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

- Have been exposed to fire.
- Have been submerged in water or exposed to flooding.
- Have significant interior or exterior damage.

**Electrical Grounding**

Unit must be grounded.

Failure to ground will result in unreliable performance 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.
Screen Outlines

Kiln Dry

Kiln Dry Start up Screen

Kiln Dry Root Screen

Kiln Dry Additional Setup Screen

Temp Screen

Support Screen

Probe Screen
Heat Treat

Heat Treat Start up Screen

Heat Treat Root Screen

Heat Treat Additional Setup Screen

Temp Screen

Support Screen

Probe Screen
Getting Started

Your kiln control system includes screens for startup, configuration, and monitoring.

Start up Screen

The Start up Screen is the default screen displayed when the kiln is powered on. This screen is used prior to starting the kiln for initial configuration. Nyle Presets the default setting for the purchased application. Check with local and state agencies to verify the default settings meet or exceed the requirement for heat treating in your area.

Follow the steps below to get your kiln started.

1. Enter Log File Name

The default log file name is: Nyle. This is provided to ensure logs are always captured during initial start up of the kiln. This should be set to a unique value for any kiln cycle run for certification and data archival purposes. When entering the name be sure to only use numbers and letters, other keyboards values will fault the log system.

2. Select the Mode of Operation

The button will turn green when selected. The input values on the right hand side will changes as well to match the selected mode.

Kiln Dry Mode: Configures the kiln to dry using only the Dry and Wet bulb set points.

Heat Treat Mode: Configured the kiln to heat treat using wood probe temperature and time once the probe set-point is reached.

3. Additional Setup

Depending on the mode previously set, enter set-points to change the defaults as required. The Additional Setup button will provide additional configuration during kiln mode for heat, vents, and fan direction if equipped. When Heat Treat Mode is set it will allow the user to set extra drying time, cool down time to the cycle, as well as the wet bulb set for vent operation if required.

4.

I.) Press the finish button and you will move to the Home Status Screen of the selected mode.

II.) Verify the required settings for the cycle are set. If correct proceed, otherwise press the setup button to go back to the start up screen.

III.) Press the start button

5.

Monitor to verify the cycle is treating or drying as intended using the Home Screen, Trends, and the Data Logs. If using Kiln Drying Mode the user will need to manually end the cycle as needed. Heat Treating Mode automatically advances to extra dry and cooling modes if enabled and ends the cycle once conditions are reached.
General Control Information

PLC Modules

The advanced control system uses a PLC controller with a built-in Ethernet switch, 24VDC power supply, and a RTD based temperature module. The HMI contains an SD data card and is used to store data logs for each cycle. The data logs are accessible via a LAN connection.

Touch Screen Interface

The advanced control system uses a color touch screen as a main interface for operating the kiln chamber. The touch screen is capable of performing kiln operations including: data logs, reading trends, and monitoring status.

Web Server and Remote Access

The advanced control offers a VNC server control with full control capabilities enabled. Kiln operators can use the built in VNC server to monitor all kiln conditions on any kiln that is connected to the LAN. This VNC server can, with very little effort, be accessed via the web on cell phones and remote computers.

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

Example kiln IP addresses are:
- For the PLC: 192.168.1.60
- For the interface: 192.168.1.61

Root Screen

The Root Screen is the home status screen for the mode you choose. From the Root Screen you can use the Root screen to access the Setup, Support, Probe, and Temperature screens. The Root screen displays current temperatures/conditions inside the kiln and cycle status. The Root screen is also the only screen capable of starting or stopping the kiln cycle.

Start Up Screen

The Start Up Screen is used for the setup of the cycle. From the Start up screen you can select your drying mode, create the data log file, as well as set up the general parameters for the cycle.

Additional Setup Screen

The Additional Setup Screen is where users go to setup their drying cycle. Through the Additional Setup Screen a kiln operator can control the Heat, Fan, and Vent controls. Extra Drying and Cool Down Cycle modes can controlled from this screen if enabled. The controlling dry bulb, dry bulb set-point, controlling wet bulb and wet bulb set-point are also displayed on this page at the bottom. To go back to the home page, click the home button.
Support Screen
The **Support** screen is a helpful interface for viewing what is happening with your kiln. On this screen, displayed is each wood probes current temperature and the dry bulb and wet bulb temperature. To the left is the Emergency stop safety and Airflow 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 blower call. These are also displayed by either a red light meaning it is off or a green light meaning it is on.

Trend Screens
The **Trend** screens are the Probes and Temp Screens accessed through the Root screen. In these screens, the user can see real time data logging. This data logs the dry bulb, wet bulb, and each wood probe. The user can print the data log by simply pressing the print button after the printer is configured to work with the HMI.

Alarm Screen
When the kiln encounters a fault it will trigger an alarm. The alarm screen lists out all of the faults and their status. These are also displayed by either a red light meaning the fault had been triggered or a green light meaning it has not been triggered.

**Alarm Fault Codes**

<table>
<thead>
<tr>
<th>Fault</th>
<th>Display</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fan Fault 1</td>
<td>Fan Overloaded</td>
</tr>
<tr>
<td>Blower Overload</td>
<td>Blower Overloaded</td>
</tr>
<tr>
<td>Burner Fault 1</td>
<td>Burner Malfunction</td>
</tr>
<tr>
<td>Burner Fault 2</td>
<td>Check Heater Control 1</td>
</tr>
<tr>
<td>Burner Fault 3</td>
<td>Burner Malfunction</td>
</tr>
<tr>
<td>Burner Fault 4</td>
<td>Check Heater Control 3</td>
</tr>
<tr>
<td>Hi Limit 1</td>
<td>Burner 1 and 2 Critical Temperature</td>
</tr>
<tr>
<td>Hi Limit 2</td>
<td>Burner 3 and 4 Critical Temperature</td>
</tr>
</tbody>
</table>

System Information

**USDA Requirements**

See Below for Typical USDA Requirements for Drying

**State Requirements may differ**

**Pallet Heat Treating**
Internal Probe Temperature of 140°F for 40 Minutes

**Firewood Heat Treating**
Internal Probe Temperature of 160°F for 75 Minutes
### Sequence of Operations

**Remote Access**

1. First, the user needs to make sure the unit is on the same network as the device or devices that the user wants to use the remote access feature with. To get the unit Online, run an Ethernet cable that is plugged into your network to the unit’s PLC. Plug the Ethernet cable into the bottom left corner of the PLC. There will be one Ethernet cable already plugged in. Plug the Ethernet cable in next to the one already plugged in, this will connect the unit to the LAN. The HMI screen will be configured to use remote access when shipped. However, if you need to setup remote access on the HMI screen, follow the steps below.

2. **Setting up Remote Access on HMI**

   - Once you have a program downloaded to the HMI and it is ready to setup, go into the control menu by pressing the top right corner of the screen on the clock.

### Data Logs

#### Heat Logic

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

2. Optionally, if activated in the configuration control screen, vents will open if wet bulb goes higher than the wet bulb set point.

#### Data Logs

1. In cycle records air temperature, wood probes, treating temperature set point, and chamber temperature.

2. Records every minute

3. Stores to Flash Drive

### Retrieving a Data Log

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

To retrieve the data through the web interface, enter the IP address of the connected HMI into a web browser connected to the same local area network. Click “ENTER” to proceed into the default web interface. Login using supplied login from Nyle Systems. Click on “DATA LOGS” to view, download, and clear the data logs stored on the HMI. Each log file will have the same name as the LOG FILE NAME 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 set time the kiln will advance to the next mode if enabled.

3. If Vent After Treat is true, vents will open after the sterilization timer reaches set time

---

### Data Logging

**Starting a Data Log**

Logging data with the control is simple. The control is capable of storing up to 25 complete cycle logs in most cases. Once the data storage space has been filled up on the HMI, an operator message will appear requiring the download and clearing of the logs through the retrieval system. The HMI will automatically save data logs every time the unit is in cycle.
2. When you are in the control menu, click on WinCC. Choose remote and change the settings.

3. Choose the password one box and set the password to 100. Apply and choose yes.

4. Check the box that reads start automatically.

5. Press the start button and press OK. You will now be able to remote access to this HMI.

Setting up Remote Access with VNC Viewer

To remote into the HMI screen from another device the user will need to install a program called VNC Viewer. The link for this program is posted below.


After VNC Viewer is installed, the user will need to set-up a connection to the HMI screen in the search bar at the top of the window in VNC Viewer. The search bar will read Enter a VNC Search Address or search. This is where the user will enter the IP address and press enter.

When the enter key is pressed, a window will pop up asking for a password. The password will always be 100.

Type in 100 and then press OK or enter. This will bring up the same screen that is displayed on the HMI screen and the user will be able to monitor or change values as the user would be able to on the HMI screen.
INPUTS CONT'D

- TBI- SET 0 PLC 1.3
- TBI- SET 1 PLC 1.1
- TBI- SET 2 PLC 1.2
- TBI- SET 3 PLC 1.3
- TBI- SIM PLC 1.4
- TBI- FAN FAULT PLC 1.3

OUTPUTS

SLICE RELAY

- TBI- PLC 3 H.C.C./ H.S. 1
- TBI- PLC 1 F.R.C.C.
- TBI- PLC 2 F.R.C.C.
- TBI- PLC 3 B.C.C.
- TBI- PLC 4 HS 2
- TBI- PLC 5 HS 3
- TBI- PLC 6 HS 4
- TBI- V.R.C.
Output Wiring

SLICE RELAYS

PLC 0.0

H.C.C. / HS1
A1
A2

PLC 0.1

F.F.C.C.
A1
A2

PLC 0.2

F.R.C.C.
A1
A2

PLC 0.3

B.C.C.
A1
A2

PLC 0.4

V.R.C.
A1
A2

PLC 0.5

HS2
A1
A2

PLC 0.6

HS3
A1
A2

PLC 0.7

HS4
A1
A2

L1

PLC 1L

2L

PLC

4-20 mA ANALOG OPTIONS
VENT AND HEAT OPTIONS

PLC

AQ0

OR

AQ0 VENTS

AQ1

YEL

AQ1 HEAT

COM + POWER

RJ45

PLC

WB

TB3

5

BLU

A

4

RED

B

L+

RED

L+

M

L+

M

OUTPUT WIRING

NYLE SYSTEMS

TITLE

OUTPUT WIRING

PART NUMBER

REV

1.0

FILE NAME

NTS

SCALE

SHEET
RTD Wiring

RTD SENSOR INPUTS

LG 46

CN1
1
2
3

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LG 46

CN1
4
5
6

---

LG 46

CN1
7
8

---

LG 46

CN2
1
2
3
4

---

LG 46

CN2
5
6
7

---

WET BULB SENSOR

WOOD PROBE SENSOR #1

WOOD PROBE SENSOR #2

WOOD PROBE SENSOR #3
Burner Wiring 3

BURNER #3

Note: If Customer safety interlocks provided, wire in series with heat enable

Models: HDA/HDB500-600
HMA/HMB500-600

Customer provided Components
Customer / Field Wiring
Internal Terminal Connection

Timer Relay - TR1-496L/H15
External Terminal Connection
Tri Terminal Connection
(2) 2nd Rollout Switch on Horizontal Burner Tray Only

Capacity Controls – 3 Series Ignition Control

DRAWN BY
DRAW FILE NAME
TITLE
SCALE

NTS 5 OF 6
**INSTALLATION NOTES**

- Actuators may be connected in parallel. Power consumption and input impedance must be observed.
- Actuators may also be powered by 24 VDC.
- A 500 Ω resistor (ZG-R01) converts the 4 to 20 mA control signal to 2 to 10 VDC.
- Control signal may be pulsed from either the Hot (Source) or Common (Sink) 24 VAC line.
- For triac sink the common connection from the actuator must be connected to the hot connection of the controller. Contact closures A & B also can be triacs. A & B should both be closed for the triac source and open for triac sink.
- Actuators with plenum cable do not have numbers; use color codes instead.

---

**Legend**

- F.F.C.C. - FANS FORWARD CONTACT COIL
- F.R.C.C. - FANS REVERSE CONTACT COIL

---

**Diagram:**

- **ON/OFF**
- **FRONT VENTS**
- **50VA TRANS**
- **120 V**
- **24 V**
- **VENTS ACTUATOR MOTOR**
- **REAR VENTS**
<table>
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<th>Issue Description</th>
<th>Date</th>
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