HempTrain™
Advanced Processing Plant

OPERATION AND MAINTENANCE MANUAL

CANADIAN GREENFIELD TECHNOLOGIES CORP.

159-3953 112 Avenue SE |Calgary, AB | T2C 0J4
Ph: 1-877-974-3377 Fax: 1-877-965-3317
info@canadiangreenfield.com www.canadiangreenfield.com
Follow Us:

Disclaimer

The information in this manual is current to the time of publication. Canadian Greenfield Technologies Corp. reserves the right to make changes without notice as engineering, technology and materials progress.

Revision History

Revision	Description
Rev. 01.01	October 25, 2019 - Initial Release
Rev. 01.02	January 6, 2020 – Edited Figure 1

159-3953 112 Avenue SE |Calgary, AB | T2C 0J4
Ph: 1-877-974-3377 Fax: 1-877-965-3317
info@canadiangreenfield.com www.canadiangreenfield.com
Follow Us:

Table of Contents

1. Safety

The HempTrain™ Advanced Processing Plant is an industrial processing plant. Therefore, industrial-level hazards to safety must be considered. There hazards are as follows:

1.1 General

- Install ALL guards before operating HempTrain™. Chains and drive belts can cause severe injury or death.
- Avoid loose closing or long hair – rotating machinery can grab hair or clothing, causing severe injury or death.
- Install the safety cable across the input of the bale opener whenever people are on top of the input belt:
    - Falling into the bale opener (**Figure *2***) when it is not operating may result in severe injury.
    - Falling into the bale opener when it is operating may result in death.
- Maintain a safe distance from bales. When bales are moved, they can roll or collapse. When bales are processed by the bale opener, they collapse onto the feed belt. A bale can crush people when it moves or collapses.
- NEVER allow people to come between a bale and the input to the bale opener. If the bale rolls or collapses, it will crush people against the spiked apron (**Figure *2***).
- Do not hang anything on the dust collection pipes and supports or use them to support body weight.
- Do not ride the conveyors.

1.2 Emergency stops

HempTrain™ has 10 Emergency Stop stations. Depressing any Emergency Stop button will stop the entire system. USE the emergency stops WITHOUT hesitation. If you have any doubts as to the safety of personnel or if the system makes unusual sounds, press any emergency stop IMMEDIATELY, investigate, and correct any issues. The system is designed to recover cleanly from emergency stops, and emergency stops are encouraged both for safety and for protection of equipment.

Lockout

HempTrain™, with the exception of the additive feeder, operates as a single integrated machine. It is NOT safe to work on any part of the integrated machine without locking out ALL parts of the machine. HempTrain™ is provided with three lock-out points:

- Main control panel disconnect (**Figure *2***) – locks out all motors, including the additive feeder;

- Main system disconnect (customer provided) – can be operated when motors are running. Locks out the main control panel and all motors, including the additive feeder;
- Additive feeder disconnect located next to the additive feeder motor (**Figure *3***) – locks out additive feeder.

LOCK OUT THE POWER before removing guards, opening control panels, attempting to manually clear jams or doing anything that involves putting body parts into the machine. Failure to lock out the power can result in severe injury or death.

1.3 Electricity

HempTrain™ is powered by 480 volt electrical service. Do not defeat panel interlocks; refer all electrical repairs to Canadian Greenfield Technologies Corp.

1.4 Dust

Though HempTrain™ is equipped with an advanced dust control system (**Figure *1***), evolution of nuisance dust is inevitable when handling agricultural products. Protect yourself with a properly fitted P100 filter mask.

1.5 Fire and explosion

Hemp and hemp dust are flammable. Under certain conditions, hemp dust can be explosive. The HempTrain™ dust collector (**Figure *1***) has fire and explosion mitigation systems (No Return Valve, Flameless Vent and Firebreak Shutter - **Figure *3***). Do not operate HempTrain™ unless all of these systems are functioning properly. To prevent secondary explosions, clean up nuisance dust, even from difficult-to-reach surfaces.

1.6 Additive feeder

- The additive feeder (**Figure *1***) is accessed by a ladder and safety gate. Use care when climbing and ALWAYS close the safety gate;
- The deck of the additive feeder has a maximum capacity of 600 lbs;
- Store additives on the platform by using a forklift to raise the pallet of additive to the height of the rail, and then transfer the additive to the platform. Do not attempt to carry additives up the ladder;
- When working on the additive feeder platform, keep both feet on the platform. Do not climb out on the feeder or over-reach.

1.7 Entering the bale opener input

It may be necessary to enter the bale opener input (**Figure *2***) to remove feedstock. The feed conveyor is steep and may be slippery. If you must enter the bale opener input,

- Lock out the system power;
- Fasten the safety cable across the input;
- Put on the fall protection harness;
- Attach the lanyard on the fall protection harness to the safety cable.

2. System Description

2.1 Major Equipment

The following three views of HempTrain™ show the locations of major equipment.

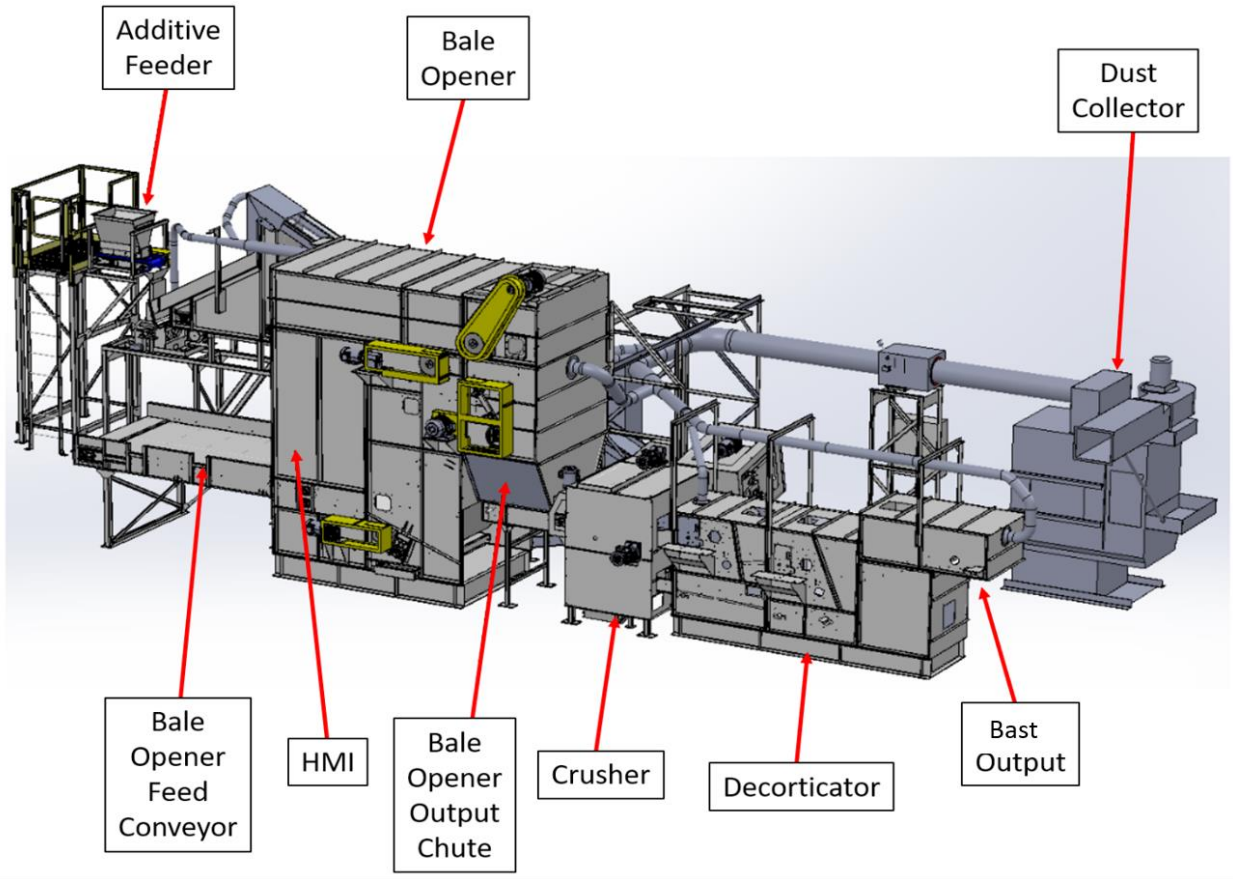

Figure 1 - HempTrain™ Advanced Processing Plant - profile 1

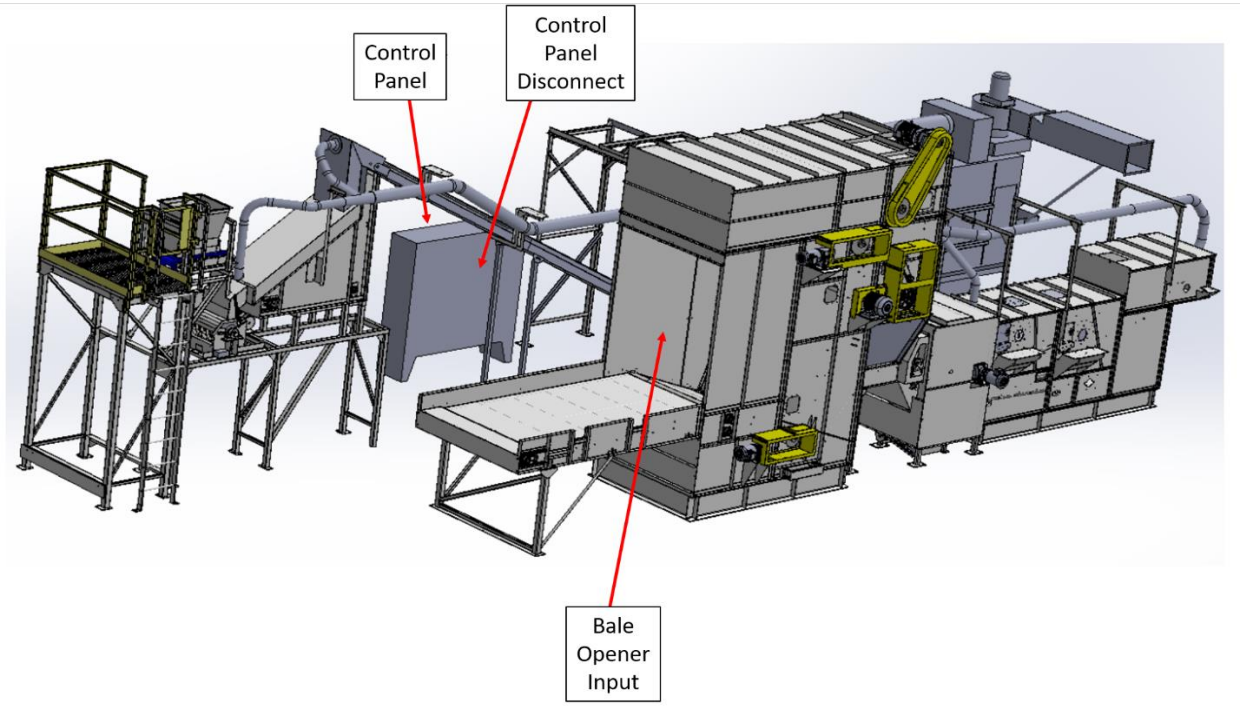

Figure 2 - HempTrain™ Advanced Processing Plant - profile 2

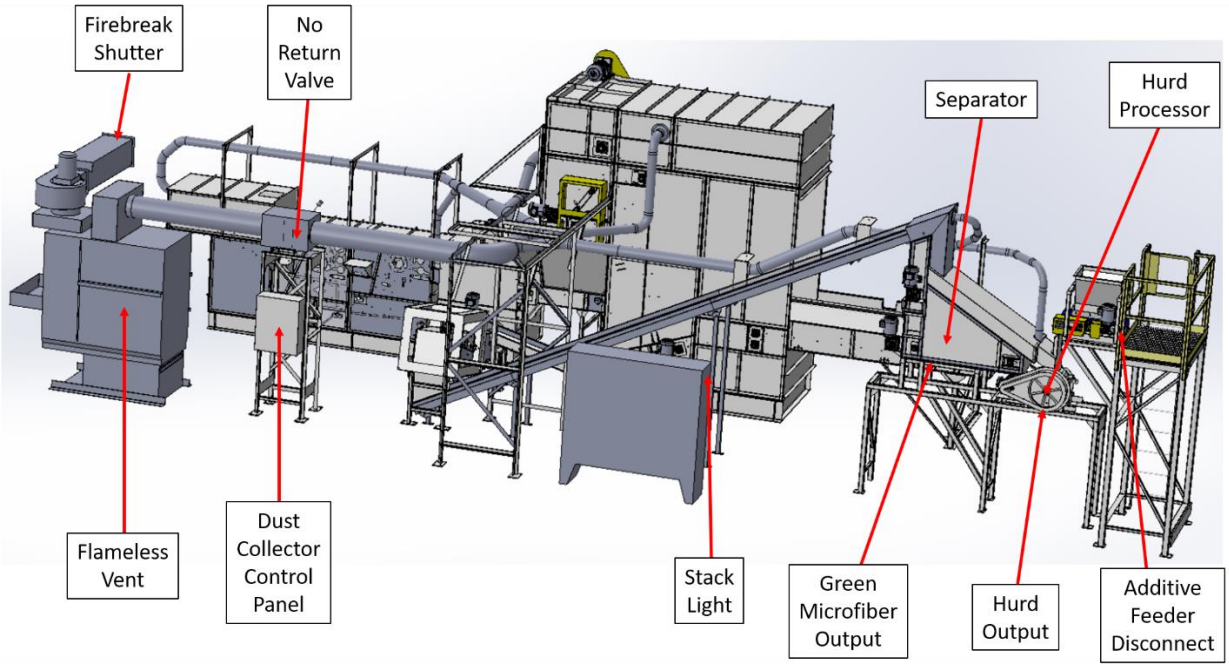

Figure 3 - HempTrain™ Advanced Processing Plant - profile 3

2.2 Stack Light

The control panel is equipped with a stack light to show the current state of the system (**Figure *4***).

Figure 4 - stack light

Table 1 - Stack light color meanings

Color	Meaning
Green	HempTrain™ is running.
Yellow	• There is an active alarm, or; • HempTrain™ is starting up, or; • HempTrain™ is shutting down.
Red	HempTrain™ is stopped.

3. Operation

HempTrain™ is equipped with a touch-screen control to access all functions of the system, located near the input to the Bale Opener (**Figure *1***). The control uses separate passwords for Operators and for Senior Operators. The passwords cannot be changed – they exist only to provide a basic level of access control, not security. If the passwords have been lost or forgotten, contact Canadian Greenfield Technologies Corp. customer support. The Operator password is 4321.

3.1 Login

When the power is turned on, the HMI screen will initialize and then show a login screen (**Figure *5***). Press LOGIN and enter the password on the pop-up keypad:

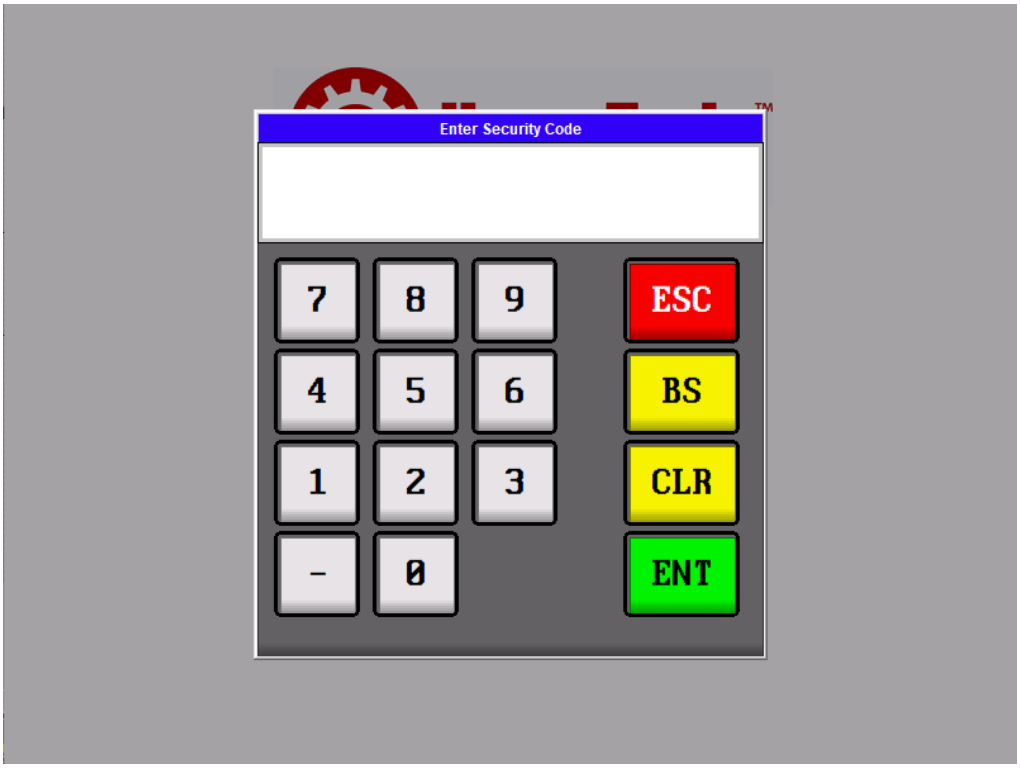

Figure 5 - Pop-Up Keypad display

- **ESC** – Closes the keypad
- **BS** – Backspaces
- **CLR** – Clears the number
- **ENT** – Enters the number

3.2 Starting the system

When you enter the correct password, the Main Screen displays:

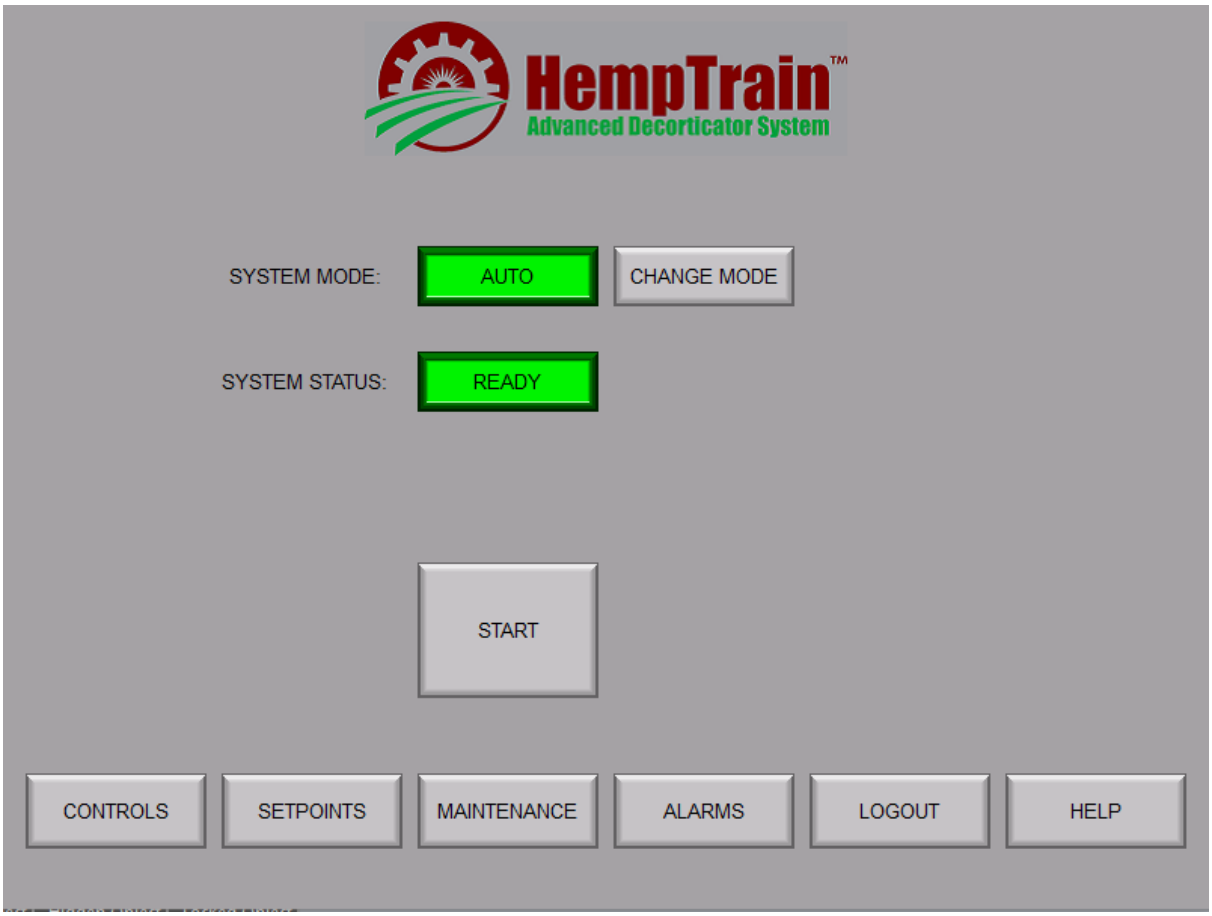

Figure 6 - Main Screen display (READY status)

The SYSTEM MODE can be AUTO or MANUAL. The system should be in AUTO mode; if it is not, press the CHANGE MODE button and enter the Senior Operator password. MANUAL mode is used to run individual motors for maintenance purposes.

Press the SETPOINTS button.

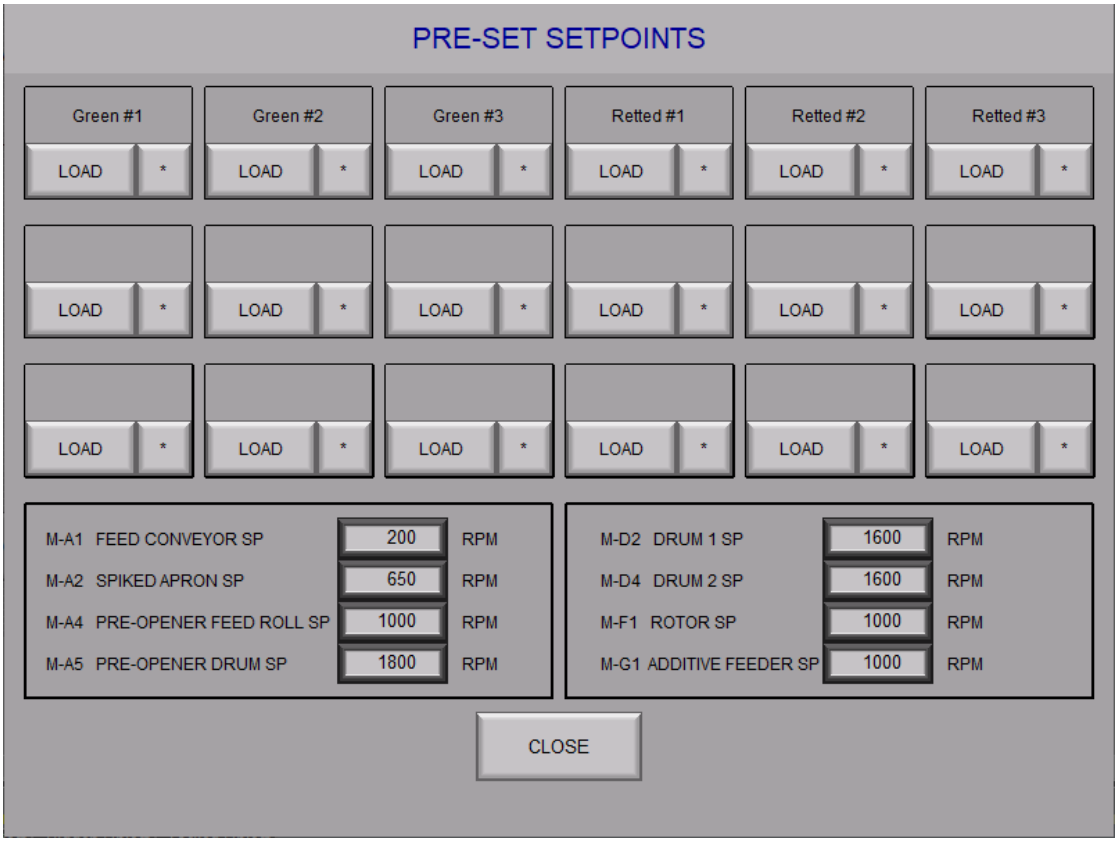

Figure 7 - Pre-Set Setpoints display

Select the Pre-set set points that your company has determined to be appropriate for the type of feedstock you are processing by pressing the LOAD button under the name (for example, Green #1). The new settings take effect immediately. Press the CLOSE button. Recommended starting values for Pre-sets are:

M-A1 FEED CONVEYOR SP	200	M-D2 DRUM 1 SP	1600
M-A2 SPIKED APRON SP	650	M-D4 DRUM 2 SP	1600
M-A4 PRE-OPENER FEED ROLL SP	1000	M-F1 ROTOR SP	1000
M-A5 PRE-OPENER DRUM SP	1800	M-G1 ADDITIVE FEEDER SP	1000

3.3 Starting the system

To start the system, place a bale on the feed belt of the bale opener (**Figure *2***). Remove any string, rope, banding, webbing or any other packing material. Do NOT pass between the bale and the entrance to the bale opener – if the bale shifts or collapses, you will be crushed against the spiked apron (**Figure *2***).

Place collection devices (bags, boxes, conveyors) under the fiber output (**Figure *1***), green microfiber output (**Figure *1***) and hurd output (**Figure *1***). The system has been designed to accommodate output containers on standard pallets so you can quickly replace filled containers. If you are using duffle-top bags, pull the duffle-tops up around the outputs to reduce the escape of dust. The fiber output has hooks to support the handle loops on bags; for the hurd and green microfiber outputs, place the aluminum bag supports across the support frame to support the handle loops.

Commence by pressing the START button. The system status will update to STARTING and the audible alarm will sound for 10 seconds so people have time to step back from the machine or press an Emergency Stop if they believe that start-up would be unsafe. The system will start up its components in the correct order, with time delays as required to prevent jamming. The start-up can be instantly stopped at any time using any Emergency Stop button including the one mounted on the HMI cabinet (**Figure *1***). If you have any misgivings about the start-up (for example, collection devices not in place), depress the E-STOP button. The system is designed to recover cleanly from an emergency stop, and this is generally less trouble than letting the system start all the way up just so you can shut it down.

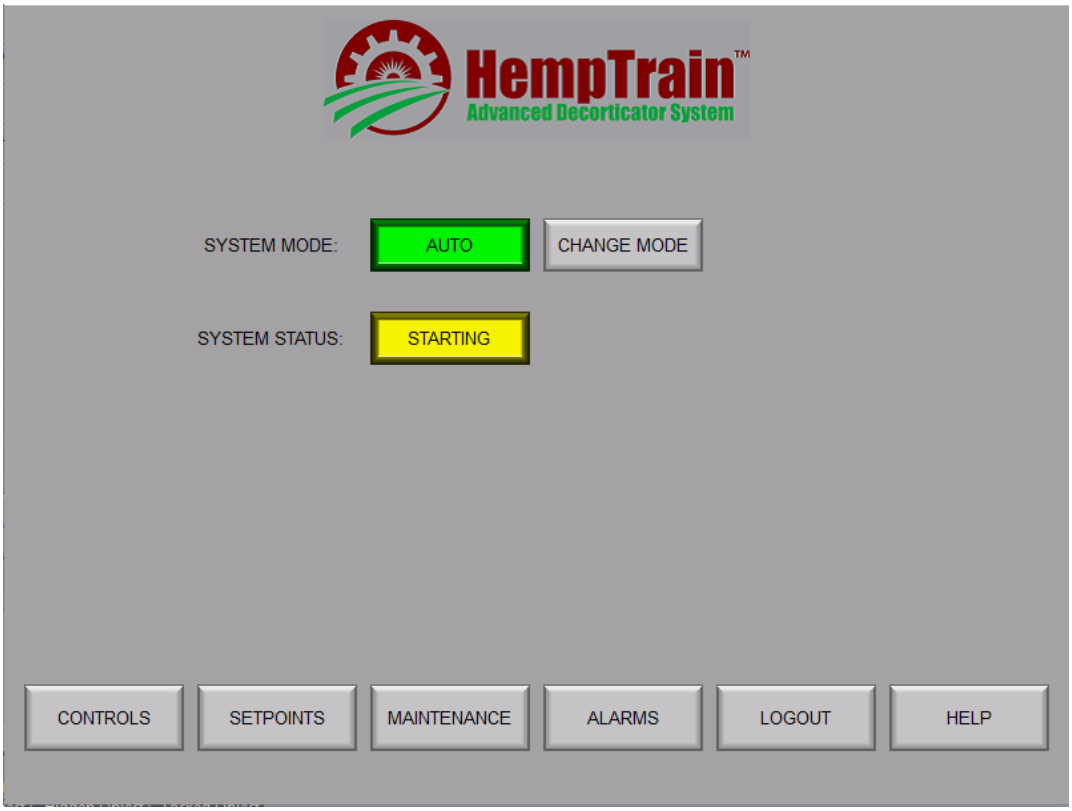

Figure 8- Main Screen display (STARTING status)

When the system has fully started, the system status updates to RUNNING and the STOP button appears:

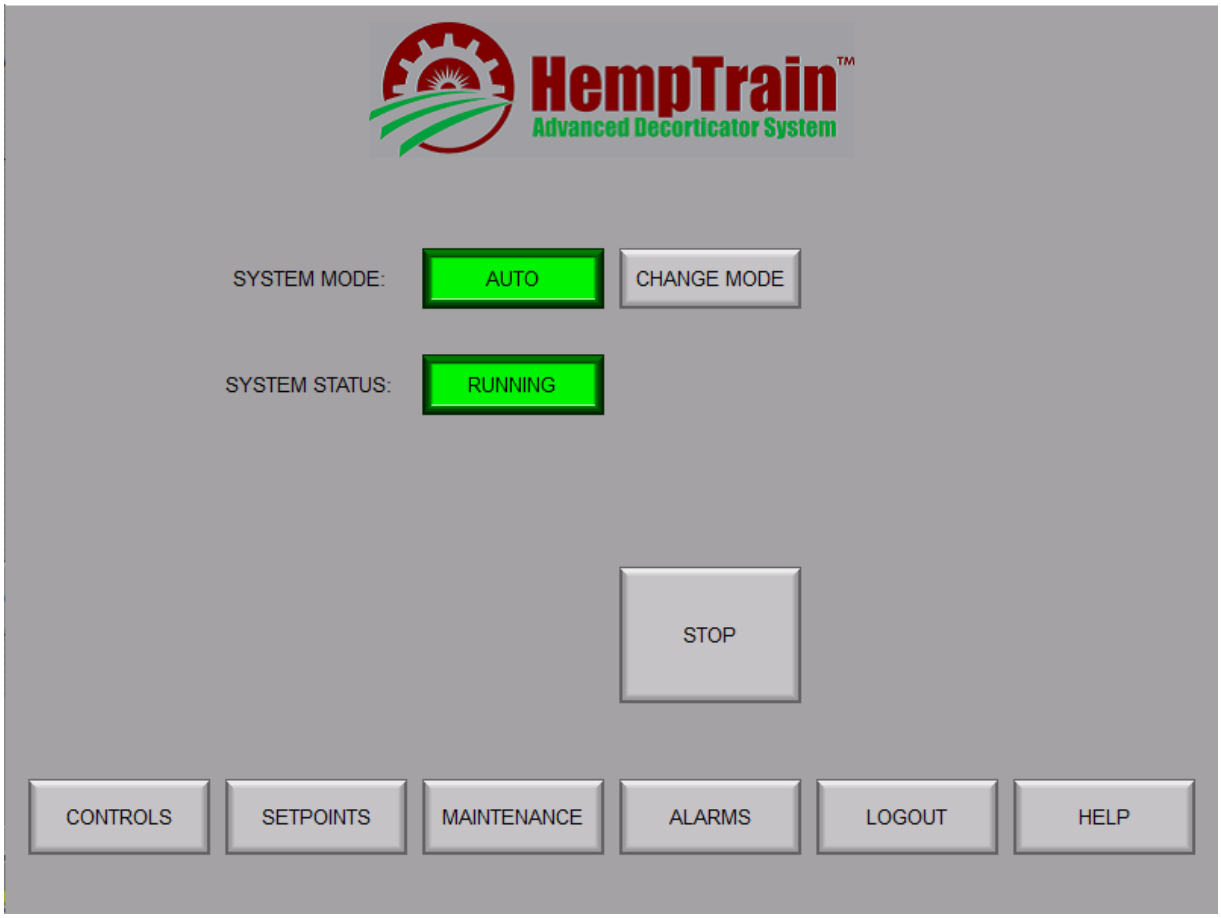

Figure 9- Main Screen display (RUNNING status)

The system is now fully started.

You can rapidly advance or remove the bale from the bale opener (**Figure *2***) using the fast Forward and fast Reverse push buttons:

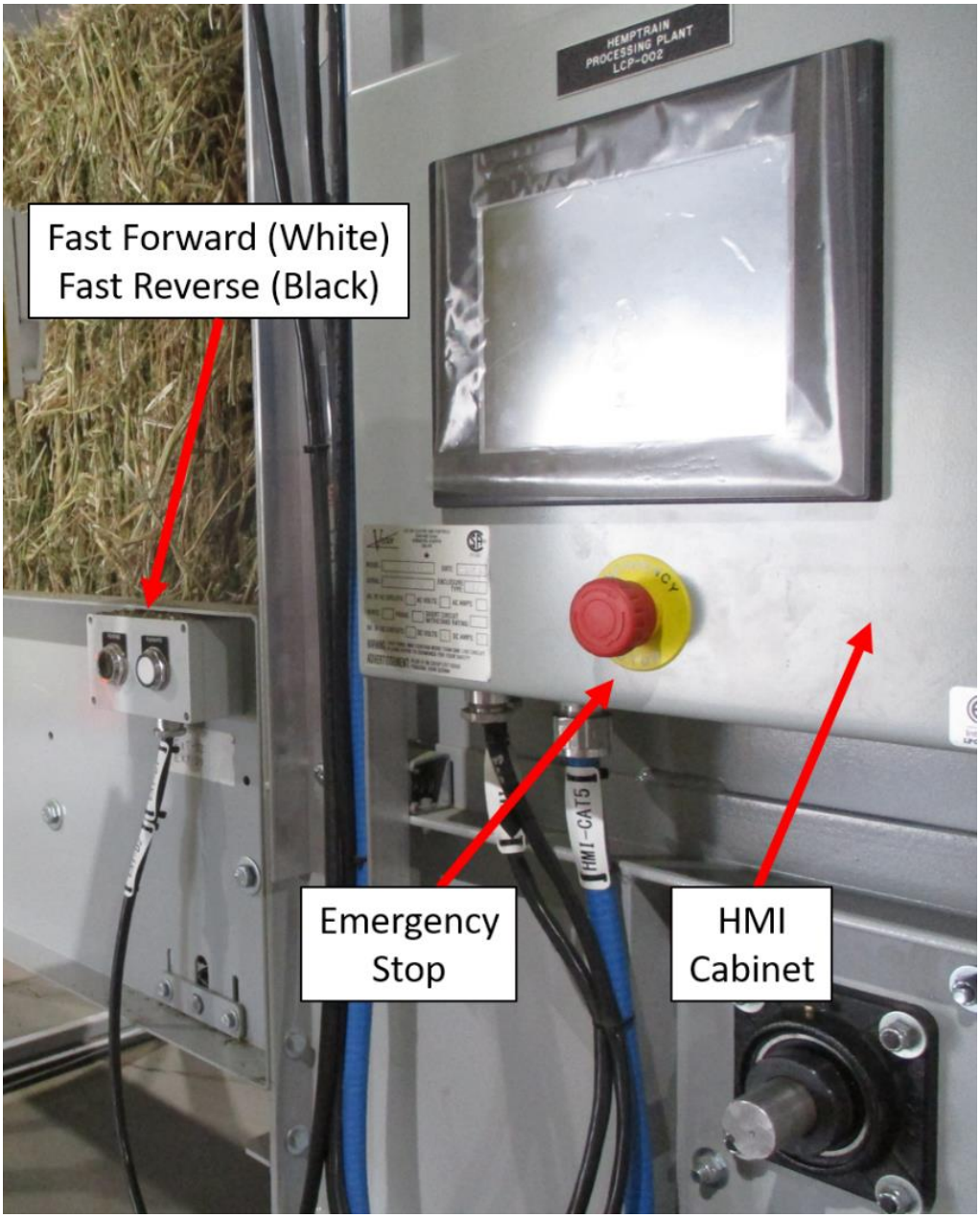

Figure 10 - HMI Control Area showing fast forward (white), fast reverse (black), and Emergency Stop buttons

You can temporarily increase or decrease the feed rate into the bale opener (**Figure *2***) using the CONTROLS screen:

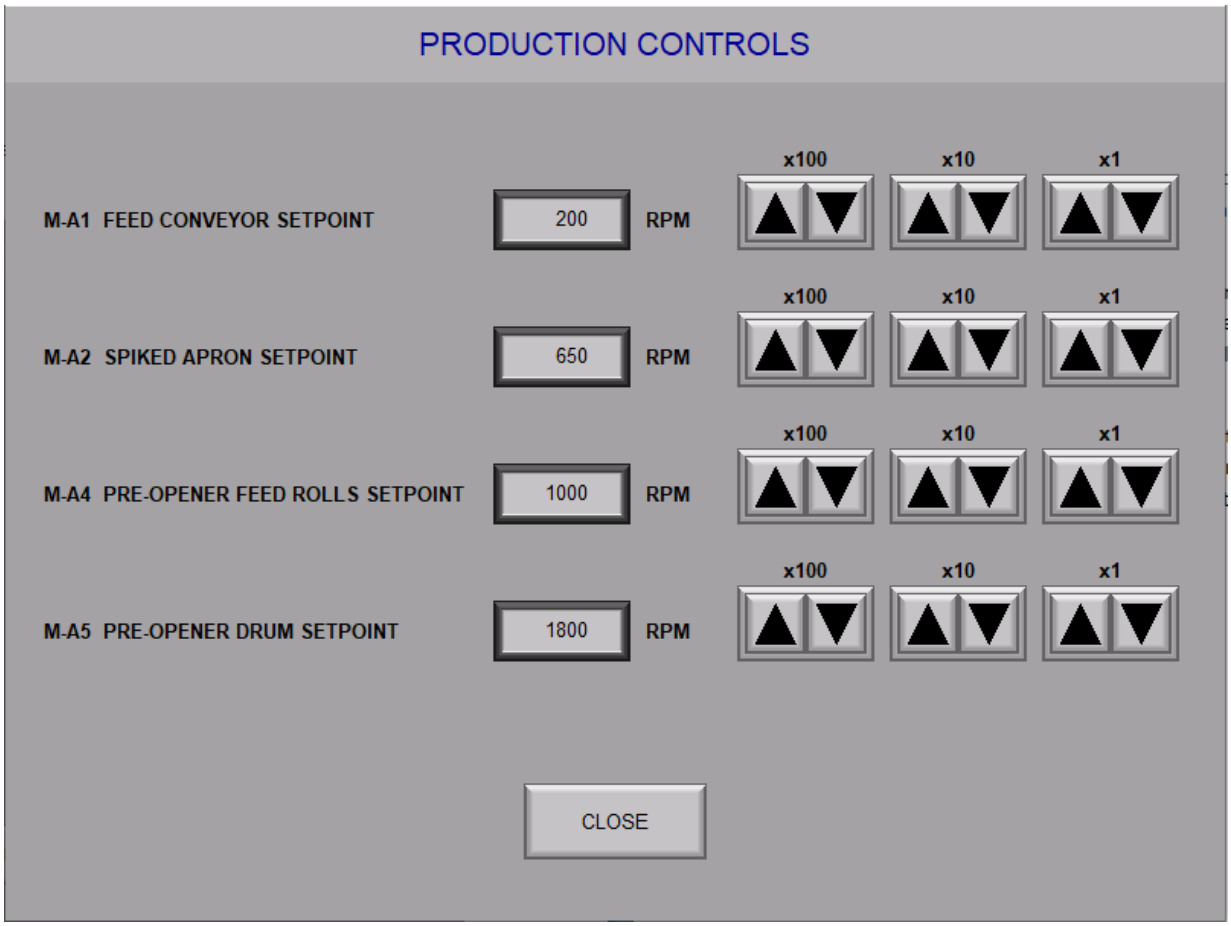

Figure 11 - Production Controls screen

Adjust the speeds up or down with the hundreds (x100), tens (x10) and ones (x1) arrow buttons. The system will restrict the speeds to those safe for the motor and drive trains. For best feeding, the Pre-opener Feed Rolls should be kept at least 1.4x the Spiked Apron speed.

3.4 Continuous production

To produce continuously, you must add bales and replace filled output containers.

3.4.1 Adding bales

To add a bale, wait until enough of the current bale has been consumed that you can place another bale on the feed conveyor (**Figure *1***). Remove all string, rope, banding, webbing or any other packing material.

When the throughput of the bale opener begins to drop at the end of the current bale, use the Fast Forward button to advance the new bale – watch as the new bale starts to be consumed and adjust the feed rate as required.

3.4.2 Replacing output containers

The output containers fill at different rates and will have very different weights when they are full.

3.4.3 Green microfiber container

The green microfiber is the densest of the output streams. Place the new container on a pallet and use two pallet jacks and two operators to speed change-out and minimize spillage. Do not overfill green microfiber container (**Figure *3***).

3.4.4 Hurd container

The hurd stream is less dense than the green microfiber stream, but Canadian Greenfield Technologies Corp. still recommends using pallets to support the containers. Place the new container on a pallet and use two pallet jacks and two operators to speed change-out and minimize spillage. Do not overfill hurd container (**Figure *3***).

3.4.5 Fiber container

The fiber stream is very light. If you are using containers to collect the fiber, you can compact the fiber in the container (using a broom or other tool) to increase the time between container changes. The fiber container is often light enough to be changed out by a single operator, but there will be less spillage if two operators are used. Do not overfill fiber container (**Figure *3***).

3.5 Stopping the System

To stop the system, press the STOP button on the HMI (**Figure *1***). The system status will change to STOPPING. The system will shut off its components in sequence so as to remove all product from the system downstream of the spiked apron (**Figure *2***).

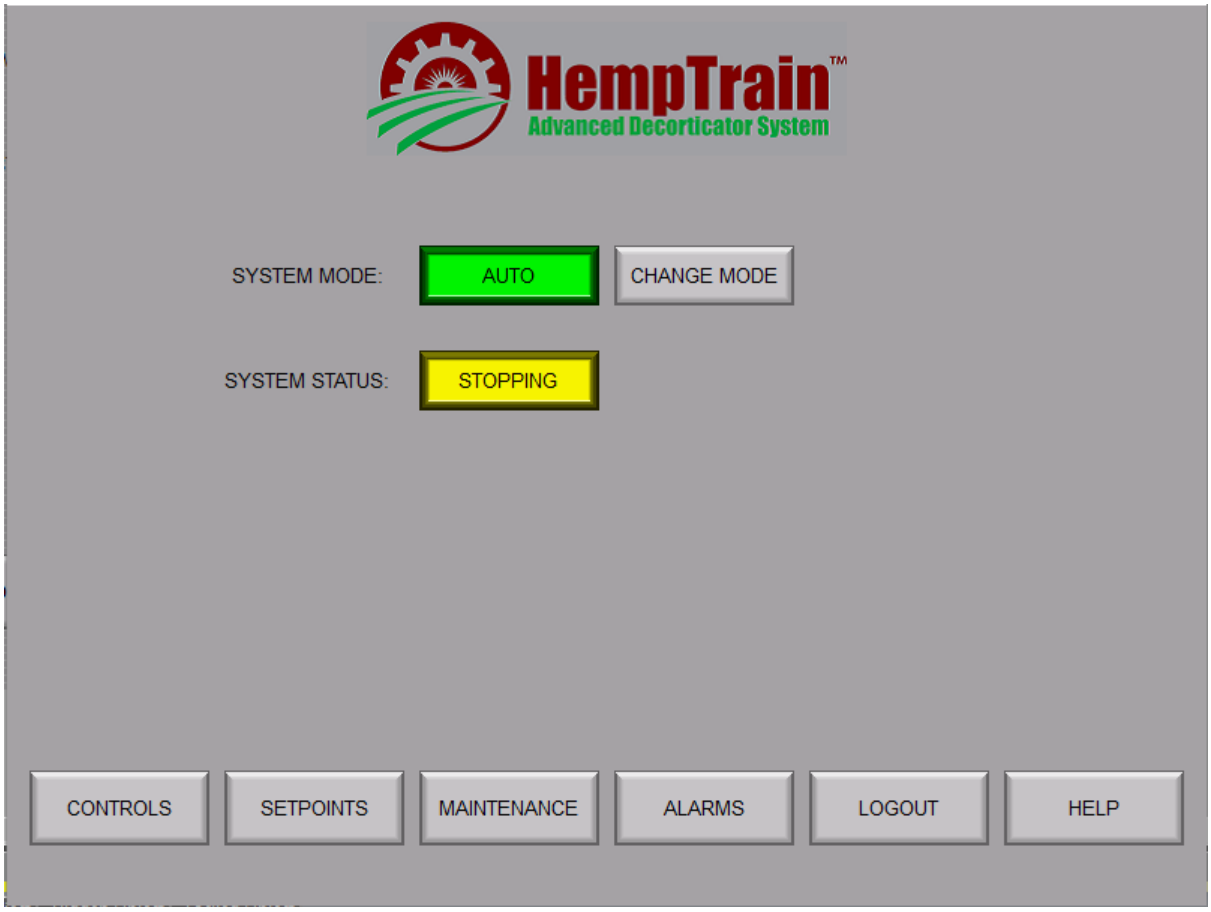

Figure 12 - Main Screen display (STOPPING status)

3.6 Dust collector operation

- Leave the Hand-Off-Auto switch on the Dust Collector control panel in the Hand position (**Figure *13***). If you do not, the automatic cleaning feature of the dust collector will not work.
- On the Dwyer Photohelic Gauge, set the left red needle to zero and leave it. The right red needle can be adjusted according to your feedstock. Canadian Greenfield Technologies Corp. recommends starting with a setting of 6.5. Higher settings give cleaner air at the outlet, but less effective collection from the machinery. Lower settings provide more effective collection from machinery but less effective cleaning of the air.
- Wear breathing protection when removing the collection bins at the bottom of the dust collector. When changing feedstocks, monitor the rate of collection in the bins to determine your emptying frequency – do not overfill. Canadian Greenfield Technologies Corp. recommends starting with a frequency of every 4 hours.

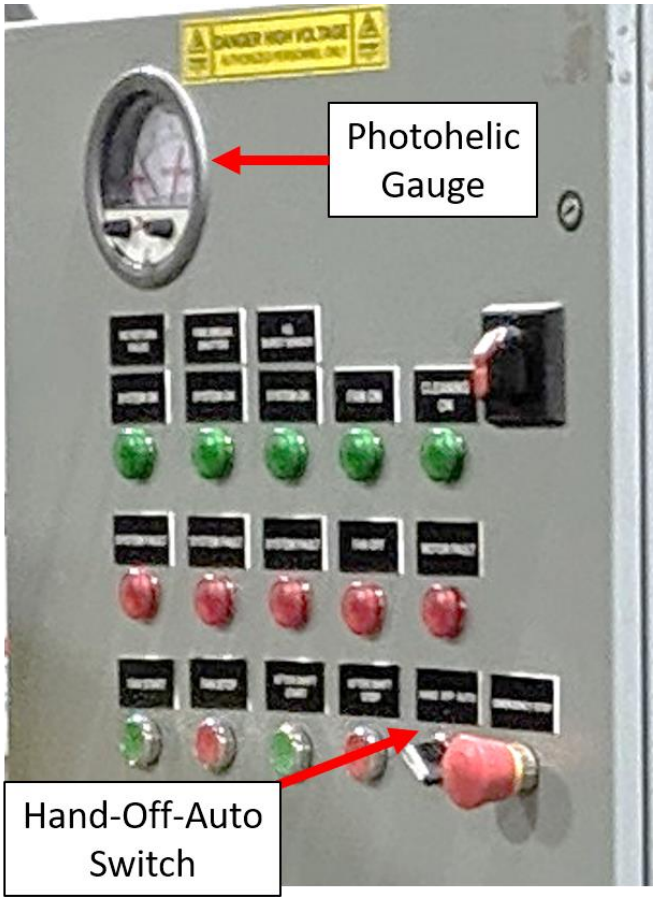

Figure 13 - Dust Collector controls cabinet

4. Alarms and troubleshooting

When there is a problem, the system will raise an alarm. The alarm is a high-pitched tone.

When an alarm is raised, go to the main screen on the HMI (**Figure *1***) and press the Alarms button; the Alarms page displays:

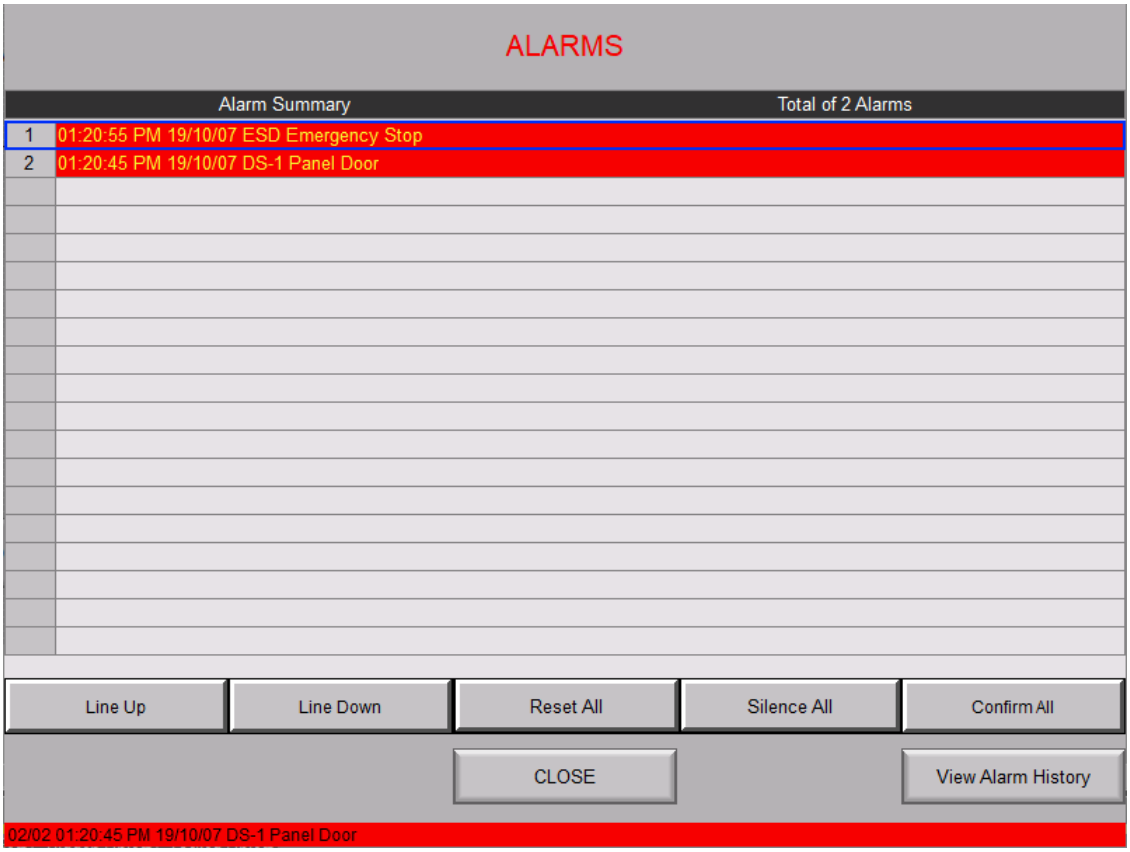

Figure 14 - Alarms display

- Press the Silence All button;
- Write down the name of the alarm. For example, the first alarm in the example Alarm screen is “ESD Emergency Stop”;
- Refer to the Alarm Table for cause and corrective action;
- Perform corrective action;
- Press the Confirm All button and then the Reset All button. If you have taken corrective action, the Alarm should disappear;

- Press Close. You can now set the system into AUTO mode (if you set it to MANUAL mode as part of a corrective action). If there are no critical Alarms, the START button displays, and you can re-start the system

4.1 Alarm Table

Alarm	Cause	Corrective action
AC-1 Air Conditioner Fault	The control panel's air conditioner isn't running	• Check the "AC" (Air Conditioner) breaker inside the control panel • This alarm is normal when the cabinet door is open
AI-01 Cutter Covers Open, Auto Start Disabled	The cover for the Hurd Processor is open	• Close the Hurd Processor cover • This alarm is normal when back lapping the processor knives
CPU Battery Low, Replace with CR2354	The battery backup for the control panel's memory is low	• Replace the battery the next time the system is down for maintenance
DS-1 Panel Door	The control panel's door is open	• Close the panel door • This alarm is normal when the panel door is open
ESD Emergency Stop	An emergency stop button has been pressed	• Determine the reason for the emergency stop, correct the problem and turn the emergency stop button to unlock it
EXT-A1 Dust Collector Fault	The dust collector is not operating	• Determine why the dust collector is not operating and correct the problem
LS-1 Crusher Jam	The crusher rolls have spread too far apart. This is usually due to a large lump of fiber entering the crusher.	• Attempt to dislodge the fiber by putting the system into manual mode (requires Senior Operator password) and running the crusher rolls backward. If they can be run backward, remove the side of the bale opener outlet and remove the fiber. Check that the height adjustment shims are not cocked. If they did, lock out the power, remove the crusher side covers,

		and measure the approximate length of the compressed spring. Back off the spring adjustments, jack up the top roll and straighten the shims. Lower the roll, making sure that the shims are not cocked, restore the spring pressure, put the covers back on, and return to operation.
M-A1 Feed Conveyor VFD Fault	The VFD that drives the motor has reported a fault. This is usually due to something jamming the process and overloading the motor or the VFD.	• Turn off the system power, allow 15 seconds to discharge VFD, turn the power ON again. Confirm and then clear the alarm. You may try to remove the blockage by entering manual mode (requires Senior Operator password) and using the controls to work the blockage free. Run the motor only briefly (use one hand for the ON button and the other hand for the OFF button) to avoid tripping the VFD again. If this doesn't work, lock out the system power and remove the blockage by hand.
M-A1 Feed Conveyor Fail to Run	The VFD doesn't report to the system controller that the motor is running.	• This error is seen only in cases of control system damage or mis-configuration. Call Canadian Greenfield Technologies Corp. customer support.
M-A2 Spiked Apron VFD Fault	See M-A1 Feed Conveyor VFD Fault	• See M-A1 Feed Conveyor VFD Fault
M-A2 Spiked Apron Fail to Run	See M-A1 Feed Conveyor Fail to Run	• See M-A1 Feed Conveyor Fail to Run
M-A3 Regulating Drum Overload	The Manual Motor Controller (MMC) that	• Turn off power to the system and open

	protects the motor from over-load has detected an over-load condition and shut down the motor. This is usually due to something jamming the process.	the control cabinet. Look for the row of rotary switches that extends across the cabinet. The one that is labelled the same as the motor will be half way between the ON and OFF positions, and the yellow button next to it will stick out. Press the yellow button, then turn the rotary switch all the way off and then back on. Close the control cabinet door and restore power to the system. • You may try to remove the blockage by entering Manual mode (requires Senior Operator password) and use the controls to work the blockage free. Run the motor only briefly (use one hand on the ON button and the other on the OFF button) to avoid tripping the MMC again. • If you can't work the blockage free using the controls, lock out the power and remove the blockage by hand.
M-A3 Regulating Drum Fail to Run	The motor contactor that controls the motor has failed to operate.	• Call Canadian Greenfield Technologies Corp. customer support.
M-A4 Pre-Opener Feed Rolls VFD Fault	See M-A1 Feed Conveyor VFD Fault	• See M-A1 Feed Conveyor VFD Fault
M-A4 Pre-Opener Fail to Run	See See M-A1 Feed Conveyor Fail to Run	• See M-A1 Feed Conveyor Fail to Run
M-A5 Pre-Opener Drum VFD Fault	The Pre-Opener Drum has become jammed with fiber.	• It is often possible to work the fiber loose using manual control of the Pre-Opener feed rolls. First, reset the VFD by turning off the system power, counting slowly to

		15 and then restoring the power. Then enter Manual mode (requires Senior Operator password) and set the speed of the Pre-Opener Feed Rolls to about 400 rpm. Run them BACKWARDS. The jammed fiber will drag the drum backwards. Keep reversing until the Pre-Opener Drum stops turning. Now, turn on the Pre-Opener drum and run the feed rolls in short bursts, listening for how hard the pre-opener is working. When you have fed all the fiber through the drum, turn off the system power and remove the side of the bale opener output chute. Remove the fiber – if you try to run it through the system you will jam the decorticator. Return the Pre-Opener Feed Rolls to their previous setting and restore the system to operation. • If you can't work the fiber loose with manual controls, lock out the system power, remove the side of the bale opener output chute and remove the jammed fiber by hand. CAUTION – pinch hazard. You may remove the guard on the guard over the Pre-Opener Drum drive belt and work the drive pulley by hand – use care because the weight of the

		drum is enough to severely pinch your fingers in the belt. Replace all guards before restoring power.
M-A5 Pre-Opener Drum Fail to Run	See M-A1 Feed Conveyor Fail to Run	• See M-A1 Feed Conveyor VFD Fault
M-A6 Fines Conveyor Overload	See M-A3 Regulating Drum Overload	• See M-A3 Regulating Drum Overload
M-A6 Fines Conveyor Fail to Run	See M-A3 Regulating Drum Fail to Run	• See M-A3 Regulating Drum Fail to Run
M-B1 Crusher Feed Conveyor Overload	See M-A3 Regulating Drum Overload	• See M-A3 Regulating Drum Overload
M-B1 Crusher Feed Conveyor Fail to Run	See M-A3 Regulating Drum Fail to Run	• See M-A3 Regulating Drum Fail to Run
M-B2 Crusher A Overload	See M-A3 Regulating Drum Overload	• See M-A3 Regulating Drum Overload
M-B2 Crusher A Fail to Run	See M-A3 Regulating Drum Fail to Run	• See M-A3 Regulating Drum Fail to Run
M-B3 Crusher B Overload	See M-A3 Regulating Drum Overload	• See M-A3 Regulating Drum Overload
M-B3 Crusher B Fail to Run	See M-A3 Regulating Drum Fail to Run	• See M-A3 Regulating Drum Fail to Run
M-C1 Bypass Conveyor Overload	See M-A3 Regulating Drum Overload	• See M-A3 Regulating Drum Overload
M-C1 Bypass Conveyor Fail to Run	See M-A3 Regulating Drum Fail to Run	• See M-A3 Regulating Drum Fail to Run
M-C2 Transverse Conveyor Overload	See M-A3 Regulating Drum Overload	• See M-A3 Regulating Drum Overload
M-C2 Transverse Conveyor Fail to Run	See M-A3 Regulating Drum Fail to Run	• See M-A3 Regulating Drum Fail to Run
M-C3 Incline Conveyor Overload	See M-A3 Regulating Drum Overload	• See M-A3 Regulating Drum Overload
M-C3 Incline Conveyor Fail to Run	See M-A3 Regulating Drum Fail to Run	• See M-A3 Regulating Drum Fail to Run
M-D1 Drum 1 Feed System Overload	See M-A3 Regulating Drum Overload	• See M-A3 Regulating Drum Overload
M-D1 Drum 1 Feed System Fail to Run	See M-A3 Regulating Drum Fail to Run	• See M-A3 Regulating Drum Fail to Run
M-D2 Drum 1 VFD Fault	The drum has been overloaded by either excessive feed rates or jammed fiber.	• Set the system to Manual Mode (requires Senior Operator password.) Reset the VFD as described in M-A1 Feed Conveyor VFD Fault. BRIEFLY run the motor forward (use one hand for the On button and the other hand for the Off button) to avoid tripping the VFD again. If the drum turns freely,

		restore the system to operation with a lower feed rate. • If the drum won't turn, lock out the system power and then loosen the large socket-head cap screws that hold the bar grid in place. Use the jackscrews to lower the grid. Remove the fiber jammed between the bar grid and the drum. You can remove the top covers from the machine to reach the fiber. It may be easier to remove the fiber from inside the machine – consult your employer's confined space work policies before entering the Decorticator. Access is by removing the lower panel on the fiber output end of the machine. Once the fiber has been removed, jack the grid back into place (about 1/16" less than full travel) and check for free movement of the drum. Tighten the socket cap screws and return the system to operation.
M-D2 Drum 1 Fail to Run	See M-A1 Feed Conveyor Fail to Run	• See M-A1 Feed Conveyor Fail to Run
M-D3 Drum 2 Feed System Overload	See M-A3 Regulating Drum Overload	• See M-A3 Regulating Drum Overload
M-D3 Drum 2 Feed System Fail to Run	See M-A3 Regulating Drum Fail to Run	• See M-A3 Regulating Drum Fail to Run
M-D4 Drum 2 VFD Fault	See M-D2 VFD Fault	• See M-D2 VFD Fault
M-D4 Drum 2 Fail to Run	See M-A1 Feed Conveyor Fail to Run	• See M-A1 Feed Conveyor Fail to Run
M-D5 Fiber Output Conveyor Overload	See M-A3 Regulating Drum Overload	• See M-A3 Regulating Drum Overload
M-D5 Fiber Output Conveyor Fail to Run	See M-A3 Regulating Drum Fail to Run	• See M-A3 Regulating Drum Fail to Run

M-D6 Hurd Output Conveyor Overload	See M-A3 Regulating Drum Overload	• See M-A3 Regulating Drum Overload
M-D6 Hurd Output Conveyor Fail to Run	See M-A3 Regulating Drum Fail to Run	• See M-A3 Regulating Drum Fail to Run
M-E1 Shaker Screen Overload	See M-A3 Regulating Drum Overload	• See M-A3 Regulating Drum Overload
M-E1 Shaker Screen Fail to Run	See M-A3 Regulating Drum Fail to Run	• See M-A3 Regulating Drum Fail to Run
M-E2 Green Micro Fiber Conveyor Overload	See M-A3 Regulating Drum Overload	• See M-A3 Regulating Drum Overload
M-E2 Green Micro Fiber Conveyor Fail to Run	See M-A3 Regulating Drum Fail to Run	• See M-A3 Regulating Drum Fail to Run
M-F1 Rotor VFD Fault	See M-A1 Feed Conveyor VFD Fault	• See M-A1 Feed Conveyor VFD Fault
M-F1 Rotor Fail to Run	See M-A1 Feed Conveyor Fail to Run	• See M-A1 Feed Conveyor Fail to Run
M-G1 Additive Feeder VFD Fault	See M-A1 Feed Conveyor VFD Fault	• See M-A1 Feed Conveyor VFD Fault
M-G1 Additive Feeder Fail to Run	See M-A1 Feed Conveyor Fail to Run	• See M-A1 Feed Conveyor Fail to Run
PM-1 480VAC Power Monitor Fault	The power monitor has detected either an under-voltage condition or a phase-loss condition in the system's 480V power supply.	• If the problem is obvious, like a building-wide electrical brown-out or power interruption, wait until the electrical utility restores power. • If the problem does not clear when the utility restores power, call Canadian Greenfield Technologies Corp. customer support.
PS-1 24VDC Power Supply Fault	One or more of the 24-volt DC power supplies in the control panel has stopped supplying power	• Turn off power to the system. Open the control cabinet and look for the row of blue buttons near the top of the cabinet. Look for a button that has popped out. Press it back in. If it doesn't stay in, call Canadian Greenfield Technologies Corp. customer support.
T-1 Panel Temperature High	The temperature in the control panel has exceeded 104°F	• Check the air conditioner screen for fiber and blow out the air conditioner with

		compressed air – accumulated dust reduces the effectiveness of the air conditioner. • If ambient air temperature is so high that the air conditioner is inadequate to maintain the control panel temperature below 104°F, consider suspending operations.
T-2 Panel Temperature High High (no, that's not a typo)	The temperature in the control panel has exceeded 113°F	• You may see this alarm very briefly before the control system shuts HempTrain™ down due to over-temperature

5. Maintenance Reference

5.1 Control Panel

1. Check the screen on the outside of the air conditioner for fiber (**Figure *2***). Remove any accumulated fiber. Adjust inspection frequency according to how much fiber is in the air. Failure to clean the screen will result in the control panel overheating.
2. Remove the screen on the outside of the air conditioner and blow dust off of the air conditioner heat exchanger fins with compressed air. Adjust frequency according to how much dust is in the air and how hot it is. Failure to clean the air conditioner heat exchanger fins will result in the control panel overheating.

5.2 Separator

1. When working on the Separator (**Figure *3***), always block the input to the Hurd Processor (**Figure *3***). Any metal or hard object allowed to enter the Hurd Processor may damage the processor knives.
2. When adding blanking sections, always use new plastic insert lock nuts.
3. Torque for the connecting-rod-to-crank bolt is 60 ft-lb. Use a torque wrench.
4. Torque for the connecting-rod-to-screen bolt is 60 ft-lb. Use a torque wrench.

5.3 Hurd Processor knife adjustment

Knife adjustment should be performed only by trained personnel.

1. Knives can be very sharp;
2. Torque for the bolts that retain the Fixed Knife Holder is 25 ft-lb;
3. Torque for the bolts that clamp the Fixed Knife in the Fixed Knife Holder is 30 ft-lb;
4. The Fixed Knife should extend 1/8” from the lower jaw of the Fixed Knife Holder;
5. Only minimal contact is permitted between the Fixed Knife and the Rotor Blades; ideally, there should be no contact – the system is stiff enough to cut paper if the knives are close together but don’t actually touch.

5.4 Belts

1. Check conveyor belts for proper tracking once a week. Poor tracking can damage conveyor belts.

5.5 Bearings

1. Lubricate bearings once a week. Remove the side panels of the crusher to access the bearings on the Crusher feed conveyor, the Crusher rolls, the Transverse Conveyor and the Input and Hurd Output conveyors of the Decorticator

5.6 Tramp metal bin

1. Empty the Tramp metal bin once a week (**Figure 15**).

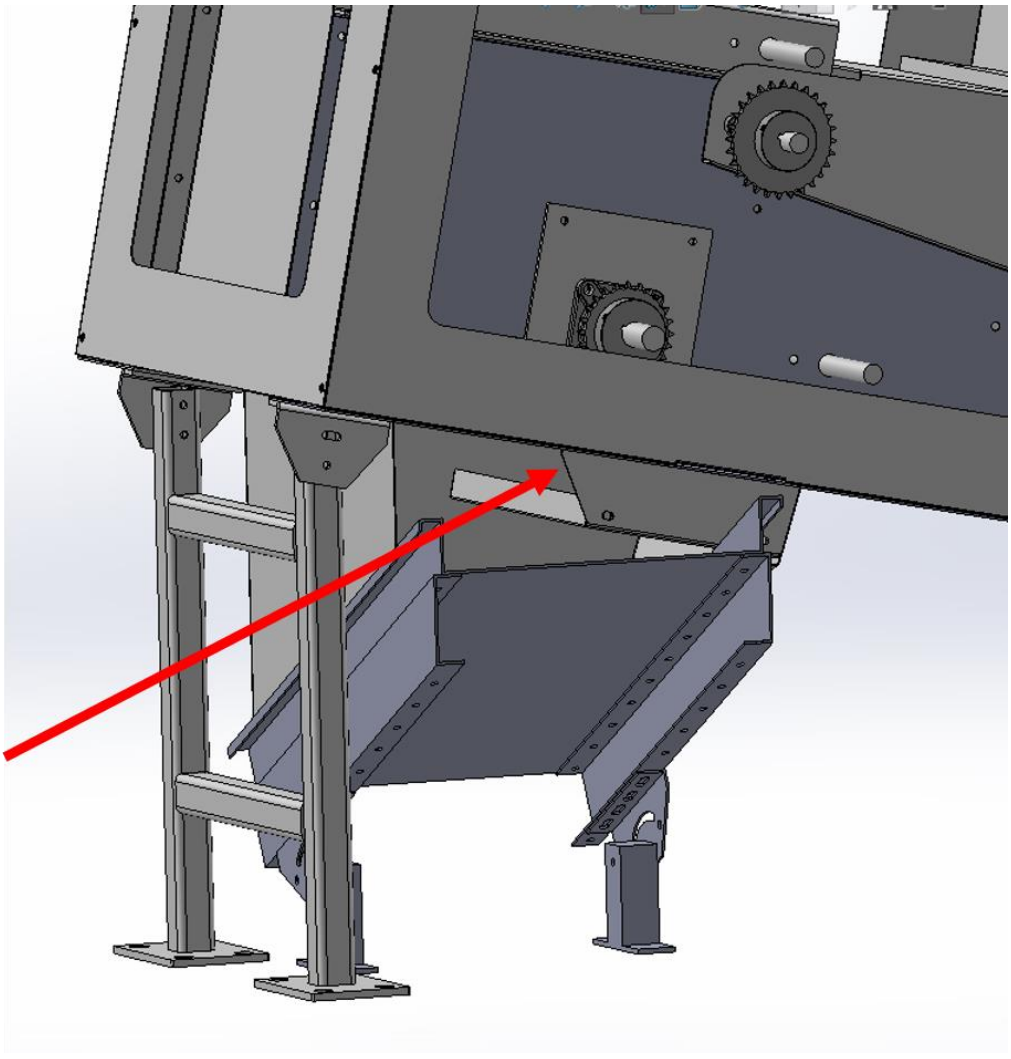

Figure 15 - Tramp Metal Bin

6. Customer Support

Customer Support: 1-877-974-3377, 8-5 PM MST, Monday-Friday

24 Hour EMERGENCY support: 1-587-392-1669