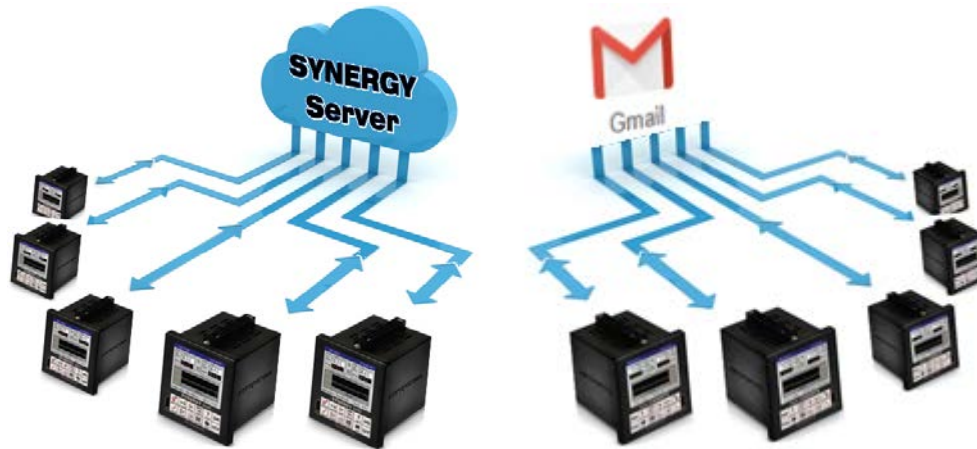


## Synergy Controller Cloud Storage Features and Benefits



The exploding popularity of cloud based data storage and application services is a direct result of the benefits they seem to provide in virtually all business and industrial applications. This note explains the Synergy Controller features developed to help test and manufacturing organizations take advantage of Cloud infrastructure with their environmental test chambers and process ovens.

Tidal Engineering's Synergy Controllers, the Synergy Micro 2, Synergy Quattro, and the ¼ DIN Synergy Nano provide state-of-the-art usability and connectivity for environmental test control and data acquisition and combine the functions of a chamber controller and a data logger. These controllers are designed to improve test efficiency by supporting both factory automation and test and measurement protocols and standards. These include: E-mail, FTP, HTTP (Web), PDF plotting, and now Cloud resources.

**Delivering Test Results** – There are two principal ways that Synergy Controllers are used in conjunction the cloud based storage and applications:



**Synergy Server.** The latest Synergy Controller software features integrated access to Synergy Cloud Servers and can automatically Deliver Test Results to it\*. The Synergy Server client is integrated into the controller and therefore provided some additional benefits; access to centrally stored test programs, controller backups, and configuration files.



**Gmail.** All Synergy Controllers have the ability to Deliver Test Results (test logs and test reports in PDF format) via e-mail. Using this Synergy Controller functionality in conjunction with a free Gmail account, engineers and managers can create cloud based archives of test results at virtually no cost.

\*Note that there are currently two Synergy Server implementations; Synergy Cloud Server and Synergy VM Server. Synergy VM Server is the Virtual Machine version of the Synergy Server that can run on a computer at your site. Synergy Server will refer to both in this application note.

\*Synergy Server requires controller application software version 4.1.4 or newer.

## Cloud Storage Benefits

Circular chart recorders were ubiquitous data recording instruments for environmental test chamber and process oven applications. Some of the biggest issues with chart recorders are keeping the instruments in running order, fed with paper and pens, and calibrated. In addition, the resulting hard copy test records are of limited utility and accuracy. Furthermore, storing the constant output of hard charts produced is time consuming.

For these reasons, cloud storage is quickly becoming the method of choice when engineers and managers consider their budgets. Storing test results electronically and remotely provides an array of advantages including:

**Cost** – Online storage services reduce the cost associated with traditional backup methods, providing ample storage space in the cloud for no cost (Google Gmail) or for a low monthly fee. As mentioned above, a big issue with chart recorders is keeping the instruments in good running order and calibrated. Online storage services eliminated the tedious process and cost of keeping chart recorders running and with the Synergy Controller/Logger only one instrument requires calibration instead of two.

**Security** – Storing confidential or sensitive information in the cloud is often more secure than storing it locally. With online storage services, data is encrypted both during transmission and while at rest, ensuring no unauthorized users can access the files.

**Automation** – Automating the logging and archival process can reduce the time spent on these tasks and reduce the risk of lost data.

**Accessibility** – From tablets to smartphones, netbooks to desktops, engineers and managers are using more devices every day. With a cloud based storage solution, you can access your test data from any internet connection, whether you're on a mobile browser or on a workstation computer.

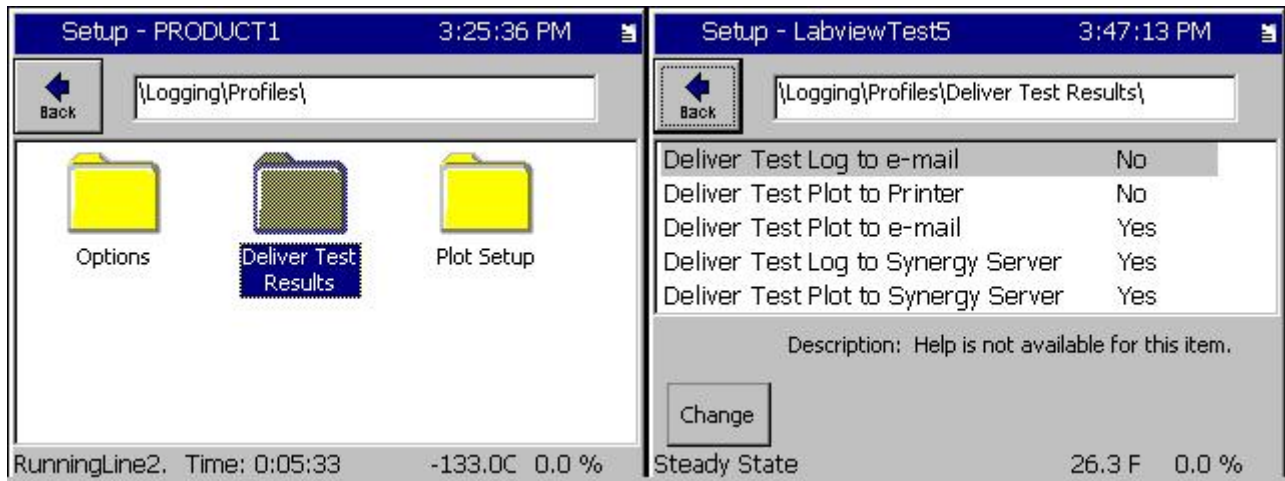
**Configuration Control** – Synergy Cloud Server based storage ensures that all of your chambers and process ovens automatically use the latest versions of the test and process programs.

**Collaboration** – Online storage services are also ideal for collaboration purposes. They allow multiple people including the test chamber technician, chamber operator, test engineer and the lab manager, access to the test results they need to do their jobs. Whether you want to share the results from a single test or from all the tests run in the lab, the Synergy Controller's cloud based storage allows you to select files with just a few clicks.

**Protection** – Cloud storage serves as an added layer of data protection for irreplaceable test results. Backups are kept in secure locations in multiple sites on the coast tails of the Google™ and Amazon™ burgeoning Cloud infrastructures.

**Recovery** – In the event of catastrophic equipment loss, test results are available anywhere and everywhere.

Setting up your controllers to use Synergy Cloud features is straightforward. To start, whether using Synergy Server integration or the controller's built-in e-mail delivery feature in conjunction with a Gmail account, the first step is to setup the Synergy Controller's **Deliver Test Results** settings in the **Setup\Logging\Profiles\Deliver Test Results** folder as shown below:



For detailed setup instructions, see the following application notes:

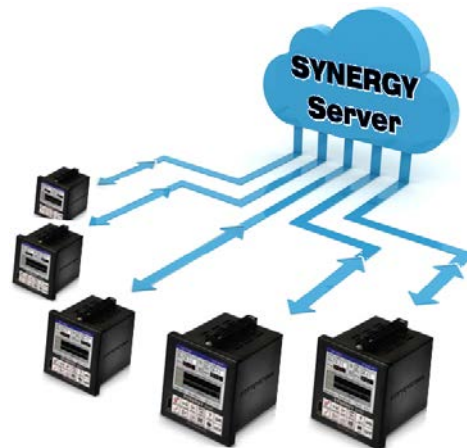
[Application Note 84 Synergy Controller E-Mail Features.](#)

[Application Note 85 Synergy Controller Logging Features and Applications.](#)

[Application Note 90 Synergy Controller Network Printing Features](#)

[Application Note 99 Synergy Server Features](#)

The sections below provide an overview of the Synergy Controller features and benefits for cloud based storage with both Synergy Server and Gmail implementations.



The **Synergy Server** is a web server application designed to provide virtually unlimited centralized and searchable storage for an unlimited number of Synergy Controllers. Based on Virtual open source LAMP server technology (Linux OS, Apache Web Server, MySQL Database, and PHP scripting platform), the **Synergy Server** provides centralized storage and a simple Web Interface for:

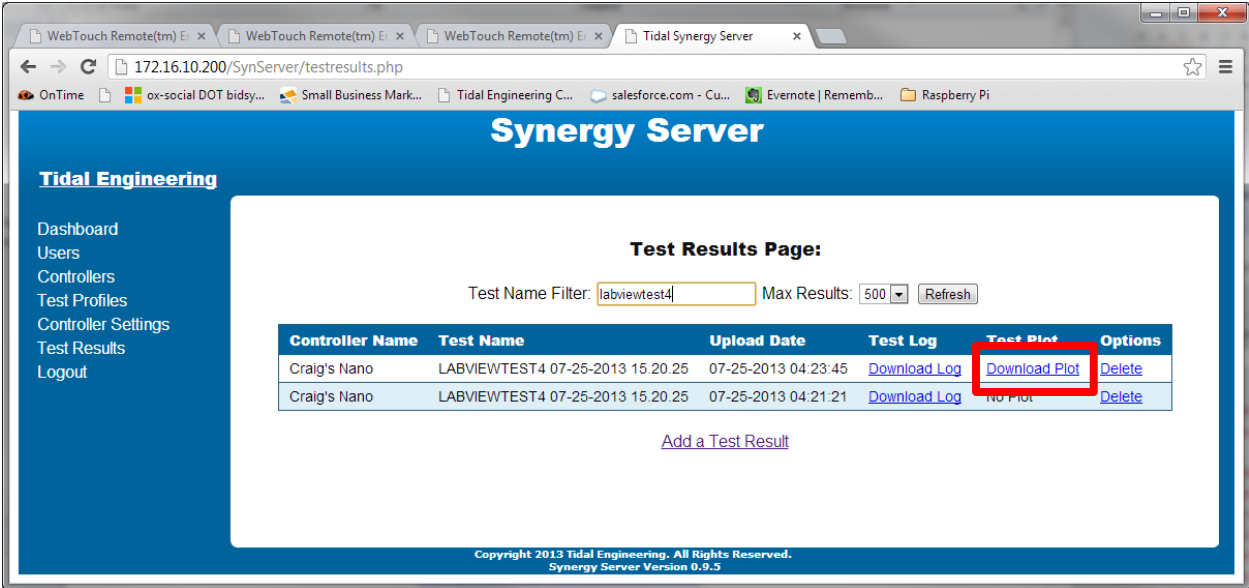
- Recipe
- Test Results
- Controller Backup

The Synergy Server can be hosted in the cloud or alternatively installed on any Windows PC or Server in the enterprise. **Synergy Server** functionality is available in Synergy Controller software versions 4.1.4 and later.

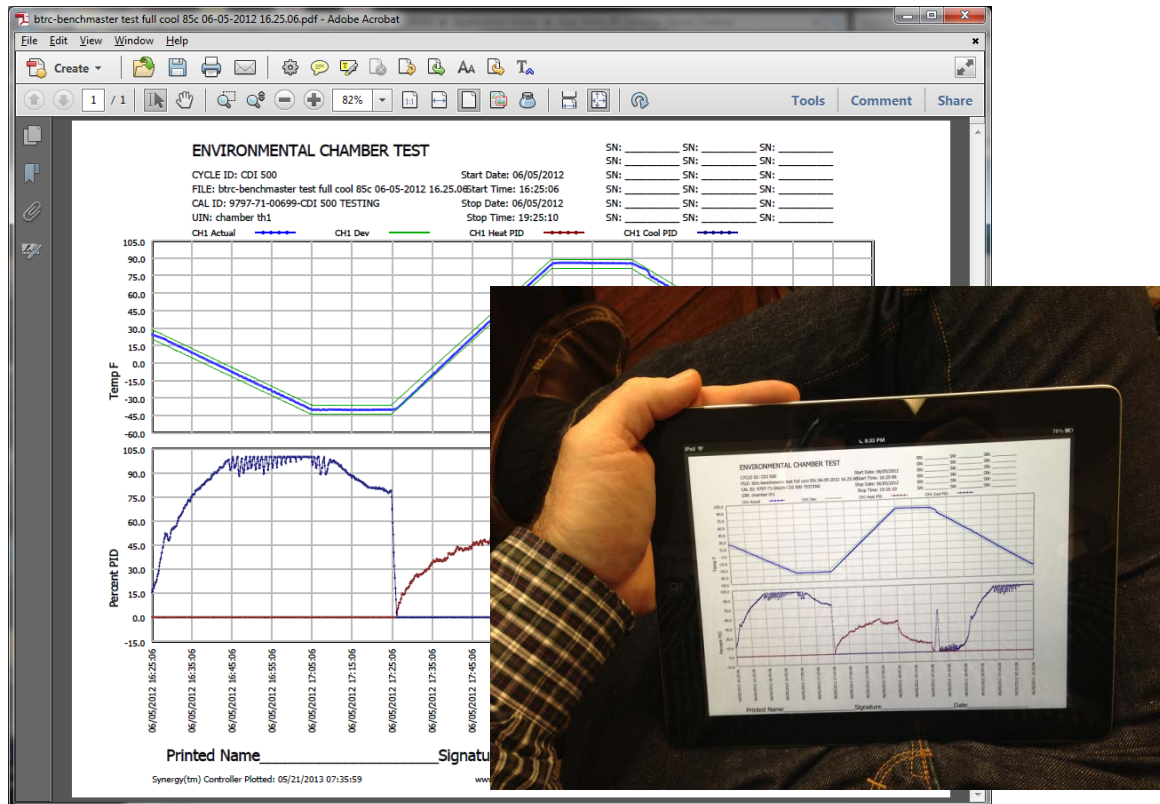
The Synergy Controller cloud storage integration provides a number of advantages for storing test results and programs critical to any testing process and manufacturing process. The Synergy Server is integrated into the Synergy Controller software. For example, the Drive List includes **Synergy Server** when loading programs and settings backup/restore files.



To retrieve a plot from the Synergy Server, click on the **Download Plot** link next to the test results.



The browser will download the plot in Adobe PDF format as shown below. As mentioned above, the Synergy Server can be accessed from any desktop or mobile browser.



To connect to the SYNERGY Server from your desktop or mobile browser, type the IP address of your **Synergy Server** in your web browser.

The Synergy Server Main Menu provides the following choices:

- Dashboard – Displays recent activity (as shown below)
- Users – Lists current users and supports user add and delete functions.
- Controllers– Lists current controllers and supports controller add and delete functions.
- Profiles– Lists current profiles and supports profiles add and delete.
- Controller Settings - Lists current Settings Backup files and supports add and delete.
- Test Results- Lists test results files and supports add and delete.
- Logout – Closes Synergy Server session.

## Synergy Server Dashboard Page

The screenshot shows the Synergy Server dashboard in a web browser. The page has a blue header with the 'Synergy Server' logo and a left sidebar menu. The main content area is titled 'Recent Activity' and contains three tables: 'Test Results', 'Profiles', and 'Settings'.

**Tidal Engineering**

Dashboard  
Users  
Controllers  
Test Profiles  
Controller Settings  
Test Results  
Logout

**Recent Activity**

**Test Results:**

Controller Name	Test Name	Upload Date
Craig's Nano	chamber th1-Labview6 08-07-2013 13.36.22	08-07-2013 03:37:09
Craig's Nano	chamber th1-LabviewTest3 08-06-2013 05.19.18	08-07-2013 02:31:21
Craig's Nano	chamber th1-LabviewTest3 08-06-2013 05.15.16	08-06-2013 06.18.15
Craig's Nano	chamber th1-LabviewTest3 08-06-2013 05.11.15	08-06-2013 06.14.14
Craig's Nano	chamber th1-LabviewTest3 08-06-2013 05.07.14	08-06-2013 06.10.13
Craig's Nano	chamber th1-LabviewTest3 08-06-2013 05.03.13	08-06-2013 06.06.13
Craig's Nano	chamber th1-LabviewTest3 08-06-2013 04.59.12	08-06-2013 06.02.12
Craig's Nano	chamber th1-LabviewTest3 08-06-2013 04.55.11	08-06-2013 05.58.11
Craig's Nano	chamber th1-LabviewTest3 08-06-2013 04.51.10	08-06-2013 05.54.10
Craig's Nano	chamber th1-LabviewTest3 08-06-2013 04.43.07	08-06-2013 05.46.04

**Profiles:**

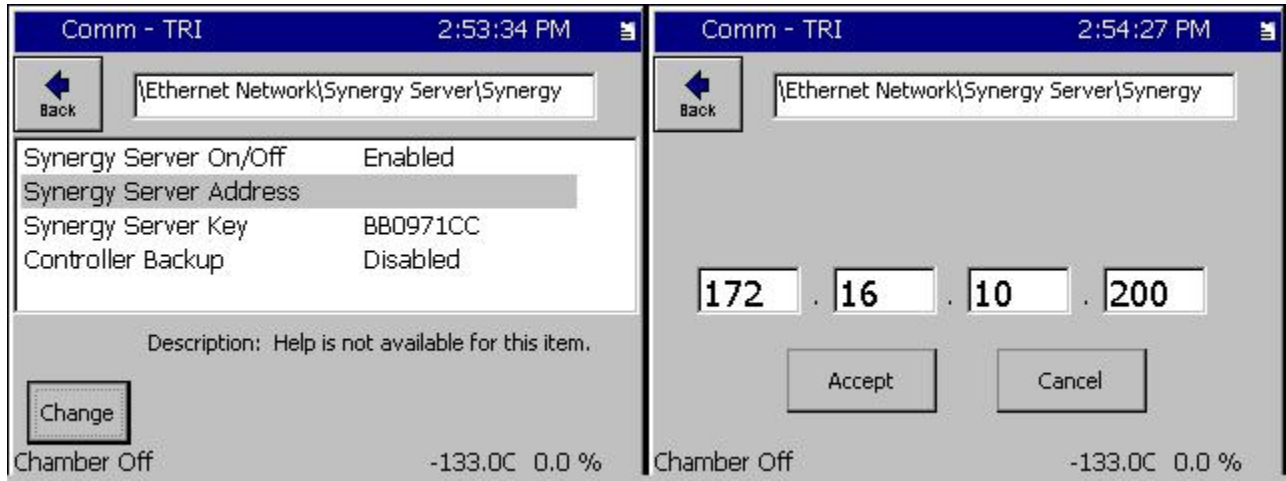
Profile Name	Last Updated
LabviewTest5.vpl	08-07-2013 02:29:31
LabviewTest4.vpl	07-25-2013 04:02:55
2CE.vpl	05-25-2013 07:29:34
1CE.vpl	05-25-2013 07:11:10
RALPH-112A.vpl	05-21-2013 03:56:55
auto tune.vpl	05-21-2013 08:36:53
tri2.vpl	05-11-2013 11:47:00
cooling4.vpl	05-05-2013 01:52:29
vplcooling4.vpl	05-05-2013 01:50:04
cooling3.vpl	05-05-2013 01:49:16

**Settings:**

Setting Name	Last Updated
syms2.cfg	08-04-2013 10:02:01
syms.cfg	07-28-2013 12:51:48
nano1.cfg	07-26-2013 02:56:23
th 24.cfg	01-01-1970 12:00:00

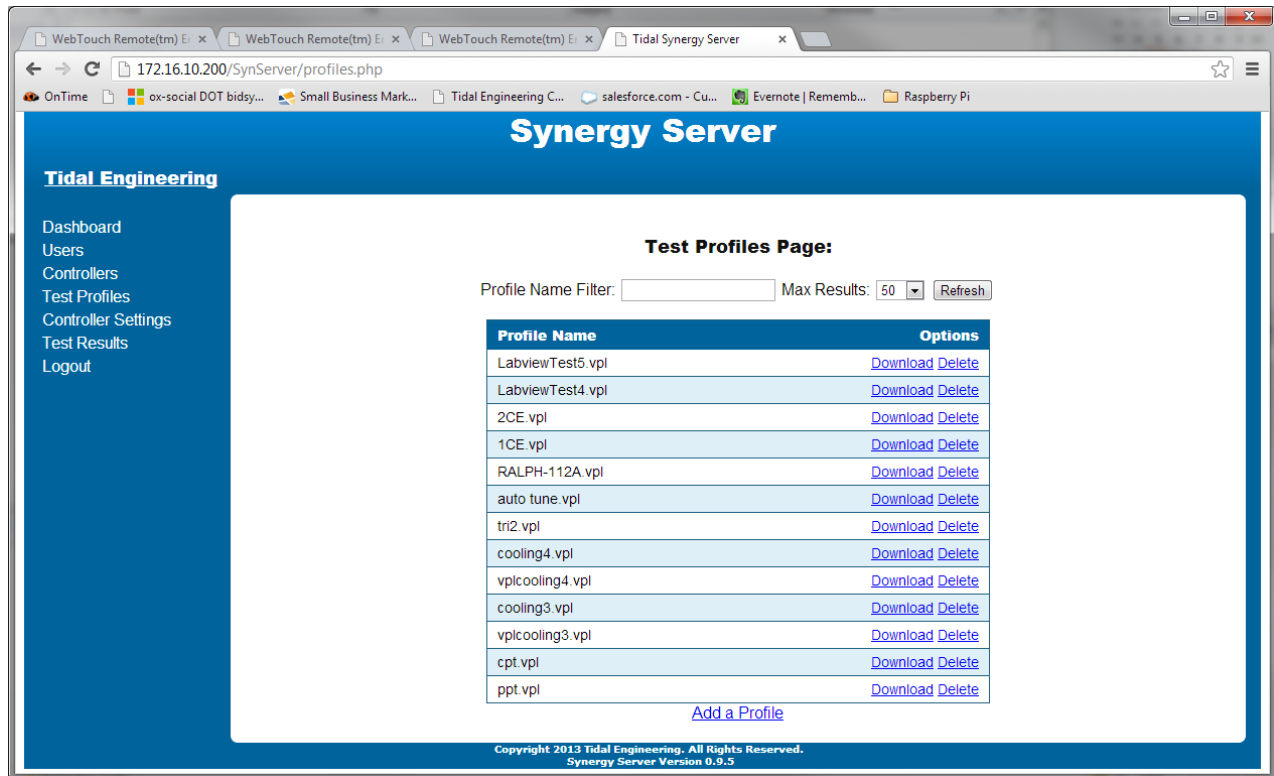
Copyright 2013 Tidal Engineering. All Rights Reserved.  
Synergy Server Version 0.9.5

To setup your controller to connect to the **Synergy Server**, set the **Synergy Server On/Off** parameter to **Enabled** and then enter the **Synergy Server Address** for your server as shown below.

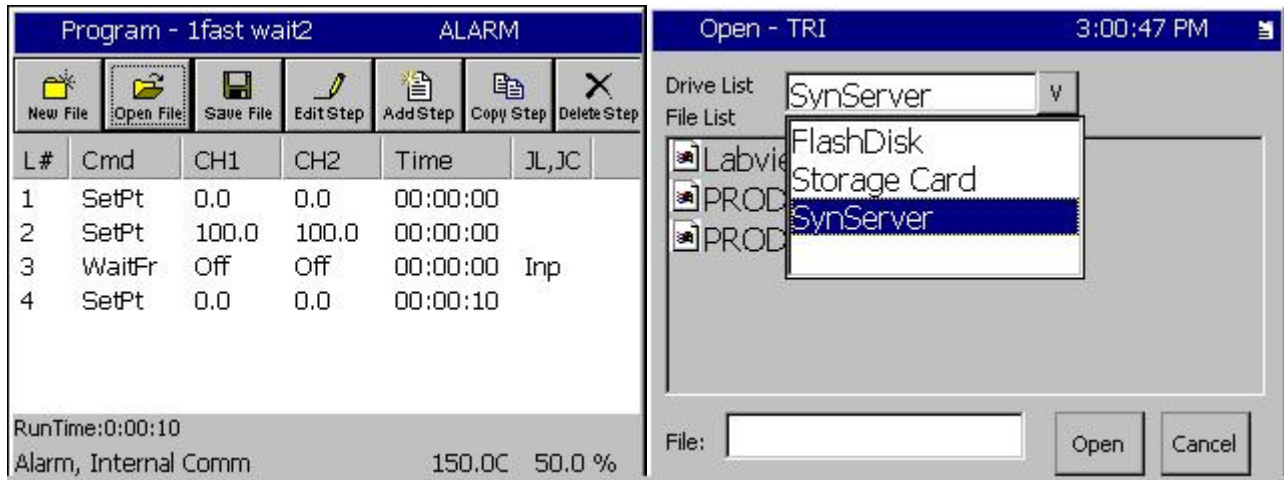


## Organizing Synergy Server Test Profiles Page using Filtering

One of the features of the Synergy Server is its large storage capability. At the top of the Test Profiles page is a Filter field that can be used to select specific test profiles on the Synergy Server. For example, you can enter MIL-STD in the Test Name Filter box at the top of the page to select all of the tests whose test name contains "MIL-STD".



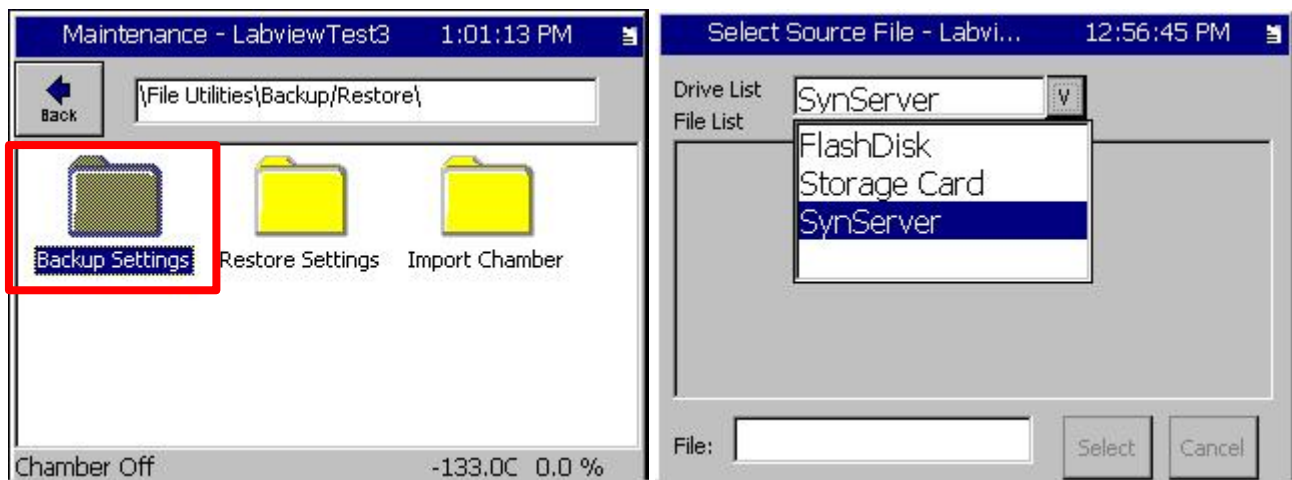
Profiles can be copied from the controller to the Test Profiles Page or from the PC to the page. You can create test profiles on your PC using Synergy Manager Software which is available as a free download from our website. <http://www.tidaleng.com/synergyman.htm>.



## Synergy Controller Backup and Restore

The Synergy Server can provide storage for controller backups. To backup your controller's settings, press the **Backup Settings** Folder in the Maintenance Screen as shown below, then press on the Browse

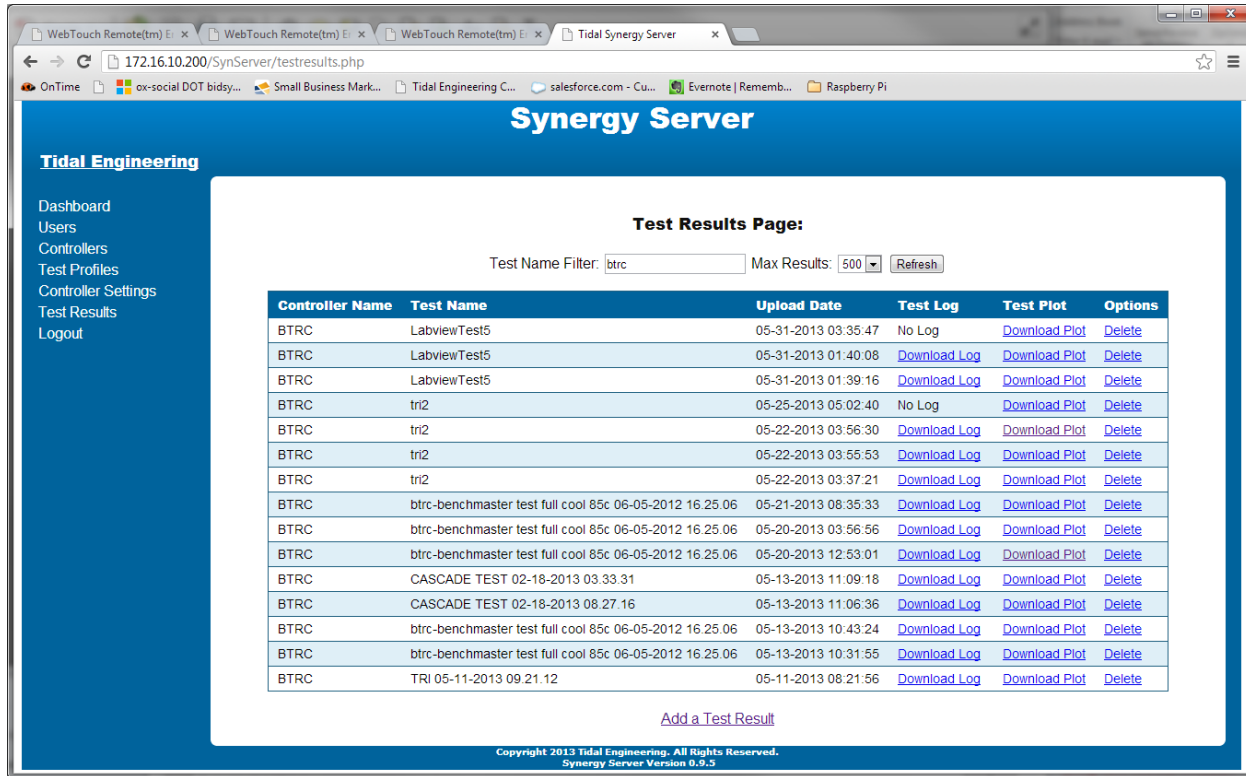
Dropdown the **Drive List** and select **SynServer**, then press the **File** text box at the bottom of the window to enter the file name.



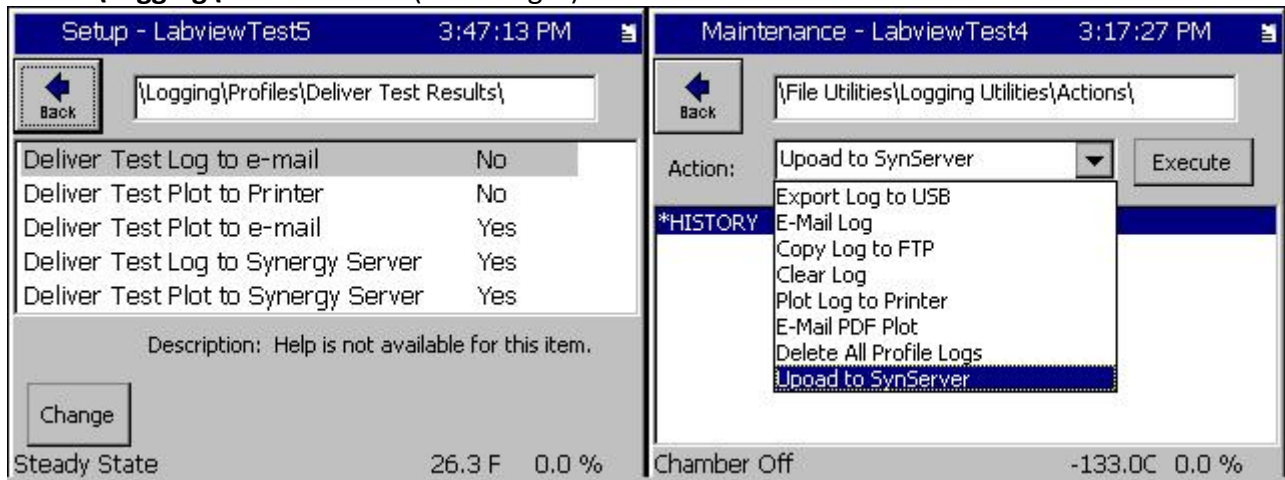


## Organizing Synergy Server Test Results Page using Filtering

As mentioned above, one of the benefits of the Synergy Server is its virtually unlimited capability to store test results. This capacity combined with Synergy Server’s search capabilities make it easy to manage results. The Filter field at the top of the Test Results Page can be used to select specific test records on the server. For example, we can type “BTRC” in the Test Name Filter box at the top of the page to select all of the tests whose controller name or test name contains “BTRC” as shown below.

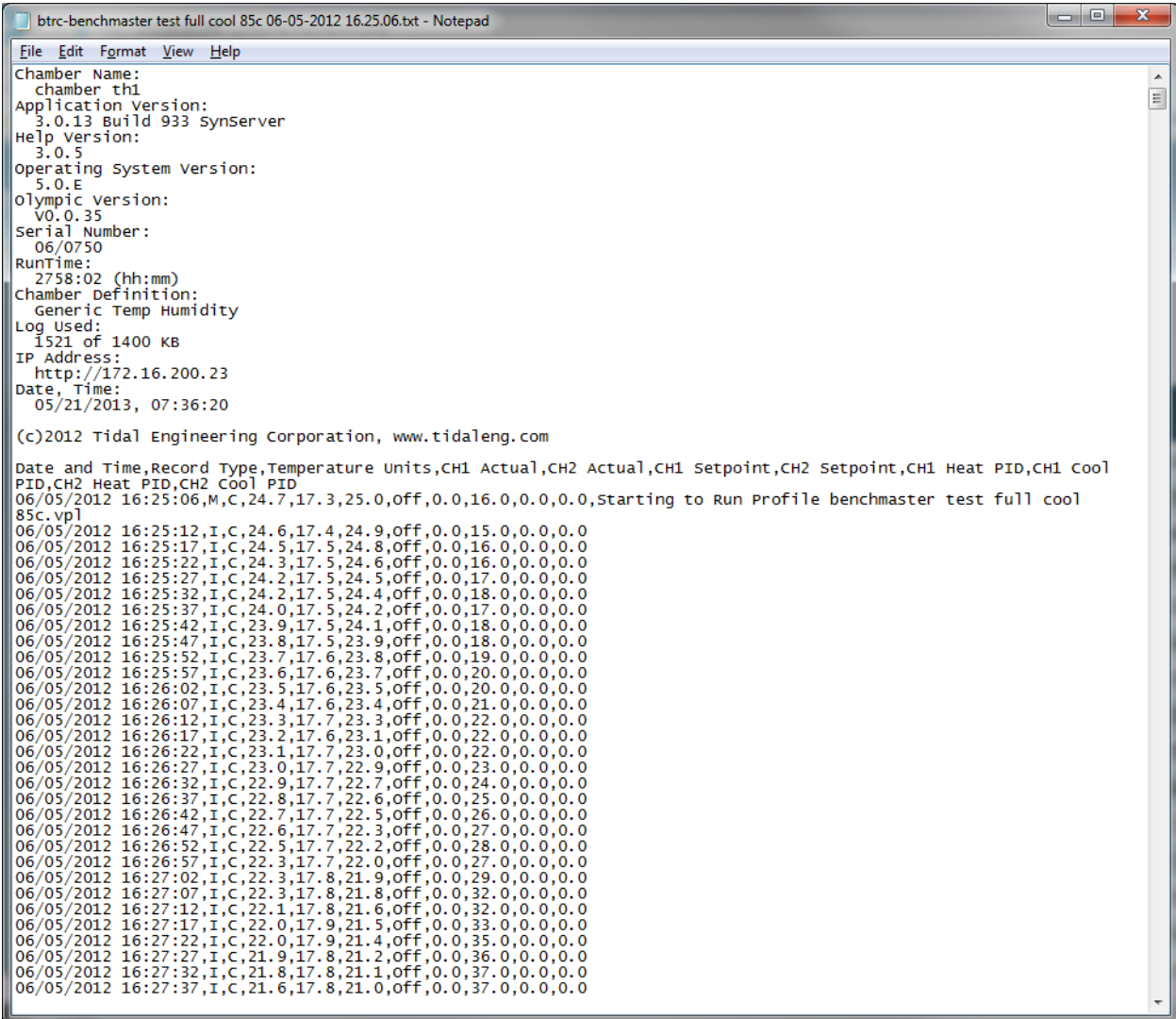


In addition to automatic delivery options in the **Deliver Test Results** folder (below left), delivery can also be triggered manually by selecting the Results file and the Action from the list in the **SETUP\Logging\Actions** folder (below right).



To retrieve log files from the Synergy Server in CSV (Comma Separated Variable) format, click on the **Download Log** link next to the test results.

## Test Log example



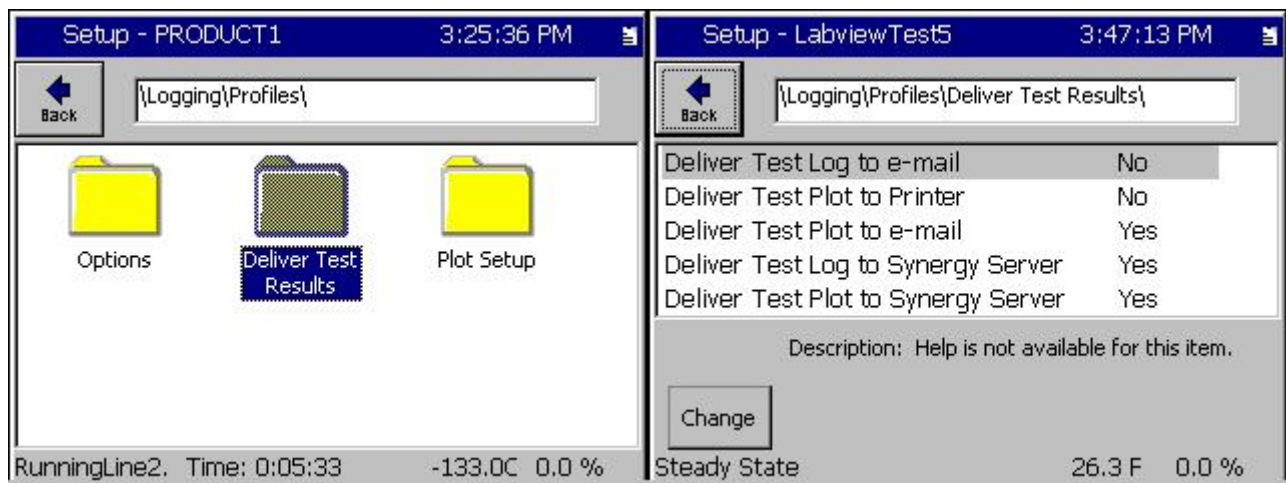
```
btrc-benchmaster test full cool 85c 06-05-2012 16.25.06.txt - Notepad
File Edit Format View Help
Chamber Name:
chamber th1
Application Version:
3.0.13 Build 933 SynServer
Help Version:
3.0.5
Operating System Version:
5.0.E
Olympic Version:
V0.0.35
Serial Number:
06/0750
RunTime:
2758:02 (hh:mm)
Chamber Definition:
Generic Temp Humidity
Log Used:
1521 of 1400 KB
IP Address:
http://172.16.200.23
Date, Time:
05/21/2013, 07:36:20

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Date and Time,Record Type,Temperature Units,CH1 Actual,CH2 Actual,CH1 Setpoint,CH2 Setpoint,CH1 Heat PID,CH1 Cool
PID,CH2 Heat PID,CH2 Cool PID
06/05/2012 16:25:06,M,C,24.7,17.3,25.0,off,0.0,16.0,0.0,0.0,starting to Run Profile benchmaster test full cool
85c.vp1
06/05/2012 16:25:12,I,C,24.6,17.4,24.9,off,0.0,15.0,0.0,0.0
06/05/2012 16:25:17,I,C,24.5,17.5,24.8,off,0.0,16.0,0.0,0.0
06/05/2012 16:25:22,I,C,24.3,17.5,24.6,off,0.0,16.0,0.0,0.0
06/05/2012 16:25:27,I,C,24.2,17.5,24.5,off,0.0,17.0,0.0,0.0
06/05/2012 16:25:32,I,C,24.2,17.5,24.4,off,0.0,18.0,0.0,0.0
06/05/2012 16:25:37,I,C,24.0,17.5,24.2,off,0.0,17.0,0.0,0.0
06/05/2012 16:25:42,I,C,23.9,17.5,24.1,off,0.0,18.0,0.0,0.0
06/05/2012 16:25:47,I,C,23.8,17.5,23.9,off,0.0,18.0,0.0,0.0
06/05/2012 16:25:52,I,C,23.7,17.6,23.8,off,0.0,19.0,0.0,0.0
06/05/2012 16:25:57,I,C,23.6,17.6,23.7,off,0.0,20.0,0.0,0.0
06/05/2012 16:26:02,I,C,23.5,17.6,23.5,off,0.0,20.0,0.0,0.0
06/05/2012 16:26:07,I,C,23.4,17.6,23.4,off,0.0,21.0,0.0,0.0
06/05/2012 16:26:12,I,C,23.3,17.7,23.3,off,0.0,22.0,0.0,0.0
06/05/2012 16:26:17,I,C,23.2,17.6,23.1,off,0.0,22.0,0.0,0.0
06/05/2012 16:26:22,I,C,23.1,17.7,23.0,off,0.0,22.0,0.0,0.0
06/05/2012 16:26:27,I,C,23.0,17.7,22.9,off,0.0,23.0,0.0,0.0
06/05/2012 16:26:32,I,C,22.9,17.7,22.7,off,0.0,24.0,0.0,0.0
06/05/2012 16:26:37,I,C,22.8,17.7,22.6,off,0.0,25.0,0.0,0.0
06/05/2012 16:26:42,I,C,22.7,17.7,22.5,off,0.0,26.0,0.0,0.0
06/05/2012 16:26:47,I,C,22.6,17.7,22.3,off,0.0,27.0,0.0,0.0
06/05/2012 16:26:52,I,C,22.5,17.7,22.2,off,0.0,28.0,0.0,0.0
06/05/2012 16:26:57,I,C,22.3,17.7,22.0,off,0.0,27.0,0.0,0.0
06/05/2012 16:27:02,I,C,22.3,17.8,21.9,off,0.0,29.0,0.0,0.0
06/05/2012 16:27:07,I,C,22.3,17.8,21.8,off,0.0,32.0,0.0,0.0
06/05/2012 16:27:12,I,C,22.1,17.8,21.6,off,0.0,32.0,0.0,0.0
06/05/2012 16:27:17,I,C,22.0,17.9,21.5,off,0.0,33.0,0.0,0.0
06/05/2012 16:27:22,I,C,22.0,17.9,21.4,off,0.0,35.0,0.0,0.0
06/05/2012 16:27:27,I,C,21.9,17.8,21.2,off,0.0,36.0,0.0,0.0
06/05/2012 16:27:32,I,C,21.8,17.8,21.1,off,0.0,37.0,0.0,0.0
06/05/2012 16:27:37,I,C,21.6,17.8,21.0,off,0.0,37.0,0.0,0.0
```



All Synergy Controllers have the ability to Deliver Test Results (test logs and test reports in PDF format) via e-mail. Using this Synergy Controller functionality in conjunction with a free Gmail account, engineers and managers can create cloud based archives of test results at virtually no cost.



Setting	Value
Deliver Test Log to e-mail	No
Deliver Test Plot to Printer	No
Deliver Test Plot to e-mail	Yes
Deliver Test Log to Synergy Server	Yes
Deliver Test Plot to Synergy Server	Yes

Description: Help is not available for this item.

Change

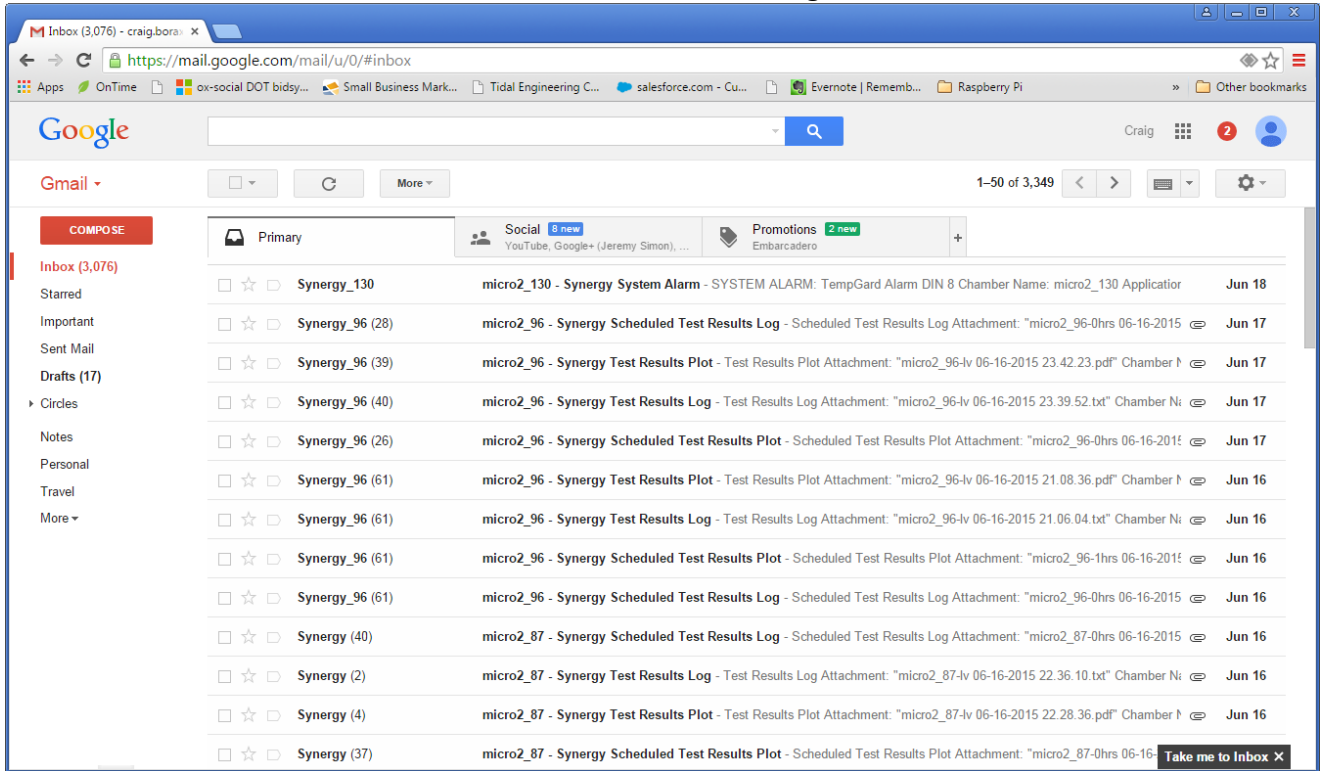
RunningLine2. Time: 0:05:33 -133.0C 0.0 %      Steady State 26.3 F 0.0 %

For detailed e-mail setup instructions, see the following application note: [Application Note 84](#).

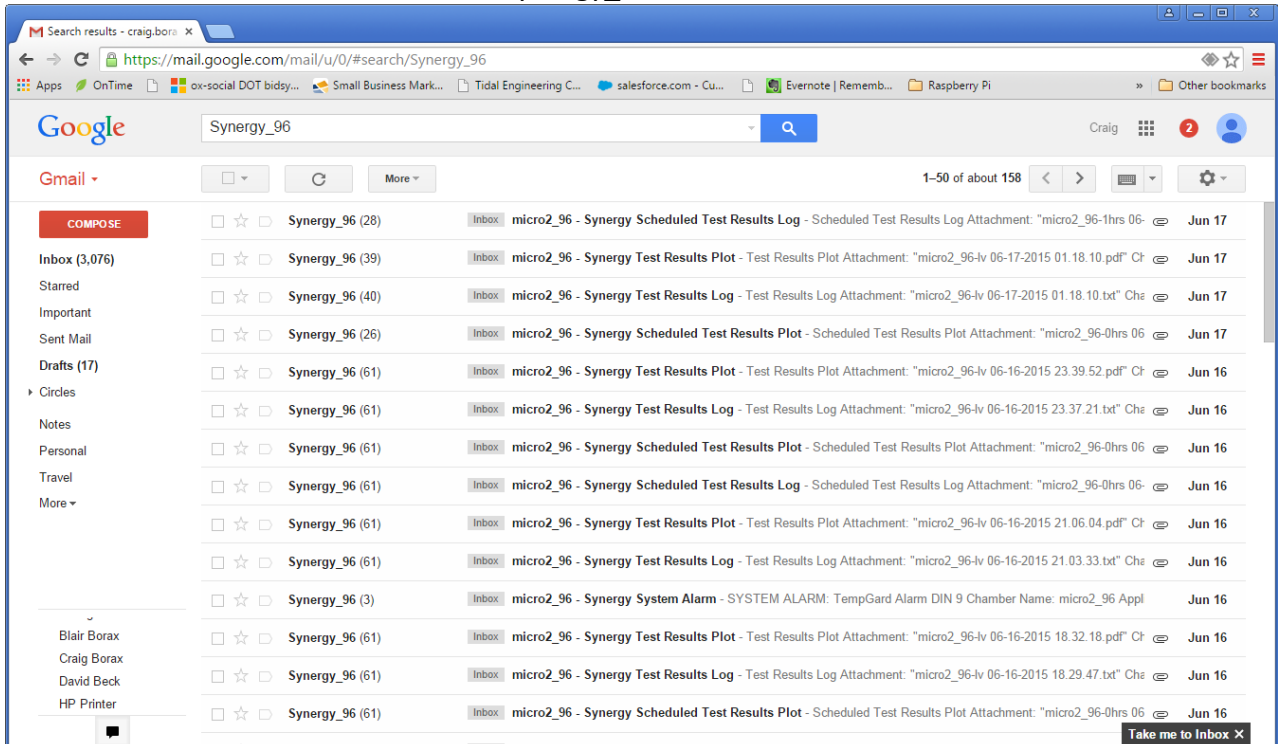
Once your Synergy controllers are delivering their results to your Gmail account, you will need to access a particular test or group of test results. Since the Synergy Controller will automatically generate file names to identify the results using time data stamps, test program, and test chamber information, there are many ways that the results can be selected using the Gmail search features:

- Results in chronological order
- Results from a specific Test Chamber/Process Oven
- Results for a specific Test Program
- Results from a specific Test date or time
- A specific test chamber, test program, and test date.

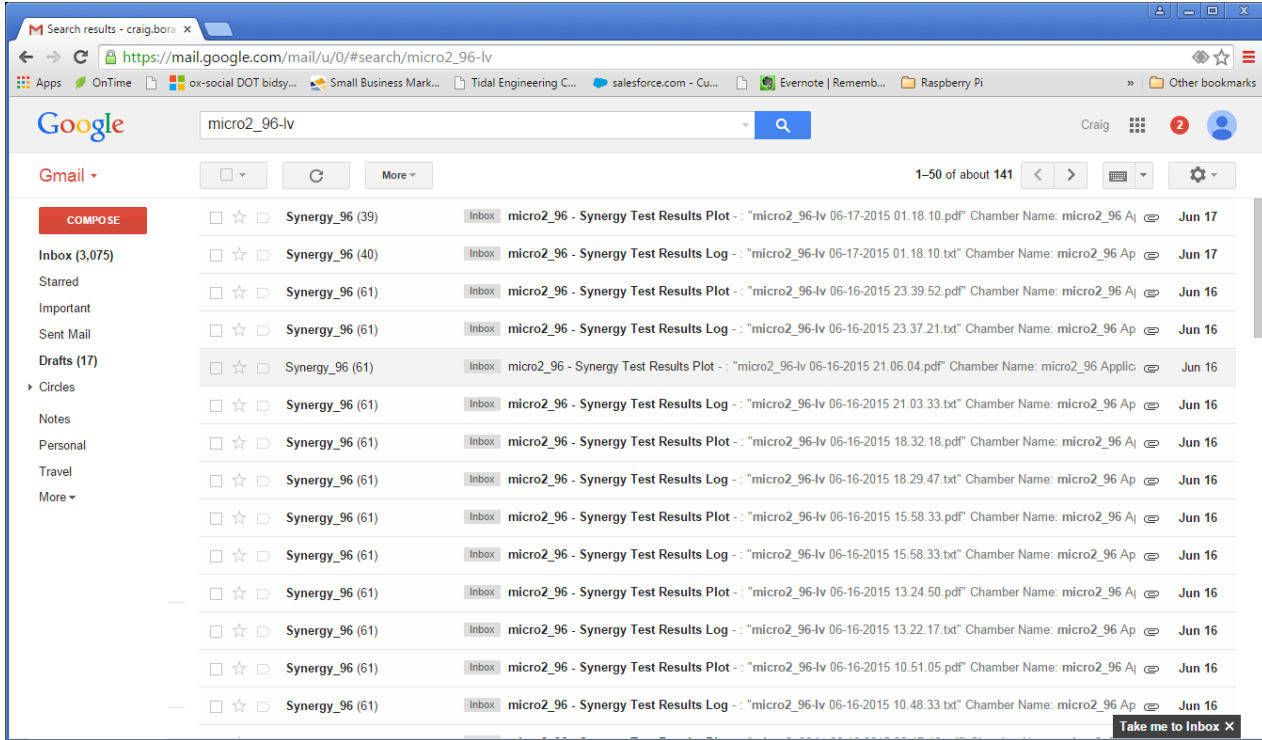
When the Gmail account is viewed the results are in chronological order as shown below:



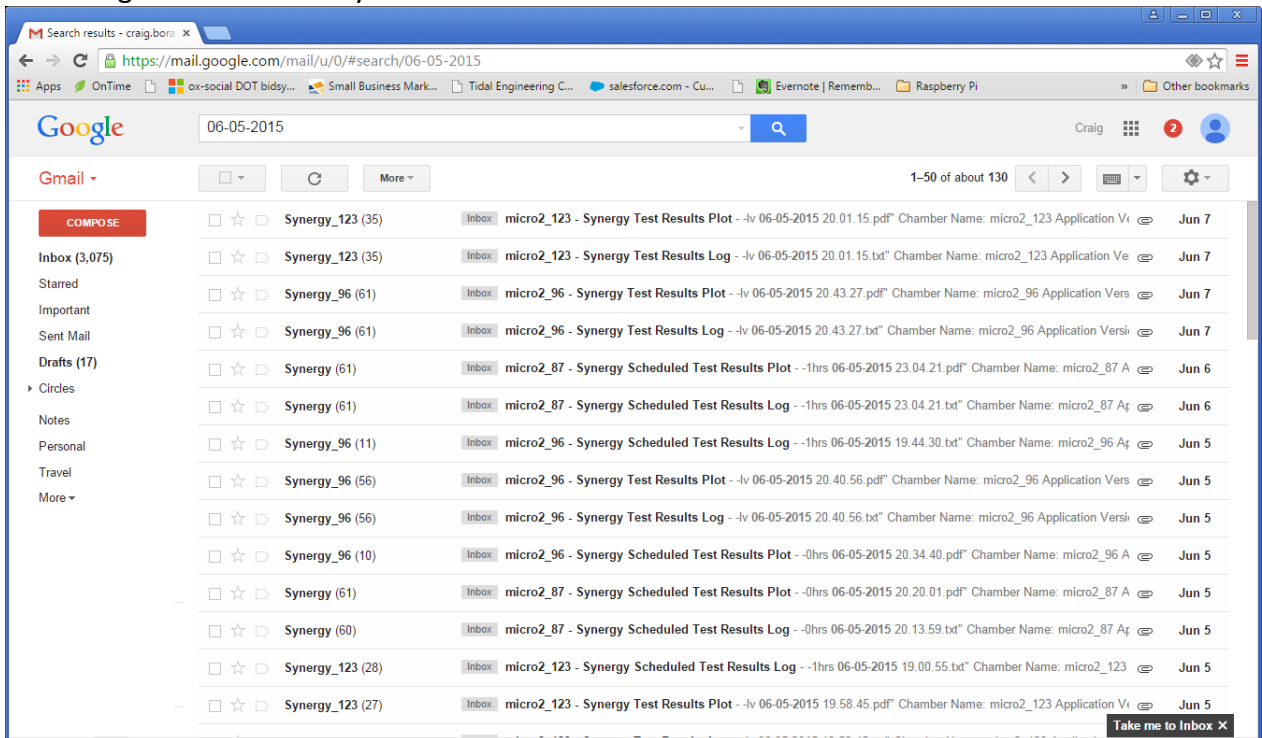
You can search your test results by the Chamber or Process Oven Name. The screen below shows the selection of results from the chamber Synergy\_96.



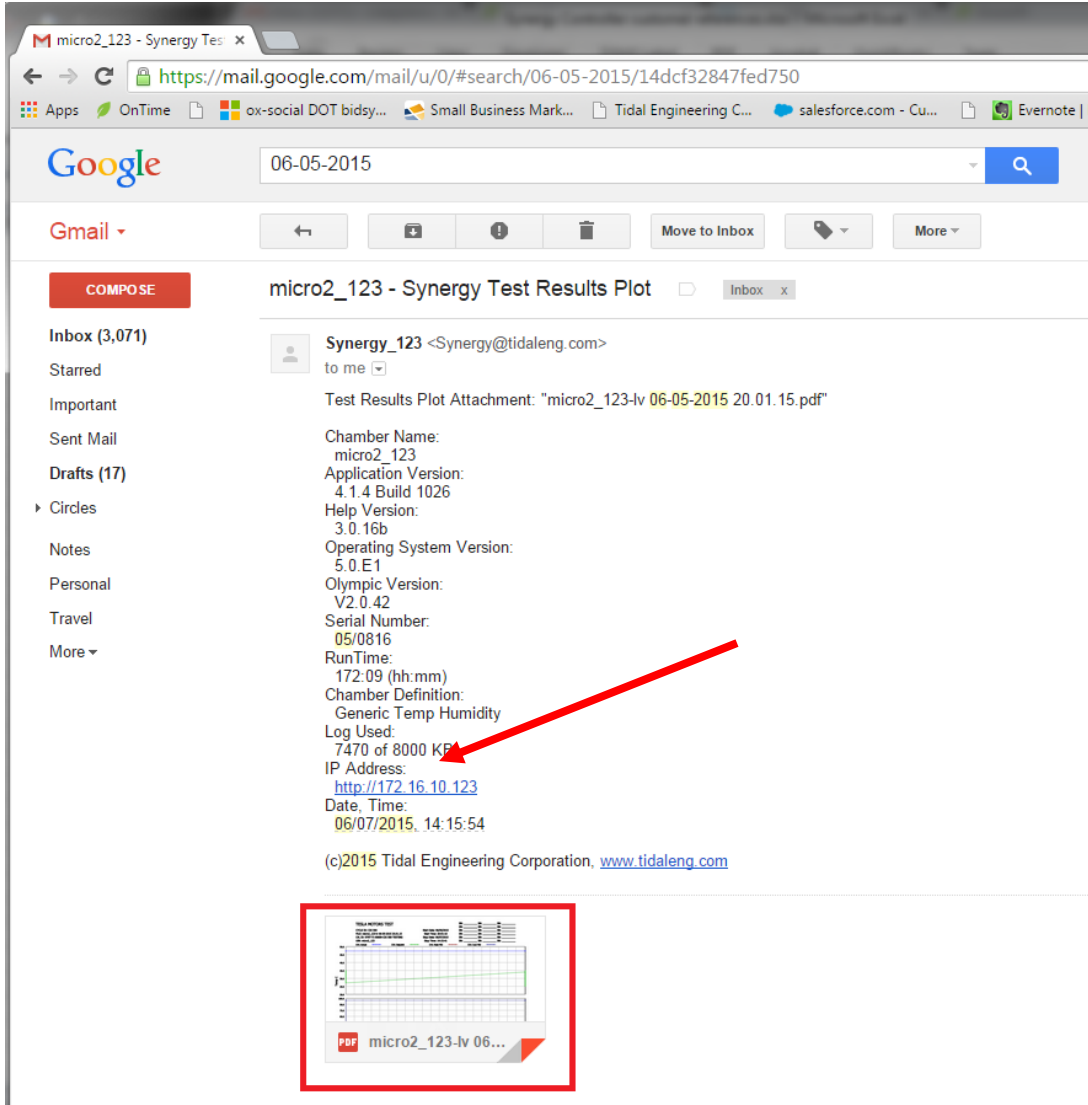
You can search your test results by the Chamber or Process Oven Name and test name. The screen below shows the selection of results from the chamber micro2\_96 and test lv.



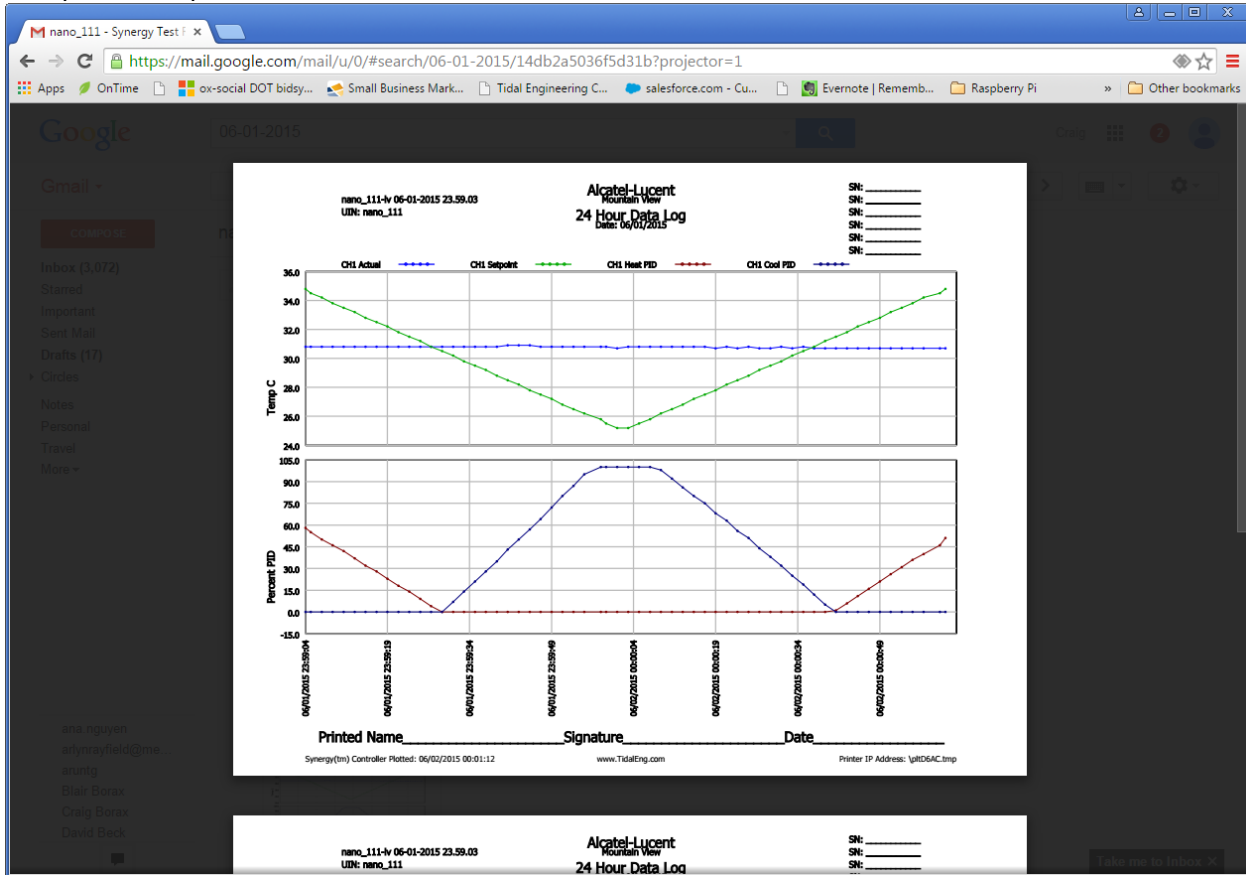
Searching for test results by the test date "06-05-2015".



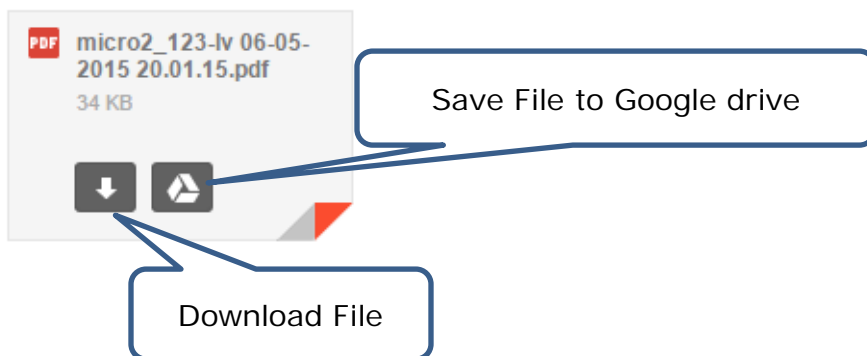
To view or download the test results, click on the test results e-mail, then the attachment.



The plot will open in Gmail.



Alternatively, you can hover your mouse over the compressed plot and select "Download File" or "save to Google Drive" options as shown below.





## About the Synergy Controller Family

Tidal Engineering's Synergy Controllers, both the Synergy Micro 2, Synergy Quattro, and the 1/4 DIN Synergy Nano provide state-of-the-art usability and connectivity for environmental test control and data acquisition and combine the functions of a chamber controller and a data logger. These controllers are designed to improve test efficiency by supporting both factory automation and test and measurement protocols and standards.

Synergy Controller feature highlights includes:

- ➔ Color touch screen
- ➔ Ethernet, RS-232 and GPIB communications
- ➔ Built in 100 MB Data logger with USB drive support
- ➔ Data Acquisition, up to 64 T-type thermocouples (Optional)
- ➔ Built-in Web Server for remote control; WebTouch Remote™
- ➔ Compatible with Synergy Manager for PC based control, monitoring and programming.
- ➔ Built-in FTP Server for factory automation and test and measurement applications

For more information regarding these controllers please see the full Synergy Controller Technical Manual on our website at <http://www.tidaleng.com/synergy.htm>

## About Tidal Engineering

Headquartered in Randolph, NJ, Tidal Engineering Corporation has been designing and building award-winning embedded hardware and software for test and measurement and data acquisition applications since 1992. The company is recognized for technical expertise in such areas as Embedded IEEE 488, and turnkey SCADA (Supervisory Control and Data Acquisition) systems.

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