

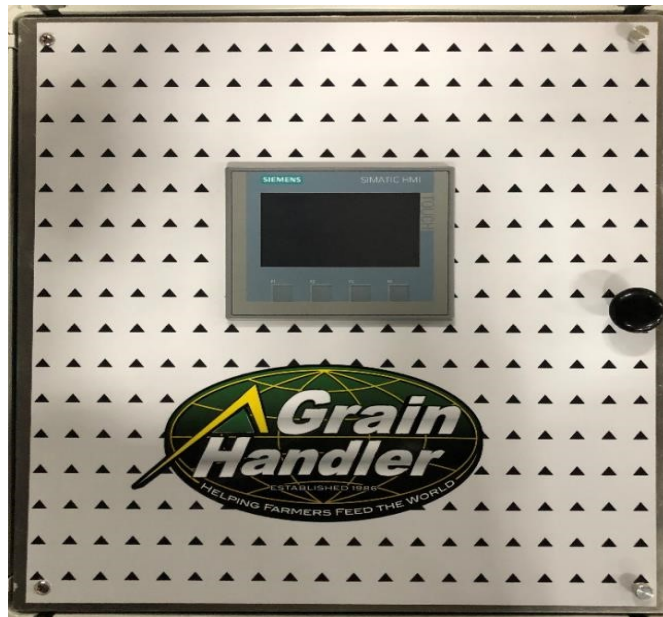


Temperature Monitoring System Manual

Product Installation

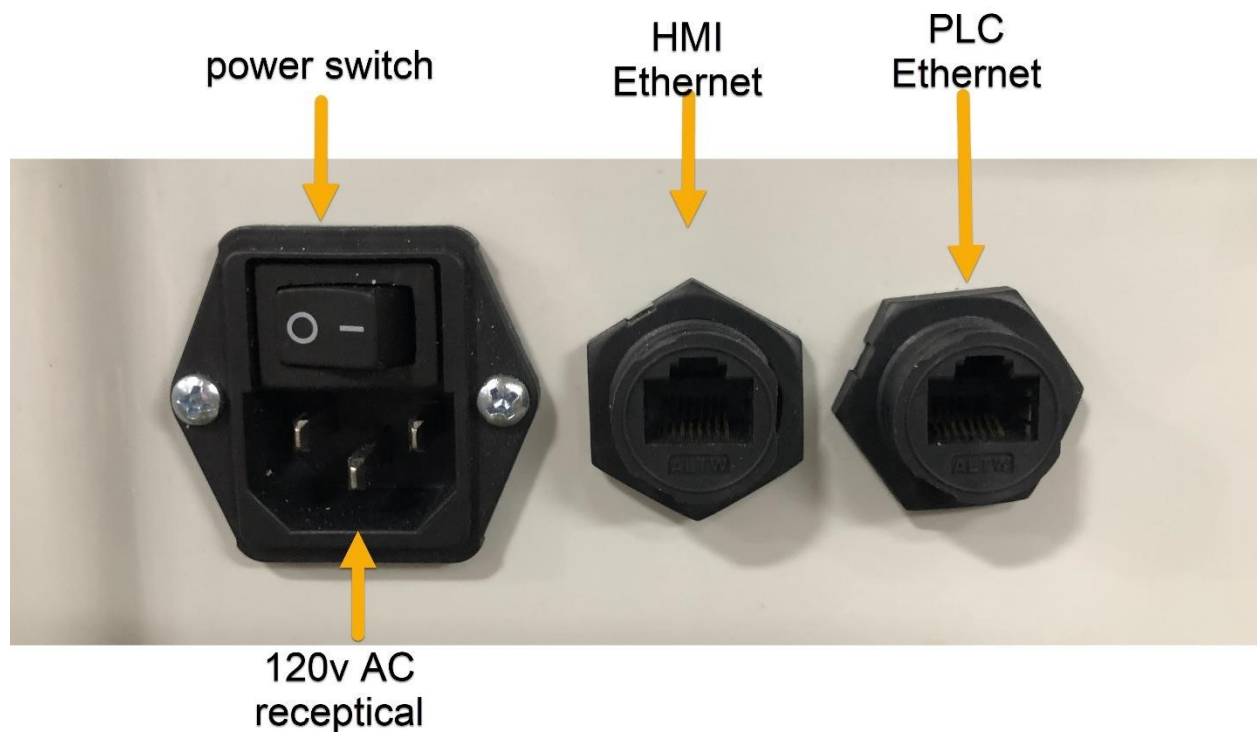
Requirements and Procedures

The Grain Handler Temperature Monitoring System includes the control system box and zone sensors in either 8, 16, or 24 zone options



It is recommended that the control box, consisting of the PLC and HMI components, be mounted indoors to limit exposure to extreme low ambient temperatures.

Control panel requires 120v ac outlet for power



After mounting the control panel, use the supplied power cord to plug into the panels 120vac receptacle. Use supplied Rj45 jumper, to connect the HMI ethernet port to the PLC ethernet port, if a router or network switch is not being used. If adding the system to an

existing network, simply plug both ports into the same router or network switch.

Temperature probe installation

The exact layout of sensors is to be determined by the installer and operator; installation recommendations are available from your dealer. Temperature probes must be landed in correct locations on the control panel term strip to allow proper temp display on HMI.

A typical installation would have the zone split between sides, i.e. Zones 1-4 on the south and Zones 5-8 on the north. The Zone terminal number will match the HMI display number.

Zone Temp Sensor Wiring

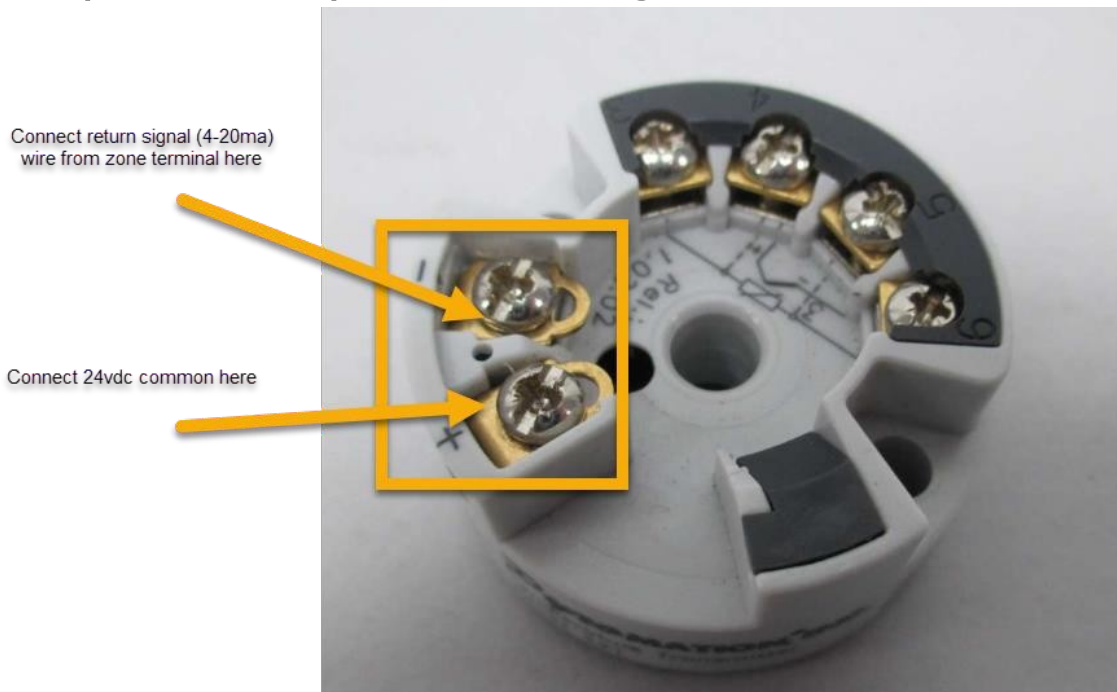
When field wiring the zone sensors, we recommend using the same pattern as used at the shop.

Starting with the sensor on tier 4 closest to gas train the colors will be laid out as follows

Tier #6	Red	Brown	Purple	Blue	Orange	Yellow
Tier #4	Red	Brown	Purple	Blue	Orange	Yellow

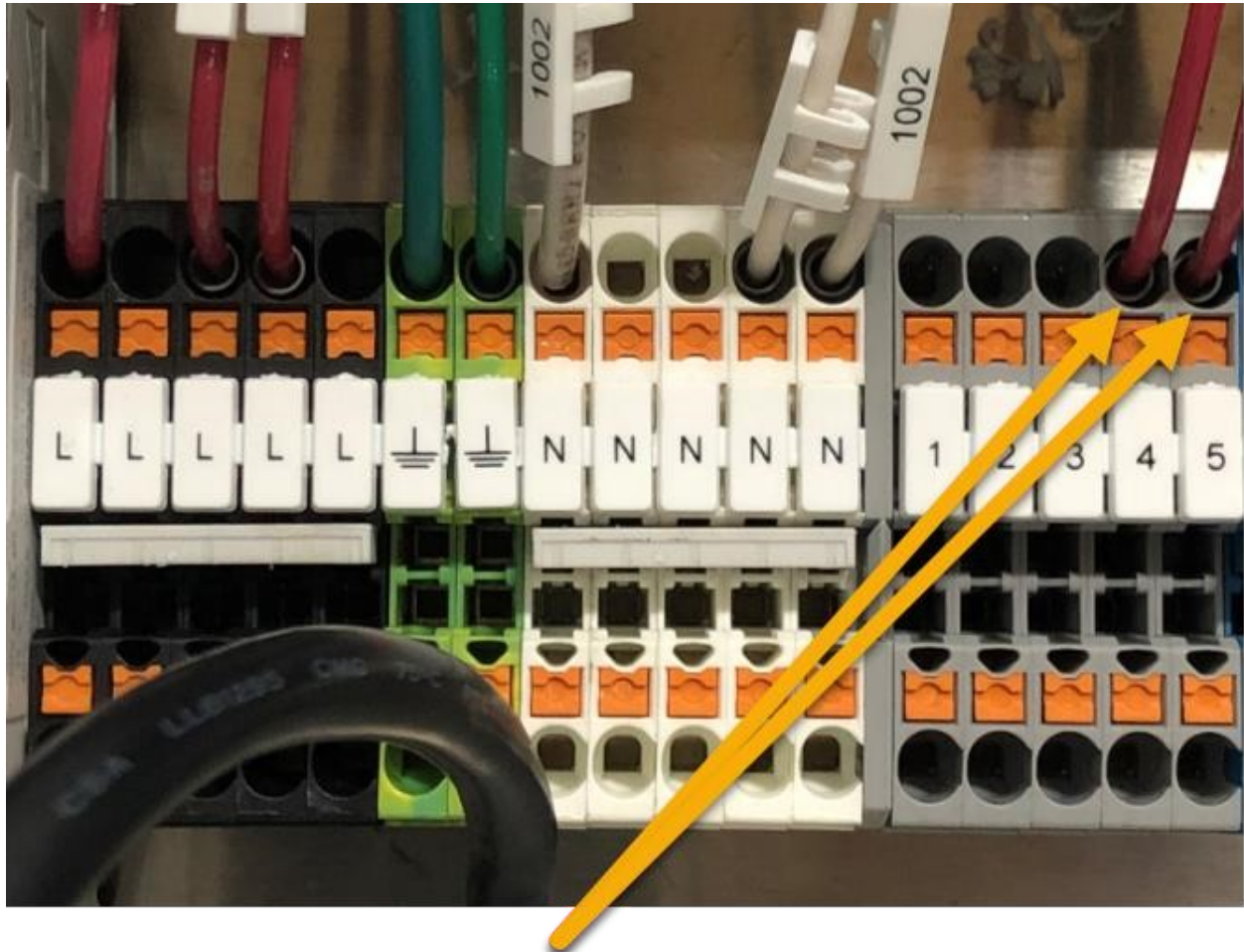
This pattern should follow the layout on both sides of the dryer. We always use black wire for 24VDC common to all sensors.

Temperature probe wiring





High Limit Monitor/Bypass wiring



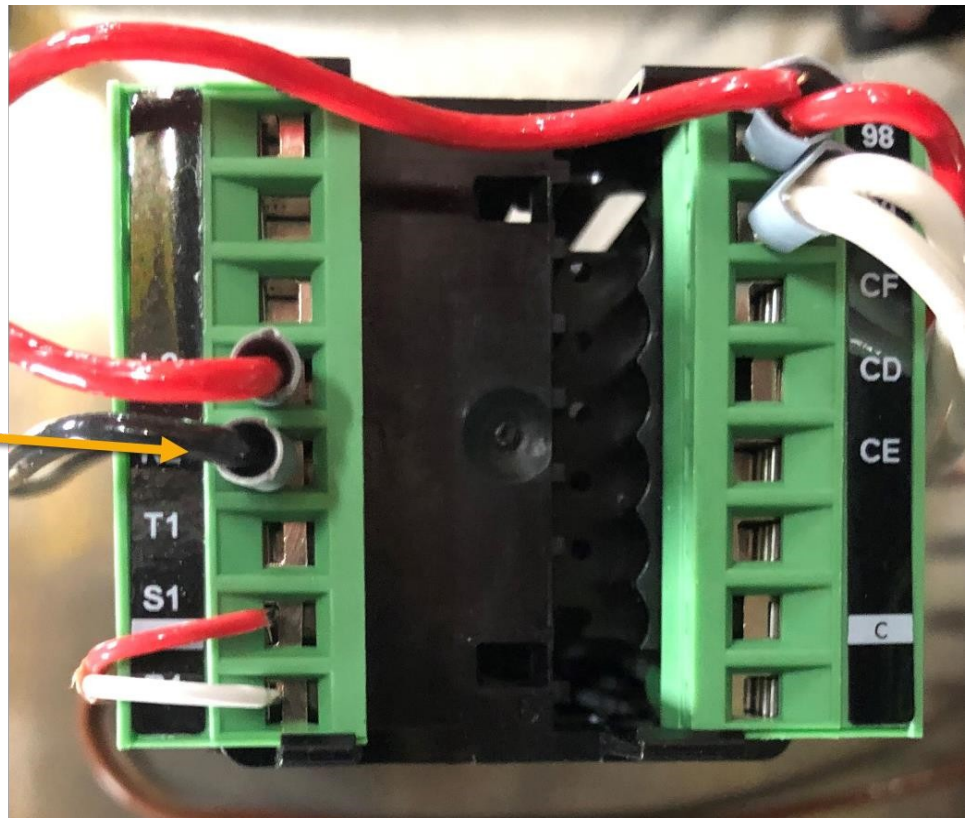
Terminals 4 and 5 are used to connect the Temperature Monitoring system to the Dryer control panel

The installer will need to pull two unshielded wires and one pair of **TYPE J** thermal couple wires to the main dryer panel. Remove the

wire from the K2 terminal on the High limit controller.



This will be the wire removed from the High limit controller.

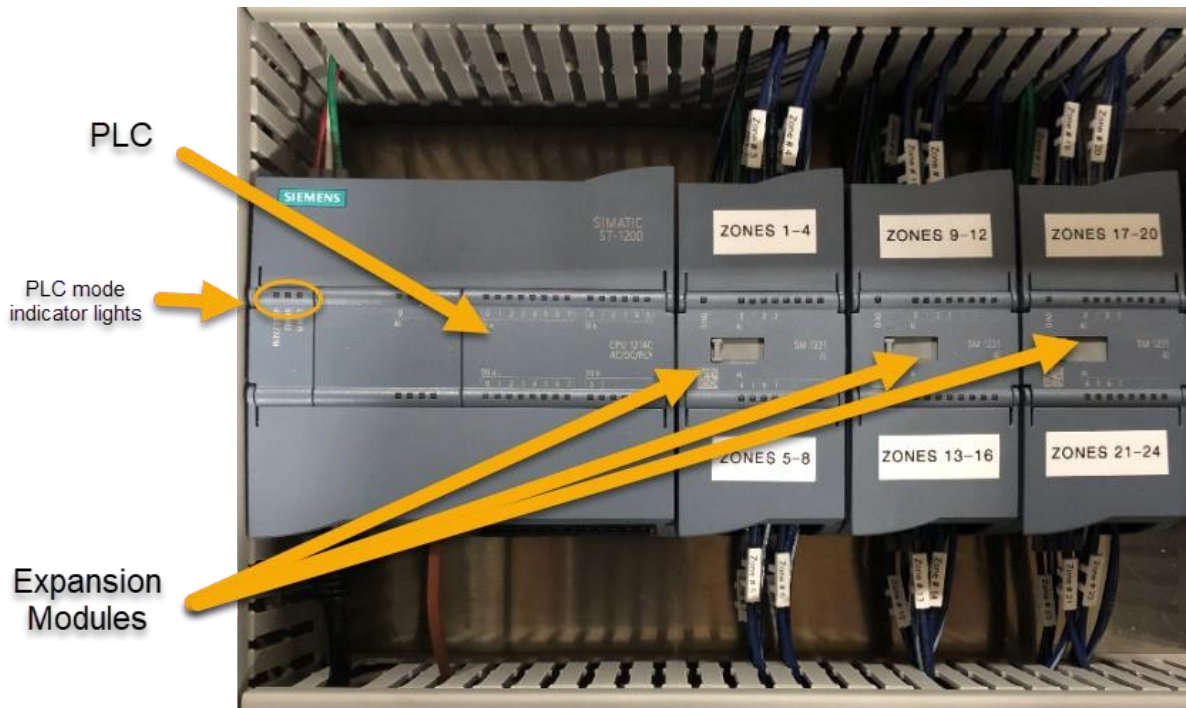


Remove the wire in terminal K2 on the High Limit controller located at the dryer control panel. Use a wire nut to connect this wire to

one of the two wires pulled from the Temp Monitor panel, land the other end to terminal 4 in the Temp Monitor panel. Now land the second unshielded wire to terminal K2 on the High Limit controller, the wire you removed in the previous step. Then land the other end, to terminal 5 in the Temp monitor panel. The **TYPE J** wire should be landed in the TYPE J terminal blocks in the dryer panel. When connected properly the dryer will shut down if the grain temp of any sensor exceeds the Temperature Monitoring set point



PLC Components



The number of expansion modules will depend on the number of zones selected when ordering your system. Upgrading to a 16 or 24 zone system only requires the addition of the corresponding expansion module.

HMI OPERATION

The first page loaded on the system HMI will be the main screen consisting of the Grain Handler Logo and four buttons.



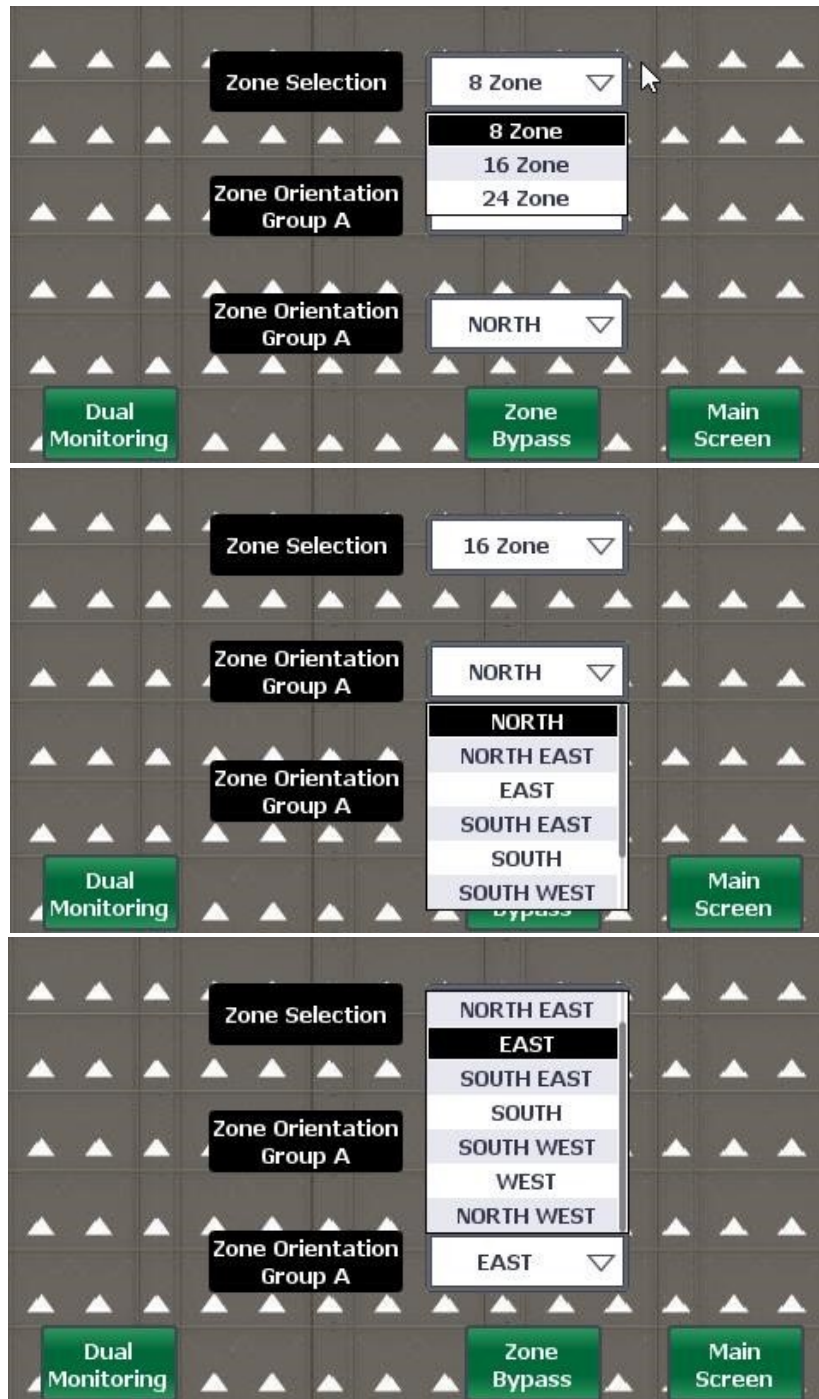
To begin set-up, press the setup button to access the setup screen.



This will open the setup screen where you can select the number of zones for your system as well as the direction the tiers face.

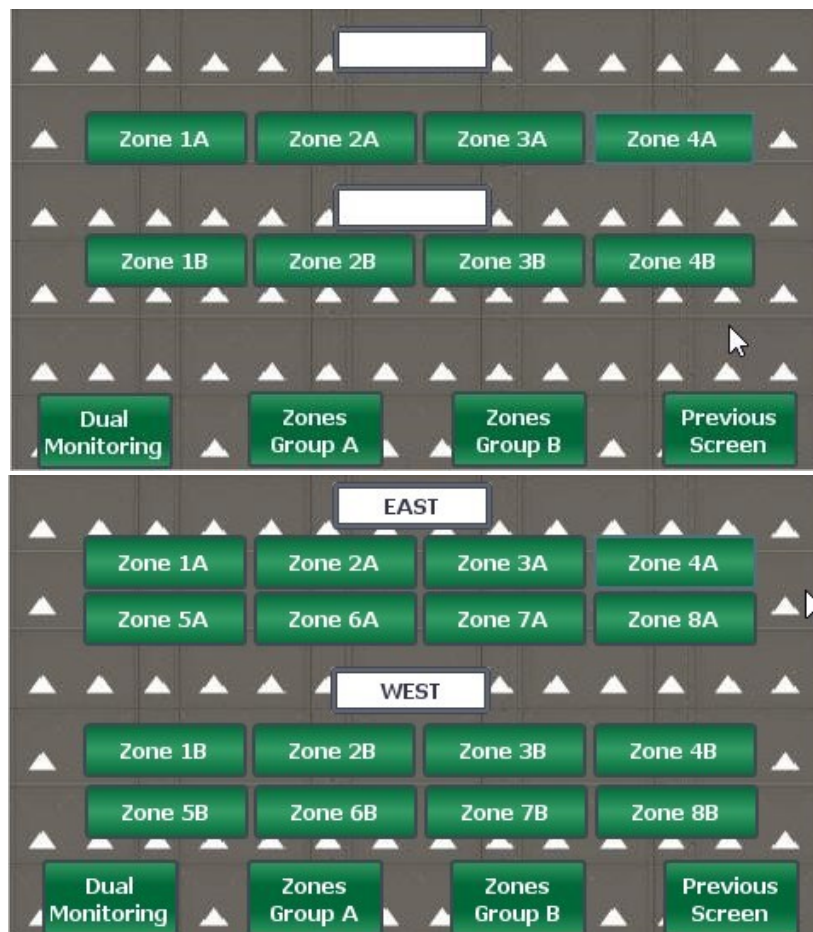


By pressing the drop-down menu, the button with the down arrow to the right of the text, the selections drop down will appear. Press on the desired text to load it into the PLC.



Once these selections have been made press the Dual Monitoring button to view all temperature zones simultaneously.

You can access zone bypass functions by pressing the Zone Bypass button, this will open the Zone Bypass screen.



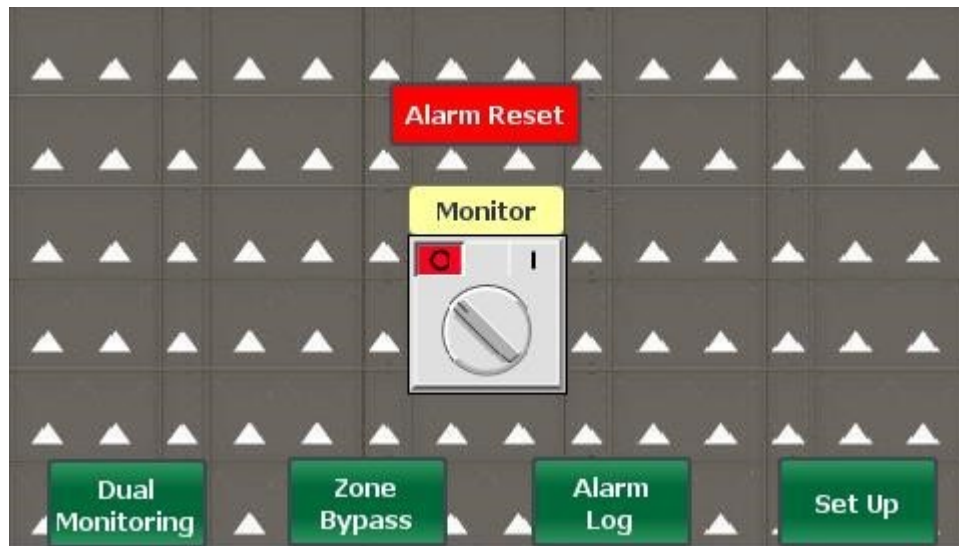
The number of zones displayed will correspond to the selection you made on the setup screen. From this screen you can select individual zones to bypass. An example of a need for this is if a sensor fails or the wire becomes disconnected causing a fault. To bypass a zone simply press the button labeled with the desired zone number and the graphic

text will change to bypassed briefly then begin to flash yellow to indicate bypass function is selection for that zone.

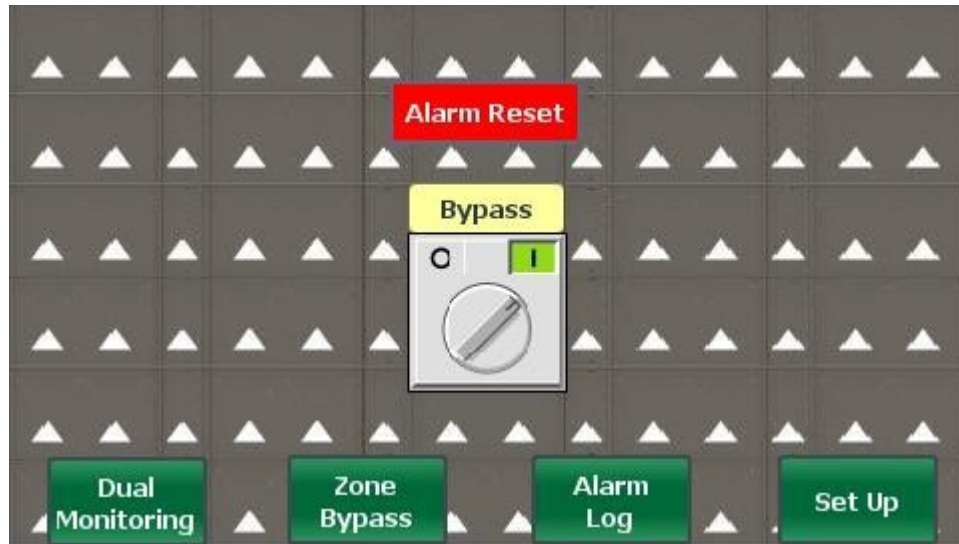


Press the Dual Monitoring button to return to the dual monitoring screen or press the previous screen button to exit.

From the Dual Monitoring screen, you can press the Alarm Reset button to open the alarm reset page.



From here you can reset the high limit alarm or choose to bypass the high limit interrupt. To reset an alarm simply press the red graphic with the Alarm Reset text. To bypass the high limit, press the switch graphic in the center of the screen. The text above will change to bypass and the red box on the top left will turn off and the green box on the right will turn on.



You can also open the Zone Bypass screen from here, as well as the Alarm Log. Press the Dual Monitoring button to exit.

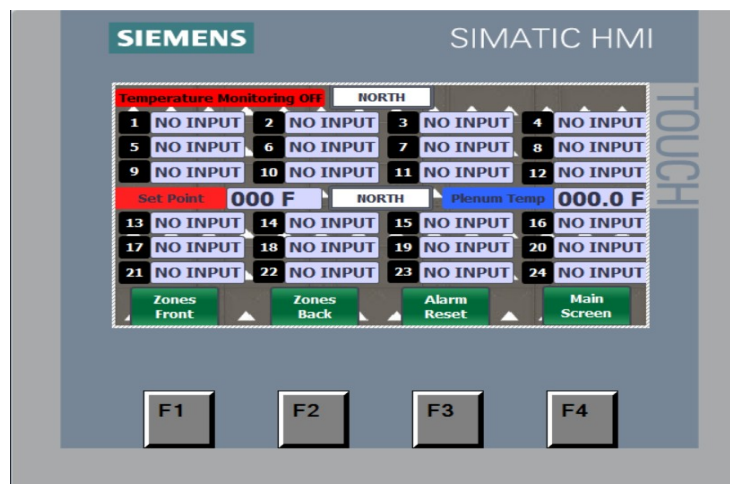
The alarm log will display the time and date of any system errors as well as the change of state on either the high limit bypass switch or the individual zone bypass buttons.

No.	Time	Date	Status	Text
1	6:54:50 AM	3/5/2019	I	Bypass Mode
2	6:54:26 AM	3/5/2019	IO	Zone 1 Bypass
1	6:54:14 AM	3/5/2019	IO	Bypass Mode
1	6:52:57 AM	3/5/2019	I	Bypass Mode
2	6:52:07 AM	3/5/2019	I	Zone 1 Bypass
1	10:12:36 AM	2/14/2019	IO	Bypass Mode
1	10:12:35 AM	2/14/2019	I	Bypass Mode

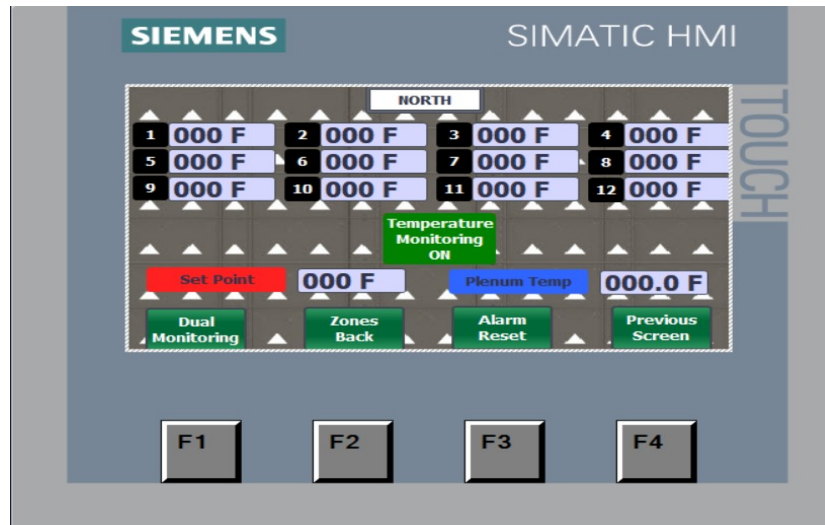
To exit the alarm log, press the F4 button below the screen to exit.

After set-up is complete your system is now ready to monitor grain temperature. Grain temps are displayed on the Dual Monitoring screen for viewing both sides at once, or Front and Back for monitoring only one side at a time.

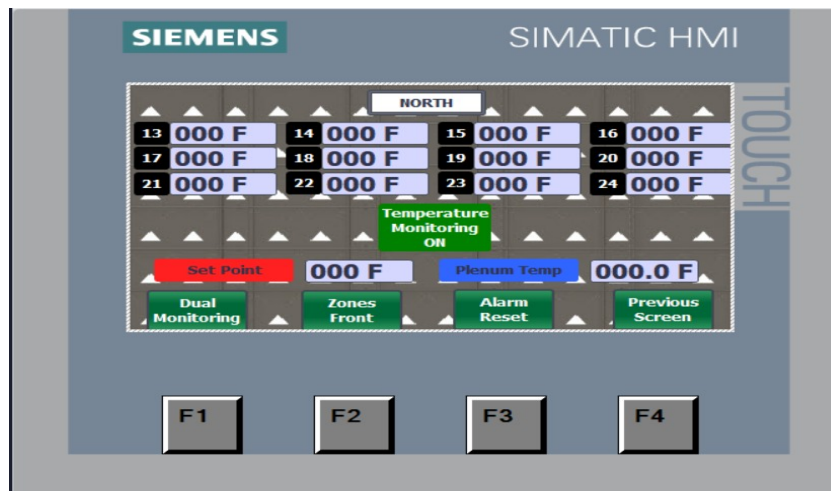
Example of the Dual Monitoring screen



Example of the Front Zones screen

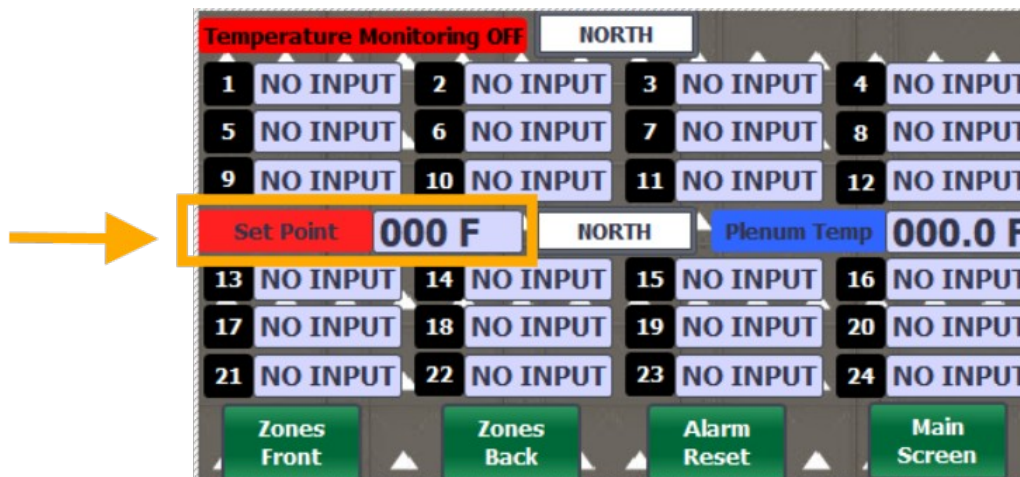


Example of the Back Zones screen

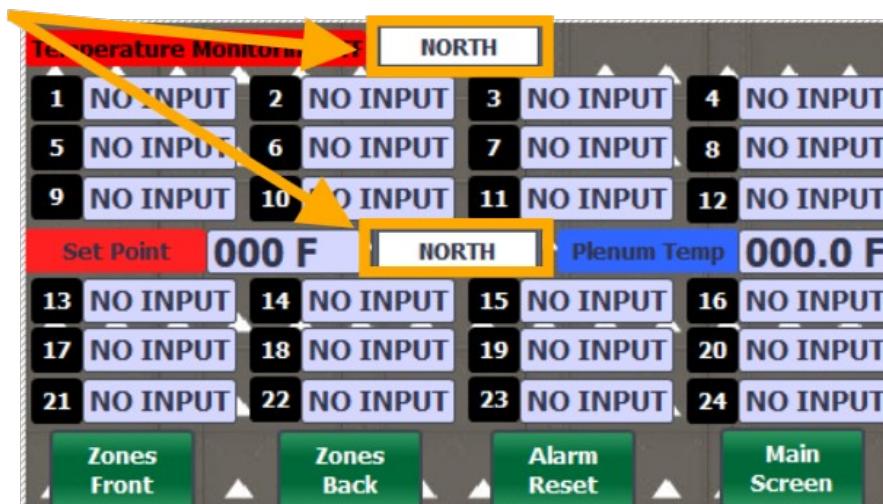


System set point; the highest grain temp you wish to allow your dryer to continue running at. Can be entered from any of the zone monitoring screens by pressing the number

field next to the text in the red box that says Set Point.

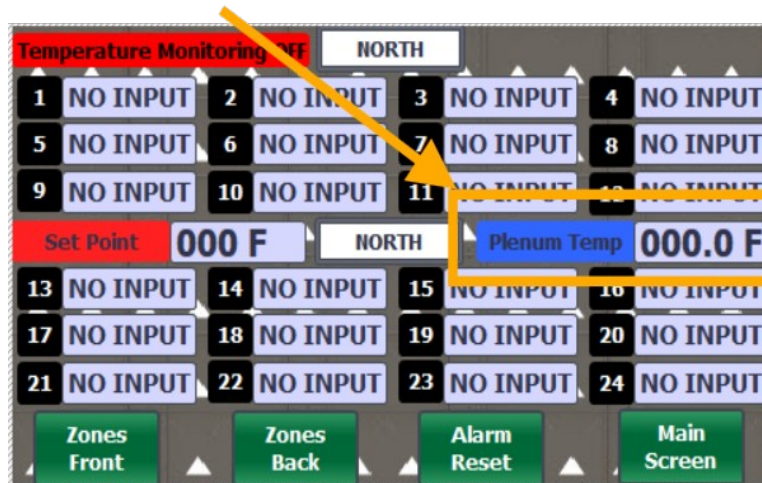


The orientation of the tiers which were selected on the set-up screen is displayed in the text boxes above the zone groups.

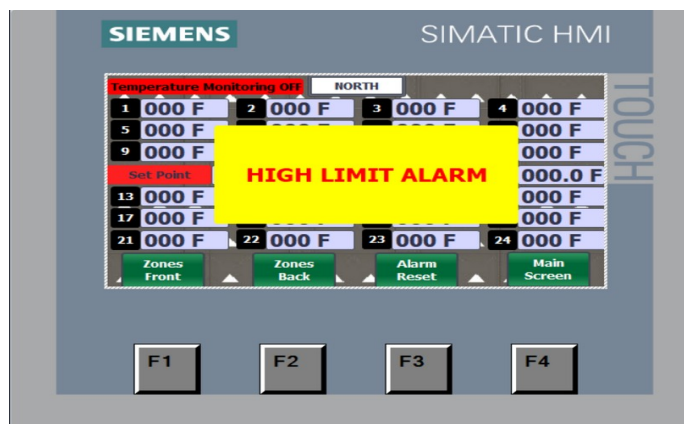


The monitoring screens will also show plenum temp; however, this cannot be set here. A

plenum temp must be set at the dryer control panel.



If one or more zones exceed the set point an alarm will trigger displaying a large graphic that will blink on the monitoring screens



This graphic will continue to blink until the high limit fault has been reset. If a zone fault occurs the area around the sensor that faulted should be inspected for blockage.

Troubleshooting

- If an individual zone sensor becomes disconnected the display will read 421 degrees for that zone. Wiring should be checked.
- If “Hash tags”, ### are displayed in the number fields, the communication cable has become disconnected or damaged and should be inspected.
- If the system does not power on check that the power supply cable is plugged in, and switch is in the on position.

INSTALLING SOFTWARE UPDATE WITH MEMORY CARD

Installing software updates using a Siemens SD memory card is very simple and strait forward. There are four simple steps to complete the action and restart the CPU.

1. Turn off system power. This is accomplished by manually tripping the single pole breaker in the CPU cabinet.
2. With power off install the SD memory card into the CPU you wish to update, note each CPU will have its own memory card.
3. Turn on system power. The status LED labeled RUN/STOP will blink Green/Orange, after start-up is complete, the LED labeled MAINT will blink Orange also. When the RUN/STOP LED turns solid Orange, the update is complete. This function can take 30 seconds to 5 minutes depending on the size of the file being loaded.
4. Turn off system power and remove the SD card for the memory card slot. Turn on power. The Status light for RUN/STOP should be green after starting up with the ERROR and MAINT not illuminated.

Your software update is now complete.



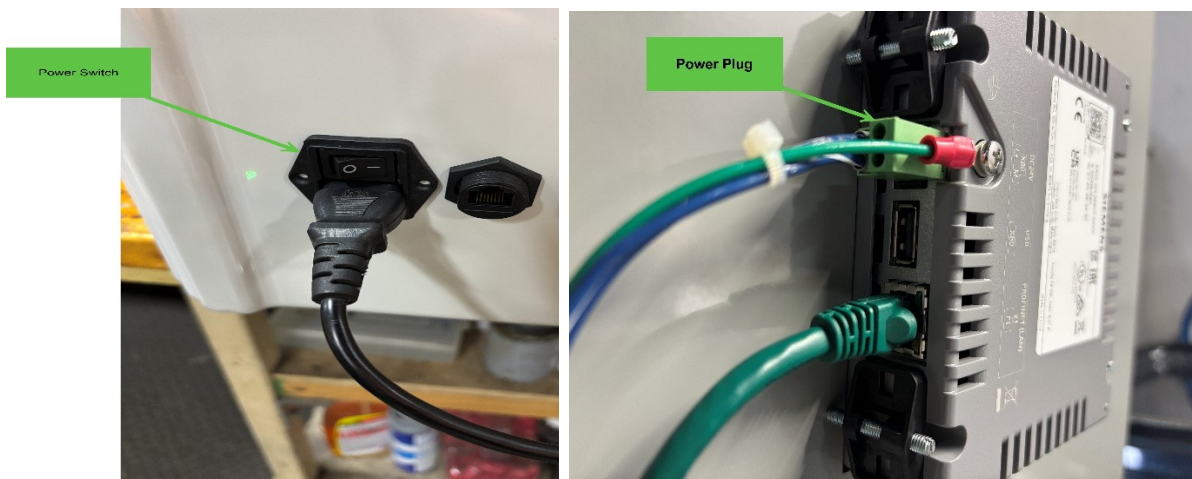
INSTALLING SOFTWARE UPDATE FOR HMI WITH USB FLASH DRIVE



Remote updating of the Temperature Monitoring HMI is done using a USB flash drive with the software update preinstalled on the drive. Follow this instruction to complete the software update once you have received your flash drive and SD card with the software update.

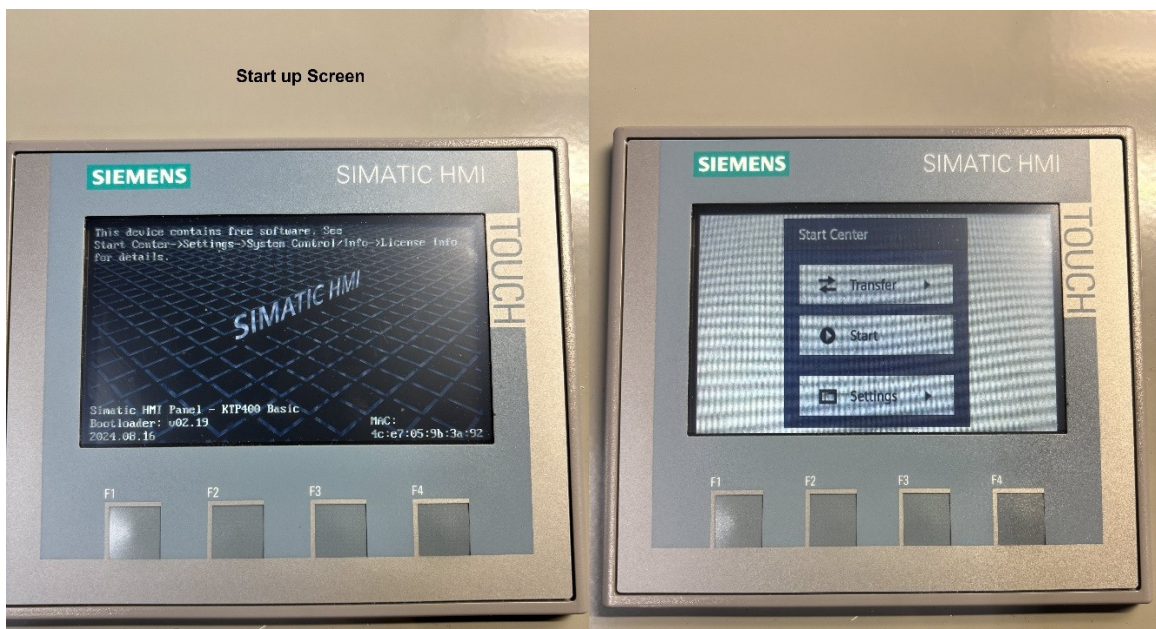
1. Turn the power off on the HMI by turning the power switch to the off position or removing the green plug from the back of the HMI.
2. If a USB drive is installed by the factory remove it.
3. Install the updated USB drive and turn the HMI power back on.
4. After the power up cycle is complete a selection window will appear with three options, "Transfer", "Start", and "Settings", select "Settings".
5. Browse the setting menu and look for a tab titled "Service and Commissioning".
6. On the left side of the tab scroll down to "Project Download".
7. Press the small circle icon in the center of the screen to expand the window and select start search.
8. The USB drive will appear in the source tab. With the USB drive highlighted in blue, press the arrow at the bottom right of the screen to advance to the next step.
9. Select the project from the "Projects" tab.
10. With the project highlighted in blue press the arrow at the bottom right of the screen twice to advance to step 4 of the Project Download process.
11. Press "Accept", the download will begin.
12. After update is completed. You may remove the USB flash drive and reinstall the original USB flash drive if it was equipped with one.
13. If the runtime does not start on its own press the "START" button after the HMI completes the download and returns to the selection window.
14. Your HMI update is now complete.

Images of the HMI control screens used in updating.



The first two images show the power switch at the bottom of the enclosure, and the power plug at the back of the HMI.

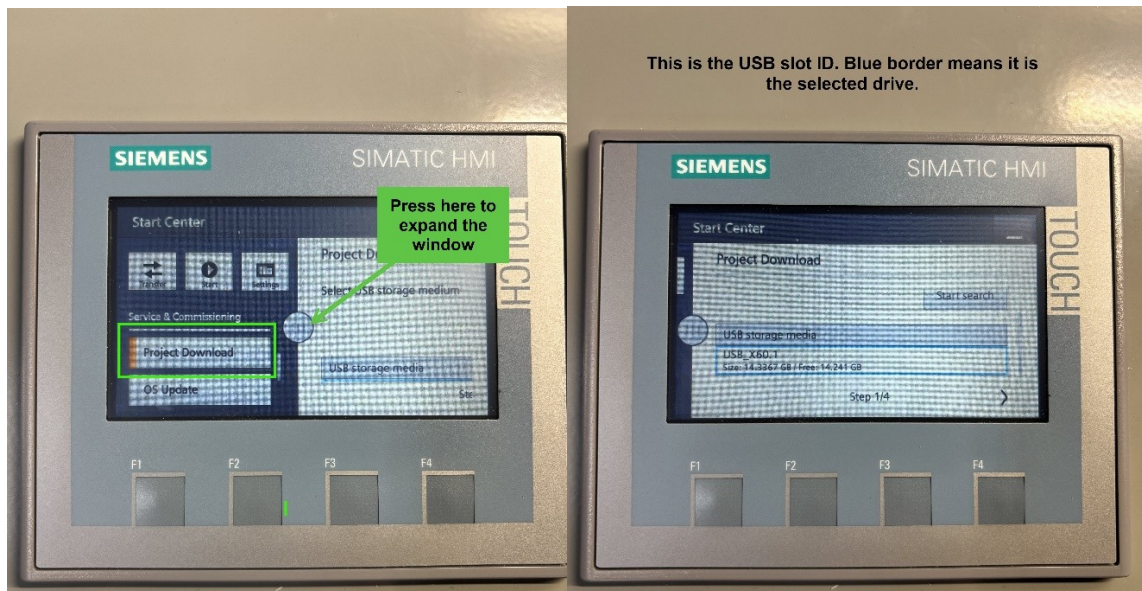
The next two images are of the Start up Screen and the Start Menu.



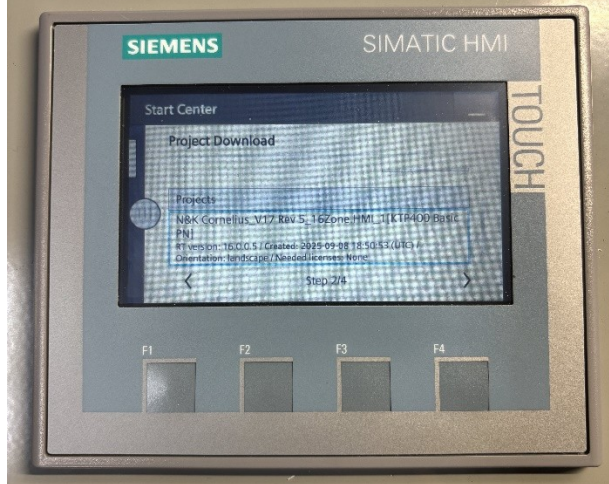
After pressing the settings button, the HMI will change to this screen.



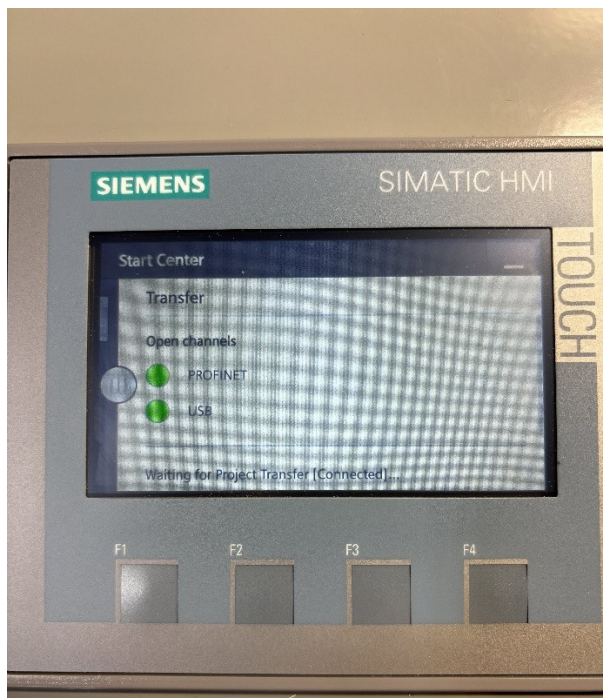
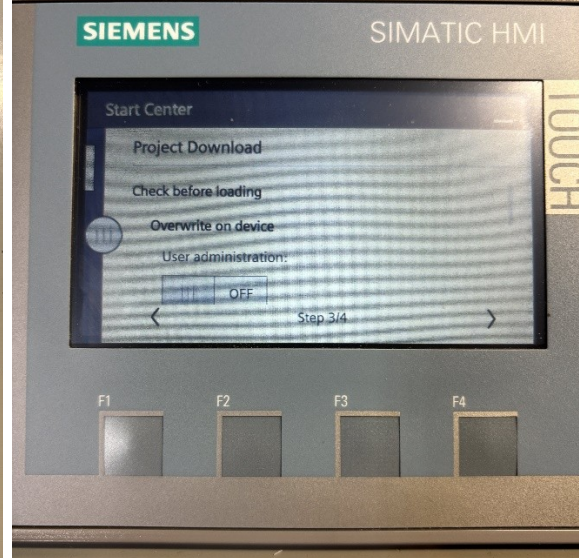
Now you will want to expand the view to make it easier to navigate through the update steps.



The project should be visible here. Press the arrow key at the bottom right.



No changes need to be made to this page. Press the arrow key at the bottom right.



After this step is completed the device will restart automatically.