# **Altanium Temperature Controllers**

Designed to provide the industry's most consistent part quality



## Benefits

- 2 to 254 zones of control
- Simple and intuitive operation
  Interchangeable cards and interfaces across the entire
- product line
- Active Reasoning Technology (ART)
- Automated mold diagnostics
   Large, intuitive, full color touchscreen
- Multi-mold set-up storage
- USB support for importing and exporting data
- Password enabled security
- Multi-language support

Accurate temperature control is essential in maintaining and optimizing the injection molding process and has a direct impact on processing window, part quality, gate vestige and part properties. The temperature controller plays a crucial role in ensuring part-to-part and shot-to-shot consistency. Having a high level of control not only helps produce better quality parts, but also helps drive down part costs, improve productivity and streamline operations. Recognized throughout the industry for their accuracy and ease of use, Husky's family of Altanium<sup>™</sup> temperature controllers provide two to 254 zones of control for maximum flexibility and configurability. Precise temperature control is achieved through the use of Active Reasoning Technology (ART). Large full color touchscreens with intuitive interfaces enable uncomplicated configuration and monitoring. Easy to use, sophisticated diagnostic routines allow tooling issues to be identified and corrected with minimal downtime.



## ART Advantage

Husky's Altanium product line achieves optimal control through the application of Active Reasoning Technology (ART), a combination of software and hardware architecture that is unique in the industry.

#### Intelligent temperature control

Requiring no intervention by the user, ART is able to generate a parameter set to precisely fit each zone's unique thermal response characteristics. Once the optimal control algorithm has been calculated, ART utilizes a modulation method that delivers a rapid, uniform flow of power to the heaters, minimizing deviations in temperature. Using a technique known as oversampling, the integrity of the temperature signal is preserved, allowing the algorithm to execute power changes based on the most accurate data. Additionally, isolated thermocouple inputs assure the reliability of incoming temperature measurement by providing a high degree of immunity to electrical noise. The outcome is the industry's most accurate and repeatable control, regardless of the hot runner system or processing environment.

Automatic thermocouple recovery In addition to optimizing temperature control, ART maps the thermal profile of each zone and compares this data with the average power output and setpoint of all zones in the mold. Using these factors, ART is able to accurately establish which zones have matching control characteristics. In the event of thermocouple failure, ART uses this intelligence to automatically maintain closed loop control by slaving the similar zone's thermocouple.

#### Benefits:

- Rule set and tuning algorithm are specifically optimized for hot runner temperature control
- Generates a parameter set to precisely fit each zone's unique thermal response characteristics
- Is fully automated and does not require any classification of zone type before initiating the tuning process
- Pairs zones and uses this information as an automated defense against thermocouple failure (auto slave)
- Employs a predictive element in the algorithm to inhibit overshoot (from a cold start) and undershoot (in situations where there is excessive shear heat)

Allocate and store up to 24 individual mold set-ups while assigning a unique name to each



Allows automatic diagnosis of problems within the mold and enables data to be compared from two different tests to determine if there is any preventative maintenance to be performed



Simple to operate with intuitive navigation

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### **Key Features**

#### Automated mold diagnostics

As a standard, Altanium includes highly accurate mold diagnostics and troubleshooting features that perform automated tests on individual or multiple zones. Once the analysis is complete, the results can be viewed in a comprehensive format that precisely locates faults so they can be quickly repaired. Altanium is also capable of rewiring crossed wired zones and can compare parameters against a baseline to determine if preventative maintenance should be performed.

#### Test for:

- Voltage delivery to each heater (X Card only)
- Thermal response and correct electrical wiring
- Detection of open, reversed or pinched thermocouples
- Kilowatt hour (kW-h) usage
- Resistance and wattage measurement for each heater (X Card only)
- · Zone-to-zone thermal analysis

#### Benefits:

- Faster and more accurate diagnosis of mold problems to reduce downtime
- Accurate accounting of power usage and associated cost to reduce operating costs
- Soft rewiring of mis-wired molds
- Heater failure detection
- Mold leak detection

#### Plastic Leak and Heater Failure Detection

The real-time power deviation monitoring feature provides early warning detection of resin leaks or heater failure in the mold.

#### Benefits

- Mold leak detection decreases downtime and operating costs
- Heater failure detection addresses issue before part quality is compromised

#### Resin Leak



- As plastic fills the nozzle bore, it will increase the heat losses to the gate insert and can affect the thermocouple connection in the nozzle body
- Additionally, a plastic leak in the manifold pocket can bridge the air gap and pull heat away from the manifold
- Both of these conditions will result in a sharp increase in duty cycle to maintain setpoint
- The Altanium monitors these variations in real-time and triggers an alarm to alert the user of a possible leak in the mold

#### Heater Failure

Single Control Zone



- Some hot runner designs include zones that bridge heaters in parallel controlled by a single thermocouple
- If one of these heaters were to fail, it would be difficult to detect the specific location of the problem
- Additionally, the functional heater would run hotter to compensate for the loss of the second heater and overheat the steel and degrade the resin
- The Altanium monitors these variations in real-time and triggers an alarm to alert the user of a possible heater failure in the mold

#### Simplicity of architecture

- Interchangeable card design—Reduces maintenance costs
- Single board integrity—Reduces mechanical connections, increasing reliability
- Board level diagnostics—Reduces downtime due to excessive troubleshooting
- Integrated power supply, microprocessor, thermocouple and communications on a single card—Lowers cost of ownership due to less spares to stock
- Distributed control design—Ensures the shortest response time, resulting in the most accurate and repeatable tempera-



Interchangeable card design from two to 254 zones together with single board integrity delivers flexibility and reliability.

#### ture control

#### Thermocouple input isolation

With Altanium, all thermocouple measurement circuits are electrically isolated from the ground. This prevents the flow of current on the thermocouple lines, which eliminates any measurement errors or damage to the card.

#### Benefits:

- More accurate and reliable temperature measurement, resulting in a more stable process +/- 1°C
- Lowest possible operating temperature, providing the fastest possible moldingcycles
- Increased part quality and less scrap
- Reduced energy consumption

#### Phase Angle or Zero Cross

Altanium provides the ability to switch between Phase Angle and Zero Cross power control for each zone.

- Phase Angle: Uniform flow of power reduces the period of time that current is not being supplied to the heater and the ability to limit applied voltage for low voltage control
- Zero Cross: Switches at 0V eliminating electrical noise that can disturb sensitive equipment on or adjacent to the controller supply lines

#### Benefits:

- Optimized power delivery to heater based on controller operating conditions and heater's thermal response
- Provides the best method for extending heater life by applying low voltage to evaporate moisture trapped in heater body

#### Wet heater bake-out

Altanium performs a ground fault test on each zone prior to applying full power to the heaters. In cases were moisture is detected, the system will automatically switch to a low voltage mode and gradually evaporate the humidity from the heater without risk of damage.



Altanium provides wet heater bake-out that evaporates humidity from the heater to reduce the risk of damage.

#### Digital input and output (I/O) signals

The mold is the center of the manufacturing cell and should be protected at all costs. The best way to protect against damage is a closed loop interlock circuit that ensures the controller and machine are in constant communication.

With Altanium, the following signals are provided to mitigate this risk:

- At-Temperature Output—Inhibits injection until the mold is at processing temperature
- PCM Output—Stops the injection molding machine from cycling if the controller stops heating the mold
- Remote Standby Input—Brings the processing setpoint to a lower temperature if the machine stops cycling

This connectivity enables both pieces of equipment to make informed decisions, based on the state of the other, which ensures the integrity of the process and the tool.



Available digital input and output signals provide the best line of defence against damage to the mold.

## Altanium Controller Platforms

Choose between Altanium Neo2<sup>™</sup>, Delta3<sup>™</sup> and Matrix<sup>™</sup> controllers, which feature interchangeable Altanium operator interfaces that provide single point access to fast and accurate information.

#### Altanium Neo2

Altanium Neo2 provides the advantages of a fully integrated controller in a compact package at an entry-level price. This control platform offers two to 48 zones of control and is equipped with 16 amps per zone, making it flexible enough to handle a wide variety of applications. Altanium Neo2 offers a user-friendly full color interface and has easy to use, yet sophisticated, diagnostic routines that allow tooling issues to be identified and corrected with minimal downtime. The advanced security system prevents unwanted process changes, eliminating unwanted operator interference.

#### Altanium Delta3

Our newest temperature controller, Altanium Delta3, provides premium performance and functionality at an affordable price. With support for up to 128 zones, large full color interactive touchscreen and broad range of features, Delta3 is ideally suited for applications from 24 to 96 cavities, for any market. Utilizing Active Reasoning Technology (ART) and the same integrated control card set as all Altanium controllers, Delta3 provides accurate, repeatable control on a flexible, reliable platform that is cost effective and easy to maintain. Delta3 employs a new, smartphone inspired interface design that greatly enhances usability by minimizing the navigation layers that menu driven systems require - to ensure any screen is no more than a button press away. This, coupled with greater zone data configurability, better auditing of user interactions, increased connectivity

and enhanced troubleshooting tools, makes Delta3 the right choice to meet any molder's demanding requirements.

Additional Delta3 features include:

- Plastic leak detection
- Remote monitoring and network data transfer
- Process trend graph and automated mold diagnostics that allow for faster and more accurate analysis of problems
- Four user definable digital I/O interlocks included as standard
- Historical event auditing
- Remote loading of hot runner process setup from the machine or mold
- Part counting function for tracking when part container is full
- Plastic leak detection

#### Altanium Matrix

With accurate temperature control in a flexible modular design, Husky's Altanium Matrix offers up to 254 zones of control. Enclosure options, user interfaces and diagnostic tools are configurable to meet the needs of any molding environment. Comprehensive diagnostics with a userfriendly full color graphic interface allow the Matrix to provide instant access to numerous functions with point-and-push simplicity.

## Altanium's modular design offers the highest levels of configuration flexibility.



Altanium Matrix Freestanding.

This configuration is available for up to 254 zones of control and can incorporate an integrated transformer enclosure.



#### Altanium Delta3

This configuration is available for up to 128 zones of control utilizing Active Reasoning Technology (ART).



#### Altanium Neo 2 12 zone.

This configuration is available for up to 24 zones of control in a single compact package with an integrated operator interface.



### External Machine Mount.

This configuration allows the controller to mount directly to the outside of the injection molding machine, saving valuable floor space.



#### Mold Mount.

This configuration mounts directly to the mold, eliminating costly cables. This patented design is exclusive to Husky.

## Intelligent Control Cards

All Altanium Intelligent Control Cards (ICC2) come standard with two zones per card at 16 amps per zone and are fully interchangeable across all mainframe designs. The externally mounted heat sink and integrated design reduce maintenance cost and downtime.



Function / Features	XL	х
Integrated design with external heat sink	•	•
Active Reasoning Technology	٠	•
Mechanical relay on non-switched leg	•	•
2 zones per card @ 16A each	•	•
Run with grounded or ungrounded thermocouples	•	•
Thermocouple slaving (auto and manual)	•	•
Zero-Cross or Phase Angle power output control	•	•
Cards interchangeability	•	•
Automated mold diagnostics	•	•
On screen board diagnostics	•	•
Plastic leak detection alarm	•	•
High precision (0.1 Degree)	•	•
2 year warranty (standard – including interface)	•	•
Real-time voltage and amperage measurement		•
Real-time wattage and ohm calculations		•
Ground fault detection		•
Multi-cycle wet-heater bake-out		•
Current deviation detection		•



Altanium X and XL Series Intelligent Control Cards.

#### **Technical Specifications**

Operating Ambient Temperature	32° to 104°F (0° to 40°C)	
Storage Temperature	-4° to 140°F (-20° to 60°C)	
Humidity	0 to 95% RH, non-condensing	
Input Power	1-Ph + E (3 wire) 200-240 VAC 3-Ph + E (4 wire) 200-240 VAC 3-Ph + N + E (5 wire) 380-415 VAC Other voltages require an input supply transformer (Supply requirements for functional integrity 190 to 240 VAC)	
Frequency Range	50/60 Hz, +/- 5%	
Measurement Accuracy	$\pm 1.0^\circ F$ (0.5 °C) for the range 32 $^\circ F$ to 932 $^\circ F$ (0 $^\circ C$ to 500 $^\circ C$ )	
Calibration	Standard (using a NIST traceable thermocouple source)	
Cold Junction Error	±1.0°F (0.5°C) @ 77°F (25°C) typically	
Temperature Stability	$\pm 0.1^\circ F$ (0.05°C) / °F (°C) from ambient	
Control Stability	±1 digit - under steady state conditions	
Tuning Method	Active Reasoning Technology (ART) or Manual PID control	
Thermocouple	Grounded or Ungrounded Type J standard (Type K optional); Sensor break and reverse detection; Upscale failure mode; High impedance input with zone to zone isolation	
Heater Outputs	All zones rated at 240 VAC (Other Voltages Optional); 16 Amps per zone standard. (20 or 30 Amps Optional); Short circuit protection for each zone (both legs fused)	
Alarms	Open Circuit Heater; Open Circuit Fuse(s); High and Low Temperature; Open, Shorted or Reversed Thermocouple(s) Ground Fault	

## Husky Injection Molding Systems www.husky.ca

 Head Office
 Canada •Tel. (905) 951 5000 • Fax (905) 951 5384

 Asia
 China • Tel. (86) 21 2033 1000 • Fax (86) 21 5048 4900

 Europe
 Luxembourg • Tel. (352) 52 11 51 • Fax (352) 52 60 10

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