Quick Start Guide

EGC C6 Environmental Control System

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ECoSys Software – Version 3

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Contents

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Introduction

The C6 Control System is a programmable logic controller (PLC) based industrial controller with a color touch-screen user interface. When used with EGC's ECoSys (**E**nvironmental **CO**ntrol **Sys**tem) software, it provides an easy to use, intuitive system for environmental chamber control. In addition to providing a simple interface for chamber operations, available C6 System options provide capability to network multiple chambers for single point monitoring, programming, reporting and remote access. Additionally, remote access and control is made simple.

This Quick Start Guide is intended as a simple primer to everyday operations. It does not include full information on system configuration and other advanced options. If these functions are needed, please refer to the full user manual or seek assistance from the system administrator.

Basic ECoSys Operations

By default, EGC's ECoSys software is setup to provide control for up to six channels and nine relays. The **Status Screen** displays two channels at a time. A **Next** button is provided in the middle right of the screen to access the "next" two channels.

ECoSys software starts on the chamber **Status Screen**. The picture below shows the chamber **Status Screen** with the operating elements identified. The pull-down menu at the top is used to select other screens and the EGC logo button at the top left to return to this Status Screen at any time.
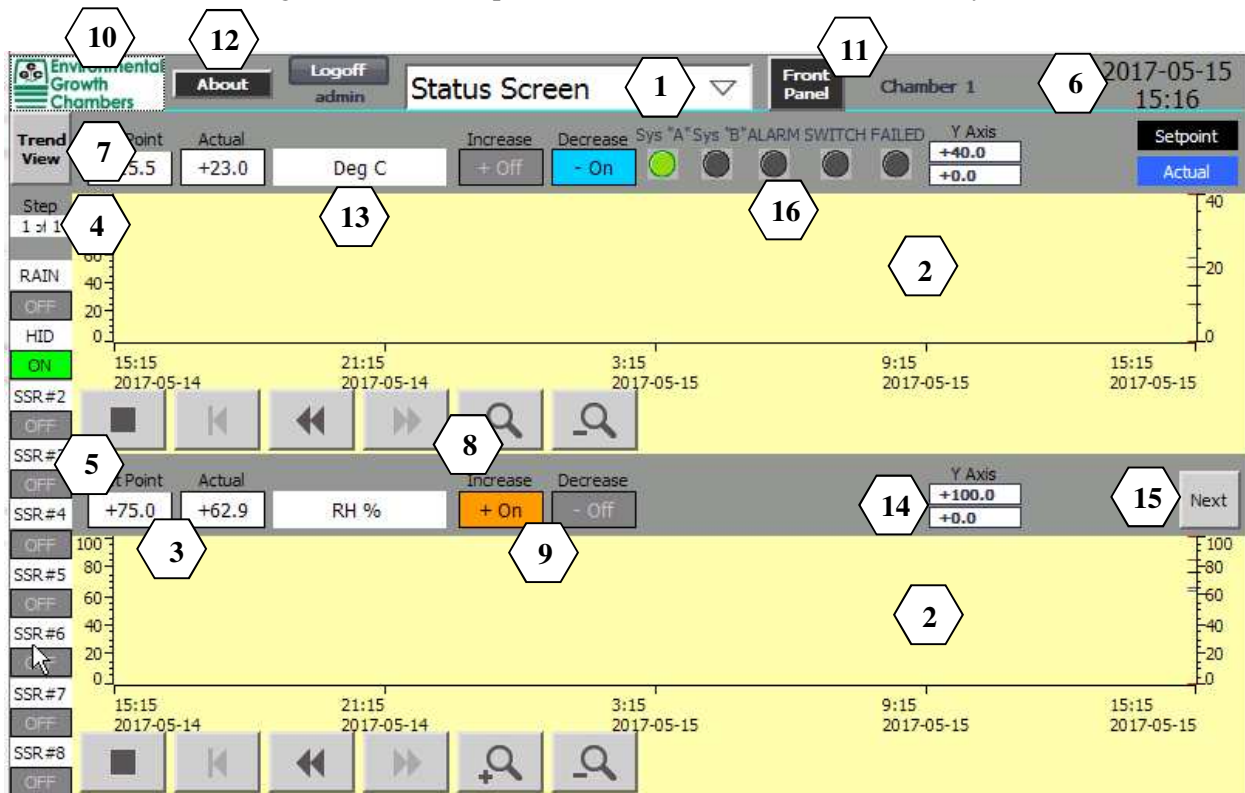

1. Pull-down menus to other screens	**9. Control Output indicators**
2. Strip chart of real-time control trend	**10. EGC Return to Status Screen button**
3. Current values and set points	**11. Front Panel access button**
4. Program Active Step indicator	**12. About ECoSys access button**
5. Relay status indicators	**13. Channel Descriptor**
6. Password access button and Date/Time	**14. Y-axis scale input fields**
7. Trend / History view selector	**15. Additional Channel access button**
8. Scroll and zoom controls for strip chart	**16. Switch Control Status (if enabled)**

The C6 touch-screen controller is designed for use without a mouse or keyboard, but will recognize them if they are present. A light finger tap on the touch-screen performs the same action as a mouse click on a regular PC. Dragging a finger across the screen surface works the same as dragging a mouse. In places where alphanumeric input is required, the ECoSys software will either show a selection button or allow the call up of a graphic keypad by clicking (tapping) on the entry box.

For certain operations it may be more convenient to use a stylus. A soft plastic stylus or even the cap of a pen will work well. **DO NOT** use any sharp or hard metal objects as a stylus on the touch-screen. Use of such objects, or excessive force, can damage the touch-screen sensors or display finish.

ECoSys software features are accessed through the pull-down menu structure shown in the picture below. Depending on how the system administrator has configured the user groups, certain menu items may be inaccessible to certain users. For a more detailed review of individual functions refer to the User Manual.
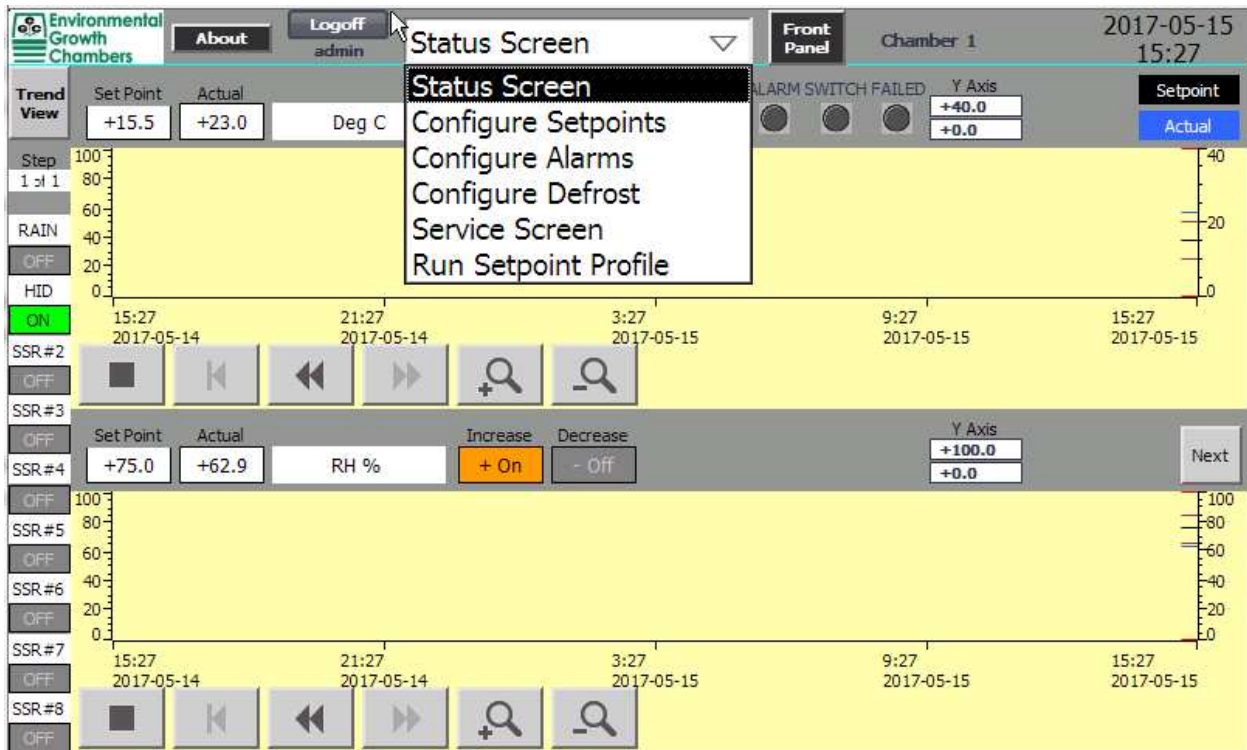
Adjusting the Status Screen Display

Arranging the Channel Status Display

Each control Channel displays its own strip chart on the Status Screen. Channel 1 is displayed on the upper chart and Channel 2 on the lower chart. If only two channels are in use, they will fit neatly within the available display space, as shown in the picture above. If more channels are being controlled, use the Next button screen selector to access them.

Scaling the Strip Chart Display

The graph zoom and scaling controls on the Status Screen are used for changing the displayed graphs to match desired time periods and resolution. Zoom control is reset to default when you leave the Status Screen or when you press the EGC Return (logo) button.

Use the Zoom In and Zoom Out features to change the horizontal scale (X-axis) for controlling the range of the Time and Date on either plot.

Use the Left and Right arrows to move through the horizontal scale (X-axis) to the desired Time or Date. Use the Back arrow to move to the beginning of the plotted data.

Use the "Y Axis" text box to input the desired values to change the vertical scale (Y-axis) for controlling the range of the variable data (temperature, humidity, etc.) on either plot. This feature is very useful to zoom in and view desired data.

Another easy method to return to the default X-axis zoom level is to click the EGC "home" button at the top left of the Status Screen.

Naming the Controls

The Name Tags screen allows users to set specific names for the chamber, each control channel, each control relay and special user designated input alarms. Access this information from the **Service Screen** by using the **Name Tags** button.

Programming

Program Operation

Programmed operation mode allows the user to establish single setpoints or create sophisticated sequences of multiple steps over a 24-hour cycle. Control channels such as temperature and humidity can be continuously varied to simulate diurnal cycles, or changed in sharper increments at predetermined setpoints.

Creating a Program

1. Select the **Configure Setpoints** option from the pull-down menu.

2. The **Configure Setpoint** screen displays the current set of time steps that make up the control program.

    Each column on the setpoint editing screen represents a data point associated with a particular time during the 24-hour program cycle. The arrow buttons can be used to select a specific time step for editing or removal. The **Add/Edit Step** button will create a new time step to edit and insert into the program.

    **Note: It is not strictly necessary to create setpoints in chronological order. Setpoints will be automatically sorted by time when saving the program.

3. To add a setpoint step, click the **Add/Edit Step** button and enter a time, in hours and minutes. The time must be entered using a 24-hour clock and must include the colon (:) or decimal (.) between hours and minutes. Enter the desired values for the control channels in the boxes next to the channel names. Click the relay buttons **(SSR)** to set the desired on/off switching status. When all data is entered correctly, click the **New** button to add the column to the existing setpoints shown above.

4. To edit an existing setpoint, click on the Step number or use the arrow buttons to select the desired step.

5. Enter the desired values for the control channels in the boxes next to the channel names.

6. Click the SSR buttons to set the desired on/off switching status of lights or other devices.

7. When the desired setpoints have been programmed, click the button marked **Save**. The saved program takes effect immediately.

8. To delete an existing setpoint, click on the Step number or use the arrow buttons to select the desired step and click the **Delete** button. Click **Confirm** to delete the selected step.

9. Use the button labelled **Select Ramp** to turn automatic ramping on/off. **NOTE**: The label will read **Ramp ON** if ramping is already selected.
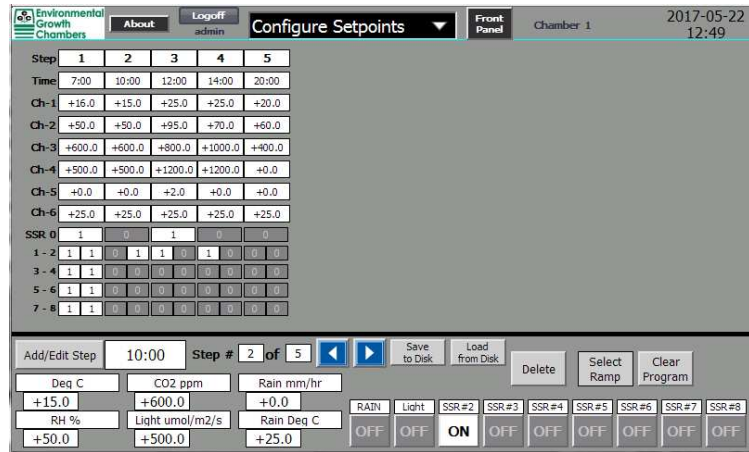
Ramping is a control feature that provides straight-line variation between setpoints. This will smooth out sharply-stepped variations and create a more natural transition between setpoint values. With ramping turned off, the control will change temperature and other control channels in sharp steps. In either case, the actual response time to program commands will depend on the size and mechanical equipment of the chamber. Ramping is either on or off for the entire program, not per step; AND affects all control channels.

10. To Clear the Setpoint program, click the **Clear Program** button then click Confirm to erase all steps of the program. This action resets the program to a single step with setpoints equal to the current conditions in the chamber and all SSR's off.

Note: If it is desired to operate the chamber at a steady state, program a single setpoint value. For normal operation, do not use the **Manual Setpoint Override** option from the **Service Screen**. Manual operation mode is intended for service diagnostics only.

Defrost Operation

When operating chambers below 10ºC / 50ºF, a defrost cycle is required to keep the evaporator coil free of ice. At and below these temperatures, the evaporator coil is likely to be operating below freezing and any moisture adhering to the coil will form ice. A periodic defrost cycle will heat the coil and melt the ice before it can affect chamber temperature control.

Configuring Defrost
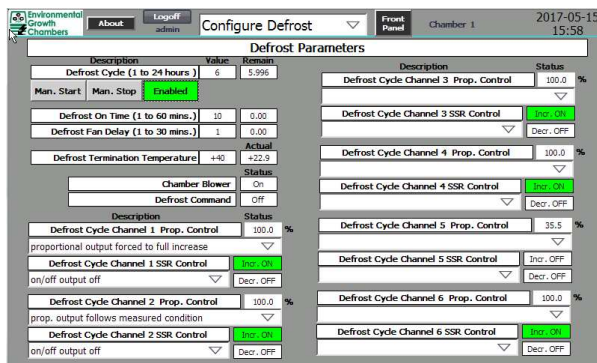
Use the **pull-down** menu to access the **Configure Defrost** screen.

The **Man. Start** and **Man. Stop** buttons provide a means to manually control defrost.
The **Enable/Disable** button activates automatic defrost cycles or prevents their operation.

Refer to the complete **User Manual** for more detailed information on defrost setup and operation.

Data Logging

The ECoSys software automatically collects and stores data per a user set interval from the chamber during normal operation. This data is used to update the on-screen display once a minute on a continuous basis. Log data for each control channel is saved to SD Card media. Data is stored as text in CSV files. In the event the SD Card media is not installed, historical data is not logged at all.

Viewing Logged Data

Pressing the **Trend View** button on the **Status Screen** switches the display to **History View**. This action reads all available data for the selected channel from the SD card and displays it onscreen. The view can be zoomed in and out to find desired data, just like in **Trend View**. While in **History View**, on-screen data is no longer updated. Click the button again to return to **Trend View** and real-time data. Historical data is displayed for ten minutes and then the system automatically returns to **Trend View**.
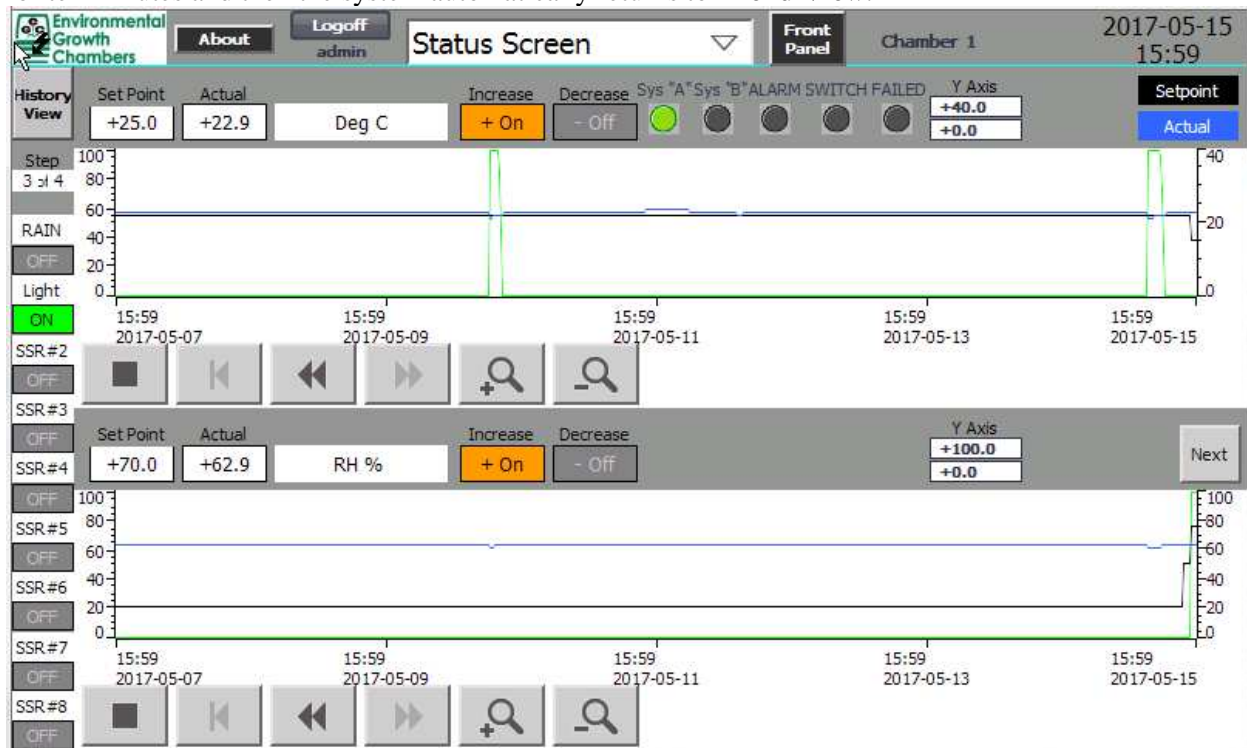
Data Log Files

SD Card stored data can be accessed and copied or saved to other media by reading the SD Card. Data files are found on the Storage Card SD in the **Logs** folder.

A data file is created for each control channel for historical control and alarms. These files are named *Channel_xx.csv* and *Alarm_log_xx.csv,* where *xx* = the channel number.

Log File Format

The data log files are written as comma-separated-values (CSV) text files. Data is stored on the SD card within the Logs folder in a file named ECoSysDataLog.csv. Each data point recorded consists of one of data in the file. There are other files located in the Logs folder that are used by the system and for other advanced processes.

Refer to the complete **User Manual** for more detailed information on logged data.

Below is a partial example of a single set of recorded data.

| DateTime	Chamber	CH1_SP	CH1_PV	CH1a_PV	CH1_ALL	CH1_AHL	CH1_RLL	CH1_RHL	SSR_0	SSR_1	SSR_2	SSR_3	SSR_4	SSR_5	SSR_6	SSR_7	SSR_8
5/19/2017 10:51	Rm 1240C	4	4.1	-40	0	40	-5	5	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
5/19/2017 10:57	Rm 1240C	4	4	-40	0	40	-5	5	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
5/19/2017 11:02	Rm 1240C	4	4	-40	0	40	-5	5	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
5/19/2017 11:07	Rm 1240C	4	3.9	-40	0	40	-5	5	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
5/19/2017 11:12	Rm 1240C	4	4	-40	0	40	-5	5	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE

Alarms

The ECoSys software includes both relative and absolute alarm limits for each control channel. The relative limits correspond to the magenta lines that run parallel to the black setpoint lines on the display graphs. Absolute alarm limits are displayed as red lines on the display graphs.

Configuring Alarms

You can select how the system responds to absolute alarm settings as follows:

1. Select **Configure Alarms** from the pull-down menu.

2. Use the **Off/Enbl** buttons to specify how the system is to respond to each alarm level. Note that the **ALARM N.O.** and **ALARM N.C.** buttons have no functionality unless the chamber has these options installed.
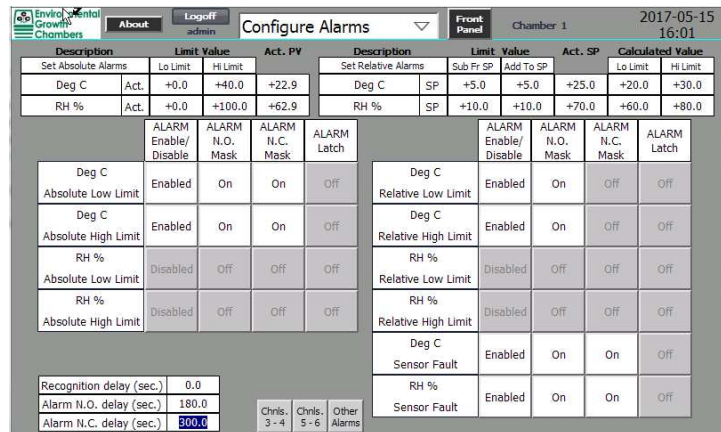
Enabling the **ALARM Latch** function will keep an alarm active until it is cleared, even if the original error condition no longer exists. With latching off, an alarm is automatically cleared if the condition passes (i.e. a temporary temperature shift). However, it will still be recorded in the alarm log.
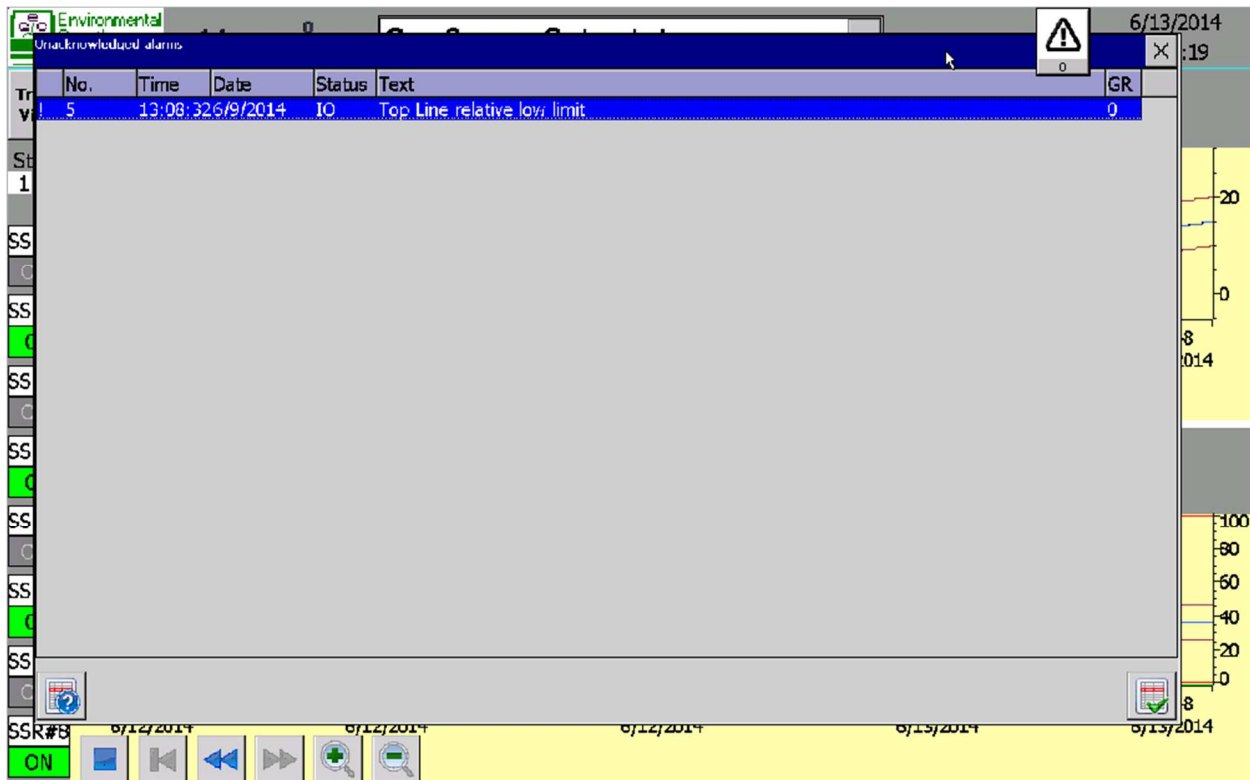
3. The input fields at the top of the screen under **Setpoint Value** are used to set desired alarm limits; **Sub Fr SP / Add To SP** for relative alarms. **Lo Limit / Hi Limit** for absolute alarms.

4. Alarm delays are available if desired and can be set at the lower left of the screen by Recognition, N.O. or N.C. Recognition delays any alarm from activating for the time set (seconds). N.O. and N.C. delays any enabled alarm with the N.O. or N.C. Mask set on from activating for the time set. Delays are typically used to avoid nuisance alarms caused by normal use, such as door openings.

Managing Alarms

 When an alarm limit is exceeded, an alarm annunciator appears near the upper right corner of the chamber display window and will blink while there is an active alarm. The number shown on the annunciator indicates the quantity of active alarms. Click this button to view and acknowledge alarms.
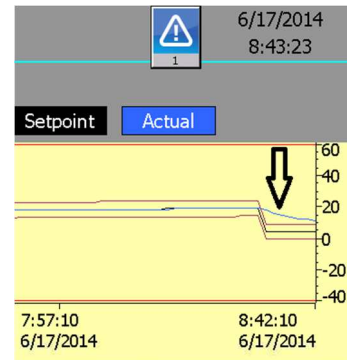
The **Unacknowledged Alarm** window displays a list of all alarms that have occurred and have not been cleared by the user.

Click on an alarm listing to select it and then press the acknowledge button to clear the alarm.

To view the full alarm history, access the **Service Screen**, and click on the **Alarm History** button.

	No.	Time	Date	Status	Text
EVT	5	15:16	2017-05-15	On	SCL-Normal Run Mode
EVT	3	15:16	2017-05-15	On	SCL-System A Run
!	32	11:56	2017-05-15	IOA	Compressor fault
!	45	11:56	2017-05-15	IOA	Door Open
!	46	11:56	2017-05-15	IOA	User Defined #1-External Fault
!	48	11:56	2017-05-15	IOA	User Defined #3-External Fault
!	47	11:56	2017-05-15	IOA	User Defined #2-External Fault
!	47	11:56	2017-05-15	IO	User Defined #2-External Fault
!	47	11:56	2017-05-15	I	User Defined #2-External Fault
!	47	11:56	2017-05-15	IO	User Defined #2-External Fault
!	47	11:56	2017-05-15	I	User Defined #2-External Fault
!	48	11:55	2017-05-15	IO	User Defined #3-External Fault
!	48	11:55	2017-05-15	I	User Defined #3-External Fault
!	48	11:55	2017-05-15	IO	User Defined #3-External Fault
!	48	11:55	2017-05-15	I	User Defined #3-External Fault
!	48	11:55	2017-05-15	IO	User Defined #3-External Fault
!	48	11:55	2017-05-15	I	User Defined #3-External Fault
!	46	11:55	2017-05-15	IO	User Defined #1-External Fault
!	46	11:55	2017-05-15	I	User Defined #1-External Fault
!	45	11:55	2017-05-15	IO	Door Open
!	45	11:55	2017-05-15	I	Door Open
!	32	11:55	2017-05-15	IO	Compressor fault
!	32	11:55	2017-05-15	I	Compressor fault

The alarm limits are preset as part of the initial system configuration. Settings for actual use must be determined and configured by the user. Contact the system administrator or refer to the **User Manual** for more detailed information on alarm functions.

The **Status** column indicates the log entry type.
> **I (Incoming)** – indicates an alarm has occurred and is active (the condition exists).
> **A (Acknowledged)** – indicates the alarm has been acknowledged by a user. The alarm condition may still exist.
> **O (Outgoing)** – indicates the alarm is no longer active (the condition no longer exists).

The Switch Control Logic feature includes event records when a normal event occurs. These entries are note as "**EVT**" at the left side of the entry. Events are not annunciated on screen nor do they require user acknowledgement.

SSR Timers

The ECoSys software records the elapsed time of each Solid State Relay (SSR) as well as the Power Cycle Count. Access this information from the **Service Screen** by using the **SSR Timers** button.

The **SSR Timers** list the Elapsed On Time for each of the eight Solid State Relays, shown in hours. The Power Cycle Count shows how many times the controller has been powered on.

| Elapsed On Time		
	Description	Value (hrs.)
SSR#1	Elapsed On Time	428.5
SSR#2	Elapsed On Time	1.9
SSR#3	Elapsed On Time	428.5
SSR#4	Elapsed On Time	1.9
SSR#5	Elapsed On Time	428.5
SSR#6	Elapsed On Time	1.9
SSR#7	Elapsed On Time	428.5
SSR#8	Elapsed On Time	0.5
	Power Cycle Count	16

Security and Access Control

Security for the C6 Control System is provided within the ECoSys software through the **Admin Screen**. In order to access this screen, an administrator must be logged on.

The **Admin Screen** provides access to two functions: user and password control; and the Exit function to quit the ECoSys software.

Navigating to the Admin Screen

Use the pull-down menu and select the **Service Screen**, access the **Admin Screen** using the **Admin** button.
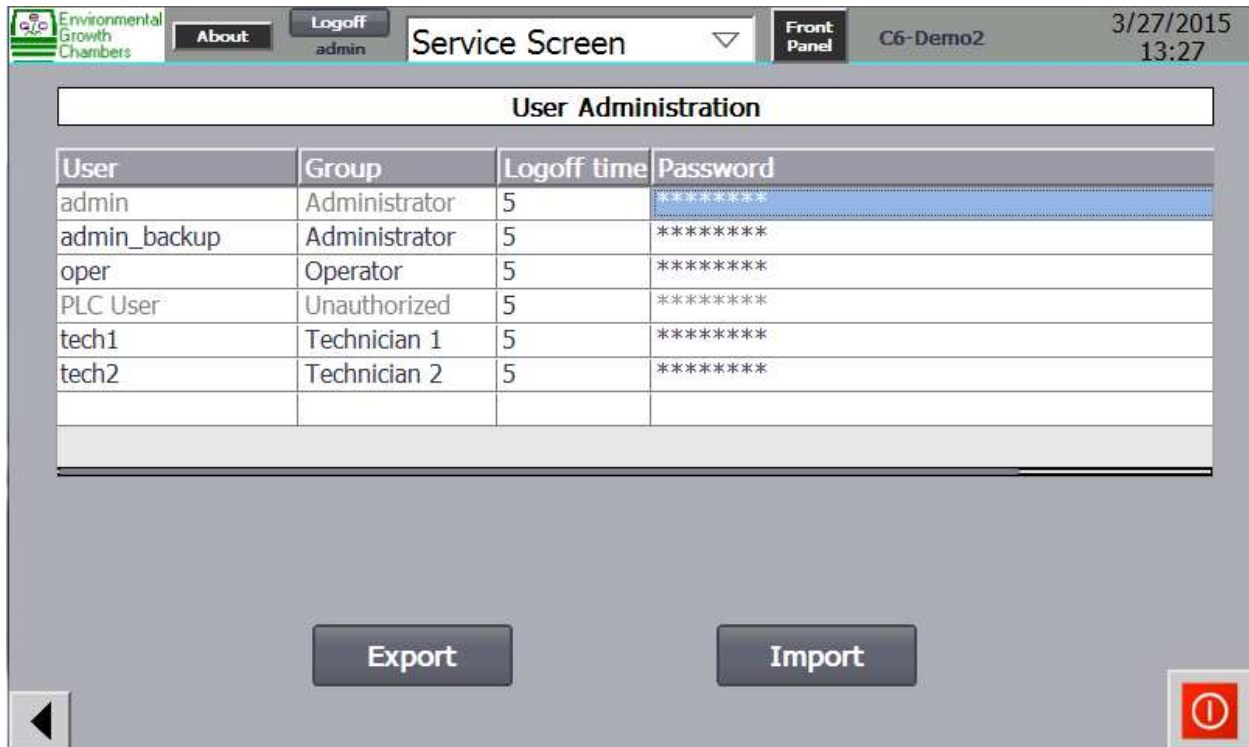
User Access and Password Control
The C6 controller includes four levels of password protection to control access to different screens and functions.

Administrator – has access to all functions including **User Administration**.

Technician 1 – has access to all functions except **User Administration**.
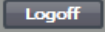
Technician 2 – has access to setpoint programming, alarms and defrost operations. But has no access to **Service Screen** functions and **User Administration**.

Operator – has access only to basic viewing, setpoint programming and operational functions.

Unauthorized – has no access and is used to keep a user listed but deny access.

The **Status Screen** and **Front Panel** can be viewed without logging on by anyone.

An administrator can:

1. **Change** a user's password by double-clicking on the user's password field and completing the new password entry pop-up window.
2. **Change** a user's assigned security group by double-clicking on the user's group listing and selecting a new group from the pull-down menu.
3. **Add** a new user by double-clicking on the blank **User** field at the bottom of the list and completing the entries for the new person.
4. **Change** Logoff time by double-clicking the desired entry and setting a new value. A logoff occurs automatically after the set amount of time has expired following logon, regardless of activity.
5. **Use** the [Logoff] **Logoff** button to log out of the system manually.
6. **Use** the back button [◀] to return to the Service Screen.
7. **Export or Import** the Username and Password encrypted file.
8. **Use** the Quit button to exit the ECoSys software to the Windows™ CE desktop. [⏻]

Screen Access using Passwords

When the controller is in the protected mode, access to all screens is disabled and users can only view the current display. To access the pull-down menu functions it is necessary to enter a password.

The date and time display at the top right of the screen is the actually the **Logon** button. Click on this button to display the logon window.

After a correct username/ password is entered the appropriate screen options will be activated. If an invalid password is entered the control will go into protected mode. Three incorrect password attempts will cause a user to become "unauthorized" and will require re-enabling by an administrator.

Once a user is logged on, the screen header bar will display a **Logoff** button and the name of the current user next to the **About** button.

To return the controller to protected mode after a user session click the **Logoff** button on the header bar.

NOTE: Auto logoff will occur at the end of the time period set up for the user when there is no activity.

The Front Panel button accesses a working screen to control alarm horm operations and select a given channel's ON/OFF output to OFF all the time, ON all the time, or AUTO where the output follows the control setpoint. This feature does not affect a channel's analog output.
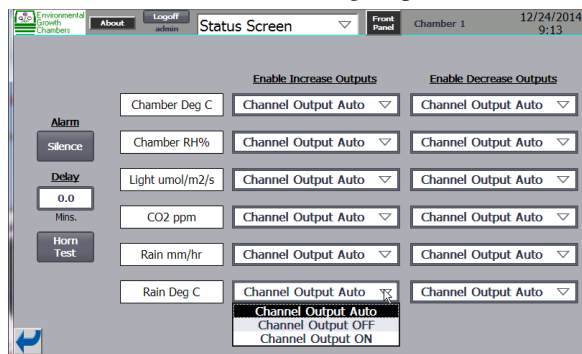
Switch Control Logic (SCL)

Switch Control Logic is an advanced designed for system with redundant mechanical system. During normal operation the logic duty cycles the system on a regular schedule. In the event of malfunction, the logic automatically switches operation to the redundant system and annunciates alarms.

Setpoint Profiles (Seasonal Programming)

Another advanced feature called Setpoint Profiles is accessed through the Run Setpoint Profile screen. This special feature reads a user developed control profile file and executes it for any period of time desired.
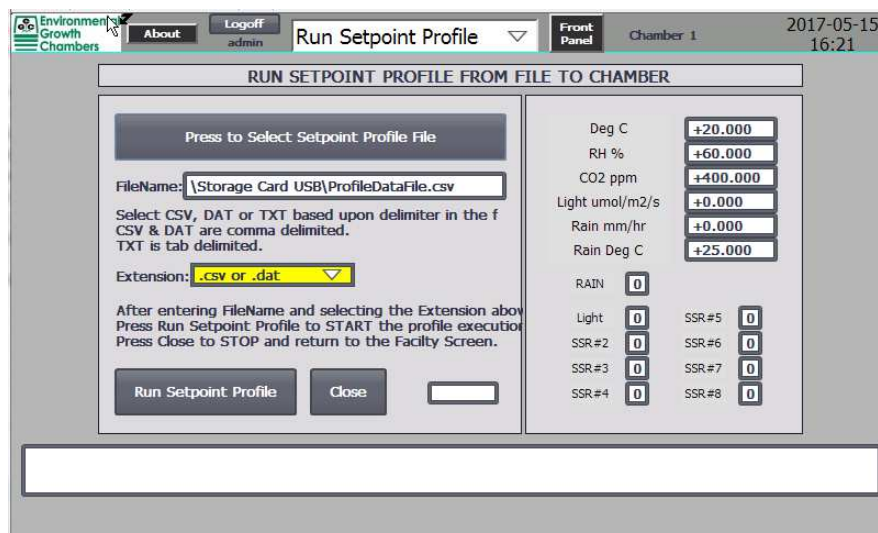
Please refer to the **User Manual** for complete information regarding these advanced features.

Technical Assistance

About this Program

About this Program is accessed from the **Status Screen** using the **About** button and displays valuable information including support address and phone numbers and software version information. Please have this information available anytime you contact EGC for technical help.