Application Note
Cryptolyte® Control

BECSys7 and BECSys5 controllers have dedicated, proprietary programming for controlling Cryptolyte®. Cryptolyte® is an EPA approved solution that accelerates oxidation of chlorine resistant pathogens (i.e. *Cryptosporidium*), the organic contaminants contributed by swimmers and existing disinfection byproducts (DBPs) thereby inhibiting accumulation. Visit truoxaquatics.com for more information on Cryptolyte®.

The BECSys7 and BECSys5 function as the EPA-required Cryptolyte® Controller, implementing a proprietary algorithm to control, confirm and document the remediation process.

Cryptolyte® delivery **control** is achieved through a closed-loop algorithm in the BECSys7 and BECSys5 controllers. A chlorine dioxide sensor (ClO_2) monitors the amount of chlorine dioxide created by the Cryptolyte® introduced into the pool basin. A Chlorine Dioxide Set Point in the controller, entered by the operator per Truox® guidelines, determines the amount of Cryptolyte® fed.

Remediation is **confirmed** by maintaining elevated chlorine dioxide levels to achieve a desired CT Set Point (mg/l x minutes). The desired CT Set Point and chlorine dioxide concentration are entered as set points in the controller by the operator, per Truox® guidelines. The Cryptolyte® control algorithm is executed by the BECSys Controller, including real-time calculation of the current CT value, until the CT Set Point is achieved and confirmed.

The remediation process is **documented** through on-board data logs in the BECSys7 and BECSys5 controllers, which are viewable directly from the front-panel user interface. All readings are maintained at 1 minute resolution for one year. When using EZConnect for remote access, data logs will automatically be uploaded to the BECSys EZConnect server nightly. Data logs can then be reviewed using the Graphing and Reporting features of the BECSys Live web-based portal. Another option is the Graphing feature of the BECSys for Windows PC software, which also allows data logs to be exported to a CSV file for import into Excel and other 3rd party applications.

The BECSys controller will also optionally manage the feed of neutralizer through a dedicated DeChlor algorithm. This is used to rapidly return the pool to normal conditions following a Rapid Shock cycle, typically in response to a fecal incident.

Cryptolyte® Control Modes in BECSys controller

Rapid Shock Mode

- Used for startup remediation and for accelerated response to fecal incidents
- Cryptolyte® is fed to an elevated chlorine dioxide level to achieve desired CT Set Point
- Optional DeChlor mode feeds neutralizer to rapidly bring water back to levels appropriate for bathers

Maintenance Mode

- Used for daily remediation in Accelerated Activation program
- Provides an off-hours (configurable by user, e.g. nightly) maintenance dose of ClO_2
- Cryptolyte® is fed to maintain a chlorine dioxide set point to achieve desired CT Set Point

Controller Input/Output Requirements

The controller will need to have the following inputs/outputs available:

- One (1) auxiliary (4-20mA) input for chlorine dioxide sensor
- One (1) solid-state relay output for Cryptolyte feeder
- One (1) solid-state relay output for DeChlor feeder (optional)

If the controller does not have enough solid-state relays available, a BECSys SRX (Solid State Relay Expansion Module) can be used to expand the number of solid-state relays.

Adding Cryptolyte to a BECSys7 or BECSys5

Installed BECSys7's and BECSys5's can be upgraded with the Cryptolyte® programming.

- Firmware version must be v3.52 or higher
  - If the controller firmware is v1.xx or v2.xx a LUI upgrade will be required
  - Systems with v3.xx firmware < v3.52 must be upgraded to the current version with a program chip change
  - Systems with v3.52 or higher do not require an upgrade
- Cryptolyte® feature must be enabled
  - Order BECS PN M000151, Cryptolyte Programming Add-On
  - If the controller is online, BECS Tech Support can enable Cryptolyte remotely
  - If the controller is not online, BECSys Distributors can contact BECS Tech Support for instructions

Specifications	
Part Numbers	
BECSys7	See BECSys7 Data Sheet #TDS-4263 for Ordering Guide
BECSys5	See BECSys5 Data Sheet #TDS-4262 for Ordering Guide
Chlorine Dioxide Sensor with flow cell	2100490, Data Sheet #TDS-6145
Free Chlorine Sensor with flow cell (optional)	2210466, Data Sheet #TDS-4349
Cryptolyte Programming Add-on	M000151
BECSys SRX (Solid State Relay Expansion Module)	1100185 (115VAC), 1100219 (230VAC), Data Sheet #ENG-4351
Controller System Requirements	
Firmware version	V3.52 or higher
Controller Sensor Input Requirements	
Chlorine Dioxide Sensor	One auxiliary input (4-20mA) and one loop power supply in controller
Free Chlorine Senosr	One auxiliary input (4-20mA) and one loop power supply in controller
Controller Relay Output Requirements	
pH control (acid)	One solid-state relay in controller or BECSys SRX
Sanitizer control (typically chlorine)	One solid-state relay in controller or BECSys SRX
Cryptolyte	One solid-state relay in controller or BECSys SRX
DeChlor (optional)	One solid-state relay in controller or BECSys SRX

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