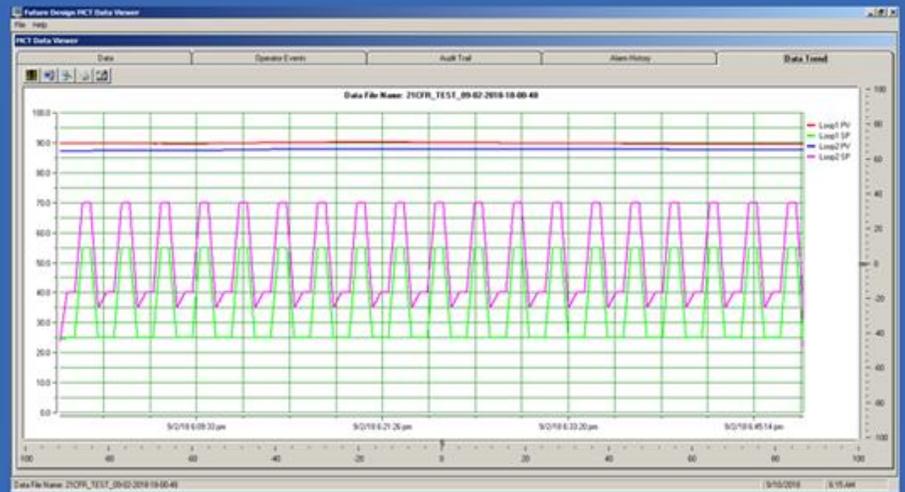


MCT Data Viewer User Manual



Technical Assistance

If you encounter a problem with your MCT control system, review all of your configuration information to verify that your selections are consistent with your application: inputs; outputs; alarms; limits; etc. If the problem persists after checking the above, you can get technical assistance by dialing +1 (866) 342-5332 or by faxing your request to +1 (866) 332-8014, Monday thru Friday, 8:00 a.m. to 5:00 p.m. Eastern Standard Time. You can also email your request to support@futuredesigncontrols.com.

An applications engineer will discuss your application with you.

Please have the following information available:

- Complete Model #'s and/or Serial #'s for Component(s) in Question
- Complete Software Version #'s
- All Configuration Information
- All User Manuals

Software license, warranty and return information is on the back cover of this manual.

Comments

Your comments or suggestions on this manual are welcome. Please send them to:
Future Design Controls, P.O. Box 1196, Bridgeview, Illinois, 60455
Telephone: +1 (888) 751-5444; fax: +1 (888) 307-8014
csr@futuredesigncontrols.com

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1 Getting Started

The MCT Data Viewer is a PC based software program that allows data files, operator event files, alarm files and audit trail files to be viewed on a PC. It provides the ability to print, export, graphically trend and verify digital signatures of MCT system files. MCT products can be used in both the general industrial and pharmaceutical markets as they are designed to conform to 21 CFR 11 requirements for electronic signatures, audit trails, encryption and security, as well as AMS2750E for heat treatment.

The Data Viewer compliments MCT products by providing the means to validate data retrieved during operation. Without the MCT Data Viewer, data file signatures can only be verified on the MCT product. With the MCT Data Viewer, the signatures of any data file can be verified on any PC, from which the data can then be graphically trended and printed.

1.1 Hardware Requirements

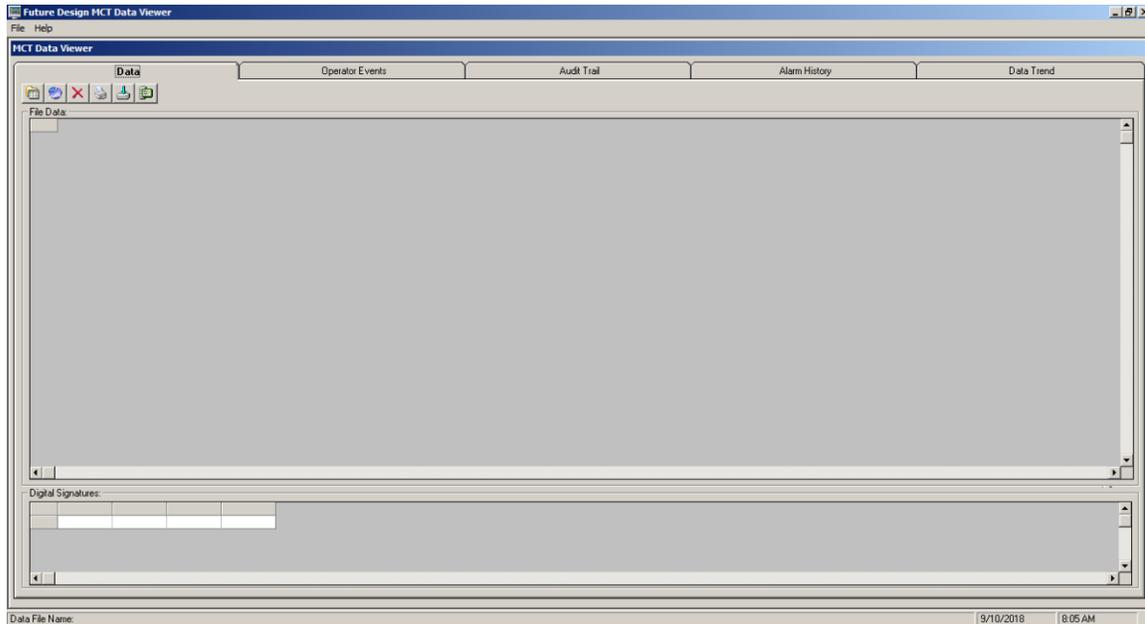
PC: minimum 2GHZ Pentium4 with 512MB of RAM.

OS: 98, NT 2000, XP Professional, Vista and Windows 7, 8 and 10 operating systems supported.

Windows® is a registered trademark of the Microsoft Corporation

2 Viewing Data Files

The MCT Data Viewer main window provides five tabs for accessing/viewing files. They include the Data, Operator Events, Audit Trail, Alarm History and Data Trend tabs. To view an MCT data file, select the Data tab.



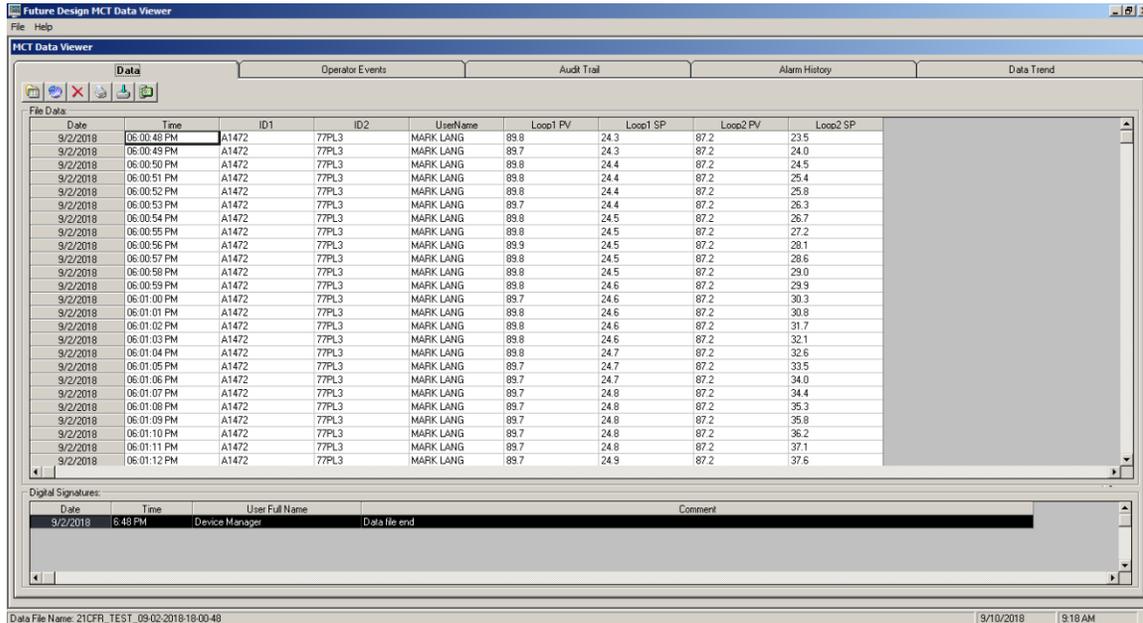
The Data tab toolbar provides the following functions:

- | | | |
|---|----------------------------------|---|
|  | Open History File: | Provides open file dialog to navigate to/select a data file. |
|  | Plot History File: | Creates data trend plot of selected data points. |
|  | Cancel History Plot: | Cancels current trend plot action. |
|  | Print History File: | Opens print dialog allowing user to print data table. |
|  | Export History File: | Opens save file dialog allowing user to save a copy of the file in .csv format. |
|  | Verify Digital Signature: | Validates selected digital signature to see if file has been altered. |

IMPORTANT: *The historical data files of the MCT product line consist of three separate files. These files include the main data file (.csv), the digital signature file (.sig) and the operator events file (.evt). When opening a historical data file, the user will be selecting the “.csv” file. The MCT Data Viewer will automatically attempt to open the matching “.sig” and “.evt” files. If these files are missing (not located in the same directory as the “.csv” file), a dialog will be shown to indicate the file(s) missing.*

The files are not required to view or trend the historical data; however, without the matching digital signature file, the data file cannot be validated to ensure it has not been altered.

To begin, select "Open History File" from the toolbar and select the desired data file. When the file is opened, the data table will automatically resize to fit all of the data contained in the file.

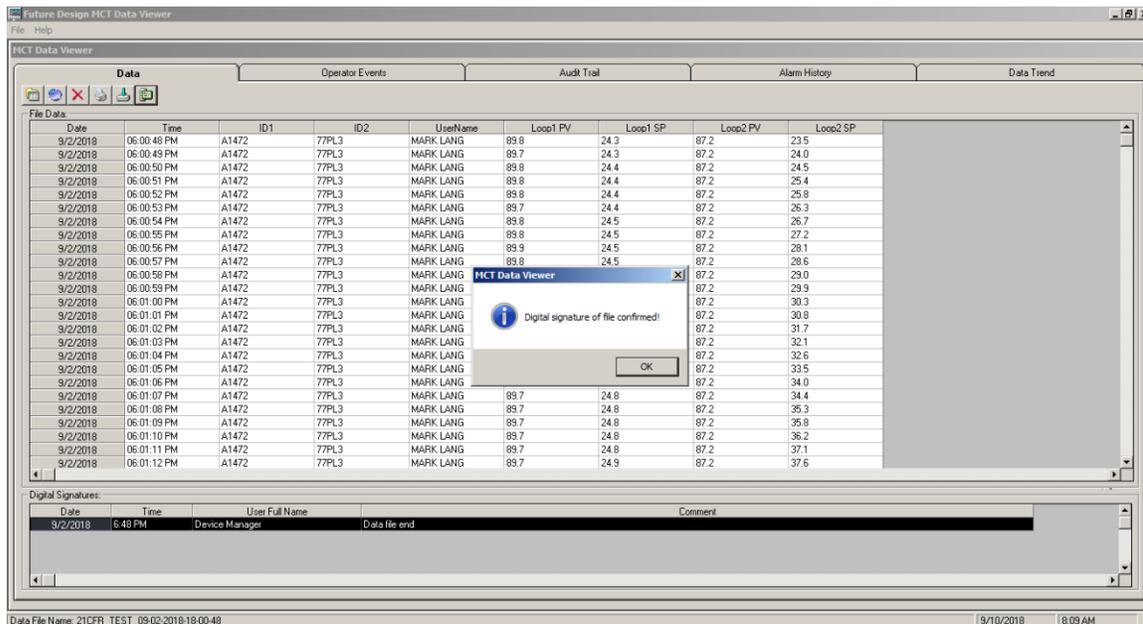


Date	Time	ID1	ID2	UserName	Loop1 PV	Loop1 SP	Loop2 PV	Loop2 SP
9/2/2018	06:00:48 PM	A1472	77PL3	MARK LANG	89.9	24.3	87.2	23.5
9/2/2018	06:00:49 PM	A1472	77PL3	MARK LANG	89.7	24.3	87.2	24.0
9/2/2018	06:00:50 PM	A1472	77PL3	MARK LANG	89.8	24.4	87.2	24.5
9/2/2018	06:00:51 PM	A1472	77PL3	MARK LANG	89.8	24.4	87.2	25.4
9/2/2018	06:00:52 PM	A1472	77PL3	MARK LANG	89.8	24.4	87.2	25.8
9/2/2018	06:00:53 PM	A1472	77PL3	MARK LANG	89.7	24.4	87.2	26.3
9/2/2018	06:00:54 PM	A1472	77PL3	MARK LANG	89.8	24.5	87.2	26.7
9/2/2018	06:00:55 PM	A1472	77PL3	MARK LANG	89.8	24.5	87.2	27.2
9/2/2018	06:00:56 PM	A1472	77PL3	MARK LANG	89.9	24.5	87.2	28.1
9/2/2018	06:00:57 PM	A1472	77PL3	MARK LANG	89.8	24.5	87.2	28.6
9/2/2018	06:00:58 PM	A1472	77PL3	MARK LANG	89.8	24.5	87.2	29.0
9/2/2018	06:00:59 PM	A1472	77PL3	MARK LANG	89.8	24.6	87.2	29.9
9/2/2018	06:01:00 PM	A1472	77PL3	MARK LANG	89.7	24.6	87.2	30.3
9/2/2018	06:01:01 PM	A1472	77PL3	MARK LANG	89.8	24.6	87.2	30.8
9/2/2018	06:01:02 PM	A1472	77PL3	MARK LANG	89.8	24.6	87.2	31.7
9/2/2018	06:01:03 PM	A1472	77PL3	MARK LANG	89.8	24.6	87.2	32.1
9/2/2018	06:01:04 PM	A1472	77PL3	MARK LANG	89.8	24.7	87.2	32.6
9/2/2018	06:01:05 PM	A1472	77PL3	MARK LANG	89.7	24.7	87.2	33.5
9/2/2018	06:01:06 PM	A1472	77PL3	MARK LANG	89.7	24.7	87.2	34.0
9/2/2018	06:01:07 PM	A1472	77PL3	MARK LANG	89.7	24.8	87.2	34.4
9/2/2018	06:01:08 PM	A1472	77PL3	MARK LANG	89.7	24.8	87.2	35.3
9/2/2018	06:01:09 PM	A1472	77PL3	MARK LANG	89.7	24.8	87.2	35.8
9/2/2018	06:01:10 PM	A1472	77PL3	MARK LANG	89.7	24.8	87.2	36.2
9/2/2018	06:01:11 PM	A1472	77PL3	MARK LANG	89.7	24.8	87.2	37.1
9/2/2018	06:01:12 PM	A1472	77PL3	MARK LANG	89.7	24.9	87.2	37.6

Date	Time	User Full Name	Data file end	Comment
9/2/2018	6:48 PM	Device Manager	Data file end	

Data File Name: 21CFR_TEST_09-02-2018-18-00-48 | 9/10/2018 | 9:18 AM

The table is read only so the data cannot be altered, only viewed. All digital signatures associated with the file will be provided in the Digital Signatures table below the main data table. To verify a digital signature, select the desired signature by clicking on its row (if more than one) and select "Verify Digital Signature" from the toolbar. The MCT Data Viewer will compare the signature to the data file and indicate whether or not the file has been altered.



Date	Time	ID1	ID2	UserName	Loop1 PV	Loop1 SP	Loop2 PV	Loop2 SP
9/2/2018	06:00:48 PM	A1472	77PL3	MARK LANG	89.9	24.3	87.2	23.5
9/2/2018	06:00:49 PM	A1472	77PL3	MARK LANG	89.7	24.3	87.2	24.0
9/2/2018	06:00:50 PM	A1472	77PL3	MARK LANG	89.8	24.4	87.2	24.5
9/2/2018	06:00:51 PM	A1472	77PL3	MARK LANG	89.8	24.4	87.2	25.4
9/2/2018	06:00:52 PM	A1472	77PL3	MARK LANG	89.8	24.4	87.2	25.8
9/2/2018	06:00:53 PM	A1472	77PL3	MARK LANG	89.7	24.4	87.2	26.3
9/2/2018	06:00:54 PM	A1472	77PL3	MARK LANG	89.8	24.5	87.2	26.7
9/2/2018	06:00:55 PM	A1472	77PL3	MARK LANG	89.8	24.5	87.2	27.2
9/2/2018	06:00:56 PM	A1472	77PL3	MARK LANG	89.9	24.5	87.2	28.1
9/2/2018	06:00:57 PM	A1472	77PL3	MARK LANG	89.8	24.5	87.2	28.6
9/2/2018	06:00:58 PM	A1472	77PL3	MARK LANG	89.8	24.5	87.2	29.0
9/2/2018	06:00:59 PM	A1472	77PL3	MARK LANG	89.8	24.6	87.2	29.9
9/2/2018	06:01:00 PM	A1472	77PL3	MARK LANG	89.7	24.6	87.2	30.3
9/2/2018	06:01:01 PM	A1472	77PL3	MARK LANG	89.8	24.6	87.2	30.8
9/2/2018	06:01:02 PM	A1472	77PL3	MARK LANG	89.8	24.6	87.2	31.7
9/2/2018	06:01:03 PM	A1472	77PL3	MARK LANG	89.8	24.6	87.2	32.1
9/2/2018	06:01:04 PM	A1472	77PL3	MARK LANG	89.8	24.7	87.2	32.6
9/2/2018	06:01:05 PM	A1472	77PL3	MARK LANG	89.7	24.7	87.2	33.5
9/2/2018	06:01:06 PM	A1472	77PL3	MARK LANG	89.7	24.7	87.2	34.0
9/2/2018	06:01:07 PM	A1472	77PL3	MARK LANG	89.7	24.8	87.2	34.4
9/2/2018	06:01:08 PM	A1472	77PL3	MARK LANG	89.7	24.8	87.2	35.3
9/2/2018	06:01:09 PM	A1472	77PL3	MARK LANG	89.7	24.8	87.2	35.8
9/2/2018	06:01:10 PM	A1472	77PL3	MARK LANG	89.7	24.8	87.2	36.2
9/2/2018	06:01:11 PM	A1472	77PL3	MARK LANG	89.7	24.8	87.2	37.1
9/2/2018	06:01:12 PM	A1472	77PL3	MARK LANG	89.7	24.9	87.2	37.6

Date	Time	User Full Name	Data file end	Comment
9/2/2018	6:48 PM	Device Manager	Data file end	

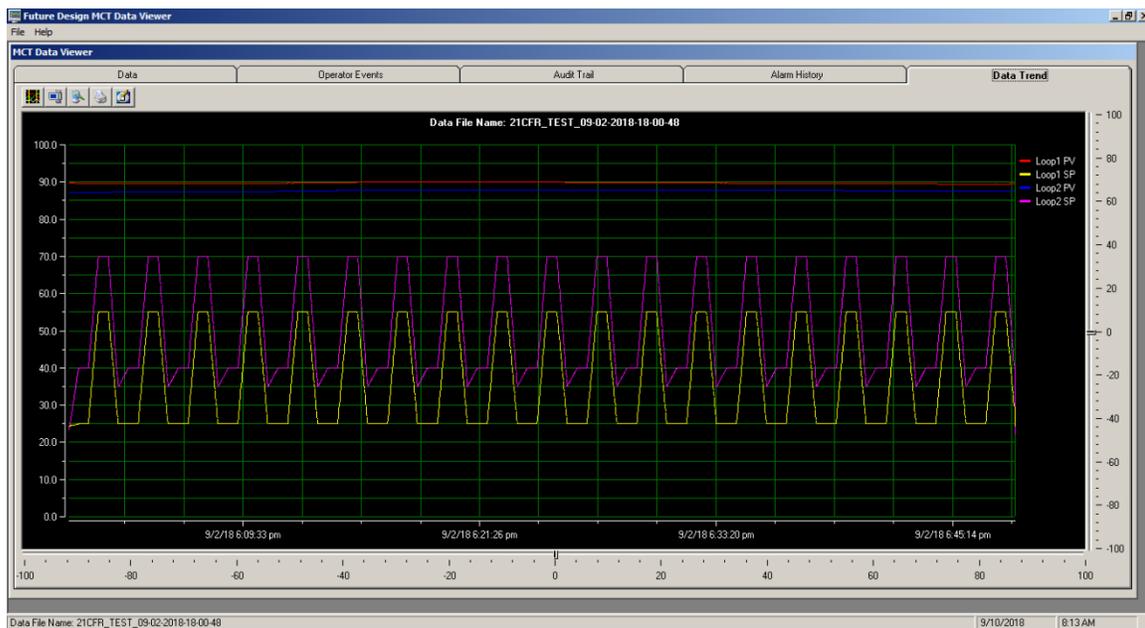
Data File Name: 21CFR_TEST_09-02-2018-18-00-48 | 9/10/2018 | 8:09 AM

2.1 Trending Data

The MCT Data Viewer permits the selection of any combination of data points to be plotted. Entire columns can be selected by simply clicking on the header of the column. Groups of cells can be selected by a left-click and hold on a cell, and then dragging the cursor along multiple cells. Discontinuous groups can also be selected by using the “CTRL” key while selecting data. A minimum of four continuous cells in a single column is required to generate a trend. If multiple columns are selected, at least four continuous cells in each column is required.

Date	Time	ID1	ID2	UserName	Loop1 PV	Loop1 SP	Loop2 PV	Loop2 SP
9/2/2018	06:00:46 PM	A1472	77PL3	MARK LANG	89.9	24.3	87.2	23.5
9/2/2018	06:00:49 PM	A1472	77PL3	MARK LANG	89.7	24.3	87.2	24.0
9/2/2018	06:00:50 PM	A1472	77PL3	MARK LANG	89.8	24.4	87.2	24.5
9/2/2018	06:00:51 PM	A1472	77PL3	MARK LANG	89.8	24.4	87.2	25.4
9/2/2018	06:00:52 PM	A1472	77PL3	MARK LANG	89.8	24.4	87.2	25.8
9/2/2018	06:00:53 PM	A1472	77PL3	MARK LANG	89.7	24.4	87.2	26.3
9/2/2018	06:00:54 PM	A1472	77PL3	MARK LANG	89.8	24.5	87.2	26.7
9/2/2018	06:00:55 PM	A1472	77PL3	MARK LANG	89.8	24.5	87.2	27.2
9/2/2018	06:00:56 PM	A1472	77PL3	MARK LANG	89.5	24.5	87.2	28.1
9/2/2018	06:00:57 PM	A1472	77PL3	MARK LANG	89.8	24.5	87.2	28.6
9/2/2018	06:00:58 PM	A1472	77PL3	MARK LANG	89.8	24.5	87.2	29.0
9/2/2018	06:00:59 PM	A1472	77PL3	MARK LANG	89.8	24.6	87.2	29.9
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9/2/2018	06:01:03 PM	A1472	77PL3	MARK LANG	89.8	24.6	87.2	32.1
9/2/2018	06:01:04 PM	A1472	77PL3	MARK LANG	89.8	24.7	87.2	32.6
9/2/2018	06:01:05 PM	A1472	77PL3	MARK LANG	89.7	24.7	87.2	33.5
9/2/2018	06:01:06 PM	A1472	77PL3	MARK LANG	89.7	24.7	87.2	34.0
9/2/2018	06:01:07 PM	A1472	77PL3	MARK LANG	89.7	24.8	87.2	34.4
9/2/2018	06:01:08 PM	A1472	77PL3	MARK LANG	89.7	24.8	87.2	35.3
9/2/2018	06:01:09 PM	A1472	77PL3	MARK LANG	89.7	24.8	87.2	35.8
9/2/2018	06:01:10 PM	A1472	77PL3	MARK LANG	89.7	24.8	87.2	36.2
9/2/2018	06:01:11 PM	A1472	77PL3	MARK LANG	89.7	24.8	87.2	37.1
9/2/2018	06:01:12 PM	A1472	77PL3	MARK LANG	89.7	24.9	87.2	37.6

Once the desired data is chosen, select Plot History File from the toolbar. If a large amount of data is selected it may take some time to generate the plot. A progress bar will appear at the top right of the Data tab window to display the current status. The plot can be cancelled at any time by selecting Cancel History Plot from the toolbar. Once the process is complete, the Data Trend tab will be automatically selected/shown.

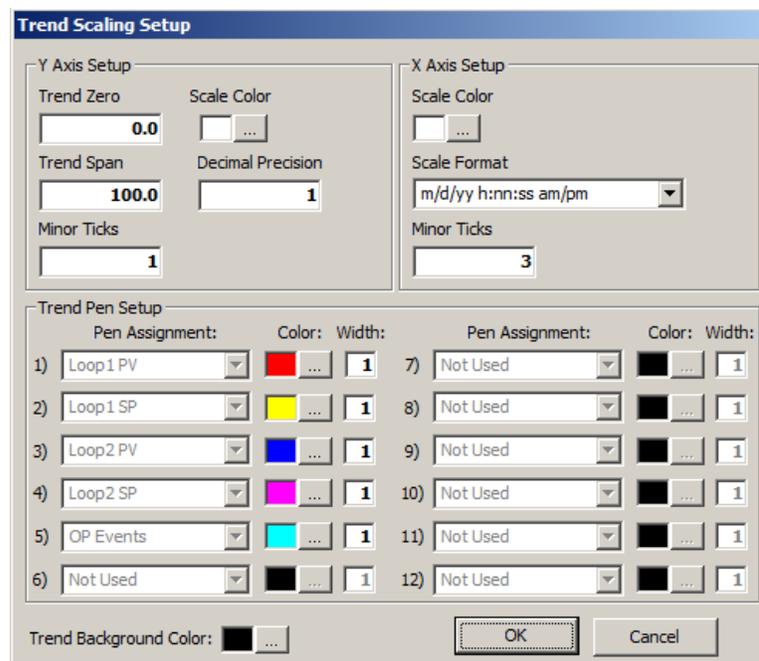


The Data Trend tab toolbar provides the following functions:

-  **Setup History Trend:** Opens the Trend Scaling Setup window to adjust trend plot colors, scales, etc.
-  **Show/Hide Cursor:** Used to toggle the data cursor on and off.
-  **Save to Jpeg:** Opens save file dialog to save the current trend view as a picture (JPEG) file.
-  **Print History File:** Opens print dialog allowing user to print the current trend view.
-  **Chart Annotation:** Allows user to enter a title for the trend (default is "Data File Name: *Filename*").

2.1.1 Trend Setup

The trend plot is first displayed using default colors and scale selections. The appearance of the trend can be modified to make it easier to view and/or print. A black background is typically better for viewing while a white background is better for printing. To adjust the trend appearance, select Setup History Trend from the toolbar.



The channel selections are automatically assigned and fixed based on the data selected for plot from the Data tab. All other settings for the trend are adjustable. Once new selections are, the choice will be remembered and used on future trend plots.

2.1.2 Data Cursor

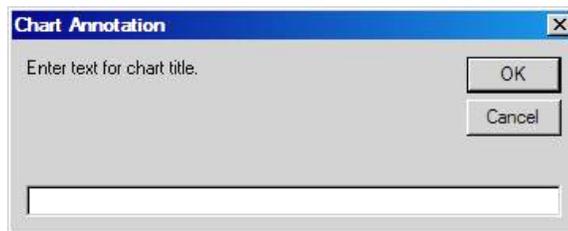
The data cursor is a vertical line that can be dragged across the trend plot. It displays the current value of the selected channel which is a useful tool when tracking actual values across a trend line. When the data cursor is activated, clicking on the channel legend on the right side of the trend plot will switch the cursor to the channel, and the color of the cursor will also change to match that of the selected channel.

Right clicking on the data cursor displays a pop-up menu where the user can select from the following cursor options:

- Channel: Allows the user to select a channel from those displayed on the current trend plot.
 - Style: Allows the user to change the cursor display from XY, X or Y values only. The Period selection provides two vertical lines that can be moved to display the time period selected between the two lines for the selected channel (always shown as 12:xx:xx for hh:mm:ss). The Peak to Peak selection provides two horizontal lines to adjust, and obtains the absolute value of the selected channel between the two lines.
 - Options: Provides the ability to select the data cursor color as the selected channel color (default) and hiding hints on release. When “hiding hints on release” is selected, the cursor data values will be hidden when the cursor is released. The value for the channel at the selected cursor position will then be shown only when the user holds the mouse button down on the data cursor.
- Flip Alignment: For XY, X and Y cursor styles, this allows the user to flip the cursor text between the left and right sides of the cursor.

2.1.3 Chart Annotation

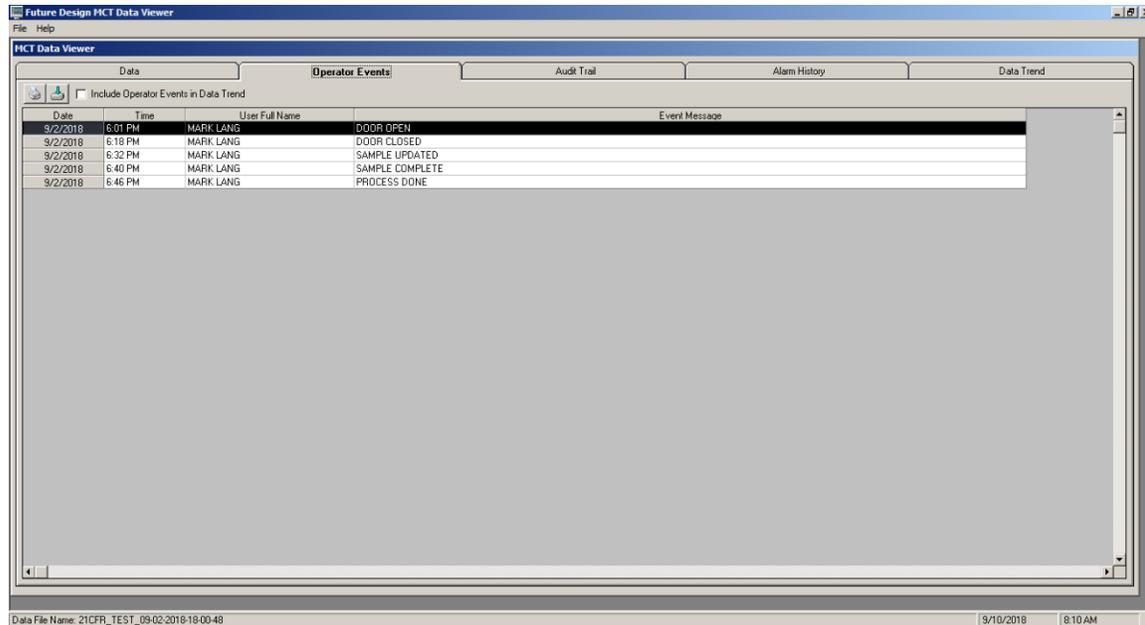
The default chart annotation for a trend plot is “Data File Name: *Filename*”. This can be changed by pressing the “Chart Annotation” button on the Data Trend toolbar. When pressed, the Chart Annotation dialog box will be shown. The user can then enter a description for the trend with up to 255 characters.



When complete, press the “OK” button to replace the current text with that entered; otherwise, press the “Cancel” button to exit without altering the current trend title.

2.2 Operator Events

When a historical data file is opened, the matching operator events file is also opened. To view the operator events (if any), select the Operator Events tab.



The Operator Events tab toolbar provides the following functions:



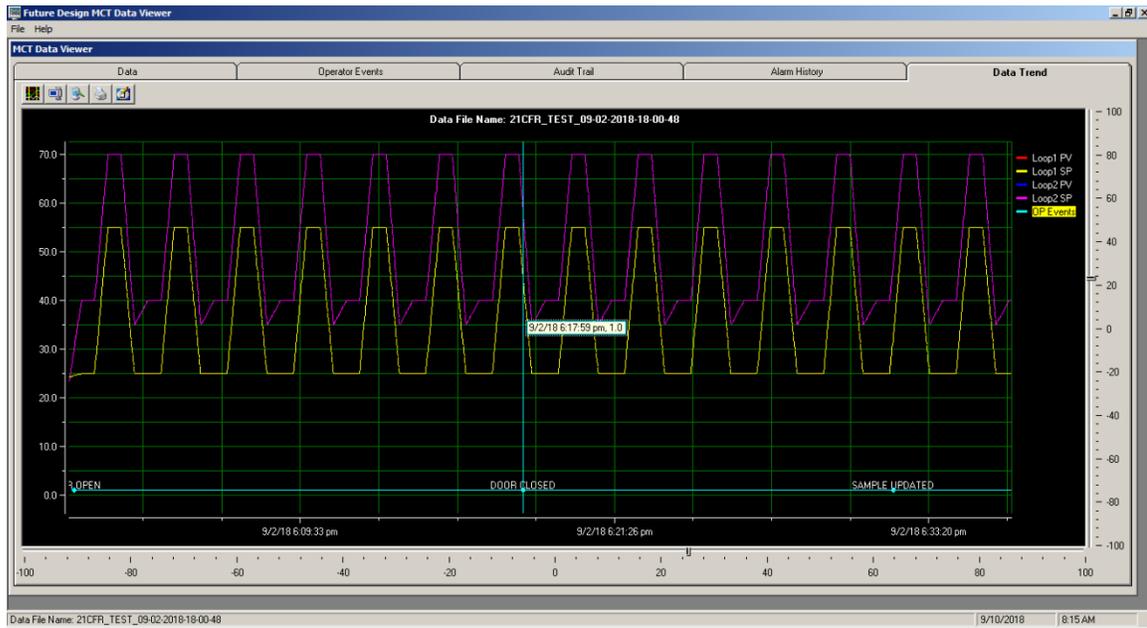
Print Operator Events: Opens print dialog allowing user to print system event table.



Export Operator Events: Opens save file dialog allowing user to save a copy of the file in .csv format.

The Operator Events table will automatically resize each time a historical data log file is opened. The date/time of each event along with the user and action will be provided. If no events are associated with the historical data file, the table will be empty.

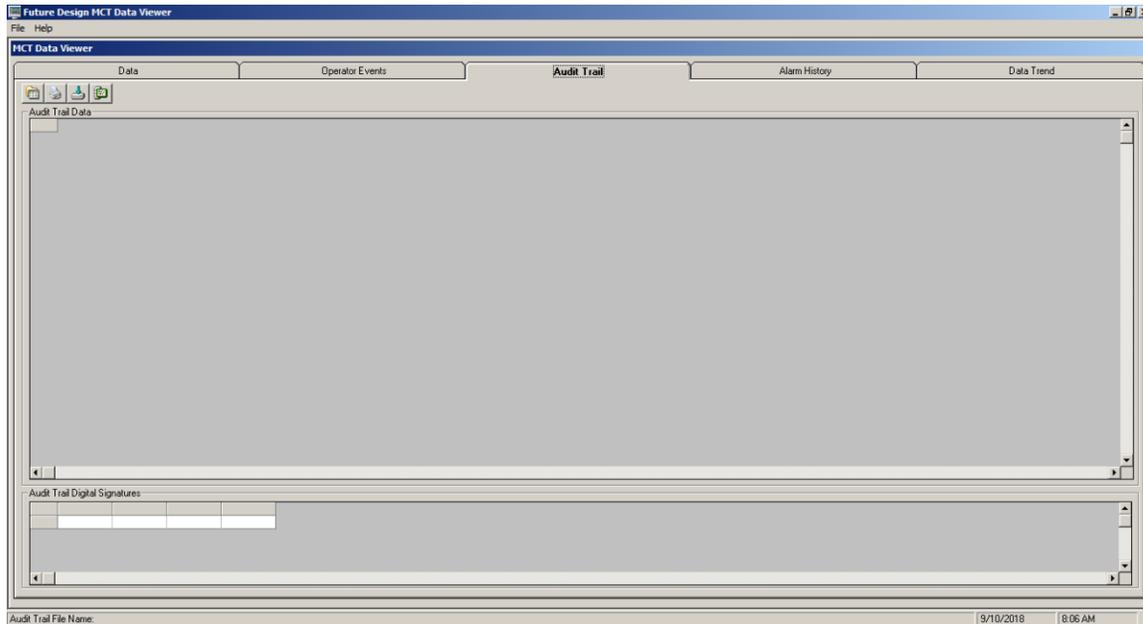
The **Include Operator Events in Data Trend** checkbox allows the operator events to be plotted on the trend at time of occurrence. In order to plot the operator events, first place a check in the checkbox. Then, from the Data tab, select at least once full column of data to plot. The operator events will not be plotted unless at least one full column is selected. Finally, select Plot History File from the Data tab toolbar. To remove the operator events from the trend plot, deselect the checkbox on the Operator Events tab and again select Plot History File from the Data tab toolbar.



The operator events will be displayed along the horizontal axis. By expanding/contracting the axis using the magnification sliders, the event messages can be viewed. Clicking and holding on the date/time labels and dragging forward/back allow the user to pan through the entire trend plot.

3 Viewing Audit Trails

The MCT Data Viewer main window provides five tabs for accessing/viewing files. They include the Data, Operator Events, Audit Trail, Alarm History and Data Trend tabs. To view an MCT audit trail file, select the Audit Trail tab.



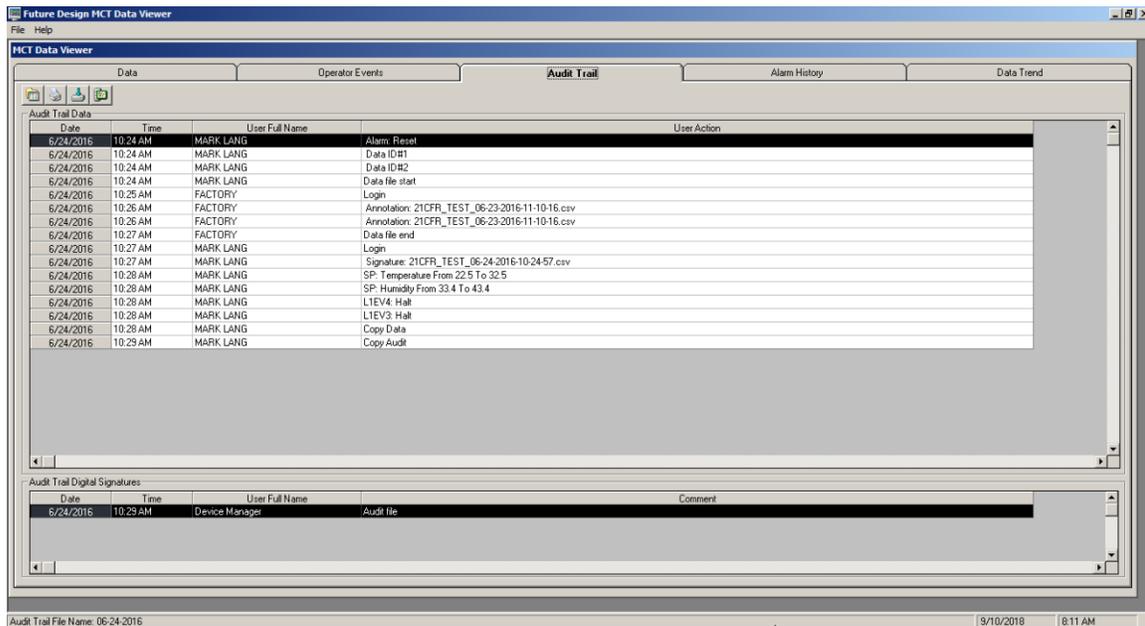
The Audit Trail tab toolbar provides the following functions:

- 
Open Audit Trail: Provides open file dialog to navigate to/select an audit trail file.
- 
Print Audit Trail: Opens print dialog allowing user to print the audit trail data table.
- 
Export Audit Trail: Opens save file dialog allowing user to save a copy of the file in .csv format.
- 
Verify Digital Signature: Validates selected digital signature to see if file has been altered.

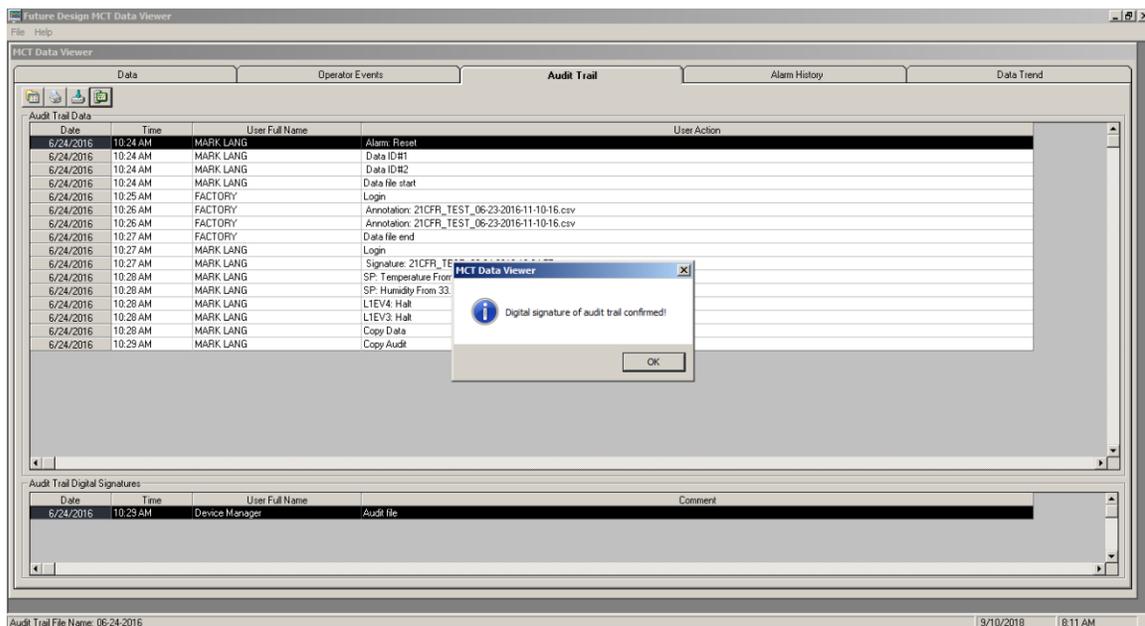
IMPORTANT: The audit trail files of the MCT product line consist of two separate files. These files include the main audit trail file (.aud) and the digital signature file (.sig). When opening an audit trail file, the user will be selecting the “.aud” file. The MCT Data Viewer will automatically attempt to open the matching “.sig” file. If the file is missing (not located in the same directory as the “.aud” file), a dialog will be shown to indicate the file is missing.

The signature file is not required to view the audit trail; however, without the matching digital signature file, the audit trail cannot be validated to ensure it has not been altered. Only audit trails exported from an MCT product using the USB File Utilities will be provided with a signature file. Audit trail files backed up using the FTP functionality of MCT products will not be provided with signature files.

To begin, select “Open Audit Trail” from the toolbar and select the desired file. When the file is opened, the data table will automatically resize to fit all of the data contained in the file.

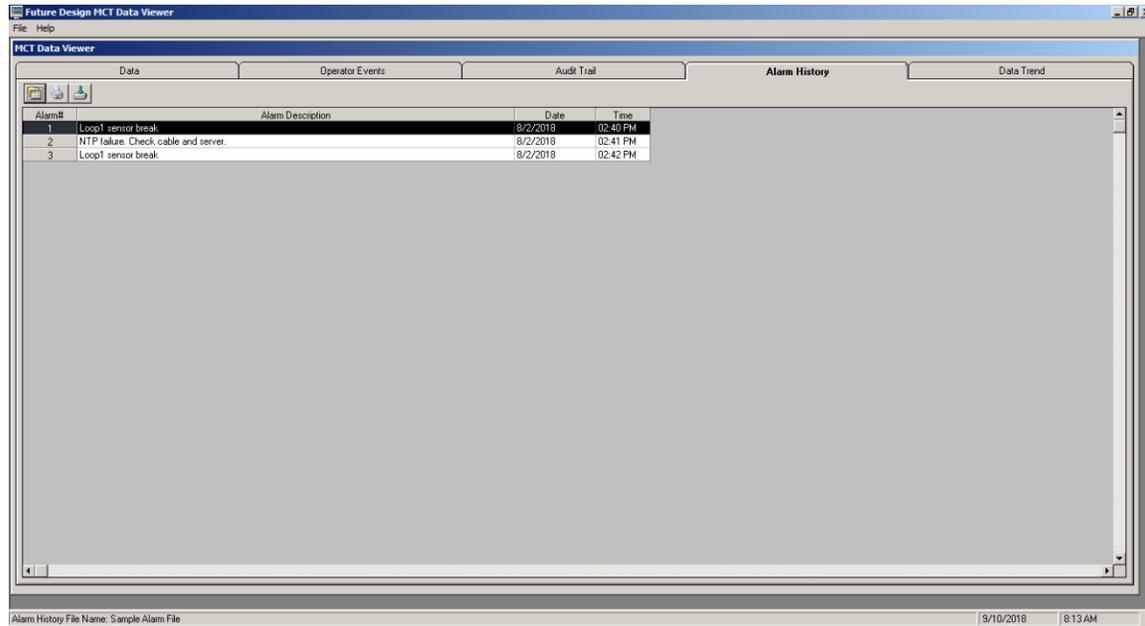


The table is read only so the data cannot be altered, only viewed. All digital signatures associated with the file will be provided in the Digital Signatures table below the main data table. To verify a digital signature, select the desired signature by clicking on its row (if more than one) and select “Verify Digital Signature” from the toolbar. The MCT Data Viewer will compare the signature to the audit trail file and indicate whether or not the file has been altered.



4 Viewing Alarm History Files

The MCT Data Viewer main window provides five tabs for accessing/viewing files. They include the Data, Operator Events, Audit Trail, Alarm History and Data Trend tabs. To view an MCT alarm file, select the Alarm History tab.



The Alarm History tab toolbar provides the following functions:



Open Alarm History:

Provides open file dialog to navigate to/select an alarm history file.



Print Alarm History:

Opens print dialog allowing user to print the alarm history data table.



Export Alarm History:

Opens save file dialog allowing user to save a copy of the file in .csv format.

Appendix

FUTURE DESIGN SOFTWARE LICENSE

Future Design Controls MCT system software (listed as "SOFTWARE" in this document) is protected by copyright laws and international copyright treaties, as well as other intellectual property laws and treaties. The SOFTWARE is licensed at no charge to the end user when all components, including but not limited to the MCT hardware, are purchased from Future Design Controls. All ownership and rights remain with Future Design Controls.

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