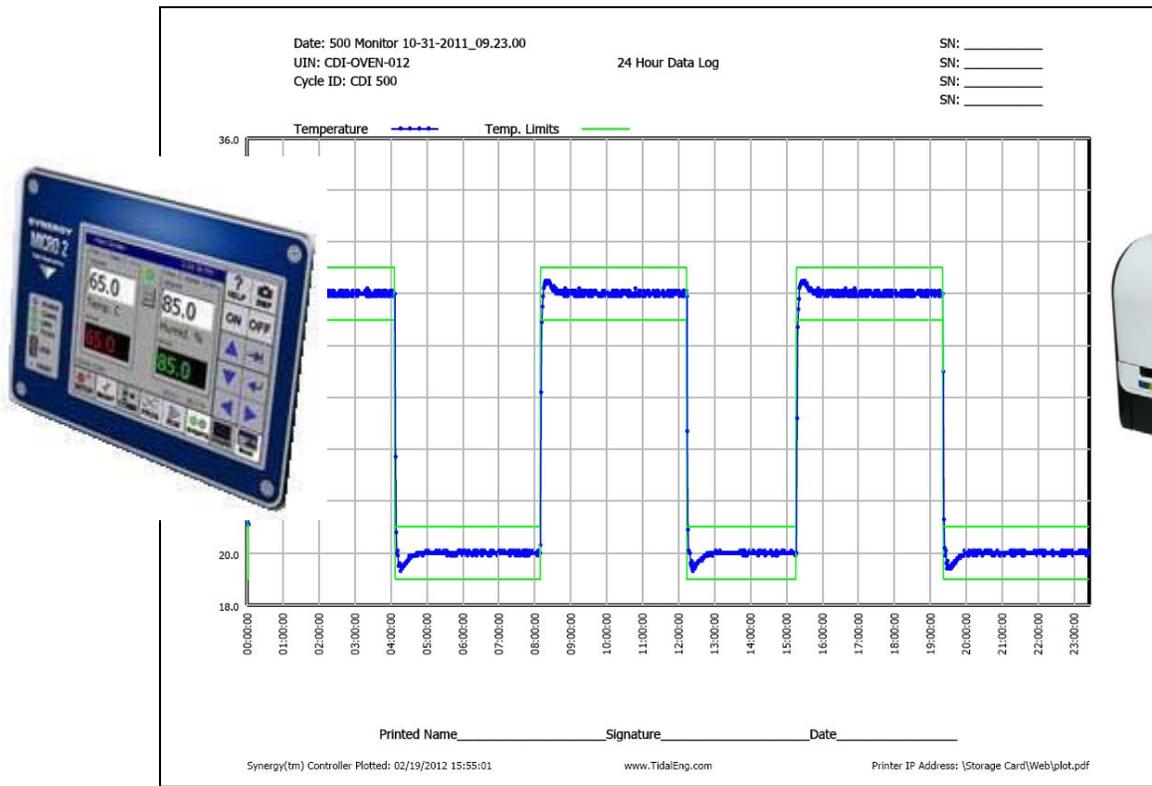


Synergy Controller Network Plotting



Introduction

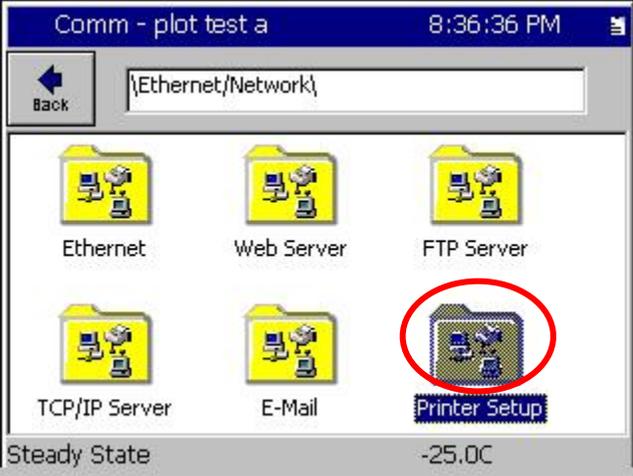
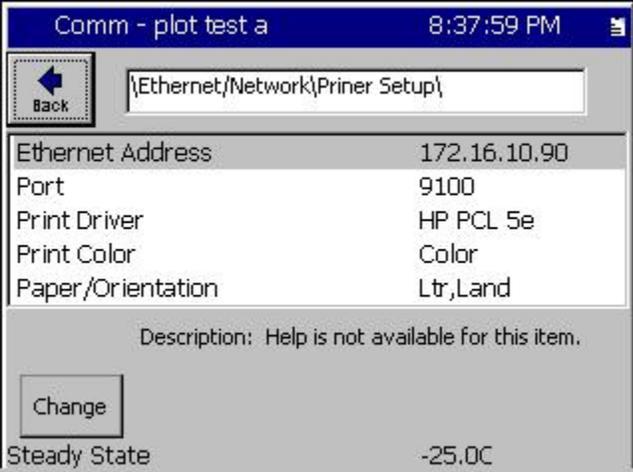
The Synergy environmental test chamber controller family provides an innovative and expanding set of features for organizations doing environmental testing in Medical, Defense, Automotive, Aerospace, and Semiconductor industries.

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. This application note describes these capabilities and the steps that you can follow to easily set them up.

The Synergy Controller is designed to connect 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 Nano, or other Synergy controller.

To Setup the controller and the printer follow these steps:

 <p>Comm - plot test a 8:36:36 PM</p> <p>{Ethernet/Network}</p> <p>Back</p> <p>Ethernet Web Server FTP Server</p> <p>TCP/IP Server E-Mail Printer Setup</p> <p>Steady State -25.0C</p>	<p>Open up the Synergy Controller Comm screen and browse to the Printer Setup folder as shown at the left.</p>										
 <p>Comm - plot test a 8:37:59 PM</p> <p>{Ethernet/Network}Printer Setup}</p> <p>Back</p> <table border="1"><tr><td>Ethernet Address</td><td>172.16.10.90</td></tr><tr><td>Port</td><td>9100</td></tr><tr><td>Print Driver</td><td>HP PCL 5e</td></tr><tr><td>Print Color</td><td>Color</td></tr><tr><td>Paper/Orientation</td><td>Ltr, Land</td></tr></table> <p>Description: Help is not available for this item.</p> <p>Change</p> <p>Steady State -25.0C</p>	Ethernet Address	172.16.10.90	Port	9100	Print Driver	HP PCL 5e	Print Color	Color	Paper/Orientation	Ltr, Land	<p>To setup the printer using a dynamically assigned IP address (via DHCP server) connect the printer to the network and read the IP Address on the printer control panel.</p> <p>To manually assign the address(Static IP), see Appendix A</p> <p>The Print Color parameter can be B/W or Color.</p> <p>Note that the Printer Port, Printer Driver, Paper, and Paper Orientation parameters are fixed as shown on the left.</p>
Ethernet Address	172.16.10.90										
Port	9100										
Print Driver	HP PCL 5e										
Print Color	Color										
Paper/Orientation	Ltr, Land										

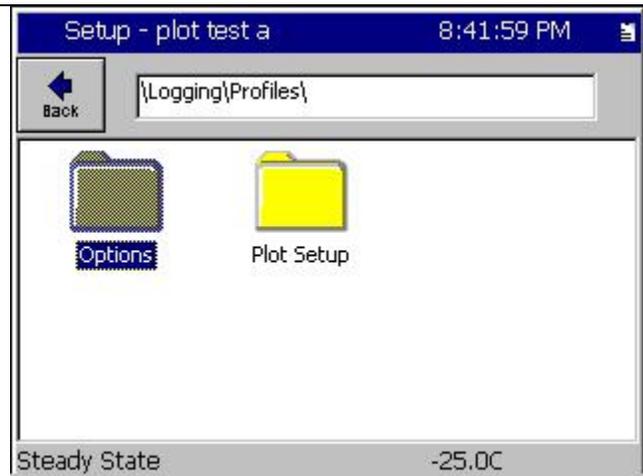
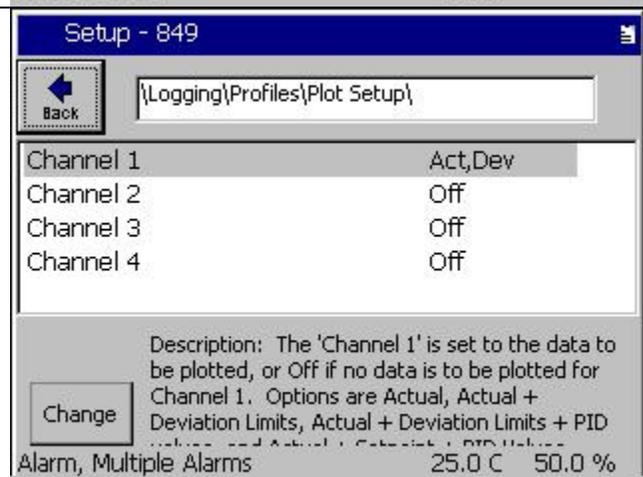
Set the Plotting Options to automatically plot the data from each test to the printer as follows:

 <p>Setup - plot test a 8:41:59 PM</p> <p>Back {Logging}\Profiles\</p> <p>Options Plot Setup</p> <p>Steady State -25.0C</p>	<p>Open the Setup\Logging\Profiles\Options folder.</p>										
 <p>Setup - plot test a 8:42:17 PM</p> <p>Back {Logging}\Profiles\Options\</p> <table border="1"> <tr> <td>Log Each Profile</td> <td>Yes</td> </tr> <tr> <td>E-Mail Profile Log</td> <td>Disabled</td> </tr> <tr> <td>Print Profile Plot</td> <td>Auto</td> </tr> <tr> <td>Email Profile Plot</td> <td>Auto</td> </tr> <tr> <td>Plot Timescale</td> <td>Realtime</td> </tr> </table> <p>Description: Help is not available for this item.</p> <p>Change</p> <p>Steady State -25.0C</p>	Log Each Profile	Yes	E-Mail Profile Log	Disabled	Print Profile Plot	Auto	Email Profile Plot	Auto	Plot Timescale	Realtime	<p>In the Setup\Logging\Profiles\Options folder at left.</p> <p>Set Log Each Profile to Yes,</p> <p>Set Print Profile Plot to Auto or Yes,</p> <p>Select Realtime or Relative Plot Timescale option as required.</p> <p>Note: See examples of both the Realtime and Relative Plot Timescale options at the end of this application note.</p>
Log Each Profile	Yes										
E-Mail Profile Log	Disabled										
Print Profile Plot	Auto										
Email Profile Plot	Auto										
Plot Timescale	Realtime										

The Profile Logs generated for each test can be reused and deleted from the Maintenance Screen.

	<p>The Profile Log files generated during each test can be plotted and e-mailed and cleared as follows:</p> <p>Open the Maintenance screen, browse to the File Utilities\Logging Utilities\Actions\ folder as shown at left.</p> <p>Select the Action from the Action Drop Down:</p> <ol style="list-style-type: none"> 1. Export Log to USB (Memory Stick). 2. E-Mail Log 3. Copy Log to FTP (FTP Directory) 4. Clear Log Clears the main History Log Deletes individual Profile Logs 5. Plot Log to Printer As described below
	<p>The Synergy Controller can be set to automatically trigger a plot to the printer after each test as described above. In addition, plots can be triggered manually from the Maintenance screen as shown at left.</p> <ol style="list-style-type: none"> 1. Select Plot Log in the Action window 2. Select the Profile Log from the list. 3. Press the Execute button.

Selecting the Channel and Plot Series

 <p>Setup - plot test a 8:41:59 PM</p> <p>Back {Logging}Profiles\</p> <p>Options Plot Setup</p> <p>Steady State -25.0C</p>	<p>Open the Setup\Logging\Profiles\Plot Setup folder to choose the data as follows:</p>										
 <p>Setup - 849</p> <p>Back {Logging}Profiles\Plot Setup\</p> <table border="1"> <tr> <td>Channel 1</td> <td>Act,Dev</td> </tr> <tr> <td>Channel 2</td> <td>Off</td> </tr> <tr> <td>Channel 3</td> <td>Off</td> </tr> <tr> <td>Channel 4</td> <td>Off</td> </tr> </table> <p>Description: The 'Channel 1' is set to the data to be plotted, or Off if no data is to be plotted for Channel 1. Options are Actual, Actual + Deviation Limits, Actual + Deviation Limits + PID Values, and Actual + Setpoint + PID Values.</p> <p>Change</p> <p>Alarm, Multiple Alarms 25.0 C 50.0 %</p>	Channel 1	Act,Dev	Channel 2	Off	Channel 3	Off	Channel 4	Off	<p>Choose the plot data for each channel in the Plot Setup folder as shown on the left.</p> <p>Act is the Actual Value (AKA Process Variable) Dev enables the Deviation Limits for the channel.</p> <p>Note that each channel prints on a separate sheet.</p> <p>In the example on the left, Channel 1 Actual (Process Variable) and Channel 1 Deviation Limits are selected.</p>		
Channel 1	Act,Dev										
Channel 2	Off										
Channel 3	Off										
Channel 4	Off										
 <p>Setup - 849</p> <p>Back {Calibration}Calibration Channel 1\</p> <table border="1"> <tr> <td>Ignore Alarm When Off</td> <td>Yes</td> </tr> <tr> <td>Channel Alarm Delay</td> <td>0</td> </tr> <tr> <td>Deviation High Alarm</td> <td>5.00</td> </tr> <tr> <td>Deviation Low Alarm</td> <td>5.00</td> </tr> <tr> <td>Deviation Alarms Enabled</td> <td>Disabled</td> </tr> </table> <p>Description: Set this Parameter to assign the Process Variable (PV) sensor for this Channel. Press Change to select from sensor list.</p> <p>Change</p> <p>Alarm, Multiple Alarms 25.0 C 50.0 %</p>	Ignore Alarm When Off	Yes	Channel Alarm Delay	0	Deviation High Alarm	5.00	Deviation Low Alarm	5.00	Deviation Alarms Enabled	Disabled	<p>When the Deviation Limits are plotted, the High Deviation and Low Deviation limits are calculated with respect to the Setpoint.</p> <p>The +5 Degree C and -5 Degree C limits setup on the left are plotted in the example below.</p>
Ignore Alarm When Off	Yes										
Channel Alarm Delay	0										
Deviation High Alarm	5.00										
Deviation Low Alarm	5.00										
Deviation Alarms Enabled	Disabled										

Plot Annotation

The Synergy Controller provides several commands for formatting and annotating plots. The commands below can be used to create up to 18 Headers and 6 footers.

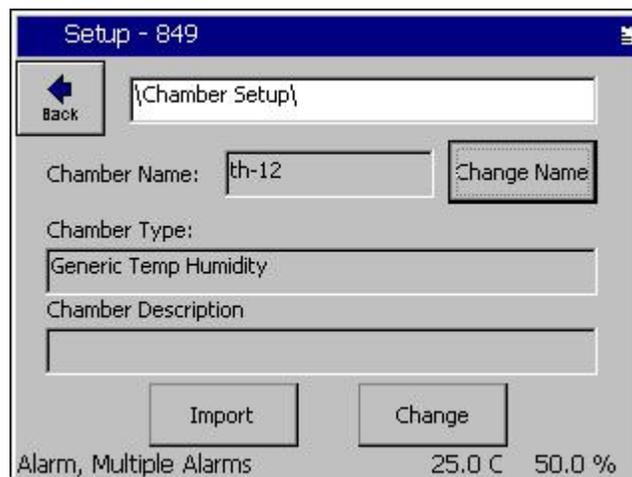
Headers are organized in three columns to accommodate a standard three-hole-punch so the plots can be conveniently stored in a binder. These annotations can be loaded on the controller from a text file using the File Utilities screen.

Annotation commands are defined as follows:

Left header column	= PLOT_HDR_Lx "abcd1234"	Where x is 1 to 6 and "abcd1234" is the text.
Center header column	= PLOT_HDR_Cx "abcd1234"	Where x is 1 to 6 and "abcd1234" is the text.
Right header column	= PLOT_HDR_Rx "abcd1234"	Where x is 1 to 6 and "abcd1234" is the text.
Center footer column	= PLOT_FTR_Cx "abcd1234"	Where x is 1 to 6 and "abcd1234" is the text.

The macros in the table below can be used to include data about the test in the annotations. In addition, macros are available to set the font size on a line-by-line basis.

Macro	Description	Example
%%STARTTIME%%	This macro is replaced by the test start time of day: HH:MM:SS. Note time is displayed in 24 Hr. format	13:12:55
%%STOPTIME%%	This macro is replaced by the test stop time of day: HH:MM:SS	13:12:55
%%STARTDATE%%	This macro is replaced by the test start day: MM-DD-YYYY	06-03-2012
%%STOPDATE%%	This macro is replaced by the test stop day: MM-DD-YYYY	06-03-2012
%%CHAMBERNAME%%	This macro is replaced by the controller name	See Chamber Name Below
%%PROFILELOGFILE%%	This macro is replaced by the Profile Log File Name	Test 06-03-2012 13:12:55
FONT8	This macro changes the font size on the line to 8.	Test
FONT10	This macro changes the font size on the line to 10.	Test
FONT12	This macro changes the font size on the line to 12.	Test
FONT14	This macro changes the font size on the line to 14.	Test



Example 1 file: "Terumo Plot Annotations A.cfg"

```
= PLOT_HDR_C1 ""
= PLOT_HDR_C2 "FONT14*24 Hour Data Log*"
= PLOT_HDR_C3 ""
= PLOT_HDR_C4 ""
= PLOT_HDR_C5 ""
= PLOT_HDR_C6 ""
= PLOT_HDR_L1 "Date: %%STARTTIME%%"
= PLOT_HDR_L2 "UIN: CDI-OVEN-012"
= PLOT_HDR_L3 "Cycle ID: CDI 500"
= PLOT_HDR_L4 "Cycle ID: CDI 500"
= PLOT_HDR_L5 "Cycle ID: CDI 500"
= PLOT_HDR_L6 "Cycle ID: CDI 500"
= PLOT_HDR_R1 "SN: _____"
= PLOT_HDR_R2 "SN: _____"
= PLOT_HDR_R3 "SN: _____"
= PLOT_HDR_R4 "SN: _____"
= PLOT_HDR_R5 "SN: _____"
= PLOT_HDR_R6 "SN: _____"
= PLOT_FTR_C1 "FONT14Printed Name _____ Signature _____ Date _____"
```

See Example 1 file: "Terumo Plot Annotations A.cfg plotted on the next page"

Plot Header
Plot_Hdr_Lx

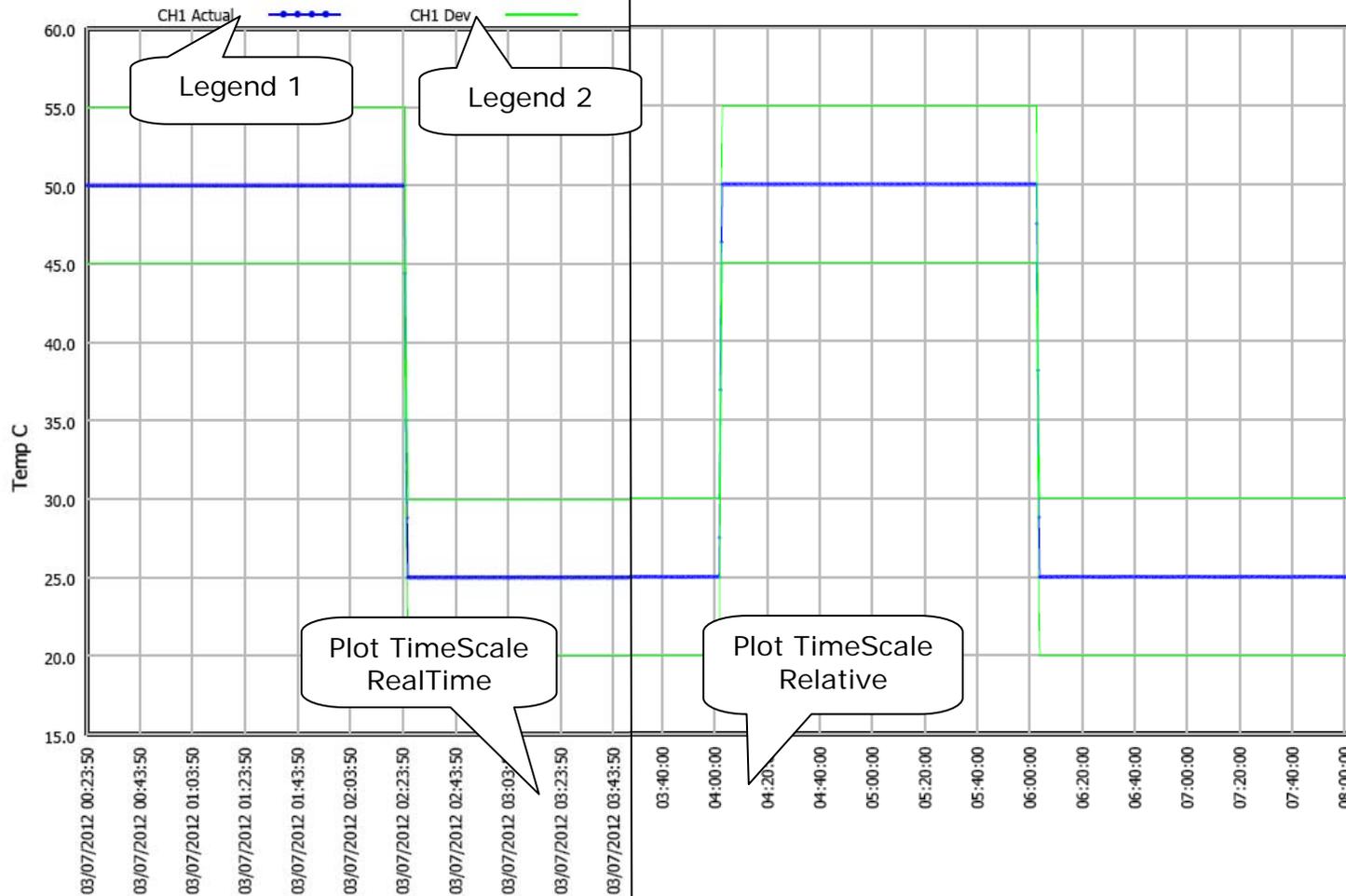
UIN: CDI-OVEN-012
Cycle ID: CDI 500

Plot Header
Plot_Hdr_Cx

24 Hour Data Log
Date: 03/07/2012

Plot Header
Plot_Hdr_Rx

SN: _____
SN: _____
SN: _____
SN: _____
SN: _____



Plot Footer
Plot_Ftr_Cx

Printed Name _____

Signature _____

Date _____

Plot ID _____

Synergy(tm) Controller Plotted: 03/07/2012 13:22:47

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Printer IP Address: \\849 03-07-2012 00.23.43.pdf

Example 2 file: "Terumo Plot Annotations D.cfg"

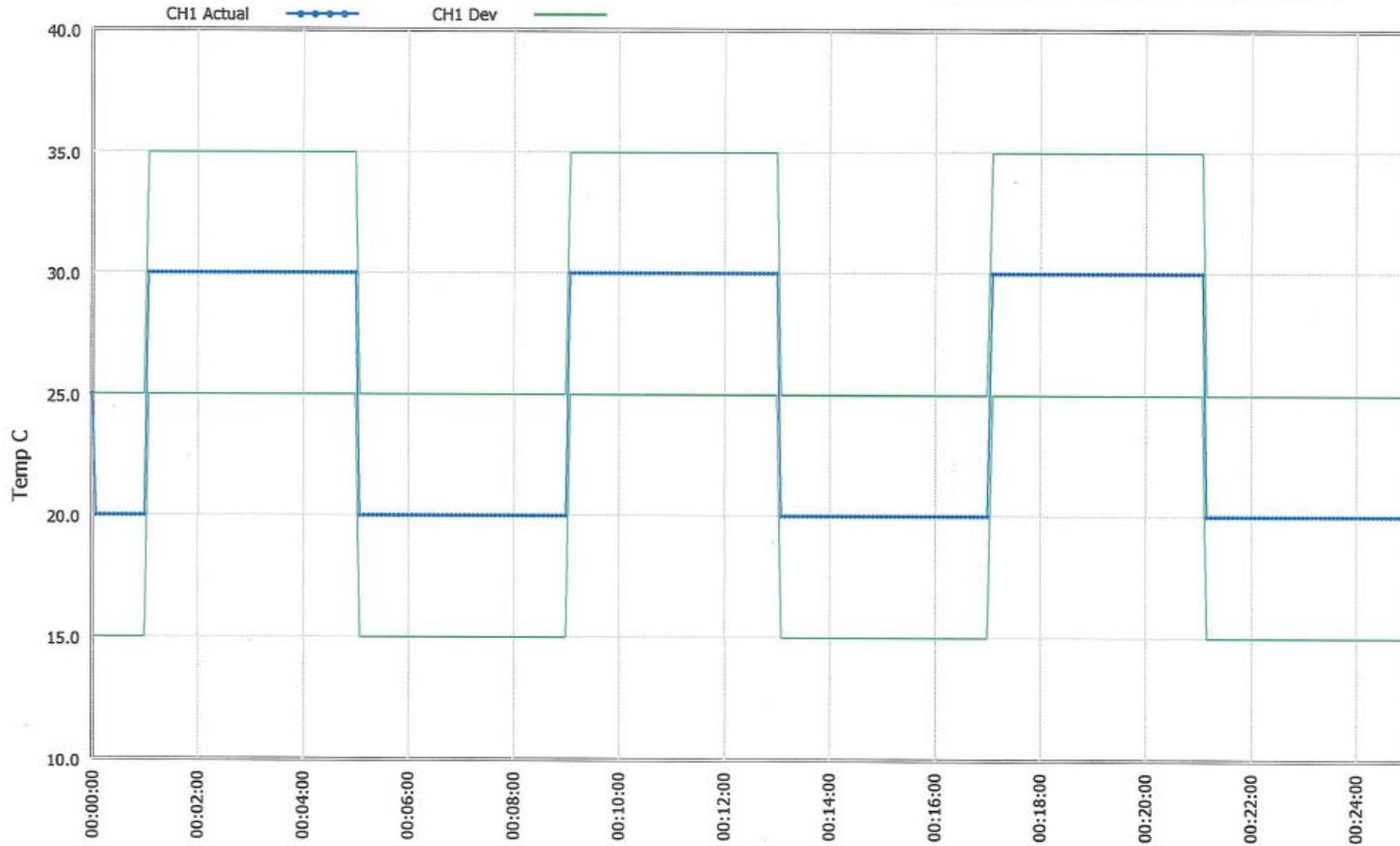
```
PLOT_HDR_C1 " "  
= PLOT_HDR_C2 ""  
= PLOT_HDR_C3 ""  
= PLOT_HDR_C4 ""  
= PLOT_HDR_C5 ""  
= PLOT_HDR_C6 ""  
= PLOT_HDR_L1 "FONT1424 Hour Data Log"  
= PLOT_HDR_L2 " "  
= PLOT_HDR_L3 "Date: %%STARTDATE%%"  
= PLOT_HDR_L4 "%%PROFILELOGFILE%%"  
= PLOT_HDR_L5 "Cycle ID: CDI 500"  
= PLOT_HDR_L6 "UIN: %%CHAMBERNAME%%"  
= PLOT_HDR_R1 "SN: _____ SN: _____ SN: _____ "  
= PLOT_HDR_R2 "SN: _____ SN: _____ SN: _____ "  
= PLOT_HDR_R3 "SN: _____ SN: _____ SN: _____ "  
= PLOT_HDR_R4 "SN: _____ SN: _____ SN: _____ "  
= PLOT_HDR_R5 "SN: _____ SN: _____ SN: _____ "  
= PLOT_HDR_R6 "SN: _____ SN: _____ SN: _____ "  
= PLOT_FTR_C1 "FONT14Printed Name _____ Signature _____ Date _____ "  
= PLOT_FTR_C2 ""  
= PLOT_FTR_C3 ""  
= PLOT_FTR_C4 ""  
= PLOT_FTR_C5 ""  
= PLOT_FTR_C6 ""
```

See Example 2 "Terumo Plot Annotations D.cfg" plotted on the next page

24 Hour Data Log

Date: 03/13/2012
CDI 500 monitor turbo 03-13-2012 14.27.29
Cycle ID: CDI 500
UIN: cdi-oven-012

SN: _____ SN: _____ SN: _____
SN: _____ SN: _____ SN: _____



Printed Name _____ Signature _____ Date _____

Synergy(tm) Controller Plotted: 03/13/2012 14:52:39

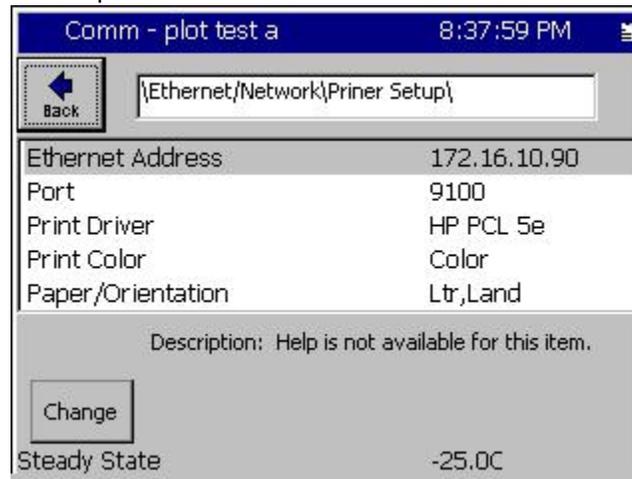
www.TidalEng.com

Printer IP Address: 172.16.10.90

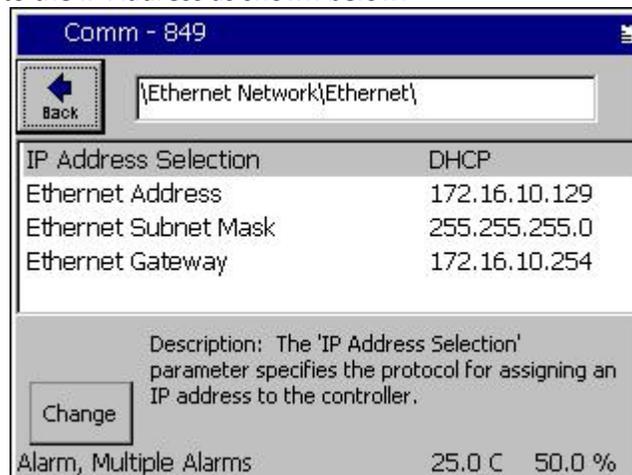
Appendix A - Manually configure IPv4 TCP/IP parameters for HP LaserJet Pro CP1525nw

1. On the Printer control panel, press the Setup button.
2. Use the arrow buttons to select the Network configuration option and then press the OK button.
3. Use the arrow buttons to select the TCP/IP configuration option and then press the OK button.
4. Use the arrow buttons to select the Manual option and then press the OK button.
5. Use the alphanumeric buttons to type the IP address and then press the OK button.
6. If the IP address is incorrect, use the arrow buttons to select the No option and then press the OK button. Repeat step 5 with the correct IP address, and then repeat step 5 for the subnet mask and default gateway settings.

For this application note, the HP printer is set to the IP Address as shown below.



Synergy Controller is set to the IP Address as shown below.



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

