

# FDC KilnView Manual



# KilnView Manual

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## What is KilnView?

KilnView is a SCADA and configuration package for FDC 300 series digital backup controllers and FDC-2010-K5C Kiln control system. Note the limitations below on FDC-2010-K5C version 2.x and above.

The FDC-2010-K5C firmware version 1.x is fully compatible with KilnView.

***(Note: KilnView v1.1 is only compatible with FDC-2010-K5C when configured as a Kiln only control system with the limitations shown at bottom of this page.)***

***KilnView v1.1 is not compatible with the FDC-2010-K5C v2.x when configured as a Pallet Heat-Treat only or Combination Kiln Pallet Heat-Treat control system while operating in the Pallet Heat-Treat mode.)***

Data from each device can be viewed and changed from the Windows® base KilnView package. Connection to controllers is accomplished via an RS485 (one to many) connection.

KilnView provides a rich set of tools for control interaction and data analysis. View Control data in Kiln Faceplate, digital, trend or bargraph format. Change setpoint, tuning parameters, alarm setpoints or units for any controller on the link.

The KilnView software can monitor up to 64 devices. Any of these 64 devices can have their data saved to the hard disk at user-defined rates. Data file analysis tools (digital and auto-trend) make looking at schedule run data a simple task.

The project based approach to the software make setup for different product runs a “snap” and easy for operators to work with.

## Important:

### KilnView Limitations when used with FDC-2010-K5C version 2.x or greater

KilnView version v1.1 is current as of April 2008.

The FDC-2010-K5C v2.x was released April 2008 that includes features that are not compatible with KilnView v1.1

#### KilnView and FDC-2010-K5C configured in Pallet Heat-Treat Mode

**KilnView v1.1 should NOT be used in applications where the FDC-2010-K5C is configured as a Pallet Heat-Treat only or as a Combination Kiln and Pallet Heat-Treat control system.**

KilnView v1.1 will NOT accurately communicate with the FDC-2010-K5C v2.x while running in the Pallet Heat-Treat Mode. KilnView will NOT generate communication error logs AND the operator may not be aware that the temperature values shown on KilnView's display DO NOT reflect the Kiln's temperature values & control action depicted while the FDC-2010-K5C is running in the Pallet Heat-Treat mode.

#### KilnView and FDC-2010-K5C configured in Dry Kiln Mode

KilnView v1.1 will communicate with the FDC-2010-K5C v2.x while in the Kiln Mode.

***KilnView may only be used with the FDC-2010-K5C v2.x when configured in the Kiln only mode with end user understanding the limitations below.***

#### KilnView Limitations when communicating with FDC-2010-K5C v2.x:

- KilnView must not have optional temperature inputs configured as MC sensors – all optional sensors must be configured within KilnView to be temperature.
- EMC: KilnView does not display nor can it configure Schedules logic based on EMC value shown on the FDC-2010-K5C color touch screen display.

## What You Need To Run KilnView

PC: 2GHZ Pentium4 with 128MB of Ram.

KilnView will run on a lesser machine but performance could suffer if large trend buffers are used. Serial port #1 must be available on the computer.

Win2000 and WinXP Professional operating system supported.

When using the security options WinXP Professional is recommended.

KilnView was developed on WinXP Professional. Although KilnView compatibility testing was done on Win98 (ver2), NT4.0 (SP6A), 2000 and XP, we found that XP Professional (SP1) offered the best system stability of all operating systems tested. System security implementation on XP Professional was also our first choice during testing.

All examples for setup of security are given using WinXP Professional.

Controller models 300 series or FDC Kiln controllers with RS 485 communications.

When using RS 485 communications (PC to many controllers) an RS485 to RS232 converter is required. Future Design Controls offers the model SN-10A converter for this purpose.

These devices convert the RS232 signal from a computer to an RS 485 multi-drop communications signal. A straight through 9-pin to 9-pin cable is required for connection from the PC to the converter.

**See the troubleshooting section of help for more data.**

### Note:

1. **Windows® is a registered trademark of the Microsoft Corporation.**
2. **This manual covers the KilnView PC software interface. For detailed operation and configuration of the Orion kiln controller, please see Orion controller manual for p/n# FDC-2010-K5C.**

## KilnView Configuration

For proper operation KilnView Configuration must match the FDC-2010-K5C configuration. Therefore it is important that the exact FDC-2010-K5C configuration is documented and available when configuring KilnView.

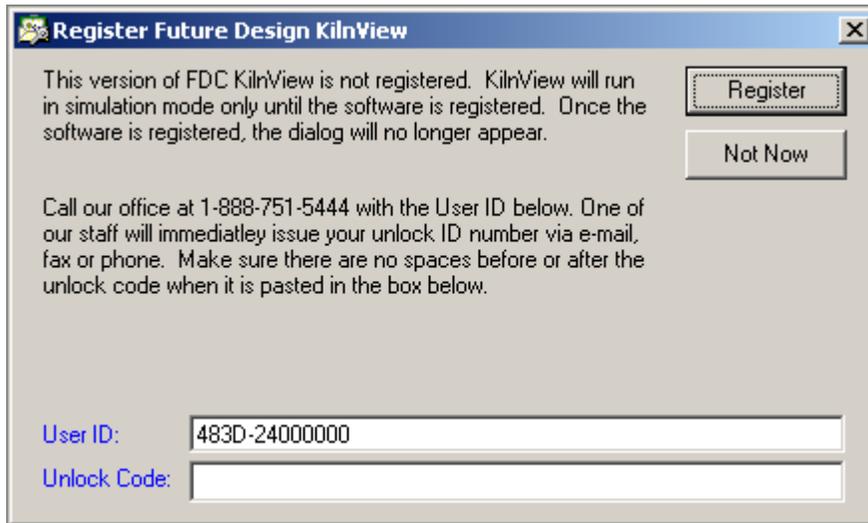
The Kiln OEM or your installer is responsible to properly configure the FDC-2010-K5C Kiln Control System and KilnView PC based software.

Note: the referenced KilnView Configuration is different than the setup & configuration covered in this manual.

For future information review ***KilnView Configuration Manual*** available on our site or through your supplier.

## Registering Software & obtaining Unlock Code

The KilnView software package must be registered to operate properly on a PC. After installation, when the software is first started, the following screen will be displayed:



The User ID displays a code specific to the PC that the software is being installed on. Call Future Design with the User ID code and we will immediately email an unlock code (or give it over the phone) to register the software. Once the software is registered, the "register" dialog will no longer appear during software startup.

If you choose not to register the software, KilnView will run in simulation mode only (will not communicate with kiln or single loop controllers) until the software is registered.

## Setting Up The FDC 300 Series Single Loop Controllers

Setting up a FDC 300 series controller(s) for KilnView is quick and easy.

It's also essential to ensure the system will work properly. The following procedure is only used when 300 series backup controllers are attached to the system. The FDC-2010-K5C Orion Kiln Controller is setup from the factory and requires no configuration to communicate with KilnView.

- 1) Make sure the controller is wired properly and powered up.
- 2) Press the "Scroll" (far left) key and "down" key simultaneously
- 3) "Set" will be shown on the top display. Press the "Scroll" key to enter the setup mode.
- 4) The first prompt on the top display is "FunC", use the "up" or "down" arrow until the bottom display reads "FuLL". Press the "Scroll" key to move to the next prompt.
- 5) "Conn" will be the next prompt, press the "up" or "down" arrow until the bottom display reads "485". Press enter to move to next prompt.
- 6) "Prot" will be the next prompt, press the "up" or "down" arrow until the bottom display reads "rtu". Press enter to move to next prompt.
- 7) "Addr" will be the next prompt, press the "up" or "down" arrow until the bottom display reads "1 to 64". Each controller must have a unique address on the communications link. When activating controllers in the software you will click next to the address to turn the controller on/off. Press enter to move to next prompt.
- 8) "bAud" will be the next prompt, press the "up" or "down" arrow until the bottom display reads "9.6". Press enter to move to next prompt.
- 9) "dAtA" will be the next prompt, press the "up" or "down" arrow until the bottom display reads "8bit". Press enter to move to next prompt.
- 10) "Pari" will be the next prompt, press the "up" or "down" arrow until the bottom display reads "EvEn". Press enter to move to next prompt.
- 11) "StoP" will be the next prompt, press the "up" or "down" arrow until the bottom display reads "1bit". Press enter to move to next prompt.

**That's it! Press the "up" and "down" keys simultaneously on the controller to revert the controller back to the "Control" Mode.**

**FDC Kiln controllers have their address set a the factory and require no configuration by the user for network address settings.**

## Turn On Devices In KilnView

The "**Controller Labels/Activation**" menu under the "Setup menu allows the user the enable/disable any controller attached to the PC. This can be done in any order (Controller addresses do not have to be in sequence for the system to work properly)

The following activation dialog will be shown when the "Controller Labels/Activation" menu item is selected.

Enter a tagname for each of the column headings below. Select the "type" of control using the drop down listBox. Click on the controller status checkbox to enable or disable scanning of the controller:

Ctrl#	Status	Control Type	Device Name	PV Tag	SP Tag
1	<input checked="" type="checkbox"/>	FDC Kiln Control	Kiln #1	Dry Bulb	Dry Bulb SP
2	<input checked="" type="checkbox"/>	FDC Kiln Control	Kiln #2	Dry Bulb	Dry Bulb SP
3	<input checked="" type="checkbox"/>	FDC 300 Series	Device #3	Controller 3 PV	Controller 3 SP
4	<input checked="" type="checkbox"/>	FDC 300 Series	Device #4	Controller 4 PV	Controller 4 SP
5	<input type="checkbox"/>	FDC 300 Series	Device #5	Controller 5 PV	Controller 5 SP
6	<input type="checkbox"/>	FDC 300 Series	Device #6	Controller 6 PV	Controller 6 SP
7	<input type="checkbox"/>	FDC 300 Series	Device #7	Controller 7 PV	Controller 7 SP
8	<input type="checkbox"/>	FDC 300 Series	Device #8	Controller 8 PV	Controller 8 SP
9	<input type="checkbox"/>	FDC 300 Series	Device #9	Controller 9 PV	Controller 9 SP
10	<input type="checkbox"/>	FDC 300 Series	Device #10	Controller 10 PV	Controller 10 SP

**Communications**  
 Scan each controller every  msec  
 Enable beep on comms error :

**System Alarms**  
 Enable alarm logging :   
 Enable single beep on new alarm :   
 Beep until any alarm is acknowledged :

Controllers not scanned while this dialog is active. Decimal position for backup scheduler:

Buttons: Cancel, Done

Turning on a controller is as easy as a click of a button. Double click in the grid to enter a tagname for controller process value, setpoint and percent output (DB temp, DB SP and DB % Out when using FDC Kiln controller). Enable/disable the controller by clicking on the checkbox in the "Status" cells. Select the type of controller with the drop down box in each row. When using the FDC-2010-K5C Kiln Controller [up to 16 Kiln Controls], an additional 12 tagnames will appear for each device. These additional tagnames are used for Wet bulb, core probe and extra probes attached to the system (extra probe types are dependent upon FDC-2010-K5C version 1.x or 2.x). Only enter tagnames for the probes that are equipped on the system. If you leave a tagname blank, it will not be included in the tag database for data save, trending, etc.

### Controller types supported:

- 1.) FDC 300 Series Single Loop Controllers:
- 2.) FDC-2010-K5C configured as a "Kiln only" or "Combination Kiln & Pallet Heat-Treat controller".  
 KilnView use with the FDC-2010-K5C while in the Pallet Heat-Treat mode is prohibited; KilnView does not communicate with the FDC-2010-K5C hardware while in the Pallet Heat-Treat control mode.

The "**Enable-disable beep on comm error**" allows an operator to select if a computer generated "beep" should occur during a communications error with a controller. The logger will store all data related to communication errors.

The "**Enable-disable alarm logging**" checkbox allows an operator to enable or disable the alarm-logging feature. Real time alarms will still be printed to the system alarm log, but disk based historical recording of alarms will be turned off if this feature is disabled. If enabled, the alarm log will be written each time an alarm occurs or when a user deletes, acknowledges or clears an alarm(s). A new alarm log is created every day.

The "**Enable single beep on new alarm**" checkbox allows an operator to enable a single computer beep whenever a new controller alarm is activated.

The "**Beep until any alarm is acknowledged**" checkbox allows an operator to enable a continuous computer beep on new alarm, until the alarm is silenced using the "alarm silence" icon located on the toolbar of the alarm window. The "**Dec position For Kiln/300 series profiler**" field allows an operator to set the decimal position for viewing on the kiln detail monitor view. Field is adjustable for a value of 0 or 1.

## KilnView Security Features

KilnView security is built around the standards required for the pharmaceutical industry. The security features were modeled around this standard to offer the most secure method of data collection as well as support for digital signing of data files. All data in KilnView is encrypted and tamperproof. Export functions provide access to data using standard PC programs without altering the original file.

21 CFR Part 11 began in 1991 when the pharmaceutical industry requested guidance from the FDA regarding the best way to implement electronic systems in the manufacturing process and meet FDA approval.

The FDA rule was announced in 1997 with 80% of the rule concerning electronic records with the remaining 20% covering electronic signatures.

Part 6 provides the definition for an electronic record, which covers any document or data that is created, maintained, modified, retrieved, archived or transmitted electronically. The electronic signature part of the Rule informs the reader about the requirements for acceptable electronic signatures.

A 21 CFR Part 11 system provides the means to audit and track all user interface and system operations. This ensures accurate repeatable electronic record keeping and verification of all steps in the electronic record keeping process.

### **KilnView Security features:**

- 1.) Security: KilnView security features can be enabled on Windows® NT4.0, Win2000 and WinXP professional operating system. Although KilnView will run on Win98 (ver2), security features are disabled. XP Home versions are not supported since the security features will be activated but the operation system is intended for home users and not business use.
- 2.) User Database: KilnView uses Windows® built in security database. Administrators are required to make a single entry only for each user in the main Windows® security database. All logins from KilnView are checked against this database for user authentication. All security policies assigned to password expiration and lockout apply, and will be enforced when logging on in KilnView.
- 3.) User Access: All software functionality is controlled by the administrator in the "User Access" portion of the software. Any software function that changes the process or creates data for the process requires a confirmation login to authenticate the user before the process change is made.
- 4.) Audit Trail: KilnView keeps a daily audit trail of all functions initiated by the software or a user. UserID, full user name, user description and user comment as well as the action is written to the audit trail. All login failures are written to the audit trail as well.
- 5.) Data Encryption: All data files, signature files and audit trails are encrypted for tamper proof operation. These files can only be decrypted by the KilnView software and are view only. Data files can be printed or exported from the KilnView software. Original data files cannot be altered.
- 6.) Electronic Signatures: All data files can be electronically signed with the proper user access rights and authenticated login. An encrypted "message digest" is also calculated for each file and is used for signature/file verification. If a data file is tampered with or altered, the signature verification function will alert the user.

### **Getting used to security in KilnView:**

The security in KilnView could seem a bit restrictive to operators using the software for the first time.

#### ***Example:***

If an operator is logged on and has access rights to change the controller setpoint, he must log in again during the setpoint change. This is done to protect the process from unauthorized changes if a "logged in" operator leaves the area for a short time and someone changes the setpoint while he is gone. The dual login also provides an audit trail of changes the process undergoes. This protection can be invaluable when trouble shooting batch or problem product runs.

**After a short time the security will become "second nature" with operations personnel.**

## How KilnView implements security

Since KilnView security uses the pharmaceutical industry model, the following overview describes compliance with each section of the rules.

All data below comes from the following document:

Part II  
Department of Health and Human Services  
Food and Drug Administration  
21 CFR Part 11 Electronic Records;  
Electronic Signatures;  
Final Rule Electronic Submissions;  
Establishment of Public Docket; Notice  
William B. Schultz,  
Deputy Commissioner for Policy.  
[FR Doc. 97-6833 Filed 3/20/97; 8:45 am]

**The complete document in text or .pdf format can be found at**  
[http://www.fda.gov/ora/compliance\\_ref/part11](http://www.fda.gov/ora/compliance_ref/part11)

*This help section will not cover the complete document, only the portions with regards to how KilnView deals with electronic record keeping and electronic signatures.*

**PART 11-ELECTRONIC RECORDS;  
ELECTRONIC SIGNATURES**  
**Subpart A-General Provisions**  
**Sec.**  
**11.1 Scope.**  
**11.2 Implementation.**  
**11.3 Definitions.**  
**Subpart B-Electronic Records**  
**11.10 Controls for closed systems.**  
**11.30 Controls for open systems.**  
**11.50 Signature manifestations.**  
**11.70 Signature/record linking.**  
**Subpart C-Electronic Signatures**  
**11.100 General requirements.**  
**11.200 Electronic signature components**  
**and controls.**  
**11.300 Controls for identification codes/passwords.**

### § 11.3 Definitions.

(a) The definitions and interpretations of terms contained in section 201 of the act apply to those terms when used in this part.

(3) Biometrics means a method of verifying an individual's identity based on measurement of the individual physical feature(s) and/or action(s) are both unique to that individual and measurable.

(4) Closed system means an environment in which system access is controlled by persons who are responsible for the content of electronic records that are on the system.

(5) Digital signature means an electronic signature based upon cryptographic methods of originator authentication, computed by using a set of rules and a set of parameters such that the identity of the signer and the integrity of the data can be verified.

(6) Electronic record means any combination of text, graphics, data, audio, pictorial or other information representation in digital form that is created, modified, maintained, archived, retrieved or distributed by a computer system.

(7) Electronic signature means a computer data compilation of any symbol or series of symbols executed, adopted or authorized by an individual to be the legally binding equivalent of the individual's handwritten signature.

(8) Handwritten signature means the scripted name or legal mark of an individual handwritten by that individual and executed or adopted with the present intention to authenticate writing in a permanent form. The act of signing with a writing or marking instrument such as a pen or stylus is preserved. The scripted name or legal mark, while conventionally applied to paper, may also be applied to other devices that capture the name or mark.

(9) Open system means an environment in which system access is not controlled by persons who are responsible for the content of electronic records that are on the system.

### § 11.10 Controls for closed systems.

Persons who use closed systems to create, modify, maintain, or transmit electronic records shall employ procedures and controls designed to ensure the authenticity, integrity, and, when appropriate, the confidentiality of electronic records, and to ensure that the signer cannot readily repudiate the signed record as not genuine. Such procedures and controls shall include the following:

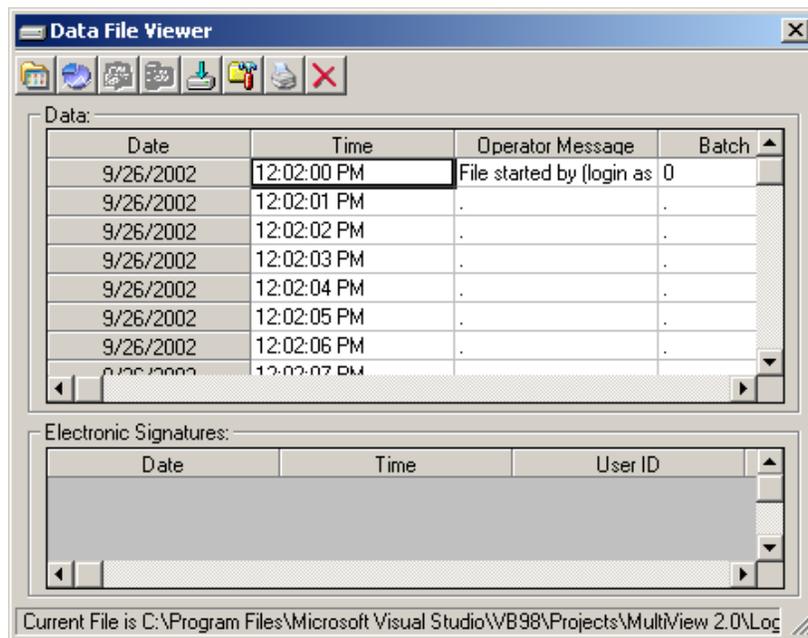
(a) Validation of systems to ensure accuracy, reliability, consistent intended performance, and the ability to discern invalid or altered records.

***KilnView creates all data files with date/time stamps and operator start information in an encrypted format that can only be read by the KilnView viewer. All data files can be signed by individuals with the proper authorization. Digital signatures can also be validated by personnel with the appropriate security. Each signed data file is compared with a unique encrypted code that alerts the user performing the validation if the data file has been altered in any way.***

(b) The ability to generate accurate and complete copies of records in both human readable and electronic form suitable for inspection, review, and copying by the agency. Persons should contact the agency if there are any questions regarding the ability of the agency to perform such review and copying of the electronic records.

***Since all KilnView files are encrypted for "tamper proof" operation, data files, audit trails and alarm logs can only be read by the built in KilnView "viewers". All text and trend data can be printed in human readable and electronic form suitable for inspection. Data can also be exported to .csv files for analysis or manipulation in spreadsheet programs. The original data is not altered in any way.***

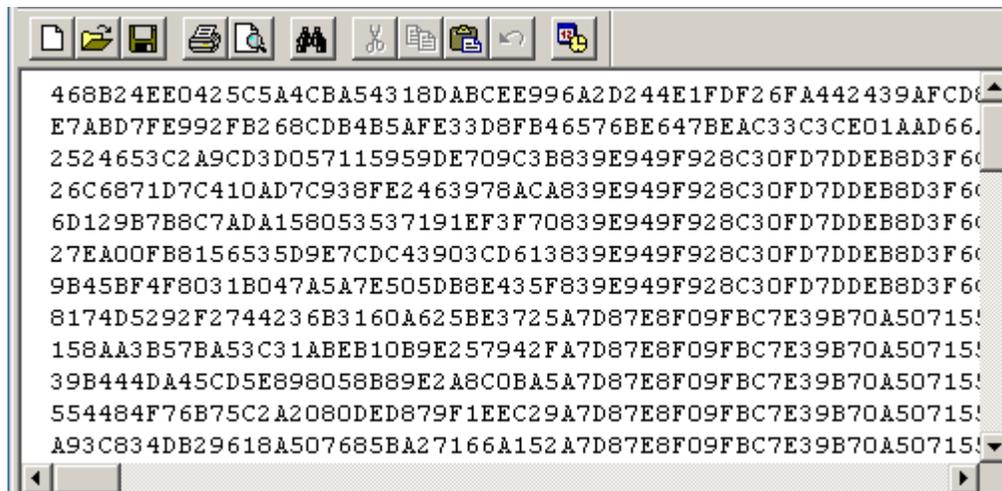
**KilnView Data Viewer:**



(c) Protection of records to enable their accurate and ready retrieval throughout the records retention period.

***KilnView records are protected from changes by encrypting all data written to files. The responsibility of protecting directories, files and folders is in the hands of the personnel setting up the computer or system security.***

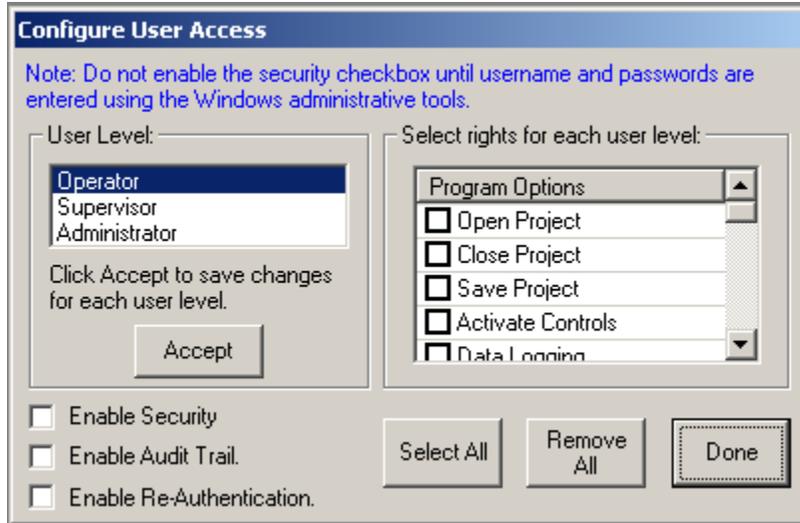
**KilnView Encrypted File Sample:**



(d) Limiting system access to authorized individuals.

***KilnView uses Windows® built in security for user authentication so only the systems user database is required for operation. KilnView enforces all user related password security policies including password aging and lockout after (x) number of logins.***

**KilnView User Access Configuration:**



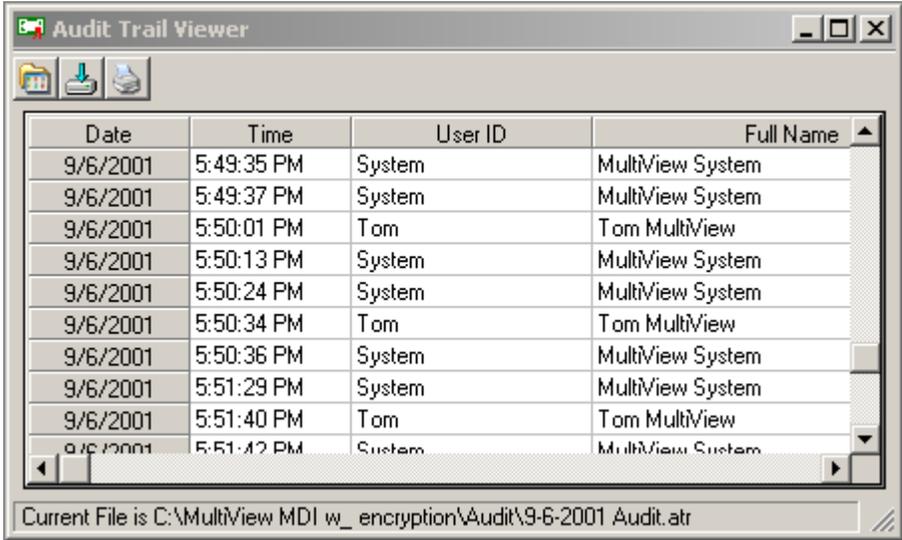
**KilnView Login:**



(e) Use of secure, computer-generated, time-stamped audit trails to independently record the date and time of operator entries and actions that create, modify, or delete electronic records. Record changes shall not obscure previously recorded information. Such audit trail documentation shall be retained for a period at least as long as that required for the subject electronic records and shall be available for agency review and copying.

***KilnView creates a daily audit trail and logs all user related actions to the log. Alarm acknowledgment, start/stop data files, setpoint changes, user logins and unauthorized attempts to gain access to the system are all logged to the audit trail. The audit trail is encrypted and can only be viewed within KilnView. Audit trails can also be printed or exported.***

## KilnView Audit Trail Viewer:



Date	Time	User ID	Full Name
9/6/2001	5:49:35 PM	System	MultiView System
9/6/2001	5:49:37 PM	System	MultiView System
9/6/2001	5:50:01 PM	Tom	Tom MultiView
9/6/2001	5:50:13 PM	System	MultiView System
9/6/2001	5:50:24 PM	System	MultiView System
9/6/2001	5:50:34 PM	Tom	Tom MultiView
9/6/2001	5:50:36 PM	System	MultiView System
9/6/2001	5:51:29 PM	System	MultiView System
9/6/2001	5:51:40 PM	Tom	Tom MultiView
9/6/2001	5:51:42 PM	System	MultiView System

Current File is C:\MultiView MDI w\_ encryption\Audit\9-6-2001 Audit.atr

(f) Use of operational system checks to enforce permitted sequencing of steps and events, as appropriate.

Any changes to the process (i.e. setpoint changed) require the user to login again for authentication before a process change is made. This is to protect the process from access by an unauthorized user if the logged in user walks off for a brief period of time without logging off.

(g) Use of authority checks to ensure that only authorized individuals can use the system, electronically sign a record, access the operation or computer system input or output device, alter a record, or perform the operation at hand.

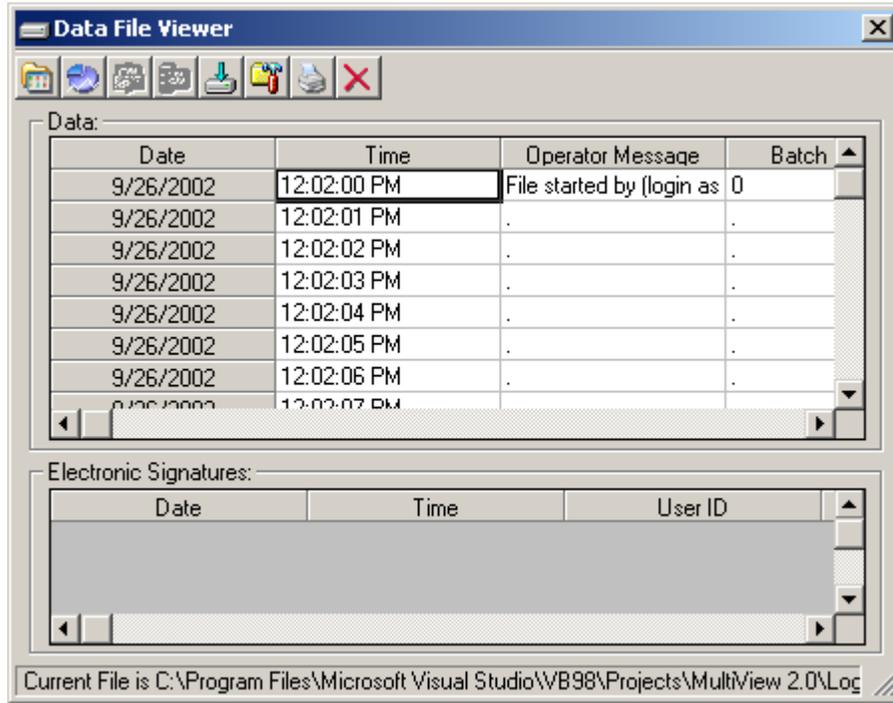
***KilnView uses Windows® built in security for user authentication so only the systems user database is required for operation. KilnView enforces all user related password security policies including password aging and lockout after (x) number of logins.***

### § 11.50 Signature manifestations.

(a) Signed electronic records shall contain information associated with the signing that clearly indicates all of the following:

- (1) The printed name of the signer;
- (2) The date and time when the signature was executed; and
- (3) The meaning (such as review, approval, responsibility, or authorship) associated with the signature.

(b) The items identified in paragraphs (a)(1), (a)(2), and (a)(3) of this section shall be subject to the same controls as for electronic records and shall be included as part of any human readable form of the electronic record (such as Operations (HFC-100), 5600 Fishers Lane, Rockville, MD 20857.



**§ 11.200 Electronic signature components and controls.**

(a) Electronic signatures that are not based upon biometrics shall:

(1) Employ at least two distinct identification components such as an identification code and password.

(i) When an individual executes a series of signings during a single, continuous period of controlled system access, the first signing shall be executed using all electronic signature components; subsequent signings shall be executed using at least one electronic signature component that is only executable by, and designed to be used only by, the individual.

***KilnView requires both components (userID and password) during all digital signatures of files.***

(ii) When an individual executes one or more signings not performed during a single, continuous period of controlled system access, each signing shall be executed using all of the electronic signature components.

***KilnView requires both components (userID and password) during all digital signatures of files.***

**§ 11.300 Controls for identification codes/passwords.**

Persons who use electronic signatures based upon use of identification codes in combination with passwords shall employ controls to ensure their security and integrity. Such controls shall include:

(a) Maintaining the uniqueness of each combined identification code and password, such that no two individuals have the same combination of identification code and password.

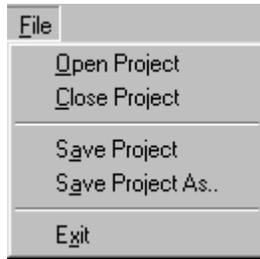
***KilnView uses built in Windows® security and user data database. Windows® user manager provides the means to cover 11.300a. KilnView 21 CFR security features are only enabled on WinNT4.0 (SP6A), Win2000 and WinXP Professional.***

(b) Ensuring that identification code and password issuance's are periodically checked, recalled, or revised (e.g., to cover such events as password aging).

***KilnView uses built in Windows® security and user data database. Windows® user manager provides the means to cover 11.300a. KilnView 21 CFR security features are only enabled on WinNT4.0 (SP6A), Win2000 and WinXP Professional.***

# KilnView Menus

## File Menu Options:



The file menu allows the user to open and save KilnView Projects.

Options are:

- **Open Project:** Allows the user to open a previously saved KilnView project. The project includes controller activation data, tagnames and trend setups. This menu item is not available while a current project is open or data logging is active.
- **Close Project:** This option closes the current KilnView project. All windows active will be closed and their setups and positions saved as default values for the next time the software is started. If data logging is active, a message box will appear and prompt the user to stop data logging before closing the current project.
- **Save Project:** Saves the current project to disk. If the project has not been named, the "Save As" dialog box will be shown to enter a name for the project.
- **Save Project As:** Allows the user to save the current project under a different name

## View Menu Options:



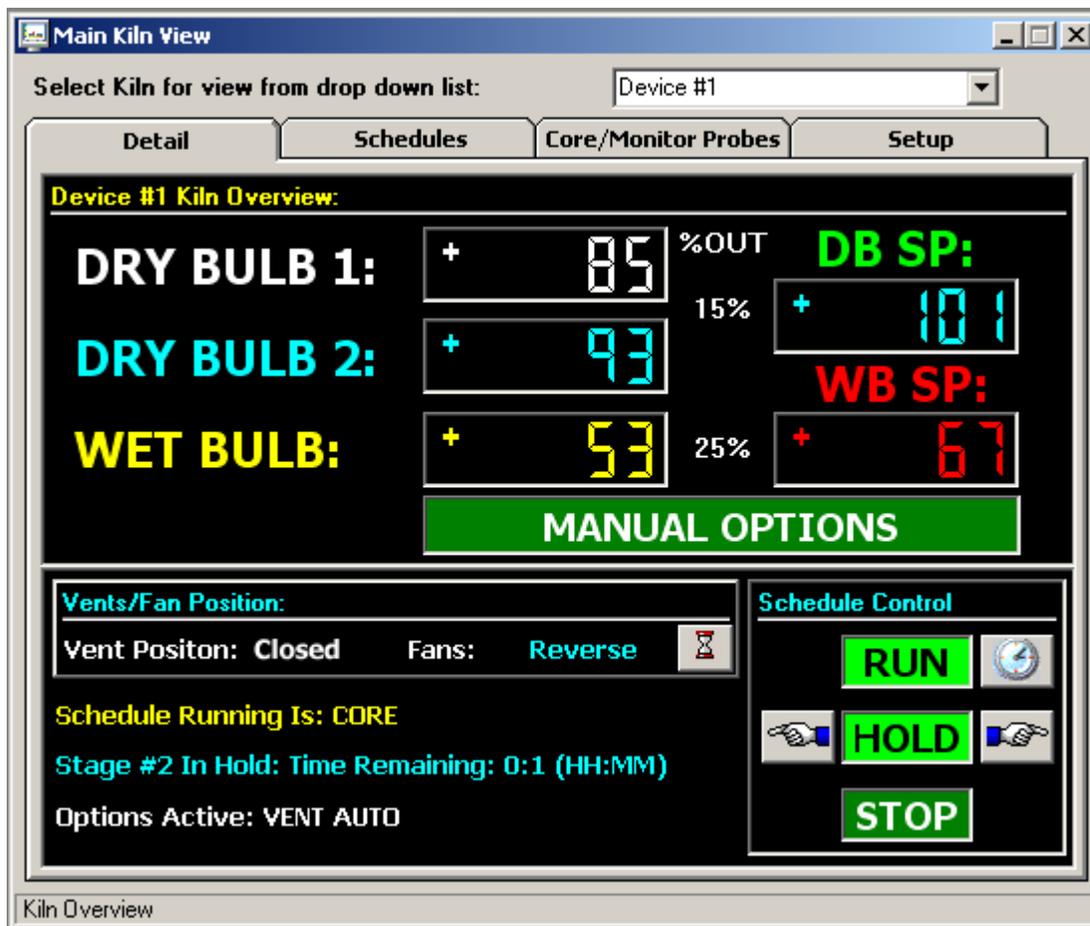
The View menu allows the user to display several windows for data monitoring.

Options are:

<b>Kiln Detail View:</b>	Displays Kiln faceplate with all Kiln data.
<b>Digital Values:</b>	Displays digital values for all kiln controls connected.
<b>Alarm Log:</b>	Displays system alarm log.
<b>Control Trends:</b>	Menu to select up to 8 configurable trend windows.
<b>Bar Graphs:</b>	Bargraph views for backup controllers.
<b>Data File Viewer:</b>	Displays historical data file viewer.
<b>Audit Trail Viewer:</b>	Displays audit trail viewer.

## Kiln Detail View:

The Kiln detail view provides the user with all data related to Kiln operations. The multi-tab interface is broken up into 4 sections.



The Kiln **Detail View** tab provides the user with all current kiln “run” data. This includes data for dry bulb (1 and 2), as well as manual and automated schedule operation control setpoints for dry bulb and wet bulb can be changed any time during schedule run. Schedule name, status and options active are also displayed. While running the system in manual mode, all event outputs (manual options) can be accessed and operated by the user. When running in automatic schedule mode, any setpoints or event options can be modified after the schedule is put into hold. These changes will not affect the saved schedule, only the current stage running in the schedule.

The vent/fans status is displayed and can be changed during schedule run if analog type (not on-off relay) vents/dampers are used in the system. Clicking on the “hourglass” icon will display the time remaining for fan forward, reverse and dwell times if fans are set to auto.

The schedule run, hold and stop buttons allow the operator to run the currently loaded schedule from the PC. If a schedule is not loaded into the controller, the schedule will not be started.

The above screen displays the layout when variable type outputs (analog) are used for heat and spray control, the actual % control output will be displayed between the “Actual and Setpoint” values for dry bulb and wet bulb.

The actual % control outputs for heat and spray are displayed between the "Actual and Setpoint" values for dry bulb and web bulb.

**FDC-2010-K5C firmware version 2.x** (April 2008) provides EMC & %RH on its' main view; KilnView does NOT show these values.

## Ramping Setpoint Control:

When running in automatic schedule mode, the kiln controller will “ramp” dry bulb and wet bulb temperatures to the target setpoints entered in the automatic schedule. During automatic schedule run, pressing the dry bulb and wet bulb setpoint fields will display the target setpoint for the user. Whenever the automatic schedule is put into hold, new target setpoints can be entered by pressing the dry bulb/wet bulb setpoint fields, and entering a new setpoint for each. The system will recalculate the new ramp rate based on time remaining in the stage. Any time schedule time is added or subtracted (while the schedule is in hold), new ramp rates will also be calculated based on the time adjustments made to the stage.

If the automated schedule is in a “soak” stage (current stage setpoints = last stage setpoints), changing the setpoints for dry bulb and wet bulb will result in an immediate setpoint change (no ramp to setpoint). This is done so “soak” stages can be modified without waiting for the complete stage to “time out” before reaching the final setpoint. This offers maximum flexibility for an operator since soak stages can be “long” and require several setpoint changes to maintain kiln “load” requirements.

**Note: When running an automatic schedule, changes to dry bulb/wet bulb, manual events and add/remove time, can only be accessed when the schedule is put into hold. The schedule can then be “continued” with manual changes remaining active until the next schedule stage is entered.**

## Additional Moisture/Weight/Temp Probes: (FDC-2010-K5C version 2.x & above offers temperature probes only)

Up to 6 additional probes can be added to the kiln system. The additional probes can be configured for moisture/weight or temperature probes (all must be configured for one type). When additional probes are configured, the values will dynamically be displayed on the “Core/Monitor Probes” screen. The Orion Kiln system comes equipped with one extra RTD input that can be used for “core” operations (explanation below), if configured to be active in the factory setup.

FDC-2010-K5C version 1.x: When additional probes are configured for moisture/weight probes and a “Mon Probe” setpoint is programmed into an automatic schedule “”, the Kiln detail screen will flash an “=” icon any time the first probe (probes activated per stage are user selectable) drops below the “Mon Probe” setpoint (entered in the schedule). The “equalize output (Q3)” will also be energized. Press the “=” icon to de-energize the equalize output and the “=” icon will disappear. This indication will alert the operator to make manual changes to the schedule once the first moisture/weight probe has fallen below the programmed moisture setpoint.

FDC-2010-K5C versions 1.x and 2.x: When additional probes are configured for temperature probes (temperature only with version 2.x and above) and a “core” setpoint is programmed into an automatic schedule, the schedule will automatically advance to the next “stage” when all probes (probes activated per stage are user selectable) are above the “core” setpoint programmed for the stage. This is useful during “sterilization” processes that require that all temperature probes be above a specific temperature before sterilization “time down” is allowed to continue. Probe usage combinations are selectable per stage when entering an automatic schedule.

When the “Cool Down” stage option is selected, and additional probes are configured for temperature probes with a “core” setpoint programmed into an automatic schedule, the schedule will automatically advance to the next “stage” when all probes (probes activated per stage are user selectable) are  $\leq$  the “core” setpoint programmed for the stage. This is useful during processes that require that all temperature probes be below a specific temperature before the schedule automatically continues to the next stage. Probe usage combinations are selectable per stage when entering an automatic schedule.

FDC-2010-K5C version 1.x: A unique feature is the ability to use the standard “core” RTD input along with up to 6 additional moisture/weight probes. This gives the operator the flexibility of monitoring when the first moisture probe drops below the programmed “Mon Probe” setpoint, and also not continue to the next automated stage until the “core” probe is above the programmed “core” setpoint.

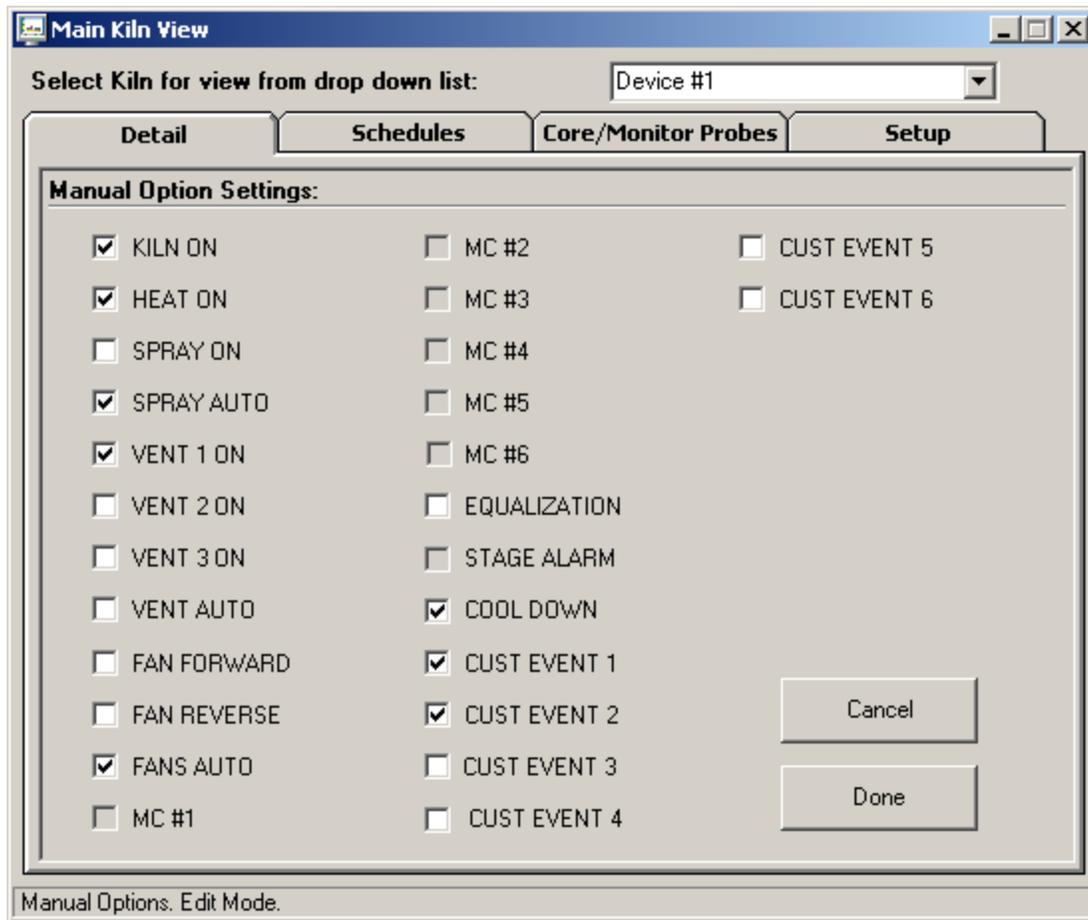
## EMC and %RH: FDC-2010-K5C firmware version 2.x (April 2008)

The EMC display and control logic described below are NOT available in KilnView.

FDC-2010-K5C firmware version 2.x, if so configured, an EMC setpoint is programmed into an automatic schedule, the schedule will automatically advance to the next “stage” when the EMC value is achieved. Instead of a Stage Advance a relay output may be configured when a Stage achieves the EMC setpoint.

## Manual Options View:

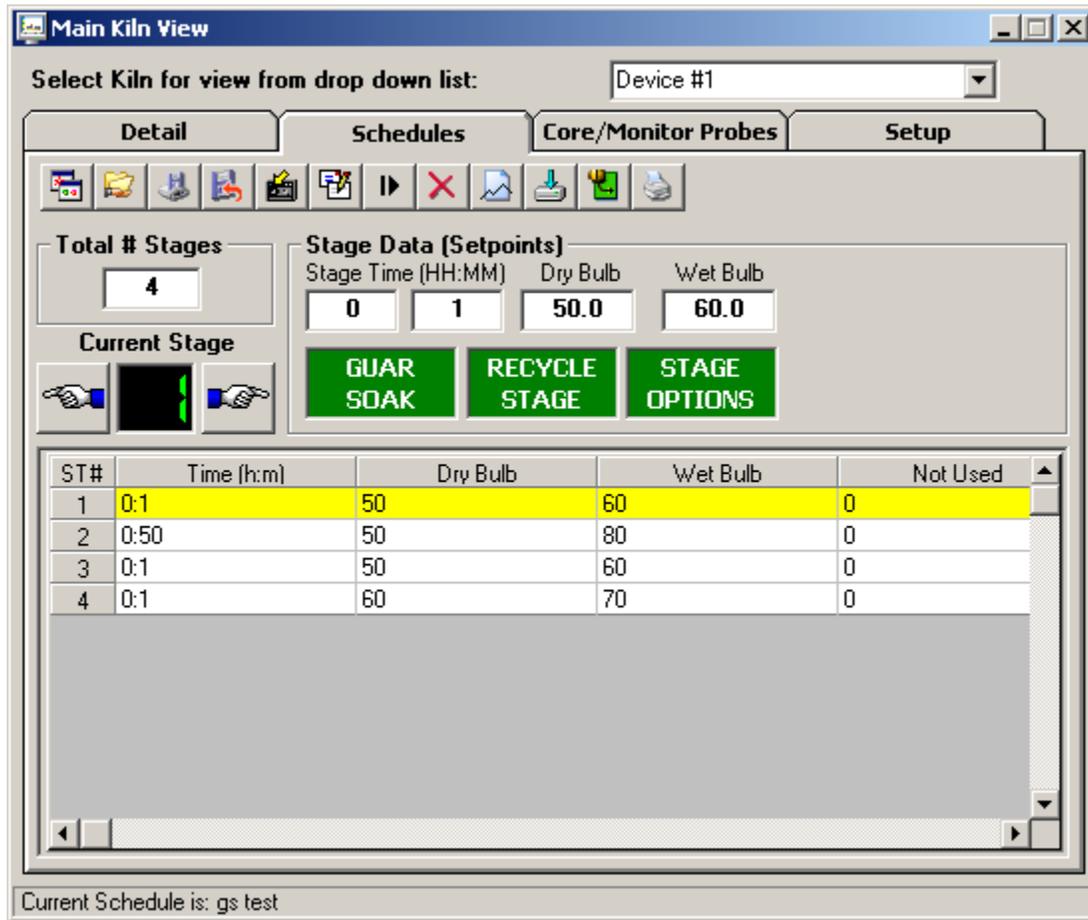
The manual options view allows the user to enable or disable control/event outputs in the system while the kiln controller is being operated in manual or automatic schedule mode.



Any manual event (or combination of events) in the system can be enabled or disabled by clicking the checkbox next to the event tagname. Up to 7 customer events allows the user to wire to any type of custom external device required for kiln operation. This section of the system is used to setup the initial drying process for heat, spray, fan position as well as custom outputs required.

When a schedule is running in automatic schedule mode, the manual events screen can be accessed for "view only" status. The manual event screen will display the current status of all events active in the stage, but the events cannot be edited or changed. When a running schedule is put into hold, any of the manual events in the system can be enabled/disabled. When the schedule is continued, the status of the events will remain "as set" by the user for the rest of the stage. These changes will not affect the saved schedule, only the stage running after the manual event changes are made. This provides the user with the flexibility to make stage changes "on the fly" without changing the saved schedule running.

**Kiln Schedule View:**



The Kiln schedule view allows an operator to open, save, create and edit schedules from the PC interface as well as download created schedule to the controller.

The toolbar icons for schedule edit are as follows (order from left to right):

- Create New Schedule:** Clear and create a new schedule.
- Open Schedule:** Open a schedule previously saved.
- Save Schedule:** Save current schedule.
- Save Schedule as:** Save current schedule with different name.
- Copy Stage:** Copy current stage.
- Paste Stage:** Paste current stage.
- Insert Stage:** Insert a new stage a current point.
- Delete Stage:** Delete stage at current point.
- Toggle Grid:** Toggles between spreadsheet and schedule trend mode.
- Export Schedules:** Displays export dialog for export of schedules to "I-Stick" data device.
- Download Schedule:** Download current schedule to controller.
- Print Schedule:** Print current schedule.

Operators can create and edit schedules at any time during Kiln operation. Clicking in the stage fields allows the user to enter data for each stage. The "tab" key will also cycle operators through each field.

The "spreadsheet" on the screen will automatically update when stage data is entered. Clicking on the spreadsheet for any stage will set all fields to the stage that the user selected in the spreadsheet. This feature allows the operator to quickly navigate through stages without pressing the "previous/next" stage buttons.

Stages can be inserted or deleted from a schedule by pressing the insert or delete icons on the toolbar. Copy and paste commands will work on any stage active when using these functions.

Up to 6 additional probes can be added to the kiln system. The additional probes can be configured for moisture/weight or temperature probes (all must be configured for one type) with FDC-2010-K5C v1.x; version 2.x and above the additional probes are temperature only with RTD or Type J Thermocouple input.

When additional probes are configured, the values will dynamically be displayed on the kiln "Core/Monitor Probes" screen. The Orion Kiln system comes equipped with one extra RTD input that can be used for "core" operations (explanation below), if configured to be active in the factory setup.

FDC-2010-K5C version 1.x: When additional probes are configured for moisture/weight probes and a "Mon Probe" setpoint is programmed into an automatic schedule, the detail system screen will flash an "=" icon any time the first probe (probes activated per stage are user selectable) drops below the "Mon Probe" setpoint (entered in the schedule). The "equalize output (Q3)" will also be energized. Press the "=" icon to de-energize the equalize output and the "=" icon will disappear. This indication will alert the operator to make manual changes to the schedule once the first moisture/weight probe has fallen below the programmed moisture setpoint.

FDC-2010-K5C version 1.x and 2.x: When additional probes are configured for temperature probes (temperature only with version 2.x and above) and a "core" setpoint is programmed into an automatic schedule, the schedule will automatically advance to the next "stage" when all probes (probes activated per stage are user selectable) are  $\geq$  the "core" setpoint programmed for the stage. This is useful during "sterilization" processes that require that all temperature probes be above a specific temperature before sterilization "time down" is allowed to continue. Probe usage combinations are selectable per stage when entering an automatic schedule.

When the "Cool Down" stage option is selected, and additional probes are configured for temperature probes (version 2.x and above may only be configured for temperature) with a "core" setpoint programmed into an automatic schedule, the schedule will automatically advance to the next "stage" when all probes (probes activated per stage are user selectable) are  $\leq$  the "core" setpoint programmed for the stage. This is useful during processes that require that all temperature probes be below a specific temperature before the schedule automatically continues to the next stage. Probe usage combinations are selectable per stage when entering an automatic schedule.

FDC-2010-K5C version 1.x: A unique feature of the FDC-2010-K5C v1.x is the ability to use the standard "core" RTD input along with up to 6 additional moisture/weight probes. This gives the operator the flexibility of monitoring when the first moisture probe drops below the programmed %MC setpoint, and also not continue to the next automated stage until the "core" probe is above the programmed "core" setpoint. (This unique feature is not available on FDC-2010-K5C v2.x & above.)

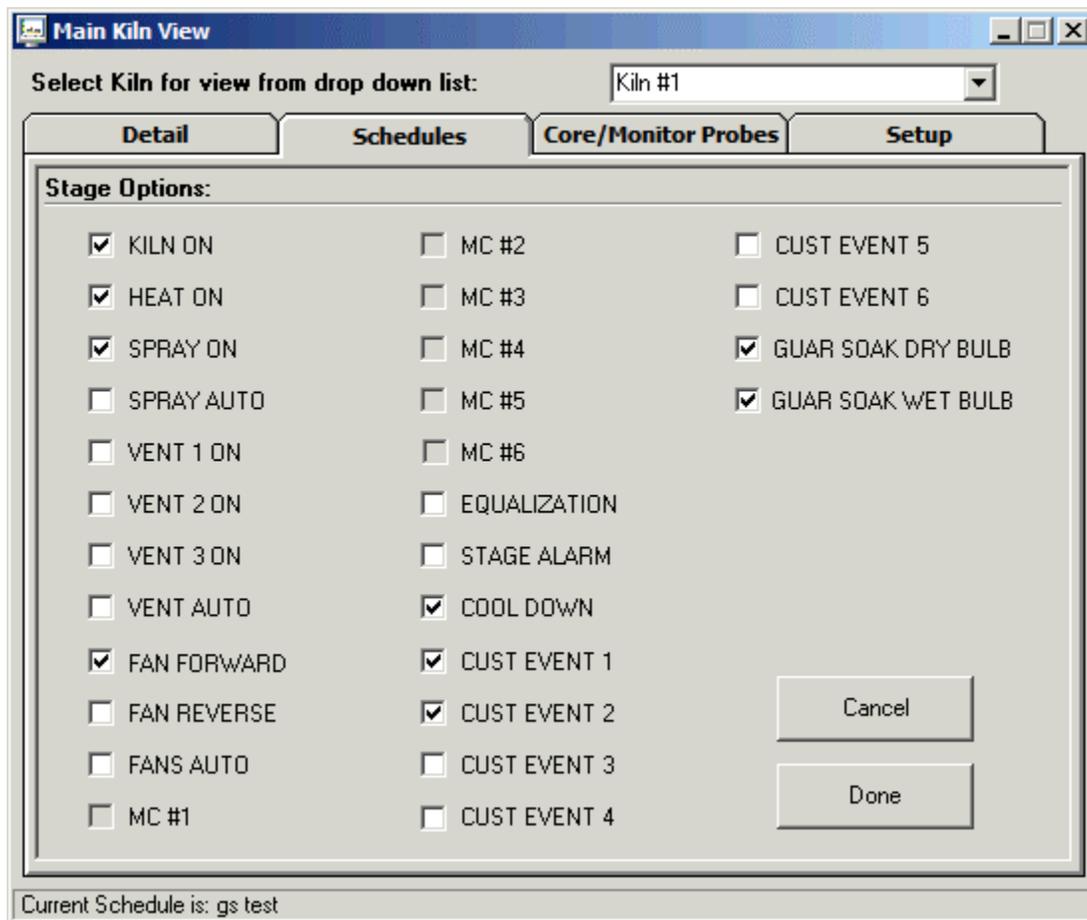
The number of schedules that can be saved to disk is limited only by the size of the hard disk on the computer used.

#### **EMC and %RH: FDC-2010-K5C firmware version 2.x (April 2008)**

The EMC display and control logic described below are NOT available in KilnView.

FDC-2010-K5C firmware version 2.x, if so configured, an EMC setpoint is programmed into an automatic schedule, the schedule will automatically advance to the next "stage" when the EMC value is achieved. Instead of a Stage Advance a relay output may be configured when a Stage achieves the EMC setpoint.

Stage Options:



The stage options screen allows the user to select all system control and user outputs for each stage while in schedule edit mode. Stage option outputs consist of heat, spray vents, fans, gs options for dry bulb and wet bulb as well as customer configurable relay outputs for custom use. Click on the checkbox if the control output should be on during the stage being edited when an automatic schedule is being run. When finished selecting all options, press the "Done" key or cancel to leave the screen.

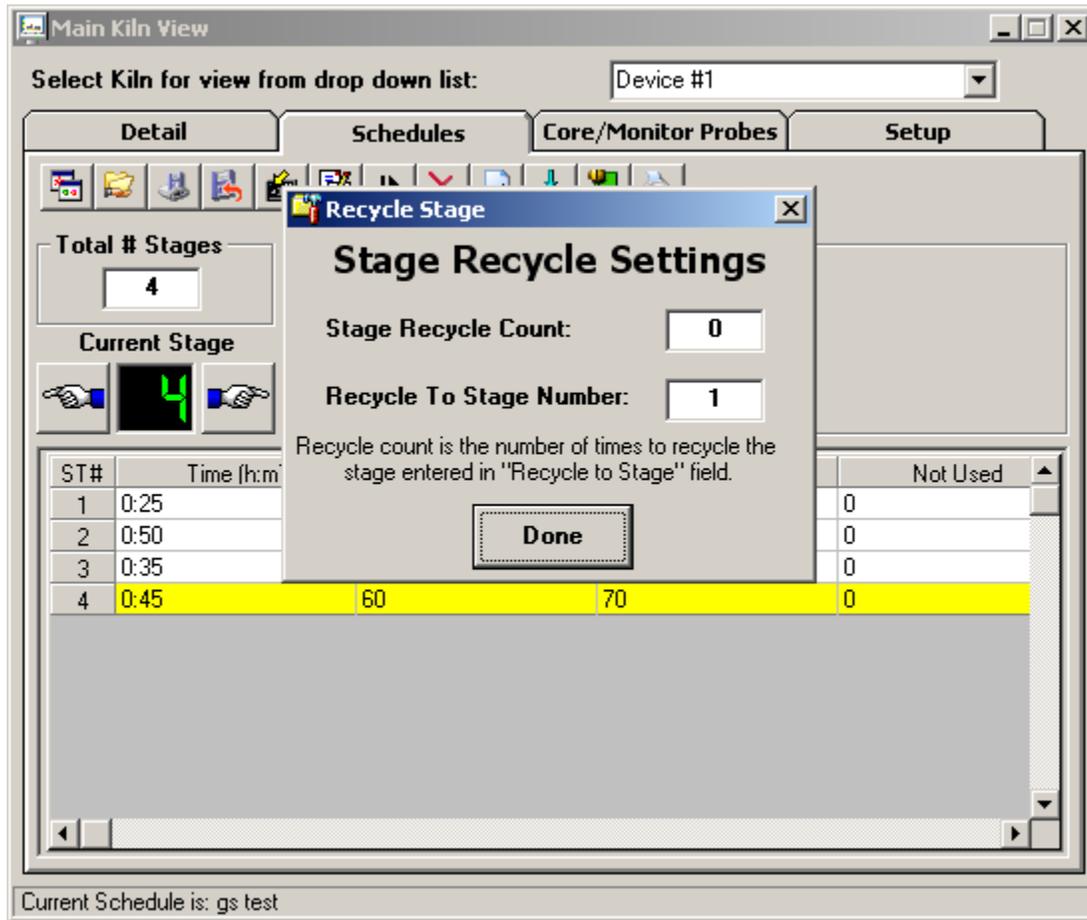
## Guaranteed Soak:

The screenshot shows the 'Main Kiln View' software interface. At the top, there is a dropdown menu for 'Device #1'. Below this are four tabs: 'Detail', 'Schedules', 'Core/Monitor Probes', and 'Setup'. The 'Schedules' tab is active. On the left side, there are controls for 'Total # Stages' (set to 4) and 'Current Stage' (set to 4). Below these is a table with columns 'ST#' and 'Time (h:m)'. The table has four rows, with the fourth row highlighted in yellow. A 'Guaranteed Soak' dialog box is open in the center, titled 'Guaranteed Soak Limits'. It contains two input fields: 'Dry Bulb Guaranteed Soak' and 'Wet Bulb Guaranteed Soak', both set to '10'. Below these fields is a note: 'Soak settings are common to all stages and need to be set only once per schedule.' and a 'Done' button. At the bottom of the main window, it says 'Current Schedule is: gs test'.

ST#	Time (h:m)			
1	0:25			
2	0:50			
3	0:35			
4	0:45	60	70	0

The Guaranteed Soak option allows the user to set a band for dry bulb and wet bulb. If during schedule run, the active dry bulb temperature or wet bulb temperature falls outside of this band, the schedule will hold until the active dry bulb temperature or wet bulb temperature is back within the band. The value entered for guaranteed soak is an "even sided" band above and below the current schedule setpoint for dry bulb and wet bulb. The guaranteed soak values are "global" and apply to all schedule stages. The operation for guaranteed soak can be enabled or disabled for dry bulb and wet bulb on a "per stage" basis by selecting or de-selecting the option when configuring the stage options for each stage of the schedule.

## Stage Recycle Settings:



The stage recycle settings screen allows the user to jump between different stages within the schedule. It can also be referred to as a "looping" function. This is useful for repeating the same sequence of stages over and over again without having to enter them into a schedule multiple times. It is valuable for providing the functionality to loop or repeat stages based on user schedule requirements.

### Notes:

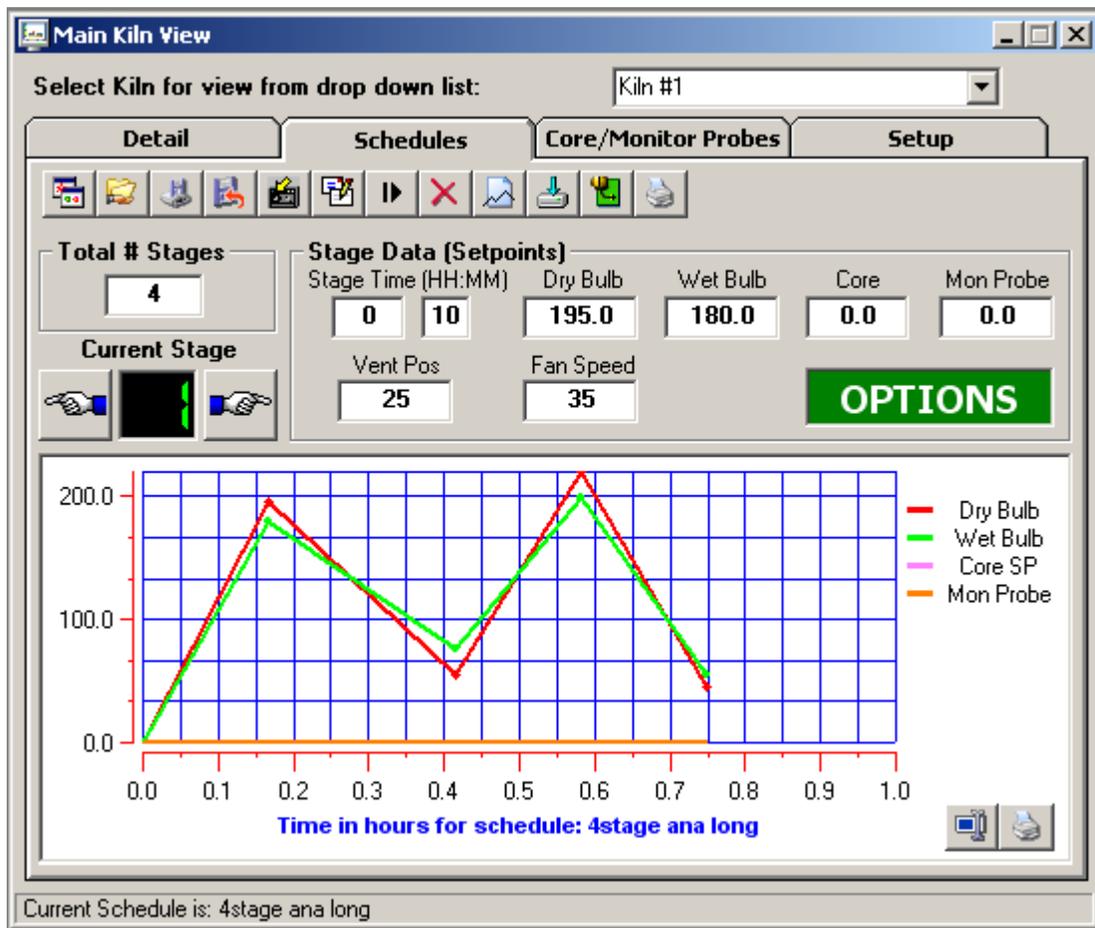
**Stage Recycle Count:** Number of times to jump

**Recycle To Stage Number:** Number of step to jump to once current stage is complete

The primary use for a Recycle is to jump back to the beginning of a schedule and repeat the same steps over again for a predetermined number of times. If a schedule needs to be repeated 20 times (for example), the Recycle function would be used to accomplish this. To repeat the schedule 20 times, set up the Recycle on the last stage for a "Recycle To Stage Number" of 1 and a "Stage Recycle Count" of 19. The Recycle stage tells the schedule to jump back to stage 1 upon the completion of the last stage. The "Recycle Count" tells the schedule to jump back to stage 1 for a total number of 19 times. This means that upon the completion of the last stage, it will jump back to stage one 19 times. The reason the "Stage Recycle Count" is one less than the desired 20 times is because it already completed the schedule once upon the first jump from the last stage. Since it was done once in order to make the first jump, you only need to repeat the schedule 19 times in order to get 20 cycles.

The schedule also has the ability to do nested looping. It has the ability to set up recycles on every stage throughout the schedule. It even has the ability to jump forward, skipping stages, only to allow them later by other recycle stage returning to the skipped steps. However, this can become confusing. Use caution with nested loops to prevent product loss. The schedule may not operate as expected due to multiple jump paths within the schedule.

## Schedule Trend View:



Clicking on the “toggle spreadsheet/trend” icon in the toolbar accesses the schedule graph view. This view allows the operator to display the schedule in “Trend” mode rather than spreadsheet mode. Any time a stage is updated, the trend will automatically update with the newest entered data. Clicking on the “toggle spreadsheet/trend” icon will switch between spreadsheet and graph view modes.

### In the schedule graph area there are two icons:

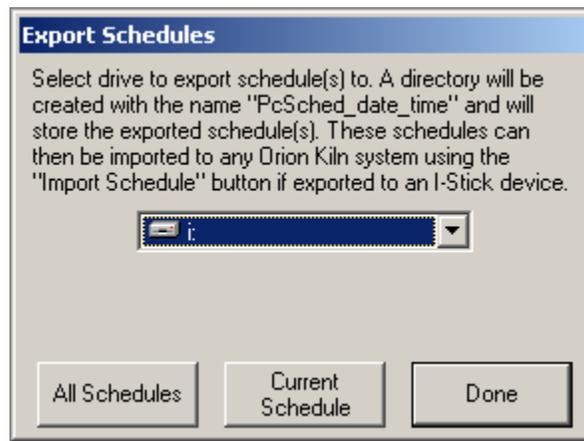
#### Data Cursor Icon:

The data cursor is a vertical line that can be dragged across trend data. When the vertical line is dragged across the trend data, the current value of the point is digitally displayed next to the data cursor. This is a useful tool when tracking actual values across a trend line. To change channels for the data cursor, first click on the data cursor and then on one of the channel names displayed to the right of the trend. The data cursor line will change to the color of the channel selected. Moving the data cursor to the left or right will display the actual value for the channel selected.

#### Print Icon:

Pressing this icon will print the current schedule in graph format.

## Export Schedules:

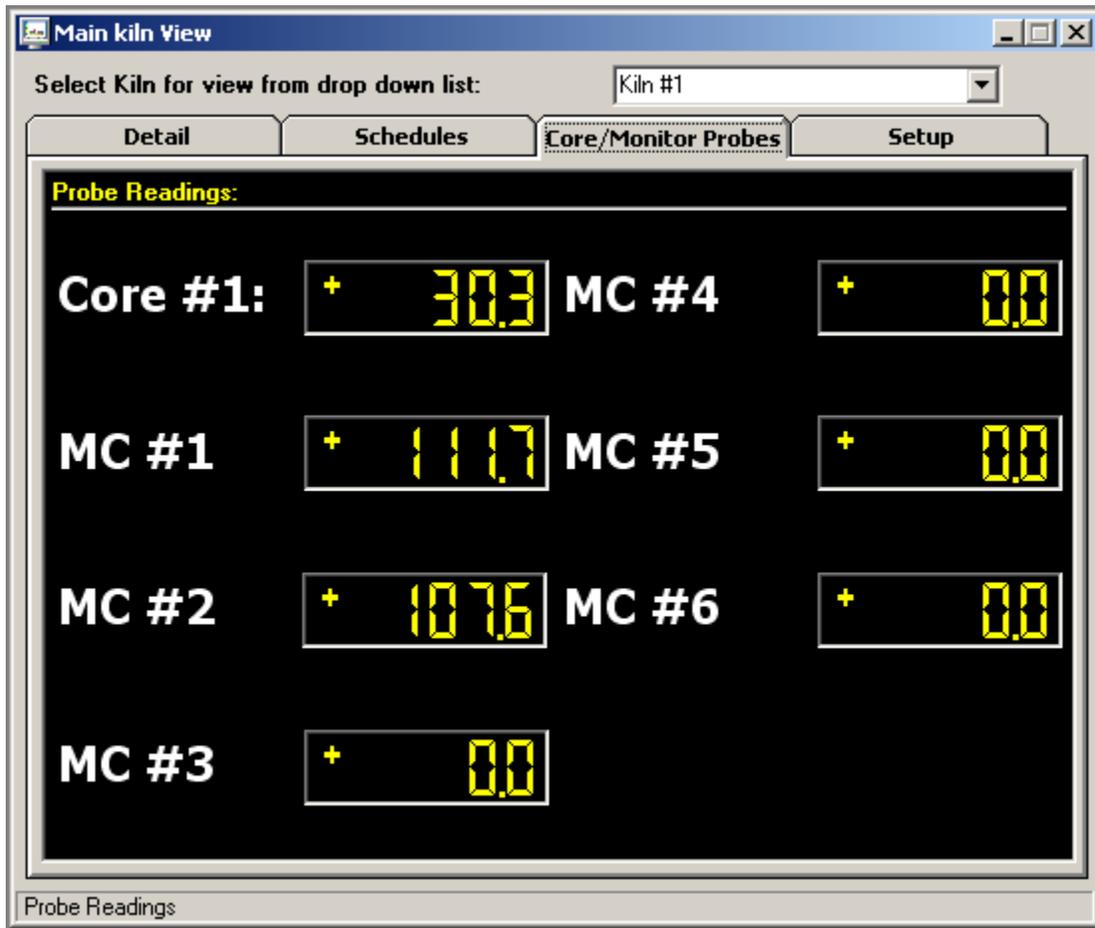


Schedules created in KilnView are compatible with schedules created at the Orion Kiln control interface. All schedules created in KilnView can be exported to the "I-Stick" data storage device for import by any Orion kiln controller device. This allows the operator to create schedules at the PC (using KilnView) and then quickly import a single schedule or a batch of schedules into the Orion kiln interface. This saves time when using multiple Orion kiln controllers since the operator does not have to enter each schedule at the Orion kiln interface.

The buttons at the bottom of the dialog allow the user to import all schedules or a single schedule. If "All Schedules" is selected, all schedules stored at the PC will be copied to the destination drive selected from the drop down "drive" list. If "Cur Schedule" is selected, then the current schedule being edited (must be saved to disk) will be saved to the destination drive selected from the drop down "drive" list box.

The drop down "drive" list box will display all current drives connected to the PC. Make sure you know which drive letter the "I-Stick" storage device is before exporting schedules to make sure they are copied to the correct drive. A directory will be created each time schedules are exported. The directory name format is "PcSched\_Date\_Time".

## Core/Monitor Probes View:



The core/monitor probes view will display all core/monitor probes configured in the system.

FDC-2010-K5C version 1.x: The system will accept up to 1 core probe and 6-monitor probes total (moisture/weight sensors or temperature probes using temperature transmitters).

FDC-2010-K5C version 2.x: The system will accept up to 1 core probe and 6-monitor probes (direct input RTD or Type J Thermocouple based upon global input type configuration).

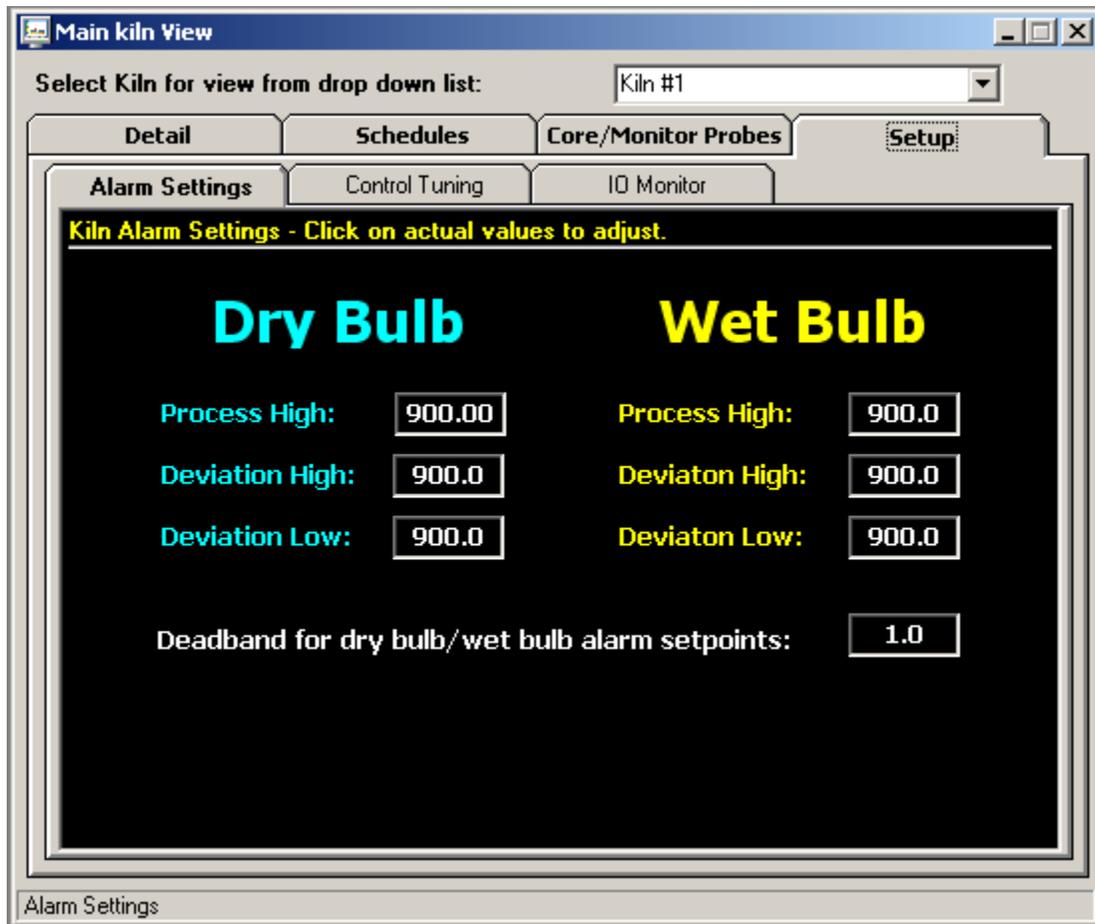
Schedule operations based on core probe/moisture probe use are selectable per stage for each schedule. If a core probe is not enabled in the system, its value will read "^^^" so the operator will know the core probe is not in use.

Core probes are used to monitor the internal temperature of a piece of lumber whereas the main dry bulb and wet bulb probes are monitoring kiln temperature. Core probes can be used to continue a schedule based on the temperature of the internal lumber (or multiple temperature probes for sterilization usage) instead of the actual air temperature in the Kiln. If additional MC/Weight/Core probes are not configured for the system, the display monitors will read "^^^" so the operator will know the probes are not in use.

FDC-2010-K5C version 1.x: Moisture/weight probes are used to monitor the % moisture of the lumber. When an automatic schedule is run, the user can select any of the probes equipped on the system, in any stage of an automatic schedule. When the first probe (out of all moisture probes selected for the stage) falls below the moisture setpoint entered for the stage, the main detail screen will display an "Equalize" message to the user. A control output will also be energized and can be wired to a light or buzzer to alert the user. Pressing the "Equalize" button will de-energize the control output and the "Equalize" button will disappear. At this time the user can put the kiln controller into hold, take the appropriate steps to equalize the system as well as add/subtract segment time or continue to the next stage if required. Moisture/weight probes may not be used with FDC-2010-K5C version 2.x or higher.

**Note:** Probe description names are configurable using the KilnView configuration program.

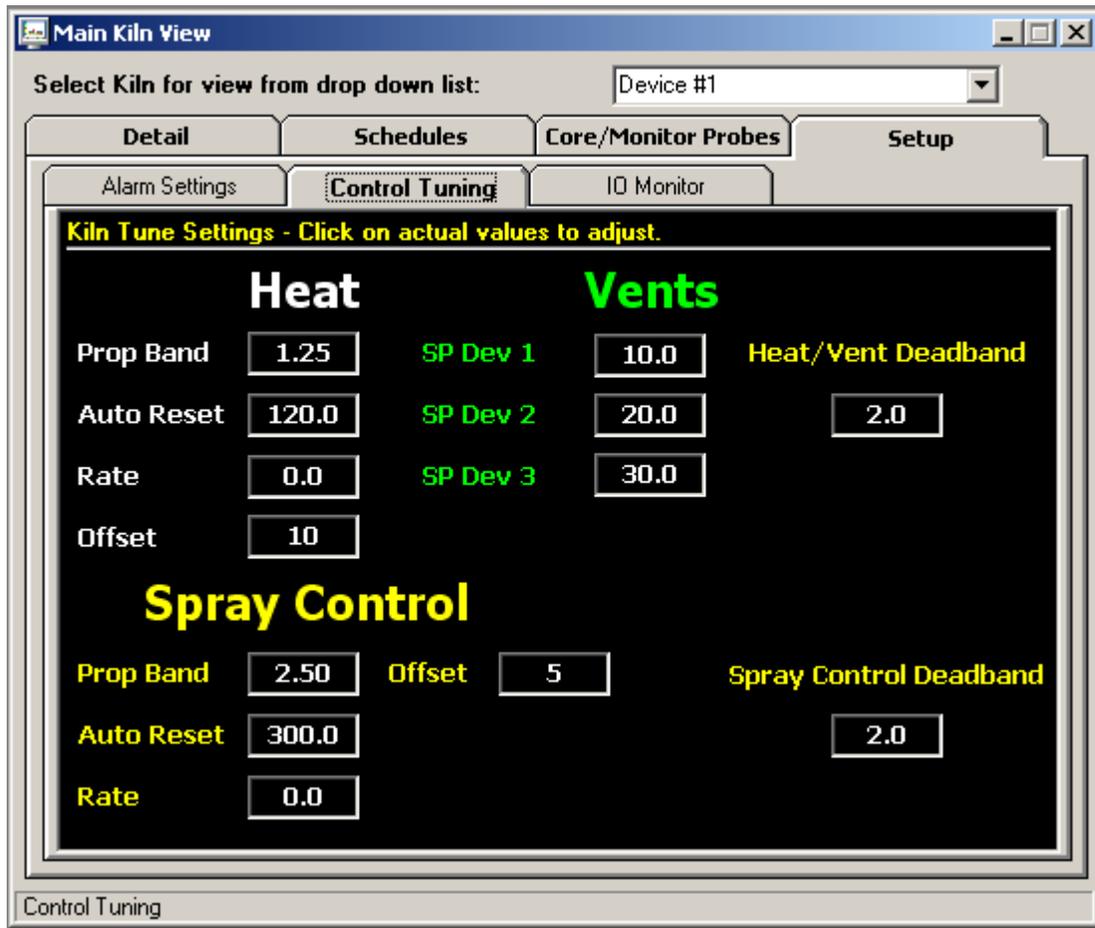
**Kiln Setup (Alarm Settings):**



The Kiln Setup tab provides the user with the ability to adjust alarm setpoints, kiln control tuning as well as an IO monitor for trouble shooting or monitoring kiln control outputs (relay and analog).

The kiln alarms setting allow the operator to adjust the alarm setpoints for dry bulb and wet bulb. Process high, deviation high and deviation low settings are provides for each probe. Click the alarm value to change the value of the alarm and press the enter key. An alarm Deadband is provided to prevent "chatter" around alarm setpoints.

## Kiln Setup (Control Tuning):



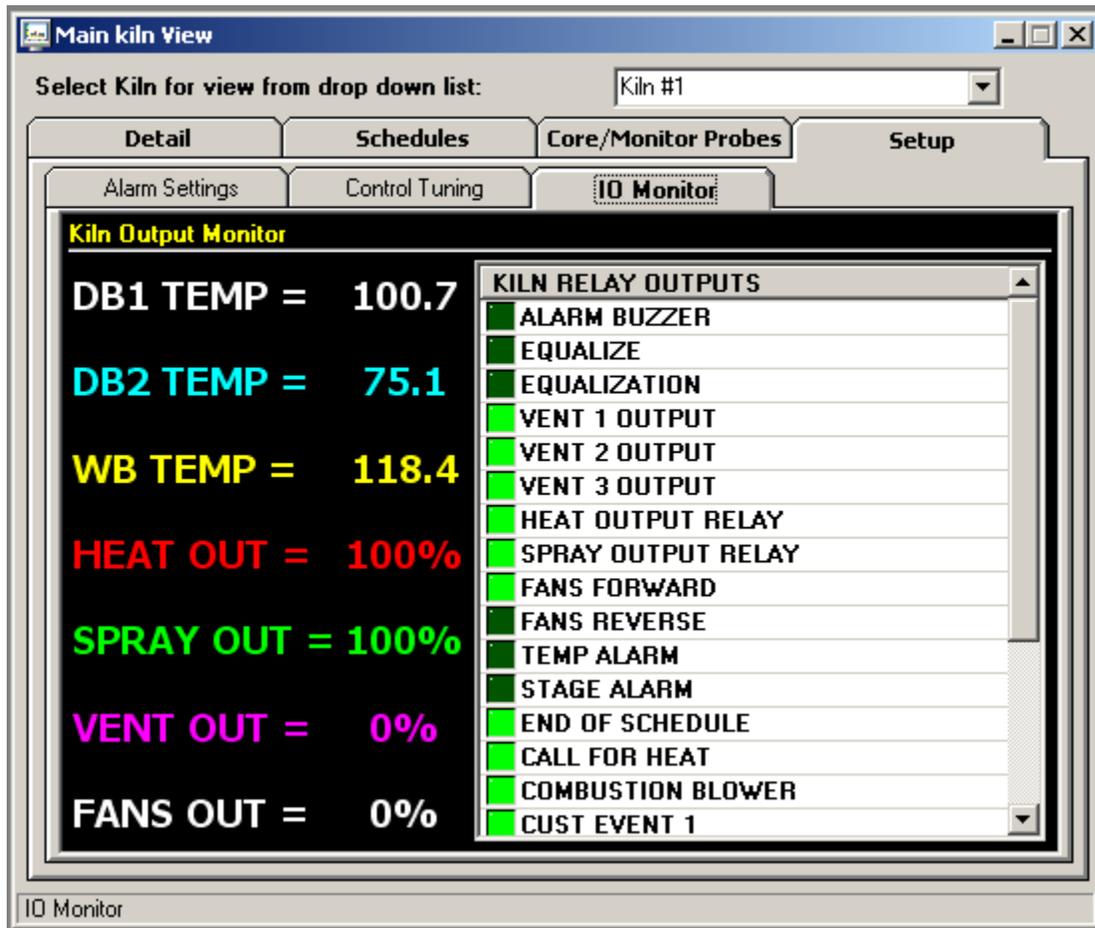
Control tuning values for temperature, vents and spray is displayed. Depending on the kiln setup, the kiln control can be equipped to control each of these process using relay or analog outputs. If the kiln is setup for relay outputs, the PID values for temperature and spray should not be adjusted and left at values of "0". The vent setpoints (1 through 3) can be adjusted as a deviation from wet bulb value. As the wet bulb temperature increase above each of the 3 setpoints, relay outputs for vent 1, 2 and 3 will be energized.

If the kiln system is configured for analog operation (non-relay control), PID tuning values for temperature, vents and spray can be adjusted. Consult the manual or Kiln manufacturer for detailed information on kiln tuning. The "offset" field for heat and spray is a dual function field. If proportional control is used, this field will adjust the position of the proportional band above or below set point. This offset action will only take place until the reset circuit repositions the proportional band (if prop control used). If on/off relay control is used for heat or spray, the offset field will position the on/off output up to +/- 80 degrees. This is useful to stop overshoot by putting a negative number into the offset field.

### Example: Dry bulb set point is set for 100 degrees.

A value of -10 put in the offset field will turn the heat output off at 90 degrees allowing the temperature to rise slowly up to set point and reduce overshoot. The heat output will turn back on at 90 degrees + the Deadband setting set in the Deadband field.

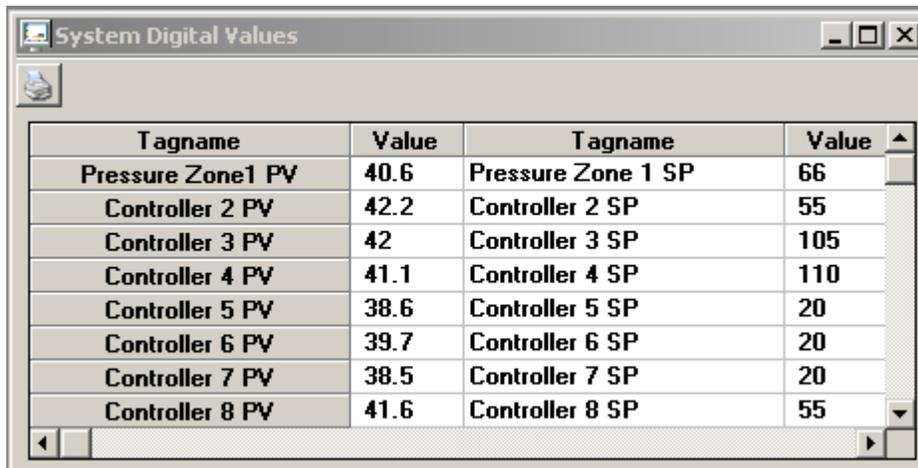
Kiln Setup (IO Monitor):



The kiln IO monitor is a useful tool to monitor all relay and analog output status during kiln operation. The kiln IO monitor displays the status of DB/WB temperatures as well as the analog output values for vents, fans and spray (if configured for analog output types). The right side of the IO monitor displays all relay outputs available on the kiln system. If the LED next to description is bright green, the output is energized. If the LED is not bright green, the output is de-energized.

### Digital Values:

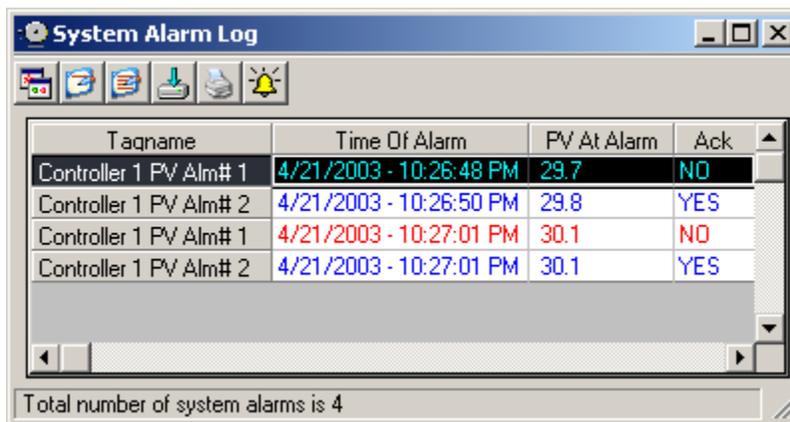
The digital values window displays all controllers activated in the system. Current process value, setpoint and % output (if configured) are displayed. The digital values window can be printed on demand by clicking on the "Print" icon on the windows upper toolbar:



Tagname	Value	Tagname	Value
Pressure Zone1 PV	40.6	Pressure Zone 1 SP	66
Controller 2 PV	42.2	Controller 2 SP	55
Controller 3 PV	42	Controller 3 SP	105
Controller 4 PV	41.1	Controller 4 SP	110
Controller 5 PV	38.6	Controller 5 SP	20
Controller 6 PV	39.7	Controller 6 SP	20
Controller 7 PV	38.5	Controller 7 SP	20
Controller 8 PV	41.6	Controller 8 SP	55

### System Alarm Log:

The system alarm log keeps track of all alarms in the system. If alarm 1 or alarm 2 is programmed in a 300 series single loop controller, activation of either of these alarms will be displayed in the alarm log. When the FDC kiln controller is attached to the system, the alarm window will display all analog and digital alarms at kiln controller. The alarm log window will automatically maximize itself upon any new system alarm (even if the window is minimized). Double clicking on any alarm will display a dialog confirming if the user wants to acknowledge the alarm.



Tagname	Time Of Alarm	PV At Alarm	Ack
Controller 1 PV Alm# 1	4/21/2003 - 10:26:48 PM	29.7	NO
Controller 1 PV Alm# 2	4/21/2003 - 10:26:50 PM	29.8	YES
Controller 1 PV Alm# 1	4/21/2003 - 10:27:01 PM	30.1	NO
Controller 1 PV Alm# 2	4/21/2003 - 10:27:01 PM	30.1	YES

Total number of system alarms is 4

### System Alarm LogToolbar:

The toolbar at the top of the trend screen provides the following functions (left to right):

**Open Alarm Log Viewer:** Opens the alarm log viewer. The alarm log viewer allows the user to view daily system alarm logs in a grid type format. This data can then be printed or exported to a .csv file.

**Clear Single Alarm:** Allows the user to clear the alarm selected in the alarm log. The user will be prompted before the alarm is cleared.

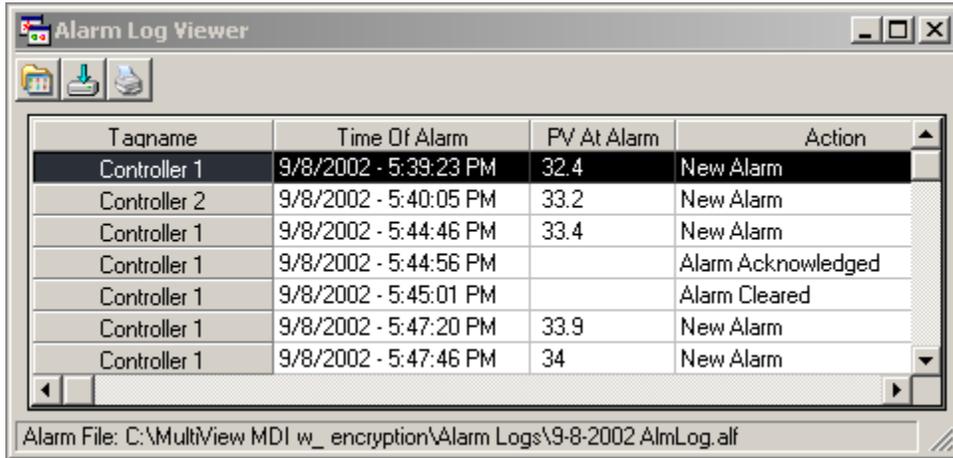
**Clear All Alarms:** Allows the user to clear the complete alarm log grid. The user will be prompted before the alarm grid is cleared.

**Export Alarm Log:** Allows the user to export the alarm log to a .csv file. Csv files can be read by Excel or any program capable of reading a comma-separated file.

**Print Alarm Log:** Allows the user to print the alarm log. Standard print dialog is used.

**Silence Alarm Beeper:** Allows the user to silence the alarm beeper.

When the open alarm log button is pressed, the alarm log viewer is displayed.



#### Alarm Log File Viewer:

The toolbar at the top of the trend screen provides the following functions (left to right):

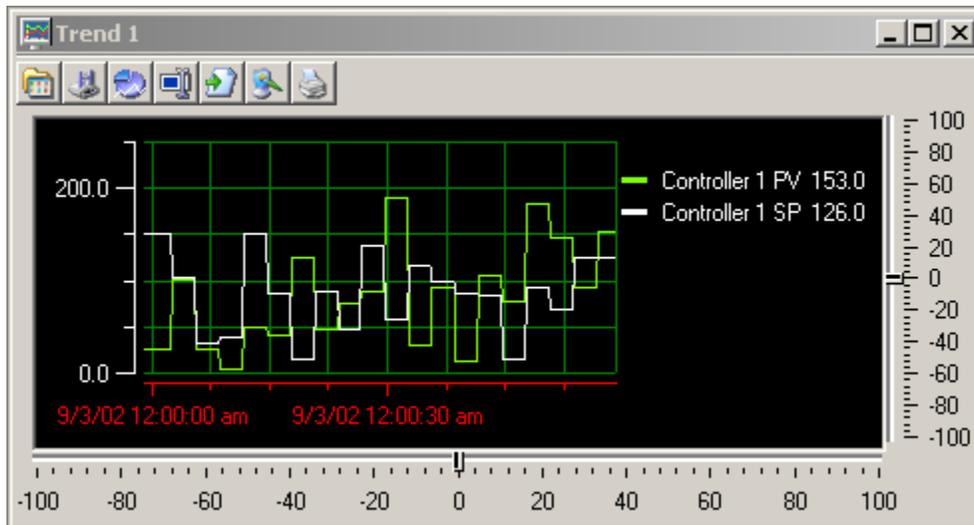
**Open Alarm Log:** Allows the user to open an alarm log file and view the data in the "Alarm Log File Viewer". Alarm logs are created and written to daily whenever an alarm occurs. To activate alarm logging, the user must click on the "Enable/disable alarm logging" checkbox in the "Configure Users" section of the program. When opening an alarm log file, the alarm log file is displayed in the alarm log viewer only with the real time system alarm data grid remaining untouched.

**Export Alarm Log:** Allows the user to export the alarm log to a .csv file. Csv files can be read by Excel or any program capable of reading a comma-separated file.

**Print Alarm Log:** Allows the user to print the alarm log. Standard print dialog is used.

## Control Trends:

Up to 8 real time control trends can be active at any time. Up to 12 channels can be assigned to any control trend. Dragging on the trend scale (left side of trend) or trend time (bottom of trend) allows the user to interactively change the trend scale or move forward/backward in time to view trend data.



## Real Time Trend Toolbar:

The toolbar at the top of the trend screen provides the following functions (left to right):

**Open Trend View:** Allows the user to open a trend setup previously saved for this trend.

**Save Trend View:** Allows the user to save the current trend setup as a file that can be loaded into the trend by using the open button. Trend View files save all information about the current trend including scale, grid lines, channels and colors.

**Trend Setup:** Provides a dialog box to customize the trend appearance. Trend Scale for X and Y, trend ticks, colors and channel assignment are all configurable by the user.

**Data Cursor:** This button turns the data cursor on/off. The data cursor is a vertical line that can be dragged across trend data. When the vertical line is dragged across the trend data, the current value of the point is digitally displayed next to the data cursor. This is a useful tool when tracking actual values across a trend line. To change channels for the data cursor, first click on the data cursor and then on one of the channel names displayed to the right of the trend. The data cursor line will change to the color of the channel selected. Moving the data cursor to the left or right will display the actual value for the channel selected.

**Resume Trending:** Any time the trend scale or time is dragged (up/down-left right) by the user, trending is stopped. After dragging scale or time, press the "Resume Trending" button to resume trend operation.

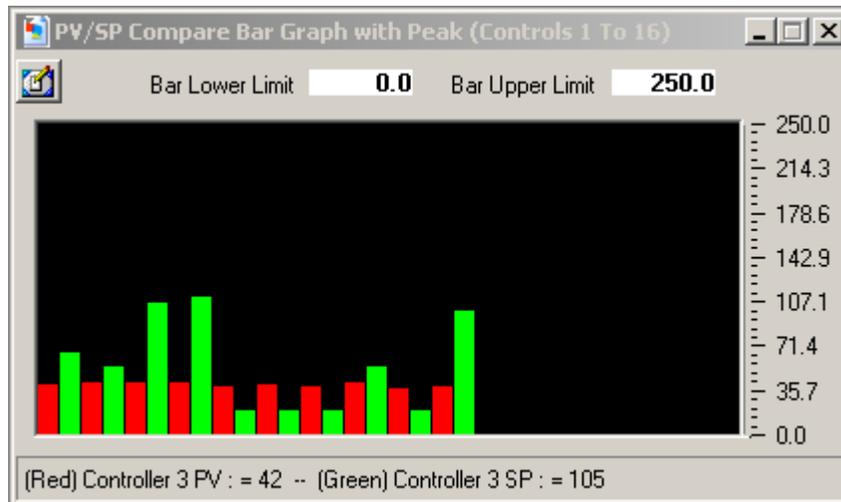
**Save as Jpeg:** This button allows the user to save the current trend snapshot as a Jpeg file:

**Print Trend:** This button sends the current trend snapshot to a printer.

The -100 to +100 scales at the bottom and to the right of the trend are for scale/time compression/expansion. This is an analysis tool to "zero" in on specific data on the trend. It's basically a zoom in/out for the trend scale and time scale.

## Bargraphs:

Up to 4 banks of bargraphs is available to the user. Each bar graph window will display up to 16 single 300 series single loop controllers. Controllers are "auto-config" and will show up on the bargraph if the controller is turned on the "Control labels/Activation" screen. Kiln controller variables will not be displayed on the bargraph screen.



Bargraph scale is adjustable by entering a zero and span for the bargraph in the fields at the top of the bargraph window.

Clicking on any bar will display the channel name and real time data for the controller selected. Data is displayed at the bottom of the bargraph window. Horizontal peak lines (in yellow) will indicate the max for each channel in the bargraph window. Click on the "Clear Sheet" icon (on the toolbar) to clear the peak values.

## Data Viewer:

The historical data viewer provides the ability to view KilnView data files without leaving the application. The data viewer is a spreadsheet type window that displays saved data in cells. These cells can be selected for printing or plotting without additional setup.

Selecting Data Viewer from the views menu displays the following window.

Date	Time	Operator Message	Batch
9/26/2002	12:02:00 PM	File started by (login as 0	0
9/26/2002	12:02:01 PM	.	.
9/26/2002	12:02:02 PM	.	.
9/26/2002	12:02:03 PM	.	.
9/26/2002	12:02:04 PM	.	.
9/26/2002	12:02:05 PM	.	.
9/26/2002	12:02:06 PM	.	.
9/26/2002	12:02:07 PM	.	.

Date	Time	User ID
------	------	---------

The center of the data viewer is a spreadsheet that displays date, time and controller data. The header for each controller saved in a data file will be shown at the top of each column. You can select (drag) any group of cells for printing or plotting by dragging across the data in the spreadsheet.

Select cells as you would in a normal spreadsheet. Clicking on the column header selects the whole column, dragging across cells selects only the cells that the mouse was dragged across. You can select multiple columns by clicking on a column header and dragging to the right or left across other column headers. Discontinuous data can be selected by using the "Ctrl" key while selecting data. You must select at least 4 cells per column before a plot can be generated.

The Electronic signatures grid is below the data grid and is used to electronically sign data files. Electronic signatures eliminate the need for paper signatures. Files can only be signed by users with the proper login and user access. The KilnView software can validate any electronic signature and verify if the original data file (when signed) has been altered in any way.

Electronic signatures can only be assigned to files under the following:

- a.) Security is enabled under the Users-Configure Users menu item.
- b.) If security is active, authentic security access and login is required to electronically sign or verify a signature on a file

#### **Data Viewer Toolbar:**

**Open File:** This button displays a standard open dialog box. The default data path will be the "Log Files" directory. Select a log file to open. Data files that are active (being written to by the logger) can be opened by the data viewer. Data files consist of 2 file types. The .mlg file is the data portion of the file and the .sif file is the signature portion of the file. Both files are encrypted and tamperproof. If these files are edited, they will be damaged and unreadable by KilnView. Data files can be moved to other directories but both .mlg and .sif files must exist in the same directory or an error will occur when trying to read the data file.

**Plot Data:** This button creates a history plot from cells selected in the data viewer.

**Sign File:** This button requires that the user authenticate himself (herself) before signing the file. The signer will be prompted to enter a user comment for the signature (pass-fail etc.) after login. The new signature information will be displayed in the signature grid.

**Verify Signature:** This button requires that the user authenticate himself (herself) before signature verification of the file. After user verification, KilnView will check the file to see if it has been altered in any way. A pass-fail dialog will be displayed to the user after verification.

**Export Data:** This button will export the current file to a .csv file that can be open by Excel or any program capable of editing a comma separated data file. This is a copy only that can be used for reporting in custom formats. The original data file is not altered in any way.

**Search for batch#:** This button prompts the user to enter a batch or lot number to search for. The KilnView software will search all files in the "Log Files" directory to find a match. If a match is found the data file is open for the user to view.

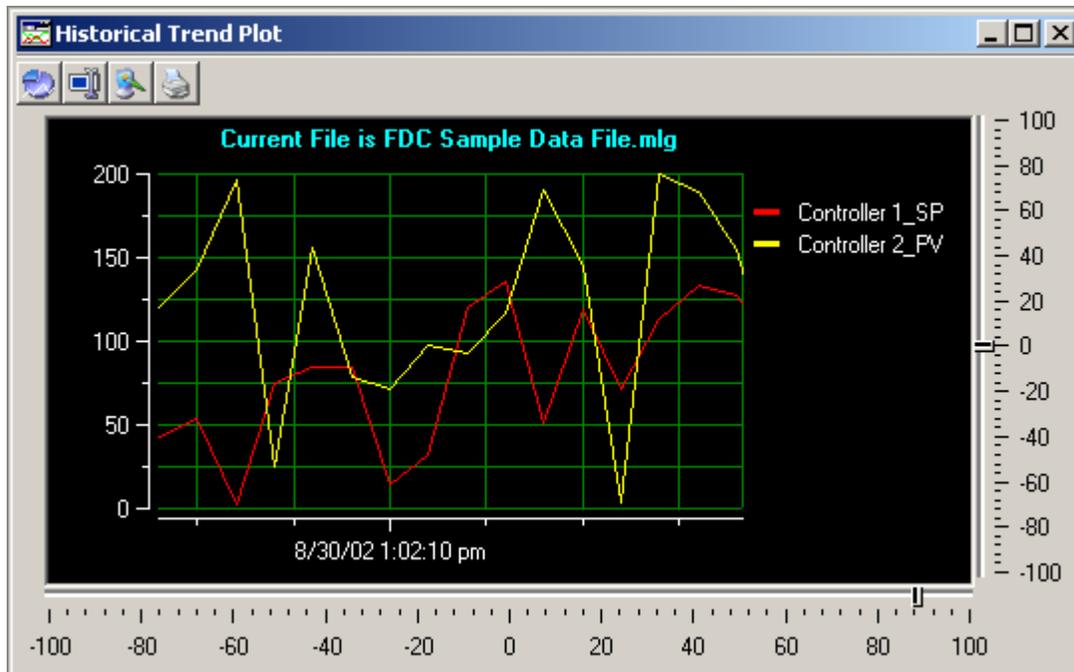
**Print Data:** This button provides a text printout of the selected data in the spreadsheet

**Cancel Trend:** This button provides the option of canceling the historical trend if selected. Trend plots with many data columns can take a while to complete so this option allows the user to stop the trend rather than wait for its completion.

### Historical Trend Plot:

This historical trend plot provides of graphic view for historical data. Data selected in the data viewer will be plotted on the trend. The only limit to the number of channels is the size of the window to view the data and computer memory. Dragging on the trend scale (left side of trend) or trend time (bottom of trend) allows the user to interactively change the trend scale or move forward/backward in time to view trend data.

The -100 to +100 scales at the bottom and to the right of the trend are for scale/time compression/expansion. This is an analysis tool to "zero" in on specific data on the trend. It's basically a zoom in/out for the trend scale and time scale. In the historical plot, these scales are real time so the data will move as you adjust the zoom amount.



### History Plot Toolbar:

**Trend Setup:** Provides a dialog box to customize the trend appearance. Trend Scale for X and Y, trend ticks, colors are all configurable by the user. Channels are automatically assigned by the data viewer so the section of the trend setup regarding channel assignment is grayed out and cannot be selected by the user.

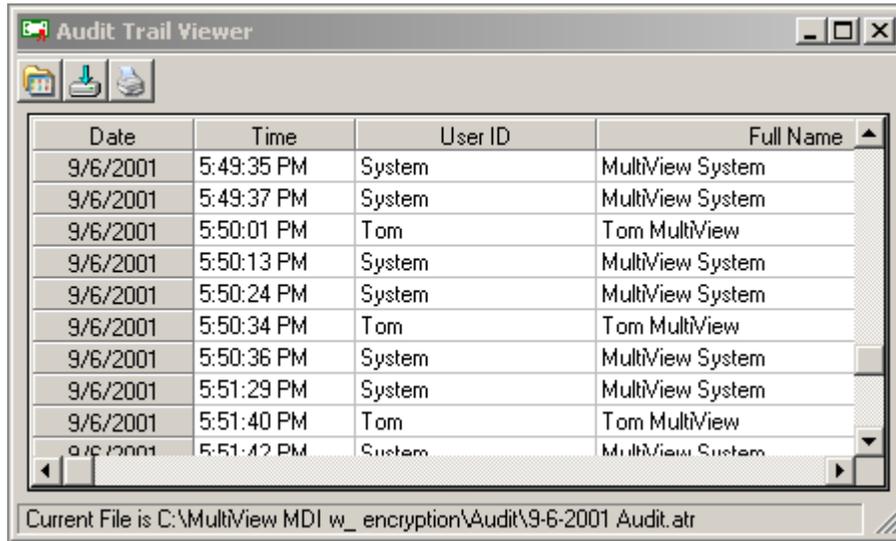
**Data Cursor:** This button turns the data cursor on/off. The data cursor is a vertical line that can be dragged across trend data. When the vertical line is dragged across the trend data, the current value of the point is digitally displayed next to the data cursor. This is a useful tool when tracking actual values across a trend line. To change channels for the data cursor, first click on the data cursor and then on one of the channel names displayed to the right of the trend. The data cursor line will change to the color of the channel selected. Moving the data cursor to the left or right will display the actual value for the channel selected.

**Save as Jpeg:** This button allows the user to save the current trend snapshot as a Jpeg file:

**Print Trend:** This button sends the current trend snapshot to a printer.

### Audit Trail Viewer:

The Audit Trail Viewer provides the operator with a grid type view of all entries made to the daily audit log. Date, Time, UserID, User Full Name, User Comment and User Action are provided. If security is enabled and the audit trail is turned on, the audit log is written to by the system during any operator event that changes a parameter in the control system. Any actions that involve data files as well as the clearing or acknowledgment of alarms is also written to the audit trail. Like data files, the audit trail is encrypted and read only.



### Audit Trail Toolbar:

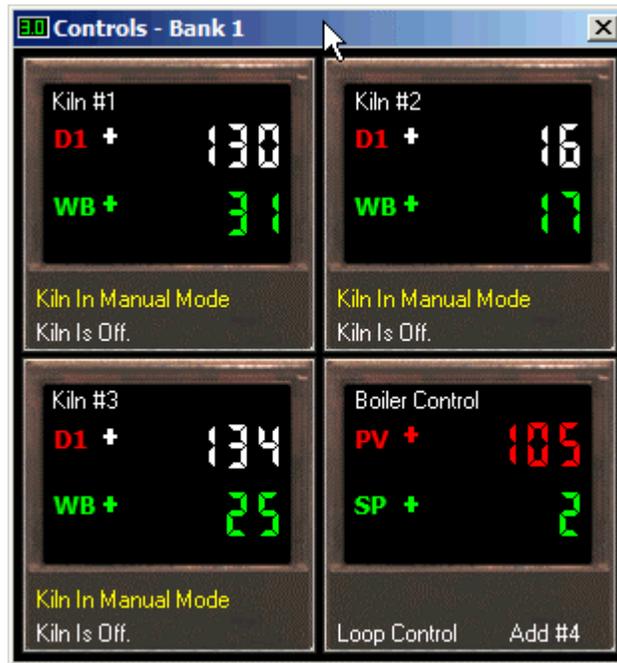
The toolbar at the top of the audit trail window provides the following functions (left to right):

**Open Audit Trail File:** Allows the user to open an audit trail file and view the data in a grid type format. Audit trail logs are created and written to daily. To activate the audit trail, the user must click on the "Enable Security" checkbox in the "Configure Users" section of the program.

**Export Audit Trail:** Allows the user to export the audit trail file to a .csv file. Csv files can be read by Excel or any program capable of reading a comma-separated file.

**Print Audit Trail:** Allows the user to print the Audit Trail Log. Standard print dialog is used.

## Control Banks Menu Options:



Controller faceplates allow the user to monitor many kilns or single loop controllers at the same time by lining up multiple faceplates on the computer monitor. This provides a "quick" view of all kilns/controllers attached to the system.

Banks consist of 4 controllers per bank. Process value (red), setpoint (green) and alarm indication are provided. The faceplate will be updated to show the schedule run, hold and stop buttons as well as current segment active. These faceplates can be used for FDC 300 series single setpoint controllers or the FDC Orion kiln controller.

When using the Kiln controller (single or multiple units), the faceplate will dynamically show dry bulb and wet bulb temperature for the kiln assigned in the setup section. The Run, Stop and Hold buttons used for the FDC 300 series single loop controllers will not be visible. These functions must be accessed from the Kiln detail screen when kiln controller is assigned to the faceplate. Current schedule running as well as schedule status will be shown at the bottom of each faceplate. Dry bulb temperature, color and heading label will alternate in the faceplate display to match fan direction (forward = white, reverse = blue).

To change the setpoint of a controller when using the FDC 300 series single setpoint controller, click on the setpoint portion of the faceplate (green display). Enter a new setpoint and hit the "Enter" key. If a setpoint value is written to the controller that is "out of range" of the controller setup limits, the software will display a dialog box with the appropriate error.

## Setup Menu Options:



The "**Controller Labels/Activation**" menu under the "Setup menu allows the user the enable/disable any controller attached to the PC. This can be done in any order (Controller addresses do not have to be in sequence for the system to work properly)

The following activation dialog will be shown when the "Controller Labels/Activation" menu item is selected.

The dialog box is titled "Controller Labels\Enable Status". It contains a table with columns: Ctrl#, Status, Control Type, Device Name, PV Tag, and SP Tag. Below the table are sections for "Communications" and "System Alarms", and a "Dec position for Kiln/300 series profiler" field.

Ctrl#	Status	Control Type	Device Name	PV Tag	SP Tag
1	<input checked="" type="checkbox"/> On/Off	FDC Kiln Control	Kiln #1	DB #1 FV	DB SP
2	<input type="checkbox"/> On/Off	FDC 300 Series	Device #2	Controller 2 FV	Controller 2 SP
3	<input type="checkbox"/> On/Off	FDC 300 Series	Device #3	Controller 3 FV	Controller 3 SP
4	<input type="checkbox"/> On/Off	FDC 300 Series	Device #4	Controller 4 FV	Controller 4 SP
5	<input type="checkbox"/> On/Off	FDC 300 Series	Device #5	Controller 5 FV	Controller 5 SP
6	<input type="checkbox"/> On/Off	FDC 300 Series	Device #6	Controller 6 FV	Controller 6 SP
7	<input type="checkbox"/> On/Off	FDC 300 Series	Device #7	Controller 7 FV	Controller 7 SP
8	<input type="checkbox"/> On/Off	FDC 300 Series	Device #8	Controller 8 FV	Controller 8 SP
9	<input type="checkbox"/> On/Off	FDC 300 Series	Device #9	Controller 9 FV	Controller 9 SP
10	<input type="checkbox"/> On/Off	FDC 300 Series	Device #10	Controller 10 FV	Controller 10 SP

**Communications**  
Scan each controller every  msec  
Enable beep on comms error :

**System Alarms**  
Enable alarm logging :   
Enable single beep on new alarm :   
Beep until any alarm is acknowledged :

Dec position for Kiln/300 series profiler :

Buttons: Cancel, Done

Turning on a controller is as easy as a click of a button. Double click in the grid to enter a tagname for controller process value, setpoint and percent output (DB temp, DB SP and DB % Out when using FDC Kiln controller). Enable/disable the controller by clicking on the checkbox in the "Status" cells. Select the type of controller with the drop down box in each row. When using the FDC Kiln controller, an additional 12 tagnames will appear for each device. These additional tagnames are used for Wet bulb, core probe and extra probes attached to the system (extra probe types are dependent upon FDC-2010-K5C version 1.x or 2.x). Only enter tagnames for the probes that are equipped on the system. If you leave a tagname blank, it will not be included in the tag database for data save, trending, etc.

### Controller types supported:

1. FDC 300 Series Single Loop Controllers:
2. FDC-2010-K5C configured as a "Kiln only" or "Combination Kiln & Pallet Heat-Treat controller".  
KilnView use with the FDC-2010-K5C while in the Pallet Heat-Treat mode is prohibited; KilnView does not communicate with the FDC-2010-K5C hardware while in the Pallet Heat-Treat control mode.

Only enter tagnames for the probes that are equipped on the system. If you leave a tagname blank, it will not be included in the tag database for data save, trending, etc.

The "**Enable-disable beep on comm error**" allows an operator to select if a computer generated "beep" should occur during a communications error with a controller. The logger will store all data related to communication errors.

The **"Enable-disable alarm logging"** checkbox allows an operator to enable or disable the alarm-logging feature. Real time alarms will still be printed to the system alarm log, but disk based historical recording of alarms will be turned off if this feature is disabled. If enabled, the alarm log will be written each time an alarm occurs or when a user deletes, acknowledges or clears an alarm(s). A new alarm log is created every day.

The **"Enable single beep on new alarm"** checkbox allows an operator to enable a single computer beep whenever a new controller alarm is activated.

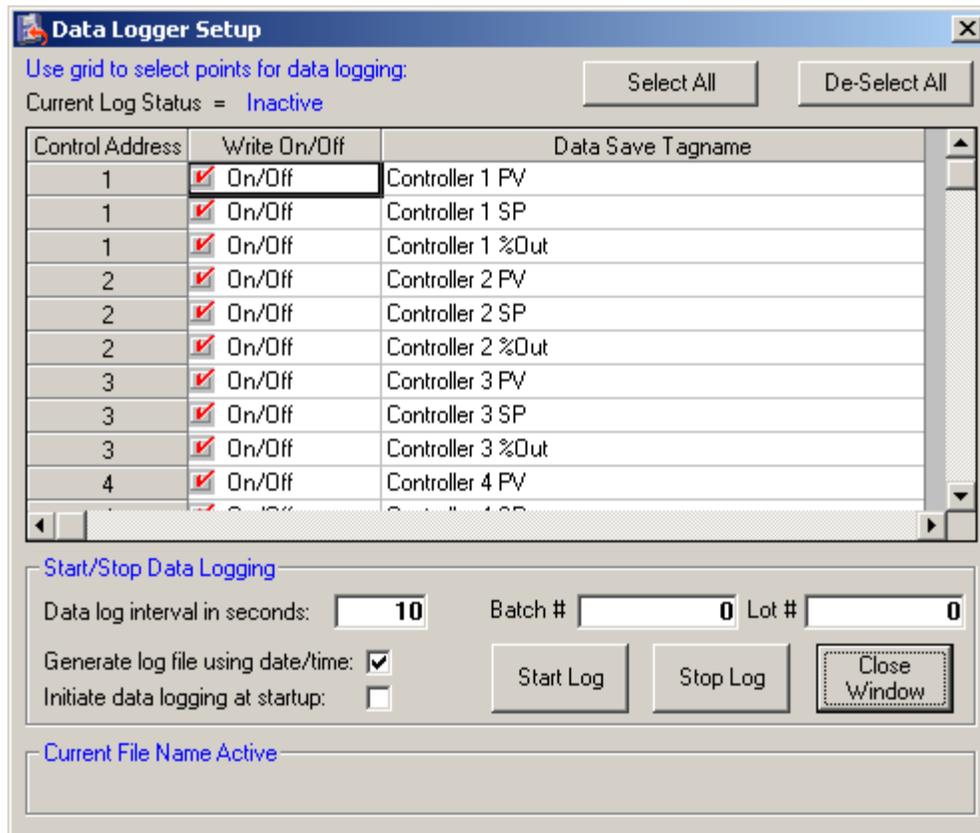
The **"Beep until any alarm is acknowledged"** checkbox allows an operator to enable a continuous computer beep on new alarm, until the alarm is silenced using the "alarm silence" icon located on the toolbar of the alarm window.

The **"Dec position For Kiln/300 series profiler"** field allows an operator to set the decimal position for viewing on the kiln detail monitor view. Field is adjustable for a value of 0 or 1.

### Data Logging:

Configuring the data logging dialog window can save data from any controller. The data save dialog window will only allow the user to save controllers that are activated in the system (turned on).

Selecting Data Logging will display the following dialog window:



Click on the checkbox next to a tagname to enable data save for that tagname. Enter a time for the data save interval. You can save all points selected at a rate adjustable from 1 second to once every 12 hrs. After the data file is started, data save points are locked and cannot be changed until data logging is stopped. This protects the file from additional data that might be added in the middle of a product run.

The **"Generate log file using date-time:"** checkbox allows the system to assign a data filename automatically using date and time stamps for the filename. When this checkbox is enabled a new data file will be started at 12:00 midnight daily.

The **"Initiate logging at startup:"** checkbox allows the system start data logging (with date-time filename) when KilnView is first started. The data file could have zeros for control values for the first few lines of the data file when this option is selected. KilnView will scan controllers based on the scan rate entered in the "Configure Controls-Labels setup" section. Process value and setpoint for each controller is zero until the scanner gets the actual value from each controller. This will be evident in the data file since the value field will be empty. This does not affect the integrity of the data file; it just means there was not available data yet to stamp the file.

The "**Batch and Lot#**" field data (if entered) will be written to the first section of data file. The data file viewer has a "Search Batch#" function to allow the user to look for data that matches a specific batch number. The "**Current Filename Active**" label will display the filename of the currently running data file. This label will be empty if no data file is active.

The "**Select All**" button allows the user to select all channels for data logging.

The "**Deselect All**" button allows the user to disable all channels for data logging.

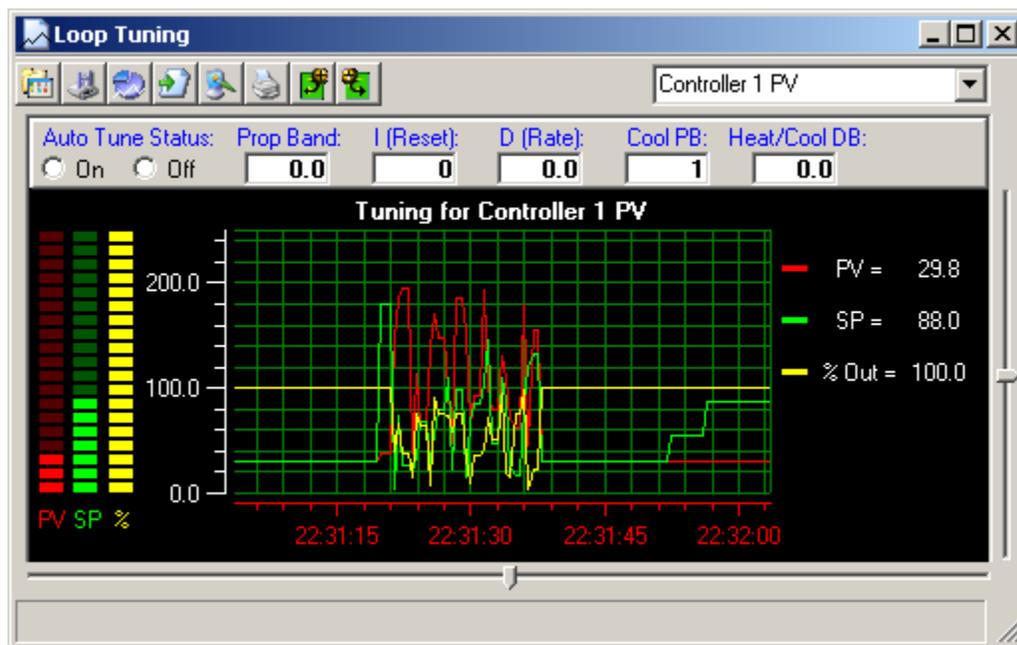
The "**Start Log**" button will start the data logging process. If the "Generate log file using date-time:" checkbox is enabled, data logging will start using date and time as the file name. Otherwise, a dialog box will be shown to allow the user to name the data log file.

The "**Stop Log**" button will stop the data logging process.

#### Loop Tuning [FDC-300 Series Digital Single Loop Controls]:

The loop-tuning window provides the user with an interface to access controller auto-tune as well as manual tune parameters. Tuning is available for FDC-300 single setpoint controllers only. Control tuning for the digital Kiln systems is accomplished via the color touch screen supplied with each FDC Kiln system. Loop tuning should only be used when the backup 300 series controller is set for PID analog (4-20mA) output control type. Auto tuning "on/off" control type will have no effect on the system.

Selecting "Loop Tuning" from the setup menu displays the following dialog:



The loop-tuning window has fields for proportional band, auto reset, rate, cooling PB and Deadband (gap between heat and cool control).

Use the drop down list box located at the top right of the loop-tuning window to select a control to work with. Only controllers that are activated in the system will show up in the list box.

The Auto-Tune on/off radio button will display if auto-tune is active when the "Read Values" button is pressed or initiate or turn off auto-tuning when the "upload values" toolbar button is pressed.

The trend is provided to monitor PV, SP and %Out through the complete tuning cycle.

#### Loop Tuning Toolbar:

The toolbar at the top of the trend screen provides the following functions (left to right):

**Open Tuning File:** Allows the user to open a tuning file previously saved.

**Save Tuning File:** Allows the user to save the current tuning settings to the hard disk for latter retrieval.

**Trend Setup:** Provides a dialog box to customize the trend appearance. Trend Scale for X and Y, trend ticks and colors are configurable by the user. Since the channels are preset to PV, SP and %Out, the channel assignment list boxes will be grayed out and not in use.

**Resume Trending:** Any time the trend scale or time is dragged (up/down-left right) by the user, trending is stopped. After dragging scale or time, press the "Resume Trending" button to resume trend operation.

**Save as Jpeg:** This button allows the user to save the current trend snapshot as a Jpeg file:

**Print Trend:** This button sends the current trend snapshot to a printer.

**Upload Tuning Values:** This button uploads the current tuning values from the controller to the PC.

**Download Tuning Values:** This button downloads the current tuning values from the PC to the controller.

### Alarm Setpoints:

The alarm setpoint dialog allows a user to read or write alarm setpoint data to 300 series single loop controllers only. Kiln controller alarms are adjusted via the color touch interface supplied with the kiln control system. When this option is selected the following dialog box will appear.

Click on the "**Read Values**" button to get alarm setpoint data from a specific controller. Use the drop down list box at the top right of the dialog box to select a controller to work with. Only controllers activated in the system will be displayed in the drop down list.

Click on the "**Write Values**" button to write the field values to the controllers.

Click on the alarm fields and enter an alarm value to change the alarm setpoint for the controller.

**Alarms type must be programmed in the 300 series single loop controller (via the faceplate of controller) before and alarm can be activated at the controller level.**

### User Menu Options:



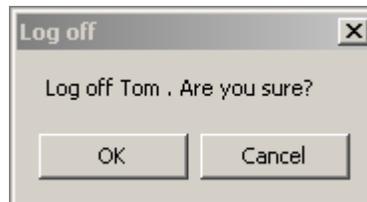
### Log on:

The "Log On..." menu item provides a user the ability to log on to the system. Enter userID and password to login. If login fails, the user will be written to the audit trail and the system security defaults back to "Operator" level.



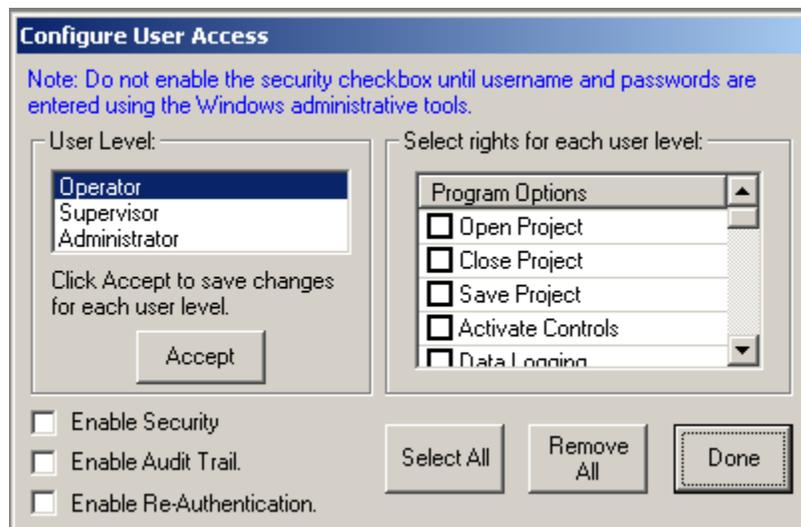
### Log Off:

The "Log Off..." menu provides a user the ability to log off of the system. Enter userID and password to log off. If log off fails, the user will be written to the audit trail and the system security defaults back to "Operator" level.



### Configure User Access:

The "Configure User Access" menu item provides a system administrator the ability to set security access for users assigned to Operator, Supervisor or Administrator levels. The following dialog will be displayed:



### Configure User Access Items:

The "**User level:**" list box allows an administrator to select the user level to assign rights to.

The "**Select rights for each user level:**" check/list box allows the administrator to set the security options for the specific user level selected. Before moving to another user level, click on the "Accept" button to save the current user level settings.

The "**Enable Security**" checkbox allows an administrator to enable or disable the security features. If this checkbox is unchecked, all software functionality is available to any user on the system without login or password check.

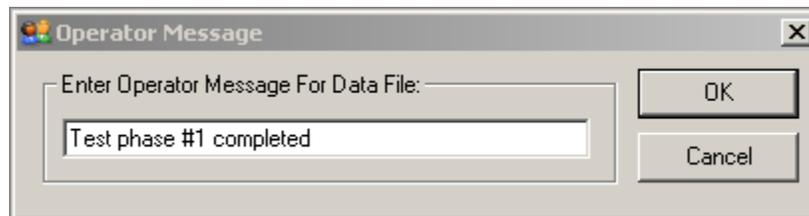
The "**Enable Audit Trail**" checkbox allows an administrator to enable or disable the audit trail. If this checkbox is unchecked, the audit trail data for each user action will not be written to the audit trail log and will not be accessible for viewing.

The "**Enable Re-Authentication**" checkbox allows an administrator to enable or disable the re-authentication feature. If this checkbox is unchecked, a user will not be required to re-authenticate his/her password before making a process change. If this feature is enabled, a user is required to login again (even if already logged on) before changing setpoints or other process changes in the system. This feature offers dual protection against unwanted system changes that might adversely affect the Kiln.

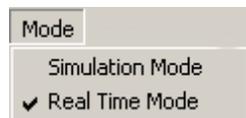
The "**Select All and Deselect All**" buttons allow an administrator to select or deselect all program options at one time.

### Operator Message For File:

This menu item gives a system operator (with proper access) the ability to write a message to an open data file. This can be used for comments, system upsets or tags that need to be related to the file. A data file must be running to add a message the file.



### Mode Menu:



The Mode menu allows a user to run the KilnView software in real time or simulation mode.

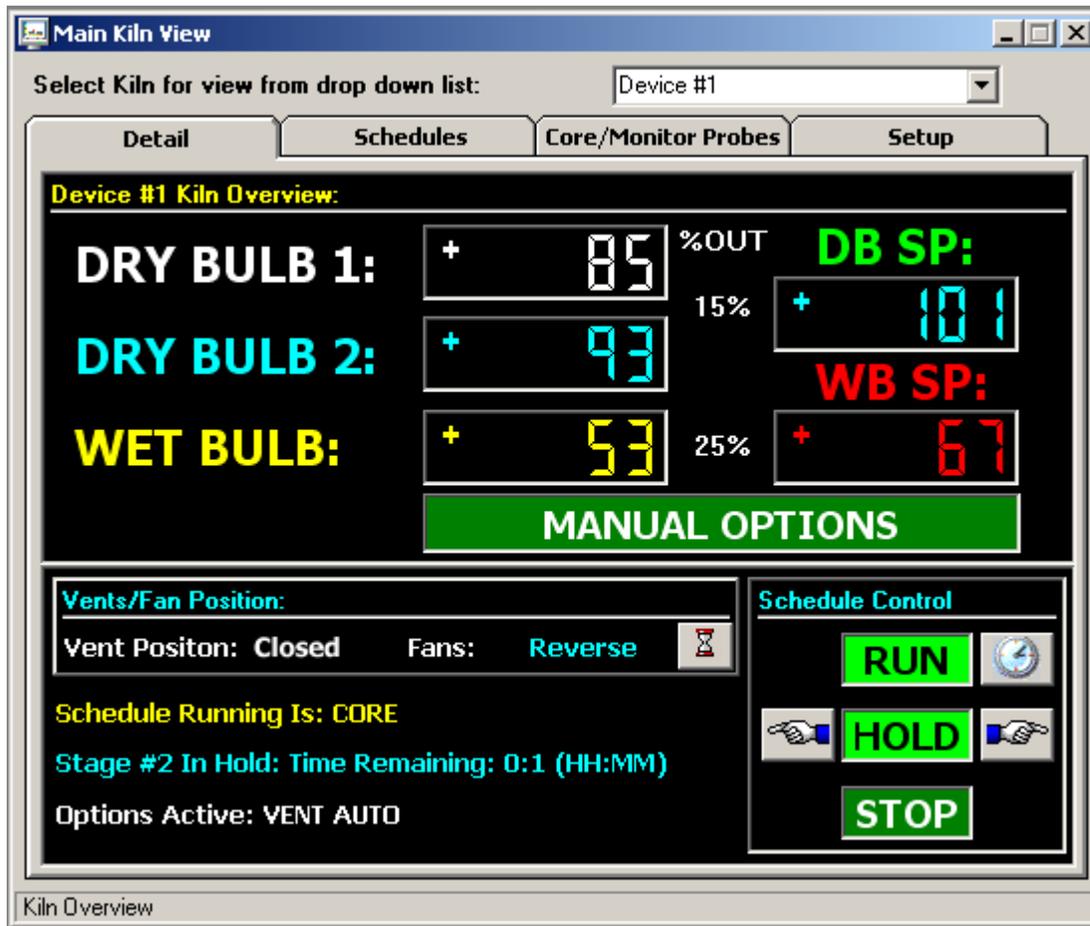
**Simulation Mode:** The simulation mode is only used in demo versions of the software or customer testing. All data is auto generated by the system.

**Real Time Mode:** The software always starts in real time mode for system safety.

This Mode [choice of Simulation & Real Time] can be locked out in the configure users section of the program.

## Data Views

The Kiln detail view provides the user with all data related to Kiln operations. The multi-tab interface is broken up into 4 sections.



The Kiln detail view tab provides the user with all current kiln “run” data. This includes data for dry bulb (1 and 2), as well as manual and automated schedule operation control setpoints for dry bulb and wet bulb can be changed any time during schedule run. Schedule name, status and options active are also displayed. While running the system in manual mode, all event outputs (manual options) can be accessed and operated by the user. When running in automatic schedule mode, any setpoints or event options can be modified after the schedule is put into hold. These changes will not affect the saved schedule, only the current stage running in the schedule.

The vent/fans status is displayed and can be changed during schedule run if analog type (not on-off relay) vents/dampers are used in the system. Clicking on the “hourglass” icon will display the time remaining for fan forward, reverse and dwell times if fans are set to auto.

The schedule run, hold and stop buttons allow the operator to run the currently loaded schedule from the PC. If a schedule is not loaded into the controller, the schedule will not be started.

The above screen displays the layout when variable type outputs (analog) are used for heat and spray control, the actual % control output will be displayed between the “Actual and Setpoint” values for dry bulb and wet bulb.

The actual % control outputs for heat and spray are displayed between the “Actual and Setpoint” values for dry bulb and web bulb.

**FDC-2010-K5C firmware version 2.x** (April 2008) provides EMC & %RH on its' main view; KilnView does NOT show these values.

## Ramping Setpoint Control:

When running in automatic schedule mode, the kiln controller will “ramp” dry bulb and wet bulb temperatures to the target setpoints entered in the automatic schedule. During automatic schedule run, pressing the dry bulb and wet bulb setpoint fields will display the target setpoint for the user. Whenever the automatic schedule is put into hold, new target setpoints can be entered by pressing the dry bulb/wet bulb setpoint fields, and entering a new setpoint for each. The system will recalculate the new ramp rate based on time remaining in the stage. Any time schedule time is added or subtracted (while the schedule is in hold), new ramp rates will also be calculated based on the time adjustments made to the stage.

If the automated schedule is in a “soak” stage (current stage setpoints = last stage setpoints), changing the setpoints for dry bulb and wet bulb will result in an immediate setpoint change (no ramp to setpoint). This is done so “soak” stages can be modified without waiting for the complete stage to “time out” before reaching the final setpoint. This offers maximum flexibility for an operator since soak stages can be “long” and require several setpoint changes to maintain kiln “load” requirements.

**Note: When running an automatic schedule, changes to dry bulb/wet bulb, manual events and add/remove time, can only be accessed when the schedule is put into hold. The schedule can then be “continued” with manual changes remaining active until the next schedule stage is entered.**

## Additional Moisture/Weight/Temp Probes: (FDC-2010-K5C version 2.x & above offers temperature probes only)

Up to 6 additional probes can be added to the kiln system. The additional probes can be configured for moisture/weight or temperature probes (all must be configured for one type). When additional probes are configured, the values will dynamically be displayed on the “Core/Monitor Probes” screen. The Orion Kiln system comes equipped with one extra RTD input that can be used for “core” operations (explanation below), if configured to be active in the factory setup.

FDC-2010-K5C version 1.x: When additional probes are configured for moisture/weight probes and a “Mon Probe” setpoint is programmed into an automatic schedule “”, the Kiln detail screen will flash an “=” icon any time the first probe (probes activated per stage are user selectable) drops below the “Mon Probe” setpoint (entered in the schedule). The “equalize output (Q3)” will also be energized. Press the “=” icon to de-energize the equalize output and the “=” icon will disappear. This indication will alert the operator to make manual changes to the schedule once the first moisture/weight probe has fallen below the programmed moisture setpoint.

FDC-2010-K5C versions 1.x and 2.x: When additional probes are configured for temperature probes (temperature only with version 2.x and above) and a “core” setpoint is programmed into an automatic schedule, the schedule will automatically advance to the next “stage” when all probes (probes activated per stage are user selectable) are above the “core” setpoint programmed for the stage. This is useful during “sterilization” processes that require that all temperature probes be above a specific temperature before sterilization “time down” is allowed to continue. Probe usage combinations are selectable per stage when entering an automatic schedule.

When the “Cool Down” stage option is selected, and additional probes are configured for temperature probes with a “core” setpoint programmed into an automatic schedule, the schedule will automatically advance to the next “stage” when all probes (probes activated per stage are user selectable) are  $\leq$  the “core” setpoint programmed for the stage. This is useful during processes that require that all temperature probes be below a specific temperature before the schedule automatically continues to the next stage. Probe usage combinations are selectable per stage when entering an automatic schedule.

FDC-2010-K5C version 1.x: A unique feature is the ability to use the standard “core” RTD input along with up to 6 additional moisture/weight probes. This gives the operator the flexibility of monitoring when the first moisture probe drops below the programmed “Mon Probe” setpoint, and also not continue to the next automated stage until the “core” probe is above the programmed “core” setpoint.

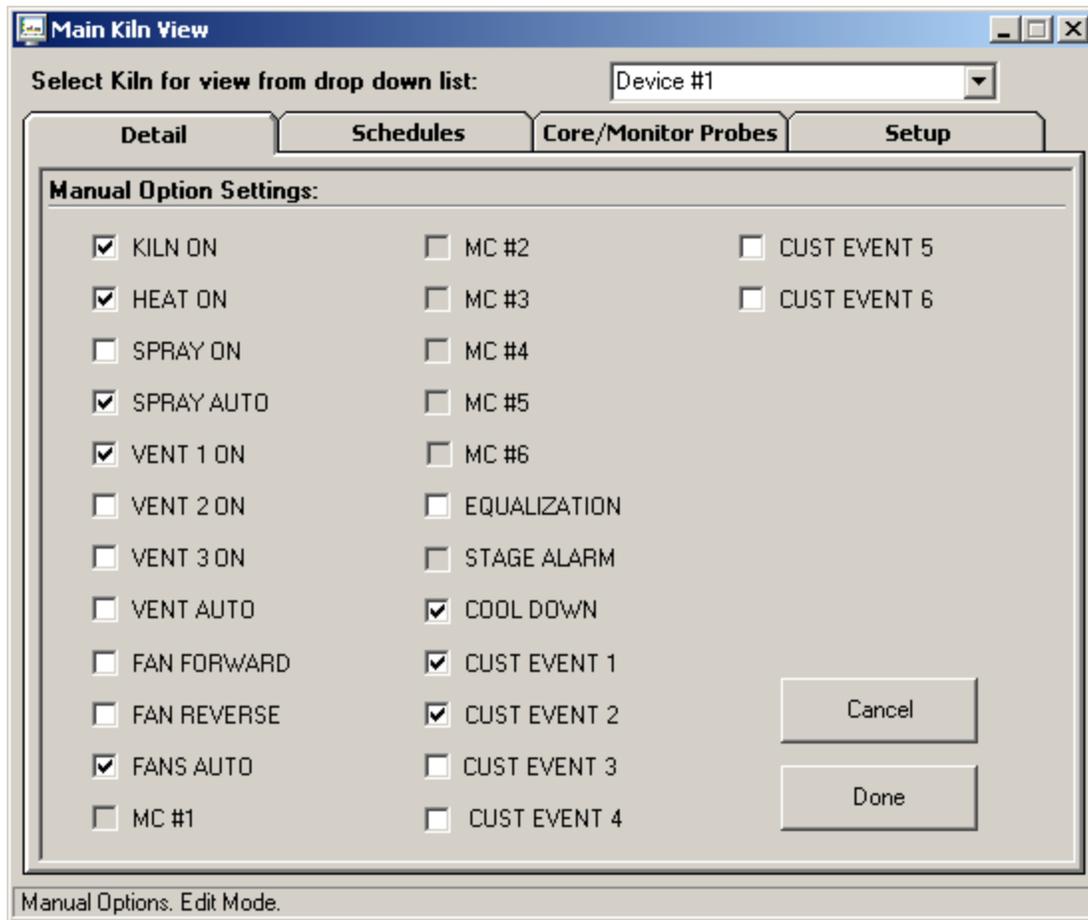
## EMC and %RH: FDC-2010-K5C firmware version 2.x (April 2008)

The EMC display and control logic described below are NOT available in KilnView.

FDC-2010-K5C firmware version 2.x, if so configured, an EMC setpoint is programmed into an automatic schedule, the schedule will automatically advance to the next “stage” when the EMC value is achieved. Instead of a Stage Advance a relay output may be configured when a Stage achieves the EMC setpoint.

## Manual Options View:

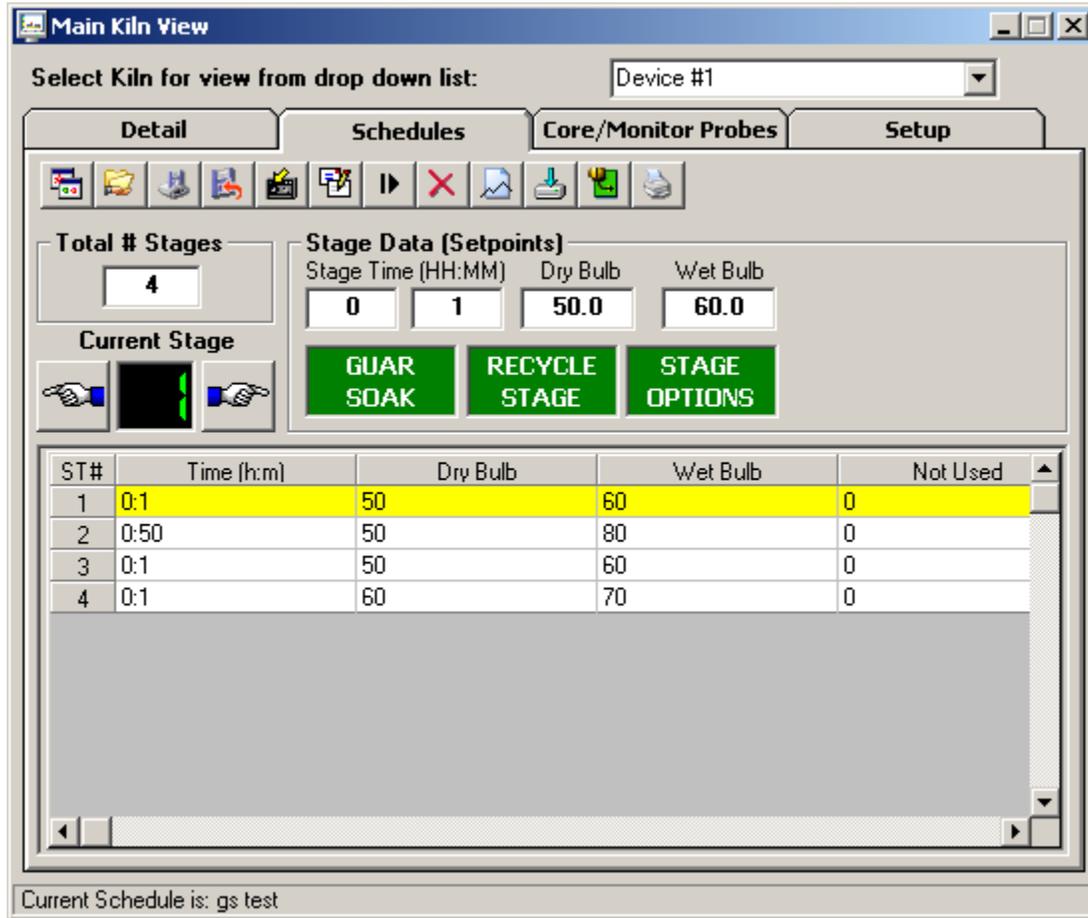
The manual options view allows the user to enable or disable control/event outputs in the system while the kiln controller is being operated in manual or automatic schedule mode.



Any manual event (or combination of events) in the system can be enabled or disabled by clicking the checkbox next to the event tagname. Up to 7 customer events allows the user to wire to any type of custom external device required for kiln operation. This section of the system is used to setup the initial drying process for heat, spray, fan position as well as custom outputs required.

When a schedule is running in automatic schedule mode, the manual events screen can be accessed for "view only" status. The manual event screen will display the current status of all events active in the stage, but the events cannot be edited or changed. When a running schedule is put into hold, any of the manual events in the system can be enabled/disabled. When the schedule is continued, the status of the events will remain "as set" by the user for the rest of the stage. These changes will not affect the saved schedule, only the stage running after the manual event changes are made. This provides the user with the flexibility to make stage changes "on the fly" without changing the saved schedule running.

## Kiln Schedule View:



The Kiln schedule view allows an operator to open, save, create and edit schedules from the PC interface as well as download created schedule to the controller.

The toolbar icons for schedule edit are as follows (order from left to right):

<b>Create New Schedule:</b>	Clear and create a new schedule.
<b>Open Schedule:</b>	Open a schedule previously saved.
<b>Save Schedule:</b>	Save current schedule.
<b>Save Schedule as:</b>	Save current schedule with different name.
<b>Copy Stage:</b>	Copy current stage.
<b>Paste Stage:</b>	Paste current stage.
<b>Insert Stage:</b>	Insert a new stage a current point.
<b>Delete Stage:</b>	Delete stage at current point.
<b>Toggle Grid:</b>	Toggles between spreadsheet and schedule trend mode.
<b>Export Schedules:</b>	Displays export dialog for export of schedules to "I-Stick" data device.
<b>Download Schedule:</b>	Download current schedule to controller.
<b>Print Schedule:</b>	Print current schedule.

Operators can create and edit schedules at any time during Kiln operation. Clicking in the stage fields allows the user to enter data for each stage. The "tab" key will also cycle operators through each field.

The "spreadsheet" on the screen will automatically update when stage data is entered. Clicking on the spreadsheet for any stage will set all fields to the stage that the user selected in the spreadsheet. This feature allows the operator to quickly navigate through stages without pressing the "previous/next" stage buttons.

Stages can be inserted or deleted from a schedule by pressing the insert or delete icons on the toolbar. Copy and paste commands will work on any stage active when using these functions.

Up to 6 additional probes can be added to the kiln system. The additional probes can be configured for moisture/weight or temperature probes (all must be configured for one type) with FDC-2010-K5C v1.x; version 2.x and above the additional probes are temperature only with RTD or Type J Thermocouple input.

When additional probes are configured, the values will dynamically be displayed on the kiln "Core/Monitor Probes" screen. The Orion Kiln system comes equipped with one extra RTD input that can be used for "core" operations (explanation below), if configured to be active in the factory setup.

FDC-2010-K5C version 1.x: When additional probes are configured for moisture/weight probes and a "Mon Probe" setpoint is programmed into an automatic schedule, the detail system screen will flash an "=" icon any time the first probe (probes activated per stage are user selectable) drops below the "Mon Probe" setpoint (entered in the schedule). The "equalize output (Q3)" will also be energized. Press the "=" icon to de-energize the equalize output and the "=" icon will disappear. This indication will alert the operator to make manual changes to the schedule once the first moisture/weight probe has fallen below the programmed moisture setpoint.

FDC-2010-K5C version 1.x and 2.x: When additional probes are configured for temperature probes (temperature only with version 2.x and above) and a "core" setpoint is programmed into an automatic schedule, the schedule will automatically advance to the next "stage" when all probes (probes activated per stage are user selectable) are  $\geq$  the "core" setpoint programmed for the stage. This is useful during "sterilization" processes that require that all temperature probes be above a specific temperature before sterilization "time down" is allowed to continue. Probe usage combinations are selectable per stage when entering an automatic schedule.

When the "Cool Down" stage option is selected, and additional probes are configured for temperature probes (version 2.x and above may only be configured for temperature) with a "core" setpoint programmed into an automatic schedule, the schedule will automatically advance to the next "stage" when all probes (probes activated per stage are user selectable) are  $\leq$  the "core" setpoint programmed for the stage. This is useful during processes that require that all temperature probes be below a specific temperature before the schedule automatically continues to the next stage. Probe usage combinations are selectable per stage when entering an automatic schedule.

FDC-2010-K5C version 1.x: A unique feature of the FDC-2010-K5C v1.x is the ability to use the standard "core" RTD input along with up to 6 additional moisture/weight probes. This gives the operator the flexibility of monitoring when the first moisture probe drops below the programmed %MC setpoint, and also not continue to the next automated stage until the "core" probe is above the programmed "core" setpoint. (This unique feature is not available on FDC-2010-K5C v2.x & above.)

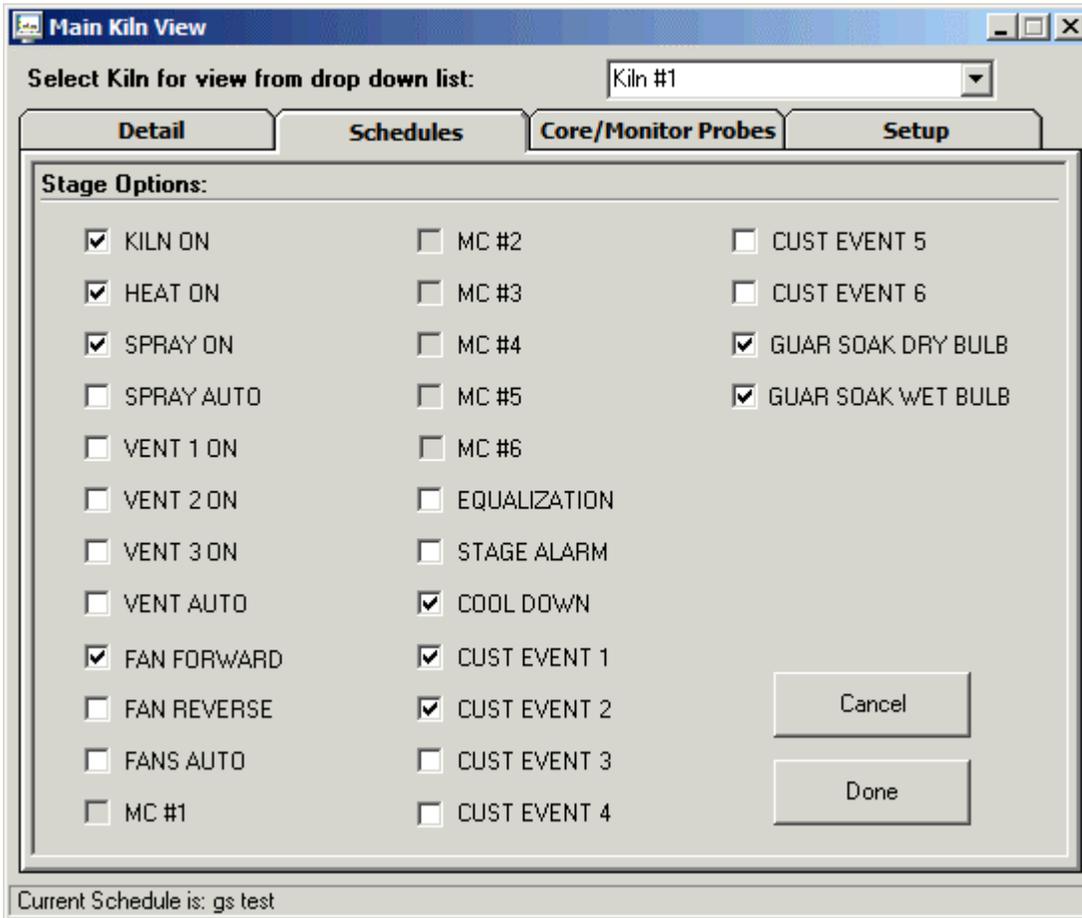
The number of schedules that can be saved to disk is limited only by the size of the hard disk on the computer used.

#### **EMC and %RH: FDC-2010-K5C firmware version 2.x (April 2008)**

The EMC display and control logic described below are NOT available in KilnView.

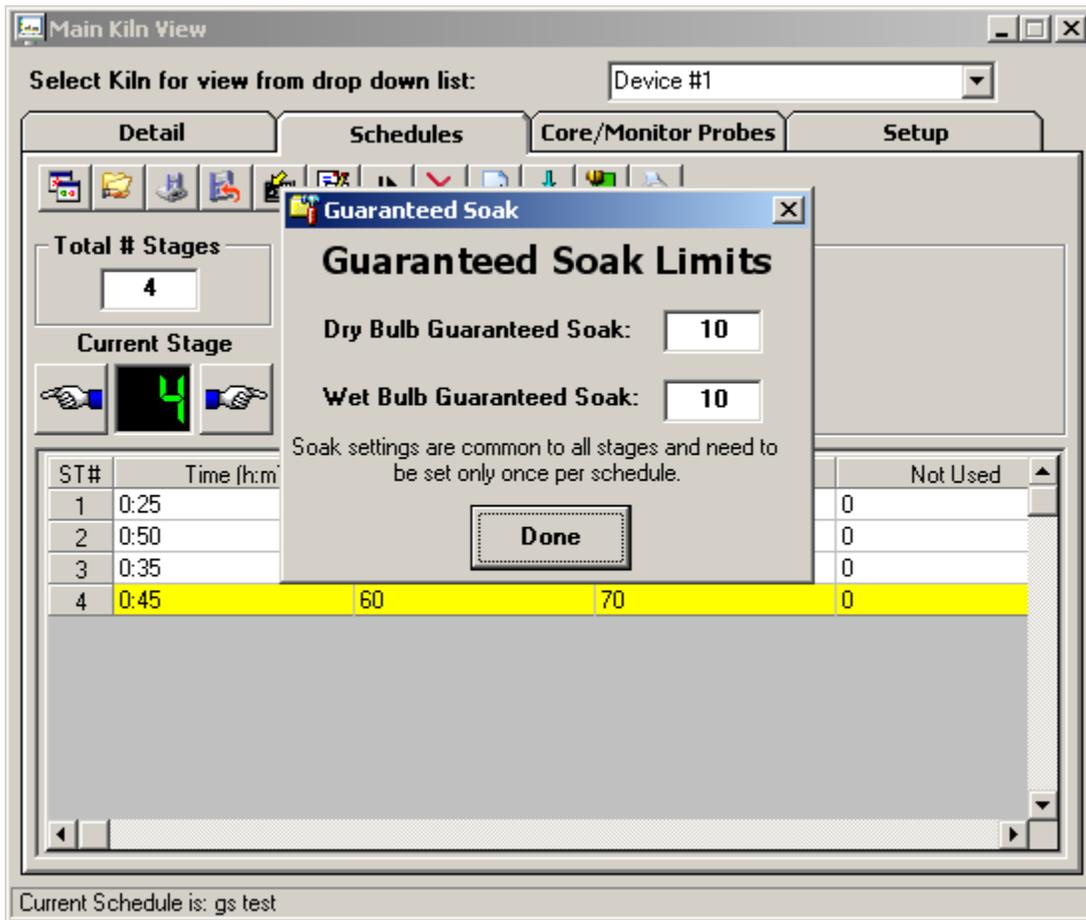
FDC-2010-K5C firmware version 2.x, if so configured, an EMC setpoint is programmed into an automatic schedule, the schedule will automatically advance to the next "stage" when the EMC value is achieved. Instead of a Stage Advance a relay output may be configured when a Stage achieves the EMC setpoint.

Stage Options:



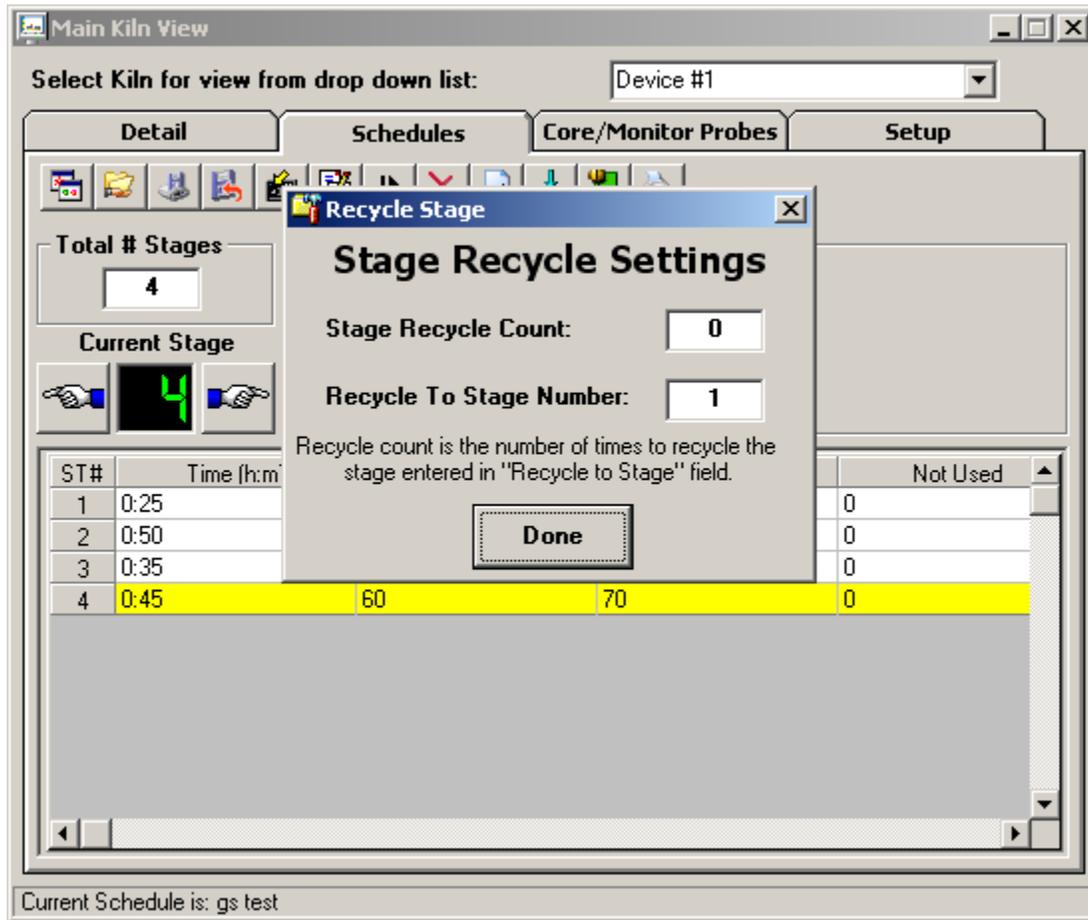
The stage options screen allows the user to select all system control and user outputs for each stage while in schedule edit mode. Stage option outputs consist of heat, spray vents, fans, gs options for dry bulb and wet bulb as well as customer configurable relay outputs for custom use. Click on the checkbox if the control output should be on during the stage being edited when an automatic schedule is being run. When finished selecting all options, press the "Done" key or cancel to leave the screen.

**Guaranteed Soak:**



The Guaranteed Soak option allows the user to set a band for dry bulb and wet bulb. If during schedule run, the active dry bulb temperature or wet bulb temperature falls outside of this band, the schedule will hold until the active dry bulb temperature or wet bulb temperature is back within the band. The value entered for guaranteed soak is an "even sided" band above and below the current schedule setpoint for dry bulb and wet bulb. The guaranteed soak values are "global" and apply to all schedule stages. The operation for guaranteed soak can be enabled or disabled for dry bulb and wet bulb on a "per stage" basis by selecting or de-selecting the option when configuring the stage options for each stage of the schedule.

## Stage Recycle Settings:



The stage recycle settings screen allows the user to jump between different stages within the schedule. It can also be referred to as a "looping" function. This is useful for repeating the same sequence of stages over and over again without having to enter them into a schedule multiple times. It is valuable for providing the functionality to loop or repeat stages based on user schedule requirements.

### Notes:

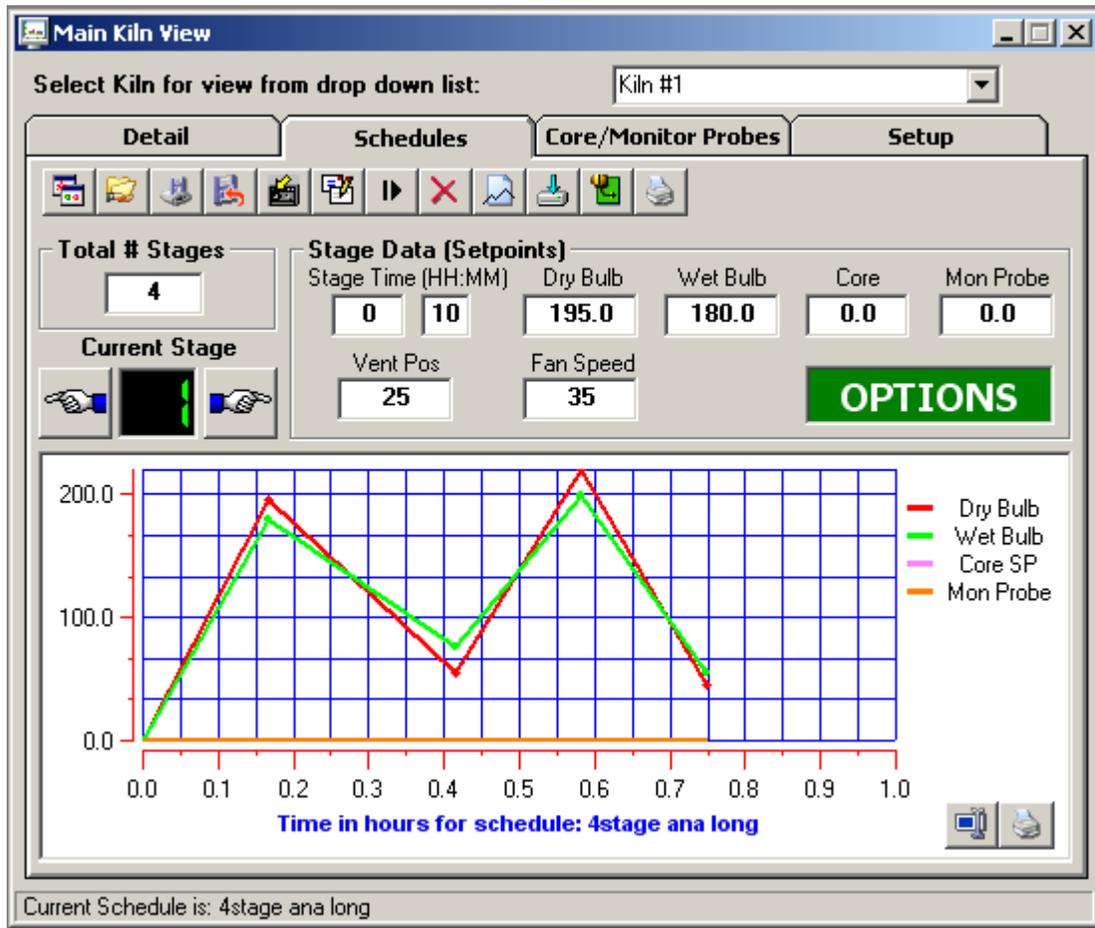
**Stage Recycle Count:** Number of times to jump

**Recycle To Stage Number:** Number of stage to jump to once current stage is complete

The primary use for a Recycle is to jump back to the beginning of a schedule and repeat the same steps over again for a predetermined number of times. If a schedule needs to be repeated 20 times (for example), the Recycle function would be used to accomplish this. To repeat the schedule 20 times, set up the Recycle on the last stage for a "Recycle To Stage Number" of 1 and a "Stage Recycle Count" of 19. The Recycle stage tells the schedule to jump back to stage 1 upon the completion of the last stage. The "Recycle Count" tells the schedule to jump back to stage 1 for a total number of 19 times. This means that upon the completion of the last stage, it will jump back to stage one 19 times. The reason the "Stage Recycle Count" is one less than the desired 20 times is because it already completed the schedule once upon the first jump from the last stage. Since it was done once in order to make the first jump, you only need to repeat the schedule 19 times in order to get 20 cycles.

The schedule also has the ability to do nested looping. It has the ability to set up recycles on every stage throughout the schedule. It even has the ability to jump forward, skipping stages, only to allow them later by other recycle stage returning to the skipped steps. However, this can become confusing. Use caution with nested loops to prevent product loss. The schedule may not operate as expected due to multiple jump paths within the schedule.

## Schedule Trend View:



Clicking on the “toggle spreadsheet/trend” icon in the toolbar accesses the schedule graph view. This view allows the operator to display the schedule in “Trend” mode rather than spreadsheet mode. Any time a stage is updated, the trend will automatically update with the newest entered data. Clicking on the “toggle spreadsheet/trend” icon will switch between spreadsheet and graph view modes.

### In the schedule graph area there are two icons:

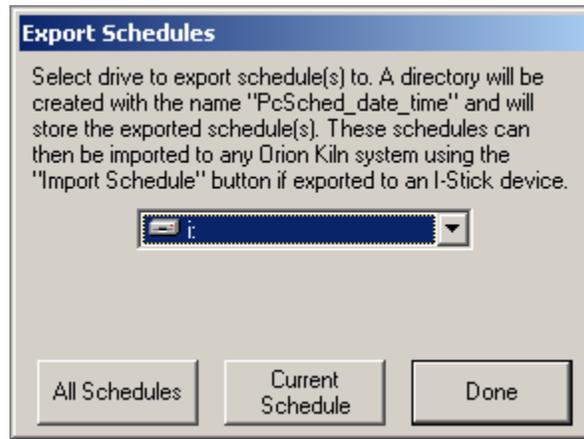
#### Data Cursor Icon:

The data cursor is a vertical line that can be dragged across trend data. When the vertical line is dragged across the trend data, the current value of the point is digitally displayed next to the data cursor. This is a useful tool when tracking actual values across a trend line. To change channels for the data cursor, first click on the data cursor and then on one of the channel names displayed to the right of the trend. The data cursor line will change to the color of the channel selected. Moving the data cursor to the left or right will display the actual value for the channel selected.

#### Print Icon:

Pressing this icon will print the current schedule in graph format.

## Export Schedules:

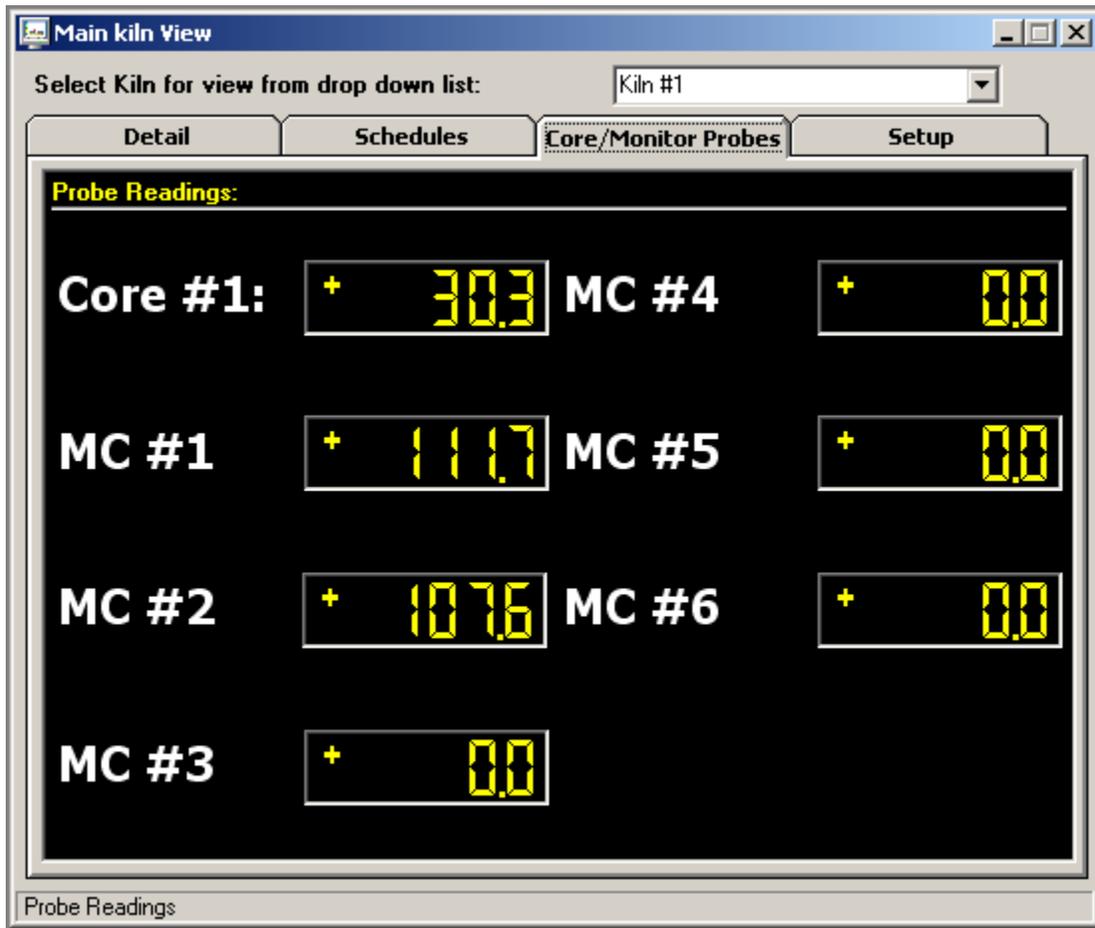


Schedules created in KilnView are compatible with schedules created at the Orion Kiln control interface. All schedules created in KilnView can be exported to the "I-Stick" data storage device for import by any Orion kiln controller device. This allows the operator to create schedules at the PC (using KilnView) and then quickly import a single schedule or a batch of schedules into the Orion kiln interface. This saves time when using multiple Orion kiln controllers since the operator does not have to enter each schedule at the Orion kiln interface.

The buttons at the bottom of the dialog allow the user to import all schedules or a single schedule. If "All Schedules" is selected, all schedules stored at the PC will be copied to the destination drive selected from the drop down "drive" list. If "Cur Schedule" is selected, then the current schedule being edited (must be saved to disk) will be saved to the destination drive selected from the drop down "drive" list box.

The drop down "drive" list box will display all current drives connected to the PC. Make sure you know which drive letter the "I-Stick" storage device is before exporting schedules to make sure they are copied to the correct drive. A directory will be created each time schedules are exported. The directory name format is "PcSched\_Date\_Time".

## Core/Monitor Probes View:



The core/monitor probes view will display all core/monitor probes configured in the system.

FDC-2010-K5C version 1.x: The system will accept up to 1 core probe and 6-monitor probes total (moisture/weight sensors or temperature probes using temperature transmitters).

FDC-2010-K5C version 2.x: The system will accept up to 1 core probe and 6-monitor probes (direct input RTD or Type J Thermocouple based upon global input type configuration).

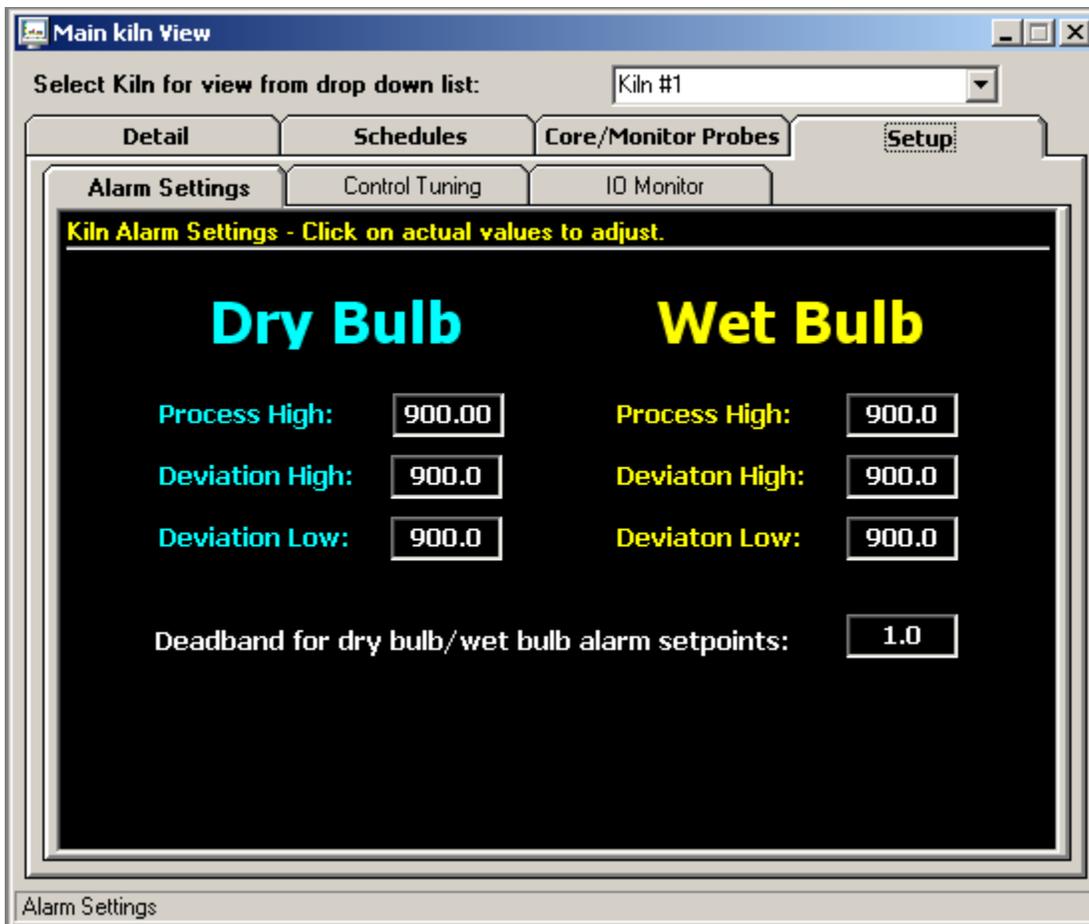
Schedule operations based on core probe/moisture probe use are selectable per stage for each schedule. If a core probe is not enabled in the system, its value will read "^^^" so the operator will know the core probe is not in use.

Core probes are used to monitor the internal temperature of a piece of lumber whereas the main dry bulb and wet bulb probes are monitoring kiln temperature. Core probes can be used to continue a schedule based on the temperature of the internal lumber (or multiple temperature probes for sterilization usage) instead of the actual air temperature in the Kiln. If additional MC/Weight/Core probes are not configure for the system, the display monitors will read "^^^" so the operator will know the probes are not in use.

FDC-2010-K5C version 1.x: Moisture/weight probes are used to monitor the % moisture of the lumber. When an automatic schedule is run, the user can select any of the probes equipped on the system, in any stage of an automatic schedule. When the first probe (out of all moisture probes selected for the stage) falls below the moisture setpoint entered for the stage, the main detail screen will display an "Equalize" message to the user. A control output will also be energized and can be wired to a light or buzzer to alert the user. Pressing the "Equalize" button will de-energize the control output and the "Equalize" button will disappear. At this time the user can put the kiln controller into hold, take the appropriate steps to equalize the system as well as add/subtract segment time or continue to the next stage if required. Moisture/weight probes may not be used with FDC-2010-K5C version 2.x or higher.

**Note:** Probe description names are configurable using the KilnView configuration program.

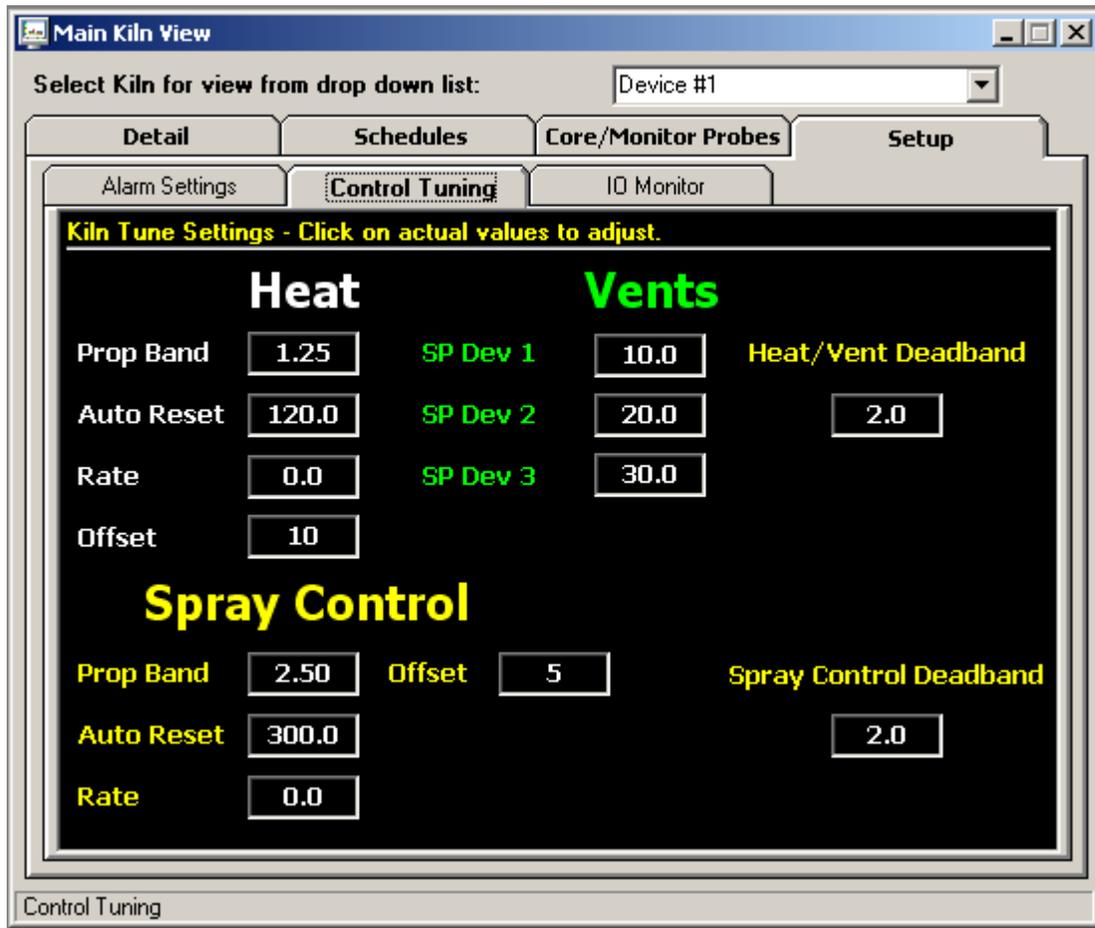
Kiln Setup (Alarm Settings):



The Kiln Setup tab provides the user with the ability to adjust alarm setpoints, kiln control tuning as well as an IO monitor for trouble shooting or monitoring kiln control outputs (relay and analog).

The kiln alarms setting allow the operator to adjust the alarm setpoints for dry bulb and wet bulb. Process high, deviation high and deviation low settings are provided for each probe. Click the alarm value to change the value of the alarm and press the enter key. An alarm Deadband is provided to prevent "chatter" around alarm setpoints.

## Kiln Setup (Control Tuning):



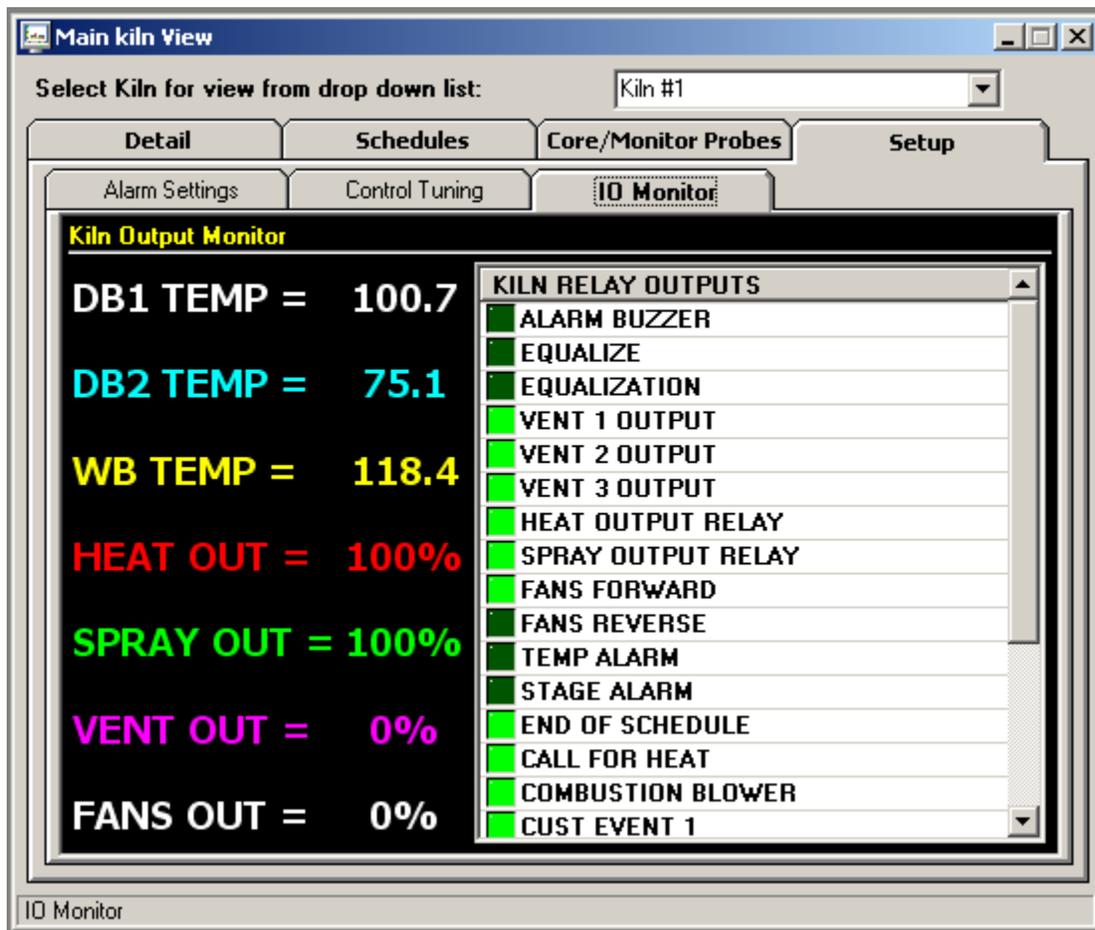
Control tuning values for temperature, vents and spray is displayed. Depending on the kiln setup, the kiln control can be equipped to control each of these process using relay or analog outputs. If the kiln is setup for relay outputs, the PID values for temperature and spray should not be adjusted and left at values of "0". The vent setpoints (1 through 3) can be adjusted as a deviation from wet bulb value. As the wet bulb temperature increase above each of the 3 setpoints, relay outputs for vent 1, 2 and 3 will be energized.

If the kiln system is configured for analog operation (non-relay control), PID tuning values for temperature, vents and spray can be adjusted. Consult the manual or Kiln manufacturer for detailed information on kiln tuning. The "offset" field for heat and spray is a dual function field. If proportional control is used, this field will adjust the position of the proportional band above or below set point. This offset action will only take place until the reset circuit repositions the proportional band (if prop control used). If on/off relay control is used for heat or spray, the offset field will position the on/off output up to +- 80 degrees. This is useful to stop overshoot by putting a negative number into the offset field.

### **Example: Dry bulb set point is set for 100 degrees.**

A value of -10 put in the offset field will turn the heat output off at 90 degrees allowing the temperature to rise slowly up to set point and reduce overshoot. The heat output will turn back on at 90 degrees + the Deadband setting set in the Deadband field.

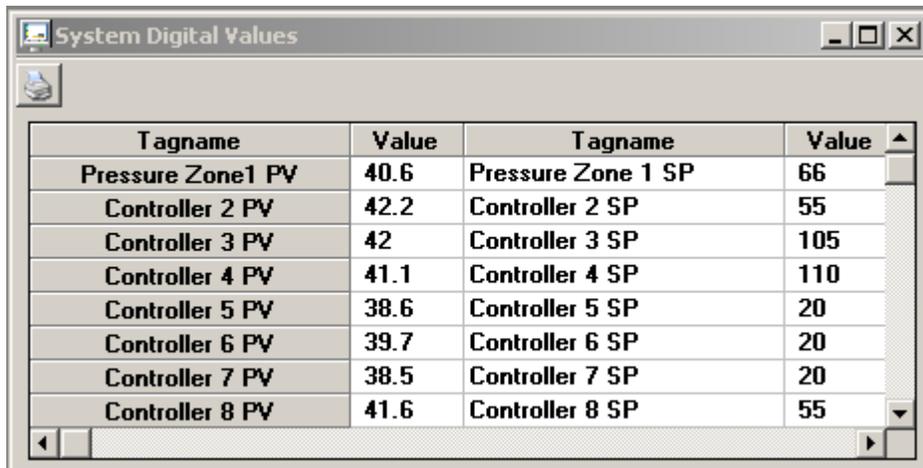
Kiln Setup (IO Monitor):



The kiln IO monitor is a useful tool to monitor all relay and analog output status during kiln operation. The kiln IO monitor displays the status of DB/WB temperatures as well as the analog output values for vents, fans and spray (if configured for analog output types). The right side of the IO monitor displays all relay outputs available on the kiln system. If the LED next to description is bright green, the output is energized. If the LED is not bright green, the output is de-energized.

### Digital Values:

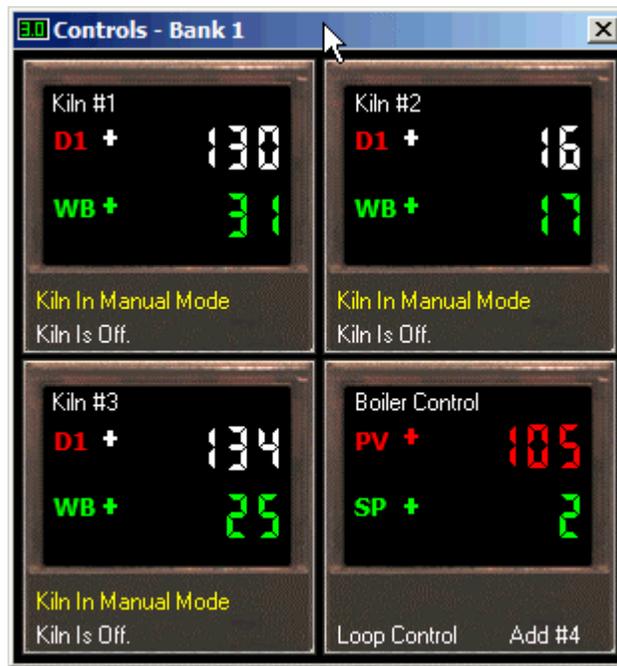
The digital values window displays all controllers activated in the system. Current process value, setpoint and % output (if configured) are displayed. The digital values window can be printed on demand by clicking on the "Print" icon on the windows upper toolbar:



The screenshot shows a window titled "System Digital Values" with a toolbar containing a print icon. The main content is a table with four columns: Tagname, Value, Tagname, and Value. The table lists data for Pressure Zone 1 and eight controllers, showing both Process Value (PV) and Setpoint (SP).

Tagname	Value	Tagname	Value
Pressure Zone1 PV	40.6	Pressure Zone 1 SP	66
Controller 2 PV	42.2	Controller 2 SP	55
Controller 3 PV	42	Controller 3 SP	105
Controller 4 PV	41.1	Controller 4 SP	110
Controller 5 PV	38.6	Controller 5 SP	20
Controller 6 PV	39.7	Controller 6 SP	20
Controller 7 PV	38.5	Controller 7 SP	20
Controller 8 PV	41.6	Controller 8 SP	55

## Controller Faceplates:



Controller faceplates allow the user to monitor many kilns or single loop controllers at the same time by lining up multiple faceplates on the computer monitor. This provides a "quick" view of all kilns/controllers attached to the system.

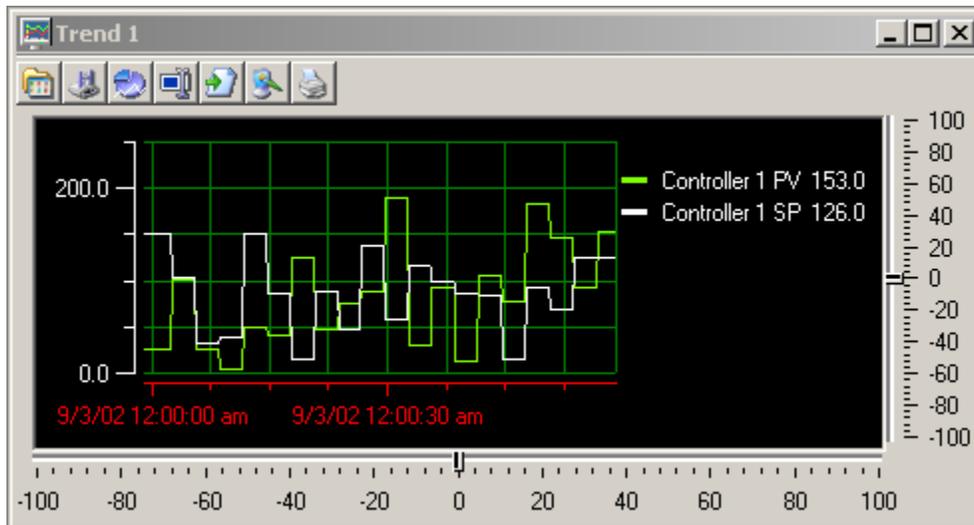
Banks consist of 4 controllers per bank. Process value (red), setpoint (green) and alarm indication are provided. The faceplate will be updated to show the schedule run, hold and stop buttons as well as current segment active. These faceplates can be used for FDC 300 series single setpoint controllers or the FDC Orion kiln controller.

When using the Kiln controller (single or multiple units), the faceplate will dynamically show dry bulb and wet bulb temperature for the kiln assigned in the setup section. The Run, Stop and Hold buttons used for the FDC 300 series single loop controllers will not be visible. These functions must be accessed from the Kiln detail screen when kiln controller is assigned to the faceplate. Current schedule running as well as schedule status will be shown at the bottom of each faceplate. Dry bulb temperature, color and heading label will alternate in the faceplate display to match fan direction (forward = white, reverse = blue).

To change the setpoint of a controller when using the FDC 300 series single setpoint controller, click on the setpoint portion of the faceplate (green display). Enter a new setpoint and hit the "Enter" key. If a setpoint value is written to the controller that is "out of range" of the controller setup limits, the software will display a dialog box with the appropriate error.

## Control Trends:

Up to 8 real time control trends can be active at any time. Up to 12 channels can be assigned to any control trend. Dragging on the trend scale (left side of trend) or trend time (bottom of trend) allows the user to interactively change the trend scale or move forward/backward in time to view trend data.



### Real Time Trend Toolbar:

The toolbar at the top of the trend screen provides the following functions (left to right):

**Open Trend View:** Allows the user to open a trend setup previously saved for this trend.

**Save Trend View:** Allows the user to save the current trend setup as a file that can be loaded into the trend by using the open button. Trend View files save all information about the current trend included scale, grid lines, channels and colors.

**Trend Setup:** Provides a dialog box to customize the trend appearance. Trend Scale for X and Y, trend ticks, colors and channel assignment are all configurable by the user.

**Data Cursor:** This button turns the data cursor on/off. The data cursor is a vertical line that can be dragged across trend data. When the vertical line is dragged across the trend data, the current value of the point is digitally displayed next to the data cursor. This is a useful tool when tracking actual values across a trend line. To change channels for the data cursor, first click on the data cursor and then on one of the channel names displayed to the right of the trend. The data cursor line will change to the color of the channel selected. Moving the data cursor to the left or right will display the actual value for the channel selected.

**Resume Trending:** Any time the trend scale or time is dragged (up/down-left right) by the user, trending is stopped. After dragging scale or time, press the "Resume Trending" button to resume trend operation.

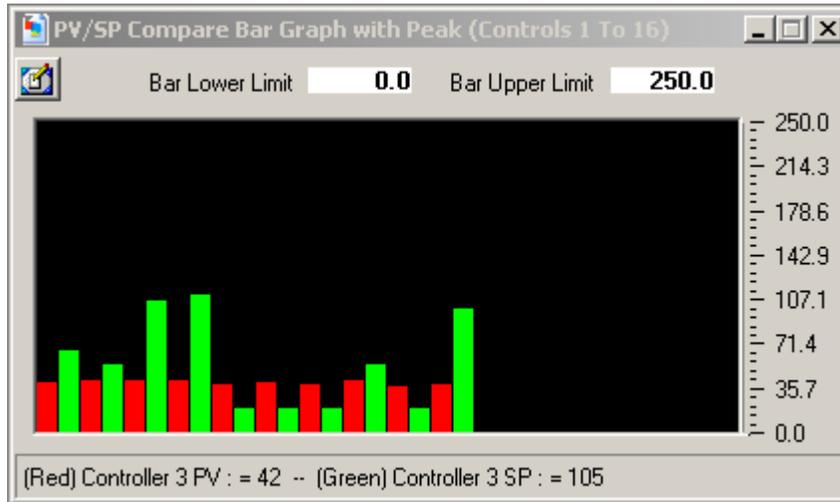
**Save as Jpeg:** This button allows the user to save the current trend snapshot as a Jpeg file:

**Print Trend:** This button sends the current trend snapshot to a printer.

The -100 to +100 scales at the bottom and to the right of the trend are for scale/time compression/expansion. This is an analysis tool to "zero" in or specific data on the trend. It's basically a zoom in/out for the trend scale and time scale.

## Bargraphs:

Up to 4 banks of bargraphs is available to the user. Each bar graph window will display up to 16 single 300 series single loop controllers. Controllers are "auto-config" and will show up on the bargraph if the controller is turned on the "Control labels/Activation" screen. Kiln controller variables will not be displayed on the bargraph screen.

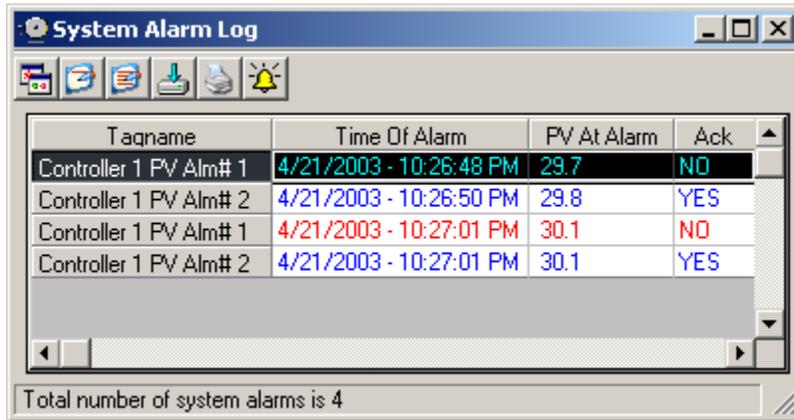


Bargraph scale is adjustable by entering a zero and span for the bargraph in the fields at the top of the bargraph window.

Clicking on any bar will display the channel name and real time data for the controller selected. Data is displayed at the bottom of the bargraph window. Horizontal peak lines (in yellow) will indicate the max for each channel in the bargraph window. Click on the "Clear Sheet" icon (on the toolbar) to clear the peak values.

## System Alarm Log:

The system alarm log keeps track of all alarms in the system. If alarm 1 or alarm 2 is programmed in a 300 series single loop controller, activation of either of these alarms will be displayed in the alarm log. When the FDC kiln controller is attached to the system, the alarm window will display all analog and digital alarms at kiln controller. The alarm log window will automatically maximize itself upon any new system alarm (even if the window is minimized). Double clicking on any alarm will display a dialog confirming if the user wants to acknowledge the alarm.



Taqname	Time Of Alarm	PV At Alarm	Ack
Controller 1 PV Alm# 1	4/21/2003 - 10:26:48 PM	29.7	NO
Controller 1 PV Alm# 2	4/21/2003 - 10:26:50 PM	29.8	YES
Controller 1 PV Alm# 1	4/21/2003 - 10:27:01 PM	30.1	NO
Controller 1 PV Alm# 2	4/21/2003 - 10:27:01 PM	30.1	YES

Total number of system alarms is 4

## System Alarm LogToolbar:

The toolbar at the top of the trend screen provides the following functions (left to right):

**Open Alarm Log Viewer:** Opens the alarm log viewer. The alarm log viewer allows the user to view daily system alarm logs in a grid type format. This data can then be printed or exported to a .csv file.

**Clear Single Alarm:** Allows the user to clear the alarm selected in the alarm log. The user will be prompted before the alarm is cleared.

**Clear All Alarms:** Allows the user to clear the complete alarm log grid. The user will be prompted before the alarm grid is cleared.

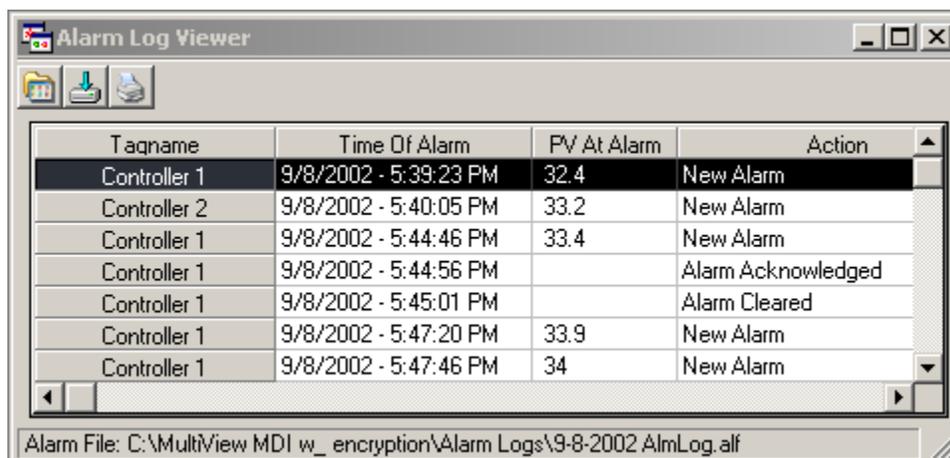
**Export Alarm Log:** Allows the user to export the alarm log to a .csv file. Csv files can be read by Excel or any program capable of reading a comma-separated file.

**Print Alarm Log:** Allows the user to print the alarm log. Standard print dialog is used.

**Silence Alarm Beeper:** Allows the user to silence the alarm beeper.

When the open alarm log button is pressed, the alarm log viewer is displayed.

## Alarm Log File Viewer:



Taqname	Time Of Alarm	PV At Alarm	Action
Controller 1	9/8/2002 - 5:39:23 PM	32.4	New Alarm
Controller 2	9/8/2002 - 5:40:05 PM	33.2	New Alarm
Controller 1	9/8/2002 - 5:44:46 PM	33.4	New Alarm
Controller 1	9/8/2002 - 5:44:56 PM		Alarm Acknowledged
Controller 1	9/8/2002 - 5:45:01 PM		Alarm Cleared
Controller 1	9/8/2002 - 5:47:20 PM	33.9	New Alarm
Controller 1	9/8/2002 - 5:47:46 PM	34	New Alarm

Alarm File: C:\MultView MDI w\_ encryption\Alarm Logs\9-8-2002 AlmLog.alf

The toolbar at the top of the trend screen provides the following functions (left to right):

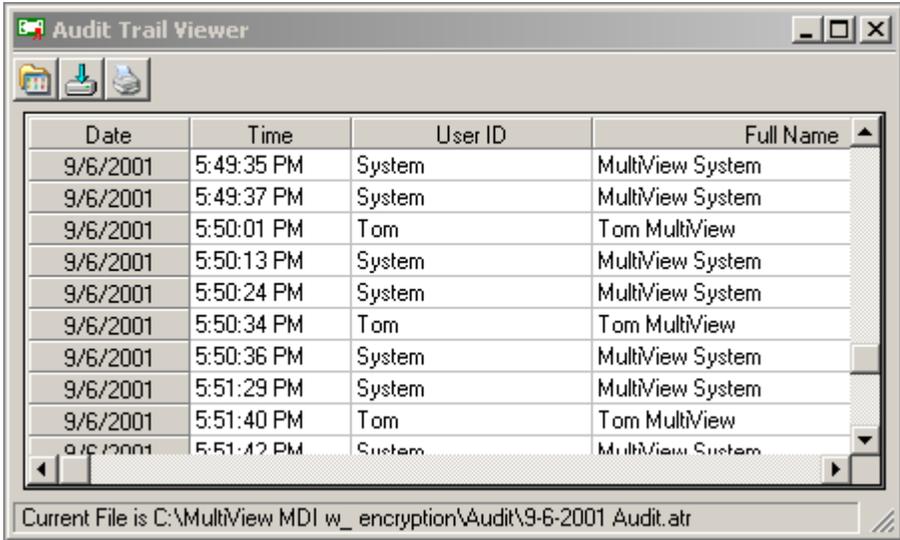
**Open Alarm Log:** Allows the user to open an alarm log file and view the data in the "Alarm Log File Viewer". Alarm logs are created and written to daily whenever an alarm occurs. To activate alarm logging, the user must click on the "Enable/disable alarm logging" checkbox in the "Configure Users" section of the program. When opening an alarm log file, the alarm log file is displayed in the alarm log viewer only with the real time system alarm data grid remaining untouched.

**Export Alarm Log:** Allows the user to export the alarm log to a .csv file. Csv files can be read by Excel or any program capable of reading a comma-separated file.

**Print Alarm Log:** Allows the user to print the alarm log. Standard print dialog is used.

#### Audit Trail Viewer:

The Audit Trail Viewer provides the operator with a grid type view of all entries made to the daily audit log. Date, Time, UserID, User Full Name, User Comment and User Action are provided. If security is enabled and the audit trail is turned on, the audit log is written to by the system during any operator event that changes a parameter in the control system. Any actions that involve data files as well as the clearing or acknowledgment of alarms is also written to the audit trail. Like data files, the audit trail is encrypted and read only.



The screenshot shows a window titled "Audit Trail Viewer" with a toolbar containing icons for file operations. Below the toolbar is a table with the following data:

Date	Time	User ID	Full Name
9/6/2001	5:49:35 PM	System	MultiView System
9/6/2001	5:49:37 PM	System	MultiView System
9/6/2001	5:50:01 PM	Tom	Tom MultiView
9/6/2001	5:50:13 PM	System	MultiView System
9/6/2001	5:50:24 PM	System	MultiView System
9/6/2001	5:50:34 PM	Tom	Tom MultiView
9/6/2001	5:50:36 PM	System	MultiView System
9/6/2001	5:51:29 PM	System	MultiView System
9/6/2001	5:51:40 PM	Tom	Tom MultiView
9/6/2001	5:51:42 PM	System	MultiView System

At the bottom of the window, a status bar displays the text: "Current File is C:\MultiView MDI w\_ encryption\Audit\9-6-2001 Audit.atr"

#### Audit Trail Toolbar:

The toolbar at the top of the audit trail window provides the following functions (left to right):

**Open Audit Trail File:** Allows the user to open an audit trail file and view the data in a grid type format. Audit trail logs are created and written to daily. To activate the audit trail, the user must click on the "Enable Security" checkbox in the "Configure Users" section of the program.

**Export Audit Trail:** Allows the user to export the audit trail file to a .csv file. Csv files can be read by Excel or any program capable of reading a comma-separated file.

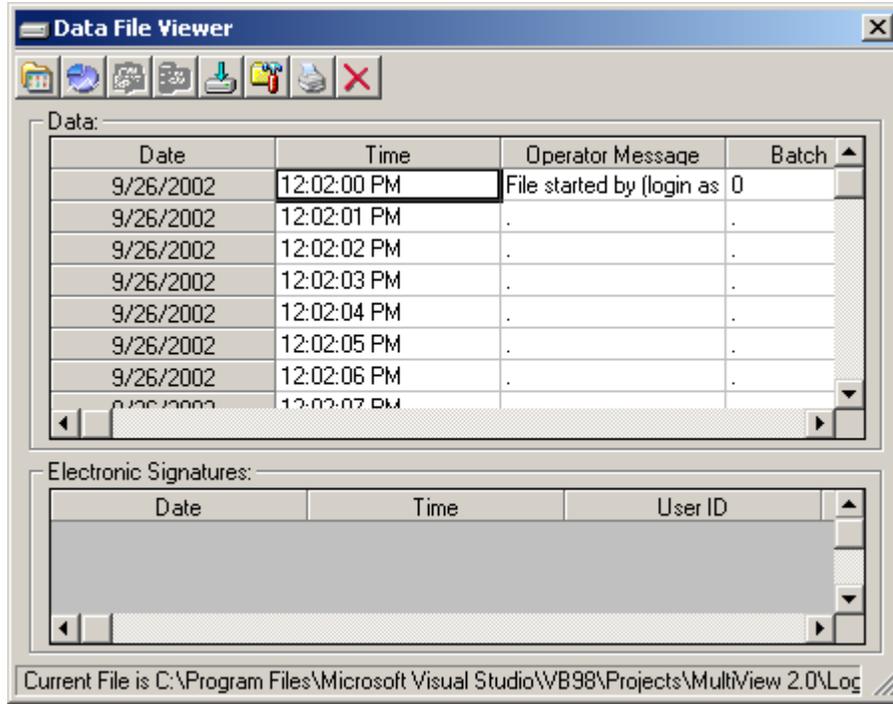
**Print Audit Trail:** Allows the user to print the Audit Trail Log. Standard print dialog is used.

## Historical Data Viewing

### Data Viewer:

The historical data viewer provides the ability to view KilnView data files without leaving the application. The data viewer is a spreadsheet type window that displays saved data in cells. These cells can be selected for printing or plotting without additional setup.

Selecting Data Viewer from the views menu displays the following window.



The center of the data viewer is a spreadsheet that displays date, time and controller data. The header for each controller saved in a data file will be shown at the top of each column. You can select (drag) any group of cells for printing or plotting by dragging across the data in the spreadsheet.

Select cells as you would in a normal spreadsheet. Clicking on the column header selects the whole column, dragging across cells selects only the cells that the mouse was dragged across. You can select multiple columns by clicking on a column header and dragging to the right or left across other column headers. Discontinuous data can be selected by using the "Ctrl" key while selecting data. You must select at least 4 cells per column before a plot can be generated.

The Electronic signatures grid is below the data grid and is used to electronically sign data files. Electronic signatures eliminate the need for paper signatures. Files can only be signed by users with the proper login and user access. The KilnView software can validate any electronic signature and verify if the original data file (when signed) has been altered in any way.

Electronic signatures can only be assigned to files under the following:

- a.) Security is enabled under the Users-Configure Users menu item.
- b.) If security is active, authentic security access and login is required to electronically sign or verify a signature on a file

## Data Viewer Toolbar:

**Open File:** This button displays a standard open dialog box. The default data path will be the "Log Files" directory. Select a log file to open. Data files that are active (being written to by the logger) can be opened by the data viewer. Data files consist of 2 file types. The .mlg file is the data portion of the file and the .sif file is the signature portion of the file. Both files are encrypted and tamperproof. If these files are edited, they will be damaged and unreadable by KilnView. Data files can be moved to other directories but both .mlg and .sif files must exist in the same directory or an error will occur when trying to read the data file.

**Plot Data:** This button creates a history plot from cells selected in the data viewer.

**Sign File:** This button requires that the user authenticate himself (herself) before signing the file. The signer will be prompted to enter a user comment for the signature (pass-fail etc.) after login. The new signature information will be displayed in the signature grid.

**Verify Signature:** This button requires that the user authenticate himself (herself) before signature verification of the file. After user verification, KilnView will check the file to see if it has been altered in any way. A pass-fail dialog will be displayed to the user after verification.

**Export Data:** This button will export the current file to a .csv file that can be open by Excel or any program capable of editing a comma separated data file. This is a copy only that can be used for reporting in custom formats. The original data file is not altered in any way.

**Search for batch#:** This button prompts the user to enter a batch or lot number to search for. The KilnView software will search all files in the "Log Files" directory to find a match. If a match is found the data file is open for the user to view.

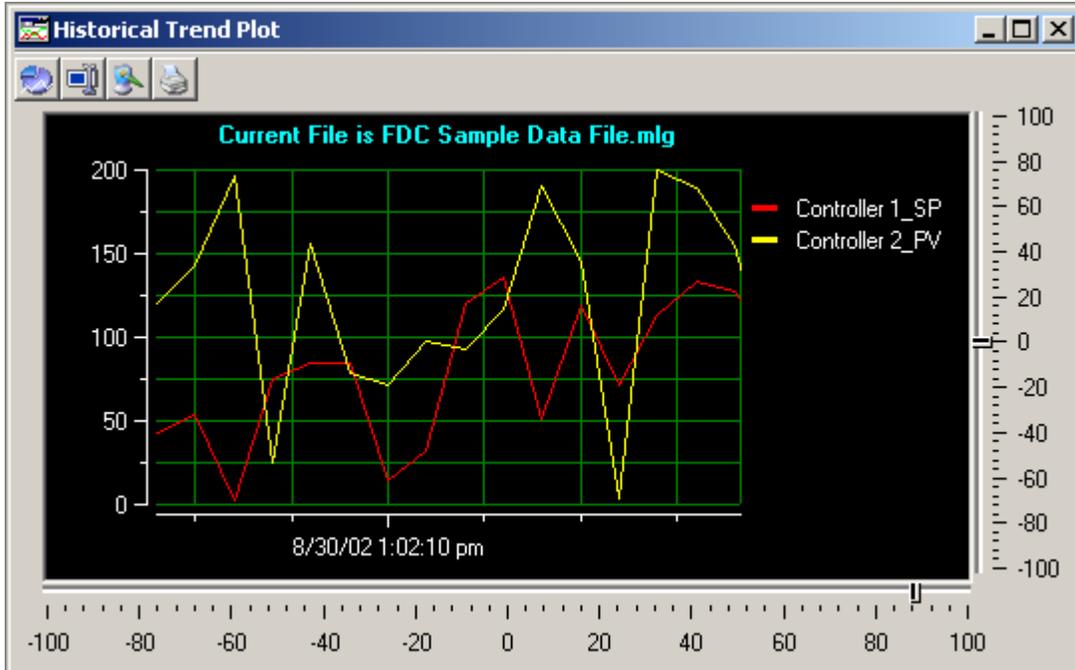
**Print Data:** This button provides a text printout of the selected data in the spreadsheet

**Cancel Trend:** This button provides the option of canceling the historical trend if selected. Trend plots with many data columns can take a while to complete so this option allows the user to stop the trend rather than wait for its completion.

### Historical Trend Plot:

This historical trend plot provides a graphic view for historical data. Data selected in the data viewer will be plotted on the trend. The only limit to the number of channels is the size of the window to view the data and computer memory. Dragging on the trend scale (left side of trend) or trend time (bottom of trend) allows the user to interactively change the trend scale or move forward/backward in time to view trend data.

The -100 to +100 scales at the bottom and to the right of the trend are for scale/time compression/expansion. This is an analysis tool to "zero" in on specific data on the trend. It's basically a zoom in/out for the trend scale and time scale. In the historical plot, these scales are real time so the data will move as you adjust the zoom amount.



### History Plot Toolbar:

**Trend Setup:** Provides a dialog box to customize the trend appearance. Trend Scale for X and Y, trend ticks, colors are all configurable by the user. Channels are automatically assigned by the data viewer so the section of the trend setup regarding channel assignment is grayed out and cannot be selected by the user.

**Data Cursor:** This button turns the data cursor on/off. The data cursor is a vertical line that can be dragged across trend data. When the vertical line is dragged across the trend data, the current value of the point is digitally displayed next to the data cursor. This is a useful tool when tracking actual values across a trend line. To change channels for the data cursor, first click on the data cursor and then on one of the channel names displayed to the right of the trend. The data cursor line will change to the color of the channel selected. Moving the data cursor to the left or right will display the actual value for the channel selected.

**Save as Jpeg:** This button allows the user to save the current trend snapshot as a Jpeg file:

**Print Trend:** This button sends the current trend snapshot to a printer.

## Data Logging

Configuring the data logging dialog window can save data from any controller. The data save dialog window will only allow the user to save controllers that are activated in the system (turned on).

Selecting Data Logging will display the following dialog window:

Control Address	Write On/Off	Data Save Tagname
1	<input checked="" type="checkbox"/> On/Off	Controller 1 PV
1	<input checked="" type="checkbox"/> On/Off	Controller 1 SP
1	<input checked="" type="checkbox"/> On/Off	Controller 1 %Out
2	<input checked="" type="checkbox"/> On/Off	Controller 2 PV
2	<input checked="" type="checkbox"/> On/Off	Controller 2 SP
2	<input checked="" type="checkbox"/> On/Off	Controller 2 %Out
3	<input checked="" type="checkbox"/> On/Off	Controller 3 PV
3	<input checked="" type="checkbox"/> On/Off	Controller 3 SP
3	<input checked="" type="checkbox"/> On/Off	Controller 3 %Out
4	<input checked="" type="checkbox"/> On/Off	Controller 4 PV
	<input checked="" type="checkbox"/> On/Off	Controller 4 SP

Start/Stop Data Logging

Data log interval in seconds:  Batch #  Lot #

Generate log file using date/time:

Initiate data logging at startup:

Start Log Stop Log Close Window

Current File Name Active

Click on the checkbox next to a tagname to enable data save for that tagname. Enter a time for the data save interval. You can save all points selected at a rate adjustable from 1 second to once every 12 hrs. After the data file is started, data save points are locked and cannot be changed until data logging is stopped. This protects the file from additional data that might be added in the middle of a product run.

The **"Generate log file using date-time:"** checkbox allows the system to assign a data filename automatically using date and time stamps for the filename. When this checkbox is enabled a new data file will be started at 12:00 midnight daily.

The **"Initiate logging at startup:"** checkbox allows the system start data logging (with date-time filename) when KilnView is first started. The data file could have zeros for control values for the first few lines of the data file when this option is selected. KilnView will scan controllers based on the scan rate entered in the "Configure Controls-Labels setup" section. Process value and setpoint for each controller is zero until the scanner gets the actual value from each controller. This will be evident in the data file since the value field will be empty. This does not affect the integrity of the data file; it just means there was not available data yet to stamp the file.

The **"Batch and Lot#"** field data (if entered) will be written to the first section of data file. The data file viewer has a "Search Batch#" function to allow the user to look for data that matches a specific batch number.

The **"Current Filename Active"** label will display the filename of the currently running data file. This label will be empty if no data file is active.

The **"Select All"** button allows the user to select all channels for data logging.

The **"Deselect All"** button allows the user to disable all channels for data logging.

The **"Start Log"** button will start the data logging process. If the "Generate log file using date-time:" checkbox is enabled, data logging will start using date and time as the file name. Otherwise, a dialog box will be shown to allow the user to name the data log file.

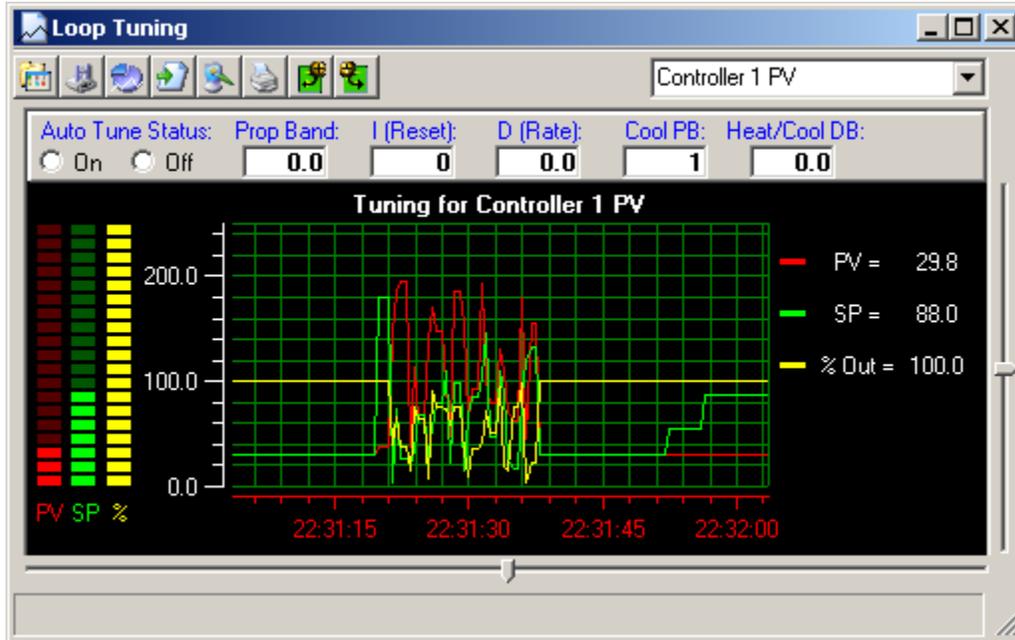
The **"Stop Log"** button will stop the data logging process.

## 300 Series Single Loop Controller Tuning & Alarm Settings

### Loop Tuning:

The loop-tuning window provides the user with an interface to access controller auto-tune as well as manual tune parameters. Tuning is available for Enviro-Pak 300 series single setpoint digital backup controllers only. Control tuning for the digital Kiln systems is accomplished via the color touch screen supplied with each digital Kiln system. Loop tuning should only be used when the backup Kiln control system is set for PID analog (4-20mA) output control type. Auto tuning "on/off" control type will have no effect on the system.

Selecting "Loop Tuning" from the setup menu displays the following dialog:



The loop-tuning window has fields for proportional band, auto reset, rate, cooling PB and dead-band (gap between heat and cool control).

Use the drop down list box located at the top right of the loop-tuning window to select a control to work with. Only controllers that are activated in the system will show up in the list box.

The Auto-Tune on/off radio button will display if auto-tune is active when the "Read Values" button is pressed or initiate or turn off auto-tuning when the "upload values" toolbar button is pressed.

The trend is provided to monitor PV, SP and %Out through the complete tuning cycle.

### Loop Tuning Toolbar:

The toolbar at the top of the trend screen provides the following functions (left to right):

**Open Tuning File:** Allows the user to open a tuning file previously saved.

**Save Tuning File:** Allows the user to save the current tuning settings to the hard disk for latter retrieval.

**Trend Setup:** Provides a dialog box to customize the trend appearance. Trend Scale for X and Y, trend ticks and colors are configurable by the user. Since the channels are preset to PV, SP and %Out, the channel assignment list boxes will be grayed out and not in use.

**Resume Trending:** Any time the trend scale or time is dragged (up/down-left right) by the user, trending is stopped. After dragging scale or time, press the "Resume Trending" button to resume trend operation.

**Save as Jpeg:** This button allows the user to save the current trend snapshot as a Jpeg file:

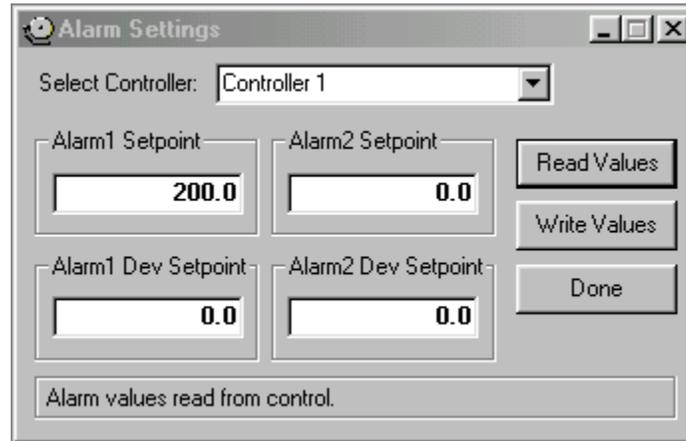
**Print Trend:** This button sends the current trend snapshot to a printer.

**Upload Tuning Values:** This button uploads the current tuning values from the controller to the PC.

**Download Tuning Values:** This button downloads the current tuning values from the PC to the controller.

## Alarm Setpoints:

The alarm setpoint dialog allows a user to read or write alarm setpoint data to 300 series single loop controllers only. Kiln controller alarms are adjusted via the color touch interface supplied with the kiln control system. When this option is selected the following dialog box will appear.



Click on the **"Read Values"** button to get alarm setpoint data from a specific controller. Use the drop down list box at the top right of the dialog box to select a controller to work with. Only controllers activated in the system will be displayed in the drop down list.

Click on the **"Write Values"** button to write the field values to the controllers.

Click on the alarm fields and enter an alarm value to change the alarm setpoint for the controller.

**Alarms type must be programmed in the 300 series single loop controller (via the faceplate of controller) before and alarm can be activated at the controller level.**

# KilnView Security

## Setting up security:

KilnView's security features are not just applicable to the pharmaceutical industry. Any industry that requires secure data files, audit trails and authenticated logins to initiate process changes can take advantage of these features. The security can also be turned off for companies that do not require security in their systems.

**Complete the following 3 steps to make sure the security features of KilnView will work properly:**

### **Step 1 - Make a sure network adapter is installed and connected to the network:**

KilnView checks user login's against Windows® built in security database. For this function to work properly the computer must have a network adapter installed. If you are connected to a network, you will already have the network card and appropriate Windows® drivers (that came with the card) installed on your computer.

If you are not connected to a network and do not have a network adapter (card) installed in your computer it's no problem, you can install the "MS loopback adapter" that Microsoft supplies with its operating system in place of a hardware network adapter.

The "MS loopback adapter" simulates a network card in your computer. It does not take up a hardware slot on your computer and requires software installation only. You install the "MS loopback adapter" just like you would any other network adapter.

### **Example for installing Microsoft "MS Loopback adapter":**

- a.) Open My Computer/Control Panels
- b.) Open "Add Hardware"
- c.) Do not let Windows® search for the hardware for you if you have the option. If Windows® must search for hardware for you, it should come up with nothing since are not really adding any hardware to the machine.
- d.) Windows® operating systems will vary but all will end up in a dialog window that will allow the user to select the type of hardware manually that is being added. At this section select "Network Adapters".
- e.) Scroll down the list of adapter manufacturers until you get to "Microsoft". When you click on "Microsoft", Microsoft loopback adapter will be shown in the listbox on the right of the window. Select the loopback adapter and continue with the installation. Have your Windows® CD available because the installation might request that you insert the Windows® CD.
- f.) After the installation is complete, you will be asked to enter a frame address for the card. The default is 802.3 and is fine; you do not need to change it.
- g.) Last step is to enter an IP Address and Subnet for the MS looback adapter. Since the computer will not be on the network an IP Address of 10.0.0.180 will work fine. Subnet of 255.255.255.248 Will also work fine. IP Address and subnet mask's all have a specific method of assigning numbers. The above numbers will work fine since a complete explanation IP/Subnet address assignments is out of the scope of this document.

## Step 2 - Setup users/groups and computer security:

- a.) Start the "user manager" in Windows® NT, 2000 or XP Professional. You will find this under the Start/Administrative tools section and will be listed as user manager or computer management (WinXP).
- b.) Create 3 new user groups. Name the groups:  
KilnView Operators  
KilnView Supervisors  
KilnView Administrators

Operators should be users that have the minimum access in the software. Supervisors are the next level up with Administrators having the highest access rights in the software. KilnView allows the administrator to assign any rights to any user level but the group naming convention is important when assigning users to the groups. The groups must be spelled exactly as shown above for the system to operate properly.

If an administrator assigns the same user to more than one KilnView group, the lowest user level of the groups is selected after login is authenticated. There is really no reason to assign the same user to more than one group. KilnView picks the lowest user level as a safety precaution in the event this happens as a mistake.

- c.) Create the new users for the system with the user manager. UserID, full user name, and user description should be entered. This data is written to the audit trail during login so the user description will make for easy identification in the audit trail log. You can assign existing users to the system if you already have them created for the computer.
- d.) Assign the users created (or existing) to the desired KilnView group using the Windows® user manager. During login, KilnView will validate if the user belongs to a KilnView group. If a user enters a valid userID and password, but is not a member of any KilnView group, the login will fail. He must be part of one of the KilnView groups before login can be authenticated.

## Step 3 - Setup security rights:

Windows® security has the ability to set the security rights for groups or users created in the system. These rights cover everything from backing up files to logging into the system. All security policies assigned to password expiration and lockout apply, and will be enforced when logging on in KilnView. In Windows® XP Professional you can set these rights in the "Local Security Policies" section. You will find this under "Start/Administrative Tools" or under "Control Panel". Under WinNT4.0 you will find the rights under "Start/Administrative Tools/ User Manager".

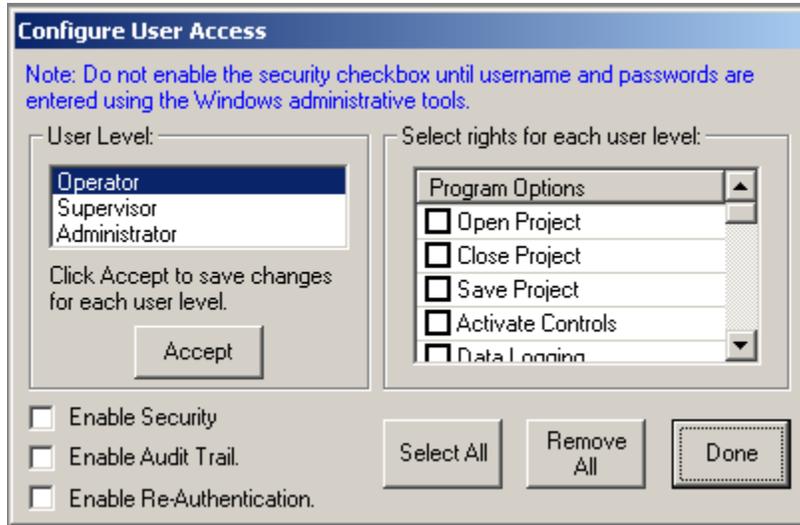
The system administrator will usually set the rights for each user in system. The main user login that is used when the computer is started must have at least 2 rights set in the security manager for KilnView to work properly.

- a.) Act as part of the operating system.
- b.) Bypass Traverse Checking

If these rights are not set for the main user login when Window's boots up, KilnView security will not work because the operating system will not respond to KilnView's request when validating a user login. All other rights can be customized to meet local security and operation requirements.

### Configure User Access:

The "Configure User Access" menu item give a system administrator the ability to set security access for users assigned to Operator, Supervisor or Administrator levels. The following dialog will be displayed:



### Configure User Access Items:

The "**User level:**" list box allows an administrator to select the user level to assign rights to.

The "**Select rights for each user level:**" check/list box allows the administrator to set the security options for the specific user level selected. Before moving to another user level, click on the "Accept" button to save the current user level settings.

The "**Enable Security**" checkbox allows an administrator to enable or disable the security features. If this checkbox is unchecked, all software functionality is available to any user on the system without login or password check.

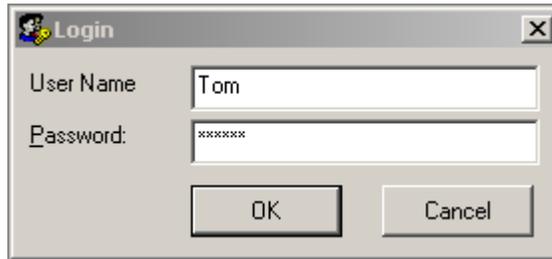
The "**Enable Audit Trail**" checkbox allows an administrator to enable or disable the audit trail. If this checkbox is unchecked, the audit trail data for each user action will not be written to the audit trail log and will not be accessible for viewing.

The "**Enable Re-Authentication**" checkbox allows an administrator to enable or disable the re-authentication feature. If this checkbox is unchecked, a user will not be required to re-authenticate his/her password before making a process change. If this feature is enabled, a user is required to login again (even if already logged on) before changing setpoints or other process changes in the system. This feature offers dual protection against unwanted system changes that might adversely affect the Kiln.

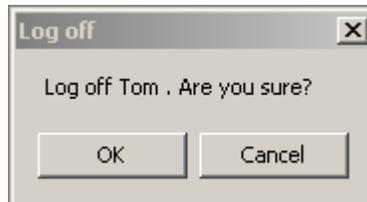
The "**Select All and Deselect All**" buttons allow an administrator to select or deselect all program options at one time.

**Log on:**

The "Log On..." menu item provides a user the ability to log on to the system. Enter userID and password to login. If login fails, the user will be written to the audit trail and the system security defaults back to "Operator" level.

**Log Off:**

The "Log Off..." menu provides a user the ability to log off of the system. Enter userID and password to log off. If log off fails, the user will be written to the audit trail and the system security defaults back to "Operator" level.



# Troubleshooting The System

## **My system is not working:**

Many of the settings in KilnView are fixed to make system setup easier.

If the system is not communicating here are some tips to get it going.

First, the system baud rate is set and cannot be adjusted. We did this because the only reason to slow down the baud rate is for noisy communication lines or to adapt to equipment that communicates at different rates. If the communication lines are run properly and follow the guidelines in type of wire and distance for an RS485 network, this should not be a problem.

The software is also fixed for communication port one. If a machine is to be used for data acquisition to track data for products runs, the data acquisition portion of the machine is usually more important than other operations that machine is used for (word processing, reports, etc.) Most of the time corporations will dedicate a machine for the data acquisition process since the data from the process runs are very important to the manufacturing or research process. Almost all computers have at least one serial port on them. This first port is usually set for comm1. Devices like modems can be moved to a second serial port or add-in card.

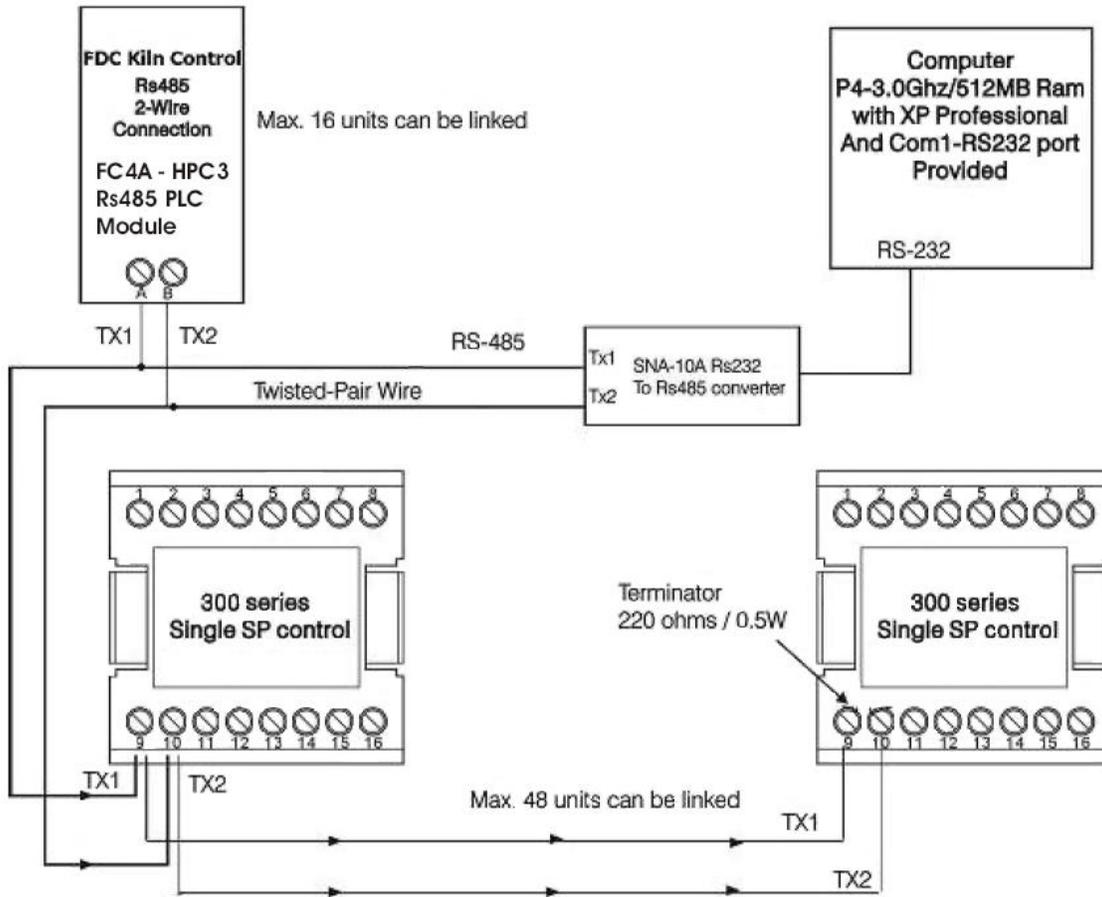
By fixing the baud rate and port configuration we take 2 of the most common problems out of the system. If you have the controller programmed for a unique address and a baud rate of 9.6KB, your half way there. (see section on getting started for controller setup)

## **How are the controllers connected to the PC?**

### **RS485Communications:**

RS485 communications provides an architecture that allows many controllers to be connected to one link. These controllers are usually wired in a parallel arrangement and each controller must have a unique address (see getting started section for controller programming).

The FDC RS485 network looks like this (Kiln and 300 series controllers connected):



First make sure the controller has RS485 communications on it. The last digit of the controller part number will be 1 if you have this option. An example part number for a 1/16DIN 9300 would be 9300-10001.

You'll also need an RS485 to RS232 communications adapter so you can connect to serial port #1 on the computer. The adapter p/n number is show in the drawing. Make sure to use an adapter that supports up to 9.6 data rate and can be setup for even parity, 8 data bits and 1 stop bit. Some adapters are auto-config and require no setup at all.

The cable that goes from the RS485/RS232 adapter to the PC is a straight through 9-pin cable. This means that all pins are directly connected between the two ends and none of the pins are switched (Null modem cables will not work because Tx or Rx or switched in these cables).

The resistor is only needed for networks that have long 2 wire runs. In most cases the resistor at the end of the link is not required.

Make sure each controller has a unique address on the network. Start at address #1 and work your way up to the last controller (See Getting Started section for control programming setup for communications).

If you still have a problem use the system info software (description above under RS232) to check the comm port. This is rare that a comm port is not working but still worth checking to make sure the proper port is used and does exist in the operating system.

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