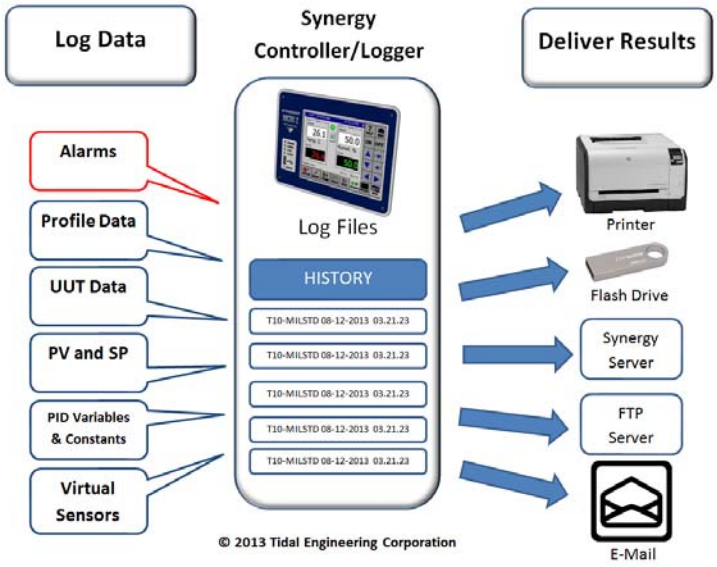
Synergy Controller Logging Features and Applications

Tidal Engineering's Synergy Controllers 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.

This application note explains the Synergy Controller's Logging system features and applications. The Synergy Controller's built in data logger is key to many powerful controller features. Synergy Controllers "Delivers Test Results"; i.e. they can create individual log files for each test and deliver this information in either table (CSV) or chart (PDF) format over the network.

Synergy Controllers capture a variety of data and "Deliver" it in multiple formats and protocols as represented in the figure below:



The logging system captures alarms and chamber control performance data as well as UUT Thermocouple data:

- Alarms
- Profile Test data
- UUT Data Acquisition
- Chamber control performance
- Other Sensors

And "Delivers" these results

- Network Plotting to Color Printers
- USB Flash Drive
- Synergy Server
- FTP Server
- E-Mail of CSV logs and PDF plots

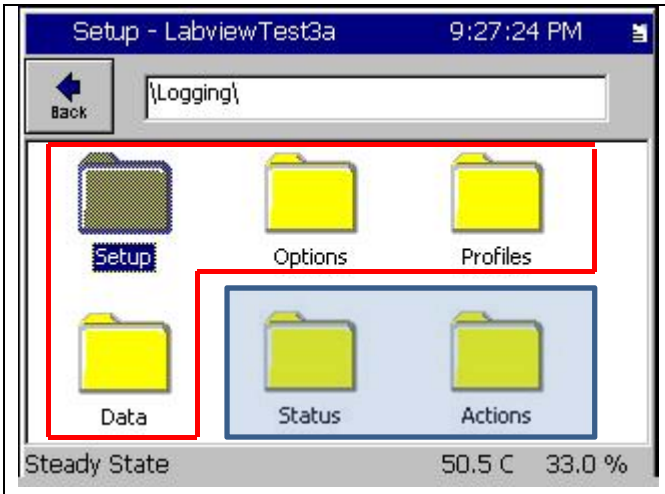
This application note describes the logging system setup for test results and for chamber monitoring. Chamber monitoring is valuable when analyzing system performance. In addition, this note also describes the log file format including alarm information, bar code scanning, profile status (i.e. Start, Stop).

Table of Contents

Synergy Controller Logging System Overview

Logging Setup

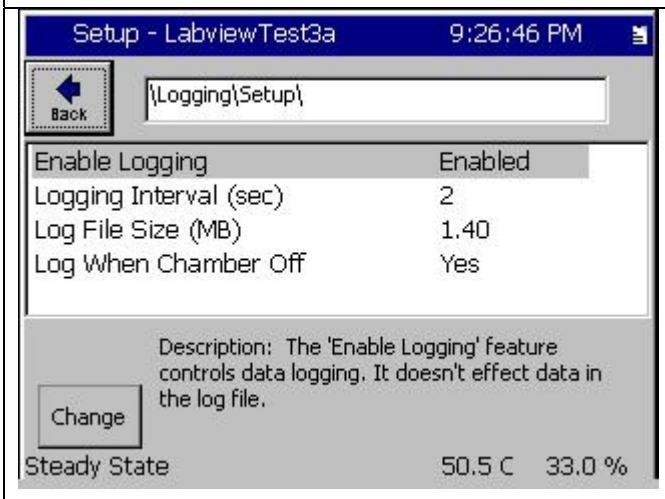
The logging system is controlled by numerous parameters arranged in a set of folders in the Setup Screen as shown below.



The Synergy Controller's logging system is fully programmable and is configured from the following four sub-folders in the **Logging** folder of the **Setup** screen as shown below and at left.

Setup
Options
Profiles
Data

Note that the last two folders in this Logging folder are used to monitor the logging Status and control the clearing and delivery of the log files.
Status
Actions



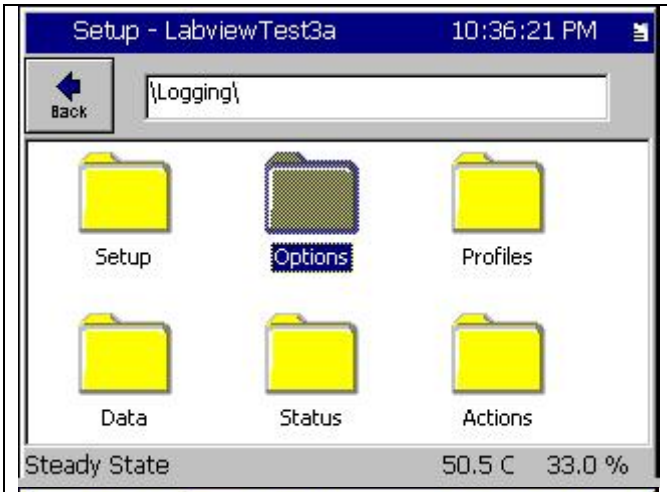
\Logging\Setup Folder Parameters

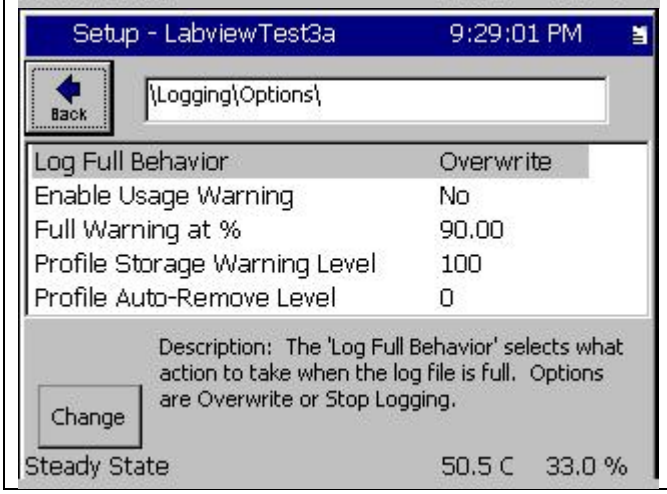
Enable Logging Enables and Disables logger.
Note that the logger will always capture message records even if logging is Disabled.
For example: alarms, profile start/stop,etc.

Logging Interval (Sec) this parameter sets the interval between log entries in seconds.

Log File Size (MB) Maximum log file size.
Note that when the log file reaches this limit the logger can be programed to stop logging or delete the oldest records. See the **Options** folder.

Log When Chamber Off Set this paramter to Yes to log when the chamber is Off otherwise interval logging will not occur when the chamber is off.





\Logging\Options Parameters

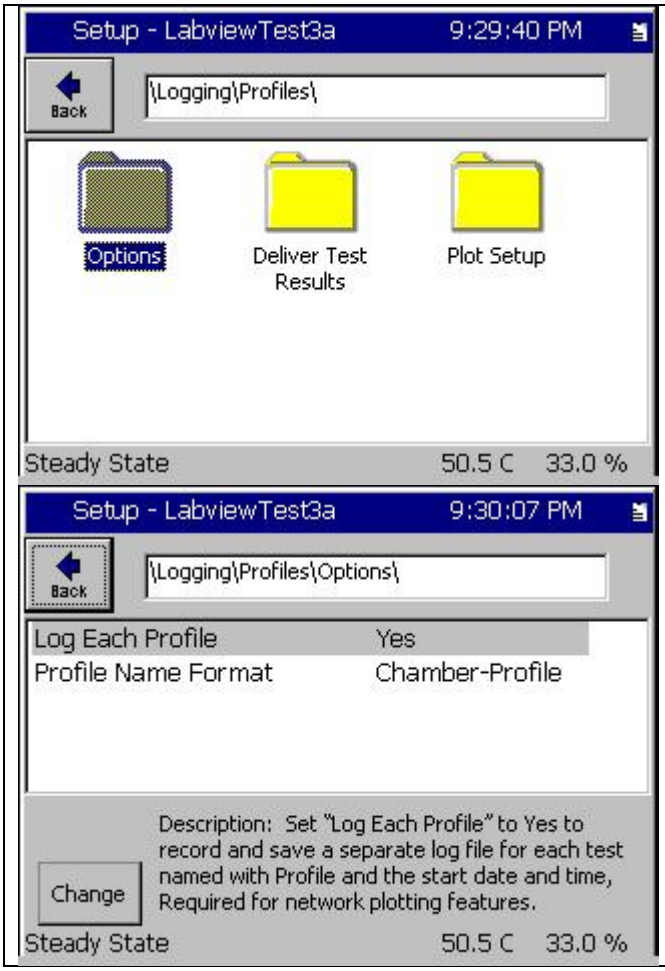
Log Full Behavior The controller can be programmed to stop logging or overwrite the oldest records when log file size reaches the **Log File Size** limit.

Enable Usage Warning parameter controls whether a warning dialog is generated when the **Full Warning Percentage** level is reached.

Full Warning Percentage parameter sets the Usage Warning percentage.

Profile Storage Warning Level The controller can be programed to display a warning when the number of profiles exceeds this level. Set to 0 to disable this feature.

Profile Auto-Remove Level The controller will automatically remove the oldest records when number of test results profiles exceeds this level.



\Logging\Profiles

Log Each Profile This parameter enables profile logging. Enable this parameter to log individual profiles so they can be delivered thru the network; i.e. via e-mail, to network printers, to the Synergy and FTP Servers, as well as via download from the front mounted USB port with a USB flash drive.

Profile Naming Format Selects either the Profile file name format or the Chamber -Profile file name format.

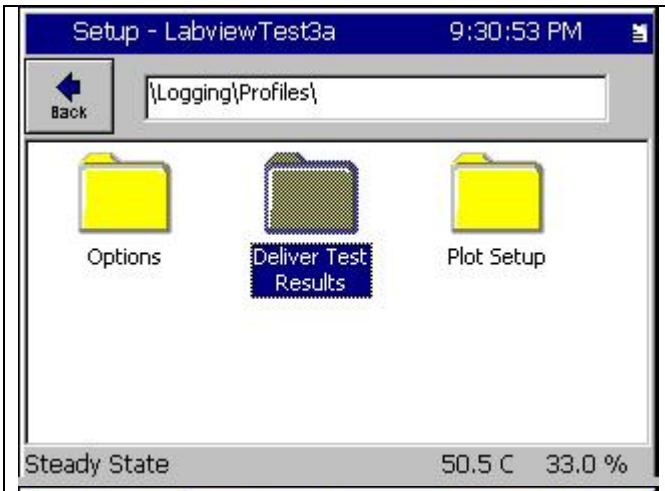
Note that time and date information is always included in the Profile file name so that each profile log can be uniquely identified.

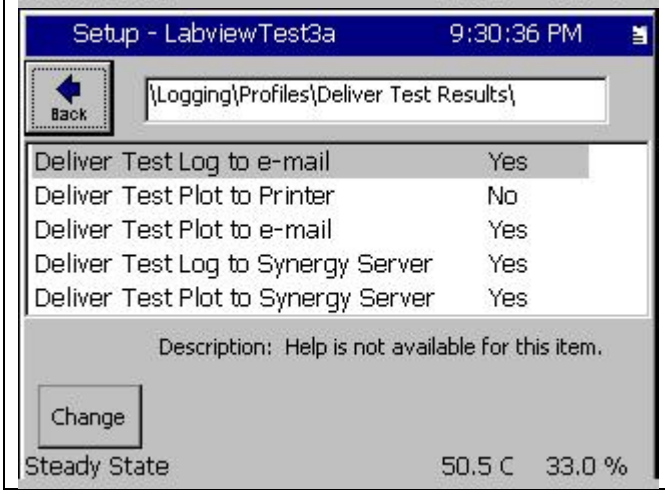
Profile Name example:
LabviewTest3a 10-01-2013 22.46.26.txt

Chamber Name -Profile Name example:
th1-LabviewTest3a 10-01-2013 22.46.26.txt

Where **th1** is the chamber name and **LabviewTest3a** is the test profile (program) name.

"Deliver Test Results" Automatic Test Data Delivery





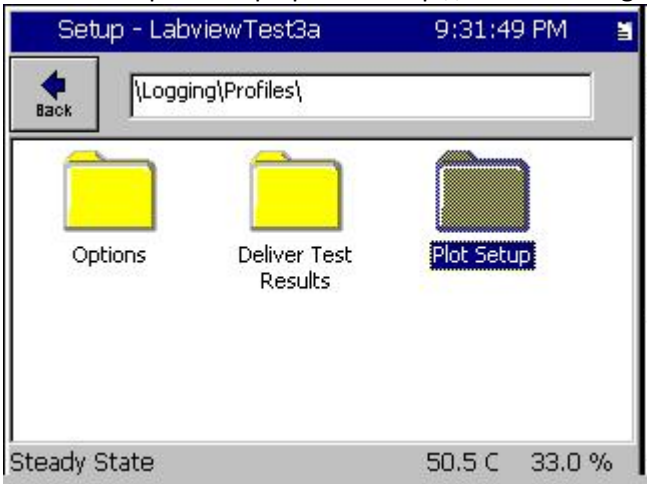
\Logging\Profiles\Deliver Test Results

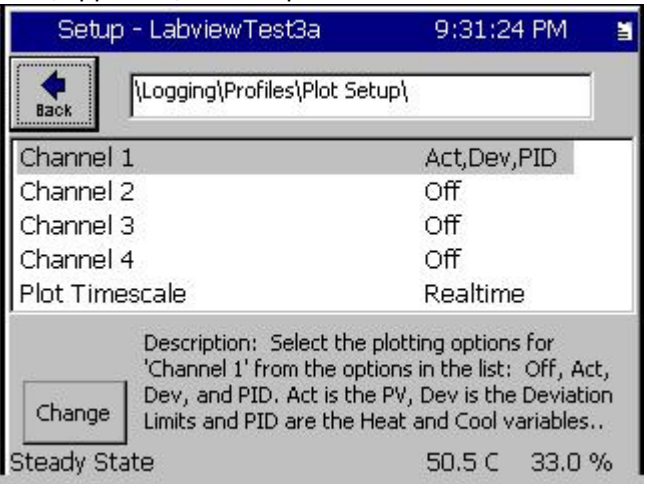
The controller can be set to automatically deliver test results in chart (plot) and Log format thru the network as follows:

Deliver Test Log to e-mail
Deliver Test Plot to Printer
Deliver Plot to e-mail
Deliver Test Log to Synergy Server
Deliver Test Plot to Synergy Server

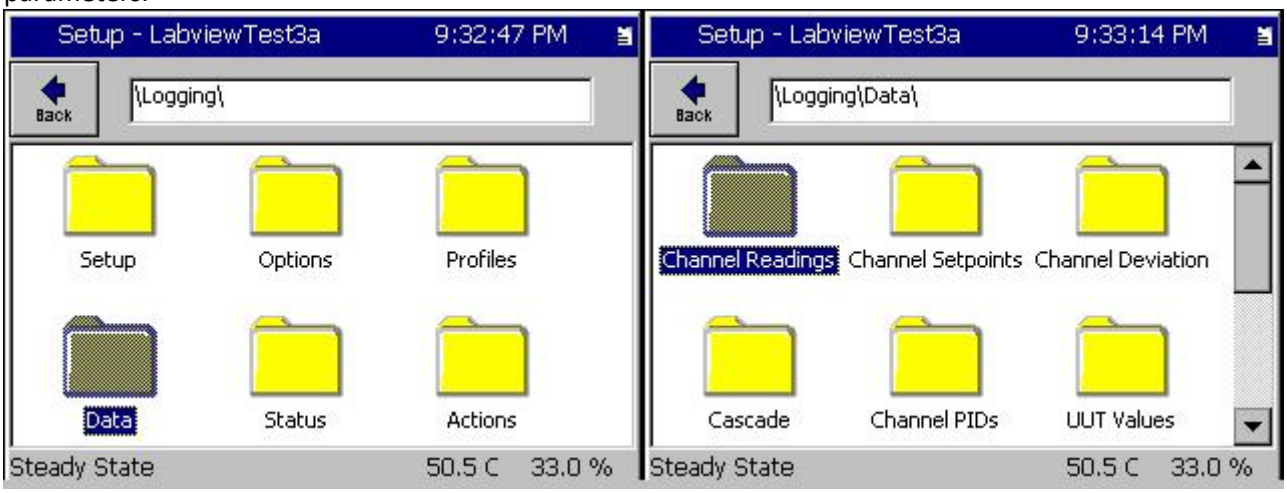
Set each parameter to enable one or more of these five automatic test data delivery methods.

Set the Plot formatting for each channel and the Plot Time scale as shown below. See Application Note 90 for detailed plot setup options. http://www.tidaleng.com/appnotes/SCAP90.pdf

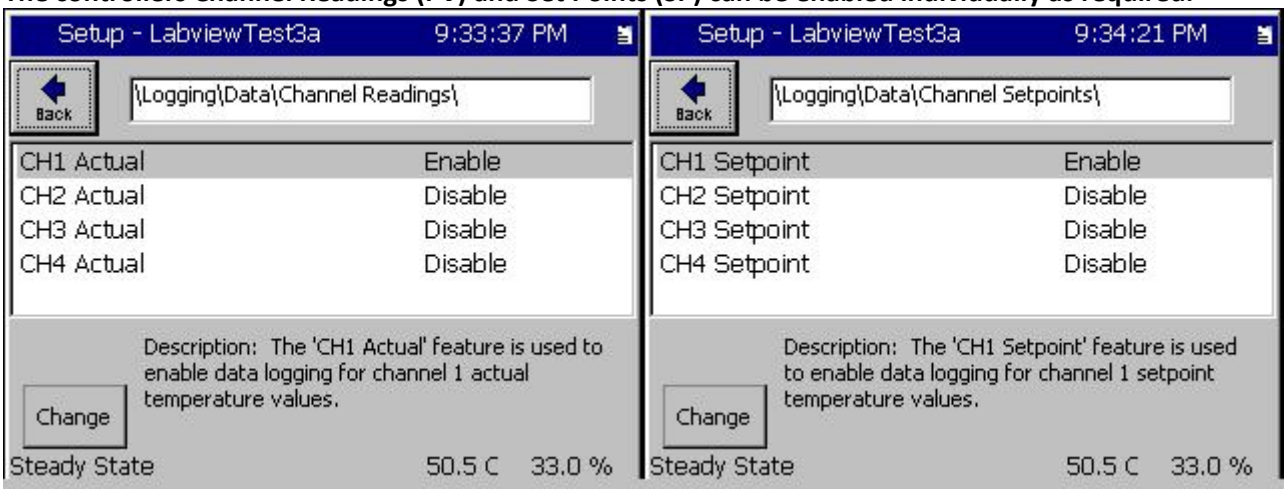




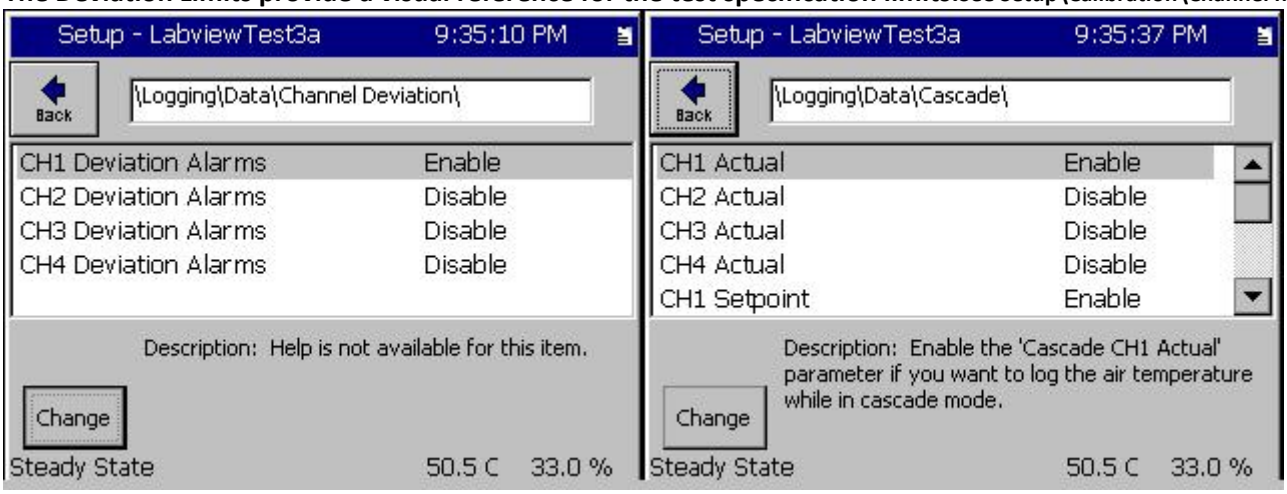
Open the **\Logging\Data** Folder in the Setup Screen and adjust the Enable/Disable value for all the data parameters.



The controllers Channel Readings (PV) and Set Points (SP) can be enabled individually as required.

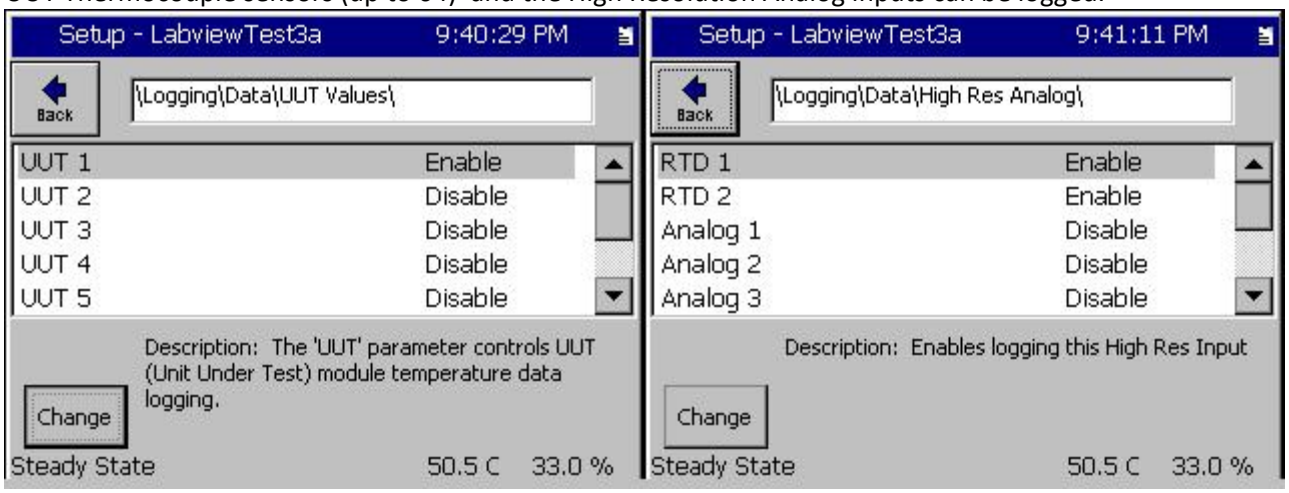


The Channel Deviation Limits and Cascade Control variables for each channel can be enabled as required. The Deviation Limits provide a visual reference for the test specification limits.See Setup\Calibration\Channel n



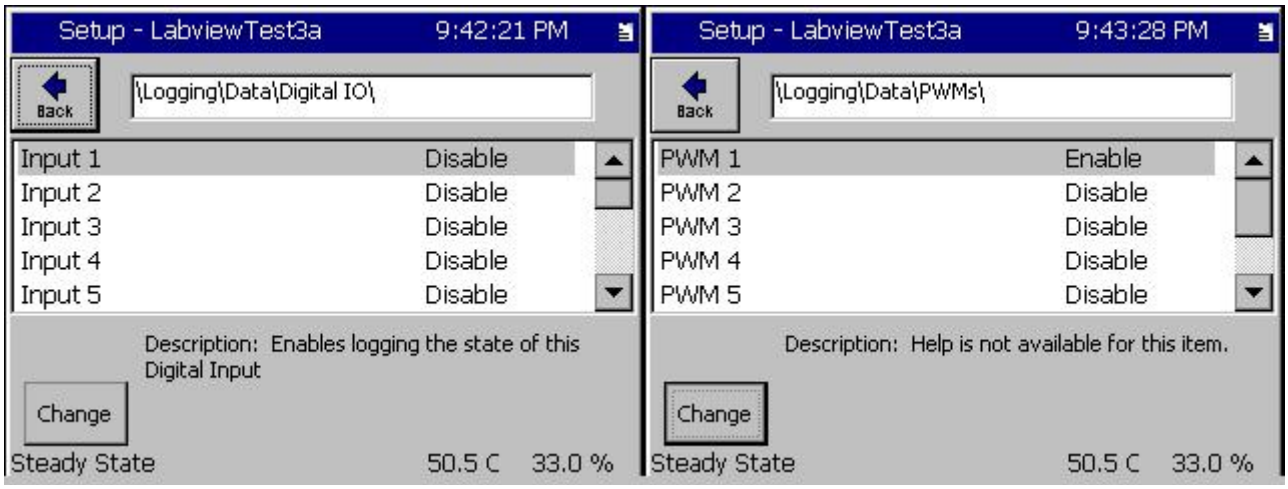
The Heat and Cool Variables and Constants for each channel can be logged to help with tuning.

UUT Thermocouple sensors (up to 64) and the High Resolution Analog inputs can be logged.



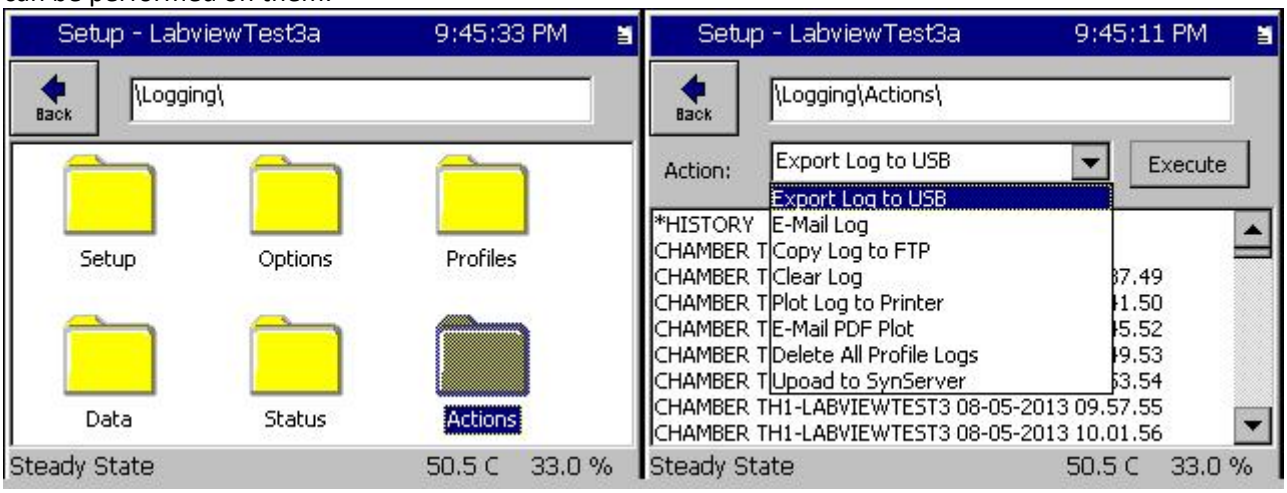
Low Resolution Analog inputs on the full sized controllers which are typically used to monitor compressor pressures can be logged.

Digital Inputs and PWM outputs can be logged.



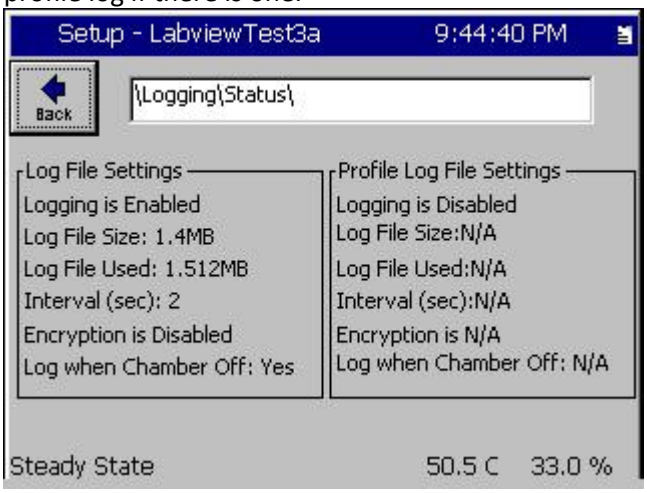
Logging Actions

The Logging Actions screen lists the test results stored on the controller and provides a set of actions that can be performed on them:



Logging Status

The Logging Status screen provides information about the History Log file (continuous) and the current profile log if there is one.



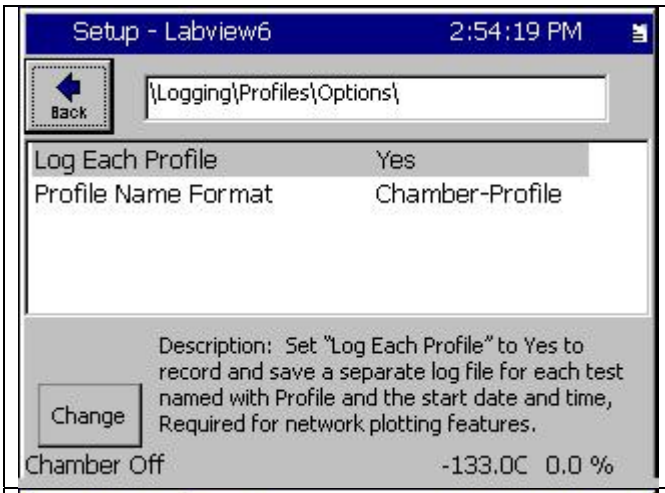
Profile Logging

As described earlier, one of the significant Synergy Controller logging system features introduced in version 3.0.x is "Profile Logging"; i.e. the ability to log each test separately and create a uniquely identifiable test results file. Many of the recent Synergy Controller innovations utilize this capability.

These features include:

- E-Mail Delivery (see Synergy Controller Application Note 84)
- Network Plotting / Printing (see Synergy Controller Application Note 90)
- Synergy Server (see Synergy Controller Application Note 99)
- FTP (see Synergy Controller Application Note 45)
- USB Flash Drive Export (see Synergy Controller Technical Manual)

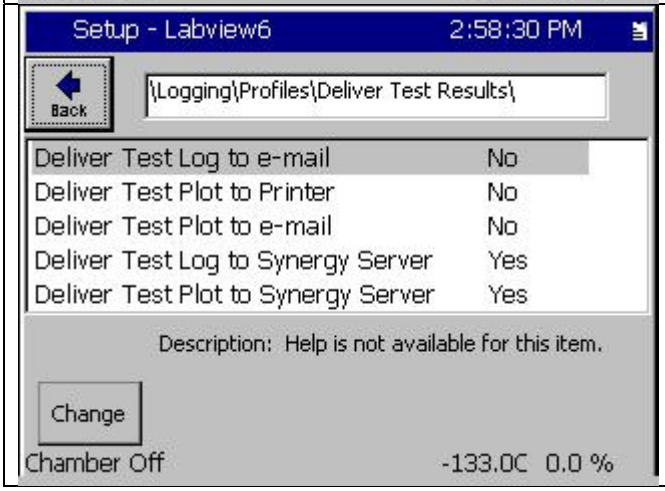
Setup for Automatic E-Mails



To E-Mail profile logs automatically, first set the Logging system to **Log Each Profile.**

Then select the Profile Name Format to set the naming convention for the profile log file.

Note: See Synergy Controller AppNote 90 - Synergy Controller Network Printing Feature for additional setup information



Then set the **Deliver Test Results** options.

Logging Commands

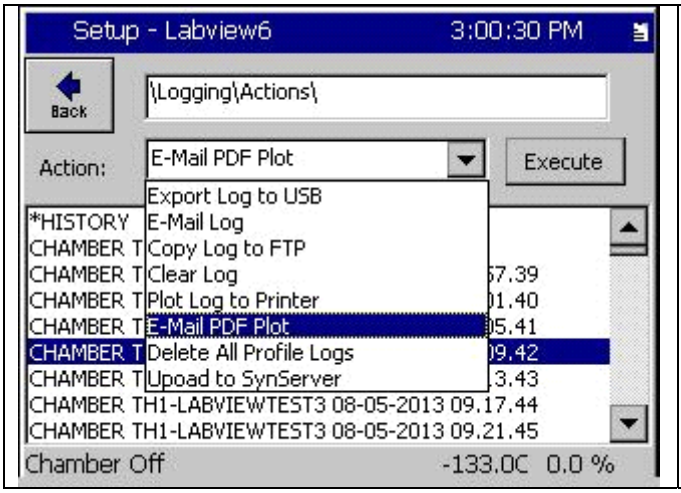
The logging system can be setup from the touch screen as described in the previous Logging Setup section of this application note. In addition, the logging system can be setup and adjusted remotely, or with command file (.CFG), or a Bar Code Macro file. The command syntax for the Logging system is as follows:

Command	Function	Example
CLEARHIST	Clear's the History Log File	= clearhist 1
COPYHISTTOFTP 1	Copies the log database to the file "history.txt" in the Controller's FTP directory.	= copyhisttoftp 1 File: history.txt
COPYHISTTOFTP 3 "name"	Copies the log database to the file "name.txt" in the Controller's FTP directory.	= copyhisttoftp 3 "test" File: test.txt
COPYHISTTOFTP 7 "name"	Copies the log database to the file "name_MM-DD-YYYY.txt" in the Controller's FTP directory.	= copyhisttoftp 7 "test" File: test_07-09-2009.txt
COPYHISTTOFTP 15 "name"	Copies the log to the file in the controller's FTP directory: "name_MM-DD-YYYY_HH.MM.SS.txt	= copyhisttoftp 7 "test" File: test_07-09-2009_02.20.05.txt
LOGGING_ENABLED	Enables/Disables Interval logging	= LOGGING_ENABLED 1
LOGGING_INTERVAL	Sets the Logging Interval in seconds	= LOGGING_INTERVAL 1
LOG_FILE_SIZE	Sets the Log file size in M Bytes.	= LOG_FILE_SIZE 1.4
LOG_WHILE_OFF	Controls whether the controller continues to log when the chamber is off	= LOG_WHILE_OFF 0
LOG_CHn_ACT	Controls whether the controller logs the Channel n Actual (Process Variable)	= LOG_CH1_ACT 1
LOG_CHn_SP	Controls whether the controller logs the Channel n Setpoint	= LOG_CH1_SP 1
LOG_DEVALMS_CHn	Controls whether the controller logs the Channel n Deviation Alarms	= LOG_DEVALMS_CH1 1
LOG_CHn_HEAT	Controls whether the controller logs the Channel n Heat output	= LOG_CH1_HEAT 1
LOG_CHn_COOL	Controls whether the controller logs the Channel n Cool output	= LOG_CH1_COOL 1
LOG_CH1_HEAT_PB	Controls whether the controller logs the Channel n Heat Proportional Band constant	= LOG_CH1_HEAT_PB 1
LOG_CH1_COOL_PB	Controls whether the controller logs the Channel n Cool Proportional Band constant.	= LOG_CH1_COOL_PB 1
LOG_LOW_n	Controls whether the controller logs the nth Low Res Analog Input.	= LOG_MACHINE1 0
LOG_UUTn	Controls whether the controller logs the nth UUT Module.	= LOG_UUT1 0
LOG_HIGH_n	Controls whether the controller logs the nth High Resolution Analog Input.	= LOG_HIGH_1 0
LOG_TCn	Controls whether the controller logs the nth Thermocouple Input.	= LOG_TC1 1
LOG_TCnCJ	Controls whether the controller logs the nth Thermocouple Cold Junction sensor.	= LOG_TC1CJ 0
LOG_OUTPUTS	Controls whether the controller logs the Outputs	= LOG_OUTPUTS 1
LOG_DIO_n	Controls whether the controller logs Digital Input n	= LOG_OUTPUTS

For more information, see the FTP application note and the Synergy Controller command list on the tidal engineering website: http://tidaleng.com/appnotes/SCAP45.pdf

Synergy Controllers "Deliver Test Results"

Triggering Test Results E-Mails Manually

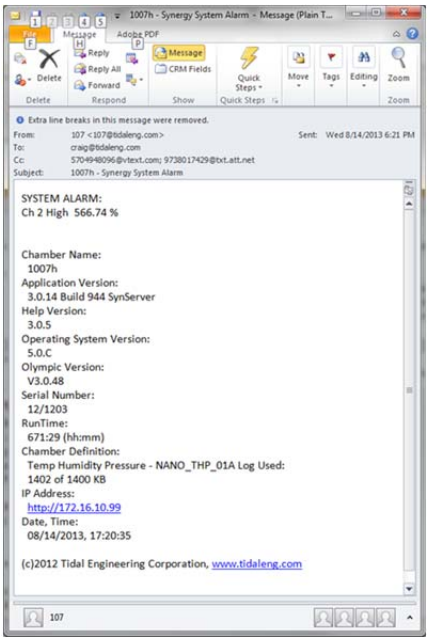


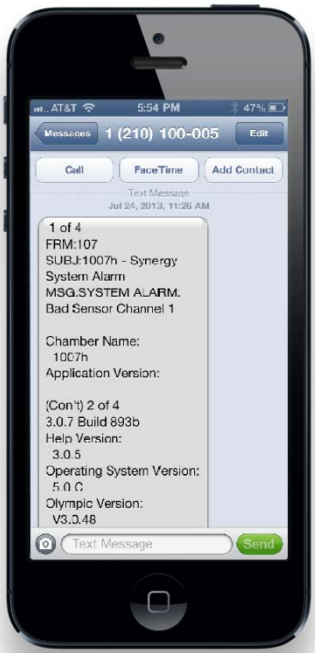
To trigger E-Mail deliveries manually, open the **Setup\Logging\Actions** folder, and pick **E-Mail Log** or E-Mail PDF Plot from the drop down selection list. Then choose the specific profile log from the list of logs and press the **Execute** button as shown at left.

Select **E-Mail Log** to deliver CSV log file test results. If Network Printing is enabled, select **E-Mail PDF Plot** to deliver formatted plots of the test results.

See Application Note 90 for Network Printing setup.

E-Mail Delivery



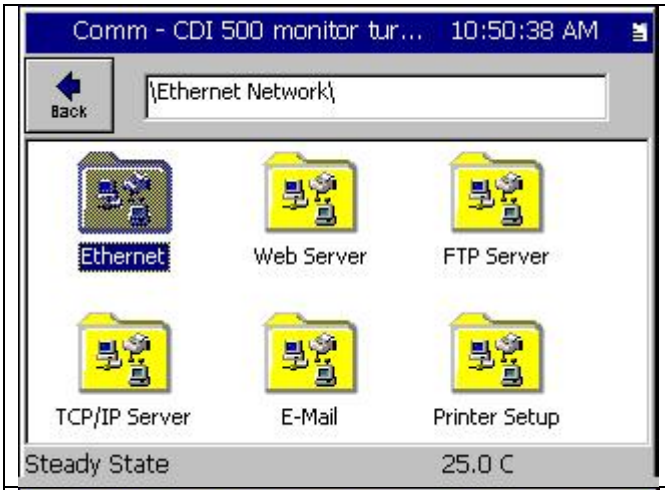
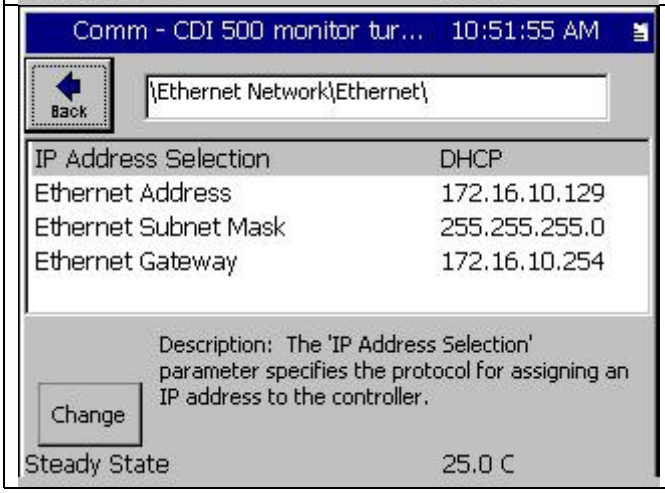


The Synergy Controller's e-mail feature sends alarm, test results plots, and log file e-mails automatically to desktop computers and mobile phones and tablets. E-Mail is supported on the Synergy Micro, Synergy Micro 2, Synergy Quattro, and the ¼ DIN Synergy Nano with software application Version 3.0.7 Build 893B and newer. Contact the Tidal Engineering if you are interested in a software upgrade.

The Synergy Controller Application Note 84 describes these e-mail features and provides detailed instructions and examples for setup.

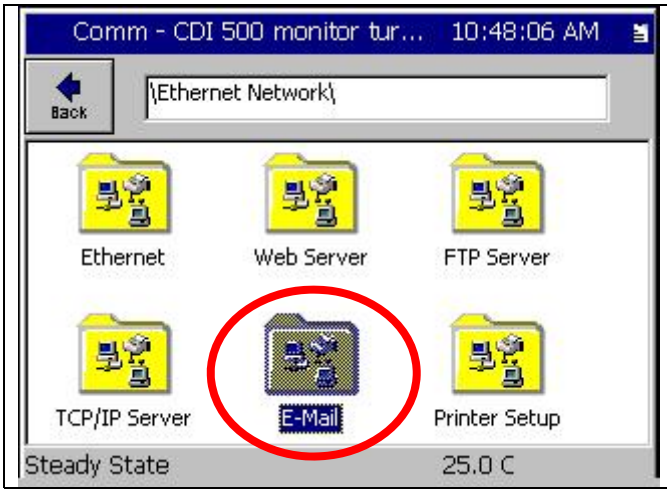
Network Setup

To send e-mail, your controller must be connected to your network and configured for an SMTP mail server. As always, the IP address of each Synergy Controller can be assigned by a DHCP server on your network if available or statically entered on the controller touch screen. See Synergy Controller Technical Manual for information concerning network setup.

	To begin, open the Comm Screen and browse to the **Ethernet Network** folder.
	Set the **IP Address Selection** and network properties as required.

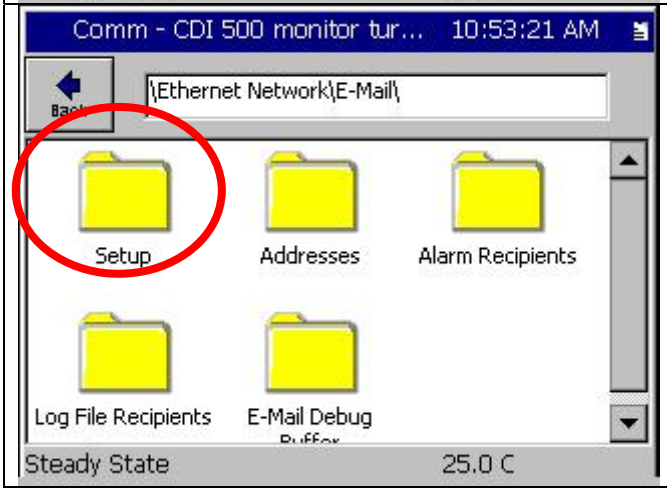
Then setup the E-Mail configuration as shown in the next section.

E-Mail Setup

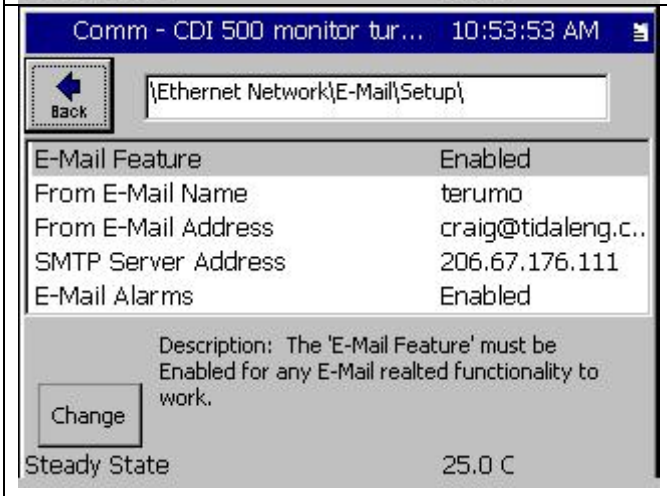


Open the **Ethernet Network** Folder in the **Comm** screen and select the E-Mail folder.

Note that some screens have been reorganized in version 3.0.7 and may be a different on older versions.



Open the **Setup** Folder as shown at left.

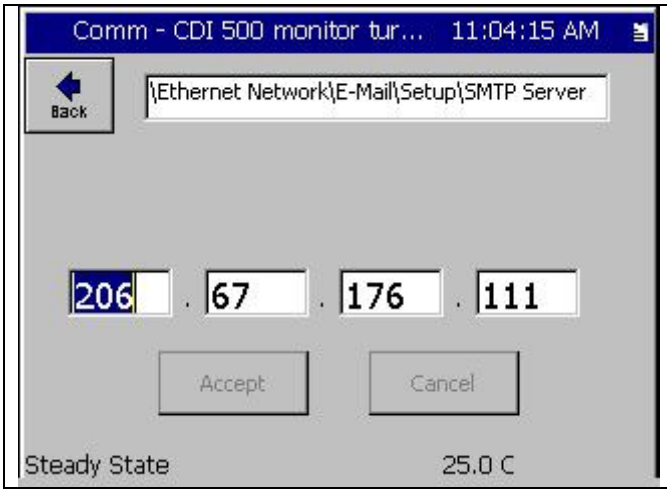


Enable the **E-Mail Feature** and set the following parameters to identify your system:

From E-Mail Name
From E-Mail Address

Note that these parameters don't usually need to be actual names or e-mail addresses. They should be set so controller messages can be identified by the recipient

Enable the **E-Mail Alarms** parameter if you want the controller to send notifications regarding alarm conditions to your e-mail or mobile phone (text messaging)

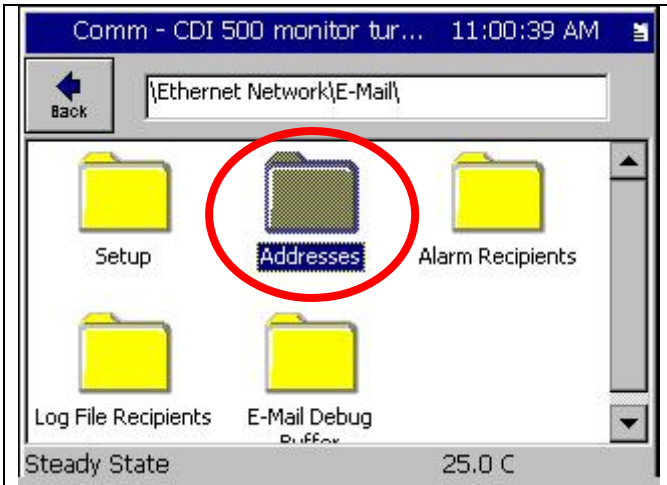


Enter the SMTP Server Address

This address can usually be provided by your e-mail administrator.

See appendix A for help using Outlook to determine your SMTP server address.

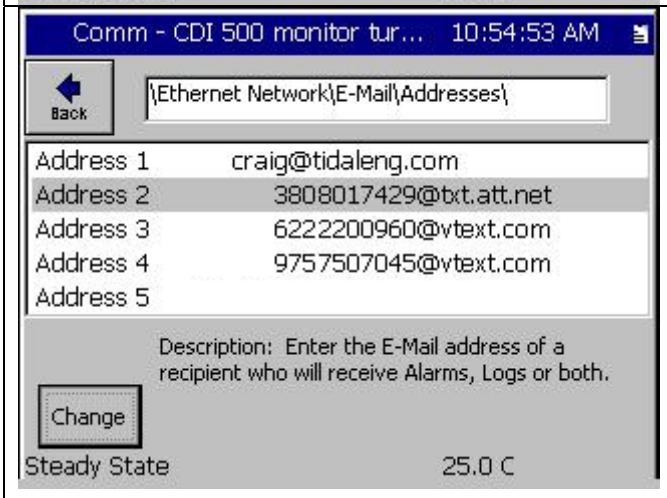
Enter the e-mail addresses.



Open the **Addresses** Folder.

Note that up to five E-Mail Addresses can be entered.

Note that each addressee can be set to receive Alarm messages and/or Test Data (Log Files) as required in the **Alarm Recipients** and **Log File Recipients** folders respectively.



Virtually all wireless carriers can forward e-mails to a mobile phone as a text message (SMS). The e-mail address formats for telephone numbers for two popular carriers are shown in the examples below:

at&t Wireless: txt.att.net
1112223333@txt.att.net

Verizon Wireless: vtext.com
1112223333@vtext.com

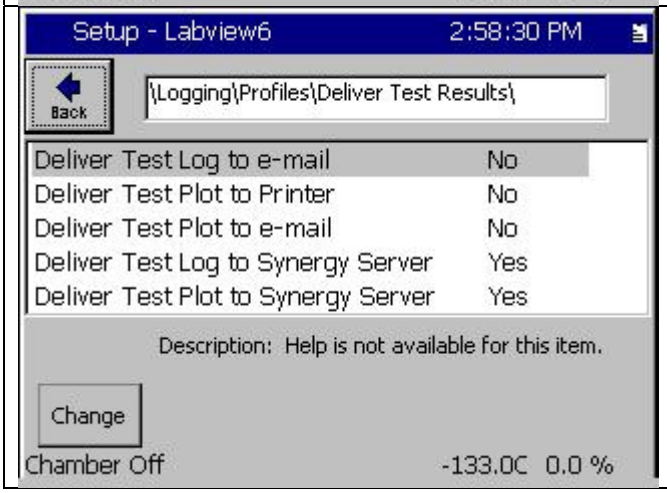
See Appendix B for a list of other wireless carriers in the US.

Setup for Automatic E-Mails

To E-Mail profile logs automatically, first set the Logging system to **Log Each Profile.**

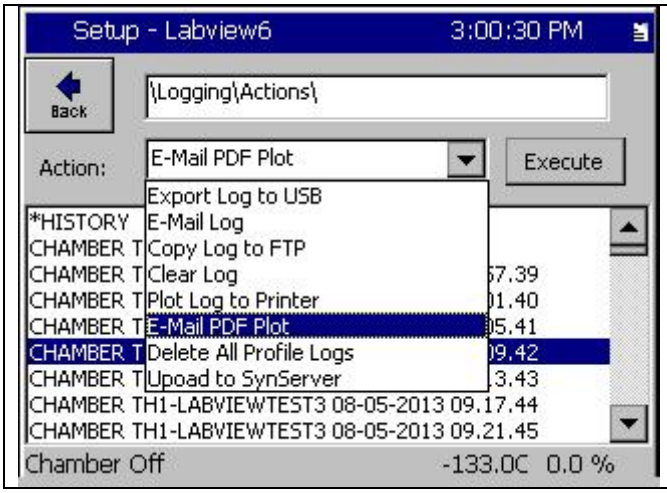
Then select the Profile Name Format to set the naming convention for the profile log file.

Note: See Synergy Controller AppNote 90 - Synergy Controller Network Printing Feature for additional setup information



Then set the **Deliver Test Results** options.

Triggering Test Results E-Mails Manually



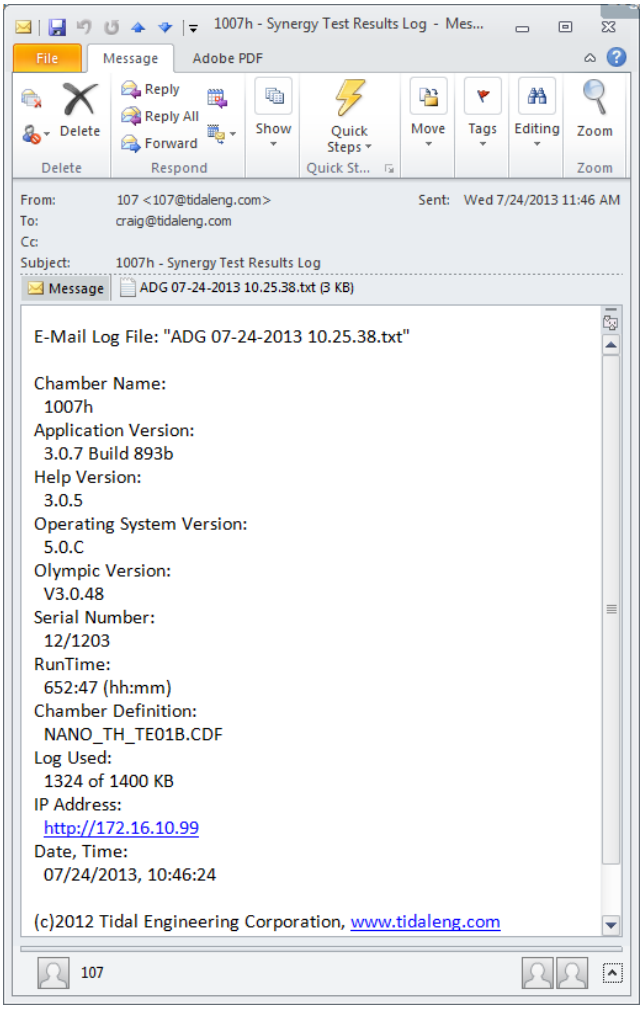
To trigger E-Mail deliveries manually, open the **Setup\Logging\Actions** folder, and pick **E-Mail Log** or E-Mail PDF Plot from the drop down selection list. Then choose the specific profile log from the list of logs and press the **Execute** button as shown at left.

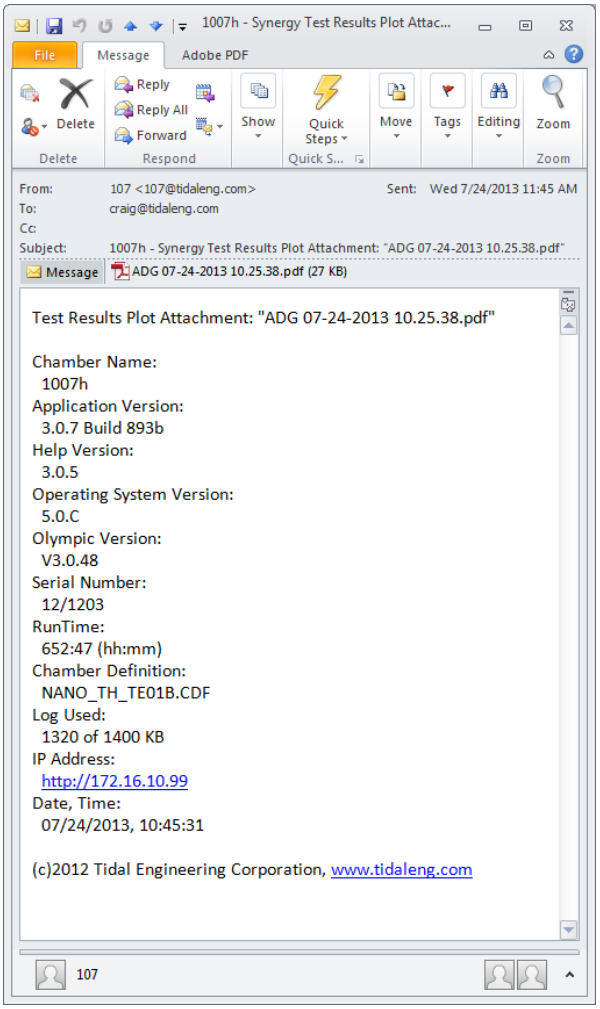
Select **E-Mail Log** to deliver CSV log file test results. If Network Printing is enabled, select **E-Mail PDF Plot** to deliver formatted plots of the test results.

See Application Note 90 for Network Printing setup.

E-mail Format

The Log File and Plot File e-mails are formatted as shown in the screenshots below. Note that controller information is included in the body of both emails for diagnostic purposes. Log file attachments are in CSV file format and Plot attachments are in PDF format.





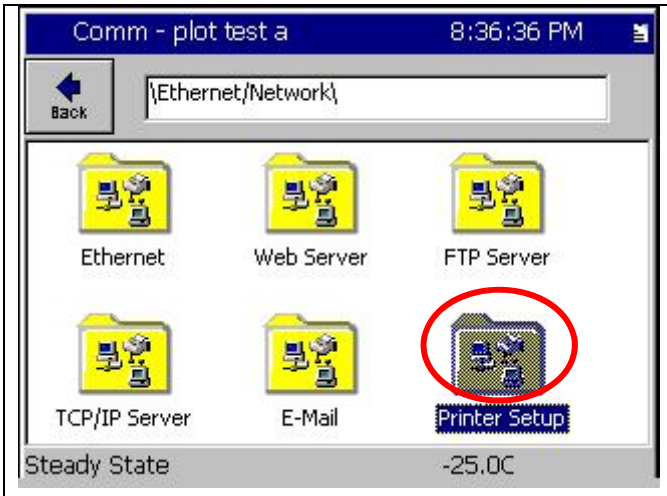
Network Plotting

The network plotting capabilities of the Synergy family provide documentation and reporting efficiencies that can enhance the performance of virtually any organization. These features automatically generate and plot test data to a network printer and/or to a PDF file. PDF plots can be automatically e-mailed to up to five recipients or viewed with a standard web browser using the Synergy Controller WebTouch™ Remote feature. See Synergy Controller Application Note 90 for detailed setup and examples.
http://www.tidaleng.com/appnotes/SCAP90.pdf

The Synergy Controller is designed to send plots to an HPCL capable printer with an Ethernet port such as the HP LaserJet Pro CP1525nw used in this example. The HP LaserJet Pro CP1525nw is a workgroup color printer that prints up to 12 ppm, with a resolution of 600 x 600 dpi.

Note: This network plotting feature requires a minimum software version 3.0.2. Contact the factory to inquire about software upgrades for your Synergy Micro 2, Synergy Quattro, or Synergy Nano controller.

To Setup the controller and the printer follow these steps:



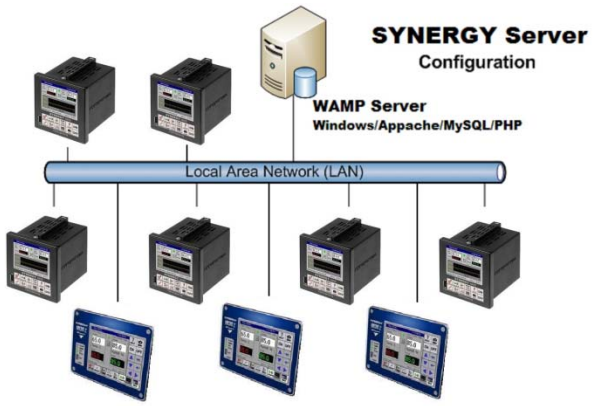
Open up the Synergy Controller **Comm** screen and browse to the **Printer Setup** folder as shown at the left.

Synergy Server

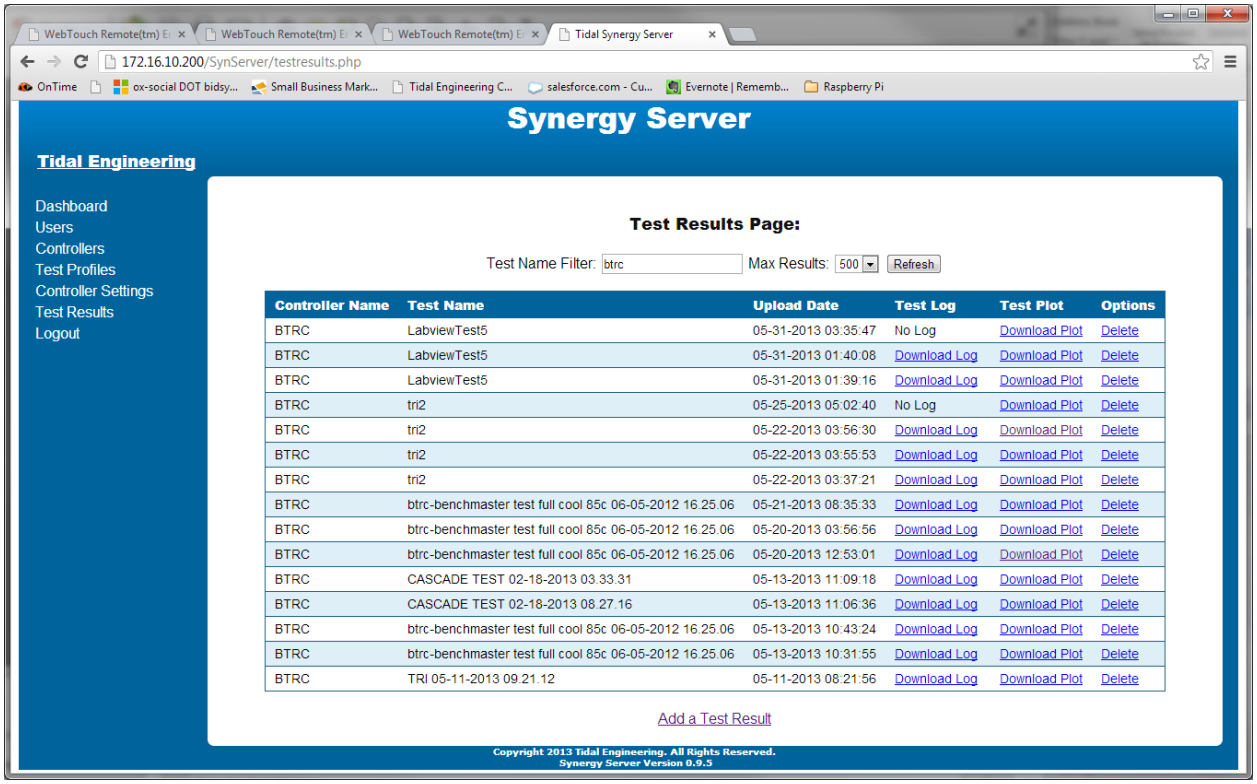
Synergy Controllers can now deliver test results and access programs from a new Tidal Engineering developed server application. The **SYNERGY Server** is a web server application designed to provide virtually unlimited centralized and searchable storage for any number of Synergy Controllers. Based on open source WAMP server technology (Windows OS, Apache Web Server, MySQL Database, and PHP scripting platform), the **SYNERGY Server** provides a simple Web Interface for the:

- Centralized Recipe Storage
- Centralized Test Results Storage
- Centralized Controller Backup Storage

The software can be installed on any Windows PC or Server in the enterprise. **SYNERGY Server** functionality is available on Synergy Controller software versions 3.0.14 and later. Section 2 of this application note provides the installation instructions for the Synergy Server and procedures for supporting multiple Synergy Controllers with Synergy Server.



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 these records. At the top of the Test Results Page is a Filter that 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.



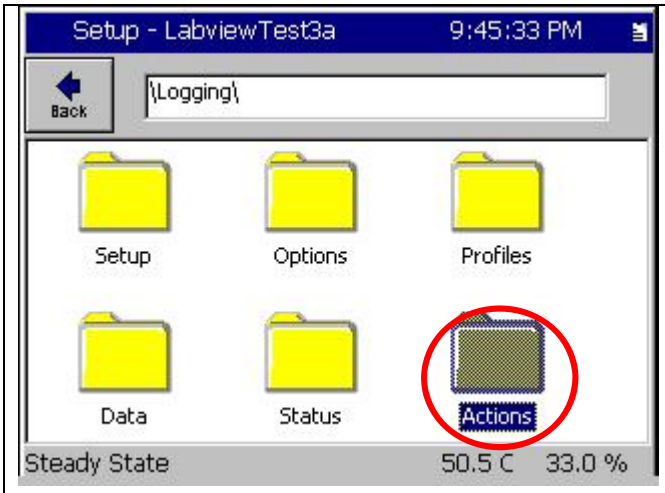
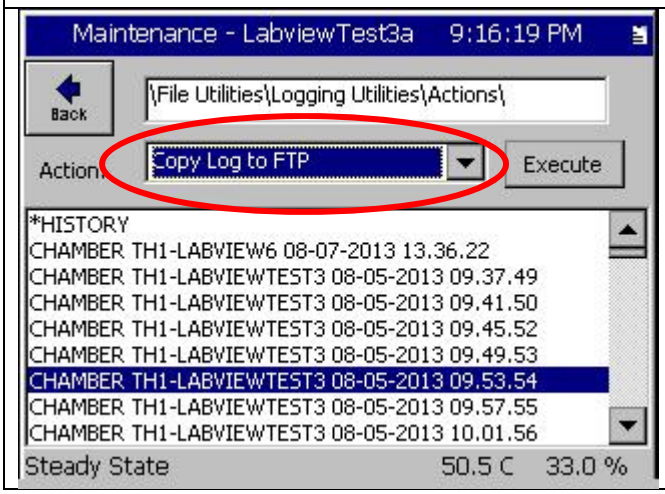
Controller Name	Test Name	Upload Date	Test Log	Test Plot	Options
BTRC	LabviewTest5	05-31-2013 03:35:47	No Log	Download Plot	Delete
BTRC	LabviewTest5	05-31-2013 01:40:08	Download Log	Download Plot	Delete
BTRC	LabviewTest5	05-31-2013 01:39:16	Download Log	Download Plot	Delete
BTRC	tri2	05-25-2013 05:02:40	No Log	Download Plot	Delete
BTRC	tri2	05-22-2013 03:56:30	Download Log	Download Plot	Delete
BTRC	tri2	05-22-2013 03:55:53	Download Log	Download Plot	Delete
BTRC	tri2	05-22-2013 03:37:21	Download Log	Download Plot	Delete
BTRC	btrc-benchmaster test full cool 85c 06-05-2012 16.25.06	05-21-2013 08:35:33	Download Log	Download Plot	Delete
BTRC	btrc-benchmaster test full cool 85c 06-05-2012 16.25.06	05-20-2013 03:56:56	Download Log	Download Plot	Delete
BTRC	btrc-benchmaster test full cool 85c 06-05-2012 16.25.06	05-20-2013 12:53:01	Download Log	Download Plot	Delete
BTRC	CASCADE TEST 02-18-2013 03.33.31	05-13-2013 11:09:18	Download Log	Download Plot	Delete
BTRC	CASCADE TEST 02-18-2013 08.27.16	05-13-2013 11:06:36	Download Log	Download Plot	Delete
BTRC	btrc-benchmaster test full cool 85c 06-05-2012 16.25.06	05-13-2013 10:43:24	Download Log	Download Plot	Delete
BTRC	btrc-benchmaster test full cool 85c 06-05-2012 16.25.06	05-13-2013 10:31:55	Download Log	Download Plot	Delete
BTRC	TRI 05-11-2013 09.21.12	05-11-2013 08:21:56	Download Log	Download Plot	Delete

The Synergy Servers capacity to store test results combined with the Synergy Controller's ability to automatically **Deliver Test Results** is a very useful combination.

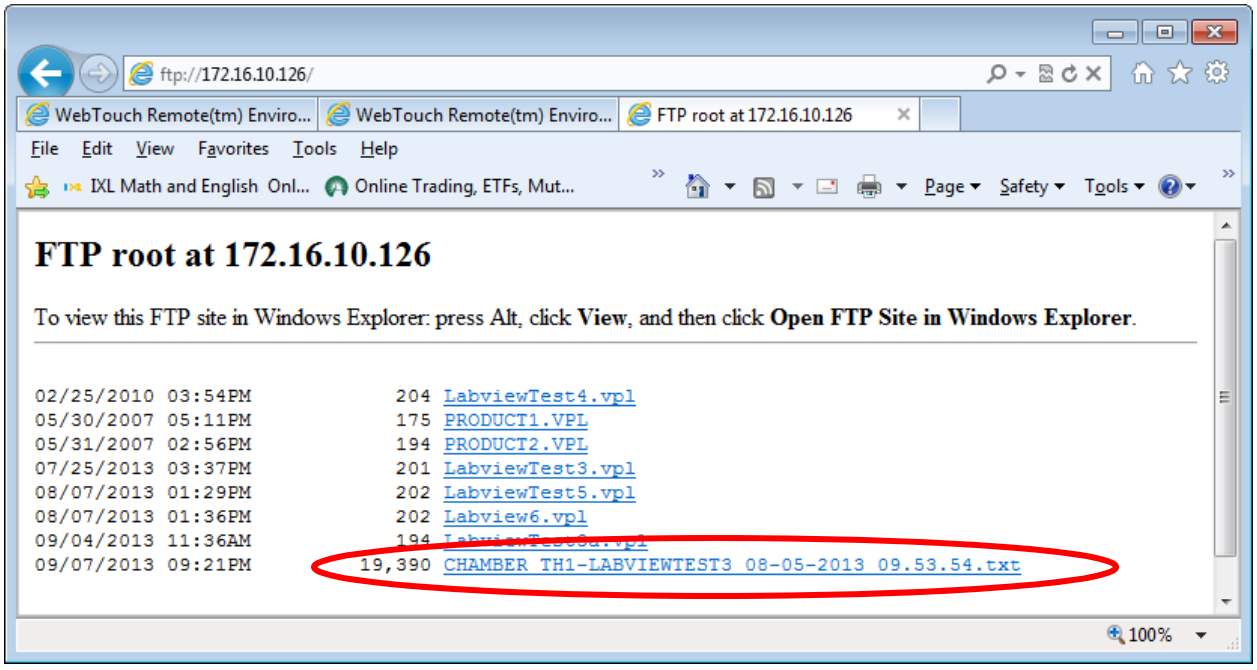
For details concerning the setup and benefits of the is feature, see
App_Note_99_Synergy_Server_Feature Rev P2.PDF
http://www.tidaleng.com/appnotes/SCAP99.pdf

FTP Server Export

Download the following application for details for the Synergy Controller's FTP Server:
http://www.tidaleng.com/appnotes/SCAP45.pdf

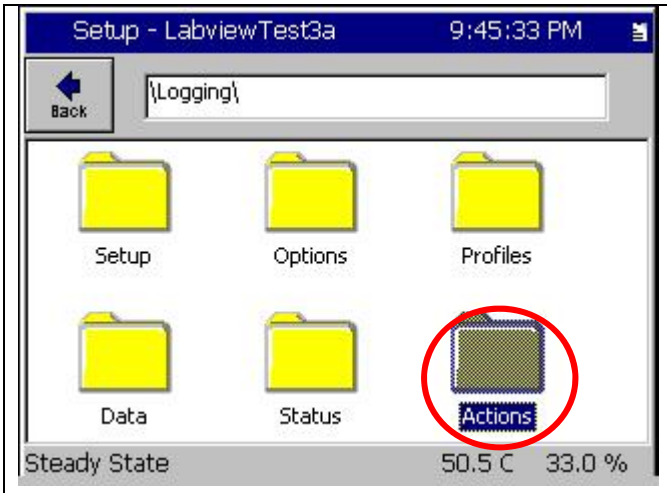
	Open up the Synergy Controller **Setup** screen and browse to the \Logging\Actions folder as shown at the left. Alternatively, Open up the Synergy Controller **Maintenance** screen and browse to the **\File Utilities\Logging Utilities\Actions** folder as shown at the left.
	Select the file (either the *HISTORY file or the Profile file), select the **Copy Log to FTP** from the **Action** drop down and press **Execute**

Open the FTP server on the controller using its IP address using with an FTP client like Microsoft Internet Explorer as shown below. Open the log file by clicking on it. For Microsoft Internet explorer type the url as shown in the following format example: ftp://172.16.10.126

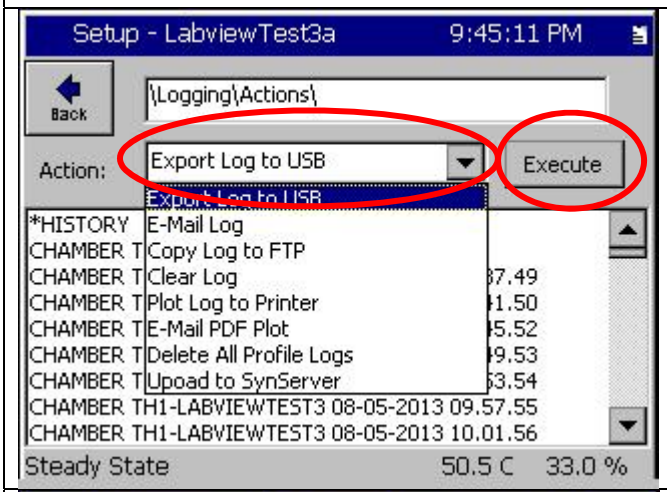

ftp://172.16.10.126/
WebTouch Remote(tm) Enviro...
WebTouch Remote(tm) Enviro...
FTP root at 172.16.10.126
File Edit View Favorites Tools Help
IXL Math and English Onl...
Online Trading, ETFs, Mut...
Page Safety Tools
FTP root at 172.16.10.126
To view this FTP site in Windows Explorer: press Alt, click View, and then click Open FTP Site in Windows Explorer.
02/25/2010 03:54PM 204 LabviewTest4.vpl
05/30/2007 05:11PM 175 PRODUCT1.VPL
05/31/2007 02:56PM 194 PRODUCT2.VPL
07/25/2013 03:37PM 201 LabviewTest3.vpl
08/07/2013 01:29PM 202 LabviewTest5.vpl
08/07/2013 01:36PM 202 Labview6.vpl
09/07/2013 09:21PM 19,390 CHAMBER TH1-LABVIEWTEST3 08-05-2013 09.53.54.txt
100%

USB Flash Drive Export

To export the log file to a USB Flash Drive, follow these steps.

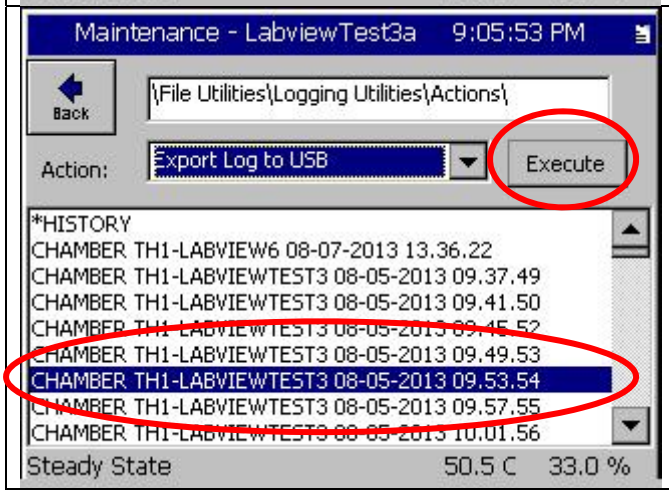


Open up the Synergy Controller **Setup** screen and browse to the \Logging\Actions folder as shown at the left.



Place the USB Flash drive in the controllers USB port.

Select the file from the file list (either the *HISTORY file or the Profile file), select the **Export Log to USB** from the **Action** drop down and press **Execute.**



Alternatively, Open up the Synergy Controller **Maintenance** screen and browse to the **\File Utilities\Logging Utilities\Actions** folder as shown at the left and follow the steps listed above.

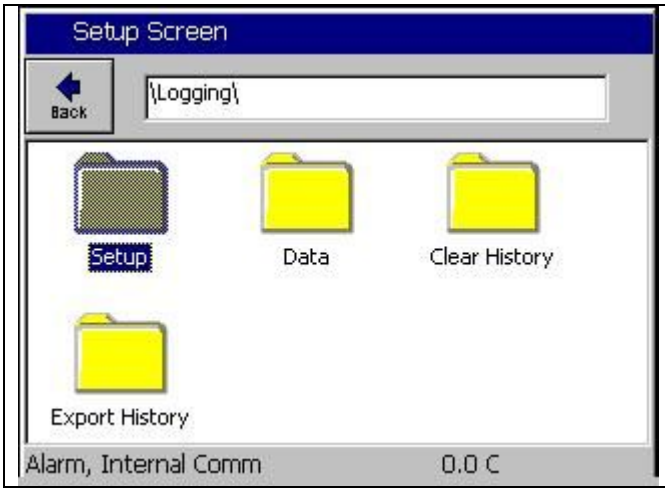
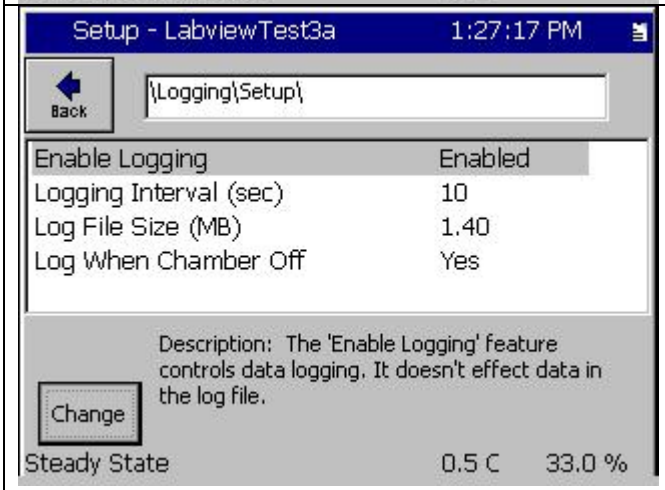
Synergy Logging Applications

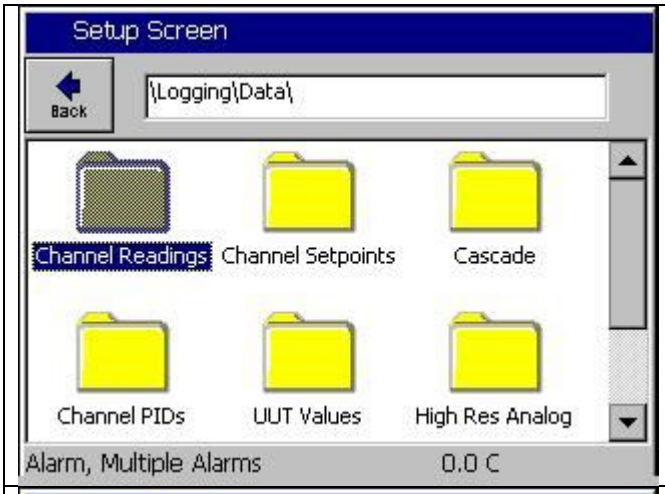
The Synergy Controller/Loggers captures and delivers test data for test reports. In addition, the Synergy Controller logging system is also useful for controller tuning and fault analysis.

Controller Tuning and Troubleshooting

The Synergy Controller's logging system is useful when tuning a test chamber or process oven. The controller can chart control parameters to provide insight into the performance of PID tuning. The following section explains how to setup the logging system and run a test to benchmark the system performance, then export the log file.

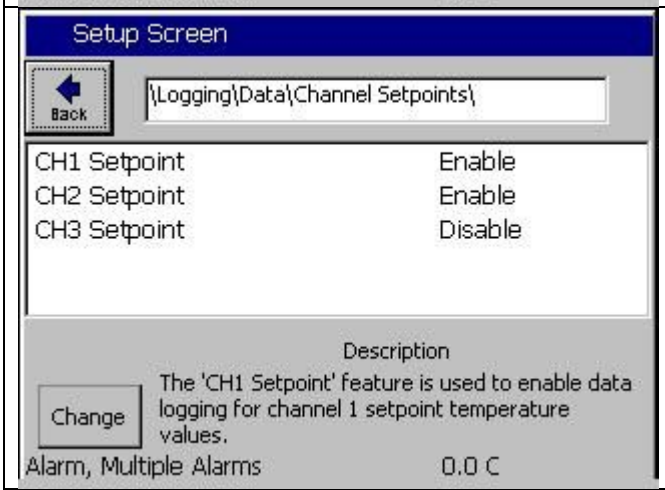
As an example, to setup the controller logging system to capture PID tuning information:

	Go to the Setup Screen and open the SETUP \Logging\Setup folder.
	**Enable Logging** Set to Enabled **Logging Interval (sec)** set the Logging Interval to 10 Seconds. **Logging File Size (MB)** set from 1.4 MB to 100MB (8MB Recommended). **Log When Chamber Off** Set this parameter to Yes if you want the logger to run all the time. Note that Profile Logs will only be generated when the chamber is on and a profile is running. The Parameter only applies to the **History** file; i.e. the continuous log.



Open the SETUP\Logging\Data\ Folder and select Channel Readings.

Enable Channel 1 Actual and Channel 2 Actual (Select the item and press the "Change" Button)



Channel 1 Setpoint Enable
Channel 2 Setpoint as required
Channel 3 Setpoint as required

Note that this folder may have up to four Setpoints listed.

PID Output Enable PID Output Logging for CH1, Cool and Heat folder.

These constants can optionally be logged
Proportional Band This is the PID Constant
Reset This is the PID Constant

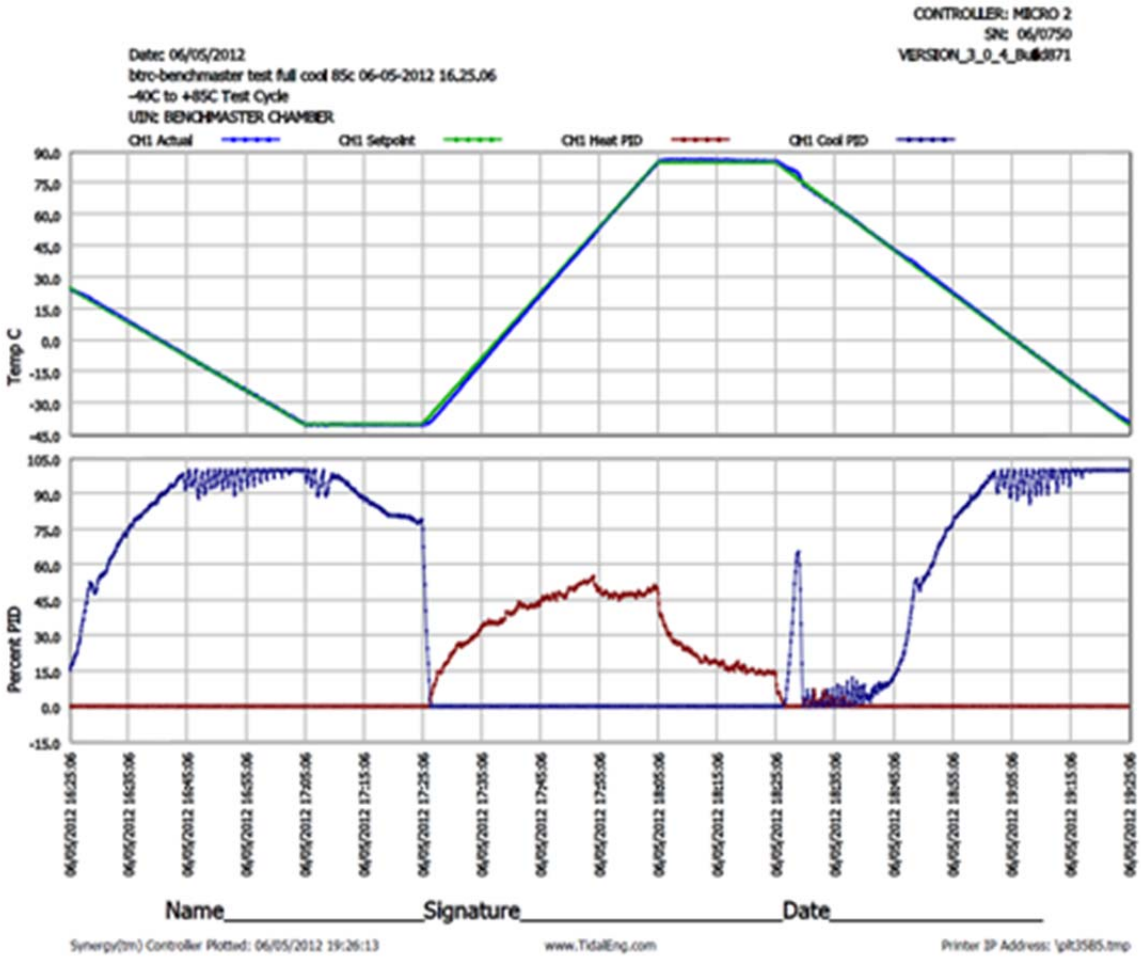
Note that PID variables **Cycle Time, Pn, In, Dn** and **Error** can also be logged but are not required logged for tuning applications

Once the logging settings are adjusted, run the chamber with a representative profile that includes the test conditions required for the application

.

After the run, export the log file to a USB Flash drive from the SETUP\Logging\ Export History Folder on the Setup screen.

To plot the test results, import the log file into Excel and chart it or use the controllers plotting feature to generate a PDF plot or send a plot directly to the printer.



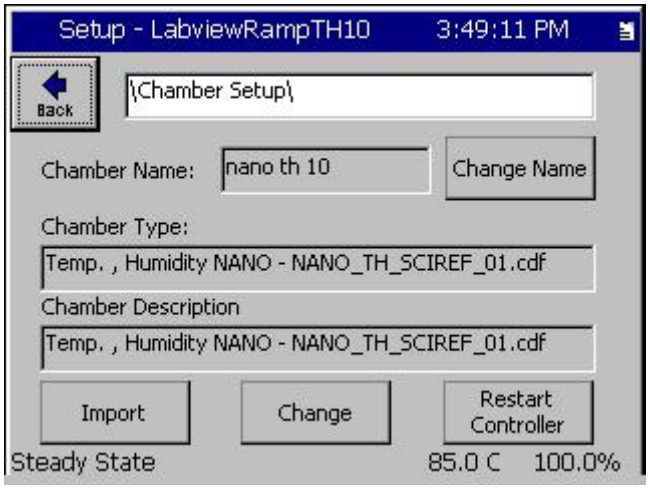
Log File Format

The log file Comma Separated Variable (CSV) format consists of a Log File Header, one or more field headers, interval records, and message records.

The **Log File Header** identifies the chamber, the software version, additional general information about the chamber, the controller, the test, time and date, etc. These parameters are identified in the table below:

Parameters	Example
Chamber Name:	nano th 10
Application Version:	3.0.7 Build 893b
Help Version:	3.0.5
Operating System Version:	5.0.C
Olympic Version:	V3.0.48
Serial Number:	12/1203
RunTime:	14:32 (hh:mm)
Chamber Definition:	Temp. , Humidity NANO - NANO_TH_SCIREF_01.cdf
Log Used:	22 of 1400 KB
IP Address	http://172.16.10.99
Date, Time:	08/30/2013, 20:54:19

Note that the chamber name in the first parameter is setup in the screen shown below:



The header record identifies the field names. For example:

```
Date and Time,Record Type,Temperature Units,CH1 Actual,CH2 Actual,CH1 Setpoint,CH2 Setpoint
```

Heading field parameters

Parameters	Value
Date and Time	MM/DD/YYYY HH:MM:SS in 24 Hour time
Record Type	I for Interval, M for Message
Temperature Units	C or F for Centigrade of Fahrenheit
Data Headings	CH1 Actual,CH2 Actual,CH1 Setpoint,CH2 Setpoint

Interval records consist of periodic samples of the enabled Data fields.

Example Interval Record

Date and Time							Message
08/30/2013 12:46:14	I	C	85.0	100.0	85.0	85.0	
08/30/2013 12:47:14	I	C	85.0	100.0	85.0	85.0	
08/30/2013 12:48:14	I	C	85.0	100.0	85.0	85.0	

Message records are other records that are generated based on alarm conditions, profile start or stop, Bar code scans, controller startup, etc.. Message records recorded whether Logging is Enabled of not.

Example Message Record

Date and Time							Message
08/30/2013 12:45:52	M	C	85.0	100.0	85.0	85.0	Stop Running Profile LVTH10.vpl

Here is an example of a log file with just Alarm records:

Log Header

```
Chamber Name:
  BTRC
Application Version:
  3.0.7 Build 893b
Help Version:
  3.0.5
Operating System Version:
  5.0.C
Olympic Version:
  V3.0.48
Serial Number:
  12/1203
RunTime:
  06:15 (hh:mm)
Chamber Definition:
  Temp. , Humidity NANO - NANO_TH_SCIREF_01.cdf
Log Used:
  0 of 1400 KB
IP Address:
  http://172.16.10.99
Date, Time:
  08/27/2013, 16:55:52

(c)2012 Tidal Engineering Corporation, www.tidaleng.com
```

Field Header

```
Date and Time,Record Type,Temperature Units,CH1 Actual,CH2 Actual,CH1 Setpoint,CH2 Setpoint
```

Message Records

```
08/27/2013 16:54:39,M,C,500.0,100.0,500.0,30.0,Ch 1 High  500.00 C
08/27/2013 16:55:07,M,C,500.0,100.0,500.0,30.0,Ch 1 High  500.00 C
```

Here is an example of a Profile log file with Interval and Message records. Note that the log file ends with the "Stop Running Profile " Message Record .

Log Header

```
Chamber Name:
  nano th 10
Application Version:
  3.0.7 Build 893b
Help Version:
  3.0.5
Operating System Version:
  5.0.C
Olympic Version:
  V3.0.48
Serial Number:
  12/1203
RunTime:
  14:31 (hh:mm)
Chamber Definition:
  Temp. , Humidity NANO - NANO_TH_SCIREF_01.cdf
Log Used:
  22 of 1400 KB
IP Address:
  http://172.16.10.99
Date, Time:
  08/30/2013, 20:53:46

(c)2012 Tidal Engineering Corporation, www.tidaleng.com
```

Field Header

```
Date and Time,Record Type,Temperature Units,CH1 Actual,CH2 Actual,CH1 Setpoint,CH2 Setpoint
```

Message Record

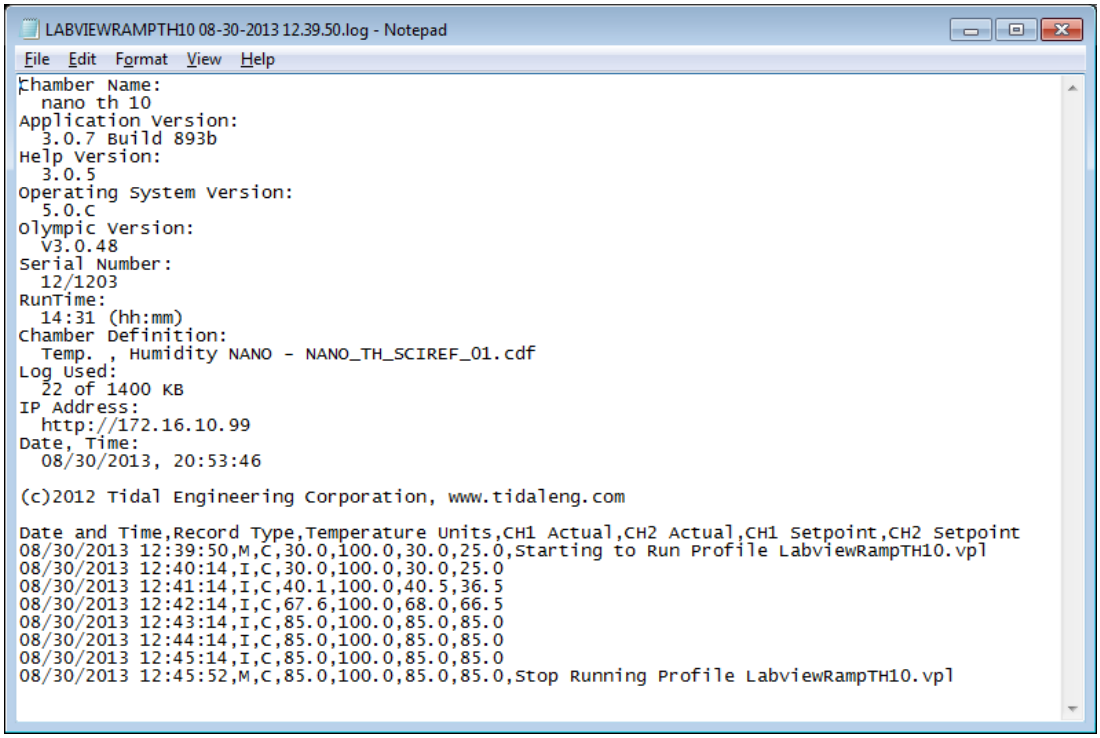
```
08/30/2013 12:39:50,M,C,30.0,100.0,30.0,25.0,Starting to Run Profile LabviewRampTH10.vpl
```

Interval Records

```
08/30/2013 12:40:14,I,C,30.0,100.0,30.0,25.0
08/30/2013 12:41:14,I,C,40.1,100.0,40.5,36.5
08/30/2013 12:42:14,I,C,67.6,100.0,68.0,66.5
08/30/2013 12:43:14,I,C,85.0,100.0,85.0,85.0
08/30/2013 12:44:14,I,C,85.0,100.0,85.0,85.0
08/30/2013 12:45:14,I,C,85.0,100.0,85.0,85.0
```

Message Record

```
08/30/2013 12:45:52,M,C,85.0,100.0,85.0,85.0,Stop Running Profile LabviewRampTH10.vpl
```



Here is an example of a History log file with Interval and Message records. Note that the log file continues past the “Stop Running Profile “ Message Record .

Log Header

```
Chamber Name:
  nano th 10
Application Version:
  3.0.7 Build 893b
Help Version:
  3.0.5
Operating System Version:
  5.0.C
Olympic Version:
  V3.0.48
Serial Number:
  12/1203
RunTime:
  14:32 (hh:mm)
Chamber Definition:
  Temp. , Humidity NANO - NANO_TH_SCIREF_01.cdf
Log Used:
  22 of 1400 KB
IP Address:
  http://172.16.10.99
Date, Time:
  08/30/2013, 20:54:19

(c)2012 Tidal Engineering Corporation, www.tidaleng.com
```

Field Header

```
Date and Time,Record Type,Temperature Units,CH1 Actual,CH2 Actual,CH1 Setpoint,CH2 Setpoint
```

Message Record

```
08/30/2013 12:39:50,M,C,30.0,100.0,30.0,25.0,Starting to Run Profile LabviewRampTH10.vpl
```

Interval Records

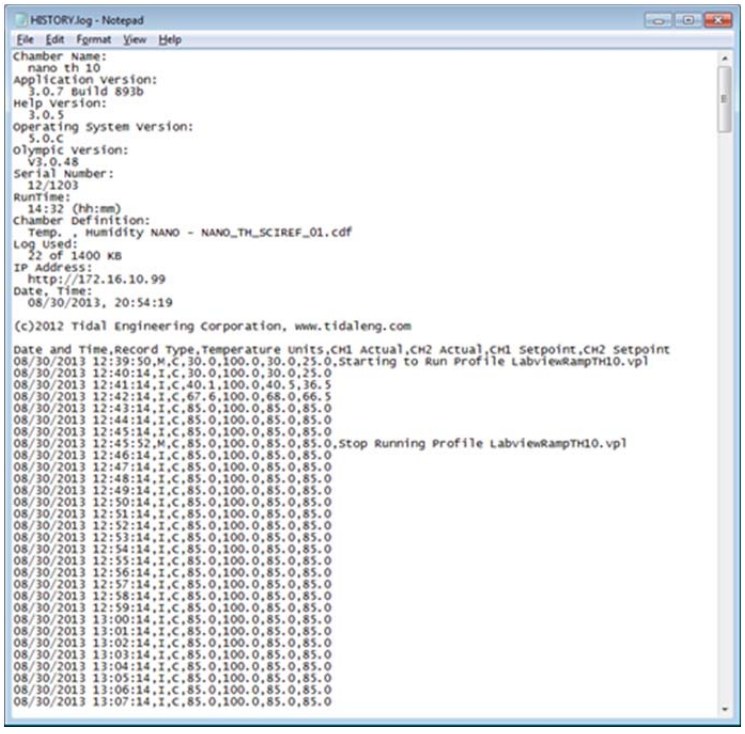
```
08/30/2013 12:40:14,I,C,30.0,100.0,30.0,25.0
08/30/2013 12:41:14,I,C,40.1,100.0,40.5,36.5
08/30/2013 12:42:14,I,C,67.6,100.0,68.0, 66.5
08/30/2013 12:43:14,I,C,85.0,100.0,85.0,85.0
08/30/2013 12:44:14,I,C,85.0,100.0,85.0,85.0
08/30/2013 12:45:14,I,C,85.0,100.0,85.0,85.0
```

Message Record

```
08/30/2013 12:45:52,M,C,85.0,100.0,85.0,85.0,Stop Running Profile LabviewRampTH10.vpl
```

Interval Records

```
08/30/2013 12:46:14,I,C,85.0,100.0,85.0,85.0
08/30/2013 12:47:14,I,C,85.0,100.0,85.0,85.0
08/30/2013 12:48:14,I,C,85.0,100.0,85.0,85.0
08/30/2013 12:49:14,I,C,85.0,100.0,85.0,85.0
08/30/2013 12:50:14,I,C,85.0,100.0,85.0,85.0
08/30/2013 12:51:14,I,C,85.0,100.0,85.0,85.0
08/30/2013 12:52:14,I,C,85.0,100.0,85.0,85.0
08/30/2013 12:53:14,I,C,85.0,100.0,85.0,85.0
08/30/2013 12:54:14,I,C,85.0,100.0,85.0,85.0
08/30/2013 12:55:14,I,C,85.0,100.0,85.0,85.0
08/30/2013 12:56:14,I,C,85.0,100.0,85.0,85.0
08/30/2013 12:57:14,I,C,85.0,100.0,85.0,85.0
08/30/2013 12:58:14,I,C,85.0,100.0,85.0,85.0
08/30/2013 12:59:14,I,C,85.0,100.0,85.0,85.0
08/30/2013 13:00:14,I,C,85.0,100.0,85.0,85.0
08/30/2013 13:01:14,I,C,85.0,100.0,85.0,85.0
```



Alarm Logging

The Synergy Controller logger captures Alarms even if logging is disabled.

When an alarm occurs it generates a message record.

For example “Ch 1 High 500.00 C” is in the last field of the record as shown below:

```
08/27/2013 16:54:39,M,C,500.0,100.0,500.0,30.0,Ch 1 High  500.00 C
08/27/2013 16:55:07,M,C,500.0,100.0,500.0,30.0,Ch 1 High  500.00 C
```

Note the record type field following the Date/Time record contains M in the records above.

Other Logging Related Application Notes

Synergy Controller Application Note 2 Data Logging Capacity Calculations

Synergy Controller Application Note 45 Using the FTP Server

Synergy Controller Application Note 60 Graphing Synergy Log Files in Microsoft Excel

Synergy Controller Application Note 72 Thermocouple Data Acquisition with Synergy UUT Modules

Synergy Controller Application Note 84 E-Mail Features

Synergy Controller Application Note 90 Synergy Controller Network Printing

Synergy Controller Application Note 99 Synergy Server Feature

About the Synergy Controller Family

Tidal Engineering's Synergy Controllers, both the Synergy Micro 2 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 and 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.

Tidal Engineering Corporation
2 Emery Avenue
Randolph, NJ 07869
Tel: 973/328-1173
Fax: 973/328-2302
www.TidalEng.com
info@tidaleng.com