

MCT Cloud Services

MCT4 - 1/4 DIN Controller

A 1/4 DIN multi-loop controller that operates like your favorite smartphone or tablet

EASY TO USE
TOUCH SCREEN
INTERFACE



Combines multiple control and monitor components into a single, low cost solution

Technical Assistance

If you encounter a problem with your MCT series controller, 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

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 MCT Controller and the Cloud

What is the cloud? This is most likely a question you've heard or even asked yourself. The term "cloud computing" is everywhere. In the simplest terms, cloud computing means storing and accessing data and programs over the Internet instead of your computer's hard drive. Internet connected servers all over the world provide large load carrying capabilities to support many users, storage services and web user interfaces so the local PC no longer needs as many specialty applications or local file storage requirements. Your information is also available from any PC, tablet or phone that is connected to the internet (using the browser of your choice) rather than logging into a remote computer that stores your files. Consider the example below:



Future Design Controls MCT products can take the place of any PC, tablet or phone in the above picture. All data from any MCT controller can be stored at the server bank shown and accessed (from any device in the picture) using a standard web browser of the user's choice. Configure an existing or new MCT device just like you configure your phone or tablet using your FDC ID. Backup all MCT data, audit and alarm files every night automatically and access the data from anywhere. View real time or historical data from any MCT device using simple search, min/max or date/time criteria like your favorite search engine (great for real time service monitoring or factory support). Export your data in spreadsheet or .CSV format. Best of all, even if the Internet is down, all of your data is stored safely and locally at the MCT device. All data interfaces at the fdcUtil.com web site use secure <https://> protocols with encrypted or digitally signed files which provide enhanced security to protect all of your data. FDC DataWeb services are SQL compatible, so your data can be shared easily across any factory floor system as required.

The fdcUtil.com site is a free Internet website that allows any user to store up to 250 controller configurations per free account, as well as test and use all other data interfaces before deciding upon the best interface for your application. The fdcUtil.com web site with all functionality can be purchased and hosted by any large service provider (i.e. Amazon Web Services, Microsoft Azure, etc.) or hosted in house using your own company servers. By providing local or global data services, the MCT controller has the standard functionality to meet your data needs.

2 MCT Data Services

The MCT series product line offers several types of data services including FTP, FileWeb and DataWeb. These services can be implemented on a LAN (local area network) like a home or office network as well as on a WAN (wide area network) also known as the internet (or cloud). The flexibility of the MCT data services caters to the service requirements of the customer and can be expanded as requirements grow.

Future Design Controls provides a free cloud service (FDCutil.com) that customers can use to test the data services offered in the MCT and also offers free storage for up to 250 configuration files (at the time of this printing). This allows an MCT to be configured anywhere, anytime as long as an internet connection is available. Same principle as restoring the configuration on your favorite smartphone or tablet.

2.1 FTP Interface

What is FTP? FTP is short for File Transfer Protocol. FTP servers have been around for many years and can be installed on local or network machines. We have all encountered FTP out there already. Have you ever downloaded the latest version of Firefox or grabbed MP3s from someone's personal server halfway around the world? Then you have probably used FTP without even knowing it. Today's web browsers allow you to download files via FTP from within the browser window. It's very convenient, and it's great for those times you need to download a file or two, but the browser-download method does not offer much in the realm of flexibility.

An FTP server allows a client (in this case the MCT) to transfer files to the FTP server. This allows for manual and automatic backup of data from the MCT. The FTP interface of the MCT allows for remote storage of all data files, alarm history files and audit trail files contained within the local storage memory of the MCT without having to touch the unit. Once the FTP server data has been entered into the MCT, the MCT can back up the data every night as well as delete it from its internal memory in order to keep free space available for additional files. Having the files automatically stored on an FTP server also provides easy access to anyone that requires them without having to be in the physical presence of the MCT to view the files.

FTP is a session based interface with the MCT supporting "passive" mode operation. Once the session is started, the MCT client (device) can establish a connection with the FTP server using a username and password or anonymously (no username or password). The connection authentication is only used when the session is started with the session being continued until the MCT device closes the session or the session is closed by the FTP remote server (could be for many reasons).

2.2 FileWeb Interface

The FileWeb interface is similar to FTP in that it allows the MCT to transfer its files to a web site for download which can then be accessed using a standard web browser. This interface provides the user the ability to setup a web site to store files for local or global access without installing an FTP server.

FileWeb is also a more secure interface. The MCT can FTP files either anonymously or with a user name and password for secure FTP. However, FileWeb uses a secure connection ("https://" connection where data is encrypted for transfer) and requires a user name and password or files will not be transferred to the website. The user name and password are also validated for each file transferred, unlike FTP where once the login is made, any number of files can be transferred until the sessions is closed without re-verifying the login credentials during each file transfer.

Once the FileWeb server data has been entered into the MCT, the MCT can back up the data every night as well as delete it from its internal memory in order to keep free space available for additional files. Having the files automatically stored on an FileWeb server also provides easy access to anyone that requires them without having to be in the physical presence of the MCT to view the files.

2.3 DataWeb Interface

The DataWeb interface provides for the transfer of secure (https://, encrypted connection), real time data which can be shared and viewed across networks for real time manufacturing systems or any “https://” data base that supports standard .NET and SQL (Structure Query Language) platforms. Instead of transferring multiple files for backup like the FTP and FileWeb interfaces, the DataWeb interface transfers records in real time based on the log setup interval at the MCT device. When logging is started at the MCT, data will begin transfer to the server-side site with real time data which matches the interval set at the MCT device.

One of the advantages of the DataWeb interface is that it removes the barrier of real time vs historical data. All data sent to the server is contained in a database that can be viewed with any web browser as real time data is added or by historical data period for any date/time range that data was recorded from the MCT device.

A good example for the DataWeb interface is Future Design Controls fdcUtil.com site. This is a free site that allows the transfer of real time information from an MCT device. No setup or configuration is required, make an entry for ID1 and/or ID2 (text or numeric) at the MCT device to describe the unit and/or batch number, and start logging data at the MCT device.

At the fdcUtil.com site, a user can view the real time data being transferred in tabular or trend format using simple search criteria for each unit connected, as well as date/time selection or min/max value limits for the data view requests. fdcUtil.com operates like your favorite search engine for the view or export of controller data. The fdcUtil.com site with all functionality (including customizable banner for company name) can be purchased and hosted at any large service provider (i.e. Amazon Web Services, Microsoft Azure, etc.) or hosted in house using your own company servers. Complete support packages are available through Future Design development partners and are included in this document.

Consider the following example:

We have five MCT devices in different locations on the plant floor connected to the same user ID at the fdcUtil.com site (or custom site developed by user).

MCT1 ID1 set for 16640Oven1
MCT2 ID1 set for 16641Oven2
MCT3 ID1 set for 16642Oven3
MCT4 ID1 set for 16642Oven4
MCT5 ID1 set for 16644Oven5

Each of the 5 MCT devices have their data log rate set for 1 minute. Using a standard web browser with access to the fdcUtil.com site (or custom site created by end user), the user can search for 16640Oven1 and set the start/end date and time settings to a specific date of xx/xx/xx from 8:00AM to 4:00PM and press enter. The browser interface will show this specific MCT device data for the given time frame in a tabular or trend format. In this example, if support personnel are remote monitoring for a service issue, the end data setting can be set to a day or so in the future and each time the “refresh” is pressed for the web page, real time data will be added to the page for each new record sent by the remote MCT controller being monitored.

Other automated systems within the company’s network can also make SQL queries to the same database which might display data from the MCT devices on networked computer stations (or other devices) in specific areas of operation where required. These queries are always made from the database, never the actual MCT device itself, and the MCT device will not respond to any command from a remote sever for security reasons. Communications is one way, from the MCT controller to the server only. The MCT controller provides other interfaces for remote control (and monitor) when required. fdcUtil.com is a free site so anyone can setup a free account and test any data interface included standard on the MCT device.

Data storage example calculation at DataWeb server:

Each char (digit in number) = 2 bytes

Value of 32767 = 10 bytes (5 chars)

MCT device with 3 loops of controller data (PV, SP, %Out) for each loop = 90 bytes

MCT device with 3 loops of controller data storage each hour = 5400 bytes (90 x 60)

MCT device with 3 loops of controller data storage each day = 129,600 bytes (5400 x 24)

Each MCT device using above example would require .12MB of storage per day. 10 units connected to the server would use 1.2MB of storage per day. A standard Amazon "T2.small" server comes with 30GB standard for around \$30.00 per month. The 30GB server would take 25,000 days (68.49 years) to fill up using the following:

$30\text{GB} = 30,000\text{MB}$ (total server space) / 1.2MB (10 controllers storage per day) = 25,000 days (68.49 years)

Note: fdcUtil.com is a user test site for DataWeb, FileWeb and FTP protocols with data being removed every hour from each user account. Configuration data is not removed and is free with a max of 250 configurations stored for each user account. The fdcUtil.com web site with all functionality (complete site with customizable banner) can be purchased and hosted by any large service provider (i.e. Amazon Web Services, Microsoft Azure, etc.) or hosted in house using your own company servers.

2.4 Cloud Controller Configuration

The cloud controller configuration interface of the MCT provides a means to globally configure any MCT through the touch of a button as long as an internet connection is available. Unlike the FTP, FileWeb and DataWeb interfaces that only allow the user to store files and data, the cloud configuration provides the user with the ability to both export and import MCT configurations to/from the cloud. Coupled with the free configuration storage service provided at the Future Design Controls FDCUtil.com website, users can store their configurations remotely, and then import it to any number of MCT units throughout the world.

To prevent any tampering of the configuration files, each file is encrypted and embedded with a digital signature to ensure data integrity. If an attempt is made to load a configuration file that has been tampered with or altered in any way, it will fail multiple encrypted security checks which will prevent the user from importing bad data or altering the configuration of the MCT device.

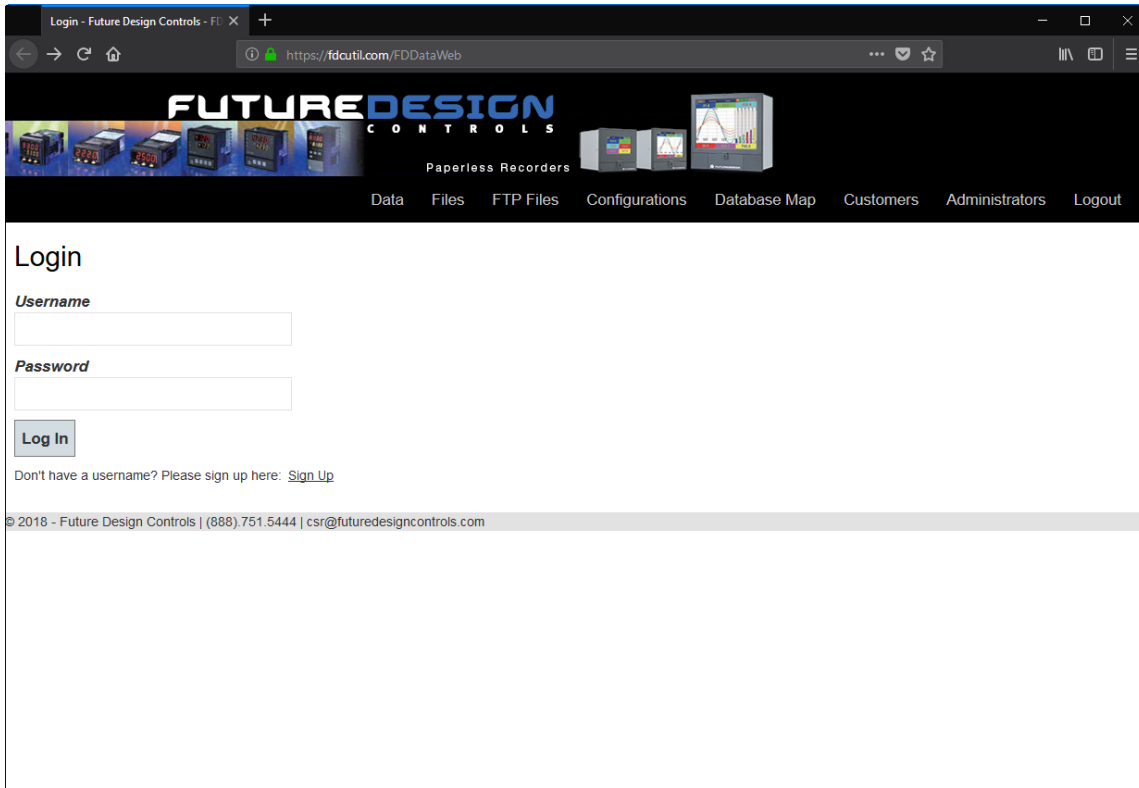
3 FDCUtil.com Website

The FDCUtil.com website is a Future Design Controls (http/https) site that allows customers to create a free account and test the FTP, FileWeb and DataWeb interfaces offered on the MCT. It also provides each account with the storage capacity of up to 250 configuration files. The site automatically deletes data files every 60 minutes since this is a test site, and cannot be used for permanent web storage of data files.

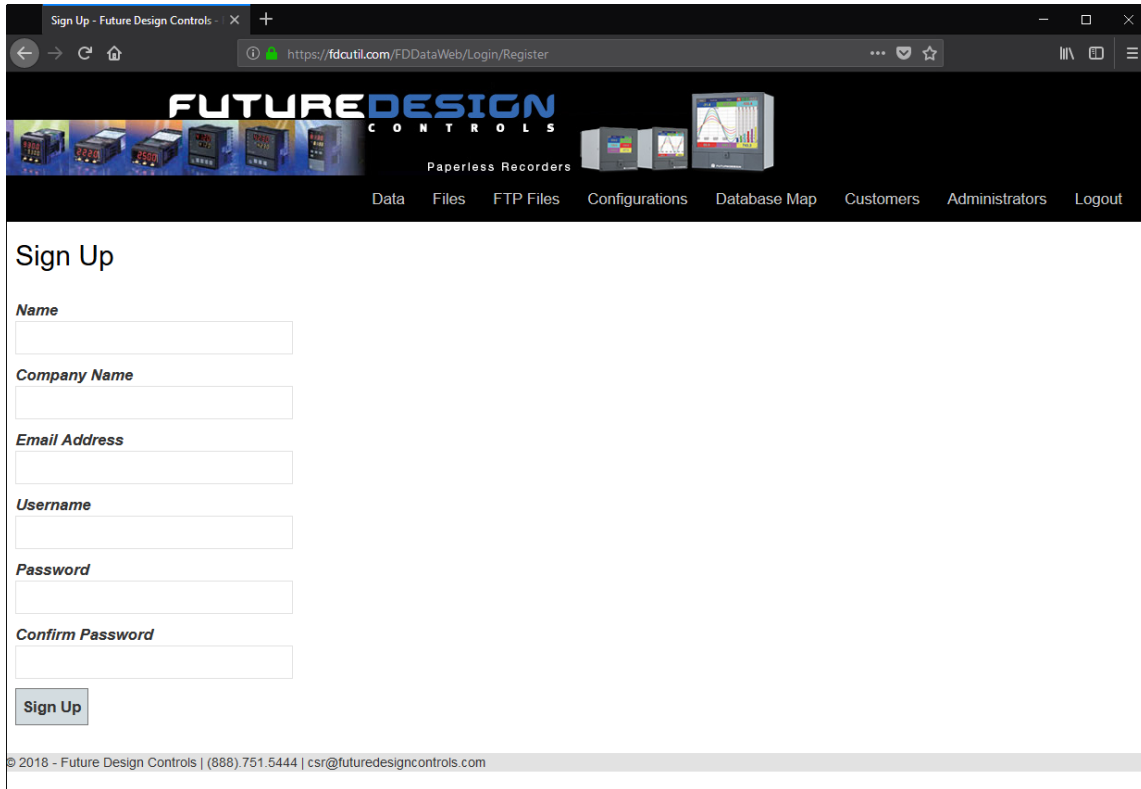
The site allows customers to fully test and verify that data is being transferred properly from the MCT device to the site thereby providing everything needed to test the MCT and the Internet connection without requiring additional software or development. This allows the customer to test the interface and pick which type of data transfer is the best for operations.

3.1 Create an Account

To create a free account, go to the following link: <https://fdcutil.com/FDDataWeb/>



Click on the "Sign Up" link. Enter your name, company name, email address and password. Note that your email address will not be used for solicitation purposes. It is used to send an account verification email. The email sent requires no confirming information; it only verifies that a real user got the email before activating the account. Although FdcUtil.com is a no-charge site, important user data is encrypted for additional protection.



Sign Up - Future Design Controls

https://fdcutil.com/FDDataWeb/Login/Register

FUTUREDESIGN
CONTROLS

Paperless Recorders

Data Files FTP Files Configurations Database Map Customers Administrators Logout

Sign Up

Name

Company Name

Email Address

Username

Password

Confirm Password

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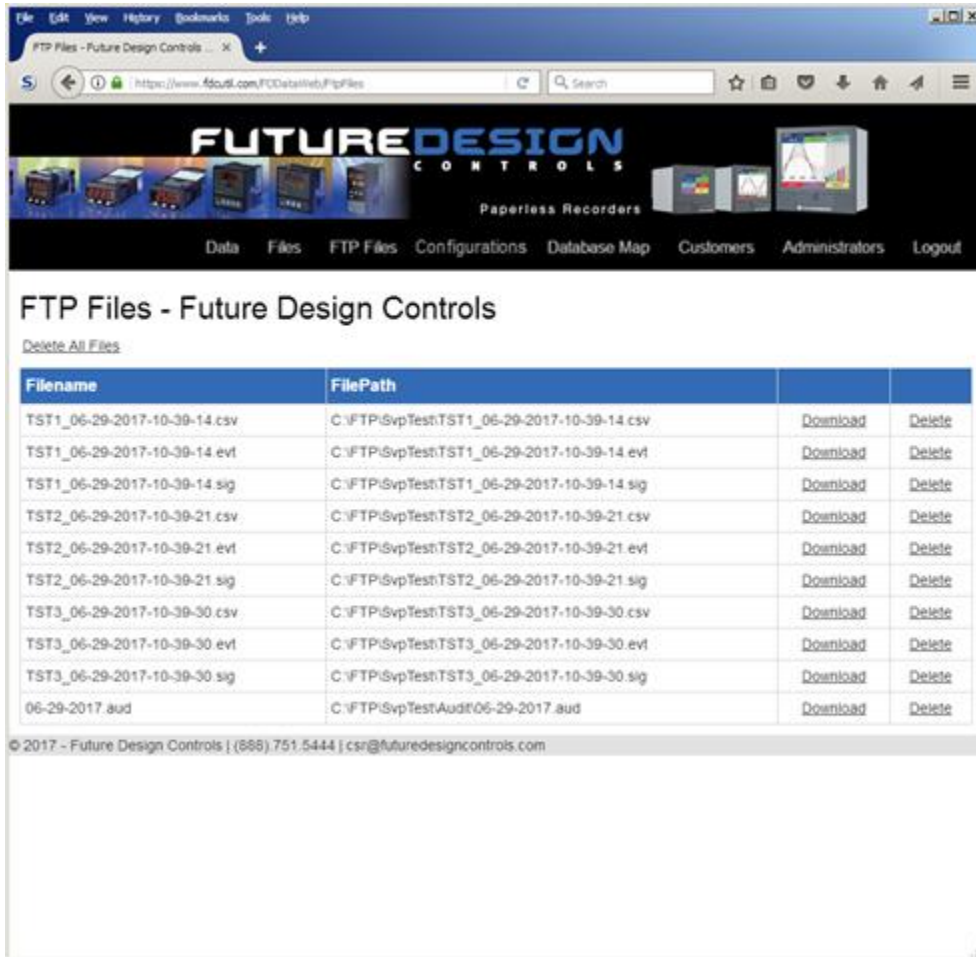
3.2 Accessing Your Account

Once you have created and verified your account, you can log in to the website. Once logged in, the main FDCUtil website will be displayed with tabs for Data (DataWeb), Files (FileWeb), FTP Files (FTP) and Configurations. These tabs can be clicked on and will display data after transfer from the MCT device. After an hour, the data will be deleted from each section (except for Configurations) or the data can be manually deleted using the “Delete” link on each page.

3.2.1 FTP Files Page

The FTP files page, accessible from the “FTP Files” menu item, lists the files in the customer’s FTP data directory. These are only the files in the customer’s directory, not all uploads. The user can delete the files from this page.

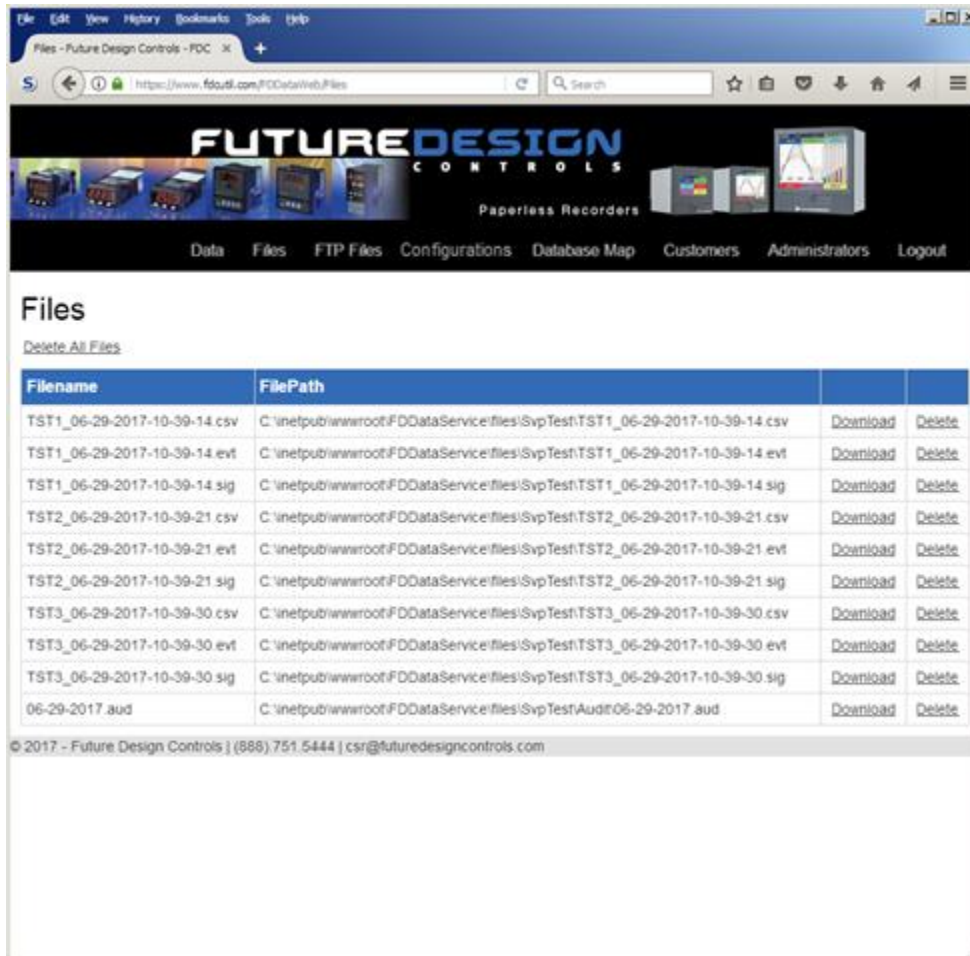
To setup the MCT for use with the FDCutil.com FTP server, contact Future Design Controls technical support for test access. The FTP section of FDCutil.com is used for tech support (pass/fail) testing only when validation if required at a customer site (customer site not working for some reason). This is due to the single login “session based” FTP functionality versus FileWeb/DataWeb which is “non-session” based and requires login credentials for each file sent to the server.



After FTP access is given by FDC technical support, press the “Save” button to complete the setup on the MCT FTP/WAN screen. Press the “Start” button to begin a manual transfer of files from the MCT to the FDCutil.com site. Login to the FDCutil.com site to view the FTP files by pressing on the FTP files link on the page (or press FTP link if already logged into FDCutil.com).

3.2.2 Data Files Page (FileWeb)

The data files page, accessible from the “Files” menu item, lists the files in the customer’s data directory. These are only the files in the customer’s directory, not all uploads. The user can delete the files from this page.



To setup the MCT for use with the FDCutil.com FileWeb server, go to the FTP/WAN screen on the MCT and enter the following data into the screen fields. Make sure to replace the “custName” and “custPassword” text below with the actual user name/password entered during the FDCutil.com sign-up process.

- Type = FileWeb
- IP Add = <https://fdcutil.com/FDDataService.svc>
- User = custName
- Password = custPassword
- Server = leave blank
- Port = not used (can be left at current value)

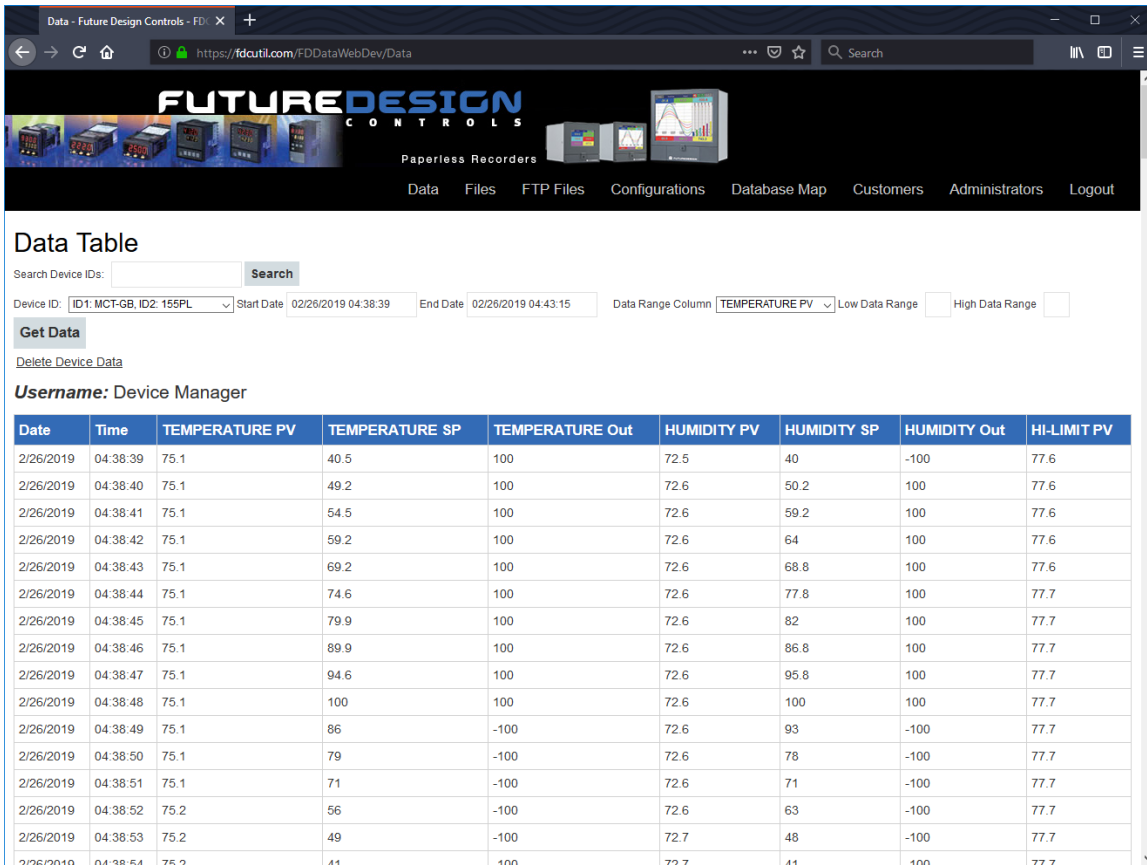
Press the “Save” button to complete the setup on the MCT FTP/WAN screen. Press the “Start” button to begin a manual transfer of files from the MCT to the FDCutil.com site. Login to the FDCutil.com site to view the data files by pressing on the Files link on the page (or press Files link if already logged into FDCutil.com)

3.2.3 Database Data Page (DataWeb)

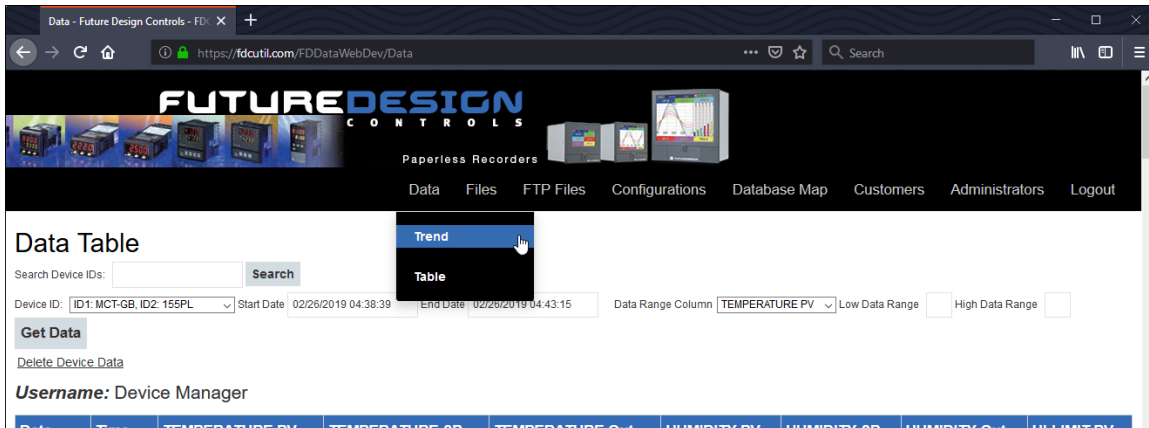
Once logged in, the customer will be shown the database data page. If data has been uploaded to the database, the “Device ID” drop-down menu will contain the list of units (according to the ID#1 and/or ID#2 entries as made on the Data logging screen).



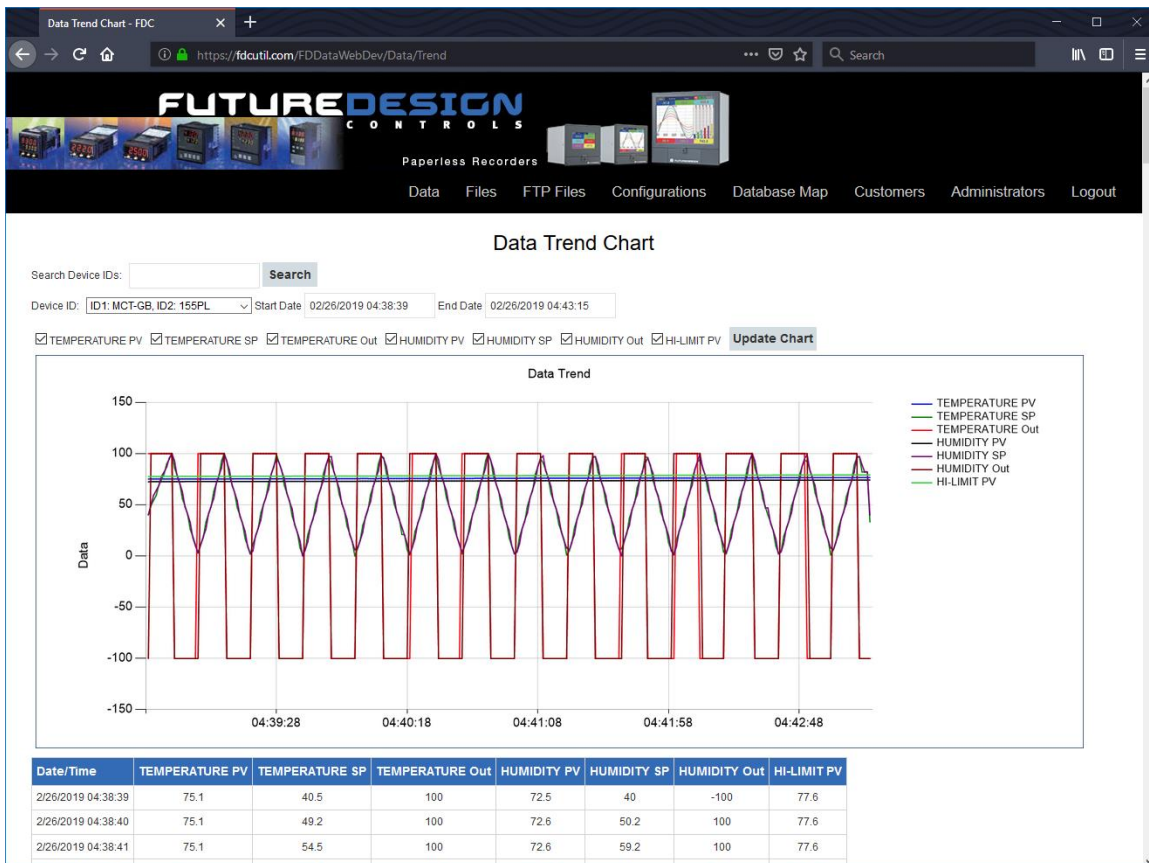
To view the data, select the desired unit from the list and click the “Get Data” button below the Device ID menu. The data available between the Start Date and End Date will be displayed.



The start and end dates can be altered by simply clicking on the fields to display only data from a specific time frame. When the specified time period is entered, press the Get Data button to refresh the data table. The Data Range Column selection and Low/High Data Range fields can also be used to search for data points that fit within the specified range. The available data can also be viewed in graph format. Hover the mouse over the Data tab and selections for Trend and Table will be provided.



Once Trend is selected, choose the desired unit from the Device ID menu. Place a check next to each available point you want to plot and click the Update Chart button. A trend plot according to the chosen plot points and time range will be displayed along with the corresponding data table below.



NOTE: *Once you access the Data Table or Data Trend Chart page, the default start and end times are based on the available data at the server. If an MCT is actively sending data, you must manually set the end time to a future date so that each time you refresh the page via the Get Data or Update Chart buttons, the page is updated with the latest data sent from the MCT.*

To setup the MCT for use with the FDCutil.com DataWeb server, go to the FTP/WAN screen on the MCT and enter the following data into the screen fields. Make sure to replace the “custName” and “custPassword” text below with the actual user name/password entered during the FDCutil.com signup process.

Type = DataWeb
IP Add = <https://fdcutil.com/FDDataService.svc>
User = custName
Password = custPassword
Server = empty (no characters)
Port = not used (can be left at current value)
ID#1 = unique identifier of your choice
ID#2 = unique identifier of your choice

Press the “Save” button to complete the setup on the MCT FTP/WAN screen. Next, navigate to the Data logging screen. Make entries in the ID#1 and/or ID#2 fields. These entries should be unique to the MCT and not duplicates of any other MCT you may have connected to the server. When logging is started at the MCT, data will begin transfer to the “Data” section of the server-side site. Data will be transferred to the server at the beginning of logging (one record) with additional records transferred based on the rate that the MCT data log interval is set for. The maximum rate of data transfer is once per minute, so if the logging interval is set to 1 second at the MCT, 60 data records (one for each second) will be transferred to the site once every minute.

4 FDC Cloud “Server” Services

Mooseworks Software is pleased to provide cloud services for Future Design Controls and the MCT devices. We provide:

1. Complete site and installation without hosting charges (includes FDC site with custom banner, site setup, all code/data model definitions and manual). User provides the server and hosting credentials including domain name and https certificate.
 2. Purchase of #1 above with hosting using Amazon Web Services (AWS). AWS T2 small server with 30GB storage. User provides the domain name and https certificate. Support cost on a yearly basis.
 3. Purchase of #1 above with no hosting but support of client server at customer facility or customer selected location. Support cost on a yearly basis for web service and application.
 4. DIY documentation – interface/data model definitions and server setup directions. DIY experience recommendations include installation and configuration of web servers, web services, SQL language and HTML/.NET code. Support packages for DIY documentation can be purchased in 5, 10 and 25 hour increments.
- Custom development services:
 - Fixed pricing available for well-defined systems.
 - Time and material options available for less defined, continuous engagements.

What to Expect

After an initial consultation, we will:

1. Provide a schedule and budget.
2. Document exactly what you want the service to do.
3. Setup hosting, server, database, service and administrative website.
4. Implement and deploy any additional features and capabilities.
5. Provide support and maintenance as desired.
6. We do not offshore work; you will always have direct contact with the person doing the work.

Pricing Models

We offer choices for pricing:

1. Standard setup without hosting charges (same functionality of fdcUtil.com) - \$4500.
Standard setup includes the following:
 - Configurable menu choices. We can hide or modify any menu item, like FTP Files, or Data.
 - Header logo image (currently the FDC logo). Customer to supply logo image. The current version is 833 wide x 101 pixels high. It can be a different size, though.
 - Header background color – currently black to work with the logo
 - Menu text color – currently a very light gray to white.
 - Table header background color – currently a blue to match the blue in the logo.
 - Table header text color – currently white.
 - Footer – text, colors
 - Installation, setup and test of all server side/web page components on customer selected server. This allows for customer testing and final decision of when web site services go live.
 - Manual which includes interface/data model definitions, and server setup directions.

2. Purchase of #1 above with addition of standard hosting with AWS including support - \$2875 / year.
 - Includes costs of hosting on Amazon “small” server with 30GB of storage data.
 - Includes server maintenance.
 - Includes database/file system maintenance.
 - Includes updates (new code/bug fixes) for any minor updates or revisions.
 - Interface with Amazon servers and server services included in price (saves IT time).
3. Purchase of #1 above with support of customer supplied server (not AWS hosting) - \$2500 / year.
 - Includes server maintenance on customer supplied server.
 - Includes database/file system maintenance on customer supplied server.
 - Includes updates (new code/bug fixes) for any minor updates or revisions.
 - Interface with customer servers and server services included in price (saves IT time)..
4. DIY Documentation – interface/data model definitions, and server setup directions - \$2000
(Support packages for DIY documentation can be purchased in 5 hour increments at \$200.00 per hour)
5. Custom development services:
 - Fixed pricing available for well-defined requirements.
 - Time and material options available for less defined, continuous engagements.

Contact Information

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For more information, please visit <http://mooseworkssoftware.com/>.

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Future Design Controls reserves the right to make changes without notification to purchaser to materials or processing that do not affect compliance with any applicable specifications.

Return Material Authorization:

Contact Future Design Controls for Return Material Authorization Number prior to returning any product to our facility:



7524 West 98th Place – Bridgeview, IL 60455 – Phone 888.751.5444 – Fax 888.307.8014

<http://www.futuredesigncontrols.com>