SMART TOUCH MANUAL FOR HOPPER BANKS

Edition 1.4.3

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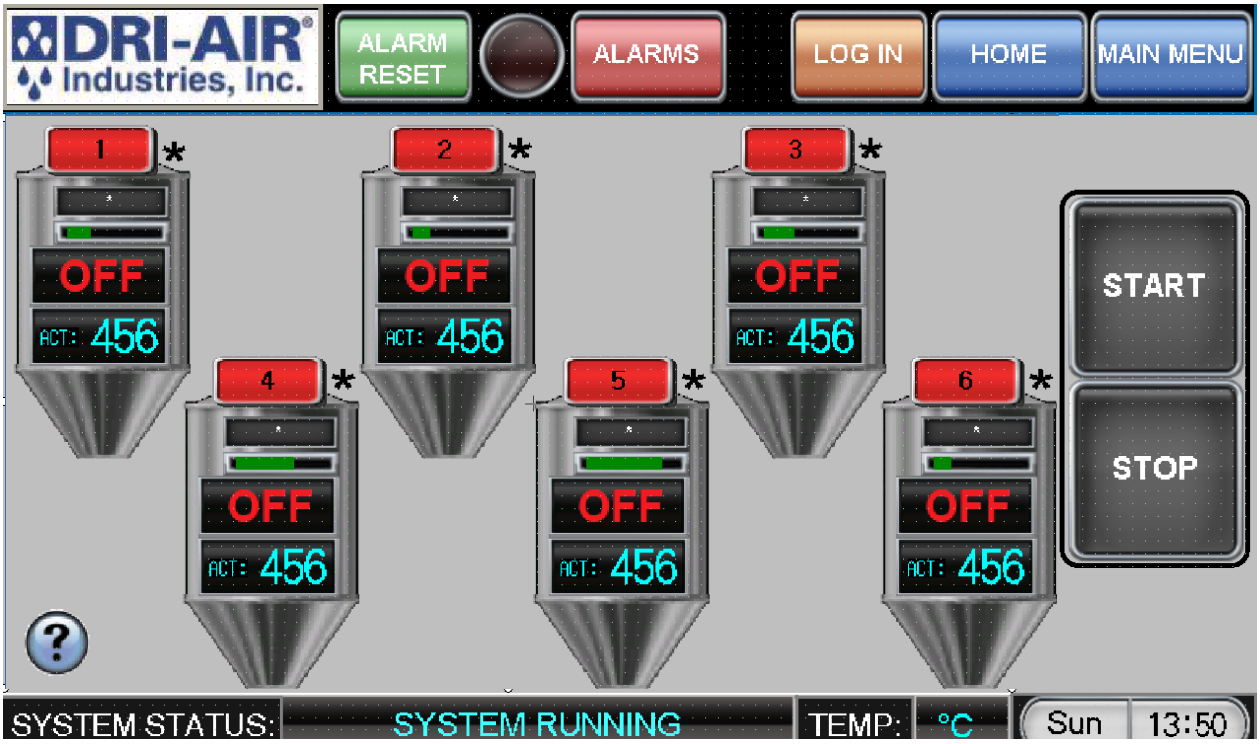
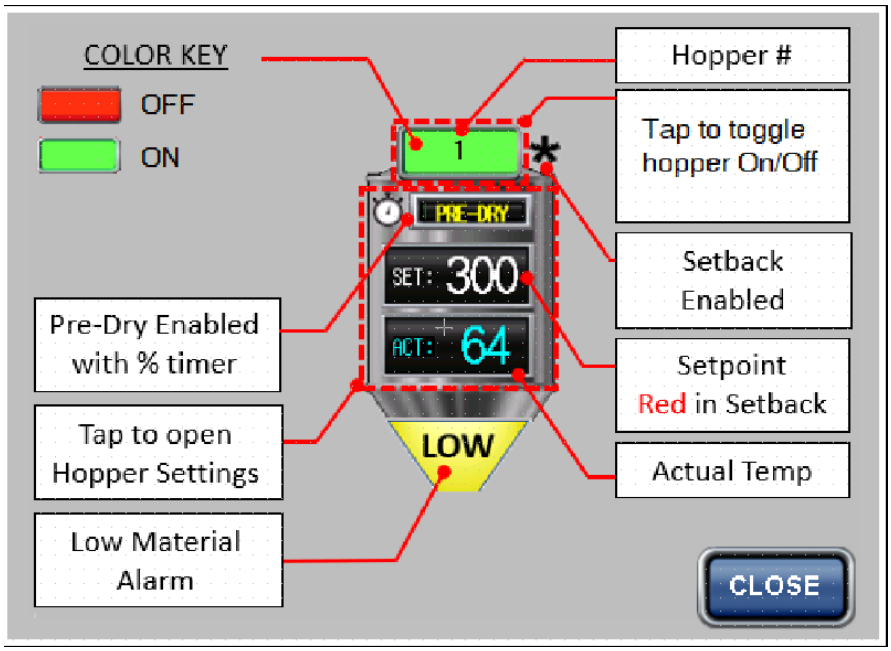
MAIN OPERATING SCREEN



The operating screen displays all of the dryer performance information in an easy-to-read format visible from a long distance. The large STOP/START button is incorporated into the screen rather than being located remotely.

All common operator inputs are located on this main screen including starting and stopping the hoppers and temperature changes. The asterisk (next to the setpoint) indicates the setback function is tuned on. The setpoint temperature numbers change to red when the dryer is in setback.

HOPPER BANK BASICS



Hopper Status:

The hopper status can be determined very easily by the color of the button above the hopper icon. If the button above the icon is red, then the hopper is off. If the button above the hopper icon is green.

Turn on a hopper:

There are two easy ways to turn a hopper on and off. The first is to press the red button above the hopper icon. If the button is red, the hopper is off. Press the button and it will turn green which is on. An alternative way is to press the red OFF. This will allow you to access the hopper settings screen below. Press the sliding on/off switch to toggle the hopper on or off.

Change drying temperature:

To change the process temperature from the HOME screen, press the SETPOINT number on the hopper icon display. Select the new temperature setting and press ENT.

Low Material Alarm:

An option that can be purchased with a dryer is the low material alarm. This is a proximity switch sensor installed on rods as part of the hopper level window on the side of the hopper. When the level of the material goes below the proximity switch, the switch will turn on and send a signal to the controls to alert all personnel that the hopper material is low. This can be due to hopper loader malfunction, the wand to the hopper loader is no longer in the material, or the hopper loader itself is off. Once the level of the material is replenished, the alarm will disappear.

Pre-Dry Timer:

With a hopper bank system, there are multiple hoppers to monitor drying times. Each hopper has a timer that indicates how long the hopper has been on and drying the material. An operator can select the Pre-Dry Timer to alert when the hopper has reached a particular drying time. For example, if the operator wanted to dry the material in Hopper 1 for 3 hours before using the material, the Pre-Dry Timer would be set for 3 hours. During the first 3 hours, the PRE-DRY will appear on the hopper icon and a slide gauge will appear indicating where the hopper is in the first 3 hours process. Once the 3 hours are complete, the indicator will change to DRY and the material is now ready to use. If the hopper is turned off, the timer will reset back to 0 and will restart once the hopper is turned on.

Temperature Setback:

In order to prevent over drying material, there is a feature called Temperature setback that allows the dryer to automatically lower the process temperature of each hopper after the hopper has come up to temperature. If an asterisk appears to the right of the hopper button, that means that the option is turned on. If the SETPOINT is in red, it is an indication that the hopper is actively in temperature setback. For details of temperature setback, please go to the setback section of the manual.

MAIN MENU SCREEN

In order to access any parameters for the hopper bank, you must first press the MAIN MENU button in the upper right hand corner of the HOME SCREEN.

The MAIN MENU will appear which allows you to access the many features of the SmartTouch Controls. (Some buttons will not appear as they are password protected for higher level programming).

RECIPES

Instead of setting the drying hopper setpoint everytime, using a configurable master recipe screen can make it easier to set drying temperatures per hopper based off names such as the material tradenames or names such as the tool/job name.

To change the name of the recipe or any other designation you prefer and the temperature, press the section to change and a screen will appear to make the changes. The **NEXT MENU** button is the second page for this selection.

Press the desired hopper button on the left to select the hopper you would like to set. Next, locate the desired material or name and the temperature setpoint of that material. Press the SELECT button and it will be activate that temperature for the hopper.

HOPPER SETUP
7 DAY TIMER

The 7-Day Timer tab allows the user to set one start and one stop time per day for each hopper.

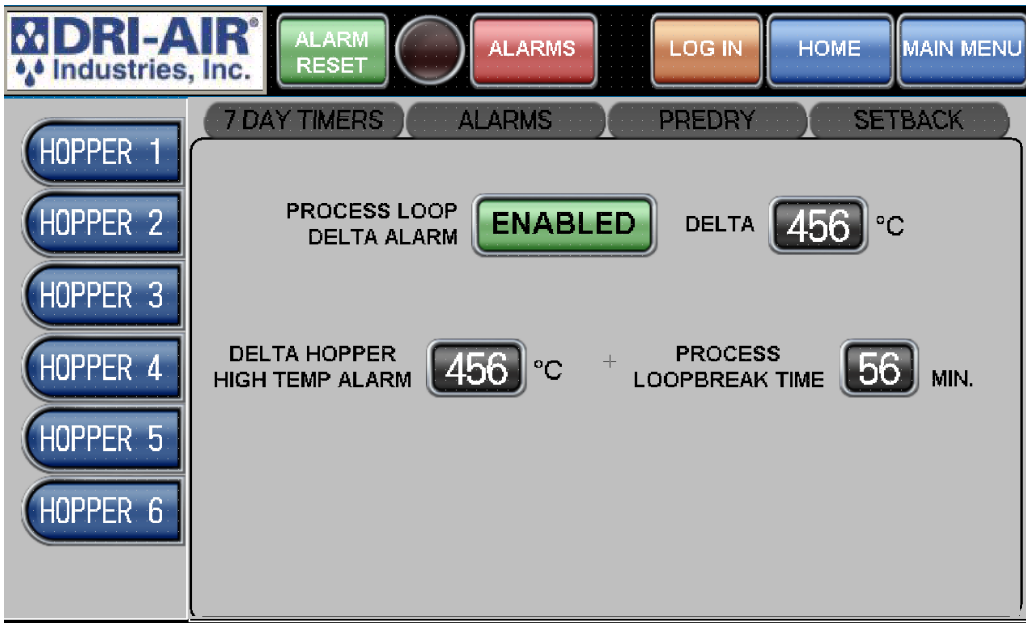
Before setting the times into the schedule, check to verify the actual time matches the time set into the dryer as shown in the upper left hand corner.

If the time is incorrect, press the hours, minutes, or seconds display and make the correction from the keypad that will be displayed.

To enter a start or stop time, press the time box on the day selected and a keypad will be displayed to make the entry desired. Note that 99 in the hour field turns off the time for that setting. All times are displayed in military time where the day is 24 hours. For 8:00 AM set 0800 and for 4:00 PM set 1600, settable 00:00 to 23:59. Then press Disabled button to Enable. You may also disable any day independently with the disabled button.

Each hopper is allowed a start time and stop time per day. The 7 day timer will only operate if the dryer for the hopper bank is running.

ALARMS

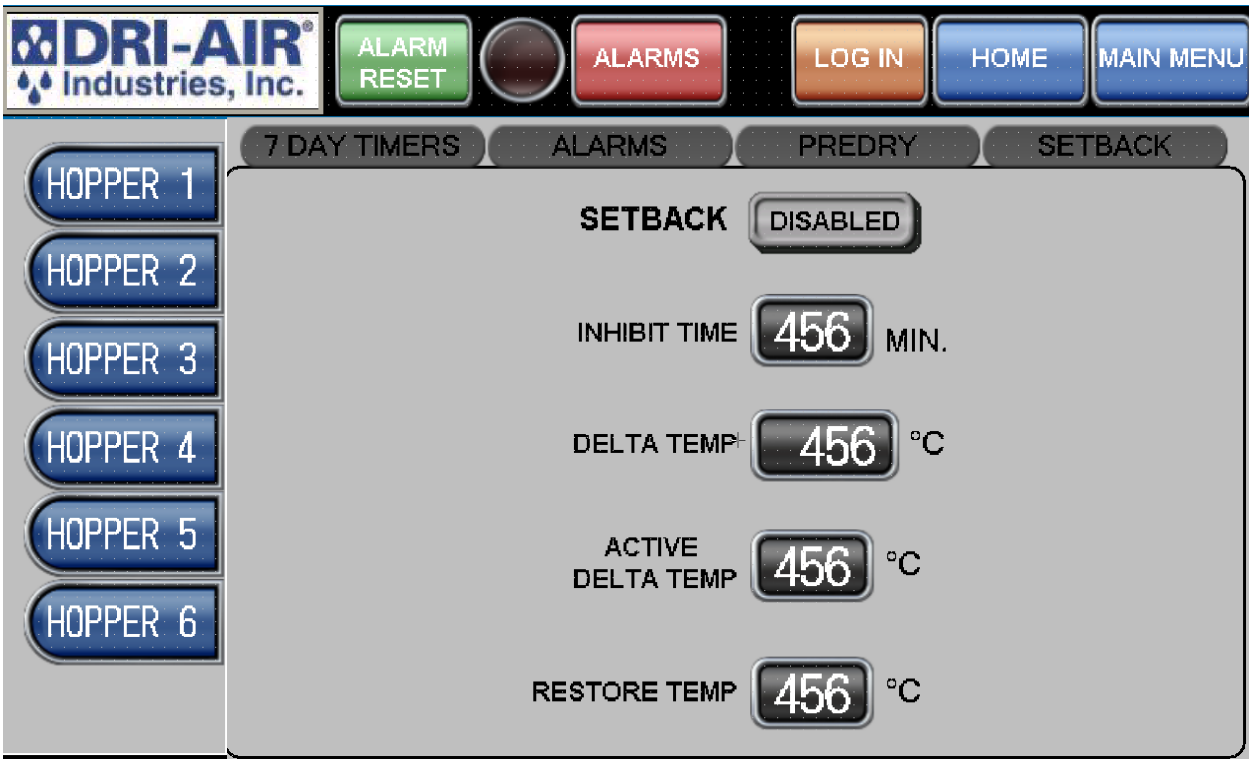


The Alarms tab allows the operator to adjust the specific alarms for the selected hopper. These alarms would be how many degrees over the setpoint the hopper would shutdown on, High Temp Alarm, how long would the hopper operate without reaching the setpoint, Process Loopbreak alarm. The alarm can also be disabled for diagnostic purposes.

PREDRY

With a hopper bank system, there are multiple hoppers to monitor drying times. Each hopper has a timer that indicates how long the hopper has been on and drying the material. An operator can select the Pre-Dry Timer to alert when the hopper has reached a particular drying time. For example, if the operator wanted to dry the material in Hopper 1 for 3 hours before using the material, the Pre-Dry Timer would be set for 3 hours. During the first 3 hours, the PRE-DRY will appear on the hopper icon and a slide gauge will appear indicating where the hopper is in the first 3 hours process. Once the 3 hours are complete, the indicator will change to DRY and the material is now ready to use. If the hopper is turned off, the timer will reset back to 0 and will restart once the hopper is turned on.

<u>TEMPERATURE SETBACK</u> (Option)



Temperature setback allows each hopper to automatically lower the process temperature after a period of time to keep from over drying the material. Here you can enable or disable the setback as well as setting setback parameters. The factory set parameters will work for most setback applications.

Parameter changes require a Log In and password. Call Dri-Air Industries for Log In password. An asterisk (*) will be displayed next to the “Hopper Is On” window on the Home Screen when setback is turned on. The new setpoint temperature will change to red when the setback activates.

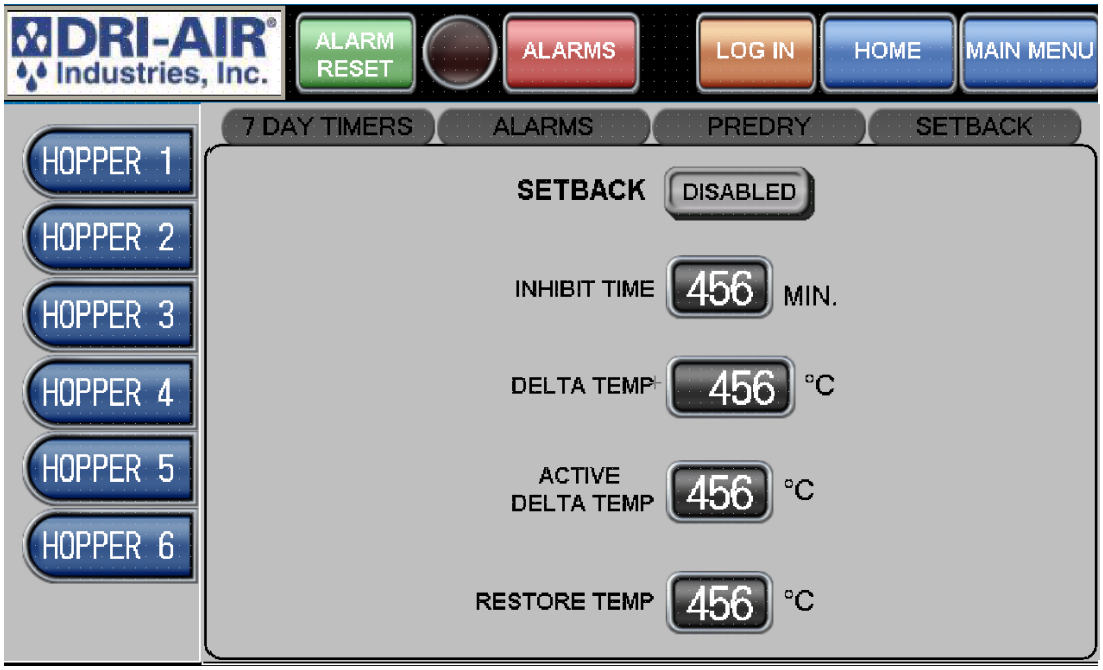
SETBACK (Option) continued

Inhibit Time = Time in minutes that the process temperature will maintain original setpoint before going into setback. (Settable 10-480 minutes)

Delta Temp = The amount the temperature will setback from setpoint (settable 0-999°F) Warning: Delta temp cannot be set higher than the High Temp Alarm delta temperature.

Active Delta Temp = The difference between the setpoint temperature and the setback thermocouple temperature. The setback thermocouple temperature must be equal or less than the setpoint temperature minus the Active Delta Temp before the setback will activate. (Settable 0-999°F)

Restore Temp = The temperature that the setback thermocouple must drop down to or below for it to come out setback and revert to the original setpoint. (Settable 0-999°F)



DIAGNOSTICS SCREEN

To enter the diagnostics screen, first tap the main menu button in the top right of the touch screen, and then select the “DIAGNOSTICS” button.

All diagnostic information about the dryer is in this screen, this includes temperature data, alarms, and event logs.

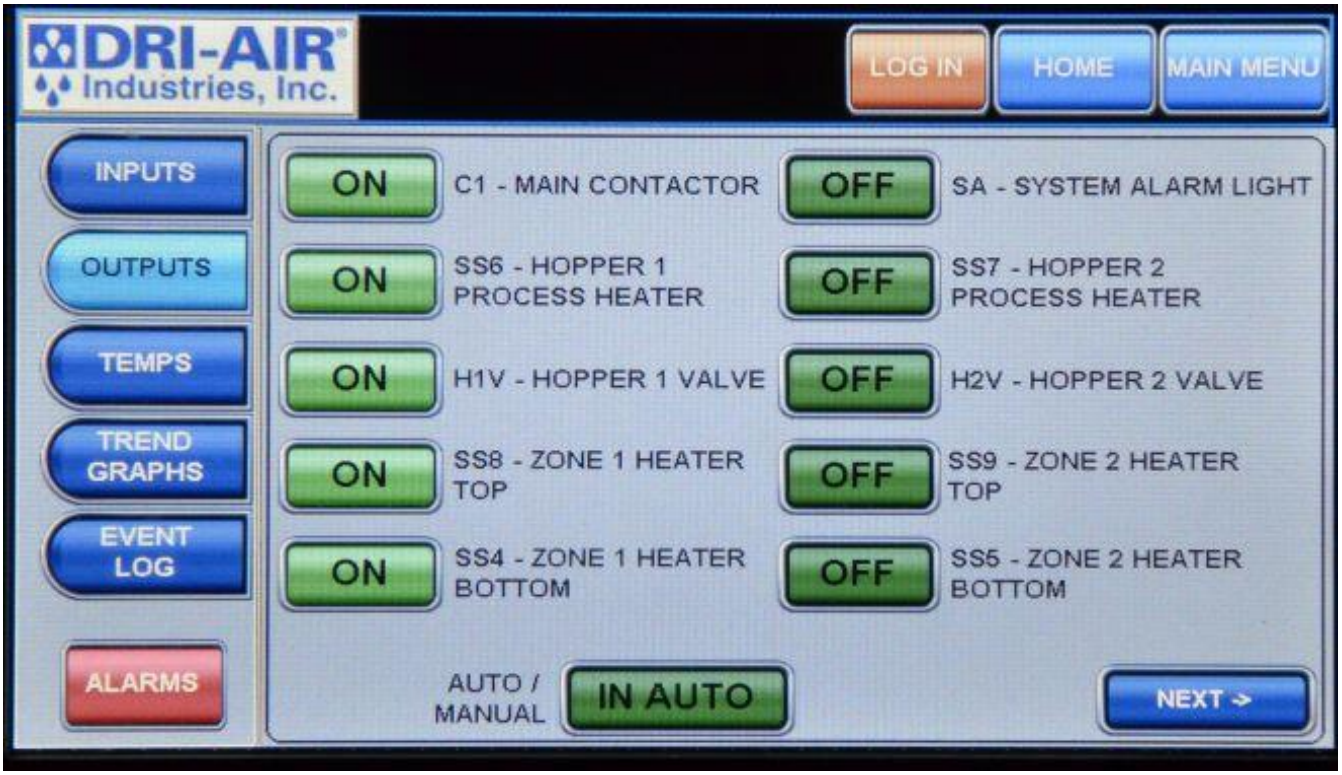
To access the area of interest, simply press the associated button.

INPUTS

The inputs screen displays different sources of inputs, in this screen you can independently tell whether or not an input is on or off, as well as switching between auto and manual mode.

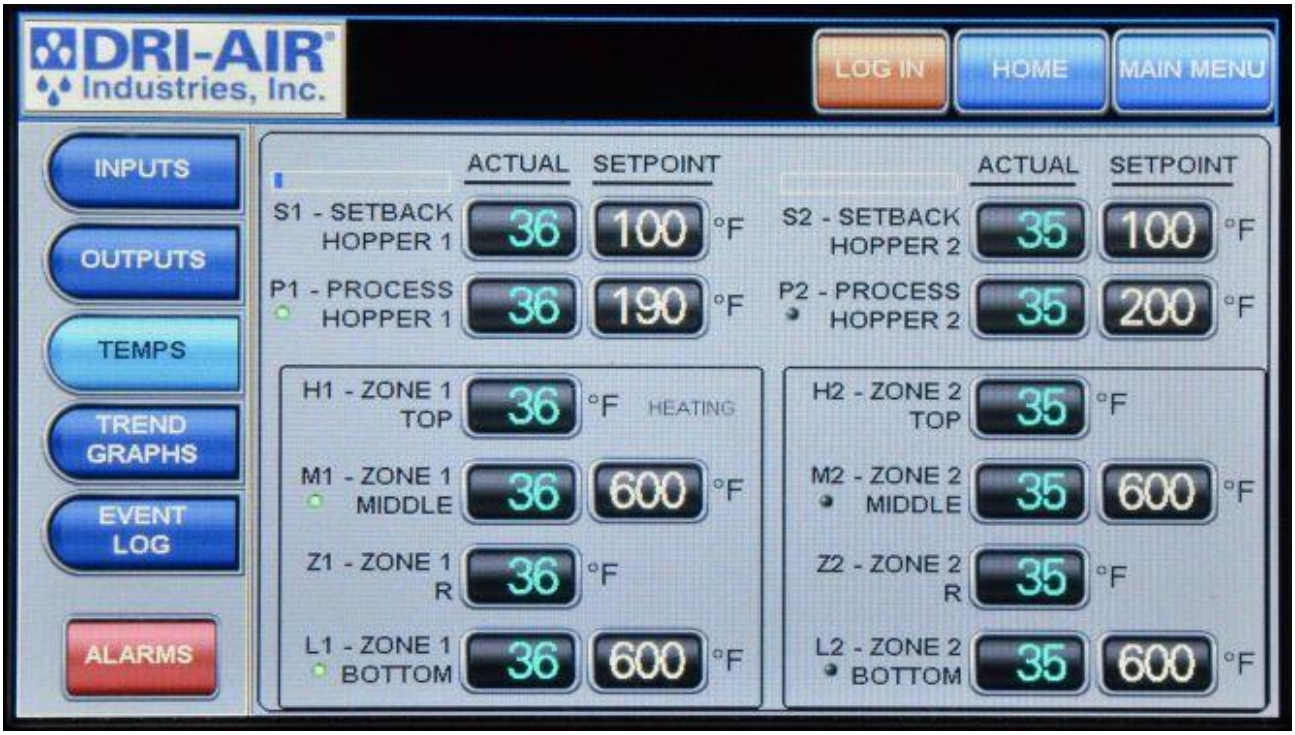
This screen also displays an Hour Meter (Not resettable) and a Preventive Maintenance (PM) Meter (Which is resettable).

OUTPUTS



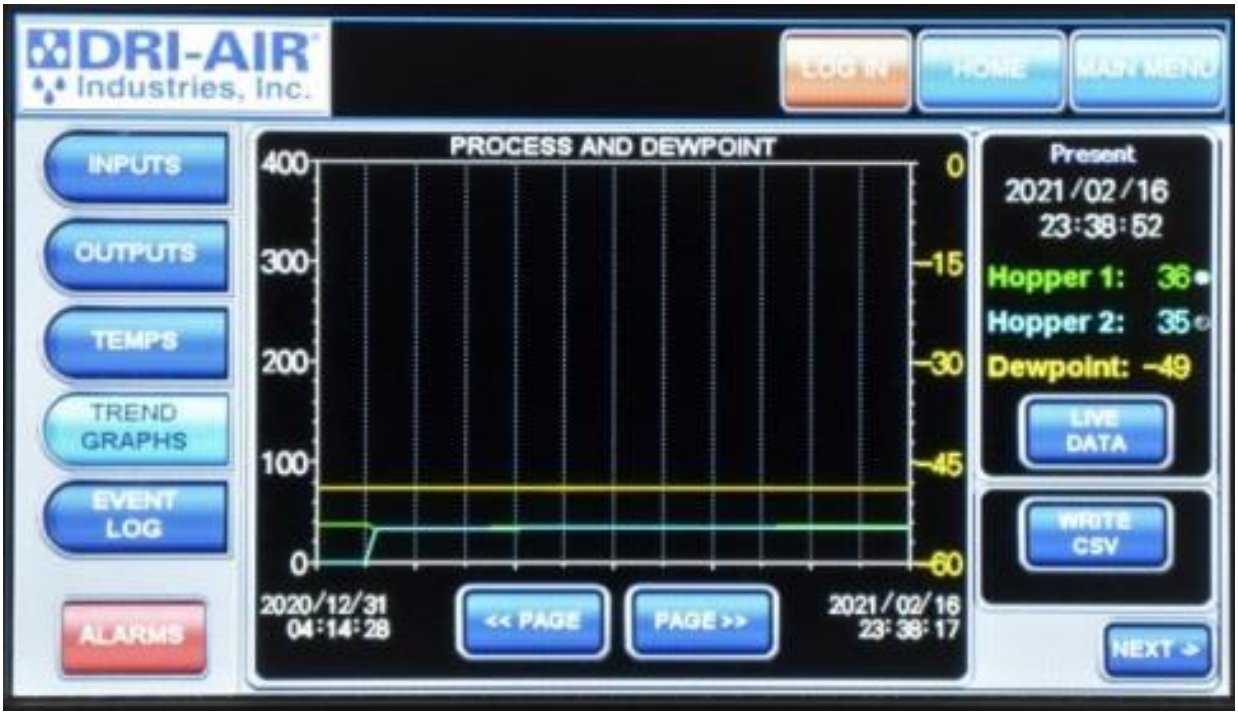
The outputs screen displays different sources of outputs, in this screen you can independently tell which output sources are on or off. You can also switch from Auto to Manual mode to test output operation.

TEMPS



The temps screen is used to display all of the thermocouple temperatures to trouble shoot a problem. The current status of the regeneration cycle is displayed in the lower right of the display. We will use this screen while assisting in determining where to look to solve a problem. Heater outputs are also displayed by a small LED to the left of each heater's temperature readout.

TREND GRAPHS



To read the temperature data in a trend graph, select the “Trend Graphs” button to get data on the dryer’s temperature and dew points over a period of time. To record data press write csv, to check older data use the “<< PAGE” and “PAGE>>” buttons, to check different data sheets use the “NEXT >” button to navigate. The Live Data button will refresh the data on the right to what the readings are at that moment. Write CSV will write a CSV file to an SD card; this is how you can send a file to Dri-Air Industries. Note: the Write CSV button will only write a CSV file for the data on the current screen, if you want other tracked data to be written to an SD card you will need to press the Write CSV file on those screens as well.

EVENT LOG

All alarms and events are stored to assist in trouble shooting a problem. They are stored in sequence with the latest one first followed by past alarms and events. To make access easier, you can select the day's events using the arrow keys on the right. All events over 7 days are cleared out with a first in, first out sequence. Alarms and events are stored in two different menus, looking at the picture above, the bottom most red button is the alarm page and the button directly above it is the event log page. Write CSV will write a CSV file to an SD card; this is how you can send a file to Dri-Air Industries. Note: the Write CSV button will only write a CSV file for the data on the current screen, if you want other tracked data to be written to an SD card you will need to press the Write CSV file on those screens as well.

ALARMS

The Alarms page can be accessed by first hitting the “Main Menu” button, then hitting the “Diagnostics”, and finally selecting the red “ALARMS” button in the bottom left of the screen. This page displays all of the alarms set off by the machine, including the cause of the alarm and the time/date it occurred. Write CSV will write a CSV file to an SD card; this is how you can send a file to Dri-Air Industries. Note: the Write CSV button will only write a CSV file for the data on the current screen, if you want other tracked data to be written to an SD card you will need to press the Write CSV file on those screens as well.

DIGITAL KEYPAD SCREEN

This keypad is used to enter all temperatures, times, and digital information. Press the desired numbers and then **ENT** to make the change.

X Close AC Clear entry +/- Unused

ALPHA-NUMERIC KEYPAD

To enter a new recipe or other designation, press the center description area and the keypad as shown will appear. Type the new entry using the keypad and press enter.

To enter the temperature, press the associated temperature display to access the entry keypad.

X	Close out of keyboard	AC	Clear entry	SPACE	Space bar
DEL	Delete	Enter	Enter		

Troubleshooting

Below is a list of the possible error codes that might appear if an error occurs in a dryer.

Fault_Overload_Alarm

-Blower overload has tripped, Check incoming power and fuses

Fault_L1_Zone1_Bottom_TC_Backwrd

-Bottom left thermocouple on desiccant bed, Check thermocouple plug connection (white wire +, Red wire -)

Fault_L1_Zone1_Bottom_TC_Broke

-Bottom left thermocouple broken, Check thermocouple and thermocouple plug connections

Fault_Z1_Zone1_R_TC_Backwrd

-Second thermocouple up on bottom left, Check thermocouple plug connection (white wire +, Red wire -)

Fault_Z1_Zone1_R_TC_Broke

-Second thermocouple up on bottom left, Check thermocouple and thermocouple plug connections

Fault_M1_Zone1_Middle_TC_Backwrd

-Third thermocouple up on bottom left, Check thermocouple plug connection (white wire +, Red wire -)

Fault_M1_Zone1_Middle_TC_Broke

- Third thermocouple up on bottom left, Check thermocouple and thermocouple plug connections

Fault_H1_Zone1_Top_TC_Backwrd

-Top thermocouple on left, Check thermocouple plug connection (white wire +, Red wire -)

Fault_H1_Zone1_Top_TC_Broke

- Top thermocouple on left, Check thermocouple and thermocouple plug connections

Fault_P1_Process_Hopper1_TC_Backwrd

-Hopper 1 air inlet thermocouple, Check thermocouple plug connection (white wire +, Red wire -)

Fault_P1_Process_Hopper1_TC_Broke

- Hopper 1 air inlet thermocouple, Check thermocouple and thermocouple plug connections

Fault_S1_Setback_Hopper1_TC_Backwrd

-Hopper 1 return air thermocouple, Check thermocouple plug connection (white wire +, Red wire -)

Fault_S1_Setback_Hopper1_TC_Broke

- Hopper 1 return air thermocouple, Check thermocouple and thermocouple plug connections

Fault_L2_Zone2_Bottom_TC_Backwrd

-Bottom right thermocouple on desiccant bed, Check thermocouple plug connection (white wire +, Red wire -)

Fault_L2_Zone2_Bottom_TC_Broke

- Bottom right thermocouple on desiccant bed, Check thermocouple and thermocouple plug connections

Fault_Z2_Zone2_R_TC_Backwrd

-Second thermocouple up on bottom right, Check thermocouple plug connection (white wire +, Red wire -)

Fault_Z2_Zone2_R_TC_Broke

- Second thermocouple up on bottom right, Check thermocouple and thermocouple plug connections

Fault_M2_Zone2_Middle_TC_Backwrd

-Third thermocouple up on right desiccant bed, Check thermocouple plug connection (white wire +, Red wire -)

Fault_M2_Zone2_Middle_TC_Broke

- Third thermocouple up on right desiccant bed, Check thermocouple and thermocouple plug connections

Fault_H2_Zone2_Top_TC_Backwrd

-Top thermocouple on right, Check thermocouple plug connection (white wire +, Red wire -)

Fault_H2_Zone2_Top_TC_Broke

-Top thermocouple on right, Check thermocouple and thermocouple plug connections

Fault_P2_Process_Hopper2_TC_Backwrd

-Hopper 2 air inlet thermocouple wiring backwards, Check thermocouple plug connection (white wire +, Red wire -)

Fault_P2_Process_Hopper2_TC_Broke

-Hopper 2 air inlet thermocouple broken, Check thermocouple and thermocouple plug connections

Fault_S2_Setback_Hopper2_TC_Backwrd

-Hopper 2 return air thermocouple wiring backwards, Check thermocouple plug connection (white wire +, Red wire -)

Fault_S2_Setback_Hopper2_TC_Broke

-Hopper 2 return air thermocouple broken, Check thermocouple and thermocouple plug connections

Fault_Z1_Bottom_Loop_Break

-Bottom left heater in desiccant bed not coming up to regeneration temperature, Check heater and solid state relay

Fault_Z2_Bottom_Loop_Break

- Bottom right heater in desiccant bed not coming up to regeneration temperature, Check heater and solid state relay

Fault_Z1_Middle_Loop_Break

- Middle left heater in desiccant bed not coming up to regeneration temperature, Check heater and solid state relay

Fault_Z2_Middle_Loop_Break

- Middle right heater in desiccant bed not coming up to regeneration temperature, Check heater and solid state relay

Fault_P1_Over_Temp

-Hopper 1 air inlet temperature alarm, Check solid state relay and zone value position

Fault_P2_Over_Temp

- Hopper 2 air inlet temperature alarm, Check solid state relay and zone value position

Fault_Hopper1_Loop_Break

-Hopper 1 air inlet not coming up to set point, Check thermocouple position, Check process heater element and solid state relay

Fault_Hopper2_Loop_Break

- Hopper 2 air inlet not coming up to set point, Check thermocouple position, Check process heater element and solid state relay

Fault_Blower_Rotation

-Check if blower is running, Check blower rotation, Check blower pressure switch

Fault_Compressed_Air

-Check compressed air connection, Check compressed air pressure switch

Fault_System_Comm_Error

-RS 485 Cable break

Alarm_Clogged_Filter

-Return air filter is clogged, clean or replace air filter

Alarm_Receiver1_Cycle_Alarm

-Receiver 1 did not satisfy proximity switch in load cycles set, Check alarm load cycles, Check proximity switch calibration

Alarm_Receiver2_Cycle_Alarm

- Receiver 2 did not satisfy proximity switch in load cycles set, Check alarm load cycles, Check proximity switch calibration

Alarm_Hopper1_Low_Material

-Material level in hopper 1 below proximity sensor, Check material levels, Check proximity switch calibration

Alarm_Hopper2_Low_Material

- Material level in hopper 2 below proximity sensor, Check material levels, Check proximity switch calibration

Alarm_High_Dew_Point_Level

-Dew point exceeded set alarm level, Check dryer filter, Check desiccant for contamination

Fault_L1_Over_Temp

-Zone 1 bottom thermocouple exceeded 850°F, Check thermocouple and plug connection, Check zone 1 bottom heater relay

Fault_M1_Over_Temp

- Zone 1 middle thermocouple exceeded 850°F, Check thermocouple and plug connection, Check zone 1 top heater relay

Fault_L2_Over_Temp

- Zone 2 bottom thermocouple exceeded 850°F, Check thermocouple and plug connection, Check zone 2 bottom heater relay

Fault_M2_Over_Temp

- Zone 2 middle thermocouple exceeded 850°F, Check thermocouple and plug connection, Check zone 1 top heater relay