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Section A: Programming the Controller

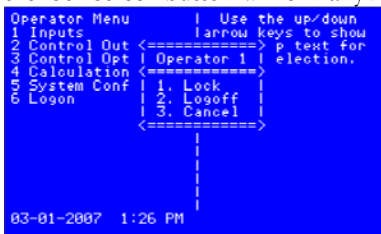
The BECSys line of controllers is the natural evolution of more than fifteen years worth of experience at designing and manufacturing aquatic controllers. And this evolution will continue as we add more features and new expansion capabilities to all of the BECSys controllers at regular intervals over the year 2007 and beyond.

As new features are added, this manual will obviously become out-of-date. If you receive a new chip, a new manual may be supplied with it, but even if it isn't, the menus themselves will include detailed information in their help text. And by the time we're done, we hope you won't even need the printed manual for you to program the controller.

A - 1: Security Settings

A - 1.1: Access Codes and levels

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



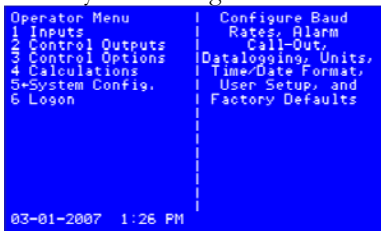
The Main Menu will also display who is logged on.

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.

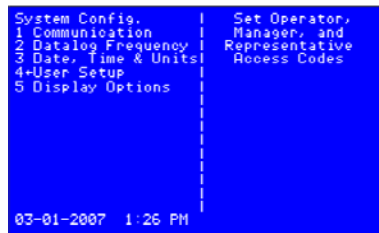
A - 1.2: Setting Access Codes

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

- ▶ Select System Config

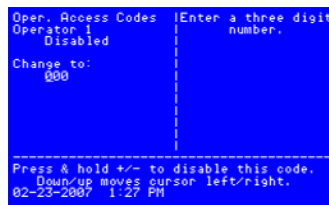
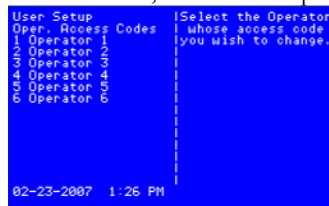


- ▶ Choose User Setup,



- ▶ 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 - 1.3: Controller Options

Depending on how the controller is configured operators and managers may see different options in the menu screens.


A - 2: Navigating the menus

Nearly all of the controller's menus incorporate built in help text that attempts to aid you in understanding what each parameter, item, and option does.

A - 2.1: 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 and 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.

 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 - 2.2: The Menu Screens

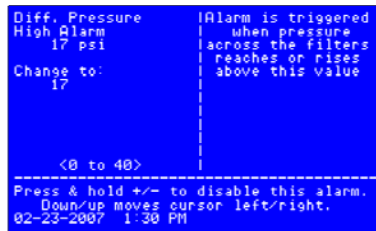
All of the features of the controller are configured via the Menu button's menus. The only options for you to set using dipswitches are the battery and flow meter type. With the exceptions of dipswitch 8 (the battery) and 6 or 7 (Flow Meter type), leave all of the dipswitches in the OFF (down) position.

 Dipswitches 1 through 5 are only useful to factory personnel. Turning any of these dipswitches on may have a detrimental affect on the controller's operation.

The menu screens can be broken up into two types: entry screens and lists.

A - 2.2.1: 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 have to retype the existing digits if you only wish to change one.

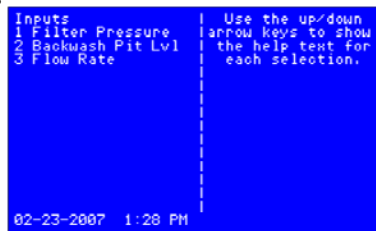
Most numerical values will display the minimum and maximum values you can enter in at the bottom of the display in the format "< ### to ###>". These ranges many times will be dependant on other values you have set, such as alarm points or set points, while others are simply fixed to stay within a reasonable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

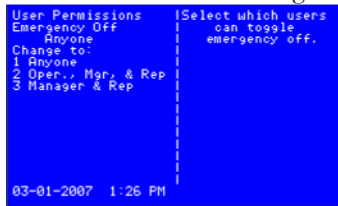
A - 2.2.2: List Screens

The menus 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 set a setting:



When a list being 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.

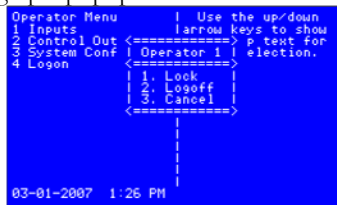
- There are a few list screens that use the entire width of the display for displaying values associated with each item and therefore do not have help. See Section E: Using the Quick Set Face Panel Keys for examples of these types of screens.

A - 2.3: The Lock Screen Key

When not in a menu (ie 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 D: 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. However, in some instances certain keys are given special functions while the screen is locked, such as using the up and down arrows to scroll the help text if all of the help text cannot be displayed at once.

- 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.

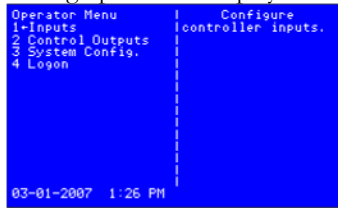
The Lock button popup menu also identifies who the current user is, and provides an option for the user to log off. You can also select cancel if you pressed the lock button in error.

The yellow Lock Screen light lights up whenever the screen is locked.

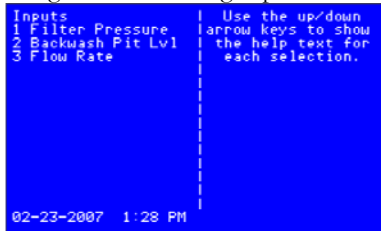
- Future options may be added to the popup menu in later firmware releases.

A - 3: Inputs

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



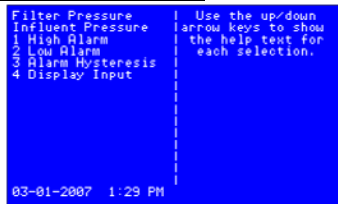
Select Inputs from the menu. This will allow the programming of the following Inputs:



A - 3.1: Filter Pressure Setup

After entering the Input option, choose the Filter Pressure from the menu. This will allow you to program the following for the filter pressure inputs.

A - 3.1.1: Influent Pressure

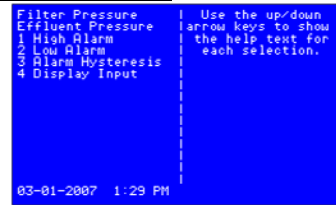


- ▶▶ High Alarm: (Operator) The high alarm will activate when the pressure reaches or rises above this setting. Input the desired pressure and press enter. You may also disable this alarm by holding down the +/- key for 1 second. (The range is dependant on the low alarm point.)
- ▶▶ Low Alarm: (Operator) The low alarm will activate when the pressure falls below this setting. Input the desired pressure and press enter. You may also disable this alarm by holding down the +/- key for 1 second. (The range is dependant on the high alarm point.)

- ▶▶ Alarm Hysteresis: (Manager) This value sets the level that the pressure reading has to rise above or fall below the high / low alarm setting before the alarm will shut off. Input the desired level and press enter. (The range is from 0 to 5)

- ▶▶ Display Input: (Operator) This option enables/disables displaying the influent pressure on the normal display.

A - 3.1.2: Effluent Pressure



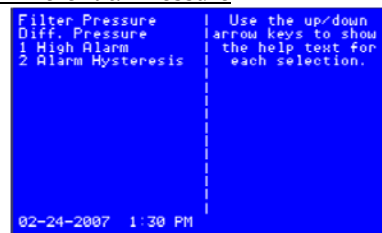
- ▶▶ High Alarm: (Operator) The high alarm will activate when the pressure reaches or rises above this setting. Input the desired pressure and press enter. You may also disable this alarm by holding down the +/- key for 1 second. (The range is dependant on the low alarm point.)

- ▶▶ Low Alarm: (Operator) The low alarm will activate when the pressure falls below this setting. Input the desired pressure and press enter. You may also disable this alarm by holding down the +/- key for 1 second. (The range is dependant on the high alarm point.)

- ▶▶ Alarm Hysteresis: (Manager) This value sets the level that the pressure reading has to rise above or fall below the high / low alarm setting before the alarm will shut off. Input the desired level and press enter. (the range is from 0 to 5)

- ▶▶ Display Input: (Operator) This option enables/disables displaying the effluent pressure on the normal display.

A - 3.1.3: Differential Pressure



- ▶ **High Alarm: (Operator)** The high alarm will activate when the pressure reaches or rises above this setting. Input the desired pressure and press enter. You may also disable this alarm by holding down the +/- key for 1 second. (the range is 0 to 40)

- ▶ **Alarm Hysteresis: (Manager)** This value sets the level that the pressure reading has to rise above or fall below the high / low alarm setting before the alarm will shut off. Input the desired level and press enter. (the range is from 0 to 10)

A - 3.2: Backwash Pit Level

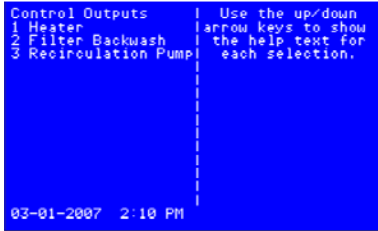
After entering the Input option, select Backwash Pit Lvl from the menu. This will allow you to program the following for the Backwash pit level input.

- ▶ **High Alarm: (Operator)** The high alarm will activate when the input reaches or rises above this setting. Enter the desired value and press enter. (the range is dependant on the input range)

- ▶ **Low Point: (Operator)** The high alarm will deactivate when the input reaches or falls below this setting. Enter the desired value and press enter. (the range is dependant on the input range)

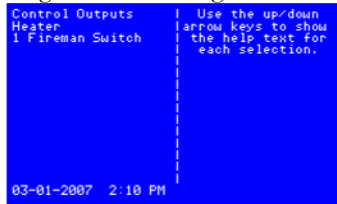
A - 4: Control Outputs

By selecting Control Outputs, the following is displayed:



A - 4.1: Heater

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



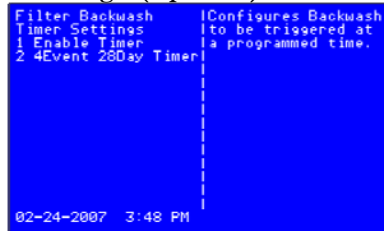
► **Fireman Switch: (Operator)** This value sets the minimum amount of time to leave the recirculation pump on after the heater shuts off.

A - 4.2: Filter Backwash

Most menus and options are the same for all of the filter/valve types, but a few are specific for either pressure or vacuum filter types. Features common to all types are listed in section C - 4.4.1. For Actuator, Pilot valve, Enhanced Pilot valve, or Standard solenoids specific settings, refer to C - 4.4.2 Pressure Filter Specific Settings. For Compak Vacuum filter specific settings refer to section C - 4.4.3.

A - 4.2.1: Common Backwash features:

► Timer Settings: (Operator)



►► **Enable Timer: (Operator)** Enables or disables triggering backwash from the 4 event 28 day timer.

►► **4 Event 28 Day Timer: (Operator)** Only shown if the timer is enabled. The 4 Event 28 Day Timer allows you to program a backwash based on a schedule.

Assuming you have not enabled an event prior to this, you will see something like the following:



Selecting Event1 will display following:

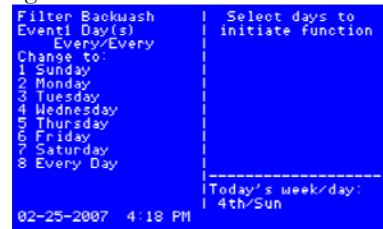


This screen allows you to select the weekly interval to trigger the Backwash. The next set of screens will allow you to choose the actual day(s).

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.

- ⑦ The week number and day of week for the current date is displayed on the bottom right side of these screens.
- ⑦ The first week is fixed to be the week of Sunday, January 2nd, 2000 and every four weeks afterwards.

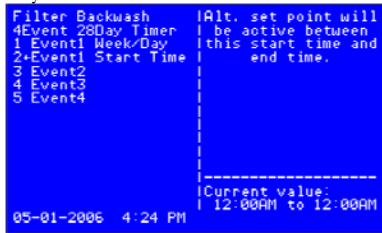
After making your selection, you will see the following:



Here you can select the day of the week (or every day) the event should be triggered on.

7 At the time of this manual's writing, the controller's firmware only allows you to select one specific day of the week or every day of the week and not a combination of days. This limitation will be eliminated in a later firmware release, in which case the screen's help text will contain detailed information on your options.

Once you make your selection, you will be returned to the 4Event 28Day Timer menu where you will have a new menu item:

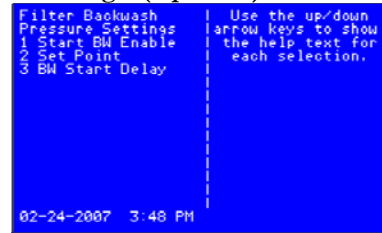


Select the Event1 Start Time from the 4Event 28Day Timer menu. You should see something like the following:



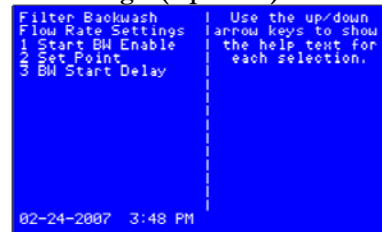
This screen allows you to set the time to trigger the event on the programmed weeks/days. The event will trigger at the start time if the controller is running at that time. To toggle AM/PM, press the +/- key. Enter the desired time and press enter.

► Pressure Settings: (Operator)



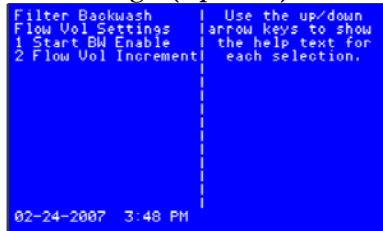
- **Start BW Enable: (Operator)** Enables or disables triggering backwash from a high differential pressure. If enabled and the filter pressure sensor type is set to transducer, the controller allows you to set the triggering differential pressure set point. If the filter pressure sensor type is set to contact switch, then the controller will trigger a backwash when it sees a contact closure on the filter 2 input.
- **Set Point: (Operator)** *Only shown if the Start BW Enable is enabled and the pressure sensor type is set to transducer.* When the differential pressure reaches or rises above this value for two minutes, the controller will trigger a backwash.
- **BW Start Delay: (Operator)** *Only shown if the Start BW Enable is enabled.* This is the amount of time the differential pressure must remain above the trigger level before it triggers a backwash.

► Flow Rate Settings: (Operator)



- **Start BW Enable: (Operator)** Enables or disables triggering backwash from a low flow rate.
- **Set Point: (Operator)** *Only shown if the Start BW Enable is enabled.* When the flow rate reaches or falls below this value for ten minutes, the controller will trigger a backwash.
- **BW Start Delay: (Operator)** *Only shown if the Start BW Enable is enabled.* This is the amount of time the differential pressure set point must remain above set point before it triggers a backwash.

▶ **Flow Vol Settings: (Operator)**

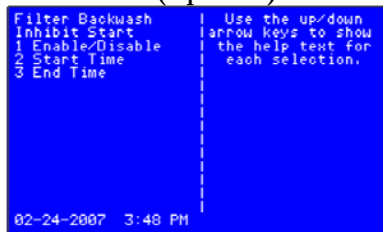


▶▶ **Start BW Enable: (Operator)** Enables or disables triggering backwash from a flow volume.

▶▶ **Flow Vol Increment (Operator)** *Only shown if the Start BW Enable is enabled.* Enter volume increment to trigger backwash. Note: this number is in 1000s of gals or liters.

▶ **BFFS Duration: (Operator)** Prevents a trigger (except manual start) from starting a backwash if triggered within this time period from the end of the previous backwash.

▶ **Inhibit BW Start: (Operator)**

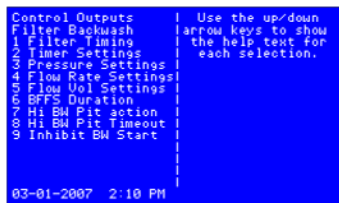


▶▶ **Enable/Disable: (Operator)** Enables or disables locking out backwashes between the Start Time and End Time.

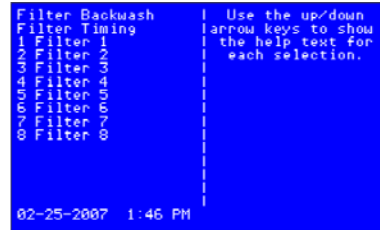
▶▶ **Start Time (Operator)** *Only shown if the Enable/Disabled is enabled.* Prevent a backwash from being triggered between this time and the End Time.

▶▶ **End Time (Operator)** *Only shown if the Enable/Disabled is enabled.* Prevent a backwash from being triggered between the Start Time and this time.

A - 4.2.2: Pressure Filter Specific Settings:



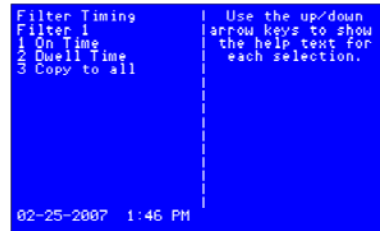
▶ **Filter Timing: (Operator)** Set each filters' timing.



▶▶ **On Time: (Operator)** Duration to backwash this filter.

▶▶ **Dwell Time: (Operator)** Time delay between backwashing of this filter and the next.

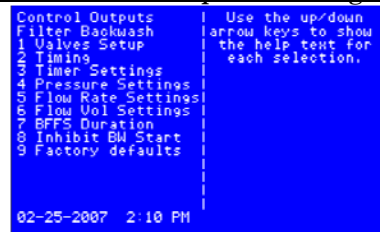
▶▶ **Copy to all (Operator)** *Filter 1 only.* Copies filter 1's On Time and Dwell Time to filters 2 through 8.



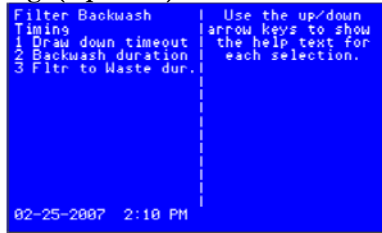
▶ **Hi BW Pit Action: (Operator)** *Only shown if the BW Pit input has been enabled and if either the recirculation pump has been assigned a relay or if the valve type is set to Enhanced Pilot valve and the isolation relay is assigned.* Choose what action you want the controller to take when a backwash pit high alarm occurs while backwashing. While the pit/tank drains, you may either switch the filter back to filter (the default setting), shut down the recirculation pump (if recirculation pump has been assigned a relay), or if the valve type is set to enhanced Pilot valve, isolate the filter from the system which prevents re-compacting the filter media.

▶ **Hi BW Timeout: (Operator)** This value sets the maximum time you wish the controller to hold a backwash while waiting for the backwash pit to drain. If the timeout is reached, the backwash will be canceled and the BW duration failsafe alarm will trigger.

A - 4.2.3: Vacuum Filter Specific Settings:

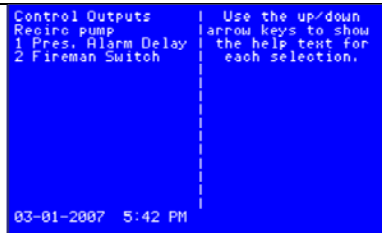


▶ **Timing: (Operator)**



- ▶▶ **Draw down timeout: (Operator)**
Maximum time to wait to reach the draw down level.
- ▶▶ **Backwash Duration: (Operator)** Length of time to backwash filter.
- ▶▶ **Filtr to Waste Dur. (Operator)** Length of time to filter to waste.

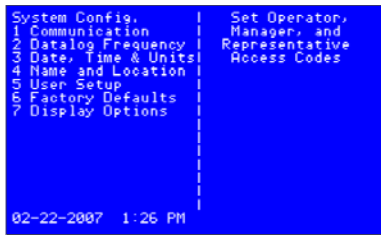
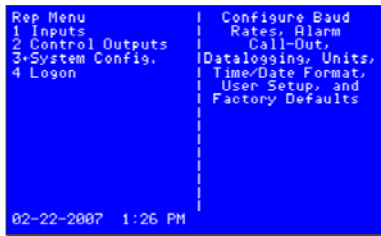
A - 4.3: Recirculation Pump



- ▶ **Pres. Alarm Delay: (Operator)** *This option is only shown if a pressure input is assigned.* Delay pressure alarms from triggering for this amount of time whenever the recirc pump starts up.
- ▶ **Fireman Switch: (Operator)** *This option is only shown if a relay is assigned to the Heater control.* This value sets the minimum amount of time to leave the recirculation pump on after the heater shuts off.

A – 5: System Configuration


Press Menu on the controller's face panel and select System Configuration from the menu:



A - 5.1: Communication:

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

- ▶ **Direct Baud Rate (Operator)** Here you can choose the desired direct connect baud rate for the system.

 The modem automatically sets its baud rate to the best speed the connection can handle.

- ▶ **Call-Out Setup (Operator)** Here you can set the parameters for the alarm call-out functions.
 - ▶▶ Call Out Enable - Here you can choose to enable call outs.
 - ▶▶ Call Start Time – *Only visible once call out is enabled.* Here you can set the time the controller will start allowing call outs.
 - ▶▶ Call End Time - *Only visible once call out is enabled.* Here you can set the time the controller will stop allowing call outs.
 - ▶▶ Ack. Page outs - *Only visible once call out is enabled.* After the first page is sent, if the controller is called back, the controller will cancel all other page outs.
 - ▶▶ Pre-Delay - *Only visible once call out is enabled.* Here you can set the amount of time the controller will delay to allow for alarm to reset before calling out. (the range is from 1:00 to 60:00 minutes)
 - ▶▶ Phone Number Setup - *Only visible once call out is enabled.* Allows configuration of eight phone numbers which can individually be configured for either fax or pager callout. A Post-Delay may also be configured which will have the

controller delay a certain amount of time before calling the next number.

A - 5.2: Datalog Frequency

(Operator) Once you have entered System Configuration, select Datalog Frequency from the menu. Here you can choose how often the controller collects data.

A - 5.3: 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 (Operator)** Here you can choose from U.S. or Metric measurements.
- ▶ **Date Format (Operator)** Here you can choose the format for the date.
- ▶ **Current Date (Operator)** Here you can set the current date.
- ▶ **Current Time (Operator)** Here you can set the current time. Use the + / - key to toggle between AM and PM.

A - 5.4: User Setup:

Managers can change the access code for all of the operators and their own access code. Operators can only change their access code.

Managers can set permissions for what operators can access.

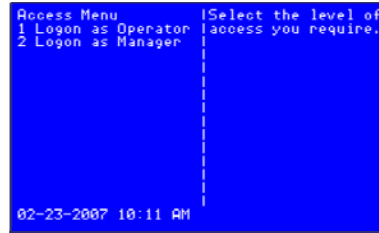
A - 5.5: Display Options:

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

- ▶ **Page Delay (Operator)** 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.
- ▶ **Toggle LCD Mode (Operator)** Toggles the LCD display between negative and positive modes.

A - 6: Logon Menu

Once the Rep and Operator access codes have been set, 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 anytime you wish to logon as another access level, you may do so by pressing the Menu key and selecting Logon from the main menu.

Section B: The Normal Display

The normal display refers to the screens that display all of your inputs, current alarms, and status messages. These are read only and do not offer any selections to choose from.

Backwash will display status information in this area as well. If there are any active alarms while one or more of these control functions' are active, the alarms will be shown every other page while the control functions will alternate with each other.

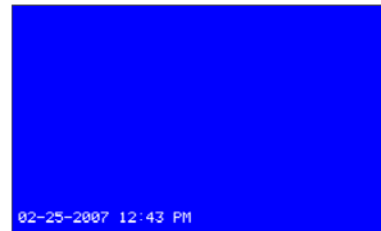
B - 1: Inputs and Feeds

When no alarms or status messages are present, the entire screen will be used to display all of the enabled inputs.

Other information such as Customer/Location/Rep information may also be displayed.

If there are more items to show than there is room for, the controller the controller will page through them until they all have been displayed, then start over.

- ➊ Pressing the right arrow key (Next) will display the next page.
- ➋ Pressing the Lock Screen button will prevent the controller from paging the screen to show more inputs, alarms, and other status information.
- ➌ You can adjust the rate at which the controller pages by pressing the up and/or down arrow keys.
- ➍ You can also adjust the display's contrast by holding down either the up or down arrow keys for two seconds, then after the control beeps three times, use the up and down keys to darken or brighten the screen. This can be done at any time, not just while viewing the normal display.



B - 2: Alarms & Status messages

When one or more alarms are active, the bottom three lines are used to list them. If more than three alarms are active, the controller will page through them three at a time until they all have been displayed, then start over.

Section C: Using the Face Panel Quick Keys

C - 1: The Set Points Key

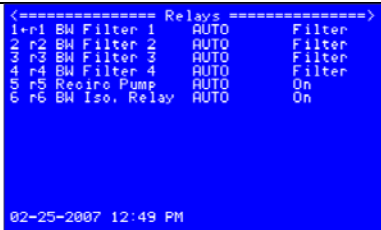
The Set Points Key on the front face panel, when pressed, displays the alarm set points for all of the enabled inputs.



All of the possible alarm set points are:
 Flow Rate Low Alarm
 Diff Pressr High Alarm
 BW Pit High Alarm

To change the existing alarm set point, select the desired option and input the new value and press enter. If permissions are set, you will have to enter your access code.

C - 2: The Relay Mode Key



Pressing the Relay Mode key on the front face panel shows you which options have been assigned relays, and each of the relays' current mode and its state. By selecting one of the assigned relays, you are allowed to choose the desired mode. Unused relays and the alarm relay cannot be manually overridden, but their current state is always displayed. If access codes are set, you will have to enter your access code.

- 1 To test a relay or to prime a pump, lock the screen while in the main Relay Mode menu, then press the relay's numeric key (i.e., for relay 3, press the 3 key). This will turn the relay on for as long as you are pressing that key. If the relay is already on, this will have no affect.

C - 3: The Cal Key (calibration)

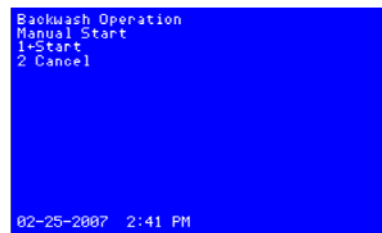
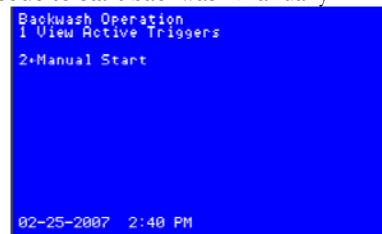
The Cal (calibration) key on the front face panel, when pressed shows you the inputs you can perform a single point calibration. Any inputs you have enabled can also be calibrated from this Menu screen. Select the input you wish to calibrate and

enter the proper value. If access codes are set, you will have to enter your access code.

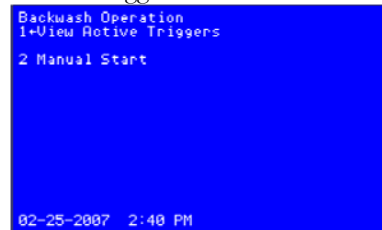
- 1 Perform a single point calibration if the reading is off by a consistent amount throughout the input range.
- 2 If the readings are accurate at one reading, but are off by an increasing amount the farther away you go from that reading, check the wiring and the condition of the probe (if applicable). If the problem is not found, you may need to do a two-point calibration located in the input's menu under the Menu button.

C - 4: The Backwash Key

When all of the necessary components needed for backwash have been assigned and configured, and if there are no conditions preventing a backwash, the backwash key allows you to start a manual backwash. If access codes are set, you will have to enter your access code to start backwash manually.



If any automated backwash triggers have been enabled, you may also view them along with their associated input if applicable by selecting the View Active Triggers. You do not have to enter an Access code to view the triggers.



```
Active Backwash Triggers
Probe          Set
Diff Pressure  0 psi  15 psi
Diff Pressure delay  stopped
Flow Rate      0.0 gpm 110.0 gpm
Flow Rate Delay  stopped

Timers:
Event 1  Every/Sun 2:00 AM
Next Sched. 02-25-2007 2:00 AM

02-25-2007 2:43 PM
```

The backwash key's main screen will also list anything preventing a backwash from occurring such as an emergency off, configuration problems, and the backwash inhibit timer.

```
Backwash Operation
1-View Active Triggers

Backwash Disabled until: 5:00 PM
BW inhibit: 8:00 AM 5:00 PM

02-25-2007 2:39 PM
```

During a backwash, the backwash key displays the progress of each filter and allows you to restart, switch to, or skip a particular filter as well as canceling the backwash entirely.

```
Backwash Operation
1-Filter 1 0:00 m:s Next to Wash
2-Filter 2 0:00 m:s Ready
3-Filter 3 0:00 m:s Ready
4-Filter 4 0:28 m:s Backwashing
5 Manual Stop

Backwashing Filter 4
Wash Time Remaining: 1:32

02-25-2007 3:23 PM
```

```
Backwash Operation
Filter 1 Details
1-Start this filter now
2-Skip this filter
Wash time 0:00 m:s out of 2:00 m:s

02-25-2007 3:19 PM
```

C - 5: The Reset Fail / Safe Key

```
Failsafe Operation
BW Freq Failsafe (BFFS)
Backwash Failsafe: BW Freq FS

1-Reset

02-25-2007 2:39 PM
```

The Reset Fail / Safe key on the front face panel, when pressed, lists any active failsafe alarms and allows you to reset them. A failsafe alarm is generally triggered when one of the relays has remained on past the set time the function has been given to reach its set point. By choosing to reset the failsafe, the control that triggered the failsafe will be able to resume operating normally once again. If permissions are set to any value except “anyone” an access code must be entered in before resetting a fail/safe.

⚠ Before resetting the Fail / Safe Alarm, ensure that all functions of the controller are working properly.





C - 6: The Emergency Off Key

When the Emergency Off button is pressed, all relays are automatically shut off with one exception, the alarm relay which will turn on. All the other relays will remain off until the emergency off button is press again. If permissions are set to any value except “anyone” an access code must be entered in before toggling the emergency off.





Section D: Tables

D - 1: Flow Meter K-Factors

D - 1.1 Schedule 40 PVC Pipe

	Pipe Size (in)	+GF+Signet 515 (red)		+GF+Signet 2536 (blue)		
		U.S. GAL	LITERS	U.S. GAL	LITERS	
SCH 80 PVC SADDLE ON SCH 40 PVC PIPE						
	2	27.350	7.226	54.700	14.452	
	2-1/2	18.874	4.987	37.159	9.818	
	3	12.638	3.339	23.697	6.261	
	4	6.728	1.778	13.456	3.555	
	6	3.730	0.985	7.459	1.971	
	8	2.153	0.569	4.529	1.197	
	10	1.350	0.357	2.800	0.740	
	12	0.960	0.254	1.980	0.523	
	PP CLAMP-ON SADDLE ON SCH 40 PP PIPE					
		10	1.350	0.357	2.800	0.740
12		0.960	0.254	1.980	0.523	
SCH 80 IRON SADDLE ON SCH 40 PIPE						
	2	26.820	7.086	53.640	14.172	
	2-1/2	18.800	4.967	37.600	9.934	
	3	11.990	3.168	23.220	6.135	
	4	6.850	1.810	13.260	3.503	
	5	5.330	1.408	11.040	2.917	
	6	3.760	0.993	7.240	1.913	
	8	2.130	0.563	4.400	1.162	
	10	1.350	0.357	2.800	0.740	
	12	0.960	0.254	1.980	0.523	
	WELDOLETS ON SCH 40 PIPE					
	2-1/2	18.800	4.967	37.600	9.934	
	3	12.170	3.215	24.340	6.431	
	4	6.960	1.839	13.920	3.678	
	5	5.260	1.390	10.860	2.869	
	6	3.690	0.975	7.520	1.987	
	8	2.130	0.563	4.340	1.147	
	10	1.350	0.357	2.760	0.729	
	12	0.960	0.254	1.940	0.513	

D - 1.2 Schedule 80 PVC Pipe

	Pipe Size (in)	+GF+Signet 515 (red)		+GF+Signet 2536 (blue)	
		U.S. GAL	LITERS	U.S. GAL	LITERS
SCH 80 PVC TEES FOR SCH 80 PVC PIPE					
	1	174.670	46.148	352.440	93.114
	1-1/4	83.390	22.032	177.180	46.812
	1-1/2	58.580	15.477	117.850	31.137
	2	32.480	8.581	66.739	17.633
	2-1/2	21.833	5.768	42.994	11.359
	3	13.541	3.578	26.652	7.041
	4	7.626	2.015	15.006	3.965
SCH 80 PVC SADDLES FOR SCH 80 PVC PIPE					
	2	32.480	8.581	66.739	17.633
	2-1/2	21.833	5.768	42.994	11.359
	3	13.541	3.578	26.652	7.041
	4	7.626	2.015	15.006	3.965
	6	4.162	1.100	8.325	2.199
	8	2.371	0.626	5.016	1.325
	10	1.530	0.404	3.060	0.808
	12	1.060	0.280	2.160	0.571
PP CLAMP-ON SADDLE ON SCH 80 PP PIPE					
	10	1.530	0.404	3.060	0.808
	12	1.060	0.280	2.160	0.571
SCH 80 IRON SADDLES ON SCH 80 PIPE					
	2	32.360	8.550	64.720	17.099
	2-1/2	22.220	5.871	42.480	11.223
	3	13.420	3.546	26.420	6.980
	4	7.660	2.024	14.700	3.884
	5	5.860	1.548	12.180	3.218
	6	4.090	1.081	8.440	2.230
	8	2.330	0.616	4.900	1.295
	10	1.530	0.404	3.060	0.808
	12	1.060	0.280	2.160	0.571

Section E: Warranty**LIMITED WARRANTY**

BECS warrants the controller electronics and flow cell 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. 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 accrued.



TECHNOLOGY Inc. has been designing and manufacturing the industry's most reliable water chemistry controller for over 15 years. Our 24,000 ft² 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.