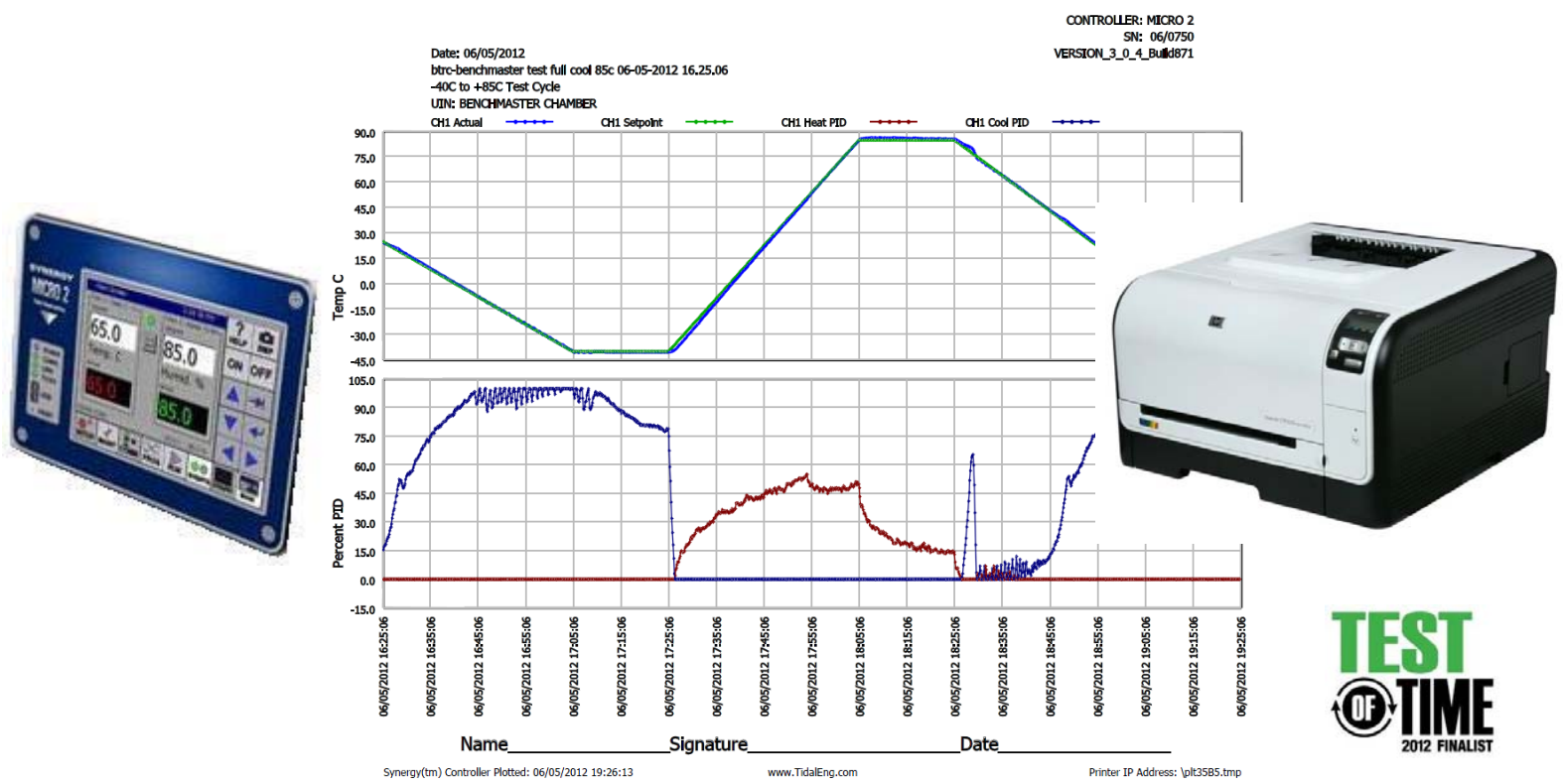
Synergy Controller Network Plotting



Introduction

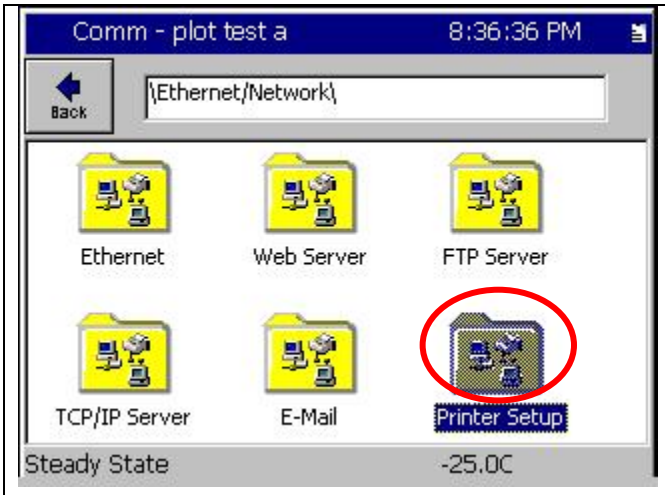
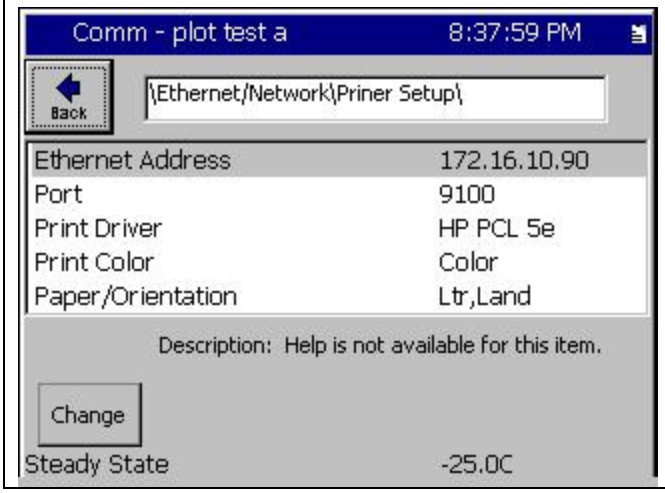
The Synergy environmental test chamber controller family provides an innovative and expanding set of features for organizations doing environmental testing in Medical, Defense, Automotive, Aerospace, and Semiconductor industries.

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. See Synergy Controller Application Note 84 for e-mail setup and examples.

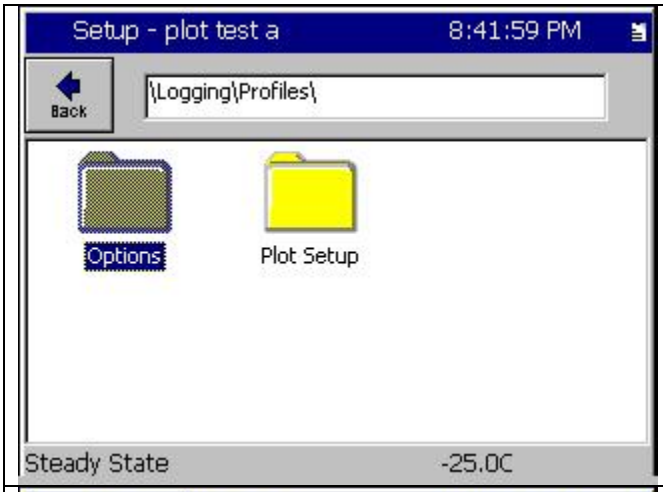
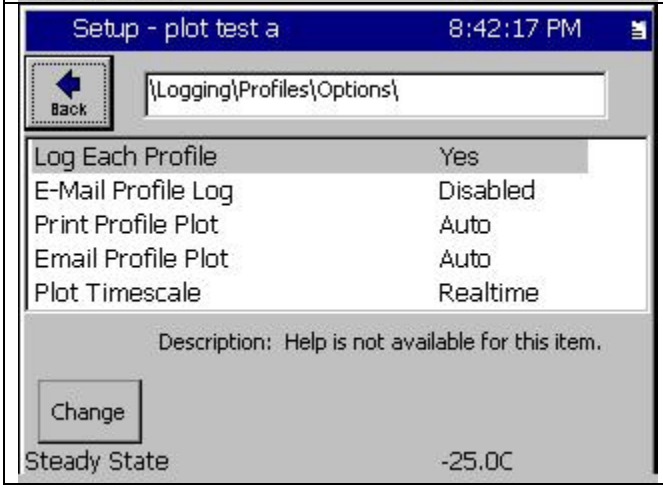
The Synergy Controller is designed to send plots to an HPCL capable printer with an Ethernet port such as the HP LaserJet Pro CP1525nw used in this example. The HP LaserJet Pro CP1525nw is a workgroup color printer that prints up to 12 ppm, with a resolution of 600 x 600 dpi.

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.

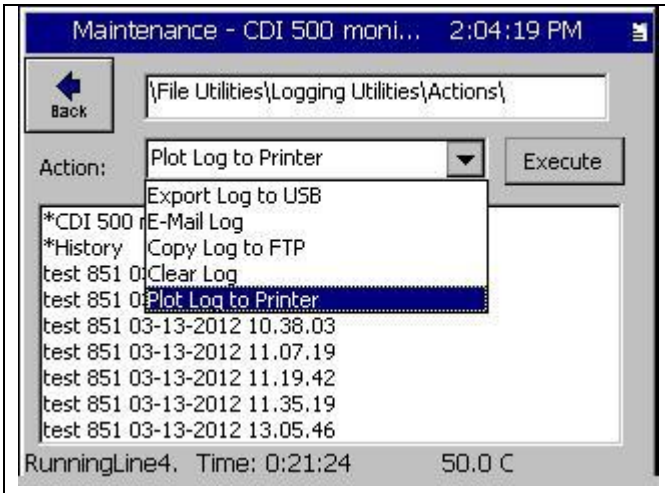
To Setup the controller and the printer follow these steps:

	Open up the Synergy Controller **Comm** screen and browse to the **Printer Setup** folder as shown at the left.
	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. To manually assign the address(Static IP), see Appendix A The **Print Color** parameter can be B/W or Color. Note that the Printer Port, Printer Driver, Paper, and Paper Orientation parameters are fixed as shown on the left.

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

	Open the **Setup\Logging\Profiles\Options** folder.
	In the **Setup\Logging\Profiles\Options** folder at left. Set **Log Each Profile** to Yes, Set **Print Profile Plot** to Auto or Yes, Select **Realtime** or **Relative Plot Timescale** option as required. Note: See examples of both the Realtime and Relative Plot Timescale options at the end of this application note.

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

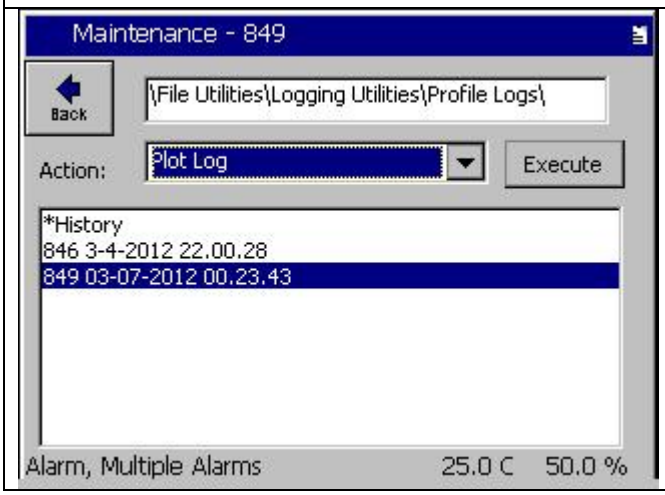


The Profile Log files generated during each test can be plotted, e-mailed, and cleared as follows:

Open the Maintenance screen, browse to the File Utilities\Logging Utilities\Actions\ folder as shown at left.

Select the **Action** from the Action Drop Down:

1. Export Log to USB (Memory Stick).
2. E-Mail Log (Note 1)
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

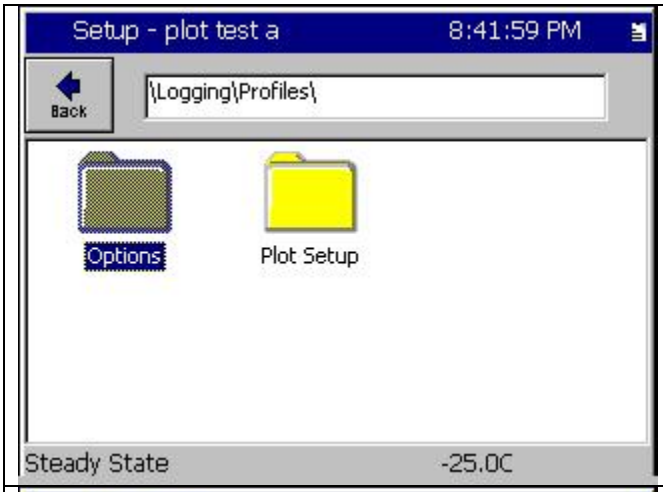
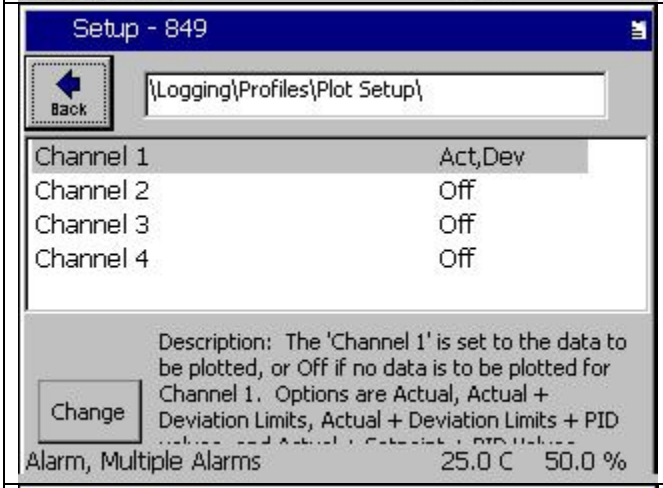


The Synergy Controller can be set to automatically trigger a plot to the printer after each test as described above. In addition, plots can be triggered manually from the Maintenance screen as shown at left.

1. Select **Plot Log** in the **Action** window
2. Select the Profile Log from the list.
3. Press the **Execute** button**.**

Note 1: See Synergy Controller Application Note 84 for e-mail setup and examples.

Selecting the Channel and Plot Series

	Open the **Setup\Logging\Profiles\Plot Setup** folder to choose the data as follows:
	Choose the plot data for each channel in the **Plot Setup** folder as shown on the left. **Act** is the Actual Value (AKA Process Variable) **Dev** enables the Deviation Limits for the channel. Note that each channel prints on a separate sheet. In the example on the left, Channel 1 Actual (Process Variable) and Channel 1 Deviation Limits are selected.
	When the Deviation Limits are plotted, the High Deviation and Low Deviation limits are calculated with respect to the Setpoint. The +5 Degree C and -5 Degree C limits setup on the left are plotted in the example below.

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.

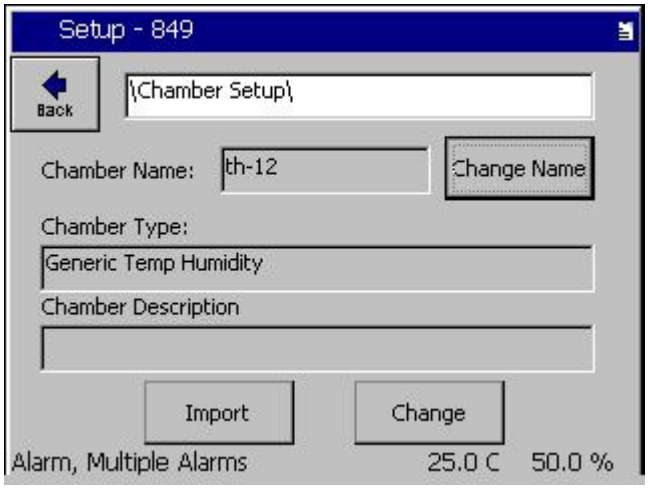
Headers are organized in three columns to accommodate a standard three-hole-punch so the plots can be conveniently stored in a binder. These annotations can be loaded on the controller from a text file using the File Utilities screen.

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.

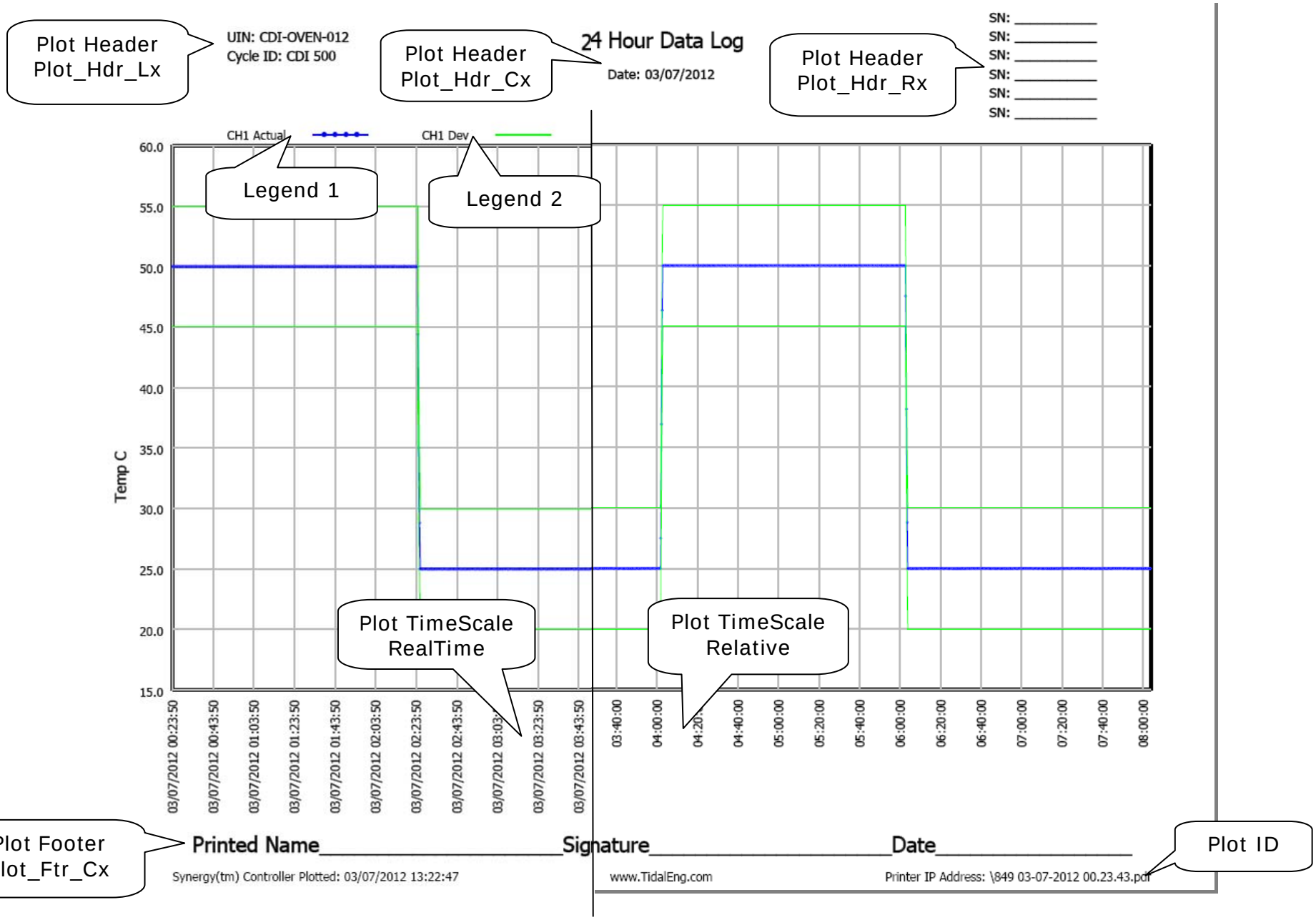
Macro	Description	Example
%%STARTTIME%%	This macro is replaced by the test start time of day: HH:MM:SS. Note time is displayed in 24 Hr. format	13:12:55
%%STOPTIME%%	This macro is replaced by the test stop time of day: HH:MM:SS	13:12:55
%%STARTDATE%%	This macro is replaced by the test start day: MM-DD-YYYY	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_____"
```

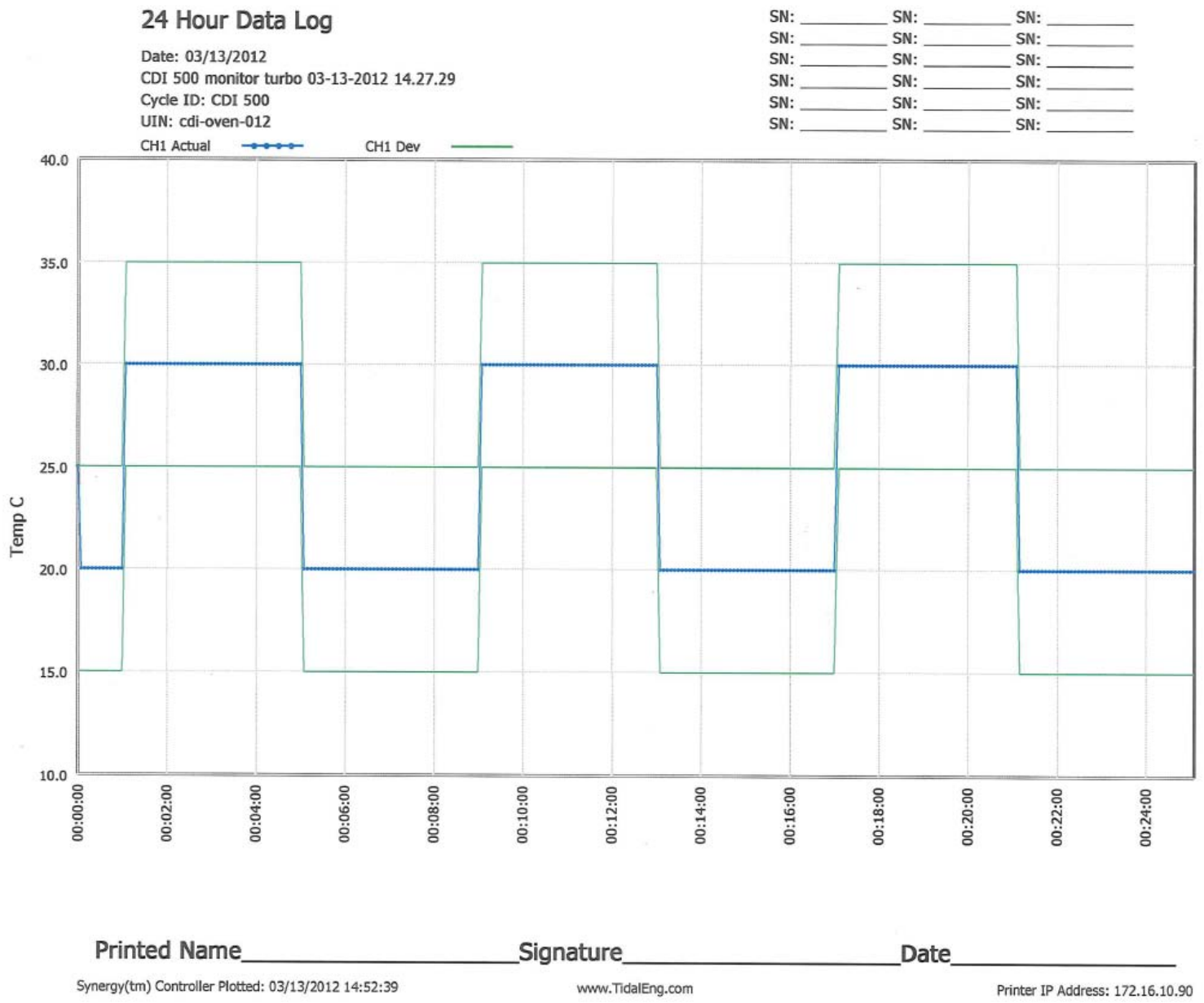
See Example 1 file: "Terumo Plot Annotations A.cfg plotted on the next page


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: _____
SN: _____
CH1 Actual
CH1 Dev
Legend 1
Legend 2
Temp C
60.0
55.0
50.0
45.0
40.0
35.0
30.0
25.0
20.0
15.0
Plot TimeScale
RealTime
Plot TimeScale
Relative
03/07/2012 00:23:50
03/07/2012 00:43:50
03/07/2012 01:03:50
03/07/2012 01:23:50
03/07/2012 01:43:50
03/07/2012 02:03:50
03/07/2012 02:23:50
03/07/2012 02:43:50
03/07/2012 03:03:
03/07/2012 03:23:50
03/07/2012 03:43:50
03:40:00
04:00:00
04:20:
04:40:00
05:00:00
05:20:00
05:40:00
06:00:00
06:20:00
06:40:00
07:00:00
07:20:00
07:40:00
08:00:00
Plot Footer
Plot_Ftr_Cx
Printed Name_____Signature_____Date_____
Synergy(tm) Controller Plotted: 03/07/2012 13:22:47
www.TidalEng.com
Printer IP Address: \849 03-07-2012 00.23.43.pdf
Plot ID

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: _____
SN: _____ SN: _____ SN: _____
SN: _____ SN: _____ SN: _____
SN: _____ SN: _____ SN: _____
SN: _____ SN: _____ SN: _____
CH1 Actual
CH1 Dev
Temp C
40.0
35.0
30.0
25.0
20.0
15.0
10.0
00:00:00
00:02:00
00:04:00
00:06:00
00:08:00
00:10:00
00:12:00
00:14:00
00:16:00
00:18:00
00:20:00
00:22:00
00:24:00
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.

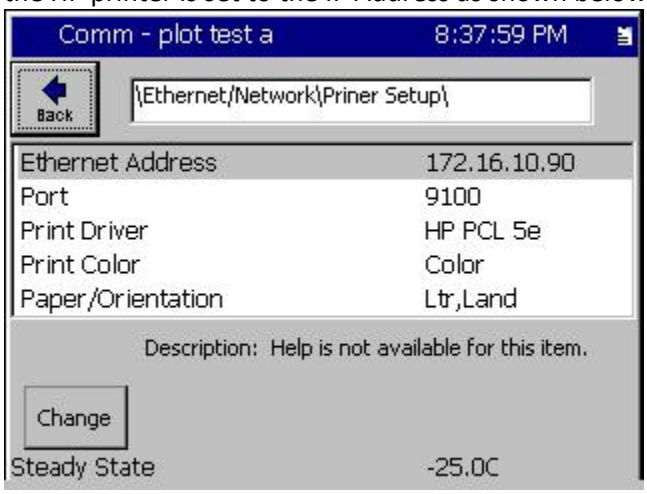
3. Use the arrow buttons to select the TCP/IP configuration option and then press the OK button.

4. Use the arrow buttons to select the Manual option and then press the OK button.

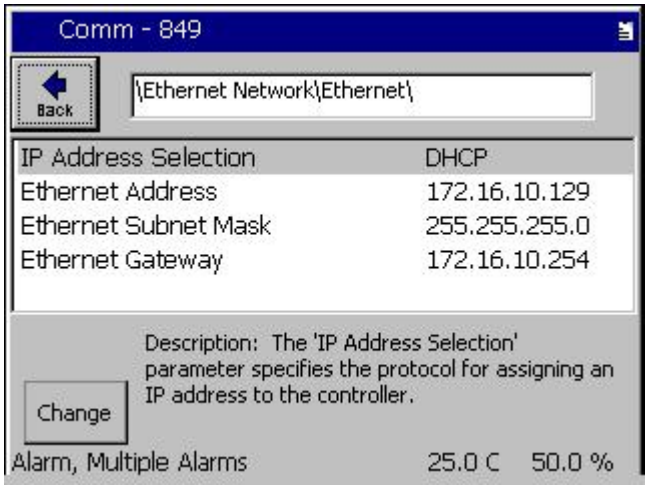
5. Use the alphanumeric buttons to type the IP address and then press the OK button.

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