User Manual

PHT Series

PHT Series Manual Version 1.0

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Table of Contents

⚠WARNING **Read through entire manual before installing, operating, or servicing this unit.** Failure to follow any steps or guidelines could result in personal injury, death, destruction of property or may cause the unit to become inoperable. **This manual must be kept with the unit at all times**.

Safety Guidelines

Precautions

Do not operate unit if it or any of its parts:

• Have been expose to fire.

• Have been submerged in water or exposed to flooding.

• Have significant interior or exterior damage.

In the case of any of the above, have the unit serviced by a qualified professional before continuing operation.

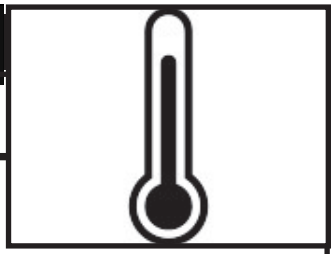
Electrical Grounding

Unit must be grounded.

Failure to ground will result in unreliable preformance or an inoperative unit. Ground by connecting unit to a grounded metal, permanent wiring system. Grounding must be in accordance with national and local electrical codes. Please contact your municipal offices for more information on building codes.

⚠WARNING

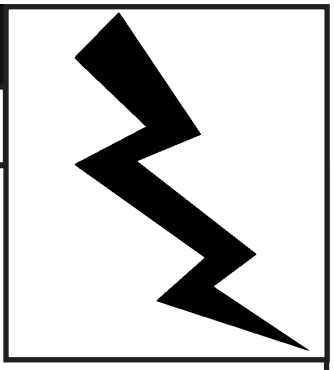
High Temperatures!



• Kiln chamber can reach internal temperatures of over 90°F. working in these temperatures can cause heat stroke and minor burns.
• Pregnant women, children, the elderly and those with significant health issues are at higher risk of heat stroke and must be supervised in high temperatures.
• Kiln operators should check for temperature and take proper safety precautions before entering the kiln chamber.

⚠WARNING

Electrical Shock!



• **Turn off power to unit before service.**
• Make sure wires are labeled before disconnecting.
• Test unit after reconnecting wires.
• Failure to do the above could result in death or injury.

⚠WARNING

Explosion Hazard!

• DO NOT purge or pressurize this system with oxygen to test for leakage. Using oxygen may cause explosive reaction.

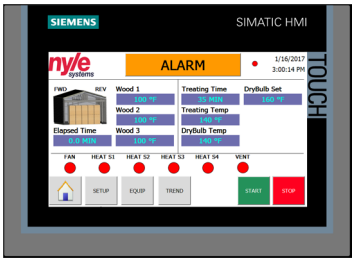
General Control Information

PLC Modules

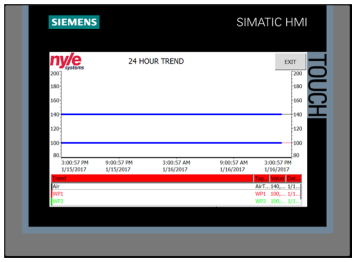
The PHT advanced control system uses a Siemens based S7-1200 PLC controller with built-in ethernet switch, 24VDC power supply and RTD based temperature module. The PLC also contains the proprietary Siemens S7 data card and is used to store data logs for each kiln cycle. The data logs are accessible via a LAN connection through the built-in web server that runs on the PLC. The S7 data card also is used to store the run time program necessary to operate the kiln.

HMI Touch Screen Interface

The PHT advanced control system uses a color touch screen control as the main interface for operating the kiln chamber. The HMI touch screen is capable of preforming all kiln operations including managing schedules, setting up data logs, reading trends, monitoring status and more.



Main Screen



Trend Screen

Web Server and Remote Access

The PHT advanced control offers a state of the art web server control. Many PLCs offer a web server, but with the PHT, full control capabilities are also enabled. Kiln operators can use the built in web server to monitor all kiln conditions on any kiln that is connected to the LAN. With very little effort, this web server can also be accessed via the web on cell phones or home computers.

Each kiln is accessible via IP address which is typically assigned in the factory. For information on changing the default IP addresses or help with port forwarding please call Nyle at 800-777-6953.

Example IP addresses for kiln are 192.168.1.63 for the PLC and 192.168.1.64 for the HMI interface.

Starting a Typical Cycle

1. Start at the Home Screen

2. Choose SETUP --> Lot ID --> Enter a new unique name (alpha numerical only) --> Press enter

3. Choose Set Points --> Enter control value set points

4. Choose HOME --> EQUIP --> Set each piece of equipment to the AUTO position

5. Choose HOME --> Choose START to begin cycle

Home Screen

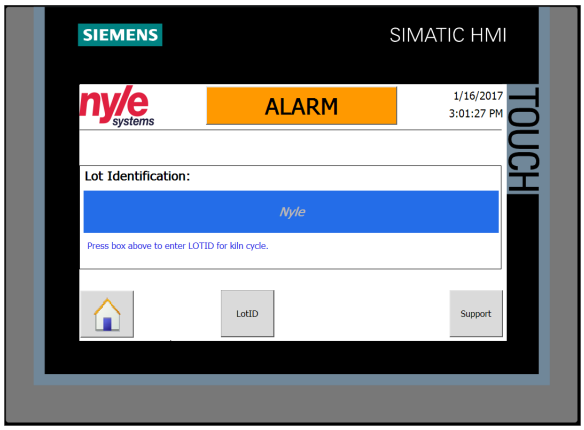
The home screen is the first screen on the HMI control. You may return to the home screen at any point by simply pressing on the button that looks like a "home". The home screen is used to display the current temperatures / conditions inside the kiln, current Lot ID, and cycle status. The home screen is also the only screen capable of starting or stopping the kiln cycle. From the home screen the operator can navigate to the other 3 branches inside the control layout.

Setup Screens

The setup screen structure is split into two individual sections: Lot ID and Support.

The **Support** section is a helpful interface for viewing what is happening with your kiln. On this screen, displayed is each wood probes current temperature and the air and wet bulb temperature. Below is the Emergency stop safety and Blower safety which is displayed by either a red light meaning it is off or a green light meaning it is on. Next to those are heat call, vent call, and fan call. These are also displayed by either a red light meaning it is off or a green light meaning it is on.

The **Lot ID** section is a simple interface for entering a unique ID for data logging. Letter and numbers are the only characters allowed to be entered in the text box. Make sure to press the return key after entering a Lot ID and verify the change at the top of the interface screen.



Data Logging

Starting a Data Log

Logging data with the PHT control is simple. Just by entering a Lot ID and pressing the start button automatically begins the data logging process. The control is capable of storing up to 2 complete cycle logs in most cases. Once the data log storage space has been filled up on the PLC, an operator message will appear requiring the download and clearing of the logs through the retrieval system.

A log bypass option is available if the data log is not required. To access this operation press "SETUP" and afterwards "SUPPORT". This operator screen will display all system real time data and the log bypass button. Press the log bypass button to disable the data log function.

Retrieving a Data Log

All data logs are stored on the PLC memory card as a .CSV data log file. To obtain the data logs the kiln operator may either log into the PLC via the web interface or pull the SD card and copy over the files to a computer.

To retrieve the data through the web interface, enter the IP address of the connected PLC into a web browser connected to the same local area network. Click "ENTER" to proceed into the default Siemens web interface. Login using supplied login from Nyle Systems. Click on "DATA LOGS" to view, download and clear the data logs stored on the PLC. Each log file will have the same name as the LOT ID that was entered when starting the kiln cycle.

Sequence of Operations

System Cycle

1. If the probes meet the treating temperature, it will start counting down.
2. When the sterilization timer reaches zero, the heat will turn off.
3. If extra time is desired, it can be entered in on the support screen during the cycle and it will count down.
4. If VentAfterTreat is true, open vents after the sterilization timer reaches zero.

Heat Logic

1. If chamber temperature gets lower than the chamber temperature set point, heat until the chamber temperature is higher than chamber temperature set point.

Vent Logic

1. If chamber temperature gets 10 degrees higher than the set point, the vents open until the chamber temperature is equal to the chamber set point.
2. Optionally, if activated in the configuration control screen, vents open if wet bulb goes higher than the wet bulb set point.

Data Logs

1. In cycle records air temperature, wood probes 1-3, treating temperature set point, and chamber temperature.
2. Records every minute.
3. Stores to SD card.
4. On Cycle start prompts user if they want to start on the same log or increment the postfix number by one.

System Information

Standard I/O Configuration

INPUTS	OUTPUTS	ANALOG IN
0.0 - ESTOP	0.0 - FAN	0 - 96 - RAW AIR
0.1 - FAN OVERLOAD	0.3 - STAGE 1	1 - 98 - RAW WP1
0.2 - HIGH LIMIT 1	0.4 - STAGE 2	2 - 100 - RAW WP2
0.3 - HIGH LIMIT 2	0.5 - STAGE 3	3 - 102 - RAW WP3
0.4 - BURNER FAULT 1	0.6 - STAGE 4	4 - 80 - RAW WB
0.5 - BURNER FAULT 2	0.7 - VENT	
0.6 - BURNER FAULT 3	1.0 - FAULT LIGHT	
0.7 - BURNER FAULT 4		
1.3 - CONFIG SAFETY		
1.4 - SIM SAFETY		

Alarms

0 - OK	N/A
1 - Fan Overload	Fan Overloaded
	Contactor Signal
2 - Burner Fault 1	Burner Malfunction
	Check heater control 1
3 - Burner Fault 2	Burner Malfunction
	Check heater control 2
4 - Burner Fault 3	Burner Malfunction
	Check heater control 3
5 - Burner Fault 4	Burner Malfunction
	Check heater control 4
6 - Hi Limit 1	Burners 1 and 2 Critical Temperature
7 - Hi Limit 2	Burners 3 and 4 Critical Temperature

Service Log

Issue Description	Date	Servicer