Altanium Individual Servo Valve Gate Controller (ISVGC)

User Guide

HUSKY®

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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 Individual Servo Valve Gate (ISVG) Controller (ISVGC) gives you accurate servo control of the individual valve stem actuators in a Husky ISVG hot runner of up to eight axes. The ISVGC can be used as a standalone system but can also control up to 255 temperature zones. 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 ISVGC. It also contains the necessary information to connect the ISVGC to an injection molding machine (IMM).

This user guide includes general warnings and cautions to avoid injury to personnel and damage to the system. These warnings and cautions are not intended to be, nor are they all-inclusive to every condition or application that may occur during operation. Maintenance and safety procedures remain the sole responsibility of the individual and his or her company.

Also, the manual contains the necessary information to test hot runners with ISVG before the hot runner is installed in an IMM.

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 ISVGC 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 ISVGC.

All personnel who install, operate, or maintain the ISVGC 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

General safety warnings and instructions follow:

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!

To avoid unpredictable system behavior that can cause death, personal injury, and property damage:

- **Perform lockout/tagout procedures before installing or servicing this equipment.**
- **Installation and service of this equipment must be performed by knowledgeable personnel who understand electromechanical, pneumatic, and hydraulic systems, how they are to be applied, and how to avoid any associated hazards.**
- **After any installation or servicing of the equipment, the equipment must be functionally tested for proper operation. The functional testing must include the operation of the IMM Safety Gates interlock. If the equipment does not function properly do not put into use.**
- **Inspect all cables for damage before each use of the equipment.**

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 must only be installed by approved personnel and obey all local codes.
- Only persons with a complete knowledge of the system's operation and function can operate the system.
- Read all of 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 ISVGC to show a hazard.

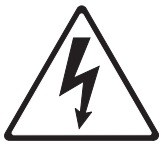
Safety Symbol	General Description of Symbol
	**General** This symbol shows a possible personal injury hazard. It normally has a pictogram or text to describe the hazard.
	**Hazardous Voltage** This symbol shows an electrical hazard that will cause death or serious injury.

Figure 1-1 shows an example of a Hazard Voltage warning.

Figure 1-1 Hazard Voltage Warning Example

1.2 Equipment Function

The Altanium Individual Servo Valve Gate (ISVG) Controller (ISVGC) controls the linear motion of up to eight axes of an ISVG hot runner system, and up to 255 temperature zones, the specific number of axes and temperature zones depends on how the system was ordered from Husky. ISVGC configurations include:

- Stand-alone control of up to 4 ISVG axes
- Stand-alone control of up to 8 ISVG axes
- Control of up to 4 ISVG axes with up to 255 temperature zones
- Control of up to 8 ISVG axes with up to 255 temperature zones

Parameter configurations and the operation of the ISVG axes and temperature zones are done with a touch screen user interface.

The ISVGC is designed as portable equipment that could be moved to different molding cells.

This user guide describes the operation of the Altanium ISVGC in a production line and its integration to an 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.

NOTE: Some of the ISVGC functions described and shown on screens in this user guide are optional. System screens on your system could show some of these functions, but they may not be installed. Contact a Husky Regional Service and Sales office if one or more optional functions are necessary for your system.

1.3 Intended Use

This controller is designed to control the motion of the ISVG hot runner electrical actuators located within the hot runner and may include optional control of the hot runner process temperature for injection molding applications only.

It is only allowed to be used for the application it was designed and sized for based on the information provided to Husky at the time of order.

1.4 Restrictions of Use

Husky injection molding equipment must never be used for any operation other than that described in Section 1.3 without Husky approval.

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

1.5 Input Wiring

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.

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

Table 1-1 Electrical Wire Standards

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

1.6 Environmental Operating Specification

CAUTION!

Mechanical Hazard — Risk of equipment damage. Liquid that is sprayed or that falls onto the ISVGC, including oil or water, could damage the equipment. Do not spray wash.

The environmental operation specifications for the ISVGC follow:

- For Indoor use only.
- Operation Temperature: 5 to 40 °C (41 to 104 °F)
- Operation Humidity: 0% to 90% RH, Non-Condensing
- Altitude: 2000 m (6562 ft)
- Pollution Degree: PD2
- Overvoltage Category: OVIII

1.7 Equipment Ratings

Ratings for the ISVGC are found on the nameplate attached to the back of the controller, or at the end of the input power cable.

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

- Supply Voltage: 100 to 240 Vac +/- 10%, single phase
- Frequency: 47 to 63 Hz
- Power Rating: 110 Watts

1.8 Reference: Altanium Matrix5 User Guide

This user guide describes the operation of the ISVGC only. The ISVGC can be a standalone system or integrated with temperature controls (heats), and operates on a Matrix5 controller platform.

The operation of temperature controls, system configurations, and common functions are described in the Altanium Matrix5 User Guide. You should read the user guide if you have not used temperature controls for a molding cell.

Most of the functions that are described in the Altanium Matrix5 User Guide will not be described again in this user guide. Some functions found in the Altanium Matrix5 User Guide are described in this user guide to make the information more self-contained for a standalone system. The information is also described here if there are some differences from the Altanium Matrix5 User Guide.

A reference to the Altanium Matrix5 User Guide is given when the function is described in that user guide. Make sure that you have a copy of the Altanium Matrix5 User Guide as you configure and operate your ISVGC system.

For integrated heats systems, temperature control configuration and view screen icons are shown on the human machine interface (HMI). The subsections that follow list those functions and screens. Refer to the applicable chapters in the Altanium Matrix5 User Guide for more information.

1.8.1 Temperature Controls

Refer to the Altanium Matrix5 User Guide for information on the functions and screens that follow:

- ART Process
- Card Layout
- Diagnostics Results
- Energy Display
- Mold Diagnostics

- Staging
- Supply Voltage
- Zone Calibration
- Zone Slot

1.8.2 Temperature Control Views

Refer to the Altanium Matrix5 User Guide for information on the functions and screens that follow:

- Graphical View
- Mold Picture View
- Multi Group View
- Neo2 View
- Quick Set
- Text View

Chapter 2 Integration

This chapter contains the instructions for the safe installation of the Altanium Individual Servo Valve Gate Controller (ISVGC). It also contains the necessary information to connect the ISVGC 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 ISVGC and the interface between the ISVGC 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 tasks that follow:

- Connect all of 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 Directives and Standards

A list of safety directives and standards follows.

NOTE: There may be other applicable directives and standards for your area and operation.

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/EC	European Low Voltage Directive
2014/30/EC	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 ISVGC.

Refer to Section 2.9 for the lockout/tagout procedures.

2.3.1 ISVGC Controls, Connectors, and Parts Identification

Figure 2-1 shows an ISVGC with temperature control and the location of the controls, connectors, and other parts on the ISVGC.

NOTE: Your ISVGC could look different from what is shown in the figure.

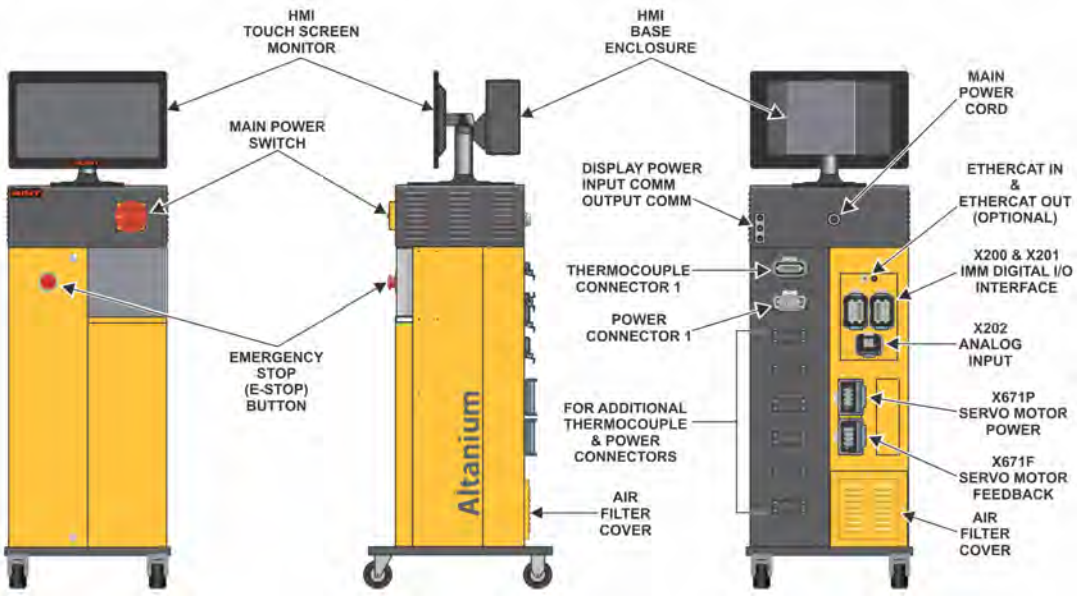


Figure 2-1 ISVGC Controls, Connectors, and Parts Identification

2.4 Initial Setup of the ISVGC

2.4.1 Remove the ISVGC from the Shipment Container

WARNING!

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

1. Remove the crating material to get access to the ISVGC and pallet.
2. Remove the straps that attach the ISVGC to the pallet.
3. Remove the material that stops the movement of the wheels.
4. Lift the ISVGC from the pallet. Refer to Section 2.4.2.
5. After you have put the ISVGC on a hard surface, the wheels of the ISVGC will let you push the ISVGC in position.

2.4.2 Lift the ISVGC

2.4.2.1 General

WARNING!

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

The ISVGC 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.

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

Table 2-1 Lift Straps

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

2.4.2.2 Lift Procedures

Do the steps that follow if the ISVGC must be lifted. The lifting device (crane or forklift) and straps that are used are different in lifting ability and lengths, depending on whether the Altanium is a single, double, or triple stack wide controller. Refer to Table 2-1 for the correct lift ability, straps, and lengths.

1. For a single stack wide ISVGC, put the two webbed straps in position below the ISVGC from left to right.
2. For a double or triple stack wide ISVGC, put the two webbed straps in position below the ISVGC from front to rear.
3. Put the webbed straps in position along the sides of the ISVGC and attach them to the lift device. Refer to Figure 2-2.

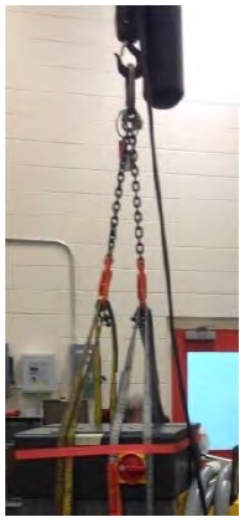


Figure 2-2 Straps and Lift Device

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

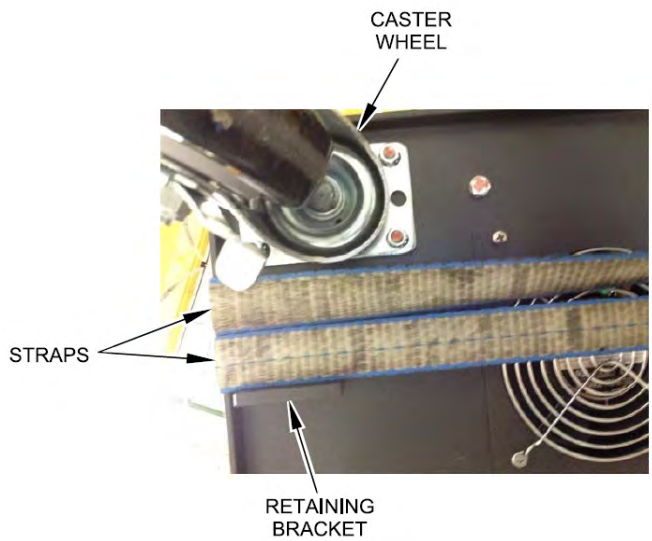


Figure 2-3 Straps - Correct Position

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

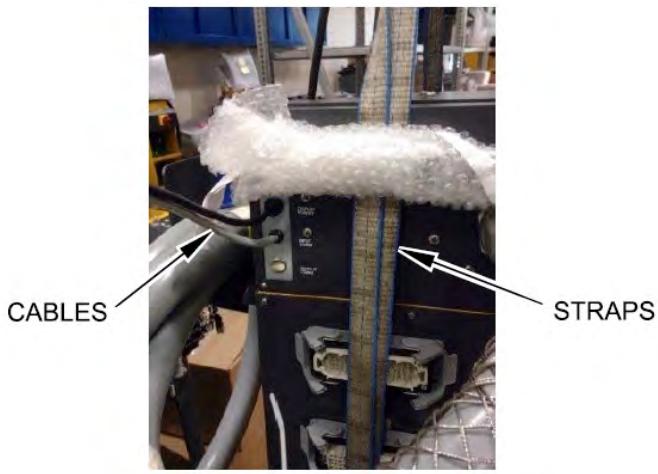


Figure 2-4 Cable Check

6. With the lift device, use only the force necessary to apply tension to the webbed straps. Do not lift the ISVGC at this time.
7. Put the ratchet strap around the top of the ISVGC and over the webbed straps. Do not tighten the ratchet strap at this time.

   NOTE: The ratchet strap will make sure the ISVGC does not tilt when you lift the ISVGC.
8. The ratchet strap can cause damage to the surface of the ISVGC. Put applicable material in all areas to prevent damage to the surface of the ISVGC. Refer to Figure 2-5.

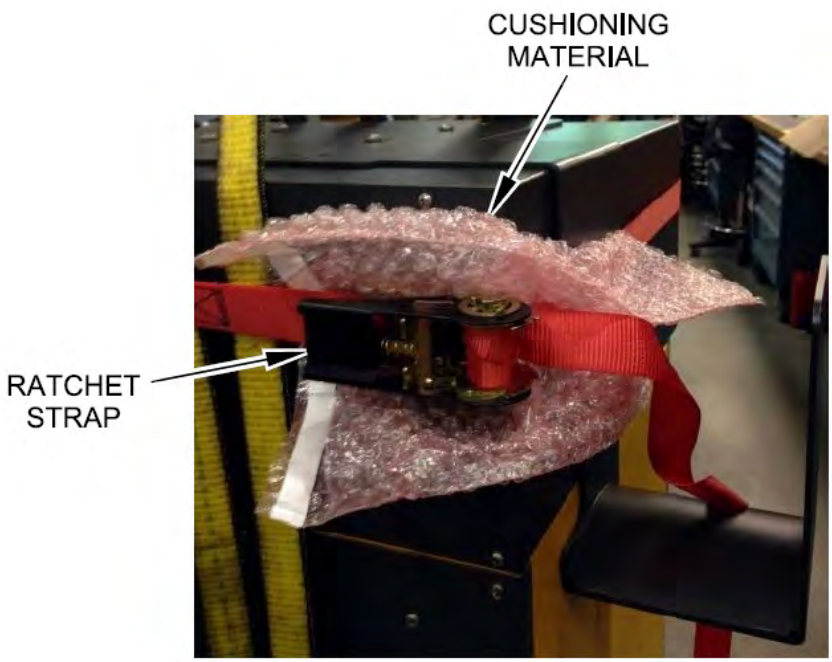


Figure 2-5 Cushion Material

9. Tighten the ratchet strap.
10. With the lift device, carefully and slowly lift the ISVGC 1 to 3 inches (25.4 to 76.2 millimeters).
11. Examine the webbed straps and ratchet strap to make sure that the ISVGC will not tilt.
12. Move the ISVGC to the correct location.
13. Carefully and slowly lower the ISVGC. Continue to lower the ISVGC until there is no tension in the webbed straps.
14. Remove the ratchet strap and the protective material, and the webbed straps.

2.5 Assemble the ISVGC

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

Do the steps that follow to install the display module on top of the ISVGC stack:

1. With the front of the ISVGC in front of you, remove the four M6 x 1mm button head cap screws from the top of the ISVGC stack.
2. Put the display module on top of the ISVGC and align the display module holes with the holes in the top of the ISVGC stack.

3. 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

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

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

WARNING!

Risk of electrical shock or electrocution.

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

2.6 Connect the Input Power

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

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

Because each ISVGC can be different, see maximum current ratings shown on the controller nameplate, or the label at either end of the input power cable.

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

2.7 Overcurrent Protective Device

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

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

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 ISVGC. Refer to Section 2.6.
- 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.

2.8 Bonding

The system integrator must make sure that the ISVGC 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.

2.9 Lockout/Tagout Procedures

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

Use the main power switch on the ISVGC cabinet to de-energize the ISVGC and the IMM. Refer to Figure 2-1.

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

Lockout/tagout procedures include the steps that follow.

NOTE: The tasks that follow do not include all of the lockout/tagout steps that you may need to do.

1. De-energize all systems.
2. Discharge all stored electrical energy.
3. Isolate all energy sources.
4. Apply locks and tags to all energy sources.
5. Install a placard at all the isolation points.
6. Block off the molding cell area.
7. 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.

2.10 Input/Output Signals and Other Connections

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

2.10.1 Input/Output Signals

An interface connection is used to send I/O signals between the ISVGC and the injection molding machine (IMM). The ISVGC can have a second I/O signal interface connection installed if more operating signals are necessary as part of the IMM operation. The ISVG can have a third analog input signal interface connection installed if analog signals from the IMM or other sensors are desired for monitoring or triggering ISVG motion.

The connector locations are on the back of the ISVGC. Refer to Figure 2-7.

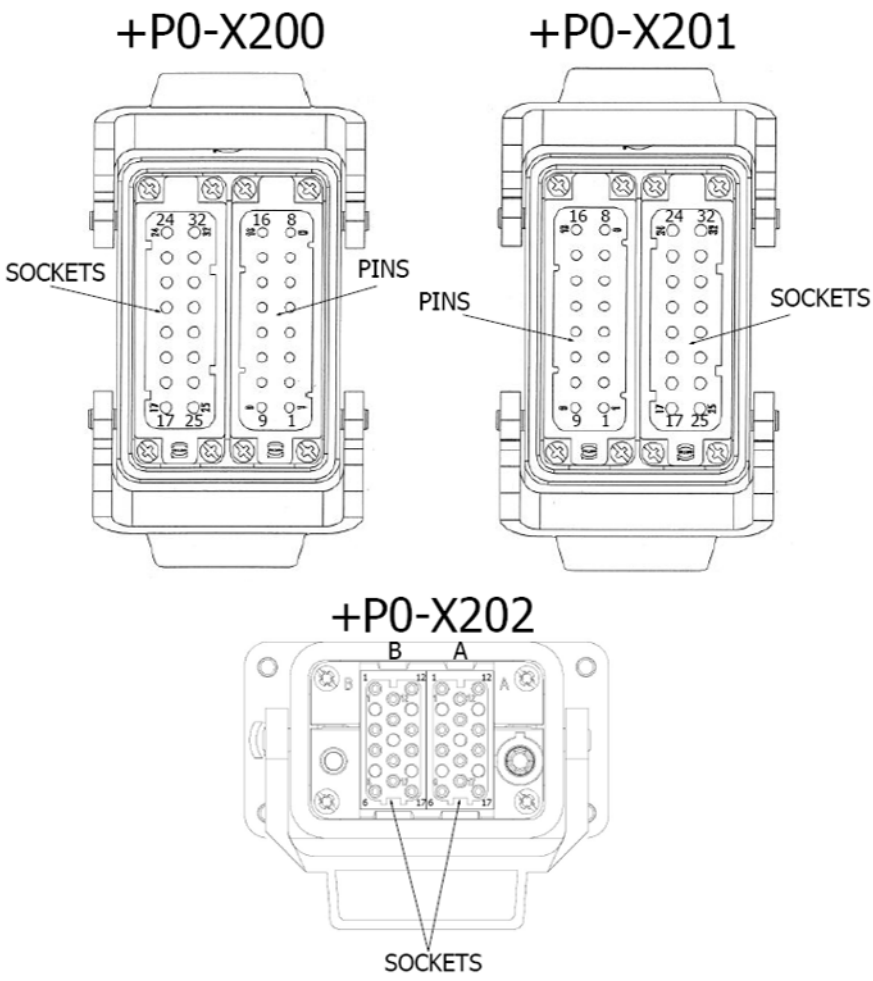


Figure 2-7 X200/X201/202 IMM Interface Connectors

2.10.2 X200/X201/X202 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 +P0-X202 IMM interface connector is used for additional analog operating signals or sensor signals, if necessary. The signals are described in Table 2-2, Table 2-3, and Table 2-4.

Three interface cables (-W-X200, -W-X201, and -W-X202) are supplied with the ISVGC. The interface cables connect the ISVGC to the IMM.

Husky uses Harting HAN 32A connectors for the +P0-X200 and +P0-X201 interface connectors, and a Harting HAN-Modular 6B connector with two HAN DDD 17-pin modules for the +P0-X202 interface connector.

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 ISVGC 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, on -W-X200/201 each cable wire is numbered along its length. The wire numbers are the same as the pin numbers on the X200/201 cable connector. On -W-X202 each cable wire is color coded along its length. 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.

NOTE: The signals from the X200/201/202 I/O system do not change, but the cable connectors and pin locations can be adapted.

Table 2-2, Table 2-3, and Table 2-4 give the descriptions for X200, X201, and X202 signals, their related pin locations, and their wire colors if not numbered.

Table 2-2 +P0-X200 Connector Pin Out

Signal Name	Safety	Operation	Description	+P0-X200 Pin
E-Stop Push Button of Controller Ch1	X		E-Stop button on the valve gate controller. OPEN when the valve gate controller emergency stop device (button) is pushed. When the switch contact opens, it must cause an emergency stop of the IMM.	1,2
E-Stop Push Button of Controller Ch2	X		E-Stop button on the valve gate controller. OPEN when the valve gate controller emergency stop device (button) is pushed. When the switch contact opens, it must cause an emergency stop of the IMM.	3,4
24 VDC from IMM		X	Reference HIGH level from the IMM, for relay outputs from the controller.	5
Handling Device		X	This signal is required when EM67 or EM12 are used. The Husky controller always operates as a “disengaged robot” to the IMM it is connected to, if connected to EM67 on the IMM side. HIGH indicates that the part handling device is not engaged, thus the IMM does not need other EM67 signals (for example, Permit Mold Close, Ejector forward/back). This signal is hardwired CLOSED (to pin 5), not connected to any relay output.	6

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

Signal Name	Safety	Operation	Description	+P0-X200 Pin
Bench Mode Plug Installed		X	Reserved for identification of the 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 input.	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)
IMM Safety Gate Ch1	X		The switch contact is CLOSED when safety devices (gates) on the IMM allow injection of plastic. The signal must be the result of limit switch contact series of mold area safety devices according to EN201. The signal must be isolated from all other signals.	17, 18
IMM Safety Gate Ch2	X		The switch contact is CLOSED when safety devices (gates) on the IMM allow injection of plastic. The signal must be the result of limit switch contact series of mold area safety devices according to EN201. The signal must be isolated from all other signals.	19,20
E-Stop of IMM Ch1	X		The switch contact must be OPEN when the IMM emergency stop device (button) is pushed. When the switch contact opens, it causes an emergency stop of the movement. The signal must be isolated from all other signals.	21,22

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

Signal Name	Safety	Operation	Description	+P0-X200 Pin
E-Stop of IMM Ch2	X		The switch contact must be OPEN when the IMM emergency stop device (button) is pushed. When the switch contact opens, it causes an emergency stop of the movement. The signal must be isolated from all other signals.	23,24
24 VDC of Controller		X	Reference HIGH level from the controller, for relay outputs from 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)
0 VDC of Controller		X	Reference of pin 25 from the controller for test purposes, but also allows for sourced digital outputs from IMM, if required.	32

Table 2-3 +P0-X201 Connector Pin Out

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 for future use.	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)

Table 2-3 +P0-X201 Connector Pin Out (Continued)

Signal Name	Safety	Operation	Description	+P0-X201 Pin
Configurable Input 15		X	Software-configurable input.	25 (X200:25)
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)

Table 2-4 +P0-X202 Connector Pin Out

Signal Name	Safety	Operation	Description	+P0-X202 Pin	W-X202 Flying Lead Conductor Color
Analog Input 1 Sensor +24 VDC		X	Analog Input 1, 24 VDC supply power for sensor.	A1	Black
Analog Input 1 Sensor Output		X	Analog Input 1, 0-10 VDC signal.	A7	White
Analog Input 1 Sensor DC Common		X	Analog Input 1, 0 VDC signal reference and common of sensor.	A12	Red
Analog Input 2 Sensor +24 VDC		X	Analog Input 2, 24 VDC supply power for sensor.	A2	Orange
Analog Input 2 Sensor Output		X	Analog Input 2, 0-10 VDC signal.	A8	Blue
Analog Input 2 Sensor DC Common		X	Analog Input 2, 0 VDC signal reference and common of sensor.	A13	White/ Black
Analog Input 3 Sensor +24 VDC		X	Analog Input 3, 24 VDC supply power for sensor.	A3	Red/Black
Analog Input 3 Sensor Output		X	Analog Input 3, 0-10 VDC signal.	A9	Green/ Black
Analog Input 3 Sensor DC Common		X	Analog Input 3 0 VDC signal reference and common of sensor.	A14	Orange/ Black
Analog Input 4 Sensor +24 VDC		X	Analog Input 4, 24 VDC supply power for sensor.	A4	Blue/Black
Analog Input 4 Sensor Output		X	Analog Input 4, 0-10 VDC signal.	A10	Black/ White
Analog Input 4 Sensor DC Common		X	Analog Input 4, 0 VDC signal reference and common of sensor.	A15	Red/White
Analog Input 5 Sensor +24 VDC		X	Analog Input 5, 24 VDC supply power for sensor.	A5	Green/ White
Analog Input 5 Sensor Output		X	Analog Input 5, 0-10 VDC signal.	A11	Blue/White

Table 2-4 +P0-X202 Connector Pin Out (Continued)

Signal Name	Safety	Operation	Description	+P0-X202 Pin	W-X202 Flying Lead Conductor Color
Analog Input 5 Sensor DC Common		X	Analog Input 5, 0 VDC signal reference and common of sensor.	A16	Black/Red
Analog Input 6 Sensor +24 VDC		X	Analog Input 6, 24 VDC supply power for sensor.	B1	White/Red
Analog Input 6 Sensor Output		X	Analog Input 6, 0-10 VDC signal.	B7	Orange/ Red
Analog Input 6 Sensor DC Common		X	Analog Input 6, 0 VDC signal reference and common of sensor.	B12	Blue/Red
Analog Input 7 Sensor +24 VDC		X	Analog Input 7, 24 VDC supply power for sensor.	B2	Red/Green
Analog Input 7 Sensor Output		X	Analog Input 7, 0-10 VDC signal.	B8	Orange/ Green
Analog Input 7 Sensor DC Common		X	Analog Input 7, 0 VDC signal reference and common of sensor.	B13	Black/ White/Red
Analog Input 8 Sensor +24 VDC		X	Analog Input 8, 24 VDC supply power for sensor.	B3	White/ Black/Red
Analog Input 8 Sensor Output		X	Analog Input 8, 0-10 VDC signal.	B9	Red/Black/ White
Analog Input 8 Sensor DC Common		X	Analog Input 8, 0 VDC signal reference and common of sensor.	B14	Green/ Black/ White
Ground		X	Ground from controller	Connector Base GND	Green

2.10.3 Safety Signals

All control panels on an IMM must have an emergency stop (E-STOP) pushbutton. There is an E-STOP pushbutton on the front of the ISVGC (refer to Figure 2-8). Its function is to operate as part of the IMM E-Stop circuit. The ISVGC E-STOP pushbutton has two isolated, normally closed, signal channels that attach to the X200 connector pins 1/2 (channel 1) and pins 3/4 (channel2). (Refer to Table 2-2 for X200 pin locations or refer to the electrical schematic). To aid in troubleshooting the E-STOP pushbutton is monitored in the ISVGC software and causes an alarm on the HMI screen when pushed.

Figure 2-8 Emergency Stop Pushbutton

If the controller is used in a bench mode operation, then the E-STOP pushbutton is connected to the ISVGC E-STOP circuit. Isolated from the IMM, the E-STOP button causes an emergency stop of the ISVGC when pushed. For bench mode operation, the -W-X200 cable is disconnected from the X200 connector and a bench mode plug is installed in the X200 connector (refer to Figure 2-9).

Figure 2-9 Bench Mode Plug

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

- E-STOP - The signal is sent by the IMM when:
  - The ISVGC E-STOP pushbutton 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 isolated channels of separate safety relays (-K1 and -K2) in the ISVGC from the X200 connector (refer to Table 2-2 or the electrical schematic for descriptions). These signals must be electrically isolated from each other. Also, they 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 where the ISVG valve stems move to the closed position.

NOTE: For ISVG valve stem movement to occur the following must be true:

On integrated systems:
- Temperature control must be in operation
- Temperature control must be 'At Temperature'
- Soak timer must have completed
- ISVGC axes must be enabled and calibrated

On systems with external temperature control:
- External 'At Temperature' signal must be active
- Soak timer must have completed
- ISVGC axes must be enabled and calibrated

When a safety signal is operated (the circuit becomes open), it causes the circuit safety relay to open. This signals the valve stems to move to the closed position, so plastic drooling does not occur, and then stops any actuator 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 all possible dangerous axis movement.

The time-released contacts are set to 0.6 seconds to give sufficient time for the valve stems to reach the closed position. This is so plastic drooling does not occur before the STO function is enabled, which prevents all possible dangerous motion.

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

The ISVGC 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:

1. Gain access to the -K1 and -K2 safety relays. The relays are mounted on a sliding plate, called the +P2-IO Drawer, located inside of the controller:
   a. Remove the four screws on the back of the controller that are around the X200/201/202 connector plate (refer to Figure 2-10).

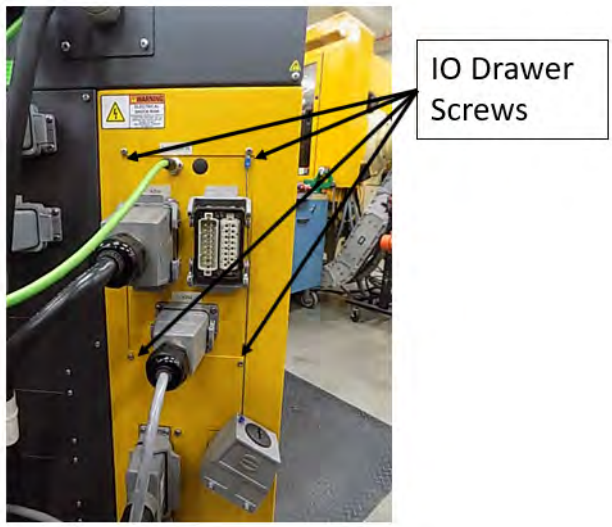


Figure 2-10 I/O Drawer Screw Locations

DANGER!

Risk of electrical shock or electrocution.

Only qualified, certified and trained personnel should open and enter the controller to perform any work described.

b. Open controller front door and unscrew the two captive thumb screws that hold the +P2-IO Drawer in place (refer to Figure 2-11).

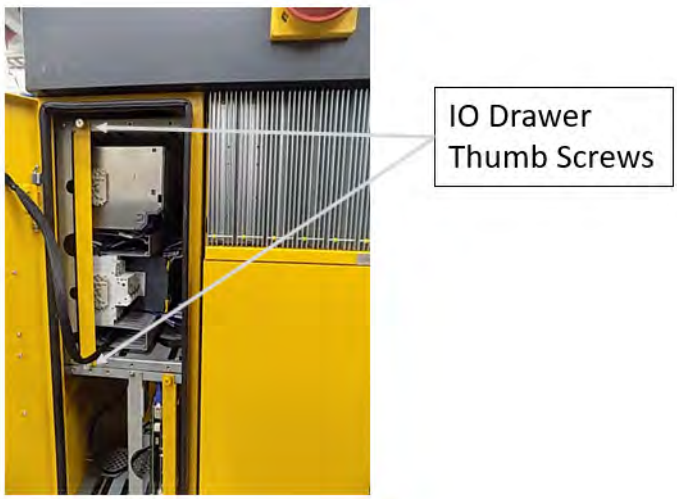


Figure 2-11 I/O Drawer Thumb Screw Locations

c. Carefully slide the I/O Drawer out far enough to access the -K1 and -K2 safety relays (refer to Figure 2-12).

Figure 2-12 I/O Drawer Pulled Out Enough to Access -K1 and -K2

2. 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, indicating a change has been made, but not confirmed or accepted yet.

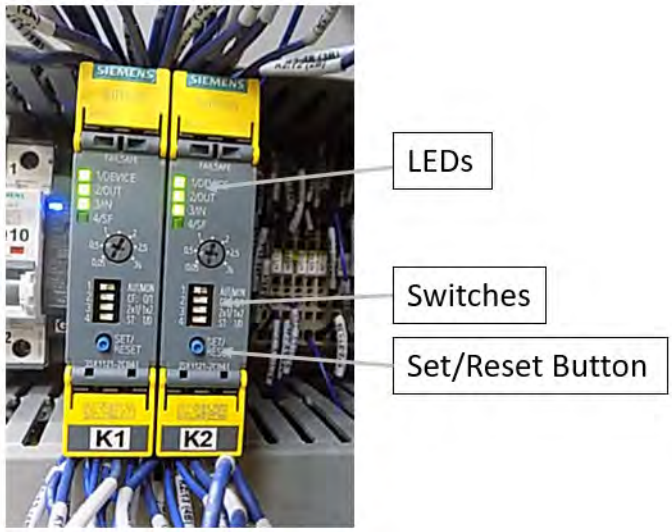


Figure 2-13 -K1 and -K2 Safety Relay LEDs, Switches, and Button (Two-Channel Configuration Shown)

3. If the switch change in step 2 was completed with the controller power off, turn the controller power on and proceed to step 4. Otherwise the safety relays need to be put into configuration mode in order 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 on the front of the relays (refer to Figure 2-13) until the LEDs turn off (3 to 4 seconds) and then let go of 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.

4. To acknowledge the changes, with the LEDs flashing Yellow (indicates the switch positions), press and hold the Set/Reset button on the front of the relays (refer to Figure 2-13) until the LEDs stop flashing (3 to 4 seconds) 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.
5. Carefully slide the I/O Drawer into the controller, back to its original position. Make sure that you do not pinch any wires.
6. Tighten the two thumb screws, and then close the controller front door.
7. Install the four screws on the back of the controller. Use the X200/201/202 connectors as a handle to help the alignment of the four screw holes on the back of the controller.
8. 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

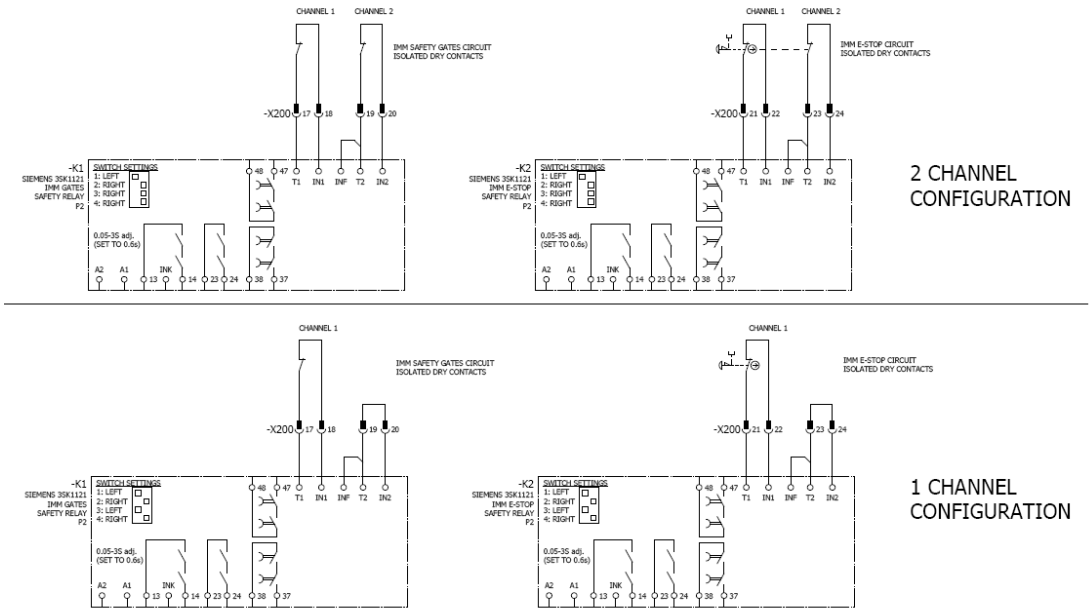


Figure 2-14 Two-Channel and One-Channel Safety Circuit Configurations

2.11 EtherCAT Connections

The EtherCAT In/Out connector locations are on the back of the controller, above the X200/201/202 connectors (refer to Figure 2-15). The operator interface display module connects to the EtherCAT In connector. EtherCAT Out is used to connect other Altanium devices.

Figure 2-15 EtherCAT Connector

2.12 Hot Runner ISVG Actuator Power and Feedback Connections

The connector location for the hot runner interface for the ISVG servo actuator power and feedback cables is on the back of the controller below the X200/201/202 connectors (refer to Figure 2-1 and Figure 2-16).

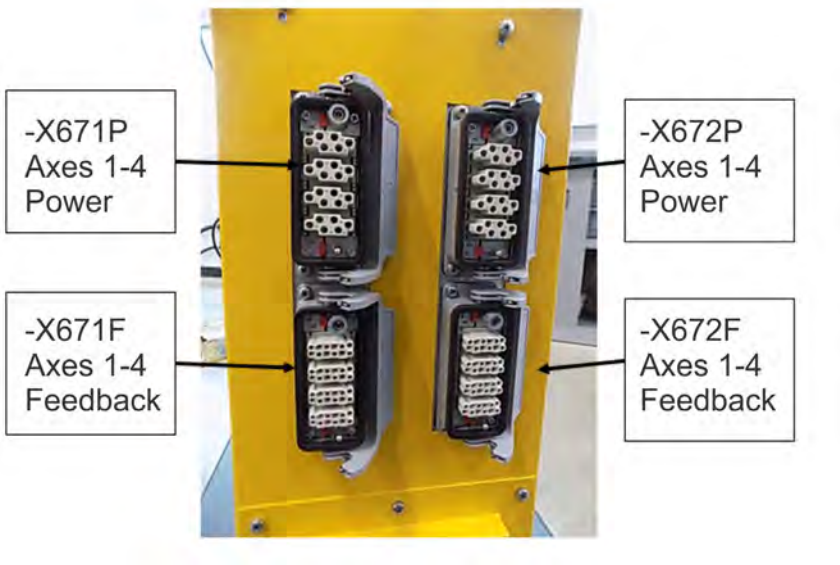


Figure 2-16 Hot Runner ISVG Actuator Connectors

The -X671P connector is used to connect the ISVG actuator power for axes 1through 4 to the hot runner ISVG actuators. The -X671F connector is used to connect ISVG actuator feedback for axes 1through 4 from the hot runner ISVG actuators. A -W-X671P cable and a -W-X-671F cable are provided with the system for the control of up to four ISVG actuators in the hot runner. These two connections are necessary to operate the ISVG actuators in the hot runner.

The controller can be ordered to control up to four ISVG actuators or it can be ordered to control up to eight actuators. If an eight axis controller was ordered you will have an additional set of connectors and cables for connecting to axes 5 through 8. The -X672P connector is for connecting ISVG actuator power for axes 5 through 8 to the hot runner ISVG actuators. The -X672F connector is to connect ISVG actuator feedback for axes 5 through 8 from the hot runner ISVG actuators. A -W-X672P cable and a -W-X-672F cable are provided with the system for the control of up to an additional four ISVG actuators in the hot runner (axes 5 through 8). These two connections are necessary to operate the additional up to four ISVG actuators in the hot runner (axes 5 through 8).

2.13 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 (Figure 2-17). 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 2-17 Display Power and Temperature Control Connections

2.14 Start the ISVGC

2.14.1 Before You Apply Power

Do the steps that follow before the ISVGC is energized:

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

CAUTION!

Make sure that there is no blockage of the air inlet and outlet vents. If there is not sufficient airflow then damage can occur to the ISVGC.

2. Make sure that there is no blockage of the air inlet and outlet vents. These are located at the top sides and the bottom rear of the ISVGC. Refer to Figure 2-18. Remove all materials around the side and rear air vents, so that there is good airflow through the ISVGC.

Figure 2-18 Side and Rear Air Vents

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 4 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 ISVGC and the electrical power source.
8. With the ISVGC main power switch in the Off position, make sure the voltage to the ISVGC is in the specified voltage limits. The voltage is measured between the main power switch and the power source.
9. Make sure that personnel are not doing maintenance on the ISVGC.
10. Make sure that all tools are removed from the area.
11. Make sure that the floors are clean.

2.14.2 Apply Power to the ISVGC

Do the steps that follow to energize the ISVGC:

1. Set the main power switch (refer to Figure 2-1) to the ON position.
2. Set up the ISVG controller:
   a. Configure controller to match the number of ISVG actuators in your hot runner
   b. Set open and close profiles to:
      - Open position: 7.4 mm
      - Close position: 0 mm

- Speed: 50 mm/s
- Acceleration/Deceleration: 500 mm/s^2

3. Heat the hot runner to its operation temperature, so the 'At Temperature' or 'External At Temperature' condition is satisfactory, and then wait for the soak timer to complete.
4. Switch control to Disengaged mode and Calibrate the valve stems.
5. Use the Open and Close manual control buttons to do a check of the valve stems and make sure they operate correctly.
6. Make sure that the valve stems go to the closed position when the ISVGC controller E-Stop or IMM E-stop is pushed and that an E-stop alarm occurs on the HMI.
7. Make sure that the valve stems go to the closed position when the IMM safety gates are opened.

For troubleshooting problems and errors, refer to Appendix B.

Chapter 3 Altanium ISVGC Operator Interface

This chapter contains the necessary information to operate the Altanium Individual Servo Valve Gate Controller (ISVGC) interface.

3.1 Operator Interface

The ISVGC human machine interface (HMI) is a high-resolution color LCD display covered by a transparent touch screen. With high definition and a wide-angle view, the 21.5-inch Matrix5 display is clearly seen, even in less than satisfactory light conditions.

Use the HMI touch screen to select screen items and change setpoints on the Altanium operator interface.

Graphic icons are the screen buttons. Text identifies each button, but the graphics make the buttons easy to understand their related screen's function.

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

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 ISVGC 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 (refer to Table 3-6).

The Home screen has three sections: header, footer, and the system screen selections area. 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 of the installed ISVGC devices.

Figure 3-1 shows the Home screen of an ISVGC system with integrated heats (temperature control). An ISVGC with no integrated heats will only show the Valve Gate, Common, and System Configuration buttons. The Temperature Control Views and Temperature Control buttons will not be seen.

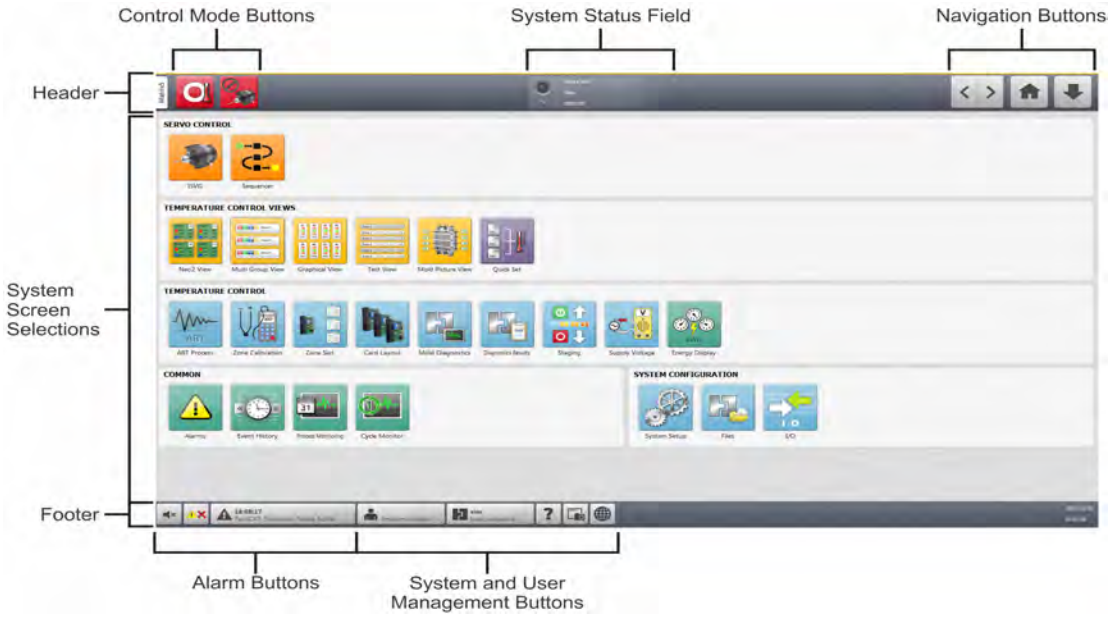


Figure 3-1 Valve Gate Sequencer Home Screen - Standalone System

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

3.2.1 Header/Footer Buttons and Indicators

The ISVGC has a screen header and a footer that are seen 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 to three modes of operation: Disabled, Manual, and Auto. On a standalone system, the mode buttons are shown next each other. On an integrated system, the mode buttons are shown in a drop-down menu. Touch the mode button that is shown to see the drop-down menu. Refer to Table 3-1 for the button descriptions.

Table 3-1 ISVGC Modes Buttons

Button	Description
	**Auto** In Auto mode: • Sequencing is enabled with triggers and delays, when Soak Time is complete. • Manual triggering is disabled. • Some settings/configurations cannot be changed. • Valve gates wait for the next signal to move.
	**Manual** In Manual mode: • Sequencing is disabled. • Manual triggering is enabled to open or close valve gates, when Soak Time is complete. - Valve gates are triggered individually. • Most settings/configurations can be changed.
	**Disabled** In Disabled mode: • Sequencing is disabled. • Manual triggering is disabled. • All sequence settings/configurations are changeable. • When entering Disabled mode, all valve gates are immediately sent a close signal state, if the system is 'At Temperature' or in a permitted period of time after the 'At Temperature' signal changes to LOW. - If the system comes up to temperature while this signal is LOW, the stems will not automatically move. - If another automatic-close condition occurs, the stems will not automatically move until the user has cleared all error conditions and the system has entered a safe and prepared-for-operation state. • All motion command requests are disabled (internal/external inputs and buttons that control Open/Close movements). • All ISVGC alarms are cleared.

3.2.1.1.1 Control Mode Change Permissions

The permissions necessary to change between control modes are shown in Table 3-2.

Table 3-2 Control Mode Change Permissions

Starting Mode	Ending Mode	Permissions
Disabled	Manual	No permissions necessary
Disabled or Manual	Auto	• Hot runner is 'At Temperature' • Safety inputs are satisfactory • No active “Stop End of Cycle” alarms • No active “Stop Immediate” alarms
Manual	Disabled	No permissions necessary
Auto	Manual	No permissions necessary
Auto	Disabled	No permissions necessary

3.2.1.2 Temperature Control Buttons

On an integrated heats system, use the temperature control buttons to select the control modes. Table 3-3 gives the descriptions of the buttons.

Table 3-3 Temperature Control Buttons

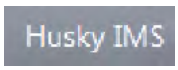
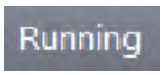
Button	Description
	**Stop** Touch the Stop button to de-energize all zones. This can be done during all system conditions.
	**Start** Touch the Start button to energize the zones that have a setpoint displayed.
	**Standby** Touch the Standby button to place the system in standby mode. If a timer is active, the time remaining is shown in the status bar. This button is not available during Active Reasoning Technology (ART).
	**Boost** Touch the Boost button to place the system in boost mode. If a timer is active, the time remaining is shown in the status bar. This button is not available during ART.

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

3.2.1.3 System Status Field

This field gives a fast indication of the system status. Refer to Table 3-4.

Table 3-4 System Status Field Indications

Indication	Description
	**At Temperature** At Temperature indicates what follows: • Flashes as the zones' temperature increases up to the setpoint temperature. • Solid when all automatic zones are 'At temperature'. • Off if the controller is in the 'Stop' condition. **NOTE:** This field shows only on systems with integrated temperature control.
	**Company Name** The Company Name is shown. This can be changed in the Setup - Main screen.
	**System Mode** For a list of the system modes, refer to Section 3.2.1.3.1. **NOTE:** This field shows only on systems with integrated temperature control.
	**System Timer** This shows the timer value.

3.2.1.3.1 System Modes (Integrated Temperature Control Systems)

The system mode is shown in the status bar on systems with integrated temperature control. Table 3-5 shows a list of system modes.

Table 3-5 System Modes

Mode	Description
Stop	The system is stopped.
Running	The system is in operation.
Manual Standby	The user touched the Manual Standby button. The system stays in the standby mode until changed.
Remote Standby	An external signal has put the system in the remote standby mode.
Delay Standby	After a set interval of time, the system changes to the remote standby mode.

Table 3-5 System Modes (Continued)

Mode	Description
Firmware Update	A firmware update is in operation on the specified control cards.
Calibration	The UltraSync-E (if installed) is in a calibration sequence.

NOTE: More system modes are used for integrated systems. Refer to the Altanium Matrix5 User Guide.

3.2.1.4 Navigation Buttons

These buttons are used to:

- Go to the Home screen from all other screens
- Move forward and backward through screen selections
- Quick navigation to the most used screens when not on the Home screen.

Refer to Table 3-6.

Table 3-6 Navigation Buttons

Button	Description
	**Back** Touch the Back 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 the Forward button to see the next screen (maximum of 10 screens forward). **NOTE:** The Home Screen is not included as part of the navigation history.
	**Home** Touch the Home button to see the Home screen.

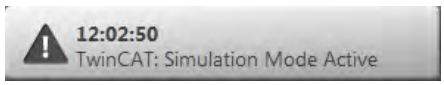
Table 3-6 Navigation Buttons (Continued)

Button	Description
	**Quick Navigation** Touch the **Quick Navigation** button for a drop-down list of view buttons for products that are configured for your system (the I/O button will always show).  ISVG  Sequencer  Neo2 View (Integrated Systems)  I/O  Process Monitoring  Cycle Monitor

3.2.1.5 Alarm Buttons

The Alarm buttons are used to stop the alarm horn, clear alarms, and to see the Alarm screen. Refer to Table 3-7.

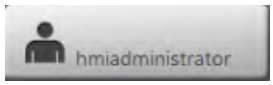
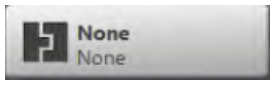
Table 3-7 Alarm Buttons

Button	Description
	**Silence Horn** Touch the 'Silence Horn button to stop the alarm horn.
	**Alarm Rest** Touch the Alarm Reset button to clear the alarm condition.
	**Alarm Status** Touch the Alarm Status 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.

3.2.1.6 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 3-8.

Table 3-8 System and User Management Buttons

Button	Description
	**User Log In/Log Out** Shows the name of the user that is logged in. Touch the User Log In/Log Out button to see the User Log in dialog window. Use this button to log in and log out of the Altanium system.
	**Mold Setup Information** The Mold Setup Information button shows the loaded mold and related mold folder. The top word 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 the HELP button to open the Portable Document Format (PDF) viewer and see the user guide on the screen.
	**Print** Touch the Print button to see the Print dialog window that contains the available print selections. For more information, refer to Section 3.4.
	**Language Selection** Touch the Language Selection button to see and select the available screen languages. For more information, refer to Section 3.3.

3.2.2 System Screen Selections

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

- Servo Control
- Common
- System Configuration

For an ISVGC system with integrated temperature control, two groups of temperature controls and monitor buttons are included:

- Temperature Control Views
- Temperature Control

NOTE: For more information on temperature control for an integrated system, 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 Control area of the screen contains the ISVG and Sequencer buttons.

Touch the **ISVG** button to see the ISVGC configuration screens. For more information, refer to Chapter 6.

Touch the **Sequencer** button to see the Sequencer configuration screens. For more information, refer to Chapter 7.

3.2.2.2 Common Buttons

The Common buttons are used for alarms, event history, and process monitoring. Refer to Table 3-9.

Table 3-9 Common Buttons

Button	Description
	**Alarms** Use the Alarm screen to see all errors that occur. For more information, refer to Chapter 10 and the Altanium Matrix5 User Guide.
	**Event History** The Event History screen shows 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 this button to get access to the process monitoring screens that let you see trend and history plots, and set limits and setup configurations. For more information, refer to Chapter 9.
	**Cycle Monitor** Use this button to get access to the Cycle monitor screen that lets you see specific curves that can help you troubleshoot your process. For more information, refer to Section 9.5.

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 ISVGC and the IMM. Refer to Table 3-10.

Table 3-10 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 Files screen, refer to the Altanium Matrix5 User Guide.
	**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 ISVGC and the IMM. For information about the I/O screen, refer to Chapter 8.

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 3-11.

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

Table 3-11 Temperature Control Views

Button	Description
	**Neo2 View** The Neo2 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.

Table 3-11 Temperature Control Views (Continued)

Button	Description
	**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 3-12 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 3-12 Temperature Control

Button	Description
	**Active Reasoning Technology (ART) Process** The 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.

Table 3-12 Temperature Control (Continued)

Button	Description
	**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.
	**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 Window Buttons

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

Table 3-13 shows the buttons usually found on the Altanium dialog windows.

Table 3-13 Dialog Window Buttons

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

3.3 Number Pads

Number pads are used when you must enter a numeric value in a field. To enter a value, touch the numeric field and the Number Pad shows. On the right side of the Number Pad a number range is shown. This range is in relation to the value field you want to set. You can only set a value in the specified range. Touch the numbers on the Number Pad and then touch the green check mark to accept the value.

Figure 3-2 shows a Number Pad example. The range in the example lets a user enter a time value between 1 and 300 minutes.

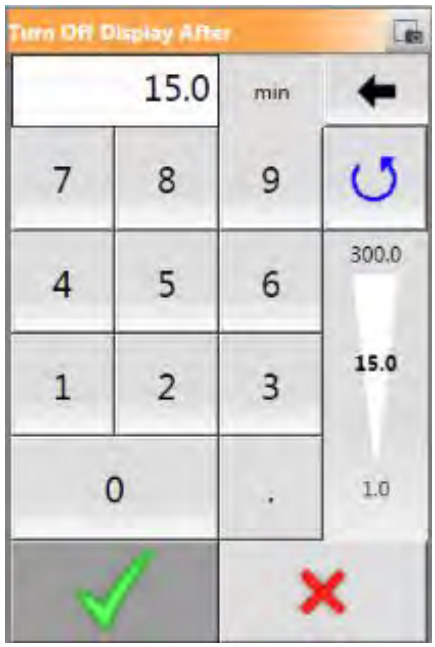


Figure 3-2 Number Pad Example

3.4 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 in the footer of the screen.

2. Do one of the tasks that follows:
   - On the Select Language dialog window, touch the **Language** field and then select a language from the list.

     The Language dialog window clears and all of the Altanium screens change to the language you selected.
   - To exit the Language dialog window without a change to the language, touch the **Exit** button.

3.5 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 3-3.

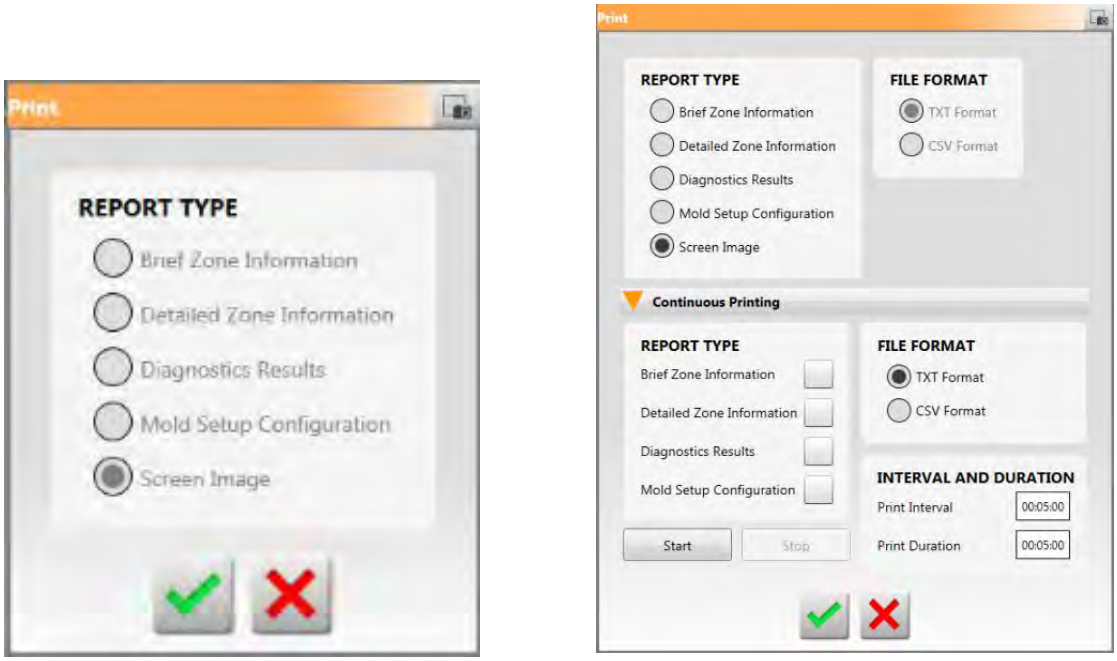


Figure 3-3 Print Dialog Windows for Standalone (Left) and Integrated (Right) Systems

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.

3.6 Help

The help is a PDF file of the Altanium Individual Servo Valve Gate Controller User Guide.

Touch the **Help** button in the footer of the screen and the user guide PDF file opens.

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

Chapter 4 Security and Administration

This chapter describes user management functions.

4.1 Security Screens

A user type is given to each person who operates the Altanium Individual Servo Valve Gate Controller (ISVGC) (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 ISVGC system.

Table 4-1 User Types

User Type	Description
Operator Level	Can change screen data as permitted by Administrator.
Supervisor Level	Can change screen data, with added user access to specified screens as permitted by Administrator.
Administrator Level	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.

ISVGC Standalone System

On an ISVGC standalone system, three tabs show at the bottom of the Security screen: MAIN 1, MAIN 2, and Servo.

1. Touch the **Main 1** tab to see the related security selections.
2. Select a user level (Administrator, Supervisor, or Operator) for each of the operations on the screen.
3. Touch the **Main 2** tab and continue to make the user level selections.
4. Touch the **Servo** tab and continue to make the user level selections.

ISVGC Integrated System

On an ISVGC integrated system (with heats), five tabs show at the bottom of the Security screen: Main 1, Main 2, Heats Page 1, Heats Page 2, and Servo.

1. Touch the **Main 1** tab to see the related security selections.
2. Select a user level (Administrator, Supervisor, or Operator) for each of the operations on the screen.
3. Touch the **Main 2** tab and continue to make the user level selections.
4. Touch the **Heats Page 1** tab and continue to make the user level selections.
5. Touch the **Heats Page 2** tab and continue to make the user level selections.
6. Touch the **Servo** tab and continue to make the user level selections.

4.1.1 Main Security Operations

The Main security operations are shown on two screens: Main 1 and Main 2. The subsections that follow give the security operations for the two screens.

4.1.1.1 Main 1 Screen

Figure 4-1 shows all of the security selections on the Main 1 tab for an ISVGC integrated system.

Figure 4-1 Main 1 Tab Security Selections (Integrated System)

For the Main 1 tab, set the user level to who can do the operations shown in Table 4-2. These operations are the same for the ISVGC standalone and integrated systems.

Table 4-2 Screen Security - Main 1 Screen

Item	Description
Enable User Security	Select the user role that can enable or disable the user security feature.
Controller Units	Select the user role that can change the controller units of measurement and the Force Temperature Units parameter on the System Setup screen.
Process Limits Edit	Select the user role that can operate functions on the Process Targets screen; however, the Default user has permission to change the Grid Selection field.
Printing	Select the user role that can operate the print feature.
Network Setup	Select the user role that can operate network setup functions and the dashboard application parameters on the Network Setup screen.
Remote Access	Select the user role that can operate the Remote Service Assistant utility on Network Setup screen.
Digital I/O Configuration	Select the user role that can configure the digital I/O on the Digital I/0 screen.
Log Transfer	Select the user role that can download the event log or data log in the Log Transfer section of the System Setup screen.
Options and Licensing	Select the user role that can load a license file that enables the options a user has purchased.
Mold Setup Auxiliary Actions	Select the user role that can view files (mold setups, images, txt files and PDF documents) and operate the buttons that follow on the Mold Setup screen: Create Folder, Delete, Copy, Paste, and Rename.
Mold Setup Load Action	Select the user role that can load a mold setup configuration file and to create a new mold setup configuration file on the Mold Setup screen.
Mold Setup Save Action	Select the user role that can save changes to mold setup files and use the Save As function on the Mold Setup screen.
System Data	<<<< Need description >>>>
Date and Time	Select the user role that can set the date and time.
Troubleshooting Data	<<<< Need description >>>>
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	Select the user role that can operate the major controller function buttons: Stop, Start, Standby, and Boost.
Clear Inactive Alarms	Select the user role that can clear audible alarms on the Alarms screen.

Table 4-2 Screen Security - Main 1 Screen (Continued)

Item	Description
Reset Alarms	Select the user role that can reset audible alarms on the Alarms screen.
Auto Log Out	Select the user role that can configure the auto logout parameter in the User Management screen.
Interface Settings (Shotscope NX)	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 Screen

Figure 4-2 shows all of the security selections on the Main 2 tab for an ISVGC integrated system.

Figure 4-2 Main 2 Tab Security Selections (Integrated System)

For the Main 2 tab, set the user level to who can do the operations shown in Table 4-3. These operations are the same for the ISVGC standalone and integrated systems.

Table 4-3 Screen Security - Main 2 Screen

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.
Save Process Data Setup	Select the user role that can save the process data setup.

4.1.2 Heats Security Operations (Integrated Systems)

On ISVGC integrated systems, two heats tabs are used for the Screen Security: Heats Page 1 and Heats Page 2. These two heats pages have all the heats related security selections. Set the user level to who can do the operations. For information on temperature control, refer to the Altanium Matrix5 User Guide.

4.1.2.1 Screen Security - Heats Page 1 Screen

Touch the **Screen Security** tab on the System Setup screen and then touch the **Heats Page 1** tab to see the Heats Page 1 screen user role items. Touch the field next to each item and then select the user role for that item in the dialog window that shows.

Figure 4-3 shows the Heats Page 1 screen and Table 4-4 describes the user role items.

Figure 4-3 Screen Security - Heats Page 1 Screen

Table 4-4 Screen Security - Heats Page 1 Screen

Item	Description
Multi Group Operations	Select the user role that can operate the Multi-Group screen functions.
Mold Picture View Edit	Select the user role that can use the edit function on the Mold Picture View screen.
ART Process	Select the user role that can operate the ART screen functions.
Mold Diagnostic Operations	Select the user role that can operate the Mold Diagnostics screen functions.
Energy	Select the user role that can manage the Altanium energy settings on the Energy Display screen.
Staging Configuration	Select the user role that can configure all the parameters in the Staging screen.
Global Output Power Limit	Select the user role that can configure the global output power limit parameter in the System Set up screen
Monitor Zone Settings	Select the user role that can configure the parameters in the Monitor Zone Settings area of the System Setup screen.
Part Count Setup	Select the user role that can use the Part Counting Setup function on the Heats Setup tab of the System Setup screen.
Temperature Calibration	Select the user role that can use the parameters in the Calibration screen to calibrate temperatures.
No Heater Detected Enable	Select the user role that can enable or disable No Heater Detection feature in the Heats Setup of the System Setup screen.
Thermocouple Reading	Select the user role that can select and clear the Display Thermocouple Reading for Manual Zones checkbox on the System Setup screen.
Power Deviation	Select the user role that can select the Setup Alarm button in the Power Deviation section on the System Setup screen.
Zone Slot Configuration	Select the user role that can operate the Zone Slot Configuration fields on the System Setup screen and the fields on the Zone Slot Configuration screen.
Zone Alarm Control Settings	Select the user role that can configure all the parameters in the Zone Alarm Control area of the System Setup screen.
Mold Cooling Enable Limit	Select the user role that can change this parameter in the Mold Cooling Enable area of the System Setup screen.
Remote Load Setup	Select the user role that can configure all the parameters in the Remote Load Setup dialog window. This option must be purchased before the user can access this dialog window.

Table 4-4 Screen Security - Heats Page 1 Screen (Continued)

Item	Description
SPI	Select the user role that can configure parameters in the SPI area of the System Setup screen. SPI must be installed on the system.
Resin Protection Timer	Select the user role that can set the protect resin timer on the Heats Setup screen in the System Setup.
Color Change	<<<< Description needed for this >>>>.
Soft Start Enable	Select the user role that can enable or disable Soft Start on the Heats Setup tab of the System Setup screen.
Soft Start Setup	Select the user role that can set the Soft Start Minimum Limit temperature on the Heats Setup tab of System Setup screen.
Earth Leakage Fault Enable	Select the user role that can enable and disable the System Earth Leakage Enable checkbox on the Heats Setup tab of the System Setup screen.
Earth Leakage Fault Setup	Select the user role that can operate the fields that follow on the System Setup screen: • Earth Leakage Fault Enable checkbox • Earth Leakage Limit field • Display Earth Leakage Reading checkbox • Circuit Overload Enable checkbox • Circuit Test Enable checkbox
Bake Out Enable	Select the user role that can enable or disable the bake out function on the Heats Setup tab of the System Setup screen.
Bake Out Setup	Select the user role that can configure the bake out fields on the Heats Setup tab of the System Setup screen.
Autoslave Enable	Select the user role that can enable the Auto Slave function on the Heats Setup tab of the System Setup screen.
Autoslave Setup	Select the user role that can set up Auto Slave Power Limit percentage on the Heats Setup tab of the System Setup screen.

4.1.2.2 Screen Security - Heats Page 2 Screen

Touch the **Screen Security** tab on the System Setup screen and then touch the **Heats Page 2** tab to see the Heats Page 2 screen user role items. Touch the field next to each item and then select the user role for that item in the dialog window that shows.

Figure 4-4 shows the Heats Page 2 screen and Table 4-5 describes the user role items.

Figure 4-4 Screen Security - Heats Page 2 Screen

Table 4-5 Screen Security - Heats Page 2 Screen

Item	Description
Quick Set Frequently Used	Select the user role that can change the fields in the Frequently Used drop-down list on the Quick Set screen.
Quick Set Setpoint Limits	Select the user role that can change the fields in the Setpoint Limits drop-down list on the Quick Set screen.
Quick Set Advanced Options	Select the user role that can change the fields in the Frequently Used, Zone Edit, Advanced Settings, and Control Settings drop-down lists on the Quick Set screen.
Quick Set Standby and Boost Setpoints Options	Select the user role that can change the fields in the Manual Standby, Manual Boost, Remote Standby, and Remote Boost drop-down lists on the Quick Set screen.
Wattage Voltage	Select the user role that can change the Wattage Voltage field on the Heats Setup tab of the System Setup screen.
Supply Configuration	Select the user role that can change the Supply Configuration field on the Heats Setup tab of the System Setup screen.
Enable	Select the user role that can enable or disable the Current Deviation on the Heats Setup tab of the System Setup screen.
Deviation Limit	Select the user role that can change the Current Deviation Limit percentage field on the Heats Setup tab of the System Setup screen.
Minimum Limit	Select the user role that can change the Current Deviation Minimum Limit amperage field on the Heats Setup tab of the System Setup screen.

4.1.3 Servo Security Operations

Touch the **Screen Security** tab on the System Setup screen and then touch the **Servo** tab to see the Servo screen user role items. Touch the field next to each item and then select the user role for that item in the dialog window that shows.

Figure 4-5 shows the Heats Page 1 screen and Table 4-6 describes the user role items.

Figure 4-5 Servo Screen Security

The operations described in Table 4-6 are the same for the ISVGC standalone and integrated systems.

Table 4-6 Servo Screen Security Operations

Item	Description
Operation – Basic	Select the user role that can change the Servo mode, do calibrations, and use the manual index control.
Operation – Advanced	Select the user role that can override and use the manual jog controls.
Configuration – Basic	Select the user role that can change servo axis names and group names. This also includes changes to position and monitoring setpoints.
Configuration – Advanced	Select the user role that change the servo gear ratio, force transmission efficiency, minimum and maximum axis positions, and home position setpoints. This also includes calibration selections.
Operating Limits – Basic	Select the user role that can set the servo index speed, jog (force limits, slow/fast speeds), and monitoring windows.
Operating Limits – Advanced	Select the user role that can set the servo maximum acceleration, deceleration, speed, and force.

Table 4-6 Servo Screen Security Operations (Continued)

Item	Description
I/O Signal Interface	Select the user role that can do servo input and output signals interface selections.
Motion Profile	Select the user role that can set the servo motion profile parameters.
Equipment Protection	Select the user role that can set the maximum servo cabinet internal temperature and air filter change reminder.

4.2 Manage Users

The User Management screen lets ISVGC administrators create a user, change a user's password, and delete a user. Figure 4-6 shows the User Management screen for an ISVGC integrated system.

NOTE: Tasks on the User Management screen are the same for ISVGC standalone and integrated systems.

Figure 4-6 User Management Screen (Integrated System)

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. Use one of the user management buttons as described in Table 4-7.

Table 4-7 User Management Buttons

Button	Description
	**Add User** Touch the Add User button to add a user to the system.
	**Change User Settings** Select one of the users (touch a user bar in the center of the screen, so it is highlighted). Touch the Change User Settings button to modify the user name, password, or user role for a given user.
	**Delete User** Select one of the users (touch a user bar in the center of the screen, so it is highlighted). Touch the Delete User button to remove a user from the system.

4. Enter the user information in the fields, or delete a user, as applicable.

4.3 Saved User Selections

A user can change the unit of measurement or make a language selection in the ISVGC. These selections are 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 ISVGC system will log a user off if the HMI screen has not been touched in 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. Refer to Figure 4-7.

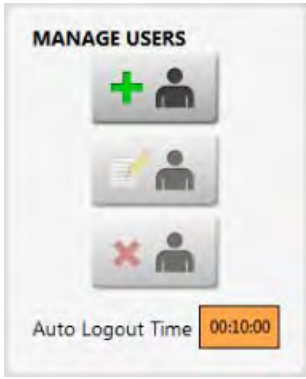


Figure 4-7 Auto Logout Time

To make adjustments for specified users, use the Screen Security tab. Refer to Section 4.1.1.

Chapter 5 System Setup Screen

This chapter describes the contents of the System Setup screen tabs. The main configurations are shown in Section 5.1. Network and remote service assistance configurations are shown in Section 5.2.

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

If your Individual Servo Valve Gate Controller (ISVGC) system is integrated for temperature control, the Heats Setup descriptions are given in Section 5.3. For more information about heats and heats setup, refer to the Altanium Matrix5 User Guide.

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

5.1 Main System Setup Screen

The Main tab of the System Setup screens (Figure 5-1) shows the system information and lets you configure user settings, event log transfers, diagnostic exports, and power conservation.

Figure 5-1 System Setup - Main Screen (Integrated System)

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 Main System Setup screen items.

Table 5-1 System Setup - Main Screen Items

Item	Description
Serial Number	The serial number is shown for information only. It is a number assigned to the system when it is manufactured. Husky support could ask for this number when troubleshooting or when the Altanium controller is upgraded.
Model	The controller model name.
Software Version	This is the software version that is loaded on the Altanium controller and is shown for information only. Husky support could ask for this number when troubleshooting or when the controller is upgraded.
Software Configuration	This identifies the configuration of the software for your Altanium controller and is shown for information only.
Disk Image Version	This shows the software disk image version that is loaded on the Altanium controller and is for information only. Husky support could ask for this number when troubleshooting or when the controller is upgraded.
Company Name	The company name shown on the status bar.
Language	The language used on the user interface.
Force Temperature Units To	Forces the temperature units to specified setting.
Units	Used to change the units of measure (SI or Imperial) seen on the user interface.
Date and Time	Used to change the date and time shown on the user interface. The default is today's date and current time.
Time Zone	The time zone used for the user interface.
Automatic Daylight Saving	Automatic daylight savings time enable checkbox.
Filter By	The options to transfer the Event Log are the "Entire Log" or by a "Time Range". The Start and End times are shown for information only.
Transfer	Touch this button to select the location where the Event Log is stored.
Diagnostics Export	Used to export diagnostics files to a USB drive. This feature is for Husky Technical Support use only. Please contact Husky for assistance, if necessary.
Equipment Protection	Used to set a reminder to change the air filter and to set a maximum temperature alarm for the servo cabinet internal temperature.
License Number	The license key is shown.

Table 5-1 System Setup - Main Screen Items (Continued)

Item	Description
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.
Acknowledge Alarm	<<<< Description Needed >>>>
Power Conservation	Enables the Altanium controller screen to turn off if the screen is not used after a set time.

5.1.1 Select a Language

This field on the Main System Setup screen has the same function as the Language Selection button in the footer of all Altanium screens.

To select a language, do the steps that follow:

1. Touch the **Language** field.
2. Do one of the tasks that follows:
   - On the Select Language dialog window, touch the **Language** field and then select a language from the list.

     The Language dialog window clears and all of the Altanium screens change to the language you selected.
   - To exit the Language dialog window without a change to the language, touch the **Exit** button.

5.1.2 Set the Units of Measure

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

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

1. On the Main System Setup screen, touch the **Units** button.

   The Units dialog widow shows. Refer to Figure 5-2.

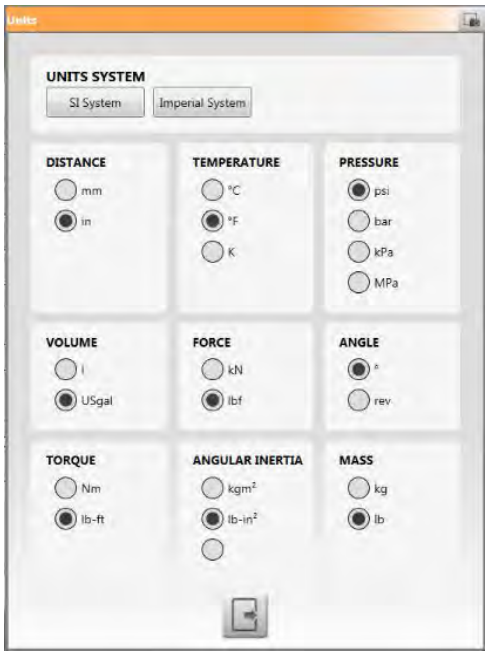


Figure 5-2 Units Dialog Window

2. In the Units dialog window, touch the **SI System** button or **Imperial System** button to make a selection.
3. Touch a circle below each heading to select a unit of measure.

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

5.2 Network Settings

Files can be stored hierarchically in the methods that follow:

- Local controller storage
- External storage (USB)
- Shared network folder (Windows standard)

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 **Network** tab on the System Setup screen. Refer to Figure 5-3.

On the Network screen, 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**.

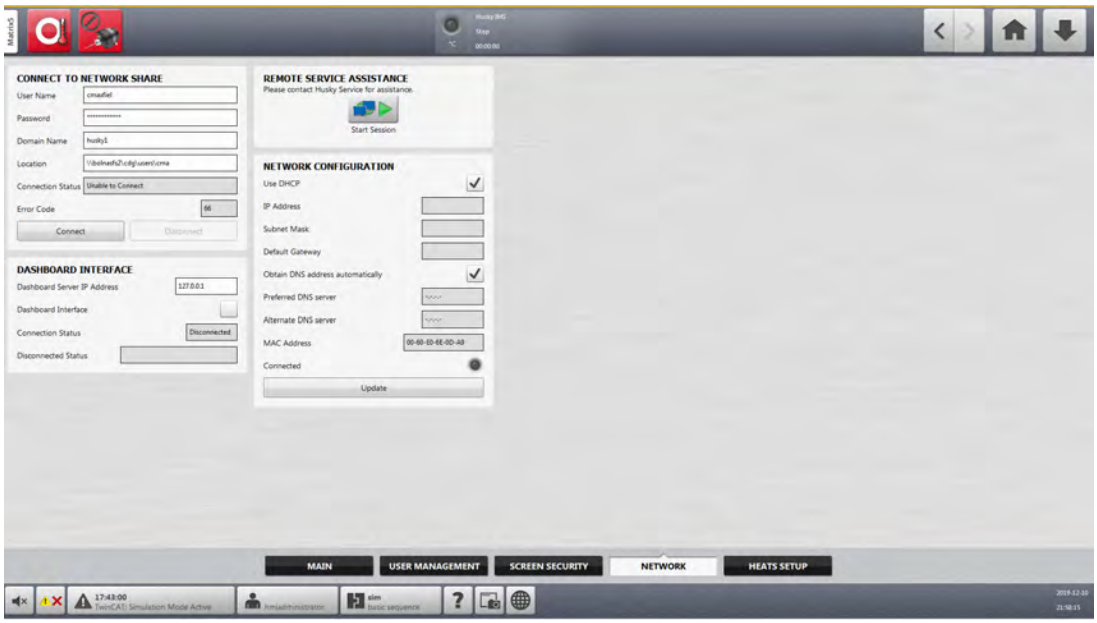


Figure 5-3 System Setup - Network Screen

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.

Table 5-2 Network Configurations (Continued)

Item	Description	
Location	The UNC path that specifies the server name and shared folder on a network. Example: \\companyserver\shared	
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.	

5.2.1 Dashboard Interface

The Dashboard Interface area 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.

5.2.2 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 an ID and password. Do the steps that follow:

1. Touch the **Start Session** button.

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

2. Enter a ID and password.

NOTE: A keyboard is necessary for this.

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

The Husky service technician can operate or see your Altanium 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.

5.2.3 Network Configuration

The Network Configuration area of the Network screen lets you enable the use of Dynamic Host Configuration Protocol (DHCP) and to have the system obtain a Domain Name Server (DNS) address automatically.

5.3 Heats Setup (Integrated System)

On an integrated system, use the Heats Setup screens to configure the temperature control operations that follow:

- Manual and standby boost
- Remote standby
- Remote boost

- Bake out
- Resin protection timer
- Soft start
- Mold cooling enable
- Part counting
- SPI
- Thermocouples
- Auto slave
- Zone slot configuration.

The Monitoring configurations can also be set for the operations that follow:

- Zone alarm control
- Monitor zone settings
- Voltage settings
- Power limiting
- Earth leakage
- Circuit test
- At temperature (minimum limit and delay timer)
- Power deviation
- No heater detection
- Current deviation.

The sections that follow give descriptions for the temperature control and monitoring settings on the Heats Setup tabs. Refer to the Altanium Matrix5 User Guide for more information.

5.3.1 Temperature Control Configurations

The temperature control configurations are divided into two tabs, Control Page 1 and Control Page 2. Figure 5-4 shows the Control Page 1 configurations and Table 5-3 gives their descriptions. Refer to Figure 5-5 and Table 5-4 for the Control Page 2 configurations.

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

Figure 5-4 Heats Setup - Control Page 1 Tab (Integrated System)

Table 5-3 Heats Setup - Control Page 1 - Temperature Control Configurations

Item	Description
Manual Standby Duration Timer	The zone temperature decreases for a given time duration or until it gets to a set standby temperature.
Manual Boost Duration Timer	The zone temperature increases for a given time duration or until it gets to a set boost temperature.
Remote Standby Duration Timer	When an external signal has started the remote standby mode, the system decreases the temperature to the remote standby setpoint during this set time value.
Remote Standby Delay Timer	When an external signal has started the remote standby mode, the system waits for this delay period before it decreases the temperature to the remote standby setpoint.
Remote Standby Input Mode	The standby setting is enabled by one of three settings: Trigger, On/Off, or a Direct signal. Trigger: Includes a delay timer and duration timer. If there is no digital input signal, Standby or Boost mode continues until the duration timer completes. On/Off: Includes a delay timer. If there is no digital input signal, the controller goes back to the operational state. Direct: The system enters Standby until there is no input signal. If there is an input signal when the system is started, it will immediately go into standby mode. Includes a delay timer.

Table 5-3 Heats Setup - Control Page 1 - Temperature Control Configurations (Continued)

Item	Description
Reset Delay Timer in Direct Mode	When enabled, this lets you reset the remote standby delay timer while in Direct mode.
Remote Boost Duration Timer	When an external signal has started the remote boost mode, the system heats up to the remote boost setpoint during this set time value.
Remote Boost Delay Timer	The system starts the remote boost mode after this set time has completed.
Remote Boost Input Mode	Remote boost is enabled by one of three settings: Trigger, On/Off, or a Direct signal.
Bake Out Enable	When enabled, the system will do the bake out test and then use a low voltage to remove the moisture in a heater, if necessary.
Force Bake Out Enable	When enabled, each zone in the system is baked out at startup.
Bake Out Alert Enable	When enabled, the system stops and gives an alarm for each zone with a bake-out condition that has not been cleared during the bake out cycle. When disabled, the system stops the bake-out cycle that is in operation and continues the startup sequence.
Bake Out Limit	During system startup, if any zone goes above this limit, the system will enter bake out mode. For ICC^2 cards, the parameter range is 0 to 5 amps. The default value is 0.2 amps. For ICC^3 cards, the parameter range is 1 to 999 milliamps. The default value is 200 milliamps.
Bake Out Power	The system uses this value during the bake out process. The parameter range is 0 to 25%. The default value is 5%.
Bake Out Time Per Cycle	Length of the bake out cycle. The parameter range is 1 to 30 minutes. The default value is 5 minutes.
Number of Bake Out Cycles	The number of times the system tries to bake out the moisture in a heater. The parameter range is 1 to 5. The default value is 1.
Bake Out Setpoint	The temperature the zones must get to during the bake out process. The default value is 100 °C (212 °F). Displays only if ICC^3 cards are installed.
At Bake Out Temperature Window	During the bake out process, all zones must be in this temperature threshold before the bake out cycle value starts its count down. The default value is 5 °C (9 °F). Displays only if ICC^3 cards are installed.

Table 5-3 Heats Setup - Control Page 1 - Temperature Control Configurations (Continued)

Item	Description
Heat to Bake Out Setpoint Timeout	The amount of time the zones must get to the bake out setpoint. If the time period completes before one or more zones get to the bake out setpoint, a warning message shows the problem and what happens when the warning message is acknowledged. Displays only if ICC^3 cards are installed.
Resin Degradation Limit	The temperature limit that is used start the cycle idle time. The default value is 121 °C (250 °F).
Cycle Idle Time Limit	The amount of time before the system performs one of the reactions. The timer starts when one of the zone's temperature is at or above the 'Resin Degradation Limit' and the controller is not cycling. The timer will reset when one of those conditions is no longer true. The minimum time is 1 minute. The maximum time is 90 minutes. The default time is 30 minutes.
Elapsed Idle Time	The amount of time that has elapsed since the timer was started. This will update in 1 minute increments.
Cycle Idle Reaction	The action that occurs if the 'Idle Time Limit' completes: • No Reaction - No operation is done. • Warning Notification - An alarm will show. • Put Heats in Standby (Default Value) - The controller changes to 'Manual Standby' mode automatically. Also, an alarm will show. • Turn Heats Off - The controller will set the power to off automatically. Also, an alarm will start and then stop, because the controller sets the power to off.
Soft Start Enable	When enabled, the Soft Start process is used at system startup.
Soft Start Minimum Limit	When the Soft Start process is started, the system calculates the difference between the zones with the highest and lowest temperatures. If the difference is less than this parameter value, then this parameter value is applied to the soft start process.
Mold Cooling Enable Limit	The temperature threshold the system uses to select when to start or stop the Mold Cooling Enable output.

Figure 5-5 shows the Control Page 2 configurations and Table 5-4 gives their descriptions.

Figure 5-5 Heats Setup - Control Page 2 Tab (Integrated System)

Table 5-4 Heats Setup - Control Page 2 - Temperature Control Configurations

Item	Description
Part Counting	Used to automatically count parts and set a 'sack full' limit.
SPI Enable	If a device is attached to the SPI connector, this area allows you to enable communication with the device and set communication protocol.
Display Thermocouple Reading For Manual Zones	When enabled, the controller view screens show the thermocouple measurements for zones in manual mode.
Same Thermocouple Assignment Maximum Limit	This value sets the maximum limit for the number of zones that can be assigned to one thermocouple.
Auto Slave Enable	Enables the Auto Slave Power Limit.
Auto Slave Power Limit	This value is the limit used by the Auto Slave operation to calculate if the average power output of a candidate zone is in the permitted deviation of the slaved zone.
Grid Size	Used to change the mainframe layout (grid size) on the Card Layout screen.
Group Offset	Used to configure the linked systems. The default is 96 zones.

5.3.2 Monitoring Configurations (Integrated System)

On an integrated system, the monitoring control configurations are on the Monitoring tab. Figure 5-6 show the Monitoring screen.

Figure 5-6 Heats Setup - Monitoring Tab (Integrated System)

Table 5-5 gives the descriptions for all of the configurations found on the Monitoring screen.

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

Table 5-5 Heats Setup - Monitoring Configurations

Item	Description
Alarm Sensitivity	The duration of time the system has to stay in an error condition before it becomes an alarm. The range is from 2 to 60 seconds with a default of 2 seconds.
Maximum Temperature Limit	The number of degrees over the setpoint the Maximum Temperature Alarm is activated. This alarm is used as a failsafe warning if an Abort Over Temperature alarm is ignored. The temperature range is from 1 to 500 °C (34 to 932 °F) with a default of 111 °C (232 °F).
No Response Limit	A global time setting of how long the system should apply 96% power or greater without a 5 degree rise in temperature before it becomes an alarm condition.
Allow Monitor Regulation For Selection	Enables the parameter that allows the change of the regulation mode to “Monitor” for the zones in the Quick Set screen.

Table 5-5 Heats Setup - Monitoring Configurations (Continued)

Item	Description
Exclude Monitor Zones From At-Temperature	Enables the parameter that allows the exclusion of zones set to “Monitor” regulation from the 'At Temperature' determination by the system.
Wattage Voltage	Insert the designed voltage rating of the heaters, so the system can accurately calculate Watt Voltage.
Supply Configuration	Used to select the supply configuration parameter: • Delta 3PH • Wye 3PH+N • Single Phase • Integrated TX
Global Output Power Limit	Used to control the maximum output power supplied to each zone. The output power limit for each zone can be set from 0% to the Global Output Power Limit value.
Earth Leakage Fault Enable	Enables the earth leakage check.
Earth Leakage Limit	For ICC^2 cards, this percentage used to calculate the earth leakage limit when the diagnostic process for a zone has completed. The control card uses a percentage of the current measured during the test to decide when to give an earth leakage error. The parameter range is 0 to 100%. The default value is 10%. For ICC^3 cards, the value is displayed in milliamps and has an adjustable range from 1 to 999 mA. The default value is 500 mA.
Display Earth Leakage Reading	Enables earth leakage readings to be shown when ICC^3 cards are installed.
Circuit Overload Enable	Enables the circuit overload error. Displays only if ICC^3 cards are installed.
Circuit Test Enable	Enables the circuit test for ICC^3 cards.
Auto Power Limiting Enable	Enables auto power limiting.
Circuit Test State 4 Power Level	There are four circuit tests, which make sure that the heater and thermocouple connections to the controller operate correctly. The tests use a low power to detect the type of heater that is connected (examples: manifold, sprue). Set this field to the percentage of power to the heater used for the tests.
Display Causes and Solutions Enable	If one of the tests in Circuit Test fails, this will display a pop-up screen with the possible causes and solutions to resolve the problem.
Display Failure Data	If one of the tests in Circuit Test fails, this shows the test failure data.

Table 5-5 Heats Setup - Monitoring Configurations (Continued)

Item	Description
At Temperature Minimum Limit	The minimum threshold used to activate the 'At Temperature' signal. The temperature range is from 1 to 500 °C (34 to 932 °F).
At Temperature Delay Timer Enable	Enables the 'At Temperature' delay timer.
At Temperature Delay Timer	Used to set the 'At Temperature' delay. When the system reads that all zones are 'At Temperature', it will delay the 'At Temperature' status until after the delay timer expires. This time is the duration of the 'soak'.
At Temperature Delay Timer Status	With a time value set in the At Temperature Delay Timer field, this shows the time remaining until the system status is 'At Temperature'.
Audible Notification Enable	Enables an audible notification to alert you when the system is 'At Temperature'.
Audible Notification Interval	Used to set the interval of tones for the Audible Notification. To stop the audible notification tones, touch the Silence Horn button in the lower left of the footer (or on the Alarms page).
Test Audible Notification	Used to test the Audible Notification.
Power Deviation Setup Alarm	When enabled and configured, this alerts the operator when the power output percentage on a zone deviates a specified amount while in operation under normal conditions. Touch the **Setup Alarm** button to set the power deviation configurations. Refer to the Altanium Matrix5 User Guide for more information.
No Heater Detection Enable	Used to enable No Heater Detection. A No Heater Detection error occurs with the conditions that follow: • The “No Heater Detected” error is enabled. • The zone is ON. • The zone is on a card that supports current monitoring. • The power output value is greater than 9%. • The zone current sensor is calibrated. • The controller is in the RUN mode. • The output current is less than the “No Heater Limit” value for over 10 seconds. The limit value is set on the Quick Set screen in the Advanced Settings tab.
Current Deviation Enable	Enables current deviation monitoring.

Table 5-5 Heats Setup - Monitoring Configurations (Continued)

Item	Description
Current Deviation Limit	The percentage used to calculate the limit as to when a current deviation error is activated. The percentage range is from 1 to 100%. The default value is 10%.
Current Deviation Minimum Limit	The calculated current deviation limit cannot be more than this minimum value. The limit range is from 0.10 to 5.0 A. The default value is 0.50 A.

Chapter 6 Individual Servo Valve Gate Screens

The Altanium Individual Servo Valve Gate Controller (ISVGC) comes in four or eight servo-operated valve gate configurations. Servos that are not used can be disabled.

The individual servo controller screens give you operational control of all the servo axis. Operations and configurations include:

- Set operation of one or more axes
- Put axes into groups
- Enter user-specified names of axes and groups
- Calibrate one or more axes
- Control manual axis movement
- Set limits for axes (minimum/maximum positions, target positions, speeds, acceleration/deceleration)
- Monitor open and close profiles
- View and change motion profiles

This chapter describes the ISVG screens and their functions.

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

There are six ISVG screens that are identified by the tabs at the bottom of the screen:

- ISVG Home
- Cycle
- Open Profile
- Close Profile
- Sequence
- Setup

This chapter describes the ISVG screens and their functions.

6.1 ISVG Home Screen

The ISVG 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. Each enabled axis is shown by its name. Axes in groups are shown together with their

group name. Command buttons allow the user to manually calibrate, open, and close each axis.

Touch the **ISVG Home** tab at the bottom of the screen to see the ISVG Home screen. Refer to Figure 6-1.

Figure 6-1 ISVG Home Screen

6.1.1 Axis Selector Bar

The Axis Selector Bar is at the top of the ISVG home screen and the Open and Close Profile and sequence screens. The user touches 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 the user changes screens. The axis names on the buttons are shown as they were specified by the user on the Tool Configuration window and the ISVG Sequence screen (refer to Section 6.2.4 and Section 6.6.1). The group names on the buttons are shown as they were specified by the user on the ISVG Setup screen (refer to Section 6.2.3).

Touch the **All** button to select all of 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 of 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, in the image that follows, “ISVG Axis 1" was selected. The user then touched and held “ISVG Axis 3" and both “ISVG Axis 1" and “ISVG Axis 3" were selected.

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

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

6.1.2 Axes Compatibility

When more than one axis is selected on the ISVG Home 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 axes are selected with a different number of positions, every setting is changeable except those on the Motion Profiles screen.

6.1.3 Status

The Status area of the screen shows when the soak time is complete and that the system is ready for auto mode (refer to Figure 6-2). The indicators illuminate when a status is TRUE.

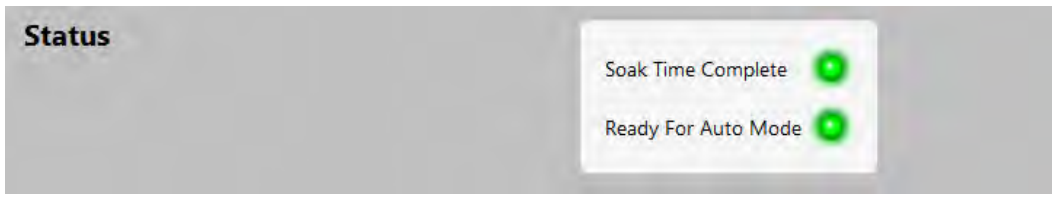


Figure 6-2 Status Area

6.1.4 Manual Control

The Manual Control area of the screen lets you calibrate, open, and close the axes (refer to Figure 6-3). These operations can be done to selected axes.

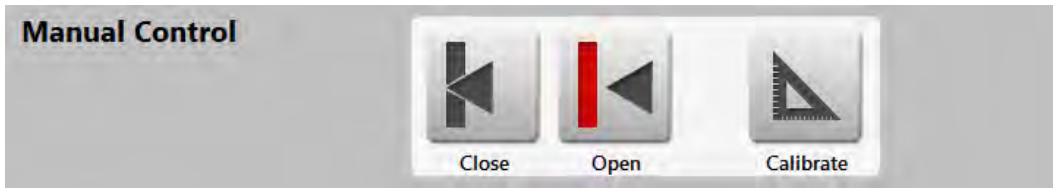


Figure 6-3 Manual Control Area

You cannot do the open and close operations on an axis until the axis is calibrated (the buttons are not available for use). After a selected axis is calibrated the Open and Close buttons become available. All or selected axes can be opened together.

To calibrate all or selected axes, the soak time has to complete. The Calibrate button becomes available when the Soak Time Complete indicator in the Status area illuminates. Then you can select individual or all axes for calibration. Touch the **Calibrate** button to start the calibration. Open and Close will become available for those axes that have been calibrated.

6.1.5 Axis Indicators

The middle of the ISVG Home screen shows the axis status indicators. The number of axes configured for your system will show on the screen (four or eight). Figure 6-4 shows a system configured for four axes.

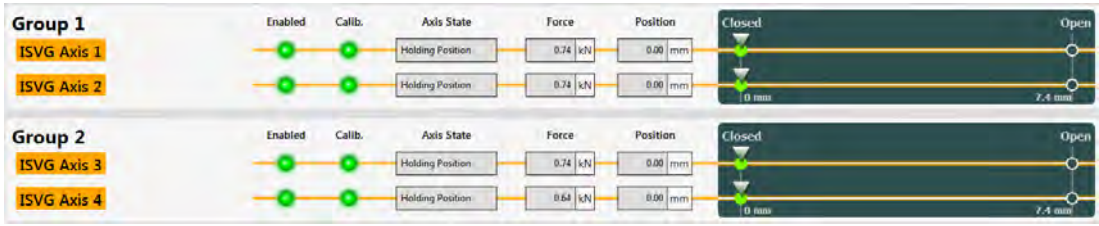


Figure 6-4 Axes Indicators

Indicators for each axis are listed in the Table 6-1. The graphical indicator shows the position for each axis in auto cycle or when in manual mode.

Table 6-1 Axis Indicator Descriptions

Item	Description
Enabled	When the indicator is green, the drive is enabled and ready for operation.
Calibrated	When the indicator is green, the axis position is calibrated.

Table 6-1 Axis Indicator Descriptions (Continued)

Item	Description
Axis State	Indicates state of the axis as follows: • Drive Disabled • Calibrating • Moving • Holding Position
Force	Shows the servo's actual applied force (lbf/kN).
Position	Shows the position of the axis (inches/millimeters).

6.2 ISVG Setup Screen

The ISVG Setup screen is used to configure the axes on your system. The configurations include:

- Activate or deactivate one or more axes.
- Enter user-selected names for the axis groups.
- Monitor the necessary conditions that let the system be changed to Auto mode.
- Set user-configured trigger that lets the system start the auto sequence.

Touch the **Setup** tab at the bottom of the screen to see the ISVG Setup screen. Refer to Figure 6-5.

Figure 6-5 ISVG Setup Screen

Table 6-2 gives the descriptions for the configurations and indicators on the ISVG Setup screen.

Table 6-2 Axis Configuration Descriptions

Item	Description
At Temperature	Used to configure the signal that tells the controller that the mold is 'At Temperature'. Refer to Section 6.2.1.
At Temperature Soak Time	Used to set the Soak Time when the mold is At Temperature. Refer to Section 6.2.1.
Soak Time Remaining	Shows in minutes how much time remains before Soak Time is completed.
Soak Time Complete	When illuminated, this indicator shows that the Soak Time has completed.
All Axes Calibrated	When illuminated, this indicator shows that all of the activated axes for your injection operation are calibrated.
No Faults	When illuminated, this indicator shows that there are no axis faults.
Ready for Auto Mode	When illuminated, this indicator shows that all conditions necessary to change to Auto mode are TRUE.
Auto Sequence Start Trigger	Used to configure the signal (trigger) that tells the controller that the auto sequence can be started. Refer to Section 6.2.2.
Auto Sequence Running	When illuminated, this indicator shows that the auto sequence is in operation.
Auto Sequence Duration	This information field shows the time used to complete one full sequence cycle.
Group Names	Used to enter the group names to which the axes can be assigned.

6.2.1 At Temperature Configuration

To set the signal type that is used to let the controller know the mold is 'At Temperature', do the steps that follow:

1. Touch the configuration gear button next to At Temperature.

   The Configure Signal dialog window shows.

2. Touch the field under **Signal Type**.

   The At Temperature - Signal Type dialog window shows. Refer to Figure 6-6.

3. Touch one of the buttons in the dialog window to select a signal type.

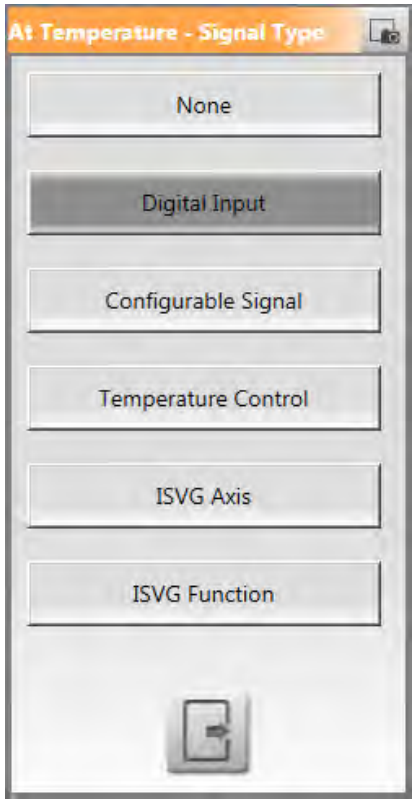


Figure 6-6 At Temperature - Signal Types Dialog Window

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

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

   The Signal Type selections and their related configurations are shown in Table 6-3.

Table 6-3 At Temperature - Signal Type Selections

Signal Type	Signal	Condition	Position
None	-	-	-
Digital Input	Servo Digital Input 1 - 22	-	-
Configurable Signal	Configurable signal 1 - 18	-	-
Temperature Control	At Temperature	-	-
ISVG Axis	ISVG Axis 1 - 4 (or 1 - 8)	• Position < • Position <	Values set by the user (mm/in)
		• Position =	• Close • Open
ISVG Function	• Ready In Auto Mode • All Stems Closed • All Stems Open	-	-

5. 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 Configure Signal dialog window illuminates if the At Temperature signal type is TRUE.

6. After the 'At Temperature' configurations are set, touch the field next to At Temperature Soak Time and enter a value in minutes.

   The value range is from 0 to 15 minutes, with a default of 0.10 minutes.

6.2.2 Auto Sequence Start Trigger

To set the signal type that is used to let the controller know the Auto Sequence can start, do the steps that follow:

1. Touch the configuration gear button next to Auto Sequence Start Trigger.

   The Configure Signal dialog window shows.

2. Touch the field under **Signal Type**.

   The Auto Sequence Start Trigger - Signal Type dialog window shows. Refer to Figure 6-7.

3. Touch one of the buttons in the dialog window to select a signal type.

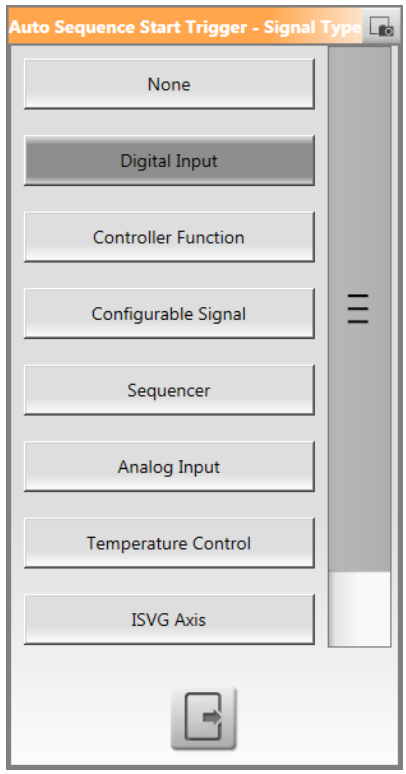


Figure 6-7 Auto Sequence Start Trigger - Signal Types Dialog Window

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

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

   The Signal Type selections and their related signals are shown in Table 6-4.

Table 6-4 Signal Type Selections

Signal Type	Signal	Condition	Position
None	-	-	-
Digital Input	Servo Digital Input 1 - 22	-	-
Controller Function	• Fault Stop Immediately • Fault Stop End Of Cycle • Calibration Active • Process Outside Limit • All Axes At Standstill	-	-
Configurable Signal	Configurable signal 1 - 18	-	-
Sequencer*	• Sequence In Auto • Home Command	-	-
	• Custom Sequence	• At Step • Before Step • After Step	• Home • Step 1-18
Analog Input	Analog Input 1 - 8	• Value < • Value >	Values set by the user
Temperature Control	At Temperature	-	-
ISVG Axis	ISVG Axis 1 - 4 (or 1 - 8)	• Position < • Position <	Values set by the user (mm/in)
		• Position =	• Close • Open
ISVG Function	• Ready In Auto Mode • All Stems Closed • All Stems Open	-	-

* Refer to Chapter 7 for information about the Sequencer application.

6.2.3 Group Names

The ISVGC lets you put specified axes into groups. The Group Names area on the ISVG Setup screen lets you change the axis group names. Touch the field next to the group name and a group name dialog window shows. Type a new group name and touch the green check mark to enter the name. Touch the red X to cancel the entry.

The axes are assigned to groups on the Tool Configuration dialog window. Refer to Section 6.2.4.

6.2.4 Hot Runner Configuration

Touch the **Tool Configuration** button in the Hot Runner Configuration area of the ISVG Setup screen to set the configurations for all axes.

The Tool Configuration dialog window shows with the setup fields for all of the axes in your ISVGC system. Refer to Figure 6-8.

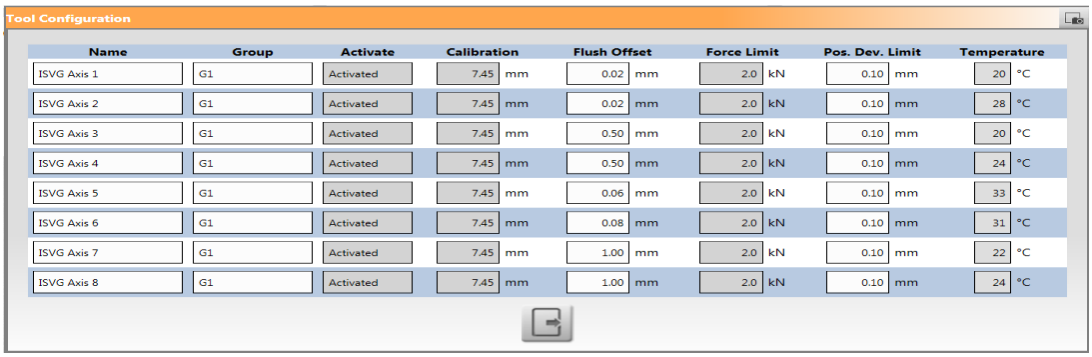


Figure 6-8 Tool Configuration Dialog Window

In the dialog window, do the steps that follow to configure the axes necessary for you system:

1. If you want to assign a name to each axis that identifies its operation or location, touch the field under the **Name** heading to see the Axis Name dialog window.
2. Type the new name and touch the green check mark to accept the name. Touch the red X to cancel the entry.
3. To assign an axis to a group, touch the axis field under the **Group** heading and touch the group button in the Group dialog window that shows.

   If you want to remove an axis from a group, touch the **Not Assigned** button in the Group dialog window.

   If you changed the group names on the ISVG Setup screen (refer to Section 6.2.3), the new names will be shown on the buttons in the Group dialog window.
4. To activate or deactivate an axis, touch the axis field under the **Activate** heading and select a mode button:
   - Deactivated
   - Deactivated with Warning
   - Activated

   NOTE: A deactivated axis is removed from the ISVG Home screen and the axis selector. No alarms are shown for deactivated axes. A deactivated axis does not operate with manual or auto mode commands.

5. Touch the axis field under the **Calibration** heading and enter the value (mm/in) to which the valve gate stem opens during the calibration operation.
6. Touch the axis field under the **Flush Offset** heading and enter the value (mm/in) measured from the valve stem to the gate (molding) surface when you do the Protrusion Calibration procedure.
7. Touch the axis field under the **Force Limit** heading and enter the maximum force value (kN/lbf) that is permitted to be entered for each axis on the Open Profile and Close Profile screens.
8. Touch the axis field under the **Position Deviation Limit** heading and enter the deviation value (mm/in).

   When the axis force is at the limit, the axis cannot follow the requested motion profile, which causes the position deviation of the axis to increase. When the position deviation is more than the Position Deviation Tolerance, it causes a position deviation alarm. All axes stop immediately.

   The Position Deviation Limit can be set as follows:

   - Minimum Value = 0.01 mm
   - Maximum Value = 0.2 mm
   - Default Value = 0.1 mm

The fields under the Temperature heading give the temperature for each axis.

6.3 ISVG Cycle Screen

The ISVG Cycle screen lets you see a line trace graph of a full cycle of an injection operation. You can select to see the time, signals, and positions for all the axes that are in operation.

Touch the **Cycle** tab at the bottom of the screen to see the ISVG Cycle screen. Refer to Figure 6-9.

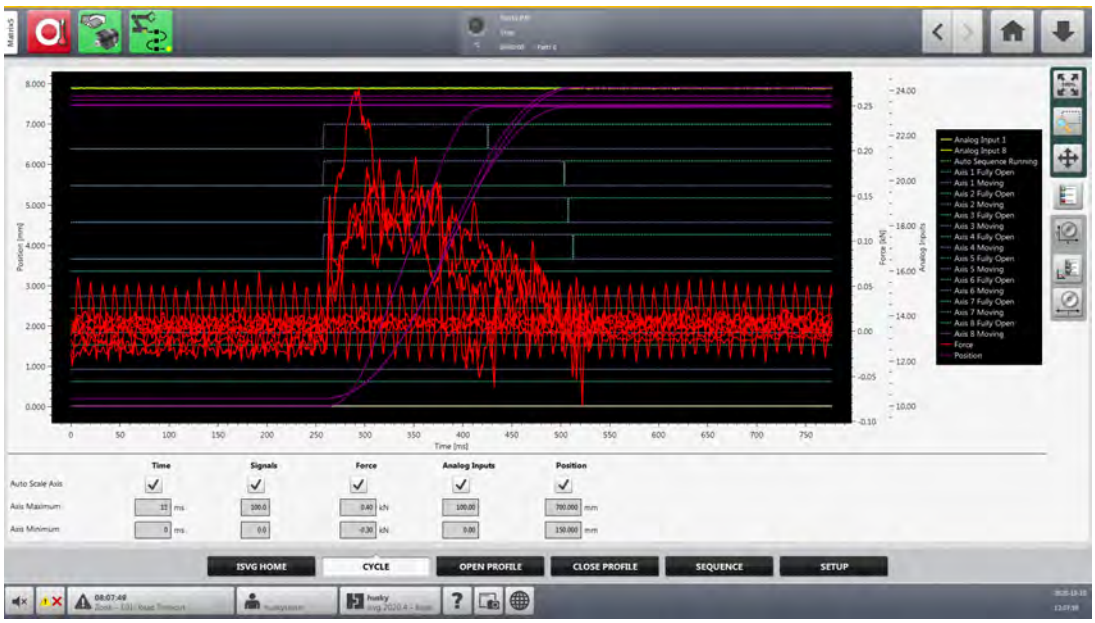


Figure 6-9 ISVG Cycle Screen

6.3.1 Chart View and Adjustment Selections

Table 6-5 shows a list of the chart view and adjustment selections used on the ISVG Cycle screen.

Table 6-5 Cycle Screen - Chart View and Adjustment Selections

Button	Description
	Returns the chart view to 100%.
	Lets the user magnify a specific area of the chart.
	Lets the user adjust the chart view when magnified.

Table 6-5 Cycle Screen - Chart View and Adjustment Selections (Continued)

Button	Description
	Identifies the chart traces.
	Used to set auto scale for the chart traces that follow: • Time • Signals • Position Information value fields for the maximum/minimum time, signals, and position are also shown.
	Lets the user select the traces that are seen on the chart: • Analog Inputs • Positions • States
	Lets the user see the curve triggers.

6.3.2 Cycle Graph Data Point Description

Touch and hold your finger on a line trace and a description of the data at that point is shown. Refer to Figure 6-10.

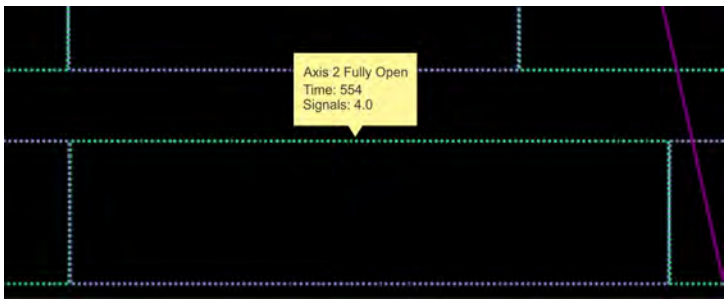


Figure 6-10 ISVG Cycle Screen - Description of Data Point

6.4 ISVG Open Profile Screen

The ISVG Open Profile screen lets you set the open configurations for all or selected valve gates. During the injection operation, a line trace graph shows the open profile for the axes for each cycle during an injection operation. You can select which axes to see on the graph with the axis selector bar at the top of the screen.

Touch the **Open Profile** tab at the bottom of the screen to see the ISVG Open Profile screen. Refer to Figure 6-11.

Figure 6-11 ISVG Open Profile Screen

6.4.1 Chart View and Adjustment Selections

Table 6-6 shows a list of the chart view and adjustment selections used on the Open Profile screen.

Table 6-6 Open Profile Screen - Chart View and Adjustment Selections

Button	Description
	Returns the chart view to 100%.
	Lets the user magnify a specific area of the chart.
	Lets the user adjust the chart view when magnified.
	Identifies the chart traces.
	Used to set auto scale for the chart traces that follow: • Time • Force • Position • Velocity 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: • Force • Position • Position Deviation • Velocity • Velocity Setpoint
 	Toggles between Time and Position on the chart X axis.

6.4.2 Profile Settings

Do the steps that follow to configure the open profile for all or selected axes:

1. In the Profile Settings area of the screen (Figure 6-12), touch the **Number of Steps** field and enter the number of steps you want the axis to move as the gate valve is opened.

   You can enter one to three steps. The default is one step.

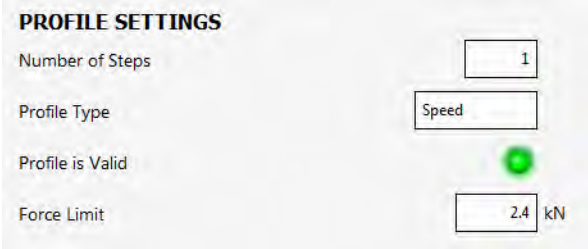


Figure 6-12 Open Profile Screen - Profile Settings

2. Touch the **Profile Type** field and select the profile type in the dialog window:
   - Speed
   - Time (Minimum Velocity)
   - Time (Minimum Acceleration)

3. Touch the **Force Limit** field and type maximum force limit that can be used to open the axis.

   NOTE: The maximum permitted for each axis is set in the Tool Configuration dialog window (refer to Section 6.2.4). The Force Limit here can be set to the same value or less than the setting in the Tool Configuration dialog window.

4. Touch the **Open Position** field to see the dialog window and enter the fully open position (mm/in) where the valve stem will stop. Refer to Figure 6-13.

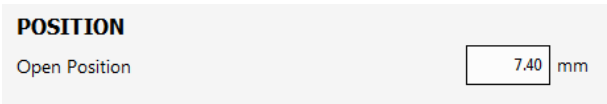


Figure 6-13 Open Profile Screen - Open Position

5. Touch the **Offset Open Position** field to set this position.

   This is the actual Open position that the motor moves is calculated by the formula that follows:

   Offset Open position = (user-entered) Open Position + Flush Offset

   Typically, the Open position is against the Open hard stop, which could be a different value with each axis. This lets you enter one Open position for all axes and can be changed as necessary without recalibrating.

The Offset Open Position can be set as follows:

- Minimum Value = 2 mm
- Maximum Value = Calibration Reference Position - 0.05 mm
- Default Value = 7.4 mm

6. If only one step was selected for the Number of Steps field (in step 1), then do the sub-steps that follow to set the speed, acceleration, and deceleration for the open profile of the valve gate stem:

   NOTE: With only one step selected for the Number of Steps field, the Position fields only show the closed-to-open positions and are not adjustable here.

   a. Touch the **Speed** field and enter the speed value in the dialog window that shows. Refer to Figure 6-14.

   b. Touch the **Acceleration** field and enter the acceleration value in the dialog window that shows. Refer to Figure 6-14.

   c. Touch the **Deceleration** field and enter the deceleration value in the dialog window that shows. Refer to Figure 6-14.

Figure 6-14 Open Profile Screen - Profile

7. If more than one step was selected for the Number of Steps field (in step 1), then do the sub-steps that follow to set the position, speed, acceleration, and deceleration for the open profile of the valve gate stem:

   NOTE: With more than one step selected for the Number of Steps field, added fields are shown that let you set the Position, Speed, Acceleration, and Deceleration fields from one step of the stem movement to the next. Refer to Figure 6-15.

   a. Touch the **Position** field and enter the position value (mm/in) in the dialog window that shows. Refer to Figure 6-15.

      If a second Position field is shown, do this step again to set that position.

   b. Touch the **Speed** field and enter the speed value in the dialog window that shows. Refer to Figure 6-15.

      NOTE: The value that you enter is the speed from one step of the valve stem movement to the next.

      Do this step again to set the additional Speed position(s).

   c. Touch the **Acceleration** field and enter the acceleration value in the dialog window that shows. Refer to Figure 6-15.

      NOTE: The value that you enter is the acceleration up to the speed value from one step of the valve stem movement to the next.

Do this step again to set the additional Acceleration position(s).

d. Touch the **Deceleration** field and enter the deceleration value in the dialog window that shows. Refer to Figure 6-15.

NOTE: The value that you enter is the deceleration from the speed value as the valve stem gets near the next position.

Do this step again to set the additional Deceleration position(s).

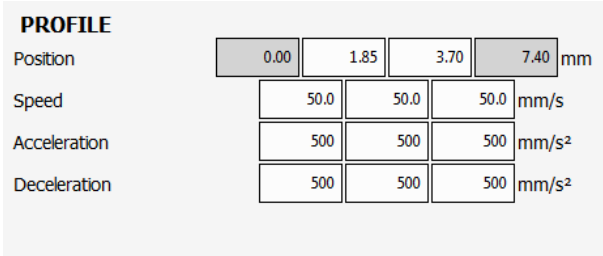


Figure 6-15 Open Profile Screen - Profile with 3 Steps Selected

6.4.3 Process Values

The Process Values area of the screen gives the data information for each open cycle. Table 6-7 describes the values given.

Table 6-7 Process Values

Item	Description
Calculated Duration	This is a time estimate that is calculated from the parameters set for the Open Profile for all or selected axes.
Actual Duration	This is the actual time for the axis to get to the open position.
Peak Force	This is the maximum force that was necessary to open an axis. You can only see the 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.

6.4.4 Open Profile Graph Data Point Description

Touch and hold your finger on a line trace and a description of the data at that point is shown. Refer to Figure 6-16.

Figure 6-16 Open Profile Screen - Description of Data Point

6.5 ISVG Close Profile Screen

The ISVG Close Profile screen is almost equivalent to the Open Profile screen in that lets you set the close configurations for all or selected valve gates. During the injection operation, a line trace graph shows the close profile for the axes for each cycle during an injection operation. You can select which axes to see on the graph with the axis selector bar at the top of the screen.

Touch the **Close Profile** tab at the bottom of the screen to see the ISVG Close Profile screen. Refer to Figure 6-17.

Figure 6-17 ISVG Close Profile Screen

6.5.1 Chart View and Adjustment Selections

Table 6-8 shows a list of the chart view and adjustment selections used on the Close Profile screen.

Table 6-8 Close Profile Screen - Chart View and Adjustment Selections

Button	Description
	Returns the chart view to 100%.
	Lets the user magnify a specific area of the chart.
	Lets the user adjust the chart view when magnified.
	Identifies the chart traces.
	Used to set auto scale for the chart traces that follow: • Time • Force • Position • Velocity 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: • Force • Position • Position Deviation • Velocity • Velocity Setpoint
 	Toggles between Time and Position on the chart X axis.

6.5.2 Profile Settings

Do the step that follow to configure the close profile for all or selected axes:

1. In the Profile Settings area of the screen (Figure 6-18), touch the **Number of Steps** field and enter the number of steps you want the axis to move as the gate valve is closed.

   You can enter one to three steps. The default is one step.

Figure 6-18 Close Profile Screen - Profile Settings

2. Touch the **Profile Type** field and select the profile type in the dialog window:
   - Speed
   - Time (Minimum Velocity)
   - Time (Minimum Acceleration)

3. Touch the **Force Limit** field and type maximum force limit that can be used to close the axis.

   NOTE: The maximum permitted for each axis is set in the Tool Configuration dialog window (refer to Section 6.2.4). The Force Limit here can be set to the same value or less than the setting in the Tool Configuration dialog window.

4. Touch the **Protrusion** field to see the dialog window and enter the value (mm/in) that the valve stem extends passed the flush position and into the cavity when it stops. Refer to Figure 6-19.

5. Touch the axis field under the **Flush Offset** heading and enter the value (mm/in) measured from the valve stem to the gate (molding) surface when you do the Protrusion Calibration procedure.

   NOTE: A calculation of the Flush Position and Protrusion values is used to show the stem tip's stop position in the Close Position field. Refer to Figure 6-19.

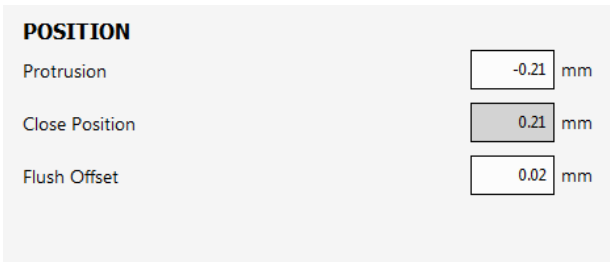


Figure 6-19 Close Profile Screen - Position

6. If only one step was selected for the Number of Steps field (in step 1), then do the sub-steps that follow to set the speed, acceleration, and deceleration for the close profile of the valve gate stem:

   NOTE: With only one step selected for the Number of Steps field, the Position fields only show the open-to-closed positions and are not adjustable here.

   a. Touch the **Speed** field and enter the speed value in the dialog window that shows. Refer to Figure 6-20.

   b. Touch the **Acceleration** field and enter the acceleration value in the dialog window that shows. Refer to Figure 6-20.

   c. Touch the **Deceleration** field and enter the deceleration value in the dialog window that shows. Refer to Figure 6-20.

Figure 6-20 Close Profile Screen - Profile

7. If more than one step was selected for the Number of Steps field (in step 1), then do the sub-steps that follow to set the position, speed, acceleration, and deceleration for the close profile of the valve gate stem:

   NOTE: With more than one step selected for the Number of Steps field, added fields are shown that let you set the Position, Speed, Acceleration, and Deceleration fields from one step of the stem movement to the next. Refer to Figure 6-21.

   a. Touch the **Position** field and enter the position value (mm/in) in the dialog window that shows. Refer to Figure 6-21.

      If a second Position field is shown, do this step again to set that position.

   b. Touch the **Speed** field and enter the speed value in the dialog window that shows. Refer to Figure 6-21.

      NOTE: The value that you enter is the speed from one step of the valve stem movement to the next.

      Do this step again to set the additional Speed position(s).

   c. Touch the **Acceleration** field and enter the acceleration value in the dialog window that shows. Refer to Figure 6-21.

      NOTE: The value that you enter is the acceleration up to the speed value from one step of the valve stem movement to the next.

      Do this step again to set the additional Acceleration position(s).

   d. Touch the **Deceleration** field and enter the deceleration value in the dialog window that shows. Refer to Figure 6-21.

NOTE: The value that you enter is the deceleration from the speed value as the valve stem gets near the next position.

Do this step again to set the additional Deceleration position(s)

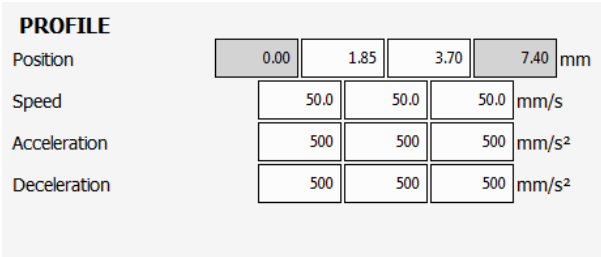


Figure 6-21 Close Profile Screen - Profile with 3 Steps Selected

6.5.3 Protrusion Calibration Procedure

The steps the follow must be done to determine the Flush Offset values to achieve a condition where the Protrusion setting equals the actual measured protrusion:

1. With the cavity plate and gates installed, bring the hot runner and mold to operation temperatures.
2. Calibrate the Axis. Refer to Section 6.1.4.
3. For the Protrusion and Flush Offset values, enter 0.00 (mm/in).
4. Open and close the valve stem a minimum of two times and stop with the valve stem closed.
5. Measure the actual distance of the valve stem to the gate (molding) surface.
6. Enter the measured value in the Flush Offset field. This should be a positive value if the stem is below the gate (molding) surface and negative (-) value if the stem is above the surface of the gate.
7. Open and close the valve stem a minimum of two times and stop with the valve stem closed.
8. Make sure that the valve stem is flush with the gate (molding) surface. Because of the accuracy of the measurement device and rounding, a small adjustment of the Flush Offset value may be necessary.
9. Do step 1 through step 8 for each axis.

6.5.4 Process Values

The Process Values area of the screen gives the data information for each close cycle. Table 6-7 describes the values given.

Table 6-9 Process Values

Item	Description
Calculated Duration	This is a time estimate that is calculated from the parameters set for the Close Profile for all or selected axes.
Actual Duration	This is the actual time for the axis to get to the closed position for the previous cycle.
Final Position	This is the closed position at which all or selected axes have stopped.
Peak Force	This is the maximum force that was necessary to close an axis. You can only see the 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.

6.5.5 Close Profile Graph Data Point Description

Touch and hold your finger on a line trace and a description of the data at that point is shown. Refer to Figure 6-22.

Figure 6-22 Close Profile Screen - Description of Data Point

6.6 ISVG Sequence Screen

The Sequence screen lets you configure the sequence of the open and close movements of each axis. Refer to Figure 6-23.

Use this screen to set the signal types, signal sources, conditions and other setpoints that start the open/close movement operations for all axes.

Figure 6-23 ISVG Sequence Screen

6.6.1 Sequence Configurations

In the Axis column of the configuration fields, you can enter a name for each axis. This helps if you want to identify the axes by their location or purpose in the injection operation.

For each axis, select signal type and signal source for the open and close operations. Select conditions and enter values where applicable. Table 6-10 shows the signal types and their related configurations.

Table 6-10 Sequence Signal Type Selections and Related Configurations

Signal Type	Signal Source	Condition	Value
None	-	-	-
Digital Input	Servo Digital Input 1 - 22	-	-
Configurable Signal	Configurable signal 1 - 18	-	-

Table 6-10 Sequence Signal Type Selections and Related Configurations (Continued)

Signal Type	Signal Source	Condition	Value
Sequencer*	• Sequencer in Auto • Home Command	- -	- -
	• Custom Sequence	• At Step • Before Step • After Step	Select Home or Step (1 -18)
Analog Input	Analog Input (1 - 8)	• Value < • Value >	Values set by the user (mm/in)
ISVG Axis	ISVG Axis (1 -4) or (1 - 8)	• Position < • Position <	Values set by the user (mm/in)
		• Position =	• Close • Open
ISVG Function	• Ready In Auto Mode • All Stems Closed • All Stems Open	-	-

* Refer to Chapter 7 for information about the Sequencer application.

The indicator in the State column illuminates when the configuration for an axis is TRUE.

6.6.2 Triggers and Delays

With each axis open/close configuration, you can select a movement trigger type and a time delay. Axis movement can start immediately with the trigger type selected or you can set a time delay that will start the axis movement when the time has completed. The time delay starts when the trigger type that you selected is TRUE.

Touch the fields in the **Trigger Type** column and select one of the triggers described in Table 6-11. The table describes the operation when a time delay is configured.

Touch the fields in the **Delay** column and enter a time (ms).

Table 6-11 Trigger Types

Item	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

Table 6-11 Trigger Types (Continued)

Item	Description
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)	

6.6.3 Invert Configuration

The Invert checkbox column lets you change the configuration to the opposite of the selections. For example, if 'Digital Inputs' is selected as a Signal Type, 'Servo Digital Input 3' is selected as a Signal Source, and the Invert checkbox is selected, the State is TRUE when there is no signal from Servo Digital Input 3.

Chapter 7 Sequencer

As described in Chapter 6, you can 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. 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.

7.1 Sequencer Mode Buttons

The Sequencer mode drop-down buttons are shown at the top of all Altanium ISVGC screens. The buttons let you change the Sequencer mode as described in Table 7-1.

Table 7-1 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, click the **Activate Sequencer** checkbox on the Sequencer Options screen, so the

check mark shows. Refer to Figure 7-1.

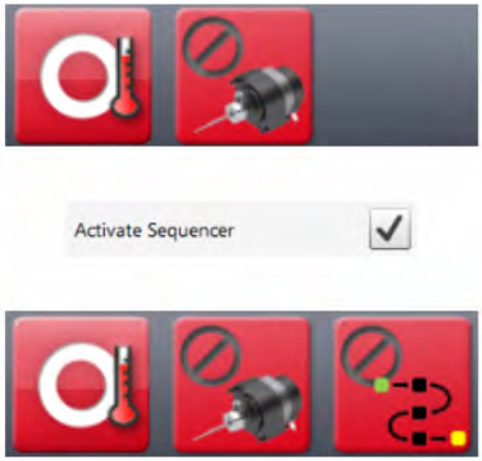


Figure 7-1 Show Sequencer Buttons (Activate Sequencer)

7.2 Sequence Screen

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

Touch the **Sequence** tab to see the Sequence screen. Refer to Figure 7-2.

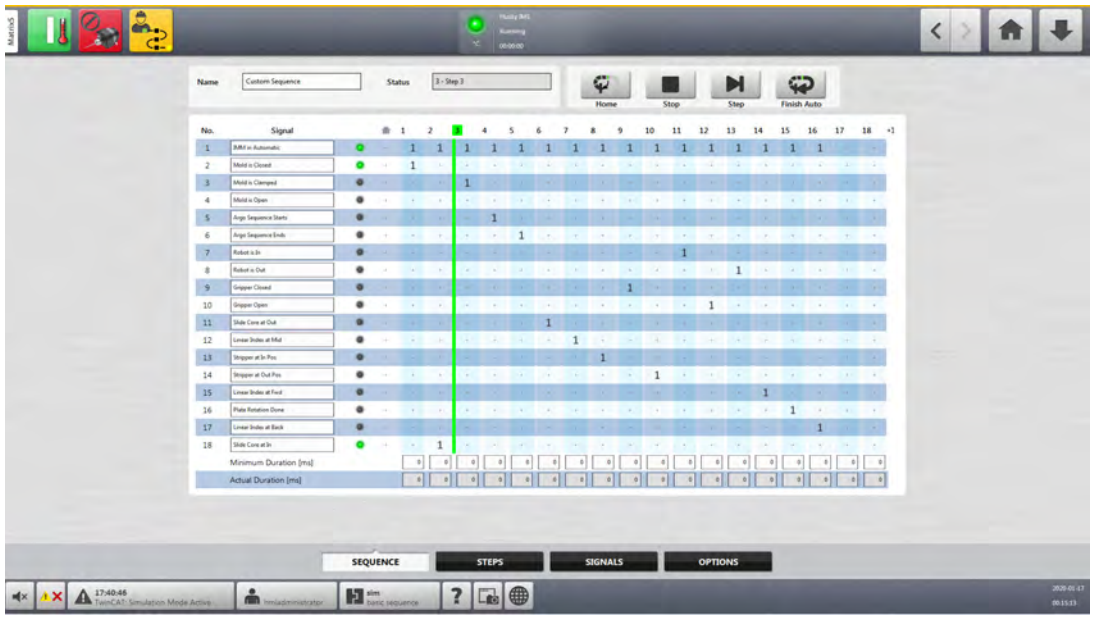


Figure 7-2 Sequence Screen

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 7.5.

After you enter all the custom signals (Section 7.5), you can enter values in the sequence matrix. When you touch a cell of the matrix, a dialog window will show. Refer to Figure 7-3.

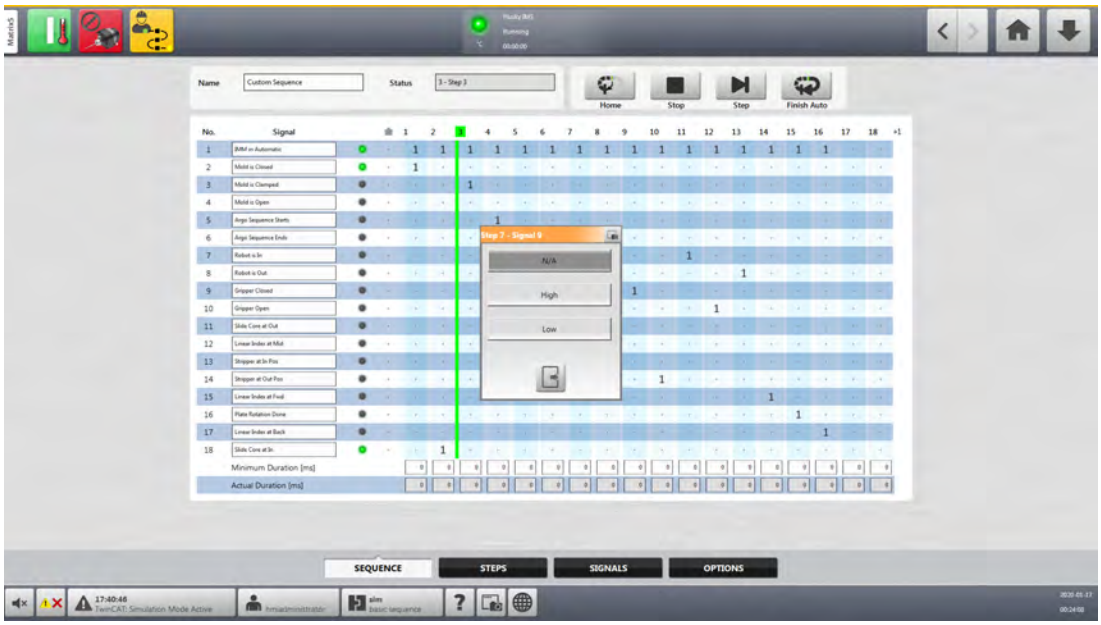


Figure 7-3 Setting Signals to High, Low, or N/A

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 7-2 describes the selections.

Table 7-2 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 7-4, 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 7-4 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.

7.3 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 7-3.

Table 7-3 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.

7.4 Steps Screen

On the Sequencer Steps screen you can set specific values for each step (1 thru 18). Touch the **Steps** tab to see the Steps screen. Refer to Figure 7-5.

Figure 7-5 Steps Screen

Table 7-4 shows the values that you can set on the Steps screen.

Table 7-4 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 7-4 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.

7.5 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 7-6.

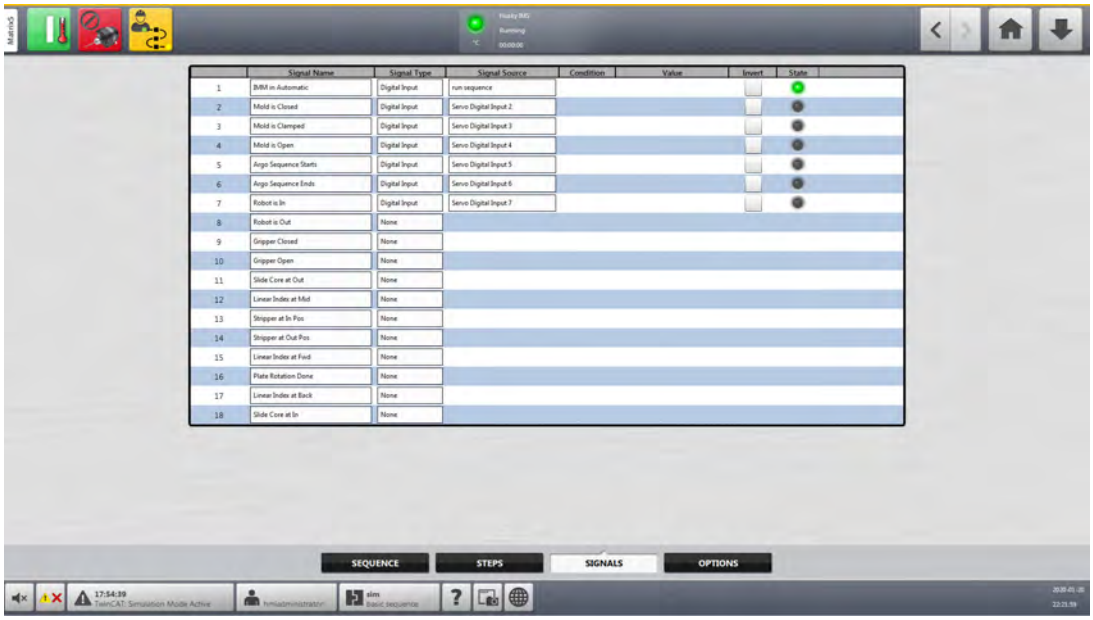


Figure 7-6 Signals Screen

7.5.1 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 7-7.

Figure 7-7 Signal Name

2. Type a name for the signal you want to configure and touch the **Accept** button.
3. Touch the field under Signal Type for the signal.
   The Signal Type dialog window shows. Refer to Figure 7-8.
4. Touch one of the buttons in the dialog window to select a signal type.

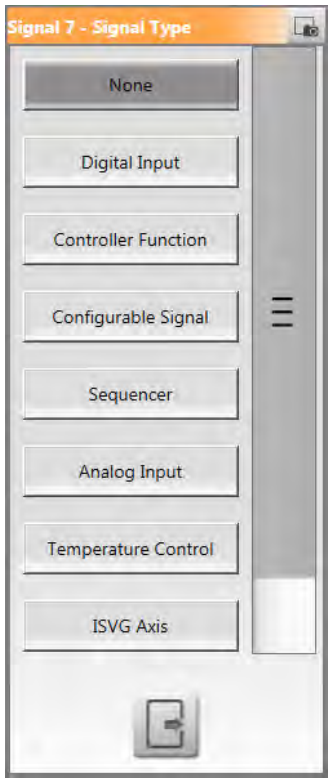


Figure 7-8 Signal Type Dialog Window

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 7-5.

Table 7-5 Signal Type Selections

Signal Type	Signal Source	Condition	Value
None	-	-	-
Digital Input	Servo Digital Input 1 - 22	-	-
Controller Function	• Fault Stop Immediately • Fault Stop End Of Cycle • Calibration Active • Process Outside Limit • All Axes At Standstill	-	-
Configurable Signal	Configurable signal 1 - 18	-	-
Sequencer	• Sequence In Auto • Home Command	-	-
	• Custom Sequence	• At Step • Before Step • After Step	• Home • Step 1-18

Table 7-5 Signal Type Selections (Continued)

Signal Type	Signal Source	Condition	Value
Analog Input	Analog Input 1 - 8	• Value < • Value >	Values set by the user
Temperature Control	At Temperature	-	-
ISVG Axis	ISVG Axis 1 - 4 (or 1 - 8)	• Position < • Position <	Values set by the user (mm/in)
		• Position =	• Close • Open
ISVG Function	• Ready In Auto Mode • All Stems Closed • All Stems Open	-	-

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 for each signal that is necessary to configure for your sequence matrix.

7.6 Options Screen

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

- The sequencer will operate in AUTO mode
- The Finish Auto will operate.

Touch the **Options** tab to see the Options screen. Refer to Figure 7-9.

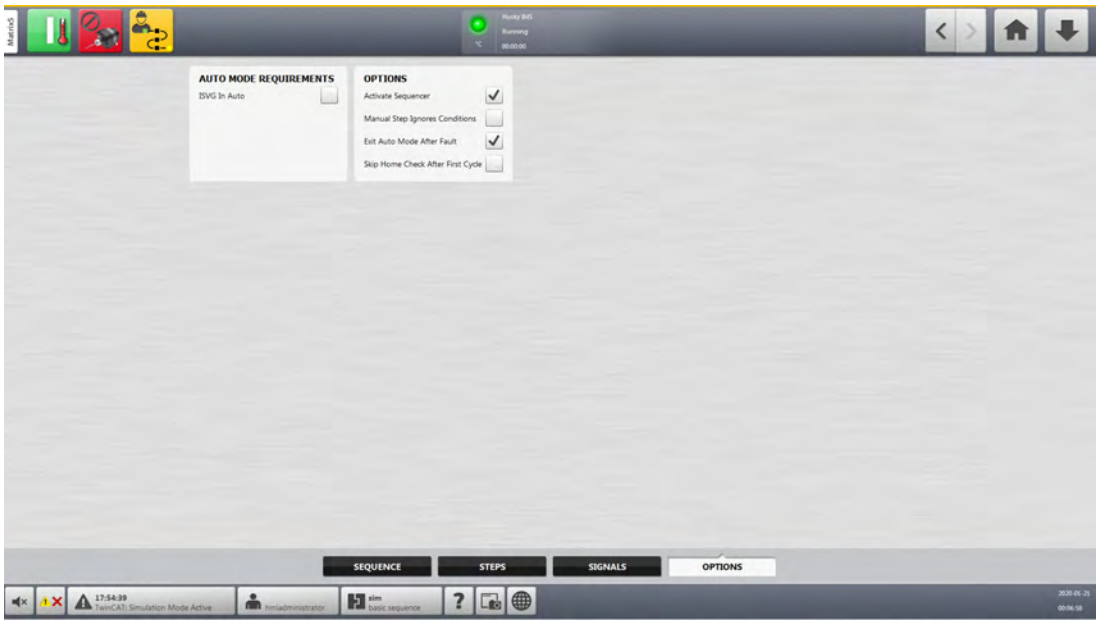


Figure 7-9 Options Screen

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 7-6 describes the options that you can enable.

Table 7-6 Option Screen Settings

Item	Description
ISVG In Auto	When enabled, the ISVG must be in Auto mode before the Sequencer can be changed to Auto mode. When not enabled, the ISVG does not have to be in Auto 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 8 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 Individual Servo Valve Gate Controller (ISVGC) and the IMM.

On the Altanium 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 8-1.

Table 8-1 Servo I/O Selections and Indicators

Item	Description
In Use	Select this checkbox to use the signal.
State	The condition of the input or output is TRUE when the indicator is green.
Function	Identifies the operation that the signal will do.
Name	Name given to the input or output signal by the user. This name is used on all of the signal screens in which this signal is shown.
Signal Type	Sets the type of output signal. The selections are Function, Configurable, or None.
Signal	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	If selected, the opposite (inverse) of the signal's normal operation will be TRUE.
Level	Shows the electrical condition of the input or output at the connector pin.
Force	Used to set (force) an input signal to always be high or low, so the system will ignore the true signal status. Force can be set to: • High - the signal level at the pin is always high. • Low - the signal level at the pin is always low. • None (default) - the signal level at the pin is not forced.
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 ISVG controller.
Scale and Offset	The scale and offset settings are used to convert a raw analog input value into engineering units.

Table 8-1 Servo I/O Selections and Indicators (Continued)

Item	Description
Value	The final value that is calculated using the scale and offset with this formula: Unfiltered Final Value = (Raw Value + Offset) * Scale
Filter	This moving average filter is applied to the Unfiltered Final Value: Value = (sum of N samples) / N The default N is 1 (no filtering). The maximum N is 100.
Raw Value	The true analog input value (V, mA or mV) measured on the hardware input cards.
Input Type	The units of measure by the card type (0-10 V card = raw value in volts).
Fault	A green indicator shows when a fault occurs with an analog input card.

8.1 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 that users are safe from possible dangerous conditions. The system will not operate unless these signals are correctly connected. The safety condition is TRUE when the Active indicator is illuminated. For more information on safety signals, refer to Section 2.10.3.

Touch the **Safety** tab to see the safety signals. Refer to Figure 8-1.

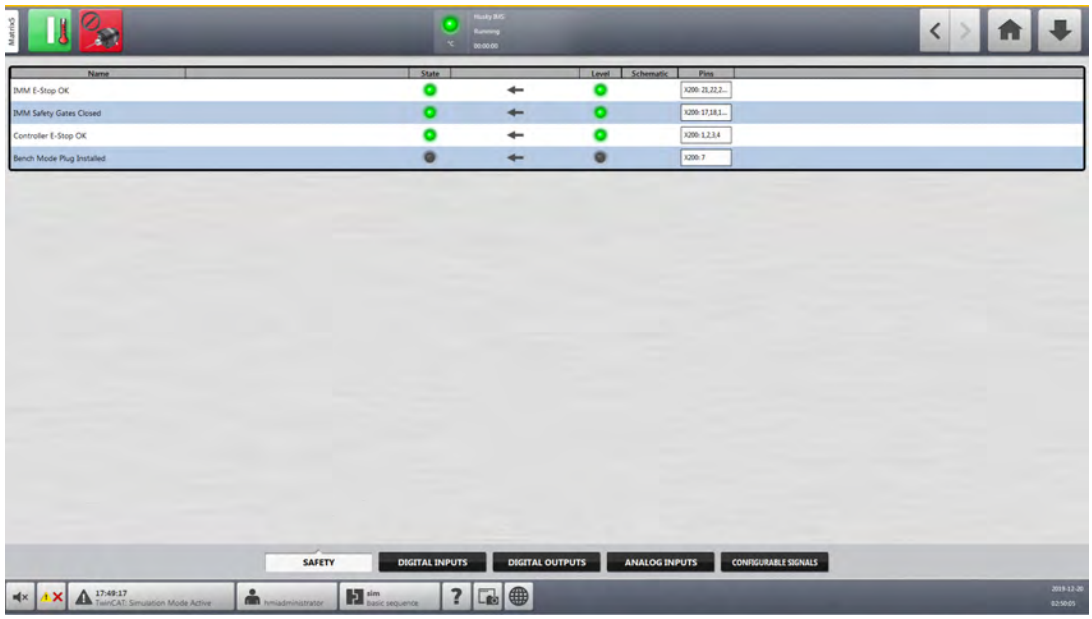


Figure 8-1 Safety Signals Screen

A list of the safety signals is shown in Table 8-2.

Table 8-2 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 all valve gate stem movement.
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. 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	This is the emergency stop button on the ISVGC. The circuit is OPEN when the ISVGC emergency stop button is pushed. The open switch contact causes an emergency stop of the IMM. 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 ISVGC.

8.2 Digital Inputs

Use the Digital Inputs screens to set the Servo and Heats digital input signals from the IMM.

8.2.1 Servo Digital Inputs

The Digital Inputs - Servo screens (pages 1 and 2) let you set up to 22 digital inputs from the IMM. Touch the **Digital Inputs** tab and then the **Servo Page 1** or **2** tabs to set the digital input signals. Refer to Figure 8-2.

You can give each signal a name and also identify the connector and pin number in which the signal is supplied. Touch the field under the **Name** and/or **Pins** columns to enter the signal name and/or the input connector pin.

When necessary, an input 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 is not shown. The Invert override is shown when Force is set to None.

The Level indicators show the electrical condition of the input signal at the pin on the connector.

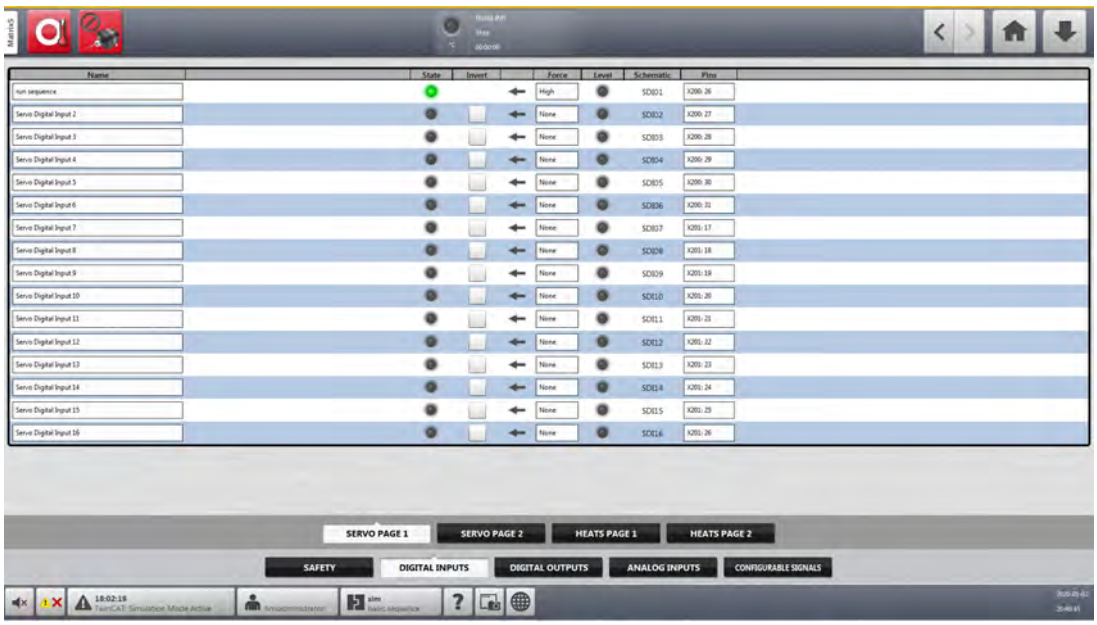


Figure 8-2 Servo Digital Inputs Screen (Servo Page 1)

A list of the usual input signals from the IMM is shown in Table 8-3.

Table 8-3 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 Stems Open Command	This signal is used to start the stems Open operation.
Valve Stems Close Command	This signal is used to start the stems Close operation.
External Permit Calibration	This signal must be TRUE to start valve stem calibration. If this signal not found (no longer 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.

8.2.2 Heats Digital Inputs

On an integrated ISVGC, two heats tabs are shown as part of the digital inputs. They are the Heats Page 1 and Heats Page 2 tabs (refer to Figure 8-3). These tabs do not show on a standalone system.

Figure 8-3 Heats Digital Inputs Screen (Heats Page 1)

The input signals on the Heats Page 1 tab give the ISVGC 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 8-4), the setup bits are shown for a remote load of mold files from the IMM. This is an optional feature for the ISVGC. Refer to the Digital Inputs section of the Altanium Matrix5 User Guide.

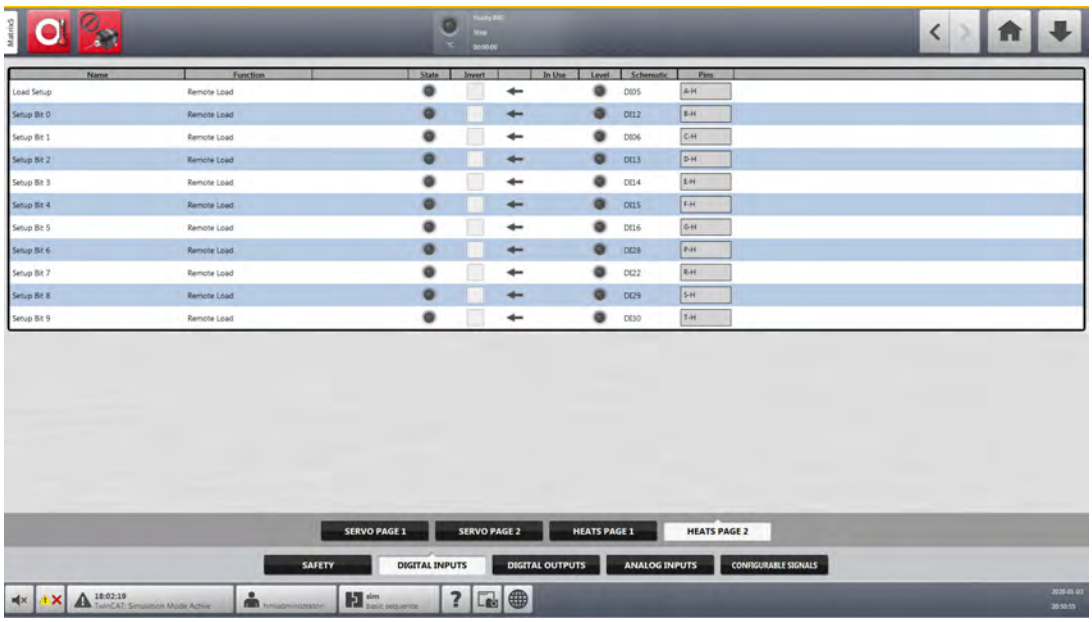


Figure 8-4 Heats Digital Inputs Screen (Heats Page 2)

8.3 Digital Outputs

The ISVGC has 15 servo digital outputs to the IMM. On integrated systems, user-selectable digital outputs for heats are also available. Touch the **Digital Outputs** tab on the I/O screen to see the digital output selection tabs.

8.3.1 Servo Digital Outputs

Touch the **Servo** tab to see the servo digital outputs to the IMM. Refer to Figure 8-5.

You can configure up to 15 digital outputs. You can give each signal a name and also 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 input 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.

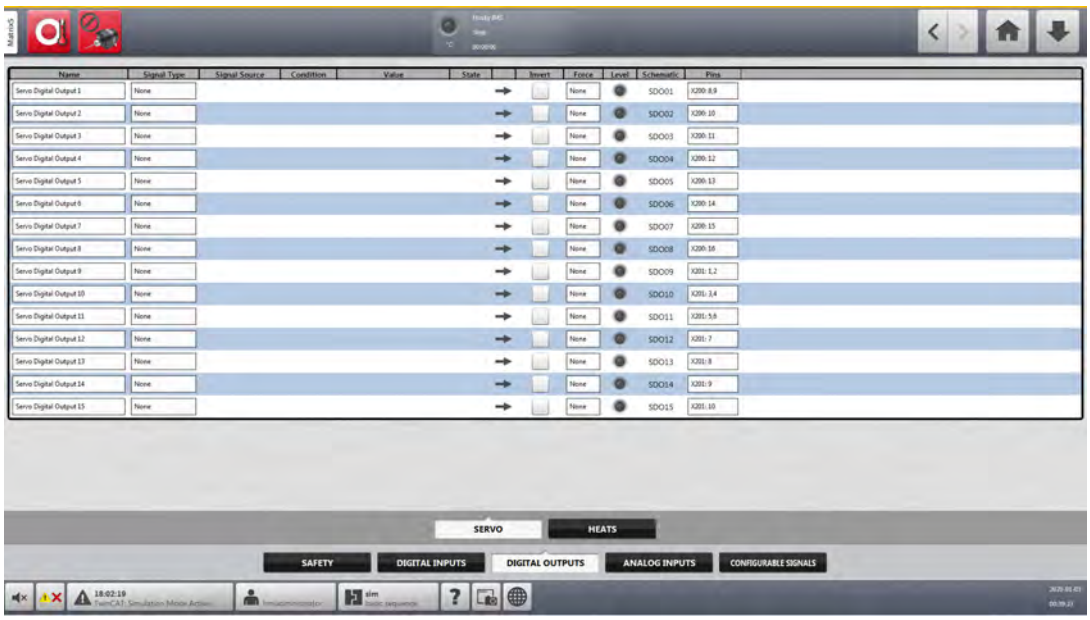


Figure 8-5 Servo Digital Outputs Screen

To set a servo digital output, touch the field in the **Signal Type** column and select a signal type in the dialog window. Complete the related configurations for that signal type, where

necessary. Table 8-4 shows the servo output signal type selections and their related configurations.

Table 8-4 Servo Digital Outputs - Signal Type Selections

Signal Type	Signal	Condition	Position
None	-	-	-
Digital Input	Servo Digital Input 1 - 22	-	-
Controller Function	• Fault Stop Immediately • Fault Stop End Of Cycle • Calibration Active • Process Outside Limit • All Axes At Standstill	-	-
Configurable Signal	Configurable signal 1 - 18	-	-
Sequencer	• Sequence In Auto • Home Command	-	-
	• Custom Sequence	• At Step • Before Step • After Step	• Home • Step 1-18
Analog Input	Analog Input 1 - 8	• Value < • Value >	Values set by the user
Temperature Control	At Temperature	-	-
ISVG Axis	ISVG Axis 1 - 4 (or 1 - 8)	• Position < • Position <	Values set by the user (mm/in)
		• Position =	• Close • Open
ISVG Function	• Ready In Auto Mode • All Stems Closed • All Stems Open	-	-

8.3.2 Heats Digital Outputs

For integrated systems, user-selectable heats digital outputs are available. Touch the **Heats** tab to see the heats digital outputs. Refer to Figure 8-6. The user-selectable outputs that follow are shown:

- 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

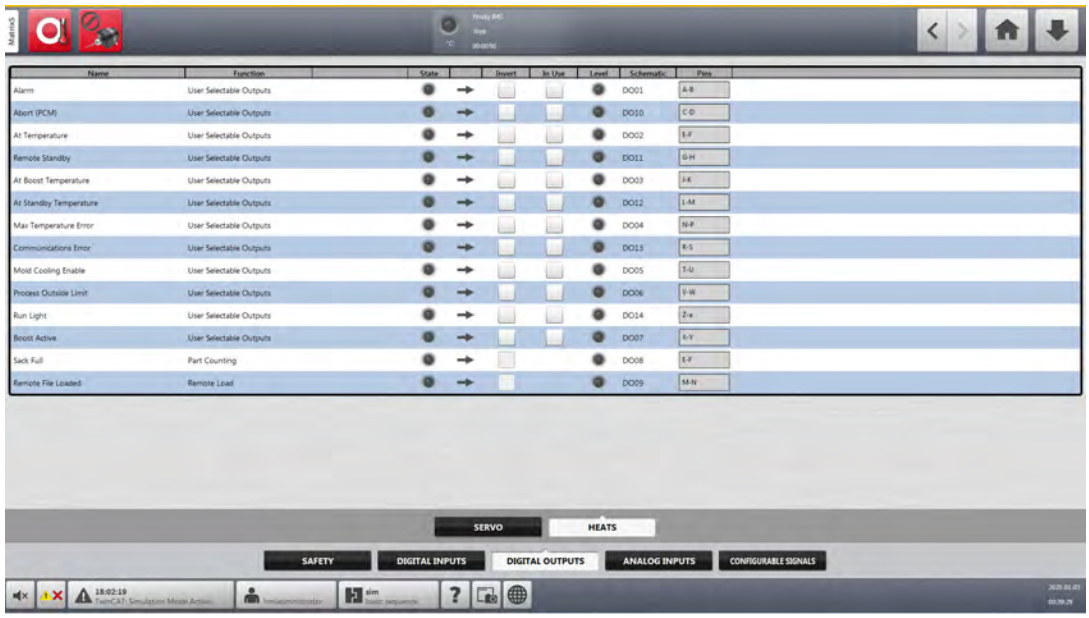


Figure 8-6 Heats Digital Outputs Screen

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

8.4 Analog Inputs

The ISVGC can use up to eight 0-10 V analog inputs from the IMM. As an example, an analog input can be used for a cable potentiometer attached to the IMM's injection screw. This input tells the ISVGC the IMM's screw position.

You can configure the eight analog input signals for your system, as necessary. Touch the **Analog Inputs** tab to see the Analog Inputs screen. Refer to Figure 8-7.

Figure 8-7 Analog Inputs Screen

8.4.1 Raw Value Conversion

The true analog input values (raw values) from the IMM are measured at the controller hardware input cards. The Scale, Offset, and Filter values are used to convert the Raw Values into engineering units that can be used by the controller. The result values are shown in the Value field boxes. Refer to Table 8-1 for more information on the Scale, Offset, and Filter values.

To select an analog input you want to use for an operation, touch the checkbox in the **In Use** column.

If one of the hardware cards detects a fault with the analog input, the indicator in the Fault column will illuminate. For example, if the 0-10 V analog input cards senses an overcurrent condition or a broken wire, the fault is shown.

8.4.2 Calibration

Each analog input has a Calibration button that opens a calculator dialog window, so you can calculate the scale and offset values to calibrate the analog input. A two-point calibration method is used, which has you enter low and high reference values and the expected calibrated values.

You can enter the reference values manually or change the sensor to high/low values and apply the sensor reading to the reference values. The expected calibrated values will always need to be entered manually.

The two-point calibration calculations are:

- Scale = (Calibrated High – Calibrated Low) / (Reference High – Reference Low)
- Offset = (Calibrated Low / Scale) – Reference Low

You can test the new values and compare to the previous values before you accept the new settings.

To see the calculator dialog window for an analog input, touch the **In Use** checkbox for the input and then touch the **Calibration** button.

Figure 8-8 shows the dialog window that lets you use the sensor to apply the raw value to the reference value.

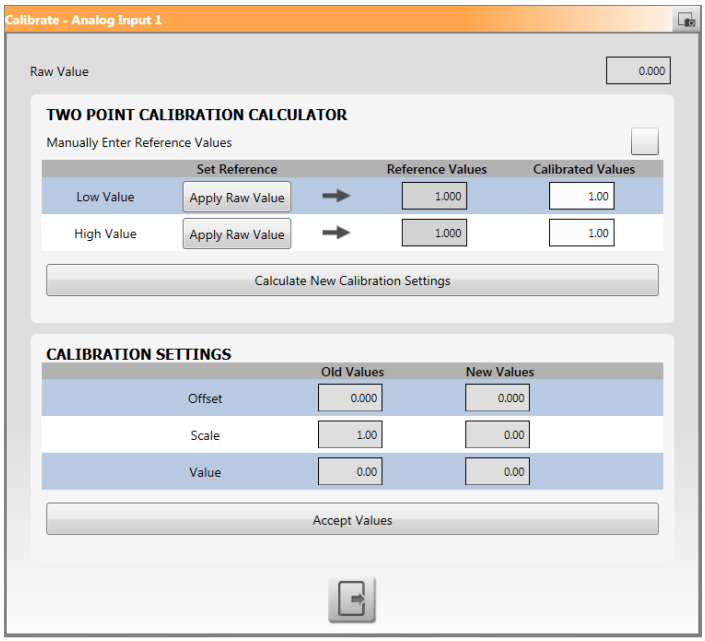


Figure 8-8 Two-Point Calibration Dialog Window - Sensor Used to Enter Raw Values to Reference Values

To manually enter the values, touch **Manually Enter Reference Values** checkbox and enter the reference values. Refer to Figure 8-9.

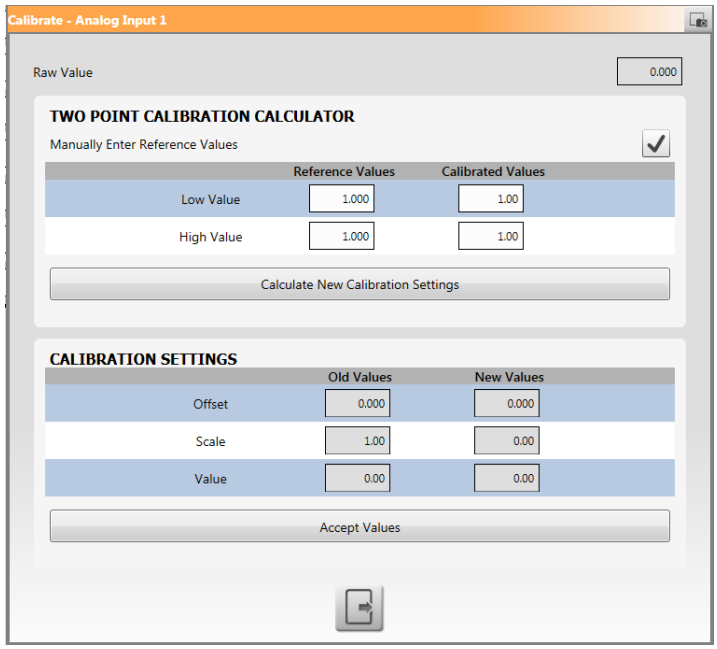


Figure 8-9 Two-Point Calibration Dialog Window - Manually Enter the Reference Value

These settings are only available when the ISVGC is disabled. This is to prevent accidental calibration changes while the system is in cycle mode. Damage to the IMM system could result.

8.5 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 adjustable 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 8-10.

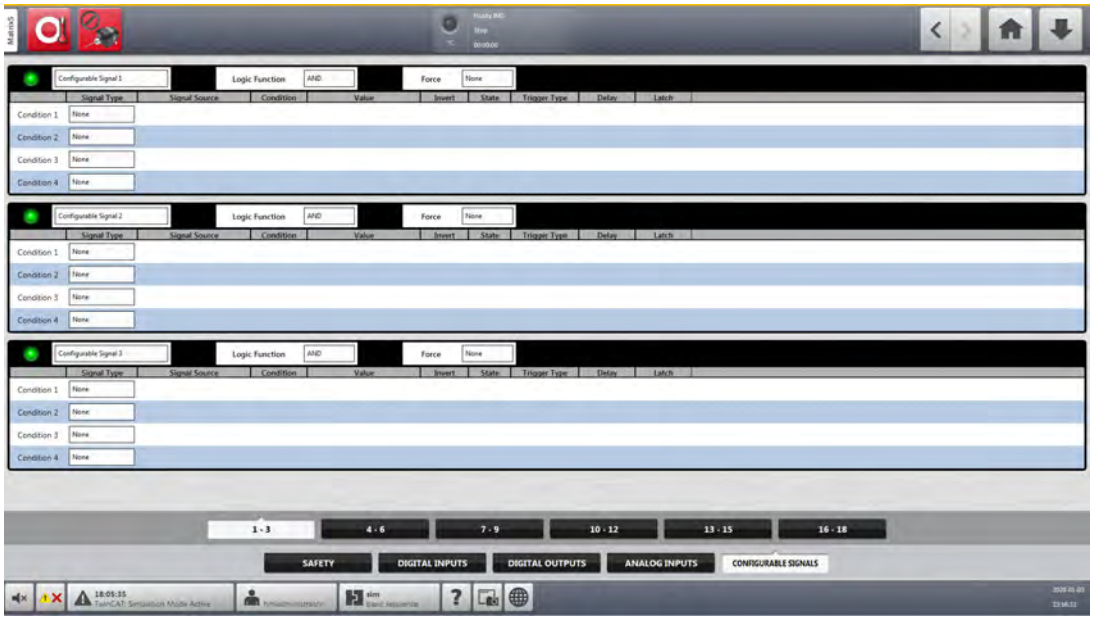


Figure 8-10 Configurable Signals Screen

8.5.1 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 8.5.2.

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 8-5.

Table 8-5 Configurable Signal Types and Parameters

Signal Type	Signal	Condition	Position
None	-	-	-
Digital Input	Servo Digital Input 1 - 22	-	-
Controller Function	• Fault Stop Immediately • Fault Stop End Of Cycle • Calibration Active • Process Outside Limit • All Axes At Standstill	-	-
Configurable Signal	Configurable signal 1 - 18	-	-
Sequencer*	• Sequence In Auto • Home Command	-	-
	• Custom Sequence	• At Step • Before Step • After Step	• Home • Step 1-18

Table 8-5 Configurable Signal Types and Parameters (Continued)

Signal Type	Signal	Condition	Position
Analog Input	Analog Input 1 - 8	• Value < • Value >	Values set by the user
Safety Signal	• IMM E-Stop OK • IMM Safety Gates Closed • Controller E-Stop OK • Bench Mode Plug Installed	-	-
Temperature Control	At Temperature	-	-
ISVG Axis	ISVG Axis 1 - 4 (or 1 - 8)	• Position < • Position <	Values set by the user (mm/in)
		• Position =	• Close • Open
ISVG Function	• Ready In Auto Mode • All Stems Closed • All Stems Open	-	-

* Refer to Chapter 7 for information about the Sequencer application.

8.5.2 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 the user sets to either 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.

8.5.3 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 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.

Chapter 9 Process Monitoring

Process monitoring lets you monitor different variables of a process and set limits for those values. Actions can be set if a process variable is above or below the specified limit.

This chapter gives an introduction to process monitoring. For more information on systems with integrated heats, refer to the Data Recording chapter in the Altanium Matrix5 User Guide.

9.1 Trend Plot Screen

You can monitor different process variables on the Trend Plot screen. On the ISVGC home screen, touch the **Process Monitoring** button. Touch the **Trend Plot** tab on the bottom of the Process Monitoring screen. The Trend Plot screen is shown in Figure 9-1.

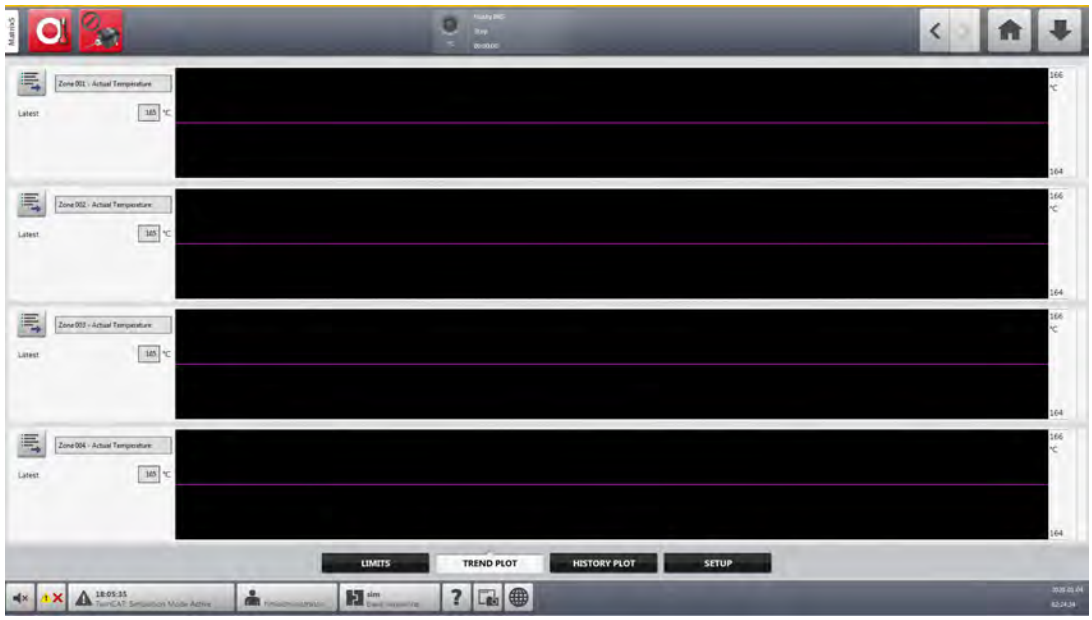


Figure 9-1 Process Monitoring Trend Plot Screen

To select a trend plot you want see, touch the **Variable Selection** button.

The Statistical Process Control Details Variable Selector window shows. Refer to Figure 9-2.

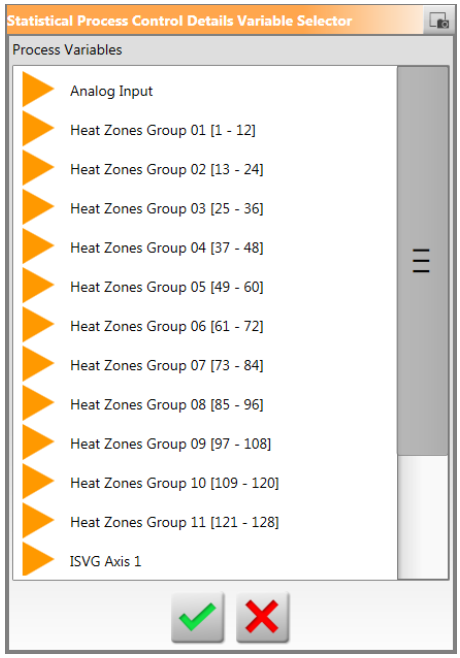


Figure 9-2 Statistical Process Control Details Variable Selector

In the selection menu, use the maximize/minimize arrows to view the variables and then select the one you want to plot. You can select from the variables that follow:

- Analog Input
- Heat Zone:
  - Actual Current
  - Actual Power
  - Actual Temperature
  - Actual Temperature Setpoint
  - Actual Voltage
- ISVG Axis:
  - Closing - Final Position
  - Closing - Move Duration
  - Closing Peak Force
  - Motor Temperature
  - Opening - Final Position
  - Opening - Move Duration
  - Opening - Peak Force
- Cycle Time

The plot of the selected variable will show in the graph area.

9.2 Limits Screen

Use the Limits screen to set an alarm if a process value is not within the specified limits. Touch the **Limits** tab on the bottom of the Process Monitoring screen. The Limits screen is shown. Refer to Figure 9-3.

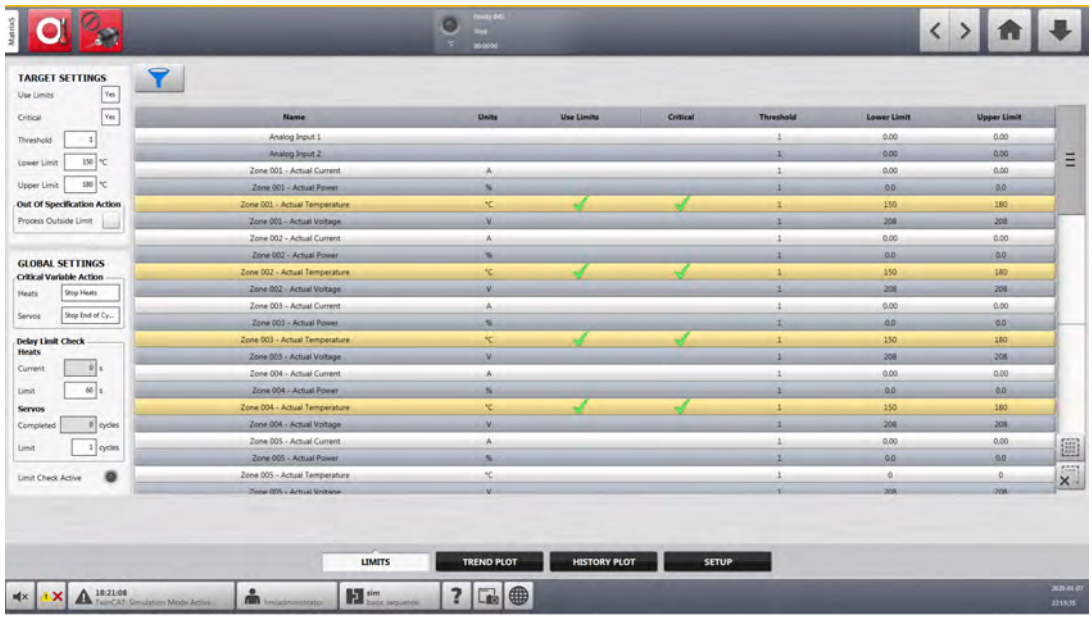


Figure 9-3 Process Monitoring Limits Screen

NOTE: The Limits screen in Figure 9-3 is shown with integrated heats. A standalone system will not show zones.

Refer to Table 9-1 for the definitions of the Target and Global settings.

Table 9-1 Limits Screen Values

Limit	Definition
Use Limits	Select **Yes** in the field box and Altanium triggers an alarm when the process variable is not in the specified limits. A green check mark shows for all values that have been selected to use limits.
Critical	Select **Yes** if the limits are critical. The system will do the actions in the Critical Variable Action area of the screen if the value is not in the upper and lower limits. A green check mark shows for all values that have been selected as critical.
Threshold	The number of times that the value must be above or below the specified limits before 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.

Table 9-1 Limits Screen Values (Continued)

Limit	Definition
Upper Limit	The highest value the process variable value can get to before the "Out of Specification" alarm occurs or the system stops.
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 • Servos	The action taken when a variable is in a critical state. • For heats, select 'No Reaction' or 'Stop Heats'. • For Servos, select 'No Reaction' or 'Stop End of Cycle'.
Delay Limit Check • Heats • Servos	Sets the delay for the limit check: • Units are in seconds for Heats • Units are in cycles for Servos
Limit Check Active	The indicator illuminates when the limits have been checked.

9.2.1 Process Variable Filter

To filter the view of process variable groups, do the steps that follow:

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

The Process Variable Selector dialog window shows. Refer to Figure 9-4.

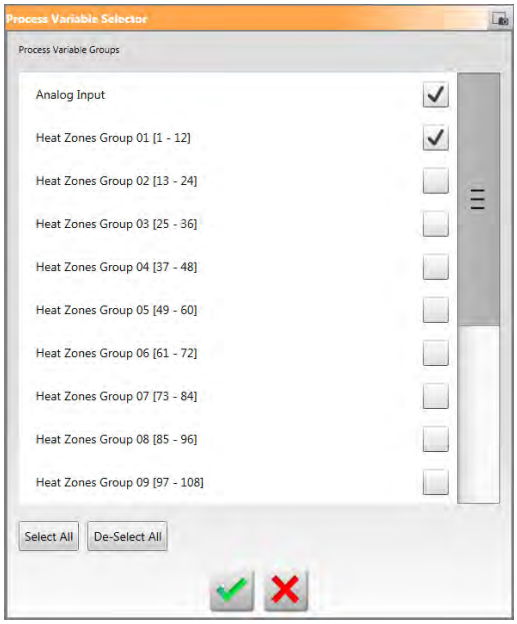


Figure 9-4 Process Variable Selector Dialog Window

2. Touch checkbox(es) for the desired unit(s) of measure.
3. Touch the **Accept** button.

9.3 History Plot Screen

The History Plot screen provides a visual summary of the recorded operations for analog inputs, cycle time, and heat zones (with integrated heats). Touch the **History Plot** tab on the bottom of the Process Monitoring screen. The History Plot screen is shown. Refer to Figure 9-5.

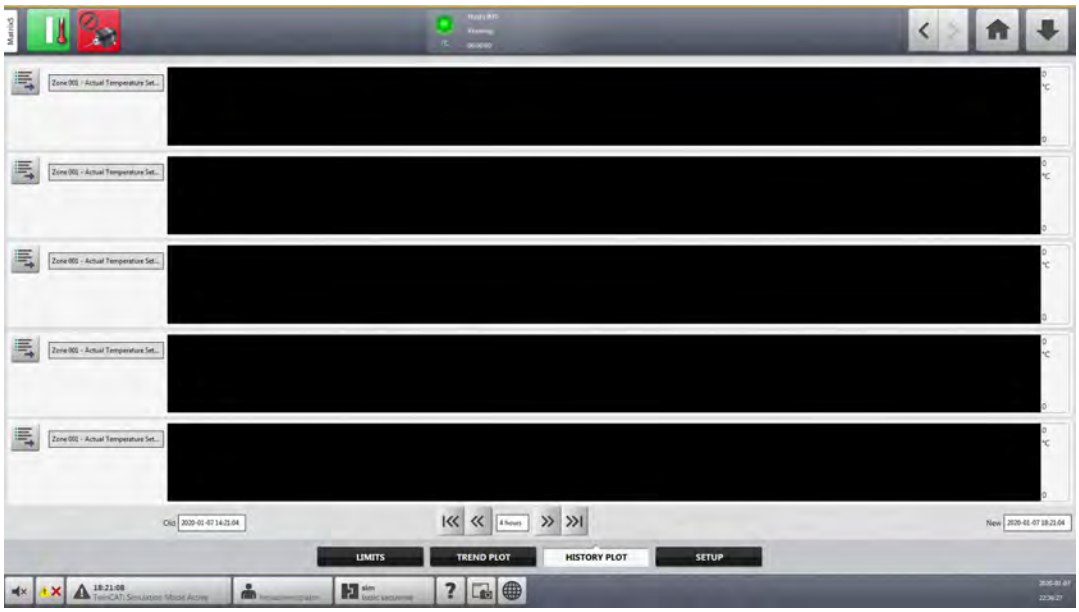


Figure 9-5 Process Monitoring History Plot Screen

9.3.1 Data Description

For a description of the data at a particular point on the graph, touch the desired point on the graph.

Table 9-2 gives a list of the of the History Plot screen curve data items. Refer to Figure 9-6 for item locations.

Table 9-2 Process History Screen Curve Data Items

Item	Location	Description
Curve	1	A line image of data values.
Curve Data Point	2	A data value selection on the curve.

Table 9-2 Process History Screen Curve Data Items (Continued)

Item	Location	Description
Midline	3	The midline is the middle value of the curve.
Description of Data	4	Shows the data point value, date, and time.

Figure 9-6 History Plot Curve Data

9.3.2 Timeframe Duration

You can select the timeframe duration for the curves as 1, 2, 4, 8, or 12 hours. The default timeframe is 4 hours. A change to the timeframe duration automatically updates the new start date and time range. The old date and time range do not change.

To change the timeframe duration, do the steps that follow:

1. On the History Plot screen, touch the **Timeframe Duration** field.

2. Touch a duration value (1, 2, 4, 8, or 12 hours) to make the selection.

9.3.3 Process History Time Range

At the bottom left of the History Plot screen, you can touch the **Old** date and time field to change it. The New date and time (at the bottom right of the screen) will be changed to be equal to the Old date and time plus the timeframe duration amount. If the New date and time is greater than the current system time, the New date and time is set to the current system time. The Old date and time will be changed to be the current system date and time minus the timeframe duration amount. The history plot data will be updated by the date range.

Touch the **New** date and time field to change it. The Old date and time will be changed to be equal to the New date and time minus the timeframe duration amount. You cannot enter a date and time greater than the current system time. If the New date and time is greater than the current system time, the New date and time is set to the current system time. The Old date and time will be changed to the current system time minus the timeframe duration amount. The history data will be updated by the date range.

9.3.4 Process History Scroll

Touch the left arrow to move the Old and New date and time backward in time by the timeframe duration amount. The history data will be updated by the date range.

Touch the right arrow to move the Old and New date and time forward in time by the timeframe duration amount. If the New date and time is greater than the current system time, the New date and time is set to the current system time. The Old date and time will be changed to the current system time minus the timeframe duration amount. The history data will be updated by the date range.

9.3.5 Variable Selections

You have a choice of variables to plot:

- Analog Inputs
- Heat Zones
- ISVG Axes
- Process Monitoring (Cycle Time)

For the ISVG Axes, you can select from:

- Closing - Final Position
- Closing - Move Duration
- Closing Peak Force
- Motor Temperature
- Opening - Final Position
- Opening - Move Duration
- Opening - Peak Force

For integrated heats, the data is presented zone by zone. Available process variables for heat zones are:

- Actual Current
- Actual Power
- Actual Temperature
- Actual Temperature Setpoint
- Actual Voltage

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

1. Touch the **Process History Variable Selector** button of the process to be changed.

The Process History Variable Selector dialog window shows. Refer to Figure 9-7.

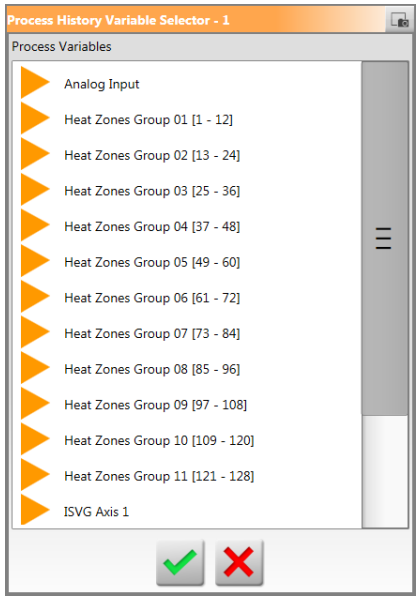


Figure 9-7 Process History Variable Selector Dialog Window

2. On the Process History Variable Selector dialog window, touch a maximize/minimize arrow.
3. Select the process variable you want to see plotted.
4. Touch the **Accept** button.

   Your selection shows in the field next to the plot area.

9.4 Setup Screen

The Setup tab of the Process Monitoring screens is used to configure the settings for cycle mode and time-based mode data collection.

Also, data log information can be filtered and transferred from this screen.

Touch the **Setup** tab on the bottom of the Process Monitoring screen. The Setup screen is shown. Refer to Figure 9-8.

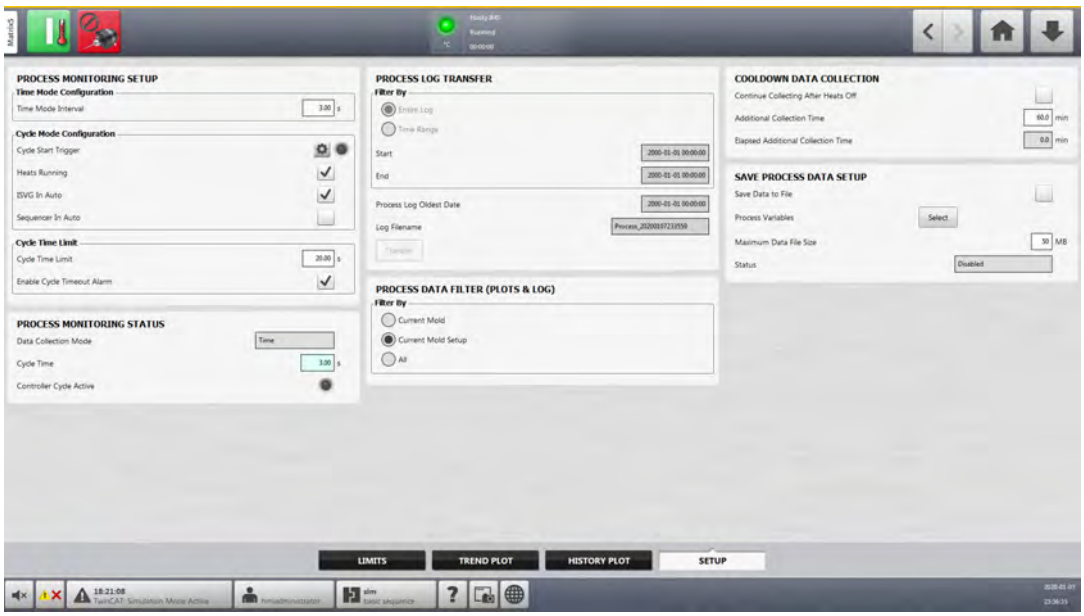


Figure 9-8 Process Monitoring Setup Screen

Table 9-3 describes the items on the Setup screen.

Table 9-3 Process Monitoring Setup Selections

Item	Description
Time Mode Interval	This is the interval used for time-based mode data collection. If no cycle signals are received during cycle mode on an integrated controller, the system changes to time-based mode data collection. This time interval is used for the data collection. Time can be set from 2 to 300 seconds. The zones do not have to be 'At Temperature' for time based data collection. If one or more zones go below temperature, the data collection continues. This would be used when data collection is not cycle dependent and must collect data regularly.
Cycle Start Trigger	Set the signal used to start the cycle data collection. Refer to Table 9-4 to see the start trigger selections. Touch the gear icon to select a signal.  The indicator illuminates green if your selection is TRUE.
Heats Running	Enable this cycle mode condition if you want data collection only if the heats are ON.
ISVG in Auto	Enable this cycle mode condition if you want data collection only if the ISVGC is in Auto mode.

Table 9-3 Process Monitoring Setup Selections (Continued)

Item	Description
Sequencer in Auto	Enable this cycle mode condition if you want data collection only if the sequencer is in Auto mode.
Cycle Time Limit	Set the maximum duration of a single cycle. The cycle timer begins when the cycle signal is received. If the next cycle signal is not received before the timer completes, the cycle has timed out. The reaction to cycle timeout is: • Integrated controller - changes to time-based mode data collection. • Standalone controller - data collection stops, but stays in cycle mode data collection, waiting for the cycle start signal to occur again. The maximum Cycle Time Limit is 300 seconds. The minimum limit is 2 seconds. The default Cycle Time Limit is 20 seconds.
Enable Cycle Timeout Alarm	Enables an alarm to show if the Cycle Time Limit is exceeded.
Data Collection Mode	Shows if the ISVGC is in cycle mode or time-based mode data collection.
Cycle Time	Shows the cycle time.
Controller Cycle Active	The indicator illuminates green when a cycle is active.
Process Log Transfer	Use this area to select the process history log transfer. You can transfer the full history log or just a specific time range. The history log can be transferred to: • Local controller storage • External storage (USB) • Shared network folder (Windows standard)
Process Data Filter	Filters 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).
Continue Collecting After Heats Off	Enable this operation to continue the history data collection after the heats are off.
Additional Collection Time	Enter a time value (minutes) in which the ISVGC continues the data collection.
Elapsed Additional Collection Time	Shows the elapsed time of the Additional Collection Time.
Save Data to File	Enable this operation to save the process variables to a file.

Table 9-3 Process Monitoring Setup Selections (Continued)

Item	Description
Process Variables	The Select button shows a dialog window that lets you select the process variables you want saved to a file: • Setpoint • Temperature • Power • Current • Line Voltage
Maximum Data File Size	You can set the size of the file to which the process variables are saved. The minimum file size is 1 MB; the maximum file size is 500 MB. The default file size is 50 MB.
Status	This field give the status of the process data file save operation.

Table 9-4 lists the signal selections for the Cycle Start Trigger.

Table 9-4 Cycle Start Trigger - Signal Type Selections

Signal Type	Signal	Condition	Position
None	-	-	-
Digital Input	Servo Digital Input 1 - 22	-	-
Configurable Signal	Configurable signal 1 - 18	-	-
Sequencer	• Sequence In Auto • Home Command	-	-
	• Custom Sequence	• At Step • Before Step • After Step	• Home • Step 1-18
Analog Input	Analog Input 1 - 8	• Value < • Value >	Values set by the user
Temperature Control	At Temperature	-	-
ISVG Axis	ISVG Axis 1 - 4 (or 1 - 8)	• Position < • Position <	Values set by the user (mm/in)
		• Position =	• Close • Open
ISVG Function	• Ready In Auto Mode • All Stems Closed • All Stems Open	-	-

9.5 Cycle Monitor (Cycle Scope) Screen

The Cycle Monitor (Cycle Scope) screen shows specific curves that can help you troubleshoot your process. The curves shown are:

- Analog Inputs
- Sequencer Step
- Servo Digital Inputs 1 - 22

From the ISVGC Home screen, touch the **Cycle Monitor** button to see the Cycle Monitor screen.

The Cycle Monitor screen shows. Refer to Figure 9-9.

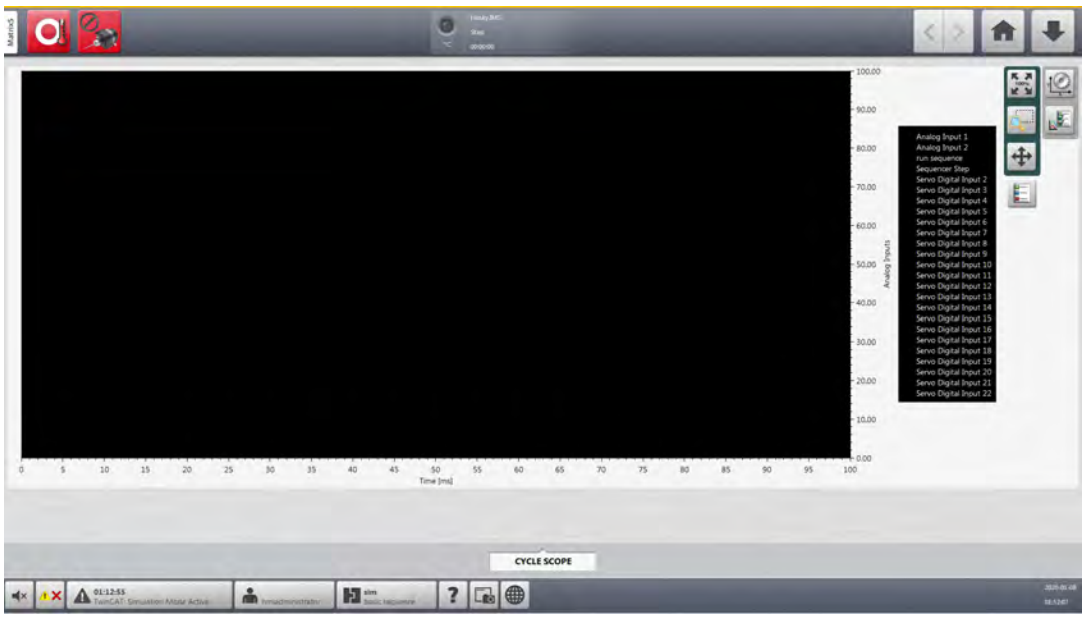
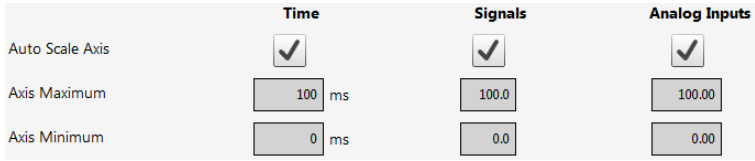
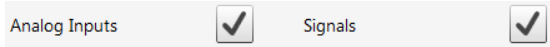


Figure 9-9 Cycle Monitor (Cycle Scope) Screen

9.5.1 Chart View and Adjustment Selections

Table 9-5 shows a list of the chart view and adjustment selections used on the Cycle Monitor screen.

Table 9-5 Cycle Monitor - Chart View and Adjustment Selections

Button	Description
	Returns the chart view to 100%.
	Lets the user magnify a specific area of the chart.
	Lets the user adjust the chart view when magnified.
	Shows a legend to identify the chart traces.
	Used to set auto scale for the chart traces that follow: • Time • Signals • Analog Inputs 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: • Analog Inputs • Signals 

Chapter 10 Alarms and Event History

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

10.1 Alarms Screen

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

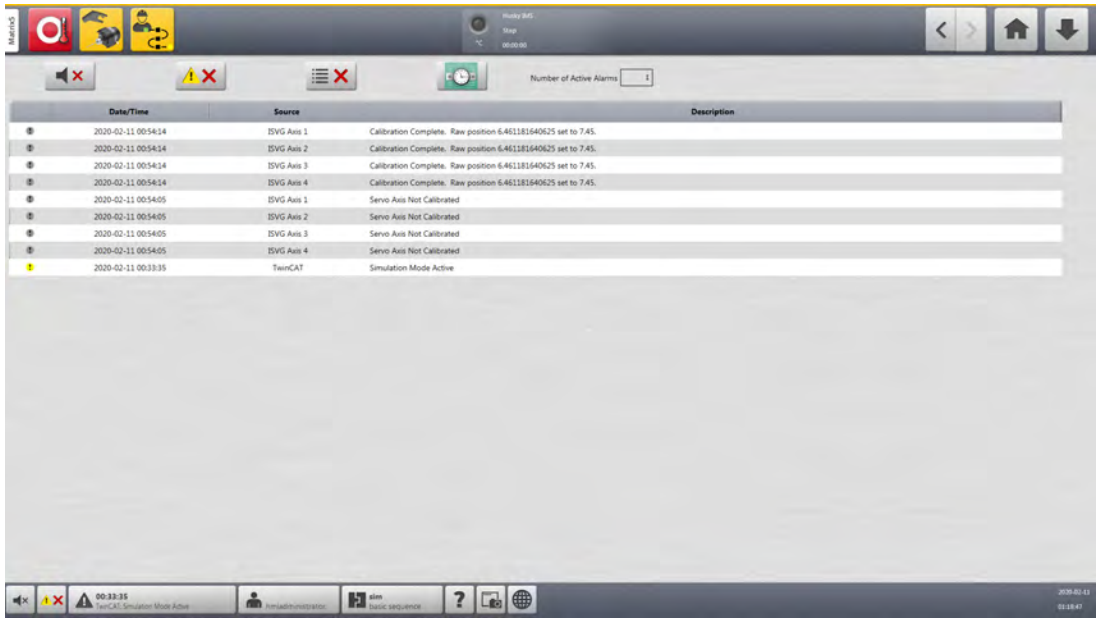


Figure 10-1 Alarms Screen

NOTE: For a list of the alarm conditions shown on the Event History screen and Alarms screen, refer to Section 10.3.

The buttons on the Alarms screen are described in Table 10-1.

Table 10-1 Alarms 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 on.
	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 information 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 (shown on all screens), touch the **Alarm Status** 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 Alarm** 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 Screen screen, on the Altanium Home or Alarms screens, touch the **Event History** button. Refer to Figure 10-2.

NOTE: For a description of the alarm conditions shown on the Event History screen and the Alarms screen, refer to Section 10.1.2. For a description of the icons used on the Event History screen and Alarms screen, refer to Section 10.3.

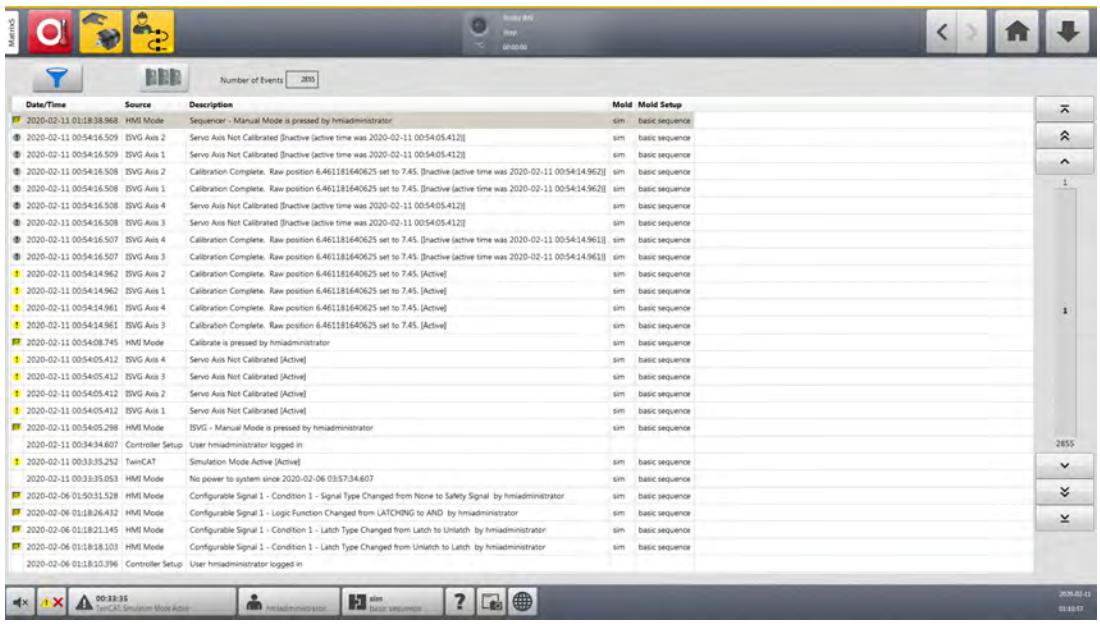


Figure 10-2 Event History Screen

Table 10-4 gives a list of the information 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 window. Refer to Figure 10-3.

Figure 10-3 Event History Filter Dialog Window

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

Button	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.

Appendix A Glossary of Terms

Table A-1 gives the definitions for terms used in this user guide and the Altanium Matrix5 User Guide.

Table A-1 Glossary of Terms

°C	Celsius temperature scale
CSV	Comma Separated Values (file)
DELTA 3PH (Input Power)	The Delta configuration has the three phases connected in a triangle shape. They do not normally have a neutral cable.
°F	Fahrenheit temperature scale
E-Stop	Emergency Stop
ft	Feet
HMI	Human Machine Interface
HRC	Hot Runner Control
Hz	Hertz
in	Inches
Imperial	Imperial Units or British Imperial Units (measurement)
IMM	Injection Molding Machine
Integrated TX (Input Power)	WYE 3PH Transformer Secondary supply power is used.
ISVG	Individual Servo Valve Gate
ISVGC	Individual Servo Valve Gate Controller
kg	Kilograms
lb	Pounds
LOTO	Lockout Tagout
m	Meter
mA	Milliampere (or milliamp)
Matrix5	21.5 inches operator interface for Hot Runner, UltraSync-E, Mold Servo, and Valve Gate control.
mm	Millimeters

Table A-1 Glossary of Terms

PDF	Portable Document Format (file)
RH	Relative Humidity
SI	International System of Units (measurement)
Single Phase (Input Power)	A two-wire (supply and neutral) power input is used.
STO	Safe Torque Off
TXT	Text (file)
US-E	UltraSync-E
Vac	Volts Alternating Current
Wye 3PH+N (Input Power)	A Wye three phase supply plus neutral configuration is when all the loads in an AC system are connected at one point. The configuration has looks like a Y shape.

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 ISVG servo actuators. This is not a full list of problems or solutions. If a problem is not shown in this appendix, contact Husky Technical Support or the nearest Husky Regional Service and Sales office for help.

WARNING!

Electrical Shock Risk. De-energize the controller prior to connecting, disconnecting, or servicing the controller, hot runner, or mold.

Only fully trained and qualified personnel should do troubleshooting and/or maintenance on the Altanium Individual Servo Valve Gate Controller (ISVGC) controller. Refer to the safety information in Section 1.2.

B.1 Startup Troubleshooting

Refer to Table B-1 for startup 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 ISVGC.	The display module has no power.	Make sure that the power cable from the ISVGC stack is correctly connected to the display module. Refer to Figure 2-1 and Section 2.13. Make sure that the main power is connected correctly. Refer to Section 2.6.
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 ISVGC cabinet, or the interface cables between the IMM and the ISVG,C are loose.	Examine all the cables and make sure that they are connected.
	Error in the software or equipment.	Contact Husky Technical Support.
The touch screen of the display module does not function normally.	Error in the software or equipment.	Contact Husky Technical Support.

B.2 Drive Fault (Error Code #)

There are many conditions that can cause this fault from the servo drive system to occur.

To find the problem, complete the steps that follow in order:

1. Make sure the servo cables are connected.
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, try 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 2.11.
   - Circuit breaker Q1M is in the ON position (switch is up).
   - Circuit breaker Q10 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 and the W-X200 cable is connected (or the bench mode plug is installed).
     - Only the first 'Power' LED will be ON if the safety gates are open or there is no connection to -X200.
   - Three green LEDs on safety relay K2 are all ON if there is no IMM E-Stop and the W-X200 cable is connected (or bench mode plug is installed).
     - Only the first 'Power' LED will be ON if there is an IMM E-Stop or no connection to -X200.

B.3 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 show again 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 coupling.
- Damaged component.
- 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. On the Open Profile and Close Profile screens, look at the graphs to see what occurred at the fault position. Did the force during motion exceed the limits?
3. Increase the close and open force limits.
4. Decrease the Speed, Acceleration, and Deceleration values.
5. 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 ISVGC cabinet and touch screen of the display module.
	Examine the air filter area on the rear of the ISVGC.
Each Month	Examine all electrical components.

CAUTION!

Make sure that there is no blockage of the air inlet and outlet vents. If there is not sufficient airflow then damage can occur to the ISVGC.

Examine the air inlet and outlet vents. Examine the air filter if one is installed on your system (do this task more frequently if you operate the ISVGC 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 of the emergency stop buttons that remain.
   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 of the other safety gates that you can move and are interlocked.

2. Examine all the ISVGC cables for wear and damage. Replace all cables that have damage or are worn.
3. Clean the ISVGC and touch screen:
   a. Remove all oil, grease, and other unwanted material from the cabinet of the ISVGC.
   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 ISVGC, 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 inlet and outlet air vent slots at the top and rear of the ISVGC do not have dust or other unwanted material.
5. Examine the air filter (if installed on your system):
   a. On the rear of the ISVGC, remove the screws that attach the air filter cover. Refer to Figure 2-1.
   b. Remove the air filter cover.
   c. Remove the air filter from the ISVGC.
   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.
      - HPN 7113472 - pleated panel air filter (7x7x1 inch) MERV8, or equivalent.
   f. Install the air filter cover and attach it with the screws.