

Altanium Matrix

User Guide



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Original Instructions

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Chapter 1 Introduction

This user guide is designed to maximize the output from the benefits and features of the Altanium Hot Runner Control Systems.

This chapter describes safety precautions, equipment configurations and environmental considerations related to the Altanium X-Series product line.



IMPORTANT!

Some manuals may contain addendums that detail new or updated information. Before reading a manual, make sure to review all available addendums located at the end of the manual.

1.1 General Safety

This user guide includes general warnings and cautions to avoid injury to personnel and damage to the system. These warnings and cautions are not intended to be, nor are they all-inclusive to every condition or application that may occur during operation.

Maintenance and safety procedures remain the sole responsibility of the individual and his or her company.

- Only a licensed electrician should install the system.
- Only persons with a thorough knowledge of the system's operation and capabilities should operate the system.
- Read all of these instructions before connecting power and turning on the system.
- Follow all warnings and instructions marked on the system.
- Only use the specified input supply voltage that is indicated on the identification label attached to the power input cable and/or the cabinet

NOTE: To confirm the appropriate supply voltage, call your nearest Husky Regional Service and Sales office.



DANGER!

Hazardous voltage – risk of electrical shock or burns. Do not connect thermocouples to any live areas of the heaters. Lock out and tag the controller and mold and make sure there is electrical insulation between the thermocouple and any live areas. Failure to do so could result in death or serious injury.

CAUTION!

Mechanical hazard – risk of damage to the equipment. NEVER allow the fan inlets or outlets on the unit to become blocked. Insufficient cooling airflow through the fan inlets and outlets could damage the system.



IMPORTANT!

When switching OFF the system wait 30 seconds before switching the main disconnect back ON. If you do not wait the required 30 seconds communication issues may occur.

1.2 Altanium X-Series Configurations

The Altanium X-Series consists of different mainframe models which change based on the number of zones required. These are referred to as Single Stack, Double Stack, Triple Stack, Quad Stack and Custom Mainframes.

Within each mainframe category there are style variations that determine how they are installed. These styles are referred to as Freestanding, External Machine Mount and Mold Mount.

Only two variations exist for the X-Series ICC² (Intelligent Control Cards). They are the XL and X. All X-Series cards have a consistent design and control temperature with an high level of accuracy. The differences between these three cards and some typical mainframe configurations are described below.

1.2.1 Altanium XL ICC² (Intelligent Control Card)

The XL ICC² card is the economical X-Series card. The XL ICC² card does not include advanced features available on the X card such as current monitoring and bake out or ground fault functionality.

The XL ICC² card is distinguishable by a black heat sink.



1.2.2 Altanium X ICC2 (Intelligent Control Card)

The X ICC² card is the mid-range X-Series card. The X card maintains the same features as the XL card while adding the ability to monitor current, and check for bake out or ground fault situations.

The X ICC² card is distinguished by a silver heat sink.



Figure 1-2 Typical X ICC² (Intelligent Control Card)

1.2.3 Altanium X-Series f-12 Mainframe

The Altanium X-Series f-12 mainframe is typically used when the user needs to relocate the system on the factory floor and zone heating requirements total 12 zones or less. Generally, the Altanium X-Series f-12 mainframe is mounted on four rubber feet. This system is small enough to be placed on a table beside the injection molding machine or on the molding machine itself. As an option, the Altanium X-Series f-12 mainframe can also be mounted on a stand with wheels.

The Altanium X-Series f-12 mainframe power and thermocouple connectors are located at the rear of the cabinet. The main disconnect is located on the front.



Figure 1-3 Typical Altanium X-Series f-12

**WARNING!**

Complete the Lockout/Tag out of all energy sources in accordance with applicable local codes before performing maintenance activities. Failure to do so could result in serious injury or death.

CAUTION!

Static electricity hazard – risk of damage to equipment. Electronic devices could be severely damaged by static electricity. Before accessing or handling any electronic device, make sure you are properly grounded and all static electricity has been discharged by either wearing an anti-static strap or touching a large grounded metal surface for several seconds.

To access all user-serviceable parts, including fuses and circuit boards:

1. Loosen the upper and lower slotted screws on each heat sink assembly.
2. Slide a screwdriver between the horizontal silver post and the ledge on the cabinet.
3. Pry the circuit board out of position.

1.2.4 Altanium X-Series f Mainframe - Freestanding

The Altanium X-Series *f* mainframe (freestanding) is typically used when the user needs to relocate the system on the factory floor. The Altanium X-Series *f* mainframe is mounted on a stand with wheels. There are three models depending on the number of zones that require heating. They are as follows:

- Single Stack for up to 48 zones
- Double Stack for up to 96 zones
- Triple Stack for up to 180 zones

Custom configurations for zone requirements over 180 or for mounting the control hardware directly inside the injection molding machine are also available.

The Altanium X-Series *f* mainframe power and thermocouple connectors are located at the rear of the cabinet. The main disconnect is located on the front.



Figure 1-4 Typical Altanium X-Series f-96



WARNING!

Complete the Lockout/Tag out of all energy sources in accordance with applicable local codes before performing maintenance activities. Failure to do so could result in serious injury or death.

CAUTION!

Static electricity hazard – risk of damage to equipment. Electronic devices could be severely damaged by static electricity. Before accessing or handling any electronic device, make sure you are properly grounded and all static electricity has been discharged by either wearing an anti-static strap or touching a large grounded metal surface for several seconds.

To access all user-serviceable parts, including fuses and circuit boards:

1. Loosen the upper and lower slotted screws on each heat sink assembly.
2. Slide a screwdriver between the horizontal silver post and the ledge on the cabinet.
3. Pry the circuit board out of position.

1.2.5 Altanium X-Series m Mainframe - Mold Mount

The Altanium X-Series *m* mainframe (mold mount) is typically used when floor space is limited. This design uses the least amount of floor space as it can be mounted to the top of the mold. There are four models depending on the number of zones that require heating. The models are as follows:

- The Compact for up to 12 zones
- The Single Stack for up to 24 zones
- The Double Stack for up to 60 zones
- The Triple Stack for up to 144 zones

Custom configurations for zone requirements over 144 or for mounting the control hardware directly inside the Injection Molding Machine are available.

This Altanium X-Series *m* mainframe requires no additional power or thermocouple cables. A main disconnect is not provided with the system. The power input cable must be attached to a disconnect that can be easily accessed by the operator.



Figure 1-5 Typical Altanium XE-Series m-12



WARNING!

Complete the Lockout/Tag out of all energy sources in accordance with applicable local codes before performing maintenance activities. Failure to do so could result in serious injury or death.

CAUTION!

Static electricity hazard – risk of damage to equipment. Electronic devices could be severely damaged by static electricity. Before accessing or handling any electronic device, make sure you are properly grounded and all static electricity has been discharged by either wearing an anti-static strap or touching a large grounded metal surface for several seconds.

To access all user-serviceable parts, including fuses and circuit boards:

1. Loosen the upper and lower slotted screws on each heat sink assembly.
2. Slide a screwdriver between the horizontal silver post and the ledge on the cabinet.
3. Pry the circuit board out of position.

1.2.6 Altanium X-Series e Mainframe - External Machine Mount

The Altanium X-Series e mainframe (external machine mount) is used when floor space is limited. This system can be hung on the molding machine or elsewhere. The Altanium X-Series e mainframe is equipped with a hanging bracket on the back of the cabinet. There are three models depending on the number of zones that require heating. These models are as follows:

- The Single Stack for up to 48 zones
- The Double Stack for up to 96 zones
- The Triple Stack for up to 144 zones

Custom configurations for zone requirements over 144 or for mounting the control hardware directly inside the Injection Molding Machine are available.

The power and thermocouple connectors are located on the top for short and simple runs to the mold. The main disconnect is located on the front of the system.



WARNING!

Complete the Lockout/Tag out of all energy sources in accordance with applicable local codes before performing maintenance activities. Failure to do so could result in serious injury or death.

CAUTION!

Static electricity hazard – risk of damage to equipment. Electronic devices could be severely damaged by static electricity. Before accessing or handling any electronic device, make sure you are properly grounded and all static electricity has been discharged by either wearing an anti-static strap or touching a large grounded metal surface for several seconds.

To access all user-serviceable parts, including fuses and circuit boards:

1. Loosen the upper and lower slotted screws on each heat sink assembly.
2. Slide a screwdriver between the horizontal silver post and the ledge on the cabinet.
3. Pry the circuit board out of position.

1.3 Input Wiring (Conventional)

The following table summarizes the wiring conventions used.

Description	Wire Color	
Neutral	Blue	
Earth/Ground	Green	Green/Yellow
Line	Black	Black
Line	Brown	Red
Line	Gray	White

**DANGER!**

Electrocution and/or mechanical hazard - risk of death or serious injury and possible damage to the equipment.

Incorrectly wiring the controller could cause death or serious injury and/or damage to the controller or hot runner. Only qualified personnel should connect the electrical power supply. All work must conform to applicable local electrical codes.

1.4 Environmental Specification

Operating Temperature: 0 °C-40 °C (32 °F-104 °F)

Operating Humidity: 0%-95% RH, Non-Condensing

Chapter 2 Hot Runner Temperature Control

This chapter describes the methods by which the Altanium controllers monitor and manage the temperature of the hot runner to maximize the operation of a hot runner mold.

2.1 Types of Temperature Control

The Altanium controller uses two basic types of control:

- Open loop control with no thermocouple feedback.
- Closed loop control with thermocouple feedback. Closed loop can be sub-categorized as follows:
 - Internal Thermocouple - Located inside and as part of the heater assembly.
 - External Thermocouple - Located close to but not actually part of a single heater assembly, and may even be allocated to a group of heaters to form a zone.

2.1.1 Open Loop Control

Without a thermocouple, it is not possible to control the temperature inside the mold, only the amount of power that is supplied to the heater. The Altanium controller is able to maintain this power output accurately with a resolution of 1%. This method of control is called Manual Regulation.

Open loop control is normally associated with tip heaters where the physical size of the tip precludes the use of an internal thermocouple.

2.1.2 Closed Loop Control

With the aid of a thermocouple, it is possible to control the actual temperature inside the mold. The Altanium controller can only control the temperature at the point at which the temperature sensor is positioned. The position of the thermocouple, combined with the capacity (wattage) of the heaters, in relation to the application, will be the over-riding factors

in the response of the system. The control parameters have been matched to this response for optimum control. This method of control is referred to as Automatic Regulation.

- Internal thermocouples are normally associated with larger part weight tips, bodies, and runners. These tend to have relatively fast responses due to the fact that the thermocouple is in close proximity to the heater.
- External thermocouples are normally associated with manifolds. These tend to have relatively slow responses due to the fact that the thermocouple is separated from the heater by a mass of metal.

2.1.2.1 Temperature Measurement (thermocouples)

To control the temperature within a closed loop system, the Altanium controller must be able to measure the process temperature. This is achieved using a thermocouple.

There are various types of thermocouples, but in the plastics industry they are predominantly of the Iron/Constantan type, generally known as Fe/Cu-Ni, Iron/Con or type "J" thermocouple. The other types used to a lesser extent are Nickel-Chromium/Nickel-Aluminum, Ni-Cr/Ni-Al, or type "K" and Constantan/Copper-Nickel, Cu/Cu-Ni, or type "T".

These thermocouple types are physically recognizable by a combination of their individual core and sheath colors; however, these vary from standard to standard.

2.2 Power Control Methods

In an effort to match the energy input requirements of differing types of loads, it is necessary for the output power delivered to the heaters to be adjusted over a range of 0 to 100%. The Altanium controller can be set up to achieve this by using either Zero Cross Control or Phase Angle Control.

2.2.1 Zero Cross Control

This method defines how the power to each heater is averaged over a period of time. This is achieved by switching complete half cycles of the heater supply voltage using an Alternistor Triac as a switching device.

2.2.2 Phase angle control

This method defines how the power to each heater is adjusted, by varying the point in each half cycle at which the Alternistor Triac (switching device) is turned on.

In either control method, the Altanium controller recalculates the power output requirements for the entire system every eight milliseconds to obtain the maximum control resolution. By combining either of the above control methods with the Active Reasoning Technology (ART) control algorithm, it is possible to achieve accurate temperature control with the expectation of control accuracy of ± 1 digit under steady state conditions.

2.3 Heating Elements

Hot runner molds can have a number of different types of heating elements:

- Integral, which is a part of the probe.
- Cartridge or bent tubular style, which is slid into the probe or directly into the mold steel.

In the manifold, a series of cartridge heaters or bent tubular style heaters are normally used.

The Altanium controller provides wattage, resistance or amperage information for the heaters if not already provided by the heating element supplier. Alternatively, OHMS Law can be used to determine the necessary information.

2.4 Thermocouple Types and Color Codes

Code	Type	International Color Code (BS4937 Part 30:1993)	BRITISH (BS1843:1952)	AMERICAN ANSI	GERMAN DIN
J	Iron/ Constantan/ (Copper-Nickel)	Overall Black	Overall Black	Overall Black	Overall Blue
		+ ve - ve Black White	+ ve - ve Yellow Blue	+ ve - ve White Red	+ ve - ve Red Blue
K	Nickel- Chromium/ Nickel-Aluminum	Overall Green	Overall Red	Overall Yellow	Overall Green
		+ ve - ve Green White	+ ve - ve Brown Blue	+ ve - ve Yellow Red	+ ve - ve Red Green
T	Copper/ Constantan/ (Copper-Nickel)	Overall Brown	Overall Blue	Overall Blue	Overall Brown
		+ ve - ve Brown White	+ ve - ve White Blue	+ ve - ve Blue Red	+ ve - ve Red Brown

Chapter 3 Connecting the System to the Mold

This chapter outlines various checks to be performed prior to starting up the system.

3.1 Prior to Start Up

- Check that the system is completely disconnected from the power source.
- Clean up any water, oil, dirt, cleaning fluids etc. that may have spilled during a mold change or since the last production run.
- Check all of the cable connections between the system and the mold (if required). Make sure all of the cables are free from wear or damage.
- Check that the earth/ground connection is in good condition. Verify the system and the mold have the same ground reference.

3.2 Verifying the Connection

1. Connect the thermocouple and power output cables (if required).
2. Using an Ohmmeter, touch one test lead to the mold and the other to the mold ground terminal on the system. Resistance must be less than 1 Ω .
3. Before connecting the controller to the power source, make sure the main input power disconnect is in the OFF position.

3.3 Start Up Procedure Checklist

Item	Step	✓
1	Connect power/thermocouple cables between the mold and controller (if required).	
2	Connect the I/O box and option cables (if required).	
3	Connect the printer cable to the printer and controller (if required).	
4	Connect the controller to the power source.	
5	Switch the controller ON.	
6	Log in to the system.	
7	Select the required mold setup.	
8	Verify the mold setup is the correct one by checking the status bar.	
9	Run Mold Test diagnostics.	
10	Correct any faults found during diagnostics.	
11	Touch START to run the system.	
12	Check that the controller is functioning correctly by monitoring the Graph/Text screen.	

NOTE: There are no Controller to Mold Interconnection details included in this User Guide. Please see the Mechanical / Electrical Engineering Documents provided with the controller.

CAUTION!

Mechanical hazard – risk of equipment damage. When switching OFF the system, wait 30 seconds before switching the main disconnect back ON. If you do not wait the required 30 seconds, communication issues may occur.

Chapter 4 Matrix Operator Interface

This chapter provides a brief overview of the functionality of the Matrix system and outlines information about the following:

- Matrix operator interface
- Matrix buttons
- Matrix status
- Language selection

4.1 Operator Interface

The Matrix Operator Interface is a high-resolution color LCD display covered by a transparent touch screen.

To change settings using the Matrix operator interface, simply touch the screen. This display is referred to as the Matrix for the remainder of this user guide.

CAUTION!

Mechanical hazard – risk of damage to the equipment. DO NOT use a screwdriver, pen, or any other tool to operate the keys as this could damage the keypad.

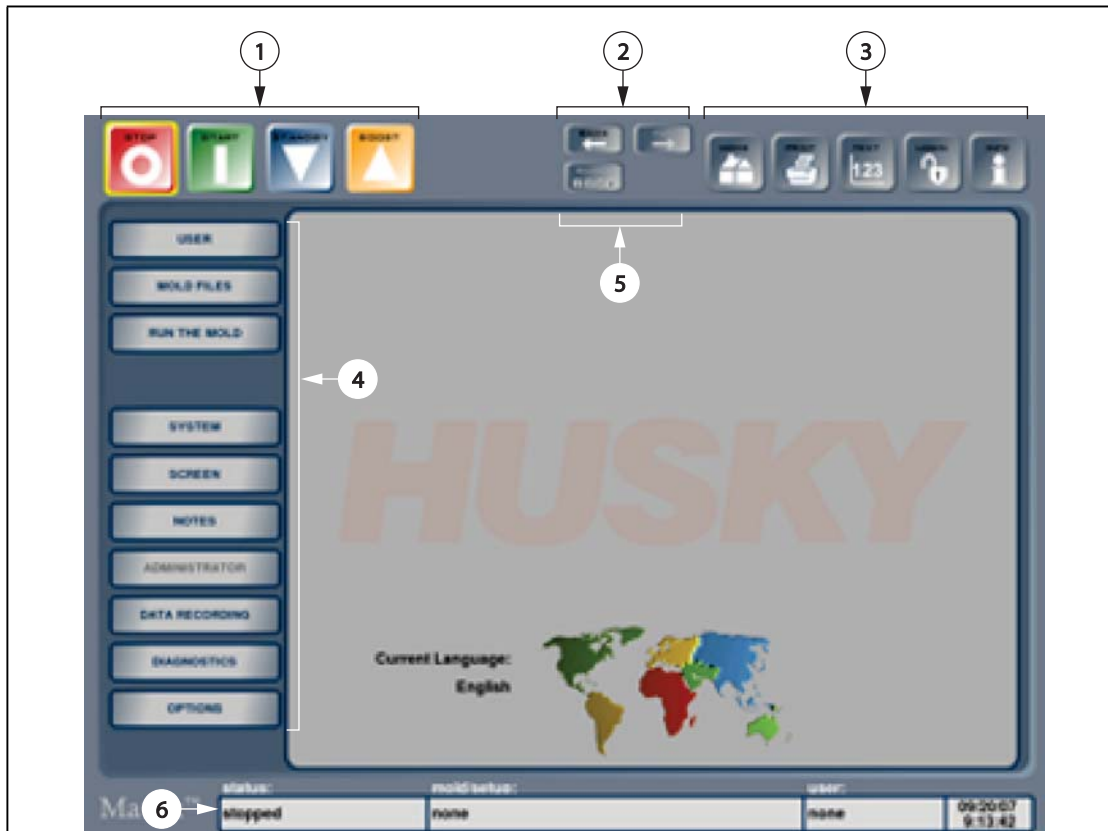


Figure 4-1 Matrix Home Screen

- 1. Controller Function buttons
- 2. Navigation buttons
- 3. Display buttons
- 4. Menu buttons
- 5. Zone buttons
- 6. Status bar

4.1.1 Matrix Buttons

Matrix has a series of buttons and a status bar that are visible on every screen throughout the system.

Table 4-1 Controller Function Buttons



Button	Description
	Touch the STOP button to switch off the power to all zones, regardless of system condition. The button has a yellow ring around it when the system is Stopped. The button is not available during ART.
	Touch the START button to switch on the power to the zones that have a setpoint displayed. The button has a yellow ring around it when the system is Running or in soft start. The button is not available during ART.

Table 4-1 Controller Function Buttons (Continued)



Button	Description
	Touch the STANDBY button to place the system in standby until either the standby timer runs out or the button is selected again. If a timer is active, the time remaining is displayed in the status bar. This button is not available during ART.
	Touch the BOOST button to place the system in boost until either the boost timer runs out or the button is selected again. If a timer is active, the time remaining is displayed in the status bar. This button is not available during ART.

Table 4-2 Navigation Buttons



Button	Description
	Touch the BACK button to display the previous screen (maximum 10 screens).
	Touch the FWD button to display the next screen (maximum 10 screens).

Table 4-3 Display Buttons








Button	Description
	Touch the HOME button to display the Home screen.
	Touch the PRINT button to display a dialog containing the available print choices.
	Touch the GRAPH button to display the Graph screen which contains a graphical representation of the zone data. This button toggles between the Graph, Text, and if configured, the Panes and Cavity Layout screens.
	Touch the TEXT button to display the Text screen which contains a textual representation of the zone data. This button toggles between the Graph, Text, and if configured, the Panes and Cavity Layout screens.
	Touch the PANES button to display the Multi-pane screen which contains zones grouped into panes allowing individual control of groups of zones. This button toggles between the Graph, Text, and if configured, the Panes and Cavity Layout screens.
	Touch the VISUAL button to display the Cavity Layout screen which provides a visualization of the physical layout of the mold. This button toggles between the Graph, Text, and if configured, the Panes and Cavity Layout screens.
	Touch the LOGIN button to display the User Login screen. This button toggles between LOGIN and LOGOUT

Table 4-3 Display Buttons (Continued)


















Button	Description
	Touch the LOGOUT button to display the User Login screen. This button toggles between LOGOUT and LOGIN.
	Touch the INFO button to launch the PDF viewer and display the On-Screen User Guide.

Table 4-4 Menu Buttons

Button	Description
	Touch the USER menu button to display a submenu containing User Login and User Files.
	Touch the MOLD FILES menu button to display the Mold Files screen.
	Touch the RUN THE MOLD menu button to display the Text, Graph or Panes screen, depending on which screen was opened previously.
	Touch the SYSTEM menu button to display a submenu containing: Version Info, System Files, System Setup, Advanced Setup, Calibration, Zone/Slot Config and CAN Information. Some of these submenus are available only to users with Administrator privileges.
	Touch the SCREEN menu button to display a submenu containing: Screen Layout and Screen Options.
	Touch the NOTES menu button to display a submenu containing View Mold Notes and Create Notes.
	Touch ADMINISTRATOR menu button to display the User Profiles screen. This menu is only available to users with Administrator privileges.
	Touch the DATA RECORDING menu button to display a submenu containing Process History, Error Log and Change Log.
	Touch the DIAGNOSTICS menu button to display a submenu containing Mold Test and Troubleshoot.
	Touch the OPTIONS menu button to display a submenu containing additional software options, such as Remote Load, I/O Box Setup and SPI Communications.

When a mold has been loaded and has been configured in the Zone/Slot Configuration screen, four additional buttons are displayed in the top center of the screen: NOZZLES, SPRUE, MANFLDS and ALL. The BLOCK button is also available when a mold has been loaded.

Table 4-5 Zone Buttons

Button	Description
	Use the BLOCK button to select multiple zones. Touch BLOCK, then the first zone of the group, then the last zone of the group of zones you want to select. All the zones in between will be automatically selected.
	Touch the NOZZLES button to select the zones categorized as Nozzles and display them in the Quick Set screen. This button is only displayed when a Mold Setup is loaded and if it has been setup in the Zone/Slot Configuration screen.
	Touch the SPRUE button to select the zones categorized as Sprues and display them in the Quick Set screen. This button is only displayed when a Mold Setup is loaded and if it has been setup in the Zone/Slot Configuration screen.
	Touch the MANFLDS button to select the zones categorized as Manifolds and display them in the Quick Set screen. This button is only displayed when a Mold Setup is loaded and if it has been setup in the Zone/Slot Configuration screen.
	Touch the ALL button to select all the zones and display them in the Quick Set screen. This button is only displayed when a Mold Setup is loaded and if it has been setup in the Zone/Slot Configuration screen.

4.1.1.1 Status Bar

The Matrix status bar is displayed on the bottom of each screen.

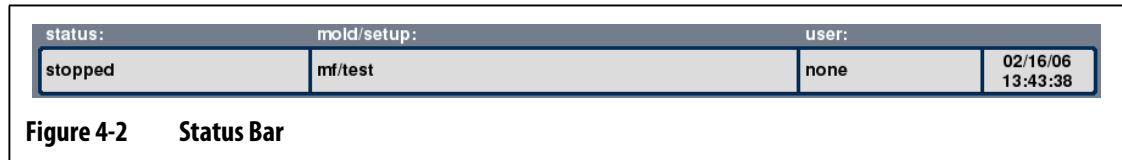


Figure 4-2 Status Bar

Table 4-6 Status Bar Items

Item	Description
status	This displays the current status of the system. Boost and Standby timers display the time remaining when in either Boost or Standby mode. Notes are displayed as a small yellow note icon. Unread notes blink, system notes appear in the status: section, mold notes appear in the mold/setup: section only when the mold setup is loaded. User notes appear in the user: section when the target user is logged in. Errors messages are displayed in red and blink. Select this area of the status bar to display the Zone Status screen, or, if there is an error, the Error Log screen. A small selection of system states is described in the table below
mold/setup	This displays the name of the current mold setup. The first word is the name of the mold folder and the last word is the name of the mold setup. For example: mold: 1276/vc7 . Touch this part of the status bar to display the Mold Files screen.
user	This displays the name of the logged in user. Touch this area to display the User Login screen.
date/time	This displays the current date and time. Touch this area to change the date and time (access rights are required).

Table 4-7 Status Descriptions

Status	Description
	The system is running the ART process.
	The BOOST button has been selected on the interface. The timer indicates the time remaining in Boost Mode.
	The system is running at processing temperature.
	The STANDBY button has been selected on the interface. The timer indicates the time remaining in Standby Mode.

4.1.2 Selecting a Language

Matrix can be presented in several languages. The default language is English.

To select a language:

1. Touch anywhere inside the map on the Home screen to display a list of the available languages.
2. Select the desired language.

4.1.3 Printing Information

Matrix is equipped with a Serial printer port (male 9D-Pin, RS-232) a parallel printer port (female 25D-pin, LPT), and a USB port installed as standard equipment. The system supports any PCL5 compatible parallel, serial or USB printer.

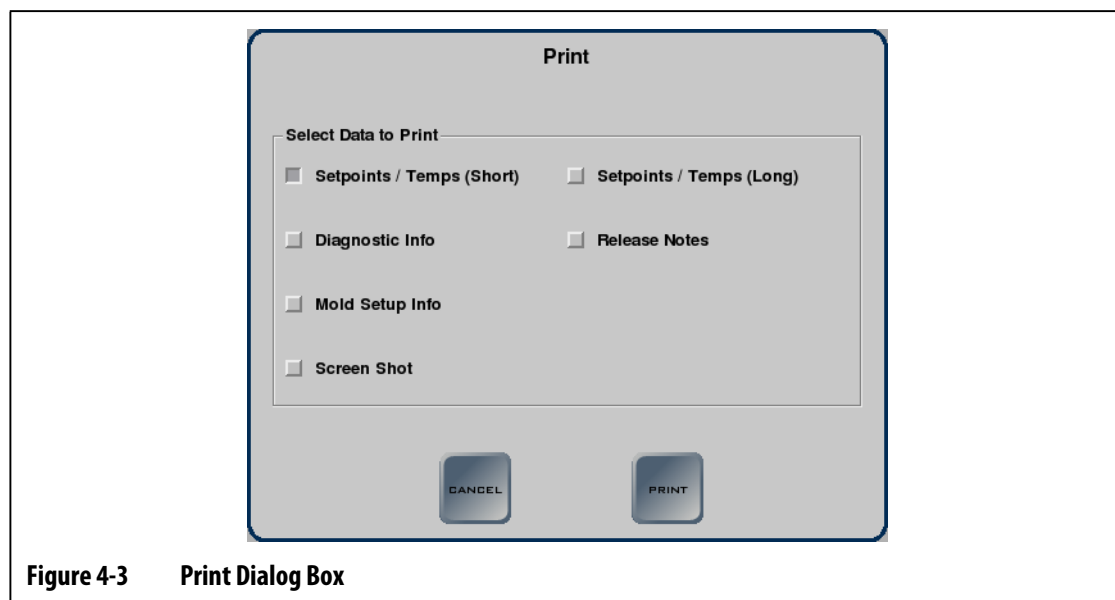


Figure 4-3 Print Dialog Box

Table 4-8 Print Dialog Box Item Descriptions

Item	Description
Setpoints / Temps (Short)	Summary of the current setpoints and temperatures of each zone.
Diagnostic Info	Details of test results.
Mold Setup Info	Mold Setup details.
Screen Shot	An image of the current screen.

Table 4-8 Print Dialog Box Item Descriptions (Continued)

Item	Description
Setpoints / Temps (Long)	Detailed list of the current status of each zone including: <ul style="list-style-type: none"> • Zone Number • Zone Name • Setpoint • Actual Temperature • Power Output • Amps • Alarm Limits • Abort Limits • Regulation • Watts • 220V Watts • Volts • Ohms
Release Notes	Matrix Release Notes.

To print:

1. Connect a serial, parallel or USB printer to the appropriate port.
2. Make sure the printer is turned on in the Print Setup screen.
3. Touch PRINT at the top of the interface to open the Print dialog.
4. Select the data to print, and then touch PRINT.

4.1.4 Multi-Pane Screen

Use the multi-pane screen layout to group zones to allow synchronized control of the grouped zones. Turn the zones in each pane ON or OFF, and put them into standby or boost mode by using the buttons in the header of each pane.



IMPORTANT!

The STOP, START, STANDBY, and BOOST buttons at the top left corner of the screen apply to all zones and will override the pane settings.

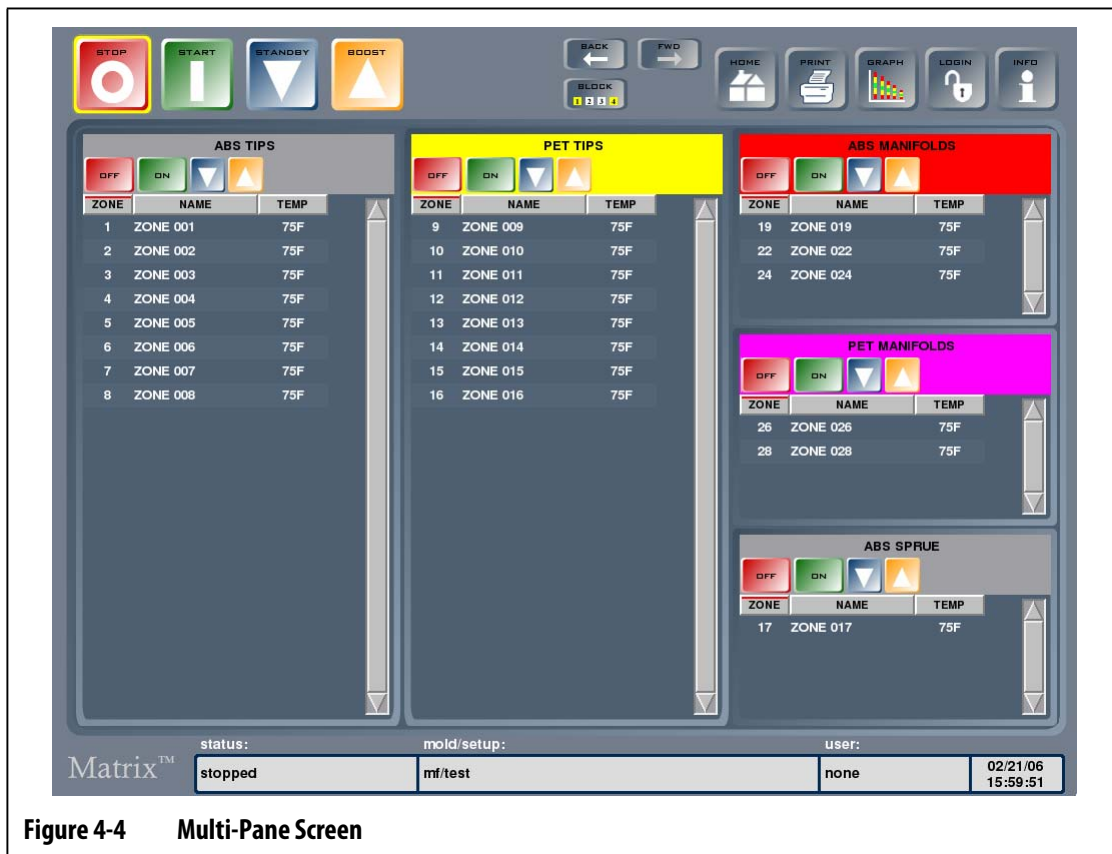






Figure 4-4 Multi-Pane Screen

Table 4-9 Multi-Pane Screen Buttons

Button	Description
	OFF turns the zones in that pane off if they are on.
	ON turns the zones in that pane on if they are off.
	Sets the zones in this pane to Manual Standby. Other panes cannot be set to standby until the current pane has returned from Manual Standby.
	Sets the zones in this pane to Manual Boost. Other panes cannot be set to standby until the current pane has returned from Manual Boost.

4.1.5 Using Online Help

To use the online Help:

1. Touch INFO on any screen in Matrix
A PDF viewer opens containing the Matrix User Guide
2. Navigate through the document using the keys at the bottom of the PDF viewer.
3. To exit the online Help and return to the previous screen, touch the Quit key in the lower right corner of the PDF viewer.

Chapter 5 Security and Administration

Once the initialization process is complete, the Home screen is displayed. This chapter describes functions that can only be performed by an administrator such as user management and database monitoring.

If security is enabled log in to operate the system. If security is not enabled, it is not necessary to log in to operate the system.

NOTE: All functions outlined in this chapter can **only** be performed by an administrator.

5.1 User Login

The User Login screen allows the user to log in or log out of the system. Only functions that have been authorized by an Administrator and saved to the user's profile can be performed. Touch LOGIN, LOGOUT or USER, and then touch the User Login menu to login. The User Login screen can also be accessed by touching inside the User area of the status bar.

Table 5-1 Login Screen Items

Item	Description
USER NAME	The drop-down box contains the available user names. Only the ADMIN username comes from the factory as a default entry. Touch the down arrow to display the list, and then select the appropriate user name
PASSWORD	To enter a password, touch inside the password box to display a keyboard. Enter the password, and then touch ENTER to close the keyboard.
LOG IN	Touch this button to authenticate the username and password. If successful, the User Login screen will close, the date of user's last login will be displayed on the Home screen, and the username will appear in the status bar. If unsuccessful, a red message will appear to notify you of an incorrect entry.
LOG OUT	Touch this button to log out the current user. If security is enabled, navigation through the system is still available but changes to the process cannot be made.

NOTE: The system will automatically log out the current user after five minutes of inactivity to prevent the possibility of system misuse. This timeout can be adjusted using the Auto Logout feature on the System Setup screen. Refer to [Section 12.2.3](#).

5.2 User Profiles

The User Profiles screen is used by the Administrator of the system to manage users and to control security settings for each user.

To access the Administrator functions:

1. Log in with Administrator privileges.
2. Then touch the ADMINISTRATOR key to open the User Profile screen.

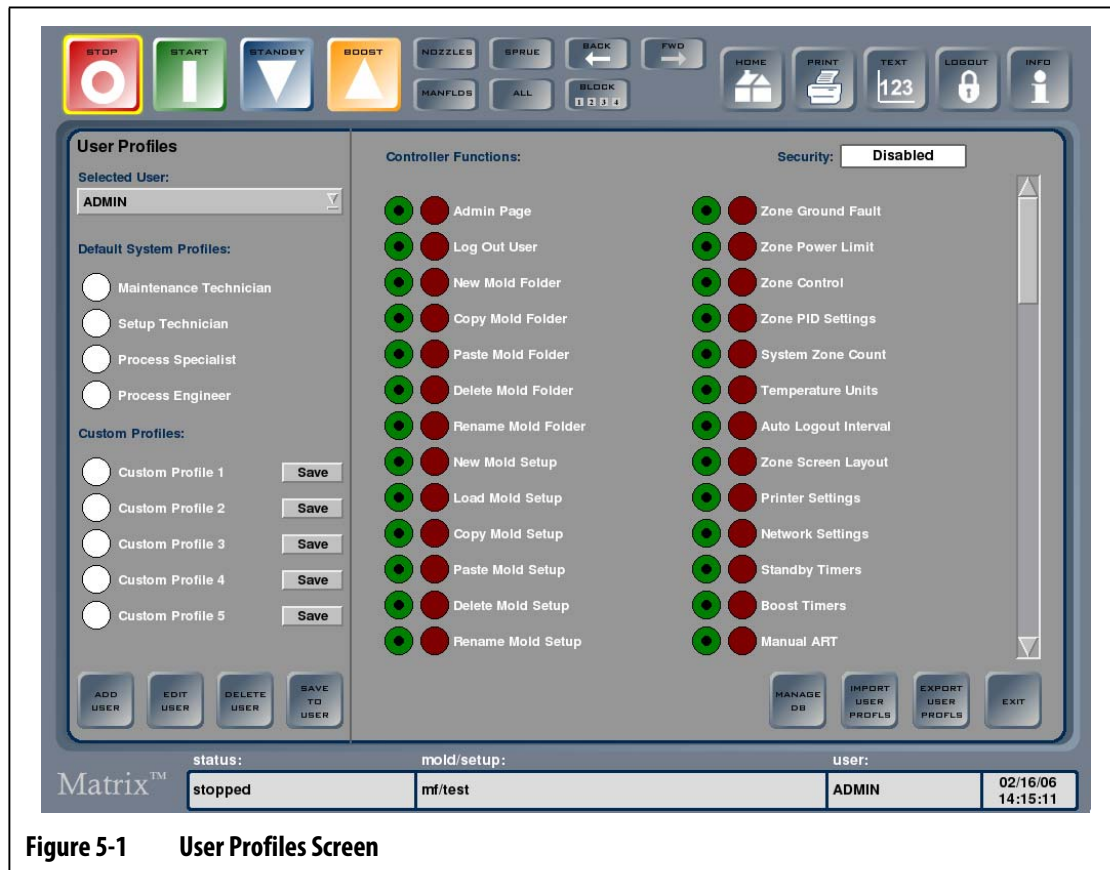


Figure 5-1 User Profiles Screen

Table 5-2 User Profiles Screen Items

Item	Description
Selected User	<p>Displays the current user.</p> <p>To select another user, touch the down arrow to show a drop-down list of all users. Use the scroll bar to view additional users. Select the name of the required user from the list.</p> <p>The security settings in the Controller Functions area change to reflect the settings for the selected user.</p>
Default System Profiles	The system comes with four default profiles to represent the common users of the system and the security settings they need.
Custom Profiles	The system allows for five custom profiles to be created.

Table 5-2 User Profiles Screen Items (Continued)

Item	Description
Controller Functions	This area contains the security settings for the controller functions of the system.
Language Selection	Selects the language for the current user. Supported languages are listed at the bottom of the Controller Functions. Scroll down to view this section.
Security	Touch this box to toggle the security setting. When Security is Disabled, any user will be able to perform any function in the system (except the Administrator functions)

Table 5-3 User Profiles Screen Buttons

Button	Description
ADD USER	Touch this button to add a user to the system.
EDIT USER	Touch this button to change a user's password.
DELETE USER	Touch this button to delete the current user.
SAVE TO USER	Touch this button to save the controller function and language settings to the current user profile.
MANAGE DB	Touch this button to view the current hard disk usage. This enables modification of low data storage available alarm setting and specify what data the system keeps if there is no storage space available. Also use this function to set when the system will record data in process history.
IMPORT USER PROFLS	Touch this button to import user profiles from a USB storage device. This feature is not available until a USB storage device has been connected to the system.
EXPORT USER PROFLS	Touch this button to export the existing user profiles to a USB storage device. This feature is not available unless a USB storage device has been connected to the system. The user profiles are saved to a file called security.dat.
EXIT	Touch this button to close the User Profiles screen and return to the Home screen.

5.2.1 Adding a New User

To add a new user perform the following:

1. Touch ADD USER.
2. Touch the USER NAME box.
3. Enter the new user's name on the displayed keyboard, and then touch ENTER to close the keyboard.

The name entered will be displayed in the USER NAME box.

4. Touch the PASSWORD box.
5. Enter the new user's password on the displayed keyboard, and then touch ENTER to close the keyboard.
The PASSWORD box contains asterisks, one asterisk representing each character in the password.
6. Touch the CONFIRM PASSWORD box.
7. Enter the same password, and then touch ENTER to close the keyboard.
The PASSWORD box contains asterisks, one asterisk representing each character in the password.
8. Touch SAVE to create the new user profile, or CANCEL to cancel the profile creation.
Both options return the Administrator to the User Profiles screen. If the new user profile is saved, the user name should now be available in the drop-down list.

5.2.2 Changing a Password

To change or reset a user password:

1. Select the required login name from the Selected User drop-down box.
2. Touch EDIT USER.
3. Touch inside the PASSWORD box to display a keyboard.
4. Enter the new password, and then touch ENTER to close the keyboard window.
5. Touch inside the CONFIRM PASSWORD box to display a keyboard.
6. Enter the same password, and then touch ENTER to close the keyboard window.
7. Touch SAVE to change the user's password.

5.2.3 Changing User Profiles

Change the Controller function settings of a user's profile to control which system functions the user can access.

To enable, disable or modify user access to a controller function:

1. Login as an Administrator.
2. Touch ADMINISTRATOR to open the User Profiles screen.
3. Select the required login name from the Selected User drop-down box.
4. Select the controller functions that to be changed. This toggles between allowing the user to access this function (green), and restricting the user from this function (red).
5. Touch SAVE TO USER.

5.2.4 Setting Default System Profiles

The system is programmed with four default profiles to represent common user access and security requirements. Controller functions for default system profiles cannot be changed. If the settings are modified they will be saved as a Custom Profile.

To set a default system profile for a user:

1. Login as an Administrator.
2. Touch ADMINISTRATOR to open the User Profiles screen.
3. Select the required login name from the Selected User drop-down box.
4. Select the default system profile to be assigned to the user.
5. Touch SAVE TO USER.

5.2.5 Creating Custom Profiles

The system allows for the creation of up to five custom profiles.

To create a custom profile:

1. Login as an Administrator.
2. Touch ADMINISTRATOR to open the User Profiles screen.
3. Select one of the five custom profile options.
4. Change the controller functions as required.
5. Touch SAVE. A keyboard will be displayed.
6. Enter a name for the custom profile, and then touch ENTER. The new profile name will appear in the Custom Profiles section.

5.2.6 Importing User Profiles

Import user profiles from a USB storage device to give users the same access rights as another Matrix machine.

NOTE: This function is not available unless a USB storage device is connected to the system.

To import user profiles:

1. Login as an Administrator.
2. Touch ADMINISTRATOR to open the User Profiles screen.
3. Touch IMPORT USER PROFLS. A file selection dialog is displayed.
4. Navigate to the required user profile file.
5. Select the file, and then touch OK to load the user profile file and return to the User Profiles screen.

5.2.7 Exporting User Profiles

Existing user profiles can be exported to a USB storage device. This allows users to be given the same access rights on another Matrix machine.

NOTE: This function is not available unless a USB storage device is connected to the system.

To export user profiles:

1. Login as an Administrator.
2. Touch ADMINISTRATOR to open the User Profiles screen.
3. Touch EXPORT USER PROFLS. A folder selection dialogue is displayed.
4. Navigate to the folder on the USB storage device where user profile file is to be stored.
5. Select the folder, and then touch OK to save the profiles to the USB storage device and return to the User Profiles screen. The file is saved as security.dat.

5.2.8 Selecting a Language

To change the system language for a user:

1. Login as an Administrator.
2. Touch ADMINISTRATOR to open the User Profiles screen.
3. Select the required login name from the Selected User drop-down box.
4. Scroll down to the Language section, and then select the language to be assigned to the selected user.
5. Touch SAVE TO USER.

NOTE: The default language setting is English.

5.2.9 Controller Functions

The following table explains the Controller Functions that can be enabled for a user.

Table 5-4 Controller Functions Descriptions

Controller Function	Description
Admin Page	Access to all ADMINISTRATOR functions.
Log Out User	Log out of the user's account.
New Mold Folder	Create new mold folders.
Copy Mold Folder	Copy mold folders.
Paste Mold Folder	Paste mold folders.
Delete Mold Folder	Delete mold folders.
Rename Mold Folder	Rename mold folders.
New Mold Setup	Create new mold setups.

Table 5-4 Controller Functions Descriptions (Continued)

Controller Function	Description
Load Mold Setup	Load mold setups.
Copy Mold Setup	Copy mold setups.
Paste Mold Setup	Paste mold setups.
Delete Mold Setup	Delete mold setups.
Rename Mold Setup	Rename mold setups.
New Note	Create new notes.
Load Note	Load notes.
Copy Note	Copy notes.
Paste Note	Paste notes.
Delete Note	Delete notes.
Rename Note	Rename notes.
Clear Note	Clear the contents of a note.
Load Image	Load images.
Copy Image	Copy images.
Paste Image	Paste images.
Delete Image	Delete images.
Rename Image	Rename images.
Load Document	Load PDF documents.
Copy Document	Copy PDF documents.
Paste Document	Paste PDF documents.
Delete Document	Delete PDF documents.
Rename Document	Rename PDF documents.
Load Udm	Load UDM files.
Copy Udm	Copy UDM files.
Paste Udm	Paste UDM files.
Delete Udm	Delete UDM files.
Rename Udm	Rename UDM files.
Zone Name	Modify zone names.
Zone On/Off	Turn zones on and off.
Zone Setpoints	Modify the zone setpoints.
Zone Setpoint Limits	Modify the zone setpoint limits.
Zone Standby Setpoints	Modify the zone standby setpoints.

Table 5-4 Controller Functions Descriptions (Continued)

Controller Function	Description
Zone Standby Setpoint Limits	Modify the zone standby setpoint limits.
Zone Boost Setpoints	Modify the zone boost setpoints.
Zone Boost Setpoint Limits	Modify the zone boost setpoint limits.
Zone Alarm Window	Modify the alarm settings
Zone Abort Window	Modify the abort settings.
Zone Regulation	Change the zone regulation.
Zone Slave	Assign the power output of one zone to another (slave the zone).
Zone Sensor Inputs	Assign the thermocouple of one zone to another.
Zone Output	Modify the zone output settings (Zero Cross or Phase Angle).
Zone PCM	Modify the zone PCM (Priority Control Mode) settings.
Zone AMC	Modify the zone AMC (Automatic Manual Control) settings.
Zone Ground Fault	Toggle the zone Ground Fault setting.
Zone Power Limit	Modify the zone Power limit.
Zone Control	Toggle between ART and PID zone control.
Zone PID Settings	Modify zone PID values.
System Zone Count	Modify the number of zones displayed on the screen.
Temperature Units	Toggle between Fahrenheit and Celsius temperatures.
Auto Logout Interval	Modify the amount of idle time before Matrix automatically logs the current user out.
Zone Screen Layout	Modify the zone screen layout for a mold setup.
Printer Settings	Modify printer settings and setup information.
Network Settings	Modify network settings.
Standby Timers	Modify standby timers.
Boost Timers	Modify boost timers.
Manual ART	Run ART manually.
Cancel ART	Cancel a running ART process.
Reset ART	Reset ART values.
Force Temperature Units	Force the system to use the specified temperature units for all users.
Watt Voltage	Modify the heater voltage value for determining the Watt Voltage.
Global Power Limit	Modify the global power limit.

Table 5-4 Controller Functions Descriptions (Continued)

Controller Function	Description
Log Reason Enable	Enable or disable the logging of reasons when changes are made.
Add Reason For Change	Add new reasons to the reasons for change list.
Sensitivity	Modify the time between an error occurring and the alarm sounding.
Max Temperature Limit	Modify the Over Maximum Temperature Limit value.
No Response Limit	Modify the maximum time a zone temperature is required to respond in before triggering a no response error.
Ground Fault Minimum	Modify the minimum current reading required to trigger a ground fault error.
Ground Fault Limit	Modify the ground fault limit.
Bake Out Limit	Modify the bake out limit.
Soft Start Limit	Modify the soft start limit.
Soft Start Enable	Enable or disable soft start.
Staged Setup Enable	Enable or disable staged startup.
Setup Stages	Modify the settings for each stage in staged startup.
Auto Slave Enable	Enable and disable the auto slave function.
Auto Slave Power	Modify the auto slave power.
At Temperature Minimum	Modify the limit that all zones must be within before the system signals the injection machine that it is ready for injection. If all zones temperatures are within their alarm windows, the signal is sent. The At Temperature Minimum is used instead when the alarm window is less than this value. For example, if the Alarm window is 2°F and the At Temperature Minimum is 5°F, the second value is used.
T/C Calibration	Calibrate the thermocouples.
Add/Delete Zones	Add or delete zones.
Zone Current Limit	Modify the zone current limit.
Zone T/C Type	Modify the zone thermocouple type.
Run Diagnostics	Run diagnostics.
Setup Diagnostics	Modify diagnostics settings.
Rewire T/C	Reassign thermocouples to different zones.
Digital I/O Comm	Enable or disable digital I/O communications.
Start/Stop Timer	Start or stop the timer.
SPI Interface	Modify the SPI interface settings.
SPI Monitor	Access the SPI communications monitor

Table 5-4 Controller Functions Descriptions (Continued)

Controller Function	Description
Clear Error Log	Clear the error log. This does not clear system errors.
Change Time/Date	Modify the time and date.

5.3 The Database

Administrators can monitor hard disk usage and set low data storage alarms. The Manage Database screen provides information about disk space usage and when the system records data in process history. Touch MANAGE DB to display this screen.

Table 5-5 Manage Database Screen Item Descriptions

Item	Description
Data Storage Capacity	The total amount of storage space installed.
Data Storage Used	The amount of storage space currently used.
Data Storage Available	The amount of storage space currently available.
Alert on low data storage available	Select the drop-down list to set an alarm for low data storage available. This can be when 100MB, 500MB or 1GB of disk storage space is available.
Database full	Select the drop-down list to select the procedure to be followed when the database is full. You may want to keep only the newest or the oldest data.
Database Table Info	The amount of disk space that is used by each of the database tables in Matrix
Record Data	You can choose to record data only when the START button has been selected, or at all times.

Chapter 6 Mold Setups

This chapter outlines how to setup, modify and customize mold setup files and process parameters required by Matrix to operate the hot runner system for a particular mold.

CAUTION!

Mechanical hazard – risk of equipment damage. Mold setup MUST be loaded before heating up the mold. Refer to [Section 6.1.2](#) for additional instructions.

6.1 Mold Files Screen

The Mold Files screen allows for the storage and management of files such as mold setups, images, notes, documents and UDM files. Files are organized in a tree structure and stored in mold folders. Each mold folder allows files associated with a specific mold to be stored.

The right side of the screen is used for previewing mold setups, images and notes. It is a quick and easy way to view information contained in the file without having to load it.

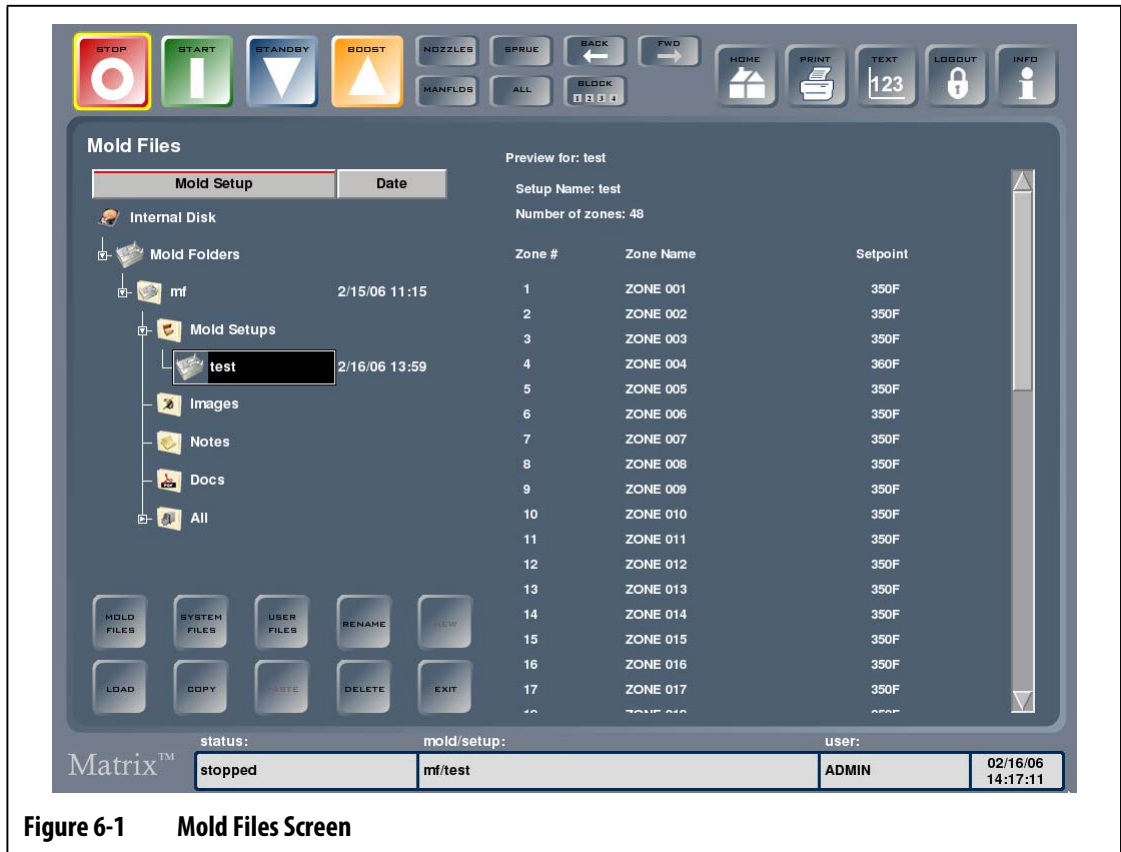


Figure 6-1 Mold Files Screen

Table 6-1 Mold Files Screen Item Descriptions

Item	Description
File Tree	<p>The Internal Disk folder is the root folder in the tree structure and can be expanded and collapsed by double-tapping it. A test folder is created before the system leaves the factory and contains a test mold setup and some sample image files. The column headers at the top of the tree view can be selected to sort the folders in ascending or descending order by name or by date.</p> <p>USB storage devices are displayed by default above the Internal Disk folder when they are connected to the system.</p>
Mold Setups Folder	Touch the Mold Setups folder to display the mold setups within the selected mold folder. This folder is automatically opened when selecting a mold folder.
Images Folder	Touch the Images folder to display image files within the selected mold folder. The system supports bitmap (BMP), JPEG (JPG or JPEG) and PNG (PNG) image file formats.
Notes Folder	Touch the Notes folder to display the note files within the selected mold folder.
Docs Folder	Touch the Docs folder to display the PDF files within the selected mold folder.
Udms folder	Touch the Udms folder to display UDM files within the selected mold folder.
All Folder	Touch the All folder to display all mold setups, images, notes and documents contained within the selected mold folder.

Table 6-2 Mold Files Screen Button Descriptions

Button	Description
MOLD FILES	Touch the MOLD FILES button to display the mold folders in the tree structure. This view is shown when you first display the screen.
SYSTEM FILES	Touch the SYSTEM FILES button to display the system files in the tree structure.
USER FILES	Touch the USER FILES button to display your user files in the tree structure. You must be logged in to view these folders.
RENAME	Touch the RENAME button to display a button board to rename a mold folder, mold setup, image, note or document. This button is not enabled unless a file or folder is selected.
LOAD	Touch the LOAD button to load a mold setup, image, note or document, depending on which one is selected. Images and notes will open in the Create Notes screen. This button is not enabled unless a mold setup, image, document or note file is selected.

Table 6-2 Mold Files Screen Button Descriptions (Continued)

Button	Description
NEW	Touch the NEW button to create a new mold setup folder, new mold setup or new note. This button is not available unless a mold setup, mold setup folder or notes folder is selected. NOTE: When creating a new mold setup, the system automatically sets all process parameters to default values.
COPY	Touch the COPY button to copy mold setups, images, documents or notes from one folder or device to another.
PASTE	Touch the PASTE button to paste a previously copied mold setup, image, document or note to a new destination. PASTE is not available unless a file has been copied.
DELETE	Touch the DELETE button to delete a mold folder, mold setup, image, document or note. A confirmation message is shown to make sure you intended to delete the file or folder. This button is not available unless a folder or file is selected.
EXIT	Touch the EXIT button to exit from Mold Files screen and return to the Home screen.

NOTE: To preview a mold setup, image or note, select a file of this type and a preview will be shown. If an image is bigger than the preview area, touch the image or scroll bar at the bottom/side of the preview, and drag it with your finger to move/view the rest of the image.

6.1.1 Transferring Data Using a USB Storage Device

Matrix allows data to be transferred using USB disks or USB CD-ROM drives. When one of these devices is plugged into the USB port, the related icon appears within the tree structure. The icon disappears when the device is unplugged. In order to load the files, they must be copied from the USB disk to the Internal Disk.

6.1.2 Loading an Existing Mold Setup

A mold setup contains the process parameters for Matrix functions for a particular mold.

To load a mold setup:

1. Log in to the system.
2. Touch MOLD FILES to display the available mold setup files.
3. Touch the required mold folder, and then touch the name of the mold setup file you want to load.
4. Touch LOAD, and then selected mold setup is loaded.

Once a mold setup is loaded, its name will be displayed at all times in the mold/setup area of the status bar.

6.1.3 Copying Files

Mold setups, images, documents or notes can be easily copied from one folder or device to another. Only files from folders with the same name or type can be copied into that folder.

For example, a mold setup file can be pasted only into a mold setup folder, an image file can be pasted only into an image folder.

To copy and paste a file:

1. Touch the file you want to copy.
2. Touch COPY.
3. Navigate to the destination folder, and then touch PASTE to create a copy of the file.

6.1.4 Copying and Saving a Mold Setup

To copy a mold setup:

1. Copy the original file.
2. Paste the original file into the required mold setup folder.
3. Load the new mold setup.
4. Make the required changes.

The changes will be saved automatically to the loaded mold setup.

6.1.5 Deleting Files

To delete a file or folder:

1. Touch the file or folder you want to delete.
2. Touch DELETE.
3. A message appears asking you to confirm the deletion. To continue, touch YES; to cancel the deletion, touch NO.

NOTE: The system will not allow you to delete the mold setup that is currently loaded.

6.1.6 Renaming Files

To rename a file or folder:

1. Touch the file or folder you want to rename.
2. Touch RENAME to display a keyboard.
3. Enter the new name, and then touch ENTER to close the keyboard and update the name of the file.

6.1.7 Creating a New Mold Folder

To create a new mold folder:

1. Touch Mold Folders, and then touch NEW to display a keyboard.
2. Enter the name of the new mold folder, and then touch ENTER to close the keyboard and create the new folder.

NOTE: The new mold folder will automatically contain the following folders: Mold Setups, Images, Notes, Docs, UDMs and All.

6.1.8 Creating a New Mold Setup

Matrix automatically sets all process parameters to default values when you create a new mold setup.

To create a new mold setup:

1. Touch the required mold folder, and then touch the Mold Setups folder.
2. Touch NEW to display a keyboard.
3. Enter the name of the new mold setup, and then touch ENTER to close the keyboard and create the new mold setup.

Now the new mold setup can be loaded by touching LOAD, and any necessary adjustments to the settings can be made before running the mold.

6.1.9 Converting Legacy Mold Setups

You can take a mold setup from an Altanium Orion 2 temperature control system and use it on Matrix.

To convert an Altanium Orion 2 mold setup to a Matrix mold setup:

1. Connect a USB storage device that contains the mold setup you want to convert.
2. Copy and paste the file from the folder on the USB storage device into an internal Mold Setup folder.

The conversion to a Matrix mold setup is done automatically when the file is copied.

6.2 Saving Changes to a Mold Setup

There are two methods of saving zone parameter changes to a mold setup. The default mode performs the action automatically after every parameter change. If this is not desired, the system can be configured to allow changes to be saved manually by the user.

6.2.1 The Manually Save Changes Feature

The Manually Save Changes feature overrides the system's default mode of operation that automatically saves zone parameter changes to the loaded mold setup. When activated, changes will only be saved if the SAVE button is pressed in the Mold Files screen. This is especially useful when validating a mold where changes are made to observe how the process reacts and if the changes are not acceptable, they can be discarded without having to go back and re-input the original values.

NOTE: This functionality is only supported in software version 2.6 revision 1 or higher.

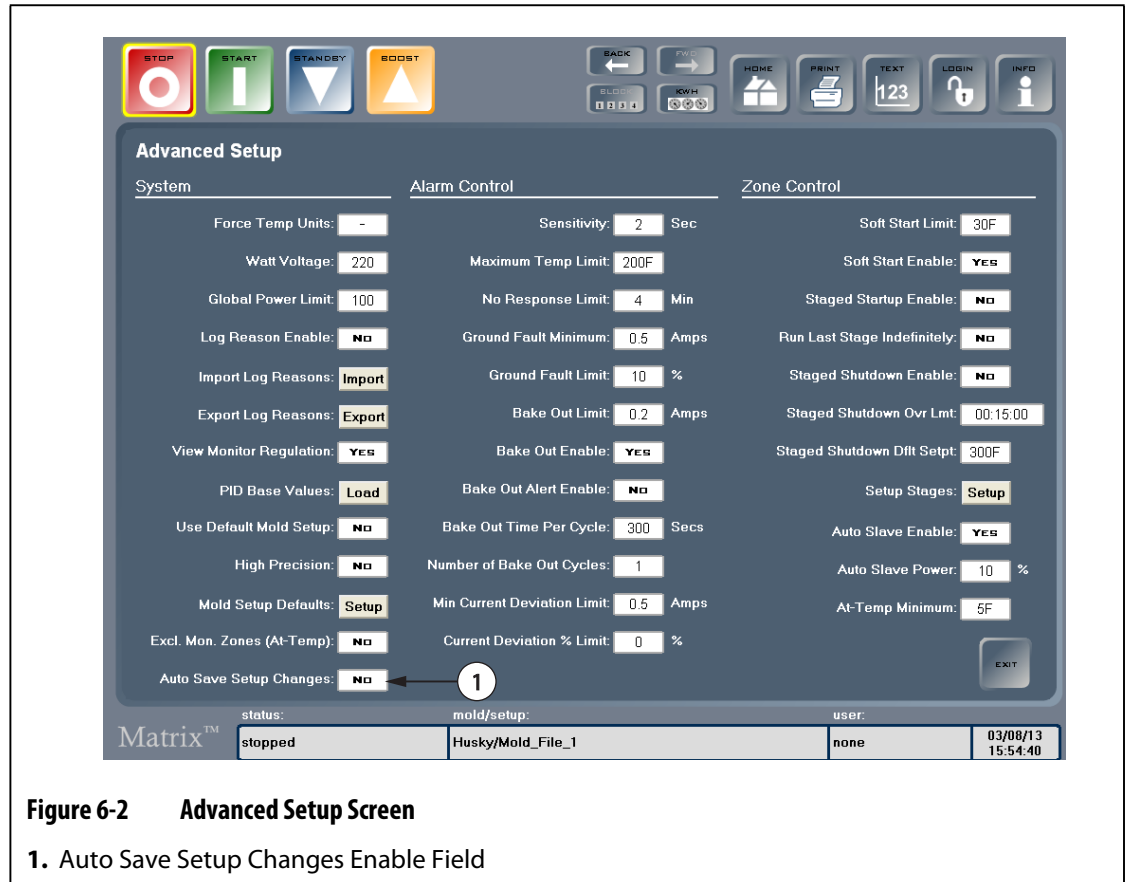


Figure 6-2 Advanced Setup Screen

1. Auto Save Setup Changes Enable Field

Table 6-3 Advanced Setup Screen Item Description

Item	Description
Auto Save Setup Changes Enable Field	This field is used to enable or disable the Auto Save Setup Changes function. When set to NO, the system will no longer automatically save zone parameter changes to the loaded mold setup. This requires a user to manually save the changes by touching the SAVE button in the Mold Files screen. NOTE: The default value is Yes .

6.2.1.1 Accessing the Advanced Setup Screen

The Advanced Setup screen is used to modify advanced system settings as well as gain access to the Mold Setup Defaults and Stage Setup screens. The settings in this screen should only be modified by well qualified users as changing these parameters can adversely affect the operation and performance of the system. Contact a Husky call center technician for the access code.

To access the Advanced Setup Screen:

1. Touch the SYSTEM button in the Home screen.
2. Touch the ADVANCED SETUP button in the Home screen submenu.
3. Touch the OK button in the Warning pop-up window.
4. Enter the appropriate Password in the Keyboard Pop-up and touch the Enter button.

6.2.1.2 Enabling the Manually Save Changes Features

Depending on the preferred mode of operation, the Auto Save function can be enabled or disabled.

To enable or disable the Manually Save Changes Feature:

1. Navigate to the Advanced Setup screen.
2. Touch the Auto Save Setup Changes field to toggle it from YES to NO.

6.2.2 Using the Manually Save Changes Feature

The Manually Save Changes feature only pertains to changes made to zone parameters available in the Quick Set screen. The following table defines what these values are:

Table 6-4 Zone Parameter Values in the Quick Set Screen

Zone Parameters		
Alarm	Manual Standby Maximum Setpoint	Output
Abort	Remote Standby Minimum Setpoint	PCM
On / Off	Remote Standby Setpoint	AMC
Regulation	Remote Standby Maximum Setpoint	Control
Slave To	Manual Boost Minimum Setpoint	Ground Fault
Locked	Manual Boost Setpoint	Power Limit
Normal Minimum Setpoint	Manual Boost Maximum Setpoint	PID - P
Normal Setpoint	Remote Boost Minimum Setpoint	PID - I
Normal Maximum Setpoint	Remote Boost Setpoint	PID - D
Manual Standby Minimum Setpoint	Remote Boost Maximum Setpoint	Inactive
Manual Standby Setpoint	Sensor	

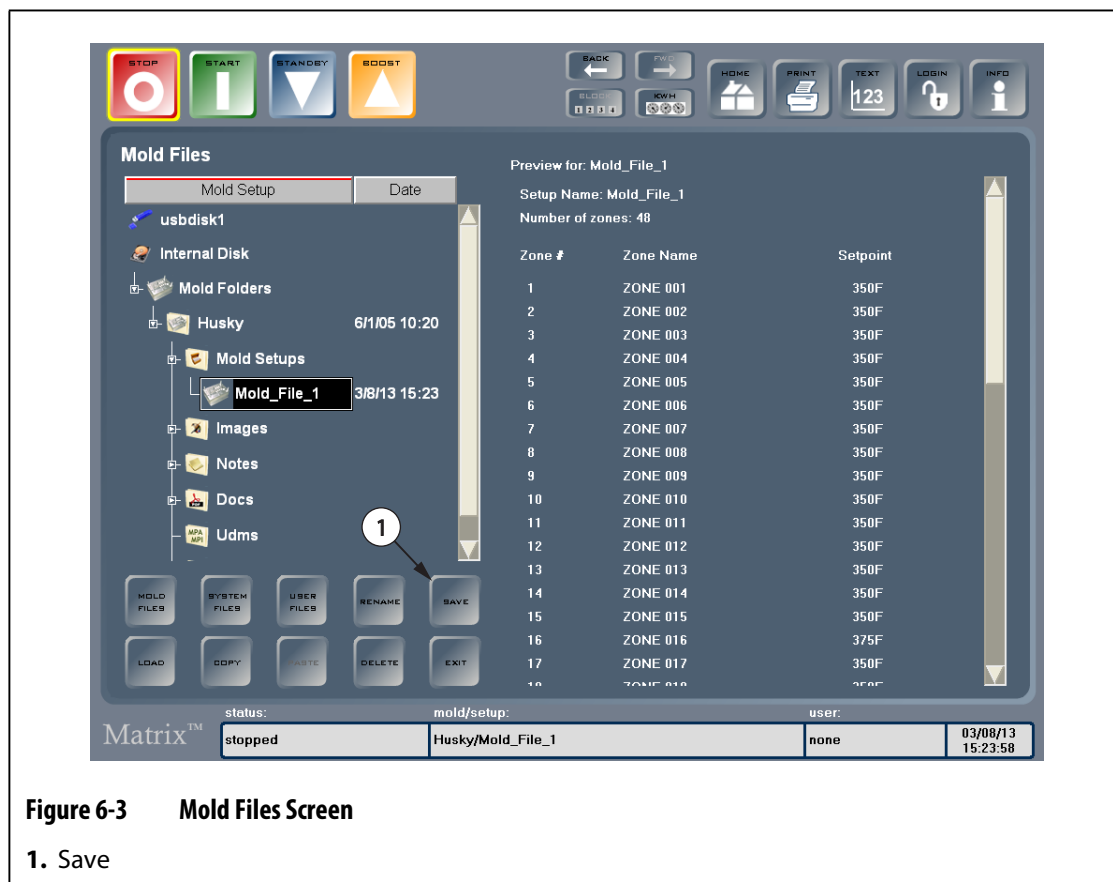


Figure 6-3 Mold Files Screen

1. Save

Table 6-5 Mold Files Screen Button Descriptions

Button	Description
Save	<p>Touch the SAVE button to permanently save all zone parameter changes to the currently loaded mold setup. All saved changes will be recalled each time the mold setup is loaded.</p> <p>NOTE: This button will only be active if the Manual Save Changes function is enabled and the currently loaded mold setup is selected within the Mold Files screen.</p>

6.2.2.1 Accessing the Mold Files Screen

The Mold Files screen is used to manage files that pertain to a specific mold. Each mold is represented by a folder that includes a sub directory for storing mold setups, images, notes and documents associated with that mold.

To Access the Mold Files Screen from the Home Screen:

- Touch the MOLD FILES button located on the left side of the Home screen.

To Access the Mold Files Screen from the System Footer:

- Touch anywhere within the Mold/Setup field located at the bottom of every screen.

6.2.2.2 Manually Saving Changes to a Mold Setup

When the Manual Save Changes function is activated a SAVE button is displayed in place of the NEW button whenever the currently loaded mold setup file is selected in the Mold Files screen. Touching this button will display a Warning pop-up window to confirm that the zone parameter changes are to be permanently saved to the mold setup.



IMPORTANT!

When the Manual Save Changes function is activated, the currently loaded mold setup file will automatically be selected whenever the Mold Files screen is accessed.

To Save Changes to a Mold Setup File:

1. Navigate to the Mold Files screen.
2. Touch the SAVE button.
3. Touch the YES button in the Warning pop-up window.



IMPORTANT!

Touching the **No** button will acknowledge the Warning pop-up window and make it disappear, but the mold parameter change history will be retained, so it can be saved at a later time.



IMPORTANT!

Zone parameter changes will not be recorded to the Change Log until the changes have been permanently saved to the mold setup file.

6.2.2.3 Loading a New Mold Setup without Saving Changes to the Current Setup

When the Manual Save Changes function is activated and a user attempts to load a different mold setup before changes were saved to the currently loaded mold setup, a Warning pop-up window will appear alerting the user to save the changes or discard them.

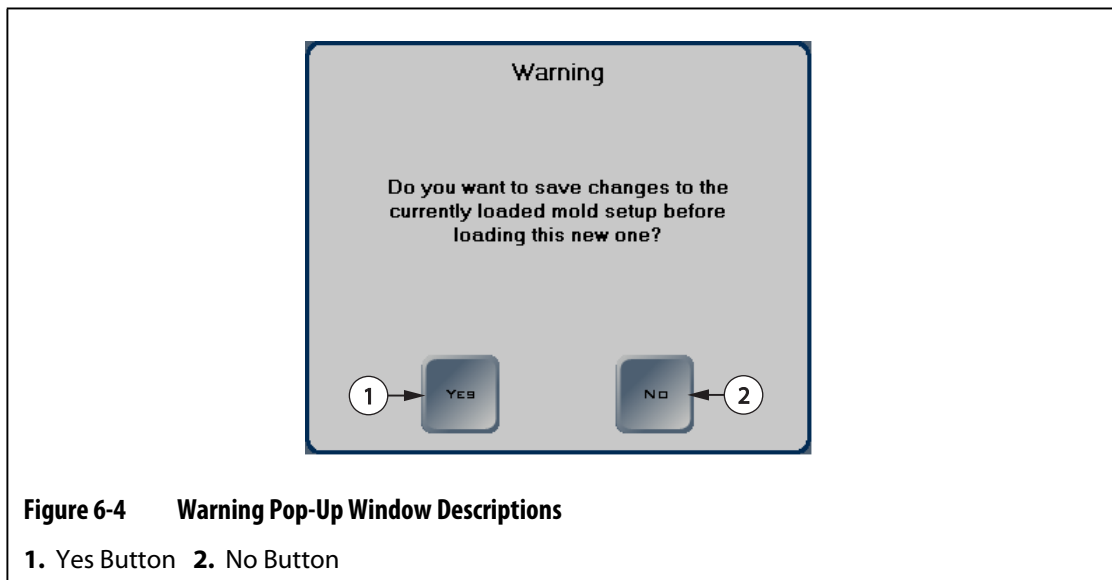


Table 6-6 Warning Pop-Up Window Descriptions

Button	Description
YES	Touch the YES button to permanently save all zone parameter changes made to the currently loaded mold setup.
NO	Touch the NO button to discard all zone parameter changes made to the currently loaded mold setup.

6.2.2.4 Disconnecting the Main Power without Saving Changes to the Mold Setup

Disconnecting the main power to the controller, without first saving changes to the currently loaded mold setup, will permanently discard the changes.

Chapter 7 Power Deviation Alarm

This chapter outlines the features and uses of the Power Deviation Alarm. It is a tool that can uncover potentially serious problems before they can result in significant downtime or irreparable damage to the mold.

Resin Leak Detection Scenarios:

- As plastic fills the nozzle bore, it will increase the heat losses to the gate insert and can affect the thermocouple connection in the nozzle body.
- A plastic leak in the manifold pocket bridges the air gap, drawing heat from the manifold.

These conditions will result in a sharp increase in duty cycle to maintain setpoint. The Matrix monitors these variations and triggers an alarm to alert the user of a possible leak in the mold.

Failed Heater Detection Scenario:

- In hot runner designs which include zones that use multiple heater elements tied to a single thermocouple for control, one heater fails.

The overall effect on power output to the zone would be very similar to those exhibited by a plastic leak therefore, the power deviation alarm would be activated, isolating the zone with the problem.

7.1 The Power Deviation Dialog Box

The Power Deviation Dialog Box is a warning used as a quick link to access the Zone/Slot Configuration screen. It is displayed the first time the START button is pressed when a new mold setup is loaded.

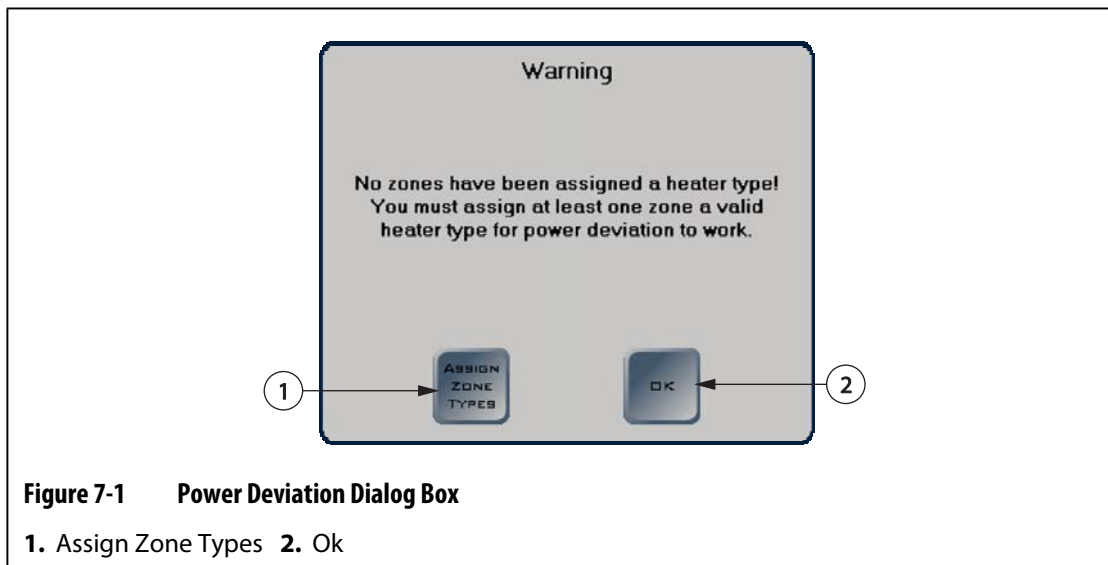


Figure 7-1 Power Deviation Dialog Box

1. Assign Zone Types 2. Ok

Table 7-1 Power Deviation Dialog Box Item Description

Item	Description
Dialog Box	The purpose of the Power Deviation Dialog Box is to display a message warning that the zones in the currently loaded mold setup have not been assigned a heater type and provides a quick link to the Zones/Slot Configuration screen to do so. If heater types are not assigned, then the Power Deviation feature will not work. The dialog box is only displayed once per mold setup and only after the START button is pressed for the first time. After this is done, it will not be displayed for that given mold setup again.

Table 7-2 Power Deviation Dialog Box Button Descriptions

Button	Description
ASSIGN ZONE TYPES	Touch the ASSIGN ZONE TYPES button to access the Zones/Slot Configuration screen to assign heaters types to the zones in the currently loaded mold setup. This is necessary for the Power Deviation feature to work.
OK	Touch the OK button to acknowledge the dialog box and make it disappear. Once this is done, the dialog box will not be displayed again for that specific mold setup and the Zones/Slot Configuration screen will have to be manually accessed, using a pass code, if heater types are to be assigned.

7.2 The Zone/Slot Configuration Screen

The Zone/Slot Configuration screen is used to assign heater types to zones in the system. It is the first step in configuring the Power Deviation Alarm. Additionally, it can be used to activate or remove zones from the software, configure the thermocouple input type and set the current limit of the cards. This section will only cover those items and steps necessary for setting up the Power Deviation Alarm. This screen is password protected unless accessed by touching the ASSIGN ZONE TYPES button in the Power Deviation Dialog Box.

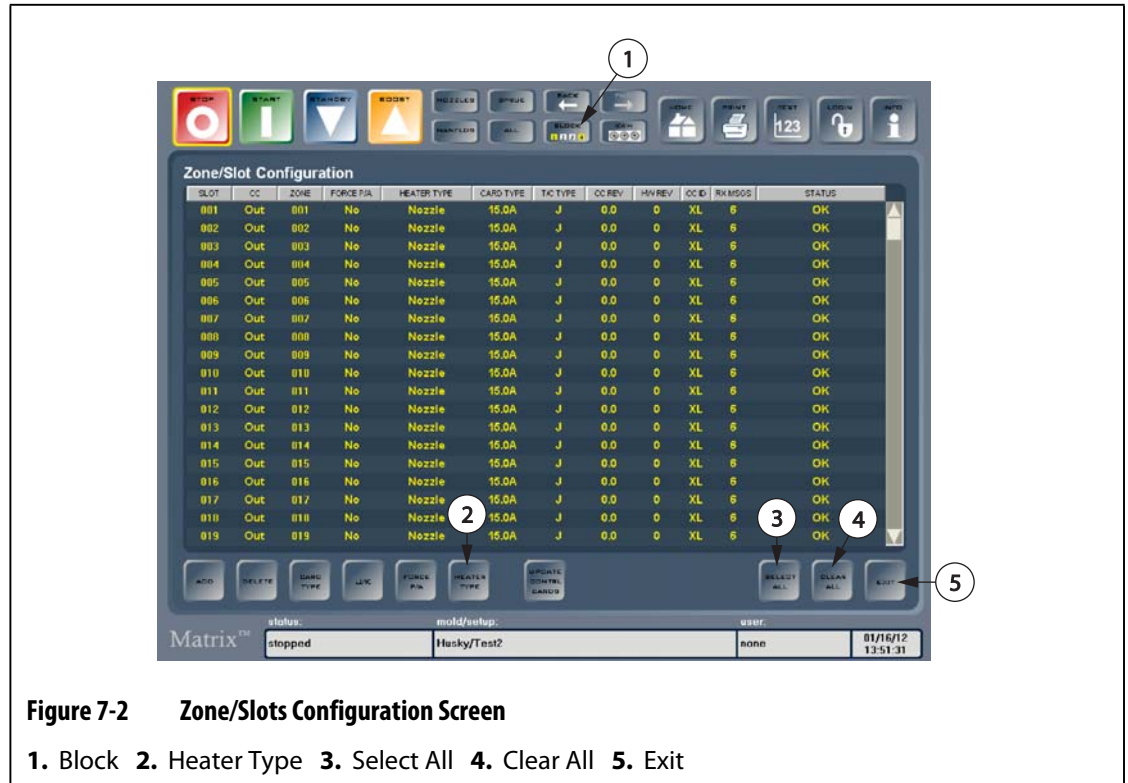


Figure 7-2 Zone/Slots Configuration Screen

- 1. Block 2. Heater Type 3. Select All 4. Clear All 5. Exit

Table 7-3 Zones/Slots Configuration Screen Button Descriptions

Button	Description
BLOCK	Touch the BLOCK button to select a group of items in consecutive order. To do so, touch the BLOCK button, then touch the first item in the group, and then touch the last item in the group. This will automatically select all of the items in-between.
HEATER TYPE	Touch the HEATER TYPE button to assign a heater type to all selected zones in the currently loaded mold setup. Each time the button is touched, it will toggle between Nozzle, Sprue, Manifold and None. The default setting is None.
SELECT ALL	Touch the SELECT ALL button to select all of the assigned slots available in the Zones/Slots Configuration Screen. A selection is indicated by all text in the line being highlighted in yellow. A slot must be selected before a heater type can be assigned to it.

Table 7-3 Zones/Slots Configuration Screen Button Descriptions (Continued)

Button	Description
CLEAR ALL	Touch the CLEAR ALL button to deselect any slots that have been selected in the Zones/Slots Configuration Screen.
EXIT	Touch the EXIT button to return to the Home screen.

7.2.1 Assigning Zone Heater Types

The Matrix allows zones to be assigned a heater type. The specific assignments are unique to each mold setup in the system. This separation ensures the optimal application of the Power Deviation algorithm. Additionally, power deviation is not applied to the sprue since it is heavily influenced by thermal transfer from the machine barrel. This assignment is the first step in configuring the Power Deviation Alarm.

To assign a nozzle heater type:

1. Select the group of zones that you want to assign as nozzles. This can be done individually or using the BLOCK button.
2. Touch the HEATER TYPE to toggle through the available heater types until the Heater Type column of the selected zones displays Nozzle.
3. Touch the CLEAR ALL button to deselect the nozzle zones

To assign a manifold heater type:

1. Select the group of zones that you want to assign as manifolds. This can be done individually or using the BLOCK button.
2. Touch the HEATER TYPE to toggle through the available heater types until the Heater Type column of the selected zones displays Manifold.
3. Touch the CLEAR ALL button to deselect the Manifold zones

To assign a sprue heater type:

1. Select the zone or group of zones that you want to assign as sprue(s). This can be done individually or using the BLOCK button.
2. Touch the HEATER TYPE to toggle through the available heater types until the Heater Type column of the selected zone(s) displays Sprue.
3. Touch the CLEAR ALL button to deselect the Sprue zone(s)

7.3 The System Setup Screen

The System Setup screen is used to configure global settings for the system. This includes the following:

- System settings - Number of zones, temperature units, Auto Logout and Delta Temp configuration.
- Utilities - Printer and networking options.

- Timers - Including standby and boost timers and type of input signal configuration.
- Standby and Boost Options - Including Standby Cycle, Hard Boost and Manual Boost Active Limit options.

In addition to these settings, this screen also includes access to the Power Deviation Alarm Configuration screen.

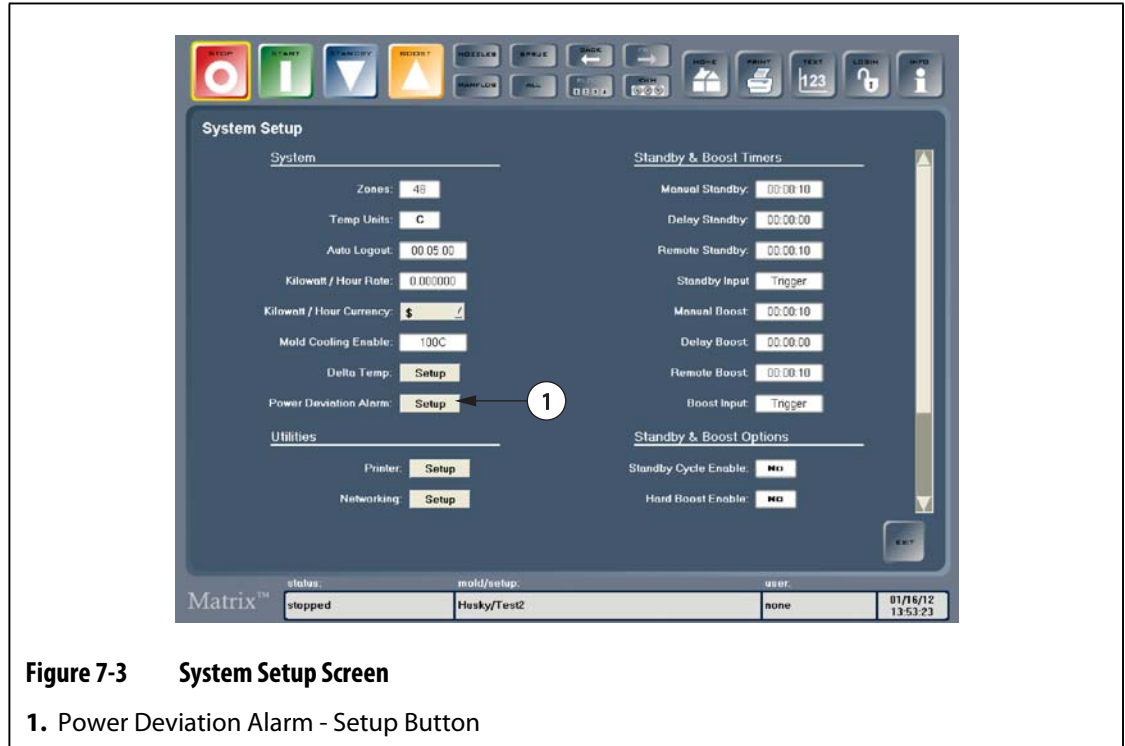


Figure 7-3 System Setup Screen

1. Power Deviation Alarm - Setup Button

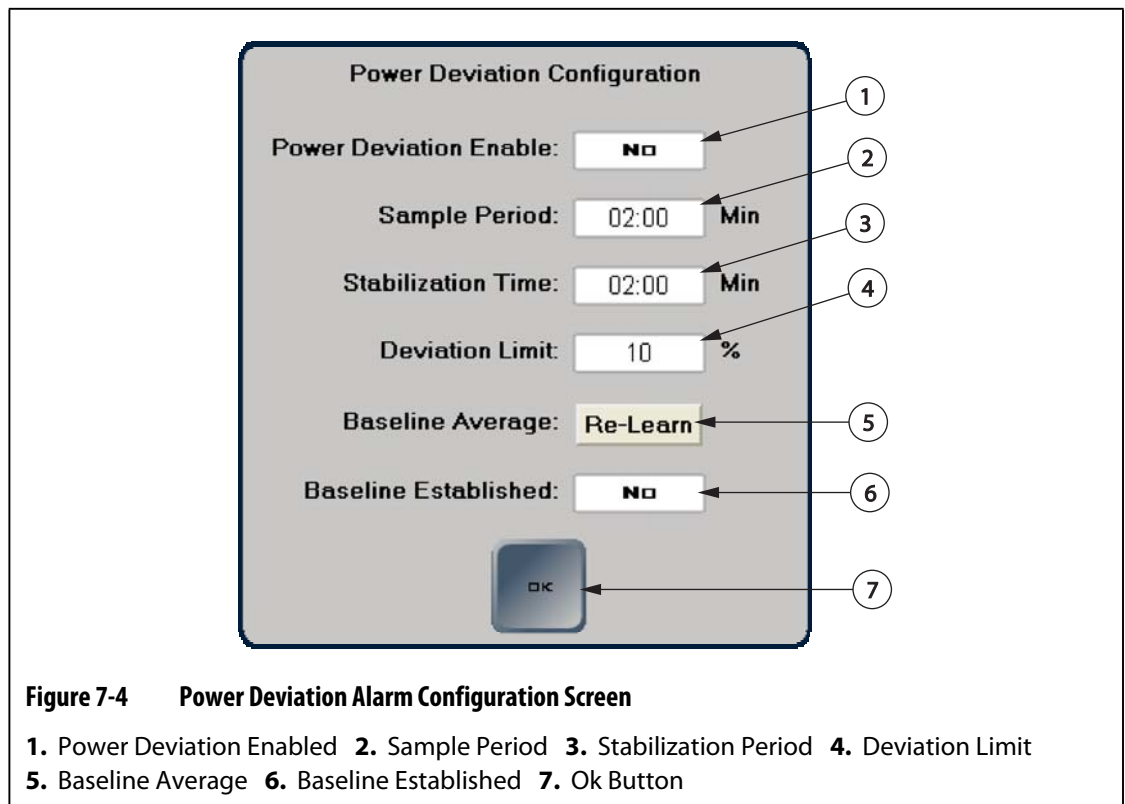


Figure 7-4 Power Deviation Alarm Configuration Screen

1. Power Deviation Enabled 2. Sample Period 3. Stabilization Period 4. Deviation Limit 5. Baseline Average 6. Baseline Established 7. Ok Button

7.3.1 Accessing the System Setup Screen

To access the System Setup Screen:

1. Touch the SYSTEM button in the Home screen.
2. Touch the SYSTEM SETUP button from the SYSTEM button submenu.

Chapter 8 Mixing Intelligent Control Cards (ICC²)

This chapter outlines how to access and use the Card Layout views to fully utilize the available control cards installed on the system.

Mixing different control card models in the same mainframe provides the flexibility to optimizing the configuration of a controller to the specific needs of the application. The system automatically detects the card type and configures the available functionality at the zone level. As a result, XL-Series cards can be grouped with X-Series cards for those applications that require full functionality on manifold zones, but only basic control for the tips.

8.1 The Card Layout Screen - Normal

The Card Layout screen provides the ability to quickly pinpoint the location of an individual card within the controller. In addition, it provides access to card specific data such as firmware version and processor temperature. This view is only accessible from the SYSTEM button sub-menu in the Home screen.

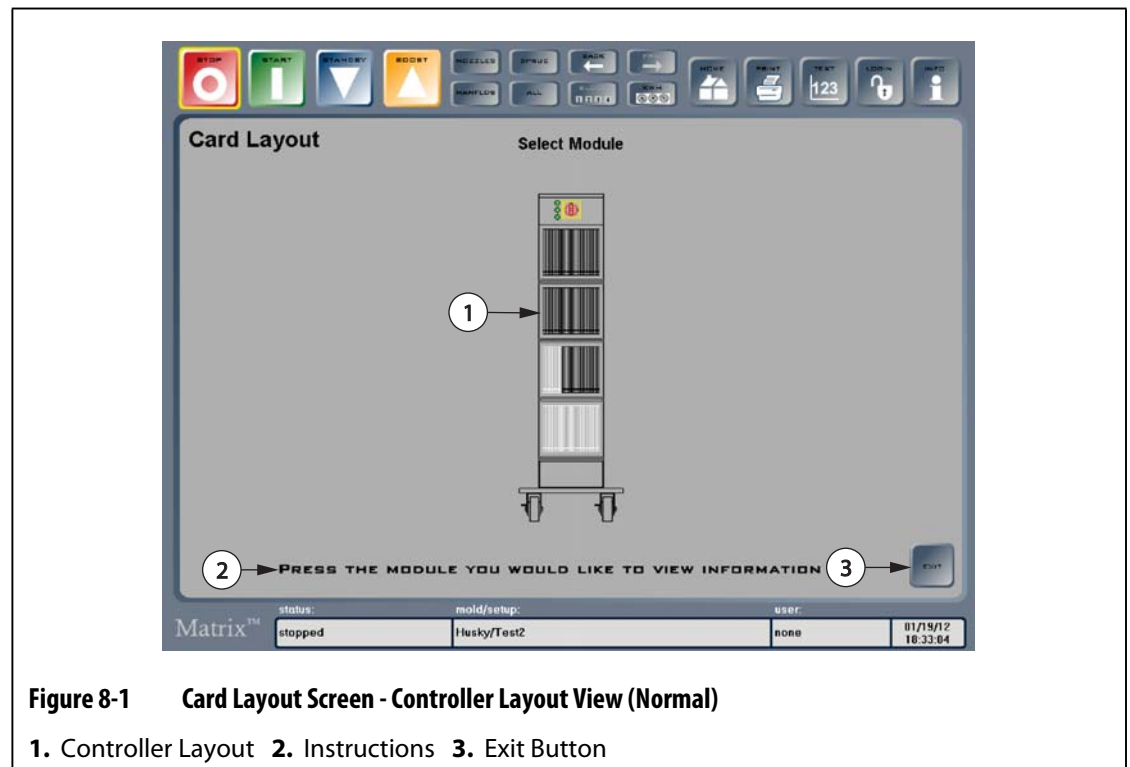


Table 8-1 Card Layout Screen Item Descriptions - Controller Layout View

Item	Description
Controller Layout	This graphic represents the hardware layout of the controller mainframe. The mainframe contains sections referred to as modules. Each module is an active field and when touched displays a detailed view of the cards included in the module. NOTE: The modules are arranged in a right to left and top to bottom orientation with the smallest zone number located in the upper most module, furthest to the right.
Instructions	This text block displays instructions on what to select. This is a common screen element within the Card Layout screen and changes based on the view.

Table 8-2 Card Layout Screen Button Descriptions - Controller Layout View

Button	Description
EXIT	Touch the EXIT button to leave the Card Layout view and return to the Home screen. This is a common screen element that is included in all of the Card Layout views.

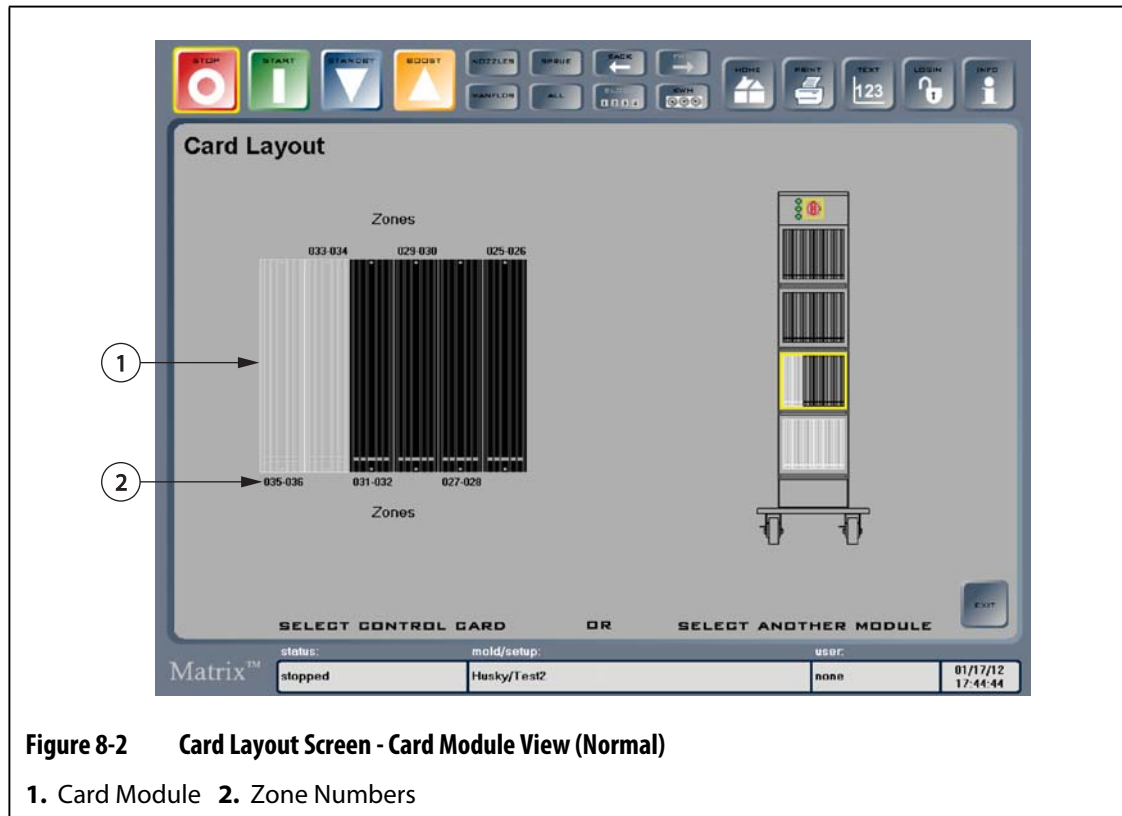


Figure 8-2 Card Layout Screen - Card Module View (Normal)

1. Card Module 2. Zone Numbers

Table 8-3 Card Layout Screen Item Description - Card Module View

Item	Description
Card Module	<p>This graphic represents the card layout within a module. Each card within the module is an active field and when touched displays a detailed view of the individual card.</p> <p>NOTE: A yellow border will appear around the module in the controller layout to indicate that it is associated with the Card Module that is currently being viewed.</p>
Zone Numbers	<p>These text blocks indicate the zone numbers that are associated with each card. For clarity, the zone numbers alternate from the top to the bottom.</p> <p>NOTE: The cards are arranged in a right to left orientation with the furthest right position being the smallest zone number.</p>

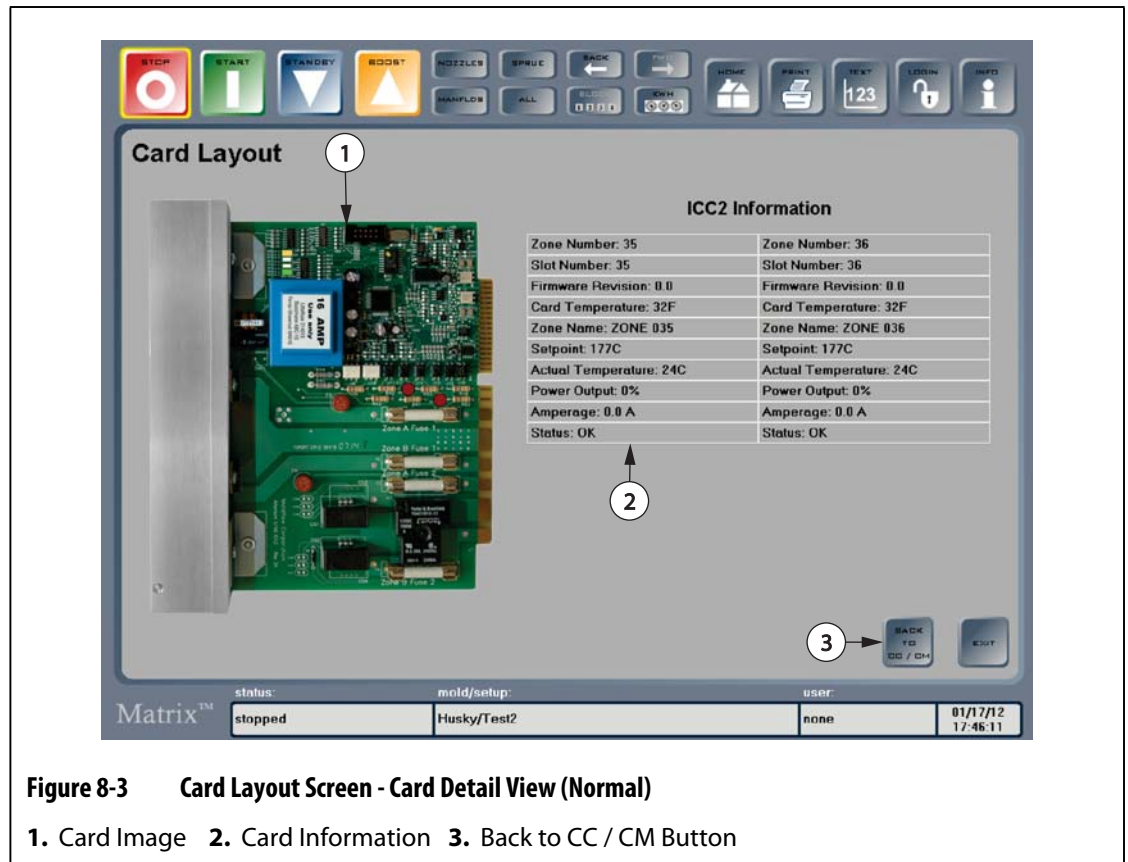


Figure 8-3 Card Layout Screen - Card Detail View (Normal)

- 1. Card Image
- 2. Card Information
- 3. Back to CC / CM Button

Table 8-4 Card Layout Screen Item Descriptions - Card Detail View

Item	Description
Card Image	This graphic represents the individual card. There are animated fields on each card image that represent diagnostic LEDs used for trouble shooting purposes. The two circular red LEDs correspond to the power output of each zone on the card.
Card Information	<p>This table displays information specific to each zone that is included on the card. The following items are displayed in the table:</p> <ul style="list-style-type: none"> • Zone # - Represents the zone # in the software • Slot # - Represents the card location in the mainframe • Firmware Revision – Represents what version of software is running on the card • Card Temp – Represents the internal temperature of the processor on the card • Zone Name – Represents the user defined name for that zone • Setpoint – Represents the setpoint for that zone • Actual Temp – Represents the actual temperature of the zone based on feedback from its thermocouple • Power Output – Represents the percentage of duty cycle the card is delivering to the zone • Amperage – Represents the real-time amperage measurement of that zone • Status – Represents the condition of the zone (i.e. running, stopped, alarm, etc.) <p>NOTE: The table will display this data for all zones on the card. If a standard 16A card is used, then there will be two zones of data displayed. If it is a 20A or 30A card, then only one zone of data will be displayed.</p>

Table 8-5 Card Layout Screen Button Description - Card Detail View

Button	Description
BACK TO CC / CM	Touch the BACK TO CC / CM button to return to the Card Module View. This is a convenient way to pick another card to view from the same Card Module.

8.1.1 Accessing the Card Layout Screen - Controller Layout View

The first view in the Card Layout screen is of the controller mainframe. This is an overall view of the controller layout for locating and selecting a module that contains a given card.

To Access the Controller Layout View:

1. Touch the SYSTEM button in the Home screen.
2. Touch the CARD LAYOUT button from the SYSTEM button submenu.

8.1.2 Accessing the Card Layout Screen - Card Module View

The second view in the Card Layout screen is of the card module. This is a detailed view of the module that was selected in the controller layout view. It is used for locating and selecting a given card within the module.

To Access the Card Module View:

1. Touch the SYSTEM button in the Home screen.
2. Touch the CARD LAYOUT button from the SYSTEM button submenu.
3. Touch any MODULE from the mainframe graphic in the Controller Layout view.

8.1.3 Accessing the Card Layout Screen - Card Detail View

The third view in the Card Layout screen is of the card itself. This is a detailed view of the card that was selected in the card module view. It is used for viewing card or zone specific data, such as the firmware revision or setpoint.

To Access the Card Detail View:

1. Touch the SYSTEM button in the Home screen.
2. Touch the CARD LAYOUT button from the SYSTEM button submenu.
3. Touch any MODULE from the mainframe graphic in the Controller Layout view.
4. Touch any CARD from the card module graphic in the Card Module view.

8.2 The Card Layout Screen - Troubleshooting

In addition to card location, the Card Layout screen can be used as a troubleshooting tool that allows an operator to drill down to the board level and identify a failed component, such as a blown fuse or damaged switching device. This view is only accessible from the Error Log screen.

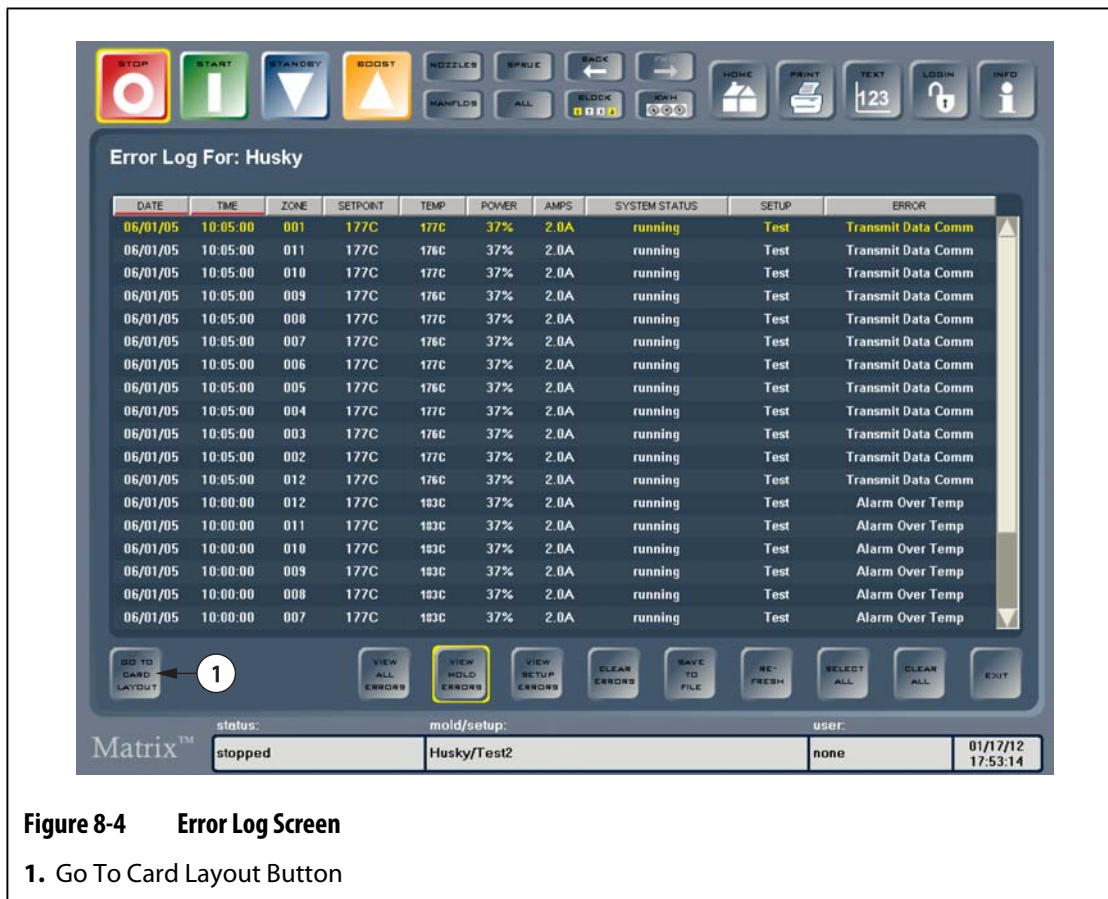


Figure 8-4 Error Log Screen

1. Go To Card Layout Button

Table 8-6 Status Screen Button Description

Button	Description
GO TO CARD LAYOUT	Touch the GO TO CARD LAYOUT button to access the Card Layout screen. Accessing the Card Layout screen from the Error Log screen will automatically put it into troubleshooting mode. NOTE: To activate the GO TO CARD LAYOUT button, at least one error must be selected in the Error Log. A user can select up to 10 individual errors and a selection is indicated by the text in the selected line being highlighted yellow.

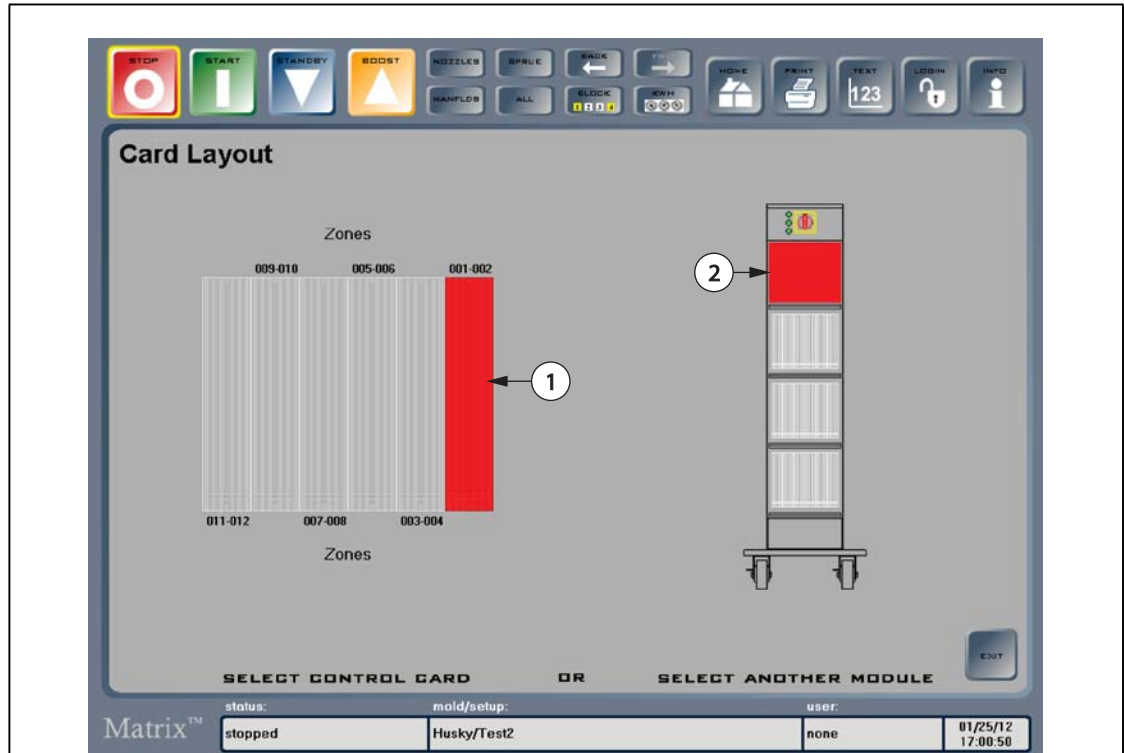


Figure 8-5 Card Layout Screen - Card Module View (Troubleshooting)

1. Card Module 2. Zone Numbers

Table 8-7 Card Layout Screen Item Descriptions - Card Module View

Item	Description
Controller Layout	<p>This graphic represents the hardware layout of the controller mainframe. The mainframe contains sections referred to as modules. Each module is an active field and when touched displays a detailed view of the cards included in the module. The module containing the card associated with the error selected in the Error Log screen will be colored red.</p> <p>NOTE: The modules are arranged in a right to left and top to bottom orientation with the smallest zone number located in the upper most module, furthest to the right.</p>
Card Module	<p>This graphic represents the card layout within a module. Each card within the module is an active field and when touched displays a detailed view of the individual card. The card associated with the error selected in the Error Log screen will be colored red.</p> <p>NOTE: The module in the Controller Layout will be colored red to indicate that it is associated with the Card Module that is currently being viewed.</p>

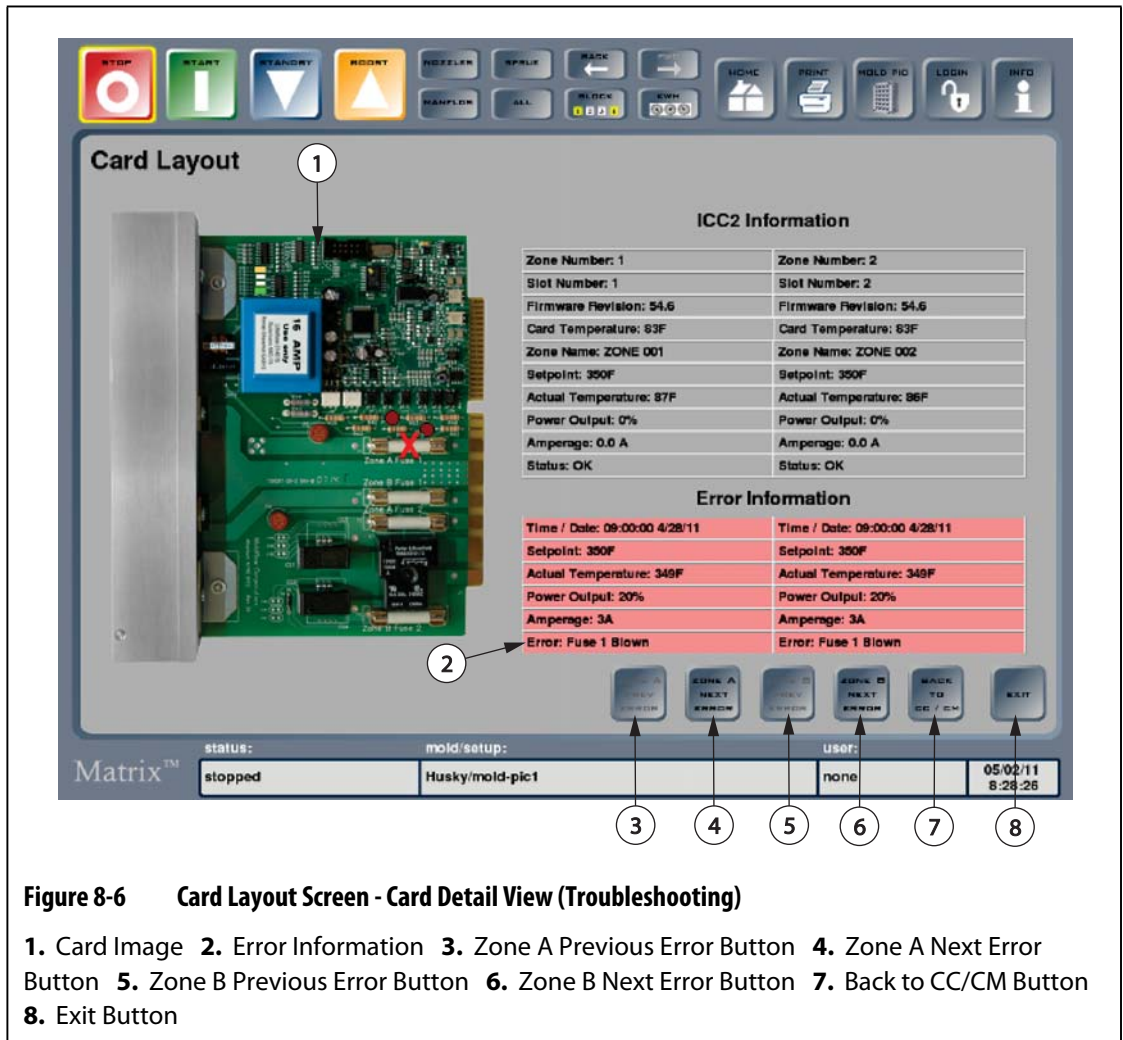


Figure 8-6 Card Layout Screen - Card Detail View (Troubleshooting)

- 1.** Card Image
- 2.** Error Information
- 3.** Zone A Previous Error Button
- 4.** Zone A Next Error Button
- 5.** Zone B Previous Error Button
- 6.** Zone B Next Error Button
- 7.** Back to CC/CM Button
- 8.** Exit Button

Table 8-8 Card Layout Screen Item Descriptions - Card Detail View

Item	Description
Card Image	<p>This graphic represents the individual card. There are animated fields on each card image that represent diagnostic LEDs used for trouble shooting purposes. The two circular red LEDs correspond to the power output of each zone on the card. Any failed component will be indicated by a red 'X'.</p> <p>NOTE: The card will only identify a failed component if the specific error selected from the Error Log screen pertained to a component, such as a blown fuse, as indicated in the screen shot above.</p>
Error Information	<p>This table displays information specific to the error that is associated to each zone on the card. The table section associated to zones with errors will be indicated by a red background. The following items are displayed in the table:</p> <ul style="list-style-type: none"> • Time/Date - Represents the time and date that the error occurred • Slot # - Represents the card location in the mainframe • Firmware Revision – Represents what version of software is running on the card • Card Temp – Represents the internal temperature of the processor on the card • Setpoint – Represents the setpoint for that zone • Actual Temp – Represents the actual temperature of the zone based its thermocouple input • Power Output – Represents the percentage of duty cycle the card is delivering to the zone • Amperage – Represents the real-time amperage measurement of that zone • Error – Represents the specific error for that zone which is based on the selection made in the Error Log screen. <p>NOTE: The table will only display data for a zone if it is associated to the error selected in the Error Log screen. If the table is blank for any zone, then this indicates that an error has not been selected for that zone.</p>

Table 8-9 Card Layout Screen Button Descriptions - Card Detail View

Button	Description
ZONE A PREVIOUS ERROR	<p>Touch the ZONE A PREVIOUS ERROR button to view the previous error associated to this zone. Zone 'A' pertains to the first or lowest numbered zone associated to the card.</p> <p>NOTE: This button is only displayed if more than one associated error was selected in the Error Log screen for this zone. Additionally, it will not be active until the ZONE A NEXT ERROR button has been touched.</p>
ZONE A NEXT ERROR	<p>Touch the ZONE A NEXT ERROR button to view the next error associated to this zone. Zone 'A' pertains to the first or lowest numbered zone assigned to the card.</p> <p>NOTE: This button is only displayed if more than one associated error was selected in the Error Log screen for this zone. Additionally, it will become inactive if there are only two errors selected and the ZONE A PREVIOUS ERROR button has been touched.</p>
ZONE B PREVIOUS ERROR	<p>Touch the ZONE B PREVIOUS ERROR button to view the previous error associated to this zone. Zone 'B' pertains to the second or highest numbered zone assigned to the card.</p> <p>NOTE: This button is only displayed if more than one associated error was selected in the Error Log screen for this zone. Additionally, it will not be active until the ZONE B NEXT ERROR button has been touched.</p>
ZONE B NEXT ERROR	<p>Touch the ZONE B NEXT ERROR button to view the next error associated to this zone. Zone 'B' pertains to the second or highest numbered zone assigned to the card.</p> <p>NOTE: This button is only displayed if more than one associated error was selected in the Error Log screen for this zone. Additionally, it will become inactive if there are only two errors selected and the ZONE B PREVIOUS ERROR button has been touched.</p>
BACK TO CC / CM	<p>Touch the BACK TO CC / CM button to return to the Card Module View. This is a convenient way to pick another card to view from the same Card Module.</p> <p>NOTE: If another card is selected, the error information will only be displayed if the card was colored red. The red color indicates that an error selected in the Error Log is associated with the card.</p>
Exit	<p>Touch the EXIT button to leave the Card Layout view and return to the Home screen. This is a common screen element that is included in all of the Card Layout views.</p>

8.2.1 Accessing the Card Layout Screen - Card Module Troubleshooting View

The first view in the Card Layout Troubleshooting screen is of the controller mainframe and card module. It contains a detailed view of the module and its location relative to the overall mainframe layout. Each module in the mainframe that contains a card with an error is colored red. The modules themselves contain the individual cards. Each card in the module that has a related error will be colored red as well. This view is used for locating and selecting a card associated to a given error within the module.

To access the Card Module Troubleshooting View from the Status Screen:

1. Touch the STATUS field in the System Footer.
2. Touch the ERROR LOG button.
3. Touch any ERROR (up to 10 total) displayed in the Error Log screen.
4. Touch the GO TO CARD LAYOUT button.

To access the Card Module Troubleshooting View from the Home Screen:

1. Touch the DATA RECORDING button in the Home screen.
2. Touch the ERROR LOG button from the Data Recording sub-menu.
3. Touch any ERROR (up to 10 total) displayed in the Error Log screen.
4. Touch the GO TO CARD LAYOUT button.

8.2.2 Accessing the Card Layout Screen - Card Detail Troubleshooting View

The second view in the Card Layout Troubleshooting screen is of the card itself. This is a detailed view of the card that was selected in the card module troubleshooting view. It is used for viewing zone specific errors and locating failed components on a card, such as a blown fuse or switching device. These devices will be marked with a red 'X'.

To access the Card Detail Troubleshooting View from the Status screen:

1. Touch the STATUS field in the System Footer.
2. Touch the ERROR LOG button.
3. Touch any ERROR (up to 10 total) displayed in the Error Log screen.
4. Touch the GO TO CARD LAYOUT button.
5. Touch any red colored CARD from the card module graphic in the Card Module view.

To access the Card Detail Troubleshooting View from the Home screen:

1. Touch the DATA RECORDING button in the Home screen.
2. Touch the ERROR LOG button from the Data Recording sub-menu.
3. Touch any ERROR (up to 10 total) displayed in the Error Log screen.
4. Touch the GO TO CARD LAYOUT button
5. Touch any red colored CARD from the card module graphic in the Card Module view.

Chapter 9 Making Adjustments

This chapter explains how to use Matrix to monitor and modify the system. Adjustments to the process settings for a mold setup can be made before mold startup, or during mold operation.

Matrix provides both a graphical and textual representation of the system state and settings. Multiple pane screen layout options are available to group zones and to control groups of zones together. Multi-paned layouts use a text display. In the Cavity Layout screen design or import a cavity diagrams to visualize the physical layout of the cavities, runners and assign associated heating zones to them.

9.1 Selecting Multiple Zones

Multiple zones can be selected in the Text screen, Graph screen, Multi-pane view and zone selection area in a number of ways, one is by using the BLOCK button.

To select multiple zones using the BLOCK button:

1. Touch BLOCK. Refer to [Figure 9-1](#).
2. Touch the first zone to be included.
3. Touch the last zone to be included. All zones in-between are selected.

The Quick Set screen is displayed with the selected zones highlighted. Refer to [Figure 9-13](#).

To select multiple zones using the touch screen:

- Select a zone and drag the selection to choose all the zones to be included. The text for selected zones are highlighted in yellow.

9.2 Graph Screen Overview

After mold setup is loaded or RUN THE MOLD selected, either the Graph screen, Text screen or Multi-pane screen appears. Toggle between these three screens, to view data according to format, by touching the TEXT, GRAPH, PANES or VISUAL button in the top right section of the screen. The image below shows the Graph screen in split screen mode, where a mold setup of 48 zones has been loaded and is controlling at setpoint.

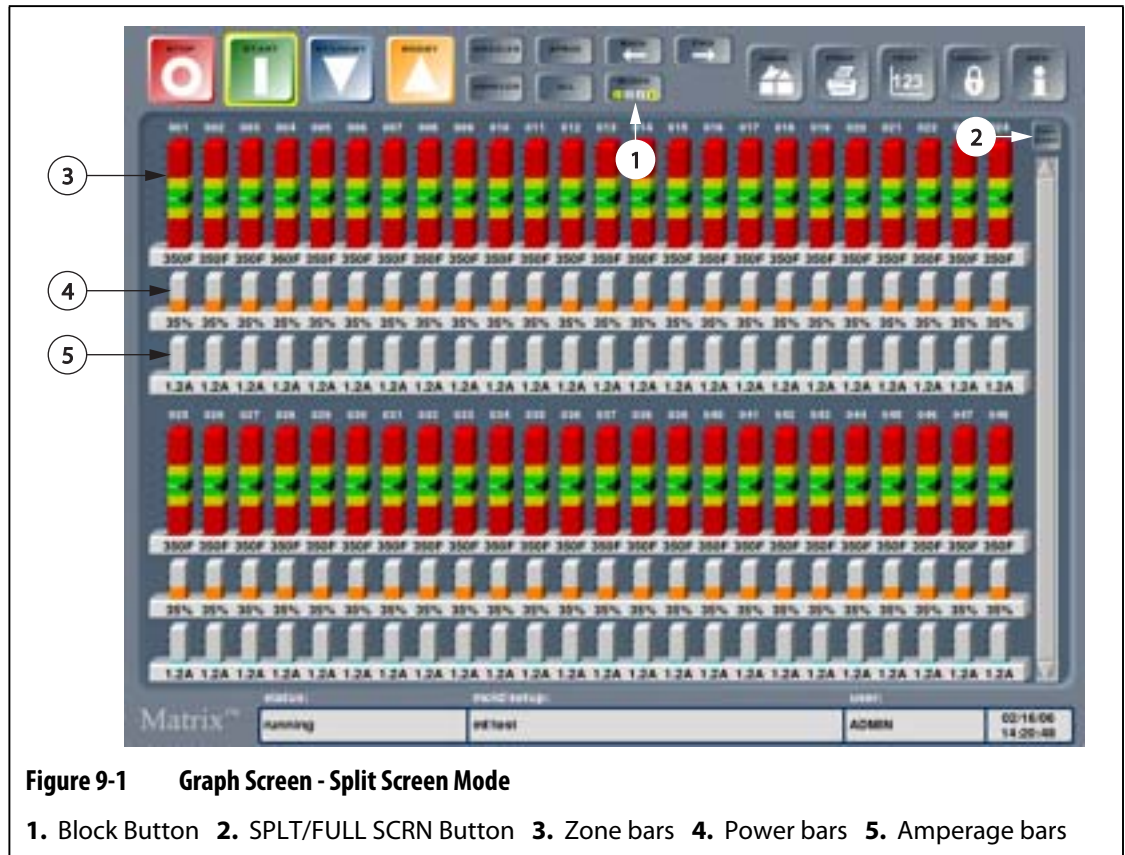


Figure 9-1 Graph Screen - Split Screen Mode

1. Block Button 2. SPLT/FULL SCRIN Button 3. Zone bars 4. Power bars 5. Amperage bars

Table 9-1 Graph Screen Item Descriptions



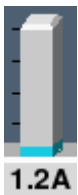
Item	Description
<p data-bbox="384 296 501 323">Zone Bars</p> 	<p data-bbox="683 296 1481 428">Each individual bar on the screen represents a single zone of temperature control. Each bar is labeled above with the zone number. The text shown at the base of each bar is the actual temperature for that zone.</p> <p data-bbox="683 447 1326 478">The different colors in each bar have a different meaning.</p> <ul data-bbox="683 495 1481 894" style="list-style-type: none"> <li data-bbox="683 495 1283 527">• The green area represents the molding window. <li data-bbox="683 535 1219 567">• The white hairline represents the setpoint. <li data-bbox="683 575 1481 751">• An arrow represents the actual temperature. <ul data-bbox="740 615 1481 751" style="list-style-type: none"> <li data-bbox="740 615 1481 680">• A yellow arrow means the temperature is not within the graph range. <li data-bbox="740 688 1481 751">• If the arrow is black and splits the line, the temperature is at the setpoint. <li data-bbox="683 783 1326 814">• The yellow area in the zone bar is the alarm window <li data-bbox="683 823 1118 854">• The red area is the abort window. <li data-bbox="683 863 1257 894">• A blank gray bar means the zone is turned off.
<p data-bbox="384 921 512 949">Power Bars</p> 	<p data-bbox="683 921 1481 1054">The shorter bars, directly below the zone bars. These show the percentage of power being applied to the heater. The text at the base of each bar is the actual power output percentage being delivered to that zone.</p> <ul data-bbox="683 1073 1481 1283" style="list-style-type: none"> <li data-bbox="683 1073 1449 1138">• If a zone is in Auto (closed loop) regulation, the bar will fill with orange depending on the percentage of power output. <li data-bbox="683 1146 1465 1211">• If a zone is in Manual (open loop) regulation, the bar will fill with green depending on the percentage of power output. <li data-bbox="683 1220 1481 1283">• If a zone is set to Monitor mode, the bar will remain grey (there is no power output for zones set to Monitor mode).
<p data-bbox="384 1306 560 1333">Amperage Bars</p> 	<p data-bbox="683 1306 1481 1409">The last group of bars, directly below the power bars, are light blue. These show the Amperage being drawn by each heater. The text shown at the base of each bar is the actual current reading for that zone.</p>

Table 9-2 Graph Screen Button Descriptions

Button	Description
<p data-bbox="384 1755 571 1782">SPLT/FULL SCRIN</p>	<p data-bbox="683 1755 1481 1887">Touch this button to toggle between displaying zones in split or full screen mode. In split screen mode, zone graphs are displayed in two groups, one on the top and one on the bottom. In full screen mode the zone graphs take up the whole viewing area. Refer to Figure 9-2.</p>

The Graph screen is capable of displaying a maximum of 48 zones of information in split screen mode and 24 zones in full screen mode.

- Touch and drag the scroll bar to bring additional zones into view.

The system always displays up to 24 or 48 zones at one time, depending on the screen mode.

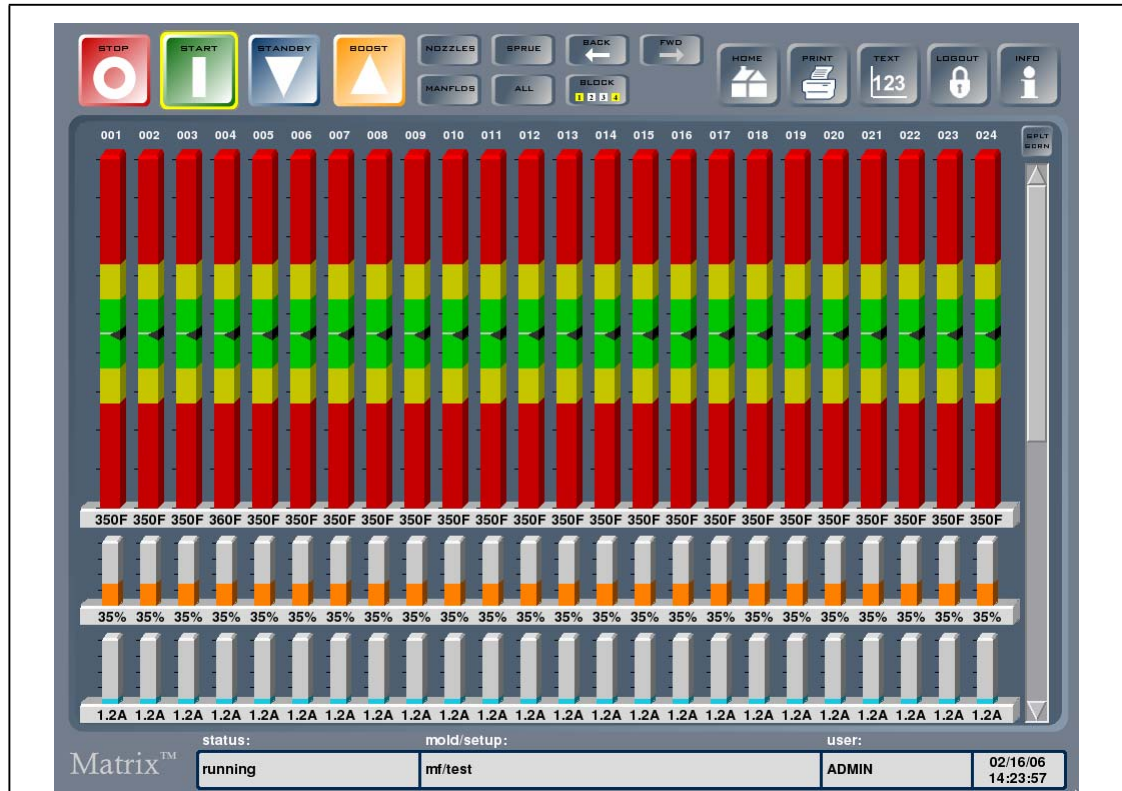


Figure 9-2 Graph Screen - Full Screen Mode

9.2.1 Zone Selection in the Graph Screen

To change any parameters for a zone, touch the bar of the zone to be changed or select multiple zones by selecting on the bar of the first zone and then drag to the required ending zone. The numbers for selected zones are highlighted in yellow. Dragging can be done in different directions, left, right, up or down, depending on the display mode.

The BLOCK button can also be used to select multiple zones. Refer to [Section 9.1](#).

9.3 Text Screen Overview

The Text screen, shown below, provides another way of viewing zone information. The data is displayed as text values instead of in a graphical format.

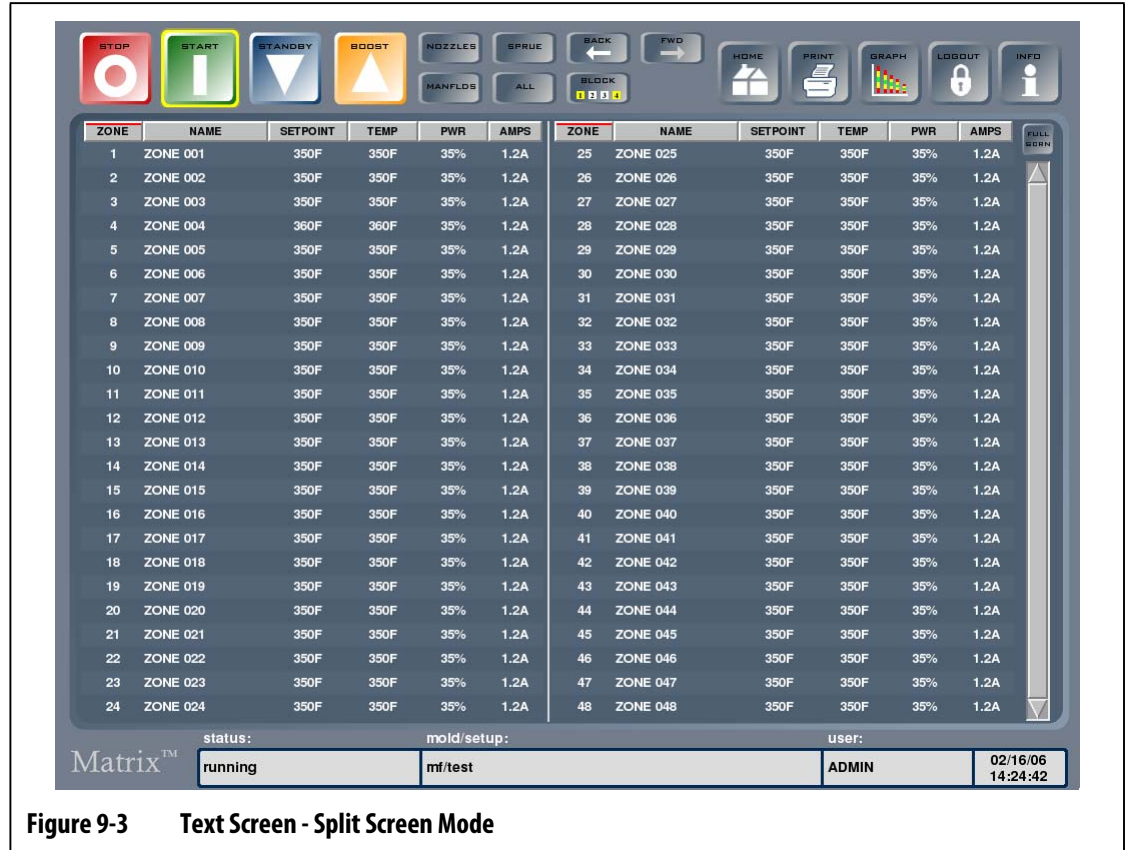


Figure 9-3 Text Screen - Split Screen Mode

Table 9-3 Text Screen Button Descriptions

Button	Description
SPLT/FULL SCRNR	Touching this button will toggle between displaying zones in split or full screen mode. Additional zone information is available in full screen mode (Figure 9-4).

The Text screen is capable of displaying a maximum of 24 zones of information in full screen mode and 48 zones in split screen mode. Touch and drag the scroll bar to view additional zones. As the scroll bar brings additional zones in to view, the system will always display up to 24 or 48 zones, depending on the screen mode.

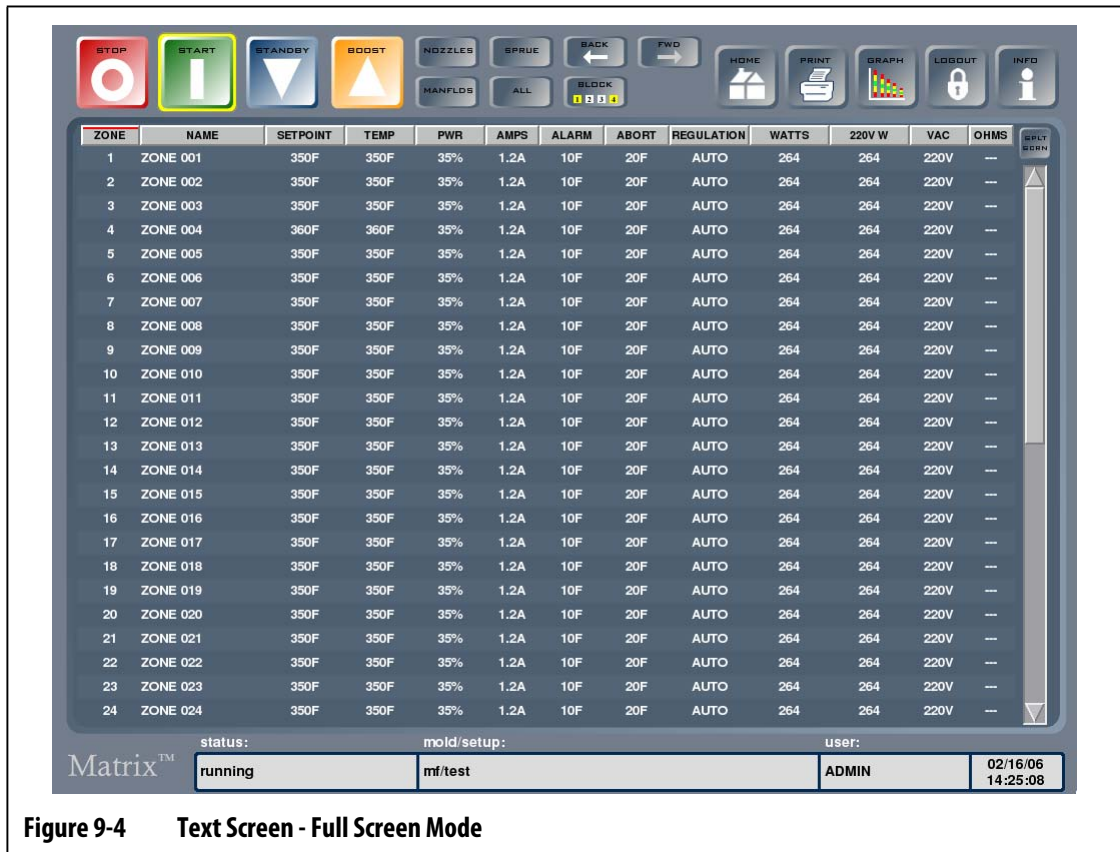


Figure 9-4 Text Screen - Full Screen Mode

9.3.1 Zone Selection in the Text Screen

To change any parameters for a zone, select the text of the zone to view, or select multiple zones by selecting on the text of the first zone and then dragging zones to the required ending zone. The text for selected zones are highlighted in yellow. Dragging can be done in different directions, left, right, up or down, depending on the display mode.

The BLOCK button can also be used to select multiple zones. Refer to [Section 9.1](#).

9.3.2 Sorting

Information can be sorted on the Text screen by selecting the Zone, Name, Setpoint, Alarm, Abort, and Regulation column headers. Sorting can be in ascending or descending order. A red line denotes the current sorting.

Information can be sorted according to the dynamic columns, for example, current (Amps), voltage (VAC), etc. This helps in figuring out which zone is drawing the most current at any given time. The ability to select column headings in order to sort information is used throughout Matrix.

9.4 Cavity Layout Screen

The 3D viewer allows the user to create and assign zone temperatures to an actual cavity layout of the mold. The creation of the layout can be completed manually or loaded from a UDM file generated by a product such as Moldflow Plastics Insight (MPI) or Moldflow Plastics Advisers (MPA). The Cavity Layout screen provides a visual representation of the mold, looking at the cavity side when the mold is open. When a problem occurs, such as a short shot or flash, the cavity can be visually located in the mold and the associated heating zone in the Cavity Layout screen to make the necessary adjustments.

Once configured, the Cavity Layout screen can be displayed by touching the Graph/Text button until VISUAL appears.

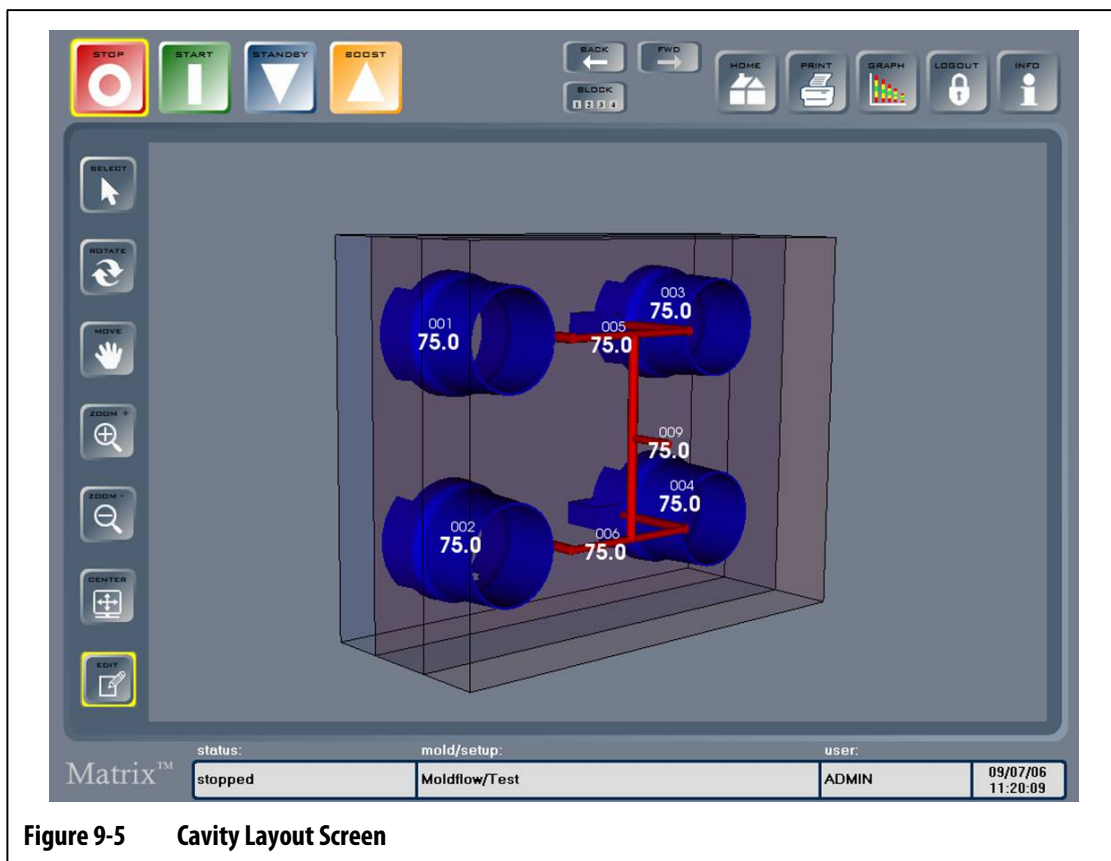


Figure 9-5 Cavity Layout Screen

Table 9-4 Cavity Layout Screen Item Descriptions

Item	Description
Cavities	Displayed using the actual part geometry or if manually created on Matrix, one of four blue shapes: <ul style="list-style-type: none"> • Box • Plate • Cylinder • Disc

Table 9-4 Cavity Layout Screen Item Descriptions (Continued)

Item	Description
Runners	Displayed as round red cylinders.
Labels	Attached to each cavity or runner and contains the actual temperature of a zone and its zone number in a smaller font.

Table 9-5 Cavity Layout Screen Button Descriptions

Button	Description
SELECT	Touch the SELECT button, and then touch the labeled cavities or runners to display the Quick Set screen for the selected zone.
ROTATE	Touch the ROTATE button, and then touch the image and drag to rotate the cavity layout.
MOVE	Touch the MOVE button, and then touch the image and drag to move the cavity layout.
ZOOM+	Touch the ZOOM + button, and then touch the image to incrementally zoom into the cavity layout.
ZOOM-	Touch the ZOOM - button, and then touch the image to incrementally zoom out of the cavity layout.
CENTER	Touch the CENTER button to re-position the cavity layout to the center of the screen.
EDIT	Touch the EDIT button, and then select a cavity or a runner to assign or reassign the zone numbers.

9.5 Mold Picture View

The Mold Picture view provides the ability to import a picture into the system and assign panels, containing critical zone data, to user defined areas of the image. When used with high cavity molds, this feature allows an operator to identify a cavity and instantly associate it to a heating zone in the controller for quick and accurate parameter changes. Additionally, there is the added advantage of providing access for up to five different views from a single screen. This is very useful for displaying separate images for each face of a stack tool or providing a picture detailing the manifold, to assist with maintenance tasks.

9.5.1 The Mold Picture Layout Configuration Screen

The **Mold Picture Layout Configuration** screen is used to select and assign a picture to each available view and configure the layout and data to be displayed on each Zone Panel. Additionally, it provides a means to customize the name of each view.

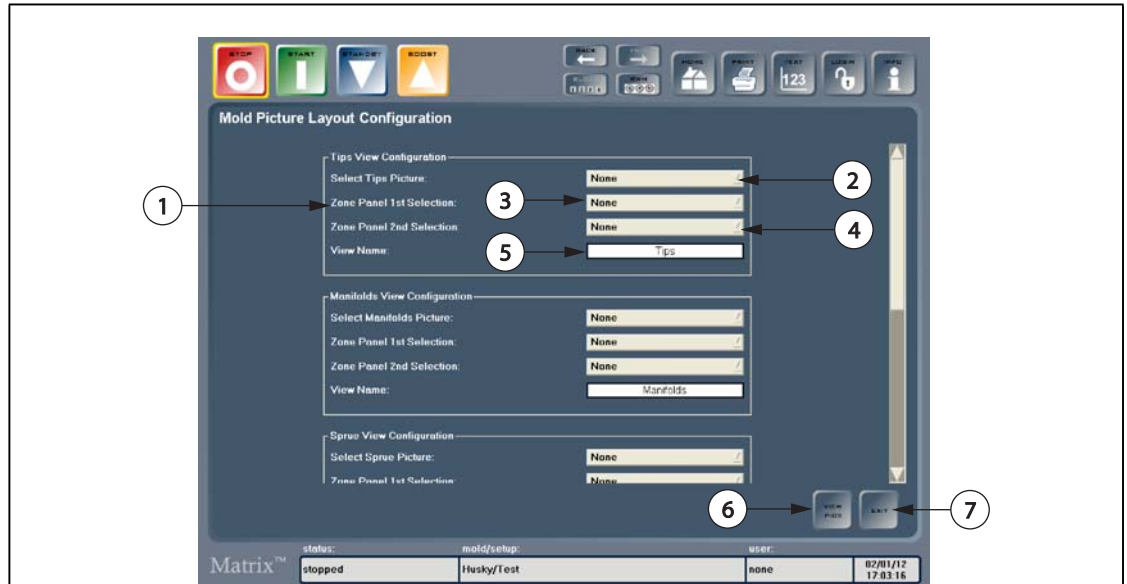


Figure 9-6 Mold Picture Layout Configuration Screen

- 1. View Configuration Box
- 2. Picture Selection Drop Down Menu
- 3. Zone Panel 1st Selection Drop Down Menu
- 4. Zone Panel 2nd Selection Drop Down Menu
- 5. View Name Field
- 6. View Pics Button
- 7. Exit Button

Table 9-6 Mold Picture Layout Configuration Screen Item Descriptions

Item	Description
View Configuration Box	There are five available view configuration boxes. Each one can be assigned a unique picture and set of zone parameters. They can also be assigned new names.
Picture Selection Drop Down Menu	This drop down menu provides a list of all available images for the Mold Folder associated to the currently loaded mold setup. NOTE: All images are stored in their associated Image folders found under each Mold folder in the Mold Files screen.
Zone Panel 1st Selection	This drop down menu provides a list of all available parameters that can be assigned to the top section of each Zone Panel.
Zone Panel 2nd Selection	This drop down menu provides a list of all available parameters that can be assigned to the bottom section of each Zone Panel.
View Name Field	This is an active field that when touched activates a keyboard pop-up for customizing the name displayed on the View Name button.

Table 9-7 Mold Picture Layout Configuration Screen Button Descriptions

Button	Description
VIEW PICS	Touch the VIEW PICS button to access the Mold Picture Configuration Screen.
EXIT	Touch the EXIT button to leave the Mold Picture Layout Configuration Screen and return to the Home screen.

9.5.2 Accessing the Mold Picture Layout Configuration Screen

To access the Mold Picture Layout Configuration Screen:

1. Touch the SCREEN button in the Home screen.
2. Touch the SCREEN LAYOUTS button from the SCREEN button sub menu.
3. Touch the MOLD PICTURE LAYOUT button from the SCREEN LAYOUTS button sub-menu.

9.5.3 Configuring a Mold Picture View

There are five available views that can be setup in the **Mold Picture Layout Configuration** screen. They are defined as follows:

Table 9-8 Mold Picture Layout Views

View	Description
Tips View Box	The intention of this view is to display a picture with all of the tip or cavity zones assigned to it.
Manifolds View Box	The intention of this view is to display a picture with all of the manifold zones assigned to it.
Sprue View Box	The intention of this view is to display a picture with all of the sprue zones assigned to it. This would be used primarily with stack tools that utilize multiple zones for heating the sprue bar.
Maintenance View Box	The intention of this view is to display a picture of the hot runner system exposed in the manifold plate or other common maintenance configuration with all of the appropriate zones assigned to it.
All View Box	The intention of this view is to display a picture with all of the zones in the system assigned to it.

9.5.3.1 Selecting a Picture

Each view configuration box has the means to assign a unique picture to it. The available choices are contained in the **Picture Selection** drop down menu. This menu is populated with the names of all the image files stored in the Images folder, located in the mold files screen, associated with the currently loaded mold setup.



IMPORTANT!

All assigned pictures are automatically stored to the associated mold setup. To minimize the size of the mold setup file and maximize system performance, it is recommended that the total of assigned images are kept to 2MB or smaller.

To assign a picture to a given view:

1. Touch the **Picture Selection** drop down menu in the desired **View Configuration** box.
2. Touch the desired file name from the **Picture Selection** drop down menu.
3. Repeat these steps for all views to be displayed.

9.5.3.2 Configuring Zone Panels

Zone Panels are active fields that are placed on an assigned picture to display zone data and provide a link to the Quick Set screen for making parameter adjustments. A choice of one or two parameters can be displayed within each zone panel. A list of parameter choices can be found in the Zone Panel drop down menus located in each View Configuration box. The available parameters are:

- Zone Number - Displays the zone number that is associated to that zone.
- Zone Name - Displays the zone name that is associated to that zone.
- Setpoint - Displays the setpoint for that zone.
- Actual Temp - Displays the actual temperature for that zone
- Power Output - Displays the percentage of power output to that zone
- Amperage - Displays the real-time amperage measurement of that zone



IMPORTANT!

The parameters selected from the zone Panel drop down menus are displayed for all Zone Panels. There is no method for assigning different parameters to each panel. the Zone Panels will increase in size if two parameters are selected for display.

To assign the **first** parameter selection to the Zone Panels:

1. Touch the Zone Panel 1st Selection drop down menu in the desired View Configuration box.
2. Touch the desired parameter type from the Zone Panel 1st Selection drop down menu.
3. Repeat step 1 and 2 for all views to be displayed.

To assign the **second** parameter selection to the Zone Panels:

1. Touch the Zone Panel 2nd Selection drop down menu in the desired View Configuration box.
2. Touch the desired parameter type from the Zone Panel 2nd Selection drop down menu.
3. Repeat step 1 and 2 for all views to be displayed.

9.5.3.3 Changing a View Name

Each view configuration box has a default name assigned to it. These names are linked to the labels on the selection buttons in the Mold Picture screen. Touching these buttons, displays the associated picture view and zone panels. In cases where the default name is not suitable, there is the means to change it to a more appropriate one.

To change the view name:

1. Touch the View Name field in the desired View Configuration box.
2. Touch the CLEAR button in the Keyboard pop-up to delete the existing name.
3. Type the new name into the word field in the Keyboard pop-up.
4. Repeat these steps for all views the require a name change.



IMPORTANT!

A maximum of 10 characters, including spaces, can be used in each new name. The new name will be displayed in the View Name field and in the title of the associated View Configuration box.

9.5.3.4 Finishing with the Mold Picture Layout Configuration Screen

After all the required views have been configured, touch the View Pics button to navigate to the Mold Picture screen.

9.6 The Mold Picture Screen

The Mold Picture screen has two functions. The first is to access the Picture Configuration screen. This screen is used for assigning zone panels to each picture view that has been assigned in the Mold Picture Layout Configuration screen. The second is to provide a functional method of displaying zone data as part of the Zone Data View button in the system header. This button also toggles between the Graph, Text and if configured the Panes and Cavity Layout screens.

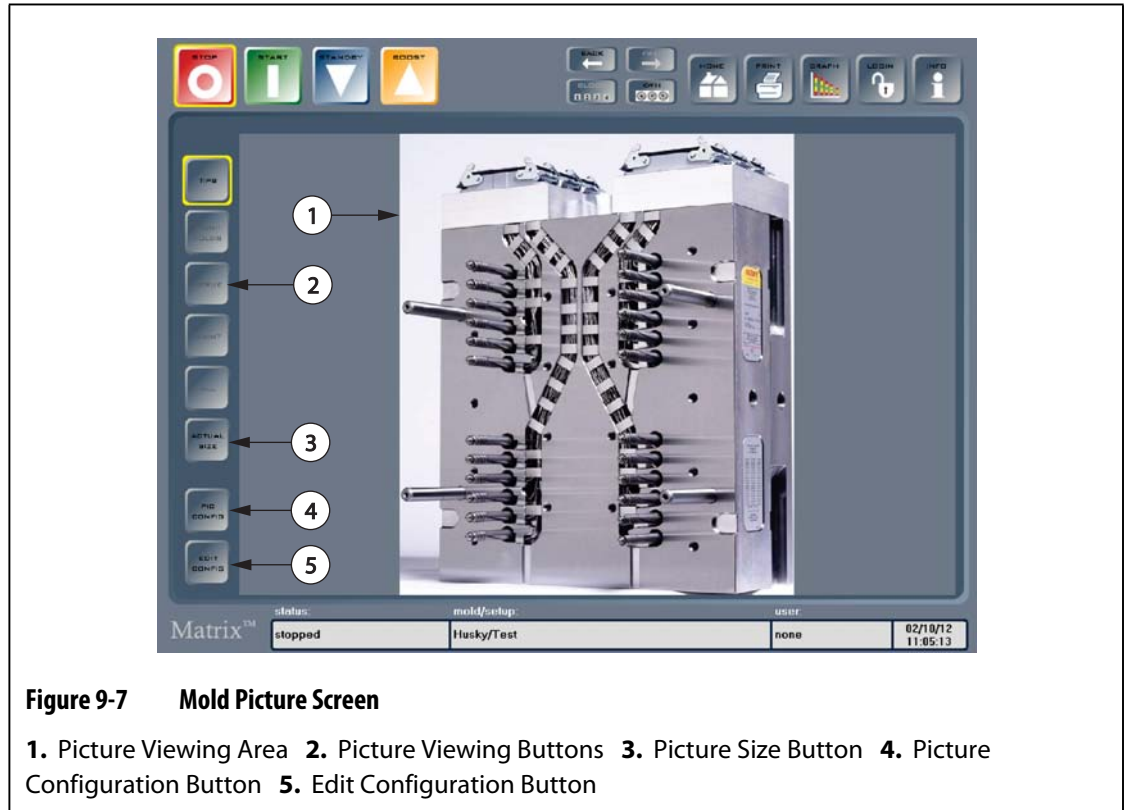


Figure 9-7 Mold Picture Screen

- 1. Picture Viewing Area
- 2. Picture Viewing Buttons
- 3. Picture Size Button
- 4. Picture Configuration Button
- 5. Edit Configuration Button

Table 9-9 Mold Picture Screen Item Descriptions

View	Description
Picture Viewing Area	This area is used to display the picture associated with the selected View button. If the view is set to actual size and the picture is larger than the available viewing area, scroll bars will appear for viewing the outer edges of the image. NOTE: The available viewing area is 893 x 576 pixels.

Table 9-10 Mold Picture Screen Button Descriptions

Button	Description
Picture View	Touch the Picture View buttons to display the associated picture for the selected view. The name assigned to each view, in the Mold Picture Layout Configuration screen, is displayed on the face of the button. The default button labels are Tips, Manifolds, Sprue, Maint and All.
Picture Size	Touch the Picture Size button to toggle between fitting the current image to the available viewing area or displaying it as actual size. The button name will change between Actual Size and Fit Screen based on the current view mode. NOTE: If the view is set to actual size and the picture is larger than the available viewing area, scroll bars will appear for viewing the outer edges of the image.

Table 9-10 Mold Picture Screen Button Descriptions (Continued)

Button	Description
Pic Config	Touch the Picture Configuration button to access the Picture Configuration screen. This screen is used to assign and position Zone Panels to the picture associated with each view. NOTE: If a picture is in Actual Size mode, the Pic Config button will be grayed out.
Edit Config	Touch the Picture Configuration button to access the Mold Picture layout Configuration screen. This screen is used to assign a picture, choose the parameters to be displayed in the Zone Panels and assign a name to each view.

9.6.1 Accessing the Mold Picture Screen

There are two methods for accessing the Mold Picture screen.

To access the Mold Picture screen from the Mold Picture Layout Configuration screen:

- Touch the VIEW PICS button

To access the Mold Picture screen from the System Header:

- Touch the Zone Data View button until the Mold Picture screen is displayed. This button toggles between the Graph, Text and is configured, the Panes, the Mold Picture and Cavity Layout screens.

9.7 The Mold Picture Panel Configuration Screen

The Mold Panel Configuration screen is used to assign Zone Panels to each image allocated to the Picture View buttons. It also provides access to the Leader Configuration screen for assigning leaders to each panel.

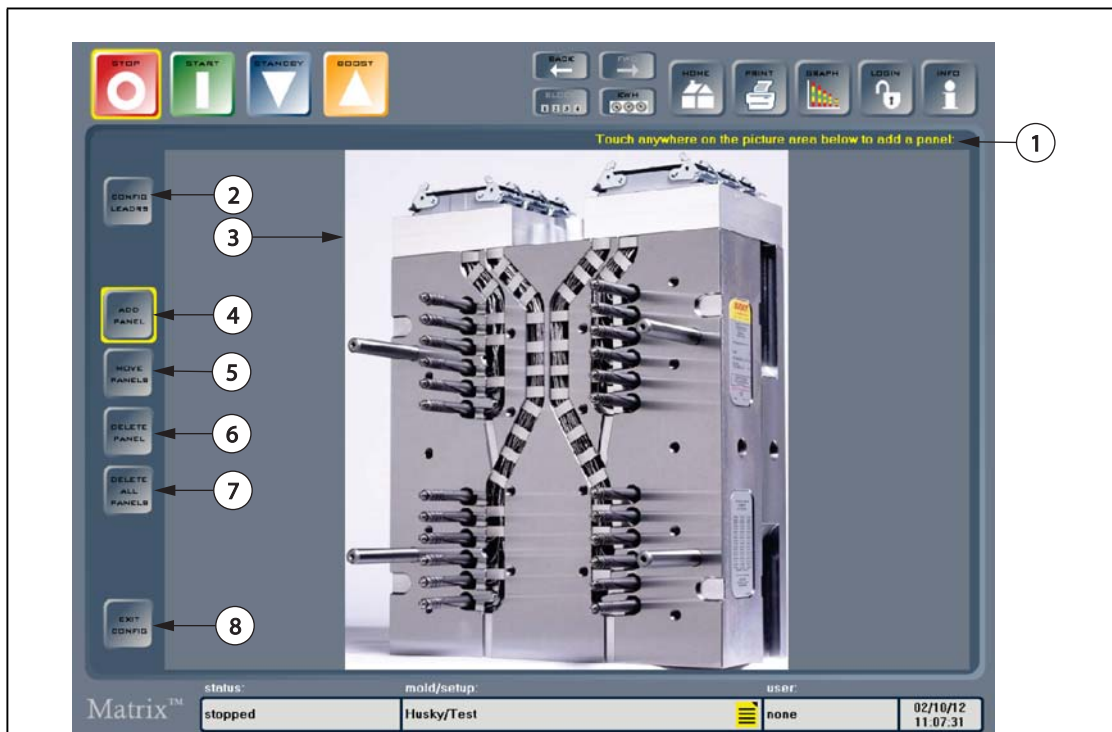



Figure 9-8 Mold Picture Panel Configuration Screen

1. Instructional Text Field 2. Configure Leaders Button 3. Picture Viewing Area 4. Add Panel Button 5. Move Panels Button 6. Delete Panel Button 7. Delete All Panels Buttons 8. Exit Panel Configuration Button

Table 9-11 Mold Picture Panel Configuration Screen Item Descriptions

Item	Description
Instructional Text Field	This field displays context sensitive instructional text on what action is required to configure the screen.
Picture Viewing Area	This area is used to display the picture associated with the selected View button. In panel configuration mode, it becomes an active area that when touched allows the image to be modified by adding Zones Panels.

Table 9-12 Mold Picture Screen Button Descriptions

Buttons	Description
Configure Leaders Button	Touch the Configure Leaders button to access the Mold Picture Leader Configuration Screen. This screen is used to add leaders to each Zone Panel to better indicate which area on the picture the panel pertains to.
Add Panel Button	<p>Touch the Add Panel button to add Zone Panels to the picture. In this mode, when the Picture Viewing area is touched it displays a Zone Grid pop-up window for selecting which zone panel will be displayed on the area that was touched.</p> <p>Zone Grid Pop-Up Window</p> 
Move Panels Button	Touch the Move Panel button to adjust the location of panels within the Picture Viewing area. In this mode, any Zone Panel can be touched and dragged to a new location within the Picture Viewing Area.
Delete Panel Button	Touch the Delete Panel button to remove individual Zone Panels from the Picture Viewing area. In this mode, touching any Zone Panel in the Picture Viewing area will delete it from the image.
Delete All Panels Button	Touch the Delete All Panels button to remove all assigned Zone Panels from the Picture Viewing area. touching this button will display a pop-up window to confirm that this is the desired action. Touching the Yes button in the pop-up window will delete all Zone Panels from the image.
Exit Configuration Button	Touch the Exit Configuration button to exit the mold Picture Panel Configuration screen and return to the Mold Picture screen.

9.7.1 Accessing the Mold Picture Panel Configuration Screen

To access the Mold Picture Panel Configuration screen:

1. Touch the Picture View button that contains the desired picture to be configured.
2. Touch the Pic Config button.

9.7.2 Assigning Zone Panels to a Picture View

Zone Panels can be assigned to the image allocated to each picture view in the Mold Picture screen. The panels identify the area of the picture that is associated to the zone to which the panel corresponds. Each panel displays the allocated data, which is configured in the Mold Picture Layout Configuration screen, for its assigned zone and provides a direct link to the Quick Set screen when touched.

To assign zone panels to a picture view:

1. Touch the Picture View button that contains the desired picture to be configured.
2. Touch the Pic Config button.
3. Touch the Add Panel button.
4. Touch the area on the picture where the panel will be located.
5. Touch the associated Zone button, in the Zone Grid pop-up window, that is to be assigned to the selected area on the picture.
6. Repeat these steps until all desired Zone Panels are assigned.

9.7.3 Moving Zone Panels in a Picture View

After they have been assigned, each Zone Panel can be moved to any position within the boundaries of the picture to which it has been allocated.

To move Zone Panels in a Picture View:

1. Touch the Picture View button that contains the desired picture to be configured.
2. Touch the Pic Config button.
3. Touch the Move Panels button.
4. Touch and drag the Zone Panel to move it to its new location.
5. Repeat these steps until all desired Zone Panels have been moved.

9.7.4 Deleting Zone Panels from a Picture View

If the Zone Panel is no longer needed or was added in error, it can be removed from the Picture View to which it was assigned.



IMPORTANT!

If a leader has been assigned to the Zone Panel, it will be deleted as well.

To delete a Zone Panel from a Picture View:

1. Touch the Picture View button that contains the desired picture to be configured.
2. Touch the Pic Config button.
3. Touch the Delete Panels button.

4. Touch and drag the Zone Panel that requires removal.
5. Repeat these steps until all desired Zone Panels have been deleted.

9.7.5 Deleting All Zone Panels from a Picture View

If Zone Panels are no longer needed they can all be deleted at one time from the Picture View to which they were assigned.



IMPORTANT!

If leaders have been assigned to the Zone Panels, they will be deleted as well.

To delete all Zone Panels from a Picture View:

1. Touch the Picture View button that contains the desired picture to be configured.
2. Touch the Pic Config button.
3. Touch the Delete All Panels button.
4. Touch the Yes button in the Warning pop-up window.

9.8 The Mold Picture Leader Configuration Screen

The Mold Picture leader Configuration screen is used to assign leaders to each Zone Panel. Leaders are lines that are used to more precisely identify the area on the picture that is associated with a given Zone Panel. They are especially useful on pictures of high cavity molds that have tight pitch spacing between tips.



Figure 9-9 Mold Picture Leader Configuration Screen

1. Instructional Text Field 2. Configure Panels Button 3. Picture Viewing Area 4. Add Leader Button 5. Move Leaders Button 6. Delete Leader Button 7. Delete All Leaders Button 8. Exit Leader Configuration Button

Table 9-13 Mold Picture Leader Configuration Screen Item Descriptions

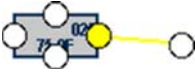
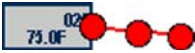
Item	Description
Instructional Text Field	This field displays context sensitive instructional text on what action is required to configure the screen.
Picture Viewing Area	This area used to display the picture associated with the selected View Button. In leader configuration mode, it becomes an active area that when touched allows the image to be modified by adding Leaders to Zone Panels.

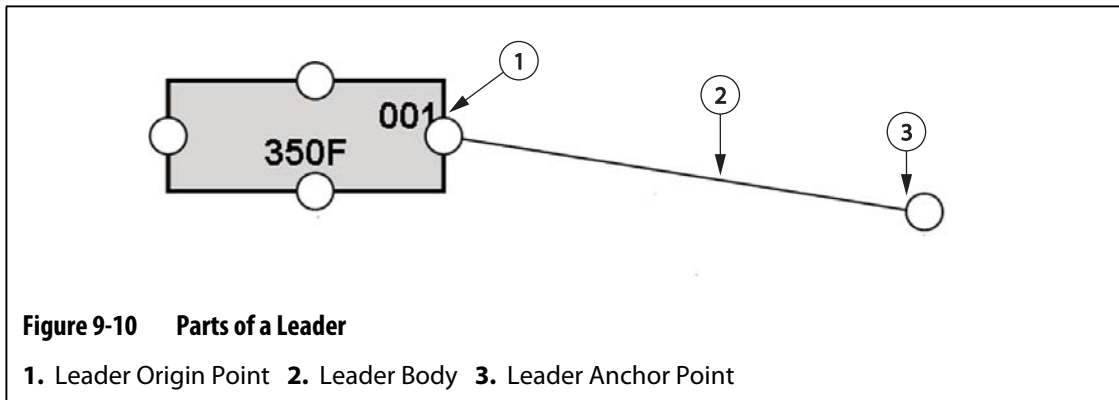
Table 9-14 Mold Picture Leader Configuration Screen Button Descriptions

Button	Description
Configure Panels Button	Touch the Configure Panels button to access the Mold Picture Panel Configuration Screen. This screen is used to add panels to a picture that displays zone specific data and provides a link to the Quick Set Screen.
Add Leader Button	Touch the Add Leaders button to attach Leaders to each Zone Panel. In this mode, each Zone Panels will be displayed with origin points that are used to anchor the leader to the panel. Zone Panel in Add Leader Mode



Table 9-14 Mold Picture Leader Configuration Screen Button Descriptions (Continued)

Button	Description
Move Leader Button	<p>Touch the Move Leaders button to adjust the location of the leader origin point on the panel or leader end point on the image. In this mode each leader and leader origin point will be highlighted in yellow.</p> <p>Zone Panel in Move Leaders Mode</p> 
Delete Leader Button	<p>Touch the Delete Leader button to remove a leader from the Zone Panel. In this mode, each leader, leader origin point and leader end point will be highlighted in red.</p> <p>Zone in Delete Leader Mode</p> 
Delete All Leaders Button	<p>Touch the Delete All Leaders button to remove all Leaders from the assigned Zone Panels. Touching this button will display a pop-up window to confirm that this is the desired action. Touching the YES button in the pop-up window will delete all Leaders from the image.</p>
Exit Configuration Button	<p>Touch the Exit Configuration button to exit the Mold Picture Leaders Configuration screen and return to the Mold Picture screen.</p>



9.8.1 Accessing the Mold Picture Leader Configuration Screen

To access the Mold Picture Leader Configuration Screen:

1. Touch the Picture View button that contains the desired picture to be configured.
2. Touch the Pic Config button.
3. Touch the Config Leaders button.

9.8.2 Assigning Leaders to a Zone Panel

Leaders can be assigned to a Zone Panel to clearly identify the area of the picture that is associated with a given Zone Panel.

To assign a Leader to a Zone Panel:

1. Touch the Picture View button that contains the desired picture to be configured.
2. Touch the Pic Config button.
3. Touch the Config Leaders button.
4. Touch the Add Leaders button.
5. Touch the origin point on the Zone Panel where the leader will attach.
6. Touch the area on the picture that is to be associated with the Zone Panel.
7. Repeat these steps until all desired Leaders are assigned.

9.8.3 Deleting All Zone Panels from a Picture View

After they have been assigned, each Leader origin point can be moved to any of the four sides of its associated Zone panel or any anchor position within the boundaries of the picture to which it has been allocated.

To move a leader origin point on a Zone Panel:

1. Touch the Picture View button that contains the desired picture to be configured.
2. Touch the Pic Config button.
3. Touch the Config Leaders button.
4. Touch the Move Leaders button.
5. Touch the Origin Point of the new position, on the Zone Panel, where the leader will attach.
6. Repeat step 5 until all desired Leader Origin Points are reassigned.

9.8.4 Deleting a Leader from a Zone Panel

If a Leader is no longer needed or was added in error, it can be removed from the Zone Panel to which it has been assigned.

To delete a leader from a Zone Panel:

1. Touch the Picture View button that contains the desired picture to be configured.
2. Touch the Pic Config button.
3. Touch the Config Leaders button.
4. Touch the Delete Leader button.
5. Touch any one of the three Delete Points on the Leader that requires removal.
6. Repeat these steps until all desired Leader have been deleted.

9.8.5 Deleting All Leaders from a Picture View

If Leaders are no longer needed in a Picture View, they can all be deleted at one time from the Zone Panels to which they have been assigned.

To delete all Leaders from a Picture View:

1. Touch the Picture View button that contains the desired picture to be configured.
2. Touch the Pic Config button.
3. Touch the Config Leaders button.
4. Touch the Delete All Leaders button.
5. Touch the Yes button in the Warning pop-up window.

9.9 Logging Reasons for Changes

The Change Log tracks all zone changes. This data can be viewed, saved to file and exported as all zone changes in the system, all zone changes for a given mold or all zone changes for a specific mold setup. Enable the Log Reason setting in the Advanced Setup screen to log reason for changes before a change is made. If Log Reason For Change is enabled the following will occur:

1. If altering a numerical value, touch the setting that requires a change.
2. The Enter a Reason for Change Dialog box is displayed.
3. Change the setting.
4. The dialog is displayed immediately if you are changing a text value.
5. If you want to enter your own reason, touch the text box to display a keyboard.
6. Enter your reason, and then touch ENTER.
7. Touch ADD TO LIST to add your reason to the drop-down list.

If you want to change your reason before adding it to the drop-down list, you can select the text box again to edit your reason.

8. Select a reason from the drop-down list. Default reasons are listed below:
 - Short Shot
 - Flash
 - Gate Drool
 - Gate Burning
 - Stuck Valve Gate
9. Touch OK to continue.

If you were changing a numerical value, the Quick Set or the Quick Set - More... screen is displayed. If you were changing a text value, an editing dialog is displayed.

9.10 Quick Set Screen

The purpose of the Quick Set screen is to centralize access to modify some of the most common zone settings. To display the Quick Set screen, select a zone or group of zones.

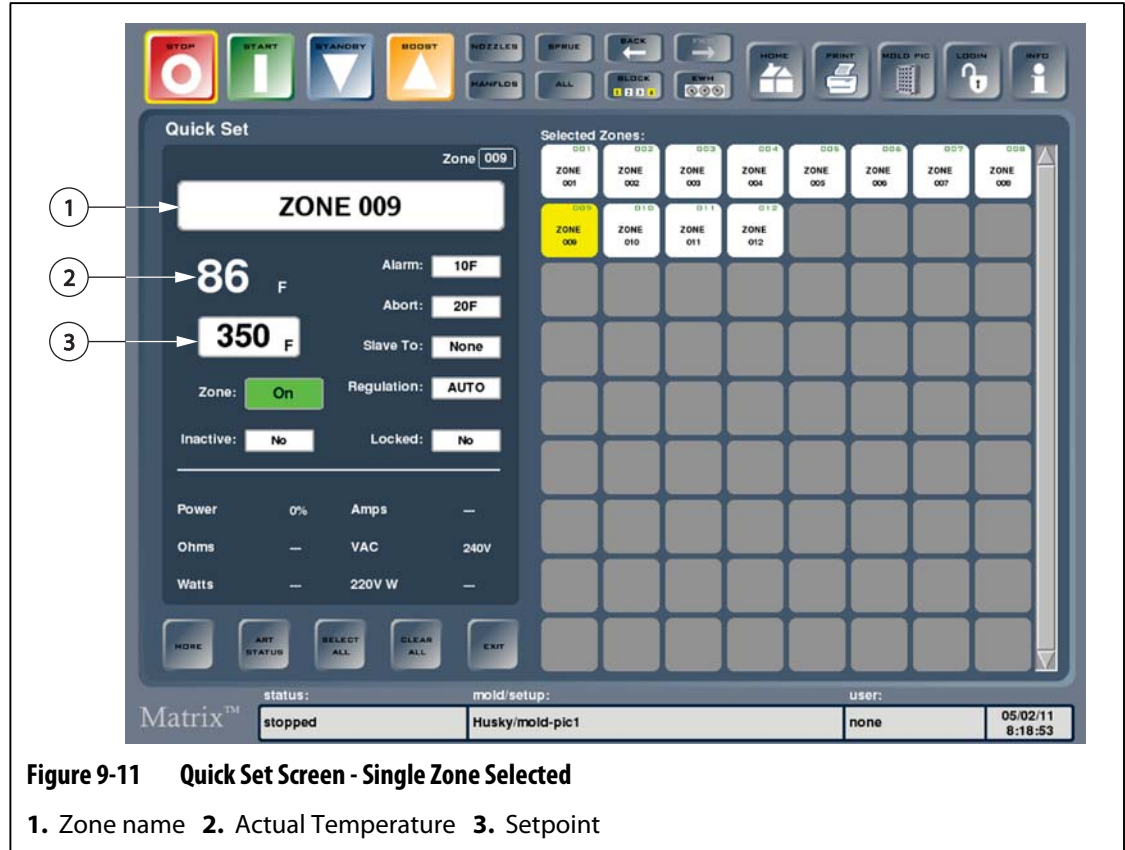


Figure 9-11 Quick Set Screen - Single Zone Selected

- 1. Zone name
- 2. Actual Temperature
- 3. Setpoint

Table 9-15 Quick Set Screen Item Descriptions

Item	Description
Zone Name	The name ZONE 009 helps you identify the zones easily.
Actual Temperature	The actual temperature of the zone is displayed directly below the zone name. Refer to Figure 9-11 , item 2.
Setpoint	The setpoint temperature for the zone is directly beneath the actual temperature. Refer to Figure 9-11 , item 3.
Zone	Touch inside the box to toggle the selected zone ON (green) or OFF (red).
Inactive	Touch inside the box to toggle the selected zone NO (active) or YES (inactive).
Alarm	The Alarm setting specifies how many degrees over or under the setpoint the alarm is to be initiated.
Abort	The Abort setting specifies how many degrees over or under the setpoint the alarm is to be initiated and the zone or system shut down, based on the chosen PCM setting (System shutdown or Zone shutdown).

Table 9-15 Quick Set Screen Item Descriptions (Continued)

Item	Description
Slave To	Slaving is sometimes necessary when a zone's thermocouple fails during normal operation. Once a master zone is specified, the zone is able to continue operation. The Slave To setting allows you to use the master zone's power output percentage for the selected zone. A value of None means that the selected zone is not slaved to any other zone.
Regulation	This setting sets the regulation mode for the selected zone. AUTO or Automatic (closed loop) means the system will use a thermocouple to control the temperature. MAN or Manual (open loop) means the system will only apply power (0 to 100%) to the heater and not look for thermocouple feedback. MON or Monitor means the system will only monitor the temperature of a thermocouple (no power output).
Locked	Touch inside the box to toggle the selected zone NO (unlocked) or YES (locked).
Settings Display	The lower portion of the settings area below the white horizontal line is used to display real-time values associated with the selected zone. The Power, Ohms, Watts, Amps, VAC and 220V W values are displayed for informational purposes only and cannot be changed.
Zone Selection Grid	The zone selection grid on the right half of the screen is used to select one or more zones to change settings. Zones selected from the Graph or Text screen are highlighted in yellow in the selection grid, and any changes made will affect the highlighted zones. To select additional zones, touch any of the zone boxes, or drag your finger in a horizontal or vertical direction to select a block of zones. To de-select a zone, select the zone box again (the box will appear white).

Table 9-16 Quick Set Screen Button Descriptions

Button	Description
MORE	Touch the MORE button to display additional zone settings.
ART STATUS	Touch the ART STATUS button to open the ART Status screen.
SELECT ALL	Touch the SELECT ALL button to select all the zones in the zone selection grid.
CLEAR ALL	Touch the CLEAR ALL button to deselect all the zones in the zone selection grid.
EXIT	Touch the EXIT button to close the Quick Set screen and return to the Graph or Text screen.

9.10.1 Changing the Zone Name

The name of each zone in the system can be customized to make it easier to find and make changes. Rename each zone to correspond with a cavity, gate, probe or manifold, or to any appropriate name as necessary.

To change a zone name:

1. Touch the zone to be changed.
2. Touch the Zone Name box.
3. Enter a new zone name on the displayed keyboard. There are specialized buttons which can automatically insert common names listed below.
 - zone
 - probe
 - tip
 - nozzle
 - sprue
 - manifold
 - bridge
 - valve gate
4. Touch ENTER to close the keyboard and return to the Quick Set screen.

9.10.2 Changing the Setpoint

The setpoint temperatures for each of the heaters in the mold must be specified. The default setting is 177 °C (350 °F).

To change a setpoint of a zone:

1. Touch the zone to be changed.
2. Touch the Setpoint box to open a keypad.
3. Enter a new setpoint value, and then touch ENTER.

9.10.3 Changing the Alarm Window

Specify how many degrees above or below the setpoint the alarm is to be initiated. The default setting is 6 °C (10 °F).

Alarm Example: Setpoint = 300 °F, Alarm = 10 ° F

An alarm is initiated above 310 °F or below 290 °F. If the setpoint is set to 350°F, the alarm will be initiated above 360 °F or below 340 °F. The setting always represents an amount above and below the current setpoint.

To change the alarm setting for a zone:

1. Touch the zone to be changed.
2. Touch the Alarm box to open a keypad.
3. Enter a new value, and then touch ENTER.

9.10.4 Changing the Abort Window

Specify how many degrees above or below the setpoint the abort is to be initiated and shut down. The default setting is 11 °C (20 °F).

Abort Example: Setpoint = 300°F, Abort = 20°F.

The abort will be initiated above 320 °F or below 280 °F and shut the zone or the system down based on the chosen PCM directive. If the setpoint is changed to 350 °F, the abort will be initiated above 370 °F or below 330 °F. The setting always represents an amount above and below the current setpoint.

To change the abort setting for a zone:

1. Touch the zone to be changed.
2. Touch the Abort box to open a keypad.
3. Enter a new value, and then touch ENTER.

9.10.5 Zone Slave

If a thermocouple fails, Matrix will initiate an alarm and display an error on the Zone Status screen for the affected zone. At this point the user choose to perform one of the following fixes:

1. Stop molding, remove the mold and repair the fault. This may not be desirable or even possible.
2. Switch the zone to Manual control mode and continue processing. This has limitations as Manual mode is not able to compensate for changes in the process that affect the heater's power requirements, i.e. shear heat.
3. Slave the faulty zone to another. Due to the symmetry in the design of hot runner molds, frequently there are other zones that have very similar thermal characteristics as the faulty zone. Matrix can apply the power output from a fully functioning zone to the zone with the defective thermocouple. This means that any processing changes that affect the power requirements of the heaters are automatically applied to the defective zone. It is similar to repairing the defective thermocouple without ever opening the mold.

9.10.5.1 Automatic Slave Function

If a thermocouple malfunctions during operation of the mold, the Matrix Auto-Slave function will take over. Matrix constantly monitors the heaters in the mold and stores comparative data. This data is used to select an almost identical Master/Slave relationship for every zone in the mold. If a thermocouple fails, Matrix will initiate an alarm and display an error on the Zone Status screen.

Based on the comparative data stored, the system knows which zone to slave the faulty zone to so it can continue to operate in a closed loop control mode. On the Graph screen, the color of the auto-slaved zone number changes from white to green and the number toggles between the original zone number and the zone to which it is slaved. The green color indicates the zone was slaved automatically. Once the error is cleared, the slave becomes permanent and turns dark blue. The Automatic Slave function can be disabled in the Advanced Setup screen.

9.10.5.2 Using the Automatic Slave Function

When using this function the user is only required to view the error, then clear and reset the alarm. On the Text and Multi-pane screen, the color of the auto-slaved zone number changes from white to green, and the number toggles between the original zone number and the zone to which it is slaved. Green text indicates the zone was slaved automatically.

Once the error is cleared and reset, the slave value is stored to the mold setup and the zone number turns dark blue. The Quick Set screen for that zone displays the zone it is slaved to.

If the automatic slaving function is unable to find a suitable partner, the Automatic Manual Control (AMC) function is activated. If AMC is set to On, the system automatically switches the bad zone into Manual mode applying a calculated average power output to the heater. If AMC is Off, Priority Control Mode (PCM) is activated and shuts down either the zone or the system based on your PCM directive.

9.10.5.3 Manually Slaving One Zone to Another Zone

If a thermocouple is about to fail, it can be slaved to another zone before it fails completely.

To manually slave one zone to another:



IMPORTANT!

Make sure a master zone with similar heater characteristics is chosen. For example, you may not want to slave a manifold zone to a tip zone. A zone cannot be slaved to itself; if this is attempt, Matrix will ignore the changes.

1. Touch the zone you want to make a slave.
2. Touch the Slave To box to open a keypad.
3. Enter the zone number of the master zone, and then touch ENTER.

On the Text and Multi-pane screens, the color of the manual-slaved zone changes from white to dark blue and the zone and name toggles between the original zones information and the zone to which it is slaved.

9.10.5.4 Changing the Zone Regulation

Each zone has the ability to run in one of three control modes. AUTO or Automatic (closed loop) means the system will use a thermocouple to control the temperature. MAN or Manual (open loop) means the system will only apply power (0 to 100%) to the heater and not look for sensor feedback. MON or Monitor means the system will only monitor the temperature of a thermocouple (no power output). Specify the control mode in which each zone must be run. The default setting is AUTO.

To change the zone regulation:

1. Touch the zone to be changed.



IMPORTANT!

If a zone is placed in MONITOR mode in error, the system will not provide power output to that heater.

2. Touch the Regulation box to toggle between the three modes.

9.11 Quick Set - More... Screen

To display the Quick Set - More... screen, touch MORE. Figure 9-12 shows how the Quick Set - More... screen appears when one zone is selected.

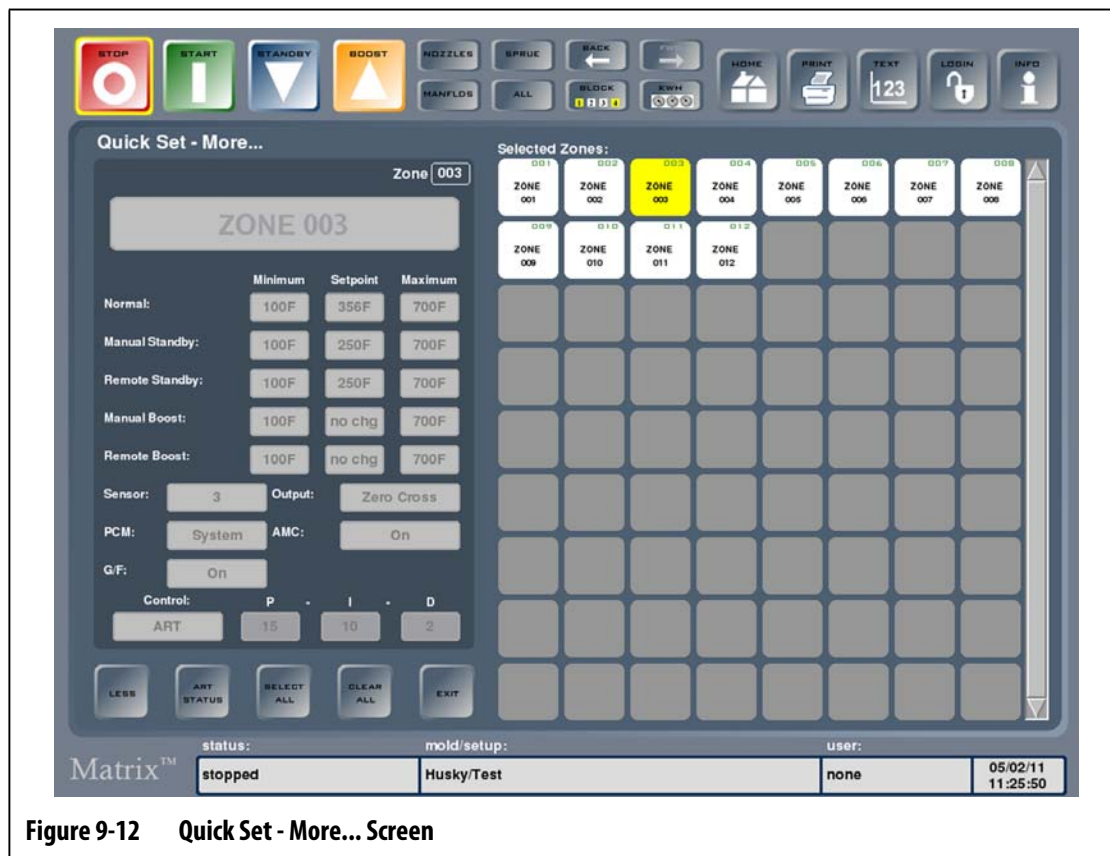


Figure 9-12 Quick Set - More... Screen

Table 9-17 Quick Set - More... Screen Item Descriptions

Item	Description
Zone Name	The name of the selected zone. The name ZONE 009 helps you identify the zones easily.
Normal	Specifies the operating temperature for the mold. The setpoint is the temperature that the mold will heat up to. The Minimum and Maximum limit are what temperature the normal setpoint can be changed to.

Table 9-17 Quick Set - More... Screen Item Descriptions (Continued)

Item	Description
Manual Standby	The temperature the mold is set to when the STANDBY button is selected. This setting allows the user to lower the temperature in the mold without changing the normal Setpoint. The Minimum and Maximum values limit what temperature the Manual Standby setpoint can be changed to.
Remote Standby	If Remote Standby is enabled, this setting controls the setpoint and the minimum and maximum values the setpoint can be set to if the mold is set to Standby remotely. This option is sold separately.
Manual Boost	This is the temperature the mold is set to when the BOOST button is selected. This setting allows the user to raise the temperature in the mold without changing the normal Setpoint. The Minimum and Maximum values limit what temperature the Manual Boost setpoint can be changed to.
Remote Boost	If Remote Boost is enabled, this setting controls the setpoint and the minimum and maximum values the setpoint can be set to if the mold is set to Boost remotely. This option is sold separately.
Sensor	This is the number of the thermocouple that the zone is connected to
PCM	The Priority Control Method (PCM) controls how the mold will react in the case of an abort condition.
G/F	The G/F setting allows the user to turn on and off the Ground Fault checking feature for each zone.
Output	Zero Cross Control or Phase Angle Output Control are the two methods that Matrix uses to supply power to the heaters.
AMC	Automatic Manual Control (AMC) allows Matrix to automatically apply a manual power output percentage to a heater in the event a thermocouple fails.
Pwr Limit (if applicable)	This feature limits the amount of power sent to the heater of a specific zone. This option is sold separately.
Control	ART automatically adjusts the control algorithm to suit different heater requirements. If a zone is not controlling properly the system allows the user to switch from the automatically adjusted ART algorithm to an algorithm you can manually adjust (PID).

Table 9-18 Quick Set - More... Screen Button Descriptions

Button	Description
LESS	Touch the LESS button to return to the Quick Set screen.

9.11.1 Setpoint Limits

Matrix allows the user to set a specific range where the operator is prevented from changing the setpoint beyond these limits.

9.11.1.1 Changing the Normal Setpoint and Limits

Specify the desired temperature to which the heaters in the mold must heat up. The default setting is 177 °C (350 °F).

To change a normal setpoint and setpoint limits for a zone:

1. Touch the zone to be changed.
2. Touch the Minimum box to open a keypad.
3. Enter the new minimum value, and then touch ENTER.
4. Touch the Maximum box to open a keypad.
5. Enter the new maximum value, and then touch ENTER.
6. Touch the Setpoint box to open a keypad.
7. Enter a new setpoint value, and then touch ENTER.

9.11.1.2 Changing the Standby Setpoint Limits

It may be necessary to lower the temperatures in the mold for a period of time. This can be achieved by selecting the STANDBY button (or from a remote location as an option) without changing the normal setpoint. Specify the temperature each heater in the mold must cool to when the system is in both manual and remote Standby. The default setting for both the manual and remote standby setpoints is 121 °C (250 °F).

To change a standby setpoint and standby setpoint limits for a zone:

1. Touch the zone you want to change.
2. Touch the Minimum box for either the manual or remote standby setting to open a keypad.
3. Enter the new minimum value, and then touch ENTER.
4. Touch the Maximum box for either the manual or remote standby setting to open a keypad.
5. Enter the new maximum value, and then touch ENTER.
6. Touch the Setpoint box for either the manual or remote standby setting to open a keypad.
7. Enter a new setpoint value, and then touch ENTER.

9.11.1.3 Changing the Boost Setpoints and Limits

It may be necessary to raise the temperatures in the mold for a period of time without changing the normal setpoint. To perform this function select the BOOST button (or from a remote location as an option). Specify the temperature each heater in the mold must heat up to when the system is in Boost. The default setting is no chg (no change) which means nothing will happen when Boost is activated.

To change a boost setpoint and boost setpoint limits for a zone:

1. Touch the zone to be changed.
2. Touch the Minimum box to open a keypad.
3. Enter the new minimum value, and then touch ENTER.
4. Touch the Maximum box to open a keypad.
5. Enter the new maximum value, and then touch ENTER.
6. Touch the Setpoint box to open a keypad.
7. Enter a new setpoint value, and then touch ENTER.

9.11.2 Changing the Sensor Assignment (Thermocouple)

The Sensor setting allows the operator to assign any thermocouple to control any heater. This is important if an instance occurs where the thermocouples or heaters in the mold are mis-wired.

For example, heater number 1 may be connected to thermocouple 5 and heater number 5 may be connected to thermocouple number 1. In this instance, the thermocouple inputs can be manually switched by changing the Sensor number in the Sensor box to the appropriate number.

NOTE: Matrix automatically accounts for mis-wired molds during Mold Diagnostics. This usually eliminates the need to make any adjustments.

To change the sensor assignment for a zone:

1. Touch the zone to be changed.
2. Touch the Sensor box to open a keypad.
3. Enter the new sensor number, and then touch ENTER.

9.11.3 Changing the Priority Control Mode (PCM) Setting

If there is a malfunction during normal operation, the software will make every attempt to bypass the problem. If this is not possible, shutdown sequence will be initiated. The user must specify what components will be shut down in such a situation.

In the case of an Abort condition, if the PCM is set to Zone, the control will turn OFF only the defective zone and continue to operate all other zones as normal. If the PCM is set to System, the controller will shutdown all power output to the mold (if the failure occurs on this zone). The PCM is zone selectable, so one zone may only shut itself OFF and another may shut down the mold. Determine the setting based on the zone and how critical it is to the mold.

Generally the cavities are set to Zone, and the manifolds are set to System. The default setting is System on all zones.

To change the PCM setting for a zone:

1. Touch the zone you want to change.
2. Touch the PCM box to toggle between the System and Zone modes.

The optional Priority Control Mode (PCM) Digital Output

If the PCM digital output option is turned on, it will be activated ONLY when a zone set to System experiences an abort condition. It will remain in this state until the PCM error is reset.

9.11.4 Changing the Ground Fault Check

When started, Matrix checks for ground fault conditions on every heater in the mold simultaneously. When necessary, it will initiate a low voltage, phase angle bake out on the faulty zone(s) to try and bake the moisture out of the heater(s).

The Ground Fault check can be set to On or Off for each zone. The default setting is ON for all zones. Turning Ground Fault OFF is only necessary under certain circumstances. If you want to turn the Ground Fault check off globally for the entire system, please call your nearest Husky Regional Service and Sales office.

9.11.5 Changing the Power Output Control Method (Output) Setting

In hot runner temperature control systems, there are two different methods for switching power output to the heaters; Zero Cross Control or Phase Angle Control.

Each method has its own set of advantages and disadvantages, but generally offer very similar results. The user must determine which method is right for the application.

Matrix provides the flexibility to run each zone in either mode. The default setting is Zero Cross for all zones.

To change the power output control method for a zone:

1. Touch the zone you want to change.
2. Touch the Output box to toggle between the Zero Cross and Phase Angle modes.

9.11.6 Changing the Automatic Manual Control (AMC) Setting

If a thermocouple malfunctions during normal operation, Matrix can automatically apply a manual power output percentage to the heater, based on the information gathered before the thermocouple failed. This feature is called Automatic Manual Control (AMC).

If a thermocouple fails and AMC is turned ON, the control changes the failed zone into manual mode and sets a manual power output, based on the previously recorded average power output to that heater. If AMC is turned OFF, the control skips to PCM (Priority Control Mode) and performs the designated task. The default setting is ON for all zones.

To change the AMC setting for a zone:

1. Touch the zone you want to change.
2. Touch the AMC box to toggle between the two modes.

9.11.7 Changing the Power Limit Setting (If Equipped)

The Power Limit setting controls the maximum amount of power that can be delivered to the heaters. The default power limit for all zones is 100%.

To change the Power Limit setting for a zone:

1. Touch the zone to be changed.
2. Touch the Pwr Limit box to display a keypad.
3. Enter the new percentage, and then touch ENTER.

9.11.8 Changing the Zone Control from ART to PID

Matrix can automatically adjust the control algorithm to suit different heater requirements. This control method is referred to as ART. In some cases, it may be necessary to switch from the automatically adjusted ART algorithm to a manually adjustable algorithm. This control method is referred to as PID.

When switching a zone from ART control to PID control, values for the Proportional, Integral and Derivative parameters can be manually entered. The default control setting for all zones is ART.

To toggle the zone control between ART and PID:

1. Touch the zone to be changed.
2. Touch the Control box to toggle between ART and PID.

9.11.8.1 Changing P, I or D Parameter Values

If ART on a zone does not provide the desired control, even when restarted, the zone to PID control can be switched and the individual PID parameters adjusted to achieve the required control.



IMPORTANT!

If the situation, worsens the zone can be switched back to ART and the previous settings are maintained. The default settings for the PID are P-15, I-10 and D-2 on all zones.

To change the PID settings:

1. Touch the zone you want to change and switch the zone control to PID.
2. Touch the boxes containing the values for the P, I or D parameters to display a keypad.
3. Enter the new value for the P, I or D parameter, and then touch ENTER.
4. If necessary, repeat the previous two steps to adjust the other PID parameters.

9.11.9 Parameters on Multiple Zones

The image below shows how the Quick Set screen appears when multiple zones are selected.

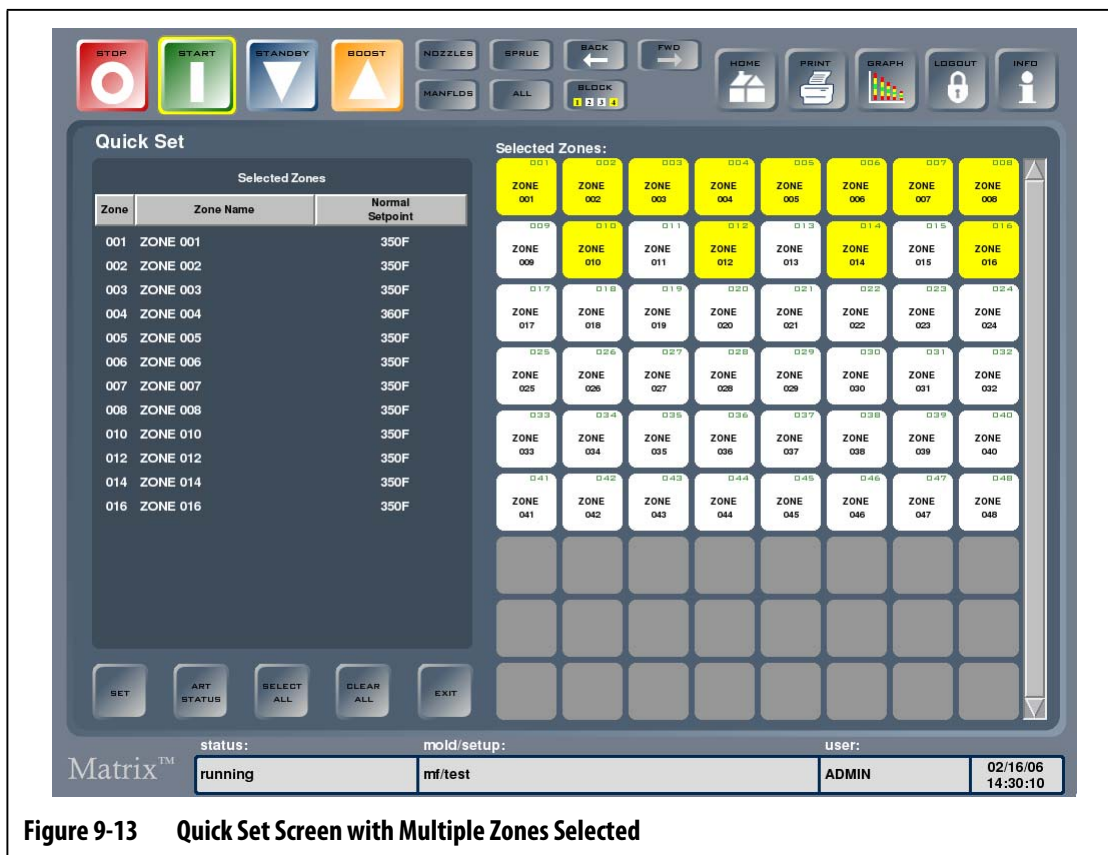


Figure 9-13 Quick Set Screen with Multiple Zones Selected

The information for multiple zones is shown in a list view. The first column displays the zone number and the second column displays the zone name. The last column is the selected zone parameter, which is adjusted by selecting the SET button. The default selected parameter is

the Normal Setpoint. Add and remove zones from the selection list by touching the required zone. If only one zone is selected, the screen displays the zone data in a single-zone view.

Table 9-19 Quick Set Screen Button Description

Button	Description
SET	To change the setting, touch the SET button to open a numeric keypad or context sensitive window. Enter the new setting values, and then touch the ENTER key.

9.11.9.1 Selecting a Different Parameter for Multiple Zones

Use this function to change a parameter other than the Normal Setpoint when multiple zones are selected.

To choose a different parameter for multiple zones:

1. Touch the Normal Setpoint column header. A drop-down list with all zone parameters appears.
2. Use the scroll bar to bring additional parameters in to view.
3. Touch the required parameter, if a key or function pad does not appear touch SET.
4. Enter the new value for the parameter on the key or function pad.
5. Touch ENTER to update the parameter and close the key or function pad.

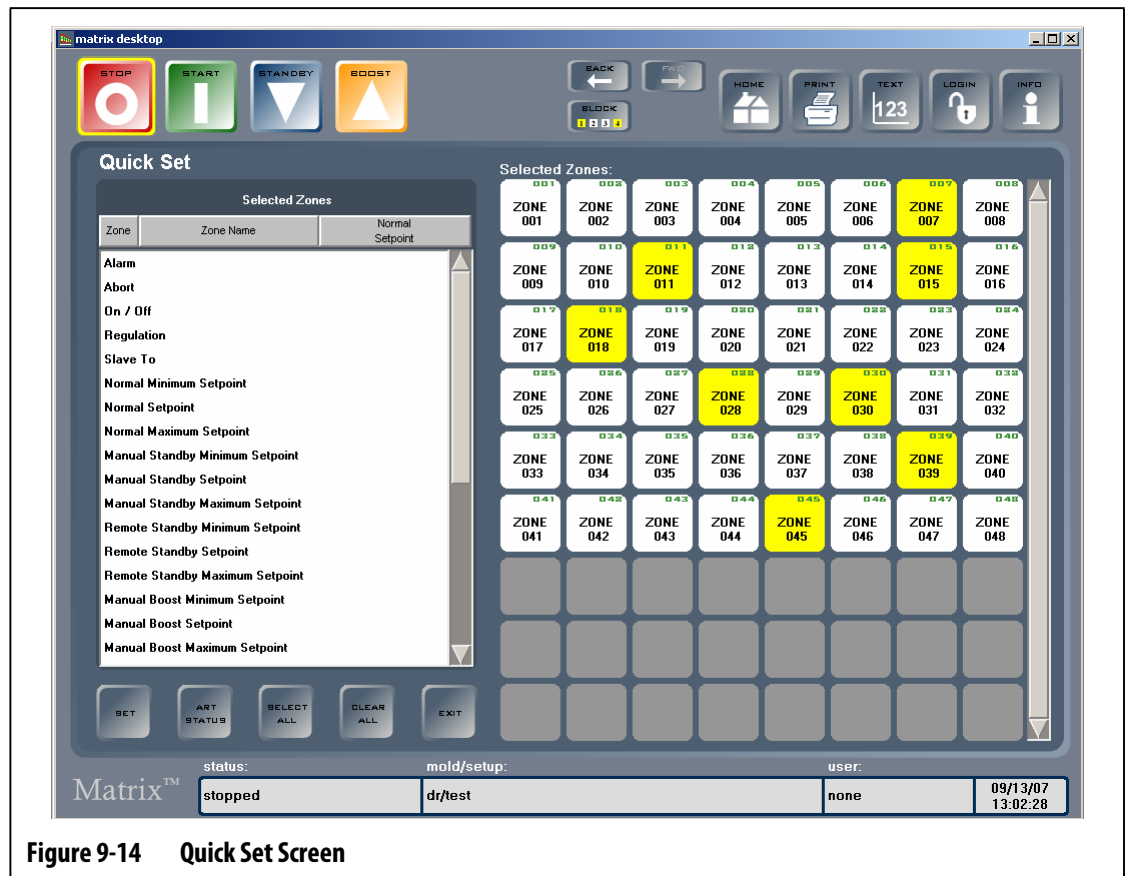


Figure 9-14 Quick Set Screen

9.11.9.2 Renaming Multiple Zones at One Time

To rename multiple zones at one time:

1. Touch the zones, and then touch the Zone Name column header.
2. Enter the name you want.

To rename multiple zones in numerical order, enter the name you want, and then touch the AUTO # key.

- Example 1: Tip (+AUTO # key) labels the selected zones automatically starting with Tip 1. You can start the numbering at a different number other than 1 by entering a different starting number.
- Example 2: Tip 12 (+AUTO # key) would label the selected zones automatically starting with Tip 12.

3. Touch ENTER to close the keyboard.

9.12 The Hide Inactive Zones Feature

In some cases, the wiring scheme of a hot runner system requires zones in the controller to be skipped over in order to properly heat the mold. These inactive zones can use up space on the screen, confuse the operator and cause erroneous alarms if turned on.

The Hide Inactive Zones feature allows the user to hide unused zones allowing active zones to be displayed in consecutive order, in all Zone Data screens (Graphs, Text, Multi-Pane, 3D View, Mold Pic and Delta T and Staging views). The configuration is saved per mold setup.



Figure 9-15 Quick Set Screen - Hide Inactive Zones Configuration

1. Zone Selection Grid
2. Zone Parameter Menu Button
3. Inactive Setting In Zone Parameter Menu

Table 9-20 Quick Set Screen Item Descriptions

Item	Description
Zone Selection Grid	<p>This Grid is used to select zones to change their parameter settings. Selected zones are highlighted in yellow and any changes made affect the highlighted zones.</p> <p>To select additional zones, touch any of the zone boxes. To de-select a zone, touch the zone box again and it will appear white.</p> <p>NOTE: Zones selected from any of the Zone Data screens will be highlighted in yellow in the selection grid.</p>
Zone Parameter Menu	<p>This pull down menu provides a list of all available parameter settings that can be changed for each zone in the system. Touching an item in the list will select it as the parameter that can be adjusted on selected zones in the zone grid.</p> <p>NOTE: The name of the currently selected parameter will be displayed in the ZONE PARAMETER MENU button.</p>

Table 9-21 Quick Set Screen Button Descriptions

Button	Description
Zone Parameter Menu Button	Touch the ZONE PARAMETER MENU button to access the list of available zone parameters in the Quick Set screen.

9.12.1 Hiding Single or Multiple Inactive Zones

If a zone or zones are not used for a given mold setup they can be assigned as inactive and hidden from view.

To hide an Inactive Zone or Zones:

1. Touch the Zone Box, in the Zone Grid, to display the Zone Parameter Menu for that zone.
2. Touch the INACTIVE field to toggle the setting to YES.

To Hide Multiple Inactive Zones:

1. 1.Touch the Zone Boxes, in the Zone Grid, that are to be assigned as Inactive.
2. Touch the ZONE PARAMETER MENU button.
3. Scroll to the bottom of the Zone Parameter Menu.
4. Touch the INACTIVE setting to display a pop-up window.
5. Touch the YES button in the pop-up window.



IMPORTANT!

Any zone that has been assigned as INACTIVE will be forced to OFF. If a single zone is set to INACTIVE then all of the zone parameters, in the Zone Parameter Menu, besides the INACTIVE setting, will be grayed out. Additionally, changes to multiple inactive zones, in the Zone Parameter Menu, besides the INACTIVE setting, will not be applied.

9.12.1.1 Inactive Zone Security

To better control user access to this feature this function has been added to the User Rights (Administrator) screen.

Inactive Zone Function in the User Rights (Administrator) Screen:

- Zone Inactive

9.12.2 Hiding Inactive Zones - User Scenarios

Depending on the scenario, hiding inactive zones will affect each Zone Data screen differently. These scenarios are described as follows:

Table 9-22 Hiding Inactive Zones Scenarios

Affected Screen	Scenario																																																
Text, Graphs, Multi-Pane and Stage Views	<p>If an inactive zone is between two active zones, the numbering sequence of the active slots should not change.</p> <p>Example: If there are six total zones in the system and zones 3 and 4 are assigned as inactive, then the Text screen will display the following:</p> <p>All Zones Active</p> <table border="1" data-bbox="948 1354 1190 1472"> <thead> <tr> <th>ZONE</th> <th>NAME</th> <th>SETPONT</th> <th>TEMP</th> </tr> </thead> <tbody> <tr><td>1</td><td>ZONE 001</td><td>176.7C</td><td>23.9C</td></tr> <tr><td>2</td><td>ZONE 002</td><td>176.7C</td><td>23.9C</td></tr> <tr><td>3</td><td>ZONE 003</td><td>176.7C</td><td>23.9C</td></tr> <tr><td>4</td><td>ZONE 004</td><td>176.7C</td><td>23.9C</td></tr> <tr><td>5</td><td>ZONE 005</td><td>176.7C</td><td>23.9C</td></tr> <tr><td>6</td><td>ZONE 006</td><td>176.7C</td><td>23.9C</td></tr> </tbody> </table> <p>Zone 3 and 4 Active</p> <table border="1" data-bbox="948 1570 1190 1661"> <thead> <tr> <th>ZONE</th> <th>NAME</th> <th>SETPONT</th> <th>TEMP</th> </tr> </thead> <tbody> <tr><td>1</td><td>ZONE 001</td><td>176.7C</td><td>23.9C</td></tr> <tr><td>2</td><td>ZONE 002</td><td>176.7C</td><td>23.9C</td></tr> <tr><td>5</td><td>ZONE 005</td><td>176.7C</td><td>23.9C</td></tr> <tr><td>6</td><td>ZONE 006</td><td>176.7C</td><td>23.9C</td></tr> </tbody> </table>	ZONE	NAME	SETPONT	TEMP	1	ZONE 001	176.7C	23.9C	2	ZONE 002	176.7C	23.9C	3	ZONE 003	176.7C	23.9C	4	ZONE 004	176.7C	23.9C	5	ZONE 005	176.7C	23.9C	6	ZONE 006	176.7C	23.9C	ZONE	NAME	SETPONT	TEMP	1	ZONE 001	176.7C	23.9C	2	ZONE 002	176.7C	23.9C	5	ZONE 005	176.7C	23.9C	6	ZONE 006	176.7C	23.9C
ZONE	NAME	SETPONT	TEMP																																														
1	ZONE 001	176.7C	23.9C																																														
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3	ZONE 003	176.7C	23.9C																																														
4	ZONE 004	176.7C	23.9C																																														
5	ZONE 005	176.7C	23.9C																																														
6	ZONE 006	176.7C	23.9C																																														
ZONE	NAME	SETPONT	TEMP																																														
1	ZONE 001	176.7C	23.9C																																														
2	ZONE 002	176.7C	23.9C																																														
5	ZONE 005	176.7C	23.9C																																														
6	ZONE 006	176.7C	23.9C																																														
Mold Pic and Cavity Layout Views	<p>If any zones have been assigned as inactive after the Mold Pic or Cavity Layout views have been configured, then the inactive zones will have to be manually removed from each of these views independently.</p>																																																

Table 9-22 Hiding Inactive Zones Scenarios (Continued)

Affected Screen	Scenario
Mold Pic and Cavity Layout Views	If any zones have been assigned as inactive, before the Mold Pic or Cavity Layout views have been configured, then those zones will be grayed out in the ZONE SELECTION grids used in the setup of these views.
Delta T View	If a paired zone in the Delta T view is assigned as inactive, then a pop-up window will appear warning that this action will remove the zone and its mate from the Delta T view. Touching the CANCEL button, in the pop-up window, will abort the change and the YES button will remove the pair from the Delta T view.

9.13 Active Reasoning Technology (ART)

Active Reasoning Technology (ART) is the science of applying microprocessor-based control systems to automatic decision making. Active Reasoning software combined with integrated hardware disseminates information so all zones interact with one another while recognizing the effects of the interaction. During Matrix start up, the control looks at all zones individually, then looks at comparisons of all zones and determines any interaction between them. It tests for any ground faults individually and as a whole. It then creates the necessary bake out and soft start routines to successfully and evenly heat the mold.

9.13.1 Control Method

The use of Active Reasoning Technology for control eliminates the tasks of using self-tune or “automatic” tune PID, PIDD or PPID algorithms. ART performs all of these tasks without the need for manual intervention. ART is based on control algorithms which through the use of fuzzy logic, perform all functions the same as a normal PID control.

9.13.2 Running ART on a Zone

When Matrix runs a mold setup for the first time, it automatically performs the ART process on all zones. If a particular zone is not controlling properly when it has reached its setpoint, ART can be manually on that zone.

9.13.3 ART Status Screen

The ART Status screen is used to manually ART zones if any of the zones are not being controlled properly. This screen also appears automatically after touching START if a new mold setup is created or some zones in the setup have not gone through the ART process. To display this screen from the Quick Set screen, touch ART STATUS.

When ART is running, the STOP, START, STANDBY and BOOST buttons cannot be used to modify the system. ART must first be cancelled by touching the CANCEL ART buttons to return to normal operation.

The selection grid indicates the status of each zone:

- Yellow represents a zone that is selected.
- Green represents a zone that has already been ARTed.
- Red represents a zone that is not ARTed.
- White represents a zone that is either turned off or configured for manual regulation.

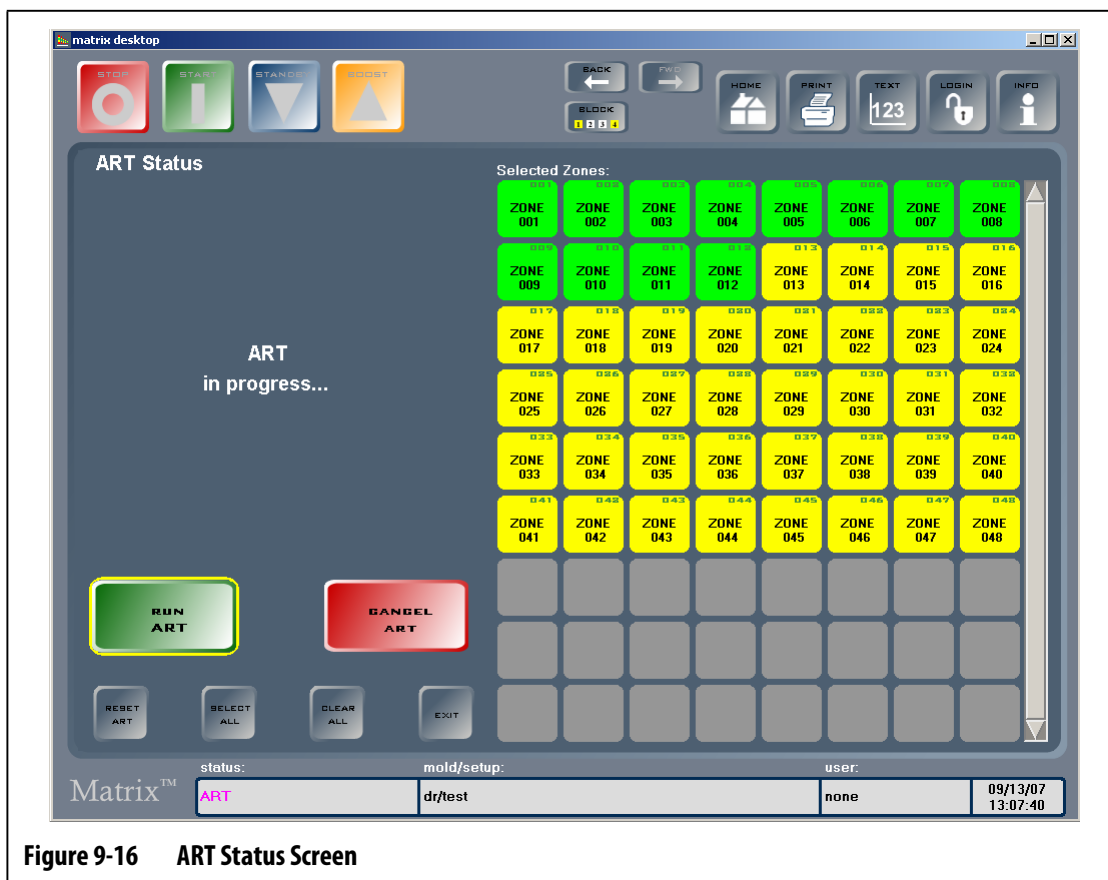


Figure 9-16 ART Status Screen

Table 9-23 ART Status Screen Item Descriptions

Item	Description
Status Text	The current ART status.
Zone Selection Grid	Zones selected from the Quick Set screen are automatically highlighted in the selection grid when this screen appears.

Table 9-24 ART Status Screen Button Descriptions

Button	Description
RUN ART	Touch the RUN button to start the ART process.
CANCEL ART	Touch the CANCEL ART button to stop the ART process.

Table 9-24 ART Status Screen Button Descriptions (Continued)

Button	Description
RESET ART	Touch the RESET ART button to reset the ART parameters for the selected zones. The next time the system is started, it will perform the ART process on those zones again.
SELECT ALL	Touch the SELECT ALL button to select all the zones in the zone selection grid.
CLEAR ALL	Touch the CLEAR ALL button to deselect all the zones in the zone selection grid.
EXIT	Touch the EXIT button to close the ART STATUS screen and return to the previous screen. If the ART process is not complete the system will automatically return to the ART Status screen.

9.13.3.1 Using the Manual ART Function

ART parameters for a zone may need to be reset from time to time. This could be due to a change in a particular zone, such as the replacement of a heating element or thermocouple. For example, the temperatures may be consistently swinging over and under setpoint, yet not triggering an alarm. This is not to be confused with shear heat from the material, which appears as sudden increases in temperature with no undershoot.

When you manually run ART on a zone, Matrix deletes its knowledge base on that zone and “re-thinks” the control process. It then stores this data and uses it to calculate the proper output to control this zone best at setpoint. Use this function sparingly and only permit highly qualified individuals to use it. The molding process may be interrupted if you ART several zones at one time, but this is rare. It is best to run ART on a zone once it is at setpoint.

To manually run ART on a zone:

1. Touch the zone or zones you want to manually ART.
2. Touch RUN ART to begin ART analysis on the selected zone(s).
3. To cancel the ART process at any time, touch CANCEL ART.

When all zones complete the ART process, the ART Status screen will close.

This will return you to the Quick Set or Quick Set - More... screen.

9.14 PID Control

Matrix gives you the choice of using ART (automatic tuning), or PID (manual tuning). The following provides a brief explanation of each parameter (P, I, and D).

9.14.1 Proportional (P) Term

The primary objective of the Proportional term of the control algorithm is to balance the amount of energy input against that which is being lost in the process and the outside world.

If the gain is too high, small temperature changes cause large power output changes, which then cause larger temperature changes and so on, ultimately resulting in the process temperature becoming unstable and oscillating. If the gain is too low, small changes in temperature produce insufficient power output to modify them and the temperature arbitrarily fluctuates.

9.14.2 Integral (I) Term

The primary objective of the integral term is to maintain the actual temperature on the setpoint. This is achieved by moving the position of the proportional band relative to the setpoint, so that the correct amount of power output is delivered to maintain a stable process at the setpoint.

If the I value is too high, the output power will be modified more quickly than the process can follow. Ultimately resulting in the process temperature oscillating and becoming unstable.

If the I value is too low, the process temperature may be stable at the setpoint, as it will be too slow to follow the normal process variations.

9.14.3 Derivative (D) Term

The function of the derivative term is to arrest any rapid changes in the process temperature and it is designed to minimize overshoot and undershoot. This is achieved by changing the output power to oppose the direction of temperature change.

The derivative term is only active during process temperature changes and has a greater effect the higher the rate of change of temperature.

If the D value is set too high, any small fluctuations in temperature produce large changes in output power which produce larger changes in temperature, and so on.

If the D value is too low, unacceptable overshoot or undershoot may occur.

9.14.4 Typical PID Values

The following is a list of some typical PID values.

Table 9-25 PID Values

P	I	D	Type	Example
015	010	002	Fast	Probes or heaters with internally located thermocouples
050	020	000	Fast	
020	010	000	Fast	
015	015	000	Fast	
020	007	100	Medium	Probes or heaters with internally located thermocouples (larger mass)
020	005	200	Medium	
100	003	000	Slow	Manifolds or heaters with externally located thermocouples
075	003	150	Slow	

9.14.5 Possible Causes of Oscillation

It is possible to set the control terms incorrectly, inducing an oscillation. The following are the most common causes:

Table 9-26 Possible Causes of Oscillation

Cause	Description
"P" too large	Power change too great per °C of temperature change.
"I" too large	Power changing too quickly for the process to follow it.
"D" too large	Stepped power change too large for the rate of change of temperature.
Shear	An important issue often overlooked is the effect of shear in the material as it passes through the gating area. This can cause rises in temperature in excess of 33 °C (60 °F) under severe conditions. Therefore, if large temperature variations occur during molding, it is worth plotting this variation against the molding cycle time. As the controller cannot initiate additional cooling, it is only possible to minimize this effect with properly selected PID terms.

9.15 Tenth of a Degree Temperature Resolution

This is a user activated feature that provides the ability to view the actual temperature and set the process setpoint to a 10th of a degree. This allows the tightest control window to ensure the best possible control. This feature is supported by both the X and XL cards.



Figure 9-17 Advanced Setup Screen

1. High Precision Field

Table 9-27 Advanced Setup Screen Item Description

Item	Description
High Precision Field	This field is used to enable or disable 10th of a degree resolution on all screens in the system that display a temperature. This also allows setpoint adjustments to 10th of a degree as well. NOTE: The default value is No.

9.15.1 Accessing the Advanced Setup Screen

The Advanced Setup screen is used to modify advanced system settings as well as gain access to the Mold Setup Defaults and Stage Setup screens. The settings in this screen should only be modified by well qualified users as changing these parameters can adversely affect the operation and performance of the system. Contact a Husky call center technician for the access code.

To Access the Advanced Setup Screen:

1. Touch the SYSTEM button in the Home screen.
2. Touch the ADVANCED SETUP button in the Home screen submenu.
3. Touch the OK button in the Warning Pop-up window.
4. Enter the appropriate Password in the Keyboard pop-up and touch the Enter button.

9.15.2 Enabling the High Precision Feature

Depending on the requirements of the process, the need to display and adjust temperature setpoints to a 10th of a degree may be necessary.

To Enable the High Precision Feature:

1. Navigate to the Advanced Setup screen.
2. Touch the High Precision field to toggle it from **No** to **Yes**.

Chapter 10 Mold Diagnostics

Diagnostics is a useful tool for troubleshooting problems with a mold or for verifying the wiring integrity of a mold after maintenance has been performed. Diagnostics can also be used to analyze the thermal isolation between all the cavities in the mold.

10.1 Testing the Mold

To open the Mold Test screen, shown below, touch DIAGNOSTICS, and then touch MOLD TEST. A yellow ring around the buttons shows the current selection.

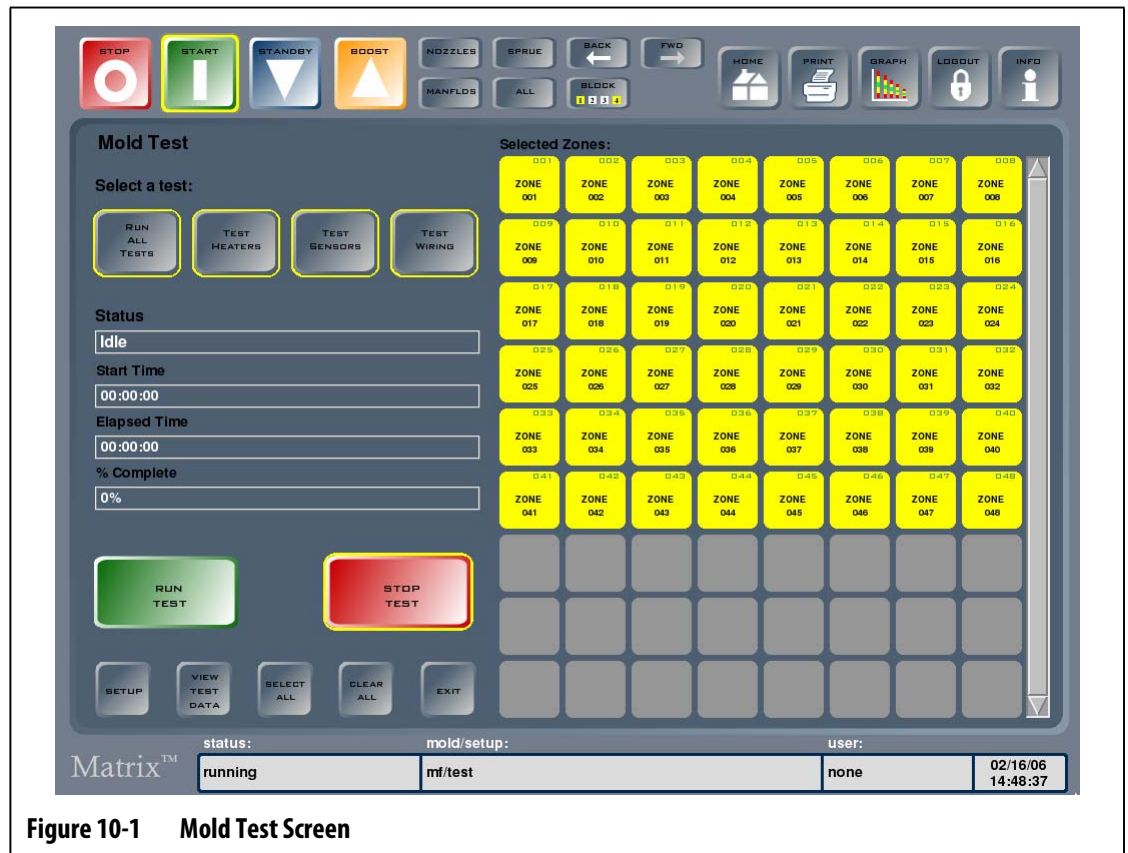


Figure 10-1 Mold Test Screen

Table 10-1 Mold Test Screen Item Descriptions

Item	Description
Select a Test	Select which test(s) to run on selected zones. Choose between HEATER, SENSOR or WIRING tests. The system automatically defaults to run ALL TESTS.
STATUS	The current status of the test. During the test, it will display the zone that is being tested.
START TIME	The time that the test was started.
ELAPSED TIME	The amount of time that has passed since the test was started.
% COMPLETE	The percentage of the total selected zones that have finished testing.
Zone Selection Grid	Zones that are turned ON in the system are highlighted in the selection grid. To test those zones, touch the RUN TEST button. Zones that are off, deselected, or in Monitor regulation will be white and will not be tested. When the test is running, zone boxes will turn green if a zone passes the test or red if there is a problem.

Table 10-2 Mold Test Screen Button Descriptions

Button	Description
RUN ALL TESTS	Touch the RUN ALL TESTS button to select all the tests.
TEST HEATERS	Touch the TEST HEATERS button to test that the selected zones are drawing current.
TEST SENSORS	Touch the TEST SENSORS button test that the selected zones temperature increases when power is applied.
TEST WIRING	Touch the TEST WIRING button to test that the selected zones thermocouple and heater pairings are correct (1 to 1 and 2 to 2 etc.).
RUN TEST	Touch the RUN TEST button to start the selected tests. Only the selected zones will be tested.
STOP TEST	Touch the STOP TEST button to stop the test. A test that has been completed will be saved automatically to the loaded mold setup. You can review the test results at a later time.
SETUP	Touch the SETUP button to display the Mold Test Setup screen. Adjust certain parameters of the test in this screen.
VIEW TEST DATA	Touch the VIEW TEST DATA button to open the Mold Test Data screen. This can be performed during the test anytime after the first zone has been tested, or after the test is completed.
SELECT ALL	Touch the SELECT ALL button to select all the zones in the zone selection grid.

Table 10-2 Mold Test Screen Button Descriptions (Continued)

Button	Description
CLEAR ALL	Touch the CLEAR ALL button to deselect all the zones in the zone selection grid.
EXIT	Touch the EXIT button to close the Mold Test screen and return to the Home screen.

10.1.1 Running a Mold Diagnostics Test

Before beginning the automated mold diagnostics test, follow the steps below:

1. Before connecting any power to the controller or the mold, clean the mold and its surroundings.

CAUTION!

Mechanical hazard – risk of equipment damage. Do not rely on the possibility of a ground in the mold cables. To prevent equipment damage, attach a piece of grounding wire to the mold ground connector on the Altanium mainframe.

2. For your safety, verify the controller and mold share the same ground.
3. Check the mold wiring to verify there are no bare wires, frayed ends or cut insulation.
4. If you have thermocouple and power cables, connect them from the controller to the mold, checking them for a clean fit.
5. Connect the Altanium mainframe to the main input power and turn it ON via the main disconnect.
6. Log in to Matrix and load a mold setup.
7. Verify the zones you want to test are turned ON. Any zones turned OFF will not be tested.
8. In the Home screen, touch DIAGNOSTICS, and then touch Mold Test to display the Mold Test screen.
9. Select the test(s) to be performed. By default, all tests are selected.
10. Touch RUN TEST and the diagnostics test begins.

10.1.2 Troubleshooting

Alternatively, Matrix can help troubleshoot potential mold problems.

1. On the Home screen, touch DIAGNOSTICS, and then Troubleshoot.
2. Select the problem from the drop-down list. Follow the system prompts which provides the necessary steps to determine the cause of the problem.

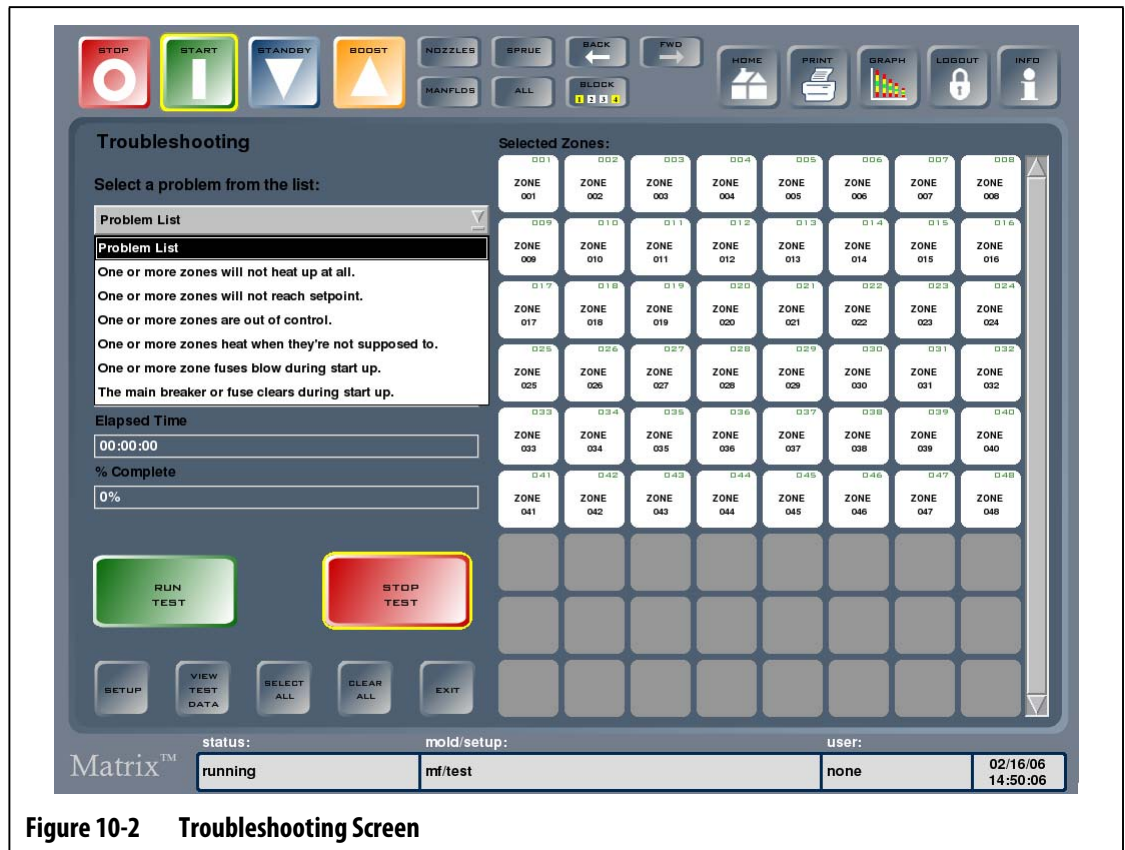


Figure 10-2 Troubleshooting Screen

10.1.3 Mold Test Setup

The delay between testing each zone and the maximum time taken for each test can be changed via this screen.

- Touch SETUP to display the Mold Test Setup screen.



Figure 10-3 Mold Test Setup Screen

Table 10-3 Mold Test Setup Screen Item Descriptions

Item	Description
DELAY TIME	The amount of time to wait after completing a previous test before starting the next test.
MAX TEST TIME	The maximum time for which a test should run.
MAX POWER	The maximum power applied during diagnostics is 100% and not adjustable.
Validate Zone After	The number of degrees that a zone must heat above its starting temperature to pass a test.

10.1.3.1 Setting the Delay Time

It may be necessary to set up delay times between testing the each zone depending on the mold. For example in large manifolds a heater may continue to heat up long after power is removed. If Matrix begins testing the next zone before the previous zone's temperature stopped increasing, this could produce inaccurate test results.

To set the delay time:

1. Touch the zones to be changed, and then touch DELAY TIME to open a keypad.
2. Enter the delay in the format displayed (MM:SS), then touch ENTER to close the keypad and update the delay time for that zone.

NOTE: The default setting is 10 seconds. Each mold setup can have its own set of delay times.

10.1.3.2 Setting the Maximum Test Time

Set the maximum test time for each zone to accommodate different types of heaters. A thermocouple wiring problem, for example, could cause damage to a low mass heater if 100% power is applied for a time longer than the heater requires to heat up. For large heaters, a short test time may not be long enough to heat up which would result in a failed test.

To set the maximum test time:

1. Touch the zone you want to change, and then touch MAX TEST TIME to open a keypad.
2. Enter the delay in the format displayed (MM:SS), then touch ENTER.

NOTE: The default setting is six minutes. Each mold setup can have its own set of max test times.

10.1.4 Mold Test Data

The Mold Test Data screen displays the results of a test in text format. The data is displayed in a table format, making it easy to find the required information. Sort the results in ascending or descending order by selecting the appropriate column heading. The column heading currently used to sort the data contains a red line.

Screen item descriptions are outlined below.

Table 10-4 Mold Test Data Screen Item Descriptions

Item	Description
ZONE	Zone number
ZONE NAME	Zone name
SENSOR	Sensor assigned to each zone
FUSES	Result of the fuse test for each zone
T/C	Result of the thermocouple test for each zone
AMPS	Current drawn by the heater during the test for each zone

Table 10-4 Mold Test Data Screen Item Descriptions (Continued)

Item	Description
VAC	Line voltage reading taken during the test for each zone
WATTS	Power calculated for each zone based on the line voltage and current readings measured during the test.
OHMS	Resistance calculated for each zone based on the line voltage and current readings measured during the test.
220V W	Estimated power rating of the heater based on the user input of the rated heater voltage.
Wiring	Result of the thermocouple wiring test
G/F	Result of the ground fault test
B/O	Result of the wet heater bake out test
TIME	Time taken to test each zone

Table 10-5 Mold Test Data Screen Button Descriptions

Button	Description
VIEW TEMP GRAPHS	Touch the VIEW TEMP GRAPHS button to display the Temperature Graphs screen for one or more zones.
VIEW CROSS TALK	Touch the VIEW CROSS TALK button to display the XTalk screen.
REWIRE	Touch the REWIRE button to automatically re-assign all of the sensors to their proper location based on the results of the test.
SELECT ALL	Touch the SELECT ALL button to select all zones displayed and view them in the Temperature Graphs screen.
CLEAR ALL	Touch the CLEAR ALL button to deselect all selected zones.
EXIT	Touch the EXIT button to close the Mold Test screen and return to the Home screen.

NOTE: If a problem was found during a test the color of the text for a zone test result is red. The color changes from red to orange when that zone is selected.

10.1.4.1 Temperature Graphs Screen

View the Temperature Graphs screen by selecting one or more zones in the Mold Test Data screen, and then touching VIEW TEMP GRAPHS.

Table 10-6 Temperature Graphs Screen Item Descriptions

Item		Description
Temperature Graph		This screen displays the temperature increase of the zones during the heater test. The current selected zone is shown as a red line in the graph, the other zones are shown as black lines. This does not show the temperatures of the zone during the cool down period.
Heat Up	Starting Temperature	The temperature of the zone when the zone started the heat up stage of the test.
	Ending Temperature	The temperature of the zone when the zone finished the heat up stage of the test.
	Total Increase	The increase in temperature of the zone while it was being heated.
	Time Duration	The time spent heating the zone.
Cool Down	Starting Temperature	The temperature of the zone at the start of the cool down period.
	Ending Temperature	The temperature of the zone at the end of the cool down period.
	Total Decrease	The decrease in temperature of the zone during the cool down period.
	Time Duration	The time spent cooling the zone.

Table 10-7 Temperature Graphs Screen Button Descriptions

Button	Description
PREV	Displays the results of the previous zone if multiple zones are selected.
NEXT	Displays the results of the next zone if multiple zones are selected.
EXIT	Return to the Mold Test Data screen.

10.1.4.2 Automatic Thermocouple Rewiring

Often thermocouples can be inadvertently cross-wired in the mold, where the thermocouple for one heater ends up connected with another heater, and vice versa.

The Matrix Wiring Test checks the thermocouple/heater wiring and determines if it is correct or not. When the test is complete and if an error was found, the zone with the error will be displayed in red.

To rewire thermocouples:

1. Touch VIEW TEST DATA.

If a mold wiring error exists the user is notified on screen.

2. Touch REWIRE to automatically reassign the mold thermocouples to their correct zones.

NOTE: This information is saved with the current mold setup.

10.1.4.3 Viewing X-Talk (Cross Talk)

This feature displays how much heat transfer occurs between zones in the mold. A zone in a correctly wired mold with no thermal isolation issues will display 100%, all other zones will display 0%.

For example, Zone 9 finishes the test and shows 100%, but zone 10 shows 60%. If zone 9 increased 10 degrees during the test, zone 10 increased 60% of this 10 degrees, or 6 degrees, without having any energy applied.

Table 10-8 X-Talk Dialog Box Item Descriptions

Item	Description
ZONE	The zone number.
ZONE NAME	The name of the zone.
X-TALK %	The amount of cross-talk between zones.

To view the cross-talk information:

1. Touch VIEW CROSS TALK to open the X-Talk dialog
2. Select the zone from the list in the X-Talk dialog.

The selected zone will be highlighted and shows the cross talk percentage with the other zones.

10.1.4.4 Saving and Printing the Test Results

Save and print test results of a mold to compare them to another test at a later date. All test data is saved automatically to the loaded mold setup. The next time this setup is loaded, the data will be there.

To print the test results:

- 1.** Touch PRINT at the top of the interface to open the Print dialog.
- 2.** Select Diagnostic Info, and then touch PRINT.

Chapter 11 Heating the Mold

This chapter describes how to start the Matrix system and check for any errors, and alarm conditions if they occur.

With all Altanium-to-mold connections made and mold cooling switched on, start the system by touching START.



IMPORTANT!

Personnel must read, understand and follow all safety precautions.

CAUTION!

Mechanical hazard – risk of equipment damage. Mold setup MUST be loaded before heating up the mold. Refer to [Section 6.1.2](#) for additional instructions.

11.1 Ground Fault/Wet Heater Bake Out System

Matrix is equipped with an advanced Ground Fault/Wet Heater Bake Out system. From the moment the system is started Matrix will constantly check for ground fault conditions on every heater in the mold simultaneously. When necessary, it will initiate a low voltage bake out on the faulty zone(s) to try and bake the moisture out of the heater(s).

There are two types of ground faults, which are described below.

1. If a zone measures 3.0 amps or higher, this is considered a severe ground fault situation. In this scenario, because the current is so high, it would be pointless for the system to enter into an automatic Bake Out procedure and therefore requires the intervention of operational personnel.

If any severe ground faults are detected, Matrix will switch the power off to all zones in the system, initiate the audible and visual alarms and display GROUND FAULT in the STATUS column of the faulty zone(s) in the Zone Status screen. The system will not allow the mold to start heating. The system will continue to alarm until the error is corrected.

NOTE: Make a note of the zone(s) that are displaying GROUND FAULT and turn the system's main breaker off as soon as possible the problem can be fixed.

2. If a zone measures 0.5 amps to 2.9 amps, this is considered a less severe ground fault. Once START is touched, the system begins an automatic Bake Out procedure. Matrix applies a low voltage to the faulty heater(s) for five minutes in an attempt to bake out any moisture that has accumulated in the heater(s).

In the event of a less severe ground fault situation:

- Touch START to begin the bake out process on the faulty zone(s).
- The status bar displays bake out and a 5:00 minute timer.
- When this timer finishes, Matrix begins the soft start process, bringing all zones up to setpoint at the same rate.

Matrix turns the Ground Fault check On or Off for the entire system. The default setting is ON for all zones. Turning Ground Fault off is only necessary under specific circumstances. To turn the Ground Fault check OFF, please call the nearest Husky Regional Service and Sales office.

11.2 Additional X and XL Card Functionality

Several features have been added to the X and XL card. These features support various aspects of the molding process, from extending heater life to higher precision control. The following table outlines the feature name and the associated card that supports it.

Table 11-1 Additional Functionality Supported by Card Type

Feature	Supported Card Type	Card Type ID
Advanced Wet-Heater Bake-Out	X	Silver Heatsink
Current Deviation Alarm	X	Silver Heatsink
10th of a Degree Resolution	X	Silver Heatsink
	XL	Black Heatsink

11.2.1 The Advanced Wet-Heater Bake-Out Feature

The term Bake-out refers to the process of applying low voltage to evaporate moisture trapped in a heater. The moisture acts as a bridge that shorts the wire core to the outer housing of the heater body. If this condition persists, it will lead to premature heater failure. This fault is detectable using a current transducer to measure leakage to ground. The proper method to evaporate moisture is to apply a phase angle power modulation mode to minimize arcing to the heater body by limiting the magnitude of the applied voltage. The Advanced Wet-Heater Bake-Out routine is used to perform the necessary number of bake-out cycles to thoroughly dehumidify a heater. This routine is initiated automatically if the system detects a low level ground fault during startup. This functionality is supported by the X card only.



Figure 11-1 Advanced Setup Screen

- 1. Bake Out Limit Field
- 2. Bake Out Enable Field
- 3. Bake Out Enable Alert Enable Field
- 4. Bake Out Time Per Cycle Field
- 5. Number of Bake Out Cycles Field

Table 11-2 Advanced Setup Screen Item Description

Item	Description
Bake Out Limit Field	<p>This field adjusts the limit for determining a bake out condition. If the measured current is greater than this setting and is less than the value that has been chosen to determine a Ground Fault, then the system will begin the bake out routine.</p> <p>NOTE: The default value is 0.2 amps and the range is 0 to 5 amps.</p>
Bake Out Enabled Field	<p>This field enables or disables the bake out routine. This field must be set to YES before the Advanced Bake Out feature will work.</p> <p>NOTE: The default is set to YES.</p>
Bake Out Alert Enable Field	<p>This field enables or disables the bake out alarm. This field must be set to YES to be alerted whenever the system has finished the assigned number of bake out cycles and the bake out condition is still present. This is an abort alarm and will put the controller in Stop mode when active. Along with the alarm, a dialog is displayed stating the condition still exists and the controller will not run unless the cause of the fault has been repaired.</p> <p>NOTE: The default value is set to No.</p>

Table 11-2 Advanced Setup Screen Item Description (Continued)

Item	Description
Bake Out Timer Per Cycle Field	<p>This field is used to adjust the duration of the bake out routine per cycle.</p> <p>NOTE: The default value is 300 seconds (5 minutes) and the range is 0 to 300 seconds.</p>
Number of Bake Out Cycles Field	<p>This field is used to adjust the number of cycles the bake out process will run before it rechecks to determine if the bake out condition has been cleared. If the condition no longer exists then the system will initiate the Softstart routine and heat up as normal. If the condition has not been cleared, and Bake Out Alert is enabled, an alarm will be initiated and the system will stop.</p> <p>NOTE: The default value is 1 cycle and the range is 1 to 10 cycles.</p>

11.2.1.1 Access the Advanced Setup Screen

The Advanced Setup screen is used to modify advanced system settings as well as gain access to the Mold Setup Defaults and Stage Setup screens. The settings in this screen should only be modified by well qualified users as changing these parameters can adversely affect the operation and performance of the system. Contact a Husky call center technician for the access code.

To Access the Advanced Setup Screen:

1. Touch the SYSTEM button in the Home screen.
2. Touch the ADVANCED SETUP button in the Home screen submenu.
3. Touch the OK button in the Warning pop-up window.
4. Enter the appropriate Password in the Keyboard Pop-up and touch the Enter button.

11.2.1.2 Adjusting the Bake Out Limit

Adjusting the Bake-Out Limit is sometimes necessary to change the level of measured current before the Bake-Out routine is started.

To Adjust the Bake-Out Limit:

1. Navigate to the Advanced Setup screen.
2. Touch the Bake Out Limit field to display a 10-Key pop-up window.
3. Enter the new limit value and touch the ENTER button.

11.2.1.3 Enabling the Bake-Out Feature

Depending on the need, the Bake-Out feature can be enabled or disabled.

To enable the Bake-Out Feature:

1. Navigate to the Advanced Setup screen.
2. Touch the Bake Out Enable field to toggle it from NO to YES.

11.2.1.4 Enabling the Bake-Out Alarm

Enable the Bake-Out Alarm to be alerted if a wet heater condition is still detected after the bake-out routine has been completed.

To enable the Bake-Out Alarm:

1. Navigate to the Advanced Setup screen.
2. Touch the Bake Out Alert Enable field to toggle it from NO to YES.

11.2.1.5 Adjusting the Duration of Each Bake-Out Cycle

A longer or shorter duration for each bake-out may be required depending on humidity levels around the molding cell.

To adjust the Bake-Out Duration per Cycle:

1. Navigate to the Advanced Setup screen.
2. Touch the Bake Out Time Per Cycle field to display a 10-Key pop-up window.
3. Enter the new value and touch the ENTER button.

11.2.1.6 Adjusting the Number of Bake-Out Cycles

In high humidity environments, the number of bake-out cycles before the system rechecks to determine if the ground fault condition has been cleared, may need to be adjusted.

To adjust the Number of Bake-Out Cycles:

1. Navigate to the Advanced Setup screen.
2. Touch the Number of Bake Out Cycles field to display a 10-Key pop-up window.
3. Enter the new value and touch the ENTER button.

11.3 The Current Deviation Alarm

The Current Deviation Alarm provides real-time heater failure detection and is especially useful on zones that are made up of multiple heaters being controlled by a single thermocouple. A Mold Test must be run before activating this feature to allow the system to calculate the full load current of each zone and to store the value as a baseline to compare against while it is running. This feature is supported by the X card only.



IMPORTANT!

This feature should only be enabled if the Power Deviation Alarm has not already been configured. Otherwise, it is recommended that the Power Deviation Alarm be used as the preferred alternative to this feature.

Advanced Setup

System	Alarm Control	Zone Control
Force Temp Units: -	Sensitivity: 2 Sec	Soft Start Limit: 30F
Watt Voltage: 220	Maximum Temp Limit: 200F	Soft Start Enable: YES
Global Power Limit: 100	No Response Limit: 4 Min	Staged Startup Enable: NO
Log Reason Enable: NO	Ground Fault Minimum: 0.5 Amps	Run Last Stage Indefinitely: NO
Import Log Reasons: Import	Ground Fault Limit: 10 %	Staged Shutdown Enable: NO
Export Log Reasons: Export	Bake Out Limit: 0.2 Amps	Staged Shutdown Ovr Lmt: 00 15:00
View Monitor Regulation: YES	Bake Out Enable: YES	Staged Shutdown Dflt Setpt: 300F
PID Base Values: Load	Bake Out Alert Enable: NO	Setup Stages: Setup
Use Default Mold Setup: YES	Bake Out Time Per Cycle: 300 Secs	Auto Slave Enable: YES
High Precision: NO	Number of Bake Out Cycles: 1	Auto Slave Power: 10 %
Mold Setup Defaults: Setup	Min Current Deviation Limit: 0.5 Amps	At-Temp Minimum: 5F
Excl. Mon. Zones (At-Temp): NO	Current Deviation % Limit: 0 %	

status: stopped mold/setup: Husky/Test user: none 03/23/12 18:07:56

Figure 11-2 Advanced Setup Screen

1. Minimum Current Deviation Limit Field **2.** Current Deviation % Limit Field

Table 11-3 Advanced Setup Screen Item Description

Item	Description
Minimum Current Deviation Limit Field	<p>This field is used to adjust the minimum current deviation level. This is the lowest current measurement value that the system will use for declaring a deviation error.</p> <p>NOTE: The default value is 0.5 amps and the range is 0.5 to 5 amps. If this limit is exceeded for at least 10 seconds, the system will alarm and display a Deviation Error in the Status screen.</p>
Current Deviation% Limit Field	<p>This field is used to adjust the current deviation percentage limit. This value defines the threshold for the percentage of variation from the baseline values (stored during the last mold test) before the system declares a deviation error. If the calculated percentage limit is less than the minimum current deviation limit, the system will use the minimum current deviation limit as the threshold for declaring an error.</p> <p>NOTE: The default value is 0%, but the recommended value is 10% and the range is 0 – 100%. If this limit is exceeded for at least 10 seconds, the system will alarm and display a Deviation Error in the Status screen.</p>

11.3.1 Accessing the Advanced Setup Screen

The Advanced Setup screen is used to modify advanced system settings as well as access the Mold Setup Defaults and Stage Setup screens. The settings in this screen should only be modified by qualified users.



IMPORTANT!

Changing these parameters can adversely affect the operation and performance of the system. Contact a Husky call center technician for the access code.

To Access the Advanced Setup Screen:

1. Touch the SYSTEM button in the Home screen.
2. Touch the ADVANCED SETUP button in the Home screen submenu.
3. Touch the OK button in the Warning pop-up window.
4. Enter the appropriate Password in the Keyboard Pop-up and touch the Enter button.

11.3.2 Adjusting the Minimum Current Deviation Limit

Depending on the design of the hot runner and heater sizing, it may be necessary to adjust the lowest current measurement value that the system will use for declaring a deviation error.

To Adjust the Minimum Current Deviation Limit:

1. Navigate to the Advanced Setup screen.
2. Touch the Min Current Deviation Limit field to display a 10-Key pop-up window.
3. Enter the new limit value and touch the ENTER button.

**IMPORTANT!**

If this limit is exceeded for at least 10 seconds, the system will alarm and display a Deviation Error in the Status screen. Since this is a warning condition, the controller will continue to run.

11.3.3 Adjusting the Current Deviation Percentage Limit

The threshold for the percentage of variation from the baseline values used by the system to declare a deviation error may need to be adjusted depending on the design of the hot runner and heater sizing.

To Adjust the Current Deviation Percentage Limit:

1. Navigate to the Advanced Setup screen.
2. Touch the Current Deviation % Limit field to display a 10-Key pop-up window.
3. Enter the new limit value and touch the ENTER button.

**IMPORTANT!**

If this limit is exceeded for at least 10 seconds, the system will alarm and display a Deviation Error in the Status screen. Since this is a warning condition, the controller will continue to run.

11.4 The Power Deviation Alarm Configuration Screen

The Power Deviation Alarm Configuration screen is used to make adjustments to settings that affect how the Power Deviation feature operates.

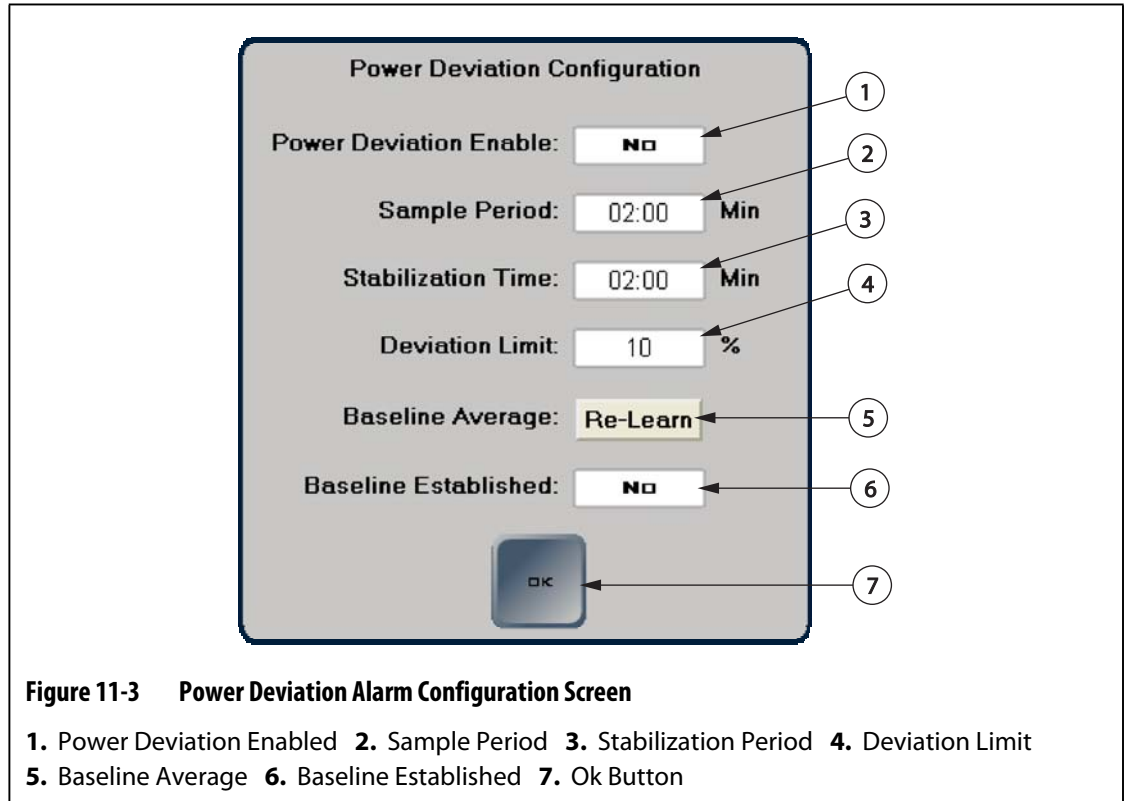


Figure 11-3 Power Deviation Alarm Configuration Screen

1. Power Deviation Enabled 2. Sample Period 3. Stabilization Period 4. Deviation Limit
 5. Baseline Average 6. Baseline Established 7. Ok Button

Table 11-4 Power Deviation Alarm Configuration Screen Item Descriptions

Item	Description
Power Deviation Enabled	This field enables the Power Deviation feature. Touching this field will toggle between NO or YES. YES indicates that the feature is enabled. NO is the default setting.
Sample Period	This field defines the amount of time that the system will take to establish a baseline average power value (Learn the mold). Touching this field will display a 10-Key pop-up window for entering a value within the range of 0.5-10 minutes. The default value is 2 minutes.
Stabilization Time	This field defines the amount of time that the system will take, after all active zones have reached setpoint, before it will initiate the Sample (Learning) Period. Touching this field will display a 10-Key pop-up window for entering a value within the range of 0.5-10 minutes. The default value is 2 minutes.
Deviation Limit	This field is used by the system to determine the tolerance value that will be used for declaring an error. This value will only be used if the value calculated by the system cannot be used. Touching this field will display a 10-Key pop-up window for entering a value within the range of 0-100% definable in 1% increments. The default value is 10%. This field will not be accessible unless security is enabled, the function is allowed in User Profiles and the user is logged in.

Table 11-4 Power Deviation Alarm Configuration Screen Item Descriptions (Continued)

Item	Description
Baseline Average	This button is used to start a new sample period (ReLearn the mold) in cases where the original sample time was not sufficient to establish good baseline average power values. This button is a manual override that is only active after all active zones have reached setpoint and the Stabilization Time has expired.
Baseline Established	This field is used to determine if a baseline has already been established for the currently loaded mold setup. It is for informational purposes only.

Table 11-5 Power Deviation Alarm Configuration Screen Button Descriptions

Button	Description
Ok	Touch the OK button to exit or acknowledge changes to the Power Deviation Alarm Configuration and return to the System Setup screen.

11.4.1 Accessing the Power Deviation Alarm Configuration Screen

The Power Deviation Alarm Configuration screen is accessed from the System Setup screen.

To Access the Power Deviation Alarm Configuration Screen:

1. Touch the SYSTEM button in the Home screen.
2. Touch the SYSTEM SETUP button from the SYSTEM button submenu.
3. Touch the SETUP button next to the Power Deviation Alarm line under the System heading section.

11.4.2 Enabling the Power Deviation Feature

The Power Deviation feature can be enabled automatically or manually:

To automatically enable the Power Deviation feature:

1. Create a new mold setup.
2. Touch the START button.
3. Touch the ASSIGN ZONE TYPES button in the Power Deviation Dialog Box.

To manually enable the Power Deviation feature:

1. Navigate to the System Setup screen.
2. Touch the SETUP button next to the Power Deviation Alarm line under the System heading section.
3. Touch the Power Deviation Enabled field. The Power Deviation Enabled field will display YES when the feature is enabled.

11.4.3 Adjusting the Sample Period

The Sample Period defines the amount of time that the system will take to establish a baseline average power value (Learn the mold).

To adjust the Sample Period:

1. Touch the Sample Period field.
2. Enter the desired time into the 10-Key pop-up window (Range is 0.5-10 minutes).
3. Touch the ENTER button. This completes the change to the Sample Period.

11.4.4 Adjusting the Stabilization Time

The Stabilization Time defines the amount of time that the system will take, after all active zones have reached setpoint, before it will initiate the Sample (Learning) Period.

To adjust the Stabilization Period:

1. Touch the Stabilization Period field.
2. Enter the desired time into the 10-Key pop-up window (Range is 0.5-10 minutes).
3. Touch the ENTER button. This will complete the change to the Stabilization Time.

11.4.5 Changing the Deviation Limit

The Deviation Limit is used by the system to determine the tolerance value that will be used for declaring an error. This value will only be used if the value calculated by the system cannot be used.

**IMPORTANT!**

This field cannot be changed unless security is enabled, the function is allowed in User Profiles and the user is logged in.

To change the Deviation Limit:

1. Touch the Deviation Limit field.
2. Enter the desired time into the 10-Key pop-up window (Range is 0-100% defined in 1% increments).
3. Touch the ENTER button. This completes the change to the Deviation Limit.

11.4.6 Establishing a New Baseline Average for the Mold

The RE-LEARN button is used to start a new sample period (Relearn the mold) in cases where the original sample time was not sufficient to establish good baseline average power values.

**IMPORTANT!**

This button is a manual override that is only active after all active zones have reached setpoint and the Stabilization Time has expired.

To establish a new baseline average:

1. Touch the RE-LEARN button next to the Baseline Average line.
2. Touch the OK button in the Confirmation dialog box (Dialog: "A new baseline will now be established").

This will start the process of establishing a new baseline average for the mold.

11.4.7 Power Deviation Alarm Configuration Security

Key functions that pertain to the setup and management of the power deviation alarm feature are available in the User Rights (Administrator) screen to better control user access.

Power Deviation Alarm Functions in the User Rights (Administrator) Screen:

1. Power Deviation Alarm Setup
2. Power Deviation Limit

11.5 Soft Start Routine

With Matrix, all zones warm up simultaneously, rising in temperature at the same rate to ensure even thermal expansion and identical residence time on the material. This removes the possibility of a mold leak or gate misalignment.

To launch the soft start routine Touch START.

Matrix will continue with the following:

1. Matrix begins the bake out process if necessary.
2. Following this, the ART process begins if it has not already been run.
3. Then "soft start" is displayed in the status bar. The power applied to the heaters varies from the probes to the manifold zones.

The probes receiving less power and the manifolds receive more. All of the zones increase in temperature at the same rate to ensure a smooth even thermal transfer within the mold. This helps to eliminate mold leakage.

4. Once all temperatures are close to their setpoint, running is displayed in the status bar.

11.6 Zone Status Screen

The Zone Status screen displays any errors that occur. The Zone Status screen appears automatically when an error occurs and displays errors in the Status column in red. The text in the status bar changes to red and blinks.



Figure 11-4 Zone Status Screen

Table 11-6 Zone Status Screen Item Descriptions

Item	Description
ZONE	Zone number
ZONE NAME	Zone name
STATUS	Error message or status

Table 11-7 Zone Status Screen Button Descriptions

Button	Description
ERROR LOG	Displays the error log
RESET	Resets the alarm light and error message
CLEAR ALARM	Clears the audible alarm
EXIT	Returns to the Home screen

11.7 Clearing Alarms

If an error occurs, Matrix will turn on audible and visual alarms and display the alarm condition in the Zone Status screen. The system automatically shows the Zone Status screen to display the error.

To clear alarms:

1. After reviewing the error, touch CLEAR ALARM to silence the audible alarm.
2. Touch RESET to reset the visual alarm and the error message in the Status column.

NOTE: If after one minute RESET was not selected, Matrix will initiate the audible and visual alarms again. STOP can also be used to clear and reset alarms. Touch it once to clear the audible alarm and touch it a second time to clear the visual alarm and reset the error.

11.8 The Error Log Screen

The Error Log screen lists the errors that have occurred previously. Touch ERROR LOG in the Zone Status screen, or from the Home screen, touch DATA RECORDING, and then the Error Log.

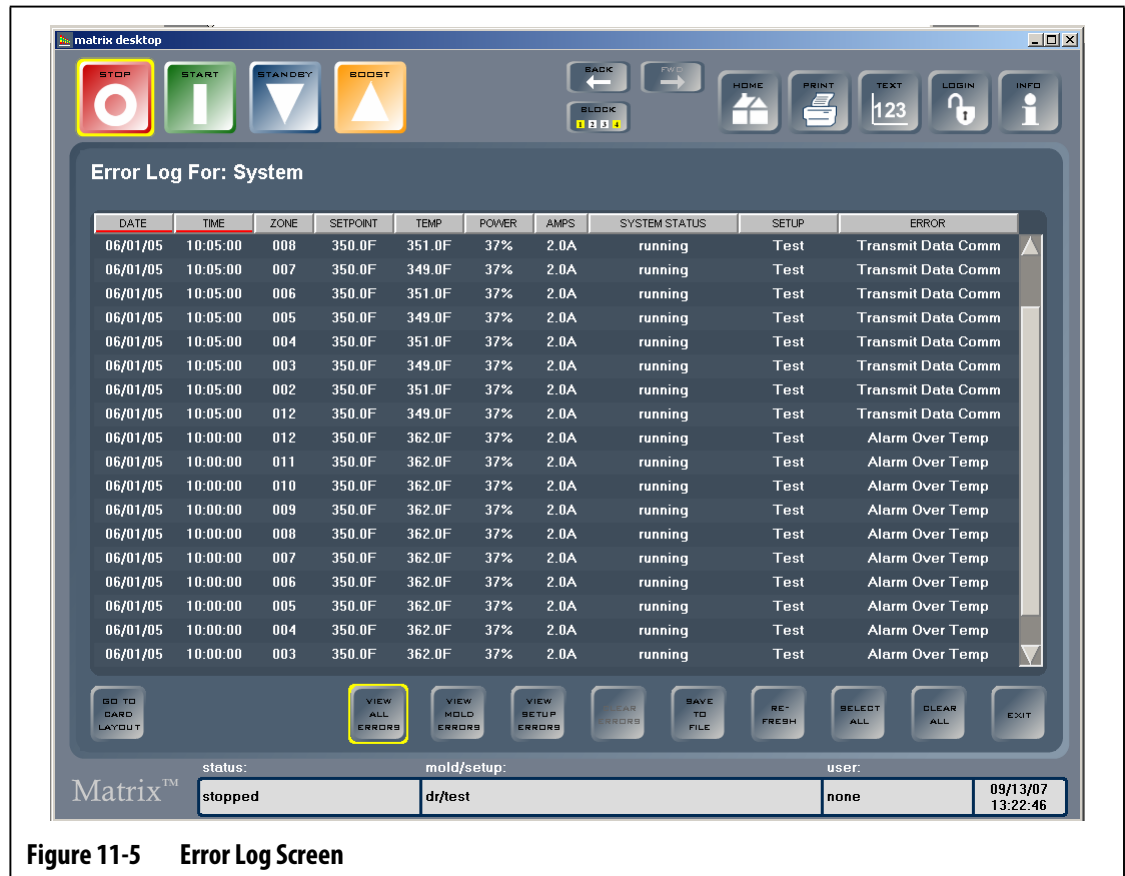


Figure 11-5 Error Log Screen

11.9 Alarm Conditions — Warning Errors

The following conditions cause the audible and visual alarms to initiate. Since they are warnings, they will not shut any part of the system down.

Table 11-8 Warning Errors

Warning	Description
Alarm Over Temp	A zone's actual temperature has exceeded its setpoint by the amount set for the alarm limit.
Alarm Under Temp	A zone's actual temperature has dropped below its setpoint by the amount set for the alarm limit.
Auto Slave Enabled	A zone thermocouple has become defective while running in automatic control mode. The system has AUTOMATICALLY SLAVED this zone to another one using data it collected before the thermocouple became faulty. The faulty zone is now being controlled by the power output from another similar zone. The master zone number will be displayed in the SLAVE TO box of the faulty zone in the Quick Set screen.
AMC Active	A zone thermocouple has become defective while running in automatic control mode. There was no match found for this zone in the mold by the Auto-Slave feature or the Auto-Slave feature is turned off. The zone has been setup to go into AMC (Automatic Manual Control) in this event. The zone is now being controlled in manual mode at a power percentage selected by the controller using data it collected before the thermocouple became faulty.

11.10 Abort Conditions — Shutdown Errors

The following conditions initiate the audible and visual alarms. Since they are shut down errors, they will cause a zone or system shut down situation based on the PCM setting.

Table 11-9 Shutdown Errors

Shut Down Error	Description
Abort Over Temp	A zone's actual temperature has exceeded its setpoint by the amount set for the abort limit.
Abort Under Temp	A zone's actual temperature has dropped below its setpoint by the amount set for the abort limit.
Fuse 1 Blown	Fuse 1 on this ICC ² (Intelligent Control Card) has blown and needs replacing.

Table 11-9 Shutdown Errors (Continued)

Shut Down Error	Description
Fuse 2 Blown	Fuse 2 on this ICC ² (Intelligent Control Card) has blown and needs replacing.
No Response	Matrix has been applying 96% to 100% power to this heater for a set amount of time, and the thermocouple connected to this zone is not responding. The thermocouple may be pinched or the heater power wires may be broken.
Lost Thermocouple	This zone has a defective or open thermocouple.
Rev. Thermocouple	The positive and negative leads from the thermocouple have been switched or the connections are reversed. As power is applied, the temperature goes down instead of up. This situation must be corrected at the point where the wires are reversed.
Ground Fault	This zone has current flowing greater than 3A to ground (earth) and there is potential for a short circuit.
Maximum Temp Limit	The temperature on this zone has risen above the maximum value allowed. This usually means the switching device has failed in the closed position and the zone ran away. The factory setting is 95 °C (200 °F) over the normal setpoint.
Over Current Limit	The current on this zone has risen above the maximum value allowed.
No Heater Detected	This zone is not showing any current draw. This usually means there is not a heater hooked up to this zone or the wires to the heater have been disconnected.
Receive Data Comm	This zone has stopped receiving data from Matrix.
Transmit Data Comm	This zone has stopped transmitting data to Matrix.

Chapter 12 System Menu

This chapter describes the functionality available within the System menu, and provides instructions on setting some of the most commonly used system wide preferences.

To display the SYSTEM submenu, touch SYSTEM. Items in the menu depend on the access rights of the user and the current state of the system.

Contact Husky for more information about Advanced Setup, Calibration, Zone/Slot Config and CAN Information.

12.1 Version Information

The Version Info screen, contains information about the software revision, build number and serial number of the system. It also allows the user to view the Release Notes for the previous versions. Touch SYSTEM, and then touch the Version Info submenu to open this screen.

Table 12-1 Version Info Screen Item Descriptions

Item	Description
Current Software Version	The Current Software Version is for informational purposes only.
Build Number	The Build Number is for informational purposes only.
Serial Number	The Serial Number is for informational purposes only. It is a number that is assigned to the system when it is manufactured.
CAN Driver Version Number	The CAN Driver Version is for informational purposes only.

NOTE: Husky support may ask for any one of these numbers when troubleshooting or upgrading Matrix.

12.1.1 Viewing Release Notes

The Release Notes describe modifications to the software in the latest version. This information is automatically updated when performing a software upgrade.

To view release notes:

1. Touch VIEW RELEASE NOTES.
A screen with a list of Release Notes for each version is displayed.
2. Select the version you want.
The Release Notes for the selected version is displayed.

12.2 System Setup Screen

The System Setup screen, [Figure 12-1](#), is used to configure additional settings for the system. The settings that can be configured include:

- System settings - Number of zones, temperature units and Auto Logout.
- Utilities -Printer and networking options.
- Timers - Including standby and boost options.
- Standby and Boost Options - Including Standby Cycle, Hard Boost and Manual Boost Active Limit options.

In addition to these settings, this screen also includes access to the Power Deviation Configuration screen.

To display the System Setup Screen:

1. Touch SYSTEM.
2. Touch the System Setup submenu.

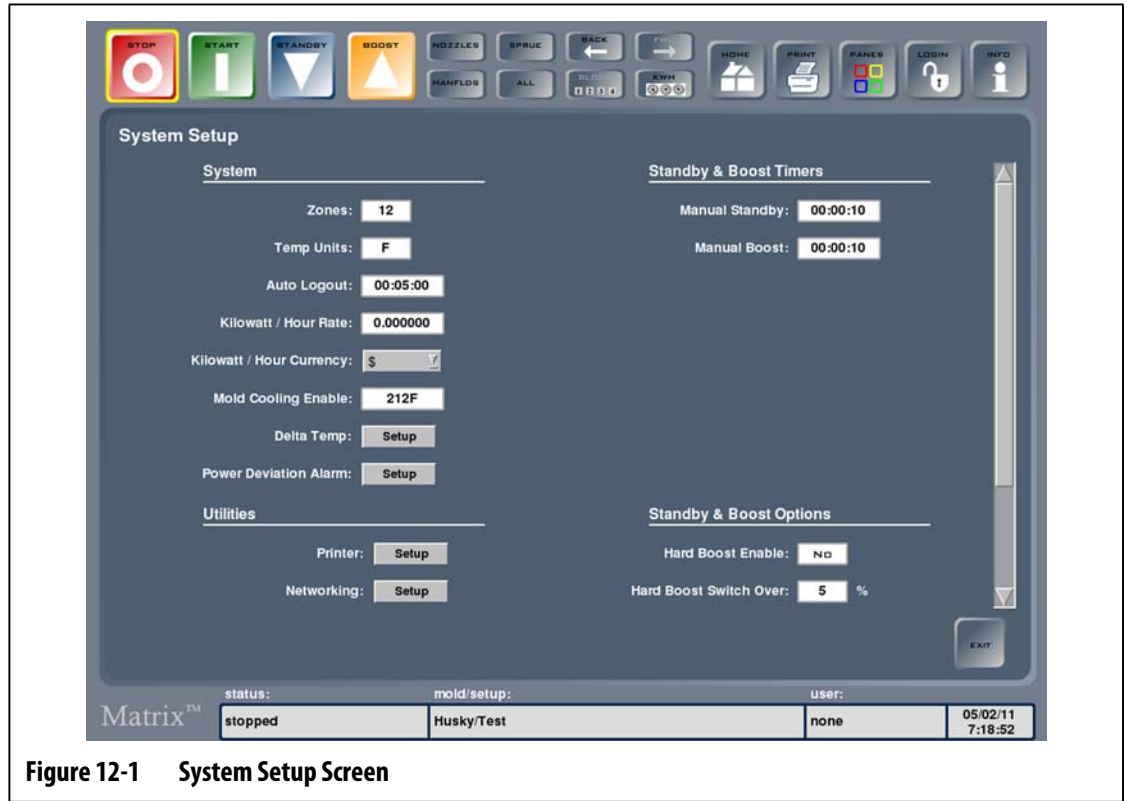


Figure 12-1 System Setup Screen

Table 12-2 System Setup Screen Item Descriptions

Item	Description
Zones	The number of zones to be displayed in the current mold setup.
Temp Units	Toggles the temperature units between °F (Fahrenheit) and °C (Celsius) in the current mold setup.
Auto Logout	The period of inactivity required for the current mold setup before Matrix automatically logs the current user out.
Kilowatt / Hour Rate	The monetary kilowatt per hour rate that is used to calculate energy consumption costs based on the number of kilowatt hours used.
Kilowatt / Hour Currency	The currency symbol for indicating what monetary value is being used to calculate the kilowatt per hour rate.
Mold Cooling Enable	Touch this field to set the Mold Cooling Enable limit used to activate the mold cooling digital output.
Delta Temp	Touch this button to access the Delta Temperature Setup screen.
Power Deviation Alarm	Touch this button to access the Power Deviation Configuration pop-up.
Standby & Boost Timers	The timers associated with the Standby and Boost functions.
Utilities	To set up a printer or networking, touch the appropriate Setup button.

Table 12-2 System Setup Screen Item Descriptions (Continued)

Item	Description
Standby Cycle Enable	Enables the Standby Cycle feature toggling from NO to YES. NOTE: Standby Cycle is only available for use with the Remote Standby Input Option.
Hard Boost Enable	Enables the Hard Boost feature by toggling from NO to YES.
Hard Boost Switch Over	Touch to adjust the percentage value that is used by the system to calculate when to switch back to Automatic regulation.
Hard Boost Power Output	Touch to adjust the percentage of power output the system will use during the manual regulation stage of the Hard Boost process.
Use Manual Boost Active Limit	Enables the Manual Boost Active feature by toggling from NO to YES.
Manual Boost Active Limit	Touch to set the temperature limit that all zones must exceed before the Boost button is enabled for use.

Table 12-3 System Setup Screen Button Descriptions

Button	Description
EXIT	Touch the EXIT button to close the System Setup screen and return to the Home screen.

12.2.1 Changing the Temperature Units

Matrix can be configured to display temperatures in Fahrenheit or Celsius for the current mold setup.

To toggle the units between Fahrenheit and Celsius:

1. Touch the Temp Units box.
2. A message appears asking you to confirm the change. Touch Yes or No.

NOTE: If the system is forced to a specified setting (°F or °C) the value can only be changed by an Administrator.

12.2.2 Changing the Number of Zones in the System

The user may need to add or remove zones to an existing mold setup. If the mold that is running has fewer control zones than Matrix, the unused zones can be removed to make sure they are not displayed.

To change the number of zones in the system:

1. Touch the Zones box to display a keypad.
2. Enter the new value
3. Touch ENTER to close the keypad and update the System Setup screen.

12.2.3 Changing the Auto Logout Time

Use this feature to configure Matrix to automatically log the current user out after a set time of inactivity. A different Auto Logout time can be set up for each mold setup.

To change the Auto Logout time for the current mold setup:

1. Touch the Auto Logout time box to display keypad.
2. Enter the new Auto Logout time.
3. Touch ENTER to close the keypad and return to the System Setup screen.

12.2.4 Standby Timer Settings

To reduce the temperatures in the mold for a certain period of time, the user can set the Standby timers associated with each standby function. Once the system enters standby, the timer will start. When the timer finishes, the temperatures will return to the normal setpoint.

12.2.4.1 Setting the Manual Standby Timer

This timer is activated when STANDBY is selected.

To set the manual standby timer:

1. Touch the Manual Standby box to display a keypad.
2. Enter the time required in the format HH:MM:SS.
3. Touch ENTER to close the keypad and return to the System Setup screen.

12.2.4.2 Setting the Remote Standby Timer

The Input Option settings and Standby Cycle Enable setting determine how the system reacts when it receives the Remote Standby input.

NOTE: If the system is not equipped with Remote Standby, only the Manual Standby timer setting is displayed on the System Setup screen.

To set the remote standby timer:

1. Touch the Remote Standby box to display a keypad.
2. Enter the time required in the format HH:MM:SS.
3. Touch ENTER to close the keypad and return to the System Setup screen.

12.2.4.3 Setting the Delay Standby Timer

The Delay Standby timer is a feature available with Remote Standby. The Delay Standby timer is used to protect the material from burning if the molding machine is stopped for a specified period. If a Delay Standby time is set, Matrix will not decrease the temperatures until the delay time has elapsed.

For example, when the door on the molding machine is opened, a signal to start Delay Standby could be sent to Matrix. If the door is closed before the delay time has elapsed, Matrix will not enter Standby. If the door remains open, Matrix then enters Standby.

NOTE: If the system is not equipped with Remote Standby, only the Manual Standby timer setting is displayed on the System Setup screen.

To set the delay standby timer:

1. Touch the Delay Standby box to display a keypad.
2. Enter the time required in the format HH:MM:SS
3. Touch ENTER to close the keypad and return to the System Setup screen.

12.2.4.4 Changing the Standby Input

To change the Standby Input:

- Touch the Standby Input box to toggle between: Trigger, On/Off or Direct.

NOTE: This setting will not appear if Remote Standby is not available on the system.

12.2.4.5 Changing the Standby Cycle

To enable or disable the Standby Cycle:

- Touch the Standby Cycle Enable box to toggle the Standby Cycle On or Off.

NOTE: This setting will not appear if Remote Standby is not available on the system.

12.2.4.6 Standby Operation Description

NOTE: Manual Standby can be cancelled at any time by touching STANDBY or STOP buttons.

Table 12-4 Manual Standby Operational Description

Manual Time	Delay Time	Remote Time	Input Mode	Cycle Enabled	Operation - STANDBY Button Select
0:00:00	----	----	----	----	System enters Standby indefinitely.
X:XX:XX	----	----	----	----	System remains in Standby until the timer expires.

NOTE: Remote Standby can be cancelled at any time by touching the STANDBY or STOP buttons.

Table 12-5 Remote Standby Operational Description

Manual Time	Delay Time	Remote Time	Input Mode	Cycle Enabled	Operation - STANDBY Button Select
----	0:00:00	0:00:00	Trigger	----	System will not enter Standby since no timers are set.
----	0:00:00	X:XX:XX	Trigger	----	System immediately enters and remains in Standby until the timer expires.
----	X:XX:XX	X:XX:XX	Trigger	No	System delays for specified time and then enters Standby until the timer expires.
----	X:XX:XX	0:00:00	Trigger	No	System delays for specified time and then enters Standby indefinitely.
----	X:XX:XX	X:XX:XX	Trigger	Yes	System delays for specified time and then enters Standby until the timer expires. If the input signal changes state while delay timer is active, the delay timer is reset to the specified value.
----	X:XX:XX	0:00:00	Trigger	Yes	System delays for specified time and then enters Standby indefinitely. If the input signal changes state while the delay timer is active, the delay timer is reset to the specified value.
----	0:00:00	0:00:00	ON/OFF	----	System enters Standby until the input signal is not active.
----	0:00:00	X:XX:XX	ON/OFF	----	System enters Standby until the input signal is not active or the timer expires.
----	X:XX:XX	X:XX:XX	ON/OFF	----	System delays for specified time and then enters Standby until the signal is not active or the timer expires
----	X:XX:XX	0:00:00	ON/OFF	----	System delays for specified time and then enters Standby until the input signal is not active.
----	----	----	Direct	----	System enters Standby until the input signal is not active. If the input signal is active when the system is started, it will immediately go into Standby mode.

12.2.5 Boost Timer Settings

To increase the temperatures in the mold for a certain period of time, set the Boost timers associated with each boost function. Once the system enters boost, the timer will start. When the timer finishes, the temperatures will return to the normal setpoint.

12.2.5.1 Setting the Manual Boost Timer

This timer is activated when the BOOST is selected.

To set the manual boost timer:

1. Touch the Manual Boost box to display a keypad.
2. Enter the time required in the format (HH:MM:SS).
3. Touch ENTER to close the keypad and return to the System Setup screen.

12.2.5.2 Setting the Remote Boost Timer

The Input Option settings determine how the system reacts when it receives Remote Boost input.

NOTE: If the system is not equipped with Remote Boost, only the Manual Boost timer setting is displayed on the System Setup screen.

To set the remote boost timer:

1. Touch the Remote Boost box to display a keypad.
2. Enter the time required in the format (HH:MM:SS).
3. Touch ENTER to close the keypad and return to the System Setup screen.

12.2.5.3 Setting the Delay Boost Timer

The Delay Boost timer is used to wait for a specified period before entering Boost.

To set the delay boost timer:

1. Touch the Delay Boost box to display a keypad.
2. Enter the time required in the format (HH:MM:SS).
3. Touch ENTER to close the keypad and return to the System Setup screen.

12.2.5.4 Changing the Boost Input

To change the Boost Input:

- Touch the Boost Input box to toggle between: Trigger, Direct or On/Off.

NOTE: This setting will not appear if your system does not have Remote Boost available.

12.2.5.5 Boost Operation Description

NOTE: Manual Boost can be cancelled at any time by touching BOOST or STOP buttons.

Table 12-6 Manual Boost Operational Description

Manual Time	Delay Time	Remote Time	Input Mode	Cycle Enabled	Operation - BOOST Button Select
0:00:00	----	----	----	----	System enters Boost indefinitely.
X:XX:XX	----	----	----	----	System remains in Boost until the timer expires.

NOTE: Remote Boost can be cancelled at any time by touching BOOST or STOP buttons.

Table 12-7 Remote Boost Operational Description

Manual Time	Delay Time	Remote Time	Input Mode	Operation - Boost Button Select
----	0:00:00	0:00:00	Trigger	System will not enter Boost since no timers are set.
----	0:00:00	X:XX:XX	Trigger	System immediately enters and remains in Boost until the timer expires.
----	X:XX:XX	X:XX:XX	Trigger	System delays for specified time and then enters Boost until the timer expires.
----	X:XX:XX	0:00:00	Trigger	System delays for specified time and then enters Boost indefinitely.
----	0:00:00	0:00:00	ON/OFF	System enters Boost until the input signal is not active.
----	0:00:00	X:XX:XX	ON/OFF	System enters Boost until the input signal is not active or the timer expires.
----	X:XX:XX	X:XX:XX	ON/OFF	System delays for specified time and then enters Boost until the input signal is not active or the timer expires.
----	X:XX:XX	0:00:00	ON/OFF	System delays for specified time and then enters Boost until the signal is not active.
----	----	----	Direct	System enters Boost until the input signal is not active. If the input signal is active when the system is started, it will immediately go into Boost mode.

12.2.6 Utilities Settings

Specify the printer and network settings in the Utilities.

12.2.6.1 Printer Configuration

Matrix supports any PCL5 compatible parallel, serial or USB printer.

Table 12-8 Printer Configuration Screen Item Descriptions

Item	Description
Enable	To enable or disable automatic printing, touch the Enable box to toggle this setting. The default is No.
Frequency	The print frequency setting, how often you want the system to print automatically. The default is 5 minutes and the maximum is 24 hours.
Information To Print	Select the types of information to print using the drop-down box. You can choose between: <ul style="list-style-type: none"> • Setpoints/Temps (short) • Diagnostic Info • Mold Setup Info • Screen Shot • Setpoints/Temps (long) • Release Notes

Table 12-9 Printer Configuration Screen Key Descriptions

Key	Description
Cancel Print Job	Touch the CANCEL button to cancel the current print job.
Print Driver	Touch the SETUP button to set up a printer driver.
Printer Selected	The name of the current printer driver.
EXIT	Touch the EXIT button to return to the System Setup screen.

12.2.6.2 Changing the Network Settings

In the Networking Configuration screen, the user can change the IP address and Subnet Mask of Matrix to enable it to be a part of your company's network.

To modify the network settings:

1. Touch inside the box you want to update to display a keypad.
2. Enter the new IP address, and then touch ENTER to return to the Networking Configuration screen.
3. Touch SAVE to save the network configuration and return to the System Setup screen.

12.2.7 System Time and Date

Matrix displays the current time and date in the status bar at the bottom right of the screen.

12.2.7.1 Setting the System Time

To set the system time:

1. Touch inside the time section of the status bar to display a dialog box with the time and date displayed.
2. Touch inside the Time box to display a keypad.
3. Enter the current time using the keys on the keypad in the format displayed (HH:MM:SS).
4. Touch ENTER to close the keypad.
5. Touch SET to return to the previous screen and update the time in the status bar.

12.2.7.2 Setting the System Date

To set the system date:

1. Touch inside the date section of the status bar to display a dialog box with the time and date displayed.
2. Touch inside the Date box to display a keypad.
3. Enter the current date using the keys on the keypad in the format displayed (MMDDYY).
4. Touch ENTER to close the keypad.
5. Touch SET to return to the previous screen and update the date in the status bar.

12.3 Advanced Setup

The Advanced Setup screen is password protected and allows administrators with appropriate access to change various system wide settings, alarm controls and zone controls. Many of these settings may adversely affect the performance of the controller. Contact Husky for more information.

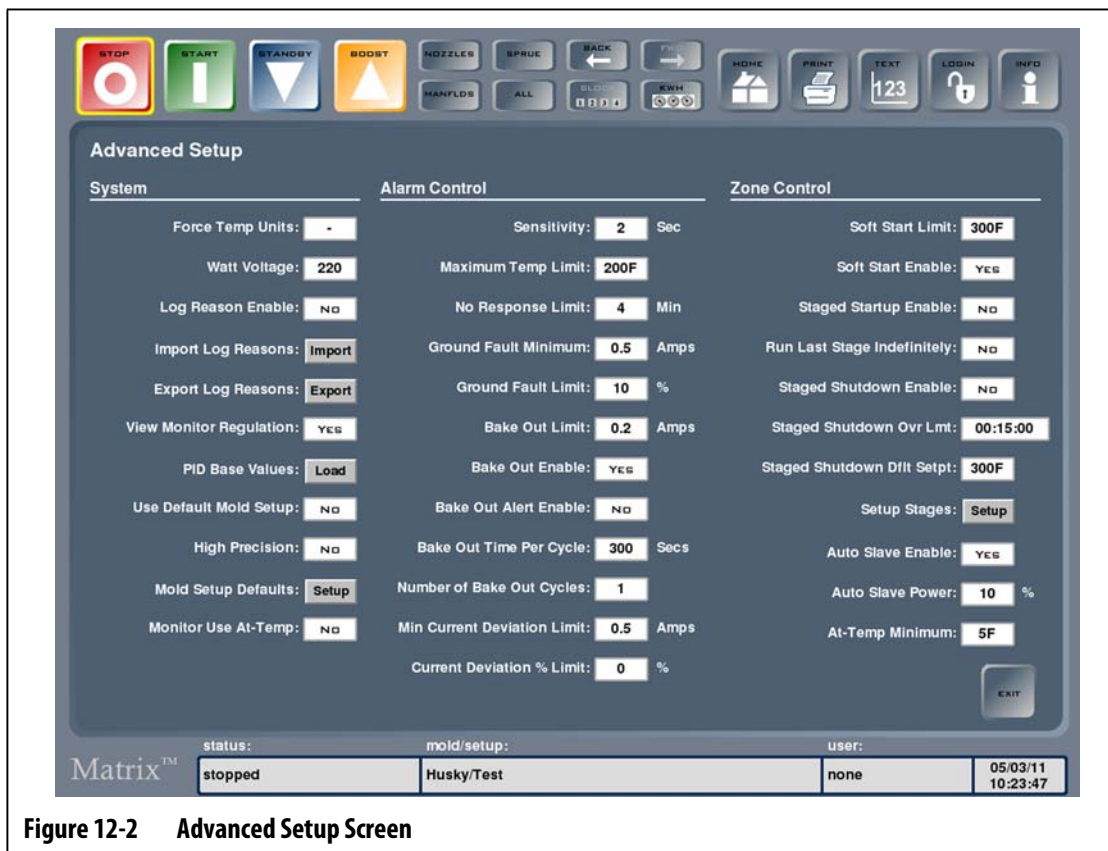


Figure 12-2 Advanced Setup Screen

To access the Advanced Setup screen, touch SYSTEM, and then touch Advanced Setup.

Table 12-10 Advanced Setup Screen Item Descriptions

Item	Description
Force Temp Units	Force the system to use the specified temperature units for all users. This toggles between °F, °C and - (not forced).
Watt Voltage	Insert the voltage rating of your heaters so the system can accurately calculate Watt Voltage.
Log Reason Enable	Toggle the required logging of reasons when a user makes a change.
Maximum Temp Limit	Modify the maximum temperature (degrees above set point) the system will shutdown in the event of a runaway heater.
No Response Limit	Modify the time a zone is required to respond in before triggering a no response error.
Soft Start Enable	Enable or disable Soft Start.
Staged Startup Enable	Enable or disable Staged Startup.

Table 12-10 Advanced Setup Screen Item Descriptions (Continued)

Item	Description
Setup Stages	Configure the stages and timers for Staged Startup.
Auto Slave Enable	Enable or disable the auto slave function.
At-Temp Minimum	Modify the limit that all zones must be within before the system signals the injection machine that it is ready for injection. If all zones temperatures are within their alarm windows, the signal is sent. The At Temperature Minimum is used instead when the alarm window is less than this value. For example, if the Alarm window is 2°F and the At Temperature Minimum is 5°F, the second value is used.

12.3.1 Enabling or Disabling the Log Reason Setting

When changes are recorded in the Change Log, the user can request a reason for the change be specified by enabling the log reason setting on the Advanced Setup screen.

To enable or disable the log reason setting:

1. Touch the Log Reason Enable box to toggle between Yes (enable) or No (disable).
2. Touch EXIT to return to the Home screen.

12.3.2 Enabling or Disabling Staged Startup or Staged Shutdown

The user can enable or disable the staged startup or staged shutdown features from the Advanced Setup screen.

To enable or disable staged startup or staged shutdown:

1. Touch the Staged Startup Enable or Staged Shutdown Enable box to toggle between Yes (enabled) and No (disabled).
2. Touch EXIT to return to the Home screen.

12.3.3 Staged Startup and Shutdown

This feature allows the system to heat or cool zones in a predetermined order by using stages. Zones can be assigned to any of the four stages and can be configured with a separate set point for each stage. A timer can also be configured for each stage which will allow all the zones to soak for a user definable amount of time.

12.3.3.1 Staged Startup Screen

From the Advanced Setup screen, the Staged Startup screen, [Figure 12-3](#), can be displayed by touching the setup stages Setup button. The user can assign zones to stages, set stage setpoints and enter soak timers for each stage.

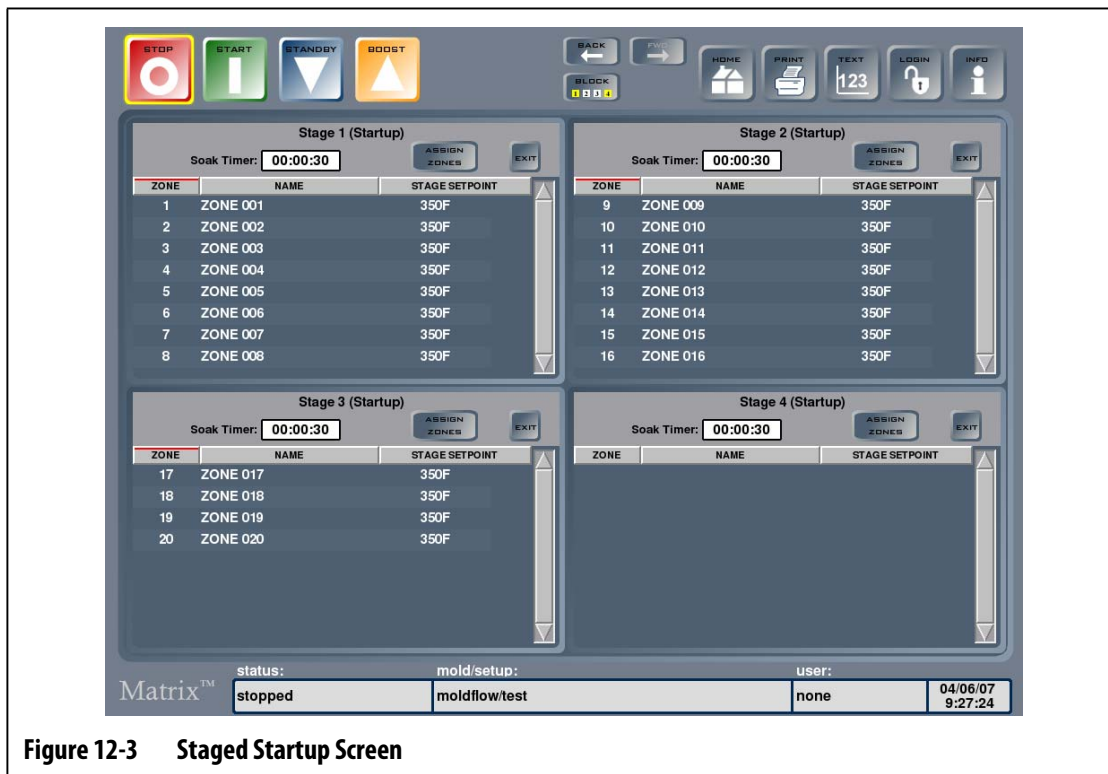


Figure 12-3 Staged Startup Screen

Table 12-11 Staged Startup Screen Item Descriptions

Item	Description
Stage	Zones assigned to Stage 1.
Stage 2	Zones assigned to Stage 2.
Stage 3	Zones assigned to Stage 3.
Stage 4	Zones assigned to Stage 4.
Soak Timer	The amount of time at each stage the zones soak at their stage setpoints before the next Stage is started.
ZONE	Zone number.
NAME	Zone name.
STAGE SETPOINT	The stage setpoint for each zone.

Table 12-12 Staged Startup Screen Button Descriptions

Button	Description
ASSIGN ZONES	Assign zones to each stage.
EXIT	Return to the Advanced Setup screen.

12.3.3.2 Staged Shutdown Screen

From the Advanced Setup screen, the staged shutdown screen can be displayed, by touching the setup stages Setup button. Zones can be assigned to stages, set stage setpoints and enter soak timers for each stage.

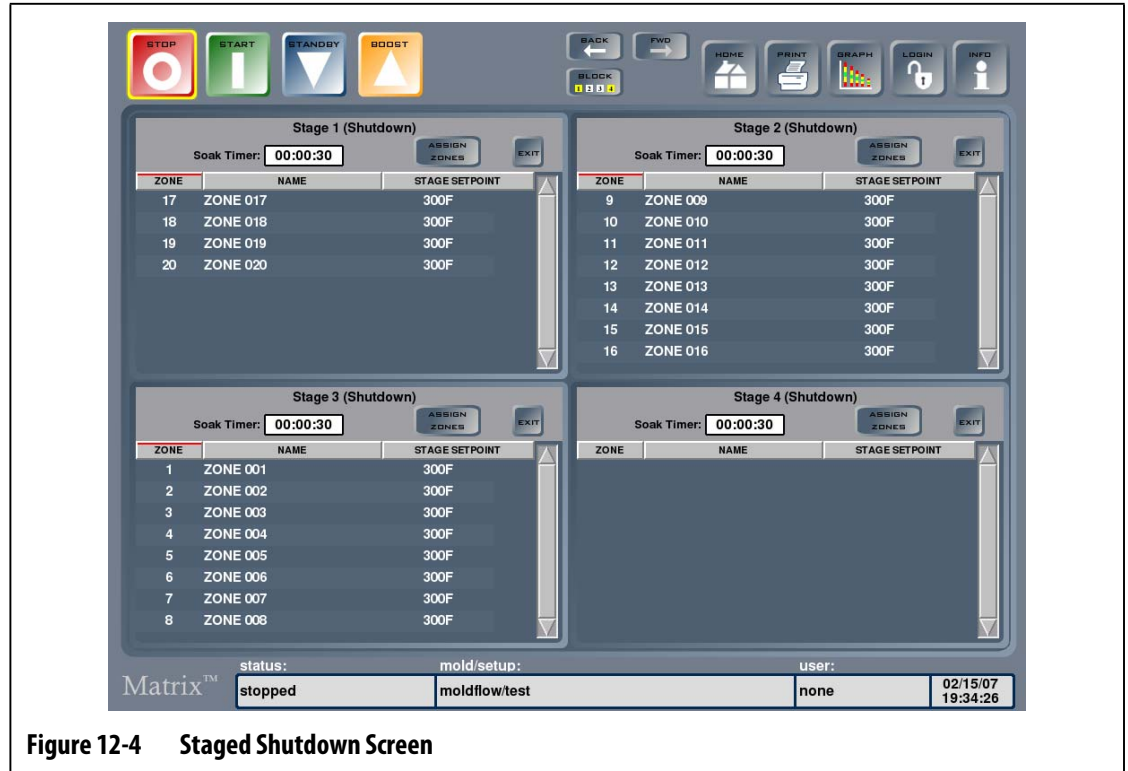


Figure 12-4 Staged Shutdown Screen

Table 12-13 Staged Shutdown Screen Item Descriptions

Item	Description
Stage 1	Zones assigned to Stage 1.
Stage 2	Zones assigned to Stage 2.
Stage 3	Zones assigned to Stage 3.
Stage 4	Zones assigned to Stage 4.
Soak Timer	The amount of time at each stage the zones soak at their stage setpoints before the next Stage is started.
ZONE	Zone number.
NAME	Zone Name
STAGE SETPOINT	The stage setpoint for each zone.

Table 12-14 Staged Shutdown Screen Button Descriptions

Button	Description
ASSIGN ZONES	Assign zones to each stage.
EXIT	Return to the Advanced Setup screen.

12.3.3.3 Assigning Zones to a Stage

A zone can be assigned to any or all of the four stages in the Staging screen.

To assign zones to a stage:

1. Touch ASSIGN ZONES in the Stage 1 header to display the Stage 1 Configuration - Zone assignment screen.
2. Choose the zones to be heated in Stage 1 by using the zone selection boxes on the right hand side of the screen.
Selected zones are highlighted yellow.
3. Touch ASSIGN ZONES to return to the Staging screen.
4. Repeat the above steps to assign zones to the other three stages.

12.3.3.4 Changing a Stage Setpoint

Zones can have different setpoints in each stage. You can assign stage setpoints using the Staging screen.

To change the stage setpoint for a zone:

1. Touch the first zone in Stage 1 and drag the selection to the last zone in that stage.
This will display the Stage 1 Configuration - Change Setpoints screen.
2. Touch the zone(s) to be changed then touch SET to display a keypad.
3. Enter the stage setpoint, and then touch ENTER to close the keypad.
4. Repeat for the other zones in the stage.
5. When all setpoints for Stage 1 have been entered, touch EXIT to return to the Staging screen.
6. Repeat the above steps to assign setpoints to the zones in each stage.

12.3.3.5 Setting Soak Timers

At the end of each stage during staged startup, when all zones have reached their stage setpoints, they can be left to "soak" for a specified time before the next stage begins. Soak timers can be changed using the Staging screen.

NOTE: It is not necessary to assign a soak time to each stage. If a delay is not desired between when a stage has reached setpoint and before the following stage is activated, set the timer to 00:00:00.

To set soak timers:

1. Touch the Soak Timer time box to be changed. A keypad is displayed.
2. Enter the time in the format HH:MM:SS then touch ENTER to close the keypad and update the soak timer. Soak timers have a range from 1 second to 24 hours.
3. Repeat the steps above for each of the stages that require soak time.
4. Touch EXIT in any of the Stage headers to return to the Advanced Setup screen.

Chapter 13 Screen Menu

This chapter describes the functionality available within the Screen menu, and provides instructions on setting the screen configurations.

To display the SCREEN submenu, touch SCREEN. Items in the menu depend on the access rights of the user and the current state of the system.

13.1 Screen Layout Configuration

The Screen Layout Configuration screen allows the user to change the multi-pane layout, load a cavity layout (UDM file), or create a new cavity layout.

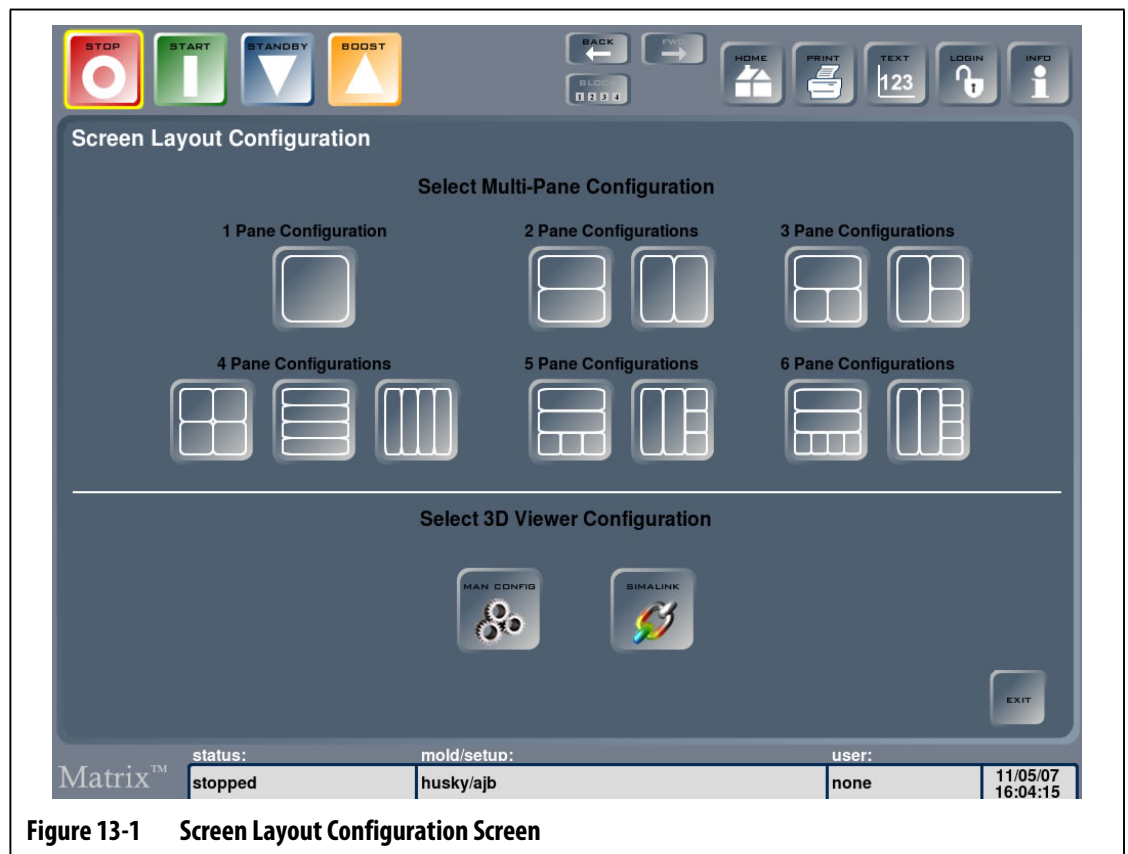


Figure 13-1 Screen Layout Configuration Screen

13.1.1 Configuring a Multi-Pane Screen Layout

The user can group zones into multiple panes to allow individual control of groups of zones. Customize the screen by assigning names to the headers of each pane and set each pane header to a different background color.

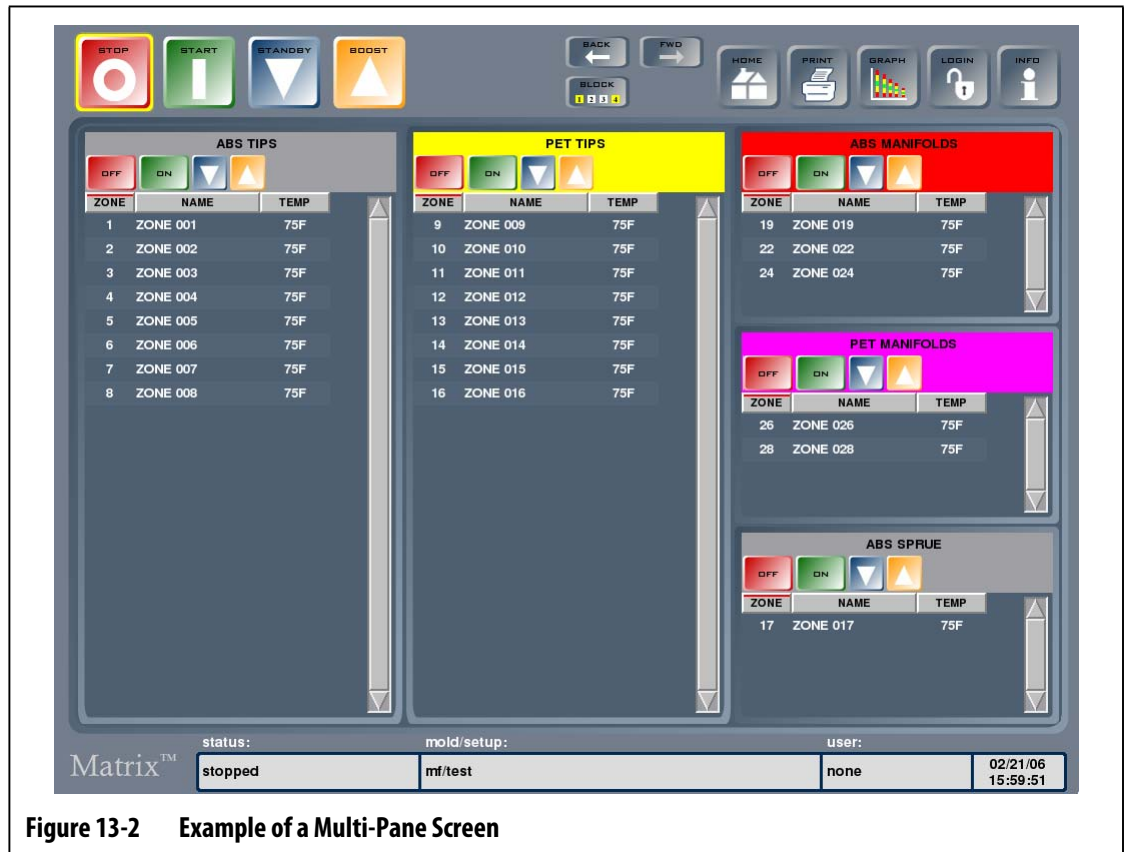
To configure a multi-pane layout:

1. Touch SCREEN, and then touch Screen Layout to display the Screen Layout Configuration screen.
2. Choose the layout by selecting one of the pane configurations. The chosen layout is displayed.
3. To add zones to a pane or delete zones from a pane, select Touch here to add or delete zones inside each pane.

The Pane Configuration - Zone Assignment screen is displayed.

4. Select the zones to be assigned to that pane, if you want to delete zones from a pane, and then select them again. Touch ASSIGN ZONES to finish assigning zones to that pane. Touch YES to return to the Pane Configuration - Zone Assignment screen
5. Repeat [step 3](#) and [step 4](#) to assign zones to the other panes in your chosen layout.
6. Change the pane header names by touching the header area within each pane.
7. Touch CHANGE HEADER NAME to display a keyboard.
8. Enter the header name, and then touch Enter. The pane headers selected will display the header names that were entered.
9. Change the pane header colors by touching the header area within each pane
10. Touch CHANGE HEADER COLOR to display a color selector.
11. Select the color, and then touch OK. The pane headers you selected are displayed in the colors chosen.
12. Once finished, touch HOME to save the screen layout configuration to the current mold setup. Alternatively, touch EXIT in any pane header to save the layout.

The new screen layout is displayed. Refer to [Figure 13-2](#) for an example.



13.1.2 Loading a 3D Viewer Layout (UDM)

Load a 3D viewer layout or create a 3D viewer layout using Simalink.

To load a 3D viewer layout:

1. Touch SCREEN, and then touch Screen Layout to display the Screen Layout Configuration screen.
2. Select SIMALINK to display the Mold Files screen.
The UDMs folder will be displayed.
3. Select the desired UDM file, and then touch LOAD.
The 3D viewer layout is displayed in the Cavity Layout screen.

13.1.3 Configuring a 3D Viewer Layout

Select cavities or runners and assign zone numbers to visualize the structure of the mold from within the Cavity Layout screen.

To configure a 3D viewer layout:

1. Touch EDIT to bring up a dialog to assign zones.
2. Select the zone or zones to be assigned to the cavity or runner, and then touch ASSIGN to close the dialog.
A label showing the actual temperature and the zone number in a smaller font is now attached to the zone or cavity.
3. Repeat the above steps to label the other cavities and runners.

13.1.4 Creating a New 3D Viewer Layout

To create a new 3D viewer layout:

1. Touch SCREEN, and then touch Screen Layout to display the Screen Layout Configuration screen.
2. Touch MAN CONFIG to display the Mold Configuration dialog.
3. Touch the Set Cavitation box to display a keypad.
4. Enter the number of cavities, and then touch Exit to return to the Mold Configuration dialog.
5. Touch the Cavity Type drop-down list to select the shape of the cavities.
Select from:
 - Box
 - Plate
 - Cylinder
 - Disc
6. Touch SET to confirm the parameters.
A dialog will appear to determine if the user wants to save the layout before displaying the Cavity Layout screen.
7. To save the layout, touch YES to display a keyboard.
8. Enter a filename then touch ENTER to save the file.
9. To discard the layout, touch NO.
The Cavity Layout screen is displayed with the new layout. The user can now assign heater zones to the layout using the method described earlier.

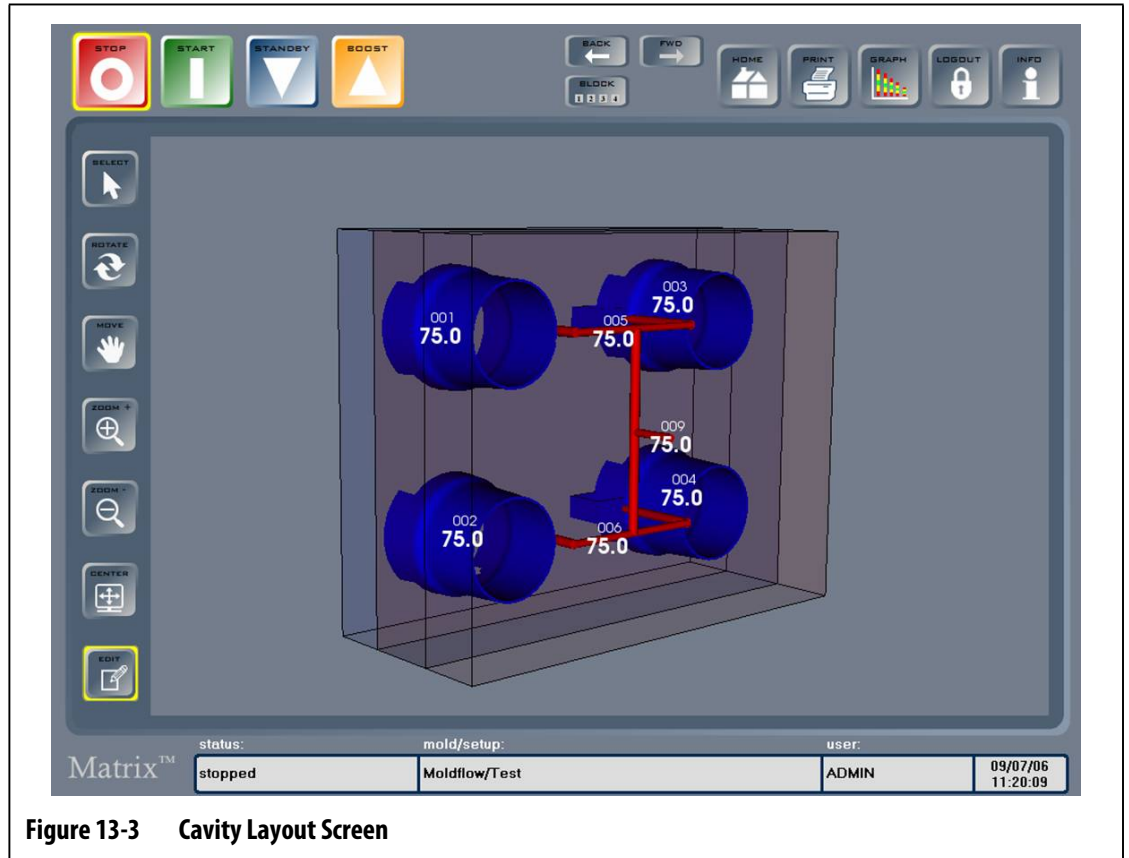


Figure 13-3 Cavity Layout Screen

Chapter 14 The Notes Screen

It may be necessary to make a note for the next shift operator when a problem with the mold occurs. Instead of writing that note on a piece of paper, which could easily get lost, online notes can be created. Simplified drawings can also be imported into the Notes screen and notes added to the drawings.

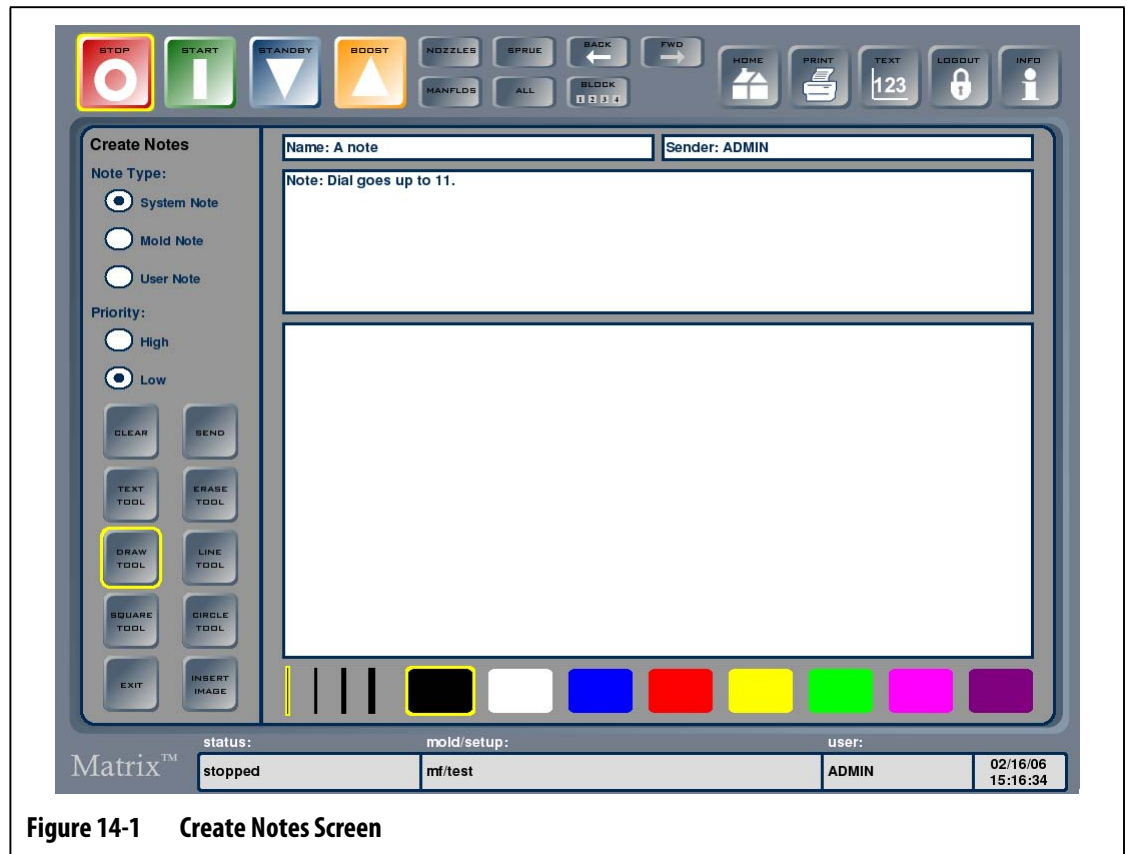


Figure 14-1 Create Notes Screen

Table 14-1 Notes Screen Item Descriptions

Item	Description
Note Type	Three different note types are available. <ul style="list-style-type: none"> • Mold notes are specific to a mold setup. • User notes are sent to a specific user. • System notes are assigned to the System and viewable by all users.
Priority	The priority of the note.
Name	The name of the note. Enter a name before sending the note.
Sender	The sender is automatically updated to be the current user.

Table 14-1 Notes Screen Item Descriptions (Continued)

Item	Description
Note	Select here to enter a text description using the on-screen keyboard.
Drawing box	This is where you can draw, import diagrams and place text.
Line type	Indicates the thickness of your drawing tool.
Color	Indicates the color of your drawing tool or text tool.

Table 14-2 Notes Screen Button Descriptions

Button	Description
CLEAR	Deletes the contents of the drawing box.
SEND	Saves the note.
TEXT TOOL	Allows you to enter text in the drawing box.
ERASE TOOL	Allows you to erase content in the drawing box.
DRAW TOOL	Allows you to draw freehand in the drawing box.
LINE TOOL	Allows you to draw straight lines in the drawing box.
SQUARE TOOL	Allows you to draw squares or rectangles in the drawing box.
CIRCLE TOOL	Allows you to draw circles or ellipses in the drawing box.
EXIT	Cancels your note and returns to the Home Screen.
INSERT IMAGE	Allows you to attach an image to your note.

14.1 Creating Notes

To create a note:

1. On the Home screen, touch NOTES, and then touch the Create Notes submenu.
2. To draw on the Create Notes screen, select a color from the color buttons at the bottom of the screen, and then touch and drag your finger across the screen in the white drawing area. Select the following drawing tools:
 - DRAW TOOL Select and drag across the screen to draw freehand.
 - LINE TOOL Select and drag across the screen to draw a line. The line is drawn between the starting position and where you removed your finger from the screen.
 - SQUARE TOOL Select and drag across the screen to draw a square or rectangle. The top left corner of the square or rectangle is where you started drawing, and the bottom right corner where you removed your finger from the screen.
 - CIRCLE TOOL Select and drag across the screen to draw a circle or ellipse. The edge of the circle or ellipse is where you started drawing, and the shape of the ellipse is determined by the position at which you removed your finger from the screen.

3. To enter text touch TEXT TOOL, and then touch anywhere in the drawing box to display a keyboard. Type the note, and then touch ENTER to close the keyboard.
4. To erase parts of a drawing, touch ERASE TOOL, select the line thickness to use and drag the cursor across the screen over the section you want to erase.
5. To clear the note, touch CLEAR. A dialog prompts whether you want to continue. Touch OK to clear the note.
6. To name the note, touch the Name box to display a keyboard, enter the name of your note, and then touch ENTER to close the keyboard.
7. Touch the appropriate Note Type.
For Mold Notes, select the appropriate mold from a drop-down list of Mold Folders.
For User Notes, select the appropriate user from a drop-down list of users.
The default note type is System Notes.
8. Touch OK to return to the Create Notes screen.
9. Select the Priority by touching the appropriate radio button.

14.1.1 Using Images in Notes

Images can be used and marked up to illustrate problems or correct settings.

To insert an image into a note:

1. Touch INSERT IMAGE. The Mold Files screen displays the Images folder for the currently loaded mold setup.
2. Navigate to the appropriate Images folder, and then select the image file to be inserted into the note.
3. Touch INSERT to insert the image into the drawing box of your note.

Drawing and text tools can be used to mark up the image.

14.1.2 Saving Notes

For a completed not to be saved it must be sent to the recipient.

To save a note:

- Touch SEND.

NOTE: System notes are displayed to all users, mold notes are displayed to whoever loads that mold. User notes are sent to the selected user.

14.2 Reading a Note

Unread notes are flagged by the yellow note icon which flashes in the status, mold setup, or user section of the status bar.

To read a note:

1. Touch the yellow note icon to open the note in the Create Notes screen.
2. Touch EXIT to return to the previous screen. A dialog prompts the choice to mark the message as read.
3. Touch YES to mark the message as read and the yellow note icon will disappear. If you touch NO, the yellow note icon continues to flash in the status bar. If a note is mark as read the note is still available for loading from the appropriate file access screen.

14.2.1 Loading a Note

Once a note is created and saved, the user can open it in the Notes screen at any time.

To load a note:

1. Touch NOTES on the Home screen, and then touch the View Mold Notes submenu. The Mold Files screen displays the notes for the currently loaded mold setup.
If the note you want to display is in another folder, navigate to the appropriate folder.
2. Select the note to open, and then touch LOAD.

14.2.2 Loading an Image

Another way to use the Notes screen is to view mold drawings and pictures. The system supports bitmap (BMP), JPEG (JPG or JPEG) and PNG (PNG) image file formats.

To load an image:

1. Touch NOTES on the Home screen, and then touch the View Mold Notes submenu. The Mold Files screen displays the notes for the currently loaded mold.
2. Navigate to the appropriate Images folder and select the file to open.
3. Touch LOAD to load the image into the Create Notes screen.

14.2.3 Viewing a PDF

Matrix has the ability to store and display PDF documents.

To view a PDF document:

1. Touch NOTES on the Home screen, and then touch the View Mold Notes submenu. The Mold Files screen displays the notes for the currently loaded mold. Alternatively, MOLD FILES can be selected on the Home screen.
2. Navigate to the appropriate Docs folder and select the PDF file to open.
3. Touch LOAD to view the document in the PDF viewer.
4. Touch Quit to return to the Mold Files screen.

Chapter 15 Data Recording

Data Recording is a useful tool to track the operation of a mold. This tool helps analyze the system to optimize the molding process, track errors, find the source of a recent error or predict where future errors may occur. The Error Log contains a record of errors that have occurred since the errors were last cleared.

The Process History screen records the operation of a mold and displays recorded data. If an error has occurred while the system was recording, the user can review the behavior of the system at the time of the error to search for potential causes.

The user can choose to record data at all times or only while the START button has been touched. This setting can be modified by the Administrator in the Manage Database screen from the User Profiles screen.

15.1 Process History Screen

The data is presented zone by zone, either in Graph mode ([Figure 15-1](#)) or Text mode. Graph mode is displayed by default and provides a visual summary of the recorded operation of one zone, noting power usage, temperature fluctuations and setpoint values. If anything looks unusual at a specific time, look at the textual representation at that particular time for further details.

The values that are logged include:

- Zone number
- Time and date
- Temperature
- Setpoint
- Alarm
- Abort
- Power
- Regulation (Automatic, Manual, Monitor)
- Amps
- Watts
- Error Status

The process history holds 1000 data sets; each data set contains 2000 records. Records contain values for all of the logged values for each zone in the system. A frequent sampling rate will fill the database faster than a slower sampling rate. Data sets help navigate the Process History to find the time frame for viewing.

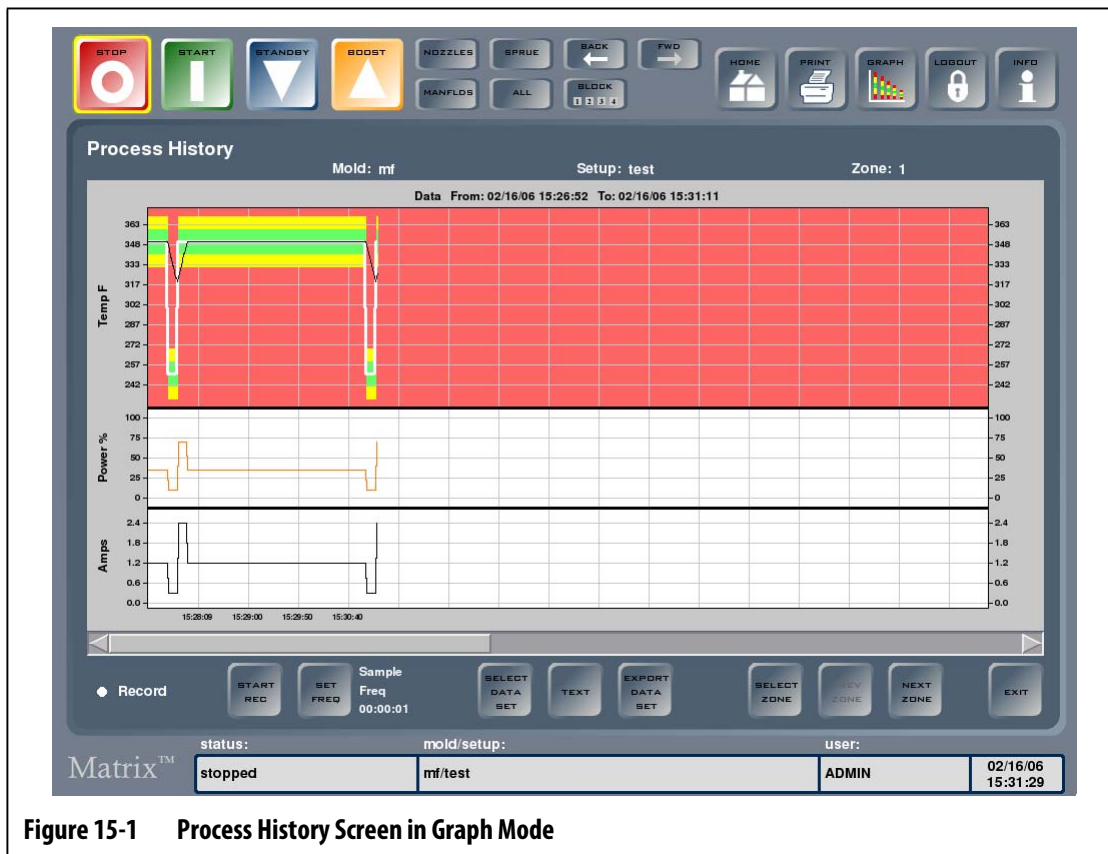


Figure 15-1 Process History Screen in Graph Mode

Table 15-1 Process History Screen Item Descriptions

Item	Description
Mold	The name of the mold for which the process history is displayed.
Setup	The name of the setup for the mold for which the process history is displayed.
Zone	The zone shown in the process history.
Graph/Text section	The operating history of one zone in either graph or text mode.
Record indicator	Indicates whether the system is currently recording (red) or not (white).

Table 15-2 Process History Screen Button Descriptions

Button	Description
START/STOP REC	Touch the START/STOP REC button to toggle recording of the current operation.
SET FREQ	Touch the SET FREQ button to modify the sample frequency. Enter the new sample frequency and touch the ENTER button to close the buttonpad and return to the Process History screen.

Table 15-2 Process History Screen Button Descriptions (Continued)

Button	Description
SELECT DATA SET	Touch the SELECT DATA SET button to display a dialog containing the data sets that have been recorded. Select the required data set and touch the SELECT button to load the details and return to the Process History screen.
TEXT/GRAPH	Touch the TEXT/GRAPH button to toggle between graph or text mode.
EXPORT DATA SET	Export the data as a .CSV (comma separated values) file to a USB storage device. Touch the EXPORT DATA SET button to display a folder selection dialog. Select the target folder and touch the OK button to return to the Process History screen. NOTE: The USB device must be connected before data can be exported.
SELECT ZONE	Touch the SELECT ZONE button to display a list of zones. Select the zone to display from the list, then touch the SELECT button to display that zone in the graph or text section. This button is selectable only when a data set has been loaded.
PREV ZONE	Touch the PREV ZONE button to display data for the previous zone. This is only selectable if there is another zone in the data set.
NEXT ZONE	Touch the NEXT ZONE button to display data for the next zone. This is only selectable if there is another zone in the data set.
EXIT	Touch the EXIT button to return to the Home screen.

Text Mode: Text mode provides more detail about the state of a single zone at the time of each sample. The user can see if any settings were changed during the operation of the mold, and how the system reacted.

15.1.1 Viewing Recorded Data

To display a recorded data set:

1. In the Process History screen, touch SELECT DATA SET.
2. Select the recorded data set you want then touch SELECT. The recorded data is displayed in the Process History screen.

15.1.2 Recording Data

To record the operation of a currently loaded and running mold:

1. Select the frequency of the recording (the minimum setting is one second, the maximum setting is 24 hours), by touching SET FREQ.
2. Enter the frequency and then touch ENTER to return to the Process History screen.
3. Touch START REC to begin recording. The recording indicator will turn red
4. Touch STOP REC to stop recording.

15.2 Error Log

The Error Log screen allows the user to view errors that have occurred. The most recent error is shown first by default. Mold errors and Setup errors can be cleared with the appropriate system permissions, but System errors are not able to be deleted.

NOTE: To sort the information shown in ascending or descending order, touch the appropriate column header. This is a useful troubleshooting tool.

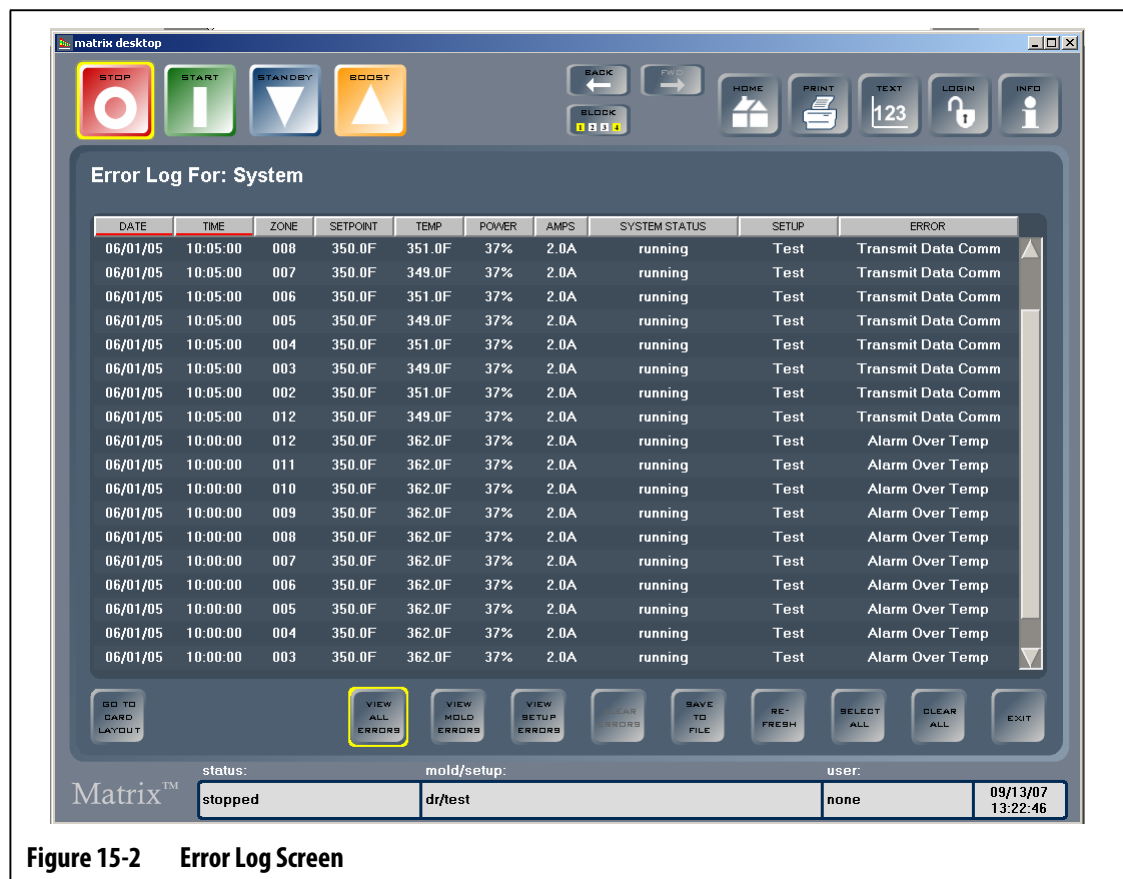


Figure 15-2 Error Log Screen

Table 15-3 Error Log Screen Item Descriptions

Item	Description
DATE	The date the error occurred.
TIME	The time the error occurred.
ZONE	The number of the zone where the error occurred.
SETPOINT	The setpoint of the zone when the error occurred.
TEMP	The actual temperature of the zone when the error occurred.
POWER	The power output percentage of the zone when the error occurred.
AMPS	The current reading of the zone when the error occurred.
SYSTEM STATUS	The status of the system when the error occurred.

Table 15-3 Error Log Screen Item Descriptions (Continued)

Item	Description
SETUP	The mold setup that was loaded at the time of the error.
ERROR	A description of the error.

Table 15-4 Error Log Screen Button Descriptions

Button	Description
VIEW ALL ERRORS	Touch the VIEW ALL ERRORS button to display the errors that have occurred using this controller. Errors cannot be cleared from this list.
VIEW MOLD ERRORS	Touch the VIEW MOLD ERRORS button to display the errors that have occurred using any mold setup within this mold folder. Touch the CLEAR ERRORS button to delete these errors.
VIEW SETUP ERRORS	Touch the VIEW SETUP ERRORS button to display the errors that have occurred using the loaded mold setup. Touch the CLEAR ERRORS button to delete these errors.
CLEAR ERRORS	Touch the CLEAR ERRORS button to delete the errors on the list.
SAVE TO FILE	Touch the SAVE TO FILE button to copy the displayed error log to a file in the System folder. For evaluation, send the error file to Husky. Depending on which type of errors you are saving, this creates a file called: sys_errors.dat, setup_errors.dat or mold_errors.dat.
REFRESH	Touch the REFRESH button to display new errors that have occurred while viewing the list.
SELECT ALL	Touch the SELECT ALL button to select all errors that are currently displayed.
CLEAR ALL	Touch the CLEAR ALL button to deselect all errors that are currently selected.
EXIT	Touch the EXIT button to close the Error Log screen and return to the Zone Status screen.

15.3 Change Log

The Change Log tracks all changes to zone settings. The change log can be associated with the current user and provides the ability to list a reason for making a change to a setting. The change log automatically logs the time a change was made, the mold setup loaded, who made the change, what setting in which zone was modified, the old value of the setting and the new value of the setting. This information helps to preserve quality control and provides accountability for changes made to the molding process. Such record keeping is vital for medical molding applications.



Figure 15-3 Change Log Screen

NOTE: The Change Log screen is wide, use the horizontal scroll bar to view all columns.

Table 15-5 Change Log Screen Item Descriptions

Item	Description
Change Log For	The selected view: System Changes, Mold Changes or Setup Changes.
DATE	The date that the change was made.
TIME	The time that the change was made.
ZONE	The zone that was changed.
VALUE CHANGED	The setting which was changed.
OLD VAL	The old value of the setting.
NEW VAL	The new value of the setting.
CHANGED BY	The name of the user who made the change.
SETUP	The mold setup that was loaded when the change was made.
REASON	The reason for the change. This feature can be turned on or off by an Administrator.

Table 15-6 Change Log Screen Button Descriptions

Button	Description
VIEW ALL CHGS	Touch the VIEW ALL CHGS button to view all changes made to the system.
VIEW MOLD CHGS	Touch the VIEW MOLD CHGS to view all changes made to setups within a specified mold folder.
VIEW SETUP CHGS	Touch the VIEW SETUP CHGS button to view all changes made to the currently loaded setup.
SAVE TO FILE	Touch the SAVE TO FILE button to save the currently viewed data to the All folder in the Mold Files screen as a .DAT (data) file.
EXPORT CHANGE DATA	Touch the EXPORT CHANGE DATA to export the currently viewed data to an external USB device as a .CSV (comma separated value) file.
EXIT	Touch EXIT to return to the Home screen.

15.3.1 Viewing the Change Log

Any user can view the Change Log to monitor the changes to the system. It provides a record of previous values therefore if changes were made which caused an error, the appropriate setting can be changed back to an older value.

To view the Change Log:

1. Load a mold setup.
2. Touch Data Recording, and then touch Change Log.

The Change Log screen is displayed.

15.3.2 Saving the Change Log

The user can save the Change Log data using the .DAT (data) file format to later print if necessary.

To save the Change Log data to a file:

1. Choose the view you want to save by touching one of the buttons below.
 - VIEW ALL CHGS
 - VIEW MOLD CHGS
 - VIEW SETUP CHGS



IMPORTANT!

File names cannot be changed. Saving the Change Log data again will overwrite the existing files. To keep earlier files, copy the three files listed below to a USB device, then save the Change Log data again.

2. Touch SAVE TO FILE.

This saves the Change Log data to the following files:

- sys_changes.dat contains system setting changes.
- mold_changes.dat contains changes to all setups of a mold.
- setup_changes.dat contains changes to mold setups.

All files are saved to System Files/system Folders/All

15.3.3 Exporting the Change Log

Export Change Log data using the .CSV (comma separated values) file format. This enables you to view the changes in a spreadsheet program.

To export the Change Log:

1. Choose the desired view to save by touching one of the buttons below.
 - VIEW ALL CHGS
 - VIEW MOLD CHGS
 - VIEW SETUP CHGS

2. Touch EXPORT CHANGE DATA.

A dialog is shown requesting the location of the storage folder.

3. Connect a USB storage device.

4. Select the desired location to export the Change Log.

5. Touch OK.

A keyboard is displayed.

6. Enter a filename for the exported data, and then touch ENTER.

The data is saved to a .CSV file in your chosen directory on the USB storage device.

Chapter 16 System Options

The Altanium/Matrix has many additional optional features available to assist the molding process. There are hardware, software and a combination of hardware and software options that can be used to complement the system.

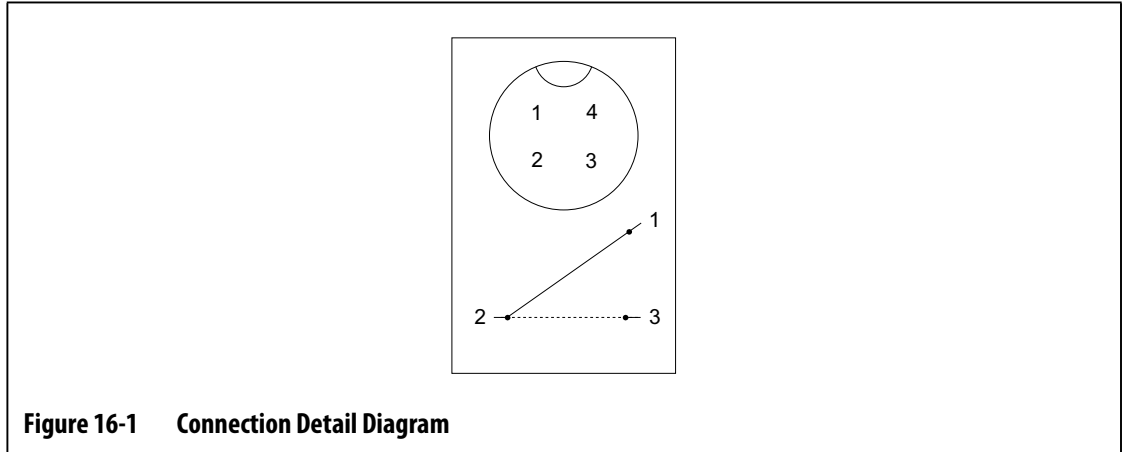
16.1 Altanium/Matrix Optional Components

Software settings for the system options are available in the OPTIONS menu.

Auxiliary Output	One output can be assigned to Auxiliary Output.
Altanium I/O Box	Enables the addition of hardware input and output options, as well as the Remote Load feature.
Hardware Input/Output Options	Optional inputs and outputs are available in packages of two, four and all options.
Remote Load	Enables Matrix to remotely load up to 64 setups from injection molding machines.
SPI Communication	The SPI protocol allows remote control and monitoring of some of the Matrix settings.

16.2 Auxiliary Output

The system comes standard equipped with one auxiliary output. The connector is located on the rear of the operator interface and labeled AUX OUTPUT. The mating cable is not included with the system, however, it is a standard Conxall 4-pin connector that can be found at most electronics retailers (part number 6-282-45G-522). The cable can be purchased from Husky. Any output can be assigned to the AUX OUTPUT position. The default selection is Comm Error. A different output can be assigned to the AUX OUTPUT by configuring the Altanium I/O Box.



16.3 Altanium I/O Box

The addition of any hardware inputs and outputs requires an Altanium I/O (Input/Output) box. This box connects to Matrix via an 8-pin communications cable. It can also be mounted remotely at a chosen location.



16.3.1 Connecting the Altanium I/O Box to the Matrix Display

1. Before using any of the hardware I/O options, connect the 8-pin communications cable between the Altanium I/O Box and Matrix.
2. Connect the appropriate wires in the Input and Output cables to the required location (for example, the injection molding machine).
3. Connect the I/O box to the I/O COMM Port on Matrix.

16.3.2 Configuring the Altanium I/O Box

Once the I/O box is connected to the Matrix, communication must be enabled. The optional Inputs and Outputs available to assist the molding process are sold in packages of two, four and ALL options. If one of these packages are purchased, you can select which options are used as shown in the image below.

For example, if the four-option package was purchased, you will be able to turn ON up to four options in any combination of inputs or outputs.



Figure 16-3 I/O Box Setup

Table 16-1 I/O Box Setup Screen Item Descriptions

Item	Description
In/Out	Correspond to the input and output numbers on the Altanium I/O Box.
Option	The names of the input and output options.
Pins	The connector pins associated with each input and output event.
Normally	Inputs normally refer to the state of the external dry contact. Outputs normally refer to the state of the internal relay switch. Determine if the relay switch is to be closed or be opened when an event occurs
Enable	Used to Enable or Disable the option.
Lvl	Indicates the actual state of the relay. If this is red, then the I/O is closed. If it is blank (grey), the I/O is open.
Status	Indicates whether the External Digital I/O is working.

Table 16-2 I/O Box Setup Screen Button Descriptions

Button	Description
OPEN/CLOSED	Touch the OPEN/CLOSED box to toggle the state of the relay switch between normally open or normally closed.
ON/OFF	Touch the ON/OFF button to toggle between enabling and disabling an option.

Table 16-2 I/O Box Setup Screen Button Descriptions (Continued)

Button	Description
Aux Output Assigned to	Touch the Aux Output Assigned to drop-down box to assign the selected output to the AUX Output connector on the back of the Matrix display.
EXIT	Touch the EXIT button to return to the Home screen.

To configure the Altanium I/O box:

1. Touch OPTIONS then the I/O Box Setup submenu
The I/O Box Setup screen is displayed.
2. Configure the settings according to your requirements.

16.3.2.1 Turning an Option On or Off

If an option package is to be used with Matrix, turn on the options that you want to use. The system will only allow the number of options purchased to be turned on. If you have reached the purchase limit and want to try a different option, turn one of the options OFF before you turn another option ON.

To toggle an option:

- Touch the box in the Enable column to choose the option to turn on or off.

16.3.2.2 Setting the Aux Output

Any ONE output can be set to AUX, even if no option packages were purchased.

To assign an output to AUX:

- Touch the drop-down box and select the option to which Aux Output is to be assigned.

16.3.3 Hardware Options (Inputs)

The Input hardware options that can be purchased for Altanium/Matrix, along with a description of each, are listed below. To activate any input, all that is required is the closure of two contacts on the Input connector.

CAUTION!

DO NOT apply a voltage to any of the inputs. Doing so may damage the I/O box or Matrix.

Table 16-3 I/O Box Options (Inputs)

Option Name	Description
R. STANDBY	If the R. STANDBY (Remote Standby) digital input option is turned on, it will place all zones that have a Remote Standby setpoint set into the Standby mode whenever this input signal gets activated.
R. BOOST	If the R. BOOST (Remote Boost) digital input option is turned on, it will place all zones that have a Remote Boost setpoint set into the Boost mode whenever this input signal gets activated.
R. START	If the R. START (Remote Start) digital input option is turned on, it will START the system whenever this signal is remotely activated. This state will remain until the STOP button is selected or Remote Stop is activated.
R. STOP	If the R. STOP (Remote Stop) digital input option is turned on, it will STOP the system whenever this signal is remotely activated. This state will remain until the START button is selected or Remote Start is activated. NOTE: When input is active the system cannot be started.
M. BOOST	If the M. BOOST (Remote Manual Boost) digital input option is turned on, it will place all zones that have a Manual Boost setpoint set into the Boost mode whenever this input signal gets activated. This acts just like selecting the BOOST button in Matrix.
LOAD SETUP	Allows you to remotely load mold. The feature is part of the Remote Load option.
SETUP B0-B5	These inputs are part of the Remote Load Option. Each input represents one binary digit in a six byte binary number, allowing 64 different mold setups to be remotely loaded.

16.3.4 Hardware Option (Outputs)

The Output hardware options that can be purchased are listed below, along with a description of each. Some of these options are part of the Remote Load option. All outputs are dry contacts; whatever is put in, you will get out when the output is activated.

CAUTION!

Mechanical hazard – risk of equipment damage. DO NOT apply a voltage greater than 120 VAC/VDC (1amp) to any of the Outputs. Doing so could damage the I/O Box or Matrix.

Table 16-4 I/O Box Options (Outputs)

Option Name	Description
ALARM RLY	If the Alarm Error dry contact output option is turned on, it will be activated when an Alarm or Abort condition occurs. This state will remain until the alarm condition is CLEARED or RESET.
PCM RLY	If the PCM dry contact output option is turned on, it will be activated when an Abort condition occurs, and the PCM setting in the Quick Set screen is set to System. This state will remain until the alarm condition is CLEARED or RESET.
AT TEMP	If the AT TEMP (at temperature) dry contact output option is turned on, it will be activated ONLY when all zones are above the Under Temperature alarm limit. This state will remain until any zone drops below the Under Temperature alarm limit.
R. STANDBY	If the R. STANDBY (Remote Standby) dry contact output option is turned on, it will be activated when Matrix has received the Remote Standby signal.
AT BOOST	If the AT BOOST (at boost) dry contact output option is turned on, it will be activated ONLY when all zones are above the under temperature alarm limit while in BOOST mode. This state will remain until any zone drops below the under temperature alarm limit. If any or all zones go above the over temperature alarm limit the state will remain.
RUN LIGHT	If the RUN LIGHT Output dry contact output option is turned on, it will be activated whenever the system is running. This state will remain until the system is stopped.
MOLD COOL	The Mold Cooling signal is activated based on the temperature limit set on the Mold Cooling Enabled button in the Options screen. If the controller is heating up (Start button is pressed), then the output changes state once all zone temperatures are above the Mold Cooling Enable limit If the controller is cooling down (Stop button is pressed), then the output returns to its original state once all of the zone temperatures are below the Mold Cooling Enable limit

Table 16-4 I/O Box Options (Outputs) (Continued)

Option Name	Description
REM. FILE LOADED	The output is part of the Remote Load Option. It is used to indicate if a mold setup is loaded remotely.
TEMP ERR	If the TEMP ERR (over maximum temperature error) dry contact output option is turned on, it will be activated when any zone exceeds the Over Maximum Temperature limit.
AT STANDBY	This signal is activated only when all zones are above the under temperature alarm limit while in STANDBY mode. This state should remain until any zone drops below the under temperature alarm limit. Additionally, If any or all zones go above the over temperature alarm limit the state will remain.
COMM ERR	If the Comm Error dry contact output option is turned on, it will get activated if Matrix stops communicating with any of the Control Cards. This state will remain until communications are restored.

16.3.5 Input/Output Option Connector Pin-Out Description

Below is the connection detail for all of the optional Inputs and Outputs

Table 16-5 Optional Inputs

Option Inputs (Female)	Pins	Wire Colors
Remote Standby Input	C - D	red, blue/red
Remote Boost Input	A - B	green, orange/green
Remote Start Input	E - F	orange, orange/black
Remote Stop Input	G - H	black, blue/black
Remote Manual Boost Input	T - U	black/red, red/black

Table 16-6 Optional Outputs

Option Outputs (Male)	Pins	Wire Colors
Alarm Error Output	G - H	black, blue/black
Priority Control Mode Output	C - D	red, blue/red
System At Temperature Output	A - B	green, orange/green
System At Boost Temperature Output	J - K	white, blue/white
Run Status Light Output	L - M	red/green, orange/red
CAN Communications Error Output	Z - A	white/red/black, red/white/black
Remote Standby Output	E - F	orange, orange/black
Max Temp Error Output	T - U	black/red, red/black

Table 16-6 Optional Outputs (Continued)

Option Outputs (Male)	Pins	Wire Colors
Mold Cooling Enabled Output	N - P	black/white, white/black
At Standby Temperature Output	R - S	green/white, black/red/white

16.4 Monitor Zones and the At-Temperature Signal

The At-Temperature output signal is used to inhibit the injection of plastic until all zones have reached their processing temperature. This is desirable for temperature control zones, but in some configurations, a system can have zones set up for Monitor only mode. The default operation mode takes the temperature of these zones into account when determining if the At-Temperature signal should be deactivated. This is not always desirable, as some Monitor zones may not reach the At-Temperature limit until long after the mold is at processing temperature, causing unnecessary delays in the molding process. To prevent this condition, a function has been added to the Advanced Setup screen that excludes monitor zones from the algorithm that determines the At Temperature signal.

16.4.1 Excluding Monitor Zones from the At-Temperature Algorithm

To decouple monitor zones from the algorithm that determines the At Temperature signal the Exclude Monitor Zones At-Temp field, in the Advanced Setup screen, must be set to **Yes**.



Figure 16-4 Advanced Setup Screen

1. Exclude Monitor Zones (At-Temp) Field

Table 16-7 Advanced Setup Screen Item Description

Item	Description
Exclude Monitor Zones (At-Temp)	<p>This field is used to include or exclude Monitor Zones from At-Temperature. This is sometimes necessary to prevent slow rising monitor zones from delaying the molding process. Touching the box will toggle between NO or YES. YES indicates that all zones in Monitor Only mode will be excluded from the At-Temperature algorithm.</p> <p>NOTE: The default setting is NO.</p>

16.4.1.1 Accessing the Advanced Setup Screen

The Advanced Setup screen is used to modify advanced system settings as well as gain access to the Mold Setup Defaults and Stage Setup screens. The settings in this screen should only be modified by well qualified users as changing these parameters can adversely affect the operation and performance of the system. Contact a Husky call center technician for the access code.

To Access the Advanced Setup Screen:

1. Touch the SYSTEM button in the Home screen.
2. Touch the ADVANCED SETUP button in the Home screen submenu.
3. Touch the OK button in the Warning pop-up window.
4. Enter the appropriate Password in the Keyboard pop-up and touch the Enter button.

16.4.1.2 Excluding Monitor Zones from At-Temperature

Excluding zones in Monitor Only mode, from the At-Temperature algorithm, is sometimes necessary to prevent delays to the molding process.

To Exclude Monitor Zones from At-Temperature:

1. Navigate to the Advanced Setup screen.
2. Touch the Excl. Mon. Zones (At-Temp) field to toggle it from NO to YES.

16.5 Remote Load Option

Load mold setups directly from the injection molding machine if you have the Altanium I/O Box hardware installed, the injection machine can signal the Altanium I/O Box on one of 64 input combinations to indicate which mold setup Matrix should automatically load. Matrix uses combinations of 6 binary inputs, allowing the user to assign a mold setup to each one of 64 possible combinations.

To configure this option, touch OPTIONS, followed by the Remote Load submenu to display the Remote Load Setup screen, shown below.

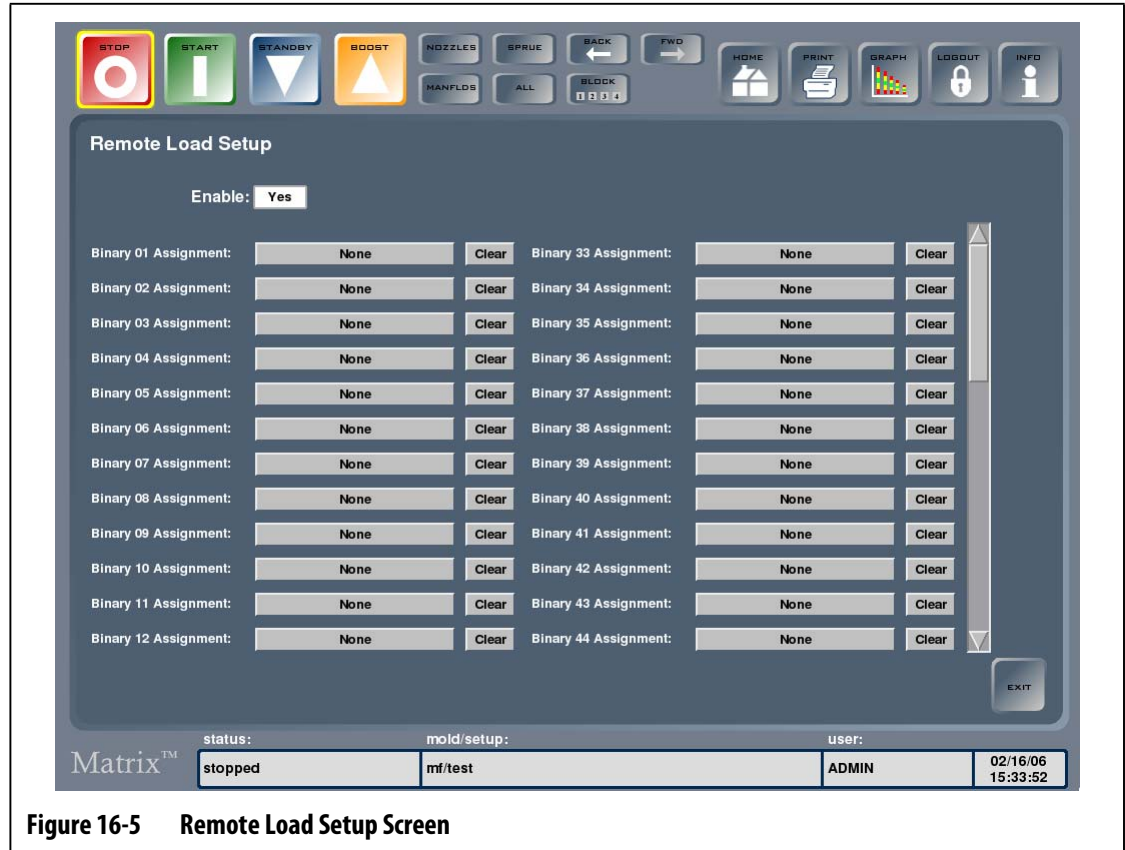


Figure 16-5 Remote Load Setup Screen

Table 16-8 Remote Load Setup Screen Item Descriptions

Item	Description
Enable	Touch the Enable box to enable or disable the Remote Load function. It is disabled by default.
Assignment boxes	There are 64 bits available which can be configured to load a specific mold setup when that bit is triggered by a signal from an injection molding machine. The default setting is None.
Clear	Touch the CLEAR button to reset the associated bit to None.

16.5.1 Assigning a Mold Setup to Remote Load

There are 64 bits available which can be configured to load a specific mold setup when that bit is triggered by a signal from an injection molding machine. The default setting is None.

To assign a mold setup to remote load:

1. Touch the Assignment key to display the Mold Files screen
2. Select the mold setup you want to assign to this binary assignment.
3. Touch ASSIGN to return to the Remote Load Setup screen.

16.6 Software Options - SPI Communication Protocol

If the SPI protocol option was purchased with the system, the option to remotely control and monitor some of the Matrix settings will be available.

Matrix communicates with any central network or molding machine that supports the Society of Plastics Industry (SPI) standard protocol.

Touch OPTIONS, then the SPI submenu to open the SPI Communication screen.

Table 16-9 SPI Communication Screen Item Descriptions

Item	Description
SPI Device Id	The SPI device ID. The default is 26h and cannot be changed.
SPI Enabled	The setting to turn SPI ON or OFF. Available settings are YES and NO. The default is NO.
SPI Address	The SPI address. Available settings are 32 to 254. The default is 32.
SPI Baud Rate	The SPI baud rate setting. Available settings are 1200, 2400, 4800, 9600, 19.2k, 38.4k, 57.6k and 115.2k. The default is 9600.

Table 16-10 SPI Communication Screen Button Descriptions

Button	Description
LOAD DEFAULT VALUES	Reset the SPI settings to the defaults.
SPI COMM MONITOR	Monitor the SPI communications.

Chapter 17 SPI Protocol Option

The system communicates with any central network or molding machine that supports the Society of Plastics Industry (SPI) standard protocol.

The system assumes a device ID of 26h on the SPI communications channel. This ID has been assigned to general-purpose temperature controllers with multiple zones. The system supports a subset of the commands that have been defined for this ID. The commands for this ID that are not supported by the system do not have equivalent functions in the system.

17.1 SPI Command Summary

The SPI commands supported by the system are listed below. The system supports the defined poll and select functions for each command. If a selected command is directed to all zones in the system, the error requirements must be satisfied for every zone before an ACK is returned.

- Echo.
- Version.
- Process Setpoint 1.
- Process Value.
- Alarm Active Status.
- Alarm 1 Setpoint.
- Alarm 2 Setpoint.
- Alarm 1 Reset.
- Controller Status.
- Manual Percentage Output.
- Open/Close Loop Control.

17.1.1 Echo

Summary	SPI controller integrity command.
Errors	If the data length for the selected function is incorrect, the system will return a NAK.
Version Summary	The system transmits the device ID (26h) and SPI software version number.
Errors	None.

17.1.2 Process Setpoint

Summary	This command is used to set and read the temperature setpoint for an automatically controlled zone. It is valid even if the selected zone is running in MANUAL or VIEW regulation mode.
Errors	<p>The following conditions result in a NAK response with an invalid data error for the select function:</p> <ul style="list-style-type: none"> • Incorrect data length. • Invalid zone number. • A value less than the minimum allowed setpoint. • A value greater than the maximum allowed setpoint. <p>The following conditions result in an invalid data error in response to a polled function:</p> <ul style="list-style-type: none"> • Invalid zone number.

17.1.3 Process Value

Summary	This command is used to read the actual temperature of a specified zone. It is valid for zones in all regulation modes. If the zone does not have a thermocouple input or thermocouple type assigned, or if the thermocouple is disconnected, 0.0 is returned. Otherwise a value between 32 °F and 932 °F is returned.
Errors	<p>The following conditions result in an invalid data error in response to a polled function:</p> <ul style="list-style-type: none"> • Invalid zone number.

17.1.4 Alarm Active Status

Summary	This command is used to read error status for a single zone. A value of 0 is returned if no errors are active. It is valid for all zones in all regulation modes.
Errors	<p>The following conditions result in an invalid data error in response to a polled function:</p> <ul style="list-style-type: none"> • Invalid zone number.

17.1.5 Alarm 1 Setpoint

Summary	This command is used to set and read the alarm window value for a single zone. The alarm window is used only for zones with Auto or View regulation.
Errors	<p>The following conditions result in a NAK response with an invalid data error for the select function:</p> <ul style="list-style-type: none"> • Incorrect data length. • Invalid zone number. • A value less than 0 °F or greater than 900 °F. • A value greater than the abort window value. <p>The following conditions result in an invalid data error in response to a polled function:</p> <ul style="list-style-type: none"> • Invalid zone number.

17.1.6 Alarm 2 Setpoint

Summary	This command is used to set and read the abort window value for a single zone. The abort window is used only for zones with Auto or View regulation.
Errors	<p>The following conditions result in a NAK response with an invalid data error for the select function:</p> <ul style="list-style-type: none"> • Incorrect data length. • Invalid zone number. • A value less than 0 °F or greater than 900 °F. • A value greater than the abort window value. <p>The following conditions result in an invalid data error in response to a polled function:</p> <ul style="list-style-type: none"> • Invalid zone number.

17.1.7 Alarm 1 Reset

Summary	This command is used to clear the errors for all the zones in the system. The system does not have the ability to clear an error for an individual zone.
Errors	<p>The following conditions result in a NAK response with an invalid data error for the select function:</p> <ul style="list-style-type: none"> • Incorrect data length. • Invalid zone number.

17.1.8 Controller Status

Summary	This command is used to read the condition of a single zone. The definition of the status bits is given below:	
	BIT	SPI DEFINITION
	0	Heater Power
	1	Soft Start
	2	Manual Control
	3	Low Alarm 1
	4	High Alarm 1
	5	Low Alarm 2
	6	High Alarm 2
	7	Open T/C Alarm
	8	Reverse T/C Alarm
	9	Shorted T/C Alarm
	10	Open Output Device
	11	Shorted Output
	12	Ground Fault
	13	Low Current Alarm
14	High current	
15	Out Of Control	
Errors	<p>The following conditions result in an invalid data error in response to a polled function:</p> <ul style="list-style-type: none"> Invalid zone number. 	

17.1.9 Manual Percent Output

Summary	This command is used to set and read the manual percent output for a manually-regulated zone. It is valid even if the zone is running in the Auto or View regulation mode.
Errors	<p>The following conditions result in a NAK response with an invalid data error for the selected function:</p> <ul style="list-style-type: none">• Incorrect data length.• Invalid zone number.• A value less than the minimum allowed percentage.• A value greater than the maximum allowed percentage. <p>The following conditions result in an invalid data error in response to a polled function:</p> <ul style="list-style-type: none">• Invalid zone number.

17.1.10 Open/Closed Loop

Summary	This command is used to set the regulation mode of a zone to either Manual or Automatic only. No provision is made for setting the regulation to View.
Errors	<p>The following conditions result in a NAK response with an invalid data error for the selected function:</p> <ul style="list-style-type: none">• Incorrect data length.• Invalid zone number. <p>The following conditions result in an invalid data error in response to a polled function:</p> <ul style="list-style-type: none">• Invalid zone number.• Zone regulation is set to View.

Chapter 18 UltraSync-E Option

This chapter describes the screens, controls and troubleshooting specific to UltraSync-E (Electric) systems. These screens and controls are not available when the controller is used with any other hot runner system.



IMPORTANT!

Controllers for UltraSync-E hot runners are designed for use with a specific hot runner. Contact your nearest Husky Regional Service and Sales office before attempting to use the controller with any other hot runner.

18.1 Connecting the Controller

To connect the controller to the injection molding machine, do the following:



IMPORTANT!

Only qualified personnel should be permitted to make modifications to the machine interface.

1. Connect the supplied W100 interface cable to the X100 connector on the controller. The W100 interface cable carries the open, close and safety gate interlock system signals from the machine to the hot runner when the controller is in Auto mode.

Refer to [Section 18.2](#) for more information about signals.

2. If equipped, connect the supplied W101 interface cable to the X101 connector on the controller. The W101 interface cable carries an optional Valve Stem Fault signal to the machine.

Refer to [Section 18.2](#) for more information about signals.

CAUTION!

Electrical hazard – risk of damage to the controller. All signals sent to the controller must be from dry or potential free contacts.

3. Using the electrical schematics for the controller and the machine, connect the color coded ends of the W100 and W101 (if equipped) cables to the machine. Some modifications to the machine may be required to connect the cables to the appropriate signal source/destination. Contact your nearest Husky Regional Service and Sales office for assistance.

18.2 Machine Interface Connections

The interface signals are wired to the machine via cables W100 for open, close, and safety gate interlock signals to the controller and W101 (if equipped) for an optional Valve Stem Fault signal to the machine. The cables connect to the controller via connectors Input X100 and Output X101 located on the back of the controller.

The close signal is not required if the 1 Signal Open/Close or 1 Signal Trigger modes are selected. The valve stem fault output signal is also not required to be connected. The open signal and the safety gate interlock are required for operation with the machine.

The controller has three control modes for controlling the opening and closing of the valve stems during automatic cycle. This allows flexibility when connecting the controller to the machine.

Control Mode	Description	Signal 1 Examples	Signal 2 Examples	Delays/Timers That Can Be Used
1 Signal Open/Close	Valve stems will open when the signal is given and stay open until the signal is dropped.	<ul style="list-style-type: none"> Configurable output Valve gate open 	—	<ul style="list-style-type: none"> Stem open delay
1 Signal Trigger	Valve stems open after Signal 1 is active and the delay timer is complete. They stay open until the stem open timer is complete.	<ul style="list-style-type: none"> Clamp closed Mold close Machine nozzle shutoff Configurable output 	—	<ul style="list-style-type: none"> Stem open delay Stem open time
2 Signal Trigger	Valve stems open after Signal 1 is active and the delay timer is complete. They stay open until Signal 2 is active and the delay timer is complete.	<ul style="list-style-type: none"> Clamp closed Mold close Machine nozzle shutoff Configurable output 	<ul style="list-style-type: none"> Hold Valve Gate Close 	<ul style="list-style-type: none"> Stem open delay Stem close delay

The control modes can only be changed in the password protected **Valve Stem Setup** screen.

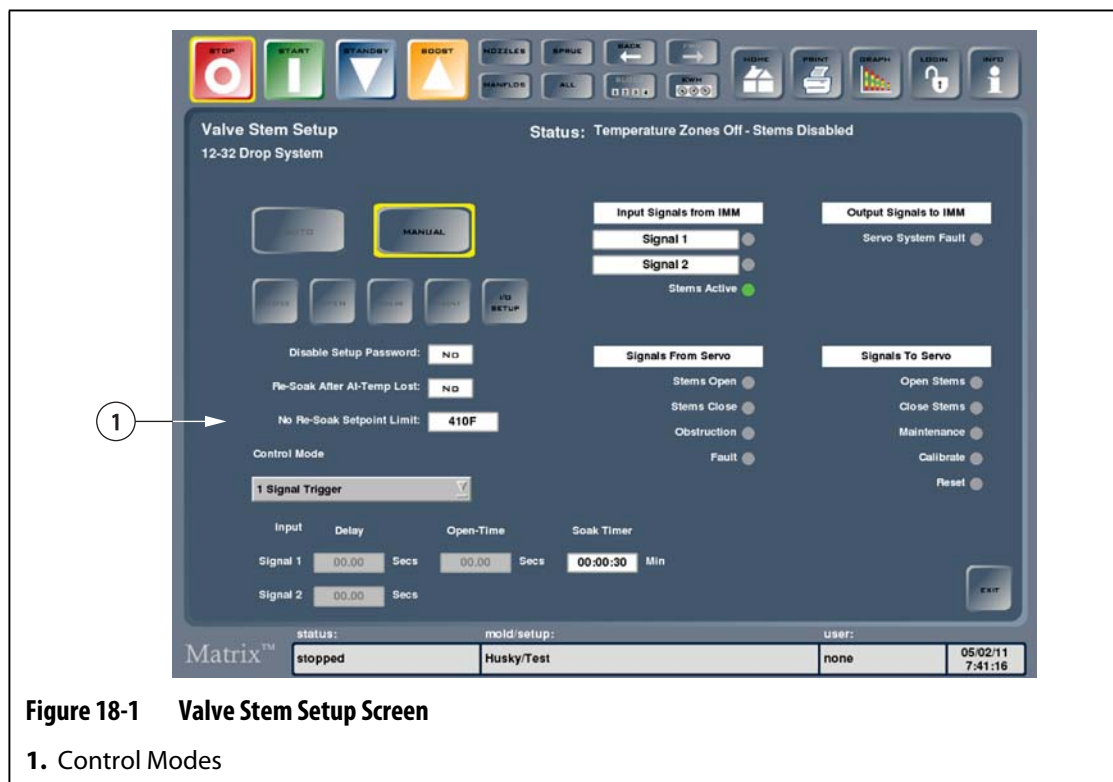


Figure 18-1 Valve Stem Setup Screen

1. Control Modes

18.3 The Valve Stem Operation Screen

The **Valve Stem Operation** screen allows an operator to monitor and control the UltraSync system. This screen is only accessible after a mold/setup file is loaded. The Valve Stems Operation screen is used to monitor and control the actuation of the valve stems. It also provides access to the Valve Stem Setup screen. The layout of this screen has been modified to make it easier to understand and includes the addition of a field to disable the servo fault error as well as status indicators for non-UltraSync-E digital I/O channels.

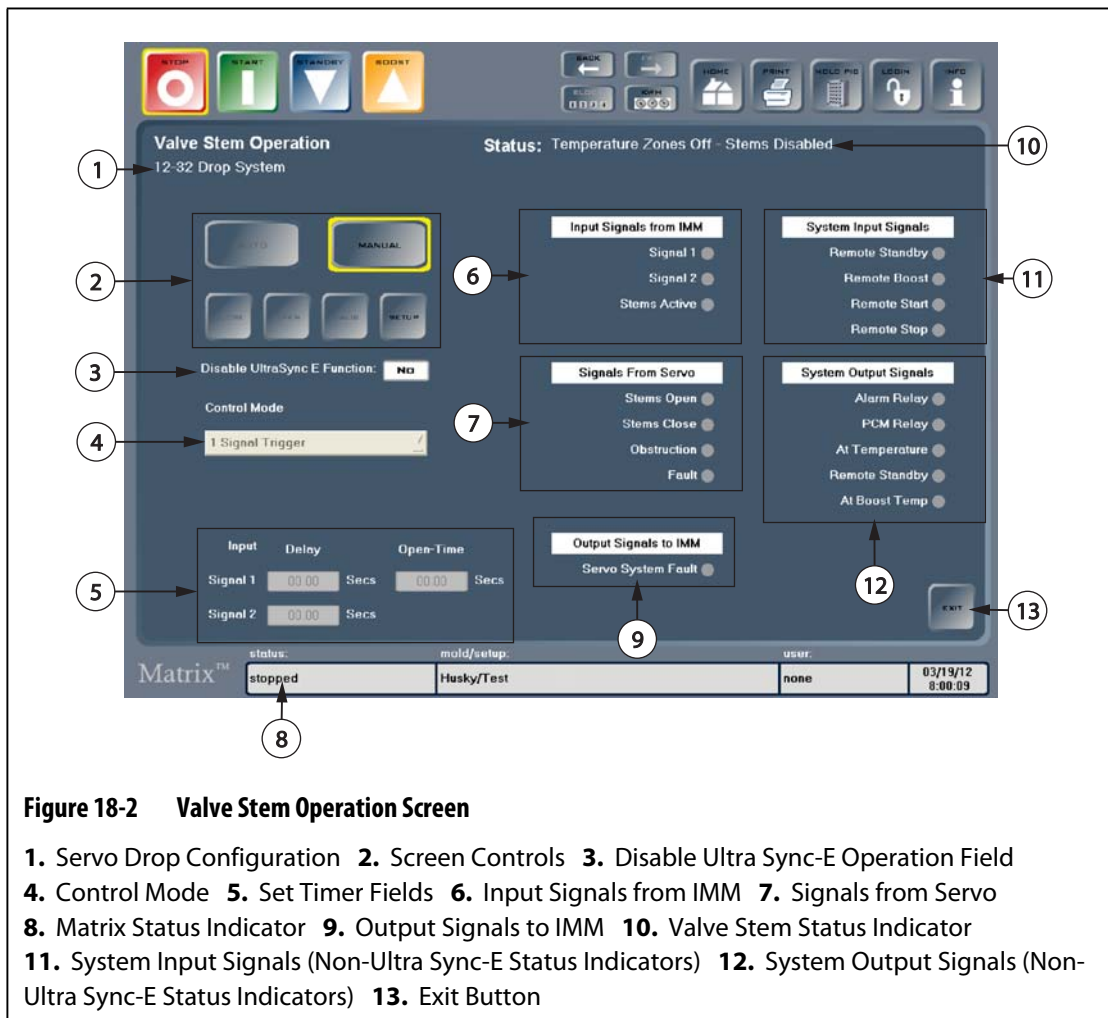


Figure 18-2 Valve Stem Operation Screen

- 1. Servo Drop Configuration
- 2. Screen Controls
- 3. Disable Ultra Sync-E Operation Field
- 4. Control Mode
- 5. Set Timer Fields
- 6. Input Signals from IMM
- 7. Signals from Servo
- 8. Matrix Status Indicator
- 9. Output Signals to IMM
- 10. Valve Stem Status Indicator
- 11. System Input Signals (Non-Ultra Sync-E Status Indicators)
- 12. System Output Signals (Non-Ultra Sync-E Status Indicators)
- 13. Exit Button

1. Servo Drop Configuration: Indicates the number of drops for which the servo controller has been programmed. The servo controller should not be used on systems for which it is not programmed/configured. The motor torque is set depending on the number of drops intended to be operated. Failure to follow this requirement can lead to component damage, nuisance stem decoupling, or poor processing (posting). If the controller is required to run on a system outside of the programmed/configured range indicated a Husky service technician can reprogram or reconfigure.

2. Screen Controls:

Button	Description
Auto	Activates Auto mode. Valve stems are controlled automatically.
Manual	Activates Manual mode. Valve stems are controlled manually using the Open and Close buttons.
Close	Closes the valve stems. Only active in Manual mode.
Open	Opens the valve stems. Only active in Manual mode.
Calib	Automatically calibrates the valve stem closed position.

Button	Description
Setup	Opens the password protected Valve Stem Setup screen.
Non-UltraSync-E Signal Status Indicators	<p>These fields show the status of non-UltraSync-E digital inputs and outputs. In cases where the controller is kept in the Valve Stem Operation screen for extended periods of time, this is useful for monitoring other I/O channels not tied to the UltraSync-E functionality. These fields are for informational purposes only and mirror the status of the level indicators displayed in the I/O Box Setup screen.</p> <p>NOTE: These fields are always present regardless of the options being enabled in the I/O Box Setup screen or not.</p>

- 3. Disable UltraSync-E Function:** This field disables the Servo Fault error. This is used in cases where the controller is running a non-UltraSync-E mold and it is necessary to disable the UltraSync-E function. Touching the box will toggle between NO or YES. YES indicates that the Servo Fault error is disabled.

NOTE: If the Disable UltraSync-E Function is set to YES, the actuation of the valve stems will be stopped. It is also recommended that the power to the servo drive section of the controller is turned off when the Servo Fault error has been disabled.

- 4. Control Mode:** Indicates the selected control mode. This can only be changed on the **Valve Stem Setup** screen.
- 5. Set Timer Fields:** Depending on the selected control mode, these fields set the various optional timers to either delay opening/closing or control the open time.
- 6. Input Signals from IMM:** Indicators show the status of the inputs to the system from the machine and are used for troubleshooting.

Input	Description
Signal 1	Open or Open/Close signal from the machine.
Signal 2	Close signal (optional based on control mode selected).
Stems Active	Machine safety gate signal indicating safety gates are closed allowing valve stems to operate.

- 7. Signals from Servo:** Indicators show the status of the inputs to the system from the servo drive and are used for troubleshooting.

Input	Description
Stems Open	Signal indicating that the stems are in the open position.
Stems Closed	Signal indicating that the stems are in the closed position.
Obstruction	Signal indicating that either an obstruction has been detected or that the stem position is unknown, calibration is required.
Fault	Signal indicating that the servo system is in a fault condition or there is a loss of power in the servo section (servo power switch is in the off position or blown fuse/tripped circuit breaker).

- 8. Matrix Status Indicator:** This field will blink red if the controller is in an alarm condition. Touching this field will open the **Status/Alarm** screen.

- 9. Output Signals to IMM:** Indicators show the status of the controller outputs and are used for troubleshooting.

Output	Description
Servo System Fault	Fault signal to the machine (optional) indicating the valve stems are inoperable. Obstruction detection or a servo drive fault results in this output being active.

- 10. Valve Stem Status Indicator:** Indicates the current status of the valve stems.

Status Message	Description
Temperature Zones Off – Stems Disabled	The temperature zones are disabled. Valve stems can not be actuated.
Heating Up – Stems Disabled	The temperature zones are enabled but not at operating temperature. Valve stems can not be actuated.
Stem soak Timer Active hh:mm:ss – Stems Disabled	The temperature zones are enabled and at operating temperature, but have not completed their set soak time. Valve stems can not be actuated until the countdown has completed.
Interlock Open – Stems Disabled	The machine safety gates are open. Valve stems can not be actuated.
Servo Fault – Reset Required	A servo-related fault has occurred. The fault must be reset.
Obstruction or Position Error – Calibration Required	The preset torque limit has been exceeded or the valve stem position is unknown.
Idle	Controller is idle.
Open Signal Detected	Open signal from the machine is detected.
Open Delay Active mm:ss	Open delay timer is active until the countdown has completed.
Stems Open	Valve stems are in the open position.
Close Signal Detected	Close signal from the machine is detected.
Close Delay Active mm:ss	Close delay timer is active until the countdown has completed.
Stems Closed	Valve stems are in the closed position.
Maintenance	Valve stems are in the maintenance position.

- 11. System Input Signals:** Indicators show the status of the system inputs and are used for troubleshooting.

Input	Description
Remote Standby	Signal indicating that the Remote Standby is active.
Remote Boost	Signal indicating that the Remote Boost input is active.

Input	Description
Remote Start	Signal indicating that the Remote Start input is active.
Remote Stop	Signal indicating that the Remote Stop input is active.

- 12. System Output Signals:** Indicators show the status of the system outputs and are used for troubleshooting.

Output	Description
Alarm Relay	Signal indicating that the alarm relay will be activated when an alarm or abort condition occurs.
PCM Relay	Signal indicating that the PCM Relay output is active.
At Temperature	Signal indicating that the At Temperature output is active.
Remote Standby	Signal indicating that the Remote Standby output is active.
At Boost Temp	Signal indicating that the At Boost Temperature output is active.

18.3.1 The Valve Stem Operation Screen

18.3.1.1 Accessing the Valve Stem Operation Screen

To Access the Valve Stem Operation Screen:

1. Touch the OPTIONS button in the Home screen.
2. Touch the VALVE STEMS button in the Options submenu.



IMPORTANT!

This screen is only available if a mold setup is loaded.

18.3.1.2 Disabling the Ultrasync-E Function

In cases where the controller will be connected to a mold without an UltraSync-E valve gate system, it is necessary to disable the Servo Fault Alarm or it will activate continuously, posing a nuisance to the operator.

To Disable the UltraSync-E Function:

1. Touch the OPTIONS button in the Home screen.
2. Touch the VALVE STEMS button in the Options submenu.
3. Touch the Disable UltraSync-E Function field to toggle it to YES.
4. Touch the OK button in the Warning Pop-up window.



IMPORTANT!

If the Disable UltraSync-E Function is set to YES, the actuation of the valve stems will be disabled and all of the UltraSync-E operation buttons, in the Valve Stem Operations screen, will be deactivated. It is also recommended that the power to the servo drive section of the controller is turned off when the Servo Fault error has been disabled.

18.4 Valve Stem Setup Screen

The Valve Stem Setup Screen is used to configure the control modes and behavior of the UltraSync-E system as well as access the I/O Box Setup screen. Fields have been added for disabling the password access to this screen and controlling the need to re-soak if the hot runner temperature setpoint is above a certain limit. This screen is password protected.

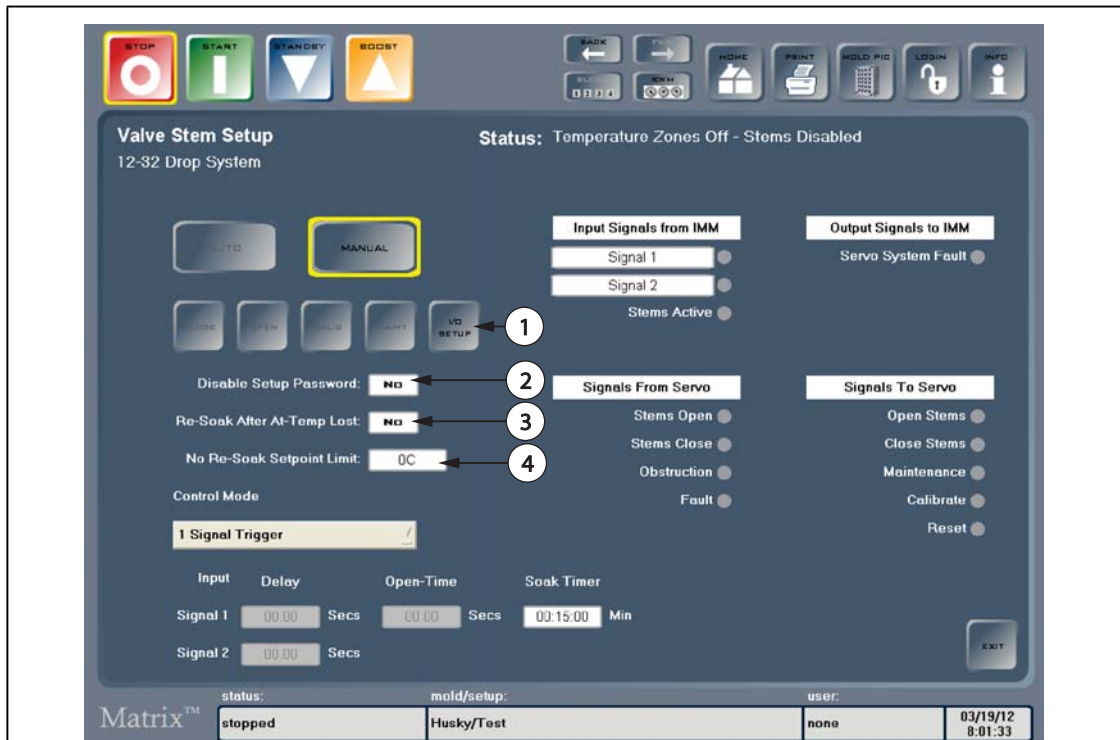


Figure 18-3 Valve Stem Setup Screen

- 1. I/O Setup Button
- 2. Disable Setup Password Field
- 3. Re-Soak After At-Temp Lost Field
- 4. No Re-Soak Setpoint Limit Field

Table 18-1 Valve Stem Setup Screen Item Descriptions

Item	Description
Disable Setup Password	<p>This field disables the need to have a password to access this screen. This is used in cases where repeated access is required to this screen, especially while validating the process. Touching the box will toggle between NO or YES. YES indicates that password access has been disabled.</p> <p>NOTE: Disabling the password access to this screen should be performed by well qualified operator only when necessary. Changing settings in this screen can adversely affect the operation and behavior of the UltraSync-E system. The default setting is NO.</p>
Re-Soak After At-Temp Loss	<p>This field cancels the activation of the re-soak timer after a setpoint change is made that is higher than the specified threshold value. This is used in cases where the automatic 15 minute soak time is not required and the desire is to override it when a setpoint change results in the loss of the At-Temperature signal. Touching the box will toggle between NO or YES. NO indicates that the Soak Timer has been disabled if the At-Temperature signal is lost and the setpoint is above the No Re-Soak Setpoint Limit.</p> <p>NOTE: Soaking refers to the time necessary to allow the material in the hot runner to come to a homogeneous temperature. This is to ensure the valve stems will move freely within the nozzle melt channel. The default setting is NO.</p>
No Re-Soak Setpoint Limit	<p>This field is used to define a limit that controls what the lowest setpoint value can be set to before the re-soak timer is activated. This value is used in conjunction with the Re-Soak After At-Temp Lost function.</p> <p>NOTE: The available range for this field is 32°F to 932F (0°C to 500°C) and the default setting is 32°F (0°C).</p>

Table 18-1 Valve Stem Setup Screen Item Descriptions (Continued)

Item	Description
Disable UltraSync-E Function	<p>This field disables the Servo Fault error. This is used in cases where the controller is running a non-UltraSync-E mold and it is necessary to disable the UltraSync-E function. Touching the box will toggle between NO or YES. YES indicates that the Servo Fault error is disabled.</p> <p>NOTE: If the Disable UltraSync-E Function is set to YES, the actuation of the valve stems will be stopped. It is also recommended that the power to the servo drive section of the controller is turned off when the Servo Fault error has been disabled.</p>
Non-UltraSync-E Signal Status Indicators	<p>These fields show the status of non-UltraSync-E digital inputs and outputs. In cases where the controller is kept in the Valve Stem Operation screen for extended periods of time, this is useful for monitoring other I/O channels not tied to the UltraSync-E functionality. These fields are for informational purposes only and mirror the status of the level indicators displayed in the I/O Box Setup screen.</p> <p>NOTE: These fields are always present regardless of the options being enabled in the I/O Box Setup screen or not.</p>

Table 18-2 Valve Stem Setup Screen Button Descriptions

Button	Description
I/O SETUP	<p>Touch the I/O SETUP button to access the I/O Box Setup - UltraSync-E screen. This screen is used to configure the digital input and output channels that support UltraSync-E specific functionality.</p>

18.4.1 Accessing the Valve Stem Setup Screen

To Access the Valve Stem Screen:

1. Touch the SETUP button in the Valve Stems Operation screen.
2. Touch the OK button in the Warning Pop-up window.
3. Enter the appropriate Password in the Keyboard Pop-up and touch the Enter button



IMPORTANT!

The Valve Stem Setup screen is password protected to limit access because changing settings in the screen can adversely affect the operation and behavior of the UltraSync-E system.

18.4.2 Disabling Password Access to the Valve Stem Setup Screen

Disabling the need for a password is used in cases where repeated access is required to the Valve Stem Setup screen, over a short period of time. This is especially useful while validating the process.

To Disable Password Access to the Valve Stem Screen:

1. Touch the SETUP button in the Valve Stems Operation screen.
2. Touch the OK button in the Warning Pop-up window.
3. Enter the appropriate Password in the Keyboard Pop-up and touch the Enter button.
4. Touch the Disable Setup Password field to toggle it to YES.



IMPORTANT!

Disabling the password access to this screen should be performed by well qualified operator only when necessary. Changing settings in this screen can adversely affect the operation and behavior of the UltraSync-E system. The default setting is NO.

18.4.3 Disabling the Re-Soak Timer after the At-Temp Signal is Lost

The soak timer is used by the system to allow the material in the hot runner to come to a homogeneous temperature. This is to ensure the valve stems will move freely within the nozzle melt channel. The timer starts once all zones have reached their setpoint and the At-Temperature signal is active. The system is ready for use after the timer expires. If this routine has finished and a setpoint is changed to a higher value, then the At-Temperature signal is lost and the soak timer will be activate again once the new setpoint has been reached. In some cases, this causes unnecessary delays, so a field has been added to the Valve Stem Setup screen to enable or disable this feature. This is used in conjunction with a setpoint limit to trigger when the system should re-soak or not.

To Disable the Re-Soak Timer:

1. Touch the SETUP button in the Valve Stems Operation screen.
2. Touch the OK button in the Warning Pop-up window.
3. Enter the appropriate Password in the Keyboard Pop-up and touch the Enter button.
4. Touch the Re-Soak After At-Temp Lost field to toggle it to NO.



IMPORTANT!

It is recommended that when the soak timer is disabled, the No Re-Soak Setpoint Limit be set to a value that is in-line with the resin manufacture's processing guidelines.

18.4.4 Configuring the No Re-Soak Setpoint Limit

The No Re-Soak Setpoint Limit is a threshold used by the system to determine when to trigger the re-soak timer. This limit only goes into affect once the soak routine has been

completed after initial start-up and a new setpoint has been entered. If the setpoint is higher than the No Re-Soak Limit value, the soak timer will be ignored once the new temperature is in range. On the other hand, if the new setpoint is lower than the No Re-Soak Limit value, the soak timer will be activated after the lower temperature has been reached. The system will use this limit only if the Re-Soak After At-Temp Lost field is set to NO, otherwise it is ignored.

To Set the No Re-Soak Setpoint Limit:

1. Touch the SETUP button in the Valve Stems Operation screen.
2. Touch the OK button in the Warning Pop-up window.
3. Enter the appropriate Password in the Keyboard Pop-up and touch the Enter button.
4. Touch the No Re-Soak Setpoint Limit field to toggle to display a 10-Key Pop-up window.
5. Enter the desired Setpoint value in the 10-Key pop-up and touch the ENTER button.



IMPORTANT!

It is recommended that this limit be set to a value that is in-line with the resin manufacture's processing guidelines.

18.4.5 Disabling Password Access to the Valve Stem Setup Screen Security

To better control user access the following function has been added to the User Rights (Administrator) screen.

Valve Stem Setup Function in the User Rights (Administrator) Screen:

- Valve Stem Setup Access

18.5 Input/Output Setup

The inputs and outputs for the controller interface can be adjusted to act as normally open or normally closed.

To setup the inputs and outputs as normally closed or normally open, perform the following:

1. Touch **Options** and then touch **Valve Stems** to open the **Valve Stem Operation** screen.

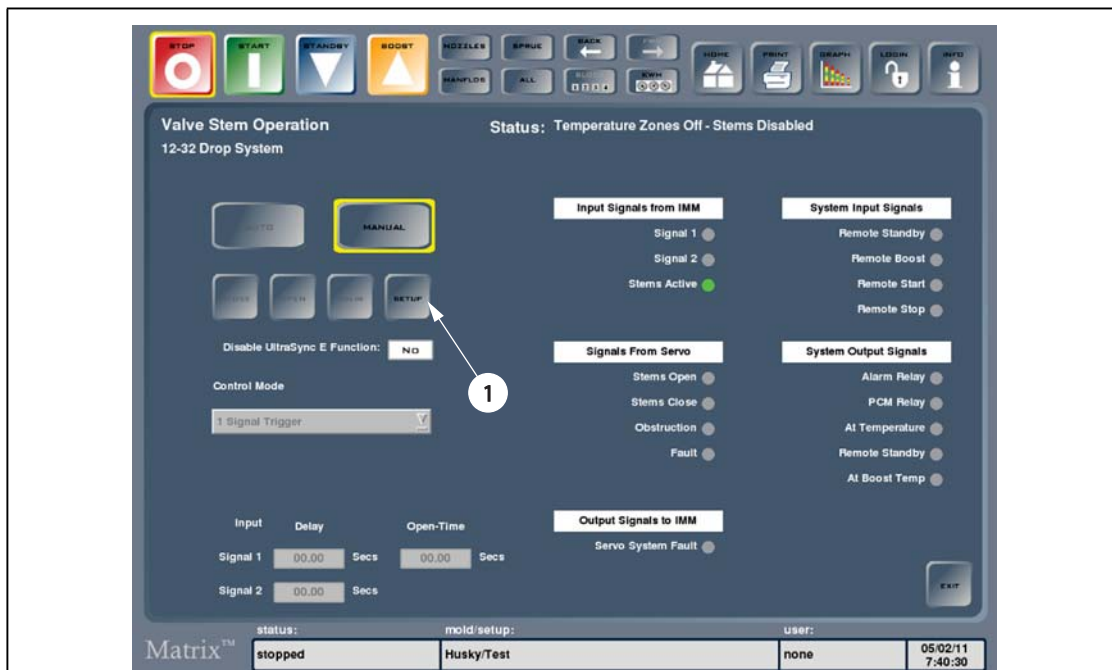


Figure 18-4 Valve Stem Operation Screen

1. Setup Button

2. Touch the **Setup** button, acknowledge the warning that appears and enter the following password (case sensitive): *SVSA1174*.
This displays the **Valve Stem Setup** screen.

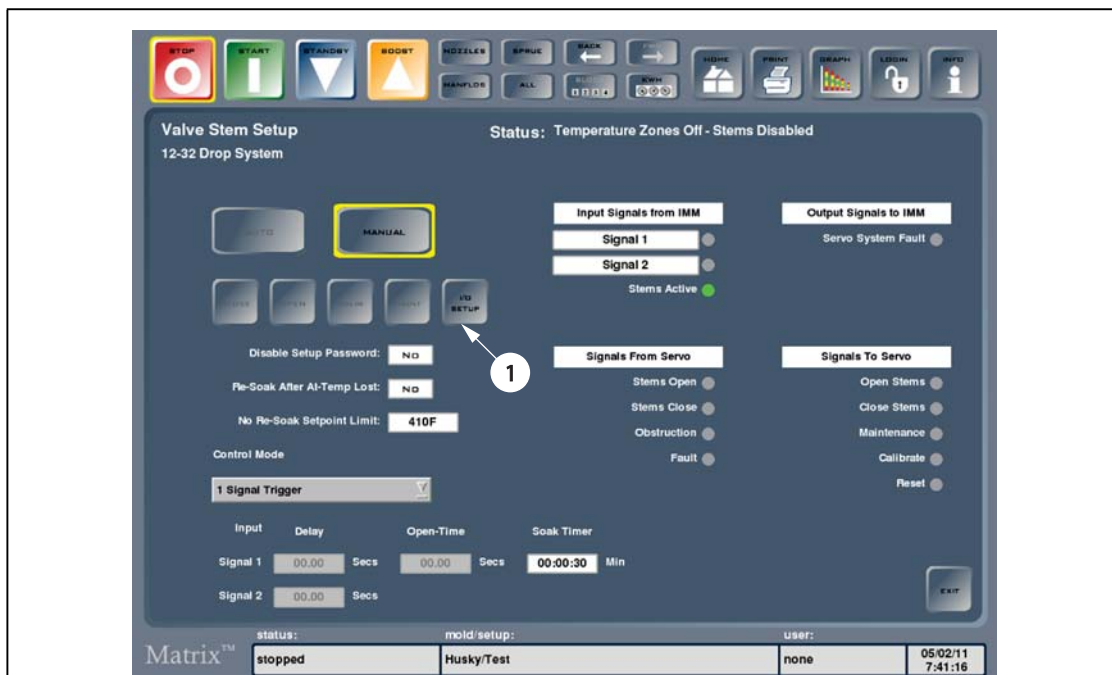


Figure 18-5 Valve Stem Setup Screen

1. I/O Setup Button

3. Touch the **I/O Setup** button to display the **I/O Box Setup - SVSA** screen.

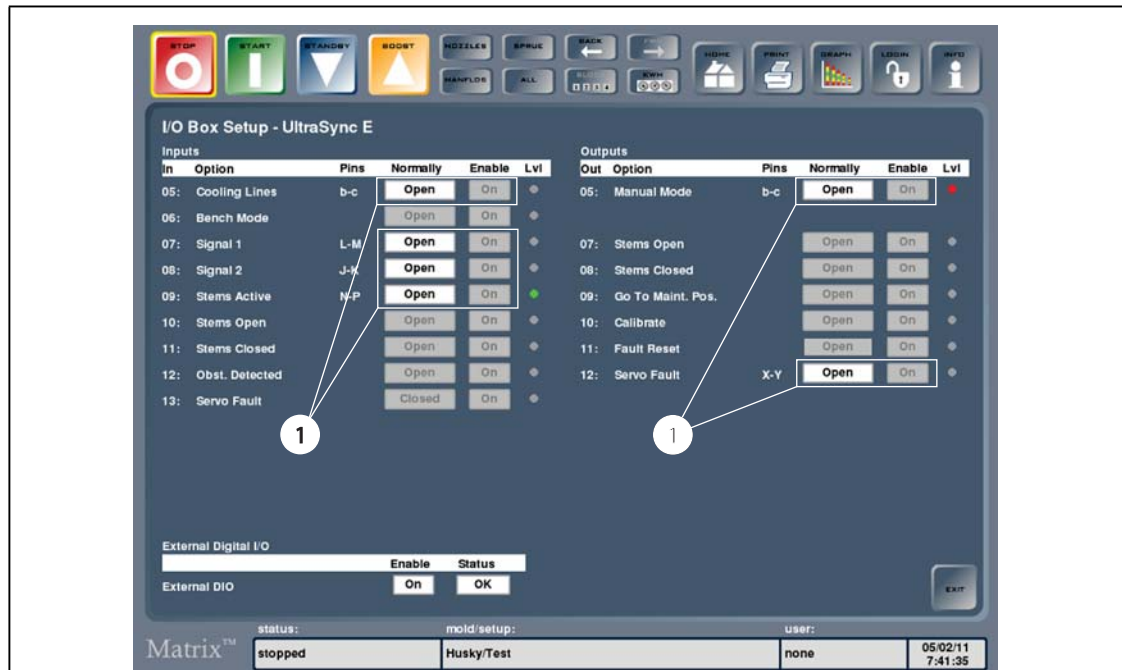


Figure 18-6 I/O Box Setup - SVSA Screen

1. Inputs/Outputs Allowed to Be Changed

4. Change the status of the following inputs and outputs (i.e. open or closed) as necessary:

CAUTION!

Only modify the inputs and outputs specified. Modifying any other field on this screen will affect the operation of the system.



IMPORTANT!

Only modify the inputs and outputs specified. Modifying any field on this screen other than those indicated in this procedure will affect the system operation.

- Input 05 (Cooling Lines)
- Input 07 (Signal 1)
- Input 08 (Signal 2)
- Input 09 (Stems Active or Safety Gate Interlock)
- Output 05 (Manual Mode)
- Output 12 (Servo Fault)



Figure 18-7 I/O Box Setup - UltraSync-E Screen

- 1. Digital Input 05 - Cooling Lines
- 2. Digital Input 05 - Manual Mode
- 3. Digital Input Fields
- 4. Digital Output Fields

Table 18-3 I/O Box Setup - Ultra Sync-E Screen Item Descriptions

Item	Description
Digital Input 05 - Cooling Lines	Digital Input channel 05 is used as an input signal from the thermolator or injection molding machine to indicate if the mold cooling has been turned on. When the signal is active, the controller displays the following warning message "Mold Cooling Lines are not Enabled". This message will remain until the signal is turned off. NOTE: This feature is only available with the UltraSync-E option. The Enable field for this input will always be set to ON and cannot be changed.
Digital Output 05 - Manual Mode	Digital Output channel 05 is used as an output signal to the injection molding machine to indicate that the UltraSync-E system is in Manual operation mode. The signal will remain active as long as the Manual button, in the Valve Stem Operation screen, is engaged. NOTE: This feature is only available with the UltraSync-E option. The Enable field for this output will always be set to ON and cannot be changed.

Table 18-3 I/O Box Setup - Ultra Sync-E Screen Item Descriptions (Continued)

Item	Description
Digital Input Fields	These field are used to configure all of the available digital input channels that support UltraSync-E specific functionality. The grayed out items pertain to signals that are used for internal communication between the controller and servo drive and cannot be modified. These settings must remain as they are to ensure the proper operation of the UltraSync-E system.
Digital Output Fields	These field are used to configure all of the available digital output channels that support UltraSync-E specific functionality. The grayed out items pertain to signals that are used for internal communication between the controller and servo drive and cannot be modified. These settings must remain as they are to ensure the proper operation of the UltraSync-E system.

18.6 Troubleshooting

The following describes troubleshooting methods and potential solutions for problems that may be encountered during operation and/or setup of an UltraSync system.

The problems discussed are not a definitive list. If the problem you are experiencing is not listed in this chapter, contact Husky Technical Support or your nearest Husky Regional Service and Sales office for assistance.

18.6.1 Servo Fault

This fault can occur for a variety of reasons. To diagnose the problem, complete the following steps in order:

1. Make sure the servo cables are connected and the servo motor power switch is in the ON position.
2. Attempt to reset the fault by doing the following:
 - a. On the **Status/Alarm** screen, touch the **Clear Alarm** button to silence the alarm.
 - b. Touch the **Reset** button once, wait two to three seconds, and then touch it again.



DANGER!

Electrocution hazard— contact with hazardous voltages will cause death or serious injury. Only qualified personnel should be allowed to perform this portion of the procedure.

3. Observe the LEDs and fault code display on the servo drive in the controller. Refer to [Table 18-4](#) and [Table 18-5](#) for a description of each indicator light.

If an error is displayed, refer to [Table 18-6](#) for information about how to resolve the error.



IMPORTANT!

During a fault condition, the fault code is displayed in sequence starting with an "F" for 1.5 seconds followed by the three fault/error code digits. Each digit is displayed for approximately 0.8 seconds. If more than one fault exists, each fault code will be displayed in sequence.

For example, if the fault codes were 125 and 91, they would be displayed as "F...1...2...5...F...0...9...1...F...1...2...5...".

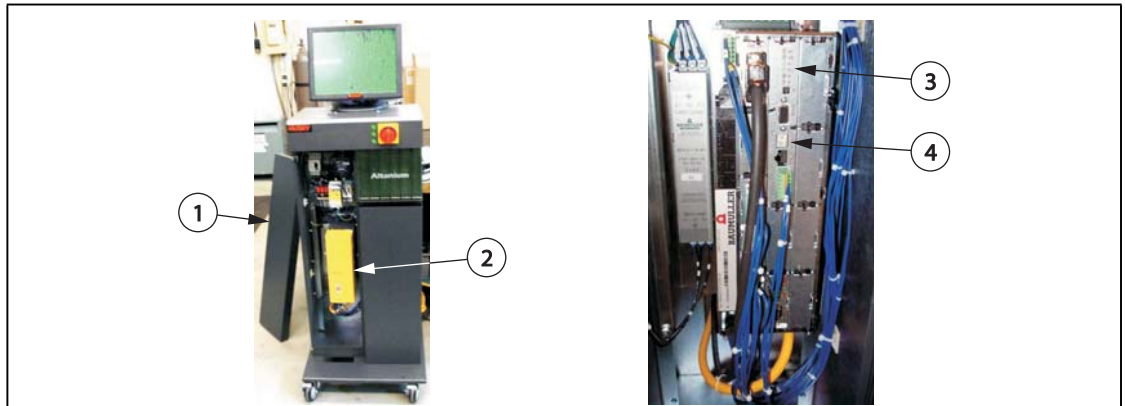


Figure 18-8 Servo Drive LEDs and Fault Code Display

1. Servo Section Cover 2. Servo Drive 3. LED Indicators 4. Fault Code Display

4. Observe the status of the electrical components and make sure the following is true:
 - Main fuses F1 have not blown (visual indicating lights indicating blown fuse) or main breaker Q1M is not tripped (voltage system dependant)
 - Circuit breakers Q1M and Q2M are on (switch up)
 - DC power supply G1 is active (green LED on)
 - 5 green LEDs on safety relay K1 are all on if the machine safety gates are closed (only the first "Power" LED will be on if the safety gates are open)

Table 18-4 Servo Drive LEDs

LED	Function	Description
UH1, UH2	Not used	These LEDs are not used
H1	Torque direction	Indicates the motor torque direction (not rotation). Green = Torque applied in closed direction. Orange = Torque applied in open direction.
H2	Drive enable	Indicates pulse enabling of the drive. Green = Pulses enabled. Drive is supplying power to the motor. Orange = Power is on, drive is ready, but pulses are not enabled, no power to the motor.

Table 18-4 Servo Drive LEDs (Continued)

LED	Function	Description
H3	Current limit	Indicates when current limit (torque limit) has been reached Red = Current limit reached.
H4	Error	Continuous Red = Drive error detected. Blinking Red = Drive warning detected. Warnings do not affect the operation of the drive.

Table 18-5 Fault Code Display LEDs

Display	Status	Description
0	Not ready to start	Drive initialization, pulses inhibited.
1	Inhibit start	Initialization complete without errors, pulses inhibited. Not a fault but stems will not actuate. Displayed when the machine safety gate signal is open.
2	Ready to start	Pulses inhibited. Not a fault but stems will not actuate. May also be displayed when the machine safety gate signal is open.
3	Switched on	Pulses enabled, no torque generation yet.
4	Operation enabled	Pulses enabled, drive functions enabled. This is the normal status for the drive and is required for stems to operate.
F (+ Numbers)	Fault/error	Pulses inhibited, error status, display shows fault numbers

Table 18-6 Servo Drive Fault Codes and Solutions

Fault Number	Fault	Solution
1	Watchdog error	Internal error. Cycle power to the drive.
2	Incorrect interrupt has occurred	Internal error. Cycle power to the drive.
3	NMI interrupt/bus error	Internal error. Cycle power to the drive.
16	Errors while booting	Internal error. Cycle power to the drive.
17	Software error	Internal error. Cycle power to the drive.
18	Time slot configuration	Internal error. Cycle power to the drive.
19	Time slot – time error	Internal error. Cycle power to the drive.
20	No free memory	Internal error. Cycle power to the drive.
21	Invalid error code	Internal error. Cycle power to the drive.
22	Invalid warning code	Internal error. Cycle power to the drive.

Table 18-6 Servo Drive Fault Codes and Solutions (Continued)

Fault Number	Fault	Solution
23	False FPGA version	Contact Husky Service.
48	Error in module A	Cycle power to the drive, check wiring to module, replace module.
50	Error in module C	Cycle power to the drive, check wiring to module, replace module.
51	Error in module D	Cycle power to the drive, check wiring to module, replace module.
53	Error in module G	Cycle power to the drive, check wiring to module, replace module.
54	Error in module H	Check that module switch is in the down position, cycle power to the drive, contact Husky Service.
64	Mains failure	Check fuses/circuit breaker, restore main power to the drive.
65	Phase failure	Check fuses/circuit breaker, restore main power to the drive.
66	Mains under voltage	Check power wiring. Measure voltage at the drive, Phase to Phase must be greater than 208 V, correct low voltage condition.
67	Mains over voltage	Check power wiring. Measure voltage at the drive, Phase to Phase must be less than 415 V, correct low voltage condition.
68	Under voltage 24 V	Check DC power supply G1 wiring. Measure DC voltage, must be between 20.4 V to 28.8 V, and adjust if necessary.
81	Heat sink over temperature	Check for obstruction of the drive heat sink fins (located out the back of the controller). There is a fan on the heat sink (bottom) that should come on before this fault occurs, is the fan coming on? Let the system cool down and try again.
82	U DC link over voltage	Motor has over generated. Make sure injection is not occurring until stems are in the open position (do not inject while stems are opening).
83	Over current	Check cabling to motor. Cycle power to the drive. Could occur if a prolonged obstruction goes undetected.
84	Ground fault	Check cabling between drive and motor, check motor for ground fault, replace motor.
85	Device internal over temperature	Make sure there are no air obstructions above or below the drive. Check heat sink fins (located out the back of the controller) for obstruction.

Table 18-6 Servo Drive Fault Codes and Solutions (Continued)

Fault Number	Fault	Solution
86	Cable break temperature sensor	Check to make sure black encoder cable is not damaged and is connected to the motor. Replace encoder cable if necessary.
87	Safety relay off or defective	Could be displayed when safety gates are opened. Check control wiring to drive (blue wires), check to make sure connector X102 on underside of drive is plugged in (safety relay connector).
88	Bridge short circuit	Cycle power to the drive. Replace drive.
89	Power unit not ready to operate	Check control wiring to drive (blue wires), cycle power to the drive.
90	Phase failure	Same as Fault 65
91	Mains failure	Same as Fault 64
92	Mains under voltage	Same as Fault 66
93	Mains over voltage	Same as Fault 67
94	U DC link under voltage	Check power connections. Replace drive.
96	Short circuit motor temperature sensor $T_m \leq -30^\circ\text{C}$	Check to make sure black encoder cable is not damaged and is connected to the motor. Replace encoder module A in the drive. Replace the motor.
97	Temperature sensor motor not connected $T_m \geq +300^\circ\text{C}$ (572 °F)	Check to make sure black encoder cable is connected between motor and drive and not damaged. Replace encoder module A in the drive. Replace the motor.
98	Motor over temperature	Let motor cool down. Increase cycle time (cycle time should not be less than 3sec).
99	Error $I^2t > 100\%$	Let motor cool down. Increase cycle time (cycle time should not be less than 3sec).
115	Cable break encoder 1	Check to make sure black encoder cable is connected between motor and drive and not damaged.
123	Field angle error	Check black encoder cable for shield damage.
146	Encoder module 1 is missing	Module A in the drive is missing or faulty. Replace if necessary.
192	Position deviation dynamic	Motor position has exceeded its control position. Make sure injection is not occurring until stems are in the open position (do not inject while stems are opening). Try decreasing hold pressure.

Table 18-6 Servo Drive Fault Codes and Solutions (Continued)

Fault Number	Fault	Solution
193	Position deviation static	Motor position has exceeded its control position. Make sure injection is not occurring until stems are in the open position (do not inject while stems are opening). Try decreasing hold pressure.
200	Homing necessary and not yet executed	Perform calibration. Cycle power to drive.
208	Drive is blocked	Motor is blocked/stalled that was not detected by obstruction detection software or torque limit exceeded for a prolonged period of time. Perform calibration. Check for obstruction in valve stem actuation system. Cycle power to drive.

18.6.2 Obstruction Detection/Position Unknown

This fault occurs when the servo motor torque is higher than the limit programmed into the software or if the main power is cycled. The problem must be corrected before the fault can be cleared.

Possible causes for this fault include:

- Maintenance pin(s) not removed before operation
- Resin in the system is too cold or the temperature zone setpoints are set too low
- Damaged component
- Servo motor not calibrated since the last startup

Chapter 19 User Service

This chapter provides instructions for servicing the Altanium/Matrix system, including the following:

- Replacing an ICC² (Intelligent Control Card). Refer to [Section 19.2.2](#)
- Replacing a blown fuse on an ICC² (Intelligent Control Card). Refer to [Section 19.2.3](#)
- Replacing a Matrix display. Refer to [Section 19.3](#)
- Replacing the Matrix Microbox. Refer to [Section 19.4](#)
- Cleaning the system. Refer to [Section 19.6](#)

19.1 Altanium/Matrix System

The Altanium/Matrix X-Series system is based around a modular concept. The two major components for the X-Series are the Matrix operator interface and the 12 - zone card cage which houses 6 ICC² (Intelligent Control Cards).



The Matrix display is used to enter and display molding parameters. There are no user-serviceable parts inside a Matrix display.

19.2 Servicing the Altanium System

The X-Series card cage can run 1 to 12 heaters in the mold. It consists of a green Passive Backplane and 1 to 6 green ICC² (Intelligent Control Cards) which are plugged into the Passive Backplane. The number of passive backplanes and ICC² the system contains is based on the number of zones ordered with the system. All ICC² are the same and can be interchanged with other ICC². The Passive Backplanes contain CAN communications address switches and can be interchanged with other Passive Backplanes if the switches are set properly.

19.2.1 Altanium X-Series Card Cage

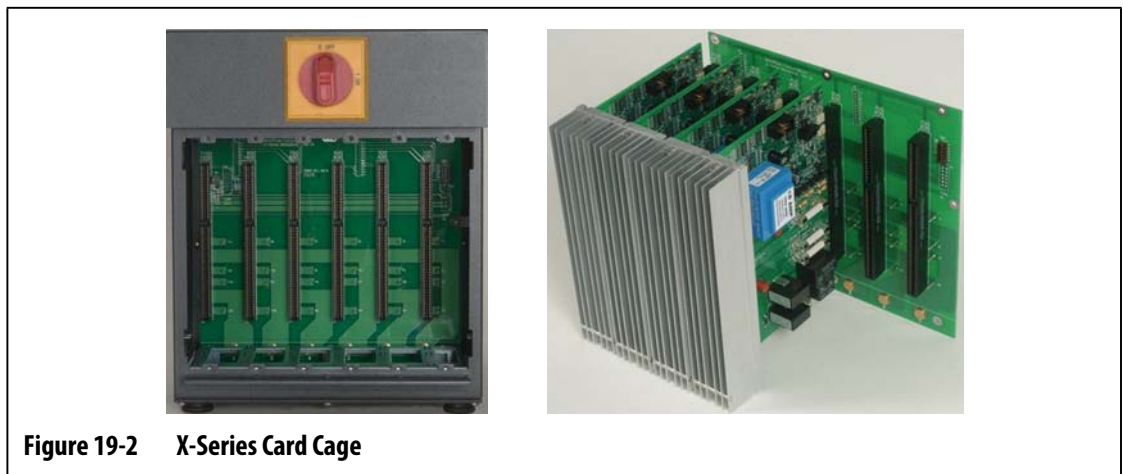


Figure 19-2 X-Series Card Cage

Access all user-serviceable parts, including fuses and circuit boards, by loosening the upper and lower slotted screws on each heat sink assembly and then sliding a screwdriver between the horizontal silver post and the ledge on the cabinet and prying the board out.

Located inside each card cage are 1 to 6 two-zone ICC² (Intelligent Control Cards) and a single Passive Backplane.



IMPORTANT!

ICC² (Intelligent Control Card) must be present in the position labeled "1" in all card cages for the system to function properly.



DANGER!

Electrical Hazard - risk of serious injury or death. Complete the lockout/tagout of all energy sources in accordance with applicable local codes before performing maintenance activities. Failure to do so could result in serious injury or death. Do not service the Altanium unit without locking out and tagging the Altanium Main switch.

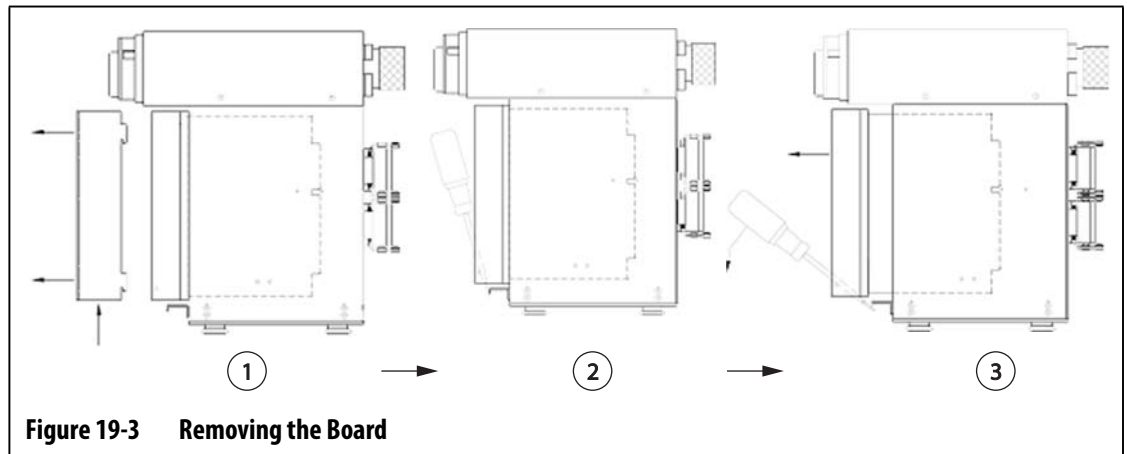
19.2.2 Replacing an ICC2 (Intelligent Control Card)

CAUTION!

Static electricity hazard – risk of damage to the equipment. Electronic devices could be severely damaged by static electricity. Before accessing or handling any electronic device, make sure you are properly grounded and all static electricity has been discharged by either wearing an anti-static strap or touching a large grounded metal surface for several seconds.

To replace an ICC²:

1. Locate the Card Cage that contains the faulty ICC² (Intelligent Control Card). If the system is equipped with XE cards use the on-screen Card Layout feature to assist in locating the card.
2. Remove the Lexan Altanium heat sink cover by lifting it up and out.
3. Loosen the upper and lower slotted screws on the heat sink. These two screws are captive so they do not fall into the system or get lost on the floor.
4. Slide a screwdriver between the silver post and the ledge on the cabinet and gently pry the board out. (Figure 19-3)



CAUTION!

Static electricity hazard – risk of damage to the equipment. A static charge could damage a PCB. Do not place any PCB on carpets, rugs, or other material that is likely to create a static charge.

5. Carefully place the PCB on an earthed/grounded surface.
6. Slide the new card into to the slot and push the card slowly and firmly back into place. A card that is incorrectly oriented card will not seat properly.
7. Tighten the upper and lower slotted screws on the heat sink.

19.2.3 Replacing a Blown Fuse on an ICC2 (Intelligent Control Card)

CAUTION!

Static electricity hazard – risk of damage to the equipment. Electronic devices could be severely damaged by static electricity. Before accessing or handling any electronic device, make sure you are properly grounded and all static electricity has been discharged by either wearing an anti-static strap or touching a large grounded metal surface for several seconds.

If Matrix informs of a blown fuse in the system, make a note of the error (which fuse is blown) before proceeding. A system equipped with XE cards on-screen Card Layout feature display a picture of the card with a red X shown over the faulty fuse.

To replace a blown fuse:

1. Locate the Card Cage that contains the faulty ICC² (Intelligent Control Card). If the system is equipped with XE cards use the on-screen Card Layout feature to assist in locating the card.
2. Remove the Lexan Altanium heat sink cover by lifting it up and out.
3. Loosen the upper and lower slotted screws on the heat sink. These two screws are captive so they do not fall into the system or get lost on the floor.
4. Slide a screwdriver between the silver post and the ledge on the cabinet and gently pry the board out. (see [Figure 19-3](#))

CAUTION!

Static electricity hazard – risk of damage to the equipment. A static charge could damage a PCB. Do not place any PCB on carpets, rugs, or other material that is likely to create a static charge.

5. Carefully place the PCB on an earthed/grounded surface.
6. Remove and replace the faulty fuse with one of identical type and rating. Husky recommends Bussmann ABC or equivalent fuses. Make sure the fuse is fully seated. Poor seating will cause a hot spot, which can cause problems for the system.

NOTE: A 30 Amp card will only have two fuses.

7. Slide the new card into to the slot and push the card slowly and firmly back into place. A incorrectly oriented card will not seat properly.
8. Tighten the upper and lower slotted screws on the heat sink.

19.3 Replacing a Matrix Display

CAUTION!

Static electricity hazard – risk of damage to equipment. Electronic devices could be severely damaged by static electricity. Before accessing or handling any electronic device, make sure you are properly grounded and all static electricity has been discharged by either wearing an anti-static strap or touching a large grounded metal surface for several seconds.

In some cases, Matrix will not work if the display is defective. If the display input power is correctly connected and all three phase indicators are lit; the display is probably faulty.



IMPORTANT!

There are no user serviceable parts inside the display module, and all warranties are void if it is opened by anyone other than factory personnel.



DANGER!

Hazardous voltage – risk of electrical shock or burns. The controller must be disconnected from the power source before maintenance is performed. Make sure the controller is turned off and unplugged. Lock out and tag the controller in accordance with local codes. Make sure the work area is blocked off and a Danger sign is posted at all entry points. Always maintain control of the work area and the power plug.

To replace the display:

1. Face the rear of the system, disconnect the Power and Input Comm cables from the mainframe.



IMPORTANT!

Assistance may be required with the following steps.

2. Facing the front of the controller, locate the four 1/4"-20 button head cap screws that hold the Matrix L bracket to the mainframe.
3. Remove these four screws using the 5/32" hex wrench that is provided with the controller.
4. Grip the bottom of the display with one hand and the bottom of the microbox with your other hand, carefully lift the whole module off the mainframe.
5. Disconnect all cables attached to the display.
6. Turn the module over to locate the four M5 X 10mm Flat Head Phillips screws on the underside of the L bracket.
7. Hold or gently brace the display and the microbox and remove these four screws
8. Install the new display module by reversing the above steps.

19.4 Replacing a Matrix Microbox

CAUTION!

Static electricity hazard – risk of damage to equipment. Electronic devices could be severely damaged by static electricity. Before accessing or handling any electronic device, make sure you are properly grounded and all static electricity has been discharged by either wearing an anti-static strap or touching a large grounded metal surface for several seconds.



Figure 19-4 Matrix Microbox - Connection Details

To replace the Matrix microbox:

1. Face the rear of the system, disconnect all cables from bottom of the Matrix microbox.
2. Face the side of the module and locate the four black thumb screws that hold the microbox in position.
3. Hold the microbox with one hand and remove the four screws with the other hand.
4. Lift the microbox away from the L bracket.
5. Install the new microbox by reversing the above steps.

19.5 Calibrating the Thermocouple Inputs

The system has been factory-calibrated and in most cases it is not necessary to recalibrate until Matrix has been running for one year. If calibration is necessary, please contact the nearest Husky Regional Service and Sales office for calibration instructions.

19.6 Cleaning the System

- Use a damp sponge or cloth. No abrasives should ever be used on the surface. The labels should also be wiped and no cleaners or solvents should be used.
- If a cleaner of any type must be used, window cleaner sprayed onto a cloth, not directly onto the cabinet, is recommended.

