	Cryptolyte CT	Cryptolyte Maintenance CT Set Point	Cryptolyte Shock CT Set Point	Cryptolyte installed	ClO_2 high alarm	Cryptolyte maintenance CT failure	Crypto shock CT failure	ClO_2 decimal places	Cryptolyte Relay State

10818 Midwest Industrial Blvd
St. Louis, Missouri 63132 USA
www.becs.com (314) 567-0088

Section A: Programming the Controller

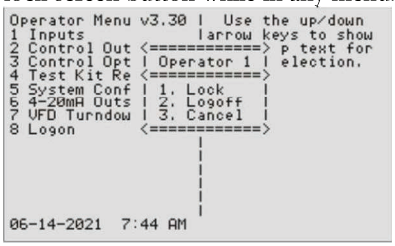
A – 1: Adjusting the Display Contrast

You can adjust the display contrast by holding down either the up or down arrow keys for two seconds, then after the controller beeps three times, use the up and down keys to adjust the contrast.

A – 2: Security Settings

A – 2.1: Access Codes & Levels

To view what access level you were given, press the lock screen button while in any menu.



The Main Menu will also display who is logged on along with the version of firmware.

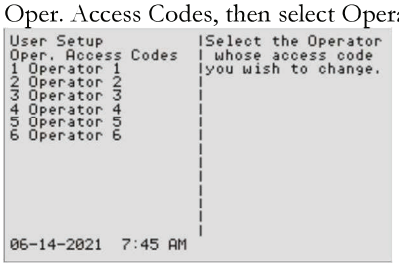
You do not need to set all the access codes for each level if you do not wish to. Also, a disabled access code is not equivalent to 000, so entering 000 when it prompts for an access code will only work if you have specifically assigned an access code to be 000.

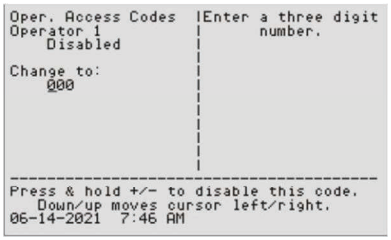
A – 2.2: Setting Access Codes

To set an access code, press the menu button, then:

- Select System Config
- Choose User Setup
- Then select the access level you want to set an access code for.

To set Operator 1's access code, you would select Oper. Access Codes, then select Operator 1.





Pressing and holding the +/- button disables the access code, while pressing enter will enable and set the access code to the value on the screen.

Operators may only change their own access code. Managers may change their access code and any of the Operators.

A – 2.3: Controller Options

Depending on how a particular controller is configured, not all of the options listed in this manual may be available.

A – 3: Navigating the menus

The controller's menus incorporate built in help text to aid in understanding the function of each parameter, item, and option.

A – 3.1: Common Status Messages

The very bottom line of the display contains the time and date on the left while the right is reserved for a number of status messages; the most common are as follows:

- "Busy..." - Indicates the controller is busy doing something critical and it cannot stop until it finishes. Until this message disappears, the controller will not respond to your key presses (although it does record them any will process them when done). Normally this message is only seen briefly after changing a setting, but it is also used for lengthier operations such as factory defaults and in the extremely rare case where the internal diagnostics detect a memory problem and attempts to correct it.

⚠ Warning: Interrupting the controller by turning the power off while it displays the busy message could result in the complete loss of all of its settings.

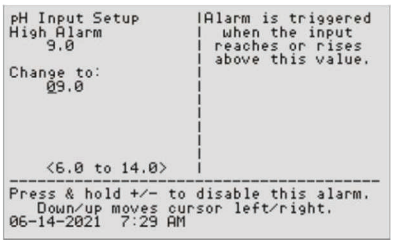
- "(1 of 2) (More →)" - and the like indicate there are more options for you to choose from than the controller could show at one time. Press the right arrow key (Next) to view them. The left number indicates the current page, while the right number indicates the total number of pages.
- "Bad Value, Retry..." - Accompanied by an error beep, this indicates the value you just entered was not within the allowable range of values and was not stored.

A – 3.2: The Menu Screens

Most of the features of the controller are configured via the Menu button's menus. The menu screens can be broken up into two types: entry screens and lists.

A – 3.2.1: Entry Screens

An entry screen is used to enter a value using the keypad.



The current value is usually displayed at the top while the cursor will be positioned under the current digit or character of the value you are entering in. The up and down arrows allow you to move the cursor right or left so you do not have to retype the existing digits if you only wish to change one.

Most numerical values will display the minimum and maximum values you can enter in at the bottom of the display in the format "< ### to ###>". These ranges many times will be dependent on other values you have set, such as alarm points or set points, while others are simply fixed to stay within a reasonable range.

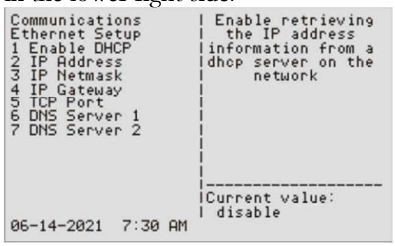
Entering a value that is not within the acceptable range will result in an error beep and the message "Bad Value, Retry..." being displayed in the status area.

For some values, certain keys may take on special functions that are explained in the lower lines of the screen. The Down/up message in the example above is one of them.

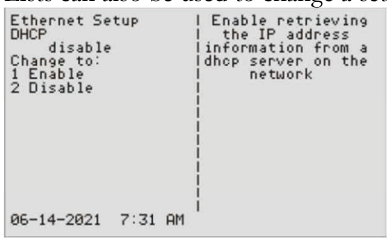
A – 3.2.2: List Screens

The list screens are mainly composed of lists of menu items that you can choose from by either pressing an item's number or by using the up and down arrow keys to select it (indicated by the arrow) and then pressing enter to choose it.

Using the up and down arrow keys also allows you to view each item's help text. And if the item leads to an entry screen or a list screen that sets a setting (see below), the current value is displayed in the lower right side.



Lists can also be used to change a setting:



When a list is used this way, it will display the current setting followed by the words "Change to:". Because it is a list, you can select an item with the up/down buttons to see help information about that particular selection.

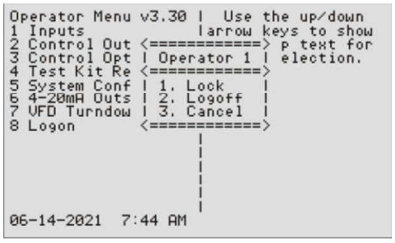
There are a few list screens that use the entire width of the display for displaying values associated with each item and therefore do not have help. See Section C: Using the Quick Set Face Panel Keys for examples of these types of screens.

A – 3.3: The Lock Screen Key

When not in a menu (i.e. viewing the normal display), pressing the lock screen key will prevent the controller from paging the screen to show more inputs, alarms, and other status information. See Section B: The Normal Display for more info about using the lock screen key in the normal display.

While within any menu, if the user does not press a key within sixty seconds of the last key press, the current user is logged out and the screen is returned to the normal display. To prevent the controller from timing out, you may lock the screen.

While within a menu, pressing the Lock Screen key will bring up a popup menu:



The first option on the popup will be either to lock or unlock the screen depending on the current lock state. While the screen is locked, key presses normally are ignored.

You can also lock/unlock the screen without bringing up the popup menu by holding down the lock button for one second. The controller will acknowledge this action with a triple beep and the yellow Lock Screen light will turn on.

The Lock button popup menu also identifies who is currently logged on, and provides an option for the user to log off. You can also select cancel if you pressed the lock button in error.

A – 4: Inputs

To enter the program menu, press the Menu button on the front face panel of your controller. This will allow the viewing of the Main Menu where the programming options are displayed.

The Cl inputs, Cl Inventory Input, Chlorine Control, and Chlorine booster control are all displayed as Chlorine (Cl).

A – 4.1: pH Setup

If your controller is configured to monitor pH, you will have the following options:

- **High Alarm (Op):** The high alarm will activate when the pH reaches or rises above this setting. You may disable this alarm by holding down the +/- key for 1 second.
- **Low Alarm (Op):** The low alarm will activate when the pH reaches or falls below this setting. You may disable this alarm by holding down the +/- key for 1 second.
- **Alarm Hysteresis (Mgr):** Sets the amount that the pH reading has to rise above the high alarm or fall below the low alarm before the alarm will shut off.

A – 4.2: ORP Setup

If your controller is configured to monitor ORP, you will have the following options:

- **High Alarm (Op):** The high alarm will activate when the ORP reaches or rises above this setting. You may disable this alarm by holding down the +/- key for 1 second.
- **Low Alarm (Op):** The low alarm will activate when the ORP reaches or falls below this setting. You may disable this alarm by holding down the +/- key for 1 second.
- **Alarm Hysteresis (Mgr):** Sets the amount that the ORP reading has to rise above the high alarm or fall below the low alarm before the alarm will shut off.

A – 4.3: Cl Inputs Setup

A – 4.3.1: Free Cl Setup

If your controller is configured to monitor Free Cl, it may be either calculated or a probe may be attached. There are two versions of the free chlorine probe, the 4-20mA amperometric probe

⚠ Caution: Free chlorine sensors require the use of a temperature sensor and a properly calibrated pH sensor.

A – 4.3.1.1: Input Source: Calculated

- **High Alarm (Op):** The high alarm will activate when the free Cl reaches or rises above this setting. You may disable this alarm by holding down the +/- key for 1 second.
- **Low Alarm (Op):** The low alarm will activate when the free Cl reaches or falls below this setting. You may disable this alarm by holding down the +/- key for 1 second.
- **Alarm Hysteresis (Mgr):** Sets the amount that the Cl input readings have to rise above their high alarm or fall below their low alarm before the alarm will shut off.

A – 4.3.1.2: Input Source: 4-20mA Probe

⚠ Caution: Never use reset calibration with the 4-20mA free chlorine sensor.

above this setting. You may disable this alarm by holding down the +/- key for 1 second.

- **Low Alarm (Op):** The low alarm will activate when the free Cl reaches or falls below this setting. You may disable this alarm by holding down the +/- key for 1 second.
- **Alarm Hysteresis (Mgr):** Sets the amount that the Cl input readings have to rise above their high alarm or fall below their low alarm before the alarm will shut off. Note this value is used for free, total, and combined Cl alarms.
- **Calibrate (Op):** This selection allows you to do a single point calibration of free Cl. Enter the reading from your test kit and press enter. The value entered must be 0.50 ppm or greater.
- **Diagnostics (Op):** This option displays input diagnostic values.
- **Reset Calibration (Op):** Resets the calibration to the original factory setting.

A – 4.3.1.3: Input Source: CP-1

- **High Alarm (Op):** The high alarm will activate when the free Cl reaches or rises above this setting. You may disable this alarm by holding down the +/- key for 1 second.
- **Low Alarm (Op):** The low alarm will activate when the free Cl reaches or falls below this setting. You may disable this alarm by holding down the +/- key for 1 second.
- **Alarm Hysteresis (Mgr):** Sets the amount that the Cl input readings have to rise above their high alarm or fall below their low alarm before the alarm will shut off. Note this value is used for free, total, and combined Cl alarms.
- **Calibrate (Op):** This selection allows you to do a single point calibration of free Cl. Enter the reading from your test kit and press enter. The value entered must be 0.50 ppm or greater for the CP-1 probe.
- **Reset Calibration (Op):** Resets the calibration to the original factory setting.

A – 4.4: Temperature Setup

If your controller is configured to monitor temperature, you will have the following options:

- **High Alarm (Op):** The high alarm will activate when the temperature reaches or rises above this setting. You may disable this alarm by holding down the +/- key for 1 second.
- **Low Alarm (Op):** The low alarm will activate when the temperature reaches or falls below this setting. You may disable this alarm by holding down the +/- key for 1 second.
- **Alarm Hysteresis (Mgr):** Sets the amount that the temperature reading has to rise above the high alarm or fall below the low alarm before the alarm will shut off.

A – 4.5: Flow Rate Setup

If your controller is configured to monitor Flow Rates, you will have the following options under each flow rate input:

- **Label (Op):** Renames this input.
- **Low Alarm (Op):** The low alarm will activate when the flow rate reaches or falls below this setting. You may disable this alarm by holding down the +/- key for 1 second.
- **Alarm Hysteresis (Mgr):** Sets the reading that the flow rate must rise above the low alarm before the alarm will shut off.

A – 5: Control Outputs

Press the Menu button on the front of the Controller and select Control Outputs. Depending on the controller configuration, some control outputs may or may not be installed.

A – 5.1: pH Control

If your controller is configured to control pH, you will have the following options:

► **Control Type (Op):** Choose from On/Off or Time Base Proportional control.

In general, if you are using a motor driven chemical feeder then you should choose the On/Off option. If you are using a solenoid driven or pulsed diaphragm chemical feeder (such as Pulsatron, most LMI models or most Prominent Models), you should choose the TBP option. This feature helps to hold a set point and to minimize over-shoot by making a standard feeder mimic the action of more sophisticated modulating feeders.

If you choose the On/Off option and are feeding up, then the controller will activate the chemical feeder whenever the pH falls below the set point and continue to feed until the pH rises above the set point plus hysteresis at which point it will stop.

If you choose the TBP option and are feeding up then the controller will activate the chemical feeder whenever the pH falls below the set point and will feed for a percentage of the Time Base (default one minute) proportional to the offset from set point. For the remainder of the Time Base the feeder will be paused. The feeder will continue this feed and pause cycle until the controller achieves the set point plus hysteresis. The closer to set point, the less time the feeder is ON.

► **Set Point (Op):** Enter the desired pH set point to maintain the pH at.

► **Span/Prop. Bnd (Op):** *This option is only shown if the Control Type is Time Base Proportional.* Sets the distance (or span) from the set point that the output will be proportionally controlled.

Warning: Increasing or decreasing the *Span/Prop. band* or *Time Base* may cause the feed to severely overshoot or never achieve set point. Adjust this option only when recommended to do so by a factory representative.

► **Time Base (Op):** *This option is only shown if the Control Type is Time Base Proportional.* Sets the total time that control is based on. During this time, the feeder will turn on for a percentage of the Time Base and turn off for the remainder.

► **Failsafe Timer (Op):** Sets the time that the relay is allowed to stay continuously on.

The most common failures of automated chemical feed systems are depletion of the chemical supply and/or chemical feeder failure. Both problems result in the controller being unable to reach set point in a reasonable period of time. The failsafe timer sets the maximum length of time the feeder can run. If the feeder has been trying to achieve set point without success for the selected time, the controller will cut power to the feeder, flash the Reset Fail/Safe LED on the face panel and display a message to alert the operator. If in TBP Pause mode, the controller will reset the timer.

An operator must reset the failsafe through the Reset Fail/Safe button to re-enable normal control.

Warning: Disabling the failsafe timers is highly discouraged. They are an important safety feature to protect against dangerous chemical overfeeds and will protect the equipment from running continuously if it runs out of chemical.

► **Dead Band (Mgr):** *This option is only shown under dual pH control.* Sets the amount the input must exceed the set point by before the feed of the opposite direction will trigger. (The range is from twice the feeds' hysteresis to 2.8 pH)

A – 5.2: Chlorine Control

If your controller is configured to control Chlorine, you will have the following options:

- **Sanitizer Chemical (Op):** Sets the sanitizer chemical name (Chlorine).
  - This option controls what chemical name the controller displays for the ppm Input and the primary sanitization/oxidizing chemical.
- **Control Input Src (Op):** *This option is only available if the controller is configured for ppm.* Choose between ORP and ppm to use as the primary control input for the sanitizer feed.
  - If the ppm Input is selected and the ppm Input source is set to probe, chlorine control is disabled while the ppm interlock timer is running.
  - If the ppm Input is selected and the ppm Input source is set to calculated, the controller still controls off of ORP, but the ORP set point is calculated by the controller based on the ppm set point, the pH set point, and the ppm calibration. Modification of any one of those three values will result in a new ORP set point.
- **Control Type (Op):** Choose from On/Off or Time Base Proportional control.
  - In general, if you are using a motor driven chemical feeder then you should choose the On/Off option. If you are using a solenoid driven or pulsed diaphragm chemical feeder (such as Pulsatron, most LMI models or most Prominent Models), you should choose the TBP option. This feature helps to hold a set point and to minimize over-shoot by making a standard feeder mimic the action of more sophisticated modulating feeders.
  - If you choose the On/Off option, then the controller will activate the chemical feeder whenever the ORP falls below the set point and continue to feed until the ORP rises above the set point plus hysteresis at which point it will stop.
  - If you choose the TBP option, then the controller will activate the chemical feeder whenever the ORP falls below the set point and will feed for a percentage of the Time Base (default one minute) proportional to the offset from set point. For the remainder of the Time Base the feeder will be paused. The feeder will continue this feed and pause cycle until the controller achieves the set point plus hysteresis. The closer to set point, the less time the feeder is ON.
- **ORP Set Point (Op):** *This option is NOT available if using calculated ppm control.* Sets the desired level to maintain the ORP at.
- **ORP Span/Prop. Bnd (Op):** *This option is only shown if the Control Type is Time Base Proportional and the ORP Set Point is shown above.* Sets the distance (or span) from the set point that the output will be proportionally controlled.

⚠ Warning: Increasing or decreasing the proportional band may cause the feed to severely overshoot or never achieve set point. Adjust this option only when recommended to do so by a factory representative.

- **Free Cl Set Point (Op):** *This option is only shown if the Control Source is set to ppm.* Sets the desired level to maintain the ppm at.
- **Free Cl Span/Prop Bnd (Op)** *This option is only shown if the Control Type is Time Base Proportional, the Control Source is set to ppm, and a ppm probe is installed.* Sets the distance (or span) from the set point that the output will be proportionally controlled.

⚠ Warning: Increasing or decreasing the proportional band may cause the feed to severely overshoot or never achieve set point. Adjust this option only when recommended to do so by a factory representative.

- **Time Base (Op):** *This option is only shown if the Control Type is Time Base Proportional.* Sets the total time that control is based on. During this time, the feeder will turn on for a percentage of the Time Base and turn off for the remainder.

⚠ Warning: Increasing or decreasing the time base may cause the feed to severely overshoot or never achieve set point. Adjust this option only when recommended to do so by a factory representative.

► **Failsafe Timer (Op):** Sets the time that the relays allowed to stay continuously on.

The most common failures of automated chemical feed systems are depletion of the chemical supply and/or chemical feeder failure. Both problems result in the controller being unable to reach set point in a reasonable period of time. The failsafe timer sets the maximum length of time the feeder can run. If the feeder has been trying to achieve set point without success for the selected time, the controller will cut power to the feeder, flash the Reset Fail/Safe LED on the face panel and display a message to alert the operator. If in TBP Pause mode, the controller will reset the timer.

An operator must reset the failsafe through the Reset Fail/safe button to re-enable normal control.

Warning: Disabling the failsafe timers is highly discouraged. They are an important safety feature to protect against dangerous chemical overfeeds and will protect the equipment from running continuously if it runs out of chemical.

► **Alt Set Point:** The 4 Event 28 Day Timer allows you to program a schedule to define when to use alternate set point.

⏩ **Alt Set Point 4 Event 28 Day Timer (Op):** To program the 4 Event 28 Day Timer, perform the following:

- Select the Alt. Set point from the Cl Control menu.
- Now select the 4Event 28Day Timer from the Alt. Set Point menu.
- Selecting Event1 will allow you to select the weekly interval to use the alternate set point.

  If the 1st, 2nd, 3rd, or 4th week is selected, the timer will only trigger on that week in the four-week cycle. The Odd Weeks selection will trigger on the 1st and 3rd weeks, the Even Weeks selection will trigger on the 2nd and 4th weeks, and the Every Week selection triggers every week.

The week number and day of week for the current date is displayed on the bottom right side of these screens.

The first week is fixed to be the week of Sunday, January 2nd, 2000 and every four weeks afterwards.
The next set of screens will allow you to choose the actual day(s).

- Select what day of the week, or every day, the alternate set point should be used.
- Once you make your selection you will be returned to the 4Event 28Day Timer menu where you will have a new menu item: Event 1 Times.
- Select the Event1 Times from the 4Event 28Day Timer menu.

  This screen allows you to set both the start time and the end time for the event's programmed weeks/days. To toggle AM/PM, press the +/- key while the cursor is on the time you wish to change.

If your start time is before midnight (12:00 AM) and the end time is after midnight, the alternate set point will continue to be used the following day up to the end time even if that day did not fall within the week/day selection for that event.

Example:
Event1 Week/Day: Odd weeks/ Tuesday
Event1 Times: 11:00 PM to 3:00 AM
Event2 Week/Day: Even weeks/ Monday
Event2 Times: 11:00 PM to 6:00 AM
Current Week/Day: 2nd/Tuesday
Current Time: 4:00 PM
The alternate set point last ran from 11:00 PM last night to 6:00AM this morning.
The next time the alternate set point will run will be from 11:00 PM next Tuesday to 3:00AM next Wednesday.

⏩ **ORP Set Point (Op):** Sets the desired level to maintain the ORP at during any of the programmed alternate set point events.

⏩ **ppm Set Point (Op):** *Shown only with ppm probe and ppm Control Source.* Sets the desired level to maintain the ppm at during any of the programmed alternate set point events.

► **Bracketed ppm (Op):** *Shown only with ppm probe and ORP Control Source.* If enabled, the controller will override the ORP control so that the ppm will not drop out of a programmed range.

► **Bracketed ORP (Op):** *Shown only with ppm probe and ppm Control Source.* If enabled, the controller will override the ppm control so that the ORP will not drop out of a programmed range.

A – 5.3: Chlorine Booster Control

If your controller is configured to control a Chlorine Booster pump (i.e. Calcium Hypochlorite Feeder), you will have the following options:

- **Control Input (Op):** *This option is only available if the ppm Input is enabled.* Choose between ORP, ppm or, if the ppm probe is used, both to control the chlorine booster.
- **ORP Trigger Point (Op):** *This option is only shown if the Control Input is ORP or Both.* Sets the ORP level that the input must drop below to activate the chlorine booster control. (the range is -1000 mV to the Cl Booster's ORP Set Point)
- **ppm Trigger Point (Op):** *This option is only shown if the Control Input is ppm or Both.* Sets the ppm level that the input must drop below to activate the chlorine booster control. (the range is from 0.0 ppm to the Cl Booster's ppm Set Point)
- **ORP Set Point (Op):** *This option is only shown if the Control Input is ORP or Both.* Sets the ORP level that once it is reached the chlorine booster control will shut off. (the range is from Cl Booster's ORP Trigger Point to the ORP high alarm point)
- **ppm Set Point (Op):** *This option is only shown if the Control Input is ppm or Both.* Sets the ppm level that once it is reached the chlorine booster control will shut off. (the range is from the Cl Booster's ppm Trigger Point to the ppm high alarm point)
- **ORP Hysteresis (Op):** *This option is only shown if the Control Input is ORP, Both, or, if ppm Input source is set to calculated, ppm.* Sets the level that the input must rise above the set point before the chlorine booster control will turn off.
- **ppm Hysteresis (Op):** *This option is only shown if the ppm probe is used and the Control Input is ppm or Both.* Sets the level that the input must rise above the set point before the chlorine booster control will turn off.
- **Failsafe Timer (Op):** Sets the time that the relay is allowed to stay continuously on. (the range is 0:00 to 18:00 hours)

The most common failures of automated chemical feed systems are depletion of the chemical supply and/or chemical feeder failure. Both problems result in the controller being unable to reach set point in a reasonable period of time. The failsafe timer sets the maximum length of time the feeder can run. If the feeder has been trying to achieve set point without success for the selected time, the controller will cut power to the feeder, flash the Reset Fail/Safe LED on the face panel and display a message to alert the operator. If in TBP Pause mode, the controller will reset the timer.

An operator must reset the failsafe through the Reset Fail/Safe button to re-enable normal control.

Warning: Disabling the failsafe timers is highly discouraged. They are an important safety feature to protect against dangerous chemical overfeeds and will protect the equipment from running continuously if it runs out of chemical.

A – 5.4: Heater

If your controller is configured for Heater Control, you will have the following options:

- **Temp. Ctrl Enable (Op):** Enables or disables controlling the Heater using the Temperature Input.
- **Set Point (Op):** *Only shown if Temp. Ctrl is enabled.* Sets the desired temperature. (the range is from the temperature low alarm to the temperature high alarm)
- **Failsafe Timer (Op):** *Only shown if Temp. Ctrl is enabled.* Sets the time that the relay is allowed to stay on without reaching set point before the relay is locked out. If the heater has been trying to achieve set point without success for the selected time, the controller will cut power to the heater, flash the Reset Fail/Safe LED on the face panel and display a message to alert the operator.

  An operator must reset the failsafe through the Reset Fail/safe button to re-enable normal control.
- **Fireman Switch (Op):** *This option is only shown if a relay is assigned to the recirculation pump.* Sets the minimum amount of time to leave the recirculation pump on after the heater relay shuts off.
- **Hysteresis (Op):** *Only shown if Temp. Ctrl is enabled.* Sets the level that the input must rise above the set point before the heater control will turn off.
- **Alternate Temperature (Op):** *Only shown if Temp Ctrl is enabled.* The 4 Event 28 Day Timer allows you to program an alternate set point on a schedule. See the Chlorine Control's Alt Set Point for details on how to set this.

  After the schedule is set, you may choose the alternate temperature set point option and enter the desired setting.

A – 5.5: Chiller

After entering the Control Outputs option, select Chiller Control from the menu. This will allow the programming of the following:

- **Priority Mode (Op):** *Only shown if the heater relay is assigned and temperature control is enabled.* Select how the heater and chiller should operate together.
  - **Mixed Mode:** Operates the heater and chiller like a home thermostat. The chiller's active set point must be above the heater's or the chiller will be disabled.
  - **Heater Primary:** Operate the heater only during regular hours and the chiller only during alternate set point hours. Set the Chiller's set point via the alternate set point.
  - **Chiller Primary:** Operate the chiller only during regular hours and the heater only during alternate set point hours. Set the Chiller's set point via the standard Chiller set point.
- **Set Point (Op):** *only shown if no heater or Priority Mode is set to Mixed Mode or Chiller Primary.* Sets the desired temperature. (the range is from the temperature low alarm or heater set point to the temperature high alarm)
- **Failsafe Timer (Op):** Sets the time that the relay is allowed to stay on without reaching set point before the relay is locked out. If the chiller has been trying to achieve set point without success for the selected time, the controller will cut power to the heater, flash the Reset Fail/Safe LED on the face panel and display a message to alert the operator.

  An operator must reset the failsafe through the Reset Fail/safe button to re-enable normal control.
- **Alternate Temperature (Op):** Shared with the heater control, the 4 Event 28 Day Timer allows you to program an alternate set point on a schedule. See the Chlorine Control's Alt Set Point for details on how to set this.

  After the schedule is set, you may choose the alternate temperature set point option and enter the desired setting.

A – 5.6: Autofill

If your controller is set up to control an Autofill valve, it can be triggered by the Surge Pit Level (if monitored) or a proximity switch.

- **Set Point (Op):** *Only shown if Autofill sensor type is set to Surge Pit Level.* Sets the surge pit level that the controller will fill to.
- **Alternate Set Point (Op):** *Only shown if Autofill sensor type is set to Surge Pit Level.* To program when to use the alternate set point, see the section on Chlorine Control's Alternate Set point Timer Settings. After the schedule is set, you may choose the alternate set point option and enter the desired setting.
- **Start Delay (Op):** Sets the time required for the water level to stay below the trigger point before fill begins.
- **End Delay (Op):** Sets the time required for the water level to remain above shutoff point before ending the fill.

- **Failsafe Timer (Op):** Sets the time that the relay is allowed to stay on without reaching set point before the relay is locked out. If Autofill has been trying to achieve set point without success for the selected time, the controller will cut power to the relay, flash the Reset Fail/Safe LED on the face panel and display a message to alert the operator.

An operator must reset the failsafe through the Reset Fail/safe button to re-enable normal control.

A – 5.7: Sensor Wash

If your controller is set up to do a Sensor Wash you will have the following options:

- **4 Event 28 Day Timer (Op):** Once you have entered Sensor Wash, select 4Event 28Day Timer from the menu. The 4 Event 28 Day Timer allows you to program the sensor wash on a schedule. See the section on Super Chlorination's 4 Event 28 Day Timer for details on how to set this.
  - **Start/End Time (Op):** Allows you to set what times the feed may be triggered during a day.
  - **# Of Cycles (Op):** *Only shown if Duration is not zero.* Sets how many times the relay will trigger between the Start and End times.
- **Duration (Op):** Sets how long the feed will run for each cycle. If set to zero, there are no cycles and the relay will simply be on when current time is between the active event's start and end times.

A – 6: Control Options

A – 6.1: Flow Restored Feed Delay

- **Enable / Disable (Op):** Once you have entered the Flow Restored Feed Delay option, select Enable / Disable from the menu. Here you will be able to select whether you want to delay the chemical feeders after flow is restored to the system.
- **Delay Duration (Op):** *This option is only available if flow restored feed delay is enabled.* Enter the desired time that the chemical feeders must wait to operate after flow is restored.

A – 6.2: Power Saver

Power Saver is a timer triggered function that saves energy by shutting down the recirculation pump for programmable periods of time while the pool is not in use.

When active, power saver has the following states:

- CONTROLLING: At least one control function is currently feeding. Once all feeds have finished, the system will enter the GOING TO SLEEP state.
- GOING TO SLEEP: All control functions must be satisfied (they don't turn their feeds on) for the Enter Sleep Delay duration before allowing system to enter the SLEEPING state.
- SLEEPING: Timed period (Sleep Duration) where the shutdown of recirculation pump is triggered and all feeds are disabled. After entering SLEEPING state, the recirculation pump will continue to run until the heater and ozone fireman switch timers run out. The sleep timer starts when all conditions have been met, not when controller shuts down the recirculation pump. Only the sleep timer expiring or the Power Saver timer expiring will put the system into the WAKING UP state. No feeds or input alarms will operate while the system is asleep or waking up.
- WAKING UP: Timed period (Exit Sleep Delay) where the recirculation pump is ran before allowing feeds to operate. Once the wake up time expires, if the Power Saver timer expired, the system will remain awake even if all feeds are satisfied. Otherwise the system enters the CONTROLLING state and will reenter GOING TO SLEEP again once all feeds have been satisfied again.

While Power Saver is active, the system automatically uses the Alternate Temperature set point for the Heater and the Alternate ORP and/or Alternate ppm set points for the Cl feed.

- **Enable (Op):** Enable or disable the Power Saver feature.
- **4 Event 28 Day Timer (Op):** The 4 Event 28 Day Timer allows you to program power saver's schedule. See the section on the Chlorine Control's Alt Set Point for details on how to set this.
- **Sleep Duration (Op):** Sets how long the controller will sleep.
- **Enter Sleep Delay (Op):** Sets how long to wait after all of the feeds have been satisfied before entering SLEEP (i.e. the GOING TO SLEEP duration). If any feed starts feeding during this time, the controller goes back to the CONTROLLING state.
- **Exit Sleep Delay (Op):** Sets how long to wait after coming out of sleep before allowing any feeds to run (i.e. the WAKING UP duration).
- **Alternate ORP (Op):** Sets the alternate ORP value used during power saver and the Cl feed's alternate set point event timer.
- **Alternate ppm (Op):** Sets the alternate ppm value used during power saver and the Cl feed's alternate set point event timer.
- **Alternate temp (Op):** Sets the alternate temperature value used during power saver and the heater's alternate set point event timer.

A – 6.3: pH Lockout

pH lockout (Mgr) disables the sanitizer feed when a pH high and/or low alarm is activated:

Full lockout:	The Cl feed is disabled when either a pH high or low alarm occurs.
Feed direction:	For pH feed up, the Cl feed is disabled on a pH low alarm. For pH feed down, the Cl feed is disabled on a pH high alarm.
Disable:	pH alarms do not disable the Cl feed. (**Not Recommended**)

⚠ Warning: Disabling the pH lockout will allow for chemical overfeeds which may damage equipment or harm patrons.

A – 7: Test Kit Readings

A – 7.1: Logged Items

The controller allows entering test kit readings for the purpose of electronically logging them in the controller's data logs without changing the calibration of any sensors. Any test kit readings entered can be viewed in BECSys for Windows.

- pH
- Free Cl
- Total Cl
- Temperature
- TDS
- Alkalinity
- Calcium Hardness
- Cyanuric Acid
- LSI & RSI

A – 7.2: LSI & RSI

Langelier Saturation Index (LSI) and the Ryznar Stability Index (RSI) are values calculated from both sensor readings and test kit readings.

▶ **Enter Parameters (Op):** By selecting this, the controller will step you through entering the values needed to calculate LSI and RSI. Once the values have been entered, the calculated LSI & Ryzner reading will appear in the menu and on the display.

LSI Setup (Op)

- **Use TDS? (Op):** Selects if the controller should use TDS for the LSI/RSI calculations. If Yes, the controller will prompt for the TDS value when entering parameters.
- **Pool Volume (Op):** Allows you to enter the volume of the pool.
- **Display RSI/LSI (Op):** Selects if the RSI/LSI information is displayed on the routine display.

A – 8: System Configuration

Press Menu on the controller's face panel and select System Configuration from the menu. This will allow you to configure the following for the system:

A – 8.1: System Info

This information menu displays the controller's system type, serial number, and firmware version information. From this menu you can also view the current Ethernet network status, Modem status, and EZConnect status. The Ethernet network status menus display the Ethernet card's version information, current network configuration, and link status.

A – 8.2: Communication

Once you have entered System Configuration, select Communication from the menu. Under communication, you can select from the following.

A – 8.2.1: EZConnect

(Mgr) If the current user's access code is set, this menu allows you to view, create and disable EZConnect authentication codes. If the current user's access code is not set, this menu will only display a notice explaining this.

A – 8.2.2: Ethernet Setup

These parameters should be set to values provided by the network's administrators.

Enable DHCP (Op): Enables/disables using DHCP. If DHCP is enabled, the controller will retrieve its IP address information from a DHCP server on the network. If DHCP is disabled, the IP address information must be set manually via the remaining items listed here.

IP Address (Op): *This option is only shown if DHCP is disabled.* Sets the controllers IP address.

IP Netmask (Op): *This option is only shown if DHCP is disabled.* Sets the controllers IP netmask.

IP Default Route (Op): *This option is only shown if DHCP is disabled.* Sets the controllers IP default route/gateway.

TCP Port (Op): Sets the TCP port to listen for connections on. Acceptable values are 1024- 1089 and 1091-65535.

DNS Server 1 (Op): Sets the IP address for the primary DNS server. Required for email call outs.

DNS Server 2 (Op): (Optional) Sets the IP address for the secondary DNS server which is only used if DNS server 1 cannot be contacted.

A – 8.2.3: SMTP Setup

- **EZMail Enable (Op):** *Only shown if EZConnect is enabled.* Enable or disable using EZConnect to send email and text message based callouts.
- **SMTP Server Addr (Op):** *Only shown if EZConnect or EZMail is disabled.* Sets the email SMTP server address used by alarm call out to send email and text messages.
- **SMTP Server Port (Op):** *Only shown if EZConnect or EZMail is disabled.* Sets the email SMTP TCP port. Set to 25 unless otherwise instructed by a network administrator.
- **Sender Email (Op):** *Only shown if EZConnect or EZMail is disabled.* Set the email address to use for the From field in email callouts. If left blank, an email address based off this unit's serial number will be used.
- **Authentication (Op):** *Only shown if EZConnect or EZMail is disabled.* Enable/Disable SMTP authentication. Many SMTP servers require users to authenticate with a user name and password before sending email through them. Usually used with SSL or TLS encryption.
- **Auth User Name (Op):** *(Only shown if Authentication is enabled)* Logon user name to use for Authorization.
- **Auth Password (Op):** *(Only shown if Authentication is enabled)* Password to use for Authorization.
- **Encryption Type (Op):** *Only shown if EZConnect or EZMail is disabled.* Select the type of encryption to use with the SMTP server (SSL, TLS, or none). SSL and TLS are usually used in combination with Authentication.

A – 8.2.4: Call Out Setup

- **Call Out Enable (Op):** Choose to enable or disable call outs.
- **Call Start Time (Op):** Sets the time the controller will start allowing call outs.
- **Call End Time (Op):** Set the time the controller will stop allowing call outs. Set this

  and Call Start Time to same value for 24 hour callouts.
- **Pre-Delay (Op):** Sets the amount of time the controller will delay to allow for alarm to reset before calling out.
- **Recipients Setup (Op):** Allows configuration of eight recipients which can individually be configured for fax, pager, email, or text message call-out.

  - **Call-Out Type:**
    - **Email:** Sends a plain text email to the recipient's email address containing all active alarms, the times they were triggered, and a summary of inputs and set points.
    - **HTML Email:** Sends an html formatted email to the recipient's email address containing all active alarms, the times they were triggered, and a summary of inputs and set points.
    - **Text Message:** Sends a text message with a list of active alarms to a text pager or cell phone using email.
    - **Disabled:** Disables the call-out recipient.
  - **Email address (Email):** *This option is only shown if the call-out type is set to email.* Enter the recipients email address. Enter the local part of the email address (the part before the @) into the first screen, then enter the domain part of the email address (the part after the @) into the second screen.
  - **Email address (text message):** *This option is only shown if the call-out type is set to text message.* The recipients email address for text messaging is usually in the form of the pager's or cell's ten-digit-number@domain.com or the like. (2223334444@txt.att.net). Enter the phone number into the first screen, then enter the domain part of the email address (the part after the @) into the second screen. Check with the recipient's wireless carrier for the correct email address to use.

Common North American text message email domains	
AT&T	@txt.att.net
Rogers	@pcs.rogers.com
Sprint PCS	@messaging.sprintpcs.com
T-Mobile	@tmomail.net
US Cellular	@email.uscc.net
Verizon PCS	@vtext.com

  - **Test:** Triggers a test call-out of the current

    recipient only. You may only test one recipient at a time. **NOTE: if the callout type is Text Message, an alarm must be active for the test message to be sent.**
  - **Current State:** Shows the current state of the recipient's call-out when a call-out is in progress.
  - **Last Status:** Shows the status of the previous call-out for the selected recipient. This is only updated when a call-out has been completed.

A – 8.3: Date, Time & Units

Once you have entered System Configuration, select Date, Time & Units from the menu. Here you can enter the values for the following:

- **Units (Op):** Here you can choose from U.S. or Metric measurements.
- **Date Format (Op):** Here you can choose the format for the date.
- **Current Date (Op):** Here you can set the current date.
- **Current Time (Op):** Here you can set the current time. Use the + / - key to toggle between AM and PM.

A – 8.4: User Setup

Once you have entered System Configuration, select User Setup from the menu. Here you can enter the access codes for Operators and Managers. You can enter 6 codes for Operators and 2 codes for Managers.

See the section on Access Codes for more information.

A – 8.5: Display Options

Once you have entered System Configuration, select Display Options from the menu.

- **Page Delay (Op):** Here you can set the delay for scrolling to the next page in the normal display. These screens will only scroll when not in a menu screen.

A – 9: VFD Turndowns

VFD Turndowns allow you to trigger or cancel manual turndowns (must have a manual turndown enabled for this menu to appear). This will also display the next scheduled turndown.

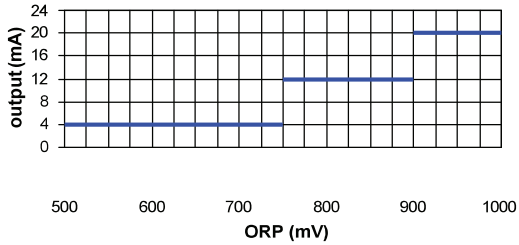
A – 10: 4-20mA Outs

The 4-20mA output board allows you to connect to either a building management system or to control a VFD.

If you have a 4-20 mA board installed in your system you may choose 4-20mA outputs from the main menu. By selecting one of the 4-20mA output channels you will be able to select the following:

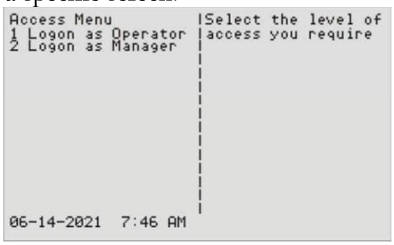
- **Usage (Mgr):** Selects what to use the selected 4 20mA output channel for.
  - **Recorder Out:** Output a 4-20mA signal based on one of the controller's inputs. Once you have selected Recorder Out, you will need to then select the Source (see below).
  - **VFD Control Out:** Use this channel to control a VFD unit connected to the recirculation pump.
  - **Disable:** Disables the 4-20mA output.
- **Source (Mgr):** *Only shown if the usage is set to Recorder Out.* Configures the recorder out's signal source.
- **20 ma value (Mgr):** *Only shown if usage is set to Recorder Out.* Enter the value which the recorder will output 20 mA for.
- **4 ma value (Mgr):** *Only shown if usage is set to Recorder Out.* Enter the value which the recorder will output 4 mA for.

Example: Source: ORP input, 4 mA value = 600 mV, 20 mA value = 900 mV. ORP values between 600 and 900 mV are lineally scaled between 4 and 20 mA as shown below.



A – 11: Access Menu

The controller will require users to enter their access code before allowing them to enter the menus or set any values under the quick set keys. The controller automatically displays the access screen whenever a user does not have a high enough access level to enter a specific screen.



To enter an Operator access code, press 1.
To enter a Manager access code, press 2.
If at any time you wish to logon as another access level, you may do so by pressing the Menu key and selecting Logon from the main menu.

A – 12: USB

The USB Menu allows you to perform the following:

- **Export logs (Op):** Exports history logs to a USB flash drive.

Section J: Warranty

LIMITED WARRANTY

BECS warrants the controller electronics against any defect in workmanship or materials for a period of five years from the date of shipment. BECS warrants the pH and ORP sensors against any defect in workmanship or materials for a period of two years from the date of shipment. BECS warrants the flow cell and all other components supplied by BECS against any defect in workmanship or materials for a period of one year from the date of shipment. In the event of a component failure due to any defect in workmanship or materials, BECS will repair, or if repair is not possible, replace the defective part or parts of the BECSys controller.

BECS will have the sole right to determine whether to repair or replace a product. BECS will not be responsible for any expense associated with installation of repaired or replacement parts.

LIMITATIONS AND EXCLUSIONS

This is a LIMITED WARRANTY. BECS makes NO WARRANTIES other than those contained herein. The LIMITED WARRANTY replaces and is in lieu of any WARRANTIES of MERCHANTABILITY or of FITNESS FOR A PARTICULAR PURPOSE which are expressly DISCLAIMED. All GENERAL, SPECIAL, INDIRECT, INCIDENTAL AND/OR CONSEQUENTIAL DAMAGES ARE EXCLUDED AND DISCLAIMED.

This Limited Warranty is governed by Missouri Law and all disputes related to or arising from this transaction or Limited Warranty shall be resolved in Circuit Court of St. Louis County, Missouri.

Any claims under this Limited Warranty must be brought within ONE YEAR after the cause of action occurred.

BECS TECHNOLOGY has been designing and manufacturing the industry's most reliable water chemistry controller for over 25 years. Our 42,000 ft^2 facility in Saint Louis, Missouri is home to an exceptional design team, and all manufacturing is performed onsite at this facility where we can personally assure the quality of our products. The BECS commitment to excellence drives the most innovative new products and unparalleled customer service.