Altanium Servo Controller

User Guide

HUSKY®

Keeping our customers in the lead

Original Instructions

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This product manual is intended to provide information for safe operation and/or maintenance. Husky reserves the right to make changes to products in an effort to continually improve the product features and/or performance. These changes may result in different and/or additional safety measures that are communicated to customers through bulletins as changes occur.

General Information

Telephone Support Numbers

North America	**Toll free**	1-800-465-HUSKY (4875)
Europe	**EC (most countries)**	008000 800 4300
	Direct and Non-EC	+ (352) 52115-4300
Asia	**Toll Free**	800-820-1667 or +800-4875-9477
	Direct:	+86-21-3849-4520
Latin America	**Brazil**	+55-11-4589-7200
	Mexico	+52-5550891160 option 5

For on-site service, contact the nearest Husky Regional Service and Sales office.

For non-emergency questions and issues, e-mail Husky at techsupport@husky.ca.

Husky Regional Service and Sales Offices

For the nearest location, please visit www.husky.co.

Product Upgrades

Upgrades are available that can improve output, reduce cycle times, and add functionality to Husky equipment.

To see what upgrades are available, visit www.husky.co or call the nearest Husky Regional Service and Sales Office.

Ordering Spare Parts

All spare parts for Husky equipment can be ordered through the nearest Husky Parts Distribution Center or online at www.husky.co.

Ordering Additional Manuals

Additional copies of this manual and other documentation can be purchased through the nearest Husky Regional Service and Sales office.

Table of Contents

Chapter 1 Introduction

The Altanium Servo Controller (ASC) gives you accurate servo control of all linear and rotary mold movements for up to six axes. The ASC can be used as a standalone system, but also control up to 255 temperature zones and an UltraSync-E system. System configurations and operations are all done from one operator interface.

This user guide contains the instructions for the safe installation, operation, and maintenance of the ASC.

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 Safety

The safe setup and installation of the ASC to operate correctly with the IMM at the customer's facility must be done by the system integrator.

Only fully trained and qualified personnel should install, operate, or maintain the ASC.

All personnel who install, operate, or maintain the ASC must read and understand all applicable safety directives and standards and the safety steps that follow.

Warnings, cautions, and notes are used in this manual. Warnings and cautions are put before the applicable step and notes are put after the applicable step. The warnings, cautions, and notes in this manual are written:

WARNING!

Risk of injury or death to personnel.

CAUTION!

Risk of damage to the equipment.

NOTE: Information that helps you do the step, but not necessary.

1.1.1 General Safety

WARNING!

Electrical shock risk - de-energize the controller before you connect, disconnect, or do maintenance on the controller, hot runner, or mold.

WARNING!

Electrical hazard - risk of shock or personal injury. ALWAYS make sure the screw on the back of the top part of the controller, marked with the general warning symbol, is installed when the controller is energized. This is the ground point for the top cover to the chassis. Removal of this screw could cause an unsafe condition unless correct precautions are done, such as Lockout Tagout (LOTO).

WARNING!

Gas/vapor hazard - risk of respiratory injury. Some processed materials could release dangerous gas, vapors, or dust. Install an exhaust system according to local codes. Plastic degrades with long exposure to the setpoint temperature. Do not leave the machine and controller unattended.

Obey the safety instructions that follow:

- The system should only be installed by qualified personnel in accordance with local codes.
- Only persons with a thorough knowledge of the system's operation and function should operate the system.
- Read all the installation instructions before power is connected and the system is energized.
- Obey all warnings and instructions identified on the system.
- Unless written in this manual or you receive special instructions from Husky, do not try to repair the system. Maintenance that is not approved could cause damage to the system, or serious personal injury.
- Only use the specified input supply voltage that is shown on the identification label attached to the power input cable and/or the cabinet.

  NOTE: If you are not sure of the applicable supply voltage, call the nearest Husky Regional Service and Sales office.

CAUTION!

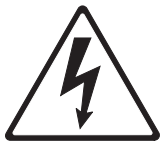
Mechanical hazard - risk of damage to the equipment. NEVER allow the fan inlets or outlets on the unit to become blocked. This is where the system's cooling airflow enters and exits. If this area of the mainframe becomes cluttered and insufficient airflow results, damage may occur to the system.

CAUTION!

When switching OFF the system wait 30 seconds before switching the main disconnect back ON. Failure to wait 30 seconds may result in communication issues.

1.1.2 Safety Signs on the Equipment

Safety signs clearly identify possible hazard areas in or around equipment. For the safety of personnel who install, operate, and do maintenance on the equipment, read and obey all safety signs. The safety symbols that follow are on the ASC to show a hazard.

Safety Symbol	General Description of Symbol
	**General** This symbol shows a possible personal injury hazard. It usually has a pictogram or text to describe the hazard.
	**Hazardous Voltage** This symbol shows an electrical hazard that will cause death or serious injury.

1.2 Equipment Function

The Husky Altanium Servo Controller (ASC) controls linear and rotary movement for up to six axes, one UltraSync-E, and up to 255 temperature zones. ASC configurations include:

- Stand-alone control of up to six electric servo motors
- Stand-alone control of one UltraSync-E
- Control of up to six electric servo motors and one UltraSync-E
- Control of up to six electric servo motors and up to 254 temperature zones
- Control of up to six electric servo motors, one UltraSync, and up to 254 temperature zones

Parameter configurations and the operation of the mold servos, UltraSync-E, and temperature zones are done with a touch screen user interface.

Contact a Husky Regional Service and Sales office if a Husky product is to be used for an operation other than for what it was made.

This document describes the operation of the Altanium Servo Controller (ASC) in a production line and its integration to an Injection Molding Machine (IMM).

Personnel must read, understand, and follow all safety precautions.

Personnel must follow applicable industry and regulatory safety requirements for safe installation, operation, and maintenance of the equipment.

1.3 Restrictions of Use

Husky injection molding equipment must never be used for any operation other than that described in Section 1.2 without Husky approval.

Only approved personnel who know the risks and necessary precautions can operate and do maintenance on the controller.

1.4 Input Wiring

Table 1-1 shows the electrical wire standards used in the ASC:

Table 1-1 Electrical Wire Standards

Description	Wire Color	
Neutral	Blue	
Earth/Ground	Green/Yellow	Green
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.

1.5 Environmental Operating Specifications

CAUTION!

Mechanical hazard - risk of equipment damage. Liquid that is sprayed or that falls onto the ASC, including oil or water, could damage the equipment. Do not spray wash.

The environmental operation specifications for the ASC follow:

- For Indoor use only.
- Operation Temperature: 5 to 40 °C (41 to 104 °F)
- Operation Humidity: 0% to 90% RH, Non-Condensing
- Altitude: up to 2000 m (6562 ft)
- Pollution Degree: PD3
- Overvoltage Category: OVIII

1.6 Equipment Ratings

Ratings for the ASC can be found on the nameplate attached to the back of the controller.

The equipment ratings for the ASC operator interface (only) follow:

- Supply Voltage: 100 to 240 VAC +/- 10%, single phase
- Frequency: 47 to 63 Hz
- Power Rating: 130 W

Chapter 2 Integration

This chapter contains the instructions for the safe installation of the Altanium Servo Controller (ASC). It also contains the necessary information to connect the ASC to an injection molding machine (IMM).

2.1 Limitations of This Manual

This chapter is for engineers and/or technicians who are responsible for the installation of the ASC and the interface between the ASC and the IMM. This person/function will be referred to as the system integrator in the pages that follow.

The system integrator must do the following

- Connect all the equipment of the injection molding cell.
- Install all the equipment safely in accordance with all industry, regulatory and local safety standards. Refer to Section 2.2 for a list of directives and standards. There may be other applicable directives and standards. The system integrator must make sure that all applicable directives and standards are obeyed.
- Know the molding cell fully, so that there are no dangerous procedures, installations, or connections.

The system integrator must be supplied by the end user. Husky does not know all the necessary information for each customer and each molding cell.

This chapter does not supply information on how to do risk identification, risk assessments, or other analysis. The system integrator must do these tasks.

2.2 Reference Directive and Standards

NFPA79	Electrical Standard for Industrial Machinery
UL508A	Standard for Industrial Control Panels
2006/42/EC	European Machinery Directive and Amendments Article 12.2 ANNEX VIII
2014/35/EU	European Low Voltage Directive
2014/30/EU	European Electromagnetic Compatibility Directive - Article 7 ANNEX II
EN12100	Safety of machinery - Basic concepts, general principles for design
EN60204-1	Safety of machinery - Electrical equipment of machines

EN201	Plastics and rubber machines - Injection molding machines - Safety requirements
EN61000	Electromagnetic Compatibility

2.3 Safety

Refer to Section 1.1 for information on warnings, cautions, and notes that are used in this manual, and the safety symbols found on the ASC.

Refer to Section 2.10 for lockout/tagout procedures.

2.3.1 ASC Controls, Connectors, and Parts Identification

Figure 2-1 shows the ASC and the location of the controls, connectors, and other parts on the ASC.

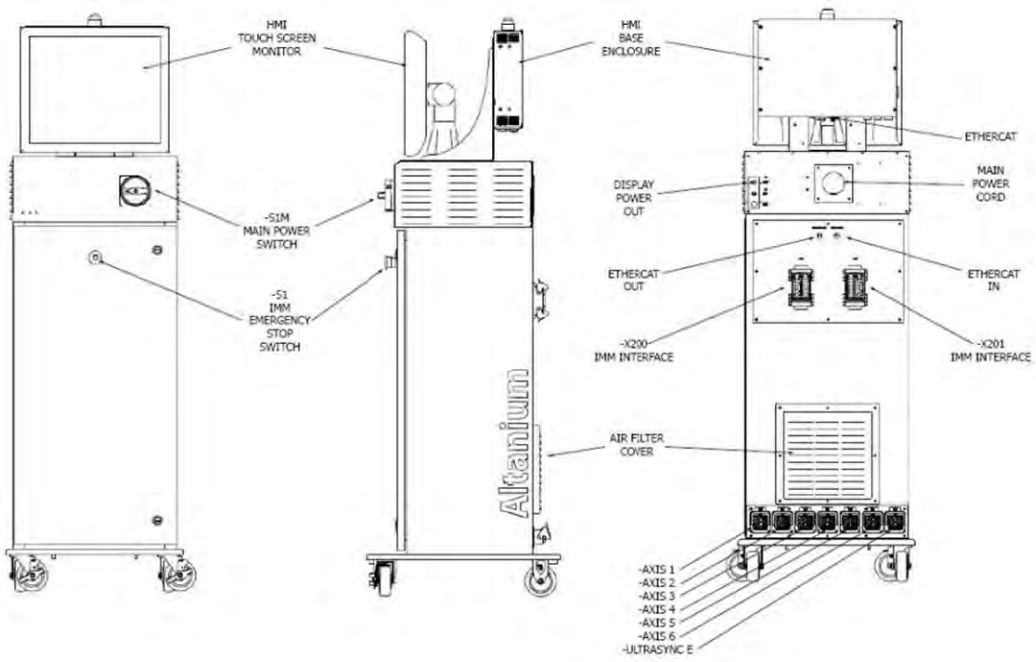


Figure 2-1 ASC Controls, Connectors, and Parts Identification

2.4 Initial Setup of the ASC

2.4.1 Remove the ASC from the Shipping Container

WARNING!

Only qualified, certified, and trained personnel are permitted to remove the ASC from the shipping container and pallet. Injury to personnel and /or damage to the ASC can occur if you do not use the correct procedures.

a. Remove the crating material to get access to the ASC and pallet.

b. Remove the straps that attach the ASC to the pallet.

c. Remove the material that stops the movement of the wheels.

d. Lift the ASC from the pallet. Refer to Section 2.4.2.

e. After you have put the ASC on a hard surface, the wheels of the ASC will let you push the ASC in position.

2.4.2 Lift the ASC

2.4.2.1 General

WARNING!

Only qualified, certified, and trained personnel are permitted to lift the ASC. Injury to personnel and /or damage to the ASC can occur if you do not use the correct lifting procedures.

The ASC has three configurations:

- Single stack
- Double stack
- Triple stack

Each of the three configurations needs webbed straps and ratchet straps of different lengths to lift them. Refer to Table 2-1.

Table 2-1 Controller Lifting Information

Altanium Controllers	Webbed Straps Rated 2903kg (6400lb)	Ratchet Strap	Lifting Device (Lift Capacity)
Single Stack	2.44 m x 25.4 mm (8 ft x 1 in) – Quantity (2)	1.52 m (5 ft) – Quantity (1)	227 kg (500 lb)
Double Stack	3.66 m x 25.4 mm (12 ft x 1 in) – Quantity (2)	1.83 m (6 ft) – Quantity (1)	454 kg (1000 lb)
Triple Stack	3.66 m x 25.4 mm (12 ft x 1 in) – Quantity (2)	2.44 m (8 ft) – Quantity (1)	907 kg (2000 lb)

Each of the three configurations needs a crane or other applicable lifting device with a different load rating. Refer to Table 2-1.

2.4.2.2 Lifting Procedures

a. For a single stack ASC, put the two webbed straps in position below the ASC from left to right.

b. For a double or triple stack ASC, put the two webbed straps in position below the ASC from front to rear.

c. Put the webbed straps in position along the sides of the ASC and attach them to the lifting device. Refer to Figure 2-2.

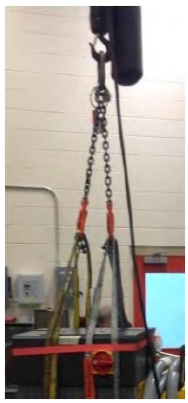


Figure 2-2 Straps and Lifting Device

d. Make sure that the webbed straps go between the caster wheel and the retaining bracket. Refer to Figure 2-3.

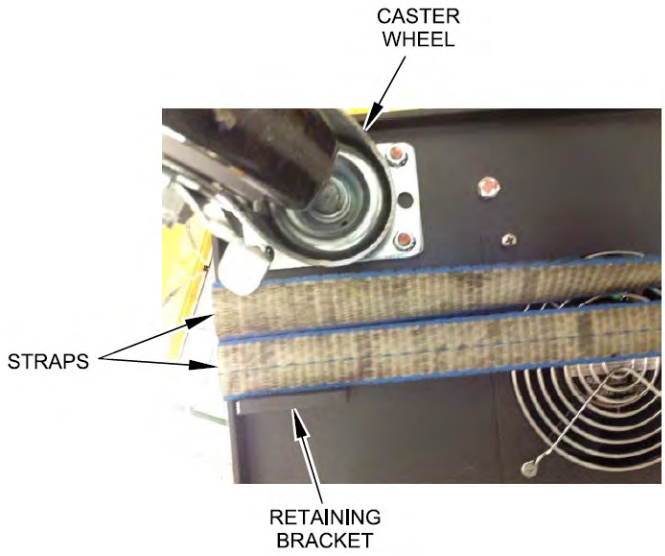


Figure 2-3 Straps - Correct Position

e. Make sure that no ASC cables are caught between the ASC and the webbed straps. Refer to Figure 2-4.

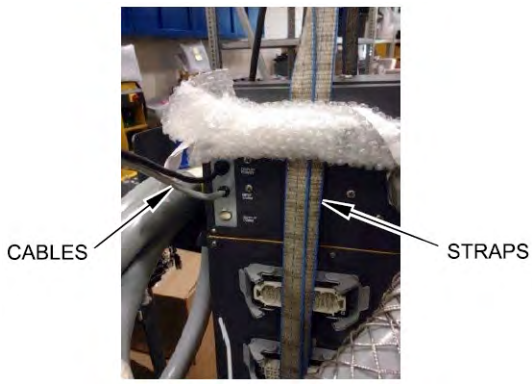


Figure 2-4 Cable Check

f. With the lifting device, use only the force necessary to apply tension to the webbed straps. Do not lift the ASC at this time.

g. Put the ratchet strap around the top of the ASC and over the webbed straps. Do not tighten the ratchet strap at this time.

NOTE: The ratchet strap prevents the ASC from tilting when you lift the ASC.

h. The ratchet strap can cause damage to the surface of the ASC. Put applicable material in all areas to prevent damage to the surface of the ASC. Refer to Figure 2-5.

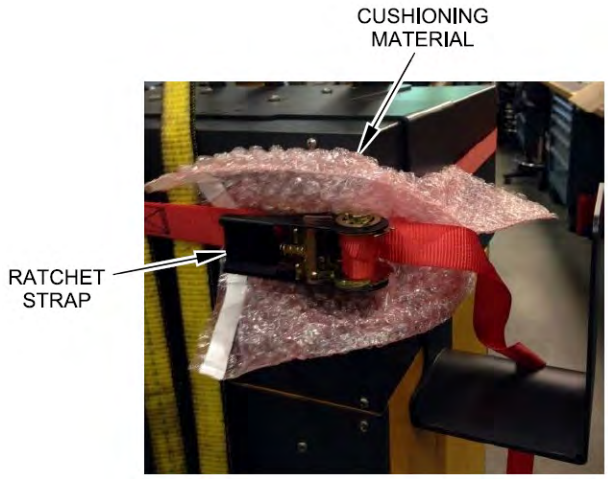


Figure 2-5 Cushioning Material

i. Tighten the ratchet strap.

j. With the lifting device, carefully and slowly lift the ASC 1 to 3 inch (25.4 to 76.2 mm).

k. Examine the webbed straps and ratchet strap to make sure that the ASC will not tilt.

l. Move the ASC to the correct location.

m. Carefully and slowly lower the ASC. Continue to lower the ASC until there is no tension in the webbed straps.

n. Remove the ratchet strap and the protective material, and the webbed straps.

2.5 Assemble the ASC

NOTE: The display module comes in a different protective box. You must attach the display module to the ASC stack.

a. With the front of the ASC in front of you, remove the four M6 x 1mm button head cap screws from the top of the ASC stack.

b. Put the display module on top of the ASC and align the display module holes with the holes in the top of the ASC stack.

c. With the supplied 4mm hex wrench, install and tighten the four button head cap screws. Refer to Figure 2-6.

Figure 2-6 Display Module - Attachment

d. On the rear of the ASC, connect the display power, EtherCAT, and Input Comm (temperature control models only) cables from the display module to the ASC stack.

NOTE: The display module receives power from the display power connection on the rear of the ASC only.

WARNING!

Risk of electrical shock or electrocution.

Connect the input power of the ASC correctly. Not correctly connecting the input power could cause death or serious injury to personnel and/or damage to the ASC or IMM. Only approved personnel should connect the input power. All applicable local electrical codes must be obeyed.

2.6 Remote Operator Interface

The remote operator interface option lets the operator interface to be placed at a location away from the controller's main enclosure (refer to Figure 2-7). If your ASC system will use the remote operator interface option, make sure that you obey the installation instructions in this section. The ASC is used with industrial machinery and must obey the requirements listed in Section 2.2 of this user guide as to Emergency Stop Devices and their locations.

The emergency stop push button on the controller's main enclosure (Figure 2-1) is an emergency stop for the injection molding machine and not as an emergency stop for the controller. When the operator interface is installed away from the controller's main enclosure, it is a requirement that its location be near an accessible emergency stop push button. As a guide, the operator interface is recommended to be no further away from an emergency stop push button than reasonable arm's length of an adult person or no more than one step away if the emergency stop push button is within the operator's line of sight.

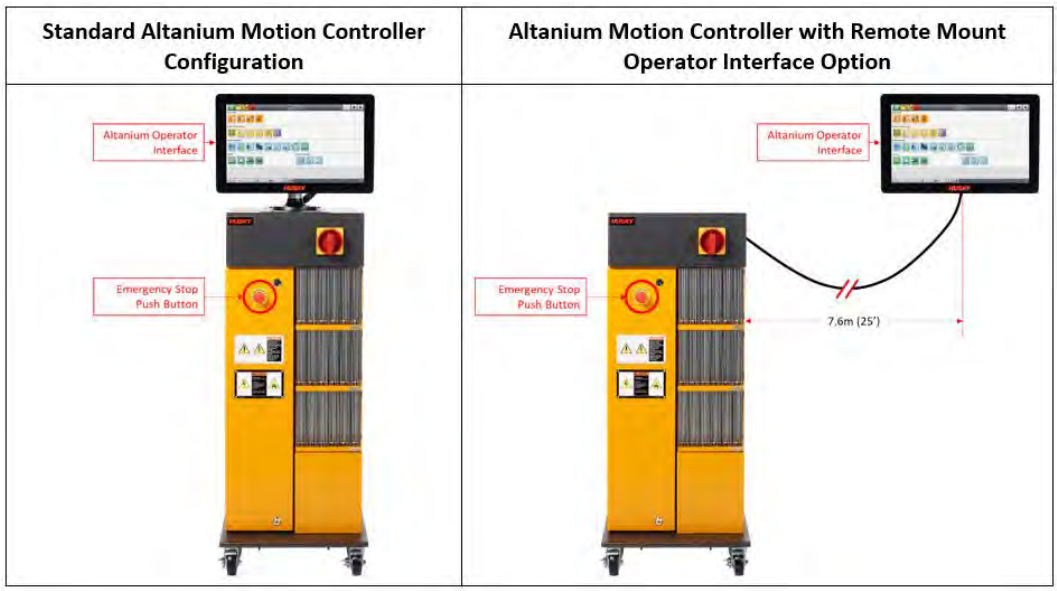


Figure 2-7 Standard and Remote Operator Interface Configurations

Use Figure 2-8 as a guideline for the correct installation position of the remote operator interface.

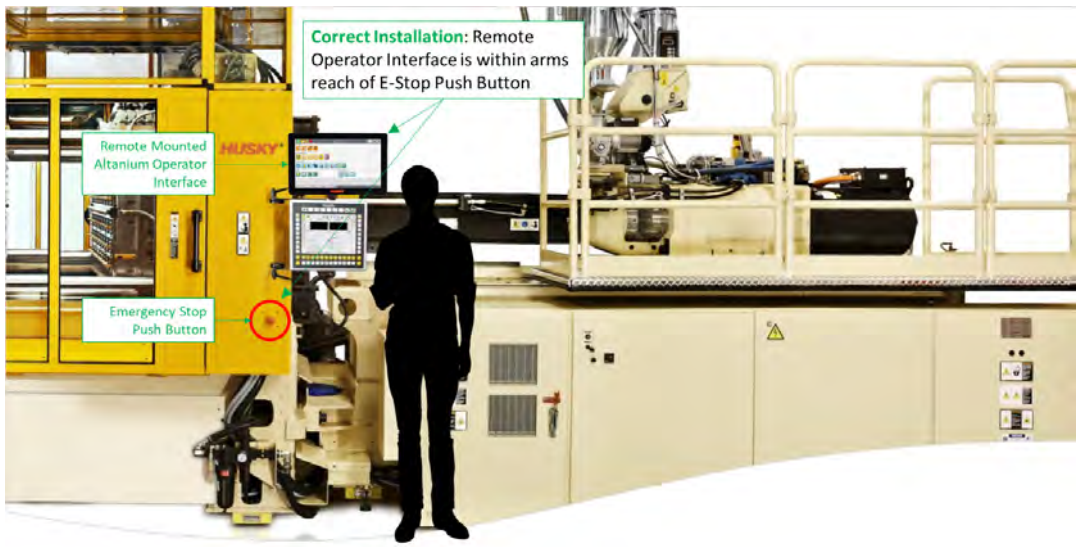


Figure 2-8 Correct Installation Position of Remote Operator Interface

Figure 2-9 shows an incorrect installation position of the remote operator interface. The interface it too far away from an emergency stop push button.

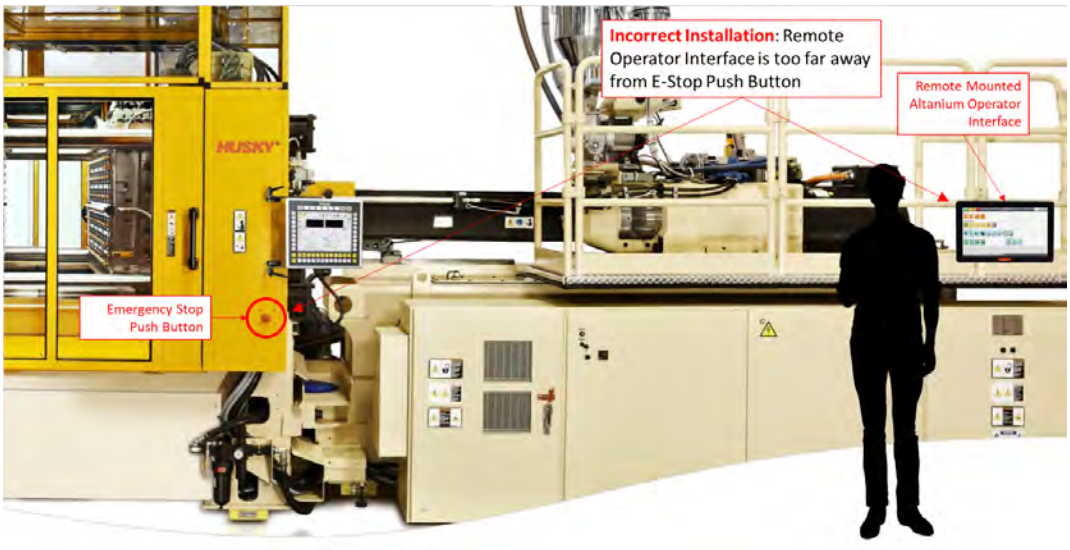


Figure 2-9 Incorrect Installation Position of Remote Operator Interface

Failure to obey these guidelines could result in death or serious injury and/or damage to the controller. Only qualified personnel should install the remote operator interface and all work must conform to applicable local electrical codes.

2.7 Connect the Input Power

a. Connect the ASC to the correct power supply. The attached nameplate or supplied schematic will show what power supply configuration the ASC has.

NOTE: The ASC is manufactured to receive main supply power in three ways:
- 400 Vac +/- 10%, 3-phase + neutral + ground (WYE), 50/60 Hz
- 240 Vac +/- 10%, 3-phase + ground (DELTA), 50/60 Hz
- 480 Vac +/- 10%, 3-phase + ground (DELTA), 60Hz

The 480 Vac configuration is fixed and cannot be adapted in the field to a different voltage like the 400 and 240 Vac configurations.

Because each ASC is different, see the controller nameplate or electrical schematics for the maximum current ratings.

b. Contact Husky customer support if it is necessary to change the power supply configuration.

2.8 Overcurrent Protective Device

The ASC has a main power switch. Refer to Figure 2-1.

The ASC does not have an input power overcurrent protective device.

To obey the electromagnetic compatibility directive, EMI/RFI filters are installed in the ASC. The leakage current range is 10 to 100 milliamps (mA).

The system integrator must supply and install the correct overcurrent protective device.

The size and rating of the overcurrent protective device must:

- Agree with the input power of the ASC. Refer to Section 2.7.
- Align with the leakage current
- Have a short circuit breaking capacity not less than fault current at the point of installation.

The overcurrent protective device must supply protection to indirect contact by automatic disconnection of the input power. It also must be applicable to the distribution system (TN/TT/IT).

You must do tests to make sure that the conditions for automatic disconnection of the input power occurs. The conditions are:

- A test of the continuity of the protective bonding circuit is done at the factory. The bonding circuit is between the PE conductor and applicable points of the bonding circuit.
- You must calculate or measure the fault loop impedance.
- You must make sure that the set points and characteristics of the overcurrent protective device obey all the local codes.

2.9 Bonding

The system integrator must make sure that the ASC and the mechanical component of the axes that it controls is correctly bonded (electrically).

The system integrator must know the distribution system type (TN/TT/IT). As an example, the correct length and cross-sectional area of the conductor that will supply the electrical bonding will change for a TN, TT, or IT system.

2.10 Lockout/Tagout Procedures

If you do maintenance on the ASC, you must do lockout/tagout procedures.

Use the main power switch on the ASC cabinet to de-energize the ASC and the IMM (refer to Figure 2-1).

You must do lockout/tagout procedures on all the equipment in the mold area (ASC, IMM, etc.).

Lockout/tagout includes the steps that follow. The list that follows does not include all the lockout/tagout steps that you may need to do.

- De-energize all systems
- Discharge all stored electrical energy
- Isolate all energy sources
- Apply locks and tags to all energy sources
- Install a placard at all the isolation points
- Block off the molding cell area
- If you must troubleshoot with power applied, then you must have another person with you. Also, emergency medical assistance should be available.

Usually, each location will have written lockout/tagout procedures. These procedures will include all local codes. You must obey these procedures. Also, each location will have special personnel that do lockout/tagout procedures.

2.11 Input/Output Signals and Other Connections

On the back of the ASC are the connections for the input/output (I/O) signals, servo motors, and EtherCAT.

2.11.1 Input/Output Signals

An interface connection is used to send input/output (I/O) signals between the ASC and the injection molding machine (IMM). The ASC can have a second I/O signal interface connection installed if more operating signals are necessary as part of the IMM operation.

The connector locations are on the back of the ASC. Refer to Figure 2-10.

Figure 2-10 X200 and X201 IMM Interface Connectors

2.11.2 X200/X201 Connections

The +P0-X200 IMM interface connector is used for operation and safety-related signals. The +P0-X201 IMM interface connector is used for additional operating signals, if necessary. The signals are described in Table 2-2 and Table 2-3.

Two interface cables (-W-X200 and -W-X201) are supplied with the ASC. The interface cables connect the ASC to the IMM. If the ASC only has the X200 interface connector, then only the W-X200 cable is supplied.

Husky uses Harting HAN 32A connectors for the interface connectors.

The interface cables have no connectors at the end that attach to the IMM. The system integrator must attach the cable leads to the IMM connectors. The system integrator must refer to the IMM electrical schematics and the ASC signal/pin descriptions to see how to connect the cable leads on the IMM connectors. The cable leads can also be hard wired directly to the IMM control cabinet.

As an aid, each cable wire is numbered along its length. The wire numbers are the same as the pin numbers on the X200/201 cable connector. This helps identify the wires when they are connected the IMM.

Optional customer-specified cable connectors are also possible. Husky can supply cables with installed connectors and specified pin locations that the customer wants for the IMM side or even the controller side.

NOTE: The signals from the X200/201 I/O system do not change, but the cable connectors and pin locations can be adapted.

Table 2-2 and Table 2-3 give the descriptions for X200 and X201 signals and their related pin locations.

Table 2-2 +P0-X200 Connector Pin Descriptions

Signal Name	Safety	Operation	Description	+P0-X200 Pin
E-Stop Push Button of Controller Ch1	X		Emergency stop button on the controller. OPEN when the controller emergency stop switch is operated and causes an emergency stop of the IMM.	1,2
E-Stop Push Button of Controller Ch2	X		Emergency stop button on the controller. OPEN when the controller emergency stop switch is operated and causes an emergency stop of the IMM.	3,4
24VDC from IMM		X	Reference HIGH level from the IMM, for relay outputs from the controller.	5
Handling Device		X	This signal is required when a EUROMAP 67 (EM67) or EUROMAP 12 (EM12) communication interface is used. The ASC operates as a "disengaged robot" to the IMM, if an EM67 is connect to the IMM. At a HIGH level, the part handling device is not engaged, so the IMM does not need any other EM67 signals (for example, Permit Mold Close, Ejector forward/back). This signal is hardwired CLOSED (to pin 5) and not connected to any relay output.	6
Bench mode plug installed		X	Reserved for the identification of a bench mode plug that is installed.	7
Configurable Output 1 (Isolated Contact)		X	Software-configurable output (isolated dry contact).	8,9
Configurable Output 2		X	Software-configurable output.	10 (5)
Configurable Output 3		X	Software-configurable output.	11 (5)
Configurable Output 4		X	Software-configurable output.	12 (5)
Configurable Output 5		X	Software-configurable output.	13 (5)
Configurable Output 6		X	Software-configurable output.	14 (5)
Configurable Output 7		X	Software-configurable output.	15 (5)
Configurable Output 8		X	Software-configurable output.	16 (5)

Table 2-2 +P0-X200 Connector Pin Descriptions (Continued)

Signal Name	Safety	Operation	Description	+P0-X200 Pin
IMM Safety Gate Ch1	X		IMM safety gate contacts must be CLOSED for the plastic injection to operate. The signal must be the result of a series of mold area safety gate contacts (refer to EN 201: Safety of Plastics Molding Machines). The signal must be isolated from all other signals.	17,18
IMM Safety Gate Ch2	X		IMM safety gate contacts must be CLOSED for the plastic injection to operate. The signal must be the result of a series of mold area safety gate contacts (refer to EN 201: Safety of Plastics Molding Machines). The signal must be isolated from all other signals.	19,20
E-Stop of IMM Ch1	X		The switch contact will OPEN when the IMM emergency stop device is operated. An OPEN safety device/switch causes an emergency stop of all IMM movement. The signal must be isolated from all other signals.	21,22
E-Stop of IMM Ch2	X		The switch contact will OPEN when the IMM emergency stop device is operated. An OPEN safety device/switch causes an emergency stop of all IMM movement. The signal must be isolated from all other signals.	23,24
24VDC of Controller		X	Reference HIGH level from the ASC, for relay outputs from the IMM.	25
Configurable Input 1		X	Software-configurable input.	26 (25)
Configurable Input 2		X	Software-configurable input.	27 (25)
Configurable Input 3		X	Software-configurable input.	28 (25)
Configurable Input 4		X	Software-configurable input.	29 (25)
Configurable Input 5		X	Software-configurable input.	30 (25)
Configurable Input 6		X	Software-configurable input.	31 (25)
0VDC of Controller		X	A reference of pin 25 from the ASC for test functions. Also used for sourced digital outputs from the IMM, if necessary.	32

Table 2-3 P0-X201 Connector Pin Locations and Descriptions

Signal Name	Safety	Operation	Description	+P0-X201 Pin
Configurable Output 9 (Isolated Contact)		X	Software-configurable output (isolated dry contact).	1,2
Configurable Output 10 (Isolated Contact)		X	Software-configurable output (isolated dry contact).	3,4
Configurable Output 11 (Isolated Contact)		X	Software-configurable output (isolated dry contact).	5,6
Configurable Output 12		X	Software-configurable output.	7 (X200:5)
Configurable Output 13		X	Software-configurable output.	8 (X200:5)
Configurable Output 14		X	Software-configurable output.	9 (X200:5)
Configurable Output 15		X	Software-configurable output.	10 (X200:5)
No Connection			No connection at this time.	11-16
Configurable Input 7		X	Software-configurable input.	17 (X200:25)
Configurable Input 8		X	Software-configurable input.	18 (X200:25)
Configurable Input 9		X	Software-configurable input.	19 (X200:25)
Configurable Input 10		X	Software-configurable input.	20 (X200:25)
Configurable Input 11		X	Software-configurable input.	21 (X200:25)
Configurable Input 12		X	Software-configurable input.	22 (X200:25)
Configurable Input 13		X	Software-configurable input.	23 (X200:25)
Configurable Input 14		X	Software-configurable input.	24 (X200:25)
Configurable Input 15		X	Software-configurable input.	25 (X200:25)

Table 2-3 P0-X201 Connector Pin Locations and Descriptions (Continued)

Signal Name	Safety	Operation	Description	+P0-X201 Pin
Configurable Input 16		X	Software-configurable input.	26 (X200:25)
Configurable Input 17		X	Software-configurable input.	27 (X200:25)
Configurable Input 18		X	Software-configurable input.	28 (X200:25)
Configurable Input 19		X	Software-configurable input.	29 (X200:25)
Configurable Input 20		X	Software-configurable input.	30 (X200:25)
Configurable Input 21		X	Software-configurable input.	31 (X200:25)
Configurable Input 22		X	Software-configurable input.	32 (X200:25)

2.11.3 Safety Signals

All control panels on an IMM must have an emergency stop (E-STOP) push button. There is an E-STOP push button on the front of the ASC (refer to Figure 2-11). Its function is to operate as part of the IMM E-Stop circuit. The ASC E-STOP push button has two isolated, normally closed, signal channels that attach to the X200 connector pins 1/2 (channel 1) and pins 3/4 (channel 2). (Refer to Table 2-2 for X200 pin locations, or refer to the electrical schematic if the ASC has a customer-specified IMM interface.) The E-STOP push button is monitored in the ASC software and causes an alarm on the Human Machine Interface (HMI) screen when pushed.

Figure 2-11 Emergency Stop Push Button

If the controller is used in a bench mode operation, then the E-STOP push button is connected to the ASC E-STOP circuit. Isolated from the IMM, the E-STOP button causes an emergency stop of the ASC when pushed. For bench mode operation, a bench mode plug is installed in the X200 connector, instead of the -W-X200 cable (refer to Figure 2-12).

Figure 2-12 Bench Mode Plug

There are two safety signals the IMM must supply to the ASC:

- E-STOP - The signal is sent by the IMM when:
  - The ASC E-STOP push button is operated, or
  - A different E-STOP within the molding cell is operated
- Safety Gates Open - The signal is sent by the IMM when the mold area safety gates are opened.

The E-STOP and safety gate signals are connected to two isolated channels and safety relays (-K1 and -K2) in the ASC from the X200 connector (refer to Table 2-2 or the electrical schematic for descriptions). These signals must be electrically isolated from each other. The E-STOP and safety gate signals must be in a usually closed-circuit condition (a non-safe condition, during machine operation). During a safety circuit fault (open circuit, broken wire, cable disconnected) the system defaults to the safe condition (no IMM movement).

When one of the two safety signals is operated (the circuit becomes open), it causes the circuit safety relay to open. This stops the servo system and any motor movement.

The safety relays have contacts that release immediately and contacts that are time-released. The contacts that release immediately let the control logic know that there is an E-STOP or safety-gates-open condition. The servo system has a Safe Torque Off (STO) safety integration function that starts when the time-released contacts open. The STO function stops the control of the servo system power unit and prevents any possible dangerous axis movement.

The time-released contacts are set to 0.6 seconds to give sufficient time to stop all axes before an operator gets close to any dangerous movement in the mold area.

The ASC logic together with the user-adjustable Fault Reaction selections on the Axis Setup screen control if the axis:

- Completes its last move
- Does a fast controlled stop in the available stop time
- Freely comes to a stop without aid from the servo system

For Axis Setup screen information, refer to Section 7.4.

A check of the 0.6 second set time is done by the controller logic each time the safety relay is operated. The ASC screen shows an alarm if the time is not set correctly. The 0.6 second time check cannot be changed.

The system integrator must make sure that the 0.6 seconds is less than the access time to any possible dangerous movement. More safety devices or gates between the operator and the mold area may be necessary.

The ASC safety signal system is set for a two-channel signal configuration to meet "EN ISO 13849-1 Safety Category 3, Performance Level d" standards.

If, after completing a safety risk analysis, the system integrator thinks that a one-channel signal configuration is sufficient for the system, the safety circuit can be changed. To change from a two-channel signal configuration to a one-channel signal configuration do the steps that follow (refer to Figure 2-13):

1. Move switch 3 on the safety relays -K1 and -K2 to the left position (refer to Figure 2-13 and Figure 2-14).

   If the switch is moved while power to the controller is on, the safety relay will detect that a change has been made to the relay settings and the top light-emitting diode (LED) will alternate between Green and Yellow. This indicates that a change has been made, but not confirmed or accepted yet.

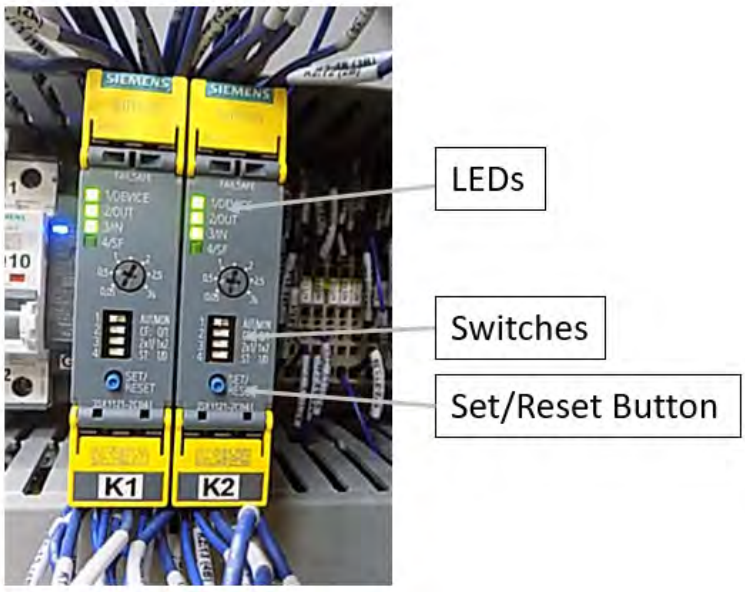


Figure 2-13 -K1 and -K2 Safety Relay LEDs, Switches, and Button (Two-Channel Configuration Shown)

2. If the switch change in step 1 was completed with the controller power off, turn the controller power on and go to step 3. Otherwise, the safety relays must be put into configuration mode to accept the changes. To put the relays into configuration mode, do one of the operations that follows.
   - Cycle the power to the controller (de-energize, then energize).
   - Press and hold the Set/Reset button (3 to 4 seconds) on the front of the relays (refer to Figure 2-13) until the LEDs turn off and then release the button.

   In configuration mode, the four LEDs will now flash Yellow, which indicates the four switch setting positions. If an LED is off, it indicates that the switch is in the Left position. If an LED is yellow, it indicates that switch is in the Right position.
3. To acknowledge the changes, with the LEDs flashing Yellow (indicates the switch positions), press and hold the Set/Reset button (3 to 4 seconds) on the front of the relays (refer to Figure 2-13) until the LEDs stop flashing and then release the button. The top LED will now be Green. This indicates that the changes have been accepted. The 2nd and 3rd LEDs will be off (system in a safe state) or be Green (System in a non-safe state). This is now back to the normal operation for the relay.
4. Connect the Channel 2 signal on the safety relay:
   - For E-STOP, connect -X200:23 to -X200:24
   - For Safety Gates Open, connect -X200:19 to -X200:20

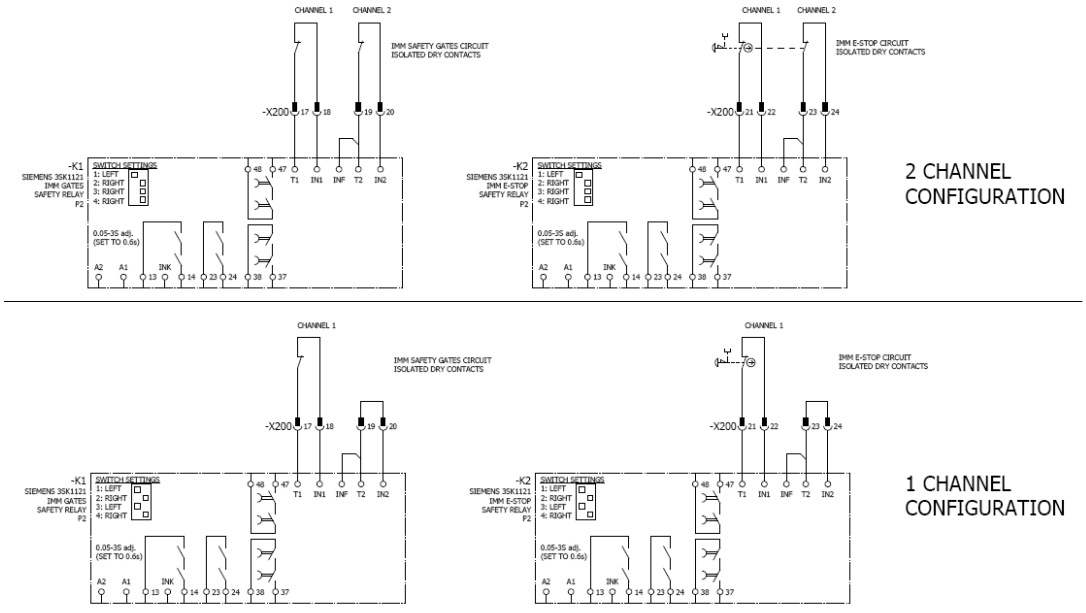


Figure 2-14 Two-Channel and One-Channel Safety Circuit Configurations

2.11.4 Safety Signal and No Power Effect on the Servo Axes

The effect on the servo axes to an E-STOP signal or Safety Gates Open signal can be set to:

- Freely comes to a stop without aid from the servo system
- Controlled stop with an adjustable stop force limit on the axis

NOTE: If there is a sudden power off, it is not possible to do a controlled stop with an adjustable stop force limit on the axis.

NOTE: The Fault Reaction settings can be missed or ignored during some start-ups. It is important for the integrator and user to configure them correctly for the application. The default "Disable Servo" settings may not be suitable.

The system integrator must make sure that the servo motor stop selections are applicable for each axis. As stop selections are made, think about how each servo motor is used in the mechanical operation of the IMM. Stop selections can be different if the servo motor operates linkages, screws, belts, pulleys, or other mechanisms. The stop force limit must be set sufficiently low to make sure there is no damage to the mechanical parts of the axis.

To set an axis to freely comes to a stop without aid from the servo system, do the steps that follow:

1. Go to the Axis Setup screen (refer to Section 7.4).
2. Select the axis on the Axis Selector Bar (refer to Section 7.1.2).
3. In the Fault Reaction area on the Axis Setup screen, set the **Other Faults** field to **Disable Servo** (refer to Figure 2-15).

Figure 2-15 Set an Axis to Slow to a Stop

1. Go to the Axis Setup screen (refer to Section 7.4).
2. Select the axis on the Axis Selector Bar (refer to Section 7.1.2).
3. In the Fault Reaction area on the Axis Setup screen, set the **Other Faults** field to **Stop at Force Limit** (refer to Figure 2-16).
4. Set the **Stopping Force Limit** field to the applicable force limit.

Figure 2-16 Set an Axis for a Controlled Stop

2.12 Ethercat Connections

The EtherCAT In/Out connector locations are on the back of the controller, above the X200/201 connectors (refer to Figure 2-17). The operator interface display module connects to the EtherCAT In connector. EtherCAT Out is used to connect other Altanium devices.

Figure 2-17 EtherCAT Connections

2.13 Servo Motor (Axis) Connections

The connector locations for the servo motor cables are on the back and bottom of the controller (refer to Figure 2-18). If the controller has connectors for a maximum of six servo motors and an UltraSync-E, the locations for the Axis 1- 6 connectors are from the far left to right. The UltraSync-E connector is at the far right. For information on the UltraSync-E, refer to the UltraSync-E User Guide.

Figure 2-18 Servo Motor (Axis) Connections

2.14 Display Power and Temperature Control Connections

The power connection cable for the operator interface display module is on the back of the controller, at the top left (refer to Figure 2-19). The input comm port is used if the mainframe controls hot runner mold process temperatures. The output comm port is used to link to another Altanium mainframe for added temperature controls.

Figure 2-19 Display Power and Temperature Control Connections

2.15 Start the ASC

2.15.1 Before You Apply Power

1. Make sure the wheels of the ASC are locked, so that the ASC cannot move.

CAUTION!

Make sure that there is no blockage of the air filter cover or the air outlets. If there is not sufficient airflow, then damage can occur to the ASC.

2. Make sure that there is no blockage of the air filter cover on the rear of the ASC, refer to Figure 1-1. Remove all materials around the air filter cover, so that there is good airflow into the air filter.
3. Make sure that the cable routing is along smooth surfaces and not sharp edges. Make sure that personnel cannot trip on the cables. Use applicable cable tracks where necessary.
4. For cable routing that has no movement, make sure that the bend radius of the cable is not less than four times the diameter of the cable.
5. For cable routing that has continuous movement, make sure that the bend radius of the cable is not less than 7.5 times the diameter of the cable.
6. Make sure that the cables are connected correctly and are not loose.
7. Make sure that the ground wire is connected correctly between the ASC and the electrical power source.
8. With the ASC main power switch in the Off position, make sure the power to the ASC is in the specified power limits. The power is measured between the main power switch and the power source.
9. Make sure that personnel are not doing maintenance on the ASC.
10. Make sure that all tools are removed from the area.
11. Make sure that the floors are clean.

2.15.2 Apply Power to the ASC

1. Set the main power switch (refer to Figure 2-1) to the ON position.
2. Set up the ASC.
   - Select a motor
   - Set a conservative force limit
   - Set a conservative speed limit
3. Do a test of each actuator at low speed (jog) and make sure that:
   - All the axes are correctly connected
   - The rotation of all the axes is correct
   - All the mechanical links, belts, screws, etc. are operating correctly
   - You can control the motor of each axis
   - The limit switches are operating correctly
4. Make sure that the ASC stops when the ASC or IMM E-stop is pushed.
5. Make sure that the ASC stops when the guard or protective gate is opened.

For troubleshooting problems and errors, refer to Appendix B.

Chapter 3 Altanium Operator Interface

This chapter contains the necessary information to operate the Altanium Servo Controller (ASC) interface.

3.1 Operator Interface

The Altanium operator interface is a high-resolution color LCD display covered by a transparent touch screen. With high definition and a wide-angle view, the 19-inch display is clearly seen, even in less than satisfactory light conditions.

Use the touch screen to select screen items and change setpoints on the Altanium operator interface. This display is referred to as the Altanium for the remaining chapters of this guide.

Screen buttons have graphics and text that make it easy to identify their related screen function.

To open a screen or select an item, touch the screen button or item with your fingertip.

CAUTION!

Mechanical hazard - risk of equipment damage. Use a finger to operate the touch screen. Do not use a screwdriver, pen, or any other tool to touch the screen as this can damage the touch screen.

3.2 Home Screen

From the Altanium Servo Controller Home screen, you can get to all other screens in the system. To go back to the Home screen from another system screen, touch the Home button in the system header.

The Home screen has three sections: header, footer, and the system screens selection area (refer to Figure 3-1). The header has the control mode buttons, navigation buttons, and a system status field. The footer has the alarm buttons and the system and user management buttons. The date and time are shown at the right side of the footer.

The system screen selections area contains the buttons that open all the screens necessary to set the parameter configurations, and to operate and monitor all the installed ASC devices.

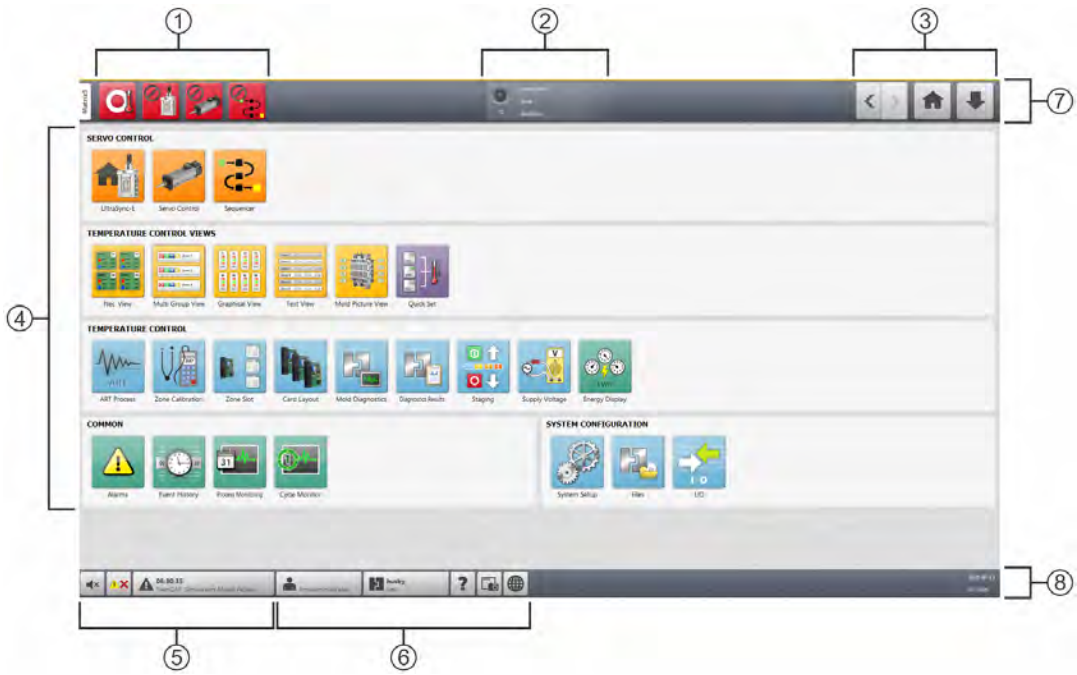


Figure 3-1 Altanium Matrix5 with Servo Controller Home Screen

1. Control Mode (drop-down) Buttons **2.** System Status Field **3.** Navigation Buttons **4.** System Screen Selections **5.** Alarm Buttons **6.** System and User Management Buttons **7.** Screen Header **8.** Screen Footer

3.2.1 Header/Footer Buttons and Indicators

The Altanium has a screen header and a footer that are visible on every screen in the system. The sections that follow contain information about the buttons and indicators in the header and footer.

3.2.1.1 Control Modes Buttons

The Control Modes buttons let you change the modes for the services installed on your controller. For an ASC system, the servos mode buttons let you change between disengaged and engaged modes, and to disable the servo system. Refer to Table 3-1.

Table 3-1 Servo Control Modes Buttons

Button	Description
	**Engage** Activates Engaged mode, where the servos are controlled by internal signals and remote inputs.
	**Disengage** Activates Disengaged mode, where the servos are controlled by the operator using the ALTANIUM user interface.
	**Disable** Disables the servo system.

If other services are installed on your Altanium controller, you will see control mode buttons for those services. Other services that can be installed on your ASC system are shown in Table 3-2 with their mode selections.

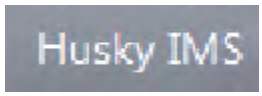
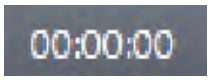
Table 3-2 Altanium Controller Services

Service	Modes
Temperature Controls	Stop, Start, Standby, and Boost.
UltraSync-E	Engage, Disengage, and Disable.
Sequencer	Auto, Manual, and Disable. **NOTE:** The Sequencer is available on all ASC systems. If the Sequencer mode drop-down buttons are not seen on the ASC home screen, you can activate the Sequencer on the Sequencer's Options screen. Refer to Section 8.6.

3.2.1.2 System Status Field

This field gives a fast indication of the system status. Refer to Table 3-3.

Table 3-3 System Status Field Indications

Indication	Description
	**At Temperature** Used on ASC systems with hot runner temperature control.
	**Company Name** This is changed on the System Setup Main Screen. Refer to Section 5.1.
	**System Mode** Used on ASC systems with hot runner temperature control. Refer to Altanium Matrix 5 User Guide for a list of the system modes.
	**System Timer** Shows the timer value.

3.2.1.3 Navigation Buttons

These buttons are used to see the Home screen, move forward/backward through screen selections, and select from a list of configured products. Refer to Table 3-4.

Table 3-4 Navigation Buttons and Indication

Button	Description
	**Back** Touch this button to see a screen that was in view before (maximum of 10 screens back). **NOTE:** The Home screen is not included as part of the navigation history.
	**Forward** Touch this button to see the next screen (maximum of 10 screens forward). **NOTE:** The Home screen is not included as part of the navigation history.

Table 3-4 Navigation Buttons and Indication (Continued)

Button	Description
	**Home** Touch this button to see the Home screen.
	**Quick Navigation** Touch this button for a drop-down list of view buttons for products that are configured for your system (the I/O button will always show).

3.2.1.4 Alarm Buttons

The Alarm buttons are used to stop the alarm horn, clear alarms, and to see the Alarm screen. Refer to Table 3-5.

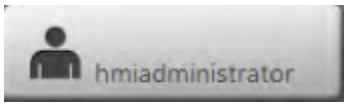
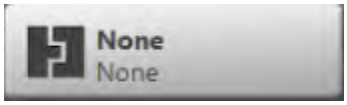
Table 3-5 Alarm Buttons

Button	Description
	**Silence Horn** Touch this button to stop the alarm horn.
	**Alarm Reset** Touch this button to clear the alarm condition.
	**Alarm Status** Touch this button to see the Alarm screen. The time and a description of the most important alarms in operation are shown. During an alarm condition, the triangle icon (Warning) changes to yellow and the background of the button flashes red.

3.2.1.5 System and User Management Buttons

The System and User Management buttons are used for user log on, mold setup, print configuration, language selection, and Altanium system help. Refer to Table 3-6.

Table 3-6 System and User Management Buttons

Button	Description
	**Log In/Log Out** Use this button to log in and log out of the Altanium system. The button shows the name of the user who is logged in.
	**Mold Setup Info** This button shows the loaded mold and related mold folder. The top word on the button is the name of the mold folder. The bottom word is the name of the mold setup file. Touch this button to see the Mold setup screen.
	**Help** Touch this button to start the Portable Document Format (PDF) viewer and see the controller user guide on the screen.
	**Print** Touch this button to see the Print dialog box that contains the available print selections.
	**Language Selection** Touch this button to see and select the available screen languages.

3.2.2 System Screen Selection Buttons

The System Screen Selection area of the Home screen gives you one location to open all the parameter configuration and monitor screens in the system. For an ASC standalone system, the system screen selection buttons are put into three groups:

- Servo Controller
- Common
- System Configuration Screens.

For an ASC system with an UltraSync-E installed, an UltraSync-E group of screen buttons is included. Refer to the UltraSync-E User Guide.

For an ASC system with hot runner control, two groups of temperature controls and monitor buttons are included:

- Temperature Control Views
- Temperature Control

NOTE: For information about ASC systems with hot runner control, refer to the Altanium Matrix5 User Guide.

The sections that follow identify the screen buttons for each group.

3.2.2.1 Servo Control Buttons

The **Servo Controller** buttons give access to all the screens used to set the servo configurations and monitor their operations. For more information, refer to Chapter 7.

Table 3-7 System Configuration Buttons

Button	Description
	**UltraSync-E** If installed, use the UltraSync-E Home screen to monitor and control the UltraSync-E system. For information about the UltraSync-E, refer to the UltraSync-E User Guide.
	**Servo Control** Use the Servo Control screen for axis setup and calibration, signal configuration, to set and view motion profiles, and other settings. For information about the Servo Control screen, refer to Chapter 7.
	**Sequencer** Use the Sequencer screen to set each valve gate open and close operation with different signal types, their related configurations, and time delays. You can also use the Sequencer application to trigger valve gate operations. For information about the Sequencer screen, refer to Chapter 8.

3.2.2.2 Common Buttons

The **Common** buttons are used for alarms, event history, and to see the targets, trends, and history of the process. Refer to Table 3-8.

Table 3-8 Common Buttons

Button	Description
	**Alarms** Use the Alarm screen to see all errors that occur. For more information, refer to Chapter 10.
	**Event History** Use the Event History screen to see past alarms, warnings, setpoint changes, setup changes, HMI startup, and operational events that do not agree with specified conditions. For more information, refer to Chapter 10.
	**Process Monitoring** Use the Process Monitoring screen to see graphical trend and history plots, enter zone target settings, and other specifications. For mor information, refer to Chapter 11.
	**Cycle Monitor** Use the Cycle Monitor screen to see specific curves that can help you troubleshoot your process. For more information, refer to Section 11.5.

3.2.2.3 System Configuration Buttons

The **System Configuration** buttons give access to screens for system setup, mold setup, and to set digital inputs and outputs between the ASC and the IMM. Refer to Table 3-9.

Table 3-9 System Configuration Buttons

Button	Description
	**System Setup** Use the System Setup screen to make user selections, do user management, screen security, and make network selections. For information about the System Setup screen, refer to Chapter 5.
	**Files** Use the Files screen to store and work with files, such as mold setups, images, documents, and reports. For information about the Mold Setup screen, refer to Chapter 6.
	**I/O** Use the I/O screens to monitor status and set the digital inputs, digital outputs, configurable signals, and safety signals transmitted between the ASC and the IMM. For information about the I/O screens, refer to Chapter 9.

3.2.2.4 Temperature Control Views (Integrated Systems)

The Temperature Control Views area of the screen lets you see zone data in different formats. Touch a view button to open the associated view screen.

Included in this area is a selection for the Quick Set screen.

Descriptions of the different views and Quick Set are given in Table 3-10.

NOTE: For more information on temperature control for an integrated system and the Temperature Control Views, refer to the Altanium Matrix5 User Guide.

Table 3-10 Temperature Control Views

Button	Description
	**Neo View** The Neo View screen shows an icon for each temperature zone in the mold. The icons give the zone temperature, temperature setpoint, power output percentage, voltage, and other information.
	**Multi Group View** The Multi Group View screen has the zones organized into groups and allows individual control of each group.
	**Graphical View** The Graphical View screen shows graphical representations of zone data.
	**Text View** The Text View screen shows textual information of zone data.
	**Mold Picture View** The Mold Picture View screen shows a picture/graphic of the mold or hot runner system layout. The image file is imported by the user.
	**Quick Set** The Quick Set screen is used to create and name groups of zones, set temperatures and limits by zone, and many other configurations. For more information about the Quick Set configurations, refer to the Altanium Matrix5 User Guide.

3.2.2.5 Temperature Control (Integrated Systems)

The Temperature Control area of the screen lets you do mold diagnostics, set zone staging, see energy accumulation and cost data, and more. Table 3-11 gives the description of the screens in this section.

NOTE: For more information on temperature controls for an integrated system, refer to the Altanium Matrix5 User Guide.

Table 3-11 Temperature Control

Button	Description
	**ART Process** The Active Reasoning Technology (ART) Process screen is used to initiate the active reasoning technology self-tuning process and monitor its progress.
	**Zone Calibration** Use this screen to calibrate the zones.
	**Zone Slot** Use this screen to identify the controller cards that operate the zones. You can also set the amperage limits, thermocouple type, select a card image (to be shown in the Card Layout Screen), and enable the cards.
	**Card Layout** The Card Layout screen shows you in what backplane (bay) and slot the zone controller cards are installed. Select a backplane on the left of the screen and then select a card slot. The controller card information and a picture are shown.
	**Mold Diagnostics** Use the Mold Diagnostics screen to troubleshoot problems with a mold. You can test the wiring integrity of a mold after maintenance has been done and analyze the thermal isolation between all the cavities in the mold.
	**Diagnostic Results** Use this screen to examine the results of the diagnostic tests.

Table 3-11 Temperature Control (Continued)

Button	Description
	**Staging** You can heat or cool zones in a selected order with the use of stages. Use the Staging screen to assign zones to stages, set stage setpoints, and enter soak timers for each stage.
	**Supply Voltage** The Supply Voltage screen shows a graphical view of the phase pairs from the Supply Configuration parameter selected in the System Setup screen: • Delta 3PH • Wye 3PH+N • Single Phase • Integrated TX Zone numbers are listed with their phase pairs, voltages, and amperage.
	**Energy Display** On the Energy Display screen, you can enter your Energy Cost Rate (Kwh) and Currency Type. During operation, energy accumulation and cost data is updated every three seconds and shown in real time.

3.2.3 Dialog Box Buttons

Dialog boxes are used to type text, enter numbers in setpoint fields, and make selections. When you touch a screen field, a dialog box opens with a letter pad, number pad, checkboxes, or buttons. Use these items to enter the value or make a selection.

Table 3-12 shows the buttons usually found on the Altanium dialog boxes.

Table 3-12 Dialog Box Buttons

Button	Description
	**Accept** Accepts the selections and changes you make in the dialog box.
	**Cancel** Cancels the selections and changes you make in the dialog box.

Table 3-12 Dialog Box Buttons (Continued)

Button	Description
	**Exit** Closes the dialog box.
	**Print** Prints the dialog box. Touch this button to see the Print dialog box that contains the available print selections.

3.3 Select a Language

Altanium screens are available in different languages. The default language is English. Each screen has a globe icon that shows the available languages.

To select a language, do the steps that follow:

1. Touch the **Language Selection** button.

2. Touch the **Language** field in the Select Language dialog box. Refer to Figure 3-2.

Figure 3-2 Select Language Dialog Box

3. On the Language dialog box, touch a language button. Refer to Figure 3-3.

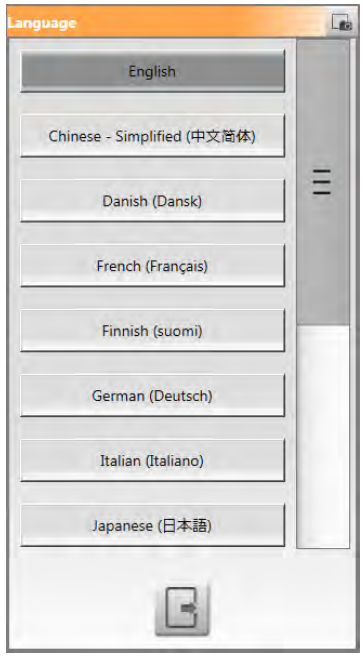


Figure 3-3 Language Dialog Box

3.4 Print to a File

To see the Print dialog window, touch the **Print** button in the footer of the screen.

The Print dialog window shows. Refer to Figure 3-4.

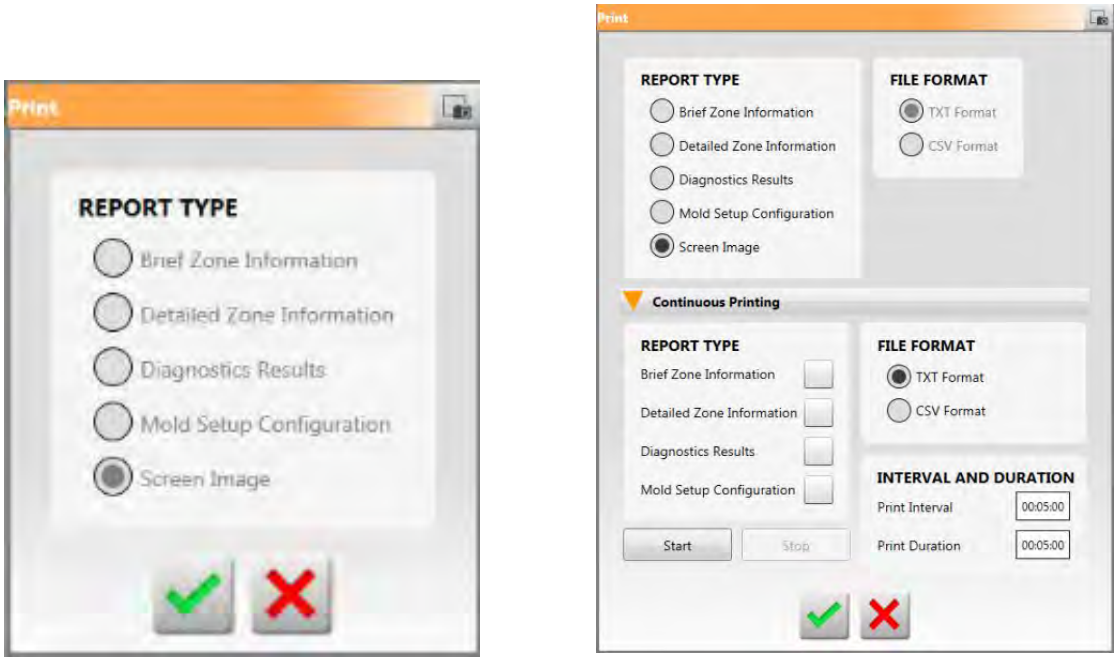


Figure 3-4 Print Dialog Windows for Standalone (Left) and Integrated (Right) Systems

On a standalone system, you can select the types of information to print:

- Brief Zone Information
- Detailed Zone Information
- Diagnostics Results
- Mold Setup Configuration
- Screen Image

On an integrated system, optional continuous printing configurations are available. The same types of information listed in the standalone system can be continuously printed to a file, except for the Screen Image. Times for print interval and duration can be set, and you can select the file be printed in TXT or CSV format. Refer to the Altanium Matrix5 User Guide for more information.

3.4.1 Print Report Types

Use the Report Type area to select how much information you want in the printed reports. The report type selections with their related information are shown in Table 3-13.

Table 3-13 Print Report Types

Report Type	Description
Brief Zone Information	Used only with hot runner temperature control.
Detailed Zone Information	Used only with hot runner temperature control.

Table 3-13 Print Report Types (Continued)

Report Type	Description
Diagnostics Results	Used only with hot runner temperature control.
Mold Setup Configuration	Used only with hot runner temperature control.
Screen Image	Saves the current user interface screen to a file in the Portable Network Graphics (PNG) format.
Firmware Update	A firmware update is in operation on the specified control cards.
Calibration	One or more servo axes or the UltraSync-E (if installed) are in a calibration sequence.

To print one file, do the steps that follow:

1. Touch the **Print** button.
2. Select a report type.

   NOTE: Only the Screen Image report type is available on an ASC system without hot runner temperature control.
3. Touch the **Accept** button to save the selections to a System\Reports folder.
4. Copy the saved content to a USB drive or Network.

Files are automatically saved to one of the directory paths that follow:

- System\Reports\Zones
- System\Reports\Diagnostics
- System\Reports\Setups
- System\Reports\Screens

3.5 On-Screen Help

The on-screen help is a PDF file of the Altanium Servo Controller User Guide.

To use the on-screen help, do the steps that follow:

1. Touch the **Help** button on the Altanium screen.

2. To close the PDF file, touch the **Exit** button.

If Remote Service Assistance is needed from Husky, refer to Section 5.2.5.

Chapter 4 Security and Administration

This chapter describes user management functions.

4.1 User Management and Security Screens

A user type is given to each person who operates the ASC (refer to Table 4-1). The user types control what level of operations and changes are permitted, and what screens can be viewed by the user in the ASC system.

Table 4-1 User Types

Role	Definition
Default User	Can only look at screens and is not permitted to change setpoints.
Operator	Can change screen data as permitted by Administrator.
Supervisor	Can change screen data, with added user access to specified screens as permitted by Administrator.
Administrator	The same change control and access permitted to the Supervisor, with the added control to create, delete, rename, and give all user types.

The Administrator can add a user, change a user password, delete a user, and make security adjustments on the User Management screen.

To set the security adjustments for the user types, do the steps that follow:

1. Log in as Administrator.
2. On the Home screen, touch the **System Setup** button.
3. Touch the **Screen Security** tab at the bottom of the screen.

   NOTE: The tabs at the bottom of the Screen Security screen are groups of related security selections. These groups are:

   - Main 1 and Main 2- Used to set user types for usual operations
   - Servo - Used to set user types for servo operations
   - Heats Page 1 and Heats Page 2 - Used to set the user types for integrated heats operations.

4. Select a tab at the bottom of the Screen Security screen to see the related security selections.
   - Main 1
   - Main 2
   - Servo
   - Heats Page 1 (integrated controller)
   - Heats Page 2 (integrated controller)

5. Select a user type (Administrator, Supervisor, Operator, or Default User) for each of the selections in the groups. The sections that follow give a list of the selections for each group.

4.1.1 Main Security Selections

Figure 4-1 Main 1 Security Screen

On the Main security selections are given in two tabs, Main 1 and Main 2. The sections that follow describe the security selections in the two tabs.

4.1.1.1 Main 1 Security Selections

Table 4-2 gives the descriptions for the controller's main security settings that are shown on the Main 1 tab.

Table 4-2 Main 1 Security Operations

Item	Description
Enable User Security	Enable/disable user security function.
Controller Units	Change the controller units of measurement.
Process Limits Edit	Operate functions on the Process Targets screen. The Default user can change the Grid Selection field.
Printing	Operate the print function.
Network Setup	Operate network adjustment functions and the Dashboard Interface parameters on the Network Setup screen.
Remote Access	Operate the Remote Service Assistant function on Network Setup screen.
Digital I/O Configuration	Set configurations for the digital inputs and outputs on the I/O screen.
Log Transfer	Download the event log or data log in the Log Transfer section of the System Setup screen.
Options and Licensing	Load a license file that enables the functions installed on the ASC.
Mold Setup Auxiliary Actions	See the files on the Mold Setup screen and operate the screen buttons: Create Folder, Delete, Copy, Paste, and Rename.
Mold Setup Load Action	Load a mold setup configuration file on the Mold Setup screen. This also lets you create a new mold setup configuration file.
Mold Setup Save Action	Save changes to the mold setup files on the Mold Setup screen. The Save As function can also be used.
System Data	Selects the user role that can change the Company Name.
Date and Time	Select the user role that can set the date and time.
Troubleshooting Data	Selects the user role that can export diagnostic data for Husky service personnel to troubleshoot problems.
User Management	Select the user role that can use the User Management screen operations.
Data Collection Setup	Select the user role that can set the data collection variables and selection.
Turn Off Display	Select the user role that can set the time limit in which the touch screen must be used. When the time limit ends the Altanium display turns off for power conservation.
Basic Controller Operations	Operate the major controller function buttons. This also sets who can operate the UltraSync-E control mode buttons.
Clear Inactive Alarms	Clear sound alarms on the Alarms screen.
Reset Alarms	Reset sound alarms on the Alarms screen.

Table 4-2 Main 1 Security Operations (Continued)

Item	Description
Auto Log Out	Change the Auto Logout Time parameter in the User Management screen.
Interface Settings (Shotscope NX Interface)	Select the user role that can set the dashboard interface items on the Network tab of the System Setup.
Interface Settings (OPC UA)	Select the user role that can set Open Platform Communication Unified Architecture (OPC UA) interface configurations.
Certificate Management (OPC UA)	Select the user role that can do the OPC UA X.509 certificate management.

4.1.1.2 Main 2 Security Selections

Figure 4-2 Main 2 Security Screen

Table 4-2 gives the descriptions for the controller's main security settings that are shown on the Main 2 tab.

Table 4-3 Main 2 Security Operations

Item	Description
Start/Stop Service (VNC)	Select the user role that can start and stop Virtual Network Computing (VNC).
Interface Settings (VNC)	Select the user role that can change the interface settings for VNC.

Table 4-3 Main 2 Security Operations (Continued)

Item	Description
Save Process Data Setup	Select the user role that can save the process data setup.
I/O Signal Interface	Select the user role that can change the input and output interface fields when servo equipment is installed on the Altanium controller.

4.1.2 Servo Security Selections

Figure 4-3 Servo Screen Security

Select the **Servo** tab to see the Servo security selections. On the Servo security screen, set the user type to who can do the operations shown in Table 4-4.

Table 4-4 Servo Screen Security Operations

Item	Description
Operation – Basic	Servo mode changes, calibration, and manual move control.
Operation – Advanced	Override and manual jog controls.
Configuration – Basic	Servo axis name and group name selections. This also includes position and monitoring setpoints.
Configuration – Advanced	Changes to the servo gear ratio, force transmission efficiency, minimum and maximum axis positions, and home position setpoints. This also includes calibration selections.

Table 4-4 Servo Screen Security Operations (Continued)

Item	Description
Operating Limits – Basic	Servo move speed adjustments, jog (force limits, slow/fast speeds), and monitoring windows.
Operating Limits – Advanced	Servo maximum acceleration, deceleration, speed, and force adjustments.
I/O Signal Interface	Servo input and output signals interface selections.
Motion Profile	Servo motion profile parameters.
Permissions	Servo operation trigger and condition parameters on the Permissions screen.
Equipment Protection	Select the user role that can set the maximum servo cabinet internal temperature and air filter change reminder.

4.1.3 Heats (Page 1 and 2)

If your ASC system has integrated heats (temperature controls), the Heats Page 1 and Heats Page 2 tabs will show as part of the Screen Security screen. These tabs let you set the user roles for the operations related to the systems temperature controls. Refer to the Altanium Matrix5 User Guide for information about these user assignments.

4.2 Manage Users

Human Machine Interface (HMI) administrators can create a user, change a user's password, and delete a user using the User Management screen.

NOTE: Administrator screens are only seen when logged in as Administrator.

Figure 4-4 User Management Screen

To manage users, do the steps that follow:

1. Log in as Administrator.
2. On the Home screen, touch the **System Setup** button and then touch the **User Management** tab.
3. Touch one of the user management buttons shown in Table 4-5.

Table 4-5 User Management Buttons

Button	Description
	**Add User** Add a user to the system.
	**Change User Settings** Modify the user name, password, or user role for a selected user.
	**Delete User** Remove a user from the system.

4. Enter the user information in the fields as applicable.

4.3 Saved User Selections

A user can change the unit of measurement or make a language selection in the ASC. These selections will be saved to that user's profile when the user logs out. The same selections are loaded the next time the same user logs in again.

4.4 Auto Logout

The ASC system will log a user off if the HMI screen has not been touched within a specified timeout period. The default timeout period is five minutes. The minimum value is 10 seconds.

To change the auto logout timeout period, do the steps that follow:

1. Log in as Administrator.
2. On the Home screen, touch the **System Setup** button and then touch the **User Management** tab.
3. Touch the **Auto Logout Time** field and enter the timeout value.

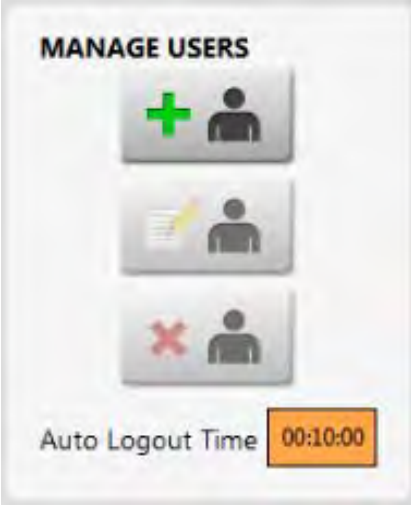


Figure 4-5 Auto Logout Time Filed

To make adjustments for specified users, use the Screen Security screen.

Chapter 5 System Setup Screen

This chapter describes the Main fields and selections on the System Setup screen. Network and remote service assistance information is also given.

For information on User Management and Screen Security, refer to Chapter 4.

If your ASC system has hot runner control installed, refer to the Altanium Matrix5 User Guide for information on heats setup.

To display the System Setup screen, touch **System Setup** button on the Home screen. Touch the **Main** tab, if necessary.

5.1 System Setup Main Screen

Figure 5-1 System Setup - Main Screen

The applicable user account level is necessary to make changes to most of the items on the Main screen. The system condition (or mode) may need to be changed before changes are made to the screen. Table 5-1 shows the System Setup Main items.

Table 5-1 Main Screen Security Operations

Item	Description	
Serial Number	The serial number is for information only. It is a number given to the system when it is manufactured. Husky support may ask for this number when they need to troubleshoot or upgrade the Altanium.	
Model	The controller model name.	
Software Version	The software version that is loaded onto the Altanium. This is for information only. Husky support may ask for this number when they need to troubleshoot or upgrade the Altanium.	
Software Configuration	This identifies the configuration of the software for your Altanium controller and is shown for information only.	
Disk Image Version	The disk image used to load the software onto the Altanium. This is for information only. Husky support may ask for this number when they need to troubleshoot or upgrade the Altanium.	
Husky Ethernet Version	The ethernet version used by Husky.	
Drive Firmware Version	Touch this button to see a list of the firmware versions installed for the servo axes on the system. The IP addresses for the axes are also shown.	
Company Name	The company name displayed on the status bar.	
User Settings	Touch the Configure button to set the items that follow:	
	Language	The language used on the Altanium user interface.
	Button Multi-Select Hold Time	The amount of time needed to touch and hold a screen button to add it to, or remove it from, another button selection. This is used for the selection of more than one axis (or group) on the Axis Selector Bar.
	Force Temperature Units to	Forces the temperature units to specified setting.
	Units	Used to set the units of measure (SI or Imperial) shown on the Altanium user interface.
	Date and Time	The date and time shown on the Altanium user interface.
	Time Zone	The time zone shown on the Altanium user interface.
	Automatic Daylight Saving	Automatic daylight savings on/off check box.
Log Transfer	Transfer data log or event log in CSV format to a specified log file destination. The complete log is transferred, or a time range can be set.	
Diagnostics Export	Used to export diagnostics files to a USB drive. This is for Husky Technical Support use only. Contact Husky for help, if necessary.	

Table 5-1 Main Screen Security Operations (Continued)

Item	Description
Air Filter	Used to set a reminder interval for the air filter replacement.
Servo Cabinet Temperature	Used to monitor the internal temperature of the ASC cabinet.
License Number	The license key is shown.
Update License	Used to upload new license file from Local, USB, and Network drives.
View License	Shows the license information.
Remote Load	Used to select the mold setups that can be loaded directly from the injection molding machine. Identifies the loaded ID and indicates that the remote file has been loaded.
Acknowledge Alarm	Used to set a signal (example: digital input) to acknowledge alarms, so the user does not have to press the alarm reset button.
Forced I/O Warning Enable	When enabled, a "Channel Forced" warning is shown when a signal is forced. This option applies to all signals able to be forced. The warning source will be a signal group. The default setting is enabled.
Turn Off Display	Enables the function to turn off the display if it is not used in a set interval of time.
Turn Off Display After	Used to set the interval of time of nonuse that the controller waits before it turns off the display.

5.1.1 Select a Language

Altanium screens are available in different languages. The default language is English.

To select a language, do the steps that follow:

1. On the System Setup - Main screen, touch the **Language** field.
2. Select a language in the dialog box.

NOTE: The Language Selection button in the Altanium screen footer has the same function.

5.1.2 Button Multi-Select Hold Time

This is the time a user must touch and hold an axis or group button on the Axis Selector Bar to add it to, or remove it from, another button selection. For more information about the Axis Selector Bar, refer to Section 7.1.2.

To set a hold time, do the steps that follow:

1. On the System Setup - Main screen, touch the **Button Multi-Select Hold Time** field.
2. Enter a time in the dialog box.

5.1.3 Set the Units of Measure

Use the Units dialog box to set the units of measure (SI or Imperial) that are shown on the Altanium screens.

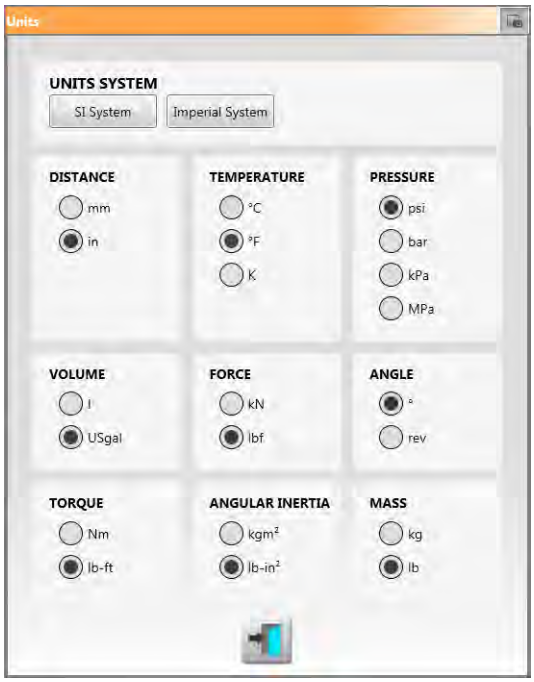


Figure 5-2 Unit Dialog Box

To set the units of measure, do the steps that follow:

1. On the System Setup - Main screen, touch the **Units** button.
2. In the Units dialog box, touch the **SI System** button or **Imperial System** button to make a selection.
3. Touch a circle under each heading to select a unit of measure.

   NOTE: The selection shows a black mark in the circle.
4. Touch the **Exit** button.

5.1.4 Air Filter

For equipment protection, a fan and air filter are installed on the Altanium cabinet. There must be good air flow, so the components do not become too hot. The filter must be changed regularly, so there is no decrease in the air flow. The Air Filter button under Equipment Protection lets you set a timer for when the filter must be changed. An "Air Filter Change Required" warning message shows when the timer has completed.

To set the time interval, do the steps that follow:

1. Touch the **Air Filter** button on the System Setup - Main screen.
2. Touch the **Change Reminder** checkbox, so the checkmark shows.
3. Touch the **Change Interval** field and enter the number of days for the timer interval.

   NOTE: The unit of measure is in days. The default is 60.
4. Touch the **Exit** Button.

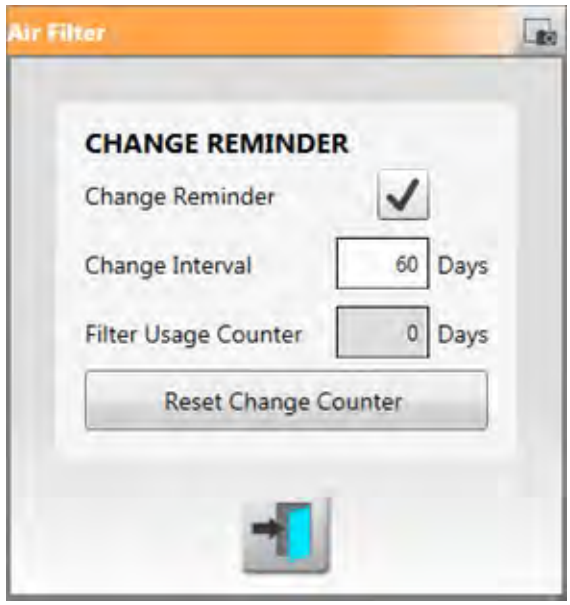


Figure 5-3 Air Filter Dialog Box

To set the timer back to the start, touch the Reset Change Counter button. This also clears the "Air Filter Change Required" warning message. Only use the Reset Change Counter button to clear the warning message and start the timer again.

NOTE: The timer goes back to the start by the use of the Reset Change Counter button only. If you disable and enable the Change Reminder checkbox, the timer will not go back to the start.

The Filter Usage Counter shows the number of days that have passed since the timer was started or when the Reset Change Counter button was touched.

5.1.5 Servo Cabinet Temperature

The ASC monitors the temperature inside the servo controller cabinet. An alarm will operate if the cabinet temperature goes above the maximum limit. The default maximum temperature limit is 55 °C and the default for the alarm is enabled. Only an administrator can disable or enable the Servo Cabinet Temperature alarm and change the maximum temperature.

To set the cabinet temperature alarm, do the steps that follow. Refer to Figure 5-4.

1. Touch the **Servo Cabinet Temperature** button on the System Setup - Main screen.
2. Touch the **Maximum Temperature** field.
3. Enter a temperature.
4. Touch the **Enable Alarm** checkbox to disable or enable the alarm.
5. Touch the **Exit** button.

NOTE: The temperature in the cabinet is shown in the Current Temperature field.

Figure 5-4 Servo Cabinet Temperature Dialog Box

5.2 Network Settings

You can configure the controller, so that it can communicate on a local network. Use this feature to transfer files between the controller and a network share, or to provide information over the network through a defined software interface (OPC, Modbus, and so on).

To get access to network selections, touch the **Network** tab on the System Setup screen.

On the Network Setup screen, you can configure the controller for a wired or wireless (WiFi) network connection. A network path can be entered for the shared network folder to upload or download files to and from the controller, in the format \\server\shared folder.

For help with your controller, Husky can give assistance with a remote connection to your system with the Remote Service Assistance application.

Figure 5-5 Network Setup Screen

5.2.1 Wired Network

To change the network settings for a wired network, do the steps that follow:

1. On the System Setup screen, touch the **Network** tab.
2. Touch the **Setup** button in the Wired Network section of the screen.
   The Wired Network Setup dialog shows. Refer to Figure 5-6.

Figure 5-6 Wired Network Setup Dialog

3. Enter the necessary information in the fields to configure the network connection.
4. Touch the **Update** button.

   The Connected indicator will show when the network connection has been made.

5.2.2 Wireless Network

To change the network settings for a wireless network, do the steps that follow:

NOTE: The controller does not have a built-in wireless adapter. To connect to a WiFi network, a D-Link DWA-182 or DWA-171 wireless adapter must be connected to the controller. Refer to Figure 5-7.

Figure 5-7 D-Link DWA-182 or DWA-171 Wireless Adapters

1. Touch the **Setup** button in the Wireless Network section of the screen.

   The Wireless Network Setup dialog shows. Refer to Figure 5-8.

Figure 5-8 Wireless Network Setup Dialog

2. Connect a D-Link DWA-182 or DWA-171 wireless adapter to the USB port on the controller.

   NOTE: After the D-Link wireless adapter is connected to the controller, it is automatically detected by the HMI software. The connection status changes to "Searching for Available Networks". If there is one or more WiFi networks available in the area, the connection status changes to "Ready to Select Network" and enables the Network SSID.

3. Touch the **Network SSID** field and a list of all available WiFi networks will show.

   NOTE: The SSID, Authentication method, and Signal strength for all available WiFi networks are shown. They listed in order by their signal strength.

4. Select an SSID from the list.

   The SSID shows in the Network SSID field.

   NOTE: The HMI application supports specific types of the authentication modes (Open, and WPA-Personal) for wireless network configuration. If an unsupported network is selected, the value of the Network SSID field does not change and the "Network security type is not supported" message shows (refer to Figure 5-9). If you selected a Network SSID that is not supported, a different one must be selected.

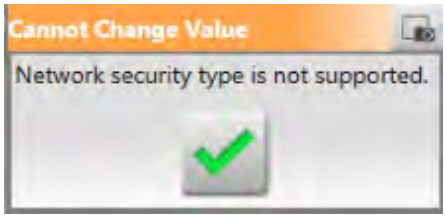


Figure 5-9 Unsupported Network Security Message

5. Enter the password for the Network SSID in the Password field.
6. Touch the **Connect** button.

   The Connected indicator will show when the network connection has been made.

   NOTE: If the password is not correct the Connections Status shows an "Unable to connect" message for a few seconds and then it changes back to "Ready to connect".

5.2.3 Network Share

The Network tab on the System Setup screen lets you enter the information necessary to connect to a network shared storage folder (network share).

To get access to network selections, touch the **Setup** button on the Network Share panel of the screen.

The Network Share Configuration dialog shows. Refer to Figure 5-10.

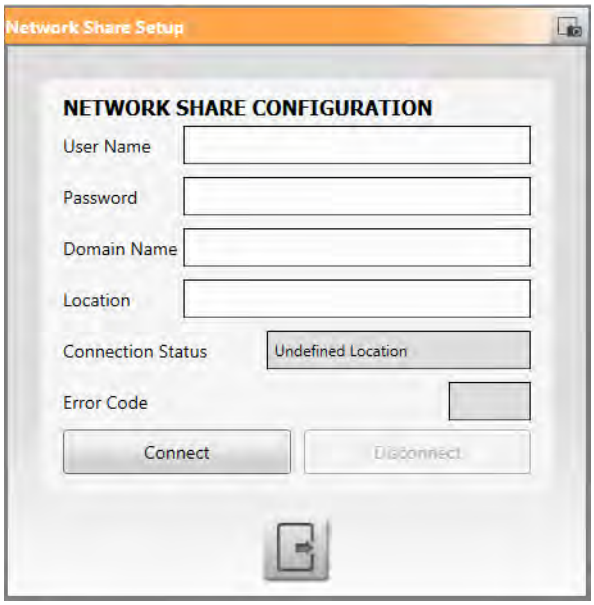


Figure 5-10 Network Share Configuration Dialog

On the Network Share Configuration dialog, you can enter the network path for the shared network folder to upload or download files to and from the controller, in the format:

\\server\shared folder.

Table 5-2 gives a description of the fields and buttons used to connect to a network share.

NOTE: Refer to the Altanium Matrix5 User Guide for more information on network configurations.

Table 5-2 Network Configurations

Item	Description
User Name	The user account name used to connect to a network share.
Password	The password used to connect to a network share.
Domain Name (Optional)	The name of the domain that the network share is on.
Location	The UNC path that specifies the server name and shared folder on a network. Example: \\companyserver\shared

Table 5-2 Network Configurations (Continued)

Item	Description	
Connection Status	A status field that notifies the user of the current state of the network share connection. Possible values are:	
	Not Connected	The system is not connected to the specified network share.
	Undefined Location	The Location field has no value specified.
	Connecting	The system does the operation to connect to the specified network share.
	Connected	The system has connected to the specified network share.
	Unable to Connect	The system could not connect to the specified network share. See the 'Error Code' field.
	Disconnecting	The system does the operation to disconnect from the specified network share.
	Unable to Disconnect	The system could not disconnect from the specified network share. Refer to the Error Code field.
	Network Unavailable	The connection to the network stops. This occurs if the network cable becomes unplugged or there is an issue with the network adapter.
Error Code	This field reports the error code returned by the Windows operating system when the controller tries to connect to, or disconnect from, a network share. This will be used to troubleshoot any problems that occur with the use the networking feature. There are approximately 16,000 documented error codes, so it is not possible to list and describe each one. Here are two examples as a reference:	
	85	The local device name is already in use.
	2250	The network connection does not exist.
Connect Button	Used to initiate a connection to the specified network share.	
Disconnect Button	Used to remove the current connection to the specified network share.	

5.2.4 Dashboard Interface

The Dashboard Interface panel of the Network screen lets you enable the interface and enter the IP address of the dashboard server. The dashboard connection status and disconnected status are also shown.

Touch the Setup button on the Dashboard Interface panel, and the Dashboard Interface Configuration dialog shows. Refer to Figure 5-11.

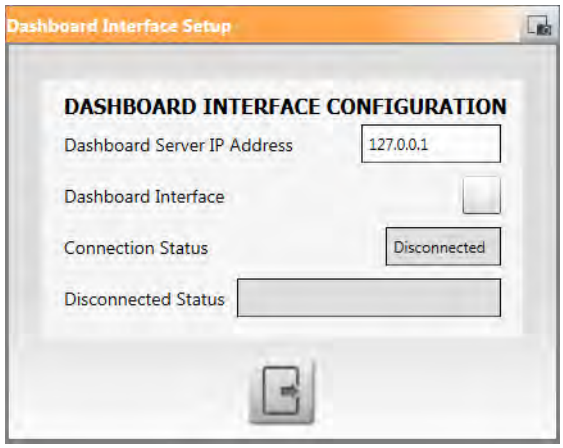


Figure 5-11 Dashboard Interface Configuration Dialog

With a numbered address entered in the Dashboard Server IP Address field, the connection is started when the Dashboard Interface checkbox is enabled.

5.2.5 Remote Service Assistance

If you find a problem that you cannot correct, contact the nearest Husky Regional Service and Sales office.

If problem cannot be corrected on the phone, the Husky representative will give you a user name and password. Do the steps that follow:

NOTE: A keyboard is necessary for some of these steps.

1. On the System Setup screen, touch the **Network** tab.
2. Touch the **Start Session** button in the Remote Service Assistance area of the screen. Refer to Figure 5-12.

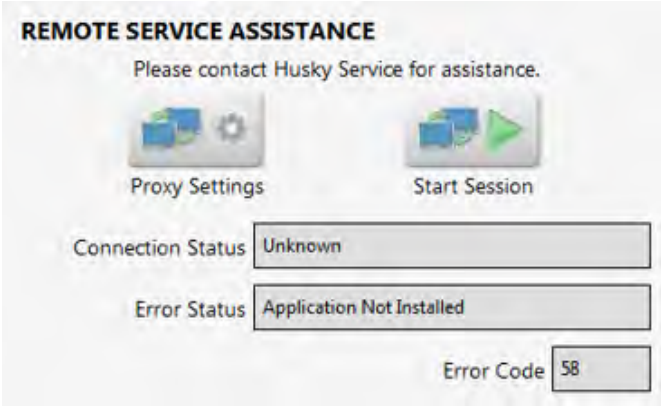


Figure 5-12 Remote Service Assistance

3. When the TeamViewer dialog shows, type the user name and password in the correct fields.
4. Touch the **OK** button.

   If there are network connection requirements, a dialog box is shown.

   A new icon is shown on the screen footer when TeamViewer starts.
5. Follow the instructions that the Husky representative gives you to complete the connection.

The Husky service technician starts a remote connection or desktop view application. You must give your approval for the remote connection when the dialog box is shown.

The Husky service technician can operate or see your ASC system screens. You will be directed to make changes, if necessary.

You can stop the remote session, or it will stop automatically when the technician stops the session. This causes the current user to be logged off. The user is also logged off if the session fails to connect. When the remote session is stopped, the icon/drop-down menu in the footer is removed.

5.2.6 Virtual Network Computing

With Virtual Network Computing (VNC), if installed, you see the ASC controller HMI on the Injection Molding Machine HMI. This lets you see data and make changes in one central location. You can relocate the ASC controller to a different location and to reduce the number of HMIs in the molding cell to a single screen.

With the VNC feature installed on your ASC system, a VNC Server Options area will show on your Network screen. Refer to Figure 5-13.

For VNC operation, a VNC client and VNC server software must be installed. The controller and the IMM must be on the same network with no firewall between them.

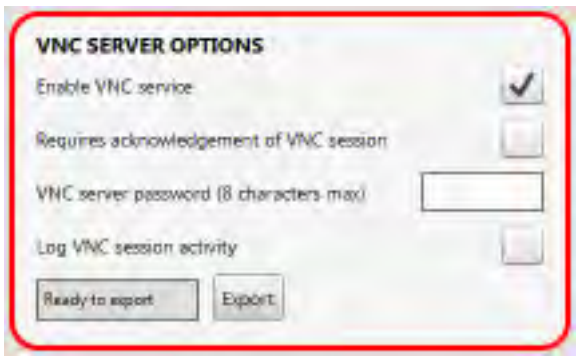


Figure 5-13 VNC Server Options

Table 5-3 describes the VNC Server Options.

Table 5-3 VNC Server Option Descriptions

Item	Description
Enable VNC service	Use this checkbox to enable the VNC service.
Requires acknowledgement of VNC session	Use this checkbox to enable the security challenge that is shown on the server when a client tries to connect.
VNC server password (8 characters max)	Use this field to set a password that must be given by the client before a VNC session/connection can occur. **NOTE:** If the password is changed using the VNC client, the client will disconnect without warning when the service stops. After a period of about 15 seconds (which lets the service to restart and stabilize), the client can reconnect to the server with the use of the new password. The password length must be between three and eight alphanumeric characters. **NOTE:** The password length is a limitation of VNC and not of the operating system.
Log VNC session activity	Use this checkbox to enable VNC logging. Logging information is written to a text file and can be retrieved with the Log File Export Option. **NOTE:** At intervals, the VNC log is deleted, so the file does not use too much disk space. If the log file is found to be over 1 MB in size, the file is deleted. This check is performed on every system start up. If the log is deleted, an entry will be made to the alarm system.
Export	Use this button to export the most recent VNC log file (and other log files) to an external drive. This feature operates the same as the log export found on the Main tab of the System screen.

5.2.6.1 VNC Client

The VNC client is the IMM that connects to, views, and/or controls a VNC server (Altanium Servo Controller). The client computer requires the installation of a VNC client viewer (for example, Real VNC).

NOTE: A VNC client should be able to connect to any computer running VNC server software, regardless of the manufacturer.

5.2.6.2 VNC Server

The VNC server is the Altanium Servo Controller that is controlled by a VNC client. For VNC server operation, it is necessary that VNC server software be installed, and specific communication ports be available. On a Windows system, the VNC server software is typically run as a service.

NOTE: On a Windows system, the VNC server software is typically run as a service.

5.2.6.3 VNC Connection

Most VNC client software applications can be used to connect to the HMI machine (VNC server). The instructions below are specifically for vncviewer.exe. However, these steps should apply to most VNC client software applications.

NOTE: Problems on the VNC client, such as blank/black screens, irregular or slow screen rendering, and other UI related problems, are a possible fault of the setting(s) on the VNC client, not the server. When in question (or when co instructions are available), always select an "auto configuration" option (if the VNC client software supports it). The client will negotiate with the server to determine the set of compatible capabilities.

For security purposes, VNC makes it necessary for a password to be used for server installation. A new password can be created by an operator with the correct screen permissions. Passwords can be an alphanumeric combination with a length between three and eight characters.

If the "Requires acknowledgement of VNC session" option is enabled, a connection cannot be made by a client until it is approved by the operator of the VNC server. When the client attempts to connect to a VNC server, a dialog will show that asks the operator to Accept or Reject the connection. If no action is taken on the server operator's part, the request will timeout in 30 seconds. The session will be closed on the client. If the connection is accepted, the client will be able to view and operate the VNC server.

For connectivity or application problems, the VNC server can optionally write its activities to a log file. The VNC server must be configured to log its activities. An operator uses the Export button at the bottom of the VNC Server Options panel to get a copy of the VNC log. You can also use the Export button in the Diagnostic Export panel on the Main tab of the System Setup screen.

To set the VNC configuration for logging, do the steps that follow:

1. On the Network tab of the System Setup, make sure the **Enable VNC service** option is enabled (check mark in the checkbox).
2. Make sure the **Log VNC session activity** option is enabled (check mark in the checkbox).

   All VNC activity will be recorded to a log file.

To download the VNC log file, do the steps that follow:

1. On the Network tab of the System Setup, disable the **Log VNC session activity** option (click to remove the check mark from the checkbox).
2. Insert a USB drive into any available USB port.

   NOTE: The USB drive should have at least 5GB if free space. Log files from other sub-systems are exported during this process.
3. Click the **Export** button at the bottom of the VNC Server Options panel.

   NOTE: The Export button in the Diagnostic Export panel on the Main tab of the System Setup screen can also be used.
4. Navigate to the location on the USB drive where you want the VNC log file saved.
5. Click the green check mark button.

   The VNC log file will be written to the selected location and will have the name: WinVNC.log.

If the VNC log file is unavailable when an export is started, there are two events that could cause this:

- The log file was deleted immediately before the export was started.
- The “Log VNC session activity” option was not enabled during VNC activity.

If the VNC log file is not available when a download is done, a placeholder file will be created with the same name (WinVNC.log) as the standard log. The contents of this placeholder file will give the possible causes for the absence of the VNC session information.

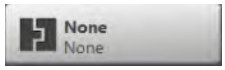
Chapter 6 Mold Setup

A mold setup contains the process parameters needed by Altanium to operate the servo motors and a hot runner system, if installed.

6.1 Mold Setup Screen

The Mold Setup screen is used to store and work with files such as mold setups, images, documents, and reports (refer to Figure 6-1). Files are shown in a tree structure and are stored in mold, system, and user folders. Each mold folder contains the mold setups, images, and documents that are related to a specified mold. The Mold Setup screen is divided into two panes. The left pane contains all directories that are on the system's local hard drive. The right pane displays all available directories and files from an external source. This includes a USB disk or a network file share system.

On the Home screen, touch the **Files** button to open the Mold Setup screen. You can also touch the **Mold Setup Info** button in the system footer.



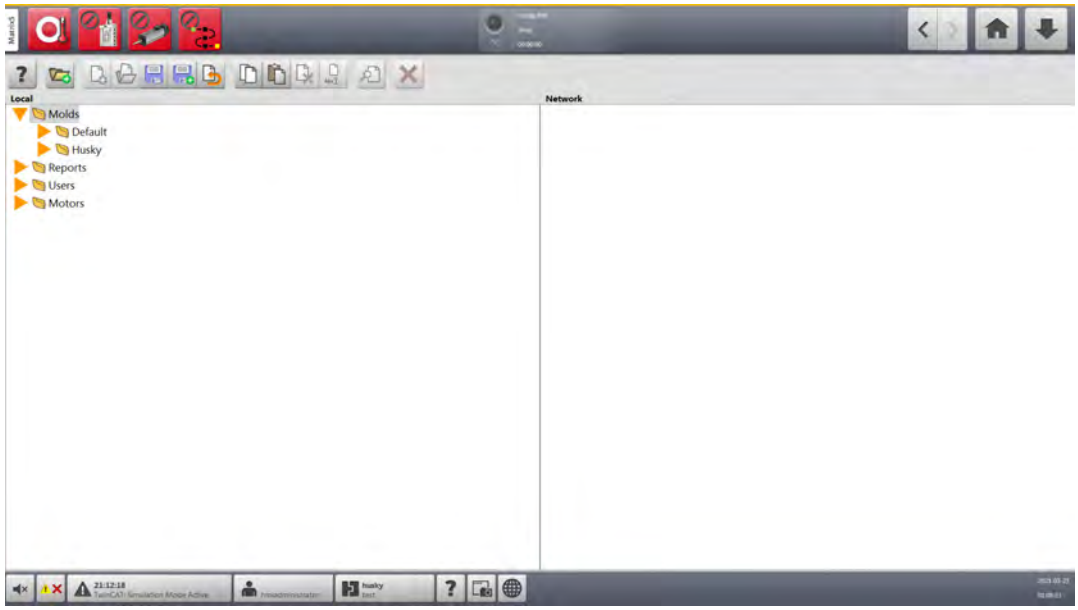


Figure 6-1 Mold Setup Screen

Table 6-1 gives a list of the items that make up the structure of the Mold Setup screen.

Table 6-1 Mold Setup Screen Item Descriptions

Item	Description
File Tree	The local drive holds all stored data contained within the Mold Setup screen. To help work with the files, there are three root directories included by default. They are the mold folder, system folder, and user's folder. USB storage devices and network folders are shown by default on the right pane, when connected to the system.
Molds Folder	The Molds folder is used to work with files related to a given mold and store the files in a user-specified sub folder. Touch the molds folder to see the sub folders. Touch each sub folder to see the mold setup files, images, and PDF documents contained in the sub folder. The default folder is found within this directory and contains the master mold file that contains the factory default adjustments.
Reports Folder	Touch the Reports folder to see all reports and documents contained within the selected system folder.
Users Folder	Touch the Users folder to see files related to a specified operator.
Motors Folder	Touch the Motors folder to see the parameter files for the servo motors connected to the system.

Table 6-2 gives a list of the buttons used on the Mold Setup screen.

Table 6-2 Mold Setup Screen Button Descriptions

Button	Description
	**Help** Gives descriptions of the mold setup icons.
	**New Folder** To make a new tool (mold) subfolder in the Molds main folder.
	**New Mold Setup** To make a new mold setup file. All new mold setup files are made from the settings contained in the Default mold setup file. This button is not available for selection unless a mold folder is selected.
	**Load Mold Setup** To load a mold setup file. This button is not available for selection unless a mold setup file is selected. The Default setup file cannot be loaded directly.

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

Button	Description
	**Save Changes** Permanently save all changes to the loaded mold setup file. If another item is selected on the screen, it will not have an effect on where the changes are saved. The changes are saved to the loaded mold setup file only.
	**Save As** Save the loaded mold setup file with a new name. If another item is selected on the screen, it will not have an effect on where the changes are saved. The changes to the loaded mold setup file are saved to the new file only.
	**Discard Changes** Discard all changes made to the loaded mold setup file. The file information goes back to the condition after it was last saved. All unsaved changes will be discarded. If another item is selected on the screen, it will not have an effect on the loaded mold setup file.
	**Copy** Copy mold setups, images, or documents from one folder or device to another.
	**Paste** Paste mold setups, images, documents, or notes copied from one folder or device to another.
	**Delete** Delete a mold folder, mold setup, image, or document. A message is shown to make sure you want to delete the item. This button is not available for selection unless a folder or file is selected.
	**Rename** Rename a mold folder, mold setup, image, note, or document. A keyboard shows on the screen that lets you type the new name. This button is not available for selection unless a folder or file is selected.
	**Preview** See mold setup files, images, notes, and documents.

6.2 Create a New Mold Setup Folder

You can use a mold setup folder to store many mold setup files.

To make a new mold setup folder, do the steps that follow:

1. Touch the **New Folder** button.
2. In the dialog box, type the name of the new mold folder.
3. Touch the **Accept** button.

The new mold setup folder is now under the Molds directory.

6.3 Create a New Mold Setup File

After a mold setup folder has been made, a new mold setup file can be added to it.

When a new mold setup file is made, and the Default folder contains only the Default mold setup file, the factory default setup file is copied and used as a start point.

If the Default folder contains a user-supplied setup file named “New Setup”, the new setup file is a copy of the 'new setup' file. You can create this 'New Setup' file by first copying an existing setup file, renaming the file to 'New Setup', and then copying the file to the Default folder. The helps provide a user-specified starting point for all setup files instead of the factory default.

NOTE: If you made setup changes and then create a new mold setup file, the system will change the setup values back to the default values. Create the new mold setup file first and then make your setup changes. Save those changes to the new mold setup file.

To make a new mold setup file, do the steps that follow:

1. On the Mold Setup screen, touch the **Molds** folder where you want to make a new mold setup.
2. Touch the **New Mold Setup** button.
3. In the dialog box, type the name of the new mold setup.
4. Touch the **Accept** button.

6.4 Save Changes to a Mold Setup File

Once a mold setup file has been loaded, any changes made to it can be permanently saved.

To permanently save changes to a mold setup file, do the steps that follow:

1. On the Mold Setup screen, touch the **Save Changes** button.

   The Mold Setup - Save dialog box is shown.
2. Make sure the dialog box shows the changes will be saved to correct mold and file.
3. Touch the **Accept** button.

All changes are permanently saved to the loaded mold setup file.

6.5 Discard Changes to a Mold Setup File

All changes to a mold setup file are held in the system's database until they are permanently saved or discarded. When changes are discarded, the mold setup file goes back to its condition after the last save was done.

To discard changes to a mold setup file, do the steps that follow:

1. On the Mold Setup screen, touch the **Discard Changes** button.

   The Mold Setup - Discard dialog box is shown.
2. Make sure the dialog box shows the changes will be discard from the correct mold setup file.
3. Touch the **Accept** button.

   All changes are discarded from the loaded mold setup file.

6.6 Save the Loaded Mold Setup File as a New File

After a mold setup file has been loaded, it can be saved as a new file.

To save a loaded mold setup file as a new file, do the steps that follow:

1. On the Mold Setup screen, touch the **Save As** button.

   The Mold Setup - Save As dialog box is shown.
2. Type the name of the new file.
3. Touch the **Accept** button.

6.7 Load an Existing Mold Setup File

After a mold setup file has been made, it is automatically loaded as the operational mold setup in the system.

To load a different mold setup, do the steps that follow:

1. On the Mold Setup screen, touch the mold setup folder that contains the mold setup file to be loaded.
2. Touch the mold setup file to be loaded.
3. Touch the **Load Mold Setup** button to load the selected mold setup.

After a mold setup is loaded, its name is always shown on the Mold Setup Info button in the system footer.

6.8 Delete Files or Folders

When a file or folder is no longer necessary on the internal disk, it can be deleted.

To delete a file or folder, do the steps that follow:

1. On the Mold Setup screen, touch the file or folder to be deleted.
2. Touch the **Delete** button.

   A message asks if you want to delete the file or folder.
3. To continue, touch the **Accept** button. To cancel, touch the **Cancel** button.

6.9 Copy Files

Mold setups, images, documents, or notes can be 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.

To copy and paste a file, do the steps that follow:

1. On the Mold Setup screen, touch the file to be copied.
2. Touch the **Copy** button.
3. Find and touch the folder where the file will be pasted.
4. Touch the **Paste** button to make a copy of the file in the selected folder.

6.10 Rename Files or Folders

To rename a file or folder, do the steps that follow:

1. On the Mold Setup screen, touch the file or folder to be renamed.
2. Touch the **Rename** button.
3. Type the new name in the dialog box.
4. Touch the **Accept** button to save the name of the file.

6.11 Transfer Data to the Network

Use the Mold Setup screen to transfer Altanium data to a network. When the Altanium is connected to a network, the network folder structure is shown on the Mold Setup screen, by default. The network folders do not show when a USB device is connected.

6.12 Transfer Data to a USB Storage Device

Altanium data can be transferred with USB disks or USB CD-ROM drives. When a storage device is connected to the USB port, the folder structure of the device is shown on the right side of the Mold Setup screen. To load files, copy and paste the files from the storage device onto the local drive. To save files onto a storage device, copy and paste the files from the local drive onto the device.

When the USB storage device is disconnected from the USB port, the folder structure of the device no longer shows on the screen.

Chapter 7 Servo Controller Screens

The Altanium has five servo motor screens with related tab views that let you set all the conditions that give accurate control over the operation of each axis. Use the servo controller screens to:

- Operate an axis
- Put axes into groups
- Enter user-specified names of axes and groups
- Calibrate an axis
- Control manual axis movement
- Set limits for axes (minimum/maximum positions, target positions, speeds, acceleration/deceleration)
- Set fault reactions
- Set permissions
- Monitor operation
- View and change motion profiles

This chapter describes the Altanium servo controller screens and their functions.

7.1 Control Buttons

Control buttons have the same function on most of the servo screens. The Control Modes and the Axis Selector Bar buttons are described in the sections that follow.

7.1.1 Servo Control Modes Buttons

The Control Modes buttons let you change the servos between disengaged and engaged modes, and to disable the servo system. Table 7-1 shows the Control Mode buttons.

Table 7-1 Control Mode Buttons

Button	Description
	**Engaged** Activates Engaged mode, where the servos are controlled by remote inputs.
	**Disengage** Activates Disengage mode, where the servos are controlled by the operator using the ALTANIUM user interface.
	**Disabled** Disables the servo system.

7.1.2 Axis Selector Bar

The Axis Selector Bar is above the Servo Home, Axis Setup, Position Setup, Permissions, and Motion Profiles screens. Touch the buttons to select one or more axes, groups of axes, or all axes at one time. Axes and groups are highlighted when selected. Selections are kept when you change screens. The axis names on the buttons are shown as they were specified on the Axis Setup screen. The group names on the buttons are shown as they were specified on the Controller Setup screen.

Touch the **All** button to select all the groups and axes. Touch the **All** button again and the selection goes back to the axes and/or groups (if any) that were selected before.

Touch a group button to select all the axes in that group. Any selections before this are de-selected.

Touch one axis button to select only that axis. Any selections before this are de-selected.

Touch and hold an un-selected axis or group button to add it to the selection. For example, touch "Axis 1" to select that axis. Touch and hold "Axis 3" and both "Axis 1" and "Axis 3" are now selected.

Touch and hold a selected axis or group button to remove it from the selection.

You cannot de-select all axes. If the last selected axis is de-selected, the first enabled axis is selected. For example:

Axis 1 disabled in the Controller Setup screen.

Axis 3 is the only selected axis on the Axis Selector Bar.

You de-select Axis 3 on the Axis Selector Bar.

Axis 2 (the first enabled axis) is selected.

The Axis Selector Bar is not shown when the system has only one axis in operation.

7.1.3 Axes Compatibility

When more than one axis is selected on the Altanium screen, many of the settings for those axes can be changed together. The settings must be compatible to be changed together. If there are settings in the selected axes that are not compatible, the values are not specified in the setting fields.

For example, if two linear axes are selected with a different number of positions, every setting is changeable except those on the Motion Profiles screen.

Another example would be if a linear axis and rotary axis are selected, all the settings that have no units, percentages, or time values are changeable.

Setpoints are considered compatible when they have the same units. Examples of incompatible setpoints would be force compared to torque, or millimeters compared to degrees.

7.2 Servo Home Screen

The Servo Home screen gives high-level information of each axis, which includes the status, current force, and current position. A graphical indicator shows the axes' positions as they cycle. Linear axes are shown from the most negative to the most positive position. The entire modulus range is shown for rotary axes. Each enabled axis is shown by its name. Axes in groups are shown together with their group name. Command buttons allow you to manually calibrate, jog, stop, move, and home each axis. There is also an override option.

Figure 7-1 Servo Home Screen

7.2.1 Servo Home Screen Indicators

The Servo Home screen indicators are listed in the Table 7-2.

Table 7-2 Servo Home Screen Indicators

Item	Description
Enabled	When the indicator is green, the drive is enabled and ready for closed loop operation.
Calibrated	When the indicator is green, the axis is calibrated.
Axis State	Indicates state of the axis as follows: • Drive Disabled • Idle • Calibrating • Delaying move • Moving • Holding Position • Applying Force • Relaxed • Stopping
Force	Shows the servo's actual applied force (lbf/kN).
Position	Shows the position of the axis (inches/millimeters for linear; degrees/revolutions for rotary).

7.2.2 Manual Control

The Manual Control bar at the top of the Servo Home screen lets you manually adjust the position of the axes. More than one axis can be adjusted at the same time when they are selected with the Axis Selector Bar (refer to Section 7.1.2).

The manual control buttons are shown in Table 7-3.

Table 7-3 Manual Control Buttons

Button	Description
	**Home** Moves the axes to their home positions, set by the Home Position field on the Position Setup screen.
	**Move** Moves the axes from one position to the next position in the sequence. The number of positions and their locations are set on the Position Setup screen.
	**Stop** Stops the movement of all axes.
	**Calibrate** Tells the axes to find their reference position. The reference position is set in the CALIBRATION fields on the Position Setup screen.
	**Jog Negative Fast** Moves an axis at a fast speed in the negative direction. The speed is set in the Jogging: Fast Speed field on the Axis Setup screen.
	**Jog Negative Slow** Moves an axis at a slow speed in the negative direction. The speed is set in the Jogging: Slow Speed field on the Axis Setup screen. For a rotary axis the negative direction is from lower to higher position values. For example, 300°, 301°, 302°...
	**Override** (permission) Lets you manually move the axes with the jog buttons.

Table 7-3 Manual Control Buttons (Continued)

Button	Description
	**Jog Positive Slow** Moves an axis at a slow speed in the positive direction. The speed is set in the Jogging: Slow Speed field on the Axis Setup screen.
	**Jog Positive Fast** Moves an axis at a fast speed in the positive direction. The speed is set in the Jogging: Fast Speed field on the Axis Setup screen. For a rotary axis the positive direction is from higher to lower position values. For example, 300°, 299°, 298°...

The Calibrate button is enabled when the axis is ready and has permission to start calibration. The Jog buttons are enabled when the Allow Jogging Using Index Permission fields on the Permissions screen are selected or when Override is toggled (refer to Section 7.6).

7.2.2.1 Stop Control

In Disengaged mode, touch the jog buttons to move one or more axes. The axes stop when you release the Jog buttons. You can touch the Stop button to stop a movement operation while in Disengaged mode.

Axes in Engaged mode must first be disengaged before the manual stop command is available.

NOTE: When a move is in operation and the safety system stop is necessary, an alarm is shown to tell the operator if the move does not complete.

7.2.2.2 Jog Control

The Jog buttons are enabled when the Allow Jogging Using Index Permission fields on the Permissions screen are selected and the permissions are TRUE in the Index To Position column that corresponds to the current axis position. Refer to Section 7.6.

Touch and hold the Jog buttons to move an axis in a positive or negative direction. There are fast and slow buttons for the positive and negative directions. The speed and force limit for these buttons is set in the Jogging area of the Axis Setup screen.

Release a jog button and the axis movement stops.

The jog motion will automatically stop at each specified position (set on the Position Setup screen), as well as the specified maximum and minimum travel positions. Touch and hold the jog button again to continue the axis move to the next position. It is possible to move the axis beyond the maximum and minimum travel positions.

The jog buttons work in Disengaged mode only. When the permission Override button is selected (ON), the jog controls use the override permissions set on the Permissions screen (refer to Section 7.6).

When the permission Override button is not selected (OFF), the jog controls use the Move conditions (on the Permissions screen). The Jog buttons obey the permission selections for the next move position or the move position before to do the move. This is only when the Allow Jogging Using Index Permission checkboxes on the Permissions screen are selected.

7.2.2.3 Permission Override

Move operation permissions are set in the table on the Permissions screen (refer to Section 7.6). The set conditions must occur before one or more axes can move. Override permissions are set in the override column (identified by the exclamation point at the top of the column) at the right side of the table. When the permission Override button is selected (ON), the override permissions replace the operation permissions used for any motion: Move, Jog, and Calibrate.

Permission Override changes to OFF when:

- The controller mode changes
- The controller is restarted
- The axis selection changes
- The screen changes
- The user logs out

When the permission Override is ON, the controller cannot be engaged.

7.2.2.4 Manual Control Permissions

Access to the manual control functions is controlled by user account levels that are set in the User Management screen as part of the System Setup screen. The default access permissions are listed in the Table 7-4.

Table 7-4 Default Access Permissions

Function	Operator	Supervisor	Administrator
Calibrate	✓	✓	✓
Move	✓	✓	✓
Home All Axes	✓	✓	✓

Table 7-4 Default Access Permissions (Continued)

Function	Operator	Supervisor	Administrator
Stop	✓	✓	✓
Jog		✓	✓
Override		✓	✓

7.2.3 Custom Status Signals

This area of the Servo Home screen lets you see the status of four different signals that you configure. The indicators show when the signal is enabled.

On the Servo Home screen, you can only change the name of the custom status signal. The configuration of the custom status signals is done on the General tab of the General Setup screen. Refer to Section 7.3.3.

7.3 General and Modes Setup Screens

There are two tabs on the servo General Setup screen: General and Modes (refer to Figure 7-2 and Figure 7-3). The General tab lets you:

- Activate the servo controller
- Activate or deactivate one or more axes
- Enter user-selected names for the axes and groups
- Enter a cable label for each axis
- Assign axes to groups
- Assign coupling types to groups
- Set custom status signals

The Modes tab lets you:

- Set conditions to permit engaging
- Set conditions to permit disengaging

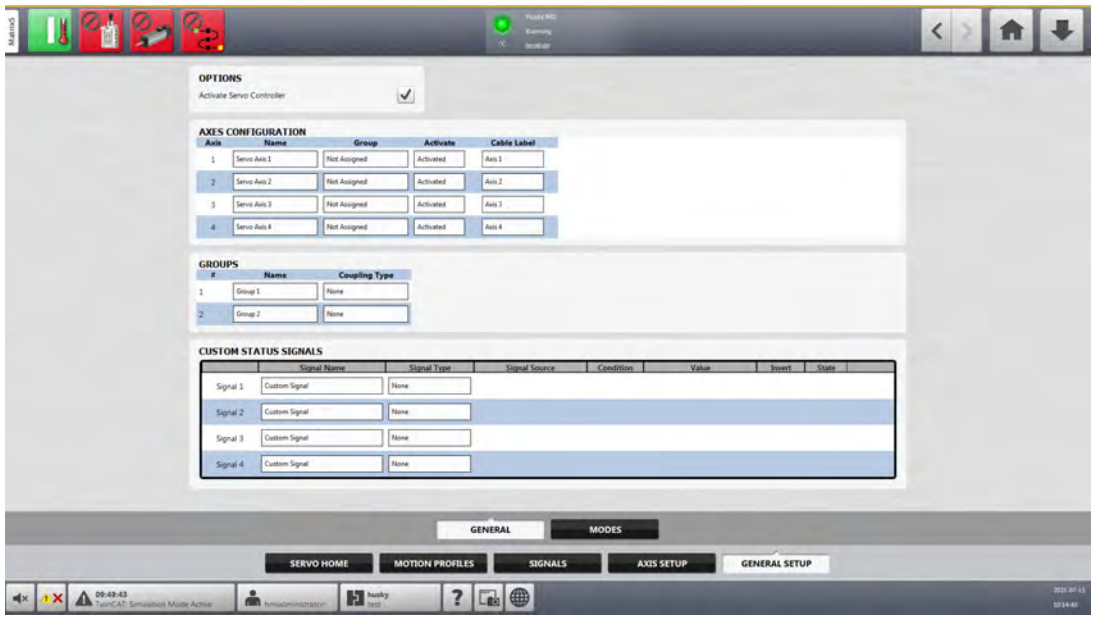


Figure 7-2 General Setup Screen - General Tab

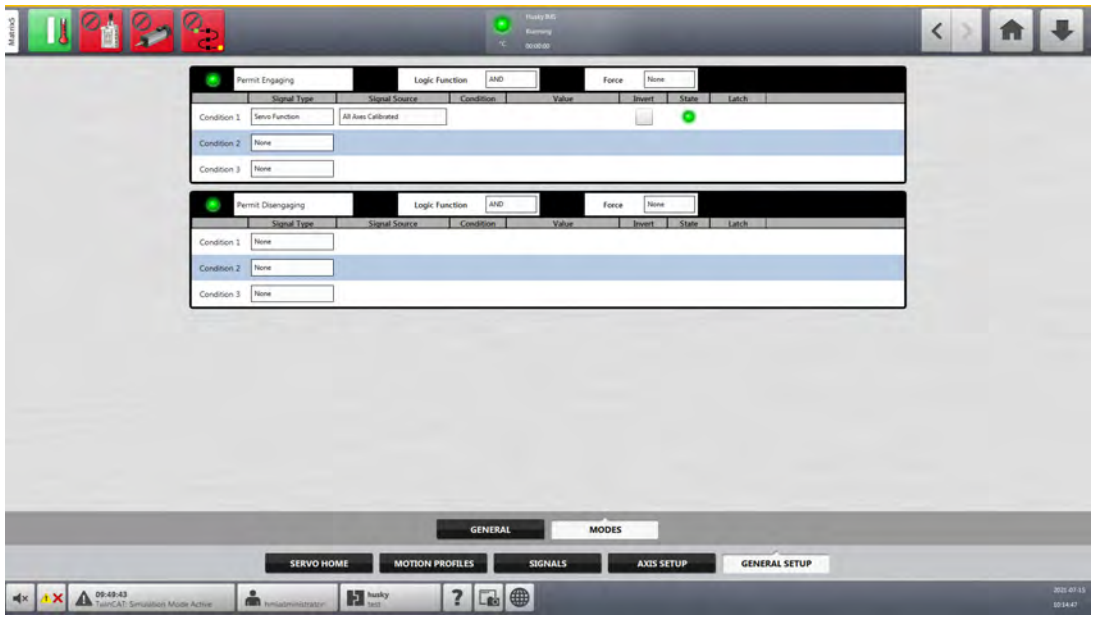


Figure 7-3 General Setup Screen - Modes Tab

7.3.1 Axis Activation

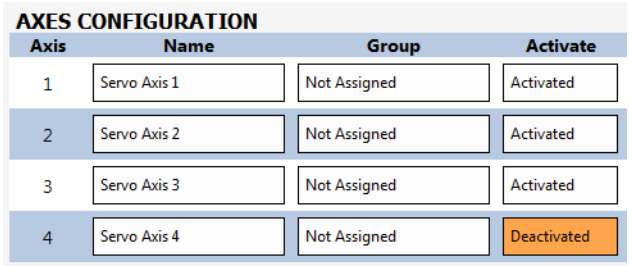
The Axis Activation area lets you activate or deactivate one or more axes. Axes that are not activated remain de-energized and are not monitored for faults. You can also deactivate an axis with a warning, which shows a warning on the alarms page.

To activate or deactivate an axis, the servo mode must be in Disable. The Activation Mode field used to change the axis mode is not available unless the servo mode is in Disable.

To change an axis mode, do the steps that follow:

1. Make sure that the servo mode is in Disable.

2. On the General tab of the General Setup screen, touch the **Activate** field next to the axis you want to change.



The Activation Mode dialog shows. Refer to Figure 7-4.

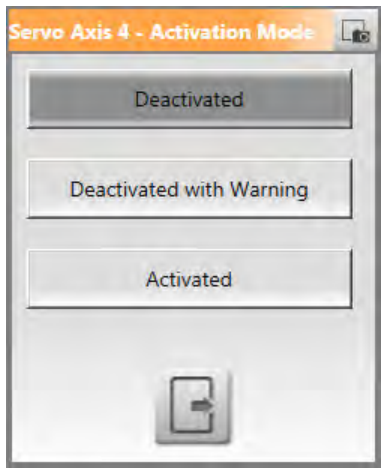


Figure 7-4 Activation Mode Dialog

3. Touch the mode you want on the Activation Mode dialog.

NOTE: At least one axis must be activated.

7.3.2 Group Names and Coupling Type

The Altanium lets you put specified axes into groups. The Groups area on the General tab of the General Setup screen lets you change the axis group names. Touch the **Name** field of a group and a group name dialog shows (refer to Figure 7-5). Type a new group name and touch the green check mark to enter the name. Touch the red X to cancel the entry.

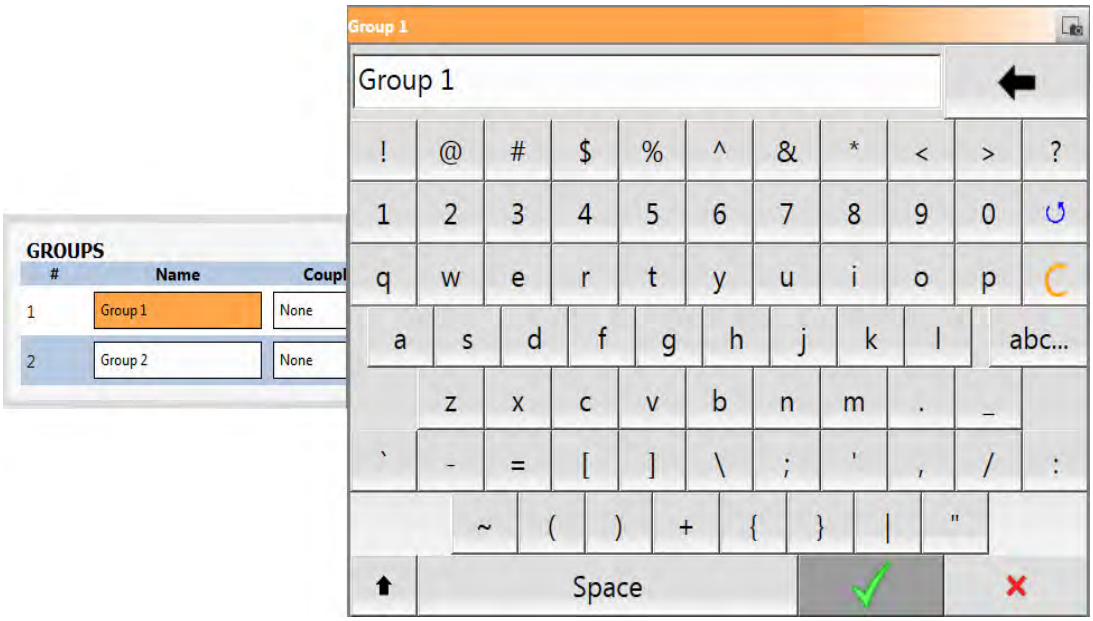


Figure 7-5 Group Name Dialog

Next to the Name field for the groups, you can change the Coupling Type for a group. Touch the **Coupling Type** field and select a type for the group:

- None
- Manual and Setpoints

7.3.3 Custom Status Signal Selections

The Custom Status Signals area on the General tab of the General Setup screen lets you configure four different signals, so their status (enable or disabled) can be seen on the Servo Home screen (refer to Section 7.2.3). The configurable signals are the as shown in Table 7-5.

Table 7-5 Signal Type Selections

Signal Type	Signal	Condition	Position
None	-	-	-
Digital Input	Digital Input 1 - 26 The first five digital inputs may be factory set for the features installed on your controller, as shown here: • IMM In Auto • External At Temperature • UltraSync-E Valve Gates Open Command • UltraSync-E Valve Gates Close Command • External Permit Calibration	-	-
Controller Function	• Fault Stop Immediately • Fault Stop End Of Cycle • Calibration Active • Process Outside Limit • All Axes At Standstill	-	-
Servo Axis	Select axis	Position < Position >	Set by the user
		Position =	• Position 1 • Position 2 • Position 3 • Position 4
Servo Group	Group selected by user	Position < Position >	Set by the user
		Position =	• Position 1 • Position 2 • Position 3 • Position 4
Servo Function	• Ready and Engaged • Override Active • All Axes At Home Position • All Axes Calibrated	-	-
Configurable Signal	Configurable signal 1 - 24	-	-
UltraSync-E (if installed)	• Valve Gates At Close • Valve Gates At Open • Ready and Engaged • Valve Gates Position	-	-

Table 7-5 Signal Type Selections (Continued)

Signal Type	Signal	Condition	Position
Sequencer	• Sequencer In Auto • Home Command	-	-
	• Custom Sequence	• At Step • Before Step • After Step	• Home • Step 1 - 18
Safety Signal	• IMM E-Stop OK • IMM Safety Gates Closed • Controller E-Stop OK • Bench Mode Plug Installed	-	-
Temperature Control	At Temperature	-	-

7.3.4 Permit Engaging Indication

On the Modes tab of the General Setup screen, you can set conditions that must be satisfied before the controller will permit engaging (refer to Figure 7-3). The configurable signals are shown in Table 7-5.

If a Signal Source, Condition, and Value are related to the Signal Type, they are shown in the screen's table. Touch each field and make the selections to set the condition.

7.3.5 Permit Disengaging

On the Modes tab of the General Setup screen, you can set conditions that must be satisfied before the controller will permit disengaging (refer to Figure 7-3). The configurable signals are shown in Table 7-5.

If a Signal Source, Condition, and Value are related to the Signal Type, they are shown in the screen's table. Touch each field and make the selections to set the condition.

7.3.6 Logic Function

The conditions that you set for a configurable signal use Boolean logic to make the signal TRUE. Touch the configurable signal's **Logic Function** field and then select a Boolean operator (AND, OR, or LATCHING).

When set to AND, the configurable signal is TRUE only when all conditions are TRUE. When set to OR, the configurable signal is TRUE whenever one or more of the conditions are TRUE.

When set to LATCHING, a configurable signal is TRUE when a specified event occurs. The signal stays TRUE until another event sets it FALSE.

When the LATCHING logic function is selected, each condition row will display a selectable Latch action, which lets you select Latch or Unlatch.

When a condition row is TRUE, one of the Latch actions that follows occurs:

- If set to Latch, the configurable signal is set to TRUE
- If set to Unlatch, the configurable signal is set to FALSE

The configurable signal then maintains this state until another condition row changes it.

The multiple conditions of a configurable signal are evaluated in the order that they are listed, top to bottom. Thus, it is possible that the configurable signal becomes latched and then unlatched at the same time. The final signal (TRUE or FALSE) is set by the last action that was evaluated.

7.3.7 Force

When necessary, a configurable signal can be set (forced) to always be high or low, so the system will ignore the true signal status. Touch the field in the **Force** column for a signal and select High, Low, or None:

- When Force is set to 'High', the signal level is always high.
- When Force is set to 'Low', the signal level is always low.
- When Force is set to 'None' (default), the signal level is not forced.

7.4 Axis Setup Screens

There are four Axis Setup screens:

- Operation
- Positions
- Mechanical
- Motor

Select the tab at the bottom of the screen to see each screen.

The sections that follow identify and describe the settings on each screen.

7.4.1 Operation Screen

On the Operation screen of the Axis Setup, you can configure one or more axes settings for holding position, jogging, identifying the home position, speed scaling, fault reaction, and so on. From the Axis Setup screen, select the **Operation** tag. Refer to Figure 7-6.

Figure 7-6 Operation Screen

The Operation screen configurations are described in Table 7-6.

NOTE: Different types of axes will show Torque or Force on the screen. Torque is used when the final transmission stage is rotary, and Force is used when the final transmission stage is linear (refer to Figure 7-8). For example, a rotary axis would show, “Holding Position Torque Limit”, while a linear axis would show “Holding Position Force Limit”.

Table 7-6 Operation Screen Setpoints

Item	Description
Holding Position	
Holding Position Torque/Force Limit	Used to set a torque/force limit when an axis is held in position.
Standstill Speed	The speed below which the axis is considered to be “at standstill”. When the axis has stopped at a location, this value sets a small tolerance for light motor fluctuation or IMM vibration. This is so the controller continues to think of the axis as At Position and does not cause an error. The range maximum number comes from the Maximum Speed in the Limits area. The range minimum number is calculated from the Motor Type selection in the Axis area.
At Standstill	The indicator shows when the axis is “at standstill”.

Table 7-6 Operation Screen Setpoints (Continued)

Item	Description
At-Position Status At-Position Window (+-)	The position limits in which the axis is thought to be at a certain position.
At-Position Status At-Position Before Motion Completes	Near the end of an axis move, the last part of a motion could take added time to complete. (For example, if the motion has added smoothing or there is a large at-position window.) When this checkbox is enabled, the "axis is not moving" condition is ignored, and the At-Position status can come on before the move completes if all other conditions in the At-Position Status panel are TRUE. When this checkbox is disabled, the At-Position status cannot become TRUE until the move is complete. The default setting is disabled.
At-Position Status At-Position While Disabled	This helps prevent unwanted alarms. When this checkbox is enabled, the "Axis Must Be Enabled" condition is ignored, and lets the At-Position status be set, even if the servo system is disabled (for example, when the safety gates are opened). When the checkbox is disabled, the At-Position status is always set false whenever the servo system is disabled. The default setting is disabled.
At-Position Status Fault When At-Position Status Is Lost	Enables the system to cause a fault if the "at position" status of an axis is ever lost after it arrives at a target position.
Moving	
Position deviation Tolerance (+/-)	Causes a position deviation alarm if the difference between the axis set position and axis actual position are more than this tolerance value.
Motion Profile Smoothing	Adjusts the higher-order derivatives of acceleration and deceleration to make sudden changes in the motion profile smoother.

Table 7-6 Operation Screen Setpoints (Continued)

Item	Description
Profile Force Limits For Inertia	This checkbox setting can be enabled for each axis. When enabled, the user-specified force limit applied during a profile move is increased by the force required to accelerate the total effective inertia (Section 7.4.3.1) of the system. This additional force is continuously calculated during the move and varies with the instantaneous acceleration setpoint. With the added adjustment force applied, the actual force limit applied may be higher than the user-set limits for calibration, homing, and jogging. The effect of this option is seen on the curves: • Torque/Force Limit curves include the added inertial adjustment force. • Total Torque/Force curves show the actual total force applied by the motor • Non-Inertial Force curves show a calculated force: - Non-Inertial Force = Total Force – Calculated Inertial Force
Torque/Force Warning Level	Used to set a torque/force warning level (percentage of the torque/force limit).
JOGGING	
Torque/Force Limit	Sets the maximum available torque/force limit for when the jog buttons on the Servo Home screen are used.
Slow Speed	Sets the slow speed for when the Jog Negative/Positive slow buttons on the Servo Home screen are used.
Fast Speed	Sets the fast speed for when the Jog Negative/Positive fast buttons on the Servo Home screen are used.
HOMING	
Home Position	Used to select the axis home position. A move to the home position is done with the Home button on Servo Home screen.
Speed	Used to set the speed of the motor when the axis returns to the home position.
Torque/Force Limit	Sets the maximum available torque/force limit for when the axis returns to home.
MOVE SPEED SCALING	
Controller Engaged	A scale factor applied to the speed setpoints when the controller is in Engaged mode.
Controller Disengaged	A scale factor applied to the speed setpoints when the controller is in Disengaged mode.

Table 7-6 Operation Screen Setpoints (Continued)

Item	Description
IDLE REACTION	
Idle Reaction	Idle time is monitored for each axis. An idle timer counts up whenever an axis is in a hold position or when force is applied. When the timer gets to the set Idle Delay time, the Idle Reaction is triggered. Use this field to set the idle reaction. You can set the reaction to: • None • Set Relaxed Force • Disable Axis
Idle Delay	Use this field to set the idle timer. When the timer gets to the set time, the action selected in the Idle Reaction field is triggered.
Torque/Force Limit	Use this field to set a torque limit on each axis when in idle.
FAULT REACTION	
Fault On This Axis	The operation when this axis encounters a servo axis fault: • Stop At Force Limit or Torque Limit • Disable Servo (the servo drive will coast to a stop)
Fault On Other Axis	The operation when another servo axis faults: • Finish Active Move • Stop At Force Limit or Torque Limit • Disable Servo (the servo drive will coast to a stop)
Stopping Torque/Force Limit	The force limit used for the “Stop at Force Limit” operation.
Exit Engaged Mode After Fault	When enabled, the system will exit engaged mode if there is a fault.
Exit Engaged Mode When Uncalibrated	When enabled, the system will exit engaged mode if one or more axes become uncalibrated.

7.4.2 Positions Screen

The Positions screen of the Axis Setup is used to set stop positions along an axis' range of travel. The settings on the Positions screen include:

- Set the number of positions (2-4) to be used
- Set minimum and maximum position ranges
- Set a position location
- Name each position

Linear and rotary axes have some different setpoint values.

The Positions screen has the setpoints necessary for axis calibration. You can specify the calibration referencing method, referencing position, traverse speed and force limit, the position after calibration has completed, and hard stop configurations. A second reference check can also be used.

From the Axis Setup screen, select the **Positions** tag. Refer to Figure 7-7.

Figure 7-7 Positions Screen

The Operation screen configurations are described in Table 7-7.

Table 7-7 Positions Screen Setpoints

Item	Description
POSITION LIMITS	
Rotary Axis Type	This selection shows only if “Rotary” is the transmission output for an axis. Selections for the rotary axis type are: • Absolute • Modulus • Relative
Minimum Position	The minimum position value permitted in the motion profile setpoints.
Maximum Position	The maximum position value permitted in the motion profile setpoints.
POSITIONS	
Number Of Positions	Used to set the number of positions to which the axis must travel. There can be up to four positions for each axis.

Table 7-7 Positions Screen Setpoints (Continued)

Item	Description
Position 1 – 4: • Name • Target Position	Used to enter a position name and set the target (stop location) for the position. Values are entered in inches/millimeters for linear axes, and degrees/revolutions for rotary axes.
MOVES	
Number of Moves	Sets the number of profile moves used when in movement from one position to the next. Up to six steps can be used in a move from one position to the next.
Name/Start Position/End Position	These fields are used to name the moves and select up to six start and stop positions for each axis move. The positions are configured in the Positions area of the screen.
CALIBRATION	
Retain Calibration Through Power Cycle	This option can be used to retain the calibration of an axis during loss of communication event, such as: • Cycled power to controller • Disconnection of the EtherCAT • Disconnection of an encoder cable from the motor This should only be used for motors with an absolute encoder. If an axis uses an incremental encoder, this option is disabled and cannot be selected on the screen.
Configuration Referencing Method	Sets the method of calibration • Hard Stop • Set Position
Configuration Reference Position	If the Hard Stop referencing method is used, this sets the reference position to the location where the hard stop is found. If the Set Position referencing method is used, this sets the reference position to the location of the axis at that time.
Configuration Position After Completion	The axis moves to this position after the calibration sequence completes.
Configuration Traverse Speed	The axis speed used for all motion during calibration, other than contacting the hard stop during "Hard Stop" calibration.
Configuration Traverse Torque/Force Limit	The maximum available torque/force for the calibration sequence.
Hard Stop Configuration Travel Direction To Hard Stop	The direction the axis moves to engage a hard stop: • Positive • Negative

Table 7-7 Positions Screen Setpoints (Continued)

Item	Description
Hard Stop Configuration Hard Stop Contact Speed	Specifies the speed at which the axis engages the hard stop as it calibrates.
Hard Stop Configuration Hard Stop Pull Back Distance	The calibration sequence moves the axis to and from the hard stop three times to calculate reference position. This value sets the distance the axis pulls back each time the hard stop is engaged.
Hard Stop Configuration Hard Stop Detection Torque/Force	A hard stop position is recorded when the torque/force to move the axis equals this setpoint value as the hard stop is engaged.
Second Reference Check Enable	Used to enable a second reference check, which is done after the reference position has been found.
Second Reference Check Referencing Method	The method used for a second reference check: • Range of Motion • Hard Stop
Second Reference Check Reference Position	This position value is used together with the Referencing Method selection: • For Range of Motion, the axis moves to this position after calibration. • For Hard Stop, the axis looks for a hard stop at the specified position.

7.4.3 Mechanical Screen

The Mechanical screen of the Axis Setup is used to set axis limits and transmission settings. On the Mechanical screen you can:

- Set the axis direction for positive travel
- Set maximum torque, acceleration, and speed limits
- Configure transmission settings

Linear and rotary axes have some different setpoint values.

From the Axis Setup screen, select the **Mechanical** tag. Refer to Figure 7-8.

Figure 7-8 Mechanical Screen

The Mechanical screen configurations are described in Table 7-8.

Table 7-8 Mechanical Screen Setpoints

Item	Description
DIRECTION	
Motor Direction For Positive Travel	Used to select the positive direction of axis travel, speed and position values used correctly. • Clockwise • Counter-Clockwise
LIMITS	
Motor Rated Force/Torque	This field shows the axis motor's maximum force or torque: • Force - Linear • Torque - Rotary
Calculated Maximum Torque/Force	Maximum available torque/force calculated from the selected axis motor model parameters as well as the motor and linkage transmission values.
Maximum Torque/Force Limit	User-specified limit for use with all torque/force setpoints.
Calculated Maximum Acceleration	Maximum available acceleration calculated from the selected axis motor model parameters as well as the motor and linkage transmission values.

Table 7-8 Mechanical Screen Setpoints (Continued)

Item	Description
Maximum Acceleration	User-specified acceleration limit for use with the motion profile setpoints.
Calculated Maximum Speed	Maximum available speed calculated from the selected axis motor model parameters as well as the motor and linkage transmission values.
Maximum Speed	User-specified speed limit for use with all speed setpoints.

7.4.3.1 Transmission

For each axis, the transmission between the motor and load can be entered so that all motion setpoints, values, and curves are displayed as load values instead of motor values.

For example, a rotary motor has base units of revolutions, but it is driving a linear load through a ball screw. By entering the appropriate transmission, you can specify speed and distance in terms of mm of load travel, instead of motor revolutions.

Figure 7-9 shows an example of Transmission settings.

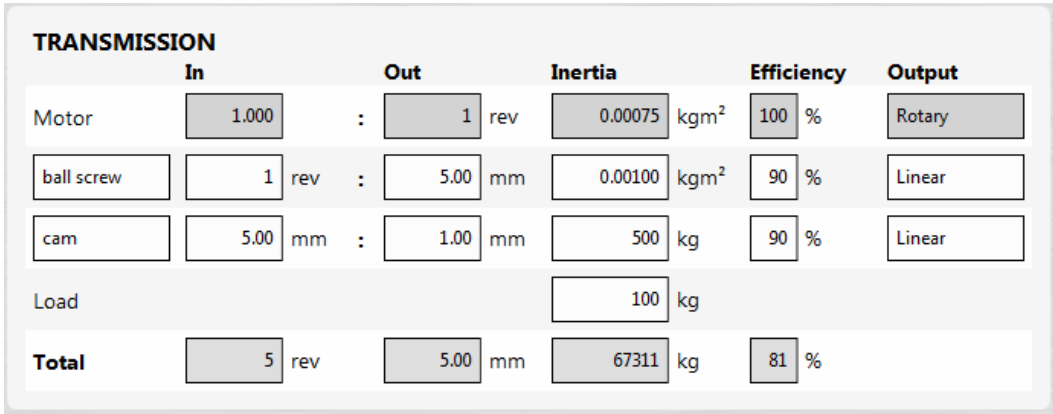


Figure 7-9 Transmission Example Settings

The entry and information fields for the Transmission area of the screen are described in Table 7-9.

Table 7-9 Transmission Field Descriptions

Transmission Area Fields	Description
Columns	
First Column	First column: the label for each row. Only stage 1 and stage 2 may be renamed by the user.
In	This is the input to this stage of the transmission. Motor input units are always in revolutions (revs). The other input units are determined by the output type of the previous stage. For the example in Figure 7-9, the input to the ball screw is 1 revolution.
Out	This is the output of this stage of the transmission. The units are determined by the output type of this stage. For the example in Figure 7-9, the output of the ball screw is 5mm (per unit input, in this case, 5mm out per 1 revolution in).
Inertia	This is inertia of this stage of the transmission, as seen at the input. For the example in Figure 7-9, the ball screw has a rotational inertia of 0.001 kgm2. The inertia of the nut riding on the ball screw is negligible and not included.
Efficiency	This is the force transmission efficiency of this stage. For the example in Figure 7-9, the cam stage has an efficiency of 90%. This means that when 10 kN is applied to the cam, only 9 kN is passed through to the load. When the cam ratio is included, a 10 kN force out of the ball screw nut would become (10 * 90% * 5) = 45 kN at the load.
Output	This is the output type of each stage, either Rotary or Linear. The input type of each stage is simply the output of the previous stage. Examples of the different possible transmission types are: • Rotary to Rotary: a gearbox • Rotary to Linear: a ball screw, roller screw, rack and pinion driven from the rotary side • Linear to Rotary: ball screw, roller screw, or rack and pinion driven from the linear side • Linear to linear: a linear cam
Rows	
Motor	Values in the Motor row are automatically loaded based on the selected motor, and hence cannot be directly modified by user.

Table 7-9 Transmission Field Descriptions (Continued)

Transmission Area Fields	Description
Stage 1 Stage 2 Load	These settings are application dependent and are specified by user.
Total	These fields show the calculated combined transmission, accounting for Motor, Stage 1, Stage 2, and Load: • Total In = (motor in) * (stage 1 in) * (stage 2 in) • Total Out = (motor out) * (stage 1 out) * (stage 2 out) • Total efficiency = (motor eff.) * (stage 1 eff.) * (stage 2 eff.) • Total inertia = total inertia as seen at the load, accounting for efficiency and inertia of each stage

7.4.4 Motor Screen

The Motor screen of the Axis Setup is used to identify configure setting for the motors used for each axis. From the Axis Setup screen, select the **Motor** tag. Refer to Figure 7-10.

Figure 7-10 Motor Screen

7.4.4.1 Motor Configuration

A new controller installation comes pre-loaded with all the motors available in that ASC software release. You can copy other motor files into the Motors folder or update motor files from a USB drive or network. These motor files will then be available for selection. You can also delete motor files from the Motors folder, so they will no longer be available for selection.

The motor configurations and indications are described in Table 7-10.

Table 7-10 Motor Configurations and Indications

Item	Description
Model	Model number of the servo motor used for that axis. (The operation parameters of each motor adjust some screen setpoints.)
Encoder Type	Used to set the encoder type for the servo motor. Selections include: • Not Selected • Resolver • Incremental TTL • SinCos HIPERFACE • SinCos EnDat 2.1 • Digital EnDat 2.1
Encoder Pulses Per Revolution	Used to set the encoder pulses necessary for one revolution of the motor. **NOTE:** This field is only shown when Incremental TTL is selected as the Encoder Type
Temperature Sensor	Used to set the temperature sensor used on the servo motor. The selections are: • PT1000 • PTC • KTY
Temperature Sensor Connection	Used to set the temperature sensor connection. The selections are: • Encoder 1 • Power Unit (only available when a BM5 mono servo drive is used) • None

Table 7-10 Motor Configurations and Indications (Continued)

Item	Description
Holding Brake	When enabled, adds brake inertia to hold the servo motor in position.
Parameter Download	Used to download the parameters for a servo motor. A notch position search is done during the parameter download, unless the motor .hps file specifies otherwise. The Download button is enabled only when all the conditions that follow are true: • The servo control is in Disabled mode. • At most, one axis is selected. • Motor options (motor model, encoder feedback, temperature sensor) are configured correctly. • Drive communication over the field bus is operational. • Drive configuration is either valid (from a previous download), or not ready, but there is no download or notch position search in progress. • The safety circuit is closed (gates, e-stop). If an axis has previously been calibrated, it is un-calibrated when the motor download is started. LEDs show the download status: • Writing • Measure • Verify • Valid

7.4.4.2 Motor Monitoring

The motor monitoring indications are described in Table 7-11.

Table 7-11 Motor Monitoring Indications

Item	Description
Motor Temperature	Shows the servo motor's temperature.
Motor I2T Actual Value	Shows the servo motor's I2T value (percentage).

7.4.4.3 Notch Position Search

Your controller system may also include a notch position search feature that lets you enable a notch position search during calibration and/or to do the search manually.

For motors with an incremental encoder, the events that follow happen:

- When the controller is restarted:
  - A notch position search must be completed.
  - The notch position search uses the calibrate permissions.
  - The Home, Move, Jog, and Override buttons are disabled until the notch position search has been completed.
- During motor download
  - The notch position search is always performed no matter what is in the motor .hps file.
  - Another notch position search is not needed unless the controller is restarted.

A Notch Position Search panel may show on Motor tab screen of the Axis Setup. Refer to Figure 7-11.

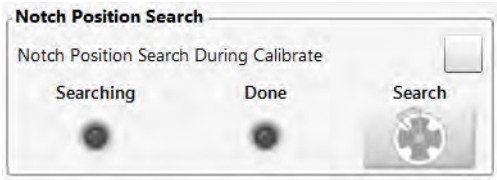


Figure 7-11 Notch Position Search Panel

Touch the **Notch Position During Calibrate** checkbox, if you want the notch search done during the motor calibration.

Touch the **Search** button if you want the notch search done manually.

NOTE: A user must be logged in at the correct security level to use the Search button. This security level is set in the Screen Security, Servo tab (Configuration - Advanced security group).

For motors without an incremental encoder, the notch position is done during the motor download with the use of the motor .hps file or the selected option on HMI. No separate notch position search is necessary. The Notch Position Search panel is not shown.

7.4.4.4 Motor Download

For a system in which the servo motors running with the Altanium were not sent to the Husky factory for testing and commissioning, a motor download must be performed to load the motor parameters to the controller and find a notch position. When the motor has been connected to the Altanium, navigate to the Motor screen of Axis Setup. Make sure that the motor configurations are set and valid. Touch the **Download** button to initiate the download. When the download is complete, the Valid LED will illuminate.

7.5 Motion Profiles Screen

The Motion Profiles screen is used to monitor the motion profiles of the servo axes in the system (refer to Figure 7-12). The motion profiles chart shows the traces for one or more selected axes, axes in a group, or all axes. Axis selections are made with the Axis Selector Bar (refer to Section 7.1.2). You can also select to see one or more moves in the MOVE Selection Bar

Motion profile traces are measured in Position Deviation, Velocity, and Force along the chart's Y axis. The position can be shown on the Y axis when the X axis is set to Time. The chart's X axis can be set for Position or Time.

Touch any position along a trace on the chart and that trace and position are identified on the screen.

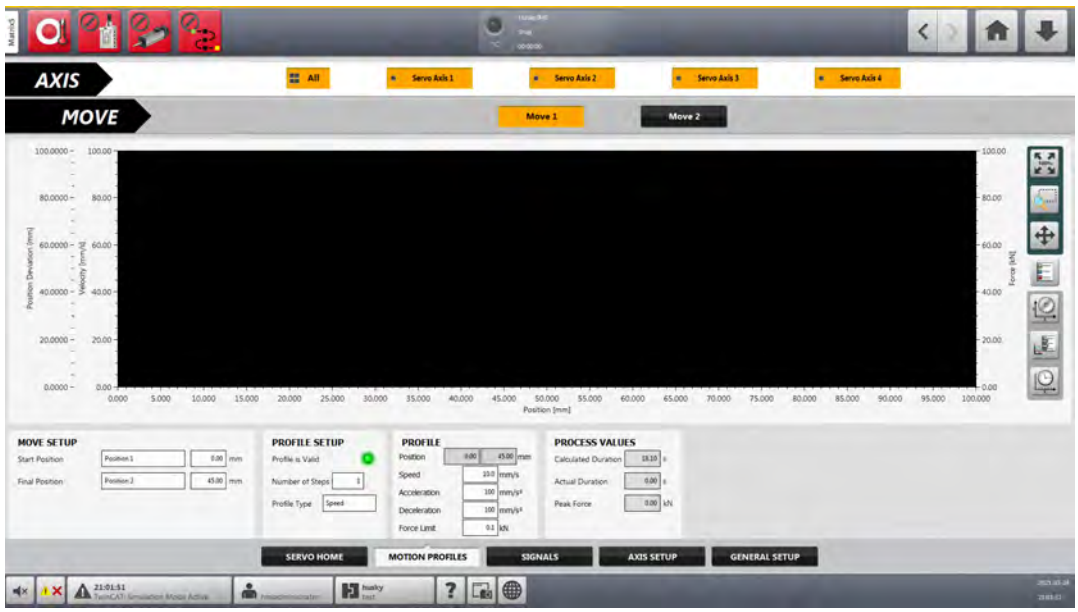


Figure 7-12 Motion Profiles Screen

7.5.1 Motion Profiles Screen Setpoints

The Motion Profiles screen setpoints are shown in Table 7-12.

Table 7-12 MOTION PROFILES Screen Setpoints

Item	Description
MOVE SETUP	
Start Position	Use this field to enter the axis start position. • Rotary - degrees • Linear - mm/in
Final Position	Use this field to enter the axis final position. • Rotary - degrees • Linear - mm/in
PROFILE SETUP	
Profile is Valid	If the open motion profile or close motion profile is valid this indicator illuminates. If the profile is not valid, the last-used valid profile will remain active.
Number of Steps	Sets the number of profile steps used when in movement from one position to the next. Up to four steps can be used in a move from one position to the next.
Profile Type	There are three configurable profile types: • Speed - Lets you set the Speed, Acceleration, and Deceleration (shown in the Profile area of the screen) • Time (Minimize Velocity) - Lets you set the time duration (shown in the Profile area of the screen) • Time (Minimize Acceleration) - Lets you set the time duration (shown in the Profile area of the screen)
PROFILE	
Position	Shows the start and stop locations for the selected position. The left field shows the axis position before it starts the move to the selected position. The right field shows the target location of the selected position. If more than one step is used to move to the selected position, then more fields become available to let you enter distance values for those steps.
Speed	Sets the speed of the step. **NOTE:** It is possible that the step will not get to this speed, because of travel distance and acceleration/deceleration setpoints.
Acceleration	Set the acceleration of the step. **NOTE:** It is possible that the step will not get to this acceleration setpoint, because of travel distance of the step.

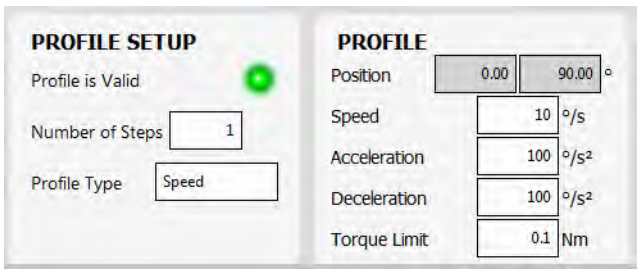
Table 7-12 MOTION PROFILES Screen Setpoints (Continued)

Item	Description
Deceleration	Sets the deceleration of the step. **NOTE:** It is possible that the step will not get to this deceleration setpoint, because of travel distance of the step.
Torque/Force Limit	Sets the maximum torque/force limit applied to each step during the movement. Equivalent to speed, acceleration, and deceleration, this torque/force limit is specified per step.
PROCESS VALUES	
Calculated Duration	This is a time estimate that is calculated from the parameters set in the Motion Profile for the selected axes.
Actual Duration	This is the actual time recorded for the axis to get to the target position.
Peak Torque/Force	This is the maximum torque/force that was necessary to complete the selected move of an axis. You can only see the torque/force value for one axis at a time. If more than one axis is selected in the Axis Selector Bar, no value will be shown in the field. **NOTE:** When dashes (---) are shown in a field, then one or more of the axes in the selection have a different value for that setpoint.

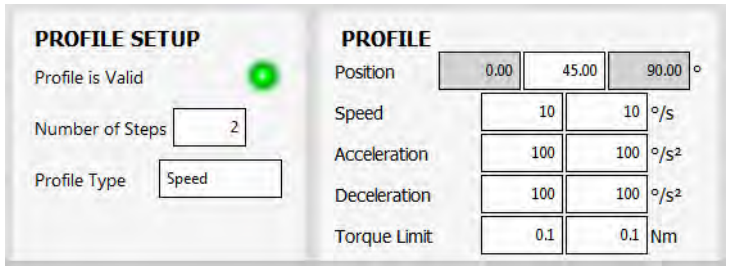
7.5.2 Number of Steps

Up to four steps can be used when going from one axis position to the next in the travel sequence. Locations can be specified between the start position and the target position where changes can be made to the movement speed, acceleration, deceleration, and force limit. For example, a location can be set where the axis slows before it gets to the target position.

A one-step movement is shown here for an axis movement to Position 2.



A two-step movement is shown here for an axis movement to Position 2.



7.5.3 Chart View and Adjustment Selections

Table 7-13 shows a list of the chart view and adjustment selections used on the Motion Profiles screen.

Table 7-13 Chart View and Adjustment Selections

Button	Description
	Returns the chart view to 100%.
	Lets you magnify a specific area of the chart.
	Lets you adjust the chart view when magnified.
	Identifies the chart traces.
	Used to set the scale for the chart traces that follow: • Position (when Position is selected for the chart X axis) • Time (when Time is selected for the chart X axis) • Force • Position Deviation • Velocity

Table 7-13 Chart View and Adjustment Selections (Continued)

Button	Description
	Lets you select the traces that are seen on the chart: • Non-Inertial Torque/Force • Position Deviation • Total Torque/Force • Velocity • Velocity Limit • Velocity Setpoint
 	Toggles between Time and Position on the chart X axis.

Figure 7-13 is an example of a motion profile with the traces identified.

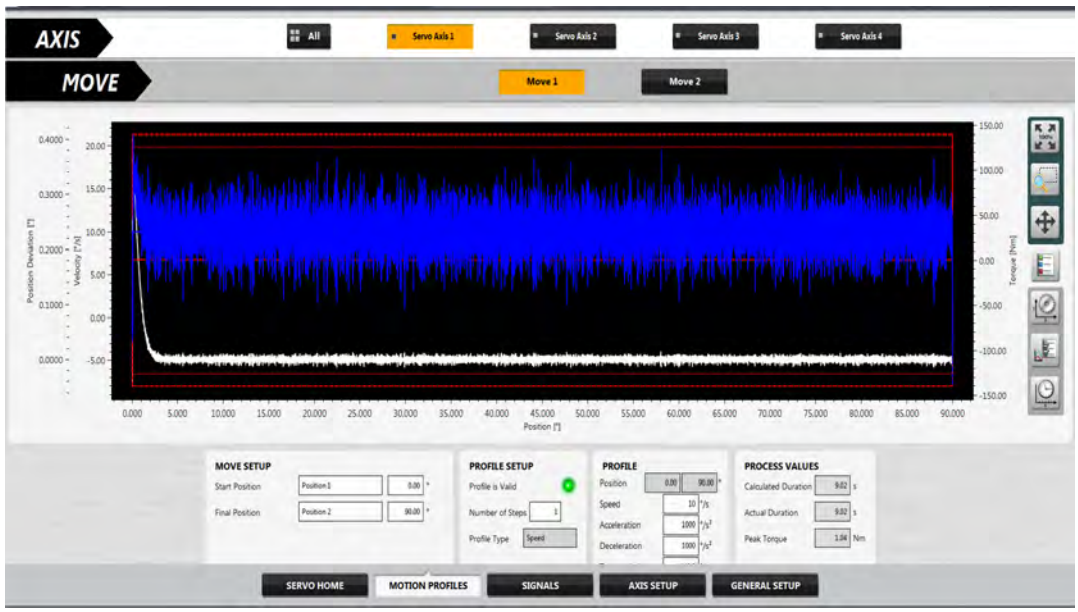


Figure 7-13 Motion Profile Example

7.6 Signals Screens

There are two Signals screens:

- Permissions
- Triggers

The sections that follow identify and describe the settings on each screen.

7.6.1 Permissions

From the Signals screen, select the **Permissions** tab if, necessary. Refer to Figure 7-14.

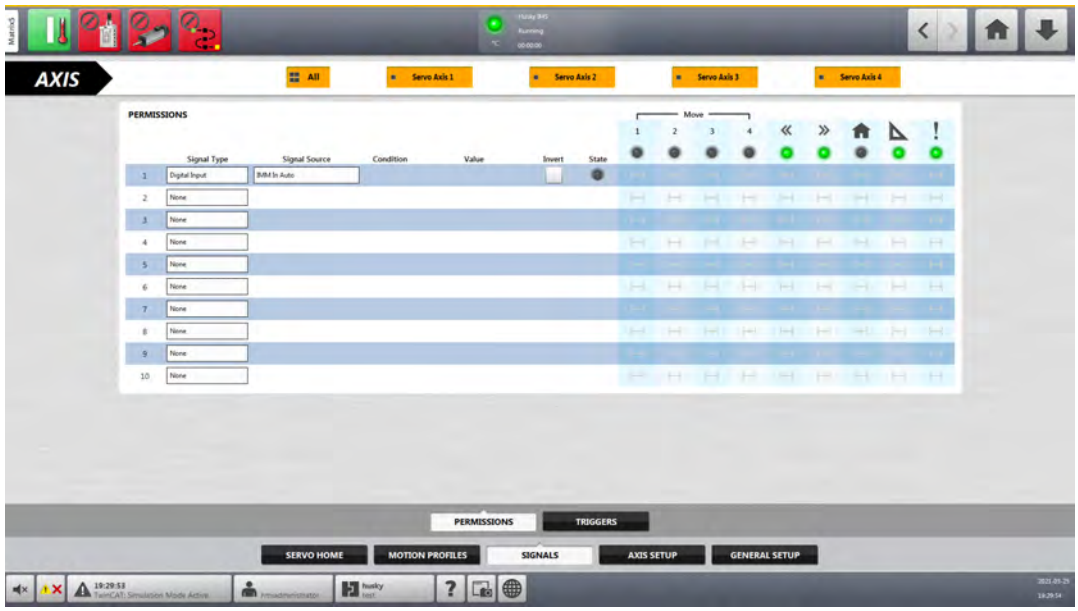


Figure 7-14 Permissions Screen

Use the Permissions screen to set permissions for one or more axes to move to the next position in their travel sequence. Some of the permission conditions include signals from digital inputs, completed moves by one or more axes, and UltraSync-E conditions (if installed).

The permission selections are used if the controller is in Engaged mode or Disengaged mode.

The setpoint fields on this screen are context sensitive. Each signal type has its own related setpoints. For example, if the signal type is Servo Axis, then the Signal Source, Condition and Value setpoint fields are available to select. If the signal type is a Digital Input, only the Signal Source setpoint is available to select.

7.6.1.1 Permission Selections

The Table 7-14 shows the context-sensitive permission signal selections for each Signal Type on the Permissions screen. These selections are the same as the signal selections used on the Triggers screen (refer to Section 7.6.2).

Table 7-14 Permissions and Triggers Signal Type Selections

Signal Type	Signal	Condition	Position
None	-	-	-
Digital Input	Digital Input 1 - 26 The first five digital inputs may be factory set for the features installed on your controller, as shown here: • IMM In Auto • External At Temperature • UltraSync-E Valve Gates Open Command • UltraSync-E Valve Gates Close Command • External Permit Calibration	-	-
Controller Function	• Fault Stop Immediately • Fault Stop End Of Cycle • Calibration Active • Process Outside Limit • All Axes At Standstill	-	-
Servo Axis	Select axis (1, 2, 3, 4, 5, or 6) **NOTE:** Number of axes depends on the system. Up to six are available.	Position < Position >	Set by the user
		Position =	• Position 1 • Position 2 • Position 3 • Position 4
Servo Group	Group selected by user	Position < Position >	Set by the user
		Position =	• Position 1 • Position 2 • Position 3 • Position 4
Servo Function	• Ready and Engaged • Override Active • All Axes At Home Position • All Axes Calibrated	-	-

Table 7-14 Permissions and Triggers Signal Type Selections (Continued)

Signal Type	Signal	Condition	Position
Configurable Signal	Configurable signal 1 - 18	-	-
UltraSync-E (if installed)	• UltraSync-E Valve Gates At Close • UltraSync-E Valve Gates At Open • UltraSync-E Ready and Engaged • UltraSync-E Valve Gates Position	-	-
Sequencer	• Sequencer In Auto • Home Command	-	-
	• Custom Sequence	• At Step • Before Step • After Step	• Home • Step 1 - 18
Temperature Control	At Temperature	-	-
Ethernet Digital Input	• IMM In Auto • External At Temperature • UltraSync-E Valve Gates Open Command • UltraSync-E Valve Gates Close Command • External Permit UltraSync-E Calibration • Servo Control Lock Request • Axes To Home Position • Axis # Motion Permission (#=1-4) • Axis # Index (#=1-4) • Axis # Jog Forward (#=1-4) • Axis # Jog Back (#=1-4)	-	-

A digital input or configurable signal can be selected as a Signal Type for a permission condition. When selected, a digital or configurable signal must be selected in the Signal Source column. If the selected input or signal is in operation, then the permission is TRUE.

If Servo Function is selected as the Signal Type for a permission condition, then Ready And Engaged or Override Active may be selected in the Signal Type column. The permission is TRUE when the servo is ready and engaged for operation or if Override mode is enabled.

If UltraSync-E is selected as the Signal Type for a permission condition, then UltraSync-E Valve Gates At Close, UltraSync-E Valve Gates At Open, or UltraSync-E Ready And Engaged may be selected in the Signal column. The selected signal makes the permission TRUE if the UltraSync-E valve gates are open or closed, or if UltraSync-E is ready and engaged for operation. For information about the UltraSync-E, refer to the UltraSync-E User Guide.

If Servo Axis or Servo Group is selected as the Signal Type for a permission condition, then an axis or a group must be selected in the Signal Type column. If “Position =” is selected in the Condition column, then, in the Value column, select the position that the other axis or group of axes must be at for the permission to be TRUE.

For example, Axis 2 is to move from Position 1 to Position 2 in its travel sequence, but must wait for Axis 1 to complete its move from Position 3 to Position 4 in its travel sequence. The permission selections for Axis 2 would look like what follows:

Signal Type	Signal Source	Condition	Value
Servo Axis	Servo Axis 1	Position =	Position 4

When Axis1 has arrived at Position 4 of its travel sequence, then Axis 2 can start its move to Position 2.

A permission can also be set for an axis or group when another axis or group is before or after, but not at, a specified position. If “Position <” or “Position >” is selected in the Condition column, then enter a number for the Value column. The number is an absolute position along another axis' range of travel.

If “Position <” is selected, then the permission is TRUE if the selected axis is less than the number entered in its range of travel. If “Position >” is selected, then the permission is TRUE if the selected axis is more than the number entered in its range of travel.

For example, Axis 2 is to move from Position 1 to Position 2 in its travel sequence, but can move only if Axis 1 is some distance before 200 mm in its range of travel. The permission selections for Axis 2 would look like what follows:

Signal Type	Signal Source	Condition	Value
Servo Axis	Servo Axis 1	Position <	200.00 mm

Axis 2 can start or continue the move if the movement occurs before Axis 1 gets to 200 mm in its range of travel.

7.6.1.2 Move, Jog, Home, Calibrate, and Override

In the Move columns of the Permissions screen, select if an axis or group requires a specified permission to be TRUE for a move to start or continue. These start and continue selections are set for axis or group movements from position to position, and also for jog (fast), home, calibration, and override movements.

Table 7-15 shows the Start and Continue icon selections.

Table 7-15 Move Icons

Icon	Name	Description
	Start Move	Shows that the related permission condition must be obeyed at the start of the operation. When the operation starts, the condition is no longer required.
	Entire Move	Shows that the related permission condition must be obeyed at the start of, and during the operation. If the permission condition is lost (not found) during the operation, a Permission Lost fault condition is recorded on the Alarm Summary screen. This stops the operation movement and does not start the movement again if the condition is found or after the fault condition is acknowledged.
	Until In Window	Shows that the related permission condition must be obeyed to start the move and for the duration of the operation, until the axis enters the At-Position window for its target move.

7.6.1.3 State Indicators

The green indicators show when a permission (state) is TRUE. For example, if Digital Input is selected as a Signal Type, and Digital Input 2 is selected as a Signal Source, then a green indicator shows when Digital Input 2 supplies a signal.

7.6.1.4 Invert

The Invert checkbox column lets you set a permission to the opposite of the selections. For example, if Digital Input is selected as a Signal Type, Digital Input 2 is selected as a Signal Source, and the Invert checkbox is selected, the permission is TRUE when there is no signal from Digital Input 2.

7.6.2 Triggers

Triggers are used to start actions when in Engaged mode. A trigger starts the configured action when:

- In Engaged mode
- A trigger start position requirement is satisfied
- A trigger signal is received
- The permission matrix rules let the action be started
- The axis is not in the process of a Move or Home action

There are two sets of configurations on the Triggers screen, Trigger Actions and Trigger Signals. Together with setting a Trigger Type and Delay (if necessary) actions can be started.

From the Signals screen, select the **Triggers** tab, if necessary. Refer to Figure 7-15.

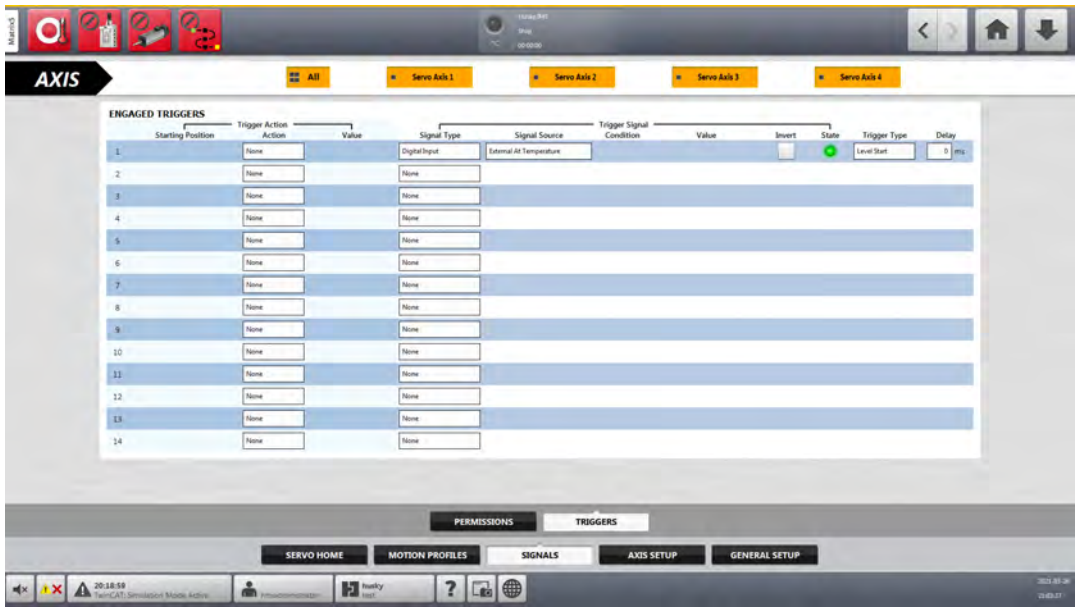


Figure 7-15 Triggers Screen

7.6.2.1 Trigger Actions

These Trigger Actions columns, at the left of the screen, are used to configure the axes actions. Use the Action column to select the action that one or more axes will do when a Trigger Signal is satisfied (TRUE). When an Action is selected, fields for the Starting Position and the Value show in their related columns. The Starting Position column lets you select what position one or more axes must be at before the action can start. The Value column lets you select a value that is related to the Action selected. The sections that follow list the Action, Starting Position, and Value from which you can select.

7.6.2.1.1 Action Column

The actions that can be started by a trigger are:

- Move
- Apply (force or torque)
- Set Relax Limit
- Home
- Jog Negative or Jog Positive
- Calibrate
- Disable Axis

When the Trigger Signal type is set to Level Hold, the action will be cancelled if the trigger signal is lost. Otherwise, the action continues regardless of the trigger signal state.

7.6.2.1.2 Starting Position Column

An action is only triggered if the Trigger Starting Position condition is satisfied. The selections for this configuration are:

- Any positions

  The action can be triggered regardless of axis position.
- At Position - Position x (x = 1, 2, 3, or 4)

  The action can only be triggered when the axis is at the specified position.
- During Move To - Position X (x = 1, 2, 3, 4, 5, or 6)

  The action can be triggered when the axis is moving to, or already at the specified position.

7.6.2.1.3 Value Column

Some Value fields will show with their related Action selections, while some Actions have no related values. Table 7-16 shows the values with their related Action selection,

Table 7-16 Trigger Values Selections

Action	Values
Move	Move 1 Move 2 Move 3 Move 4 Move 5 Move 6 These are configured on the Positions screen of the Axis Setup. Refer to Section 7.4.2.
Apply	Enter an applied force (kN or lbf).
Set relax Limit	Enter a relaxed force (kN or lbf).
Home	No value

Table 7-16 Trigger Values Selections (Continued)

Action	Values
Jog Negative / Jog Positive	No value
Calibrate	No Value
Disable Axis	No Value

7.6.2.2 Trigger Signals

The Trigger Signal columns of the screen are configured signals that, when TRUE, start the Trigger Actions. These signal configurations are the same as those on the Permissions screen. Refer to Table 7-14.

There are Invert checkboxes for each trigger that lets you set a trigger to the opposite of the configurations. State indicators show when a trigger is TRUE.

The Trigger Signal is configured with a standard Signal, and the additional trigger options for Trigger Type and Trigger Delay. The trigger delay resets when:

- Trigger signal is false (this is standard behavior)
- Trigger starting position requirement has not been satisfied
- Not in engaged mode

7.6.2.3 Trigger Type and Delay

With trigger configuration, you can select a Trigger Type that lets you select what part of the signal wave form to start the action. Touch the **Trigger Type** field to see the selections (refer to Figure 7-16).

Figure 7-16 Trigger Type Dialog

The Trigger Type selections are described in Table 7-17.

Table 7-17 Trigger Type Selections

Trigger Type	Description
Level Start	Only while the signal state is TRUE.
Level Hold	With a signal level held (TRUE), the action continues. If the signal level drops (changes to FALSE) during the action, then the action is cancelled.
Rising Edge	When the signal changes from FALSE to TRUE.
Falling Edge	When the signal changes from TRUE to FALSE.

For the Level Hold trigger type, the action is cancelled when the signal is lost. For the other triggered types, they do not cancel when the signal stops. For example, the "Apply" signal is set as a "Level Start" trigger. When the signal is at a level status, the axis does the "Apply" operation. When the signal stops, the axis continues to apply the force. The operation does not stop when the signal stops.

Axes must be compatible for a group to be able to have the move triggers changed. If axes are not compatible, no settings are changeable, and the values are not specified.

An action can start immediately with the Trigger Type selected or you can set a time delay that will start the action when the time has completed. The time delay starts when the Trigger Type that you selected is TRUE.

Table 7-18 shows when the time delay starts with the Trigger Type selected.

To add a delay to the selected Trigger Type, touch the field in the **Delay** column and enter a time (ms).

Table 7-18 Trigger Types

Item	Delay Description
Level Start	• Delay starts when the signal state is TRUE • Delay continues counting even if the signal state becomes FALSE
Level Hold	• Delay starts when the signal state is TRUE • Delay resets when the signal state is FALSE
Rising Edge	• Delay starts when the signal state goes from FALSE to TRUE • Delay continues counting even if the signal state becomes FALSE
Falling Edge	• Delay starts when the signal state goes from TRUE to FALSE • Delay continues counting even if the signal state becomes FALSE
The trigger signal output is set TRUE when the Delay has completed. The trigger signal output is set FALSE when: • For Level Start or Level Hold, when the signal state becomes FALSE • For Rising edge or Falling edge, immediately (after 1 ms)	

Chapter 8 Sequencer

As described in Chapter 7, you can set each axis open and close operation with different signal types, their related configurations, and time delays. You can also use the Sequencer application to trigger axis operations. The Sequencer is a state machine that goes from step to step when the conditions for each step are TRUE. The Sequencer operates independently from the other operations in the controller.

The Sequencer has four screens that let you enter specific signals and set a sequence of steps, or matrix, using those signals.

Each step in the Sequencer matrix is defined by one signal or a group of signals. With the use of Boolean logic, the signals in a group are AND'd together, so that when all conditions in the group are TRUE, the sequencer goes to the next step.

The Sequencer lets you step through the molding process in a particular sequence. You can use the signals associated with each step to use as outputs. You can use these Sequencer outputs to help control the molding process.

8.1 Sequencer Mode Buttons

The Sequencer mode drop-down buttons are shown at the top of all Altanium ASC screens. The buttons let you change the Sequencer mode as described in Table 8-1.

Table 8-1 Sequencer Mode Buttons

Button	Description
	**Auto** Manual control buttons are disabled. Sequencer is enabled if the permissions checked on the options screen are true.
	**Manual** Manual control buttons are active.
	**Disable** Sequencer is disabled.

If the Sequencer mode drop-down buttons do not show at the upper left corner of your screen, do the steps that follow:

1. Touch the **Sequencer** button near the top of the Home screen.

2. Touch the **Options** tab.
3. In the Option area of the screen, touch the **Activate Sequencer** checkbox so the check mark shows.

   The Sequencer mode drop-down buttons will show. Refer to Figure 8-1.

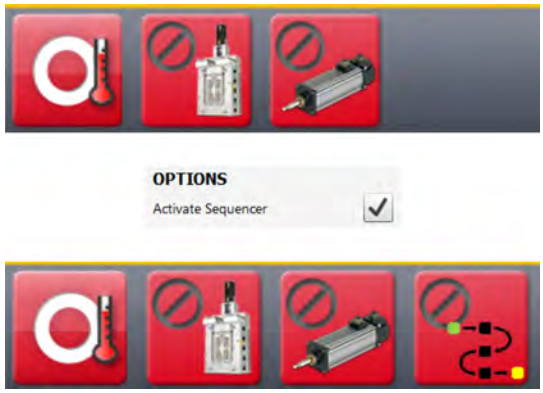


Figure 8-1 Show Sequencer Buttons (Activate Sequencer)

8.2 Sequence Screen

To see the Sequencer screens, touch the **Sequencer** button on the Altanium Home screen.

The Sequence screen shows. Refer to Figure 8-2.

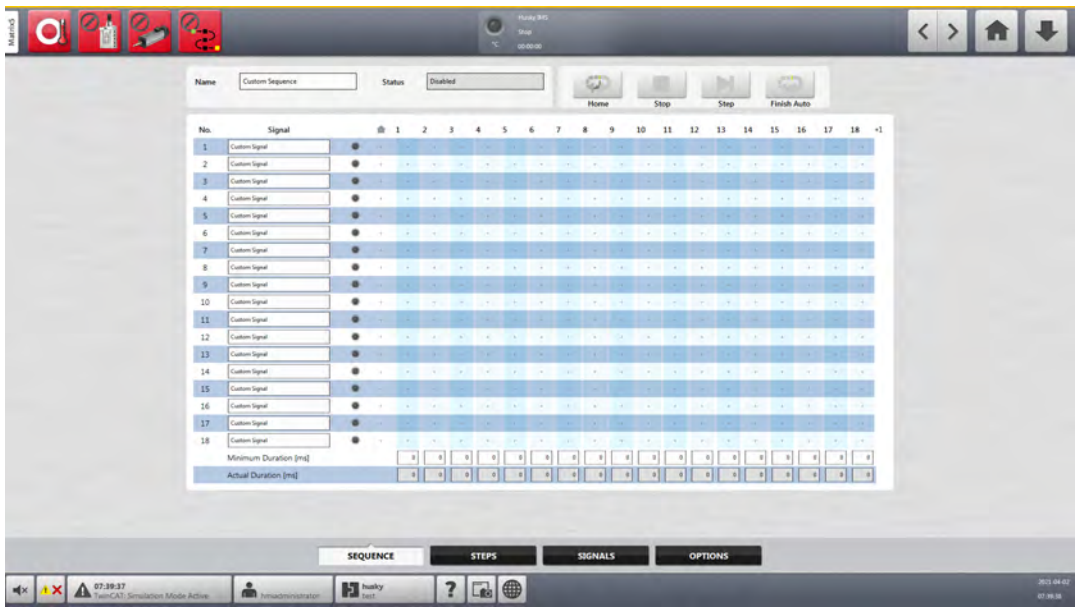


Figure 8-2 Sequence Screen

The sequence matrix is in the middle of the Sequence screen. The matrix shows that you can enter a maximum of 18 steps (listed horizontally across the top of the screen) and 18 signals (listed vertically down the left side of the screen).

The indicator to the right of the signal names shows the status of the signal. It is green when the level is high (TRUE).

Each step consists of one or more signals. You must enter the signals (1 through 18), as necessary, that you will use in the step. Refer to Section 8.5.

After you enter all the custom signals (Section 8.5), you can enter values in the sequence matrix. When you touch a cell of the matrix, a dialog window will show. Refer to Figure 8-3.

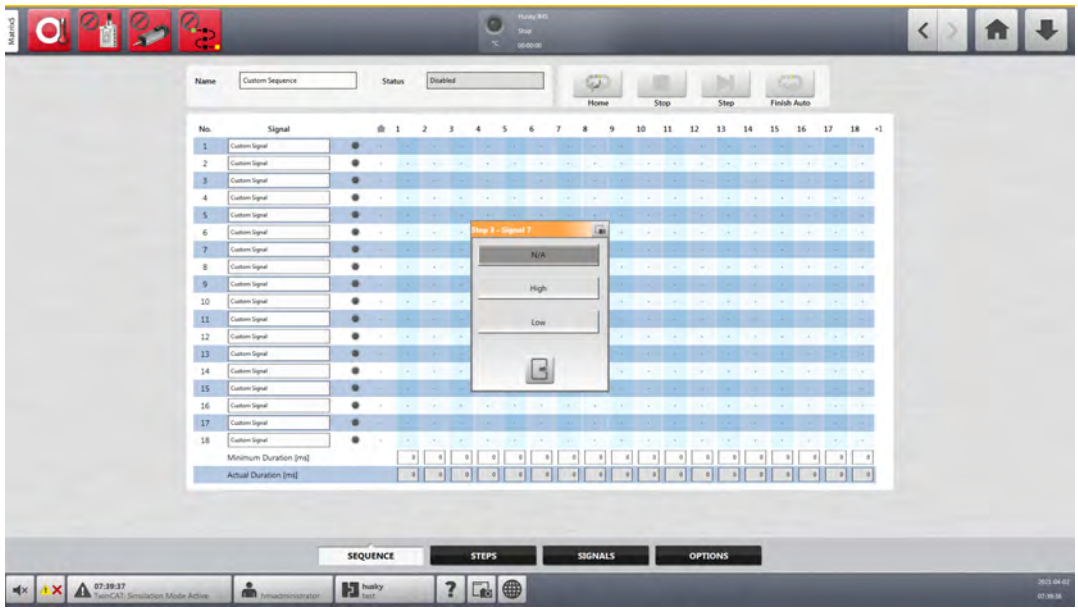


Figure 8-3 Setting Signals to High, Low, or N/A

You can choose N/A (Not Applicable), High, or Low. When you select High or Low, a 1 or 0 will show in that cell. Table 8-2 describes the selections.

Table 8-2 Signal-Step Setting

Selection	Description	Icon
N/A (Not Applicable)	Signal is not included for evaluation for sequence step transition.	·
High	Signal must be TRUE as part of the evaluation for sequence step transition.	1
Low	Signal must be FALSE as part of the evaluation for sequence step transition.	0

To move from step to step in the sequence, the signals with a 1 in the step must be active (TRUE/HIGH) and the signals with a 0 must be inactive (FALSE/LOW).

For example, to move from step 2 to step 3 in Figure 8-4, the 'IMM in Auto' signal must be active (TRUE/HIGH) and the 'Mold is Clamped' signal must be active (TRUE/HIGH). After the minimum duration time has expired (if set), the sequencer moves to step 3.

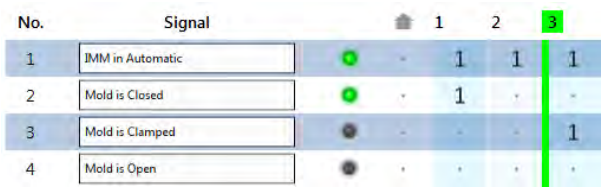


Figure 8-4 Sequencer Step Example

The Minimum Duration field at the bottom of each step column makes sure that the sequence stays in a step for the minimum time that you enter. The Actual Duration of each step (when in operation) is shown below the Minimum Duration field.

8.3 Manual Control Buttons

The control buttons on the Sequence screen let you manually move (step) through the sequence matrix. The buttons are described in Table 8-3.

Table 8-3 Manual Control Buttons

Button	Description
 **Home**	Sets the step to the Home position.
 **Stop**	Stops the active command (Step or Finish Auto) and the sequence remains at the current active step.
 **Step**	The sequencer starts to monitor the conditions to move to the next step and moves when these conditions are TRUE.
 **Finish Auto**	Starts a single auto sequence which continues from the active step through the steps that remain in the sequence, until it gets back to Home. This will depend on the auto enabled setting of the steps. The auto permissions that are checked on the options screen must be TRUE.

8.4 Steps Screen

On the Sequencer Steps screen you can set specific values for each step (1 through 18). Touch the **Steps** tab to see the Steps screen. Refer to Figure 8-5.

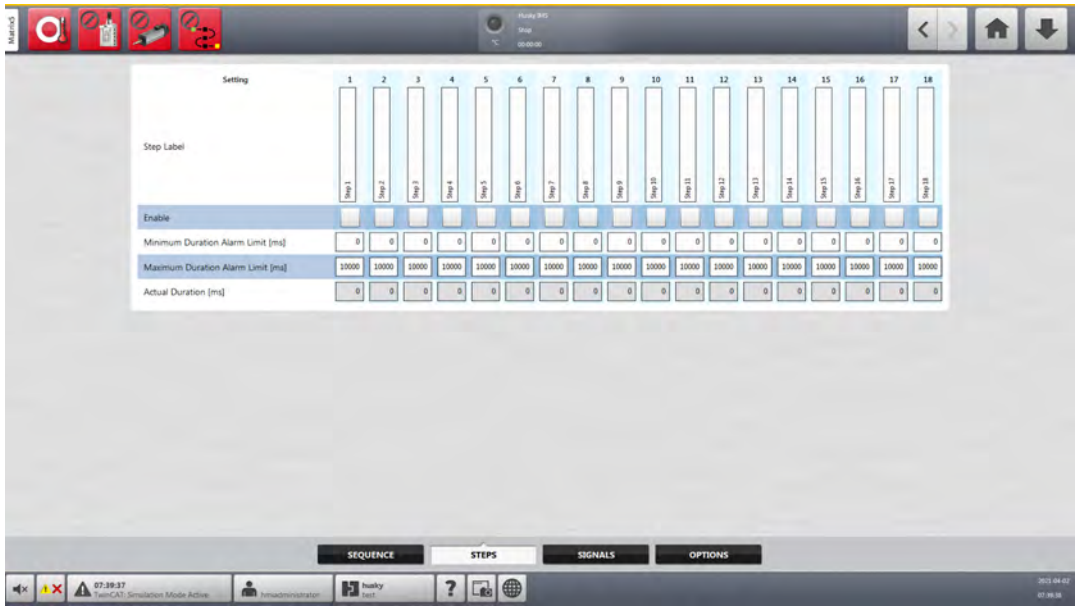


Figure 8-5 Steps Screen

Table 8-4 shows the values that you can set on the Steps screen.

Table 8-4 Steps Screen Settings

Item	Description
Step Label	Lets you give a name to each step. Touch the step label box and you can type in the name of the step.
Enable (checkbox)	Click a step's checkbox to enable the step. When a check mark shows in the checkbox, the step is enabled and included in the sequence.
Minimum Duration Alarm Limit [ms]	This is a watchdog timer. When the step duration is less than the minimum limit, the alarm that follows is generated: Sequence Too Fast (Step: ?, Duration: ? ms) A Fault Stop Immediate condition and alarm are given, and the sequencer switches from Auto mode to Manual. If the limit is set to 0, no limit is set.

Table 8-4 Steps Screen Settings (Continued)

Item	Description
Maximum Duration Alarm Limit [ms]	This is a watchdog timer. When the step duration is more than the maximum limit, the alarm that follows is generated: Sequence Timeout (Step: ?, Duration: ? ms) A Fault Stop Immediate condition and alarm are given, and the sequencer switches from Auto mode to Manual. If the limit is set to 0, no limit is set.
Actual Duration [ms]	The actual time that the sequence stays in the step.

8.5 Signals Screen

The Signals screen is used to configure the signals that will be used in the sequencer matrix. Touch the **Signals** tab to see the Signals screen. Refer to Figure 8-6.

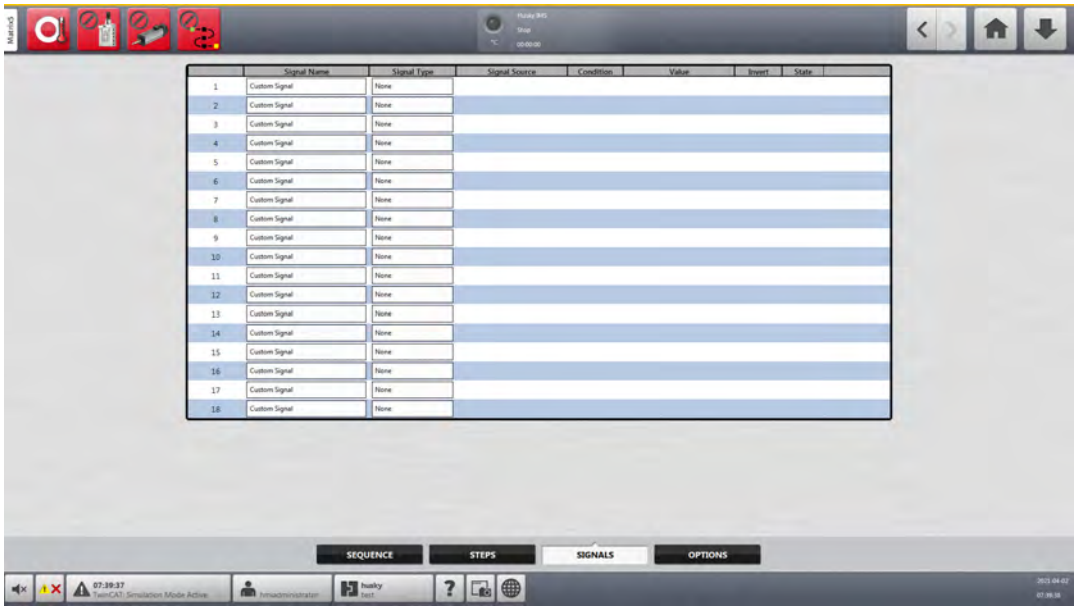


Figure 8-6 Signals Screen

8.5.1 Signal Configurations

To set a signal that will be used in the sequencer matrix, do the steps that follow:

1. Touch the field in the **Signal Name** column to give a name to the new signal.
   The Name dialog window shows. Refer to Figure 8-7.

Figure 8-7 Signal Name

2. Type a name for the signal you want to configure and touch the **Accept** button.
3. Touch the field in the **Signal Type** column for the signal.
   The Signal Type dialog window shows. Refer to Figure 8-8.
4. Touch one of the buttons in the dialog window to select a signal type.

Figure 8-8 Signal Type Dialog Window

If a Signal Source, Condition, and Value are related to the Signal Type, they are shown in the screen's table.

5. Touch each field and make the selections to set the condition.

   The Signal Type selections and their related signals are shown in Table 8-5.

Table 8-5 Signal Type Selections and Parameters

Signal Type	Signal	Condition	Position
None	-	-	-
Digital Input	Digital Input 1 - 26	-	-
Controller Function	• Fault Stop Immediately • Fault Stop End Of Cycle • Calibration Active • Process Outside Limit • All Axes At Standstill	-	-

Table 8-5 Signal Type Selections and Parameters (Continued)

Signal Type	Signal	Condition	Position
Servo Axis	Select an axis	Position < Position >	Set by user (in/mm for linear; °/rev for rotary)
		Position =	• Position 1 • Position 2 • Position 3 • Position 4
Servo Group	Select a group	Position < Position >	Set by user (in/mm for linear; °/rev for rotary)
		Position =	• Position 1 • Position 2 • Position 3 • Position 4
Servo Function	• Ready And Engaged • Override Active • All Axes At Home Position • All Axes Calibrated		
Configurable Signal	Configurable signal 1 - 18	-	-
UltraSync-E (if installed)	• UltraSync-E Valve Gates At Close • UltraSync-E Valve Gates At Open • UltraSync-E Ready and Engaged • UltraSync-E Valve Gates Position	-	-
Sequencer	• Sequencer In Auto • Home Command	-	-
	• Custom Sequence	• At Step • Before Step • After Step	• Home • Step 1 - 18
Temperature Control	At Temperature	-	-

6. If necessary, you can invert the signal type and related configurations when you touch the **Invert** checkbox.

NOTE: The indicator at the right of the configured signal dialog window illuminates if the signal is TRUE.

7. Do step 1 through step 6 again for each signal that is necessary to configure for your sequence matrix.

8.6 Options Screen

The Options screen lets you enable the conditions that must be true before:

- The sequencer will operate in AUTO mode
- The manual reset auto will operate
- The Finish Auto will operate

Touch the **Options** tab to see the Options screen. Refer to Figure 8-9.

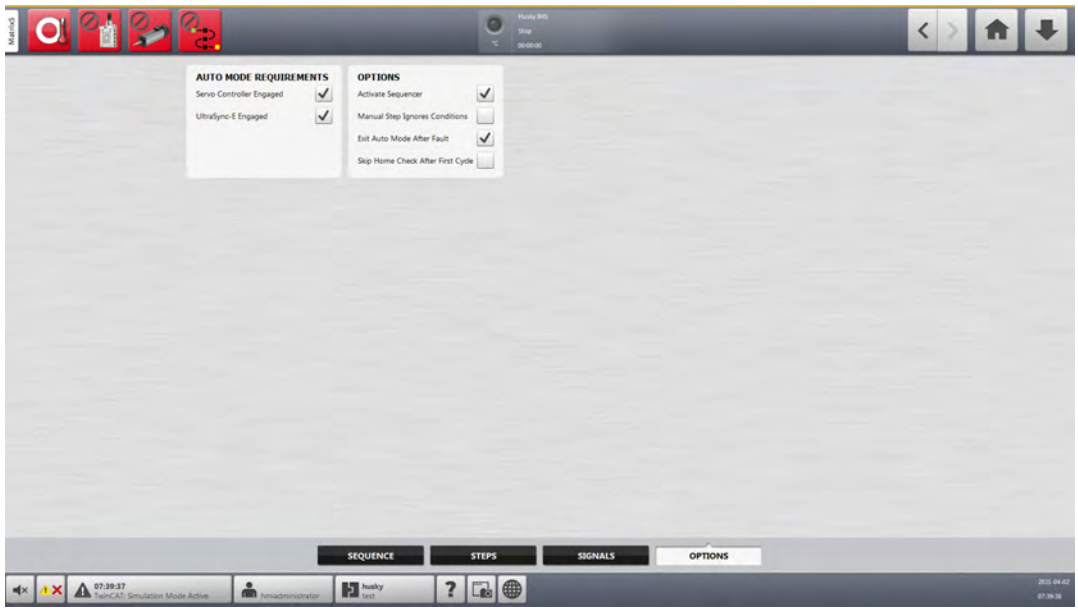


Figure 8-9 Options Screen

Touch the checkbox next to the option that you want to enable. A check mark shows in the checkbox if an option is enabled.

Table 8-6 describes the options that you can enable.

Table 8-6 Option Screen Settings

Item	Description
UltraShot in Auto (if installed)	When enabled, the UltraShot must be in Auto mode before the Sequencer can be changed to Auto mode.
Servo Controller Engaged	When enabled, the servo controller must be in Engaged mode before the Sequencer can be changed to Auto mode. When not enabled, the servo controller does not have to be in Engaged mode for the Sequencer to be changed to Auto mode. The Sequencer can run independently.
UltraSync-E Engaged (if installed)	When enabled, the UltraSync-E must be in Engaged mode before the Sequencer can be changed to Auto mode. When not enabled, the UltraSync-E does not have to be in Engaged mode for the Sequencer to be changed to Auto mode. The Sequencer can run independently.
Activate Sequencer	When enabled, this option activates the Sequencer function and causes the Sequencer mode buttons to be displayed in the top banner.
Manual Step Ignores Conditions	The signals configured in the Sequencer matrix are ignored when this option is enabled. The “Step” button can be used to freely move the steps forward in the Sequencer matrix.
Exit Auto Mode After Fault	When enabled (default), the sequencer stops Auto mode in the event of a controller fault condition.
Skip Home Check After First Cycle	When enabled, the 'At Home' status is not necessary to start a new cycle. But the 'At Home' status is still necessary for the first cycle after the Sequencer is changed to Auto mode.

Chapter 9 I/O Screens

Use the I/O screens to monitor status and set the digital inputs, digital outputs, configurable signals, and safety signals transmitted between the ASC and the IMM.

On the ASC Home screen, touch the **I/O** button to see the I/O screens.

The selections and indicators on the I/O screens are divided into categories. A list of the categories is shown in Table 9-1.

Table 9-1 Servo I/O Selections and Indicators

Item	Description
State	The condition of the input or output is TRUE when the indicator is green.
Name	Name given to the input or output signal by the user. This name is used on all the signal screens in which this signal is shown.
Condition	Conditions are shown when Servo Axis or Servo Group is selected as the Signal Type. The condition column lets you select a position for a servo axis or servo group of axes. The position can be equal to, less than, or greater than what you select in the related Value column. Conditions are also shown when Sequencer (if installed) is selected as a Signal Type with Custom Sequence selected as a Signal Source.
Value	Lets you set a value for the related selection in the Condition column.
Signal Type	Sets the type of output signal. The selections are Controller Function, Configurable Signal, or None.
Signal Source	Gives the output signals that are available for selection as related to the signal type selection. The signal selection controls the function of the output.

Invert	The inputs and outputs can be set as normally open or normally closed. The default is normally open.
	To set to normally open, select the checkbox so no checkmark shows.
	• When set as normally open:
	  • Inputs: ON condition (or in operation) when the input gets 24V.
	  • Outputs: ON condition closes the relay output
	To set to normally closed, select the checkbox so a checkmark shows.
	• When set as normally closed:
	  • Inputs: ON condition (or in operation) when the input gets 0V
	  • Outputs: ON condition (or in operation) opens the relay output.

Level	Shows the electrical condition of the input or output at the connector pin.

Table 9-1 Servo I/O Selections and Indicators (Continued)

Item	Description
Force	I/O signals can be forced high or low. • When Force is set to High, the signal level at the pin is set high. • When Force is set to Low, the signal level at the pin is set low. • When Force is set to None, the signal level at the pin is not changed.
Schematic	This is the signal identification name used in the electrical schematics.
Pins	Text fields that show the connector and pins that the input or output signal is wired to on the outside of the Altanium Servo Controller.

9.1 Safety Signals

Safety signals are not adjustable and are part of a relay safety circuit inside the controller. These signals must be connected to the IMM safety gate and E-Stop circuits to make sure users are safe from possible dangerous conditions. The system will not operate unless these signals are correctly connected. The safety condition is satisfied when the State indicator is green. For more information on safety signals, refer to section 2.10.3.

Touch the **Safety** tab to see the Safety Signals Screen. Refer to Figure 9-1.

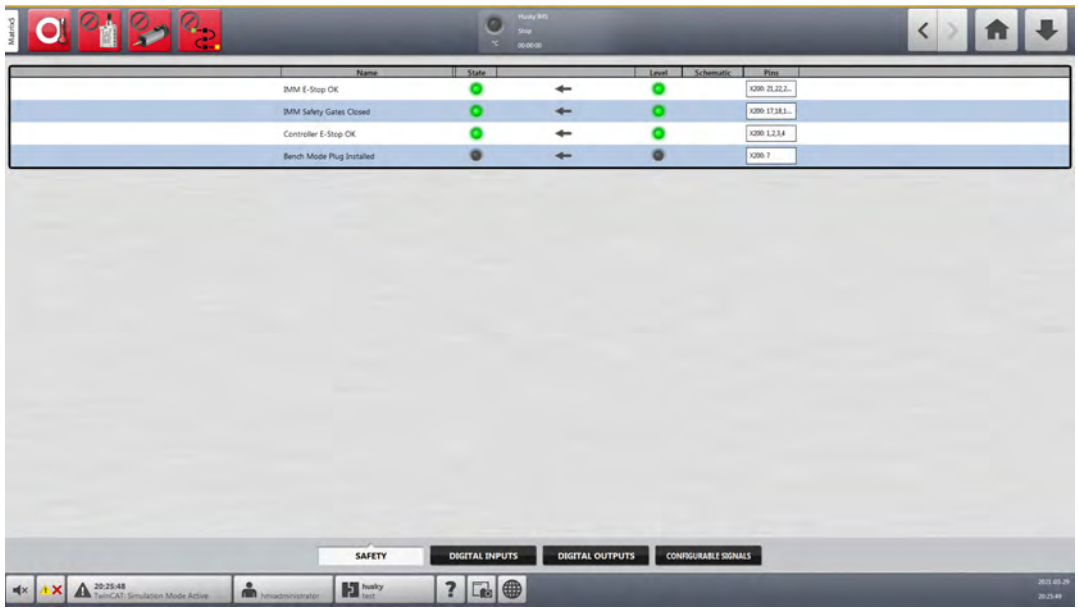


Figure 9-1 Safety Signals Screen

A list of the safety signals is shown in Table 9-2.

Table 9-2 Safety Signals

Signal Name	Description
IMM E-Stop OK	During usual operation, the IMM E-Stop switch contact is CLOSED. The switch contact must be OPEN when the IMM emergency stop device is operated. The open contact condition causes an emergency stop of valve gate stem movement (if installed). Axis movements are stopped based on the fault reaction settings on the Axis Setup screen (see Section 7.4.1).
IMM Safety Gates Closed	Injection of plastic is permitted when the IMM safety gate switch contacts are CLOSED. The open contact condition causes the valve gate stems to close and then stop (if installed). Axis movements are stopped based on fault reaction settings on the Axis Setup screen (see Section 7.4.1). The signal must be the result of connected gate safety devices that give protection against user access to the mold area. Refer to EN 201: Safety of Plastics Molding Machines.
Controller E-Stop OK	The emergency stop button on the ASC. The circuit is OPEN when the ASC emergency stop button is pushed. The open switch contact causes an emergency stop of the IMM (2 Channels). For diagnostic purposes, the button status is monitored by the software and will give an alarm condition on the controller.
Bench Mode Plug Installed	Shows that the bench mode plug is installed in the X200 connector of the ASC.

9.2 Digital Inputs

Use the Digital Inputs screens to set the digital input signals from the IMM. There are three sets of input screens that you can configure. Tabs at the bottom of the screen give you access to digital inputs that follow:

- Servo (Page 1 and 2)
- Ethernet (Page 1 and 2) - If installed
- Heats (Page 1 and 2) - If installed

The sections that follow describe the Digital Inputs screens.

9.2.1 Servo Digital Inputs

There are 26 servo digital inputs. For ASC systems with UlraSync-E, Husky sets the input signals that follow to digital inputs 1 through 5. These input signals can be changed to agree with customer IMM configurations and operations.

- IMM in Auto
- External At Temperature
- UltraSync-E Valve Gates Open Command
- UltraSync-E Valve Gates Close Command
- External Permit Calibration

Servo digital inputs 6 through 26 can be configured as necessary for your controller.

Touch the **Digital Inputs** tab and then touch the **Servo Page 1** or **Servo Page 2** tab to see the Servo Inputs. Refer to Figure 9-2.

Figure 9-2 Servo Digital Inputs Signals Screen

A list of the usual input signals from the IMM is shown in Table 9-3.

Table 9-3 Servo Digital Input Signals from the IMM

Signal	Description
IMM In Auto	This signal is TRUE when the IMM is in automatic cycle mode. When the IMM is in automatic cycle mode, the servos cannot change from Engaged mode. This prevents accidental cycle stops.
External At Temperature	This signal is TRUE when all heat zones are within their specified tolerance range.
Valve Gates Open Command	This signal is used to start the Valve Gates Open operation.

Table 9-3 Servo Digital Input Signals from the IMM (Continued)

Signal	Description
Valve Gates Close Command	This signal is used to start the Valve Gates Close operation.
External Permit Calibration	This signal must be TRUE to start valve stem calibration. If this signal is lost (not TRUE) during calibration, the calibration sequence is cancelled. This prevents calibration when damage can occur, such as when the mold is closed with parts in the cavities.

For Servo Digital Inputs, you have the options to Invert the input signal and to use Force to set the signal state to:

- None
- Low
- High

As an option, you can use the Filter column to debounce a signal. The amount of the debounce is entered in milliseconds (ms). The range is 0 to 100 ms, with a default of 3 ms.

9.2.2 Ethernet Digital Inputs (if installed)

If installed, you can monitor Ethernet input signals on the Ethernet Digital Input screens. Touch the **Digital Inputs** tab and then touch the **Ethernet Page 1** or **Ethernet Page 2** tab to see the screens. Refer to Figure 9-3.

Figure 9-3 Ethernet Digital Inputs Signals Screen

From the Ethernet Digital Inputs screens, you can monitor the inputs that follow:

- IMM In Auto
- External At Temperature

- UltraSync-E Valve Gates Open Command (if installed)
- UltraSync-E Valve Gates Close Command (if installed)
- External Permit UltraSync-E Calibration (if installed)
- Servo Control Lock Request
- Axes To Home Position
- Axis x Motion Permission (x = 1, 2, 3, 4, 5 or 6)
- Axis x Index (x = 1, 2, 3, or 4)
- Axis x Jog Forward (x = 1, 2, 3, or 4)
- Axis x Jog Back (x = 1, 2, 3, or 4)

From these screens, you can use Force to set the signal state to:

- None
- Low
- High

9.2.3 Heats Digital Inputs

On an integrated system, two heats tabs are shown as part of the digital inputs. Touch the **Heats Page 1** or **Heats Page 2** tab to see the screens. Refer to Figure 9-4. These tabs do not show on a standalone system.

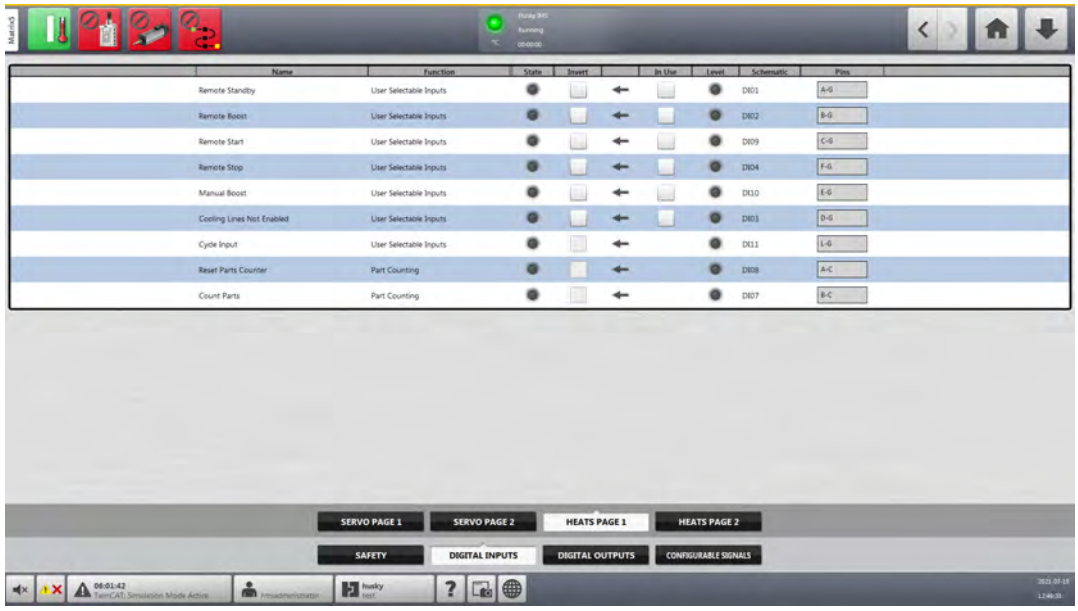


Figure 9-4 Heats Digital Inputs Signals Page 1 Screen

The input signals on the Heats Page 1 tab give the ASC the status of different operations at the IMM. Some of these input signals are optional and may not be used on your system. The available signals are:

- Remote Standby
- Remote Boost

- Remote Start
- Remote Stop
- Manual Boost
- Cooling Lines Not Enabled
- Cycle Input
- Reset Parts Counter
- Count Parts

To use an input heats signal, touch its checkbox in the **In Use** column, so a check mark shows. To invert an input heats signal, touch its checkbox in the **Invert** column.

On the Heats Page 2 tab (refer to Figure 9-5), the setup bits are shown for a remote load of mold files from the IMM. This is an optional feature for the ASC. Refer to the Digital Inputs section of the Altanium Matrix5 User Guide.

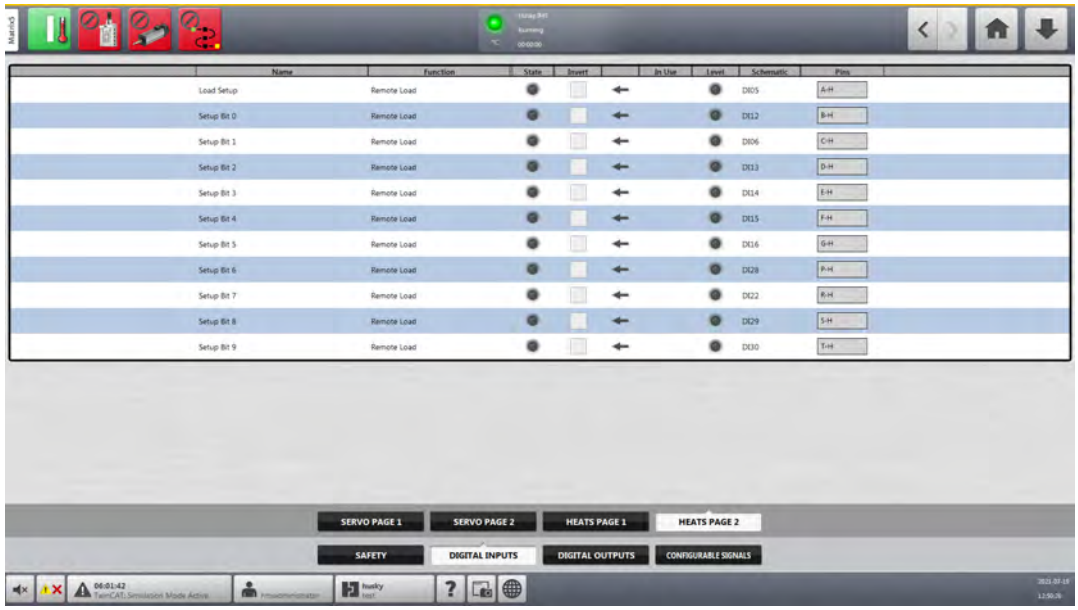


Figure 9-5 Heats Digital Inputs Signals Page 2 Screen

9.3 Digital Outputs

Use the Servo Outputs screen to set the digital output signals to the IMM. Touch the **Digital Outputs** tab to see the output signal selection tabs.

Use the Digital Outputs screens to set the digital output signals to the IMM. There are three sets of output screens that you can configure. Tabs at the bottom of the screen give you access to the digital outputs that follow:

- Servo
- Ethernet (Page 1, 2, and 3)
- Heats - If installed

The sections that follow describe the Digital Outputs screens.

9.3.1 Servo Digital Outputs

Touch the **Servo** tab to see the servo digital outputs to the IMM. Refer to Figure 9-6.

You can configure up to 16 digital outputs. You can give each signal a name and identify the connector and pin number in which the output signal is supplied. Touch the field under the **Name** and/or **Pins** columns to enter the signal name and/or the output connector pin.

When necessary, an output signal can be set (forced) to always be high or low, so the system will ignore the true signal status. Touch the field in the **Force** column for a signal and select High, Low, or None:

- When Force is set to 'High', the signal level at the pin is always high.
- When Force is set to 'Low', the signal level at the pin is always low.
- When Force is set to 'None' (default), the signal level at the pin is not forced.

NOTE: The Invert override is not related to the force High or Low settings, so the checkbox does not have an effect on the signal. The Invert override operates when Force is set to None.

Figure 9-6 Servo Digital Outputs Signals Screen

A list of the usual output signals to the IMM is shown in Table 9-4. For ASC with UltraSync-E systems, Husky sets these output signals to digital outputs 1-4. These output signals can be changed to agree with customer IMM configurations and operations.

Table 9-4 Output Signals to the IMM

Signal	Description
Fault Stop Immediate	These contacts are closed when the IMM must stop immediately, because of a fault or alarm on the controller. This signal can be used to tell the IMM when clamp movement is permitted.
Ready and Engaged	This signal is ON when the controller is in automatic/Engaged mode with no faults.
Valve Gates Open	This signal tells the IMM that the valve gates are at the Open position. The At-Open output signal is ON when all of the conditions that follow are TRUE: • Movement to the Open position is complete (applicable when the At-Position Only When Command Completes is selected) • No movement on the plate • Open position is within the At Position tolerance • If installed, the UltraSync-E drive has completed calibration, there are no faults, and is prepared to operate If one of these conditions is no longer TRUE, the At-Open signal changes to OFF. This signal can be used to tell the IMM that injection is permitted.
Valve Gates Closed	This signal tells the IMM that the valve gates are at the Closed position. The At-Closed output signal is ON when all of the conditions the follow are TRUE: • Movement to the Closed position is complete (applicable when the At-Position Only When Command Completes is selected) • No movement on the plate • Closed position is within the At Position tolerance • If installed, the UltraSync-E drive has completed calibration, there are no faults, and is prepared to operate If one of these conditions is no longer TRUE, the At-Closed signal changes to OFF.

Table 9-5 shows other Servo outputs from which you can select.

Table 9-5 Servo Digital Output Selections

Signal Type	Signal	Condition	Position
None	-	-	-
Digital Input	Digital Input 1 - 26 The first five digital inputs may be factory set for the features installed on your controller, as shown here: • IMM In Auto • External At Temperature • UltraSync-E Valve Gates Open Command • UltraSync-E Valve Gates Close Command • External Permit Calibration	-	-
Controller Function	• Fault Stop Immediately • Fault Stop End Of Cycle • Calibration Active • Process Outside Limit • All Axes At Standstill	-	-
Servo Axis	Select axis (1, 2, 3, 4, 5, or 6)	Position < Position >	Set by the user
		Position =	• Position 1 • Position 2 • Position 3 • Position 4
Servo Group	Group selected by user	Position < Position >	Set by the user
		Position =	• Position 1 • Position 2 • Position 3 • Position 4
Servo Function	• Ready and Engaged • Override Active • All Axes At Home Position • All Axes Calibrated	-	-
Configurable Signal	Configurable signal 1 - 18	-	-

Table 9-5 Servo Digital Output Selections (Continued)

Signal Type	Signal	Condition	Position
UltraSync-E (if installed)	• UltraSync-E Valve Gates Closed • UltraSync-E Valve Gates Open • UltraSync-E Ready and Engaged • UltraSync-E Valve Gates Position	-	-
Sequencer (if installed)	• Sequencer In Auto • Home Command	-	-
	• Custom Sequence	• At Step • Before Step • After Step	• Home • Step 1 - 18
Temperature Control	At Temperature	-	-

9.3.2 Ethernet Digital Outputs (if installed)

If installed, the ASC controller can also use configured Ethernet digital outputs. Touch the **Digital Outputs** tab and then touch the **Ethernet Page 1**, **Ethernet Page 2**, or **Ethernet Page 3** tab to see the Ethernet Digital Outputs screen. Refer to Figure 9-7.

Figure 9-7 Ethernet Digital Outputs Signals Screen

The Ethernet output signals are configured for the operations that follow:

- Fault Stop Immediate
- UltraSync-E Ready And Engaged (with UltraSync-E installed)

- UltraSync-E Stems At Open (with UltraSync-E installed)
- UltraSync-E Stems At Close (with UltraSync-E installed)
- All Axes Ready And Engaged
- All Axes At Home Position
- Axis x At Position 1 (x = 1-4)
- Axis x At Position 1 Proxy (x = 1-4)
- Axis x At Position 2 (x = 1-4)
- Axis x At Position 2 Proxy (x = 1-4)
- Axis x At Position 3 (x = 1-4)
- Axis x At Position 3 Proxy (x = 1-4)
- Axis x At Position 4 (x = 1-4)
- Axis x At Position 4 Proxy (x = 1-4)

These operations come factory set for your controller, but can be changed, if necessary.

9.3.3 Heats Digital Outputs

For integrated systems, user-selectable heats digital outputs are available. Touch the **Digital Outputs** tab and then touch the **Heats** tab to see the Heats Digital Outputs screen. Refer to Figure 9-8. The user-selectable outputs that follow are shown:

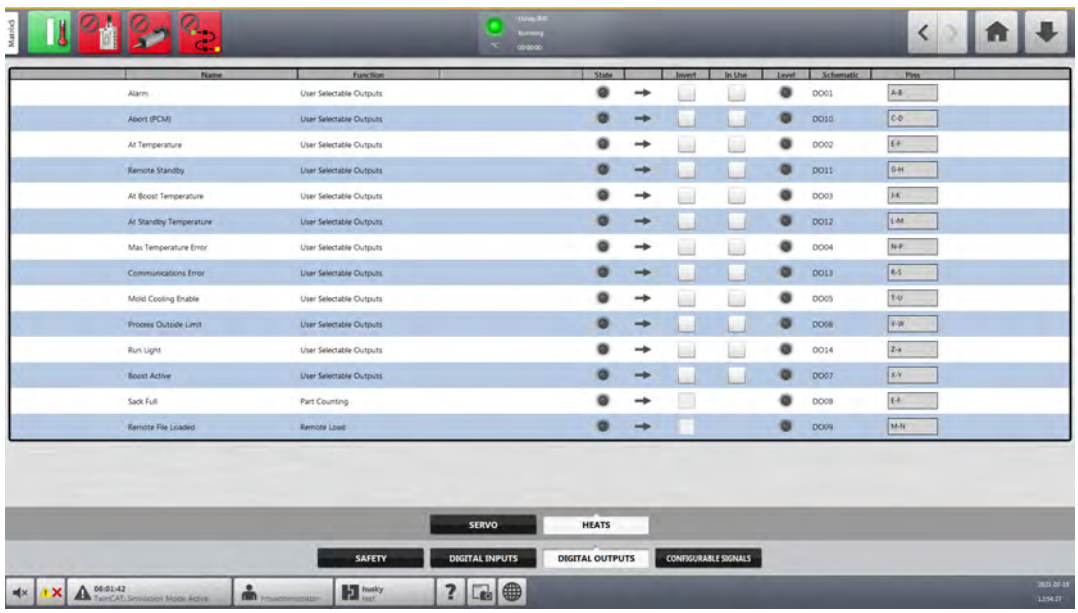


Figure 9-8 Heats Digital Outputs Signals Screen

- Alarm
- Abort (PCM)
- At Temperature
- Remote Standby
- At Boost Temperature

- At Standby Temperature
- Max Temperature Error
- Communications Error
- Mold Cooling Enable
- Process Outside Limit
- Run Light
- Boost Active
- Sack Full
- Remote File Loaded

Use the In Use column checkboxes to enable the output signal. You can also select to invert the output signal.

For information about integrated temperature control, refer to the Altanium Matrix5 User Guide.

9.4 Configurable Signals

Configurable signals are outputs that use Boolean logic. Input functions, output functions, and other adjustable signals can be used as conditions for a specified configurable signal that, when all are TRUE, the specified signal is ON.

You can set up to 18 configurable signals. The signals are shown in six screens (three signals per screen) in these tabs: 1-3, 4-6, 7-9, 10-12, 13-15, and 16-18.

Touch the **Configurable Signals** tab to see the Configurable Signals screen. Refer to Figure 9-9.

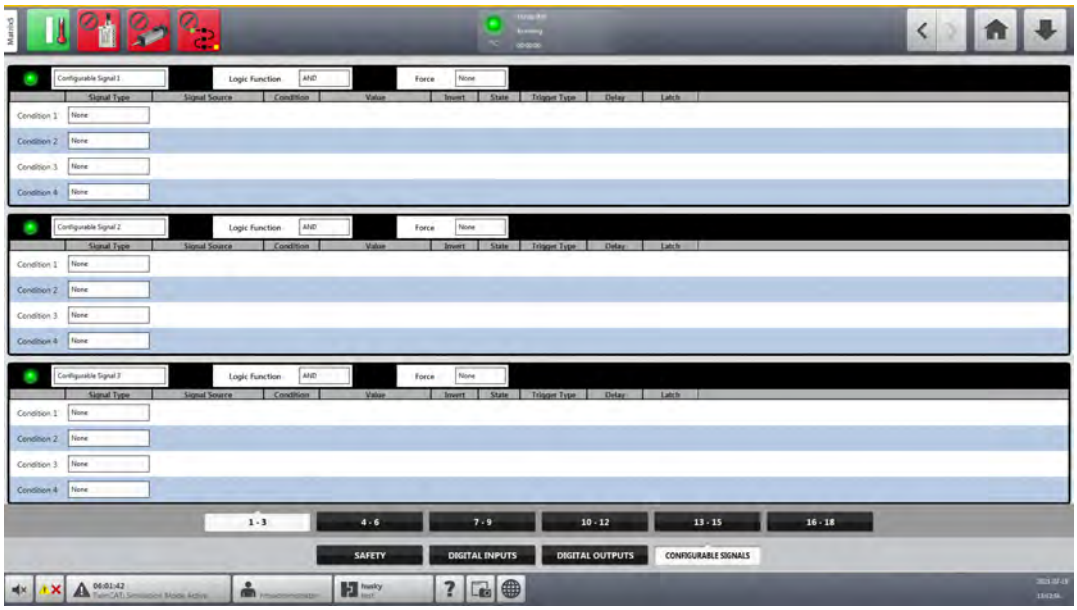


Figure 9-9 Configurable Signals Screen

A list of the configurable signal selections and parameters is shown in Table 9-6.

9.4.1 Condition Selections

You can set up to four conditions for each configurable signal. Boolean logic is used with the set conditions to make the configurable signal TRUE. Refer to Section 9.4.2.

Select a signal type for each condition you want to use and then set the parameters for that signal type, if necessary. A list of the signal types and parameters is shown in Table 9-6.

Table 9-6 Configurable Signal Selections and Parameters

Signal Type	Signal	Condition	Position
None	-	-	-
Digital Input	Digital Input 1 - 26	-	-
Controller Function	• Fault Stop Immediately • Calibration Active • Process Outside Limit	-	-
Servo Axis	Select axis	Position < Position >	Set by user (in/mm for linear; °/rev for rotary)
		Position =	• Position 1 • Position 2 • Position 3 • Position 4
Servo Group	Group selected by user	Position < Position >	Set by user (in/mm for linear; °/rev for rotary)
		Position =	• Position 1 • Position 2 • Position 3 • Position 4
Servo Function	• Ready And Engaged • Override Active		
Configurable Signal	Configurable signal 1 - 18	-	-
UltraSync-E (if installed)	• None • UltraSync-E Valve Gates At Close • UltraSync-E Valve Gates At Open • UltraSync-E Ready and Engaged	-	-

Table 9-6 Configurable Signal Selections and Parameters (Continued)

Signal Type	Signal	Condition	Position
Sequencer (if installed)	• Sequencer In Auto • Home Command	-	-
	• Custom Sequence	• At Step • Before Step • After Step	• Home • Step 1 - 18
Safety Signal	• IMM E-Stop • IMM Safety Gates Closed • Controller E-Stop OK • Bench Mode Plug Installed	-	-
Temperature Control	At Temperature	-	-

9.4.2 Logic Function

The conditions that you set for a configurable signal use Boolean logic to make the signal TRUE. Touch the configurable signal's **Logic Function** field and then select a Boolean operator (AND, OR, or LATCHING).

When set to AND, the configurable signal is TRUE only when all conditions are TRUE. When set to OR, the configurable signal is TRUE whenever one or more of the conditions are TRUE.

When set to LATCHING, a configurable signal is TRUE when a specified event occurs. The signal stays TRUE until another event sets it FALSE.

When the LATCHING logic function is selected, each condition row will display a selectable Latch action, which lets you select Latch or Unlatch.

When a condition row is TRUE, one of the Latch actions that follows occurs:

- If set to Latch, the configurable signal is set to TRUE
- If set to Unlatch, the configurable signal is set to FALSE

The configurable signal then maintains this state until another condition row changes it.

The multiple conditions of a configurable signal are evaluated in the order that they are listed, top to bottom. Thus, it is possible that the configurable signal becomes latched and then unlatched at the same time. The final signal (TRUE or FALSE) is set by the last action that was evaluated.

9.4.3 Force

When necessary, a configurable signal can be set (forced) to always be high or low, so the system will ignore the true signal status. Touch the field in the **Force** column for a signal and select High, Low, or None:

- When Force is set to 'High', the signal level is always high.
- When Force is set to 'Low', the signal level is always low.
- When Force is set to 'None' (default), the signal level is not forced.

Chapter 10 Alarms and Event History

This chapter gives information about the Alarm and Event History screens.

10.1 Alarm Screen

The Alarm screen shows all errors that occur. When an alarm is active, an icon in the Alarms button in the system footer changes to yellow and flashes red. Touch the **Alarms** button to open the Alarm screen. Refer to Figure 10-1.

NOTE: For a list of the alarm conditions shown on the Event History screen and Alarm screen, refer to Section 10.4. For a list of the abort conditions shown on the Event History screen and Alarms screen, refer to Section 10.5.

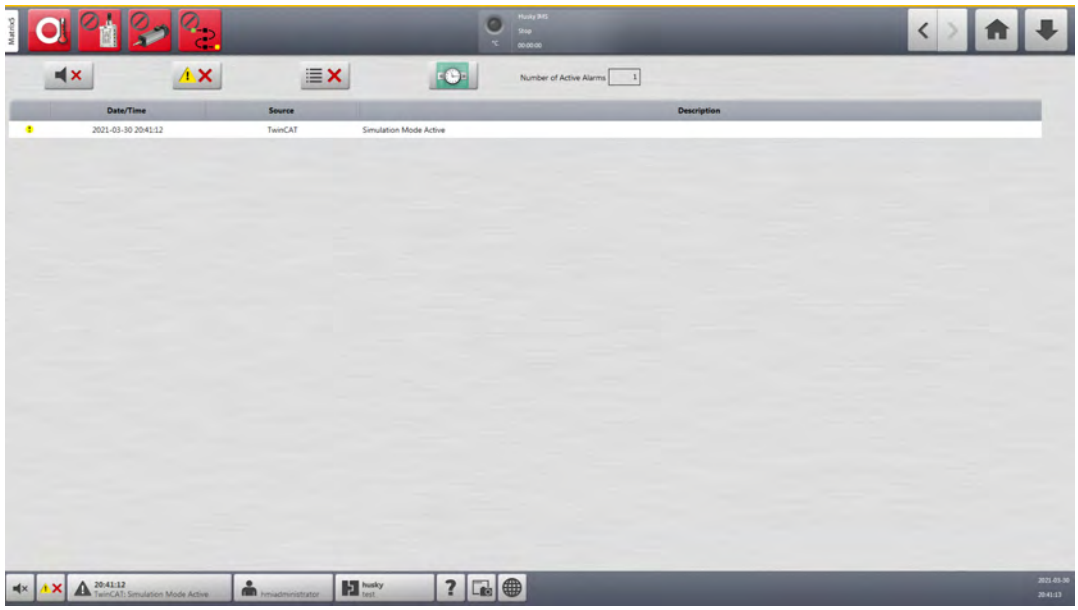


Figure 10-1 Alarms Screen

Table 10-1 gives descriptions of the Alarms screen buttons.

Table 10-1 Alarm Screen Buttons

Button	Description
	The Silence Alarm button stops the alarm sound. This button is also in the system footer of all Altanium screens.
	The Reset Alarms button stops the alarm light and error message. This button is also in the system footer of all Altanium screens.
	The Clear Inactive Alarms button clears the alarms that are no longer active.
	The Event History button shows the Event History screen. This button is also on the Altanium Home screen.

Table 10-2 gives a list of the items on the Alarm screen.

Table 10-2 Alarm Screen Items

Item	Description
Number of Active Alarms	This number shows how many alarms are active.
Date/Time	The date and time that the alarm was started.
Source	The cause of the alarm.
Description	A description of the problem that started the alarm.

10.1.1 Opening the Alarm Screen

To see the Alarms screen, do one of the instructions that follow:

- On the Home screen, touch the **Alarms** button.
- In the system footer, touch the **Alarms Information** button.

10.1.2 Alarm Conditions

Table 10-3 gives a list of the Alarm conditions.

Table 10-3 Alarm Condition

Condition	Description
Active	When an alarm first occurs, it is in an ON condition.
Inactive, Not Acknowledged	Touch the **Reset Alarms** button and the alarm is changed to an inactive, not acknowledged condition.
Inactive, Acknowledged	Touch the **Clear Inactive Alarms** button and the alarm is changed to an inactive acknowledged condition.

10.1.3 Clear Alarms

If an error occurs, there is an alarm sound and a visual alarm indication. The alarm condition is seen on the Alarms screen.

To clear an alarm, do one of the instructions that follow:

NOTE: Before you clear an alarm, correct the source of the alarm.

- To stop the alarm sound, touch the **Silence Alarms** button.
- To reset the alarm light and change the alarm to an inactive, not acknowledged condition, touch the **Reset Alarms** button.

10.2 Event History Screen

The Event History screen shows past alarms, warnings, setpoint changes, setup changes, HMI startup, and operational events that do not agree with specified conditions.

To see the Event History screen, on the Home or Alarms screens, touch **Event History** button. Refer to Figure 10-2.

NOTE: For a description of the alarm conditions shown on the Event History screen and the Alarm screen, refer to Section 10.4. For a description of the abort conditions shown on the Event History screen and Alarms screen, refer to Section 10.5.

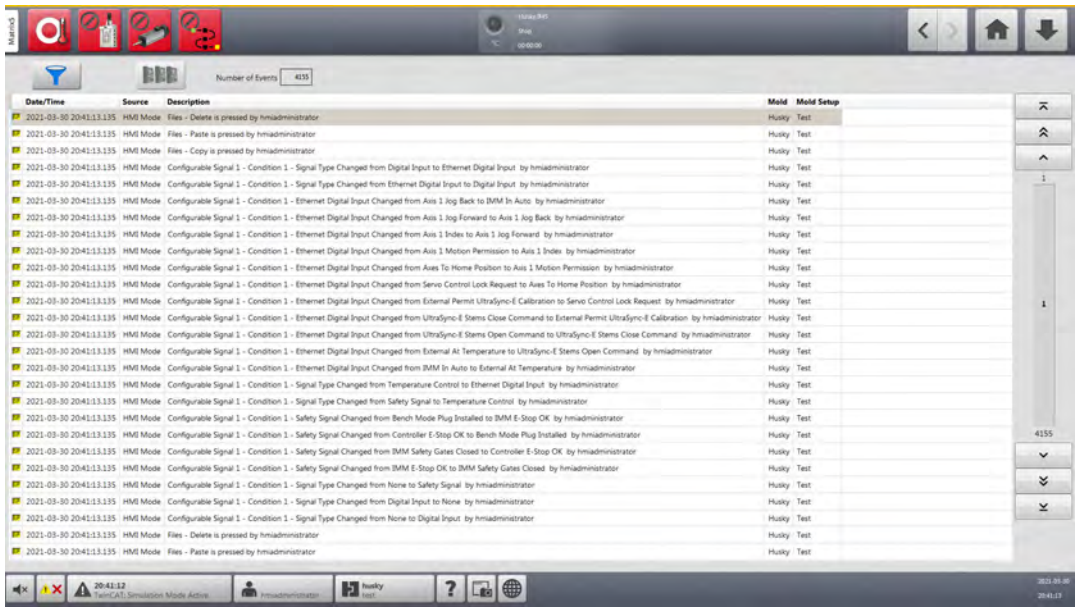


Figure 10-2 Event History Screen

Table 10-4 gives a list of the items on the **Event History** screen.

Table 10-4 Event History Screen Items

Item	Description
Number of Events	The number shows how many events are on the Event History screen.
Date/Time	The date and time that the event occurred.
Source	The cause of the event.
Description	The description of the event.
Mold	Shows the mold with the mold setup that was loaded when the event occurred.
Mold Setup	Shows the mold setup that was loaded when the event occurred.

10.2.1 Filter Events

Events can be filtered by user selections of one or more event types.

To filter events, do the steps that follow:

1. On the Event History screen, touch the **Filter** button (shown here).

2. Select the one or more filter type(s) in the Event History - Filter dialog box. Refer to Figure 10-3.

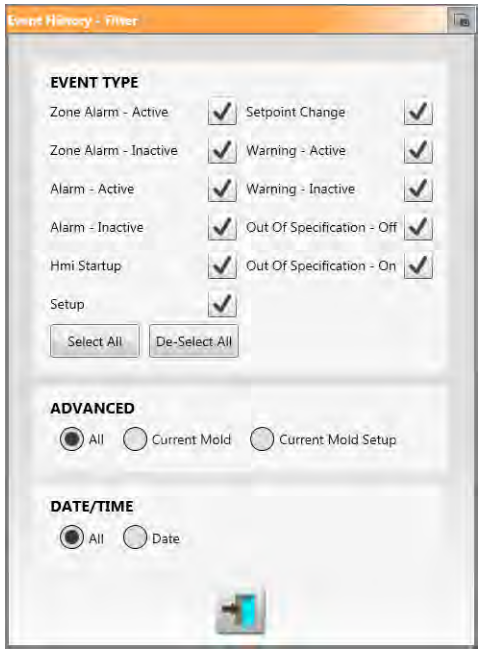


Figure 10-3 Event History Filter Dialog Box

3. Touch the **Exit** button.

10.3 Alarm and Event Icons

The icons in Table 10-5 are used on the Alarms screen and the Event History screen.

Table 10-5 Event History Screen Icons

Icon	Description
	The warning is inactive.
	The warning is active.
	An alarm is active.
	An alarm is inactive.
	A user has made a change. **NOTE:** This icon is shown on the Event History screen, not on the Alarms screen.

10.4 Alarm Conditions — Warning Errors

Alarm conditions are shown on the Alarms and the Event History screens. The conditions listed in Table 10-6 cause audible and visual alarms. Because they are warnings, they will not shutdown the system.

Table 10-6 Warning Errors

Warning	Description
Alarm Over Temp	A zone's actual temperature is more than its setpoint by the degrees set in the Alarm Window field on the Quick Set screen.
Alarm Under Temp	A zone's actual temperature is less than its setpoint by the degrees set in the Alarm Window field on the Quick Set screen.
Auto Slave Enabled	A zone's thermocouple has become defective as the system operates in automatic control mode. The system has automatically slaved this zone to a different zone with the use of data it collected before the thermocouple became defective. The zone with the defective thermocouple becomes controlled by the power output from a similar zone. The master zone number is shown in the Slave to Zone field of the defective zone on the Quick Set screen.
AMC Active	A zone's thermocouple has become defective as the system operates 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 OFF. The zone has been set to go into Automatic Manual Control (AMC) in this event. The zone is now controlled in manual mode at a power percentage selected by the controller with the use of data it collected before the thermocouple became defective.
Power Deviation	The zone's power output value has deviated by an amount calculated by the power deviation algorithm. The power deviation algorithm uses calculation factors, which include a historical power average, heater type, changes to the power supplied to the unit, and other values.

10.5 Abort Conditions — Shutdown Errors

Abort conditions are shown on the Alarms screen and the Event History screen. The conditions listed in Table 10-7 cause audible and visual alarms. Because they are shutdown errors, they will cause a zone or system shutdown condition controlled by the Priority Control Mode (PCM) settings.

Table 10-7 Shutdown Errors

Shut Down Error	Description
Abort Over Temp	A zone's actual temperature is more than its setpoint by the degrees set in the Abort Window field on the Quick Set screen.
Abort Under Temp	A zone's actual temperature is less than its setpoint by the degrees set in the Abort Window field on the Quick Set screen.
Circuit Overload	The current on this zone has increased above the maximum value for current deviation.
Configuration	Each zone's control parameters are compared to the values sent and received by each zone. If the values are different, the system automatically corrects the problem. If the problem is not corrected after one minute, the configuration alarm is triggered.
Control Card Over Temperature	A control card temperature is more than 76 °C (170 °F).
Fuse 1 Blown	Fuse 1 on this Intelligent Control Card (ICC^2 or ICC^3) has opened and must be replaced.
Fuse 2 Blown	Fuse 2 on this Intelligent Control Card (ICC^2 or ICC^3) has opened and must be replaced.
Earth Leakage Limit	ICC^2: If the earth leakage is more than the calculated limit or default value, the earth leakage error is triggered.
	ICC^3: If the measured leakage level is more than the Earth Leakage Fault Limit value, the earth leakage error is triggered.
Lost Thermocouple	This zone has a defective or open thermocouple.
Maximum Temp Limit	The temperature on this zone has increased above the maximum value permitted. The usual cause for this is that the switching device has failed in the closed position and the zone heater continued to apply heat. The factory setting is 95 °C (200 °F) over the normal setpoint.
No Response	The Altanium has applied 96% to 100% power to this heater for a set amount of time, and the thermocouple connected to this zone does not show an indication. The thermocouple is possibly damaged, or the heater power wires are broken.
Over Current Limit	The current on this zone has increased above the maximum value permitted.

Table 10-7 Shutdown Errors (Continued)

Shut Down Error	Description
Receive Data Comm	The data that the zone receives from the Altanium controller has stopped.
Rev. Thermocouple	The positive and negative leads from the thermocouple have been switched or the connections are reversed. As power is applied, the temperature decreases when it should increase. Correct this problem at the location where the wires are reversed.
Read Time Out	The data that is transmitted from the zone to the Altanium controller has stopped.

Chapter 11 Data Records

Data Records helps monitor the operation of a mold. This tool is used for system analysis to:

- Make the molding process more functional
- Track errors
- Find the source of an error
- Tell where future errors may occur

The Alarm screen contains a record of errors that have occurred since the errors were last cleared. Use the Process Monitoring screen to monitor the operation of a mold and see recorded data. If an error has occurred while the system recorded data, examine the system operation at the time of the error to find possible causes.

11.1 Process Monitoring - Trend Plot

The **Trend Plot** screen shows the information that follows:

- The last 400 samples on four charts, where the X axis is the sample number and the Y axis is the value of the sampled variable.
- The data available for a selected variable.
- The timestamp and value for points on a graph.

To see the Trend Plot Screen, touch the **Process Monitoring** button on the Home screen, and then touch the **Trend Plot** tab. Refer to Figure 11-1.

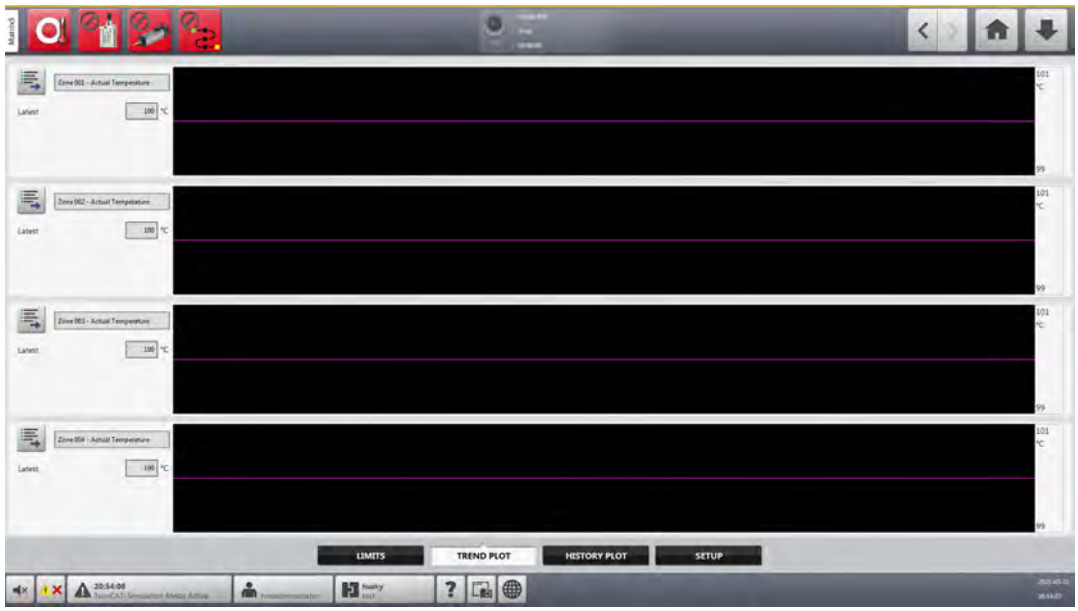


Figure 11-1 Process Monitoring Trend Plot Screen

11.1.1 Change a Trend Plot

To change the zone or process shown on the Trend Plot screen, do the steps that follow:

1. On the Trend Plot screen, touch the **Variable Selection** button (shown here).

2. On the Process Trend - Process Variable Selector dialog box, touch a minimize/maximize arrow. Refer to Figure 11-2.

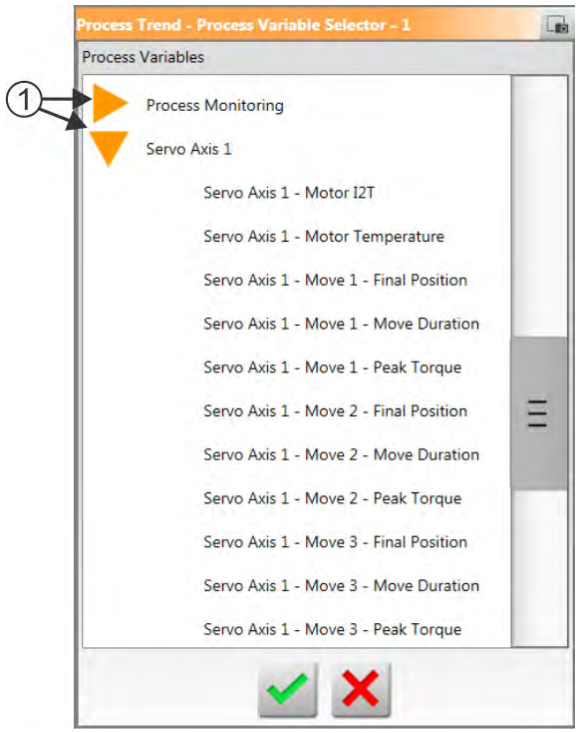


Figure 11-2 Process Trend - Process Variable Selector Dialog Box

1. Minimize/Maximize Arrows

3. Select a process variable from the maximize list.

11.2 Process Monitoring - History Plot

The History Plot screen gives a visual report of the recorded operation, with power usage, temperature changes, setpoint values, pressures, positions, and times. Data is shown zone by zone. A detailed textual representation is offered for specific times.

To see the History Plot Screen, touch the **Process Monitoring** button on the Home screen, and then touch the **History Plot** tab. Refer to Figure 11-3.

Figure 11-3 Process Monitoring History Plot Screen

1. Variable Selection Button **2.** Process Variable **3.** Graph Section **4.** Old Date and Time Range **5.** New Date and Time Range **6.** Time Frame

Items on the History Plot screen are described in Table 11-1.

Table 11-1 Process History Screen Items

Item	Description
Process Variable	The process variable shown in the process history graph section. Touch the variable selection button to select a different variable.
Graph Section	Shows graphic plot of one variable selection.
Time Frame	The period of time shown on the graphs.
Date Range Old	The oldest date shown on the graph.
Date Range New	The newest date shown on the graph.

Available process variables for heat zones (if installed):

- Current
- Earth Leakage (displayed only when configured in System Setup)
- Power
- Temperature
- Temperature Setpoint
- Voltage

Available process variables for UltraSync-E (if installed):

- Close Position
- Closing Duration
- Closing Peak Force
- Motor I2T
- Motor Temperature
- Open Position
- Opening Duration
- Opening Peak Force

The process history holds 100,000 records. Records contain values for all the logged values for each zone in the system or servo axis. A frequent rate of recorded samples will fill the database faster than a slower rate.

11.2.1 Curve Data Point

For a description of the data at some point on the graph, touch that location and the description shows in a box. Refer to Figure 11-4

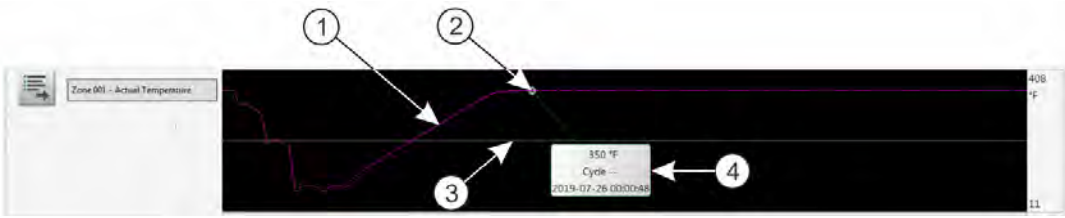


Figure 11-4 History Plot Screen Curve Data

1. Curve **2.** Curve Data Point **3.** Midline **4.** Description of Data

The curve information is described in Table 11-2.

Table 11-2 History Plot Screen Curve Data Items

Item	Description
Curve	Graphical plot of data values.
Curve Data Point	A data value selection on the curve.

Table 11-2 History Plot Screen Curve Data Items (Continued)

Item	Description
Midline	The midline is the middle value of the curve. For example, if the high temperature is 540°F and the low temperature is –90°F, the midline would be (540 + (–90)) / 2 = 225.
Description of Data	Shows the data point value, date, and time.

NOTE: The X Axis value shows the value of the parameter selected at a point in time.

11.2.2 Set the Time Frame

Select the Time Frame for the curves as 1, 2, 4, 8, or 12 hours. The default Time Frame is 4 hours.

A change to the time frame automatically updates the new start date and time range. The old date and time range do not change.

To change the Time Frame, do the steps that follow:

1. On the Process History screen, touch the **Time Frame** field.

2. Touch a Time Frame to make the selection.

11.2.3 Set the Date and Time Range

Select the date range you want for the curves. The default Old date is the New date value minus the Time Frame value. The default end date is the current date at this time.

The Old and New date and time range fields are identified in Figure 11-3.

11.2.3.1 Change the Old Date and Time Range

Touch the **Old Date and Time Range** field, enter the date and time in the Old dialog window that shows, and then touch the **Accept** button.

If the calculated Date Range End value is later than the system date (at this time), the Old Date value is adjusted automatically to keep the Time Frame value.

11.2.3.2 Change the New Date and Time Range New

Touch the **New Date and Time Range** field, enter the date and time in the Old dialog window that shows, and then touch the **Accept** button.

A change to the date range end automatically updates the date range old, with the use of the Time Frame value.

NOTE: The date and time cannot be changed to a value later than the system time (the value at this time).

11.2.4 Variable Selection

To change a process that is shown on the History Plot screen, do the steps that follow:

1. Touch the **Variable Selection** button of the process to be changed.

2. On the Process History Variable Selector dialog box, touch the minimize/maximize arrow. Refer to Figure 11-5.

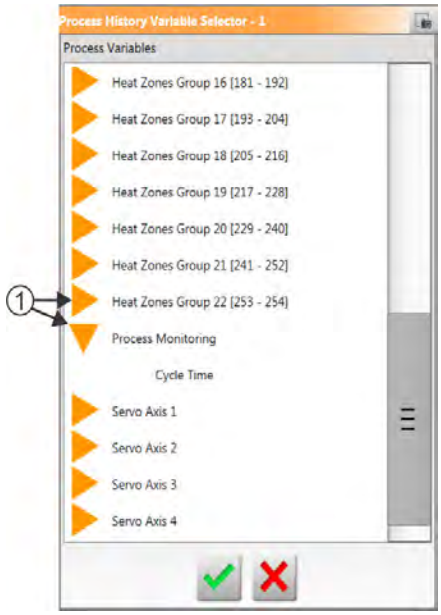


Figure 11-5 Process History Variable Selector Dialog

1. Minimize/Maximize Arrows

3. Select the process.
4. Touch the **Accept** button.

11.3 Process Monitoring - Limits

Use the Limits screen to set the specification limits for each variable. When a variable value is not in the specified limits, the variable is out of specification and triggers an alarm, a digital output, and/or the controller may stop.

To see the Limits Plot Screen, touch the **Process Monitoring** button on the Home screen, and then touch the **Limits** tab. Refer to Figure 11-6.

Figure 11-6 Process Monitoring Limits Screen

The Limits screen settings and information fields are described in Table 11-3.

Table 11-3 Process Targets Screen Limits

Limit	Definition
Use Limits	Select the Use Limits checkbox and Altanium triggers an alarm when the process variable is not in the specified limits.
Critical	The controller may stop when the process variable is not in the specified limits. To do this operation, select the **Stop Controller** checkbox.
Threshold Limit	The number of times that the value must be above or below the specified limits before an alarm occurs or the system stops.
Lower Limit	The lowest value the process variable value can get to before the "out of specification" alarm occurs, or the system stops.
Upper Limit	The highest value the process variable value can get to before the "out of specification" alarm occurs, or the system stops.

Table 11-3 Process Targets Screen Limits (Continued)

Limit	Definition
Out of Specification Action Process Outside Limit	If selected, the operation can continue if a process variable is above or below the specified limits.
Critical Variable Action Heats	The action taken when a heats variable is in a critical state.
Critical Variable Action Servos	The action taken when a servo variable is in a critical state.
Delay Limit Check Heats	Sets the delay for the heats limit check.
Delay Limit Check Servos	Sets the delay for the servos limit check.
Limit Check Active	Illuminates when the limits have been checked.

Touch the rows at the center of the screen to select the variables for which limits will be set. The example in Figure 11-7 shows the Actual Temperature has been selected for all the zones.

Figure 11-7 Highlighted Selections

The sections the follow describe how to set the limits.

11.3.1 Target Settings

Use the Target Settings fields of the screen to enable and configure the zone limit ranges for:

- Current
- Power
- Temperature
- Voltage

To configure the Target Settings for one or more zones, do the steps that follow:

1. On the process Limits screen, touch to highlight one or more zones you want to set.

   NOTE: If you select more than one zone, select them by the same category (Current, Power, Temperature, or Voltage) if they are to be in the same limits.

2. Touch the **Lower Limit** field, enter the setting for the category measurement (amps, percentage, degrees, or volts), and then touch the **Accept** button.
3. Touch the **Upper Limit** field, enter the setting for the category measurement (amps, percentage, degrees, or volts) and then touch the **Accept** button.
4. Touch the **Threshold** field and enter the number of times that a value must be outside of the lower and upper limit before Out of Specification Action starts.
5. Touch the **Accept** button.
6. To enable the Target Settings, touch the **Use Limits** field and select **Yes**.
7. If you want to set these Target Settings critical, touch the **Critical** field and select **Yes**.
8. If you want to activate the Process Outside Limit (Digital Output 6) signal during an out of limit condition, touch the **Process Outside Limit** check box, so the check mark shows.

11.3.2 Global Settings

In the Global Settings area, you can set a Critical Variable Action for the heats and/or servos that are installed on your system. For heats, the selections are No Reaction or Stop Heats. For servos, the selections are No Reaction or Stop End of Cycle.

To set a Critical Variable Action, do the steps that follow:

1. On the process Limits screen, touch the **Heats** or **Servos** field.
2. Select the action you want for the heats or servos.

11.3.3 Delay Limit Check

If you want the Altanium controller to wait a specified time or number of cycles before the system does the limit check, those parameters can be set in the Delay Limit Check area.

To set the heats parameter, do the steps that follow:

1. On the process Limits screen, touch the Heats **Time Delay** field and enter the number of seconds for the delay (1 to 900 seconds).
2. Touch the **Accept** button.

To set the servos parameter, do the steps that follow:

1. On the process Limits screen, touch the Servos **Cycle Delay** field and enter the number of cycles for the delay (1 to 999 cycles).
2. Touch the **Accept** button.

11.3.4 Process Variable Selector

To use units of measure to filter data, do the steps that follow:

1. On the Limits screen, touch the **Filter** button.

2. On the Process Variable Selector dialog, touch a checkbox next to the variables you want to see. Refer to Figure 11-8.

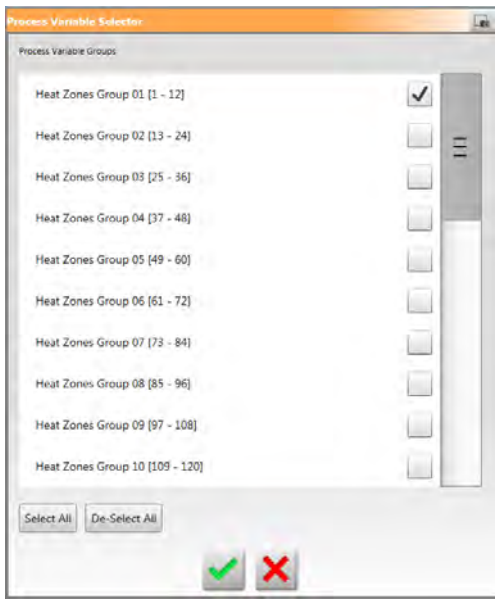


Figure 11-8 Process Variable Selector Dialog

3. Touch the **Close** button.

11.4 Process Monitoring - Setup

On the process monitoring Setup screen, you can set the system to record data in a time mode interval or with a cycle mode start configuration. Cool down data collection can also be enabled from this screen.

To see the process monitoring Setup screen, touch the **Process Monitoring** button on the Home screen and then the **Setup** tab. Refer to Figure 11-9.

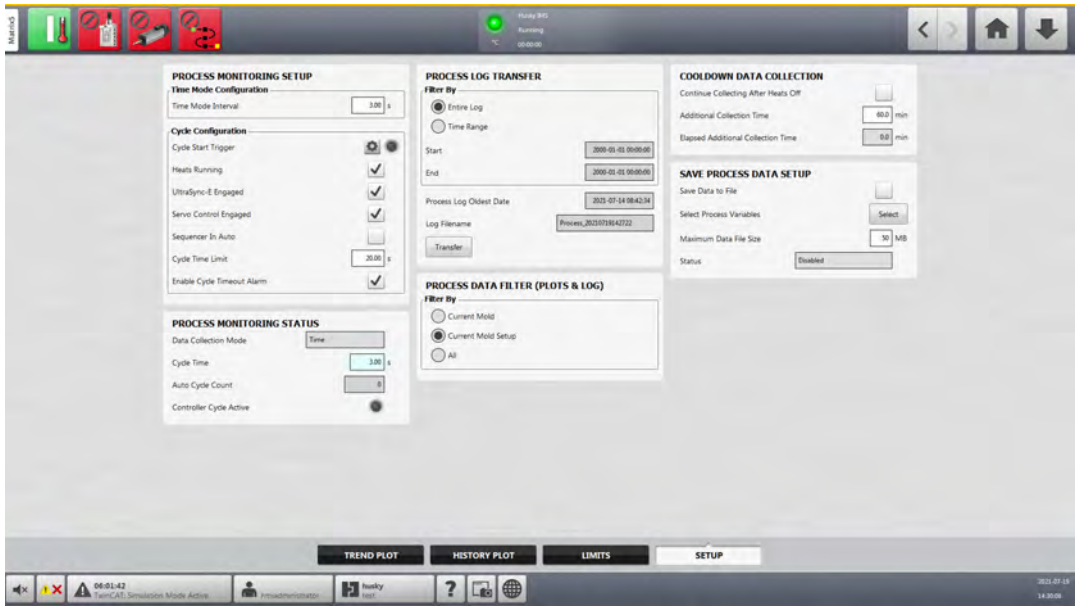


Figure 11-9 Process Monitoring Setup Screen

11.4.1 Time Mode Configuration

Time mode is used in operations when data collection is not cycle dependent and data must be collected at a timed interval. You can set how often process data is sampled. The value can be set from 2 to 300 seconds. The default time is 3 seconds.

During data collection, the selected data is sampled at approximately the same time. The zones do not have to be At Temperature.

NOTE: Time mode data collection is not done when the heats controller is in Stop, ART, Calibration, or Diagnostics modes.

To set the time mode interval, do the steps the follow:

1. Touch the **Time Mode Interval** field.
2. Type the number of seconds for how often the data must be sampled and then touch the **Accept** button.

11.4.2 Cool Down Data Collection

You can continue data collection for an interval of time after the controller has stopped. In the Cooldown Data Collection area of the process Limits screen, you can set a time value from 1 to 180 minutes. The default value is 60 minutes. When the timer expires, the data collection stops.

NOTE: Cool down data collection is only available if the controller is configured with temperature control. This feature will only work when the controller changes from the Running, Standby, or Boost state to the Stop state.

To set and enable the cool down data collection timer, do the steps that follow:

1. From the Home screen, touch the **Process Monitoring** button.
2. Touch the **Setup** tab.
3. Touch the **Additional Collection Time** field and type the time you want the controller to continue its data collection after the controller has stopped.
4. Touch the **Accept** button.
5. Touch the **Continue Collecting After Heats Off** check box, so the check mark shows.

11.4.3 Cycle Mode Configuration

You can set the Altanium system to cycle mode data collection. Data collection starts at the rising edge of the selected cycle start signal. The time mode data collection stops.

To use the cycle mode configuration, the Altanium controller must have one of the control technologies that follow:

- UltraSync-E
- Servo Control
- UltraShot
- Altanium Valve Gate Sequencer

The cycle mode configuration can also be used when the Cycle Input signal is selected for use when the Altanium controller is configured for heats only.

The data collection can be set to start by the signals that follow:

- IMM in Auto
- External At Temperature
- UltraSync-E Valve Gates at Open
- UltraSync-E Valve Gates at Closed
- External Permit Calibration
- Servo Digital Input 6 - 26
- Configurable Signal 1 - 18
- Cycle Input (refer to Section 11.4.3.3)

To set the cycle mode configuration, do the steps that follow:

1. Touch the **Cycle Start Trigger** gear icon.
2. Select a trigger in the Configure Signal dialog and configure its parameters. Refer to Table 11-4.

   NOTE: If necessary, you can invert the start cycle trigger that you configure.
3. When the start cycle trigger is configured, touch the Exit icon at the bottom of the dialog.
4. If applicable, touch the **Heats Running** checkbox, so the check mark shows.
5. If applicable, touch the **UltraSync-E Engaged** checkbox (if installed), so the check mark shows.
6. If applicable, touch the **Altanium Servo Controller Engaged** checkbox, so the check mark shows.

Table 11-4 Cycle Start Trigger Selections and Parameters

Signal Type	Signal	Condition	Position
None	-	-	-
Digital Input	Digital Input 1 - 26	-	-
Controller Function	• Fault Stop Immediately • Calibration Active • Process Outside Limit	-	-
Servo Axis	Select axis	Position < Position >	Set by user (in/mm for linear; °/rev for rotary)
		Position =	• Position 1 • Position 2 • Position 3 • Position 4
Servo Group	Group selected by user	Position < Position >	Set by user (in/mm for linear; °/rev for rotary)
		Position =	• Position 1 • Position 2 • Position 3 • Position 4
Servo Function	• Ready And Engaged • Override Active • All Axes At Home Position • All Axes Calibrated		

Table 11-4 Cycle Start Trigger Selections and Parameters (Continued)

Signal Type	Signal	Condition	Position
Configurable Signal	Configurable signal 1 - 18	-	-
UltraSync-E (if installed)	• UltraSync-E Valve Gates At Close • UltraSync-E Valve Gates At Open • UltraSync-E Ready and Engaged • UltraSync-E Valve Gates Position	-	-
Sequencer (if installed)	• Sequencer In Auto • Home Command	-	-
	• Custom Sequence	• At Step • Before Step • After Step	• Home • Step 1 - 18
Ethernet Digital Input	• IMM In Auto • External At Temperature • UltraSync-E Stems Open Command • UltraSync-E Stems Close Command • External Permit UltraSync-E Calibration • Servo Control Lock request • Axes To Home Position • Axis x Motion Permission (x = 1-4) • Axis x Index (x = 1-4) • Axis x Jog Forward (x = 1-4) • Axis x Job Back (x = 1-4)	-	-

11.4.3.1 Data Collection Start Conditions

Table 11-5 shows the data collection start conditions with specified operations enabled and disabled.

Table 11-5 Cycle Mode - Conditions to Start (shown with UltraSync-E installed)

Heats Running Condition Enabled	UltraSync-E Engaged Condition Enabled	Servo Controller Engaged Condition Enabled	Cycle Mode Conditions Selection Shown on Screen	Conditions to Start
Yes	Yes	No	Yes	Start signal goes High AND heats are turned On and At Temperature AND UltraSync-E is engaged
Yes	No	Yes	Yes	Start signal goes high AND heats are turned on and At Temperature AND Servo Controller is engaged
Yes	Yes	Yes	Yes	Start signal goes high AND heats are turned on and are At Temperature AND UltraSync-E is engaged AND Servo Controller is engaged
No	Yes	No	No	Start signal goes high AND UltraSync-E is engaged
No	No	Yes	No	Start signal goes high AND Servo Controller is engaged
No	Yes	Yes	Yes	Start signal goes high AND UltraSync-E is engaged AND Servo Controller is engaged
Yes	No	No	Yes	Not permitted

11.4.3.2 Data Collection Stop Conditions

Table 11-6 shows the data collection stop conditions with specified operations enabled and disabled

Table 11-6 Cycle Mode - Conditions to Stop (UltraSync-E or Altanium Servo Control Installed)

Heats Running Condition Enabled	UltraSync-E Engaged Condition Enabled	Servo Controller Engaged Condition Enabled	Cycle Mode Conditions Selection Shown on Screen	Conditions to Stop
Yes	Yes	No	Yes	If pair of digital inputs (start and end) • End digital input does not go high before the cycle time limit has expired • Heats are turned off or not At Temperature • UltraSync-E is disengaged or disabled System changes to timed data collection
				If one digital input to start and timer to end data collection: • Start digital input is not high again before the cycle time limit has expired • Heats are turned off or not At Temperature • UltraSync-E is disengaged or disabled System changes to timed data collection
				If one digital input to start and end data collection: • Start digital input does not go high again before the cycle time limit has expired • Heats are turned off or not At Temperature • UltraSync-E is disengaged or disabled System changes to timed data collection

Table 11-6 Cycle Mode - Conditions to Stop (UltraSync-E or Altanium Servo Control Installed) (Continued)

Heats Running Condition Enabled	UltraSync-E Engaged Condition Enabled	Servo Controller Engaged Condition Enabled	Cycle Mode Conditions Selection Shown on Screen	Conditions to Stop
Yes	No	Yes	Yes	If pair of digital inputs (start and end): • End digital input does not go high before the cycle time limit has expired • Heats are turned off or not At Temperature • Servo Controller is disengaged or disabled System changes to timed data collection
				If one digital input to start and timer to end data acquisition: • Start digital input is not high again before the cycle time limit has expired • Heats are turned off or not At Temperature • Servo Controller is disengaged or disabled System changes to timed data collection
				If one digital input to start and end data acquisition: • Start digital input does not go high again before the cycle time limit has expired • Heats are turned off or not At Temperature • Servo Controller is disengaged or disabled System changes to timed data collection

Table 11-6 Cycle Mode - Conditions to Stop (UltraSync-E or Altanium Servo Control Installed) (Continued)

Heats Running Condition Enabled	UltraSync-E Engaged Condition Enabled	Servo Controller Engaged Condition Enabled	Cycle Mode Conditions Selection Shown on Screen	Conditions to Stop
Yes	Yes	Yes	Yes	If pair of digital inputs (start and end): • End digital input does not go high before the cycle time limit has expired • Heats are turned off or not At Temperature • UltraSync-E is disengaged or disabled • Servo Controller is disengaged or disabled System changes to timed data collection
				If one digital input to start and timer to end data acquisition: • Start digital input is not high again before the cycle time limit has expired • Heats are turned off or not At Temperature • UltraSync-E is disengaged or disabled • Servo Controller is disengaged or disabled System changes to timed data collection
				If one digital input to start and end data acquisition: • Start digital input does not go high again before the cycle time limit has expired • Heats are turned off or not At Temperature • UltraSync-E is disengaged or disabled • Servo Controller is disengaged or disabled System changes to timed data collection

Table 11-6 Cycle Mode - Conditions to Stop (UltraSync-E or Altanium Servo Control Installed) (Continued)

Heats Running Condition Enabled	UltraSync-E Engaged Condition Enabled	Servo Controller Engaged Condition Enabled	Cycle Mode Conditions Selection Shown on Screen	Conditions to Stop
No	Yes	No	No	If pair of digital inputs (start and end): • End digital input does not go high before the cycle time limit has expired • UltraSync-E is disengaged or disabled System does not change to timed data collection
				If one digital input to start and timer to stop data acquisition: • Start digital input is not high again before the cycle time limit has expired • UltraSync-E is disengaged or disabled System does not change to timed data collection
				If one digital input to start and end data acquisition: • Start digital input does not go high again before the cycle time limit has expired • UltraSync-E is disengaged or disabled System does not change to timed data collection
No	No	Yes	No	If pair of digital inputs (start and end): • End digital input does not go high before the cycle time limit has expired • Servo Controller is disengaged or disabled System does not change to timed data collection
				If one digital input to start and timer to end data acquisition: • Start digital input is not high again before the cycle time limit has expired • Servo Controller is disengaged or disabled System does not change to timed data collection
				If one digital input to start and end data acquisition: • Start digital input does not go high again before the cycle time limit has expired • Servo Controller is disengaged or disabled System does not change to timed data collection

Table 11-6 Cycle Mode - Conditions to Stop (UltraSync-E or Altanium Servo Control Installed) (Continued)

Heats Running Condition Enabled	UltraSync-E Engaged Condition Enabled	Servo Controller Engaged Condition Enabled	Cycle Mode Conditions Selection Shown on Screen	Conditions to Stop
No	Yes	Yes	Yes	If pair of digital inputs (start and end): • End digital input does not go high before the cycle time limit has expired • UltraSync-E is disengaged or disabled • Servo Controller is disengaged or disabled System does not change to timed data collection
				If one digital input to start and timer to end data acquisition: • Start digital input is not high again before the cycle time limit has expired • UltraSync-E is disengaged or disabled • Servo Controller is disengaged or disabled System does not change to timed data collection
				If one digital input to start and end data acquisition: • Start digital input does not go high again before the cycle time limit has expired • UltraSync-E is disengaged or disabled • Servo Controller is disengaged or disabled System does not change to timed data collection
Yes	No	No	Yes	Not applicable

11.4.3.3 Cycle Input (Heat Control Only)

Cycle Input supplies a start or end of cycle signal from the injection molding machine. This input can be configured as the trigger to log process data on Altanium systems configured for heats control only.

When this input is selected for use, the controller looks for a rising edge to trigger the start or end of a cycle.

NOTE: This should be connected to a cyclical signal (the signal goes HIGH to LOW during each injection cycle)

This feature can be enabled or disabled when you select or deselect the 'In Use' checkbox in the Cycle Input line on the Heats Page 1 tab of the Digital Inputs screen. Refer to Section 9.2.3.

11.4.4 Cycle Time Limit

This field is used to stop cycle mode if no cycle signal is received for the set time. The cycle timer starts when the cycle signal is received. If the next cycle signal is not received before the timer completes, the cycle has timed out.

With a cycle time-out, one of the actions that follow occurs:

- With temperature control, the data collection changes to time based.
- Without temperature control, the data Collection will end, but stay in cycle-based data collection, waiting for the cycle start signal to occur again.

You can set the time limit between 2 and 300 seconds. The default is 20 seconds.

11.4.4.1 Enable Cycle Timeout Alarm

If the Enable Cycle Timeout Alarm is enabled, what follows will occur:

- If a controller cycle was active when the cycle time limit completed, an alarm is shown.
- If the controller cycle was not active, the systems thinks that the cycle has completed and it waits for the next cycle, so no alarm is shown.

11.4.5 Process Monitoring Status

The process monitoring Setup screen lets you see the controller's monitoring status. In the Process Monitoring Status area of the screen, the information that follows is shown:

- Data Collection Mode - shows the "Collecting" or "Not Collecting" status
- Cycle Time - shows the actual cycle time for the data collection
- Auto Cycle Count - shows the total number of cycles while in Auto mode
- Controller Cycle Active - an indicator that shows the cycle operation is active

11.4.6 Process Log Transfer

The Process Log Transfer area of the monitoring Setup screen lets you select the quantity of saved data and where to save it. You can select to save the Entire Log or by a Time Range. If you select the Time Range option, the Starts and Stop time field are available for you to set those values.

The Process Log Oldest Date and Log Filename fields are shown for information only.

Touch the **Transfer** button to navigate to the location where the Process Log is stored.

11.4.7 Process Data Filter

The Process Data Filter lets you filter which process variables are shown on the Trend and History Plot screens and saved in the Process Log. The selections are:

- Current Mold
- Current Mold Setup
- All (available data)

The default is the Current Mold Setup (when the controller is first started).

11.5 Cycle Monitoring

The Cycle Monitor screens let you see user-selected curve data on a graphic plot. You can also record and save the curve data for future reference.

From the Home screen, touch the **Cycle Monitor** button to see the Cycle Monitor screens.

11.5.1 Cycle Scope

The Cycle Scope screen shows specific curves that can help you troubleshoot your process. The curves shown include:

- Analog Inputs
- Sequencer Step
- Servo Digital Inputs 1 - 26

Touch the **Cycle Scope** tab at the bottom of the screen to see the Cycle Scope screen. Refer to Figure 11-10.

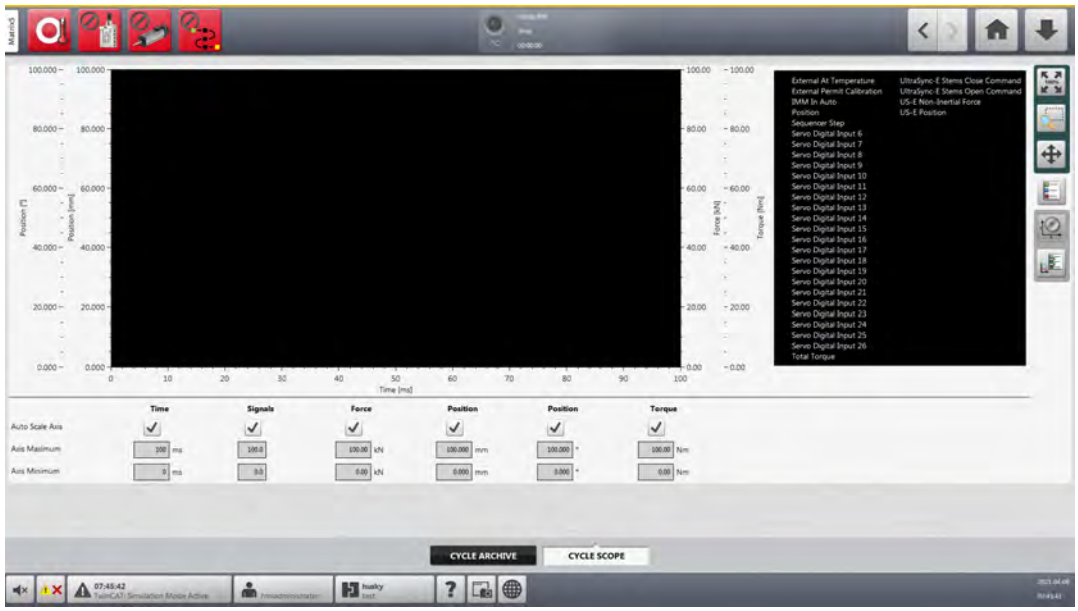


Figure 11-10 Cycle Scope Screen

11.5.2 Cycle Archive

The Cycle Archive screen lets you record and save the curve data that you selected on the Cycle Scope screen. The archived files can be loaded back onto the screen for reference when troubleshooting or for operation adjustment analysis.

Touch the **Cycle Archive** tab at the bottom of the screen to see the Cycle Scope screen. Refer to Figure 11-11.

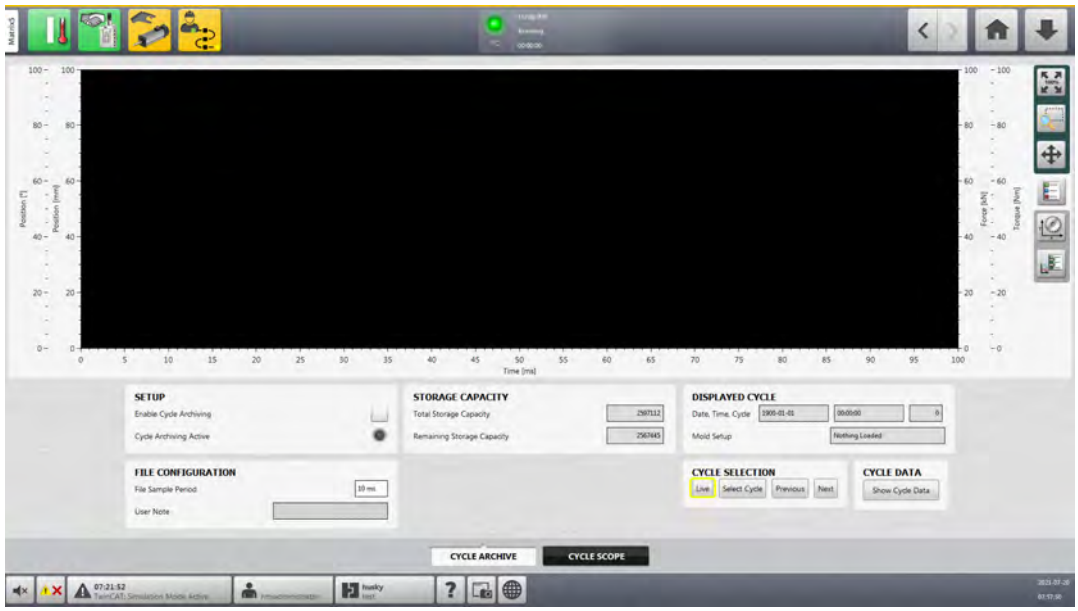


Figure 11-11 Cycle Archive Screen

The Cycle Archive screen settings and indications are described in Table 11-7.

Table 11-7 Cycle Archive Screen Descriptions

Item	Description
Enable Cycle Archiving	Use this checkbox to enable the cycle archiving.
Cycle Archiving Active	The indicator illuminates green while the cycle archiving is active.
File Sample Period	Touch the **File Sample Period** field to select the time period in which the samples are taken. A File Sample Period dialog will show that lets you select from nine sample periods (1ms up to 1000 ms).
User Note	This field is used to add a short note to the archived cycles.
Total Storage Capacity	This field shows the total number of cycles that can be archived on the system.
Remaining Storage Capacity	This field shows the storage space that remains in which cycles can be stored. The storage is shown as remaining cycles.
Date, Time, Cycle	These fields give the date, time, and assigned cycle number of a recorded cycle.
Mold Setup	This field give the name of the mold setup.
Live	Touch this button to see the live cycle curve plot and datalog values. A loaded cycle curve and datalog is discarded, and the last cycle curve and datalog table is shown. As new cycles complete, the last cycle curve is always shown.

Table 11-7 Cycle Archive Screen Descriptions (Continued)

Item	Description
Select Cycle	Touch this button to open a dialog that lets you navigate to, and select, a cycle curve plot file that you want to load.
Previous/Next	Use these buttons to see the next or previous cycle curve plot.
Show Cycle Data	Touch this button to see the actual data numbers for a cycle.

11.5.3 Chart View and Adjustment Selections

Table 11-8 shows a list of the chart view and adjustment selections used on the Cycle Monitor screens.

Table 11-8 Cycle Monitor - Chart View and Adjustment Selections

Button	Description
	Returns the chart view to 100%.
	Lets you magnify a specific area of the chart.
	Lets you adjust the chart view when magnified.
	Shows a legend to identify the chart traces.

Table 11-8 Cycle Monitor - Chart View and Adjustment Selections (Continued)

Button	Description
	Used to set auto scale for the chart traces that follow: • Time • Signals • Force • Position • Torque When auto scale is not selected, you can enter maximum/minimum values for a trace. 
	Lets you select the traces that are seen on the chart: • Servo Axis x Force or Torque (x = 1-6) • Servo Axis x Position (x = 1-6) • Signals • US-E Non-Inertial Force (if installed) • US-E Position (if installed)

Appendix A Glossary of Terms

Table A-1 describes the abbreviations and terms used in this user guide.

Table A-1

ASC	Altanium Servo Control
CSV	Comma Separated Values (file)
HMI	Human Machine Interface
HRC	Hot Runner Control
IMM	Injection Molding Machine
Imperial	Imperial Units or British Imperial Units (measurement)
Linear (movement)	Extend or retract movement along a straight line or measurement
LOTO	Lock Out/Tag Out
Matrix5	19-inch operator interface for hot runners
PCM	Priority Control Mode
PDF	Portable Document Format
PNG	Portable Network Graphics (format)
Rotary (movement)	Circular movement around a center or axis
SI	International System of Units (measurement)
TXT	Text (file)
US-E	UltraSync-E
VNC	Virtual Network Computing

Appendix B Troubleshooting

This appendix gives troubleshooting information and possible solutions for problems that could occur when the controller is energized, during configuration selections, and the operation of the servo motors and the UltraSync-E system.

This is not a full list of problems or solutions. If a problem is not shown in this chapter, contact Husky Technical Support or the nearest Husky Regional Service and Sales office for help.

B.1 Hazardous Voltage

The servo power controllers have capacitors installed on the direct current (DC) bus. These capacitors hold a dangerous electrical charge after the ASC is de-energized. The location of the DC bus is under a cover, refer to Figure B-1. The cover has warnings written on it, refer to Figure B-2. Make sure that you wait a minimum of 15 minutes after you de-energize the ASC before you remove the cover.

Figure B-1 DC Bus Covers

Figure B-2 DC Bus Cover Warnings

After you remove the cover, with a multimeter measure the voltage of the DC bus, refer to Figure B-3. Make sure that the measured voltage is less than 60 VDC before you continue maintenance or troubleshooting.

Do not operate the ASC with the covers removed.

Figure B-3 DC Bus Bar Under Cover

B.2 Startup Troubleshooting

Refer to Table B-1 for troubleshooting procedures.

Table B-1 Startup Troubleshooting

Problem	Potential Cause	Solution
The touch screen of the display module does not show data when you start the ASC.	The display module has no power.	Make sure that the power cable from the ASC stack is correctly connected. Refer to Figure 3-9. Make sure that the main power is connected correctly. Refer to paragraph 2.4 and Figure 1-1.
The touch screen of the display module does not fully boot up.	The boot drive has damage.	Contact Husky Technical Support.
The touch screen of the display module boots up and the software starts, but the controls do not function correctly.	The Cables from the display module to the ASC cabinet, or the interface cables between the IMM and the ASC are loose.	Examine all the cables and make sure that they are connected.
	Error in software or equipment.	Contact Husky Technical Support.
The touch screen of the display module does not function normally.	Error in software or equipment.	Contact Husky Technical Support.

B.3 Drive Fault (Error Code #)

There are many conditions that can cause this fault from the servo drive system to occur. A list of the drive faults is shown in Table B-2.

To find the problem, complete the steps that follow in order:

1. Make sure the servo cables are connected and the servo motor power switch is in the ON position.
2. Do the steps that follow to clear the fault:
   a. On the Status/Alarm screen, touch the **Silence Alarm** button to stop the alarm noise.
   b. Touch the **Reset Alarms** button one time and then wait two to three seconds. If the alarm does not clear, touch the **Reset Alarms** button again.

3. Monitor the condition of the electrical components and make sure what follows is true:

- The EtherCAT cable is connected to the ETHERCAT IN port on the back of the Altanium cabinet. Refer to Section 2.12.
- Main fuses F1 are not open (indicator lights are ON)
- Circuit breaker Q1M is in the ON position (switch is up)
- DC power supply G1 is ON (green LED is ON)
- Three 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.
- Circuit breakers Q1, Q10, Q11 are in the ON position.
- Examine the K2 relay (related to the Altanium E-Stop circuit); three green LEDs are ON.

Table B-2 Drive Faults

BMAXX5000 Error Codes:		
Communication Faults		
Alarm Description: Drive Fault: Communication (Error Code XXXX)		
Error Code	**Fault**	**Solution**
119	Drive no longer synchronous with fieldbus	Resolve any fieldbus communication alarms reported on the HMI screen. Check fieldbus communication cables and connections. Check for any sources of electrical noise. Check for EMC problems, shielding problems, loss of 24V power supply. Check for faulty devices on the same fieldbus as the servo drive system. Cycle power and if problem persists contact Husky
127	Timeout fieldbus interrupt	
501	Current Controller Cycle > RT0-Cycle time	
505	Fieldbus cycle time < RT0-Cycle time	
1023	Communication error with MUX register to the FPGA	
1037	Signal error during communication with the One Wire EEprom	
1937	Actual data were not picked up on time	
1938	No data is available yet	
Configuration Faults		
Alarm Description: Drive Fault: Configuration (Error Code XXXX)		
Error Code	**Fault**	**Solution**
128	Unknown identification System FPGA	Cycle power and if problem persists contact Husky
129	System FPGA version does not fit to DSP software	
130	The fallback version was booted by Bootloader 1	
131	The communication firmware has booted the fallback version	
132	The firmware has booted the fallback version	
133	The FPGA has booted the fallback version	
153	Value less minimum value	
154	Value greater maximum value	

Table B-2 Drive Faults (Continued)

BMAXX5000 Error Codes:		
157	Wrong axis index	(Continued)
2702	Error in the configuration of the return motion	
Feedback Faults		
Alarm Description: Drive Fault: Feedback Sensor (Error Code XXXX)		
Error Code	**Fault**	**Solution**
400	Amplitude of the encoder signal too small	Check to make sure encoder cable is not damaged and is connected to the motor. There could also be a defect in the encoder hardware and, if so, the motor will need to be serviced.
401	Amplitude of the encoder signal too great	
402	Error while initializing the position through Sin/Cos signals.	
403	Encoder monitoring: Overspeed due to sector error	
404	Signal monitoring at square-wave incremental encoder	
405	CRC error in received data	
406	Lighting failure EnDat® interface	
407	Signal amplitude too small EnDat® interface	
408	Position error EnDat® interface	
409	Overvoltage EnDat® interface	
410	Under voltage EnDat® interface	
411	Overcurrent EnDat® interface	
412	Battery error EnDat® interface	
413	Alarm Bit set	
414	Error during reception: Address mirroring returns an error	
415	Variance of encoder signals exceeds adjustable limit	
1730	Encoder temperature critical	
1733	Position error Multi-turn	
1734	Position error Multi-turn	
1735	Position error Multi-turn	
1752	Error while initializing the encoder (multiple errors)	
1753	Position generally not dependable	

Table B-2 Drive Faults (Continued)

BMAXX5000 Error Codes:		
1754	Unknown error from encoder	(Continued)
1800	No or invalid data in the encoder motor type plate	
1801	Invalid section found in the encoder OEM memory	
1813	No memory available in the encoder	
Overload of Device Faults		
Alarm Description: Drive Fault: Overload (Error Code XXXX)		
Error Code	**Fault**	**Solution**
2022	Overload of the Device	Clear the error and evaluate the deceleration value in the motion profile and reduce if possible
Overvoltage in Power Unit Faults		
Alarm Description: Drive Fault: Overvoltage (Error Code XXXX)		
Error Code	**Fault**	**Solution**
1002	Power unit maximum DC link voltage exceeded	Clear the error and evaluate the deceleration value in the motion profile and reduce if possible
1055	DC link voltage chopper threshold (DC link voltage max-30V) exceeded	
2008	Overvoltage in DC link	
Under Voltage in Power Unit Faults		
Alarm Description: Drive Fault: Under Voltage (Error Code XXXX)		
Error Code	**Fault**	**Solution**
1019	Under voltage DC link voltage	Check voltage at supply to controller and confirm that it is within specifications Cycle power and if problem persists contact Husky
2009	Under voltage in DC link	
Power Unit Over Temperature Faults		
Alarm Description: Drive Fault: Drive Over Temperature (Error Code XXXX)		
Error Code	**Fault**	**Solution**
1006	Power unit excess temperature	Make sure there are no air obstructions above or below the drive and that the air intake filter at the back of the unit is clear of any debris or obstructions.
1020	Heat sink excess temperature	
1021	Excess temperature inside temperature	

Table B-2 Drive Faults (Continued)

BMAXX5000 Error Codes:		
Safety Function Faults		
Alarm Description: Drive Fault: Drive Function (Error Code XXXX)		
Error Code	**Fault**	**Solution**
1007	Power unit safety relay	Cycle power and if problem persists contact Husky.
Motor Over Temperature Faults		
Alarm Description: Drive Fault: Motor Over Temperature (Error Code XXXX)		
Error Code	**Fault**	**Solution**
709	Motor excess temperature	Check area surrounding the motor for any source of excessive heat. Duty cycle maybe too aggressive. Reduce the frequency of actuation if possible Evaluate the motion profile settings and use less aggressive settings if possible
712	Short circuit on temperature encoder	
713	Temperature encoder is not connected	
714	Motor excess temperature PTC resistor	
Position Deviation Faults		
Alarm Description: Drive Fault: (Error Code XXXX)		
Error Code	**Fault**	**Solution**
207	Exceeded position error limit 1	Check for a and clear any obstructions in the mechanical mechanism in the mold Evaluate the motion profile settings and use less aggressive settings if possible
208	Exceeded position error limit 2	
Velocity Deviation Faults		
Alarm Description: Drive Fault: Velocity Deviation Limit Exceeded (Error Code XXXX)		
Error Code	**Fault**	**Solution**
201	Exceeded limit pos. speed control deviation	Check for and clear any obstructions in the mechanical mechanism in the mold Evaluate the motion profile settings and use less aggressive settings if possible
202	Exceeded limit pos. speed control deviation	

Table B-2 Drive Faults (Continued)

BMAXX5000 Error Codes:		
Motor I^2t Overload Faults		
Alarm Description: Drive Fault: Motor Overload (Error Code XXXX)		
Error Code	**Fault**	**Solution**
205	Motor I^2t overload	Evaluate if excessive force is being applied when motor is at position Adjust the relax limit setting in the Permissions screen to reduce the applied force as necessary Check for and clear any obstructions in the mechanical mechanism in the mold
Motor Over Current Faults		
Alarm Description: Drive Fault: Motor Over Current (Error Code XXXX)		
Error Code	**Fault**	**Solution**
1003	Overcurrent error in the power unit	Check cabling to motor. Cycle power to the drive. Could occur if a prolonged obstruction goes undetected. Motor maybe damaged and needs replacing
Motor Earth Faults		
Alarm Description: Drive Fault: Motor Earth Fault (Error Code XXXX)		
Error Code	**Fault**	**Solution**
1004	Power section fault current / earth fault monitoring	The ground fault may occur in the motor, motor cable or bleeder resistor or its feed cable. Find and replace the defective device.
Communication Warning		
Alarm Description: Drive Warning: Communication (Error Code XXXX)		
Error Code	**Fault**	**Solution**
139	Drive not synchronous with RT fieldbus (Warning)	Resolve any fieldbus communication alarms reported on the HMI screen. Check fieldbus communication cables and connections. Check for any sources of electrical noise. Check for EMC problems, shielding problems, loss of 24V power supply.
1931	General transmission error. Client must repeat telegram (e.g. with fragmented transmissions)	
1934	Communication partner reports error number in telegram user data	
2413	The transmit process is busy	

Table B-2 Drive Faults (Continued)

BMAXX5000 Error Codes:		
2414	The receive process is busy	Check for faulty devices on the same fieldbus as the servo drive system. Cycle power and if problem persists contact Husky
2415	Timeout of transmit process	
2416	Timeout of receive process	
Feedback Warnings		
Alarm Description: Drive Warning: (Error Code XXXX)		
Error Code	**Fault**	**Solution**
417	Warning Collision of frequency	Check to make sure encoder cable is not damaged and is connected to the motor. There could also be a defect in the encoder hardware and, if so, the motor will need to be serviced.
418	Warning Excess temperature	
419	Warning lighting controller reserve reached	
420	Warning Battery load too small	
421	Warning Reference point	
203	Positive overspeed limit exceeded	
204	Negative overspeed limit exceeded	
Motor Over Temperature Warnings		
Alarm Description: Drive Warning: Motor Over Temperature (Error Code XXXX)		
Error Code	**Fault**	**Solution**
96	Short circuit motor temperature sensor Tm<=-30°C	Do a check to make sure that the 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 Tm >=+300 °C (572 °F)	Do a check to make sure that the 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 the motor cool down. Increase the cycle time (cycle time should not be less than 3 sec).
99	Error I^2t > 100%	Let the motor cool down. Increase the cycle time (cycle time should not be less than 3 sec).
710	Motor Temperature Threshold 1 exceeded	Check area surrounding the motor for any source of excessive heat. Duty cycle maybe too aggressive. Reduce the frequency of actuation if possible Evaluate the motion profile settings and use less aggressive settings if possible
711	Motor Temperature Threshold 2 exceeded	
Power Unit Over Temperature Warnings		

Table B-2 Drive Faults (Continued)

BMAXX5000 Error Codes:		
Alarm Description: Drive Warning: Drive Over Temperature (Error Code XXXX)		
Error Code	**Fault**	**Solution**
1049	Temperature warning threshold heat sink exceeded	Make sure there are no air obstructions above or below the drive and that the air intake filter at the back of the unit is clear of any debris or obstructions.
1050	Temperature warning threshold Inside Air exceeded	

B.4 Alarm: Position Deviation Limit Exceeded

This fault occurs when an axis position is more than or less than the Position Deviation Tolerance setpoint. You can clear the alarms, but it could immediately show again or during the next axis movement if the problem stays.

Possible causes for this fault include:

- Opening Force Limit or Closing Force Limit values are set too low.
- Position Deviation Tolerance is set too small.
- Resin in the system is too cold or the temperature zone setpoints are set too low.
- A physical blockage of the valve stem plate.
- Damaged component.
- Maintenance pin(s) not removed before operation (UltraSync-E Generation 1 systems only).
- Force limit set too low to complete the movement.

Do the troubleshooting steps that follow:

1. On the Alarm or Event History screens, read the alarms that are related to the fault to see when the fault occurred. Was it during an open or close movement, or while held at an end position?
2. Increase the close and open force limits.
3. Decrease the speed, acceleration, and deceleration values.
4. Increase the Position Deviation Tolerance value.

Appendix C Preventive Maintenance

The tasks that follow should be done on regular schedule.

Interval	Task
Each Day	Make sure that all safety devices operate correctly.
	Examine all the cables.
	Clean the ASC cabinet and touch screen of the display module.
	Examine the air filter area on the rear of the ASC.
Each Month	Examine all electrical components.

CAUTION!

Make sure that there is no blockage of the air filter cover or the air outlets. If there is not sufficient airflow, then damage can occur to the ASC.

Examine the air filter (do this task more frequently if you operate the ASC where the airflow has a large quantity of contamination).

1. You must check all the safety devices on the molding cell before you start the IMM.
   a. Do a check of the emergency stop buttons.
      1) Push an emergency stop button.
      2) Make sure that all movement in the molding cell has stopped.
      3) Pull out the emergency stop button.
      4) Start the IMM.
      5) Do step 1 through step 4 again for all the remaining emergency stop buttons.
   b. Do a check of the safety gates.
      1) Open a safety gate.
      2) Make sure that all movement in the molding cell has stopped.
      3) Close the safety gate and start the IMM.
      4) Do step 1 through step 3 again for all the remaining safety gates that you can move and are interlocked.
2. Examine all the ASC cables for wear and damage. Replace all cables that have damage or are worn.

3. Clean the ASC and touch screen.
   a. Remove all oil grease, and other unwanted material from the cabinet of the ASC.
   b. De-energize the display module.
   c. With a soft lint-free cloth, remove dust and other unwanted contamination from the touch screen.

CAUTION!

Mechanical hazard - risk of equipment damage. Liquid that is sprayed or that falls onto the ASC, including oil or water, could damage the equipment. Do not spray wash.

   d. If necessary, spray a small amount of glass cleaner to make the soft lint-free cloth moist. Avoid glass cleaners with ammonia. Wipe the screen with the moist cloth.

4. Make sure that the slots of the air filter cover on the rear of the ASC do not have dust or other unwanted material.
5. Examine the air filter.
   a. On the rear of the ASC, remove the screws that attach the air filter cover. Refer to Figure 1-1.
   b. Remove the air filter cover.
   c. Remove the air filter from the ASC.
   d. Examine the air filter. Make sure that it is clean and not clogged with contamination.
   e. If necessary, clean or replace the air filter.
   f. There are two different sizes of air filter.
      1) HPN 7113453 - pleated panel air filter (10x10x1 inch) MERV8, or equivalent.
      2) HPN 7113472 - pleated panel air filter (7x7x1 inch) MERV8, or equivalent.
      3) Install the applicable air filter in the ASC.
      4) Install the air filter cover and attach it with the screws.

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