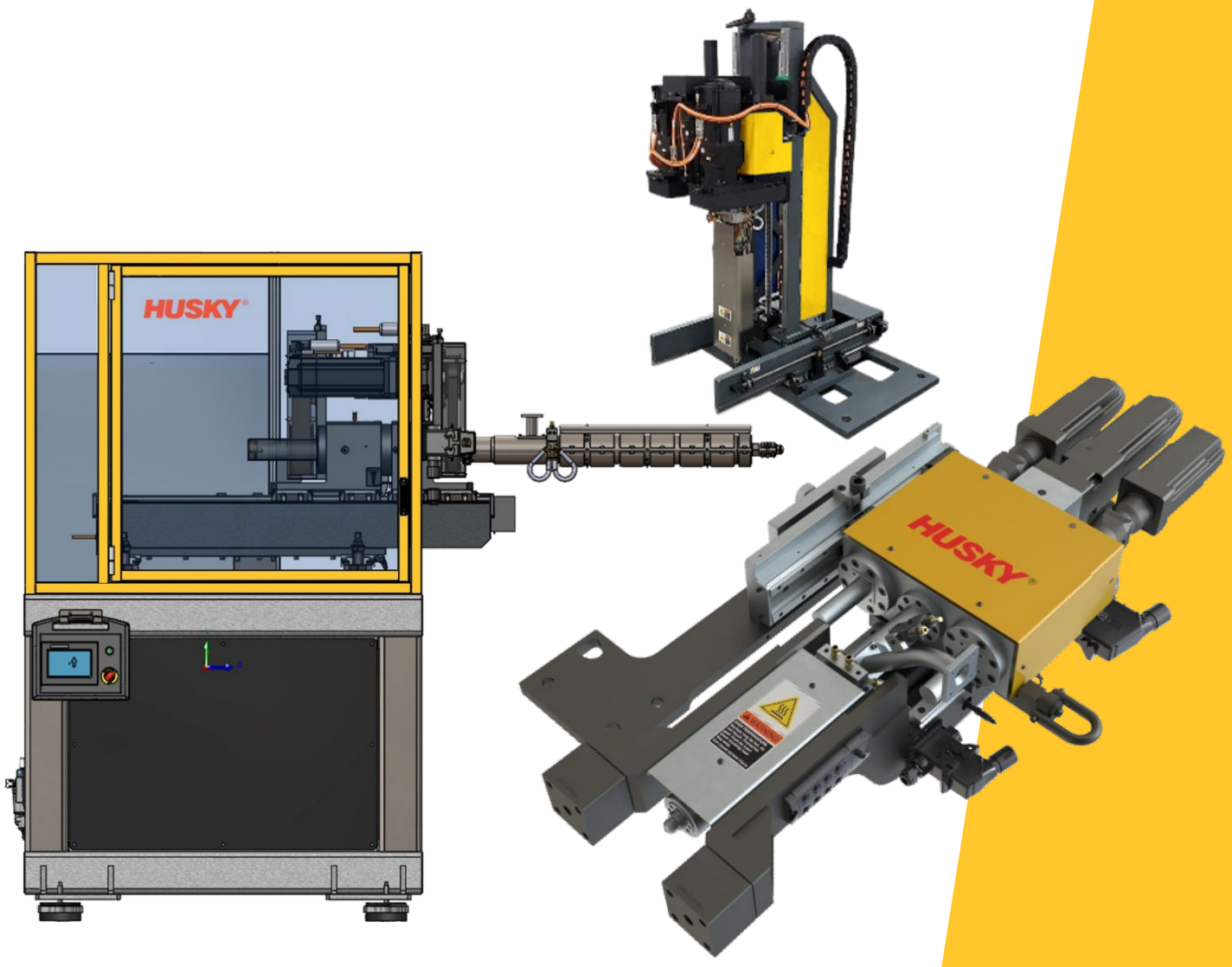

Altanium Multishot™

Fully-servo driven injection unit

Owner's Manual
Mold-Mount, Vertical, and Horizontal Models

HUSKY®

Issue: v0 — December 2025

Document No.: 13990852

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2 Scope

The target audience of this document is the personnel who will be operating and maintaining the ALTANIUM MULTISHOT™ Portable Injection Unit.

Read this manual entirely and understand the system before operating the related injection molding equipment.

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3 Safety Information

WHEN OPERATED INCORRECTLY THIS DEVICE HAS THE CAPABILITY TO CAUSE DEATH OR SERIOUS INJURY, OR ECONOMIC LOSS TO THE MOLDING EQUIPMENT OR MOLD

THIS MANUAL USES THE FOLLOWING CONVENTIONS TO ALERT Y FOR SPECIFIC AREAS OF CONCERN.

TO ALERT AREAS WHERE POTENTIALLY HAZARDOUS SITUATIONS WHICH, IF NOT AVOIDED, COULD RESULT IN DEATH OR SERIOUS INJURY, THIS SYMBOL APPEARS WITH ADDITIONAL INFORMATION RELATED TO THE HAZARD.

TO ALERT AREAS WHERE A POTENTIALLY HAZARDOUS SITUATION WHICH, IF NOT AVOIDED, MAY RESULT IN MINOR OR MODERATE INJURY OR ECONOMIC LOSS, THIS SYMBOL APPEARS WITH ADDITIONAL INFORMATION RELATED TO THE HAZARD.

3.1 General

This machine, like all injection molding machines, has the potential to harm the operators, setup, and maintenance personnel who work with it. The machine has components that operate at high temperature, high voltage, or high hydraulic pressure. All safety information in this manual is preceded by the stop sign symbol to alert the operator of its importance. Do not install, setup, operate, or repair this equipment withour reading and understanding all of the safety information contained in this manual.

3.2 Injection Barrel

The barrel has electric heating elements that may be operating at extreme temperatures. Make sure to use the correct personal protective equipment when exposed to these items.

3.3 Hydraulic System

If equipped, the hydraulic system operates at up to 2900 PSI. A leak in the system has the potential to cause injury or damage. All leaks must be corrected as soon as possible. The system also MAY use an accumulator that has the capability to store hydraulic energy. Before opening any part of the hydraulic system, make sure that the system pressure has been relieved to a™ospheric pressure. See the maintenance section for instructions on manually relieving this pressure.

3.4 Molten Plastic

Molten plastic that is expelled from the nozzle of this machine has the potential to harm personnel in several ways. The most obvious of these is being burned. Another hazard is the release of potentially harmful gases from specific types of plastic material.
Make sure to use the correct personal protective equipment when exposure to these items is possible. Note that it may be good practice to use additional exhaust equipment to prevent the accumulation of gases near the machine.

3.5 Unintentional Expulsion

Certain types of plastic materials may unintentionally be expelled from the nozzle orifice or feed throat when processed improperly.
Make sure to use the correct personal protective equipment when exposure to these items may occur.

The Altanium Multishot™-portable injection unit relies on the injection molding machine's safety devices and interlock circuits to prevent operation in an unsafe manner. We recommend to frequently test the function of these devices and circuits.

3.6 Test Gate Safeties

With the press in manual mode and with its front gate open, attempt to raise or lower the Altanium Multishot ™ carriage. If the carriage moves, immediately find the cause and correct it. Do not operate the machine until corrective actions have been verified.

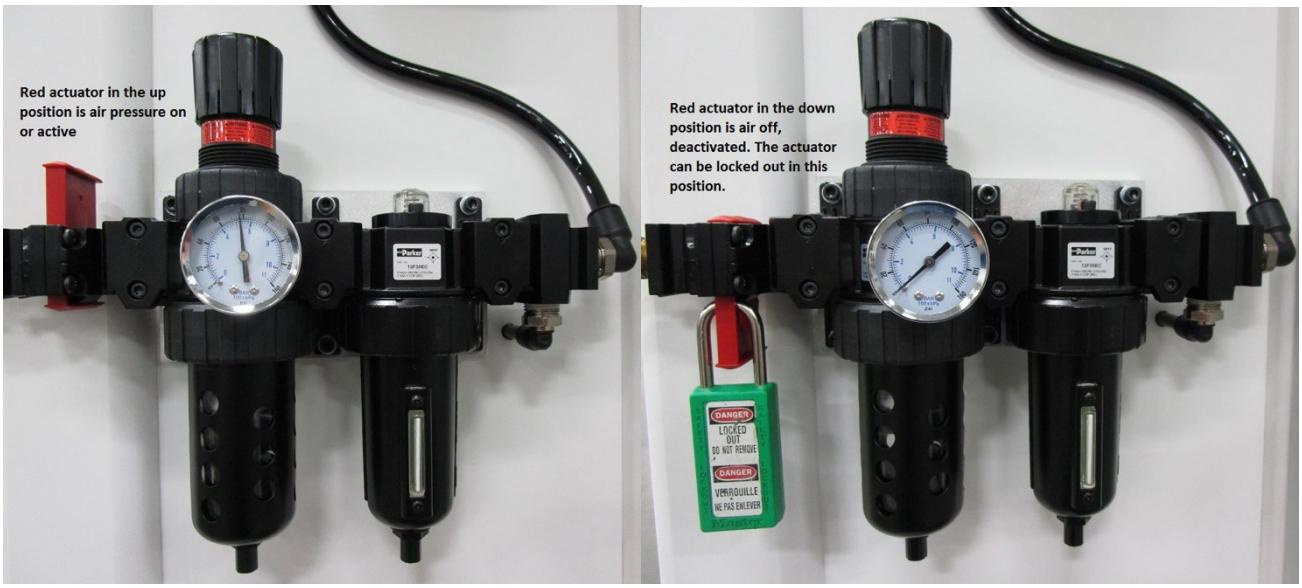
Some press manufacturers will provide an E-Stop condition to the EM67 interface when the back gate is open. With the press in manual mode and the pump running, open the back gate. If the manufacturer provides an E-Stop condition, the Altanium Multishot ™ injection unit should also get an

E-stop fault and all motion of the Altanium Multishot ™ unit should be disabled. If this does not occur, immediately find the cause and correct it. Do not operate the machine until corrective actions have been verified.

3.7 Lock Out Tag Out

Local Lock Out Tag Out procedures should always be the primary procedure followed to ensure a safe working environment is maintained. The Altanium Multishot ™ system has a single electric power source lock out device on the electric cabinet door. Be aware that when the main disconnect switch is turned off the incoming power to the main disconnect switch could still have power going to it. If you need to service the main disconnect switch, be sure to lock out the incoming power source to the main disconnect switch.

If the Altanium Multishot ™ machine is equipped with a pneumatic manifold, there will also be a lock out mechanism on the air prep supply manifold.



4 Utilities

4.1 Electricity

Refer to the electrical schematics provided with the machine. If the electrical schematics are missing, please contact Altanium Multishot™ and request a copy. Have the unit serial number available for example “106001-01” so that we may give you the correct schematics for your equipment.

4.2 Water

Cooling water for the feed throat, up to 3 GPM depending on unit size.

Cooling water for the hydraulic power unit heat exchanger, up to 20 GPM depending on unit size.

4.3 Compressed Air

The Altanium Multishot™ unit does not require compressed air unless optional items are purchased. The venturi material feeder option requires up to 33 SCFM of compressed air at 90 PSI. The pneumatic valve gate control option requires up to 10 SCFM at 90 PSI, depending on the devices employed inside the mold. The air blow-off control option can consume up to 10 SCFM at 90 PSI. All these pneumatic loads are intermittent, not continuous.

4.4 Communications

The Altanium Multishot™ injection unit communicates with the target injection molding machine via the EM67 Standard Robot/Injection Molding Machine Electrical Interface. This system coordinates the cycles of the connected devices to ensure proper sequencing. The operator interface communicates with the controller via Ethernet/ IP.

5 System Description

This system has three major components:

5.1 Injection Unit Assembly

Refer to the mechanical prints provided with the machine. If the mechanical schematics are missing, please contact Altanium Multishot™ and request a copy. Have the unit serial number available for example “106001-01”so that we may give you the correct schematics for your equipment.

5.2 Control Enclosure

The control enclosure contains the logic controller, heater circuit breakers and solid-state relays, power supplies, etc. A flexible cable terminates in a standard EM67 Robot/Injection Molding Machine Electrical Interface which integrates the Altanium Multishot™ operation to the target molding machine.

5.3 Operator Interface PANEL (OIP)

An industrial duty color touch screen allows the operator to setup, monitor, and maintain the system. All setup parameters are directly entered using an alphanumeric keypad image that is displayed as required. Production and quality information are presented in an easy to read format.

6 Installation

Make sure the unit is securely suspended and stable while it is still low to the ground.

Do not proceed with the installation in an unsafe manner.

6.1 Install Injection Unit to Machine

6.1.1 Mold Mount Style Injection Unit

Configure the mounting feet to place the nozzle in the correct location for parting line molding if required. Attach suitable lifting devices and pick the injection unit up a short distance.

Continue lifting the unit and place it in position above or next to the mold. Lower the unit down near the intended mounting surface then move the unit so that the mounting bolt holes in the mounting legs are lined up with the threaded holes on the mold and the nozzle tip is aligned with the sprue bushing. Continue lowering the unit until it contacts the mounting surface.

Leave the unit attached to the lifting device while installing the bolts into the threaded holes on the top or side of the mold. When the unit is aligned properly and securely fastened in place, detach the lifting device from the unit.

6.1.2 Vertical Style Injection Unit

Continue lifting the unit and place it in position above the stationary platen. Lower the unit down onto the platen's top surface, then move the unit so that the mounting bolt holes in the base plate are lined up with the threaded holes on the platen's top surface. It may be helpful to use removable studs in one or more of these threaded holes to aid in placing the unit in the correct position.

Leave the unit attached to the lifting device while installing the bolts into the threaded holes on top of the machine platen. Torque the fasteners down, and then check that the base rails of the unit are square to the platen's vertical surface. It may be necessary to install steel shims in between the unit's mounting plate and the platen's top surface to make sure the alignment is correct. The shims should have a hole through them so that the attaching bolts will prevent the shims from moving. When the unit is aligned properly and securely fastened in place, detach the lifting device from the unit.

Drape the two feed throat cooling hoses across the injection molding machine. Make sure that the hoses will not be exposed to damage from heated surfaces or machine movement. Secure the hoses in place with suitable devices, such as wire ties. Connect the hoses to facilities cooling water system. Different processes require can require adjusting the amount of cooling water flowing through the feed throat.

Attach the hopper to the feed throat and attach the material hoses to the hopper. Make sure that the hoses will not be exposed to damage from heated surfaces or machine movement. Secure the hoses in place with suitable devices, such as wire ties. Attach the material hoses to the hopper loader.

6.2 Install the Operator Interface Pedestal or Pendant

If the Altanium Multishot™ unit is equipped with the pendant mounted operator interface terminal, attach it to the press. Extend the interface cable from the side of the main enclosure up and across the surfaces of the injection molding machine and attach it to the operator interface enclosure's mounting arm. Make sure that the cable will not be exposed to damage from heated surfaces or machine movement. Secure the cable in place with suitable devices, such as wire ties.

6.3 Power the System Up

Rotate the operating handle of the disconnect switch to the ON position.

When the system powers up, the devices will establish communications with each other, and the PROCESS screen will be displayed at the operator station. When a screen is displayed for the first time after a start-up, the variable data must be read from the controller. During this time the data fields will be blank, and the operator interface cannot respond to service requests. A simple method to make sure all of the variable data is refreshed, and the interface is available is to press the buttons to navigate to each screen once after startup.

6.4 Nozzle Installation and Alignment

Install a nozzle/nozzle tip with a suitable orifice and radius. Machines equipped with open style nozzles use conventional 7/8-14 replaceable tips. The barrel end cap to replaceable nozzle tip adapter (if equipped) has 1 ¾-8 threads, a ¾" rear opening, and a ½" through hole. All nozzle tip and nozzle adapter heater bands should be connected to heat zone 1 and must operate on 240 volts. The circuit is protected with a circuit breaker, and the total of all connected nozzle bands should not exceed the rating of the breaker installed in the Altanium Multishot™ unit. If the Altanium Multishot™ machine has customized heating options, the electrical drawings and heater plugs will have unit specific information.

Use the X and Y-axis to position the nozzle in line with the mold's sprue bushing/nozzle seat.

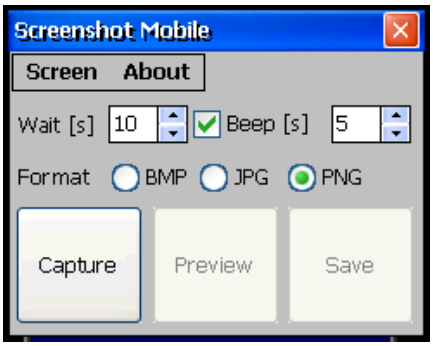
Do not lock this position yet, as small adjus™ents may be required later when the carriage is moved forward allowing the nozzle to contact the mold.

6.5 Automatic X Axis Adjustment "Vertical Style Injection Units Only"

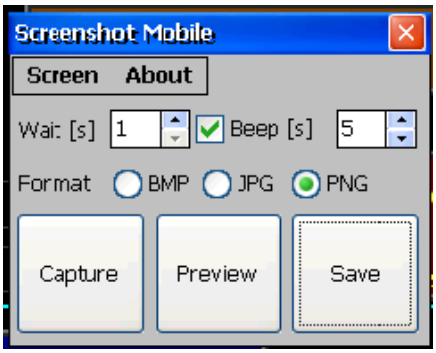
If Altanium Multishot™ machine is equipped with the optional Automatic X-Axis Adjustment feature, the position of the nozzle, parallel with the molding machine tie bars, is capable of being controlled directly from the operator interface. An electric motor is used to drive the mechanism, and a linear position sensing device monitors the nozzle location. The MANUAL screen of machines that have this option has additional items located in the middle (see below).

6.6 Print Screen

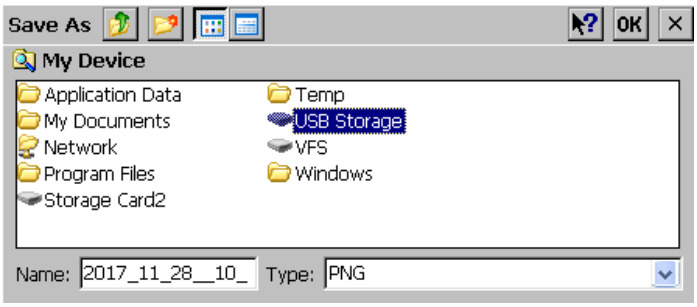
There is a print screen function button on the right corner of each screen available. This button can be used to take a screen shot of the current screen and save this to a USB stick. There is a USB port on the side of the HMI cabinet. Install a USB stick in the port on the side of the HMI cabinet. Navigate to the desired screen and press the Print Screen button. You will then get a pop-up screen.



Select Format as BMP or JPG, press Capture. The same pop up screen will appear and pressing Save will allow the screen to be saved.



After the Save button has been pushed another pop up will appear with locations to save the screen image. Select the USB, press the OK button and it will save the screen shot to the USB stick in the USB port on the side of the HMI cabinet.



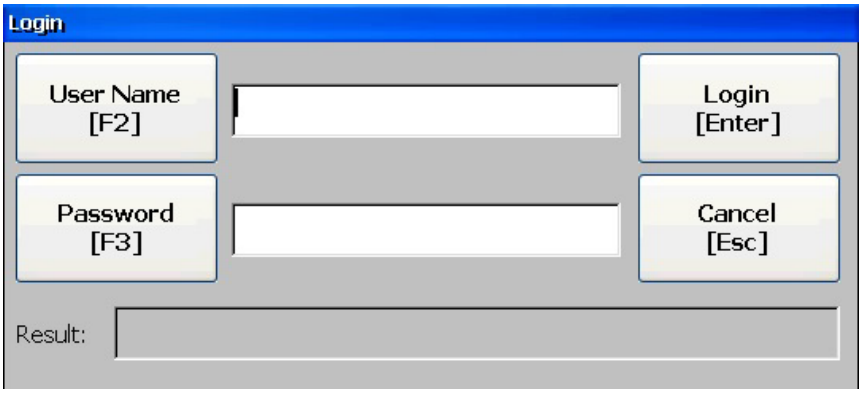
7 General Operation

7.1 User Login

System parameters affecting unit operation such as running parameters, heat tuning, screw size, etc. are protected from unauthorized changes by utilizing password protection. When the system powers up, it defaults to “Default” level security. The “Default” security level is a view only level. The manual and auto functions can be activated but set points cannot be adjusted.

Access to change set point values requires the “Setup” security level. To log in press the Log In button at the top right of the screen. Access to the heat tuning and unit set-up/maintenance screens is restricted to the “Tech” level security. After 15 minutes, the system will revert to the “Operator” security level. To gain access to the “Setup” or “Tech” levels of security, press the [USER] button on the MAIN MENU screen, or on the footer menu, and this graphic will appear.

User Login Graphic



7.1.1 Login User ID

Press the Login button and a keyboard graphic image will appear.

Type in for example “SETUP”, then press the [ENTER] button on the keyboard graphic.

Press the [PASSWORD] button and the keyboard graphic image will appear.

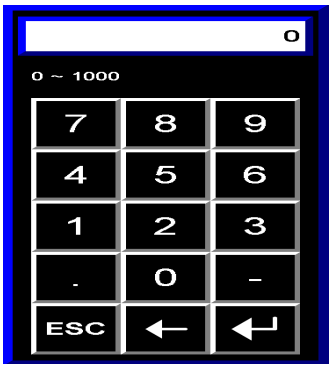
Type in for example “SETUP”, and then press the keyboard graphic image’s [ENTER] button.

The letters typed in will be shown as a username and password in the LOGIN graphic image.

Press the [ENTER] button to enter the information, or the [ESC] button to exit.

User access to the secured screens is now allowed. To change the user level back to operator, press the Log in button and the control will log out into {DEFAULT} level security. The system will automatically revert to operator level security in 15 minutes. The user currently logged in is displayed on the Login button.

7.1.2 Numeric Keypad



On any of the user screens that have a gray box surrounding a numeric value a value can be entered in this position. To change the value press inside the gray box, a pop-up numeric keypad will appear.

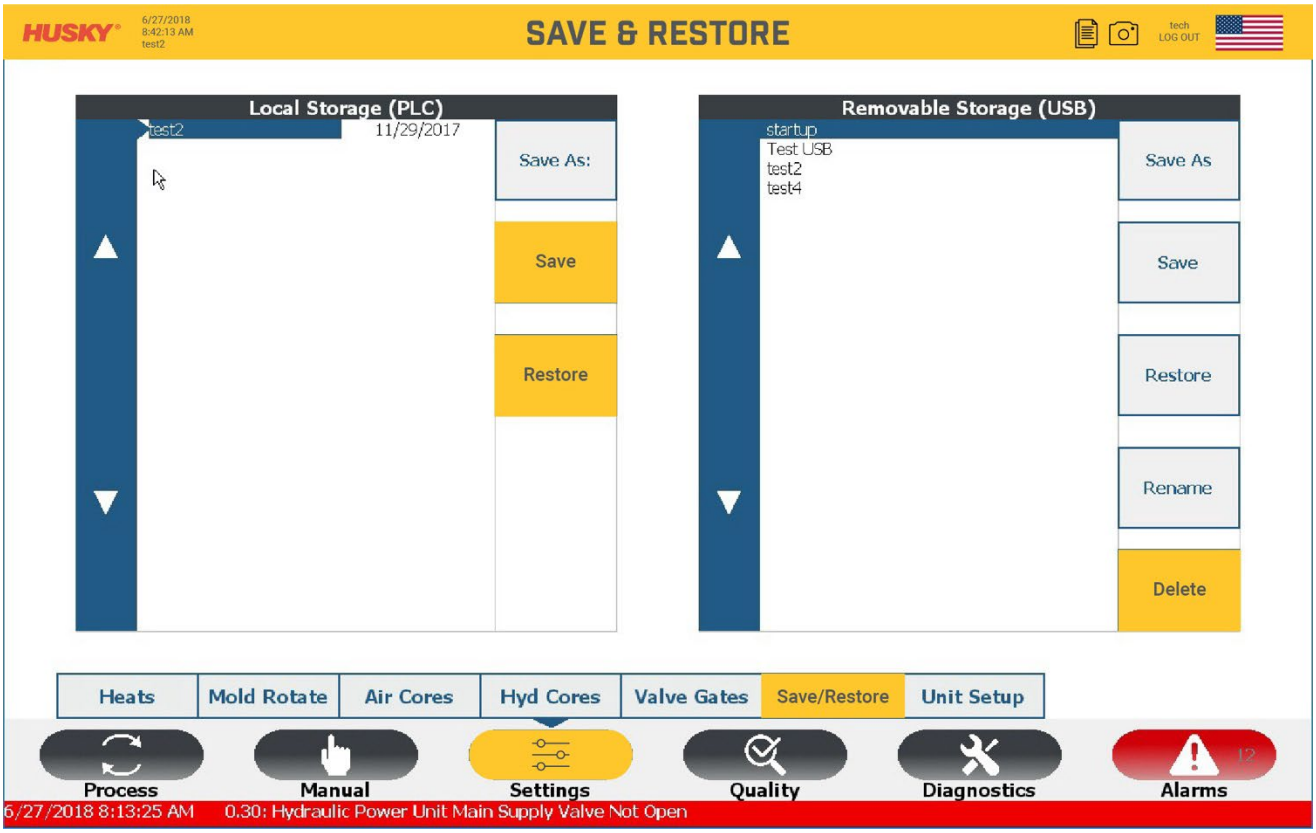
Enter the desired value on the keypad. To accept the value, press the enter arrow button. To escape from the numeric keypad without making a change to the value press the ESC. Button. The valid range available for each value is shown at the top of the keypad, for example 0-1000 as shown.

7.1.3 Machine options

Screens for optional items are described in this manual that may not be enabled on this specific Altanium Multishot™ machine. To upgrade the Altanium Multishot™ machine with any desire options, please contact Altanium Multishot™ at:

https://www.husky.co/en/contact/

7.2 Save & Restore



This screen allows the operator to assign a name to job processes, and then save and/or recall the information as required. All process parameters are saved, including pressures, times, speeds, etc.

NOTICE

Logging as SETUP or TECH level is required to save or restore jobs

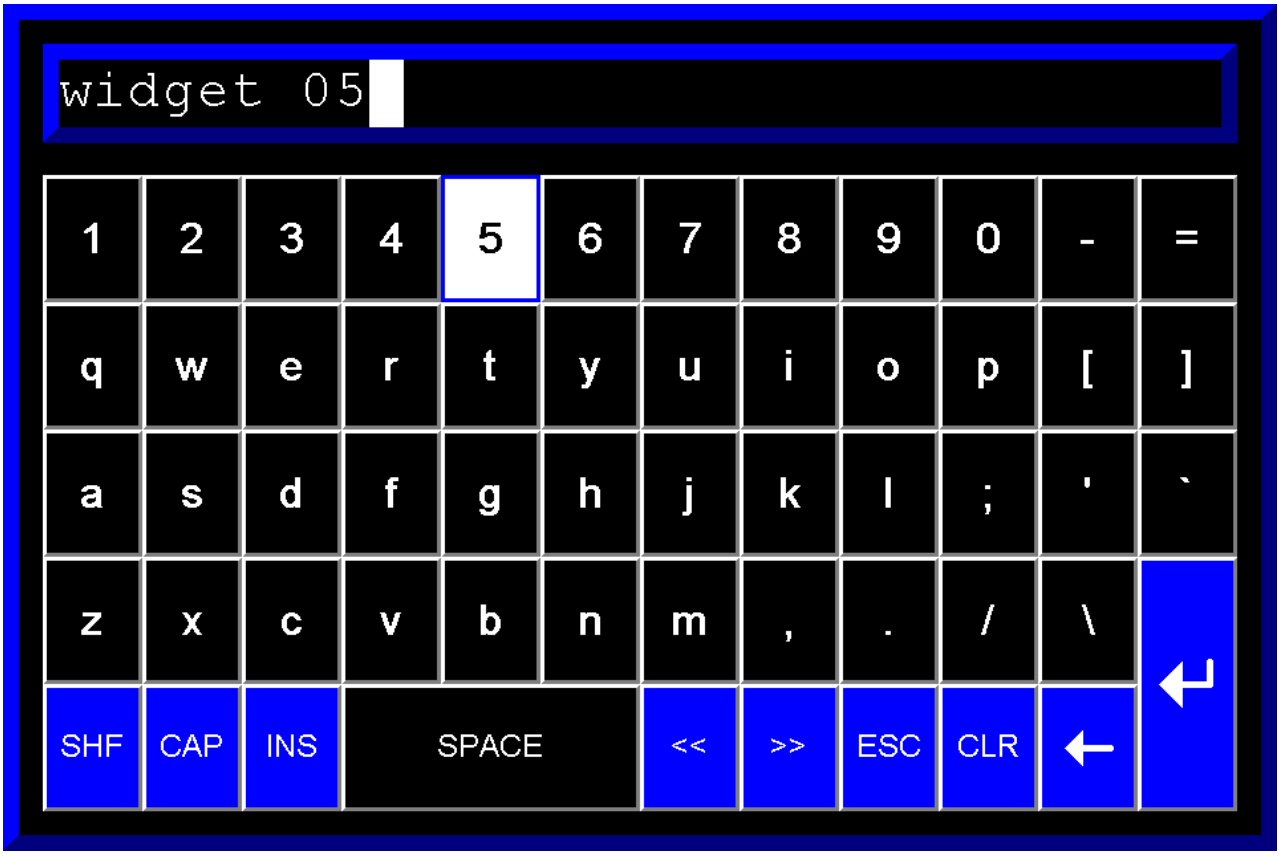
Save As (Save a new job)

Press the [SAVE AS] box, the keyboard will appear. Press the buttons for the job name, then press the [ENTER] button. The name that was entered will be displayed in the job name dialogue box.

Job names may be up to 20 characters long. Any combination of letters and numbers may be used, and spaces are allowed.

Data saved and restored includes inject/hold set points, backpressure set point, heat set points, etc.

Keyboard



Save (Update an existing job)

Move the cursor to the desired job to update, make sure it is highlighted. Press Save.

Restore

Move the cursor to the job desired to upload from the storage, make sure it is highlighted and press Restore.

Save As (Save a new job)

Press the [SAVE AS] box, the keyboard will appear. Press the buttons for the job name, then press the [ENTER] button. The name that was entered will be displayed in the job name dialogue box.

Job names may be up to 20 characters long. Any combination of letters and numbers may be used, and spaces are allowed.

Data saved and restored includes inject/hold set points, backpressure set point, heat set points, etc.

Save (Update an existing job)

Move the cursor to the job desired to update, make sure it is highlighted. Press Save.

Restore

Move the cursor to the job desired to upload from the storage, make sure it is highlighted and press Restore.

Saving the job in a location overwrites any data previously stored in that location.
It is prudent to provide hard copy records of setup data in addition to the electronic versions.

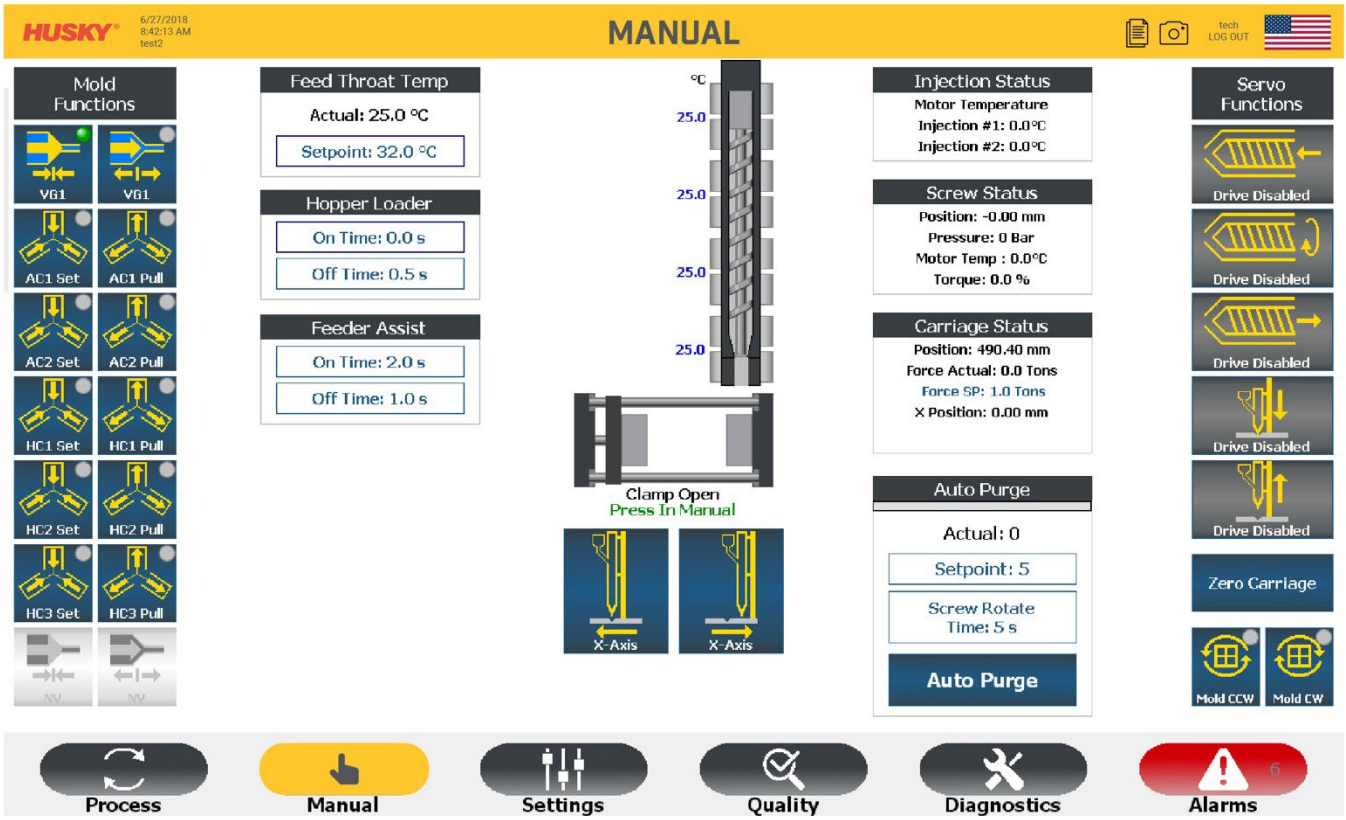
Restore Selected Job Data

Restoring job data will overwrite any variable data currently in use.

Make sure to save current data first.

8 Manual Mode Operations

Manual Mode Operations Screen



To navigate to the Manual screen, touch the Manual button on the footer menu.

8.1 Emergency Stop

The E-stop button is located on the front or side of the operator interface enclosure. Press the button in to initiate an E-stop. Twisting and pulling the E-stop button out resets an e-stop condition.

All machines connected together using the EM67 interface must e-stop when any one device's e-stop is pressed. ALL E-STOP CONDITIONS MUST BE CLEARED AND RESET BEFORE ANY DEVICE CAN BE PLACED INTO SERVICE.

8.2 Power On

There is a green momentary push button either on the front or side of the operator interface enclosure. Press the button to reset the Safety Relay. This is required to be able to enable servo drives or to turn on the pump.

8.3 Manual Mode Motion

To perform any of the manual mode functions listed, press the button with that function's icon displayed. For example, to rotate the screw, press the button with the screw rotation icon on it. Buttons for manual core motion change color to indicate the core's current position.

These functions are only available when the press is in manual and the gates and guards are closed. The cores and/or table will not function if a sequence has not been entered, or conditions allowing core motion are not met, i.e. ejectors back before core set. The Injection Unit must be "ON" for any manual function of the injection unit to occur.

Make sure that all obstructions are removed before performing any manual motions.

8.3.1 Inject

Press the [MANUALLY INJECT] button and the screw will move forward at the speed selected using the INJECTION Phase 1 VELOCITY and INJECTION PRESSURE settings on the process screen. Releasing the [INJECT] button will stop injection regardless of screw position.

8.3.2 Retract Screw

Press the [RETRACT SCREW] button and the screw will move backwards at the speed programmed for decompression velocity on the PROCESS screen. Manual screw retraction will rotate the screw until it has reached shot size position and stop. the screw will continue to retract until the button is released, or the screw has reached the limit of its travel

8.3.3 Rotate Screw

Press the [ROTATE SCREW] button and the screw will begin rotating at the speed selected using the INJECTION BACKPRESSURE setting on the process screen. Manual screw rotation will rotate until it has reached shot size position and stop. Releasing the [ROTATE SCREW] button will stop screw rotation regardless of position.

To protect the screw assembly, the barrel temperatures must be within the acceptable operating range before any screw motion will be allowed to occur.

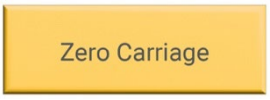
8.3.4 Carriage Advance

Press the [CARRIAGE ADVANCE] button and the carriage will move the carriage towards the mold. Releasing the [CARRIAGE ADVANCE] button will stop carriage motion regardless of position.

8.3.5 Carriage Retract

Press the [CARRIAGE RETRACT] button and the carriage will move up. Releasing the [CARRIAGE RETRACT] button will stop carriage motion regardless of position.

8.3.6 Zero Carriage



Located on the MANUAL screen is a button labeled [ZERO CARRIAGE], which is the position where the nozzle is in contact with the sprue bushing. This button must be pressed during the setup operation to store the nozzle forward position in the memory of the machine. With the mold installed in the press, set the ZERO CARRIAGE position as follows (the press must be in manual mode and the gates and guards must be closed).

Press the button labeled [CARRIAGE ADVANCE]. The injection unit's carriage will move forward. When the nozzle tip is close to the sprue bushing, (approximately 1/4") release the [CARRIAGE ADVANCE] button. Confirm the horizontal location of the nozzle. Adjust the nozzle position by loosening the mounting bolts (on a mold mount unit) or adjusting the manual adjustment points on a horizontal or vertical unit, moving the injection unit assembly as required, then, tighten the mounting bolts.

Press the button labeled [CARRIAGE ADVANCE]. The injection unit's carriage will move forward until the nozzle contacts the sprue bushing.

Make sure that the carriage does not move laterally or rock when it contacts the sprue bushing. If it does, re-adjust the nozzle horizontal position.

Using the [CARRIAGE ADVANCE] and [CARRIAGE RETRACT] buttons move the nozzle forward and back, as required, so that when the tip contacts the seat, little if any deflection can be seen in the barrel.

When you have the nozzle horizontal position set, depress the [ZERO CARRIAGE] button. The machine now has the nozzle contact position stored in memory.

Auto mode injection will not occur until the carriage is at the zero position.

To ensure reliable machine operation, do not rely on recalled jobs having correct nozzle touch positions. The nozzle touch position procedure must be repeated each time a job is started, or when the nozzle tip or sprue bushing is changed.

Make sure that there are no obstructions to moving the carriage up and down. The carriage moves under electric power and can cause severe injury to personnel, or can damage equipment.

When pressing the Mold Rotate, Cores and Valve Gates for manual functions the button should get a green box around the button when pushed. If all requirements for the motion you are attempting to move a yellow LED will illuminate on the button. Once the function has moved to position making the limit switch for that motion or the move timer has timed out for that function the yellow LED should illuminate green.

8.3.7 Rotate Mold CW

Press the [ROTATE MOLD CLOCKWISE] button and the mold will rotate clockwise. When the mold clockwise limit switch is detected, the LED on the button will illuminate green.

8.3.8 Rotate Mold CCW

Press the [ROTATE MOLD COUNTER-CLOCKWISE] button and the mold will rotate counter-clockwise. When the mold counterclockwise limit switch is detected, the LED on the button will illuminate green.

8.4 Optional Manual Motions

8.4.1 Hydraulic Core # Set

Press the [HYDRAULIC CORE # SET] button and the core will set. When the end of stroke limit switch is detected, the LED on the button will illuminate green. Releasing the button will stop actuator motion regardless of position.

8.4.2 Hydraulic Core # Pull

Press the [HYDRAULIC CORE # PULL] button and the core will pull. When the end of stroke limit switch is detected, the LED on the button will illuminate green. Releasing the button will stop actuator motion regardless of position.

8.4.3 Air Core # Set

Press the [AIR CORE # SET] button and the core will set. When the end of stroke limit switch is detected, the LED on the button will illuminate green.

8.4.4 Air Core # Pull

Press the [AIR CORE # PULL] button and the core will pull. When the end of stroke limit switch is detected, the LED on the button will illuminate green.

8.4.5 Nozzle Open

Press the [NOZZLE OPEN] button and the nozzle shutoff valve (if equipped) will open. The state of the shutoff nozzle will be indicated by the LED in the operator button illuminating green.

8.4.6 Nozzle Close

Press the [NOZZLE CLOSE] button and the nozzle shutoff valve (if equipped) will close. The state of the shutoff nozzle will be indicated by the LED in the operator button illuminating green.

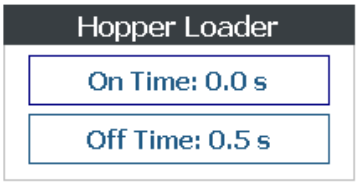
8.4.7 Valve Gate Open

Press the [VALVE GATE OPEN] button and the valve gate (if equipped) will open. The state of the valve gate will be indicated by the LED in the operator button illuminating green.

8.4.8 Valve Gate Close

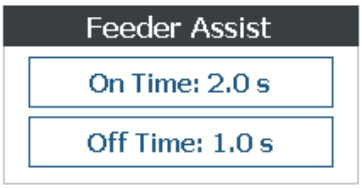
Press the [VALVE GATE CLOSE] button and the valve gate (if equipped) will close. The state of the valve gate will be indicated by the LED in the operator button illuminating green.

er Loader Control



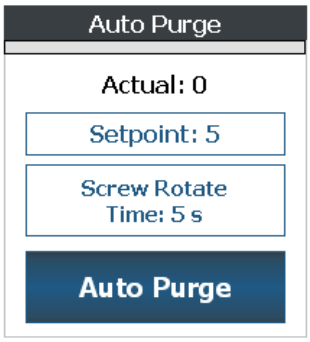
Under the heading of “Hopper Loader” are two timer values. The “ON TIME” controls how long the venturi loader solenoid will be on when the hopper sensor calls for plastic. The “OFF TIME” controls how long the venturi loader solenoid will be off when the hopper sensor calls for plastic. To adjust these values, press the appropriate display value and enter the new desired value on the keypad. These values are in seconds. Entering a zero for “ON TIME” will disable the hopper loader system.

8.6 Feeder Assist Control



With the optional loader air assist enabled, the on time and off time of the air blower solenoid is controlled by the settings on this display. Air is injected into the screw feed throat while the screw is turning to prevent clumping and bridging of the material as it enters the screw. To adjust these values, press the appropriate display value and enter the new desired value on the keypad. These values are in seconds. Entering a zero for “ON TIME” will disable the loader air assist system.

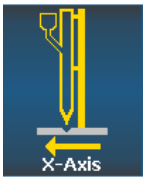
8.7 Auto Purge



This function will run an Auto Purge cycle. The Auto Purge when enabled will retract the screw to shot size rotate the screw for the time entered in the SCREW ROTATE TIME and then inject. It will do this for the cycles entered in the PURGE CYCLES.

8.8 X-Axis Control

8.8.1 X-Axis Forward



If your machine has a motor operated X-axis option. When this button is pushed it will actuate the X-axis of the injection unit out over the mold area of the clamp.

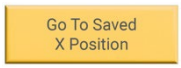
8.8.2 X-Axis Retract

If your machine has a motor operated X-axis option. When this button is pushed it will actuate the X-axis away from the mold area of the clamp to give clearance for installing or removing a mold.

8.8.3 SAVE X POSITION

If your machine has a motor operated X-axis option. The functionality of this button is to first align the nozzle to the sprue bushing of the mold and then press this button. This will save the X-axis position.

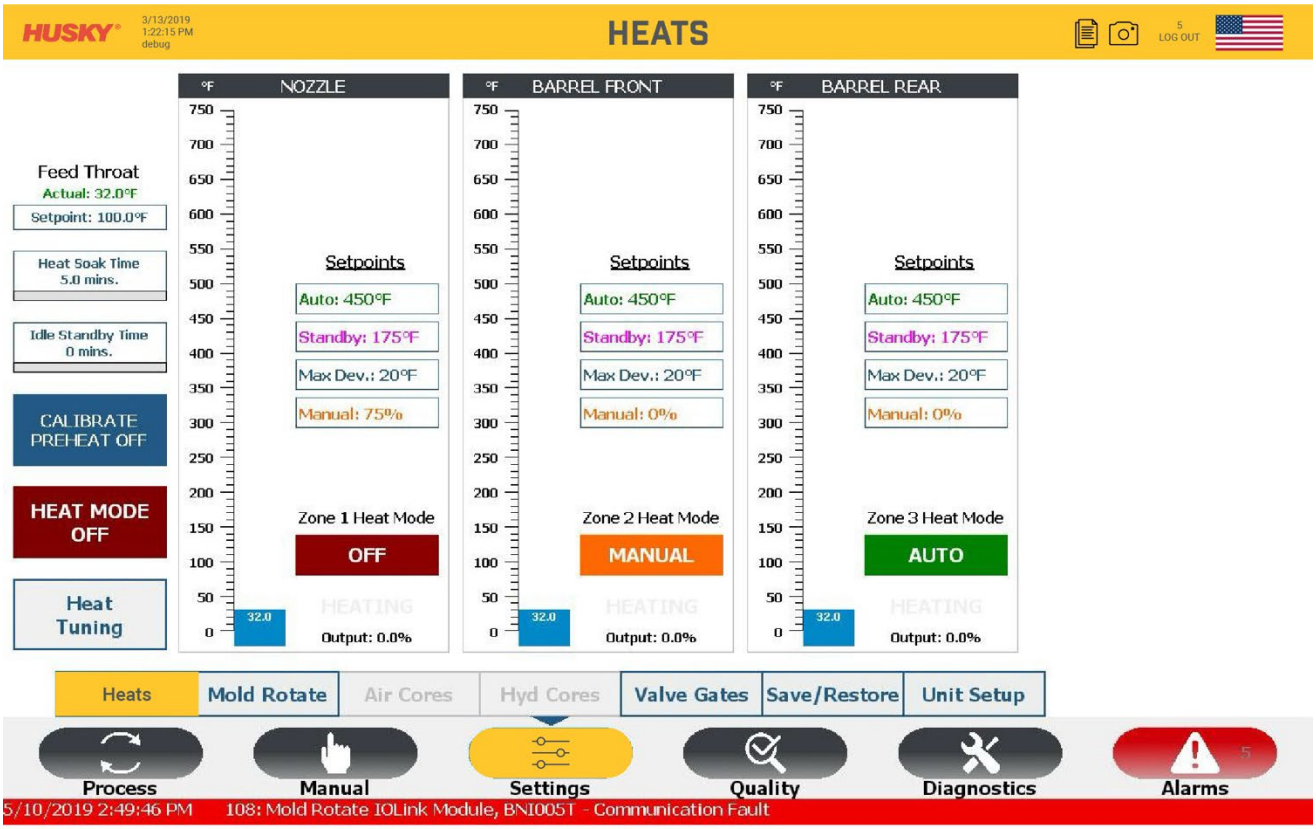
8.8.4 GO TO SAVED X POSITION



If your machine has a motor operated X-axis option. When this button is pushed it will automatically move the X-axis to the position that was saved when you pushed the SAVE HORZ. POSITION button.

9 Barrel Heats

Barrel Temperature Control Screen



9.1 Barrel Temperature Control Overview

To navigate to the Barrel Heats Screen, press the Settings button on the footer menu then press the Heats button. The barrel has 3 to 4 heating zones, zone 1 is the nozzle, and zone 3 or 4 is the feed end. Each temperature zone's control window displays actual temperature bar graph with actual value inside its respective temperature bar. These bar graphs/values will change color based on actual temperature compared to the set point and deviation settings. The bar will be blue when the actual temperature is below set point and deviation, green when within set point and deviation, and red when it is above set point and deviation. Each zone also has digital input and display values for Auto Set Point, Standby Set Point, Manual setting %, Maximum Temperature Deviation, and Percent Output. There is an [AUTO/MANUAL/OFF] mode button for each zone, and a heat output indicator light.

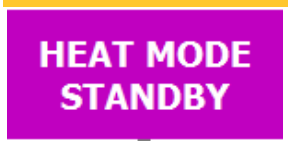
9.2 Heat Mode

The Heat Mode button allows the operator to turn on the barrel heats in either a Standby or Auto setpoint mode. It also allows the operator to turn off the barrel heats.

9.2.1 Heat Mode Off

When the Heat Mode Off is selected the barrel heat control is turned off or inactive.

9.2.2 Heat Mode Standby



Heat Mode Standby will enable the barrel heats and operate at the Standby temperature setpoint. Movement of the screw is not allowed when in the Standby Mode.

9.2.3 Heat Mode Auto

Heat Mode Auto will enable the barrel heats to operate at the Auto temperature setpoint.

The temperature will need to be at the Auto setpoint and the Heat Soak timer timed out to allow for any screw motion

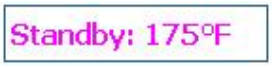
.

9.3 Heat Settings

9.3.1 Auto Temperature Setpoint

Press the screen in the value for AUTO: to enter the desired Auto temperature. The keypad will appear to enter the desired Auto temperature setpoint.

9.3.2 Standby Temperature Setpoint



Press the screen in the value for STANDBY: to enter the desired Standby temperature. The keypad will appear to enter the desired Standby temperature setpoint.

9.3.3 Manual Temperature Setpoint

Press the screen in the value for MANUAL to enter the desired Manual output percentage. The keypad will appear to enter the desired Manual percentage setpoint.

9.3.4 Zone # MANUAL Mode

It is possible to function any one of the available heat zones in a MANUAL mode. It is not recommended to operate any of the individual zones in this mode. However, if one of the zones has a thermocouple failure and a replacement is not available this mode would allow the operator to enter a Manual Temperature setpoint percentage. The heat control will operate at a percentage of the current PID and maintain a heat output to the heater bands. The temperature monitoring for the zone that is running in MANUAL mode will be disabled.

if a thermal couple breaks, manual mode allows you to continue automatic operations until you can replace it.

Observation of the ACTUAL OUTPUT values while in AUTOMATIC mode will give you an approximation of duty cycles appropriate for your process.

The zones operating in manual mode are operating in open loop mode and may overheat.

Overheating temperature sensitive materials may cause a dangerous condition, leading to unintentional expulsion.

9.3.5 Zone # AUTO Mode

This is the suggested mode for each heat zone that is enabled for the Altanium Multishot™ injection unit.

9.3.6 Zone # OFF Mode

It is not suggested to ever select one of the barrel heat zones to be in the OFF mode. This setting is available for performing maintenance tasks by trained maintenance personnel. There is no heat output enabled to any zone that is selected as OFF mode. The thermal couple monitoring is also turned off in the OFF mode.

The zones operating in OFF mode are not enabled. The temperature of these zones are not monitored. The posibility of damaging the screw and screw tip assembly in this mode is very HIGH!

9.3.7 Max Deviation Settings

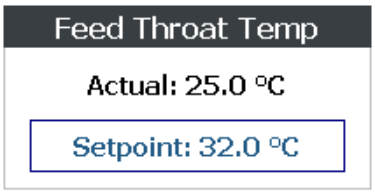
The MAX TEMP DEVIATION set points are used for cold start protection, and low/high limit alarms.

For cold start protection, the formula is: Actual Temperature + Max Temp Deviation must be greater than or equal to the Set point.

If this condition is true, the screw is allowed to move, the nozzle valve (if equipped) is allowed to open or close, and the injection unit is allowed to function in AUTO mode. If this condition is false, these functions are inhibited, and an alarm message will be displayed when the action is initiated.

For high limit alarm, the formula is: Set point + Max Temp Deviation must be less than or equal to the Actual temperature.

9.3.8 Feed Throat Temp Setting



The Feed Throat Temp Setting will control the water flow cooling to the water jacket that cools the barrel at the feed tube area of the barrel. It is suggested to set this temperature about 10 degrees below whatever temperature would cause the material you are running to bridge up at the feed tube.

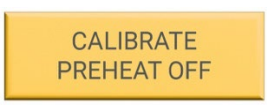
9.3.9 Heat Soak Time

When a value of higher than 0 is entered in this set point the control will not allow motion of the screw until the barrel has reached the Auto Setpoint Temp and the time value entered has timed out. The minimum setpoint for this value is 5.0 minutes.

9.3.10 Idle Time to Standby

If you are running a volatile material that will gas out or crystalize if it sits in the barrel at Auto Set point for too long you can enter a set point value that will bank the heats to the Standby temperature setting. So, if the barrel heats are at Auto Set point and the screw has not moved in the time value that you have entered here the barrel heats will be changed from Auto Heat Mode to Standby Heat Mode. Note that the Injection Unit must be enabled on the Process Screen and this will work in both Automatic Mode as well as in Manual Mode.

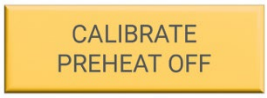
9.4 Calibrate Preheat



This button is available when logged in as TECH. This feature will perform a barrel heat up calibration to help prevent the barrel from over shooting, the Auto Setpoint when the barrel heats are initially turned on.

To perform this TASK, you must be sure that the current barrel temp actual temperatures are below 100 degrees F. If the actual barrel temperatures are above 100F this operation will not properly tune.

To perform the **Calibrate Preheat** make sure the Barrel Heat Mode is off, actual barrel temperatures are below 100F. Press the **Calibrate Preheat Off** button. This will initiate the Calibration procedure and you will then need to wait until the controls have completed this task. You will know that the calibration is active as the state of the button will change to Calibrating Press to Cancel and flash red and black.



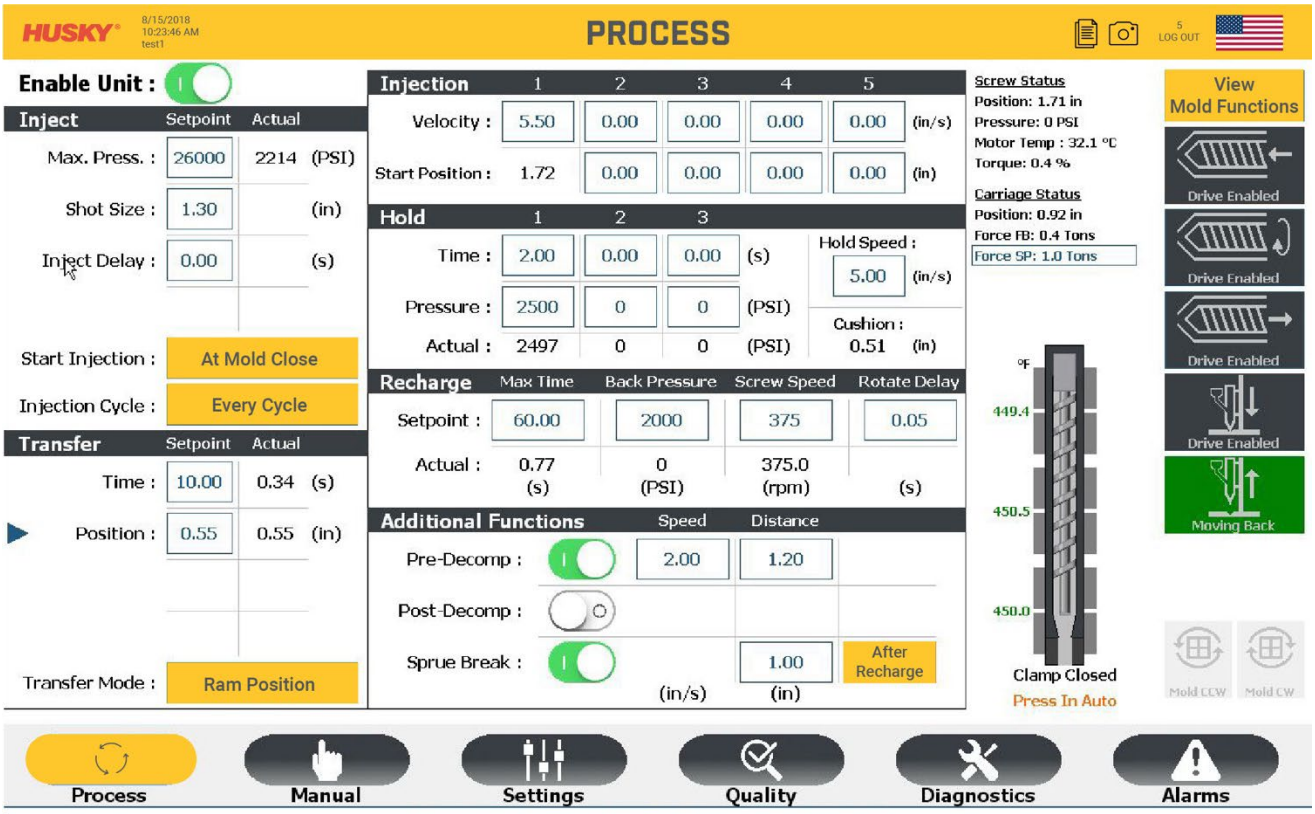
Once the calibration has completed the button will return to the state it was when you began the calibration procedure.

9.5 Heat Tuning

The HEAT TUNING screen button is only available when logged in as TECH. The heat tuning is factory set and may only need to be adjusted if the screw and barrel diameter is changed.

10 Processing

Process Screen



10.1 ALTANIUM MULTISHOT™ Unit On/Off

Enable Unit : 

To navigate to the Process screen, touch the Process button on the footer menu. Press the button labeled [Enable Unit] top left side of screen. If the unit is “ON”, the button will turn green. This allows the unit to operate. Pressing this button causes the system to toggle between the “ON” and “OFF” states. The injection unit must be turned on for manual mode functions to operate. The clamp must be open, or the press in manual to turn “ON”.

When the Altanium Multishot™ unit is on and the press is cycling in semi-automatic or fully automatic mode, all programmed actions will take place.

Do not place the Altanium Multishot™ unit INTO” ON” mode until you are ready to begin cycling it in this mode.

10.2 Injection Setpoints & Settings

10.2.1 Max. Press.

Max. Press. : 26000

This is setting will limit the Maximum Injection Pressure during Injection Phase.

MAKE SURE THAT YOU ENTER A HIGH ENOUGH PRESSURE TO ALLOW YOUR PROCESS TO REACH THE DESIRED INJECTION VELOCITY.

10.2.2 Shot Size

Shot Size : 1.30

Shot size is the screw recover position.

10.2.3 Injection Delay

Inject Delay : 1.50

The delay timer starts when the press signals clamp fully closed to the Altanium Multishot™ unit via the EM67 interface, the Altanium Multishot™ nozzle tip is in contact with the mold, and the nozzle valve, if equipped, is open. If no delay is desired enter a value of “0”.

10.2.4 Start Injection

At Mold Close

The normal setting for this will be At Mold Closed. If your machine is equipped with a Core Back Injection sequence or Co-injection option, it will be selectable at this location.

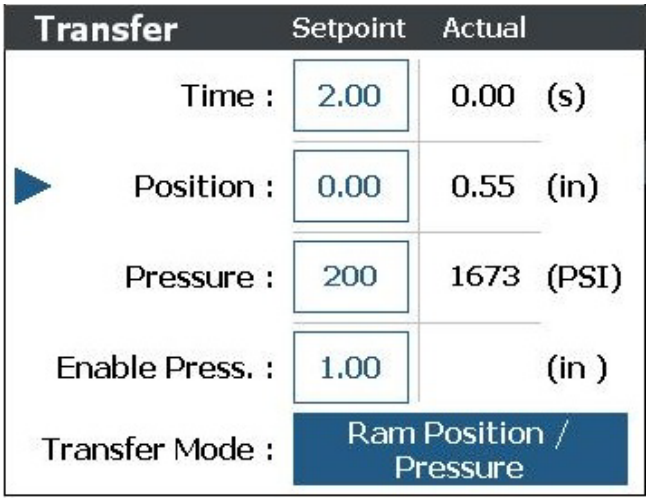
10.2.5 Injection Cycle

Every Cycle

Every cycle is the normal setting for this. If you have a Mold Rotate option available with your machine, then you can select At Mold CW or At Mold CCW but if either one of these are selected the injection unit will ONLY rotate when the mold rotate is in the selected mold rotate position.

10.3 Transfer Setpoints & Settings

Transfer is the point during inject when the control changes from the fill velocity mode to the pack and hold mode. Set points for the process settings are entered in this block.



10.3.1 Time

This timer will initiate the transfer into hold phase as a safety if the Transfer position is not reached. The time will always be monitored as a failsafe.

10.3.2 Position

Screw position setpoint for switching to hold phase.

10.3.3 Pressure

Screw or injection pressure setpoint for switching to hold phase. When switching to hold phase by pressure a screw position value is required to be entered in the Enable Pressure transfer.

10.3.4 Enable Press

This function setpoint allows you to ignore hydraulic pressure spikes that may occur before you wish to transfer to holding pressure. Example, at injection start the hydraulic pressure momentarily increases while the system accelerates the screw and plastic. If this pressure spike is greater than or equal to your desired transfer pressure set point, the system will immediately transfer to holding pressure. Enter a position that is just before your transfer position to allow the system to use the pressure that is being applied to the plastic as the cavity is almost full.

10.3.5 Transfer Mode

The Altanium Multishot™ unit can be configured to transfer from Injection Phase to Hold Phase in four different ways; at a fixed position, at a fixed pressure, at either a fixed position or a fixed pressure depending upon which occurs first, and at an adjustable time. The unit will always monitor the transfer time as a safety. Press the button next to Transfer Mode to toggle between these choices.

the Altanium Multishot™ unit can be set up to display pressures as melt pressures. The melt pressure is determined by the ratio between the area of the injection forward piston(S) and the screw's area, in conjunction with the hydraulic system pressure. This ratio, CALLED THE INTENSIFICATION RATIO, is calculated internally by entering the unit size and screw diameter at the UNIT setup screen. The Altanium Multishot™ unit comes pre-programmed with its maximum system pressure, correct screw diameter, and injection unit size when you purchase it

If a different screw diameter is installed, you must enter it before using the machine. Failure to follow this step may cause damage to your molds. Example, you are molding a part with a 35mm screw that requires 30,000 PSI melt pressure. You install a smaller screw, but do not enter its diameter at the UNIT setup screen, and then attempt to run a job. Because the new screw is smaller in diameter than the original screw, the corresponding melt pressure is considerably higher than before, and may be enough to damage mold components or the Altanium Multishot™ injection unit

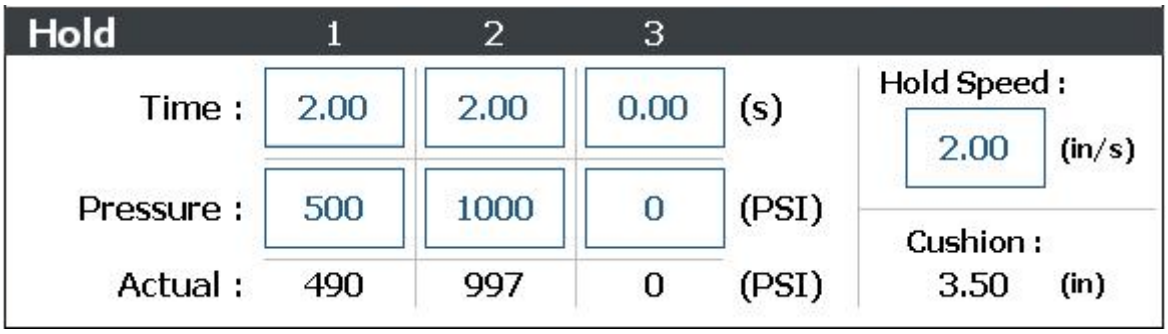
10.4 Injection Velocity Setpoints

Press the value display to the right of INJECT VELOCITY. The keypad graphic screen will appear. Enter the desired first stage injection velocity. The units are in inches/second. Press the [ENTER] key on the Keypad to enter this set point. Subsequent velocity phases also include a screw position start point of the phase. Velocity phases with a start point of zero are ignored. However, entering a start point with a velocity of zero will create an alarm condition.

Injection	1	2	3	4	5	
Velocity :	4.00	7.00	2.00	0.00	0.00	(in/s)
Start Position :	3.50	1.50	1.00	0.00	0.00	(in)

10.5 Holding Pressure Setpoints

The section labeled HOLD is used to enter the holding time and pressure. Press the value display next to HOLD TIME to enter a desired holding time. Press the value display next to HOLD PRESSURE to enter a desired holding pressure.



10.5.1 Hold Speed

This is the velocity set point during the Hold Phase. Press the value display next to the Hold Speed to enter the desired Hold Velocity.

10.6 Recharge Settings & Setpoints

10.6.1 Max time

The screw recovery time can be monitored, and an alarm can be triggered by setting the maximum recovery time set point in the value below Max Time.

10.6.2 Back Pressure

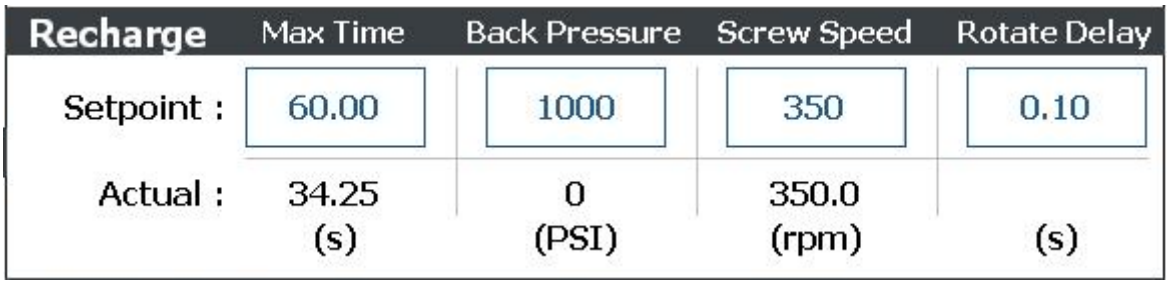
The back pressure set point is entered in the value below Back Pressure.

10.6.3 Screw Speed

Press the value display below Screw Speed to enter the desired screw RPM.

10.6.4 Rotate Delay

If your process requires you to delay screw rotation after hold phase complete, press the value display below Rotate Delay to enter the desired value.



10.7 Pre-Decompression

If Pre-decompression is desired, press the Pre-Decomp button on the right to enable or disable this function. The velocity and position can be set in the values to the right.

10.8 Post-Decompression

If Post-decompression is desired, press the Post-Decomp button on the right to enable or disable this function. The velocity and position can be set in the values to the right.

NOTICE

These values are incremental, not absolute.

Enter the desired amount of pre-decompression, post-decompression, and the shot size directly in inches, do not enter the screw stopping position.

10.9 Sprue Break

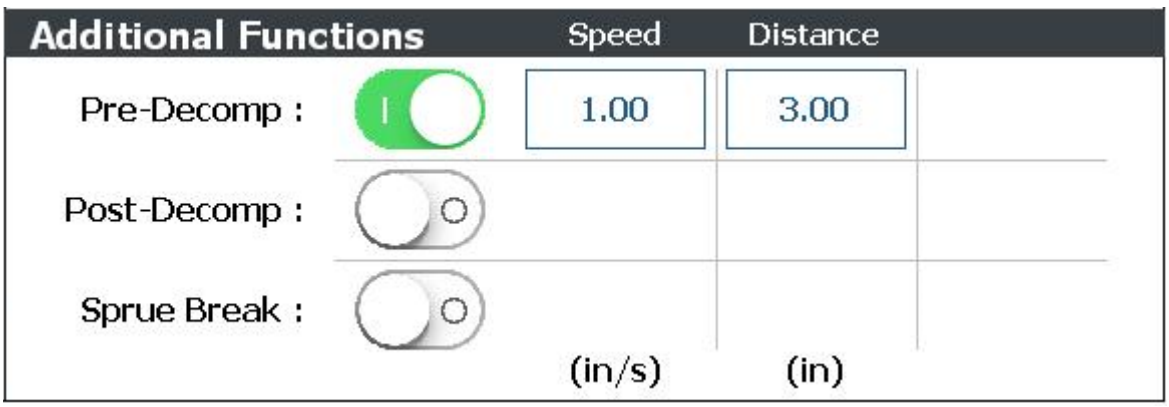
Sprue Break is enabled by the toggle button labeled [AUTO SPRUE BREAK OFF/ON] (must be logged in as “Setup” or above). To change the distance the carriage retracts during sprue break, press the value display to the right of SPRUE BREAK (IN). The keypad graphic screen will appear. Enter the desired Sprue Break distance. Press the [ENTER] key on the Keypad to load this set point. The sprue break set point distance is entered in inches to two decimal points and represents the distance above the zero-carriage position that the carriage retracts.

CAUTION

When sprue break is enabled the carriage must be raised to a position greater than or equal to the sprue break distance set point before clamp motion is allowed. This feature is active in both auto and manual

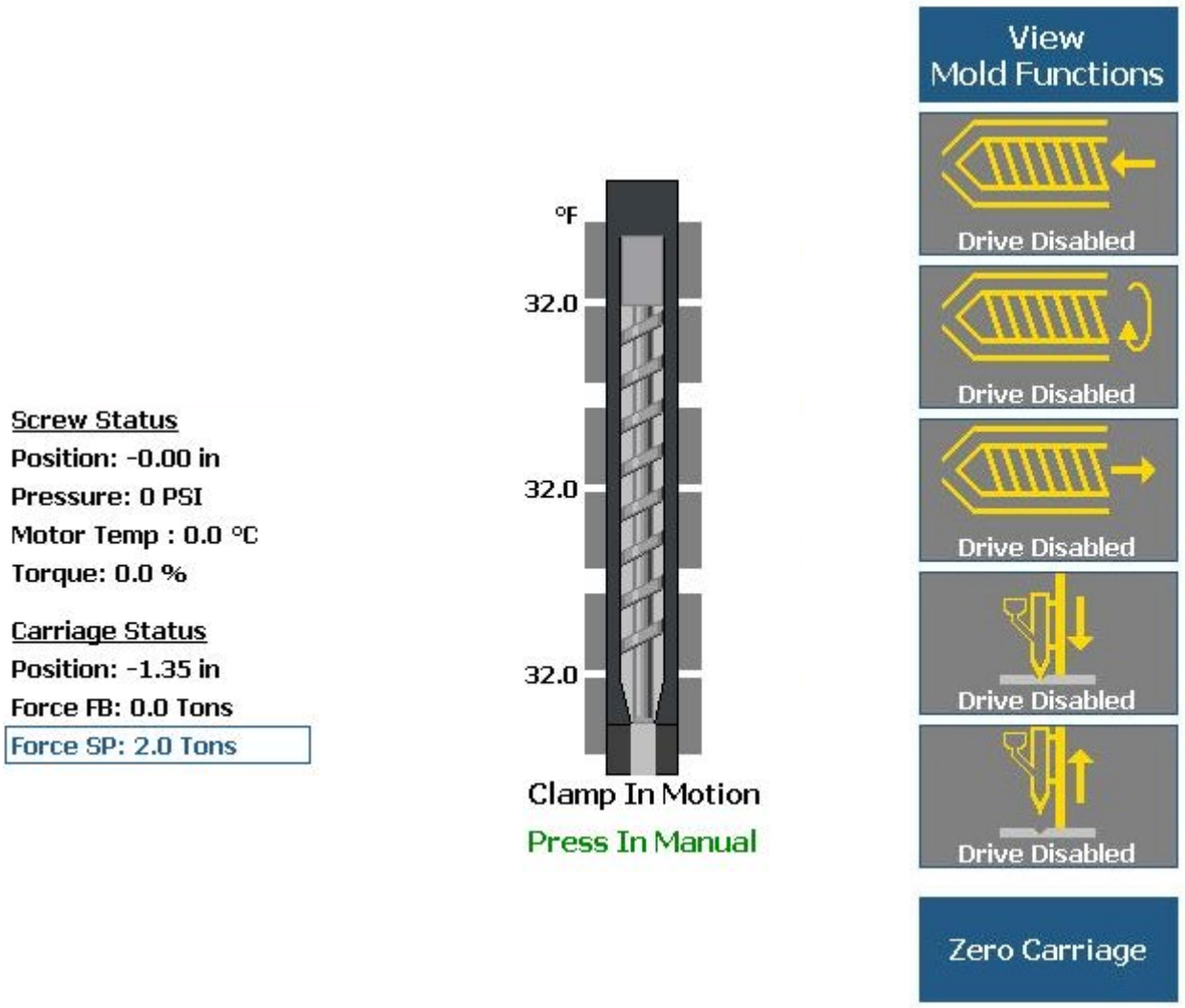
NOTICE

If the Sprue Break function is selected the Carriage position will need to be beyond the Sprue Break position to allow the IMM Clamp to open or close.



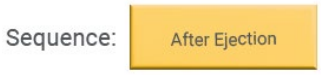
10.10 Additional Screen Information

Status displays are included on this screen to indicate the actual screw position and pressure, the carriage position, the injection molding machine's manual/auto mode and clamp open/close status. There are also manual functions buttons for both the injection unit and any type of auxiliary mold functions such as cores or mold rotate.



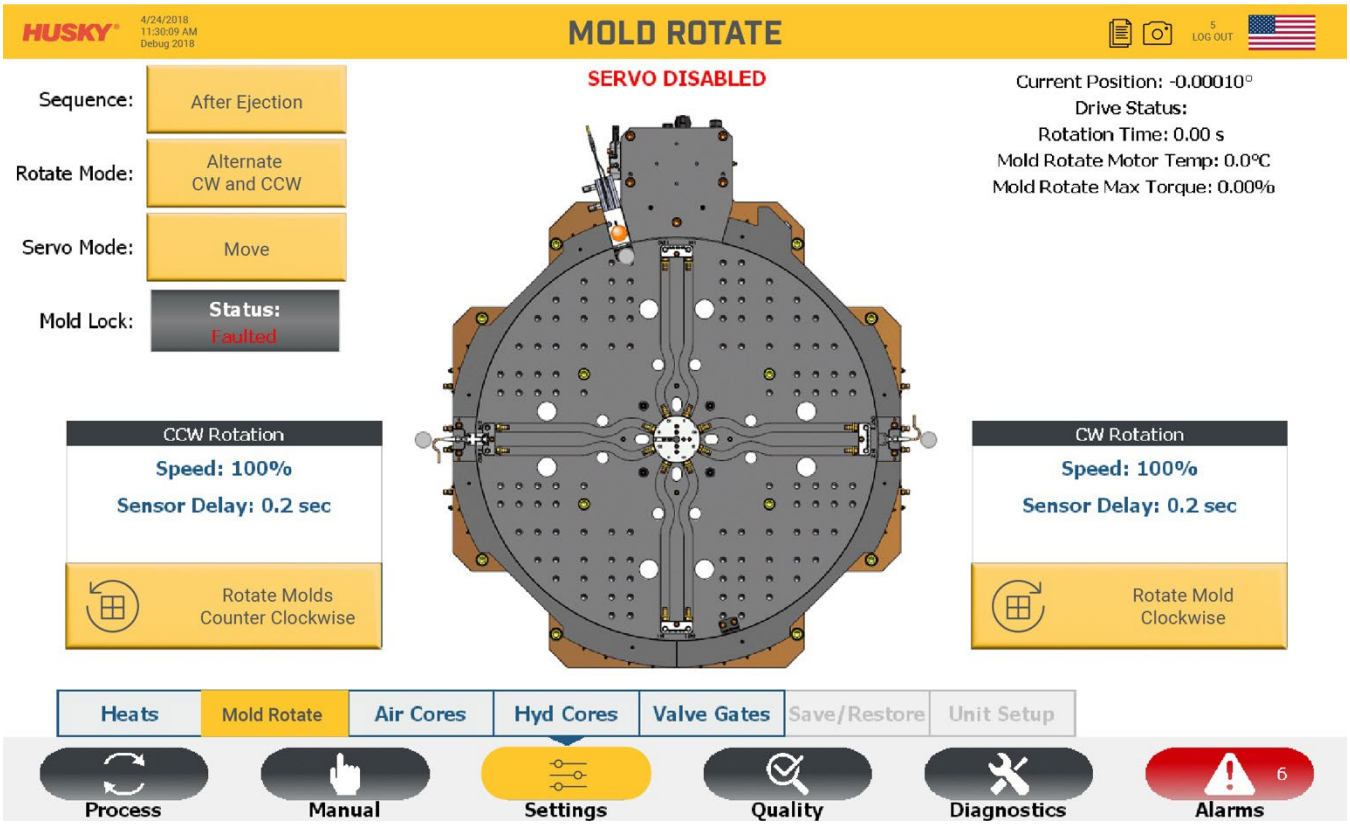
11 Rotary Platen

11.1 Sequence



To navigate to the Mold Rotate screen, first touch the Settings button on the footer menu then press the Mold Rotate button. The Sequence button toggles between the available mold rotation sequences when pressed. The available selections are “MOLD ROTATION IS OFF”, “ROTATE BEFORE EJECTION” and “ROTATE AFTER EJECTION”. Log in as “Setup” or "Tech" to modify this selection.

Mold Rotation Screen



11.2 Rotate Mode

This display if the mold is set up to rotate Alternately Clockwise/ Counter-Clockwise, Continuously Clockwise or Continuously Counter-Clockwise. This option is not selectable by ‘SETUP” or “TECH”, to change this option please contact Husky Technologies™ Service.

11.3 Servo Mode

There are two different Servo Mode functions available. The normal operating mode is “MOVE”, in this mode if all the safeties are met to rotate the mold when the rotate button is momentarily pushed the lock pin will retract, the disk will rotate to position and the lock pin will engage.

If the “JOG” mode is selected the lock pin will automatically retract. The disk in this mode will only rotate while the rotate button is pushed. The “JOG” mode is intended to be used as a set up mode to rotate the disk if there is the concern of a mechanical interference. It is suggested to rotate the disk ensuring any mechanical interference is not present. Once this has been determined select the “MOVE” mode, press the rotate button and the disk will complete the rotation by automatically moving to either +180 or -180 degrees, and then engage the lock pin. Attempting to get the disk into the exact zero- or 180-degree position using the “JOG” mode is very difficult but, the “MOVE” mode will do it automatically.

11.4 Mold Lock

The Mold Lock is only used with Electric Servo controlled platens. When the button is Blue it can be touched to manually unlock or lock the lock pin, when the button is grey the motion is not allowed. This is also a status indicator for the lock pin. It will display if the lock pin is locked, unlocked or faulted.

11.5 Settings & Setpoints

11.5.1 Speed

Inside the CCW and CW Rotation function blocks there is a Speed setting. Touching the numeric value next to Speed will allow the value to be changed. The size and weight of the mold will determine if the mold can be rotated at 100% speed. Use caution in adjusting this setting not to cause damage to the rotary platen or mold.

11.5.2 Pressure

Inside the CCW and CW Rotation function blocks there is a Pressure setting. The pressure setting option is only visible with a hydraulically controlled rotary platen. Touching the numeric value next to Pressure will allow the value to be changed. This setting will help to tune the mold rotation time along with the Speed setting. The size and weight will determine the amount of pressure that can be used, it may not be possible to use 100% pressure. Use caution in adjusting this setting not to cause damage to the rotary platen or mold.

11.5.3 Sensor Delay

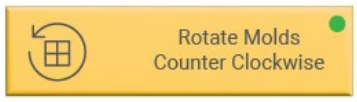
Sensor Delay: 0.2 sec

This setting is to allow a little time for the rotate control to acknowledge the CCW and CW proximity switches.

With a hydraulic platen it will hold the platen in position with pressure on it to ensure it is in position until the timer has timed out.

11.6 Control & Feedback

11.6.1 Rotate Mold Counter-Clockwise/ Clockwise Buttons



These are manual function buttons and will be blue when it is possible to move the function and grey if the motion is not allowed. There is a LED indicator in the button that will illuminate green when the platen is in position and the proximity sensor is made.

11.6.2 Current Position

Current Position: -0.00010°

This displays the current position of the Rotary Platen

11.6.3 Drive Status

Drive Status:

This is only visible when the Rotary Platen is an Electric Servo controlled platen. This displays the current status that the drive is in.

11.6.4 Rotation Time

Rotation Time: 0.00 s

This displays the amount of time it takes to make a rotation cycle.

11.6.5 Mold Rotate Motor Temp

Mold Rotate Motor Temp: 0.0°C

This will only be visible when the Rotary Platen is an Electric Servo controlled platen. This displays the temperature of the electric servo motor that controls the mold rotation.

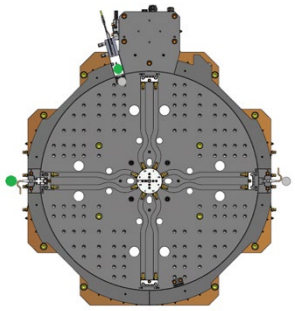
11.6.6 Mold Rotate Max Torque

Mold Rotate Max Torque: 0.00%

This will only be visible when the Rotary Platen is an Electric Servo controlled platen. This displays the max torque that was present during the mold rotate cycle.

11.6.7 Indicator Status

The rotary platen has a proximity sensor for the CCW/ CW position verification. There are LED indicators at the 9 O'clock position and 3 O'clock positions on the screen that will illuminate when CCW or CW indicators are made. There is also LED indicators at the top of the platen that will display if the lock pin locked or unlocked proximity switches are made.



11.7 Safety

The rotary platen relies on the injection molding machine's safety devices and interlock circuits to prevent rotation when any of the gates are opened, or when the mold, ejectors, or cores are in an incorrect position. It is recommended to frequently test the function of these devices and circuits.

11.7.1 Test Front Gate Safeties

With the press in manual mode and with its front gate open, attempt to rotate the platen. If the platen rotates, immediately find the cause and correct it. Do not operate the machine until corrective actions have been verified.

11.7.2 Test Rear Gate Safeties

With the press in manual mode open the back gate, attempt to rotate the platen. If the platen rotates, immediately find the cause and correct it. If the IMM goes into E-stop, the Altanium Multishot™ unit must also E-stop. If this does not occur, immediately find the cause and correct it. Do not operate the machine until corrective actions have been verified.

11.7.3 Test Clamp Closing Safeties

With the press in manual mode and the rotary platen not in either one of its home positions, attempt to close the clamp. If the clamp closes, immediately find the cause and correct it. Do not operate the machine until corrective actions have been verified.

11.7.4 Test Platen Rotation Safeties

With the press in manual mode and the clamp full open, the ejector rods removed and ejectors forward, attempt to rotate the rotary platen. If the rotary platen turns, immediately find the cause and correct it. Do not operate the machine until corrective actions have been verified.

11.7.5 Test Ejector Forward Safeties

With the press in manual mode, the ejector rods removed, and the rotary platen not in either one of its home positions, attempt to extend the ejectors. If the ejectors extend, immediately find the cause and correct it. Do not operate the machine until corrective actions have been verified.

Your injection molding machine controls the timing between the rotary platen, cores, and ejectors. When placing the unit in automatic operation you must verify these actions occur when you intend them to. If you are new to using rotary platens, we recommend you verify the set-up with the ejector rods removed and the cores in a safe position. Follow this procedure until you have tested each of the possible table/ejector/core permutations available on your machine.

A convenient place to monitor the status of the signals on the press's EM67 Interface are the I/O monitoring screens in the Altanium Multishot™ operator interface.

Operation

The Rotary Platen has two modes of operation, After Ejection and Before Ejection. The choice of which mode to use is dependent upon the molding cycle in use, i.e. where and how is the part to be removed, how does the mold shutoff between first and second shot, which shot is first shot, etc. The selection of After Ejection or Before Ejection is done from the operator interface's rotary table screen.

Operation of the Rotary Platen differs from conventional core sequences because the Rotary Platen alternates direction. A traditional core sequence will always be in one position or the other (pulled or set) before allowing the sequence to continue. The Rotary Platen allows the sequence to continue when it is in either position (clockwise or counterclockwise). The controller logic must remember and distinguish between the two POSITIONS AND perform the correct function when the rotary platen is in either position.

11.8 Example Sequences

11.8.1 Traditional Core Sequence:

1. Clamp opens
2. Cores pull
3. Ejectors forward then retract
4. Cores set
5. Clamp close

11.8.2 Rotate After Ejection Sequence:

1. From a mold full open position, with the ejectors back and the platen counter-clockwise, the clamp closes.
2. The injection cycle progresses normally from injection through screw rotation, then the clamp opens.
3. At clamp full open the ejectors are driven forward to their set-point position, then they retract.
4. When the ejectors are fully retracted the clamp is inhibited from closing and the platen rotates clockwise.
5. When the platen is fully clockwise, the clamp is permitted to close.

6. The next time the clamp opens and the ejectors cycle, the platen will rotate counterclockwise.

11.8.3 Rotate Before Ejection Sequence:

From a mold full open position, with the ejectors back and the platen counter-clockwise, the clamp closes.

The injection cycle progresses normally from injection through screw rotation, then the clamp opens.

At clamp full open the ejectors are inhibited from extending and the platen rotates clockwise.

When the platen is fully clockwise, the ejectors are permitted to extend and then retract.

When the ejectors are fully retracted, the clamp is permitted to close.

The next time the clamp opens, the platen will rotate counterclockwise.

Note that due to the platen's operating mechanism, the Process Tech needs to determine not only which sequence is correct, but also which way the platen is required to rotate.

The Rotate after Ejection Sequence may be slightly modified for jobs that require operation in semi-automatic mode, where the parts are held captive on the ejector pins while they are extended. In this type of sequence, cycling the operator gate is required to retract the ejectors before the platen rotates. Note that the EM67 Robot Interface does not distinguish between operations in the semi-automatic mode vs. full automatic; hence, the device controlling the rotary platen must inhibit ejector retraction until the operator gate has cycled.

Platen rotation is always inhibited in every machine operating mode
unless the front AND REAR gateS ARE closed, the ejectors are fully retracted, and the clamp is full open.

In multi-stroke ejector jobs, permission to rotate (i.e. the EM67 ejector retracted signal) cannot be given until all ejector strokes are completed.

12 Hydraulic Cores

12.1 Selections

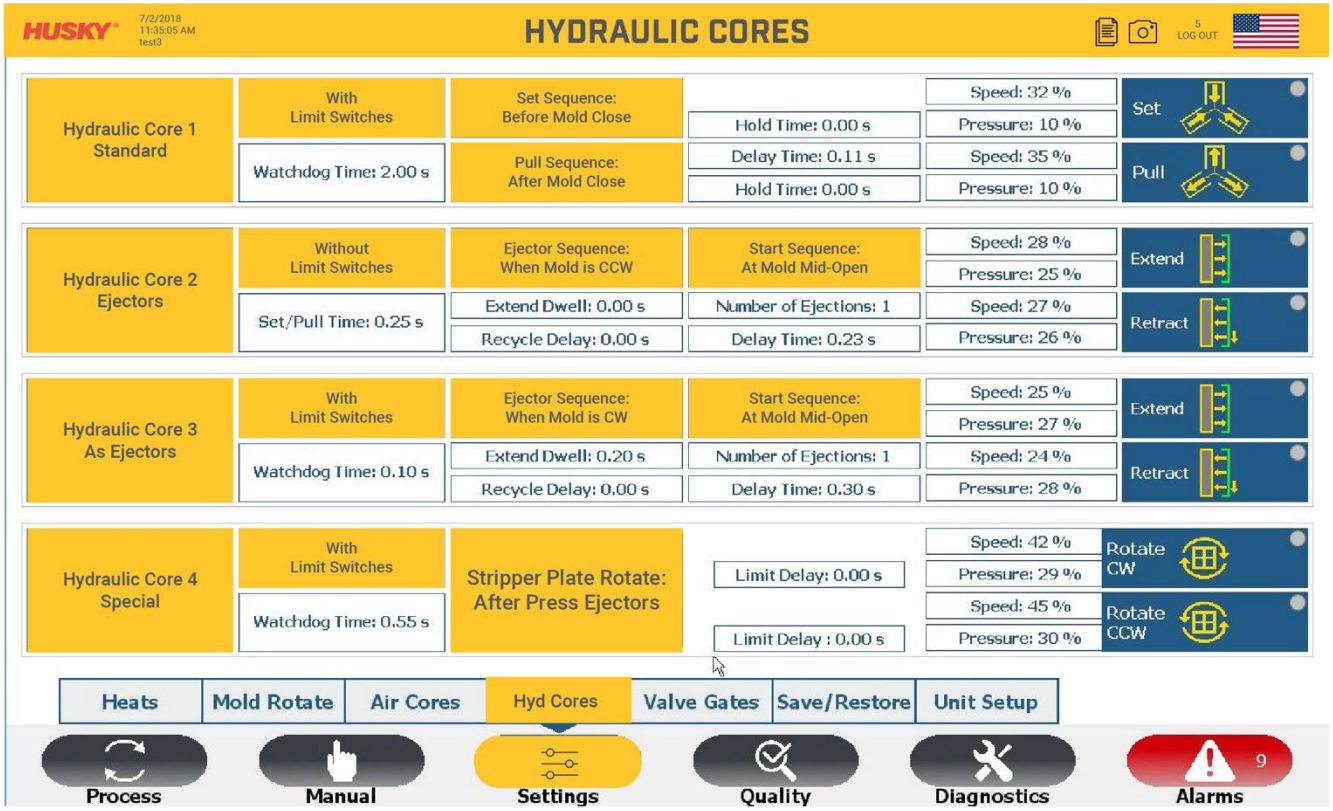
To navigate to the Hydraulic Cores screen first touch the Settings button on the footer menu then press the Hyd Cores button. The HYDRAULIC CORES screen allows you to set up the operation of up to 4 hydraulic core functions

12.2 Sequences

The sequence choice for each hydraulic core is selected by pressing the [HYDRAULIC CORE SEQUENCE] button, which toggles between the available core sequences. The available selections are “HYDRAULIC CORE # OFF”, “HYDRAULIC CORE # STANDARD”, “HYDRAULIC CORE # AS EJECTORS” (optional), and “HYDRAULIC CORE # SPECIAL” (custom optional).

Logging in as “Setup” or "Tech" is required to select core sequence options.

Hydraulic Core Screen



12.3 Limit Switches/Timers

If your mold is equipped with limit switches to signal end of stroke, configure the hydraulic core to operate as “WITH LIMIT SWITCHES". If you are operating a mold with hydraulic cores that do not use limit switches, configure the hydraulic core as "WITHOUT LIMIT SWITCHES". This will then display a PULL/SET timer, that allows you to energize the hydraulic core set or pull solenoid valves for an adjustable time period.

CAUTION

to avoid potential mold damage, Experiment with your mold to determine what the correct timer set point, pressure, and speed must be before placing the machine into automatic operation.

12.4 Set/Pull Speed and Pressure

The hydraulic system's pressure and flow rate may be independently adjusted for each core set and core pull function. Enter a value by pressing the displayed set point percent, press the keys for the value you want, then press enter.

CAUTION

Before you set the system pressure for hydraulic cores set and pull, determine what the safe working pressure is for your mold components.

It is very common for core cylinders to have a 500 PSI working pressure. Setting the CORE pressure set point at 100% will allow full system pressure to be introduced into your mold components, and may cause damage or injury.

12.5 Standard Sequences

When the HYDRAULIC CORE # Standard function is selected, the screen displays separate buttons to select the [CORE SET] sequence and the [CORE PULL] sequence.

Pressing the [CORE SET] button will toggle between available options; “OFF”, “SET BEFORE MOLD CLOSE”, “SET AFTER MOLD CLOSE with Time Delay”, "AS MOLD OPENS with Time Delay ", “AT MOLD OPEN”, "AFTER CORE 2 SET", "AFTER CORE 3 SET", “AFTER CORE 4 SET” and “AT SCREW POSITION”. If a timed mode is selected, the timer set point will be displayed and may be modified as required.

Pressing the [CORE PULL] button will toggle between available options; “OFF”, “AFTER MOLD CLOSE with Time Delay” “PULL AFTER UNIT CYCLE”, “AS MOLD OPENS with Time Delay”, “AFTER MOLD OPEN", "AFTER MOLD OPEN UNSCREW", "AFTER CORE 2 PULLED", "AFTER CORE 3 PULLED" and “AFTER CORE 4 PULLED”. If a timed mode is selected, the timer set point will be displayed and may be modified as required.

To enable the core set or pull solenoids to be maintained energized after the function is completed there is a “HOLD TIME” setting for each solenoid. Entering a value here will keep the appropriate solenoid energized for that period of time.

CAUTION

to avoid potential mold damage, WHENEVER TIME MODE IS SELECTED BE CERTAIN THAT THE CORE MOVES WHEN IT WILL NOT INTERFERE WITH OTHER OBJECTS. TEST THE SYSTEM IN MANUAL MODE BEFORE COMMENCING AUTOMATIC OPERATIONS.

12.6 Ejector Functions

A hydraulic core can be configured to operate as an ejection system, which will operate every time the press reaches the full open position when in automatic mode. To select this function, press the [HYDRAULIC CORE SEQUENCE] button until it toggles to “CORE AS EJECTORS”. Several options will be presented to you, allowing you to select the following sequences:

Ejector Sequence: "EJECT EVERY CYCLE", "EJECT WHEN MOLD IS CLOCKWISE", or "EJECT WHEN MOLD IS COUNTERCLOCKWISE".

Ejector Start Sequence: “START EJECTORS AT MOLD OPEN”, “RUN EJECTORS WITH PRESS EJECTORS FORWARD”, “START EJECTORS AFTER PRESS EJECTORS”, or “START EJECTORS AT CLAMP MID OPEN”.

The clockwise and counterclockwise position ejection sequences may be used when a mold that is running on a Rotary Platen that has in-mold ejectors. This sequence allows you to eject one half of the parts located on the mold's face when the press opens.

Note that the option of using limit switches or timers is valid when using a hydraulic core as an ejection system. Additionally, there are several new operating parameters that must be set as well: "# OF EJECTS", “EXTEND DWELL TIME", and "RECYCLE DELAY TIME".

OF EJECTS is a multi-stroke ejection system. Enter the number of ejector extend strokes your process requires to reliably eject the part.

EXTEND DWELL TIME is a timer that maintains the ejectors in the extend position for an adjustable period before retracting them.

RECYCLE DELAY TIME is a timer that prevents the cycle from continuing until the ejectors have been retracted for an adjustable delay.

to avoid potential mold damage, WHENEVER TIME MODE IS SELECTED BE CERTAIN THAT THE CORE MOVES WHEN IT WILL NOT INTERFERE WITH OTHER OBJECTS. TEST THE SYSTEM IN MANUAL MODE BEFORE COMMENCING AUTOMATIC OPERATIONS.

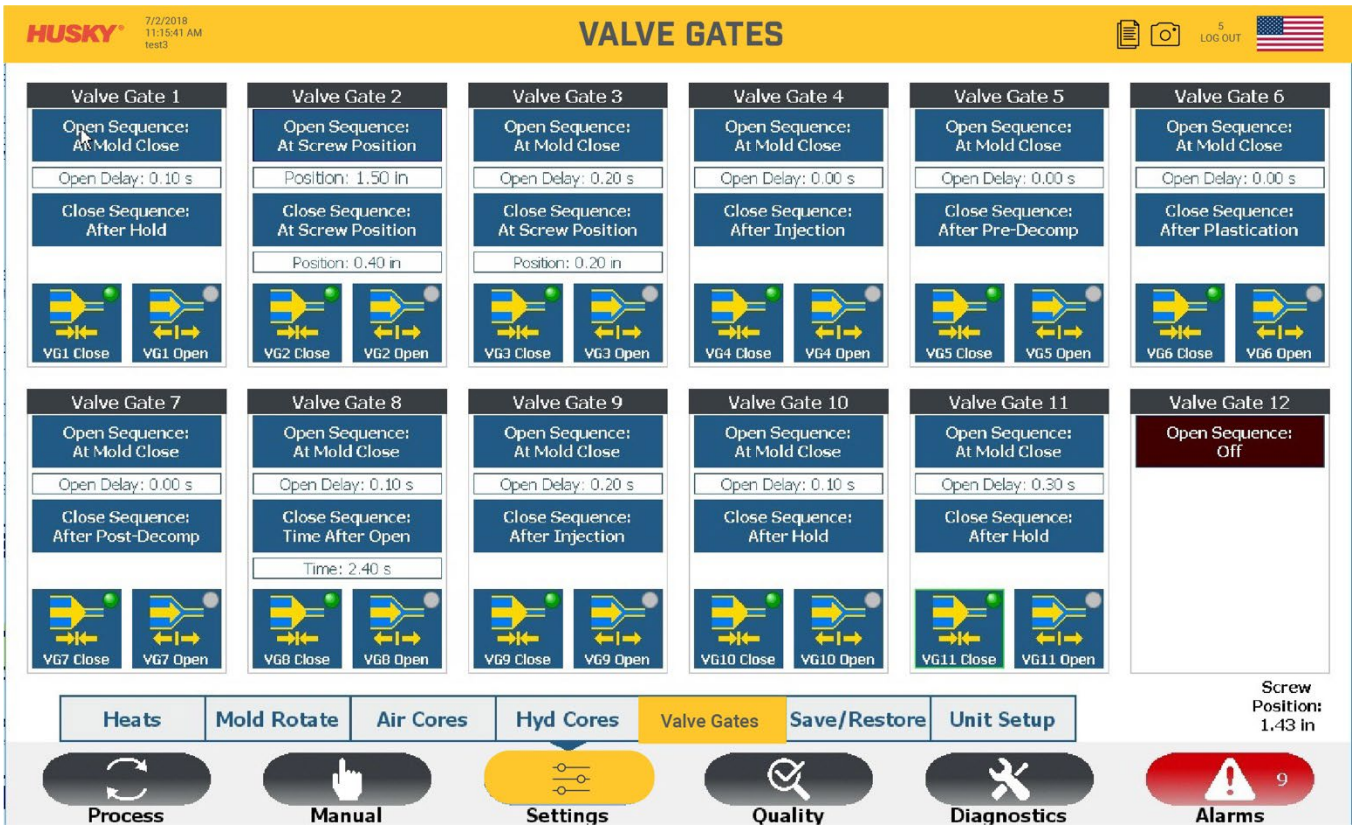
12.7 Manual Operation

Buttons to extend and retract the cores in manual mode are provided, which have and LED in the button which illuminates yellow when the solenoid is being activated, green when the core is in the set or pulled position.

To move the core with the manual buttons the machine must be in manual, with the clamp in the correct position for the sequence selected, with the gates and guards closed.

13 Valve Gate Control

Shut-Off Nozzle/Valve Gate Screen



To navigate to the Valve Gate screen first touch the Settings button on the footer menu the press the Valve Gates button. Valve gate functions are enabled, and the operating parameters are set on this screen.

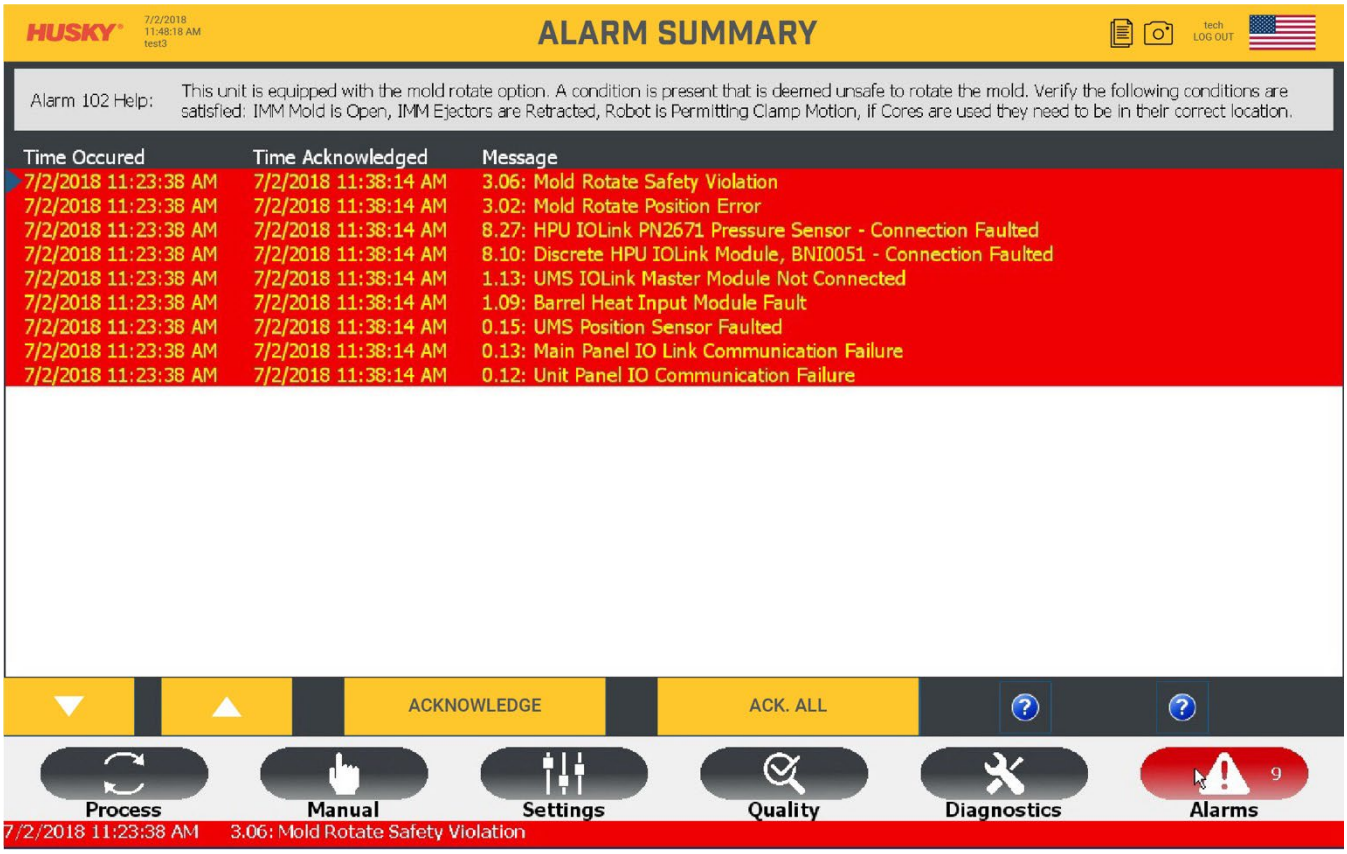
Valve Gates can be programed to “OPEN” at “Mold Close” with an open delay or by Screw Position. The “OPEN” button toggles between these choices.

The Valve Gate may be closed at the end of injection, end of hold, end of pre-decompression, end of Plastication, end of post-decompression, or a time delay after opening. The “CLOSE” button toggles between these choices. Valve gates may also be closed by screw position. Buttons to manually [Open VALVE GATE] and [CLOSE VALVE GATE] have an LED indicator on them to indicate when the function is true.

CAUTION MUST BE USED TO KEEP A CONTINUOUS FLOW OF PLASTIC THRU THE VALVE GATE SYSTEM WHILE INJECTING AND USING OPENNING AND CLOSING VALVE GATES BY SCREW POSITION.

14 PROCESS MONITORING AND ALARMS

Alarm Summary



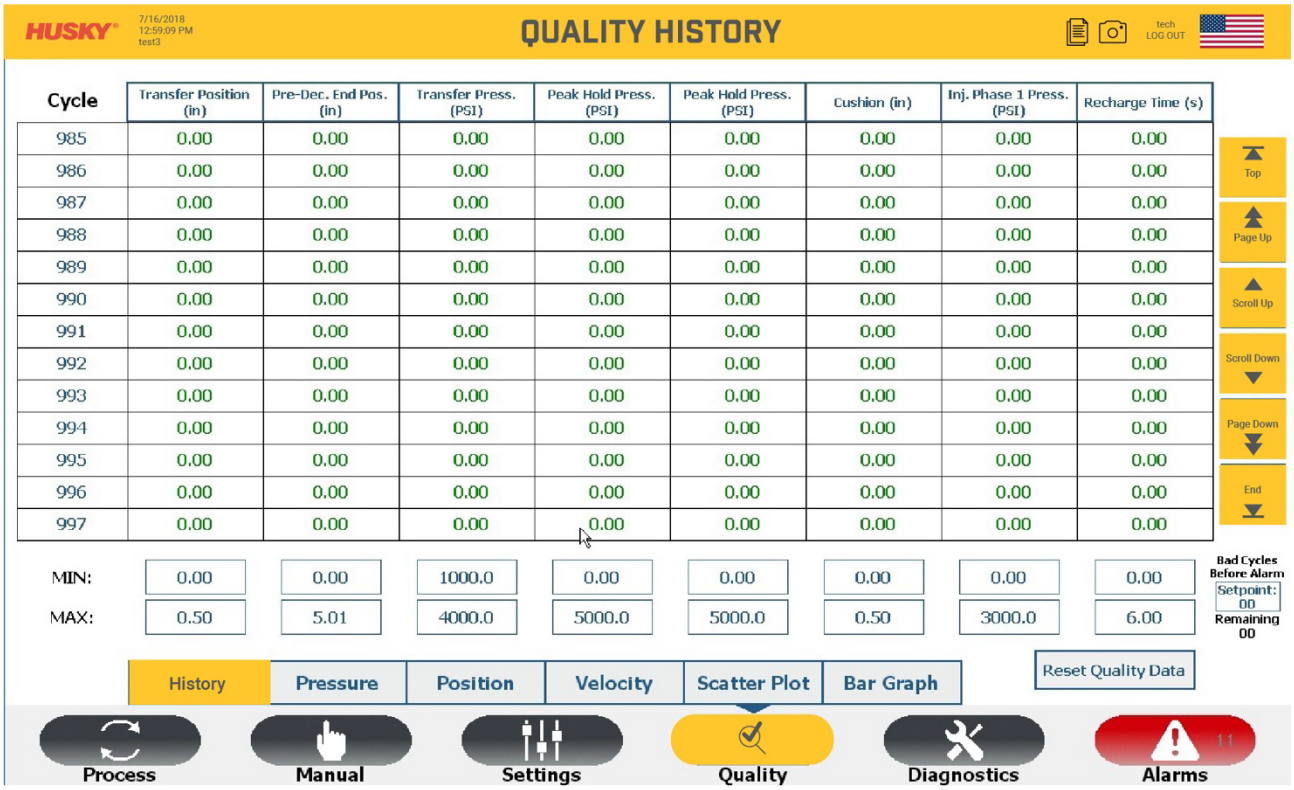
To navigate to the Alarm screen, touch the Alarm button on the footer menu. When the Altanium Multishot™ control system detects an abnormal condition, it alerts the operator of this condition by displaying an alarm banner on the bottom of the screen, indicating the alarm condition and the time and date it occurred.

The alarms can be acknowledged by pressing the [ACK ALARM] which will Acknowledge the last activated alarm. If you press the [Ack. All] button it will reset any alarm that is no longer active.

The up and down cursor buttons are used as a help tool. Move the cursor in front of the alarm that you would like help with, and it will give you the alarm number and an explanation of the alarm.

15 Quality History

Quality Menu



There are 6 different Quality menu screens available to navigate to from the Quality Screen.

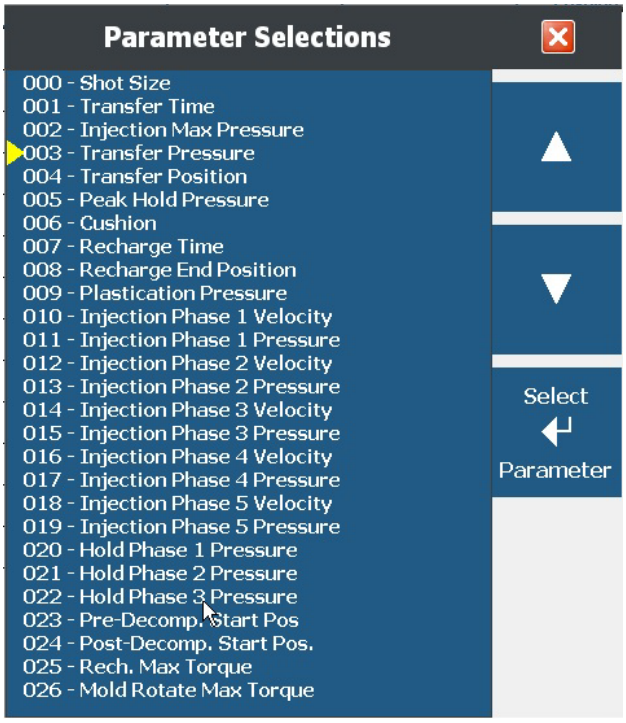
Process data from the last 998 shots are displayed on this screen. In addition, minimum and maximum alarm values may be entered for each displayed process variable. Press the MIN or MAX value display in each variable's column to pull up a numeric keypad. Press the keys for the desired value, and then press the enter button to enter this set point. During a cycle, if your minimum value is not reached, or your maximum value is exceeded, the data displayed for that shot is highlighted to indicate an out of range condition. If this condition continues, an alarm is given. A counter indicates how many cycles remain until the alarm condition is triggered.

15.1 Reset Quality Data

Pressing this button will delete the values in the Quality History.

15.2 Parameter Selection

When you press a parameter at the top of each column a pop-up window will appear which will allow you to select a different parameter for that column.



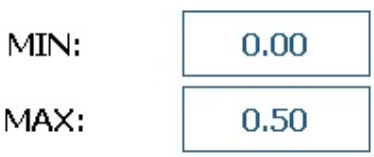
15.3 Bad Cycles Remaining Before Alarm

At the bottom right of the screen is a “remaining cycles before alarm” value display. This represents the number of “bad shots” in a row the system will allow before setting an alarm condition. Adjust this value by pressing the value display and entering a new set point on the keypad.

15.4 Number of Bad Cycles Before Alarm

At the bottom right of the screen is a “number of bad cycles before alarm”. This will count the number of consecutive cycles out of the specified tolerances that have been set. If there is a cycle within tolerance it will reset this counter.

15.5 Alarms



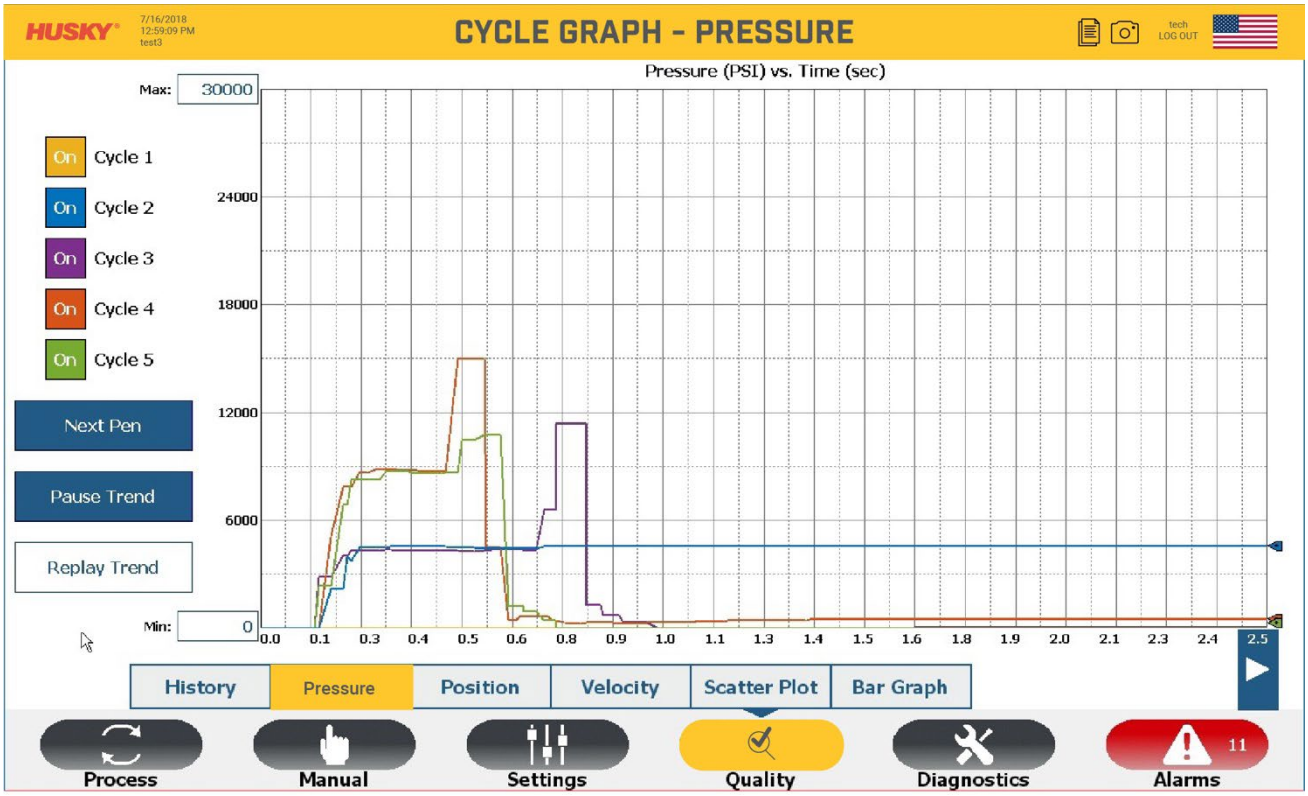
The minimum and maximum values entered on this screen are set points used to alert you when process data is outside of the specified range. Each parameter has a minimum and maximum value you can set as your process requires. Press the MIN or MAX value display in each variable's column to pull up a numeric keypad.

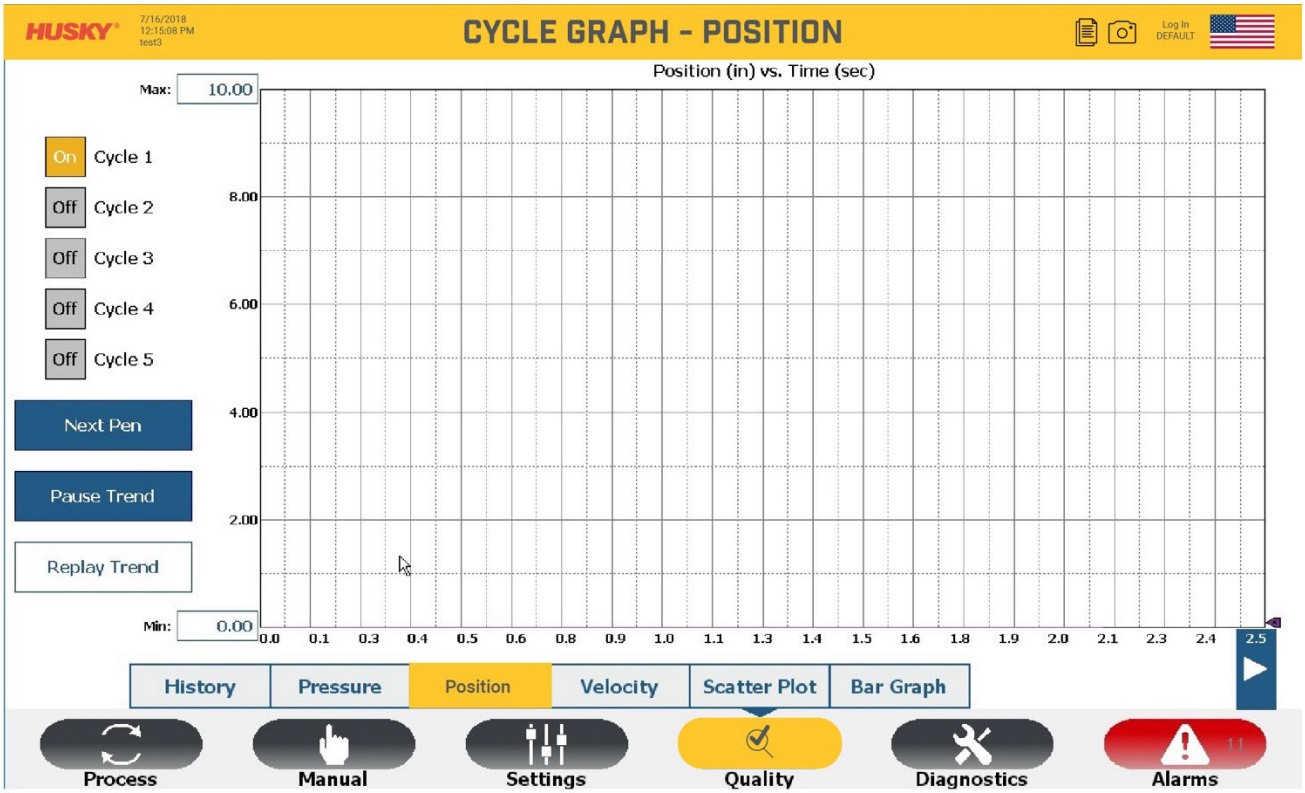
Press the keys for the desired value, and then press the enter button to enter this set point. Process data from the most recent cycle is displayed on the top row and moves down the list with each successive cycle. Process parameters that are outside of the range you enter are displayed in red. Process parameters within your range are displayed in white. When the current cycle has no process parameters outside of your specified range, the green tower indicator light is lit. When any one or more of the parameters are out of your specified range, the yellow tower indicator lamp is lit. When the number of successive out of range parts in any one category equals or exceeds the failed part limit, the red light and alarm horn will be energized. A counter indicates how many cycles remain until the alarm condition is triggered. Pressing the RESET ALARM button will stop the red light and alarm, as will changing the injection molding machine from automatic to manual mode.

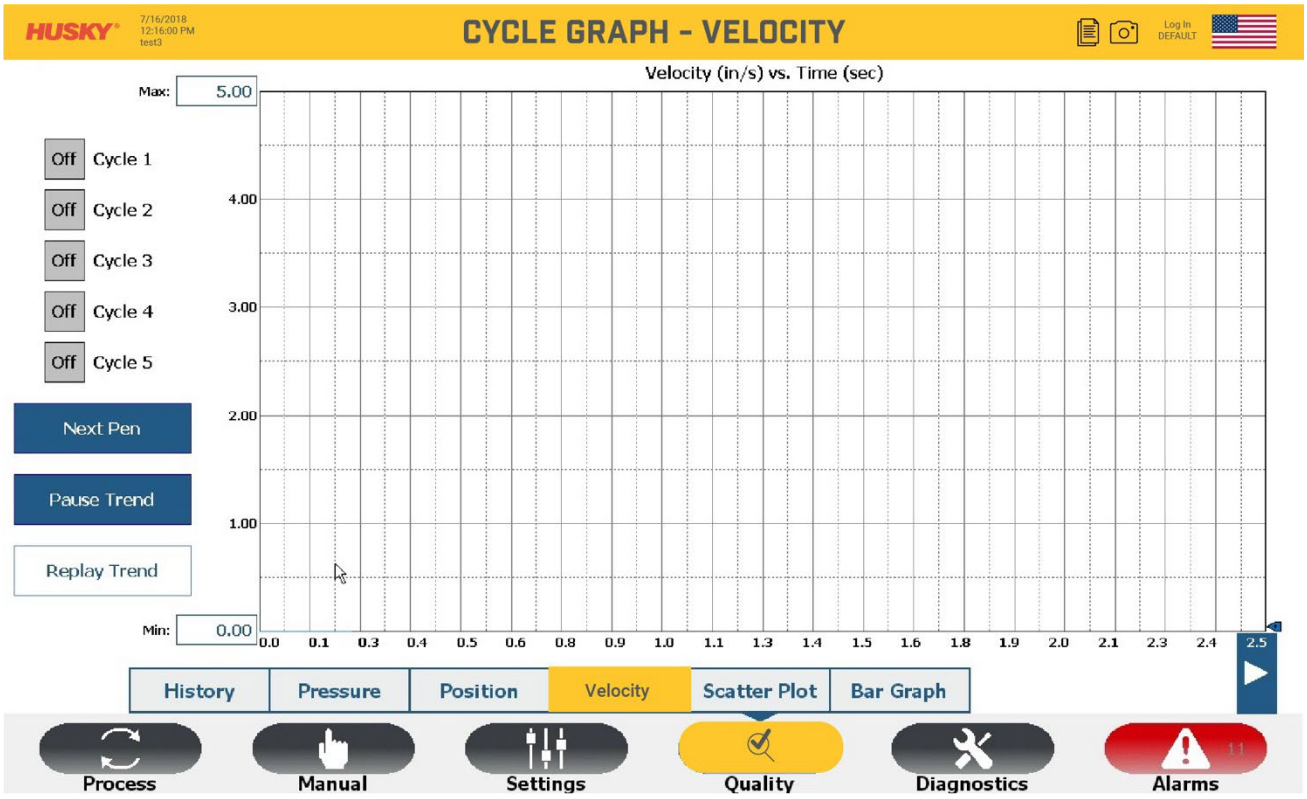
If you do not want to use the red light and alarm, enter a zero as your failed part limit.

16 Cycle graph Pressure, Position and Velocity

These screens can overlay up to 5 injection cycles over each other. There are Min and Max settings on the left side of the graph and time base on the bottom of the screen.

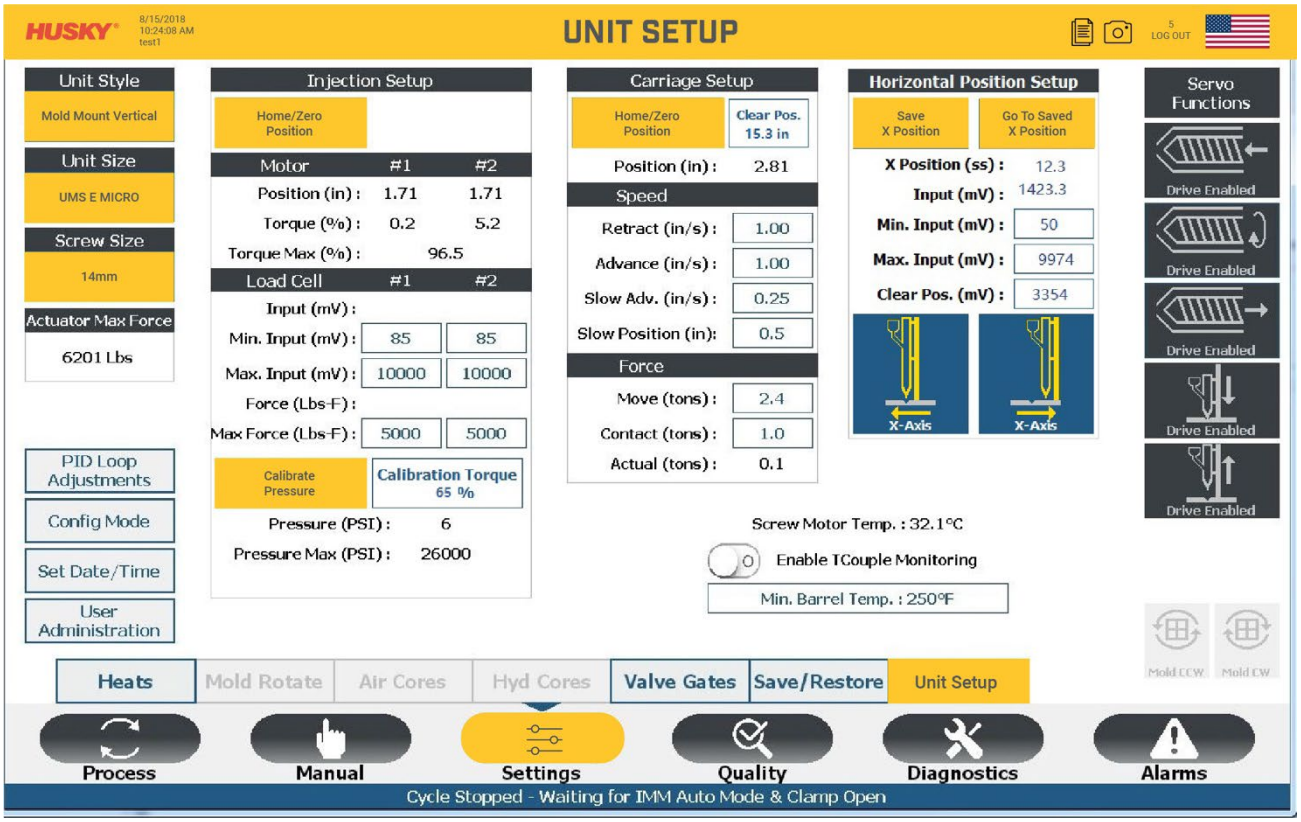



HUSKY
7/16/2018
12:15:08 PM
test3
CYCLE GRAPH - POSITION
Log In
DEFAULT
Position (in) vs. Time (sec)
Max: 10.00
On Cycle 1
Off Cycle 2
Off Cycle 3
Off Cycle 4
Off Cycle 5
Next Pen
Pause Trend
Replay Trend
Min: 0.00
8.00
6.00
4.00
2.00
0.0 0.1 0.3 0.4 0.5 0.6 0.8 0.9 1.0 1.1 1.3 1.4 1.5 1.6 1.8 1.9 2.0 2.1 2.3 2.4 2.5
History
Pressure
Position
Velocity
Scatter Plot
Bar Graph
Process
Manual
Settings
Quality
Diagnostics
Alarms
11


HUSKY
7/16/2018
12:16:00 PM
test3
CYCLE GRAPH - VELOCITY
Log In
DEFAULT
Velocity (in/s) vs. Time (sec)
Max: 5.00
Off Cycle 1
Off Cycle 2
Off Cycle 3
Off Cycle 4
Off Cycle 5
Next Pen
Pause Trend
Replay Trend
Min: 0.00
4.00
3.00
2.00
1.00
0.0 0.1 0.3 0.4 0.5 0.6 0.8 0.9 1.0 1.1 1.3 1.4 1.5 1.6 1.8 1.9 2.0 2.1 2.3 2.4 2.5
History
Pressure
Position
Velocity
Scatter Plot
Bar Graph
Process
Manual
Settings
Quality
Diagnostics
Alarms
11

17 Unit Setup

ALTANIUM MULTISHOT™ Unit Setup Screen

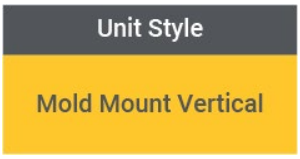


NOTICE

This screen is only accessible when logged in as “TECH”

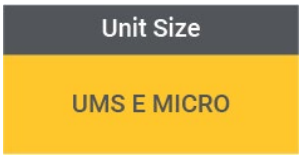
When trying to navigate to the UNIT SETUP screen a pop-up window will appear verifying that you want to navigate to this screen.

17.1 Unit Style



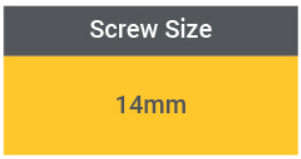
The type of Altanium Multishot™ unit is selected by pressing the button labeled “UNIT STYLE”. This button toggles through the types of units available; “Vertical”, “Horizontal”, or “Mold Mount”. Touch it until it displays the proper type of injection unit. This is a setting that should NEVER be changed.

17.2 Unit Size



The size of the injection unit is selected by pressing the button labeled “UNIT SIZE”. This is a setting that NEVER should be changed. This button toggles through the range of injection unit sizes available. Press it until it displays the proper size injection unit. If you are unsure what size your injection unit is, consult the nametag riveted onto the frame of the unit or contact Altanium Multishot™ Service.

17.3 Screw Size



The diameter of the screw installed in the unit's barrel is selected by pressing the button labeled “SCREW SIZE “. This button toggles through the range of sizes available for that size unit. Press it until it displays the correct diameter of the screw installed in the Altanium Multishot™ machine. If the diameter the screw is unknown, inspect the end of the barrel nearest the screw drive end or the area in the vicinity of the feed throat opening.

The screw diameter is stamped onto either of these surfaces. This value should ONLY be changed if the screw and barrel are replaced with a different diameter.

17.4 Actuator Max Force

This is the maximum amount of force the injection motors can create

17.5 PID Loop Adjustments

Pressing this button will navigate you to the PID Settings screen. Adjusting the Proportional Gain and Integral Gain will affect how quickly the pressure control will react and stabilize.

17.6 Injection Setup

Home/ Zero Position

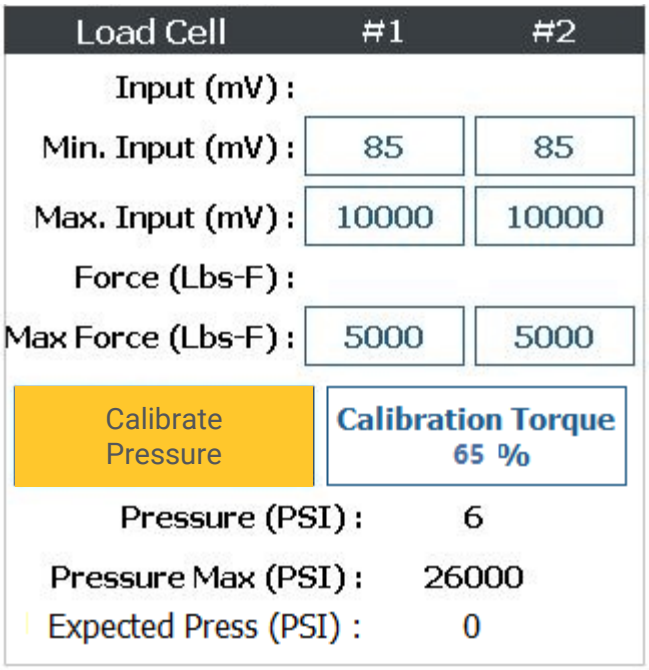
temperature for the material you have in the barrel. Navigate to the Process screen and turn the

To calibrate the Screw Position first make sure that the barrel heats are up to safe operating injection unit “OFF”. Navigate back to the Unit Setup screen. Press the HOME/ ZERO DRIVE button. The injection unit will inject forward slowly bottom out against the injection stroke stops. Watch the Injection 1 and 2 Position while it is calibrating the position, both position values should change to 0.0 (in./mm).

To protect the screw from damage, movement is inhibited when the barrel temperature is outside of the programmed maximum deviation limits.

Take extream caution when performing any calibration procedures to make sure that the person performing the calibration is doing it to the correct axis. If calibration is performed on an axis that is not able to move the full stroke, the calibration will be incorrect.

17.7 Injection Pressure

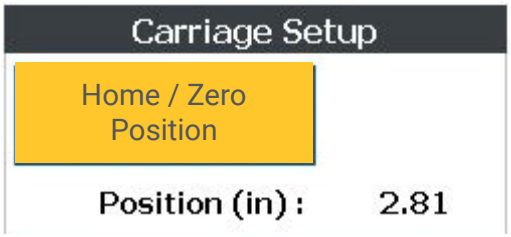


“Min Value” INPUT SETPOINT adjustment. Navigate to the Process Screen and turn the injection unit “ON”. Navigate back to the Unit Setup screen. To set the “Min Value” first retract the screw to make sure there is no load on the load sensors. Press the Calibrate Pressure button, this will enable the calibrate pressure mode and display the current actual millivolt feedback from the load sensors. Enter Motor 1 Input value (Mv) in the MIN INPUT (Mv) for motor 1 and Motor 2 Input value (Mv) in the MIN INPUT (MV) for motor 2. Press the Calibrate Pressure button to disable the calibrate pressure mode.

“Max Value” INPUT SETPOINT adjustment. To adjust the ‘Max Value” for the load cell press the Calibrate Pressure button. Set the CAL TORQUE value to the same value as the Max Motor Force. For example, on this screen it is 65%. When you have the unit in pressure calibration mode you will have another value visible below the Pressure Max, EXPECTED INJECTION PRESSURE. This is the value that we are going to want to be able to achieve when we move the screw forward and bottom out on the injection stroke stops. Press the inject forward button to get the screw to move fully forward and allow it to bottom out. Watch the values in both Motor 1 and Motor 2 INJECT PRESSURE (PSI). This value should be equal to the EXPECTED INJECTION PRESSURE value. If the value is low, you will need to lower the MAXIMUM INPUT (Mv) for that respective motor and if the pressure is high you will need to raise the MAXIMUM INPUT (Mv) for that respective motor.

17.8 Carriage Setup

Home/ Zero Position



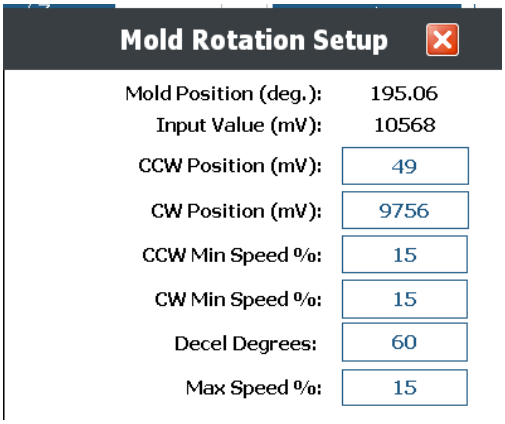
To calibrate the Carriage position, the carriage needs to move forward until it is able to make the forward over travel switch. You may need to do this when the mold is removed. Manually move the carriage to the fully forward position until you get the alarm for the carriage forward overtravel limit. Press the Acknowledge Alarm button and then press the HOME/ZERO SERVO DRIVE BUTTON under the Carriage Position Setup.

When scaling the carriage potentiometer, make sure the nozzle does not contact anything when the carriage is moved down in step one.

Take extream caution when performing any calibration procedures to make sure that the person performing the calibration is doing it to the correct axis. If calibration is performed on an axis that is not able to move the full stroke, the calibration will be incorrect.

17.9 Mold Rot Setup (Hyd controlled platens only)

When this button is pressed a popup screen will be displayed to be used to set up the calibration of the rotary platen.

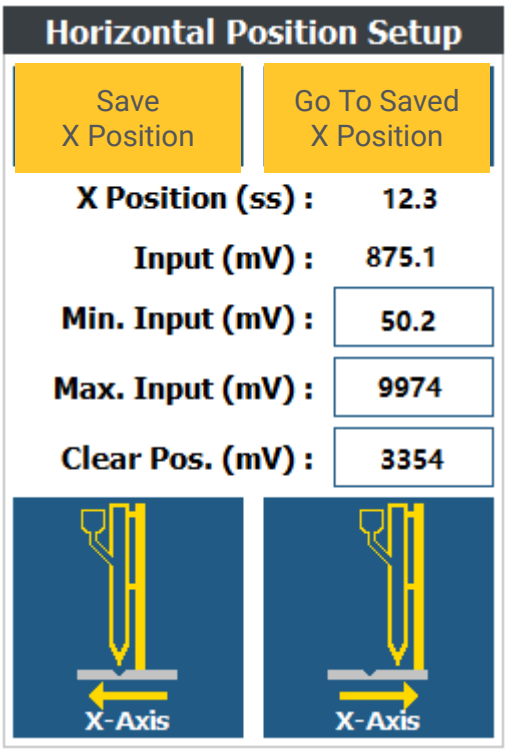


When the optional hydraulic motor rotary platen is used, the table position feedback pot is scaled to provide 0-180 degrees of table position. Manually rotate the table to its counterclockwise position and enter the “Input Value” into the “CCW Position (mV)”. Manually rotate the table to its clockwise position and enter the “Input Value” into the “CW Position (mV)”. When setting up the position the CCW value must be smaller than the CW value, if not the pot must be removed and adjusted accordingly. When the units are set up at the factory the CCW Position Value is set at or near “50mV”, this is a good practice to use so that the position sensor does not roll over its max value.

Next, rotate the platen approximately 10 degrees from each stop and adjust the “CCW Min Speed” and the “CW Min Speed” so that the platen creeps into each end stop. Adjust the “Max Speed %” (0-100) and the “Max Press %” (0-100) to limit the maximum speed and pressure output to the platen rotation, to prevent bouncing and slamming into the end stops.

Enter the degrees of deceleration into the “Deccel Degrees” appropriate for the size of mold installed on the platen. This is the distance in degrees from the end stop that the mold will start its deceleration program when rotating to either direction.

17.10 Horizontal Position Setup



SAVE X POSITION

If the Altanium Multishot™ unit has a motor operated X-axis option. The functionality of this button is to first align the nozzle to the sprue bushing of the mold and then press this button. This will save the X-axis position.

GO TO SAVED X POSITION

If the Altanium Multishot™ unit has a motor operated X-axis option. When this button is pushed it will automatically move the X-axis to the position that was saved when the SAVE HORZ. POSITION button was touched.

X Position (In):

This is the calculated position of the X-axis

Input (mV):

This is the current millivolt value coming from the X-axis POT.

Min Input (mV):

This value is adjustable and should be equal to the Input mV when the X-axis is fully extended out over the molding area.

Max Input (mV):

This value is adjustable and should be equal to the Input mV when the X-axis is fully retracted away from the molding area.

X-Axis Extend and Retract manual function buttons

These two buttons will extend or retract the X-axis

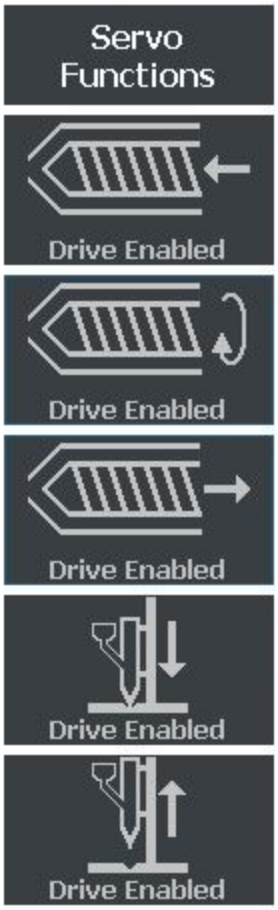
Other Settings

Minimum Barrel Temp

This value can be set so that a barrel temperature set point cannot be set lower than this value on the Barrel Heats page.

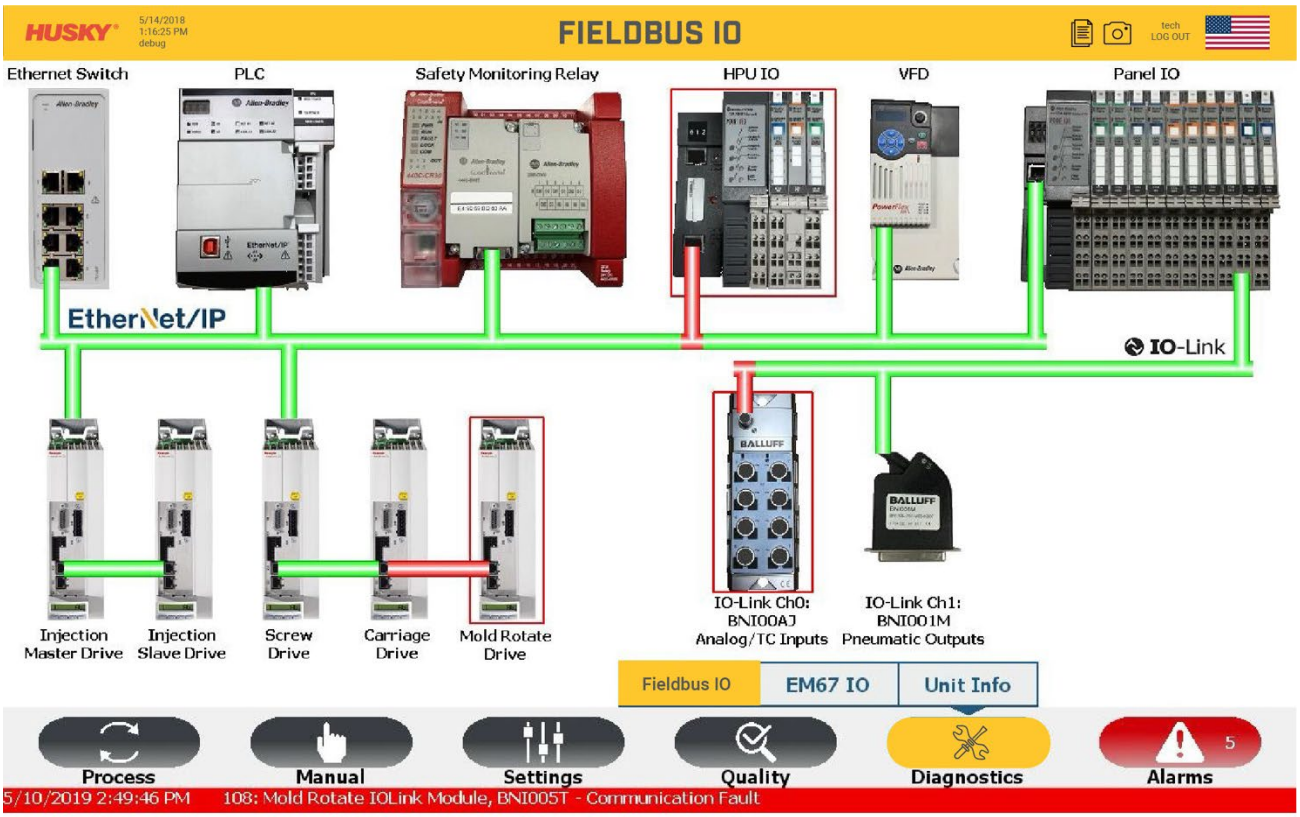
ALTANIUM MULTISHOT™ Functions

These functions buttons will allow manual motions of the respective function button when pressed as long as all safeties for that function are met. The buttons will be blue when they are functional, if they are gray they are not functional.



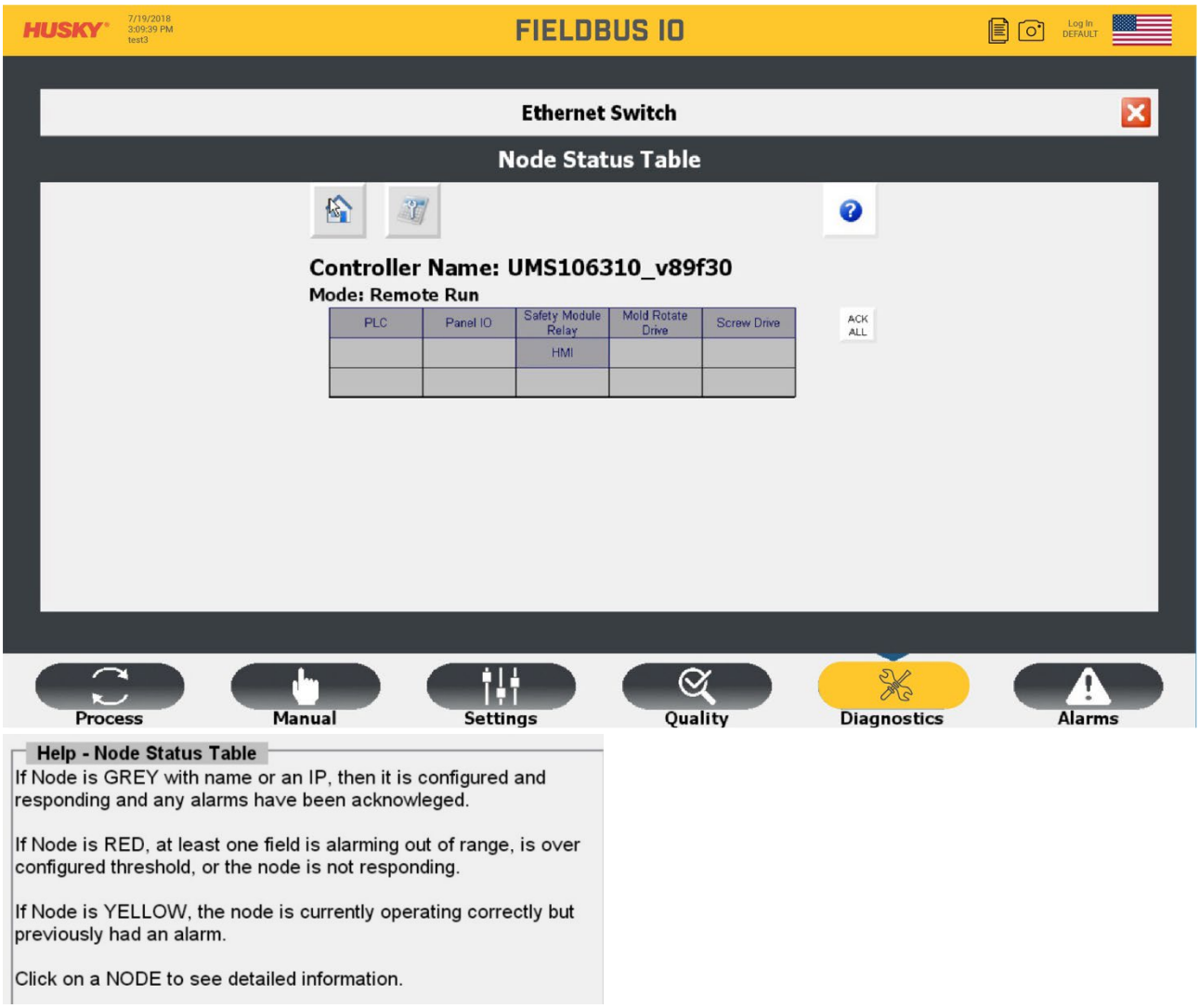
18 Diagnostics

Fieldbus IO



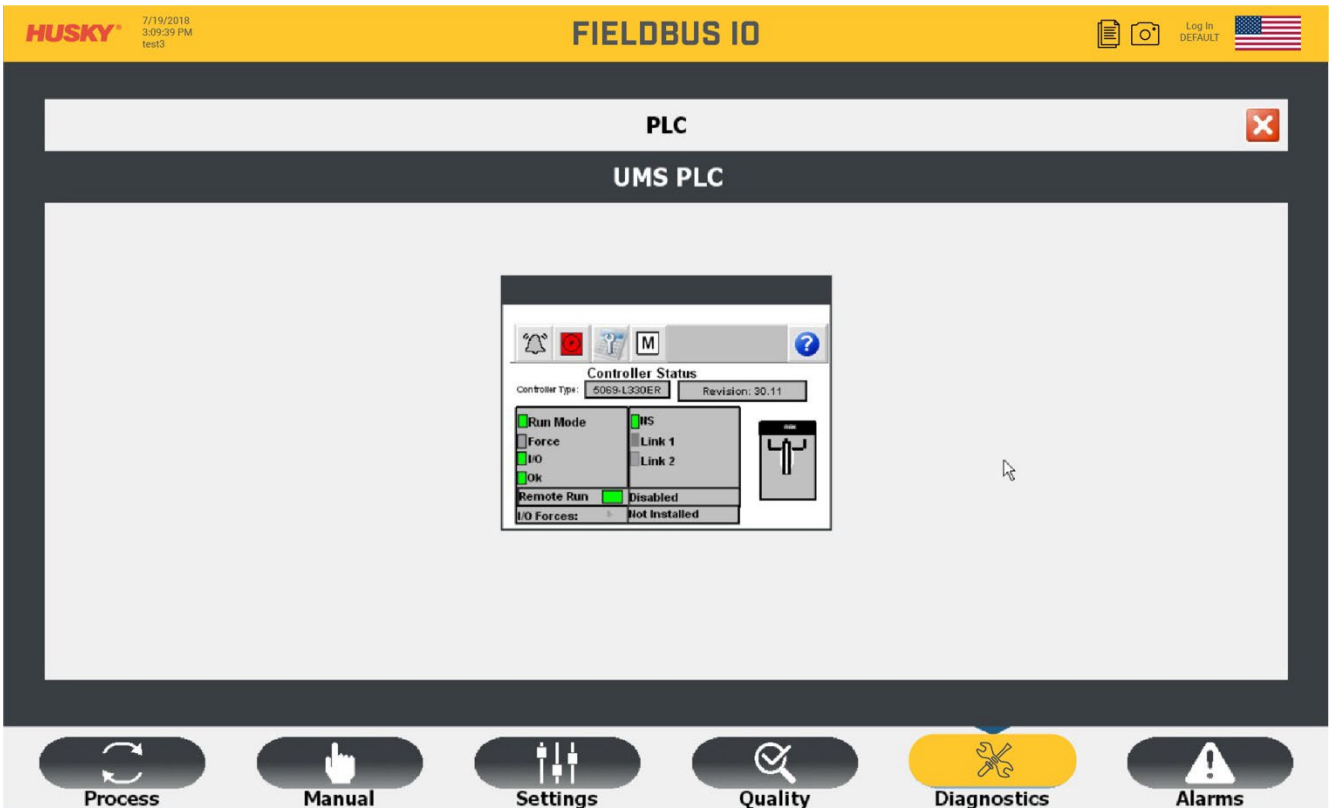
The Fieldbus IO screen monitors the communications of the control system. On this screen you will see the Ethernet switch, PLC, Safety relay, Panel IO, IO Link and any other device hardware for machine specific options you may have. Not all the Field Bus structures are the same this screen is for reference only. The devices are connected with either a green or a red communication link. If the link is green the communication is connected and if the link is red the communication has been lost. On this screen you can navigate to each device by touching that device. Each individual device will have monitoring capabilities that can be used for trouble shooting or diagnosing potential machine issues.

Ethernet Switch



The Ethernet switch screen provides the communication status of each device. If you touch the (help) button the Help-Node Status Table will pop up and this explains the status colors for the devices.

PLC

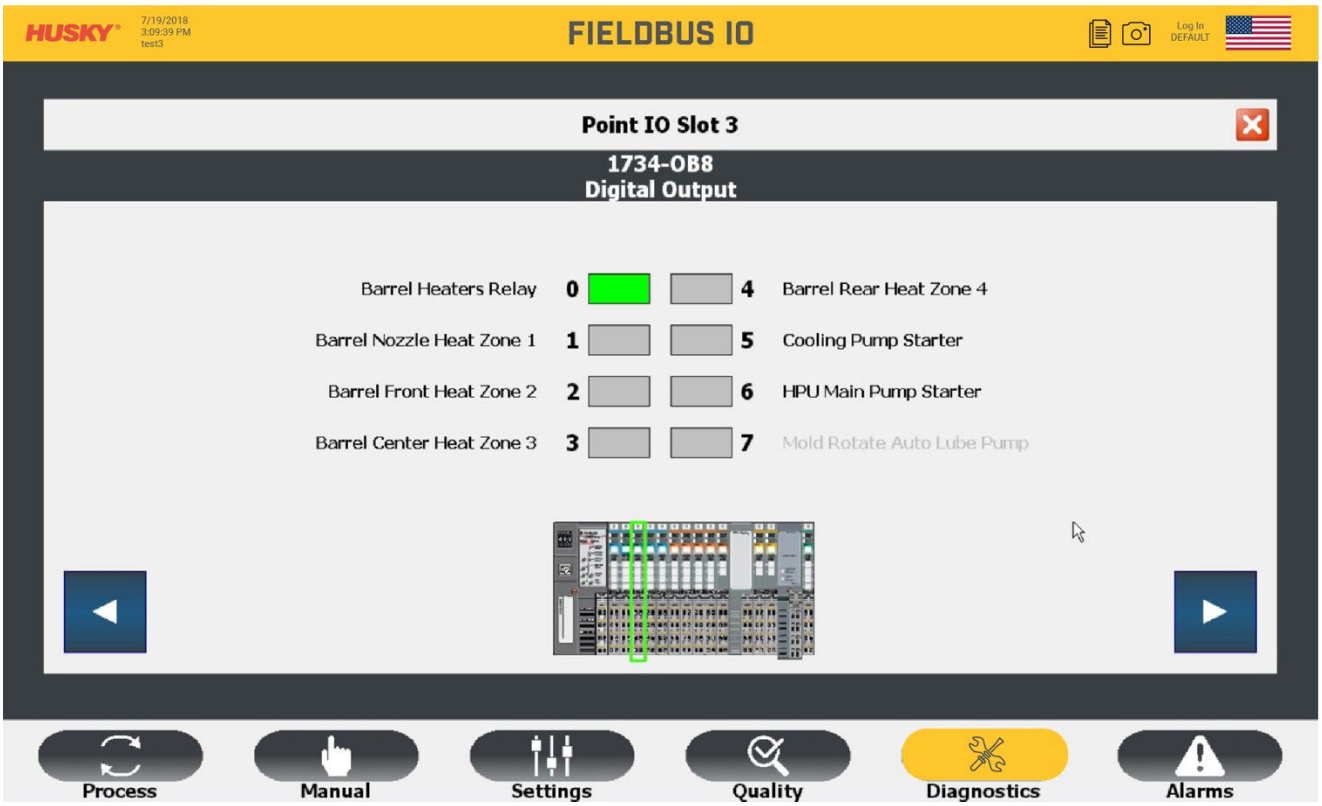


The PLC screen has 4 status screens available to navigate through to provide information on the status of the PLC, faults and software version.

Safety Monitoring Relay

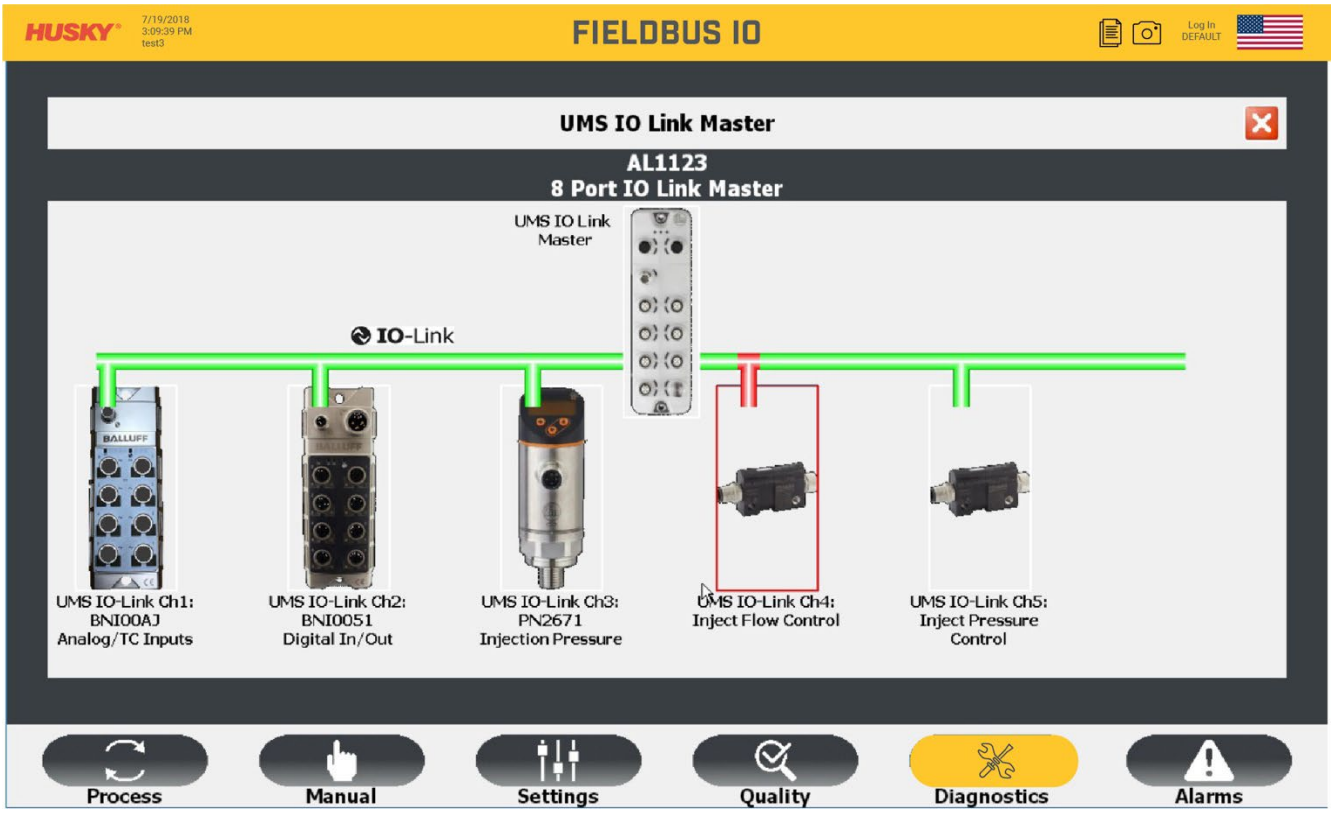
The Safety Monitoring Relay has several screens available to monitor safety inputs and outputs for the E-Stop and Safety Gate monitoring.

Panel I/O



Point I/O screen has the ability to toggle across the I/O rack of the machine to monitor the inputs and out puts of the machine. Toggling left or right using the left or right arrows on the screen a green box will move over the I/O module that is being displayed. A grey box is an input or output that is low (de-energized) and a green box has an input or output that is high (energized).

ALTANIUM MULTISHOT™/ HPU IO Link Master



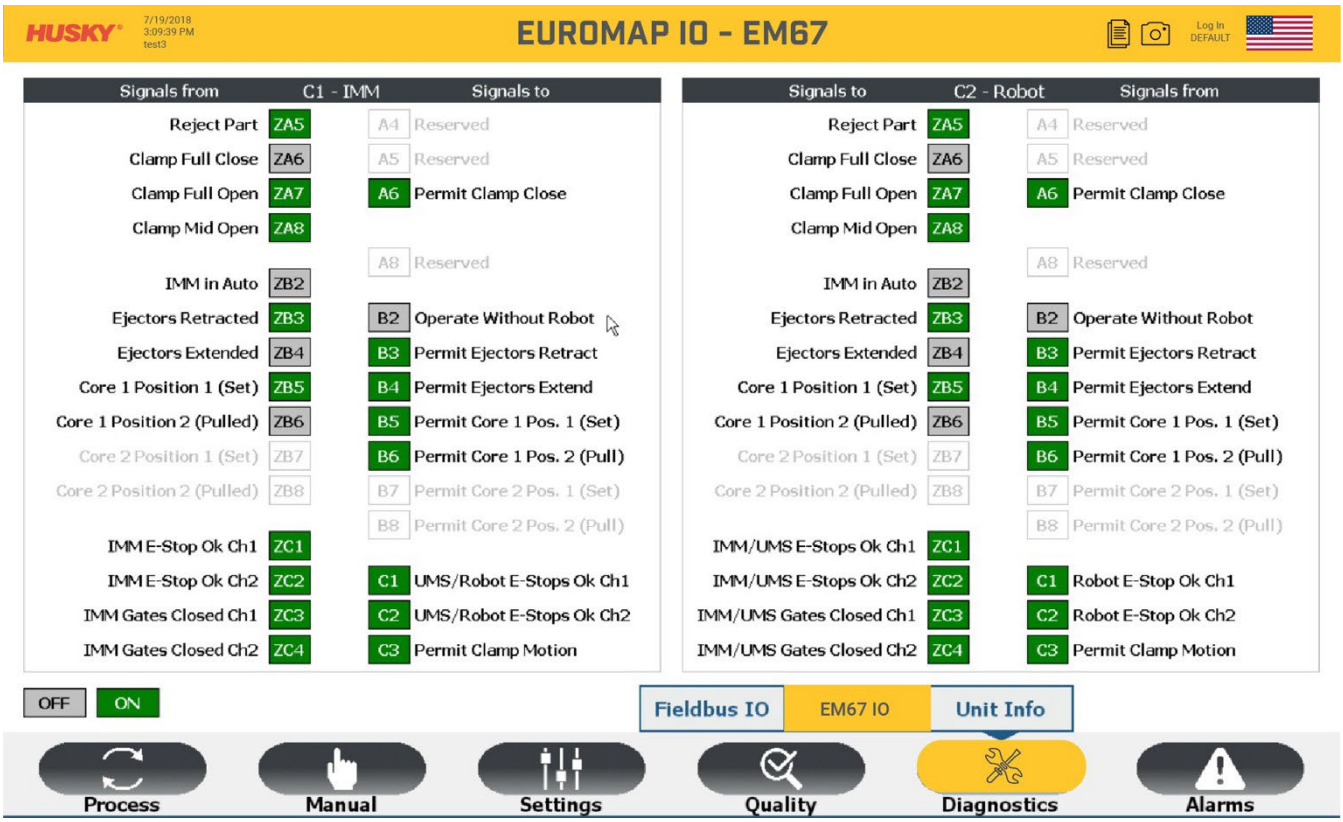
The Altanium Multishot™ IO Link Master devise is the IO Link device on the injection unit. This device communicates signals back and forth from the injection unit to the PLC in the electrical cabinet. The devices are connected and communicating when the link to the displayed device is green and not connected or communicating when the link is red. Touch each individual device to monitor the specific I/O of that device.

The HPU Link Master devise is the IO Link devise on the hydraulic power unit that the IO devices communicate signals back and forth from the hydraulic power unit to the PLC in the electrical cabinet. The devices are connected and communicating when the link to the displayed device is green and not connected or communicating when the link is red. Touch each individual device to monitor the specific I/O of that device.

Analog/ TC Inputs

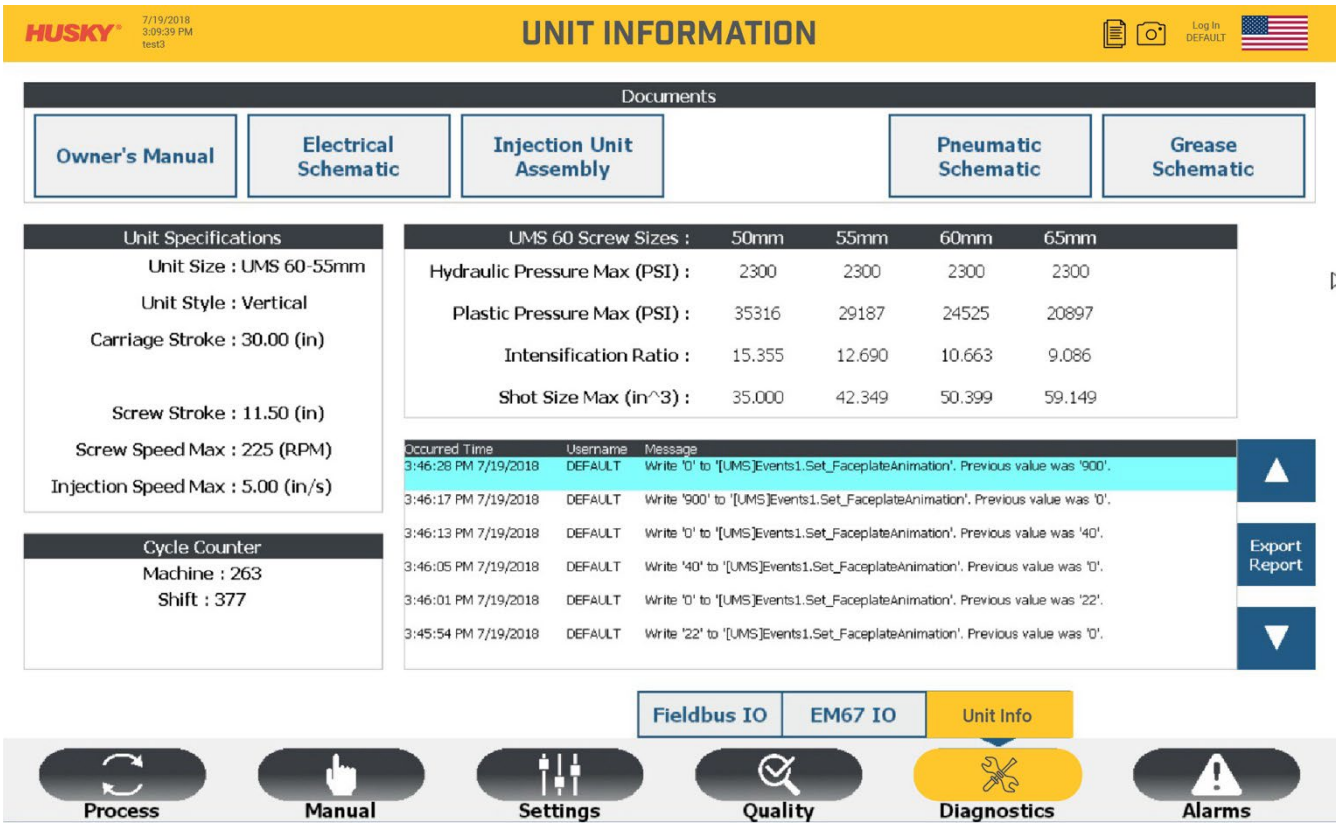
This screen shows the status of the Analog inputs and Thermo Couple inputs on the injection unit. If there is an issue with one of the inputs this give an indication of what type of problem is happening with that input.

EM67 IO



The Euromap IO- EM67 screen displays the status of the signals between the IMM, Robot and Altanium Multishot™ Injection unit. The screen is broken into two halves. On the left side is C1-IMM which are signals that the IMM sends to the Altanium Multishot™ Injection unit and permissions that the Altanium Multishot™ Injection unit sends to the IMM. On the right side is C2-Robot which are signals that the Altanium Multishot™ Injection unit sends to the Robot and permissions the Robot sends to the Altanium Multishot™ Injection unit. The status of the signal will be green when the signal is high (energized) and grey when the signal is low (de-energized).

Unit Information Screen



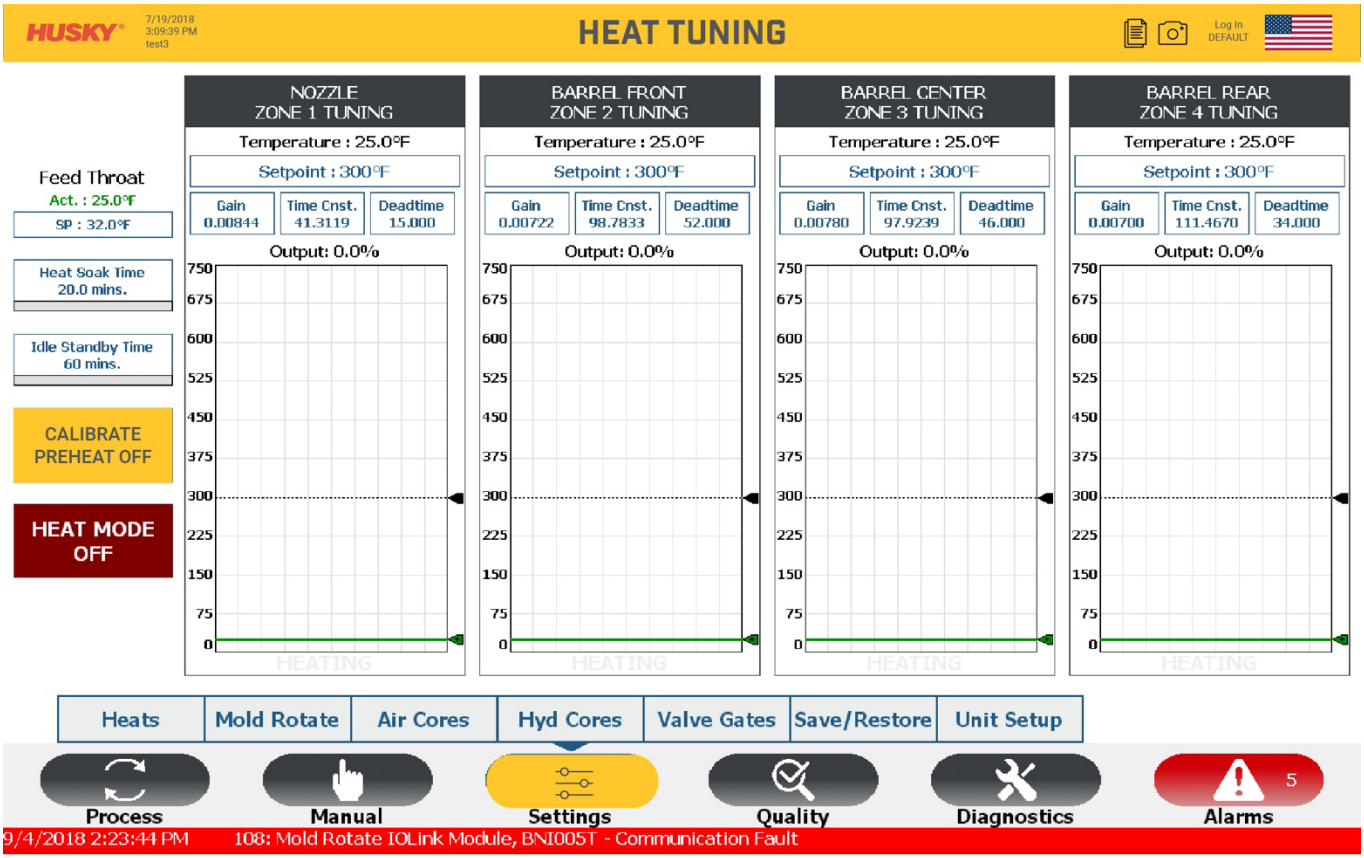
This screen has a few different information aspects directly related to the specific machine. It shows the basic physical characteristics of the various screw and barrel combinations, the size and style of machine, as well as available strokes, speeds and pressures. At the top of the screen are selectable buttons that will display on the screen the user manual, and any related schematics to your specific machine.

Occurred Time

This log will display any changes made on the screens such as process settings.

19 Barrel Temperature Control Tuning

Heat Tuning Screen



This screen is accessed from the Barrel Heats screen. To access this screen log in as “Tech”. All zones should be tuned at the same time.

The Gain (proportional), Time Constant (integral), and Dead Time (derivative) gains for all three or four heat zones may be manually adjusted from this screen.

NOTICE

Always record the current gains in use before beginning the tuning process.

Z1 P gain=_____ Z2 P gain=_____ Z3 P gain=_____

Z1 I gain=_____ Z2 I gain=_____ Z3 I gain=_____

z1 D gain=_____ z2 D gain=_____ z3 D gain=_____

20 Definitions

Proportional Control - A technique of controlling a process where the controller produces a variable output whose magnitude is in proportion to the degree of error that exists between the set point and actual value.

Proportional Band - The area around the set point where the temperature controller is actually controlling the process, expressed as a percent of the temperature control range. A 10% proportional band is a 40 °F. "window" equally spaced above and below a 400 °F temperature control range, e.g. 380°F. to 420°F.

When the actual temperature is below the proportioning band, the control output is 100%. When the actual temperature is above the proportioning band, the control output is 0%. When the actual temperature is within the proportional band, the control output varies depending upon how far from the set point the actual temperature is.

If the proportional band is too large the controller will not provide close enough control. If the proportional band is too narrow, the system will be unstable.

Proportional Gain - A different way to express the proportional band, which equals:

100%/proportioning band %

Example 1: a proportional band of 5% may be expressed a gain of 20

Example 2: a proportional band of 20% may be expressed a gain of 5

Example 3: a proportional band of 2% may be expressed a gain of 50

If the gain is too small the controller will not provide close enough control.

If the gain is too high, the system will be unstable.

Proportional control operating by itself will produce a fairly stable actual temperature (when tuned correctly), but frequently the stable temperature band is above or below the set point. To maintain the actual temperature closer to the set point, controllers incorporate two other mechanisms that work in conjunction with the proportional control.

Time Constant/ Integral – (aka Reset) Corrects for any offset between the set point and the actual temperature automatically by appearing to shift the proportioning band (or using an artificially high set point). Used to make sure the controller is producing an actual temperature within a proportioning band that is centered around the desired set point. Integral output is active when the actual temperature is consistently below the set point. The amount of integral output increases as the difference between actual and set point temperatures continues over time.

Dead Time/ Derivative - (aka Rate) Produces a control output depending upon how fast the system temperature is coming up to heat or cooling down. Used to prevent over/under shoot. Derivative output is only active when the actual temperature is changing.

Tuning

The classic method of tuning temperature controls requires the technician to inhibit the integral and derivative actions by setting these gains to zero, then starting the process with a low proportional gain (try 5). The process is considered stable when the deviations above and below the set point are equal. It is easiest to start the tuning process when the barrel is at ambient temperature. A small starting set point of perhaps 150°F. will reduce the total time spent tuning by eliminating time wasted for cooling down.

To narrow the amount of deviation above and below the set point, increase the proportional gain slowly until the process becomes unstable, then reduce it. The process is unstable when the deviation above and below the set point appears to be random.

If the proportioning gain is too high, an oscillation around the set point will result. If the proportioning gain is too low, the control will respond in a sluggish manner, could take a long time to settle out at set point, or may not respond adequately to upsets.

When the proportional gain appears to be adequate, continue the tuning process by raising the set point 50°F. above its current actual temperature. When the temperature stabilizes, observe if the proportional band is centered around the set point. Next raise the set point another 50°F. and allow the system to stabilize again. When it does, observe if the proportional band is centered around the set point. What may be observed in this process is that the temperature variation attributed to the proportional band is below the desired set point by some margin. To adjust for this, adjust the integral gain in very small increments (0.01 steps) until the process is stable and centered around the set point. Typical integral gains would be in the range of 0.02 to 1.00 but may be higher or lower.

If the integral gain is too high a continuous oscillation will result. If the integral gain is too small the process will take too long to settle out at set point

When you have adjusted the proportional and integral gain, raise the set point 50°F. above the current actual temperature and observe the degree of overshoot or undershoot as it approaches the set point. If the actual temperature exceeds the set point by a considerable degree as it first approaches it, slowly increase the derivative gain in very small increments (0.01 steps) until the actual temperature does not exceed the set point at all, or within a few degrees. Typical derivative gains would be in the vicinity of 0.01 but may be higher or lower.

If the derivative gain is too high the process will heat up too slowly. If the derivative gain is too small the control will be slow to respond to upsets.

When the barrel heaters respond properly with no load (no plastic processing occurring) the unit is ready to begin molding operations again. Observe the performance and adjust as required.

During the tuning process the barrel temperature may exceed the normal operating range of temperature sensitive resins by a considerable degree. It is very important that the barrel be

purged clean of these materials before the tuning process begins. Do not tune the heats when pvc, acetals, etc. are in the barrel.

20.1 Injection Unit

20.1.1 Lubrication

The linear bearings should be wiped clean and greased monthly. The screw drive bearings should be lubricated quarterly. The front of the screw drive bearing housing has a small "weep hole" machined into the mating surfaces to prevent over pressurizing the screw drive bearing housing, which may cause leakage through the screw drive quill seal. We suggest you use a premium grade NLGI grade 2 grease meeting AS™ D 4950 service classification GC-LB for all machine lubrication.

20.1.2 Heater Bands

The screws that clamp the heater bands around the barrel should be checked monthly for the proper torque. The barrel should be at operating temperature when this operation is performed.

20.1.3 Thermocouples and Thermocouple Wells

The thermocouples should be inspected monthly for loose or frayed connections. When you remove the thermocouple, check that the well is clean, and that the thermocouple junction contacts the bottom of the well.

20.1.4 Feed Throat Cooling

The feed throat cooling jacket water passages should be inspected for blockages monthly. With the water lines disconnected, blow compressed air through the passage to clear any blockages.

20.1.5 Fastener Torque

All fasteners on the injection unit should be inspected semi-annually for proper torque.

Bolt Size	Torque, Ft. Lbs.
M8 x 1.25	24
3/8-16	32
7/16-14	53
M16 x 2.0	200

20.1.6 Barrel and Screw Assembly

The condition of the barrel, screw, and screw tip assembly should be inspected regularly. The plastic you are processing will dictate the specific schedule used.

Abrasive or corrosive plastic materials can have a significant negative impact on the life of these components.

20.2 Operator Interface Terminal

The operator interface terminal will not require regular maintenance except for occasionally wiping it clean.

1. Disconnect power from the terminal.
2. Use a clean sponge or a soft cloth to clean the display with a mild soap or detergent.
3. Dry the display with a chamois or moist cellulose sponge to avoid water spots.
4. To remove oil or grease, rub lightly using isopropyl alcohol (70% max concentration).

Use of abrasive cleaners or solvents may damage the window. Do not scrub or use brushes.

Control Processor

The controller PLC used in the Altanium Multishot™ unit contains a capacitor to maintain the program in RAM, there is no battery to replace.

21 Troubleshooting

21.1 Overview

Troubleshooting the Altanium Multishot™ unit is similar to troubleshooting any other machine, in other words there are always symptoms and causes. The fastest way to find and repair the root cause of any failure is to have a thorough understanding of how the machine acts when it is functioning properly. This will allow you to rapidly identify the problem area or system, and then find the exact cause.

Your machine operators are also an excellent source of information. During the course of their day, they can detect when a machine is not functioning properly by the sounds it makes and by subtle changes in the cycle. The first step in troubleshooting is to ask the operator if he or she has any information about the problem.

The next step during the troubleshooting process is to identify whether the problem is mechanical, hydraulic, or electrical in nature. There will be occasions where it may be difficult to ascertain the root cause, but in general, the symptom will be most apparent in one of these systems.

The two most difficult problems to correct are when there is more than one failure, or when the failure occurs intermittently. In each case, a technician may spend hours looking for clues with poor results. There is no substitute for an experienced technician when it comes to these two problems. This manual cannot provide answers to every problem that may arise in the usage of the Altanium Multishot™ unit. A brief overview of general principles and concepts used in troubleshooting all machines is provided. When possible, specific examples that apply to the Altanium Multishot™ unit will be given.

The electrical and hydraulic drawings in the appendix are an excellent source of information. We suggest familiarizing yourself with these documents before you need them to repair something.

21.2 Mechanical

In general, mechanical failures are the easiest to find, and therefore, the fastest to repair. Having an adequate stock of items such as thermocouples, nozzle heater bands, hoses, etc. is relatively inexpensive and can save a great deal of time. The frame of the Altanium Multishot™ unit is quite robust and should not provide many opportunities for repair. You should keep a modest supply of items such as cylinder repair kits, potentiometers, etc. on hand as spares. These parts have a peculiar habit of wearing out when you cannot schedule any downtime.

21.2.1 Hydraulic Core, Hyd Valve Gate and Hyd Nozzle Valve

The hydraulic core 1, hydraulic core 2, Hyd valve gate and Hyd nozzle functions are controlled by conventional 24VDC spring-centered or offset solenoid operated directional valves. These valves allow flow from P to A or P to B, depending on which coil is energized. All valves are equipped with manual bypass actuation for test purposes, and all have removable coils. The presence or absence of a control signal can be verified directly at the coil wires by removing the wiring compartment chamber cover. Never remove a coil from a solenoid valve while it is being supplied with voltage, and never apply voltage to a coil while it is not mounted on a valve. Doing so will significantly increase the coil's current draw and may have a negative impact on the coil or electrical system. Where a circuit is equipped with a pressure reducing valve a gauge port has been installed to allow you to measure the reduced

pressure. In cases when a mold has a valve gate mechanism operated by a hydraulic cylinder, the cylinder may have a maximum working pressure rating of 500 PSI. If this operation is to be performed by the core 1 or core 2 circuits of the ALTANIUM MULTISHOT™ unit, the operating pressure will need to be verified and/or adjusted at this reducing valve.

21.3 Electrical

The Altanium Multishot™ unit is controlled by a programmable controller system composed of a power supply, a memory backup capacitor, a CPU and various input and output devices.

21.3.1 CPU

The CPU contains the actual program that operates the machine including any process set points you enter. The program flows from one step to the next by monitoring various conditions, including timers, counters, external devices, set points, etc. As an example, if the screw is rotating during the Plastication phase of the injection cycle, the system will monitor the position of the reciprocating screw. When the screw has traveled backwards sufficiently, so that the shot size position is reached, rotation ceases. When the program detects an abnormal condition, you will be alerted to this by an alarm message on the operator interface.

21.3.2 I/O Devices

The input and output devices are designed for industrial applications and buffered (where required) against externally caused damage. The input devices receive signals from the machine and communicate the status of each address to the PLC via the data bus contained in the backplane, or over remote I/O. At the appropriate time in the program, the CPU sends commands to the output devices via the same data bus. The output devices translate this signal, then switch the correct output address on or off.

All of the I/O modules have positive and/or negative VDC supplied to them at all times. If an I/O module does not appear to be functioning properly, always check for voltage on the VDC and DCCOM terminals first.

21.3.3 Analog I/O

The analog I/O devices receive analog signals and translate this into a binary number of up to 16-bit resolution before sending it to the CPU. The analog value of this number can be read on the operator interface as a position, pressure, or temperature. The input devices can be tested by measuring the voltage at the terminal block of the device. If you read a variable voltage on the terminal, but a value does not appear on the operator interface in the corresponding location, substitute a known good module for comparison.

Before installation of a substitute module, verify that the signal being received at the module is the correct range and type. The inputs in slots one and two are capable of receiving 0-10 VDC.

The analog outputs are variable voltages in the range of ± 0-10 VDC. If the output is supposed to be present and is not, substitute a known good module for comparison.

The millivolt input devices receive signals generated by type "J" thermocouples. Substitution of a known good type "J" thermocouple will allow you to test the functioning of the input section of these devices. If you connect a known good thermocouple, and the expected temperature is not displayed on the operator interface, substitute a known good I/O module and verify the results.

Before installation of a substitute module, verify that the signal being received at the module is the correct range and type.

22 Preventative Maintenance Schedule

Weekly

- Grease linear bearings under the screw motor block. Refer to the Husky Technologies™ Grease Location print in the mechanical drawings of your Machine Manual.
- Grease linear bearings under the barrel block if you are using sprue break in Auto mode, if sprue break is not used semi-annually would be fine. Refer to the Husky Technologies™ Grease Location print in the mechanical drawings of your Machine Manual.
- Overall cleanliness of machine and listen for any abnormal noises.
- If your machine is equipped with an auto-lube system inspect to make sure that there are no leaks in the grease system (lines, fittings manifold block).

Monthly

- Check the feed throat water cooling circuit to make sure there is no blockage and that the control valve is working properly.
- If your machine is equipped with an auto-lube system inspect to make sure that there are no leaks in the grease system (lines, fittings manifold block).
- Inspect the condition of the Servo Cables for any damage, pinching, sharp bends or rubbing. If you do find that a cable needs to be replaced be sure to first turn off the power and lock out the machine to your specific lock out procedure prior to disconnecting any Servo Cable.

Semi-Annually

- Grease Screw Bearings. Refer to the Husky Technologies™ Grease Location print in the mechanical drawings of your Machine Manual.
- Grease linear bearings under the barrel block. Refer to the Husky Technologies™ Grease Location print in the mechanical drawings of your Machine Manual.

Semi-Annually (continued)

- If your machine is equipped with an auto-lube system inspect to make sure that there are no leaks in the grease system (lines, fittings manifold block).
- Clean or replace filters on the cooling fans in the electrical cabinet.
- Check to make sure all electrical connections in the cabinet are tight. Look cabinet over for any type of overheating and general cleanliness of the cabinet.
- If your barrel has post terminals on the barrel heater bands check to make sure the ceramic covers are intact and that the wire connections are tight.
- Check condition of thermo couples and thermo couple wiring. Replace any that appear to have any damage. Also check the wires at the connections for any fraying wires at this can cause bad feedback to the controls for the barrel temperatures.
- Check all fasteners on the injection unit for proper torque and that there are no broken fasteners. Please refer to the torque spec reference sheet.

23 Warranty

Limited Warranty: Seller warrants that the Goods shall be free from defects in material and workmanship for a period of twelve (12) months from the date of start-up or eighteen (18) months from the date the Goods are delivered to Buyer, whichever occurs first. This warranty is contingent upon the following: that Seller promptly receives written notice of any defect; that Buyer establishes that the Goods have been properly installed, maintained and operated within the limits of related and normal usage as specified by Seller; and that upon Seller's request, Buyer will return to Seller at Buyer's expense any defective Goods or parts thereof. If Buyer, after delivery, shall modify, alter, substitute or change any of the Goods acquired from Seller, then Seller's warranty with respect thereto shall be null and void and of no force and effect whatsoever. This Warranty of Seller does not extend to: (i) damage caused by corrosion; (ii) damage to parts subject to wear, including but not limited to, defects in motors, controls, timers or valves; (iii) damage caused by Buyer's improper selection of materials of construction; (iv) damage caused by Buyer's failure to provide a suitable installation environment for the Goods; (v) damage caused by the use of the Goods for purpose other than those for which they were designed; (vi) damage caused by disasters such as fire, flood, wind and lightening; (vii) damage during shipment; and (viii) parts or components not manufactured by Husky Technologies™ Mfg. Group, Inc. (but any manufacturer's warranties of such accessory equipment will be passed through Seller to Buyer). The conditions of actual production in each end user's plant vary considerably. Therefore, description of the production or performance capabilities of the Goods are estimates only and are not warranted.

Warranty Disclaimer: THE WARRANTIES SET FORTH IN THESE *CONDITIONS OF SALE ARE* IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

Exclusive Remedy: Buyer agrees that Buyer's sole and exclusive remedy against Seller with respect to any claim of any kind relating to the Goods shall be limited to the repair and / or replacement of nonconforming or defective Goods, F.O.B. Seller's plant. This Exclusive Remedy shall not be deemed to have failed of its essential purpose provided Seller is willing and able to repair and / or replace the nonconforming or defective Goods.

24 Document Information and Feedback

This owner's manual has been produced to allow you to successfully operate and maintain your Altanium Multishot™ Electric Series portable injection unit. We would appreciate your feedback on what we can do to make it better. Please contact us at:

https://www.husky.co/en/contact/