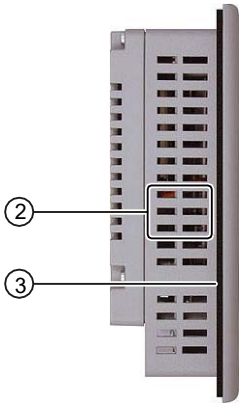
HMI COMPONENTS



1. Display / Touch Screen	7. Power Supply Connector
2. Recesses for Mounting Clamps	8. Rating Plate
3. Mounting Seal	9. Interface Name
4. Function Keys	10. DIP Switch
5. PROFINET Interface	11. Guide for Labeling Strips
6. Connection for Functional Ground	

Maintenance and care (HMI)

Introduction

The HMI device is designed for maintenance-free operation. The touch screen And keyboard membrane should nevertheless be cleaned regularly.

Requirements

Use a cleaning cloth dampened with a cleaning agent to clean the equipment. Only use water with a little liquid soap or a screen cleaning foam.

Notice
Unintentional response When cleaning the touchscreen, an unintentional response in the controller can be triggered by touching keys. Switch the HMI device off before cleaning to prevent unintentional responses. Damage caused by unauthorized cleaning products The HMI device may be damaged of compressed air, steam jet-air ejectors, aggressive Solvents or scouring powders that are used for cleaning purposes.

Procedure

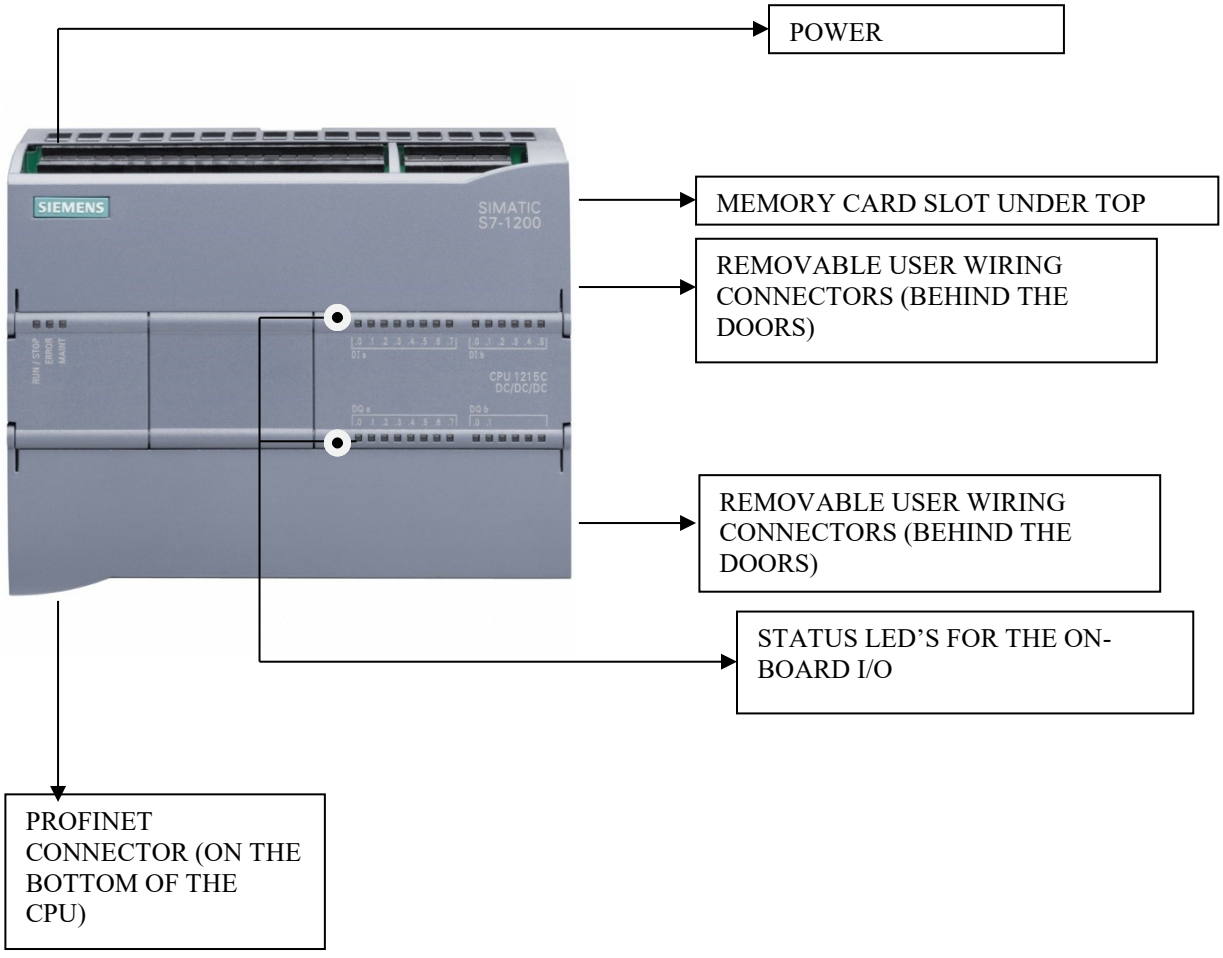
Proceed as follows:

1. Switch off the HMI device.
2. Spray the cleaning solution onto a cleaning cloth.
3. Clean the HMI device, wipe from the screen edge inwards

Introducing the S7-1200 PLC

The S7-1200 controller provides the flexibility and power to control a wide variety of devices in support of your automation needs. The compact design, flexible configuration, and powerful instruction set combine to make the S7-1200 a perfect solution for controlling a wide variety of applications.

The CPU combines a microprocessor, an integrated power supply, input and output circuits, built-in PROFINET, high-speed motion control I/O, and on-board analog inputs in a compact housing to create a powerful controller. The CPU contains the logic required to monitor and control the devices in your application. The CPU monitors the inputs and changes the outputs according to the logic of your user program, which can include Boolean logic, counting, timing, complex math operations, and communications with other intelligent devices. The CPU provides a PROFINET port for communication over a PROFINET network. Additional modules are available for communicating over PROFIBUS, GPRS, RS485 or RS232 networks.



MODBUS ADDRESS LIST

INFO
SLAVE ID = 1
PORT = 502
PLC CPU IP = 192.168.0.1
HMI IP = 192.168.0.2
SUBNET MASK = 255.255.255.0
MODE = MODBUS TCP

MODBUS ADDRESS	DESCRIPTION	DATA TYPE
40001	STAGE NUMBER	INTEGER
40002	HEATER TEMPERATURE	INTEGER
40003	PURGE EXHAUST TEMPERATURE	INTEGER
40004	PURGE LINE TEMPERATURE	INTEGER
VALUES BEFORE INTEGER CONVERSION BELOW		
40005	HEATER TEMPERATURE	REAL
40006	HEATER TEMPERATURE	REAL
40007	PURGE EXHAUST TEMPERATURE	REAL
40008	PURGE EXHAUST TEMPERATURE	REAL
40009	PURGE LINE TEMPERATURE	REAL
40010	PURGE LINE TEMPERATURE	REAL

CONTINUED MODBUS ADDRESS LIST

STAGES

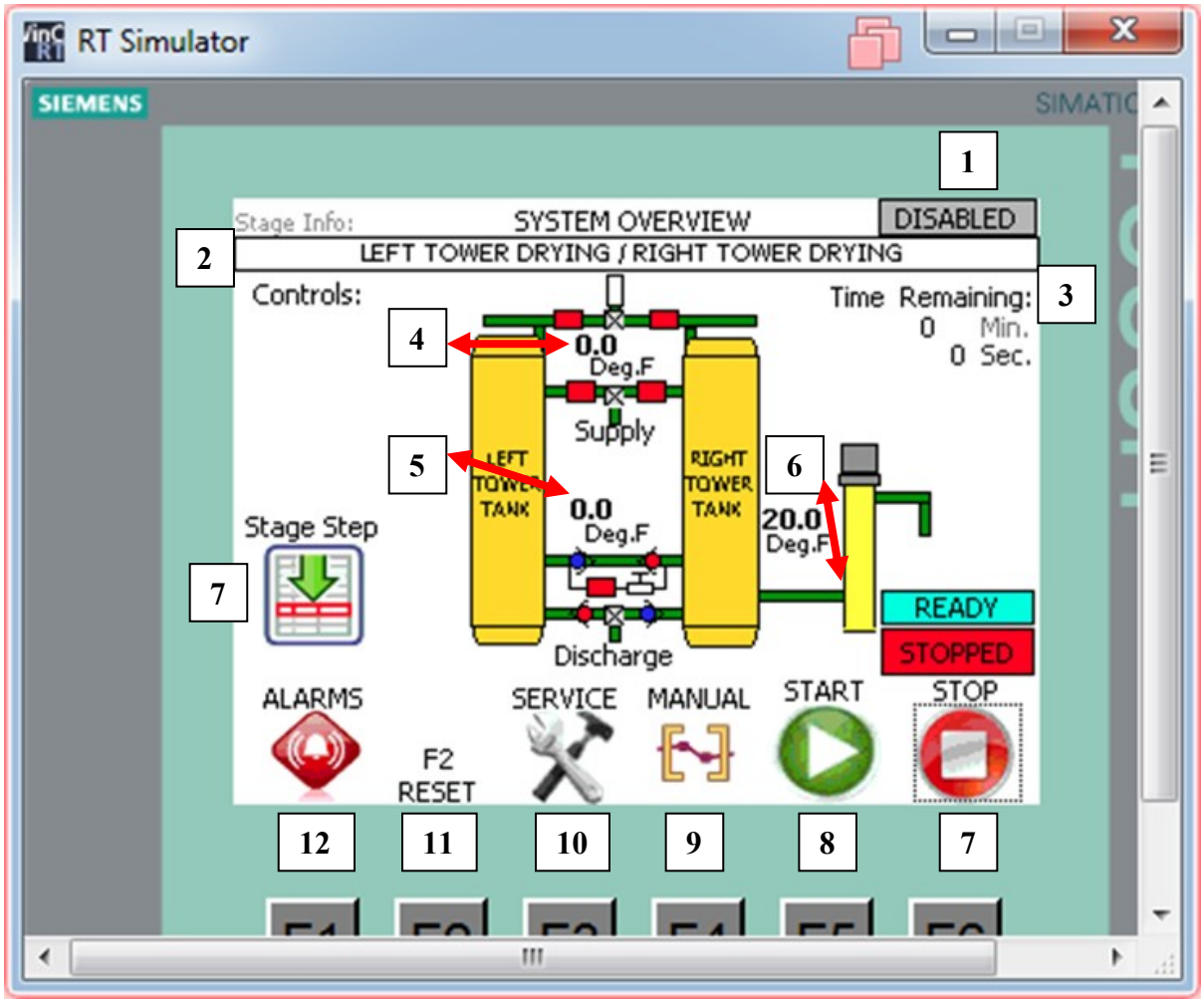
0	**RIGHT TOWER DRYING**
1	**RIGHT TOWER DRYING / LEFT TOWER DE-PRESSURIZE**
2	**RIGHT TOWER DRYING / LEFT TOWER HEATING**
3	**RIGHT TOWER DRYING / LEFT TOWER COOLING**
4	**RIGHT TOWER DRYING / LEFT TOWER RE-PRESSURIZE**
5	**LEFT TOWER DRYING**
6	**LEFT TOWER DRYING / RIGHT TOWER DE-PRESSURIZE**
7	**LEFT TOWER DRYING / RIGHT TOWER HEATING**
8	**LEFT TOWER DRYING / RIGHT TOWER COOLING**
9	**LEFT TOWER DRYING / RIGHT TOWER RE-PRESSURIZE**
10	**RIGHT TOWER DRYING/ LEFT TOWER DRY AIR COOLING**
11	**LEFT TOWER DRYING / RIGHT TOWER DRY AIR COOLING**
12	**RIGHT TOWER DRYING / LEFT TOWER IN STANDBY**
13	**LEFT TOWER DRYING / RIGHT TOWER IN STANDBY**
14	**HEATER HIGH LIMIT**
15	**PURGE AIR HIGH LIMIT**
16	**BLOWER FAILURE**
17	**BLOWER HIGH PRESSURE**
18	**HIGH HUMIDITY**
19	**HEATER OVERLOAD TRIP**
20	**LEFT TOWER FAIL TO DE-PRESSURIZE OR HIGH PRESSURE**
21	**RIGHT TOWER DRYING LOW PRESSURE**
22	**LEFT TOWER FAIL TO RE-PRESSURIZE**
23	**RIGHT TOWER FAIL TO DE-PRESSURIZE OR HIGH PRESSURE**
24	**LEFT TOWER DRYING LOW PRESSURE**
25	**RIGHT TOWER FAIL TO RE-PRESSURIZE**
26	**RIGHT TOWER LOW PRESSURE OR LEFT TOWER STANDBY**
27	**LEFT TOWER LOW PRESSURE OR RIGHT TOWER STANDBY**

TAGS

PLC

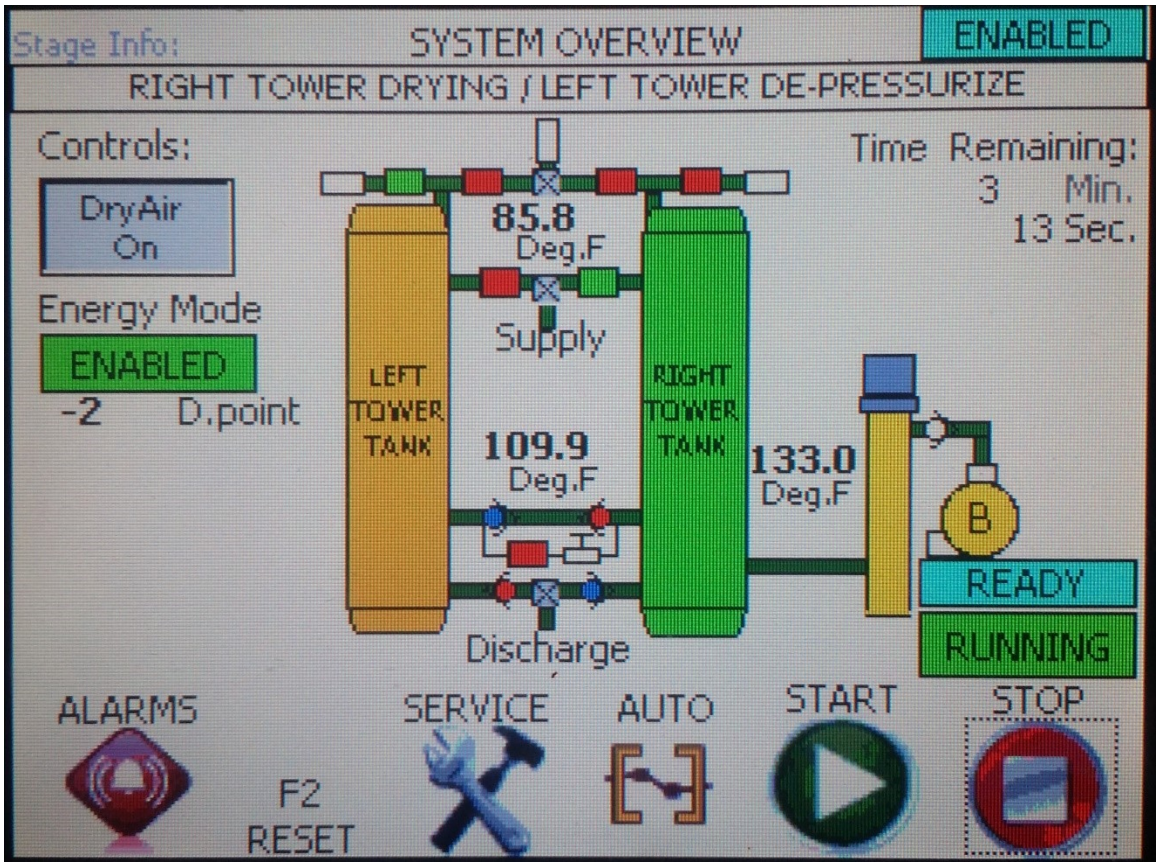
NAME	ADDRESS	COMMENT
M1_1	I-0.0	HEATER CONTROL CONTACTOR (AUX CONTACT)
PS1	I-0.1	LEFT TOWER LOW PRESSURE SWITCH 20 PSI
PS2	I-0.2	LEFT TOWER HIGH PRESSURE SWITCH 60 PSI
PS3	I-0.3	RIGHT TOWER LOW PRESSURE SWITCH 20 PSI
PS4	I-0.4	RIGHT TOWER HIGH PRESSURE SWITCH 60 PSI
PS5	I-0.7	BLOWER PRESSURE SWITCH
BLOWER RUNNING	I-1.0	BLOWER MOTOR STARTER AUX CONTACT
BLOWER OL	I-1.1	BLOWER MOTOR OVERLOAD CONTACT

HMI SCREEN OVERVIEW



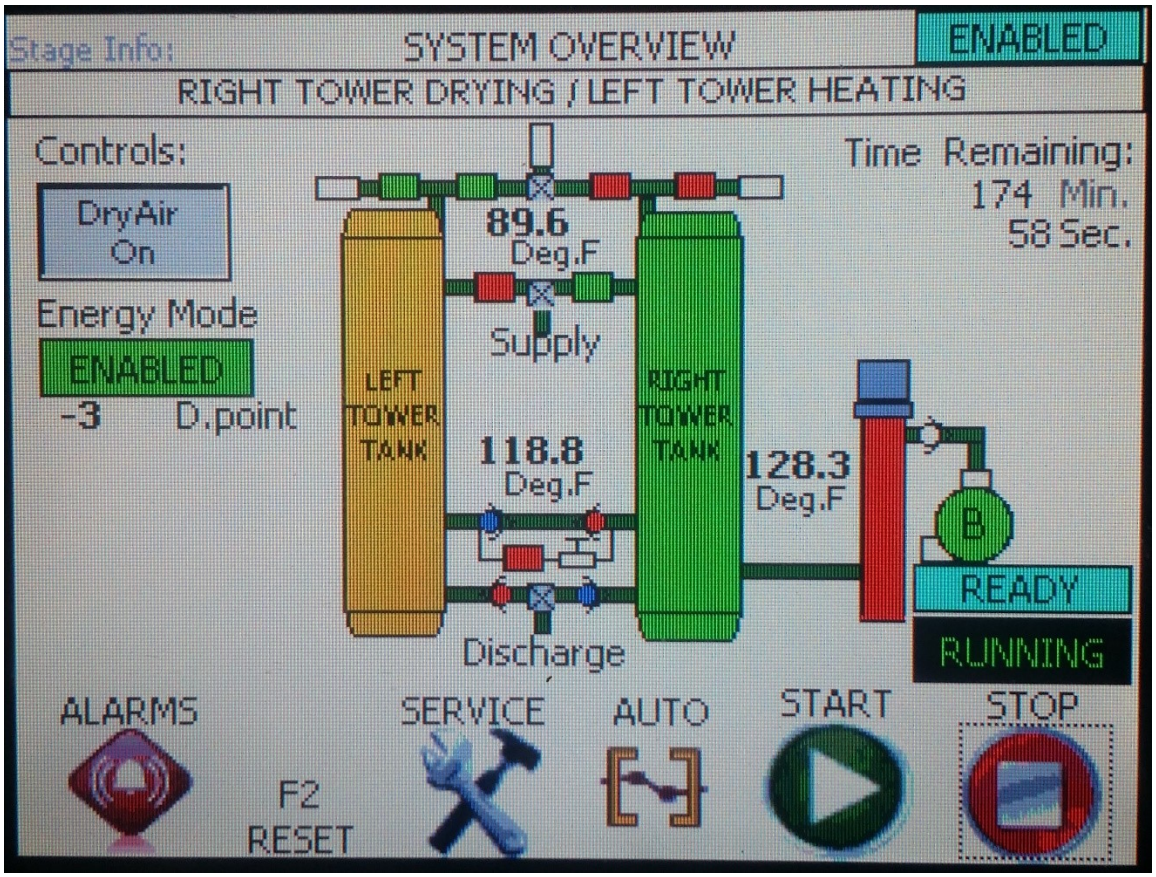
1.-Shows if dryer is disabled
2.-Shows dryer stage that it is currently in
3.-Shows time remaining. Note: seconds will count up and minutes count down
4.-Purge air outlet temperature
5.-Purge air inltet temperature
6.-Heater High limit temperature
7.-Stop Button
8.-Start Button
9.-Manual Button *Used only for troubleshooting purpose*
10.-Service Button *Used to change setpoints* Requires Password from Nortek Service
11.-Reset Button *Used to clear alarms*
12.-Alarm Button*Used to check alarms*

OPERATING THE DRYER (Automatic Mode)

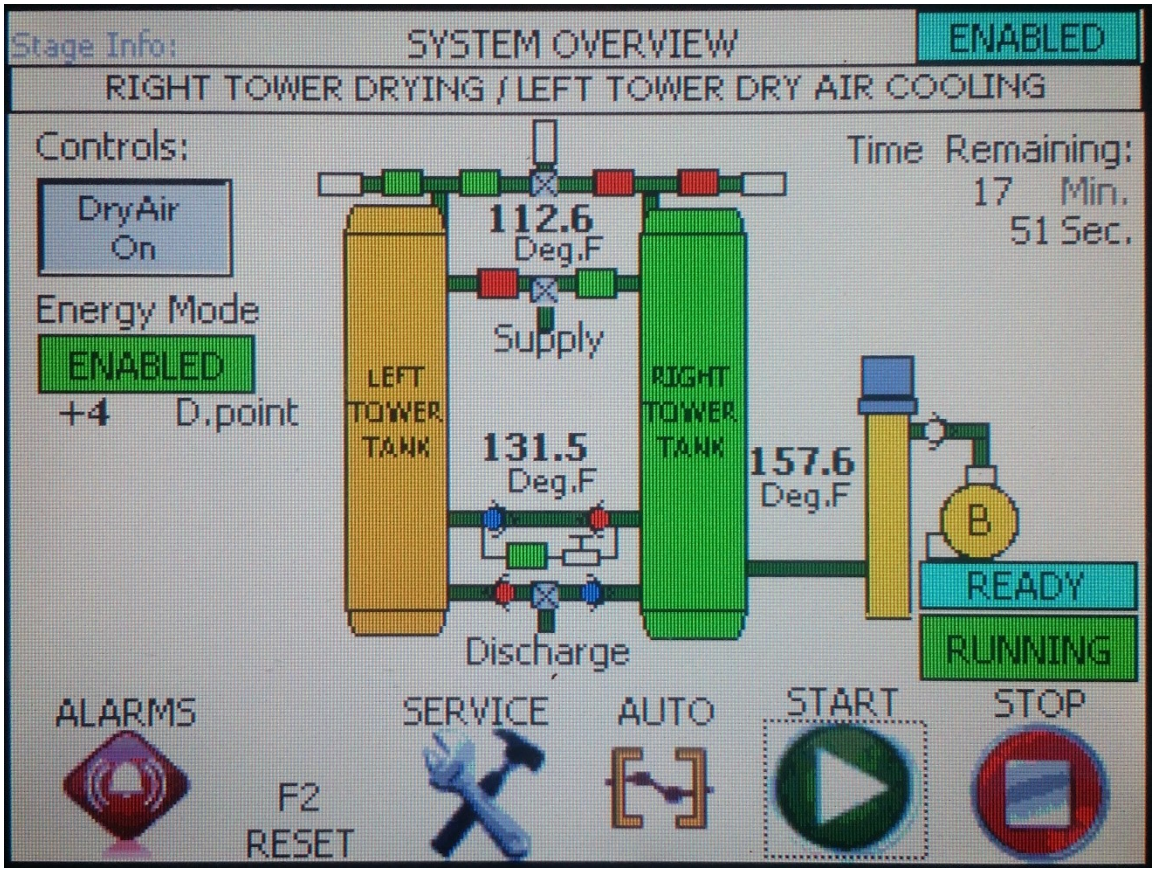


Once the dryer is ready to be put into operation the customer must first pressurize both towers before turning the dryer on. See section 4.7 before operating dryer

Once towers are pressurized turn red power switch on, HMI will boot up. This initial boot up will take 1-2 minutes. Once the HMI is fully loaded, the user will see a screen displaying the company logo. The user will then press the logo to enter the system. Once the system initializes, the normal operation screen will be present on the display. In this screen, the user can change the system to run with either dry air **ON** or the dry air **OFF** feature by pressing the grey controls tile in the upper left hand portion of the screen. Once this feature has been selected, the user will then press the green start button in the lower right hand corner of the screen. The unit will begin operating automatically by dumping the left tower tank first. The machine status tile will display that the machine is **RUNNING.** No further action is required at this time.

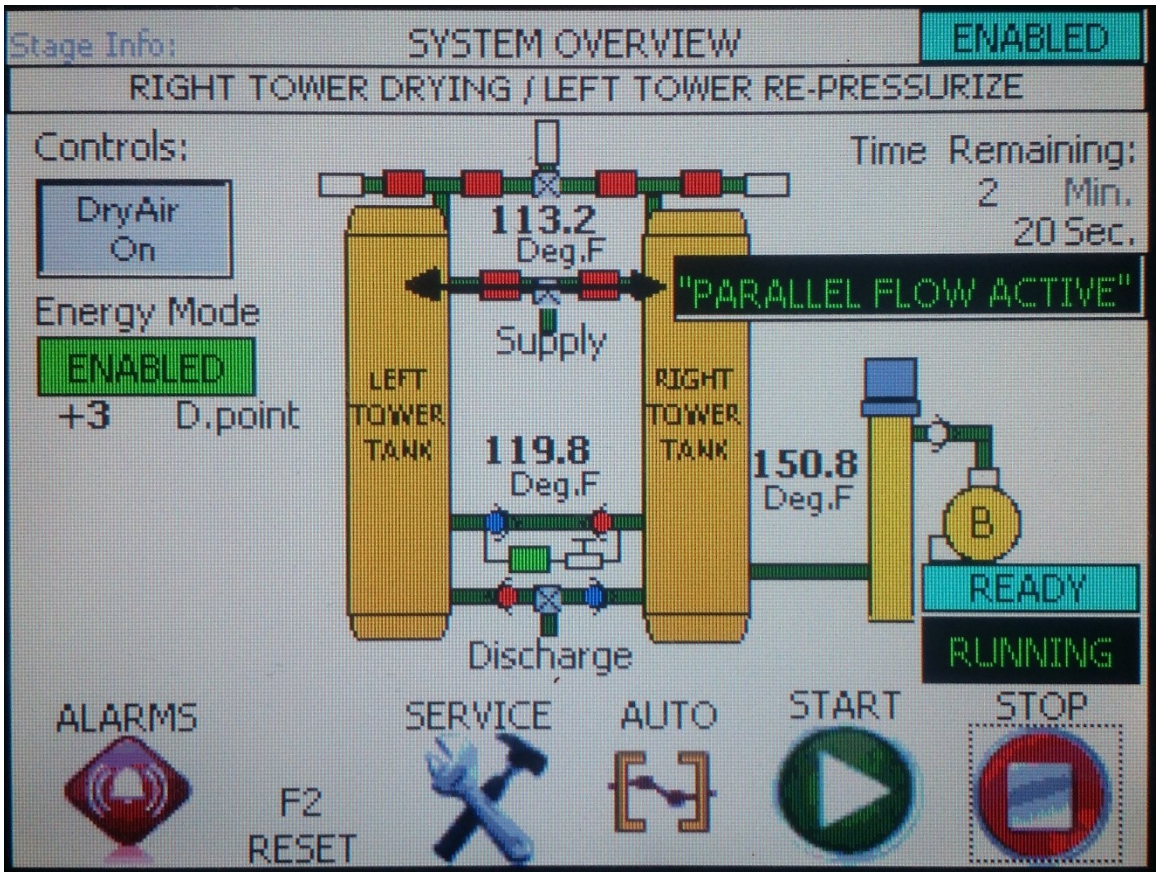


After the left tank is fully depressurized, the blower system will initialize to begin introducing the purge air into the depressurized vessel. After a short amount of time, the heater will be activated and the purge air will be heated to aid in the drying process.

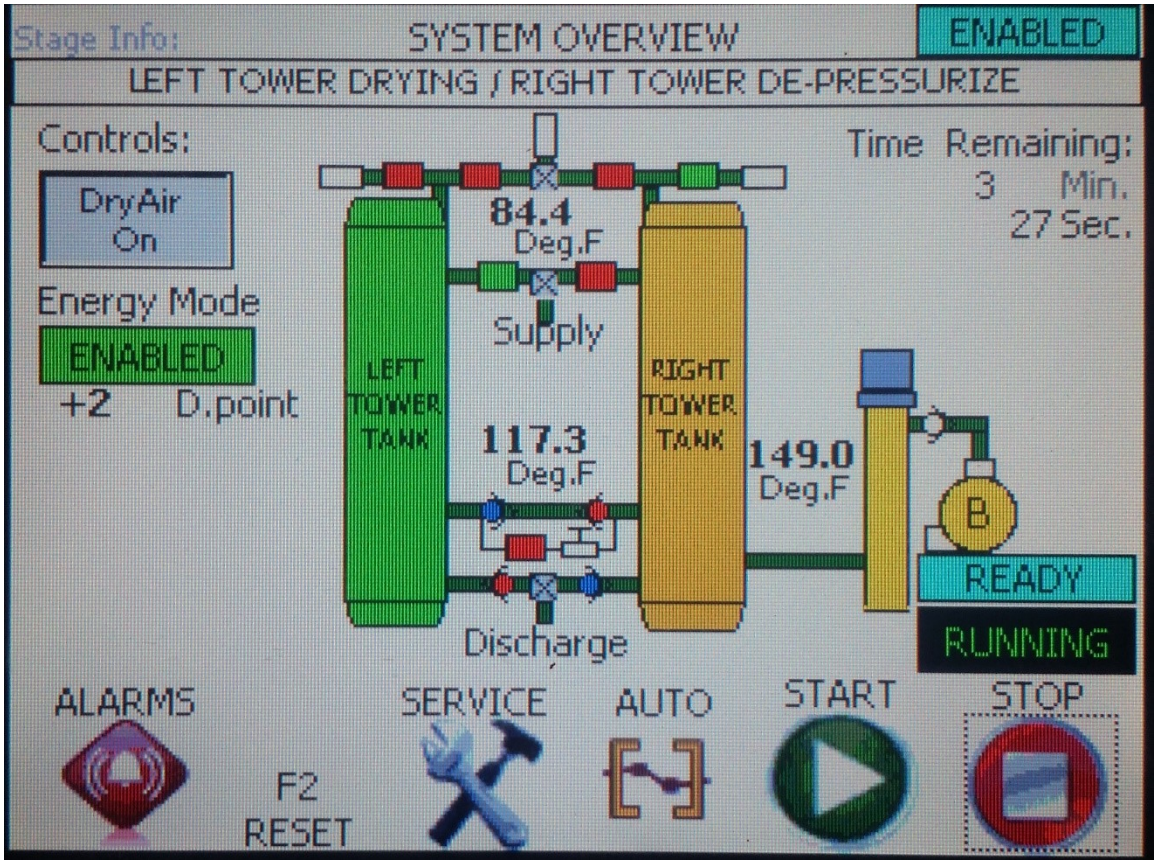


At this portion of the operation, if **DRY AIR COOLING ON** is enabled, the blower will shut down, and the system will use an average of 2% of the compressed air to cool the desiccant bed before the tanks are switched over during the regen process. This prevents dewpoint spikes that can occur during tank switch-over.

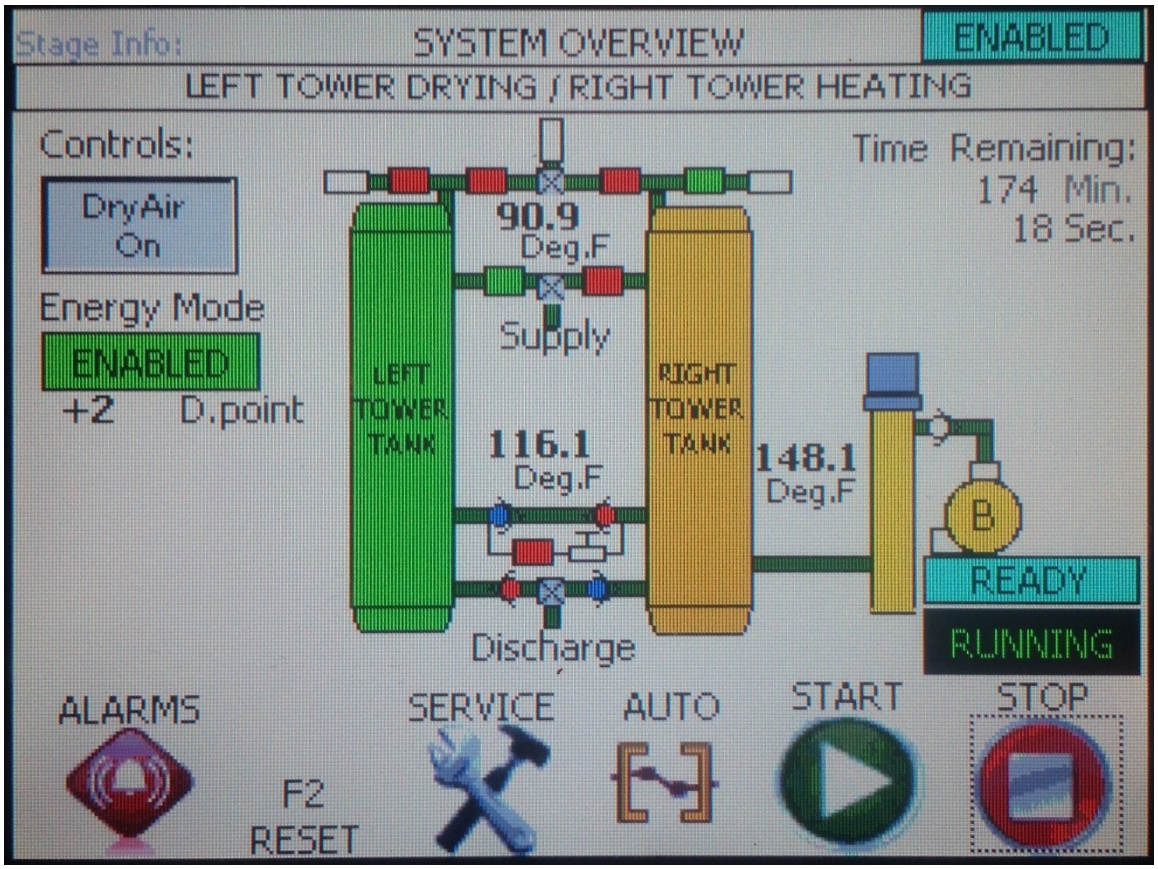
If the user decides to have the machine enabled to **DRY AIR COOLING OFF** control, a dewpoint spike could occur for at least 30 minutes or longer. It is recommended per the manufacturer, that the machine stay enabled to **DRY AIR COOLING ON** control, to prevent such dewpoint level spikes during normal operation.



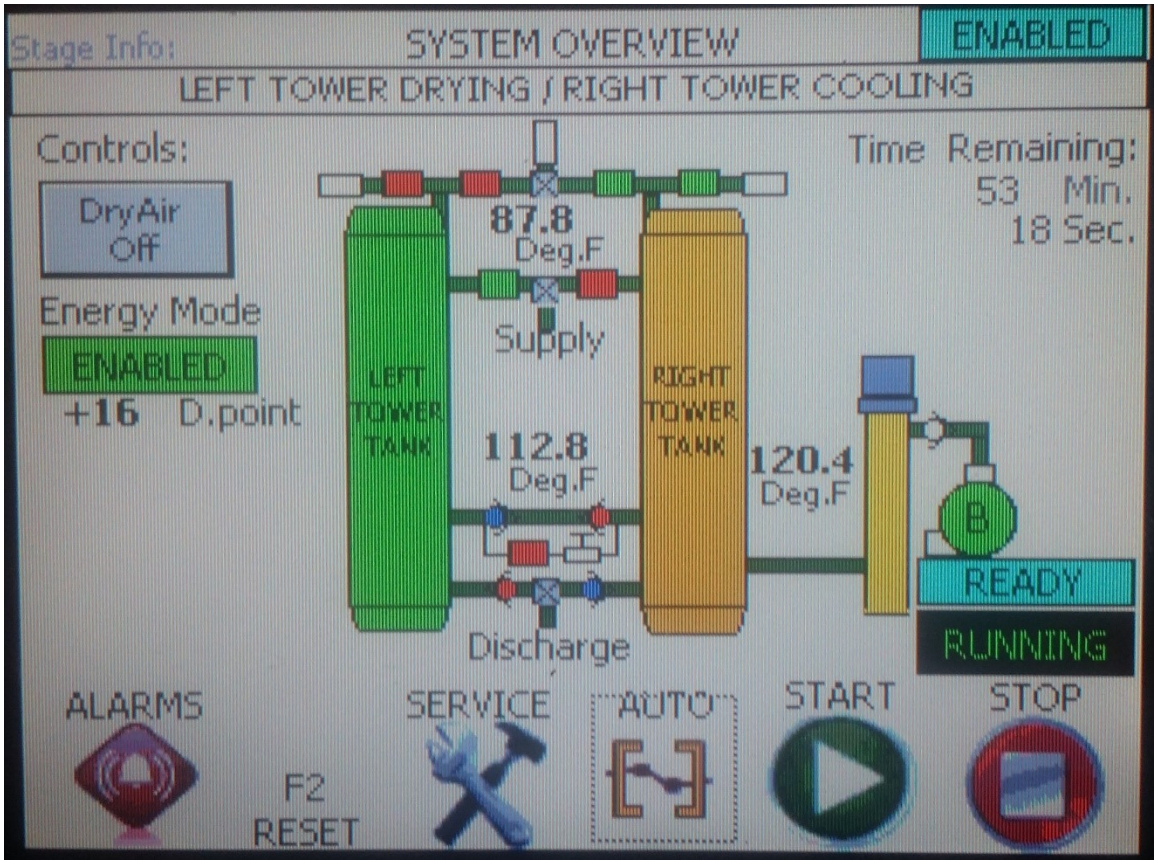
During this stage, the tower will begin to repress the unpressurized tank to plant air psi. Also, at this time, the parallel flow control will show as active. During this process, the purge valves are both shut, and the cool air and the warm air from the previously active tank will mix. This process is activated to prevent dewpoint spikes during tank switch-over.



During this process of regen, the left tower will begin the drying process and the right tower will be depressurized. High and Low pressure switches are in place to ensure the system switch-over is initialized on the proper tanks.



At this portion of time, the right tank is fully depressurized, the blower system will initialize to begin introducing the purge air into the depressurized vessel. After a short amount of time, the heater will be activated and the purge air will be heated to aid in the drying process.



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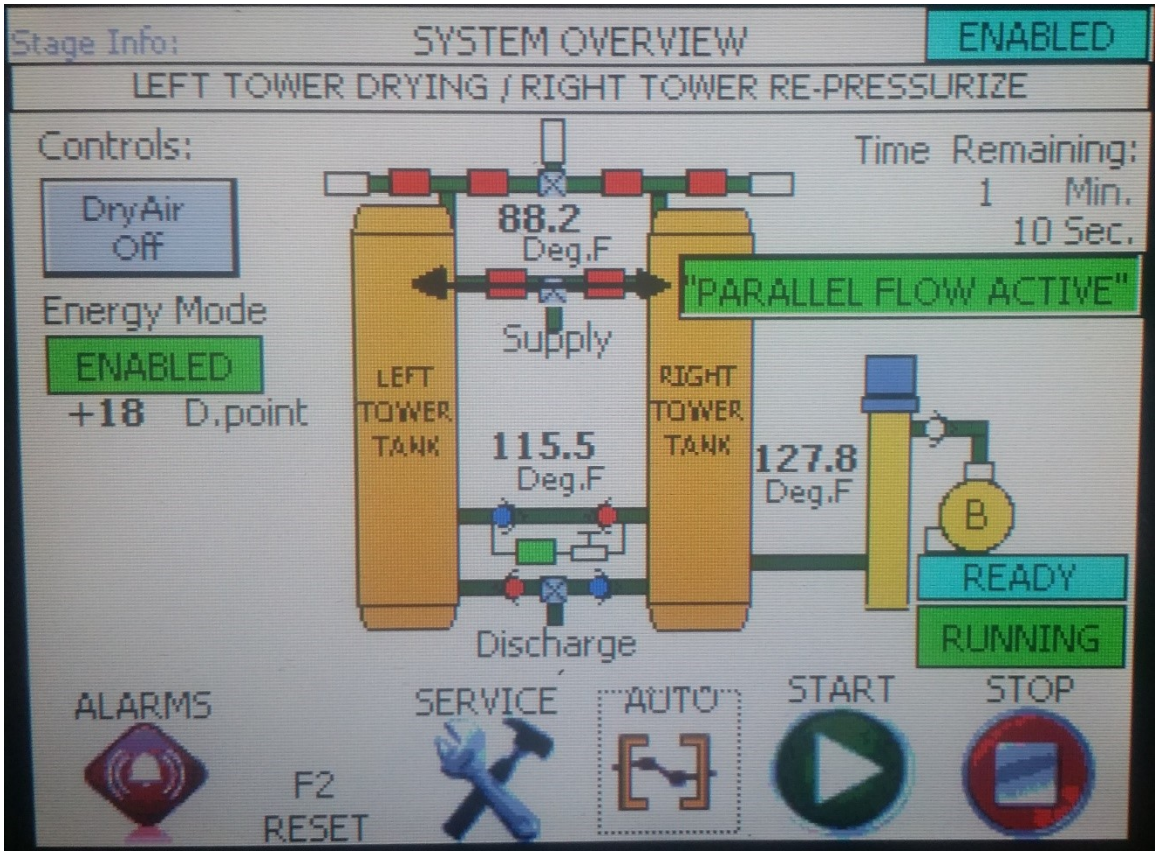

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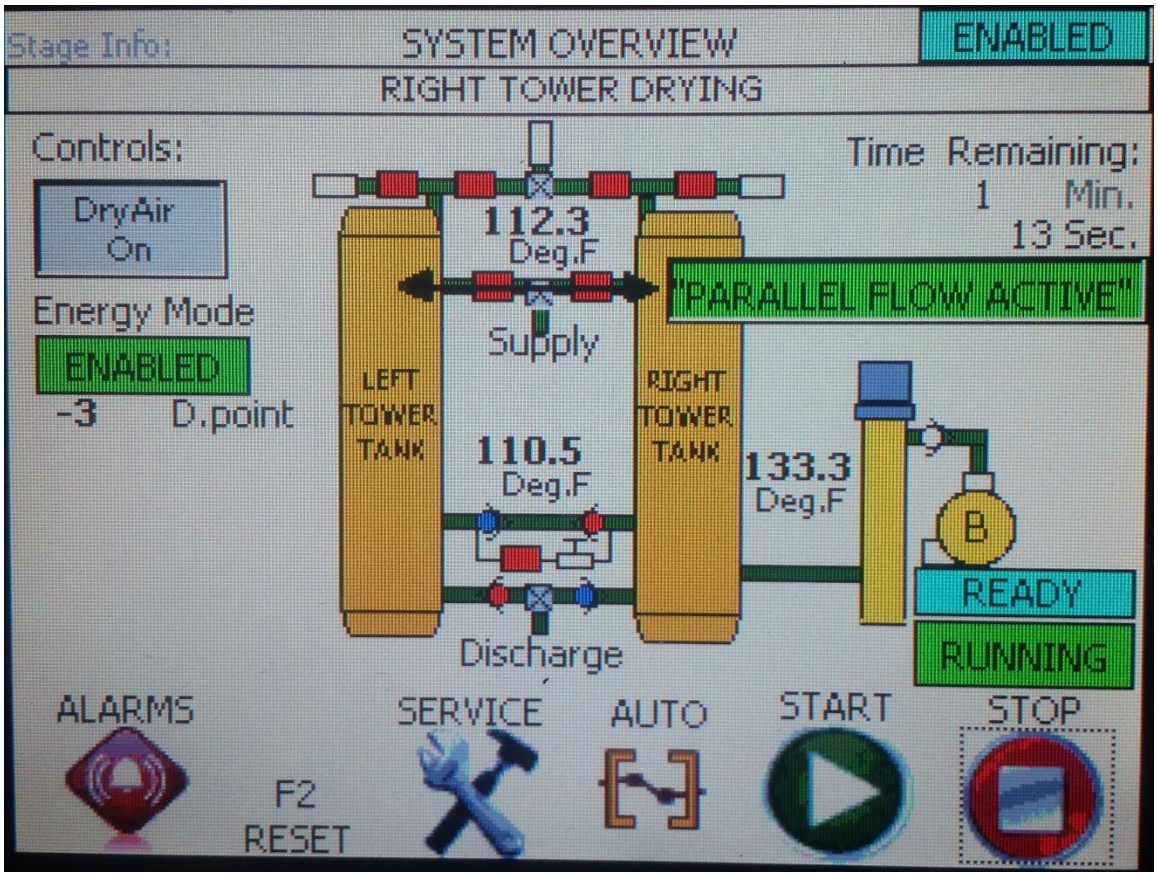
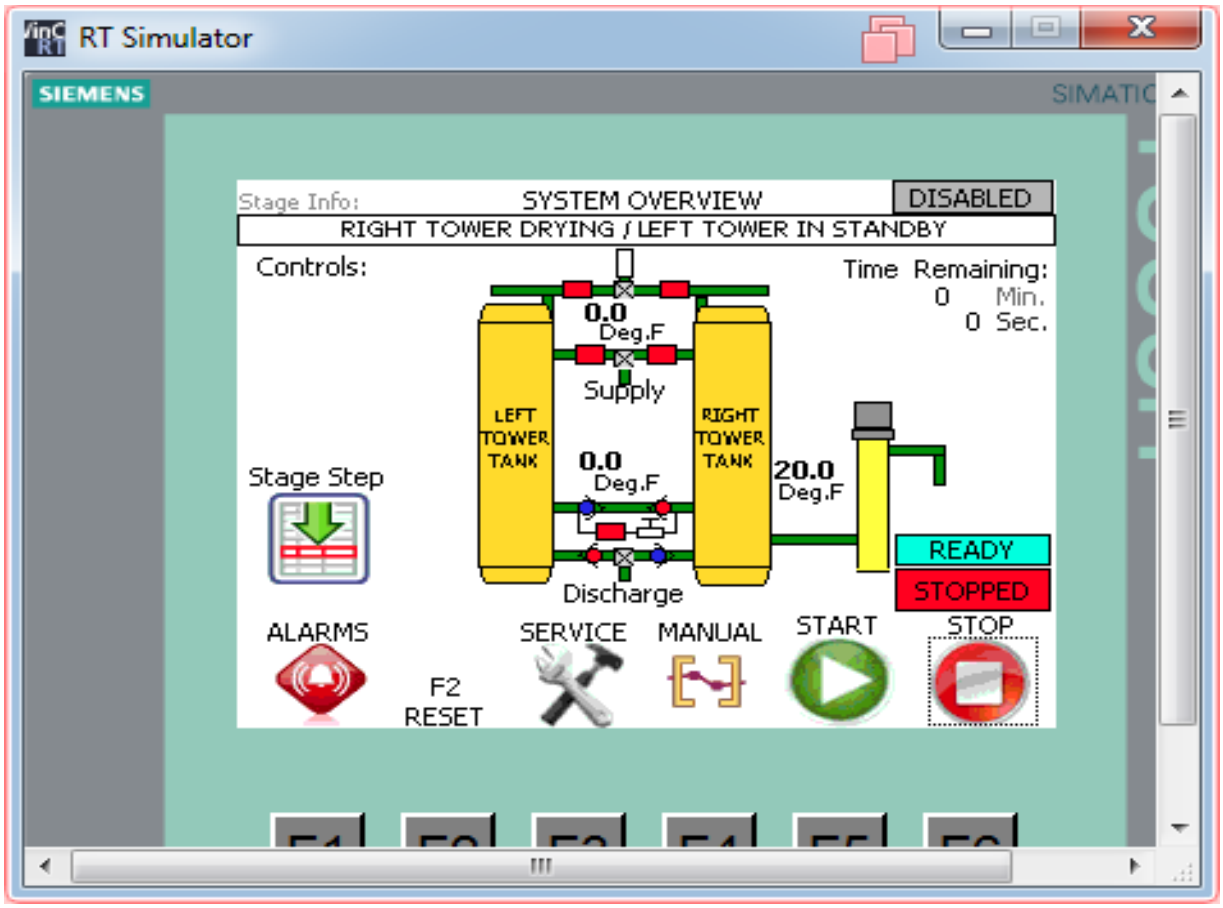


Once the right tank is fully repressurized, this screen will show before the system continues to automatically step throug the drying process.



If a dewpoint monitor is installed, and the low dewpoint set point level is reached, the machine will not shut off but will remain in a standby condition. When the dewpoint rises above the high dewpoint set point, the machine will be commanded back to normal operation, and will function until the low dewpoint set point has been met.