



# TempMaster™ series M2+ PLUS

## ADVANCED, FULLY FEATURED CONTROL FOR SUPERIOR MOLDING PERFORMANCE IN ALL APPLICATIONS

CONSUMER GOODS



MEDICAL



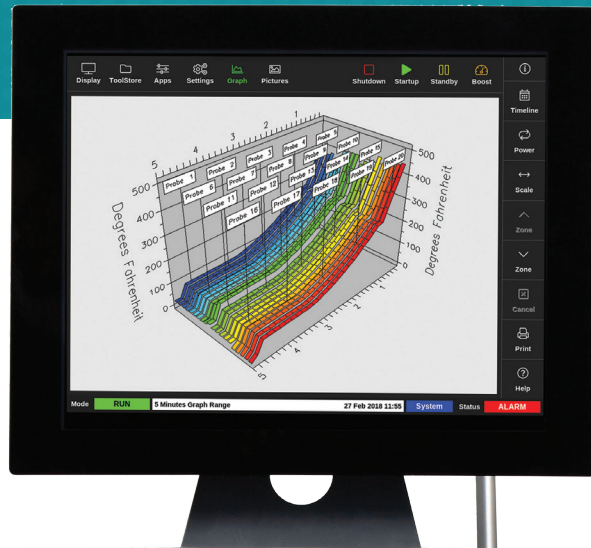
ELECTRONICS



PERSONAL CARE



SUSTAINABILITY



CAPS & CLOSURES



THIN WALL PACKAGING



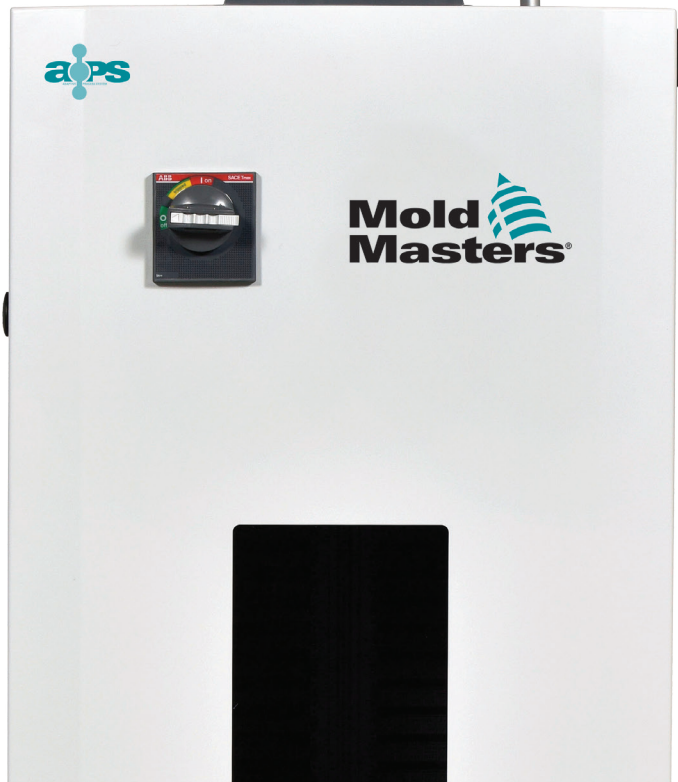
PET (DRINK BOTTLES/PREFORMS)



AUTOMOTIVE



BIO-RESINS



# PRECISE APS CONTROL TECHNOLOGY

All TempMaster controllers feature **APS** (Adaptive Process System) technology. **APS** is the industries leading heat control algorithm delivering unmatched precision and reliability. Optimize the performance of any hot runner system and unlock your operations full potential with TempMaster.

**APS** continuously monitors and adjusts system temperature. Making almost instantaneous micro adjustments every 20ms ensures mold temperatures are maintained with the highest degree of precision, varying only the slightest amount from set point. The result is the most precise control in the industry with accuracy of 1°F.

## APS TECHNOLOGY HELPS TO:

- Enhance Part Quality.
- Reduce Scrap.
- Improve Part Consistency.
- Lower Power Consumption.
- Maximize Profit Margins.



Precise control. Set-point is maintained.



Less control. Set-point fluctuates.

# ADVANCED MODULAR CONTROL CARDS

## HIGH CAPACITY DESIGNS

- Reduces card requirements by up to 66% compared to competitive systems.
- Minimizes cabinet dimension requirements.
- Lowers costs.

## ALL-IN-ONE CARD DESIGN

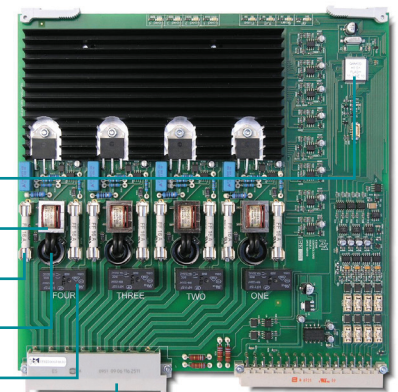
- On-board heater and thermocouple fuses.
- Eliminates the need to pull apart the cabinet.
- Minimizes cabinet wiring.
- Simple to service and maintain.

## UNBEATABLE RELIABILITY

- 5 year warranty.
- Minimal maintenance requirements.
- Reduced spare part inventory requirements.

## SERVICE FRIENDLY

- LED status lights make it quick and easy to identify issues.
- Cards can be swapped out in seconds.
- Significantly reduces downtime.

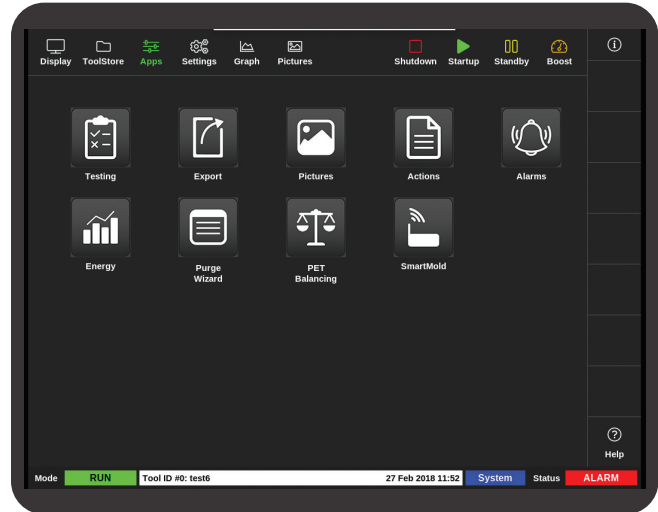


- New faster CPU
- Current measurement
- Dual line fusing
- Ground fault detection
- Dual line switching
- Reliable bus connector

# INTUITIVE TOUCH SCREEN CONTROLS

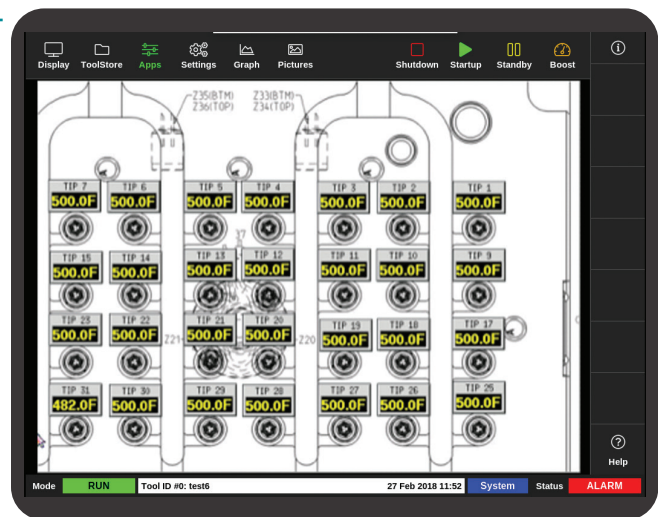
Featuring a completely overhauled modernized interface, control screens are designed to be highly intuitive and efficient. Information and functionality is quickly accessible and users are often comfortable enough to start molding right away with no training. M2+ takes full advantage of our large screen sizes and instantaneous response rates for an experience like no other. For those not quite ready for change, the classic appearance is still available.

- Temperature Actual
- Temperature Range
- Temperature Min.
- Temperature Max.
- Temperature Deviation
- Deviation Alarms
- Power % Output
- Current (A)
- Volts
- Watts & Kw per hour
- Resistance (ohms),
- and more

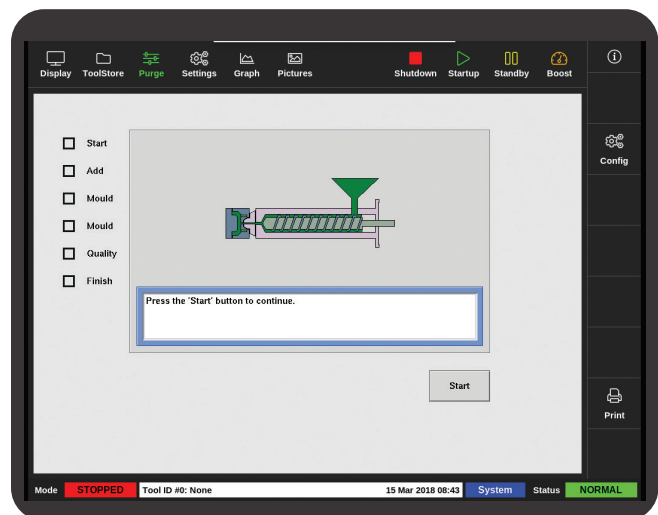


## Easy View

Quickly and easily identify zones with the intuitive “Easy View” zone naming software. Simply upload a mold image or GA drawing and drag, drop and customize zone labels. Attach zone labels and adjust temperature setting directly on the GA drawings or mold images. Greatly simplifies complicated molds and work environments. Improves operator experience and convenience.



Purge Wizard provides an intelligent step by step guide to clear resins from the system for faster color changes. Takes into account resin type, temperature and the IMM. Minimizes downtime to keep your operation in production.



# PREMIUM FEATURES

## Cutting Edge Touch Screen Technology

M2+ now boasts large, tablet like, crisp hi-resolution displays with instantaneous response to touch inputs. Users can now make adjustments to process values and navigate screens without any noticeable delay. Data is displayed in real time (no avg.) and even incorporates familiar gestures like pinch-to-zoom.

## Most Compact Cabinet Dimensions in its Class

Up to 57% more compact overall dimensions and up to 53% smaller footprint than competitive systems. Preserves a significant amount of valuable space and makes units easier to handle.

## Multiple, Interchangeable Card Options

Select the perfect mix of control cards to configure the controller to your operations application, power consumption needs and space requirements. Take advantage of high zone cards and reduce your card requirements by up to 33%.

### CARD OPTIONS INCLUDE:

- 6 Zone (5A ea) – Hot Runner Tips
- 4 Zone (15A ea) – Hot Runner Tips, Bridges, Manifolds
- 2 Zone (20A ea) – Manifolds (Large)
- **NEW** 2 Zone (30A ea) - Manifold (X-Large)
- 1 Zone (40A ea) – Manifolds (X-Large)
- **NEW** 1 Zone (30A ea, 3 Phase-480V) - Automotive

## QUICK REFERENCE CONTROL CARD INDICATOR LED'S

- Displays Scan, Fuse, T/C Failure, Ground Fault and Power %.
- Easily check the status of each card and identify issues through the cabinet window.
- Greatly improves operational efficiency and reduces downtime.

## WIRELESS NETWORK CONTROL

- Multi Cell Operation.
- Multiple IP Operation.
- Download/Upload Tool Setup.
- Excellent solution for clean room applications.



# EXPANDABLE CONTROL PLATFORM

Integrate a wide range of options into the M2+ to monitor and obtain full control of the entire molding process from a single, centralized point. Improve part quality, eliminate unnecessary equipment and streamline operational costs with M2+.

## Advanced Control Options\*

**SVG Sequential Valve Gate**  
(Pneumatic or Hydraulic)



**E-Drive Synchro Plate**  
(Electric)



**M-Ax Servo Motion Axis**  
(Linear or Rotary)



**E-Multi Auxiliary**  
Injection



## Water Flow Monitoring

Coolant flow and temperature are often critical factors in the consistent production of quality molded parts. Our modular manifold features electronic flow sensors with no moving parts that easily tolerate contaminated water. Available to handle a range of capacities from 1 Lpm (0.26 gpm) up to 150 Lpm (40 gpm).



### MONITOR:

- Water Temperature
- Delta T
- Volume/Flow Rate
- Reynolds #
- Pressure
- Delta P

## Communication Ready

M2+ is compatible with several industry standard protocols for easy integration and data processing with the injection molding machine and auxiliary equipment. Allows for greater capabilities.



## Daisy Chain Capable

Connect control cabinets and increase your number of zones. Control multiple cabinets and over 500 zones from a single HMI.



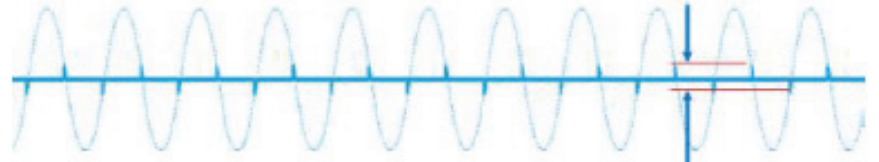
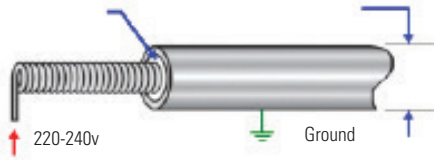
# PROTECTION & DIAGNOSTICS

## Soft Start

Heaters can be severely damaged from arcing in damp conditions. Soft start eliminates this risk by using low voltage Phase Angle Firing to dry out heaters on start-up. Significantly extends the life of your equipment.

Insulation material, typically magnesium oxide, is hygroscopic (absorbs moisture). When insulation is damp, high voltage arcing across to ground can occur.

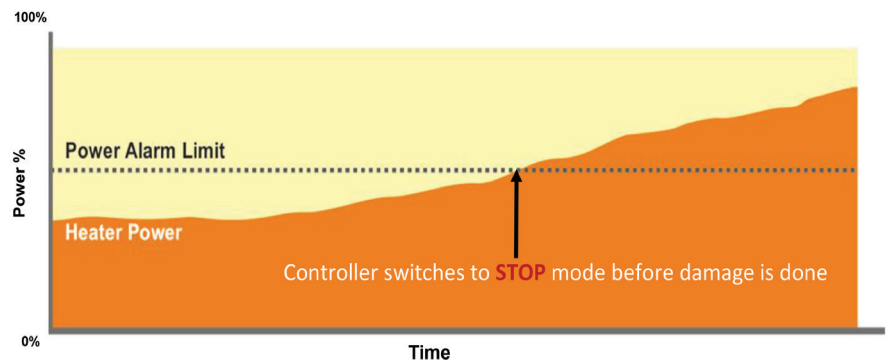
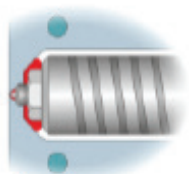
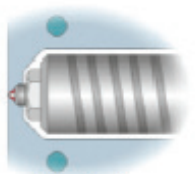
Steel tube, swaged down to as little as 2mm diameter.



Phase Angle Firing (requires a fast, dedicated CPU)  
Controller begins soft start at very low voltage levels, eliminating the possibility of heater arc over.

## Plastic Leak Detection

Plastic leakage can result in costly repairs and extended downtime to fix. This protection feature continuously monitors for unusual power consumption increases and automatically stops the process before damage is done.



## Low Mass, High-Watt Density Nozzle Control

Specialized, separate control for smaller more sensitive nozzles and their unique thermal characteristics. Improves power balance and performance. Especially valuable in molds utilizing a range of nozzle sizes.

## Continuous Ground Fault Detection

The system monitors itself for power level loss to prevent compromising the molding process and maintain consistent production quality. Quickly notifies operator for fast corrective action.

## NEW

## Rapid Automatic Tool Diagnostics

Now 4x faster, tool test diagnostics can be completed in as little as 15 minutes. Minimize costly downtime and identify issues early.

Control Features	TS8	TS12	TS17
APS (Adaptive Process System)	S	S	S
Low Mass High Watt Nozzle Control	S	S	S
Phase Angle, Burst Firing	S	S	S
Infield Calibration Mode	S	S	S
Thermocouple Slave (Manual)	S	S	S
Thermocouple Slave (Auto)	S	S	S
Auto Standby/Alarm Output	S	S	S
T/C Auto/Man Kick-Off	S	S	S
Wet Heater Bakeout	S	S	S
T/C Filtering	S	S	S
Delta/Wye Convertible Option	S	S	S
Circuit Breaker Sized to Load	S	S	S
Interface Autopilot Control	S	S	S
Set Point Limit	S	S	S
Set Power Limit	S	S	S
Auto Load % Output	S	S	S
Uniform Start-Up	S	S	S
Standby Timer	S	S	S
Even Heat (controlled heating)	S	S	S
Even Cool (controlled cooling)	S	S	S
Sequential Melt-Start	S	S	S
Mold ID	S	S	S
Daisy Chain Enclosures	-	-	S

Protection Features	TS8	TS12	TS17
On-Board Load Fuses	S	S	S
On-Board T/C Fuses	S	S	S
Soft Start	S	S	S
Continuous Ground Fault Detection	S	S	S
Current Measurement	S	S	S
Overload Protection	S	S	S
Short Circuit Protection	S	S	S
Automatic Tool Diagnostics	S	S	S
Plastic Leak Detection	Auto	Auto	Auto
IO Card (Interlock with IMM)	S	S	S
LED Fault Indicators	5	5	5

Alarms	TS8	TS12	TS17
Audible Alarm	S	S	S
Alarm Beacon	S	S	S
Zone Alarm Configure	S	S	S
(+) High Temperature	S	S	S
(-) Low Temperature	S	S	S
T/C Open (remembered % output)	S	S	S
T/C Reversed	S	S	S
Open Fuse	S	S	S
Open Heater	S	S	S
Shorted Heater/Wet	S	S	S
Ground Fault Detection	S	S	S
Plastic Leak Detection	S	S	S

"S" = Standard, "O" = Optional, "-" = Not Available

Operational Features	TS8	TS12	TS17
Auto/Manual Control	S	S	S
Zone "on", "off" and "locked off"	S	S	S
Menu "Auto Save"	S	S	S
Tool Store	200	200	200
USB Port	S	S	S
Zone Naming	S	S	S
Touch Screen Calibration	S	S	S
Programmable Groups	S	S	S
Sequence Start	S	S	S
Sequence Shutdown	S	S	S
Sequenced Power Up (Manual)	S	S	S
Tool/Data Export/Archive	S	S	S
Multi-Level Password	UNLTD	UNLTD	UNLTD
Time and Date Change	S	S	S
Networking Printing (Ethernet IP)	S	S	S
On-line Help	S	S	S
Purge Wizard (Color Change)	S	S	S
HR Performance Tracking System	S	S	S
Boost (Automatic)	S	S	S
Boost (Manual)	S	S	S
Operator ID	S	S	S
LAN Network	S	S	S
WLAN Network	-	-	S
Wireless Control (WiM2)	O	S	S

Monitoring/Reporting	TS8	TS12	TS17
Instant Data Reporting	S	S	S
Data Report Archive	S	S	S
Print Screen in jpg, png, pdf format	S	S	S
Save to USB Drive	S	S	S
Historical Graph	3-D	3-D	3-D
Easyview	S	S	S
Alarm History	S	S	S
Power Consumption Monitoring	S	S	S
Bar Graph Display (Temp/Power%)	S	S	S
Event Log	UNLTD	UNLTD	UNLTD
Spreadsheet View	S	S	S
Bar Graph Overview (All Zones)	S	S	S

Communication	TS8	TS12	TS17
SPI	S	S	S
OPC-UA	-	S	S
Real VNC	-	S	S
MODBUS	-	S	S

Expandable Options	TS8	TS12	TS17
SmartMOLD	-	O	O
Water Monitoring	O	O	O
SVG (Sequential Valve Gate)	-	O	O
E-Drive (Syncro Plate)	-	O	O

# SPECIFICATIONS

<b>User Interface</b>	Full Color LCD Touch Screen
<b>Display Sizes</b>	8" (203mm), 12" (305mm), or 17" (432mm)
<b>Control Algorithm</b>	APS (Adaptive Process System)
<b>Power Control</b>	Phase Angle and Burst Firing Modes (Time Proportional, Zero-Crossing)
<b>Temp. Display Resolution</b>	0.1 (°C or °F)
<b>Power Response Time</b>	8.3 ms at 60 Hz
<b>Temperature Scale</b>	°C or °F (Software Selectable)
<b>Thermocouple</b>	J or K-Type (Software Selectable)
<b>Operating Range</b>	0 - 472°C (32 - 882°F)
<b>Output Voltage (Max)</b>	264 VAC
<b>Supply Voltage</b>	200/240V 3P Delta or 380/440V 3P Star (480V, 3P with transformer)
<b>Frequency</b>	50 - 60 Hz Automatic Switching
<b>Ambient Temperature Range</b>	5 - 45°C (41 - 113°F)
<b>Humidity Range</b>	Up to 95% non-condensing
<b>Ground Fault Detection</b>	40mA per Zone
<b>Alarm Output</b>	Closing Contact Relay 5A, 230V (Max)
<b>T/C Connector</b>	Various Options Available
<b>Power Connector</b>	Various Options Available
<b>Input Protection</b>	63mA Nano Fuses on Both T/C Legs
<b>Overload Protection</b>	Semi-conductor fuses on both heater legs
<b>Heater Fuses</b>	15A @ 220V Super Fast Blow Type (FF)
<b>Control Modes</b>	Closed Loop (Auto), Open Loop (Manual), Standby, Boost, Slave
<b>Ports</b>	USB and Ethernet
<b>LED Indicators</b>	Scan, Fuse, Thermocouple, Failure, Ground Fault, Power%
<b>Communications</b>	SPI, Real VNC, Modbus, OPC-UA
<b>Languages</b>	English, French, German, Portuguese, Spanish, Polish, Russian, Chinese, Japanese, Czech, Italian, Turkish

Cabinet Size	# of Cards (Max)	# of Zones (Max)	Dimensions WxDxH cm (in.)
XS	6	24	31x45x81 (12x18x32)
S	12	48	36x45x96 (14x18x38)
M	24	96	45x60x116 (18x24x46)
L	36	144	45x60x141 (18x24x56)
XL	63	252	56x61x168 (22x24x66)

Based on 4z-15A cards. Increase max zones with 6z-5A cards.

## Screens



TS8



TS12



TS17