Altanium Valve Gate Sequencer Controller (VGSC)

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 Valve Gate Sequencer Controller (VGSC) gives accurate pneumatic and hydraulic valve gate sequencing for:

- Controlled part filling
- Elimination of weld lines (cascade filling)
- Positioning of weld lines (sequential filling)
- Mechanical balancing of family molds

The VGSC operates with the use of screw position, time, and other user-defined analog and/or digital inputs. The VGSC can be used as a standalone system or with integrated temperature controls (heats). System configurations and operations are all done from one operator interface. The interface options for the VGSC are the Altanium Delta5 or Matrix5.

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

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 Reference Directives and Standards

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
Euromap 67	Electrical Interface between Injection Moulding Machine and Handling Device / Robot
Euromap 13	Injection Molding Machines, Core Pullers Electrical Interface
Euromap 74	Electrical Interface between Injection Molding Machine and Electrically Driven Cores
	Altanium Delta5 User Guide
	Altanium Matrix5 User Guide

1.2 Safety

The safe setup and installation of the VGSC 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 VGSC.

All personnel who install, operate, or maintain the VGSC 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.

1.2.1 General Safety

WARNING!

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

WARNING!

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

WARNING!

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.

1.2.2 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 VGSC to show a hazard.

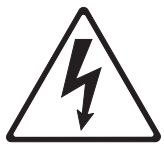
Safety Symbol	General Description of Symbol
	**General** This symbol shows a possible personal injury hazard. It normally has a pictogram or text to describe the hazard.
	**Hazardous Voltage** This symbol shows an electrical hazard that will cause death or serious injury.

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

Figure 1-1 Hazard Voltage Warning Example

1.3 Equipment Function

The Husky Altanium Valve Gate Sequencer Controller (VGSC) supports a maximum of 16 control channels (outputs) on the Delta5 and 32 on the Matrix5, which come in four-channel increments. Each control channel is an output to a valve gate sequencer solenoid or actuator. These can be a single signal to open and close, or a separate signal to open and a separate signal to close.

The VGSC controls pneumatic and hydraulic valve gate sequencing. It can be used on an injection molding machine (IMM) as a standalone system or integrated with temperature controls (heats).

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

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

This user guide describes the operation of the Altanium VGSC 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 VGSC 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.

1.4 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 VGSC:

Table 1-1 Electrical Wire Standards

Description	Wire Color	
Neutral	Blue	N/A
Earth/Ground	Green	Green/Yellow
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 VGSC, including oil or water, could damage the equipment. Do not spray wash.

The environmental operation specifications for the VGSC 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 VGSC are found on the nameplate attached to the back of the controller.

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

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

1.8 Reference User Guides - Altanium Delta5 and Matrix5 User Guides

This user guide describes the operation of the Valve Gate Sequencer Controller (VGSC) only. The VGSC can be a standalone system or integrated with temperature controls (heats). The VG sequencer operates on an Altanium Delta5 or Matrix5 controller platform.

The operation of temperature controls, system configurations, and common functions are described in the Altanium Delta5 or Matrix5 User Guides. You should read the user guide that is applicable to your system if you have not used temperature controls for a molding cell.

Most of the functions that are described in the Altanium Delta5 or Matrix5 User Guide will not be described again in this user guide. Some functions found in the Altanium Delta5 or 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 other guides.

A reference to the Altanium Delta5 or Matrix5 User Guide is given when the function is described in those user guides. Make sure that you have a copy of the user guide that is applicable for your system. The Altanium Valve Gate Sequencer Controller User Guide and the Altanium Delta5 or Matrix5 User Guide are necessary to operate/control the VG Sequencer and molding cell.

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 Delta5 or Matrix5 User Guide for more information.

1.8.1 Temperature Controls

Refer to the Altanium Delta5 or 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 Delta5 or 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 Valve Gate Sequencer Controller (VGSC). It also contains the necessary information to connect the VGSC 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 VGSC and the interface between the VGSC and the IMM. This person/function will be referred to as the system integrator in the pages that follow.

The system integrator must do what follows:

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

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

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

2.2 Reference Directive, Standards, and User Guides

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

EN201	Plastics and rubber machines - Injection molding machines - Safety requirements
EN61000	Electromagnetic Compatibility
	Altanium Delta5 User Guide
	Altanium Matrix5 User Guide

2.3 Safety

Refer to Section 1.2 for information on warnings, cautions, and notes that are used in this manual, and the safety symbols found on the VGSC.

Refer to Section 2.10 for the lockout/tagout procedures.

2.3.1 VGSC Controls, Connectors, and Parts Identification

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

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

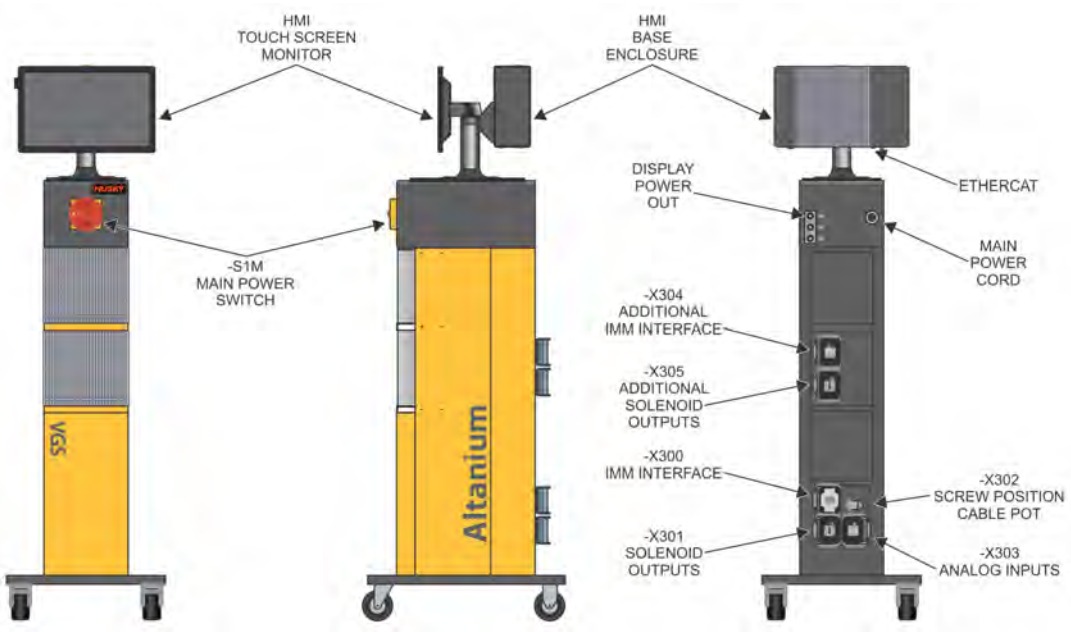


Figure 2-1 VGSC Controls, Connectors, and Parts Identification (Standalone System)

2.4 Initial Setup of the VGS Controller

2.4.1 Remove the VGSC from the Shipping Container

WARNING!

Only qualified, certified, and trained personnel are permitted to remove the VGSC from the shipping container and pallet. The VGSC weighs between 227 kg (500 lb) and 907 kg (2000 lb). Injury to personnel and /or damage to the VGSC can occur if you do not use the correct procedures.

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

2.4.2 Lift the VGS Controller

2.4.2.1 General

WARNING!

Only qualified, certified, and trained personnel are permitted to lift the VGSC. The VGSC weighs between 227 kg (500 lb) and 907 kg (2000 lb). Injury to personnel and /or damage to the VGSC can occur if you do not use the correct lifting procedures.

The VGSC 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	Lifting Device (Lift Capacity)
Single Stack	2.44 m x 25.4 mm (8 ft x 1 in) – Quantity (2)	1.52 m (5 ft) – Quantity (1)	227 kg (500 lb)
Double Stack	3.66 m x 25.4 mm (12 ft x 1 in) – Quantity (2)	1.83 m (6 ft) – Quantity (1)	454 kg (1000 lb)
Triple Stack	3.66 m x 25.4 mm (12 ft x 1 in) – Quantity (2)	2.44 m (8 ft) – Quantity (1)	907 kg (2000 lb)

2.4.2.2 Lift Procedures

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

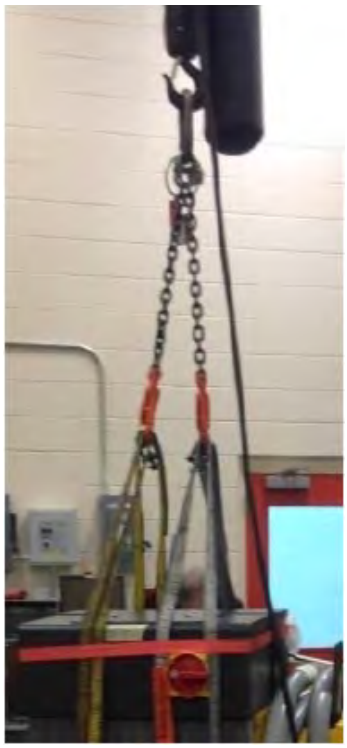


Figure 2-2 Straps and Lift Device

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

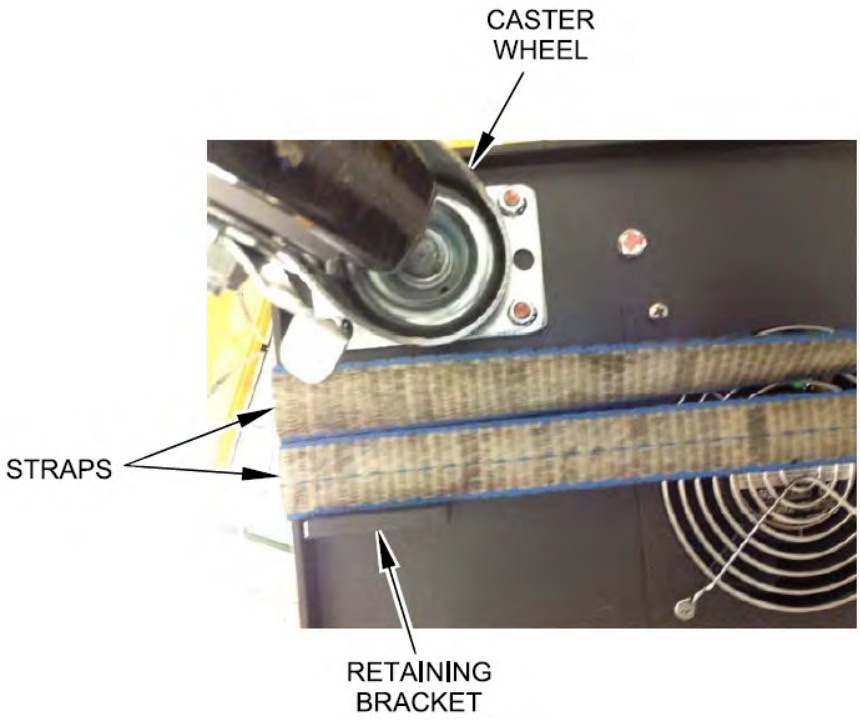


Figure 2-3 Straps - Correct Position

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

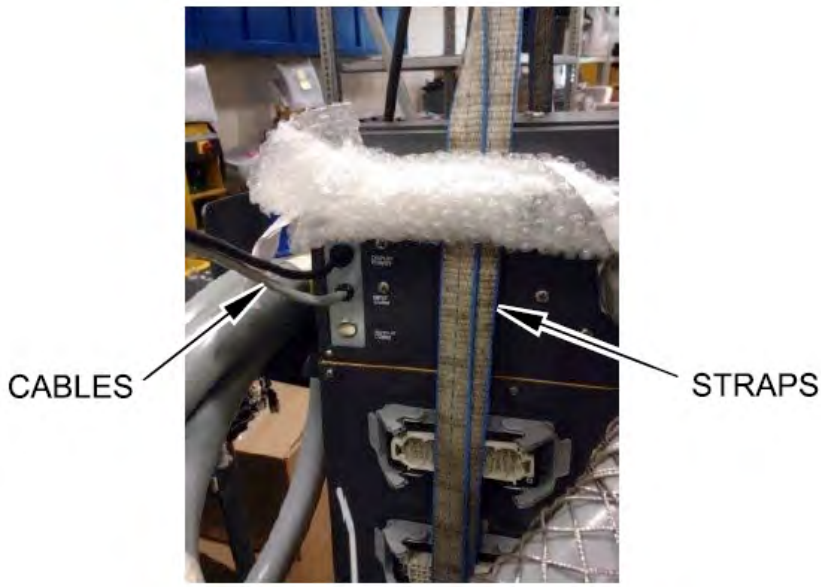


Figure 2-4 Cable Check

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

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

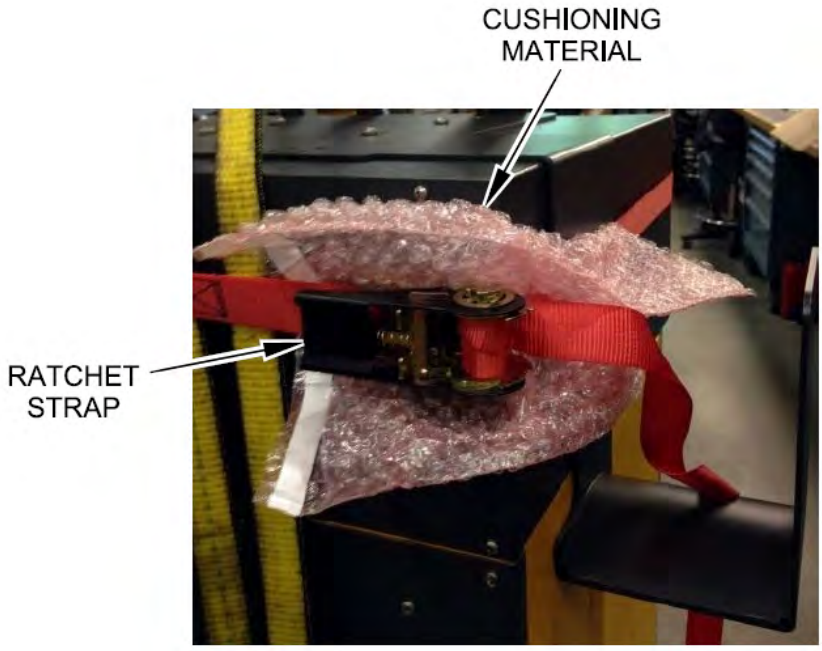


Figure 2-5 Cushioning Material

9. Tighten the ratchet strap.
10. With the lift device, carefully and slowly lift the VGSC 1 to 3 inches (25.4 to 76.2 millimeters).
11. Examine the webbed straps and ratchet strap to make sure that the VGSC will not tilt.
12. Move the VGSC to the correct location.
13. Carefully and slowly lower the VGSC. Continue to lower the VGSC 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 VGSC

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

1. With the front of the VGSC in front of you, remove the four M6 x 1mm button head cap screws from the top of the VGSC stack.
2. Put the display module on top of the VGSC and align the display module holes with the holes in the top of the VGSC stack.
3. With the supplied 4mm hex wrench, install and tighten the four button head cap screws. Refer to Figure 2-6.

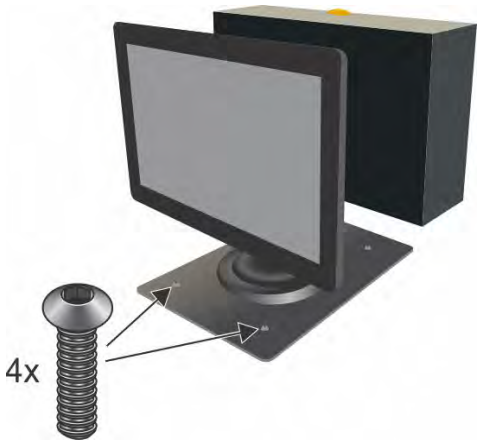


Figure 2-6 Display Module - Attachment

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

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

2.6 Connect the Input Power

WARNING!

Risk of electrical shock or electrocution.

Connect the input power of the VGSC correctly. If not correctly connected, the input power could cause death or serious injury to personnel and/or damage to the VGSC or IMM. Only approved personnel should connect the input power. You must obey all applicable local electrical codes.

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

   NOTE: The VGSC is manufactured to receive main supply power in two ways:
   - 400 VAC ±10%, 3-phase + neutral + ground (WYE), 50/60 Hz
   - 240 VAC ±20%, 3-phase + ground (DELTA), 50/60 Hz.

   Because the standalone and integrated VGSC models are different, see the controller nameplate or electrical schematics for the maximum current ratings.
2. Contact Husky customer support if it is necessary to change the power supply configuration.

2.7 Overcurrent Protective Device

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

The VGSC 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 VGSC. Refer to Section 2.6
- 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 VGSC 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 VGSC, you must do lockout/tagout procedures.

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

You must do lockout/tagout procedures on all the equipment in the mold area (VGSC, IMM, and other operation components).

Lockout/tagout includes the steps that follow. The list that follows does not include all of the lockout/tagout steps that you must do. It is possible that your company has other preventative steps that must be done.

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

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

2.10 Input/Output Signals and Other Connections

The subsections that follow describe the input and output connections. The signals for each of the X300/X301/X302/X303/X304/X305 cable connectors are described in Table 2-3, Table 2-4, Table 2-5, Table 2-6, Table 2-7, and Table 2-8.

Usually, the interface cables have no connectors at the end that attaches to the IMM (field end). The system integrator must attach the cable leads (or flying leads) to the IMM connections. The system integrator must refer to the IMM electrical schematics and the VGSC signal/pin descriptions to see how to connect the cable leads on the IMM connectors. The cable leads can also be hard wired directly to the IMM control cabinet.

As an aid, each cable wire is numbered along its length. Refer to Table 2-3, Table 2-4, Table 2-5, Table 2-6, Table 2-7, Table 2-8 and the electrical schematics to see which wire number goes with which signal and pin.

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

Table 2-2 lists the available VGSC input and output signals.

Table 2-2 Available Signals

Signal Type	Quantity	Purpose	Comments
Digital Inputs	8 or 36	User configurable for triggers that interface with the IMM or auxiliary equipment.	Two digital inputs are used for the signals that follow: • IMM Safety Gate Status • VGS Enable These are safety inputs and cannot be changed. Refer to Section 2.10.1.1 and Section 2.10.1.2.
Digital Outputs	4	User configurable for signals to the IMM.	
24 VDC Outputs	Delta5: 4-16 Matrix5: 4-32	Control for solenoids on air valves or hydraulic valves.	2 amperes per circuit.
0-10 V Analog Inputs	4	User configurable for position feedback or other analog sensors in the mold or IMM.	One analog 0-10 V input dedicated to an optional linear position transducer.
4-20 mA Analog Inputs	2	User configurable for position feedback or other analog sensors in the mold or IMM.	

The input/output connector locations are on the back of the VGSC cabinet. Refer to Figure 2-7and Figure 2-8 for identification. Refer to Figure 2-1 for their location. These connectors are:

- X300 - Injection Molding Machine Interface
- X301 - Solenoid Outputs
- X302 - Analog Input 1, Screw Position Cable Potentiometer (0-10 V)
- X303 - Additional Analog Inputs (3x 0-10 V, 2x 4-20 mA)
- X304 - Additional Injection Molding Machine Interface
- X305 - Additional Solenoid Outputs

To prevent possible damage to the cables, make sure they are correctly routed, so they do not lay on, or pull against sharp edges.

Analog input cables (W-X302, W-X303) must be routed away from all electrical noise generating cables or devices. This makes sure the electrical signals are clean and stable.

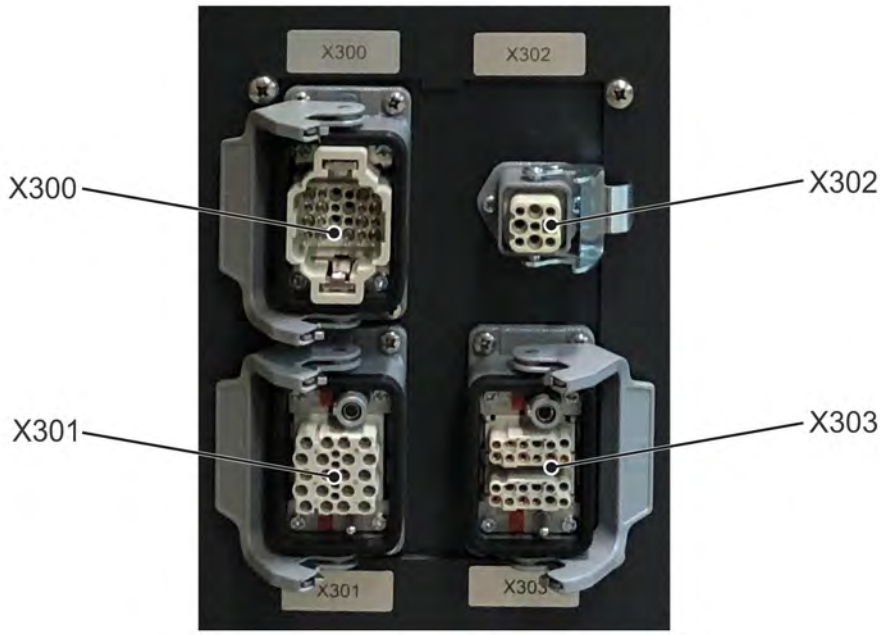


Figure 2-7 Input/Output Connectors

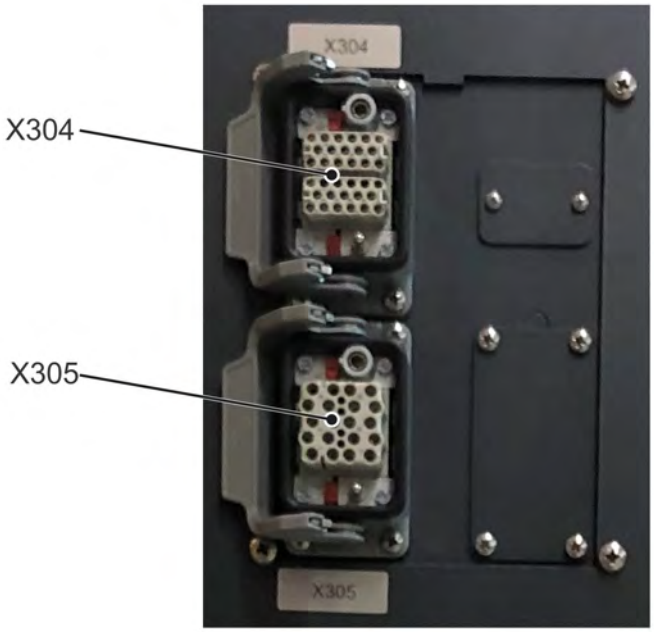


Figure 2-8 Additional Connectors

2.10.1 Injection Molding Machine Interface — X300 Connector

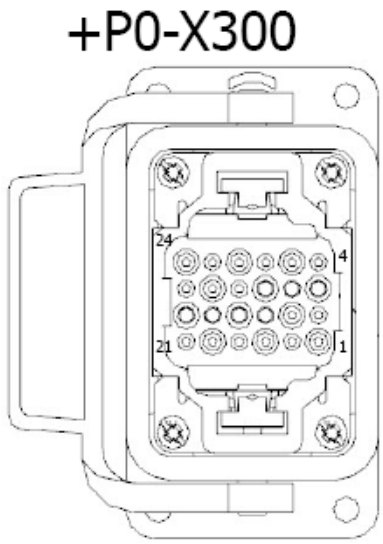


Figure 2-9 X300 Connector

The X300 is a 24-pin connector that is used for the input and output signals to interface with the IMM. The inputs are rated at 24 VDC, with pin 1 as the power source from the VGSC. The outputs are relay contacts, rated up to 2 amperes each, at up to 30 VDC. The VGSC is supplied with a mated W-X300 cable that has flying leads with numbered conductors on the field end.

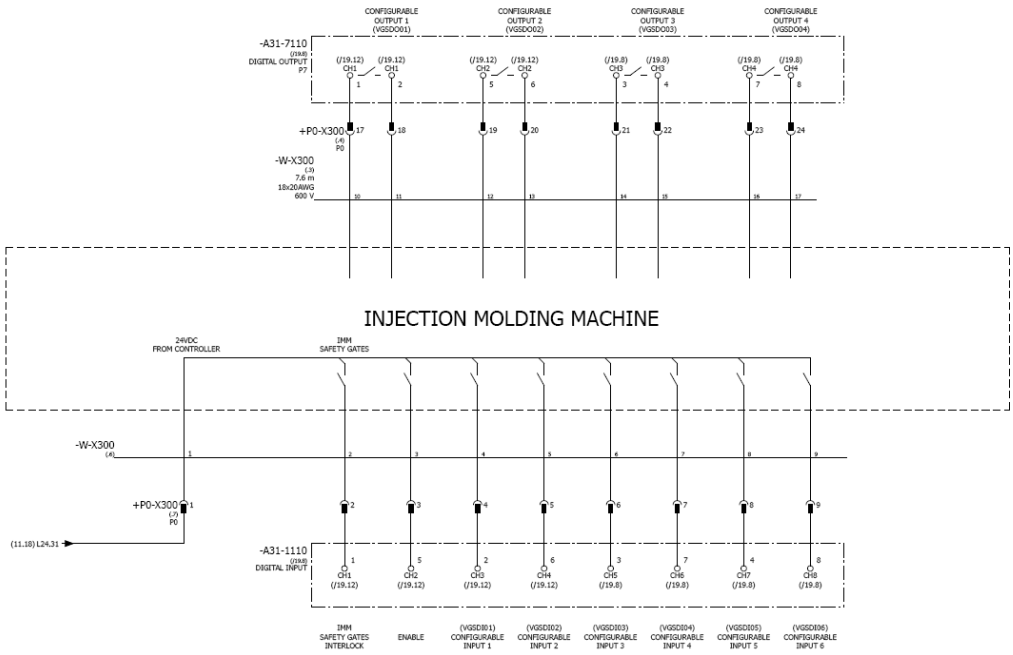


Figure 2-10 W-X300 Cable Electrical Schematic

Table 2-3 X300 Signal Definitions with Connector Pinout and Flying Lead Conductor Numbering

Signal Name	Description	+P0-X300 Pin	W-X300 Flying Lead Conductor Number
24VDC From Controller	Reference HIGH level from the controller, for relay outputs from IMM, to be used for all VGSC digital inputs.	1	1
IMM Safety Gate Status	Interlock with IMM Safety Gate Circuit. Required signal. The signal must be ON when safety devices on the IMM (example: molding area gates) allow the injection of plastic. If this signal changes to OFF, all solenoid outputs will change to the valve stem closed position. Refer to Section 2.10.1.1.	2	2
VGS Enable	If this signal changes to OFF (LOW), all solenoid outputs will change to the valve stem closed position and an alarm is generated. For VGSC operation this signal must be ON. Refer to Section 2.10.1.2.	3	3
Configurable Input 1	Software configurable input.	4	4
Configurable Input 2	Software configurable input.	5	5
Configurable Input 3	Software configurable input.	6	6
Configurable Input 4	Software configurable input.	7	7
Configurable Input 5	Software configurable input.	8	8
Configurable Input 6	Software configurable input.	9	9
Not Used	Not Used	10-16	-
Configurable Output 1	Software configurable relay output.	17, 18	10, 11
Configurable Output 2	Software configurable relay output.	19, 20	12, 13
Configurable Output 3	Software configurable relay output.	21, 22	14, 15
Configurable Output 4	Software configurable relay output.	23, 24	16, 17
Ground	Ground	Ground	GREEN/ YELLOW

2.10.1.1 IMM Safety Gates Status - Pin 2

Pin 2 is a fixed special-function input that is used to interlock the VGSC with the IMM safety gates. It must be wired to the IMM safety gate circuit, so that the signal goes LOW when a safety gate in the IMM molding area is opened.

When the signal is HIGH:

- The safety gates on the IMM are closed.
- The system is considered safe, and the solenoid outputs can change states.

When the signal is LOW:

- One or more safety gates are open.
- All stems 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.
- The system disables all movement command requests (internal/external inputs and buttons that control Open/Close movements).
- The system stops the VGSC cycle that is in operation.
  - This triggers the Valve Stems Open Outside of Cycle Warning if one or more stems have an OPEN signal state.

2.10.1.2 Enable Input — Pin 3

Pin 3 is a fixed special-function input that is used to enable the operation of the VGSC. If this signal is off (LOW), the valve gate sequence ends, an alarm occurs, and no changes to the solenoid outputs are permitted.

- All stems 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.
- The system disables all movement command requests (internal/external inputs and buttons that control Open/Close movements).
- The system stops the VGSC cycle that is in operation.
  - This triggers the Valve Stems Open Outside of Cycle Warning if one or more stems have an OPEN signal state.

For normal operation this signal must be on (HIGH).

2.10.1.3 Software Configurable Inputs — Pins 4-9

Pins 4 through 9 are software, user-configurable inputs 1 through 6. They are used, as necessary, by the application for sequence triggering, interlocking, and more.

2.10.1.4 Software Configurable Relay Outputs — Pins 17-24

Pins 17 through 24 are software, user-configurable relay outputs 1 through 4.

2.10.2 Solenoid Outputs — X301 Connector

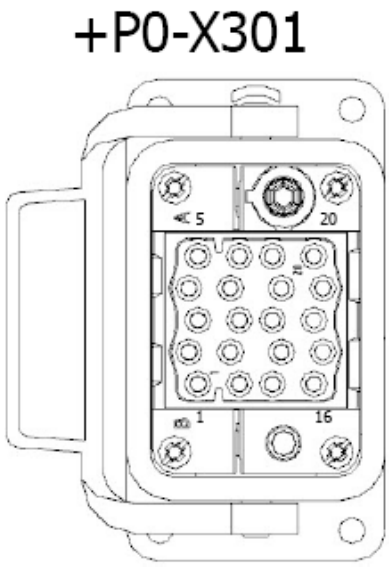


Figure 2-11 X-301 Connector on Back of Controller

The X301 is a 20-pin connector that has all of the solenoid valve digital outputs used to interface with the pneumatic or hydraulic valve stack.

NOTE: Air kit packages are available through Husky for pneumatic systems. If ordered, Husky provides an Assembly and Installation Guide for Air Kit Packages document.

The outputs are rated 2 amperes maximum at 24 VDC from the controller. The common references for the 24 VDC outputs are on pins 19 and 20. These two pins are rated for up to 16 amperes each.

The controller is factory configured with a maximum of 4, 8, 12, or 16 solenoid outputs. These cannot be field upgraded for more.

The VGSC is supplied with a mated W-X301 cable that supports either up to 8 or up to 16 solenoid outputs to match the controller configuration. The cable can be supplied with one of the field ends that follow:

- Flying leads with numbered conductors
- A mated connector to interface with the valve stack of a Husky supplied pneumatic valve air kit.

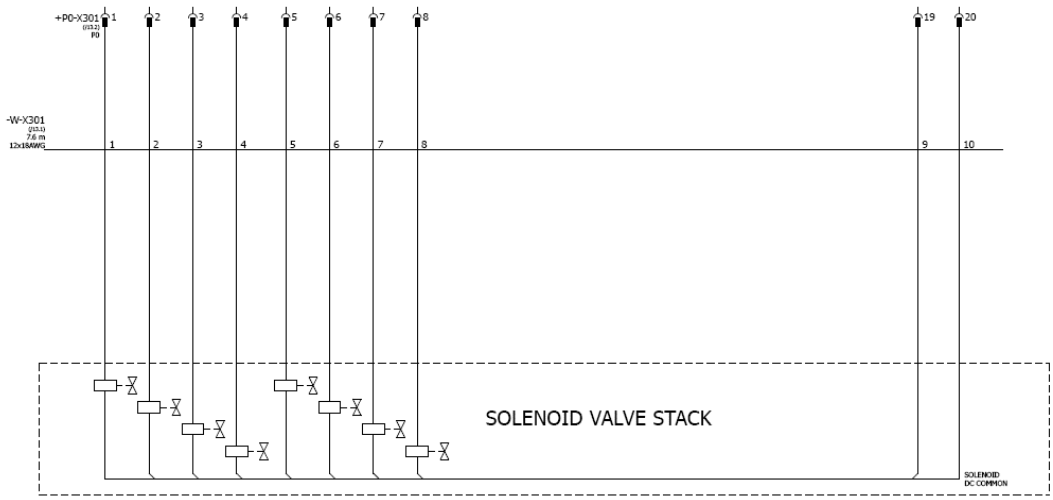


Figure 2-12 X301 Flying Lead Electrical Schematic, 8 Solenoid Outputs

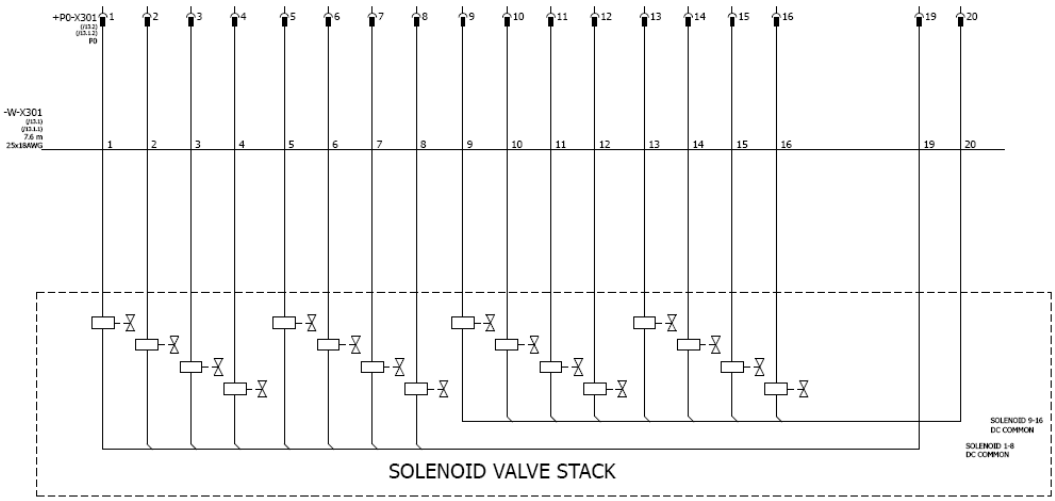


Figure 2-13 X301 Flying Lead Electrical Schematic, 16 Solenoid Outputs

Table 2-4 X301 Signal Definitions with Connector Pinout and Flying Lead Conductor Numbering

Signal Name	Description	+P0-X301 Pin	8 Circuit W-X301 Flying Lead Conductor Number	16 Circuit W-X301 Flying Lead Conductor Number
Solenoid Output 1	24 VDC power to solenoid valve 1.	1	1	1
Solenoid Output 2	24 VDC power to solenoid valve 2.	2	2	2
Solenoid Output 3	24 VDC power to solenoid valve 3.	3	3	3
Solenoid Output 4	24 VDC power to solenoid valve 4.	4	4	4
Solenoid Output 5	24 VDC power to solenoid valve 5.	5	5	5
Solenoid Output 6	24 VDC power to solenoid valve 6.	6	6	6
Solenoid Output 7	24 VDC power to solenoid valve 7.	7	7	7
Solenoid Output 8	24 VDC power to solenoid valve 8.	8	8	8
Solenoid Output 9	24 VDC power to solenoid valve 9.	9	-	9
Solenoid Output 10	24 VDC power to solenoid valve 10.	10	-	10
Solenoid Output 11	24 VDC power to solenoid valve 11.	11	-	11
Solenoid Output 12	24 VDC power to solenoid valve 12.	12	-	12
Solenoid Output 13	24 VDC power to solenoid valve 13.	13	-	13
Solenoid Output 14	24 VDC power to solenoid valve 14.	14	-	14
Solenoid Output 15	24 VDC power to solenoid valve 15.	15	-	15
Solenoid Output 16	24 VDC power to solenoid valve 16.	16	-	16
Valve DC Common 1-8	DC common to solenoid valves 1-8.	19	9	19

Table 2-4 X301 Signal Definitions with Connector Pinout and Flying Lead Conductor Numbering (Continued)

Signal Name	Description	+P0-X301 Pin	8 Circuit W-X301 Flying Lead Conductor Number	16 Circuit W-X301 Flying Lead Conductor Number
Valve DC Common 9-16	DC common to solenoid valves 9-16.	20	10	20
Not Used	Not Used	17-18	11	17-18, 21-24
Ground	Ground	Ground	GREEN/ YELLOW	GREEN/ YELLOW

2.10.3 Screw Position Cable Potentiometer Analog Input — X302 Connector (Optional)

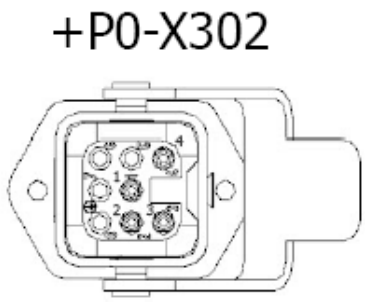


Figure 2-14 Screw Position Cable Potentiometer Analog Input - X302 Connector

The X302 is an optional 8-pin analog input connector used to connect the screw position cable potentiometer (or Linear Position Transducer). 24 VDC power is available from pin 1 to supply power to the sensor. The signal input is 0-10 VDC only.

A mated W-X302 cable is supplied and can be ordered with one of the field ends that follow:

- Flying leads with identified conductors
- A mated connector for the Husky supplied cable potentiometer (if ordered).

Figure 2-15 Screw Position Cable Potentiometer

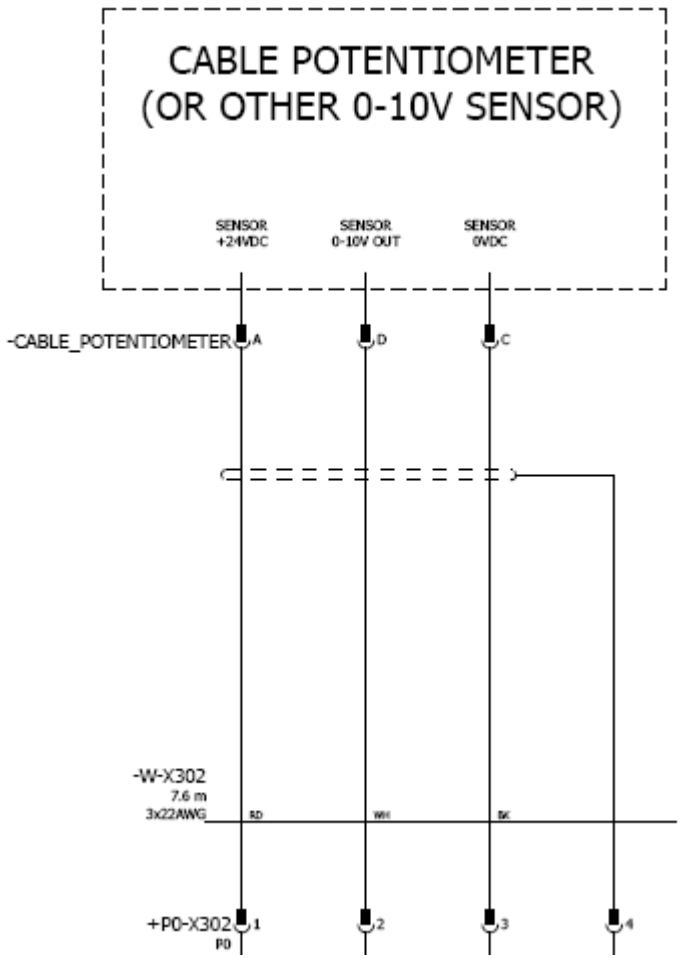


Figure 2-16 W-X302 Cable Potentiometer Cable Electrical Schematic

Table 2-5 X302 Signal Definitions with Connector Pinout and Cable Conductor Color Code

Signal Name	Description	+P0-X302 Pin	W-X302 Flying Lead Conductor Color
Sensor +24 VDC	24 VDC supply power for sensor.	1	RED
Analog Input 1 (Sensor Output)	Analog Input 1, 0-10 VDC, for the screw position cable potentiometer.	2	WHITE
Sensor DC Common	0 VDC common of sensor.	3	BLACK
Cable Shield	Cable shield.	4	DRAIN WIRE
Not Used	Not Used	5-8	-

2.10.4 Additional Analog Inputs — X303 Connector

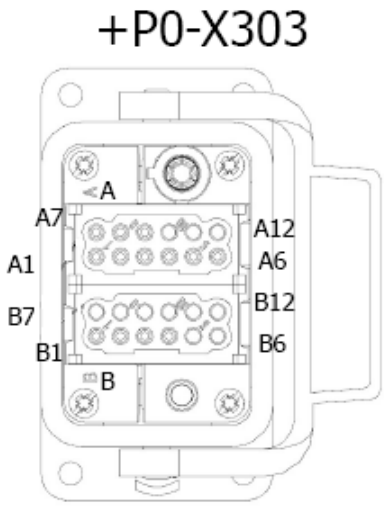


Figure 2-17 Additional Analog Inputs - X303 Connector

The X303 is a 24-pin analog input connector used for other sensors that may be attached to the VGSC. It supports up to an additional three 0-10 VDC three-wire signals, and two 4-20 mA two-wire signals.

The mated W-X303 cable (ordered separately) has flying leads on the field end.

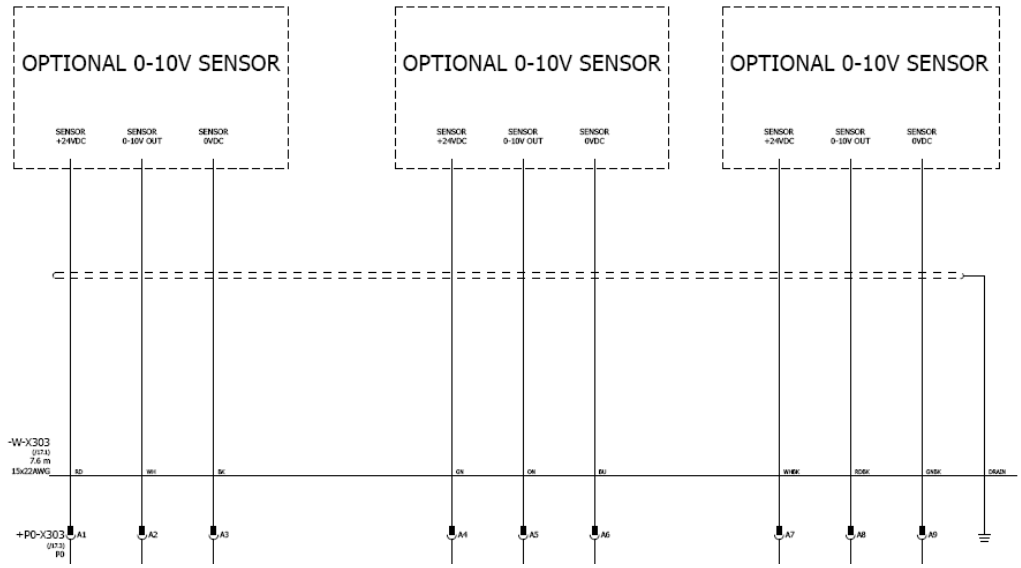


Figure 2-18 W-X303 Cable Electrical Schematic, 0-10 V Signals

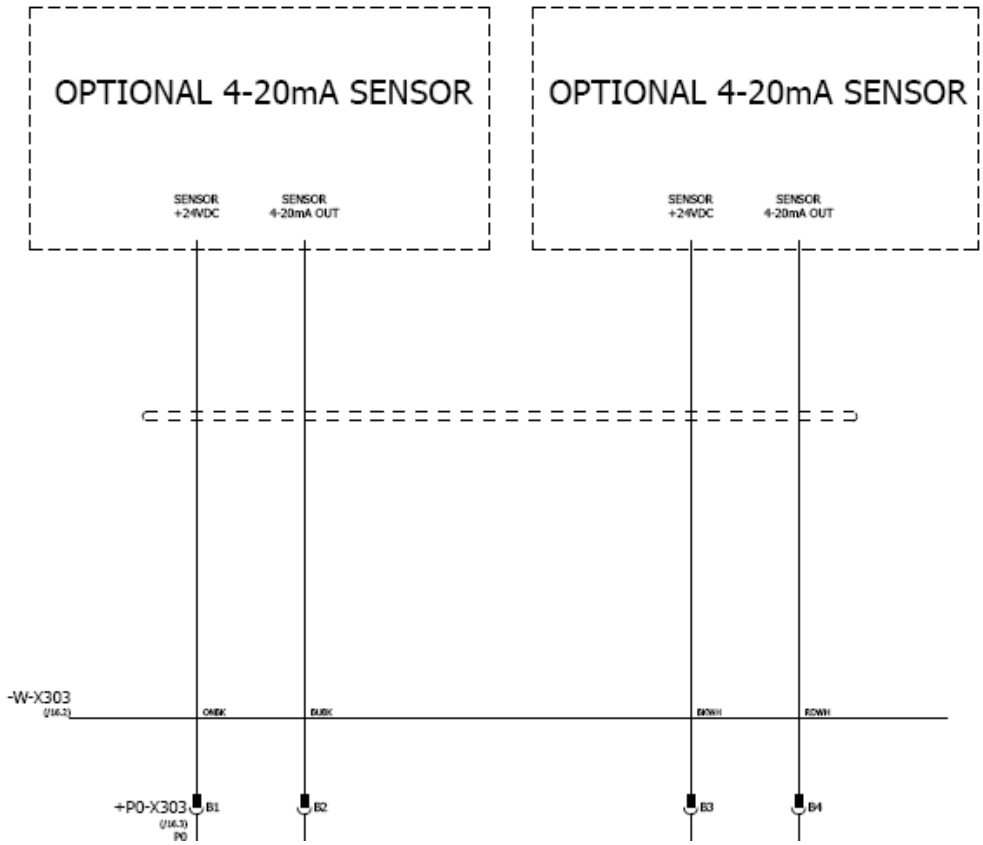


Figure 2-19 W-X303 Cable Electrical Schematic, 4-20 mA Signals

Table 2-6 X303 Signal Definitions with Connector Pinout and Cable Conductor Color Code

Signal Name	Description	+P0-X303 Pin	W-X303 Flying Lead Conductor Color
Analog Input 2 Sensor +24 VDC	Analog Input 2, 24 VDC supply power for sensor.	A1	RED
Analog Input 2 Sensor Output	Analog Input 2, 0-10 VDC signal.	A2	WHITE
Analog Input 2 Sensor DC Common	Analog Input 2, 0 VDC common of sensor.	A3	BLACK
Analog Input 3 Sensor +24 VDC	Analog Input 3, 24 VDC supply power for sensor.	A4	GREEN
Analog Input 3 Sensor Output	Analog Input 3, 0-10 VDC signal.	A5	ORANGE
Analog Input 3 Sensor DC	CommonAnalog Input 3, 0 VDC common of sensor.	A6	BLUE
Analog Input 4 Sensor +24 VDC	Analog Input 4, 24 VDC supply power for sensor.	A7	WHITE/BLACK
Analog Input 4 Sensor Output	Analog Input 4, 0-10 VDC signal.	A8	RED/BLACK
Analog Input 4 Sensor DC Common	Analog Input 4, 0 VDC common of sensor.	A9	GREEN/BLACK
Analog Input 5 Sensor +24 VDC	Analog Input 5, 24 VDC supply power for sensor.	B1	ORANGE/BLACK
Analog Input 5 Sensor Output	Analog Input 5, 4-20 mA signal.	B2	BLUE/BLACK
Analog Input 6 Sensor +24 VDC	Analog Input 6, 24 VDC supply power for sensor.	B3	BLACK/WHITE
Analog Input 6 Sensor Output	Analog Input 6, 4-20 mA signal.	B4	RED/WHITE
Not Used	Not Used	A10-A12, B5-B12	GREEN/WHITE, BLUE/WHITE

2.10.5 Injection Molding Machine Interface — X304 Connector

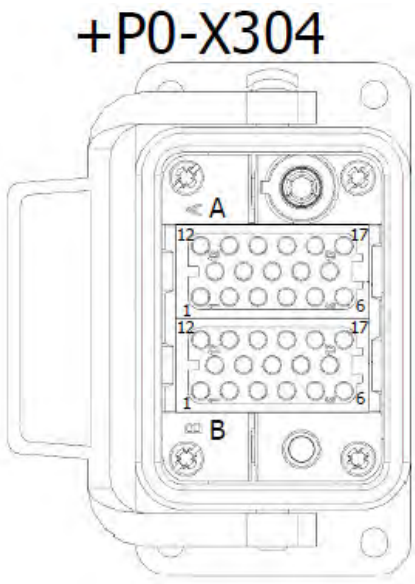


Figure 2-20 Injection Molding Machine Interface - X304 Connector

The X304 has two 17-pin modular connectors for the input signals to interface with the Injection Molding Machine. The inputs are rated at 24 VDC, sourced from the controller by pin A1. The controller is supplied with the mating W-X304 cable with numbered flying lead conductors on the field end.

Pins A2-A17 are software user configurable inputs 7-22 that can be used as necessary by the application for sequence triggering and/or interlocking. Pins B1-B12 are software user configurable inputs 23-34 that can be used as necessary by the application for sequence triggering and/or interlocking.

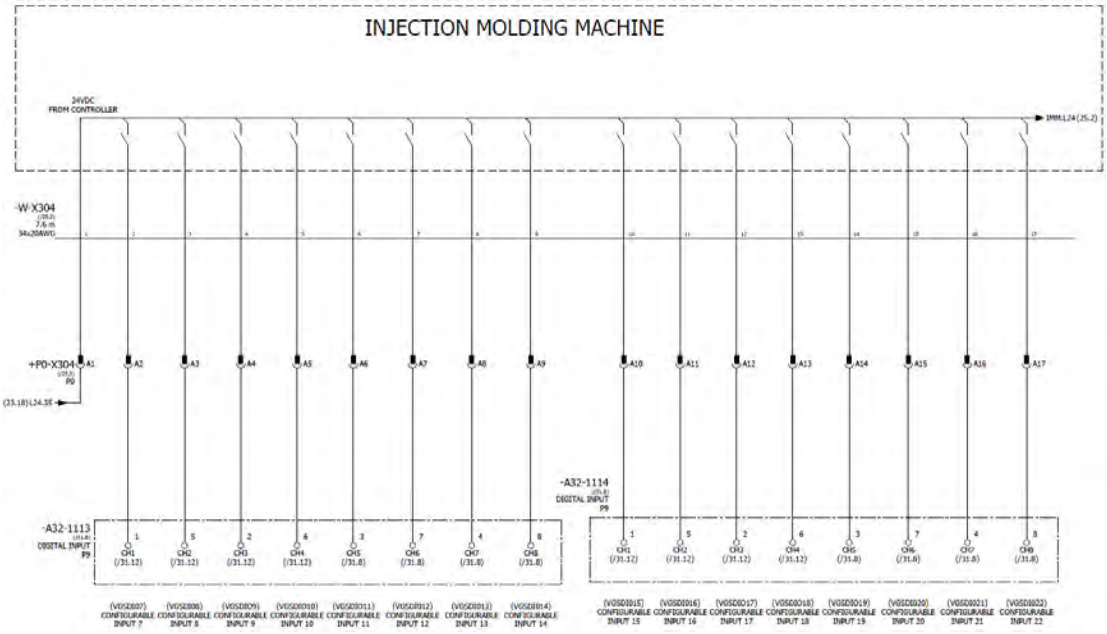


Figure 2-21 W-X304 Cable Electrical Schematic (1)

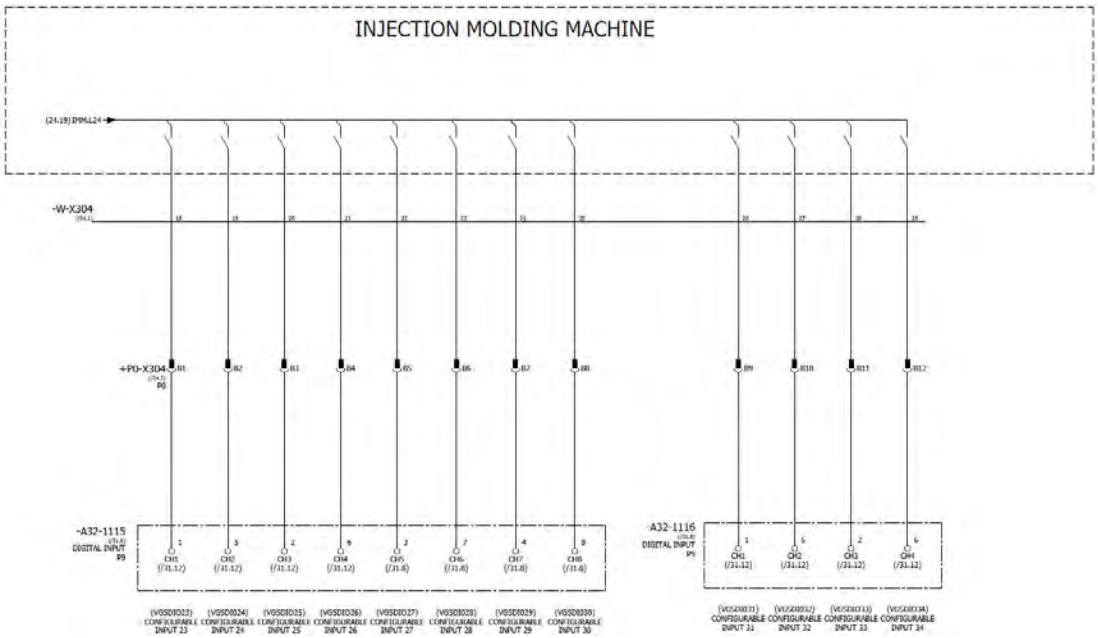


Figure 2-22 W-X304 Cable Electrical Schematic (2)

Table 2-7 X304 Signal Definitions with Connector Pinout and Cable Conductor Numbering

Signal Name	Description	+P0-X304 Pin	W-X304 Flying Lead Conductor Number
24 VDC From Controller	Reference HIGH level from the controller, for relay outputs from IMM, to be used for all VGS digital inputs.	A1	1
Configurable Input 7	Software configurable input.	A2	2
Configurable Input 8	Software configurable input.	A3	3
Configurable Input 9	Software configurable input.	A4	4
Configurable Input 10	Software configurable input.	A5	5
Configurable Input 11	Software configurable input.	A6	6
Configurable Input 12	Software configurable input.	A7	7
Configurable Input 13	Software configurable input.	A8	8
Configurable Input 14	Software configurable input.	A9	9
Configurable Input 15	Software configurable input.	A10	10
Configurable Input 16	Software configurable input.	A11	11
Configurable Input 17	Software configurable input.	A12	12
Configurable Input 18	Software configurable input.	A13	13
Configurable Input 19	Software configurable input.	A14	14
Configurable Input 20	Software configurable input.	A14	15
Configurable Input 21	Software configurable input.	A14	16
Configurable Input 22	Software configurable input.	A14	17
Configurable Input 23	Software configurable input.	B1	18
Configurable Input 24	Software configurable input.	B2	19
Configurable Input 25	Software configurable input.	B3	20
Configurable Input 26	Software configurable input.	B4	21
Configurable Input 27	Software configurable input.	B5	22
Configurable Input 28	Software configurable input.	B6	23
Configurable Input 29	Software configurable input.	B7	24
Configurable Input 30	Software configurable input.	B8	25
Configurable Input 31	Software configurable input.	B9	26
Configurable Input 32	Software configurable input.	B10	27

Table 2-7 X304 Signal Definitions with Connector Pinout and Cable Conductor Numbering (Continued)

Signal Name	Description	+P0-X304 Pin	W-X304 Flying Lead Conductor Number
Configurable Input 33	Software configurable input.	B11	28
Configurable Input 34	Software configurable input.	B12	29

2.10.6 Solenoid Outputs— X305 Connector

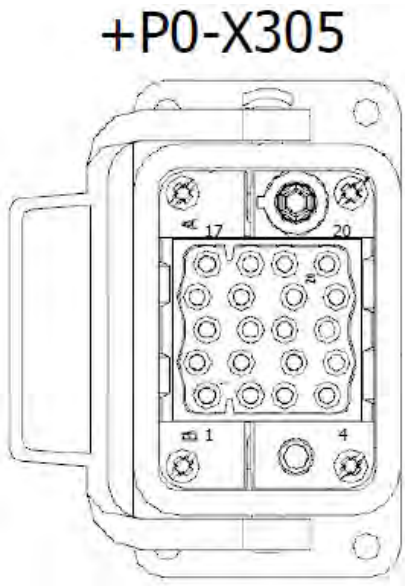


Figure 2-23 Solenoid Outputs - X305 Connector

The X305 is a 20-pin connector that contains the solenoid valve digital outputs (number 17-32) used to interface with the pneumatic or hydraulic valve stack. The outputs are rated 2 A maximum each at 24 VDC sourced from the controller. The common reference for the 24 VDC outputs are located on pins 19 and 20 and are rated for up to 16 A each.

The controller is factory configured with a maximum of either 20, 24, 28, or 32 solenoid outputs and cannot be field upgraded for more.

The mating W-X305 cable supplied supports up to 8 or up to 16 solenoid outputs to match the controller configuration. The cable can be supplied as flying lead on the field end with numbered conductors, or be supplied with the mating connector to interface with the valve stack of a Husky supplied pneumatic valve air kit.

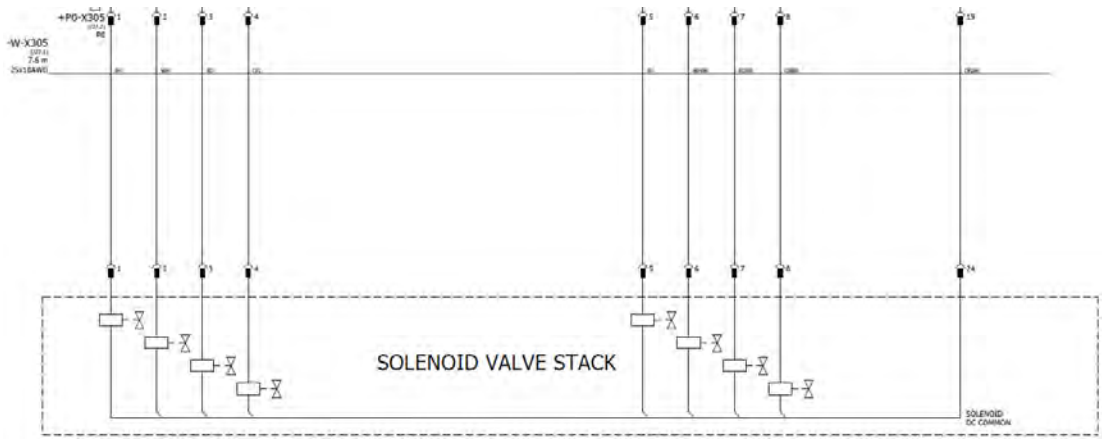


Figure 2-24 X305 Flying Lead Electrical Schematic, Solenoid Outputs 17-24

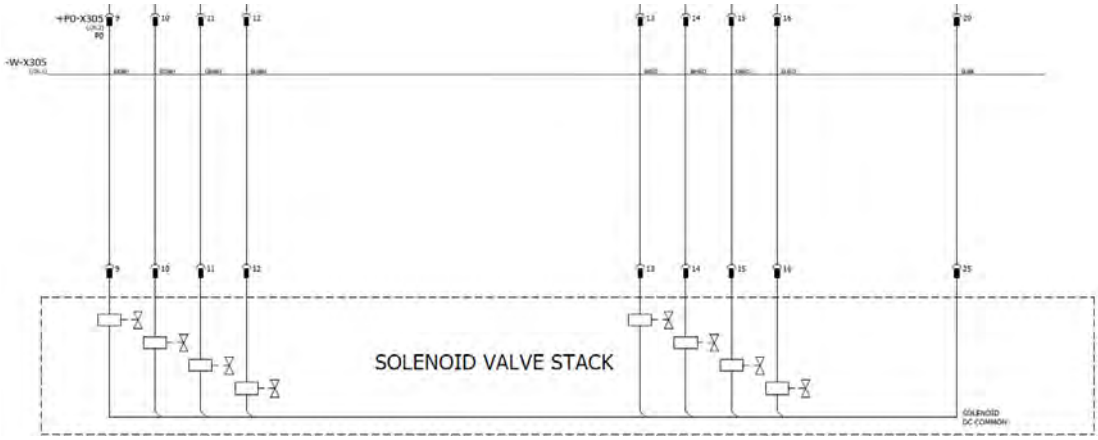


Figure 2-25 X305 Flying Lead Electrical Schematic, Solenoid Outputs 25-32

Table 2-8 X305 Signal Definitions with Connector Pinout and Cable Conductor Numbering

Signal Name	Description	+P0-X305 Pin	8 Circuit W-X305 Flying Lead Conductor Number	16 Circuit W-X305 Flying Lead Conductor Number
Solenoid Output 17	24 VDC power to solenoid valve 17.	1	1	1
Solenoid Output 18	24 VDC power to solenoid valve 18.	2	2	2
Solenoid Output 19	24 VDC power to solenoid valve 19.	3	3	3
Solenoid Output 20	24 VDC power to solenoid valve 20.	4	4	4
Solenoid Output 21	24 VDC power to solenoid valve 21.	5	5	5
Solenoid Output 22	24 VDC power to solenoid valve 22.	6	6	6

Table 2-8 X305 Signal Definitions with Connector Pinout and Cable Conductor Numbering (Continued)

Signal Name	Description	+P0-X305 Pin	8 Circuit W-X305 Flying Lead Conductor Number	16 Circuit W-X305 Flying Lead Conductor Number
Solenoid Output 23	24 VDC power to solenoid valve 23.	7	7	7
Solenoid Output 24	24 VDC power to solenoid valve 24.	8	8	8
Solenoid Output 25	24 VDC power to solenoid valve 25.	9	-	9
Solenoid Output 26	24 VDC power to solenoid valve 26.	10	-	10
Solenoid Output 27	24 VDC power to solenoid valve 27.	11	-	11
Solenoid Output 28	24 VDC power to solenoid valve 28.	12	-	12
Solenoid Output 29	24 VDC power to solenoid valve 29.	13	-	13
Solenoid Output 30	24 VDC power to solenoid valve 30.	14	-	14
Solenoid Output 31	24 VDC power to solenoid valve 31.	15	-	15
Solenoid Output 32	24 VDC power to solenoid valve 32.	16	-	16
Valve DC Common 17-24	DC common to solenoid valves 17-24.	19	9	19
Valve DC Common 25-32	DC common to solenoid valves 25-32.	20	10	20
Not Used	Not Used	17-18	11	17-18, 21-24
Ground	Ground.	Ground	Green/ Yellow	Green/ Yellow

2.10.7 EtherCAT Connection

The EtherCAT In connector locations are on the back of the controller (Figure 2-7). The operator interface display module connects to the EtherCAT In connector. An optional EtherCAT Out is used to connect other Altanium devices.

2.10.8 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 2-26). 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.

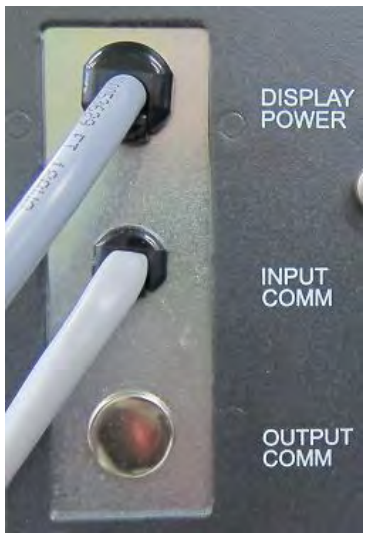


Figure 2-26 Display Power and Temperature Control Connections

2.11 Start the VGS Controller

2.11.1 Before You Apply Power

1. Make sure the wheels of the VGSC are locked, so that the VGSC cannot move.
2. 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.
3. For cable routing that has no movement, make sure that the bend radius of the cable is not less than four times the diameter of the cable.
4. 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.
5. Make sure all cables are connected correctly and are not loose.
6. Make sure that the ground wire is connected correctly between the VGSC and the electrical power source.

7. With the VGSC main power switch in the OFF position, make sure the power to the VGSC is in the specified power limits. The power is measured between the main power switch and the power source.
8. Complete all pneumatic/hydraulic connections between the solenoid valve stack and valve gate cylinders in the hot runner.
9. Make sure that personnel are not doing maintenance on the VGSC and IMM.
10. Make sure that all tools are removed from the area.
11. Make sure that the floors are clean.

2.11.2 Apply Power to the VGSC

1. Set the main power switch (refer to Figure 2-1) to the ON position.
2. Set up the VGSC.
   - Load the applicable mold setup file, or
   - Configure the solenoid outputs, as necessary, for your injection operation.
3. Do a test of each solenoid output and make sure that only the correct cylinder actuates and in the correct open/close direction.
4. Make sure that all valve gate cylinders move to their closed position when the guard or protective gate is opened on the injection molding machine.

For troubleshooting problems and errors, refer to Appendix B.

Chapter 3 Altanium VGSC Operator Interface

This chapter contains the necessary information to operate the Altanium Valve Gate Sequencer Controller (VGSC) interface.

3.1 Operator Interface

The VGSC 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 15.6-inch (Delta5) or 21.5-inch (Matrix5) display is clearly seen, even in less than satisfactory light conditions.

NOTE: The screens shown in this manual are of a Valve Gate Sequencer (VGS) installed on an Altanium Matrix5 platform. If your VGS is on a Delta5 platform, your screens may be different. Icons/buttons could be in different positions and screen areas are sized differently, but settings and operations are the same.

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 fingertip.

CAUTION!

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

3.2 Home Screen

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

The Home screen has three sections: header, footer, and the system screens selection area. 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 VGSC devices.

Figure 3-1 shows the Altanium controller Home screen for the VGSC system with integrated heats (temperature control). A VGSC 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.

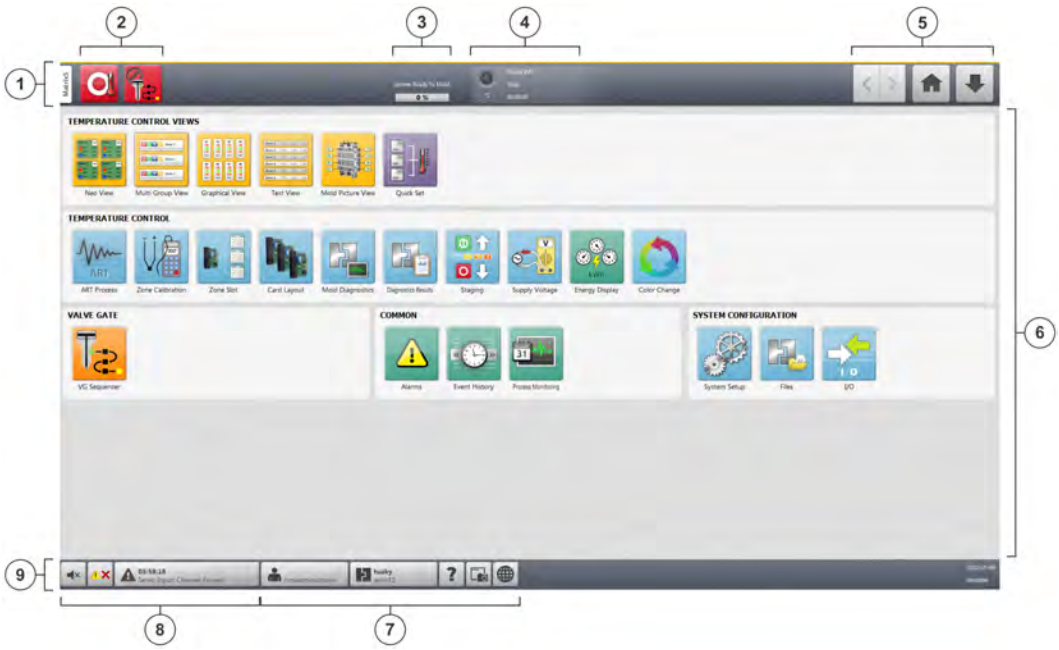


Figure 3-1 Altanium Controller Home Screen with Valve Gate Sequencer - Integrated Temperature System

1. Header **2.** Control Mode Buttons **3.** System Ready To Mold Progress Bar **4.** System Status Field **5.** Navigation Buttons **6.** System Screen Selections **7.** System and User Management Buttons **8.** Alarm Buttons **9.** Footer

3.2.1 Header/Footer Buttons and Indicators

The VGSC 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 VGSC Modes Buttons

Button	Description
	**Auto** In Auto mode: • Sequencing is enabled with triggers and delays when the Soak Time is complete. • Manual triggering is disabled. • Most settings/configurations cannot be changed. Start delay and analog comparison values can be changed during Auto mode. • Valve gates wait for the next signal to move.

Table 3-1 VGSC Modes Buttons (Continued)

Button	Description
	**Manual** In Manual mode: • Sequencing is disabled with triggers and delays. • Manual triggering is enabled to open or close valve gates when the Soak Time is complete. - Valve gates are triggered individually. • Settings/configurations cannot be changed. • Valve stems wait for the next signal to move.
	**Disabled** In Disabled mode: • Sequencing is disabled with triggers and delays. • Manual triggering is disabled. • All sequence settings/configurations are changeable (does not include manual triggers). • 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). • On Start-Up, all outputs default to LOW for safety. • All VGSC 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	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

Table 3-2 Control Mode Change Permissions (Continued)

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

3.2.1.2 Temperature Control Modes

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

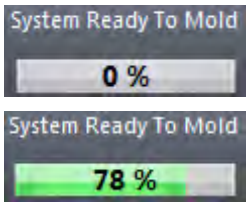
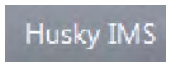
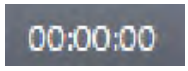
Button	Description
	**Stop** Touch the Stop button to de-energize all zones. This can be done during all system conditions.
	**Start** Touch the Start button to energize the zones that have a setpoint displayed.
	**Standby** Touch the Standby button to place the system in standby mode. If a timer is 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 Delta5 or 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
	**System Ready To Mold** When the system starts, this status bar shows the progress as the mold zones heat to the At Temperature setpoint. The status bar and label do not show after the zones get to the At Temperature setpoint.
	**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.

Table 3-5 System Modes (Continued)

Mode	Description
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.
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 Delta5 or Matrix5 User Guide.

3.2.1.4 Navigation Buttons

The Navigation 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.

These buttons take you directly to the screen or sub-tab described in 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). These buttons are used the most and the drop-down list gives you access from all screens.  VG Sequencer  I/O  Process Monitoring  Neo2 View (Integrated Systems)

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.

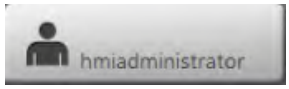
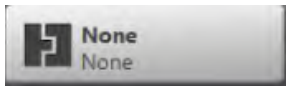
Table 3-7 Alarm Buttons

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 Buttons

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 a VGSC standalone system, the system screen selection buttons are put into three groups:

- Valve Gate
- Common
- System Configuration

For a VGSC 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 Delta5 or Matrix5 User Guide.

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

3.2.2.1 Valve Gate Button

The Valve Gate area contains the VG Sequencer button.

Touch the **VG Sequencer** button to see the VG Sequencer screens. For more information, refer to Chapter 6.

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 Appendix B Section B.3. and the Altanium Delta5 or 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 8.
	**Process Monitoring** The process monitoring screens let you see trend and history plots. You can also set limits and process monitoring configurations. For more information, refer to Chapter 8.

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 VGSC 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 Altanium Delta5 or 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 VGSC and the IMM. For information about the I/O screen, refer to Chapter 7.

3.2.2.4 Temperature Control Views (Integrated Systems)

The Temperature Control Views area of the screen lets you select 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 Delta5 or Matrix5 User Guide.

Table 3-11 Temperature Control Views

Button	Description
	**Neo2 View** Touch the Neo2 View button to see the Neo2 View screen, which 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** Touch the Multi Group View button to see the Multi Group View screen, which contains zones organized into groups and allows individual control of each group.
	**Graphical View** Touch the Graphical View button to see the Graphical View screen, which contains a graphical representation of zone data.
	**Text View** Touch the Text View button to see the Text View screen, which contains a textual representation of zone data.
	**Mold Picture View** Touch the Mold Picture View button to see the Mold Picture View screen, which provides a picture/graphic of the mold or hot runner system layout. The image file is imported by the user.
	**Quick Set** Touch the Quick Set button to see the Quick Set screen, which lets you 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 Delta5 or Matrix5 User Guide.

3.2.2.5 Temperature Control Screens (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 Delta5 or 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 zone thermocouples. .
	**Zone Slot** Use this screen to identify the controller cards that operate the zones. 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 for troubleshooting 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.

Table 3-12 Temperature Control (Continued)

Button	Description
	**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 amperes.
	**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.
	**Color Change** The Color Change screen is an optional feature for the Altanium VGS controller. This feature offers a more integrated approach to resin color changes and mold cleaning. Use this screen to inject Chem-Trend's Ultra Purge purging compounds that are designed specifically to reduce color-change time and carbon formation in hot runners. For more information about the Color Change feature, refer to the Color Change chapter in the Altanium Matrix5 User Guide or Altanium Delta5 User Guide.

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.

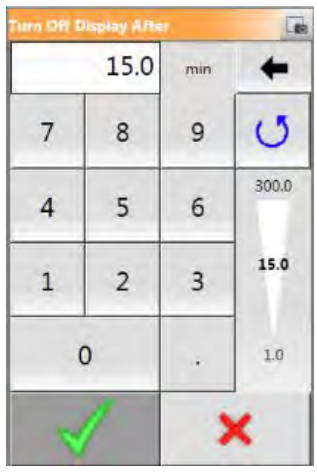


Figure 3-2 Number Pad Example

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 screen, touch the **Print** button in the footer of the screen.

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

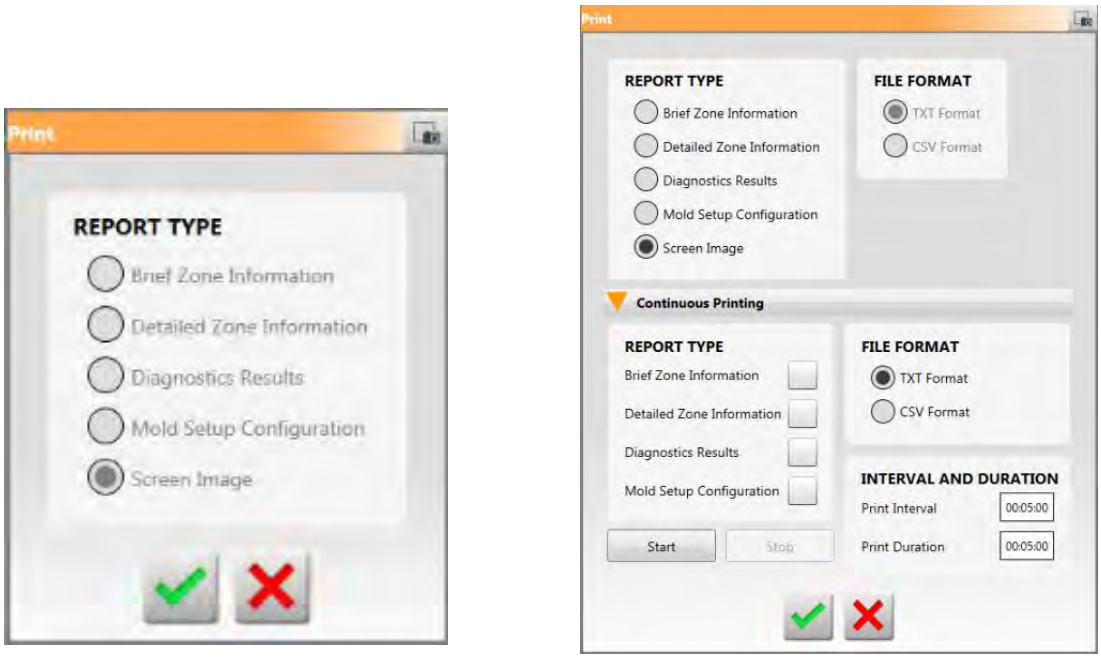


Figure 3-3 Print Screens for Standalone (Left) and Integrated (Right) Systems

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 Delta5 or Matrix5 User Guide for more information.

3.6 Help

The controller Help is a PDF file of the Altanium Valve Gate Sequencer Controller User Guide.

To use the Help, do the steps that follow:

1. Touch the **Help** button in the footer of the screen.

The user guide PDF file opens.

2. 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 Valve Gate Sequencer Controller (VGSC) (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 VGSC 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.

On a VGSC standalone system, two tabs show at the bottom of the Security screen (MAIN 1 and MAIN 2).

1. Touch the **Main 1** tab to see the related security selections. Refer to Section 4.1.1 for descriptions of the operations.
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.

On a VGSC integrated system (with heats), there are two heats tabs (Heats Page 1 and Heats Page 2).

1. Touch the **Heats Page 1** tab to see the related security selections. Refer to Section 4.1.2 for descriptions of the operations.
2. Select a user level (Administrator, Supervisor, or Operator) for each of the operations on the screen.
3. Touch the **Heats Page 2** tab and continue to make the user level selections.

4.1.1 Main Security Operations

Figure 4-1 shows all of the security selections on one Main 1 tab for a VGSC integrated system.

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

Set the user level to who can do the operations shown in Table 4-2. These operations are the same in the VGSC 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.

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

Item	Description
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	
Date and Time	Select the user role that can set the date and time.
Troubleshooting Data	
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. Stop is always available. This setting also grants permission to operate the UltraSync-E control mode buttons. For more information about buttons, refer to Chapter 3.
Clear Inactive Alarms	Select the user role that can clear audible alarms on the Alarms screen.
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

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

Item	Description
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)	Set OPC UA interface configurations.

Figure 4-1 shows all of the security selections on one Main 2 tab for a VGSC integrated system.

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

Set the user level to who can do the operations shown in Table 4-3. These operations are the same in the VGSC 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.

Table 4-3 Screen Security - Main 2 Screen (Continued)

Item	Description
Operation (VG Sequencer)	Select the user role that can operate the manual triggers.
Configuration (VG Sequencer)	Select the user role that can set the: • Start triggers on the Signals screens • Start triggers and groups on the Multi-Select screen • Fields on the VGS Options screen • Valve gate names in the VGS Status screen

4.1.2 Heats Security Operations (Integrated Systems)

On VGSC 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 Delta5 or 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.
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.
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.

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.

4.2 Manage Users

The User Management screen lets VGSC administrators create a user, change a user's password, and delete a user. Figure 4-5 shows the User Management screen for a VGSC integrated system.

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

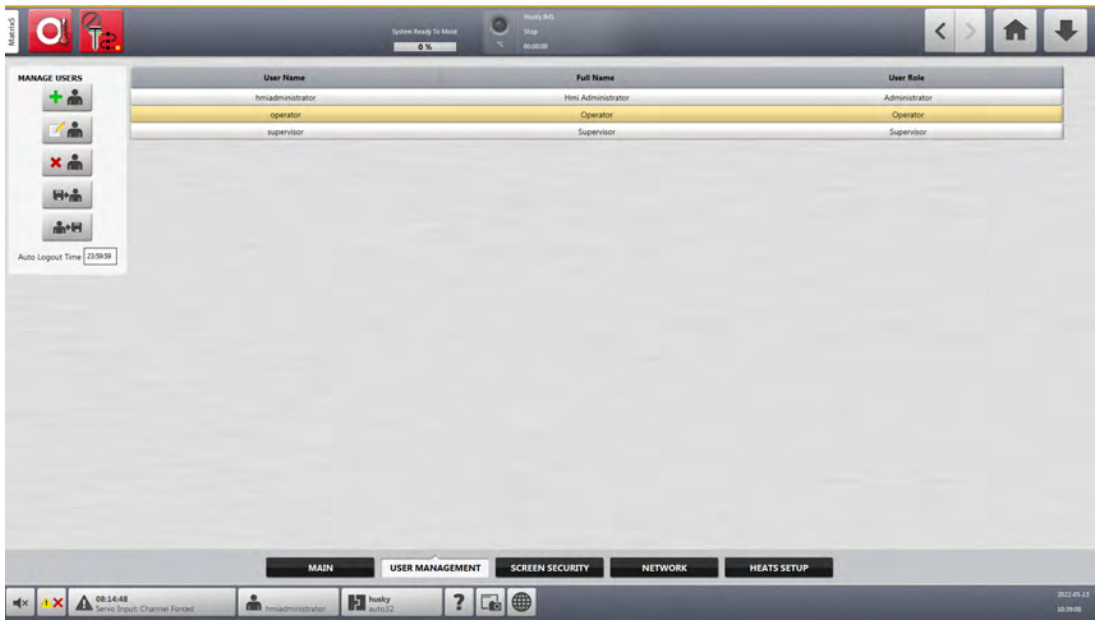
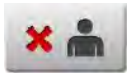


Figure 4-5 User Management Screen (Integrated System)

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 4-6.

Table 4-6 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 username, 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 VGSC. 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 VGSC 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 4-6.

Figure 4-6 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 Valve Gate Sequencer Controller (VGSC) 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 Delta5 or 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 System Setup Main Screen

The Main tab of the System Setup screens (Figure 5-1) shows the system information and lets you configure user settings, even 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 System Setup - Main 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.
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 Time Range lets you set specific start and stop times. The Eventlog Oldest Date and Log Filename fields are shown for information only.
Transfer	Touch this button to select the location where the Eventlog 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.
License Number	The license key is shown.
Update License	Used to upload new license file from Local, USB, and Network drives.
View License	Shows the license information.

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

Item	Description
Remote Load	Used to select the mold setups that can be loaded directly from the injection molding machine.
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 System Setup - Main 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 System Setup - Main screen, touch the **Units** button.

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

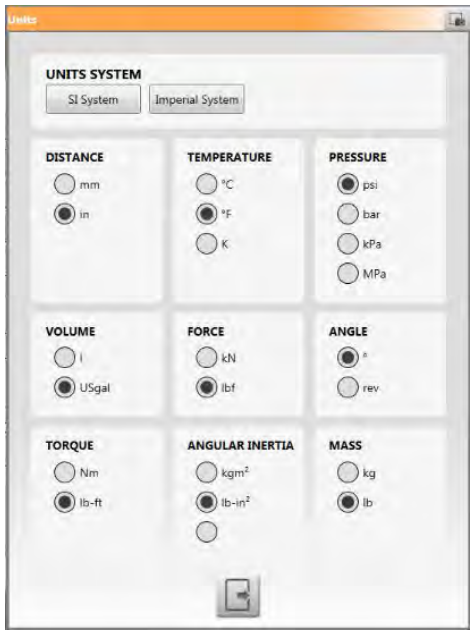


Figure 5-2 Units Dialog Window

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 Delta5 or 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.
MAC Address	The physical address assigned to 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.	

5.3 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 and standby boost
- Bake out resin protection
- Soft start
- Mold cooling enable
- Options and licensing
- SPI
- Remote load
- Part counting
- Thermocouple reading
- Auto slave
- Zone slot configuration.

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

- Alarm limits
- 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 Delta5 or Matrix5 User Guide for more information.

5.3.1 Temperature Control Configurations

Use the Heats Setup to configure all of the temperature and monitor settings for the mold. To access the Heat Setup, touch the **System Setup** button on the Home screen and then touch the **Heats Setup** tab at the bottom of the screen.

The Heats Setup is divided into four groups of related configuration settings, accessed with the tabs at the bottom of the screen:

- Control Page 1
- Control Page 2
- Control Page 3

The sections that follow describe the configuration settings found in each group.

NOTE: Refer to the Altanium Delta5 or Matrix5 User Guide for more information on temperature control configurations.

5.3.1.1 Heats Setup - Control Page 1

Figure 5-4 shows the Control Page 2 configurations and Table 5-3 gives their descriptions.

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.

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

Item	Description
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.
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.

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

Item	Description
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.
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.

5.3.1.2 Heats Setup - Control Page 2

On the Control Page 2 tab of the Heats Setup screen, configurations are set for the categories that follow:

- Part Counting
- SPI
- Thermocouples
- Auto Following
- Zone Slot Configuration

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	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.
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.

Table 5-4 Heats Setup - Control Page 2 - Temperature Control Configurations (Continued)

Item	Description
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.

5.3.1.3 Heats Setup - Control Page 3

On the Control Page 3 tab of the Heats Setup screen, configurations are set for the categories that follow:

- Heat Sequencing
- Heat Uniformity
- Tuning

The Control Page 3 tab is shown in Figure 5-6 with the configuration settings for each category. The configuration settings are described in Table 5-5.

Figure 5-6 Heats Setup - Control Page 3 Tab (Integrated System)

Table 5-5 System Setup Screen - Heats Setup - Control Page 3

Item	Description
AltaStart Enable	Used to enable AltaStart function for heat sequencing. Refer to Section 9.3. **NOTE:** At least one zone's heater type must be set to 'Tips' or the system will not allow you to enable the function.
Heat Uniformity Method	Lets you select the heat uniformity method you want to use: • UniStart - When selected, this provides the shortest start-up time while ensuring that all temperatures track to their setpoint. Refer to Section 9.4. • Soft Start - When selected, the soft start process is applied upon startup. Refer to Section 9.6. • None The default value is UniStart. Only the settings that are specific to the method selected will be enabled. For example, if UniStart is selected then all the Soft Start settings will be disabled. This setting is saved to the mold setup.
Global Ramp Limit	This setting is applied to all zones in the UniStart process. It is the rate at which temperature will increase per minute as it heats to setpoint. The valid range is 9°F to 180°F or 5°C to 100°C. The default value will be 180°F or 100°C. This setting is saved to the mold setup.
Fast Heating Enable	Used to enable the Fast Heating function (refer to Section 9.5).
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 this difference is less than this parameter value, then this parameter value is applied to the soft start process. **NOTE:** This setting is enabled only when Soft Start is selected in the Heat Uniformity Method field.
Tuning Strategy	Used to select the ART Classic or ART 2.0 tuning strategy. ART 2.0 is selected by default. Refer to Section 7.9 for information on the ART process.
Heater Classification Gap	Used to specify the gap that is used to determine where tip zones end and where manifold zones begin. The range is 1 to 9.9 dBG and the default value is 6 dBG. Refer to Section 7.9.2 for information on this setting.

5.3.2 Monitoring Configurations (Integrated System)

On an integrated system, the monitoring control configurations are on the Monitoring tab for a Matrix5 controller and divided into two tabs (Monitoring and Monitoring 2) for a Delta5 controller. Figure 5-7 show the Heats Setup - Monitoring screen on a Matrix5 controller. The configurations are the same for the Matrix5 and Delta5 controllers.

Figure 5-7 Heats Setup - Monitoring Tab (Integrated System)

Table 5-6 gives the descriptions for all of the configurations found on the Heats Setup - Monitoring screens for Matrix5 and Delta5.

NOTE: Refer to the Altanium Delta5 or Matrix5 User Guide for more information on monitoring configurations.

Table 5-6 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.

Table 5-6 Heats Setup - Monitoring Configurations (Continued)

Item	Description
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.
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.

Table 5-6 Heats Setup - Monitoring Configurations (Continued)

Item	Description
Display Failure Data	If one of the tests in Circuit Test fails, this shows the test failure data.
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 Delta5 or 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 5-6 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 Valve Gate Sequencer Screens

The Valve Gate Sequencer screens let you see graphic curves for the process operations, set start triggers for the valve gates, and configure other process options.

From the Altanium Home screen, touch the **VG Sequencer** button for access to the Valve Gate Sequencer screens.

6.1 VGS Home Screen

Touch the **VGS Home** tab to see the VGS Home screen. Refer to Figure 6-1.

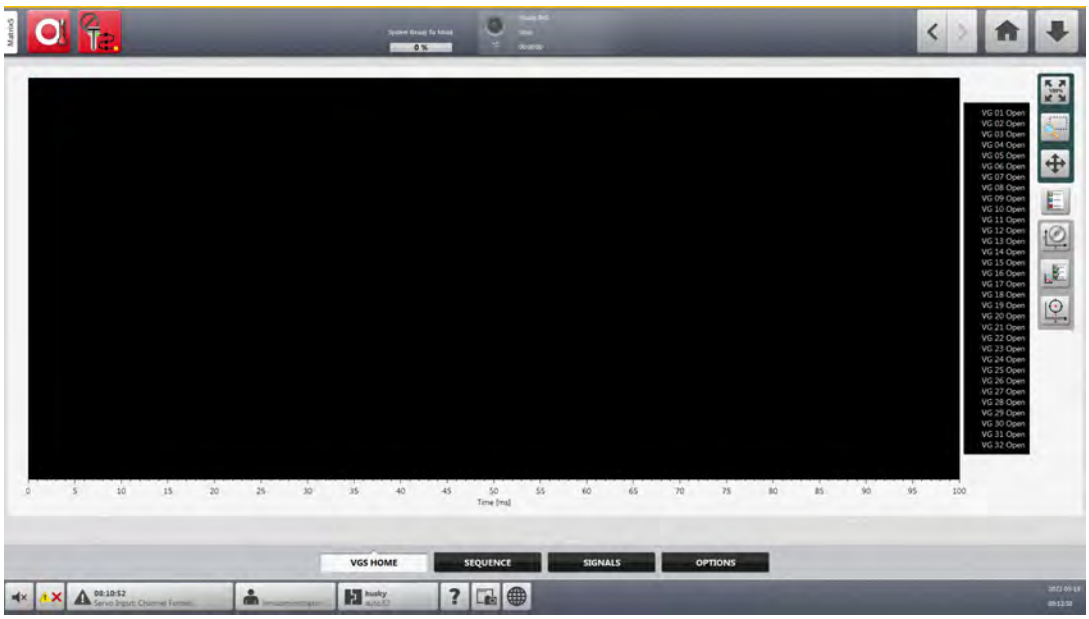


Figure 6-1 VGS Home Screen

The VGS Home screen has a graphic line chart that shows curves for the configured operations that follow:

- Valve gate sequencer Open states (1-32, as available)
- Digital input values (8 or 36 signals, as available)

- IMM screw position (Analog Input 1)
- Analog Input Values (5 signals)

Curves for the status of each valve gate (open or closed) are shown in order of sequence by how they are configured.

Each curve is color coded on the chart for identification. The data in the chart can be shown by time or screw position on the x-axis.

6.1.1 Curve Chart View and Adjustment Selections

Table 6-1 shows a list of the chart view and adjustment selections used on the VGS Home screen.

Table 6-1 Chart View and Adjustment Selections

Button	Description
	**100% view** Returns the chart view to 100%.
	**View Selection** Lets you magnify a specific area of the chart.
	**View Position** Lets you adjust the chart view when magnified.
	**Chart Curves** Identifies the curves.
	**Chart Curves Scale** Used to set the scale for the curves that follow: • Time • Valve Gate Open States • Digital Input Values • IMM Screw Position • Analog Input Values

Table 6-1 Chart View and Adjustment Selections (Continued)

Button	Description
	**Curve Selection** Lets you select the curves that are seen on the chart. Refer to Section 6.1.2.
	**Time or Position** Lets you change between Time and IMM Screw Position on the chart X axis.

6.1.2 Curve Selections

You can select what curves are shown on the line chart:

1. Touch the **Curve Selection** button.

The selection screen shows. Refer to Figure 6-2.

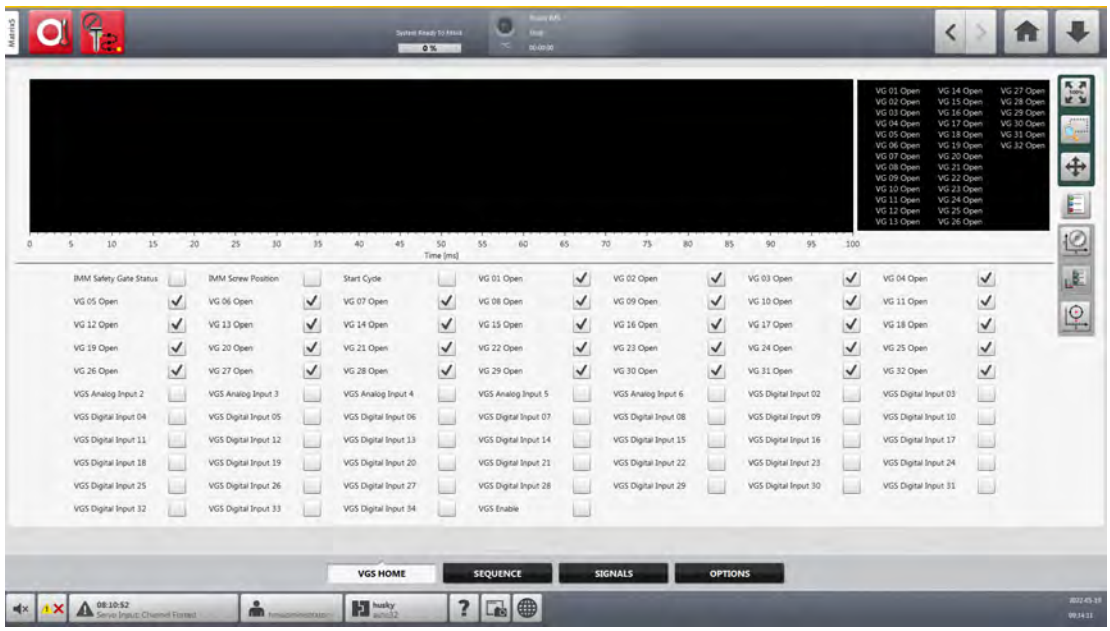


Figure 6-2 Curve Selection

2. Touch the checkbox next to each curve you want to see in the chart.

   A check mark shows in the selected checkbox.

3. Touch the Curve Selection button again to close the selection screen.

Only the curves you selected will show on the line chart.

6.2 Sequence Screen

The Sequence Screen gives an easy-to-follow graphical preview of the sequence for the valve gates before you start the IMM. The valve gates are shown by order of operation in a flow chart with open/close symbols, triggers, times, delays and more. Figure 6-3 shows a basic example of a Sequence Screen flow chart.

NOTE: The example in Figure 6-3 is not an actual sequence of an injection operation. It is only to show what a sequence could look like.

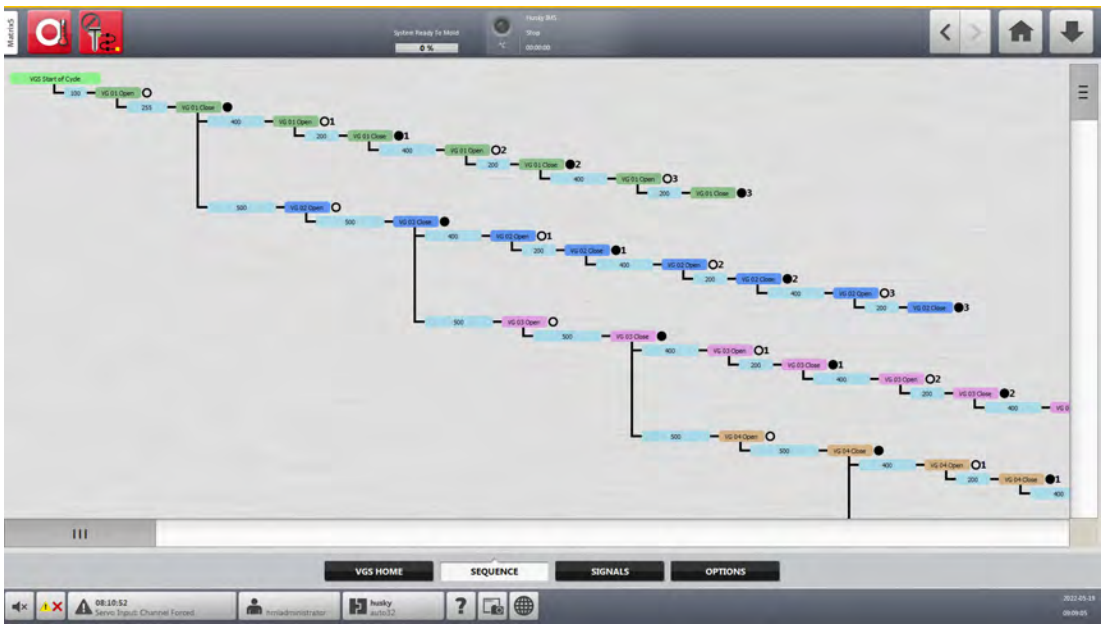


Figure 6-3 Sequence Screen Example (Integrated System)

6.2.1 Linked Data Assemblies

Because internal and external triggers can have time frames that are not easily known, the triggers cannot be accurately linked together in one flow chart. Thus, each internal and external signal (VG Open/Close states not included) will be shown on a separate chart. When triggered from VG Open/Close states, a new chart is not created. The new signal will branch from the assigned trigger's location.

The data will be shown as linked assemblies by the start triggers:

- Signal Type
- Signal

NOTE: The

Only the signal will be shown on the Sequence screen.

6.2.2 Sequence

If a valve gate is triggered by another valve gate, or a previous step of the same valve, it will be shown in a sequence. It will be shown as a row that comes from that valve gate step (Open/Close, Fill/Pack stage). Multiple valve gates triggered from the same previous valve gate step will be sorted the same as the signal group.

6.2.3 Data Sorts

The data is sorted by the signal settings in each group of signals, as follows:

Start Triggers

- Sorted by the Condition, if applicable
- Then sorted by the Value, if applicable
  - IMM Screw Position (Analog Input 1) will have a sort that descends
  - Inputs that remain (Analog Input 2-6) will have a sort that ascends (standard)
- Then sorted by the Invert, if applicable
  - Non-inverted signals are shown first
  - Inverted signals are shown last

Delay Timers

- Sorted by the Value

VGS Outputs

- Sorted by the Value
- Then sorted by the Stage
  - Fill,
  - Pack 1
  - Pack 2
  - Pack 3

6.2.4 Scale

The Value and Delay Timers will be scaled to show their duration in relation to each other as follows:

Value

- This is scaled for each group of signals independently
- IMM Screw Position (Analog Input 1) will have an inverted scale
  - The highest value will be the smallest size
  - The smallest value will be the largest size
- Inputs that remain (Analog Input 2-6) will not be scaled
  - All will have base size

Delay Timers

- This is scaled for all signals, globally
- Delay Times will have a normal scale
  - The lowest value will be the smallest size
  - The highest value will be the largest size

The Sequence screen has no manual scale settings.

6.2.5 Data Colors

The data on the Sequence screen is color coded as follows:

Start Triggers

- All settings are Green
  - Signal
  - Condition
  - Value
  - Invert

Delay Timers

- All settings are blue

VGS Outputs

- Each valve gate has its own color (the color order starts again after 16 valve gates)
  - Same for Open, Close states
  - Same for Fill, and Packing stages
- The colors make it easy to identify which signals are tied together and when the close signals occur.

6.2.6 Symbols

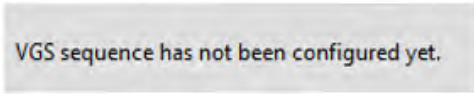
Each state and stage has a different symbol to quickly identify that one from another. Some of the symbols used are:

- Empty circle - Fill Open
- Solid black circle - Fill Close
- Empty circle with "1" - Pack 1 Open
- Solid black circle with "1" - Pack 1 Close

NOTE: For Pack 2 Open/Close and Pack 3 Open/Close, a 2 or 3 shows after their related empty and solid black circles.

6.2.7 Error Message

If there are no valve gate settings configured, there will be an error message on the Sequence screen that says a Sequence has not been configured.



Use the Signals screen, Options screen, and Packing dialog windows to configure the valve gates. As you configure the valve gate sequence, the sequence flow chart will build on the Sequence screen.

6.3 Signals Screen

The Signals screen lets you configure the triggers that open and close the valve gates. Signals and start time delays are chosen to trigger the open and close operation for each valve gate. Digital/analog inputs, valve gate sequence functions/outputs, and configurable signals can all be used to trigger the valve gates.

Touch the **Signals** tab to see the Signals screen. Refer to Figure 6-4.

Figure 6-4 Valve Gate Sequencer Signals Screen

To open a valve gate, you set a signal as the trigger. A start delay can be set before the valve gate opens. When the trigger signal is TRUE, the start delay counts down before the valve is opened.

To close a valve gate, you can set a signal and start delay as the trigger in the same way you set the valve gate to open.

NOTE: To set separate signals for the valve gates to open and close, the Auto Mode Input Type must be set to "Two Triggers" on the Valve Gate Sequencer screen Options tab. Refer to Section 6.4.3.3.

You can also set a valve gate to close without a signal. For this, only a start delay is used. Set a start delay value for when the valve gate must close. When the valve gate opens, a timer counts down from the value you set. When the timer completes, the valve gate closes.

NOTE: To use a start delay only for the valve gates to close, the Auto Mode Input Type must be set to **"**Level**"** or **"**One Trigger**"** on the Valve Gate Sequencer screen Options tab. Refer to Section 6.4.3.1 and Section 6.4.3.2.

6.3.1 Start Triggers

On the Signals screen, the start triggers are configured. When you select a Signal Type, the signal configurations show, as shown in the example in Figure 6-5.

Figure 6-5 Signal Configurations Example

The available start trigger signals are shown in Table 6-2.

Table 6-2 Start Trigger Signal Selections

Signal Type	Signal	Condition	Value	Actual Value	Comments
Digital Input	IMM Safety Gate Status VGS Enable Start Cycle VGS Digital Input 2-6 (Standard IO) VGS Digital Input 2-36 (Extended IO)	-	-	-	Two digital inputs are used for the signals that follow: • IMM Safety Gate Status • VGS Enable These are safety inputs and cannot be changed. Refer to Section 2.10.1.1 and Section 2.10.1.2. Six VGSC digital inputs can be set as necessary. Inputs are renamed on the DIGITAL INPUTS tab on the I/O screen. Refer to Section 7.1.
Configurable Signal	1-6 (standard IO, Delta5) 1-18 (standard I/O, Matrix5) 1-18 (extended I/O, Delta5) 1-33 (extended I/O, Matrix5)	-	-	-	These signals are configured on the CONFIGURABLE SIGNALS tab on the I/O screen. Refer to Section 7.4.
Analog Input	IMM Screw Position VGS Analog Inputs 2-6	Value <Value >	Enter a numerical value.	Shows current analog input values.	One analog input is used for the IMM Screw Position. Five VGSC analog inputs can be set as necessary. Inputs are configured on the ANALOG INPUTS tab on the I/O screen. Refer to Section 7.3.

Table 6-2 Start Trigger Signal Selections (Continued)

Signal Type	Signal	Condition	Value	Actual Value	Comments
VGS Function	VGS Start of Cycle VGS Cycle Running Fill Complete Pack 1 Complete Pack 2 Complete Pack 3 Complete	-	-	-	VGS start of cycle is an instantaneous signal only. It is only TRUE for 1 ms.
VGS Command	VG (1-32)	Fill Stage Pack 1 Stage Pack 2 Stage Pack 3 Stage	Open Command Close Command	-	Open and close output signals for each valve gate for each stage. This supports up to 3 pack and hold stages.

To set a start trigger for a valve gate to open or close, select a signal type. Touch the field box in the Signal Type column next to the valve gate (example: VG 1 Open) and the Signal Type selection window shows. Refer to Figure 6-6.

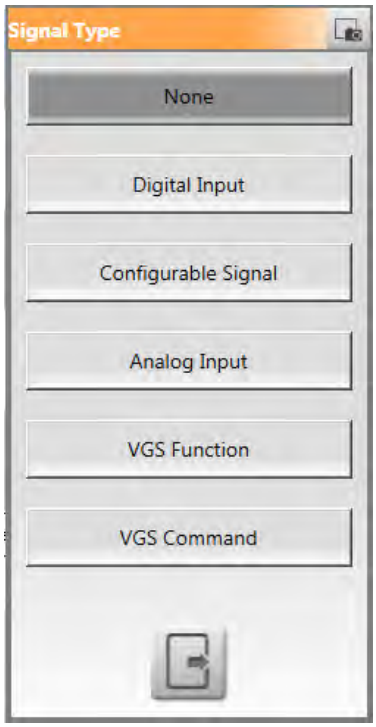


Figure 6-6 Signal Type Selection Window

Touch a selection on the screen and that selection shows in the Signal Type field box.

A new field box shows in the Signal column next to the Signal Type you selected. To select a start trigger signal, touch the field box in the Signal column. A list of signals shows. These signals are related to the Signal Type you selected. Touch a signal to select it and that signal shows in the Signal field box.

If you select an analog input as a Start Trigger for a valve gate, you must also enter a Condition and Value. In the Condition column, touch the field box. Select if the valve gate is triggered when the condition is less than or greater than a specified value. The selections are:

- Value <
- Value >

In the Value column, touch the field box. Touch the numbers to type a value and then touch the green check mark to accept the value. The number shows in the field box.

The Invert checkbox column lets you set a start trigger to the opposite of the selections you have set.

For example, if Digital Input is selected as a Signal Type, VGS Digital Input 3 is selected as a Signal, and the Invert checkbox is selected, then the valve gate movement is triggered when the VGS Digital Input 3 signal is LOW.

The indicators in the Input column show when a Start Trigger configuration is TRUE. For example, if Digital Input is selected as a Signal Type and VGS Digital Input 3 is selected as a Signal, the indicator shows green when the VGS Digital Input 3 signal changes to HIGH (or LOW, if the Invert checkbox is selected).

6.3.2 Start Delay

The Start Delay column lets you set a timed delay before the valve gate movement occurs. Without the Start Delay, the valve gate movement starts immediately when the Start Trigger configuration is TRUE. When a Start Delay value is entered, a timer counts down from that set value as soon as the Start Trigger configuration is TRUE. The Start Trigger configuration does not have to stay TRUE for the duration of the Start Delay. When the timer completes, the valve gate movement occurs.

The Start Delay values are in milliseconds. If you want a valve gate to open 3 seconds after the Start Trigger configuration is satisfied, you would set the value to 3000 ms. The Start Delay value can be set from 0 to 120000 ms.

If you do not use a Start Trigger to close a valve gate, then the Start Delay value is used to set a time in which the valve gate stays open.

Figure 6-7 shows an example of a Start Trigger configuration with Start Delay. In the example, valve gate 7 opens one second after the Start Trigger configuration is TRUE (one second after VGS Digital Input 3 changes to HIGH). There is no Start Trigger configured for valve gate 7 to close, so it closes four seconds after it opens.

The Remaining Time column shows a countdown of the time until the open/close movement is triggered.

Figure 6-7 Start Delay Example

6.3.3 Active Indicators

The Active column has indicators that show the states of the valve gates (open or closed). When an indicator is green, that valve gate state is active (open or closed).

6.3.4 Manual Triggers

The Manual Trigger column lets you use a button to manually change trigger states between Open and Close without the use of inputs. The Start Delay is ignored for manual triggers. Outputs are changed immediately, when the button is pressed.

NOTE: If the VGS is in Auto Mode, the column containing the Manual Triggers is not shown.

There is a single visible button for Open and Close.

The button changes its graphic to show what the next output action would be. If the output is closed, the button will show Open. If the output is open, the button will show Closed. A Manual Trigger button is shown in the column only if the valve gate for that button is configured. If not, the button is not shown.

After startup, when all outputs are LOW, the button will default to Open.

The conditions that follow must be TRUE for manual triggers to operate:

- The valve gate has both the open and close triggers correctly configured with the use of the signal configuration selected.
- The VGSC is in Manual mode.
- The System is 'At Temperature'.
- There are no faults or alarms.
- The VGS Enable input is HIGH.
- The IMM Safety Gate Status input is HIGH.

6.3.5 Packing Configuration

The VGS controller lets you include packing stages (also referred to as pack and hold stages) after a fill cycle. Up to three packing stages can be done for each valve gate. The primary use of packing is for parts that are cascade filled to equally pack out all drops at the end of a fill. Packing buttons are shown for each valve gate that is configured, and to be used as necessary.

When you touch a Packing button for a valve gate, a Packing window shows that lets you configure one, two or three packing stages for that valve gate. Refer to Figure 6-8.

Each packing stage can have its own trigger and delay timer; the same as available for the fill stage.

Packing is only used in Auto mode

The number of packing stages is selected on the VGS Options screen. Refer to Section 6.4.6.

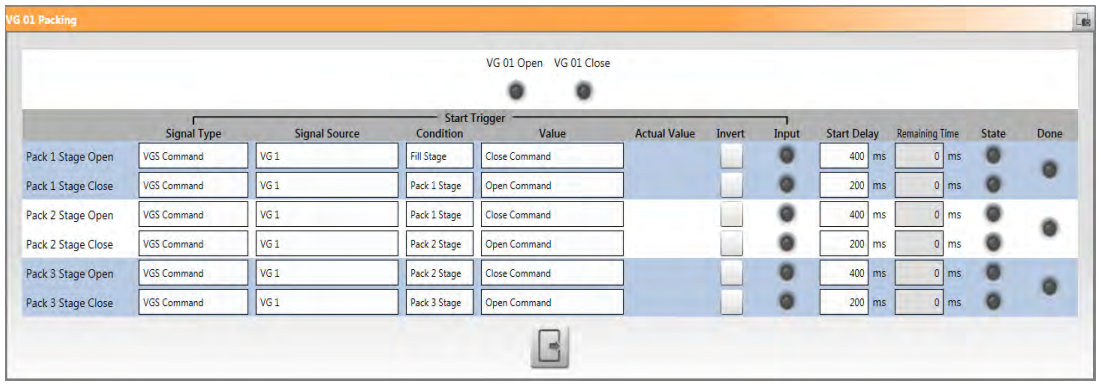


Figure 6-8 VG # Packing Window

The packing stages are shown on the left side of the window. In Figure 6-8, three packing stages are shown. The order that the packing stages will occur is from top to bottom. The example screen in the figure shows that a Level or One Trigger selection has been made for the Auto Mode Input Type that was done on the Options screen. Only the delay time configuration settings are shown for the valve gate Close start triggers. If Two Triggers had been selected for the Auto Mode Input Type, then configurable start triggers would show for the Close operations.

NOTE: The Auto Mode Input Type for Packing is a different setting than Fill. It is configured the same or differently by what is necessary for each stage.

Configure the packing start triggers for each stage as you would with the start triggers in Table 6-2. The column selections, delay entries, and indicators have the same function. At the top of the Packing window, indicators show when the valve gate is open or closed. At the right of the Packing window, the Done column indicators show that packing stage has completed.

6.3.5.1 3-Stage, Two Triggers Packing Example

The diagram in Figure 6-9 shows an example of an injection operation that uses two triggers with 3-stage packing.

NOTE: For information on valve gate triggers, refer to Section 6.4.3.

Figure 6-9 Packing Delays Example

In this example, the order of the operation is as follows:

1. The fill open trigger starts (goes HIGH) at 200 ms and the open delay timer starts (goes HIGH for 100 ms).
2. When the delay timer completes (goes LOW) at 300 ms, the valve gate opens.
3. The fill close trigger starts (goes High) at 600 ms and the delay timer starts (goes HIGH) for 300 ms.
4. When the delay timer completes (goes LOW) at 900 ms, the valve gate closes.
5. When the Pack 1 Open Trigger starts (goes HIGH) at 1100 ms, the Pack 1 Open Delay timer starts (goes HIGH) for 100 ms.
6. When the delay timer completes (goes LOW) at 1200 ms, the valve gate opens.
7. When the Pack 1 Close Trigger starts (goes HIGH) at 1300 ms, the Pack 1 Close Delay timer starts (goes HIGH) for 100 ms.
8. When the delay timer completes (goes LOW) at 1400 ms, the valve gate closes.
9. When the Pack 2 Open Trigger starts (goes HIGH) at 1500 ms, the Pack 2 Open Delay timer starts (goes HIGH) for 100 ms.
10. When the delay timer completes (goes LOW) at 1600 ms, the valve gate opens.
11. When the Pack 2 Close Trigger starts (goes HIGH) at 1700 ms, the Pack 2 Close Delay timer starts (goes HIGH) for 100 ms.
12. When the delay timer completes (goes LOW) at 1800 ms, the valve gate closes.

13. When the Pack 3 Open Trigger starts (goes HIGH) at 1900 ms, the Pack 3 Open Delay timer starts (goes HIGH) for 100 ms.
14. When the delay timer completes (goes LOW) at 2000 ms, the valve gate opens.
15. When the Pack 3 Close Trigger starts (goes HIGH) at 2100 ms, the Pack 3 Close Delay timer starts (goes HIGH) for 100 ms.
16. When the delay timer completes (goes LOW) at 2200 ms, the valve gate closes and the full injection cycle is complete.

6.3.6 VGS Status

To monitor and help troubleshoot the status of a cycle during operation, use the VGS Status window. Refer to Figure 6-10.

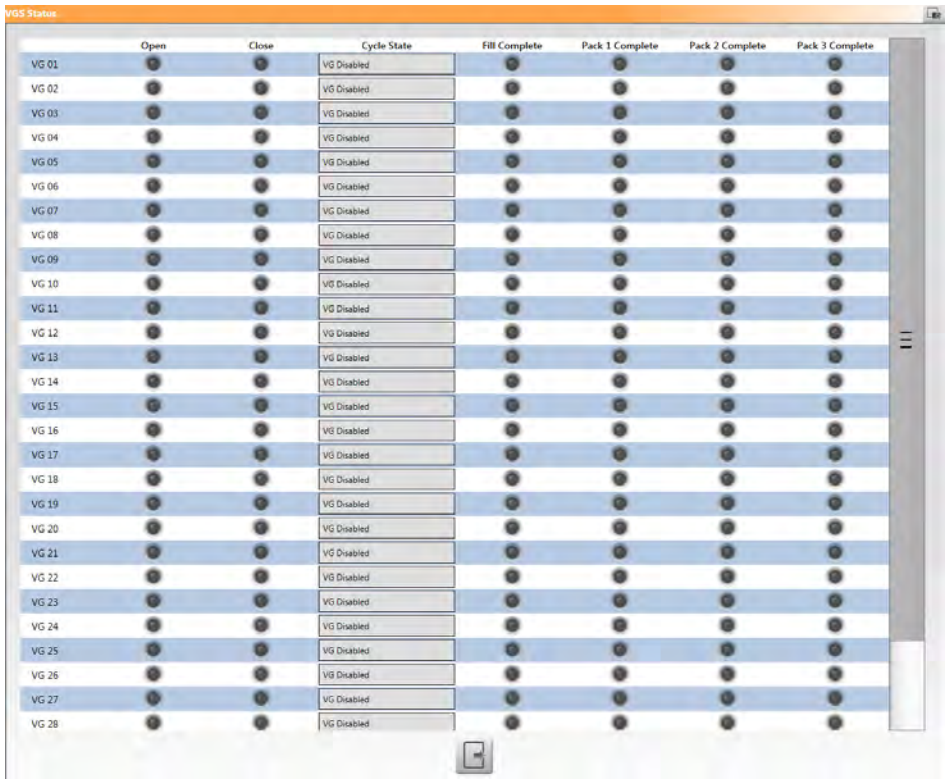


Figure 6-10 VGS Status Window

Touch the **VGS Status** button to see the VGS Status window.

The VGS Status window shows the information that follows for each valve gate:

- Open output state (independent of stage)
- Close output state (independent of stage)

- Status:
  - Waiting for New Cycle
  - Fill Stage
  - Pack # Stage
  - Manual
  - VG Disabled
- Stage completed status:
  - Fill – shown if the valve gate is configured
  - Pack stages – shown if Fill is configured, packing is enabled, and the configured Number of Stages supports it
  - Status stays at the end of cycle, and is cleared at the beginning of new cycle

6.3.7 Multi-Select Screen

You can use the Multi-Select screen to decrease the configuration time for similar valve gate triggers or delays. Touch the **Multi-Select** tab to see the Multi-Select screen. Refer to Figure 6-11 for an example of the Multi-Select screen that shows a valve gate selected with fill and packing stages ready to be configured. The number of packing stages is selected on the Options screen (Section 6.4.6). If no packing stages are selected for your injection process, the packing configurations will not show on the Multi-Select screen. Only the number of packing stages selected will show.

Figure 6-11 Multi-Select Screen

Individual valve gates can be selected, or you can use the group selector to modify multiple valve gates at the same time. This can be necessary with the increased support of a maximum of 32 circuits.

With one or more valve gates selected, you can:

- Set the start triggers for the fill open and close operations
- Set the start triggers for the packing stage(s)
  - Only the packing stages that are enabled will show
  - Only the number of stages that are configured on the Options screen will show
- Manually open and close the valve gates together
  - The Open and Close buttons will operate only the selected valve gates
- Assign valve gates into groups
- See the states of the valve gates

With the valve gate(s) selected, you can configure the start triggers, start delays, and packing stages (if necessary) as described in Section 6.3.1, Section 6.3.2, and Section 6.3.5.

NOTE: When dashes (---) are shown in a setpoint field, then one or more of your selected valve gates have a different value for that setpoint. If these settings are changed, they will all be changed to the new value. Other settings can be changed (that may, or may not be the same) and not have an effect on the settings that are different.

6.3.7.1 Valve Gate Groups

Valve gates can be put together into groups. This helps when two or more valve gates are configured to the same settings. If there is a sequence to the injection of a mold, groups can be used to identify when specified valve gates are used during the sequence, or identify the area of the mold in which the valve gates are used. Use valve gate groups as necessary for your injection process.

To create a valve gate group, do the steps that follow:

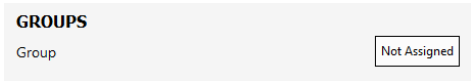
1. Touch one valve gate button at the top of the screen to select only that valve gate.

   The selected valve gate is highlighted in orange.

2. Touch and hold an un-selected valve gate button to add it to the selection.
3. Do step 2 again until all of the valve gates that you want in the group are selected.

   NOTE: You can touch and hold a selected valve gate button to remove it from the selection.

4. With the valve gates selected, touch the field in the **Groups** area of the screen.



   The Group dialog window shows. Refer to Figure 6-12.

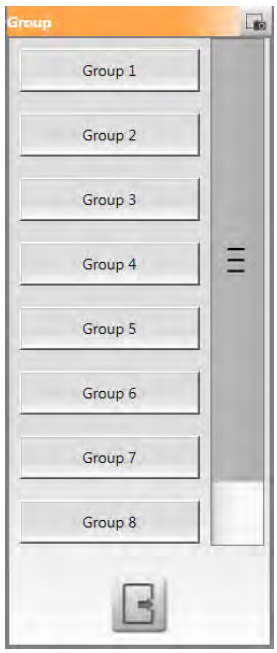


Figure 6-12 Group Dialog Window

5. Touch a group button in the dialog window to put all of the selected valve gates into that group.

Figure 6-13 shows an example of valve gates in their groups. Valve gates 01 through 06 are in Group 1. Valve gates 07 through 12 are in Group 2. When you touch a group button, all of the valve gates in that group are selected (highlighted), as shown with 'Group 1' in the figure example.

Figure 6-13 Valve Gates in Groups

With a group selected, use the Start Trigger area of the Multi-Select screen to set the same operational configurations for all of the valve gates in that group. With 'Group 1' selected in the Figure 6-13 example, the Start Trigger configurations will be made to valve gates 01 through 06 only.

You can select more than one group in the same way that you selected the valve gates. Touch the first group button you want selected, and then touch and hold the next group button so it is selected (highlighted) with the first group. Continue to select more groups, as necessary.

The number of groups available is calculated from the number of valve gates on your system divided by two, with a maximum of eight groups:

VGs / 2 = Groups (Maximum of 8)

For example, if you have 12 valve gates, 6 groups are available. If you have 32 valve gates, 8 groups are available.

The group names default to 'Group #', such as 'Group 1', 'Group 2', and 'Group 3'. You can change the name of a group to help identify the valve gates by their function, location, or a description that is necessary to your operation. Group name changes are done on the Options screen. Refer to Section 6.4.7.

6.4 Options Screen

On the VGSC Options screen, you set the options that follow:

- Input signals:
  - External At Temperature
  - VGS Start of Cycle
  - VGS End of Cycle
- Signal Configuration for Auto Mode Input Type
- At Temperature Soak Time
- VGS Cycle Time Limit
- Packing:
  - Enable
  - Set the number of packing signals
  - Signal configuration for packing's Auto Mode Input Type

This screen also lets you open/close all stems when in Manual mode.

Touch the Valve Gate Sequencer screen **Options** tab to see the Options screen. Refer to Figure 6-14.

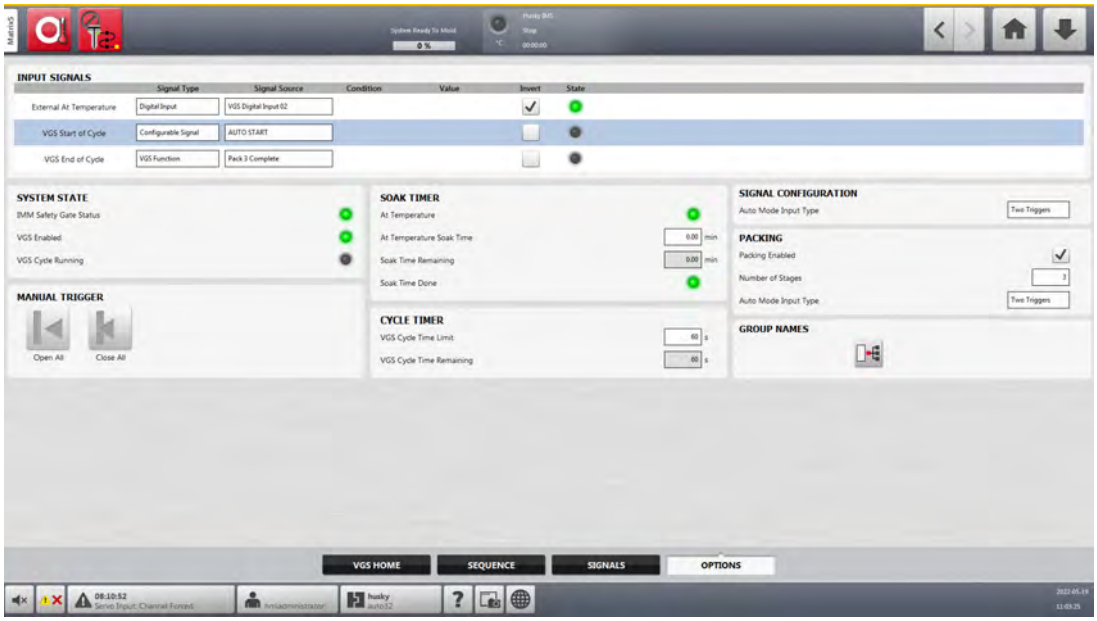


Figure 6-14 Valve Gate Sequencer Options Screen

6.4.1 Input Signals

The Input Signals area of the screen lets you set the External At Temperature, Start of Cycle, and End of Cycle input signals. Refer to Figure 6-15.

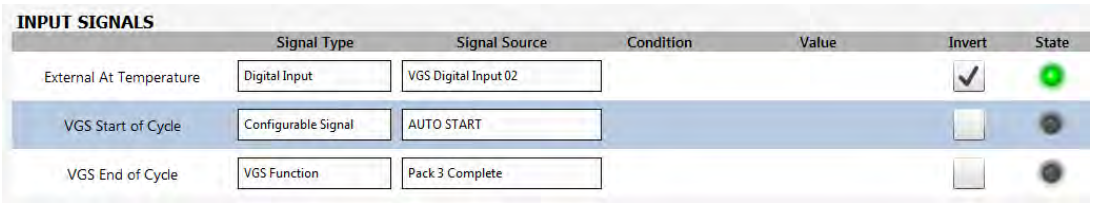


Figure 6-15 Valve Gate Sequencer Options Screen - Input Signals

6.4.1.1 External At Temperature

To configure the External At Temperature input, select a signal type and then a signal. You can select Signal Types from digital/analog inputs and configurable signals, as necessary for your IMM. An analog input would need additional condition and value entries.

The Invert checkbox lets you set the External At Temperature input to the opposite of the selections you have set.

A green indicator lets you know when the External At Temperature signal is TRUE.

6.4.1.2 VGS Start and End of Cycle

You can configure the start and end triggers for a valve gate sequence cycle, which is used for curves, alarm checks, and alarm responses.

For the VGS Start of Cycle input, the rising edge of the configured signal triggers the start of cycle. If the VGS End of Cycle input is set to "None", the falling edge of the VGS Start of Cycle signal triggers the end of cycle.

For the VGS End of Cycle input, if configured, the rising edge of this signal triggers the end of cycle.

For more information on the start and end of cycles with the use of one- or two-trigger configurations, refer to Section 6.4.3.2 and Section 6.4.3.3.

To configure the VGS Start of Cycle and End of Cycle inputs, select a signal type and then a signal for each input. Digital/analog inputs and configurable signal types are available. An Analog input configuration would need additional condition and value entries. The VGS Function and VGS Output signal types are available for the End of Cycle configuration, but not the Start of Cycle.

The Invert checkboxes let you set the start and end cycle triggers to the opposite of the selections you have set.

A green indicator lets you know when a cycle is in operation.

6.4.2 System State

In the System State area of the screen, green indicators let you know when the states that follow are TRUE:

- IMM Safety Gate Status
- VGS Enable
- VGS Cycle Running.

6.4.3 Signal Configuration

The Signal Configuration area of the screen is where you set the Auto Mode Input Type. Select in what way signals are used to trigger the movement of valve gates. Select one of the types that follow:

- Level
- One Trigger
- Two Triggers

NOTE: These triggers can be used with or without start delays. Refer to Section 6.3.2.

6.4.3.1 Level

Select Level only if a level OPEN signal is used. The OPEN trigger occurs only when the signal is at a HIGH level state. If a start delay is set for the OPEN trigger, the delay time starts when the level changes to HIGH. When the delay time completes, the valve gate opens. If no start delay is set for the valve gate to close, the valve gate stays open for as long as the OPEN signal stays HIGH. If a start delay is set for the gate valve to close, the delay time starts when the OPEN signal goes LOW. When the close delay time completes, the valve gate closes.

NOTE: To trigger the close signal and start the delay counter, the valve gate must be in the Open state. Thus, if you start a cycle with a low signal, the close delay will not start its count down. It waits until after the signal goes HIGH and then LOW again to trigger the delay.

Figure 6-16 shows an example of a Level cycle. In the example, the steps that follow occur:

1. The Open Trigger level goes HIGH:
   a. The Open Delay timer starts.
   b. When the Open Delay timer completes, the gate valve opens (Open State goes HIGH).
      Open Output = TRUE, Close Output = FALSE
2. The Open signal level goes LOW:
   a. The Close Delay timer starts.
   b. When the Close Delay timer completes, the gate valve closes (Open State goes LOW).
      Close Output = TRUE, Open Output = FALSE

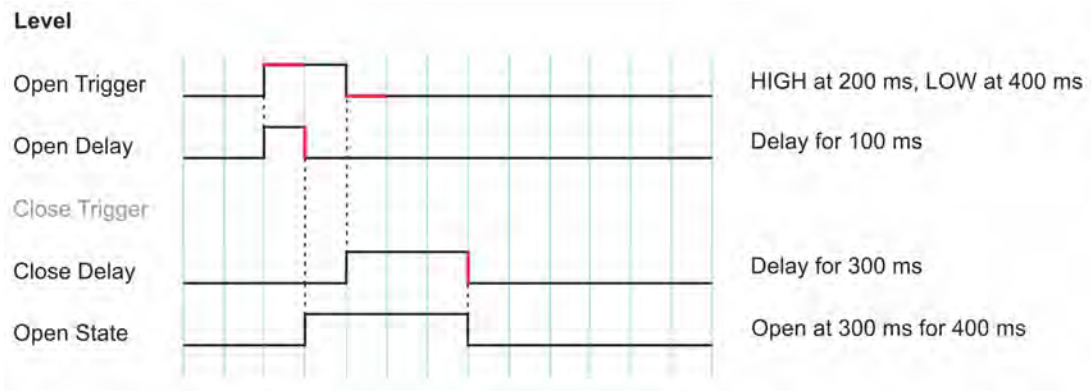


Figure 6-16 Level Cycle Example

6.4.3.2 One Trigger

Select One Trigger only if an OPEN signal rising edge is used. The OPEN trigger occurs at the signal's rising edge. If a start delay is set for the OPEN trigger, the delay time starts at the signal's rising edge. When the delay time completes, the valve gate opens. A start delay is set

for the gate valve to close. The delay time starts from the time the valve gate opens. When the close delay time completes, the valve gate closes.

Figure 6-17 shows an example of a One Trigger cycle. In the example, the steps that follow occur:

1. The Open Trigger rising edge occurs.
2. The Open Delay timer starts.
3. When the Open Delay timer completes, the gate valve opens (Open State goes HIGH). Open Output = TRUE, Close Output = FALSE
4. The Close Delay timer also starts when the Open Delay timer completes.
5. When the Close Delay timer completes, the gate valve closes (Open State goes LOW). Close Output = TRUE, Open Output = FALSE

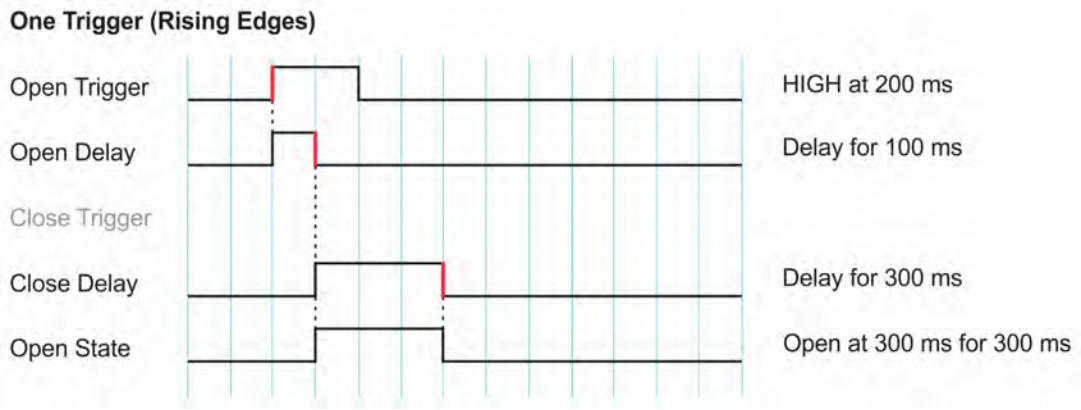


Figure 6-17 One Trigger Cycle Example

6.4.3.3 Two Triggers

Select Two Triggers if the rising edges of two trigger signals (open and close) are used. If a start delay is set for the OPEN trigger, the delay time starts at the signal's rising edge. When the delay time completes, the valve gate opens. If a start delay is set for the CLOSE trigger, the delay time starts at the signal's rising edge. When the delay time completes, the valve gate closes.

Figure 6-18 shows an example of a Two Triggers cycle. In the example, the steps that follow occur:

1. At the rising edge of Open Trigger:
   a. The Open Delay timer starts.
   b. When the Open Delay timer completes, the gate valve opens (Open State goes HIGH).
   Open Output = TRUE, Close Output = FALSE

2. At the rising edge of Close Trigger:
   a. The Close Delay timer starts.
   b. When the Close Delay timer completes, the gate valve closes (Open State goes LOW).
   Close Output = TRUE, Open Output = FALSE

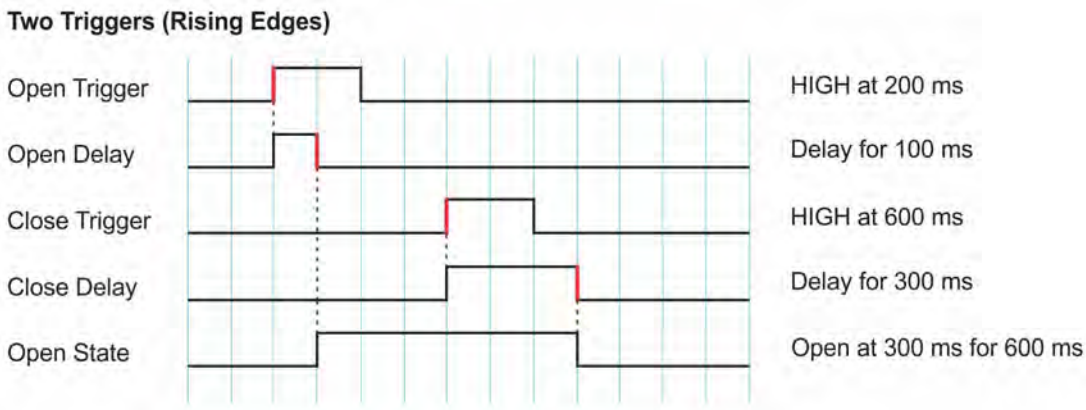


Figure 6-18 Two Triggers Cycle Example

6.4.4 Soak Timer

To make sure that there is no movement of the valve gates when they are below temperature, an adjustable soak timer is used as an interlock. The adjustable soak timer starts when the heats are 'At Temperature'. No valve gate movement can occur until the soak timer has completed.

The soak timer works independently from the integrated heats. This is only for the VGSC system to know when it is safe to trigger valve gate movement.

In the Soak Timer area of the screen, touch the **At Temperature Soak Time** field to set the soak time. Refer to Figure 6-19. The time is set in minutes.

The Soak Timer area of the screen also includes a Soak Time Remaining field and two indicators that show the 'At Temperature' status and when the soak time has completed.

Figure 6-19 Soak Timer

6.4.5 Cycle Timer

Use the Cycle Timer area of the screen to set a VGS Cycle Time Limit. Refer to Figure 6-20.

If the end cycle is not received in the specified time after the start cycle is triggered, the cycle automatically ends, all stems are closed, and you are given a warning.

NOTE: This does not stop the next cycle from starting.

The VGS Cycle Time Limit has a maximum of 300 second (5 minutes) and a minimum of 1 second. The default is 120 seconds (2 minutes).

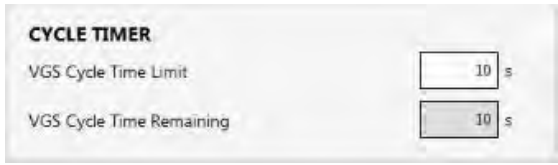


Figure 6-20 Cycle Timer

6.4.6 Packing

The VGSC lets you include packing stages after a fill cycle. Up to three packing stages can be done for each valve gate.

Each packing stage can have its own trigger and delay timer; the same as available for the fill stage.

Packing is only used in Auto mode.

To enable the packing operation, do the steps that follow:

1. Touch the **Packing Enabled** checkbox in the Packing area of the Options screen. A check mark in the checkbox indicates that Packing is enabled. Refer to Figure 6-21.
2. Touch the **Number of Stages** field and enter the number of packing stages you want to use (1, 2, or 3).

3. Touch the **Auto Mode Input Type** field and select one of the input types that follow in the selection window that shows:
   - Level
   - One Trigger
   - Two Triggers

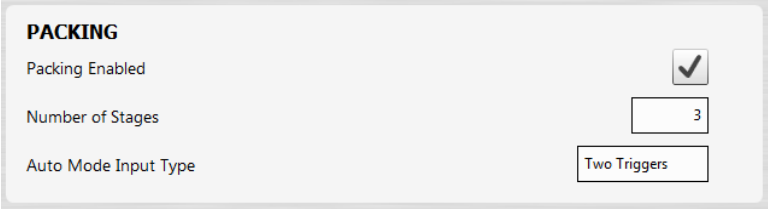


Figure 6-21 Packing Enable and Stages

Refer to Section 6.3.5 for information about packing configuration.

6.4.7 Group Names

If some or all of your valve gates have been put together into groups, the VGS Options screen lets you change the group names. Group names can help identify how the valve gates are used during the injection process or possibly the location of the valve gates in the mold. The group names default to 'Group #' when created. For example, 'Group 1', 'Group 2', and 'Group 3'. To change the gate valves' group name to something that is easier to identify, touch the **Group Names** button.

The Edit Group Names dialog window shows. Refer to Figure 6-22.

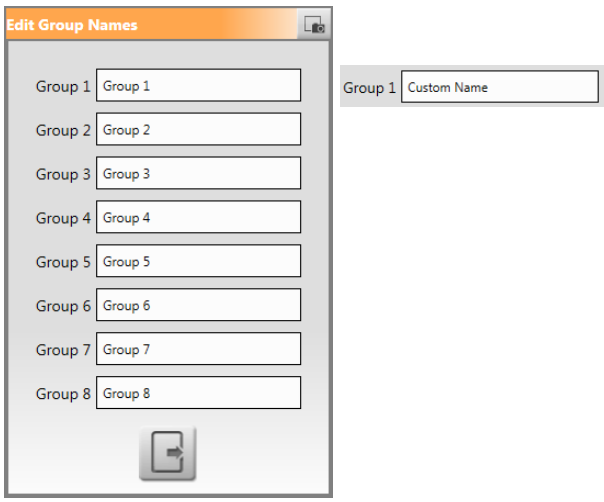


Figure 6-22 Edit Group Names Dialog Window

Touch the field next to the group name and then type the new name for that group. Touch the **Accept** button to complete the name change. Do this for all of the group names that you want to change.

Figure 6-23 is an example of how 'Group 1' was changed to 'Custom Name', as shown in Figure 6-22.

Figure 6-23 Group Name Change

Chapter 7 Input/Output Screens

Use the Input/Output (I/O) screens to monitor status and set the digital inputs, digital outputs, analog inputs, thermocouples, and configurable signals transmitted between the VGSC and the:

- IMM
- Hot runner
- Mold.

Refer to the Section 2.10 for information on I/O connector identification and pin locations.

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

The I/O screens have selections and indicators. Not all the selections and indicators are used on each screen. A list of the selection and indicators is shown in Table 7-1.

Table 7-1 Servo I/O Screen Selections and Indicators

Item	Description
Name	The name is given to the input or output signals by Husky or the user. This name is used on all of the signal screens in which this signal is shown.
Function	Name of the operation that the input signal will do.
Active	The condition of the input or output is TRUE when the indicator is green.
Invert	If selected, the inverse of the signal's normal operation will be TRUE.
Force	I/O signals can be made high or low. • When Force is set to High, the signal level at the pin is set high. • When Force is set to Low, the signal level at the pin is set low. • When Force is set to None, the signal level at the pin is not changed.
In Use	Select this checkbox to use the signal.
Level	Shows the electrical condition of the input or output at the connector pin.
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 VGSC controller.
Scale and Offset	The scale and offset settings are used to convert a raw analog input value into engineering units.
Value	The final value that is calculated from the scale and offset with this formula: Unfiltered Final Value = (Raw Value + Offset) * Scale

Table 7-1 Servo I/O Screen Selections and Indicators (Continued)

Item	Description
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 • 4-20 mA card = raw value in milliamps • Load cell = raw value in millivolts
Fault	A green indicator shows when a fault occurs with an analog input card.

7.1 Digital Input Screens

On the I/O screen, touch the **Digital Inputs** tab.

On a VGSC standalone system, only the VG Sequencer digital inputs show. On an integrated VGSC system, both VG Sequencer and heats digital inputs are available. Refer to Figure 7-1.

Figure 7-1 VG Sequencer Digital Inputs (Integrated Heats System)

7.1.1 VG Sequencer

The VGSC has eight digital inputs, but you have the option to increase the number of digital inputs to 36. Figure 7-1 shows the added digital inputs are divided into three tabs: VGS Page 1, 2, and 3.

The first two digital inputs signals are used for safety circuits. The third digital input is normally set (defaulted to) a Start Cycle signal from the IMM, but can be changed for your system if necessary. The digital inputs that remain are user configurable.

The initial eight signals come into the VGSC through the X300 connector, and the optional signals come into the VGSC through the X304 connector. Refer to Table 2-3 for their pin numbers.

7.1.1.1 Safety Signals

The two safety signals are monitored to make sure the system does not continue to operate in an unsafe condition. These are locked signals, so you cannot modify the name, invert the signal, or force the signal. The safety signals are described here:

7.1.1.1.1 IMM Safety Gates Status

When the signal is HIGH:

- The safety gates on the IMM are closed.
- The system is considered safe, and the solenoid outputs can change states.

When the signal is LOW:

- All valve gates are immediately sent a close signal state, as long as the system is 'At Temperature' or in a permitted timeframe after the system is not 'At Temperature'.
  - If the system comes up to temperature while this is low, the valve gates will not automatically move.
  - If another auto-close condition occurs, the valve gates will not automatically move until you have cleared all conditions and the system has entered a safe and ready operation state.
- The system disables all motion command requests (internal/external inputs and buttons tied to Open/Close).
- The system ends the VGS cycle that is in operation.
  - This triggers the Valve Stems Open Outside of Cycle Warning if one or more stems have an open signal state.

7.1.1.1.2 VGS Enable

When the signal is HIGH:

- The system is considered enabled (and safe) and the solenoid outputs can change states.

When the signal is LOW:

- All valve gates are immediately sent a close signal state, as long as the system is 'At Temperature' or in a permitted timeframe after the system is not 'At Temperature'.
  - If system comes up to temperature while this is low, valve gates will not automatically move.
  - If another auto-close condition occurs, the stems will not automatically move until you have cleared all conditions and the system has entered a safe and ready operation state.
- The system disables all motion command requests (internal/external inputs and buttons tied to Open/Close).
- The system ends the VGS cycle that is in operation.
  - This triggers the Valve Stems Open Outside of Cycle Warning if one or more stems have an open signal state.
- This triggers the Lost Enable Input Alarm.

7.1.1.2 Configurable Digital Inputs

The number of configurable digital inputs are:

- 6 standard digital input
- 34 extended digital inputs

NOTE: The extended digital inputs are only available on a Matrix5 system.

You can configure and name the configurable digital inputs as necessary. As an example, one of the inputs can be set to receive an 'At Temperature' digital signal from the IMM.

7.1.2 Heat Screens

On an integrated VGSC, 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 7-2). These tabs do not show on a standalone system.

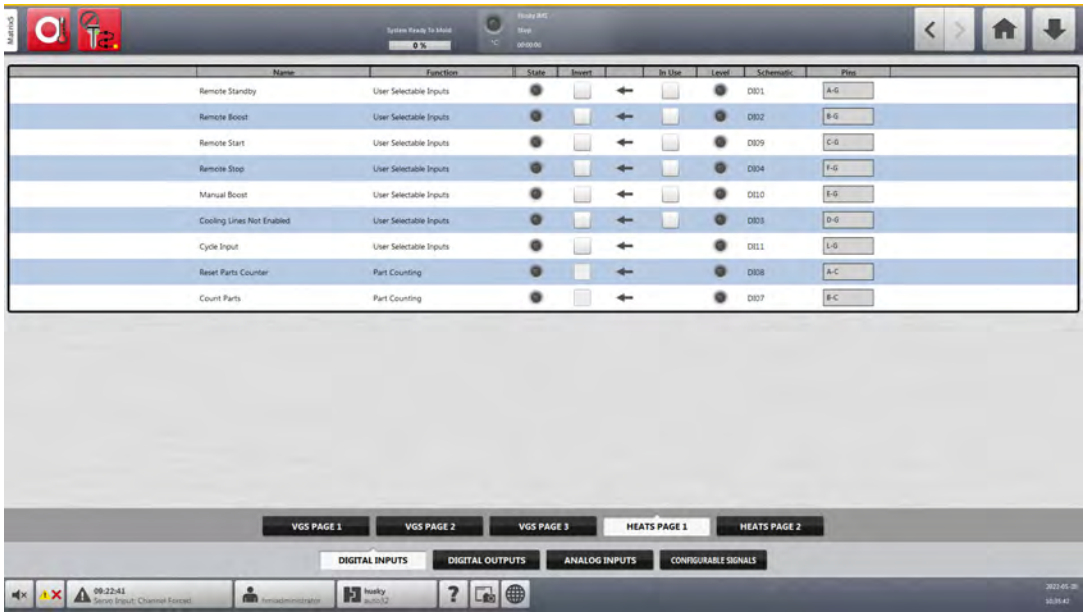


Figure 7-2 Heats Digital Inputs (Integrated Heats System)

The input signals on the Heats Page 1 tab give the VGSC 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

On the Heats Page 2 tab, the setup bits are shown for a remote load of mold files from the IMM. This is an optional feature for the VGSC. Refer to the Remote Load section of the Altanium Delta5 or Matrix5 User Guide.

7.2 Digital Outputs Screens

The VGSC has digital solenoid outputs to the hydraulic or pneumatic unit and four additional user-configurable 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.

7.2.1 VGS Solenoids Digital Outputs

The VGSC has a maximum of 16 control channels (digital outputs) on a Delta5 system and 32 control channels on a Matrix5 system.

NOTE: A minimum of four channels come standard with the VGSC. More channels are available as an option for your IMM, which come in 4-channel increments.

Each control channel is an output to a solenoid on a valve gate actuator. They give up to 2 A of current and are only used to energize the solenoids. You can configure these outputs as follows:

- One output signal to open and close a valve gate
- Two output signals - one to open and one to close the valve gate

Touch the **VGS Solenoids** tab(s) to see the output selections (Refer to Figure 7-3). From this screen, you can change the name of the output and set what valve gate to open or close.

Figure 7-3 VGS Solenoids Digital Outputs Screen

7.2.2 VG Sequencer

Four user-configurable digital outputs are available to send informational signals to the IMM or where needed (refer to Figure 7-4). These signals are not used as valve gate Open or Close signals, because they have a lower amperage output that is used for communication to the IMM.

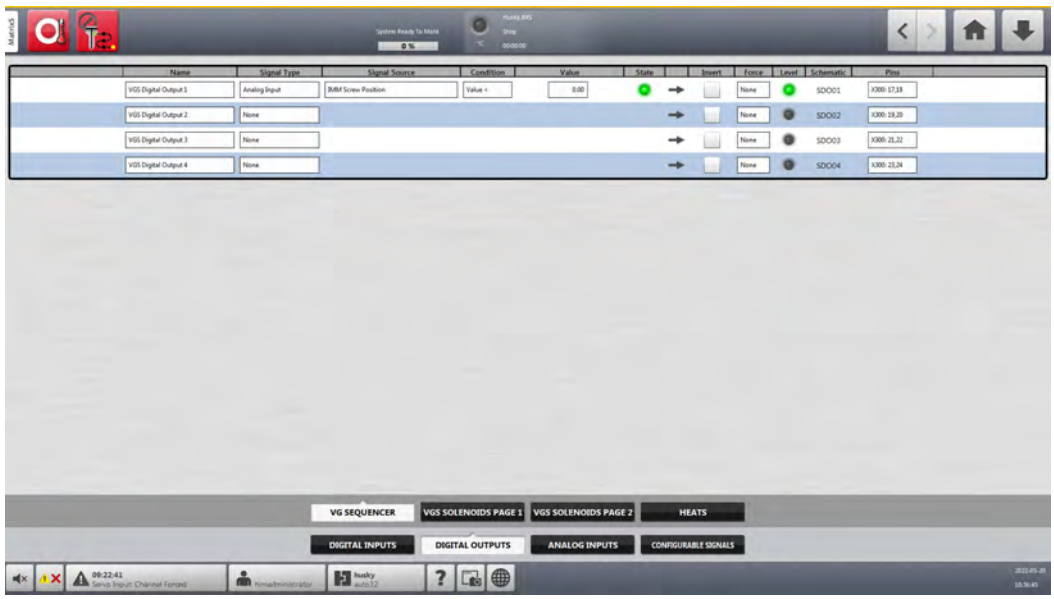


Figure 7-4 VG Sequencer Digital Outputs Screen

Table 7-2 shows the signal types and signals you can select for these outputs.

Table 7-2 VG Sequencer Digital Output Selections

Signal Type	Signal	Condition	Value	Comments
Digital Input	IMM Safety Gate Status VGS Enable Start Cycle VGS Digital Input 2-6 (Standard I/O) VGS Digital Input 2-36 (Extended I/O) VGS Digital Input 1 defaults to Start Cycle	-	-	Two digital inputs are used for the signals that follow: • IMM Safety Gate Status • VGS Enable These are safety inputs and cannot be change. Refer to Section 2.10.1.1 and Section 2.10.1.2. 6 or 32 VGS digital inputs can be set as necessary, depending on the I/O.
Controller Function	Fault Stop Immediate Fault Stop End of Cycle Calibration Active Process Outside Limit			
Configurable Signal	Configurable Signals: 1-18 Standard I/O - Matrix5 1-33 Extended I/O - Matrix5 1-6 Standard I/O - Delta5 1-18 Extended I/O - Delta5	-	-	These signals are configured on the Configurable Signals tab on the I/O screen. Refer to Section 7.4.

Table 7-2 VG Sequencer Digital Output Selections (Continued)

Signal Type	Signal	Condition	Value	Comments
Analog Input	VGS Analog Inputs 1-6	Value < Value >	Enter a numerical value.	These signals are configured on the Analog Inputs tab on the I/O screen. Refer to Section 7.3.
Temperature Control	At Temperature	-	-	
VGS Function	VGS Start of Cycle VGS Cycle Running Fill Complete Pack 1 Complete Pack 2 Complete Pack 3 Complete	-	-	

Descriptions for other column selections on this screen are the same as those in Table 7-1.

7.2.3 Heats Digital Outputs

For integrated systems, user-selectable digital outputs are available. Touch the **Heats** tab (Matrix5) or the **Heats Page 1/Heats Page 2** tab (Delta5) to see the heats digital outputs. Refer to Figure 7-5. 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
- Remote File Loaded
- Sack Full

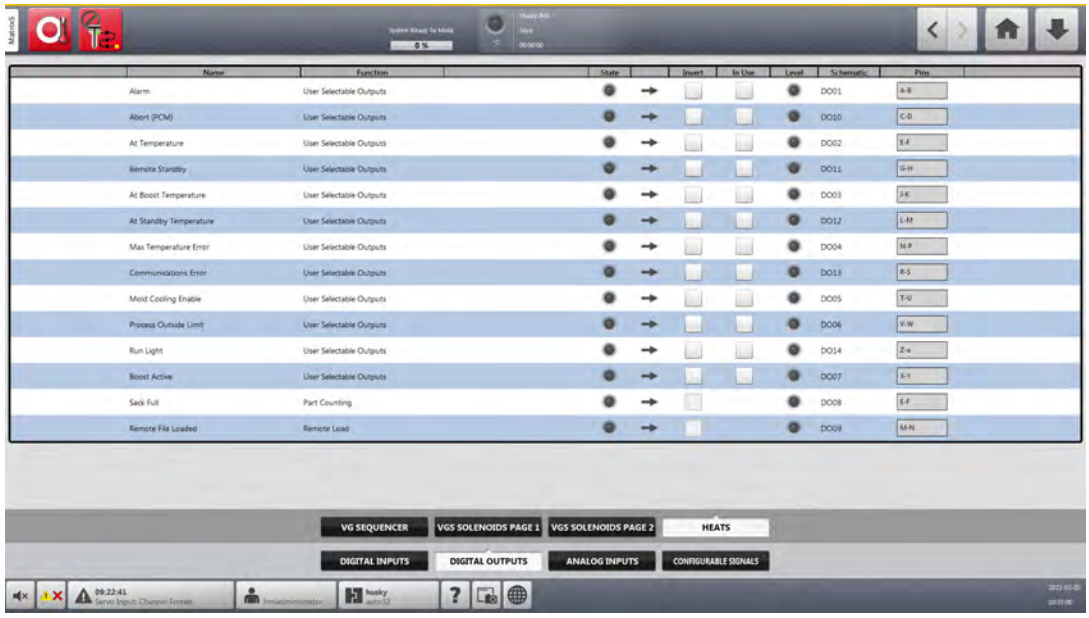


Figure 7-5 Heats Digital Outputs Screen

For information about integrated temperature control, refer to the Matrix5 or Delta5 User Guide.

7.3 Analog Inputs

The VGSC has four 0-10 V and two 4-20 mA analog inputs (refer to Figure 7-6). The first 0-10 V signal is used for a cable potentiometer attached to the IMM's injection screw. This input tells the VGSC the IMM screw position. You can configure the remaining five analog input signals for your system, as necessary.

Figure 7-6 Analog Inputs

Table 7-3 identifies the analog inputs available on the VGSC.

Table 7-3 Analog Inputs

Analog Input	Rating
IMM Screw Position (only)	0-10 V
VGS Analog Input 2	0-10 V
VGS Analog Input 3	0-10 V
VGS Analog Input 4	0-10 V
VGS Analog Input 5	4-20 mA
VGS Analog Input 6	4-20 mA

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 7-1 for more information on the Scale, Offset, and Filter values.

To select an analog input that 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 4-20 mA analog input cards sense an overcurrent condition or a broken wire, the fault is shown.

7.3.1 Analog Input Calibration

You can calculate the Scale and Offset values to calibrate the analog input. A two-point calibration method is used, which will require low and high reference values and 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 are always entered manually.

The two-point calibration calculations are as follows:

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

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

Use the Calibrate window (Figure 7-7) to help calculate the Scale and Offset values. Touch the **Calibrate** button next to the analog input to open the Calibrate window.

NOTE: The Calibrate button only shows for the analog inputs that are 'In Use'.

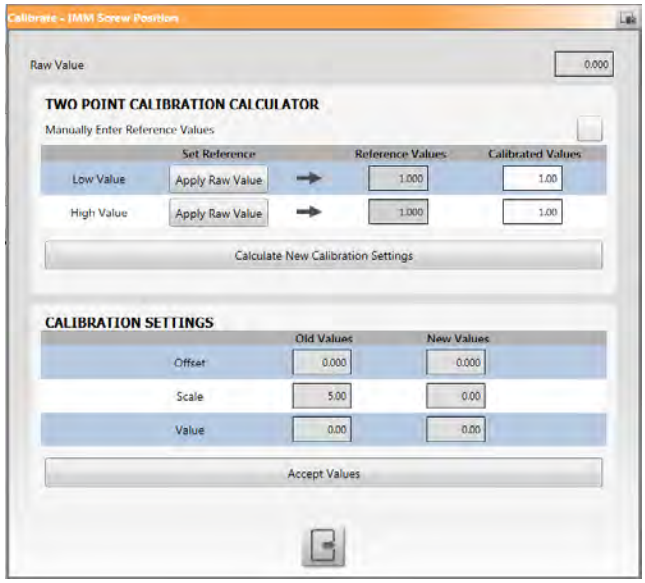


Figure 7-7 Calibrate Window

7.4 Configurable Signals

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

Touch the **Configurable Signals** tab to see the Configurable Signals screen. Refer to Figure 7-8.

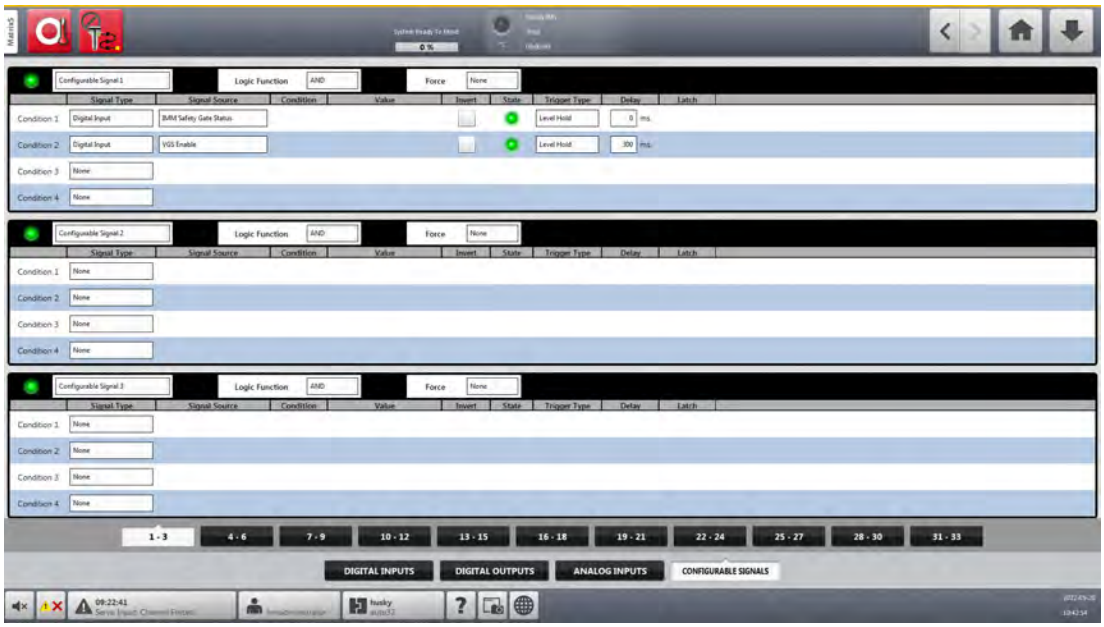


Figure 7-8 Configurable Signals Screen

Tabs at the bottom of the Configurable Signals screen give access to the signals. There are three configurable signals on each tab. Figure 7-8 shows a Matrix5 system with 33 configurable signals (divided into 11 tabs). The number of signals and tabs could be different on your VGSC system.

Table 7-4 shows the number of configurable signals available for the Matrix5 and Delta5 systems.

Table 7-4 Configurable Signals

Matrix 5	1-18 standard
	1-33 extended
Delta5	1-6 standard
	1-18 extended

7.4.1 Logic Function

When set to AND, the configurable signal is TRUE only when all conditions are TRUE. When set to OR, the configurable signal is TRUE when one or more 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 show a Latch action that you can set to 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 stays in this state until a different condition row changes it.

A configurable signal with more than one condition is evaluated in the order that the conditions are listed, top to bottom. Thus, it is possible that the configurable signal becomes latched and then unlatched at the same time. The final signal (TRUE or FALSE) is set by the last action that was evaluated.

7.4.2 Force

You can force a configurable signal High or Low (TRUE or FALSE). This will override all of the condition settings that are configured for a signal.

When Force is set to None, the signal operates by the configured conditions.

When Force is set to Low, the configured conditions are ignored and the signal stays low (FALSE).

When Force is set to High, the configured conditions are ignored and the signal stays High (TRUE). The Active indicator illuminates.

This setting can be used to manually force a signal to High or Low when a signal's status must stay in one state for an operation. This helps when you initially configure other signals for an operation that would be triggered from the forced signal. Also, you can use Force to bypass specific signals when troubleshooting.

Chapter 8 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 chapters in the Altanium Delta5 or Matrix5 User Guide.

8.1 Trend Plot Screen

You can monitor different process variables on the Trend Plot screen. On the VGSC 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 8-1.

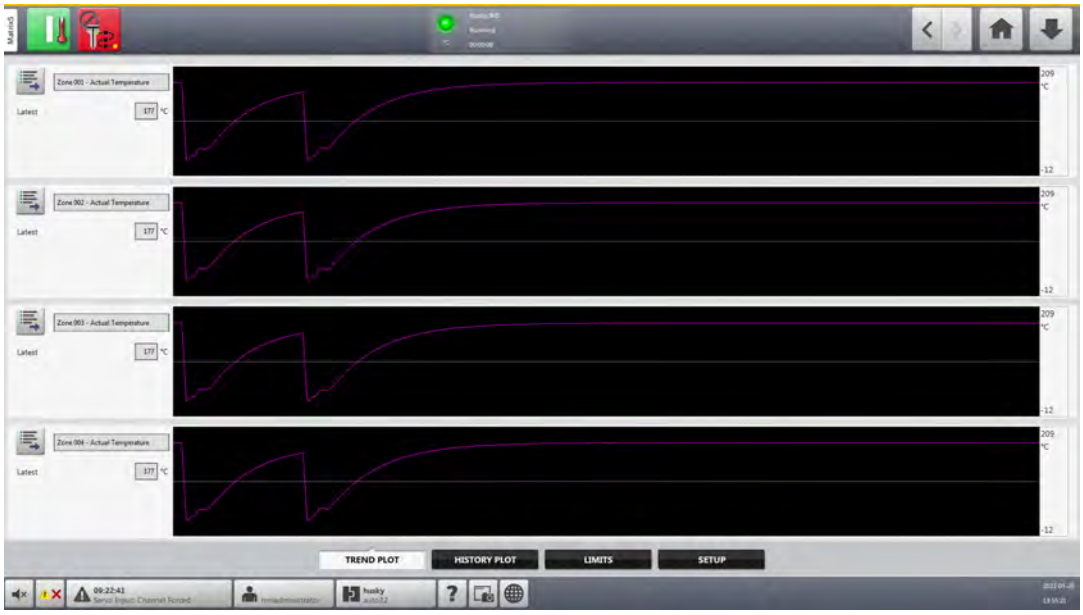


Figure 8-1 Trend Plot Screen

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

The Statistical Process Control Details Variable Selector window shows (Figure 8-2).

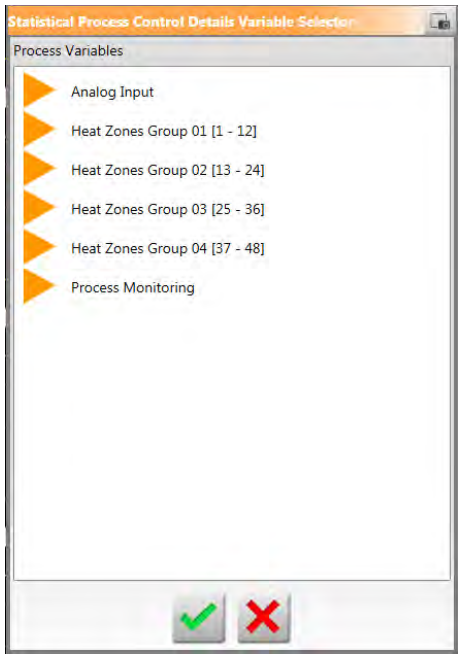


Figure 8-2 Statistical Process Control Details Variable Selector

In the drop-down selection menu, use the minimize/maximize arrows to view the variables and then select the one you want to plot. You can plot the actual temperature, current, and power for each zone on an integrated system. You can also plot analog inputs and cycle time. The selected plot will show in the graph area.

8.2 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 screen. The Limits screen is shown (Figure 8-3).

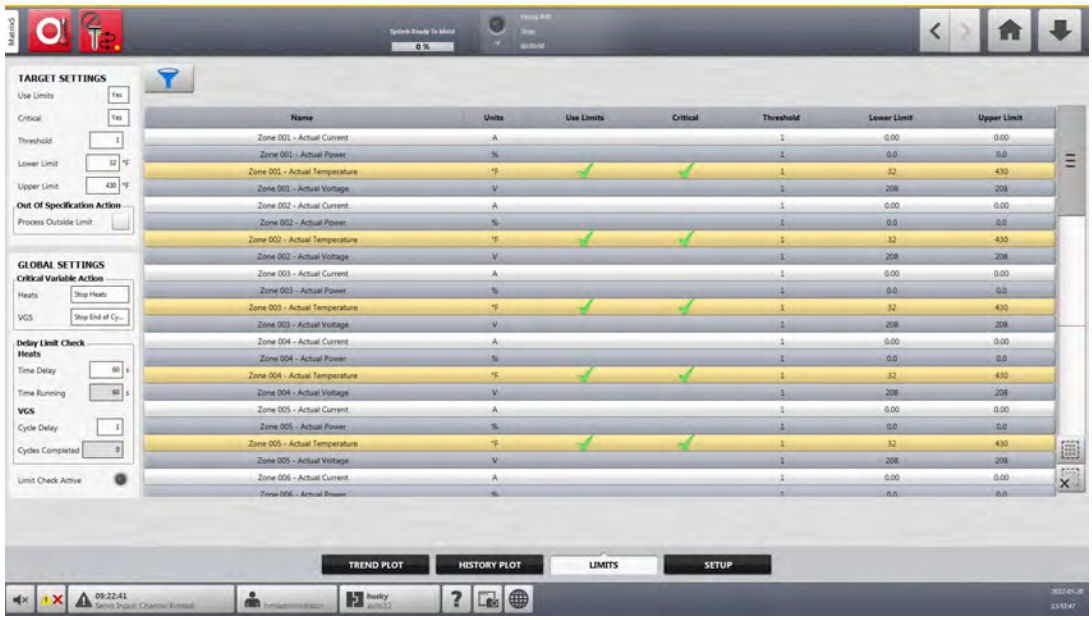


Figure 8-3 Limits Screen

NOTE: The Limits screen in Figure 8-3 is shown with integrated heats. A standalone system will not show zones.

Refer to Table 8-1 for the definitions of the Target and Global settings.

Table 8-1 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.
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.

Table 8-1 Limits Screen Values (Continued)

Limit	Definition
Critical Variable Action • Heats • VGS	The action taken when a variable is in a critical state. • For heats, select “No Reaction” or “Stop Heats”. • For VGS, select “No Reaction” or “Stop End of Cycle”.
Delay Limit Check • Heats • VGS	Sets the delay for the limit check.
Limit Check Active	The indicator illuminates when the limits have been checked.

8.2.1 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 shows (Figure 8-4).

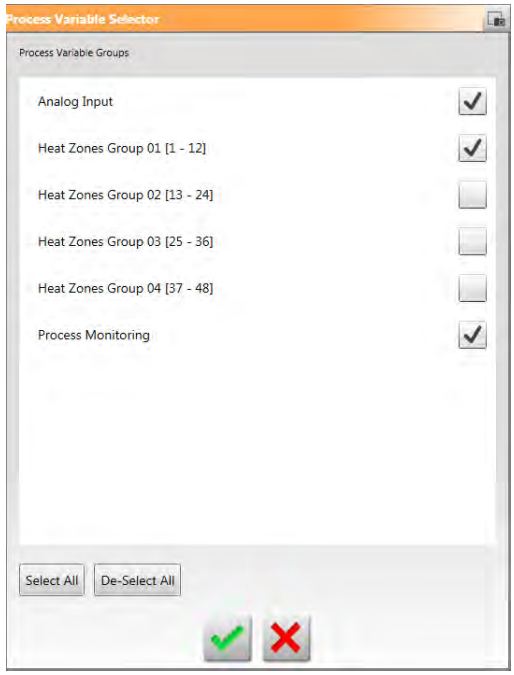


Figure 8-4 Process Variable Selector Dialog

2. Touch the desired unit of measure.
3. Touch the **Accept** button.

8.3 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).

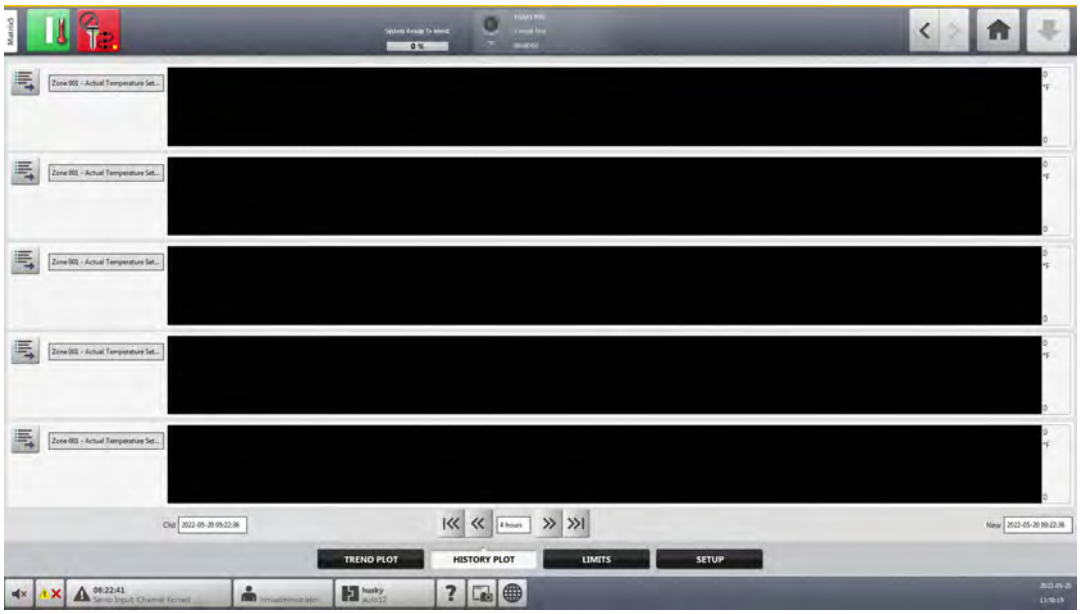


Figure 8-5 History Plot Screen

8.3.1 Data Description

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

Table 8-2 gives a list of the of the History Plot screen curve data items. Refer to Figure 8-6 for item locations.

Table 8-2 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.
Midline	3	The midline is the middle value of the curve.
Description of Data	4	Shows the data point value, date, and time.

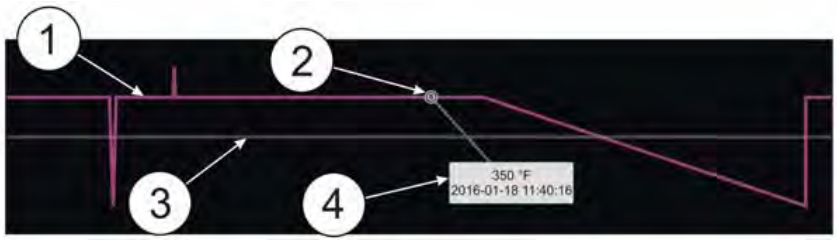


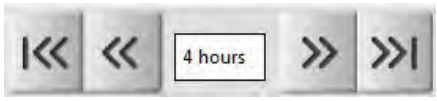
Figure 8-6 History Plot Curve Data

8.3.2 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.

8.3.3 Process History Time Range

Touch the Old date and time field to change it. The New date and time 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 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 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.

8.3.4 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.

8.3.5 Variable Selections

You have a choice of variables to plot:

- Analog Inputs ('In Use' only - set on the Analog Inputs screen, Section 7.3)
- Heat Zones
- Process Monitoring (Cycle Time)

For 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 shows (Figure 8-7).

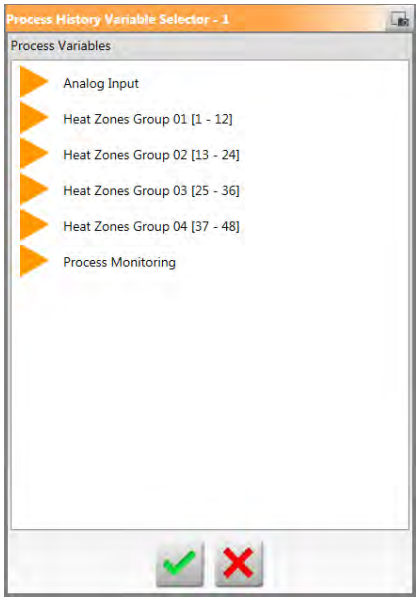


Figure 8-7 Process History Variable Selector Dialog

2. On the Process History Variable Selector dialog, touch the minimize/maximize 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.

8.4 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. Refer to Figure 8-8.

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

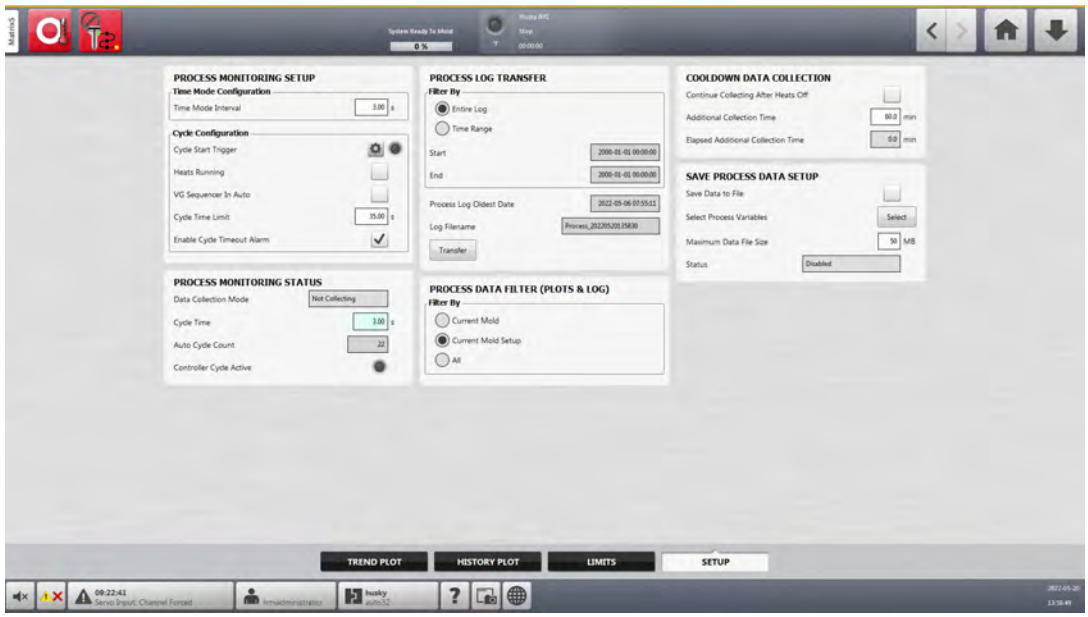


Figure 8-8 Cycle Mode and Time-Based Mode Data Collection Settings

Table 8-3 describes the items on the Setup screen.

Table 8-3 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 Signal	Set the signal used to start cycle data collection.
Heats Running	Enable this cycle mode condition if you want data collection only if the heats are ON.
VG Sequencer in Auto	Enable this cycle mode condition if you want data collection only if the VGSC is in Auto mode.

Table 8-3 Process Monitoring Setup Selections (Continued)

Item	Description
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 set by the Time Mode Interval. 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 VGSC is in cycle mode or time-based mode data collection.
Cycle Time	Shows the cycle time.
Auto Cycle Count	Shows the total number of cycles while in Auto mode.
Controller Cycle Active	The indicator illuminates when a cycle is active.
Process Log Transfer (panel)	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 (panel)	Filter which process variables are shown on the Trend and History Plot screens, and saved in the Process Log. The selections are: • Current Mold • Current Mold Setup • All (available data) The default is the Current Mold Setup (when the controller is first started).
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 VGSC continues the data collection.

Table 8-3 Process Monitoring Setup Selections (Continued)

Item	Description
Elapsed Additional Collection Time	Shows the elapsed time of the Additional Collection Time.
Save Process Data Setup (panel)	Used to save a process data file to a shared network directory.

8.4.1 Time Mode Configuration

Time mode is used in operations when data collection is not cycle dependent and data must be collected at a timed interval. You can set how often process data is sampled. The value can be set from 2 to 300 seconds. The default time is 3 seconds.

During data collection, the selected data is sampled at approximately the same time. The zones do not have to be At Temperature.

NOTE: Time mode data collection is not done when the heats controller is in Stop, ART, Calibration, or Diagnostics modes.

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

1. From the Home screen, touch the **Process Monitoring** button.
2. Touch the **Setup** tab.
3. Touch the **Time Mode Interval** field.
4. Type the number of seconds in which the data must be sample and then touch the **Accept** button.

8.4.2 Cooldown Data Collection

You can continue data collection for an interval of time after the controller has stopped. In the Cooldown Data Collection panel of the process Limits screen, you can set a time value from 1 to 180 minutes. The default value is 60 minutes. When the timer expires, the data collection stops.

NOTE: Cool down data collection is only available if the controller is configured with temperature control. This feature will only work when the controller changes from the Running, Standby, or Boost state to the Stop state.

To set and enable the cool down data collection timer, do the steps that follow:

1. From the Home screen, touch the **Process Monitoring** button.
2. Touch the **Setup** tab.
3. Touch the **Additional Collection Time** field and type the time you want the controller to continue its data collection after the controller has stopped.
4. Touch the **Accept** button.
5. Touch the **Continue Collecting After Heats Off** check box, so the check mark shows.

8.4.3 Cycle Mode Configuration

You can set the Altanium VGS system to cycle mode data collection. Data collection starts at the rising edge of the selected cycle start signal. The time mode data collection stops.

To use the cycle mode configuration, the Altanium VGS controller must have heats installed.

The cycle mode configuration can also be used when the Cycle Input signal is selected for use when the Altanium controller is configured for heats only.

To set the cycle mode configuration, do the steps that follow:

1. From the Home screen, touch the **Process Monitoring** button.
2. Touch the **Setup** tab.
3. Touch the **Cycle Start Trigger** gear button. The Configure Signal dialog window shows (refer to Figure 8-9).

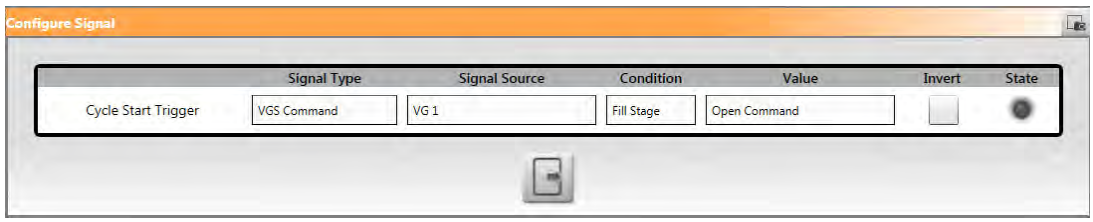


Figure 8-9 Configure Cycle Start Trigger Window

4. Select the signal type and related source, condition, and value to configure a start signal.
5. Touch the **Heats Running** check box, so the check mark shows, if applicable.
6. Touch the **VG Sequencer In Auto** check box, so the check mark shows, if applicable.

For information on data collection start and stop conditions, refer to the Data Recording chapter of the Altanium Matrix5 User Guide or Altanium Delta5 User Guide.

Appendix A Glossary of Terms

Table A-1 gives the definitions for terms used in this user guide.

Table A-1 Glossary of Terms

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.
Delta5	15.6 inches operator interface for Hot Runner, UltraSync-E, and Valve Gate control.
ft	Foot or Feet
HMI	Human Machine Interface
HRC	Hot Runner Control
Hz	Hertz
I/O	Input/Output
ICC	Intelligent Control Card
Imperial	Imperial Units or British Imperial Units (measurement)
IMM	Injection Molding Machine
in	Inch or Inches
Integrated TX (Input Power)	WYE 3PH Transformer Secondary supply power is used.
kg	Kilograms
Kwh	Kilowatt hour
lb	Pound(s)
LOTO	Lockout Tagout
m	Meter(s)
mA	Milliampere (or milliamp)
Matrix5	21.5 inches operator interface for Hot Runner, UltraSync-E, Mold Servo, and Valve Gate control.
mm	Millimeter(s)
OPC UA	Open Platform Communication Unified Architecture

Table A-1 Glossary of Terms (Continued)

PCM	Priority Control Mode
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.
SPI	Society of Plastics Industry
TXT	Text (file)
VAC	Volts Alternating Current
VDC	Volts Direct Current
VGS	Valve Gate Sequencer
VGSC	Valve Gate Sequencer Controller
VNC	Virtual Network Computing
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 or during configuration selections. 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 VGS 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 VGS.	The display module has no power.	Make sure that the power cable from the VGSC stack is correctly connected to the display module. Refer to Figure 2-1 and Figure 2-19. 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.

Table B-1 Startup Troubleshooting (Continued)

Problem	Potential Cause	Solution
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 VGSC cabinet, or the interface cables between the IMM and the VGS,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 Q31 Circuit Breakers

The Q31 circuit breakers give protection to the 24 VDC signal/sensor power pins X300:1, X302:1, X303:A1, X303:A4, X303:A7, X303:B1, X303:B3, and X304:A1 inside of the controller. If you accidentally short one of these pins out to ground, the Q31 circuit breaker will trip (open). The circuit breaker must be manually reset by qualified personnel after the short circuit is corrected.

To reset the Q3 circuit breakers:

1. Do the Lockout/Tagout procedure on the controller.
2. Remove the front air duct cover (Figure B-1).

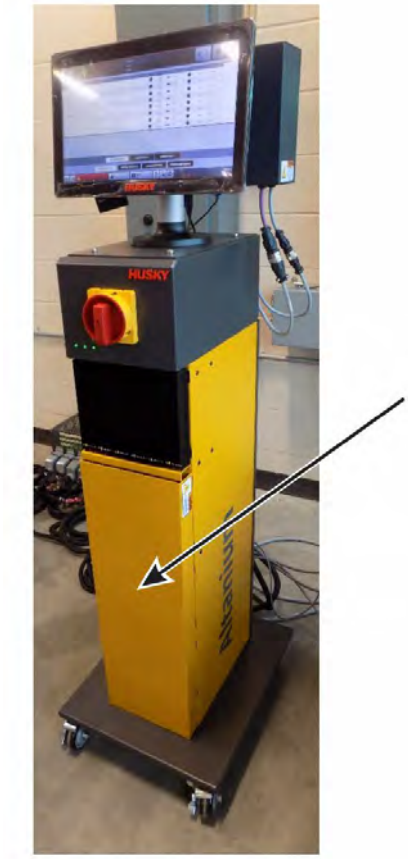


Figure B-1 Air Duct Cover

The circuit breakers are in the second and forth bays from the bottom of the VGSC cabinet (Figure B-2).

The circuit breakers are identified as P6 and P8 in the electrical schematics. Tripped circuit breakers will have their switch in the OFF (downward) position. All switches must be up, in the ON position to operate.

Figure B-2 Circuit Breakers Location - Second Bay

NOTE: On a four-circuit VGS controller, the circuit breakers are in the bottom bay of the VGS cabinet. They are identified as P7 in the electrical schematic.

NOTE: On a twenty-circuit or extended I/O VGS controller, the circuit breakers are in the bottom and third bays of the VGS cabinet. They are identified as P7 (bottom bay) and P9 (third bay) in the electrical schematic.

3. Move the tripped circuit breaker to the ON position (Figure B-3).

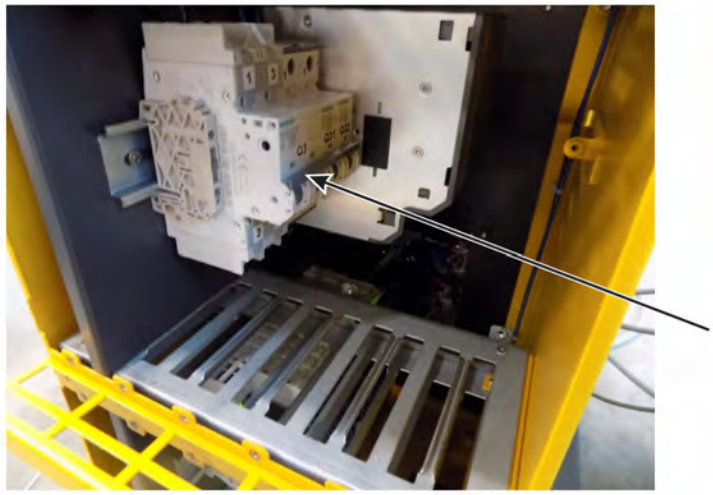


Figure B-3 Circuit breaker Switches in the ON (Up) Position

4. Install the front air duct cover (Figure B-1).
5. Energize the controller and do a functional test.

B.3 VGS Controller Alarms

The subsections that follow describe the VGS controller alarms.

B.3.1 FAULT STOP IMMEDIATE

When this alarm shows, all valve gates are immediately sent a close signal state, as long as system is 'At Temperature' or in an acceptable timeframe after 'At Temperature' starts to decrease. All motion command requests (internal/external inputs and buttons to Open/Close) are disabled.

- If the system goes back to 'At Temperature' while this is active, the valve gates will not automatically move.
- If a different auto-close condition occurs, the valve gates will not automatically move until you have cleared all of the conditions and the system has entered a safe and ready operation state.

This signal is OR'd with the Fault Stop Immediate bit from other subsystems.

B.3.2 STOP END OF CYCLE

When this alarm shows, there is no valve gate movement after the end of the current cycle has completed. Until the end of the cycle, all valve gate movement will occur as usual.

This signal is OR'd with the Stop End of Cycle bit from other subsystems.

B.3.3 LOST AT TEMPERATURE

This alarm shows if the 'At Temperature' status is lost (signal changes to FALSE) while a valve gate is open. No alarm is shown if all valve gates are closed.

All valve gate movement stops at the end of the cycle or after 20 seconds (the faster of the two actions).

You cannot manually trigger valve gate movement as soon as 'At Temperature' status is lost. There is no delay to this response.

This alarm can occur in Manual and Auto modes.

B.3.4 OUTPUT SIGNAL STATE ERROR

Solenoid output signals are looped back to a monitored input signal (not seen on the HMI). An alarm shows during the conditions that follow:

- Output State is HIGH in the HMI, but the monitored input is LOW
- Output State is LOW in the HMI, but the monitored input is HIGH

Because the monitored input is compared with the expected Output (not the actual Output), it can find problems with the Output Signal wiring.

There is a 5 ms delay before the alarm is shown. This makes sure that the normal state changes (physical output to change states, physical input to read state changes) do not trigger a false alarm.

This is a Fault Stop Immediate condition. Refer to Section B.3.1.

This alarm can occur in Manual and Auto modes.

B.3.5 VGS CYCLE TIMEOUT WARNING

This warning shows if the Cycle Time Limit completes before the cycle ends.

- This does not stop the VGSC from sequencing.
- This does not stop the next cycle from starting.

This alarm is shown in Auto mode, only.

B.3.6 VALVE STEMS OPEN OUTSIDE OF VGS CYCLE WARNING

The valve gate states are always monitored; not only during the VGS cycles. If one or more valve gates opens while they are not in a cycle, a warning is shown for each valve gate that is open.

This alarm is shown in Auto mode, only.

B.3.7 VGS ENABLE INPUT IS LOW

The VGS Enable input is always monitored. This alarm shows if the VGS Enable signal changes to LOW, unless the VGSC is in Disabled mode.

This is a Fault Stop Immediate condition. Refer to Section B.3.1.

This alarm is shown in Manual and Auto modes.

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