PROGRAMMABLE BOX APPLICATIONS

(REQUIRES SEPARATE OWNERS MANUAL)

- RESIDENTIAL SPA
- RESIDENTIAL POOL
- 100% CHEMICAL-FREE WATER FEATURES
  Pond, Waterfall, Fountain
- COOLING TOWER
  Chillers, Swamp Coolers
- CLOSED LOOP
  Process Water, Scale and Fungus Control
- GREYWATER
  Soft Oxidation; Bacteria Control

IMPORTANT SAFETY INSTRUCTIONS

When installing and using this electrical equipment, basic safety precautions should always be followed, including the following:

1) READ AND FOLLOW ALL INSTRUCTIONS.
2) (For all units) WARNING - To reduce the risk of injury, do not permit children to use this product unless they are closely supervised at all times.
3) (For cord- and plug-connected units) WARNING - Risk of Electric Shock Connect only to a grounding type receptacle protected by a ground-fault circuit-interrupter (GFCI). Contact a qualified electrician if you cannot verify that the receptacle is protected by a GFCI.
4) (For cord- and plug-connected units) Do not bury cord. Locate cord to minimize abuse from lawn mowers, hedge trimmers, and other equipment.
5) (For cord- and plug-connected units) WARNING - To reduce the risk of electric shock, replace damaged cord immediately.
6) (For cord- and plug-connected units) WARNING - To reduce the risk of electric shock, do not use extension cord to connect unit to electric supply; provide a properly located outlet.
7) SAVE THESE INSTRUCTIONS.

Eliminate Acid   WiFi Compatible

SWIM IN BOTTLED WATER®

1-800-ION-SWIM (466-7946)
www.ecosmarte.com
www.ecosmartecloud.com

Ecosmarte Planet Friendly
Programmable Control Box Manual
Initial Setup

When power to the controller box is first turned on, the following message is displayed on the screen as shown below:

```
      ECO Smarte
    Planet Friendly
   1-800-ION-SWIM
  (C) 1999-2006 V4.12
```

* Language Setting Screen *

Choose Language

Wait for this screen to pass automatically (about 5 seconds), then the "security screen" will be displayed as shown below:

```
Please Enter
Security Sequence
```

To continue, press the keys: "Up, Down, Up" in succession. This sequence of buttons will always unlock and activate your keypad. This is to protect your system from any accidental programming by an unauthorized source (children, neighbors, pool services).

SECURITY SEQUENCE

⬆️   ⬇️   ⬆️

When the security sequence is entered correctly, the display will change to the "**Home Screen**."

```
2:22:20P          1/01/2007
Pool   10:00A-    4:00P-
Oxy    10:00A-    4:00P-
Ion    None
```

Now, it is time to set up the DATE and TIME of your box. Press "CLOCK" or "DATE" to setup either or both values. You will get the following screen:

```
10:18:07A        1/04/2014
Press CLOCK to set
the   DATE   and   TIME
or NEXT to continue
```

Press "CLOCK" or "DATE" a second time to continue setting up the DATE and TIME of your box. The "Right" arrow key will return you to the "home screen." Upon pressing "CLOCK" or "DATE" the display will read as follows:

```
Use ↑↓ >< Keys to set
Day   and   Date
TU    1/04/2014
Press NEXT when done
```

The cursor automatically starts on the day of the week. Press the "UP" or "DOWN" arrows until the correct day of week is displayed. Then press the "RIGHT" arrow key to move the cursor across the LCD to the month. Continue this process until the correct year, day, month and day of the week is displayed. At any time, use either the "LEFT" or "RIGHT" arrow keys to move within the LCD. Use "UP" and "DOWN" to change any values. When all values are correct, press the "NEXT WEEK" key to move onto the next screen where you can setup the correct time. The screen is displayed as follows:

```
Use ↑↓ >< Keys to set
Time
10:18:27A
Press NEXT when done
```

The cursor automatically starts under the "hour" clock. Use the "UP" or "DOWN" keys to set the correct hour. Then press the "RIGHT" arrow key to switch to minutes. Repeat process until the correct time is displayed. Then press the "NEXT WEEK" key to complete the setup. The display will then return to the "Home Screen." The correct TIME and DATE should be displayed across the top (Shown top of Page 4).

PROGRAMMABLE TIPS

AT START-UP

■ The MAN or manual override will put copper constantly to your pool limit until the initial residual reaches .5 ppm.

■ PH is controlled in minutes per day AND YOU CANNOT over adjust it using carbonic acid. You can lower your time in minutes the third week to save CO2 gas.

■ A 20lb cylinder weighs 35lbs FULL, 15lbs EMPTY. Gauges are not accurate and a $5.00 Bathroom scale can be put under your tank.

■ Profile your pool on the ECOsmarte Cloud. Go to www.ecosmartecloud.com/register and use your email address for your user name & water1 for the initial password.

PROBLEM SOLVES

TYPICAL CO2 TANK LIVES		
20 LB	20 min. per day	8 weeks
35 LB	40 min. per day	6 weeks
	60 min. per day	4 weeks
50 LB	20 min. per day	20 weeks
	40 min. per day	10 weeks
	60 min. per day	6 weeks

1. PROGRAMMABLE BOX CHATTERS
  A) Metal remover is in the water
  B) Salt level is over 600
  C) Phosphates are over 1000ppb

TURN OFF BOX IMMEDIATELY. CALL TECH SUPPORT AT 1-800-ION-SWIM FOR DIRECTIONS.

REPLACEMENT PARTS	
CO2 SOLENOID (4YR - 5YR)	$85.00
INJECTOR CELL (4YR - 5YR)	$297.00

WARRANTY IS THREE YEARS

2. "LOW VOLTAGE" PLATE ALARM IONIZE / OXIDIZE MODES
  A) Chamber leads hooked up wrong
  B) Metal remover, salt, or phosphate levels are too high
  C) The entire chamber needs cleaning.

Continued operation will crash the software in the INTEL chip requiring factory reinstall.

CO$_2$ Swimming Pool Installation Guide

SWIMMING POOL INSTALLATION

1) Confirm 110V outlet cord and CO$_2$ tubing will reach target install area, which is as close as possible to swimming pool on the return lines.
2) Plug in electrical timer or Ecosmarte Programmable Controller
3) Select area and measure 7", mark pipe
4) Cut PVC, and clean pool pipe ends & Chamber fittings.
5) Using PVC Glue, install chamber fittings to the pool pipe ends. Let dry, then screw the chamber onto the fittings.
6) Screw Flow Regulator into CO2 Cylinder, and connect 1/4" pressure hose from Regulator to the Solenoid.
   NOTE: C02 Cylinder must be standing up.
7) With Solenoid "OFF," open valve on CO2 tank SLOWLY until open all the way. Then turn 1/4 turn back. Test all fittings between tank and solenoid for leaks using "Soapy" water. Tighten any loose fittings.
8) Start using 30 minutes per day on pools, 3 minutes on spas. Modify as test results dictate with twice weekly testing

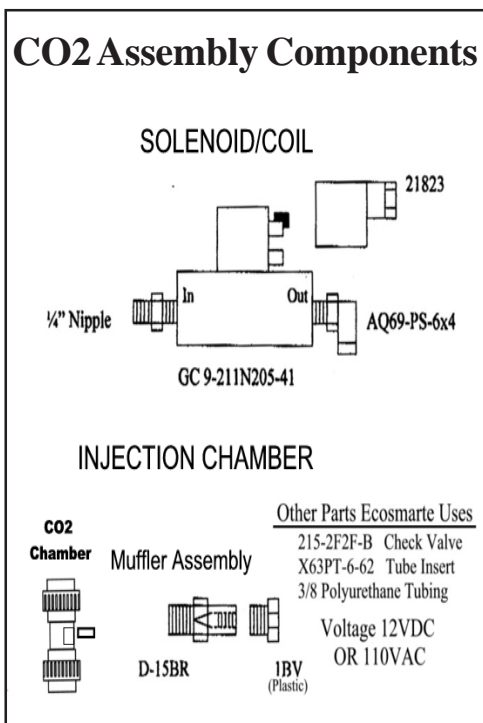## Specifications

ELECTRICAL

- Manual: 110V, 60 Hz
- Programmable: 12V
- CE, UL Listed Solenoid,
- Power Cord

PLUMBING

- Maximum Tank PSI: 3000
- Maximum Operating PSI: 60
- CGA 320 Valves, Tanks, Fittings

CO 2

- Indoor installations require vented rooms
- Northern units should avoid freezing; 5lb cylinders fit inside cabinet
- Direct sunlight above 120°F on Southern Units should be avoided

CO2 Assembly Components

SOLENOID/COIL

21823

¼" Nipple   In   Out   AQ69-PS-6x4

GC 9-211N205-41

INJECTION CHAMBER

CO2 Chamber   Muffler Assembly

Other Parts Ecosmarte Uses
215-2F2F-B   Check Valve
X63PT-6-62   Tube Insert
3/8 Polyurethane Tubing

D-15BR   1BV (Plastic)

Voltage 12VDC
OR 110VAC

HOME SCREEN

```
2:22:20P        1/04/2006
Pool   10:00A-   4:00P+
Oxy    10:00A-   4:00P+
Ion    None
```

+ Plus sign indicates output is occurring.

POOL FUNCTION

The next step is to setup the parameters for your pool pump. The "POOL" Key allows you to set the pool Start and Stop times. If you received and ECOsmarte Controller with the Pool Pump Relay Option* your pool pump will be turned ON and OFF at the Start and Stop times set with this function. Press the "POOL" Key to display the following screen:

```
Use ↑↓ >< Keys to set
              Start   Stop
Pool        8:00A-  4:00P-
Press NEXT when done
```

The cursor automatically starts below the hour hand of the start time. Use the "UP" and "DOWN" arrow keys to set the appropriate hour. Then press the "RIGHT" arrow key to move to the minute hand. At any time, use either the "LEFT" or "RIGHT" arrow keys to move within the LCD. Use "UP" and "DOWN" to change any values. When all values are correct, press the "NEXT WEEK" key to return to the "Home Screen."

SPECIAL NOTES: "OXY" and "ION" start and end times **MUST** be set within the "POOL" start and end times or no power will be delivered, although the LCD will display your selected values, (this is a safety feature). In addition, even if you do not own a pump timer, you must set the "POOL" start and end times according to when you manually turn your pump on and off, therefore we assure that we are never Ionizing or Oxidizing when the water is not flowing. Those without a firemans switch on thier timer must turn the pool heater off 15 minutes before pool is turned off.

Upon completing the setup for the "POOL" time, the "Home Screen" will display the new settings:

```
10:42:09A       5/22/2006
Pool    8:00A-   5:00P+
Oxy    10:00A-   4:00P+
Ion    None
```

OXY FUNCTION

The next step is to setup the "OXY" mode. Typically **residential** pools should run **6 to 10 hours per day**, commercial pools 18 to 24 hours per day. This is how long you are going to want to set up the "OXY" mode. It is strongly recommended that the running time of the Oxygen should be done during daylight hours. The parameters for the "OXY" mode must also be set within the "POOL" parameters. Now press the "OXY" key and the screen will display as shown:

```
Use ↑ ↓ >< Keys to set
            Start   Stop
Oxy        8:00A-  4:00P-
Press NEXT when done
```

The cursor automatically starts on the hour hand of the Start time. Use the "UP" and "DOWN" arrow keys to set the hour hand. Then press the "RIGHT" arrow key to move to the minute hand. Repeat the same process until the Start time (Hours/Minutes) and the Stop time (Hours/Minutes) are set to run "OXY" for the appropriate length of time, and within the pool pump parameters. Press "NEXT WEEK" when all values are correct.

The screen should now display the correct TIME, DATE, POOL "On" and "Off," and OXY "On" and "Off." The "Home Screen" will look as follows:

```
8:51:04A            1/11/2005
Pool   8:00A-    4:00P+
Oxy    8:00A-    4:00P+
Ion    None
```

NEXT WEEK FUNCTION

The next step is to setup your ION mode. The NEXT WEEK feature allows you to set a DAY and a TIME period for Copper Ionization to occur. The ionization will occur once per week on the day and the time selected with this feature. It is NOT recommended that future ION settings be programmed without an operating history. Actual Ion time needed is often less than one full Oxy cycle.

SPECIAL NOTE: If you select MANual or ION which will turn ION on for the POOL run time, or OXY run time, **the setting for NEXT WEEK will need to be reset. In addition, no OXY or ION will actually occur outside the time parameters entered for POOL.**

WARNING: Never set OXY or ION to start and stop during times when your pool pump is not running.

Glass Pack®

Characteristic	Glass	ZEOlite	Sand
Environmentally sound	●		
Long Lasting (3x longer)	●		
Ionically charged (traps small particles)	●		
Removes twice the iron & manganese	●		
Self-sterilizing	●		
Reduce chemical use	●		
Less likely to block or channel	●		
Requires a salt bath		●	
Requires more water for backwash		●	●
Requires more chemicals		●	●
Class I Carcinogen*²		●	●
Harmful to breathe		●	●
Surface houses bacteria		●	●
Strip mined: depletes our environment		●	●

• 100% Post Consumer Waste • 100% Post Consumer Waste •

SWIM IN BOTTLED WATER®

Glass Media

Using ECOsmarte's glass water filtration media not only results in outstanding performance, but in real cost benefits over the life of a filter bed:

Savings with Glass
Based on Filtration for a 24" Pool Filter

Product	Cost	Life	Cost over 9 Years
Glass	$300	9 yrs	$300*¹
Sand	$60	3 yrs	$180
ZEOlite	$150	3 yrs	$450
DE	$15	2 mo	$1,500* (1 set grids)

*¹Glass provides added savings due to reduced chemical use, and easier/less frequent backwashing. These costs are not reflected.

*² No aspirant silica dust for customer. Glass Media is dust free.

GLASS FILTERS WILL NOT LOAD PHOSPHATES

SETTING MULTIPLE DAYS OF IONIZATION

```
Use ↑ ↓ >< Keys to set
Day Run   Start     Stop
SU  OFE   10:00A-  4:00P-
Press NEXT when done
```

MANUAL FUNCTION

The MANual feature is used to set the IONization time to be equal to the POOL run time. This feature is usually used at start-up when you fill your pool or need to make a gross adjustment in the copper level in your water.

To activate this, simply push the "MAN" key once. This will set your ION Time to be equal with your POOL run time, and your OXY Time will read NONE. Your pool will now IONize when your pump is running. If you need to manually IONize longer, simply go into your POOL setup, and change the Start and Stop times of your pump. Then return to the "Home Screen" and press the "MAN" key to change the ION Start and Stop times. Your screen will now look as shown:

```
10:09:51A          1/04/2006
Pool  10:00A-      4:00P+
Oxy   None
Ion   10:30A-      3:30P+
```

Actual ION hours required to get your first residual will be a function of total gallons, TDS (total dissolved solids) and pH below 7.2 of your pool. A water test seeking 0.5 ppm copper should be taken before 10 hours of POOL and ION running time have passed. PH will rise during initial ionization, therefore, daily adjustments may be necessary at first.

The manual override key "MAN" is the most convenient method to put copper constantly to your pool. Select the "OXY" key to switch the unit back to oxygen equal to your programmed POOL run time.

AUTOMATION

Your water will become predictable after three weeks and the ION and CO2 values can auto repeat for weeks, after dialing them in with the water tests.
Set "ION" to come on the day before you test (or your service) the copper each week.

ACC FUNCTION

The last function on the box to be discussed is the "ACC" key. The first feature listed is CO2, the other items are not relevant for residential pools or water features.

Pushing the arrow key pointing to the right will bring you to the screen where you can choose between "Timed", "ON" or "OFF" modes.

The screen is pictured on page 7.

SETTING CO2 FEED & PH TIME

The programmable controller will automatically split your minutes per day. CO_2 setting into 4 equal increments beginning at pool start time. Minimum setting is 4 minutes per day (OR OFF).

For further technical support, please e-mail us at:
pools@ecosmarte.com

BELOW:

Ecosmarte Chamber installed before CO2 injector, between pump and filter.

SET YOUR POOL UP

www.ecosmartecloud.com/register

FREE LIFETIME CLOUD SUBSCRIPTION
Use your email for your username and water1 for your initial password

INSTRUCTIONAL VIDEO

ONLINE:
www.ecosmarte.com/
onlinesupport.htm
Pass: customer2007

The ECOsmarte chamber can be installed anywhere on the pressure line, CO2 is <u>always a</u>fter Cu/Oxy.

Glass Filtration Media

Finely crushed glass for pool, industrial, and environmental filtration that provides outstanding water clarity and quality - a direct replacement for sand or ZEOlite in both freshwater and saltwater pools.

Superior Cleaning

- Cleaner, lighter weight, highly angular crushed recycled glass provides an amazing 25% improvement in turbidity removal over silica sand, and is equivalent to ZEOlite.
- Crushed glass filtration media generally removes finer particles from water than silica sand of an equivalent grade, and is comparable to properly configured ZEOlite.
- Weak negative surface charge holds fine particles and positively charged iron and manganese ions that are easily released upon back washing. Perfect for well water pools.
- Crushed glass filtration media is less likely to block or channel than silica sand or ZEOlite and will not support moss or fungus growth in the media.

Safer to Use

- Glass contains no crystalline silica–resulting in better lung protection for employees and a far healthier environment.
- Glass grains are amorphous, smooth particles that have higher attrition strength and do not permanently trap bacteria in cracks.
- Use of crushed glass filter media will lower your consumption of chlorine and coagulants. Coagulants and metal removers foul ZEOlite and are compatible with glass.
- Manufactured from 100% recycled glass

Lower Operating Costs: Easy Install and Maintenance

- Labor and time savings at install.
- Improved performance for pressure or gravity-flow filters
- Weighing 20% less than sand, ECOsmarte® crushed glass filtration media provides more filter volume per pound.
- Lower density requires up to 20% less media to fill your filter vessel.
- Better permeability–backwashes with up to 25% less water, saving down-time and water/sewer charges.
- Because glass cleans better, you save energy, operating costs, and extend the life of your filter.
- Comparable initial cost to ZEOlite.

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ECOsmarte Glass Pack™ is U.S. trademark with pending registration.

SAND FILTRATION IS DEAD, BUT YOUR SAND FILTER MAY NOT BE.

ECOsmarte® glass is made from 100% recycled glass. It is crushed, dried at 250 degrees Fahrenheit, and screened into various sized fractions to achieve optimal filtration properties.
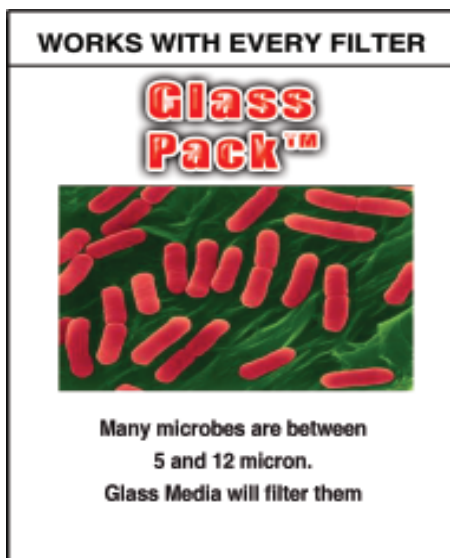
As the grains are nearly all angular in shape and have a fairly high degree of sphericity, the filter bed tends to have more opened packing resulting in better permeability than a filter of spherical silica grains.

Because glass is amorphous and has no internal crystal structure, the particles are homogenous and have no grain boundaries. This gives glass more resistance to breakdown through filtration backwashing cycles.

Furthermore the lack of grain boundaries minimizes cracks where bacteria can lodge and resist flushing in backwashing.

Glass particles have a slight negative charge on their surface, which tend to hold onto fine particles during the filtration cycle. Upon backwashing, this weak charge releases these fine particles to the effluent thereby contributing to better filtration action. There is less water to the better permeability of a glass filter.

As crushed glass is lighter than silica sand, between 15 and 20% less glass is needed to fill a filtration unit. With the better filtration characteristics and lower density glass is a superior filtration media for many filtration applications. It can be used in swimming pool and spa filters as well. Glass filter media is now being used in storm water runoff filtration systems as a replacement for silica sand. Using glass not only results in good performance, but in real cost benefits over the life of a filter bed.

WORKS WITH EVERY FILTER

Glass Pack™

Many microbes are between 5 and 12 micron.
Glass Media will filter them

ECOsmarte®

Makes Your Water Look Like Glass...

2007 Automated CO2 Feature
Enchancements

The default settings are shown below:

```
Use ↑↓ >< Keys to set
CO2    Output    Enable
CO2    TIMED
Press NEXT when done
```

Changing the setting should be done after install. All CO2 users must use the ACC keypad, choose CO2 ON. Right arrow key will bring you to the next screen that allows to choose between several options such as "ON", "TIMED" and "OFF". It is strongly recommended that CO2 feed feature be set on "TIMED" option.

```
Feature          Setting >
CO2  Feed        OFF
PH Sense         OFF
↑ More Features ↓
```

The "NEXT" button will bring you to the screen where CO2 injection time should be set. Right arrow key used to move cursor to the next necessary entry (from hours to minutes). The up and down arrow keys allow you to program or change the number of hours/minutes per day. It is the rule that Southern pools should begin at 40 minutes (minimum time is 4 minutes).

```
Use ↑↓ >< Keys to set
CO2    Output    Enable
CO2    TIMED
Press NEXT when done
```

All pools should make an initial major PH down adjustment with Muriatic acid before depending on the CO2, the pool should be monitored three times the first week and minutes modified upward or downward as needed.

CO2 Minutes are injected four times per day with the first injection occuring at the beginning of the programmed pool run time.

NOTE: Default setting on CO2 feeds constant gas to pool to confirm no leaks at install. You must reselect "TIMED" and use Right arrow key to get minutes to appear on the cursor. Your tank can drain in one day if the time is not entered correctly.

CO2 PH control is a maintenance method only. Acid supplement is required in early weeks of use.

ECOsmarte

PLANET FRIENDLY™

↑ ↓ ↑ SECURITY SEQUENCE:
UNLOCKS KEYPAD AT ANY TIME
TO ENTER INFORMATION

SECURITY SEQUENCE

1) Your new unit will prompt you to enter the security sequence (up, down, up).
2) Each time you want to enter information into the operating unit, you first **need to touch the keypad** and then enter the security sequence.

↑ ↓ INCREASES or DECREASES values when depressed.
Holding down keys will run the numbers faster.

← → RIGHT Arrow when correct values are entered. Both will move cursor to the various number fields within the LCD, and RIGHT will return back to first cursor position, when at the end of a line.

DATE **CLOCK** Either button will allow you to change TIME, DATE, or DAY of the week. A "Super Cap" instead of a battery will give you an operating clock of at least 100 hours if power is interrupted.

ZERO:SALT **ZERO:CHLORINE**

POOL Tells ECOsmarte unit maximum hours your POOL is running. The ECOsmarte unit will not output outside of the programmed pool run time. **NOTE:** Pool Heater must turnoff 15 minutes before the pool to avoid plumbing damage due to heat.

OXY To setup the number of hours of OXYGEN your pool needs per day. (i.e. OXYGEN purifies water in plumbing 6-10 hours per day.)

ION CU COPPER IONization is delivered to the pool for the number of hours programmed. Press ION to change the Start and Stop times. Press OXY to stop ionizing immediately when Copper ppm is reached. At setup confirm all settings after using this button.

MAN This key will change default from POOL = OXY to POOL = ION Ideal at new fill or when you wish to IONIZE today. Will auto repeat, so you must press OXY when ION levels are reach.

NEXT ENTER Allows you to select future day for Copper to IONIZE your Pool or to oxidize and ionize on the same day. Will repeat each week if function is not turned OFF. **THIS key also allows completion of ALL programming tasks.**

ACC Activates Pool pump Relay option, CO2, PH sensor, a visual or audio alarm for PH range and power to chambers and CU sensors (if technology becomes available), TDS and Water Temp are Future upgrades, as is remote computer windows interface.

PROGRAMMING MEMORY

Your unit retains all values in the RAM programmed for seven days consecutive without power to ECOsmarte box. No battery is utilized.