

# MLC 9000+™

Bus Compatible  
PID Controller

Maximum Productivity  
and Versatility for Control  
without Compromise.



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## Features/Benefits

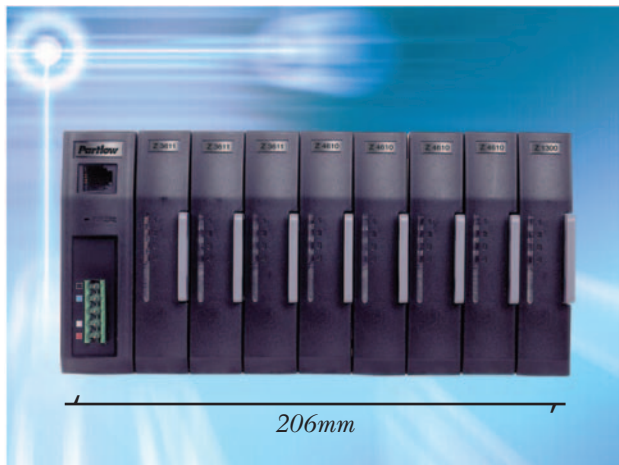
### *Compact, Affordable And Modular System*

Complements your machine control structure system for compact and seamless integration with PLC or SCADA/HMI systems.

- **Compact DIN rail mount system** – Designed to be built into a behind the panel (BTP) machine control system. Easily expandable by snapping in additional modules. Perfect for limited space applications; no panel cutouts required; less wiring needed. Fully configured 32 loop system requires only 8.1 inch width.
- **Modules available in smaller terminal bundles of 1, 3 or 4 loop configurations** – Provides greater flexibility, less waste and lower installation cost. Buy only the loops needed.
- **Detachable terminals optimized for easy maintenance and wiring** – Individual backplane construction and snap-in, detachable terminal design simplifies repair, replacement and wiring of individual modules. It also simplifies field maintenance/service – particularly when coupled with “Hot Swap” and auto-configuration features. You can remove only the defective module leaving the rest intact.

### *Seamless Integration and Application Versatility*

- **NEW Equipped with more field bus communication and loop control options than ever before** – Popular industry communications protocols including, CANopen, EtherNet/IP™, Modbus®/TCP, Profibus and DeviceNet™. Choose from one, three, or four loops – including a single loop or three loop module with heater break alarm (designed for the application requirements of the plastics industry).
- **Centralized programming** – When MLC 9000+ is integrated with PLC and HMI the need for multiple interfaces is eliminated. MLC 9000+’s BCM provides one centralized, customizable interface for complete access to temperature control data; equipment can be managed and monitored using one device versus many.



- **NEW Improved Windows®-based PC configuration software** – Point and click setup of the MLC system via PC saves programming time.

### *Uncompromised Performance, Accuracy and Integrity*

- **Standard deterministic 100 ms sample times** – Fast scan rates provide highly dynamic and “real-time” process control (ideal in the plastics industry).
- **Standard Hot Swap with Auto-configure** – Pull out defective loop control without needing to turn off system power; requires no operator intervention, other than module replacement; and virtually no downtime between repairs.
- **NEW 3-Loop Module with Heater Break Alarm** – Immediately alerts the machine operator to faults within the heater load as they occur. Provides superior control and process monitoring integrity and improved product quality.
- **NEW Continuous (Adaptive or Self) Tune** – Continually monitors the controller’s performance for disturbances or oscillations and modifies PID values to suit the current process condition. This results in optimum controller performance, accuracy, integrity and superior control and process monitoring at startup and beyond.
- **NEW Loop Enable/Disable** – Enables loops to be switched on and off via the communications interface without disruption to other loops (within the same module). Provides for application flexibility, reduced downtime and increased productivity.
- **NEW Improved Sensor Management** – Detects when process sensor input has broken. This prevents process runaway under fault conditions and implements required safety procedures. As a result, it increases process and user safety, ensures optimal productivity, and prevents waste and material scrap caused by broken sensors.

**Applications:** *Ideal for multi-zone temperature or process control applications (speed, flow, pressure, etc.) in place of either a PLC or multiple discrete controllers, or combination PLC/HMI. This product is designed for applications requiring an integrated solution or improved PLC performance.*



**Application/Industries:**

*Packaging*

*Plastics*

*Converting*

*Semiconductor*

*Food Processing*

*Heat Treat*

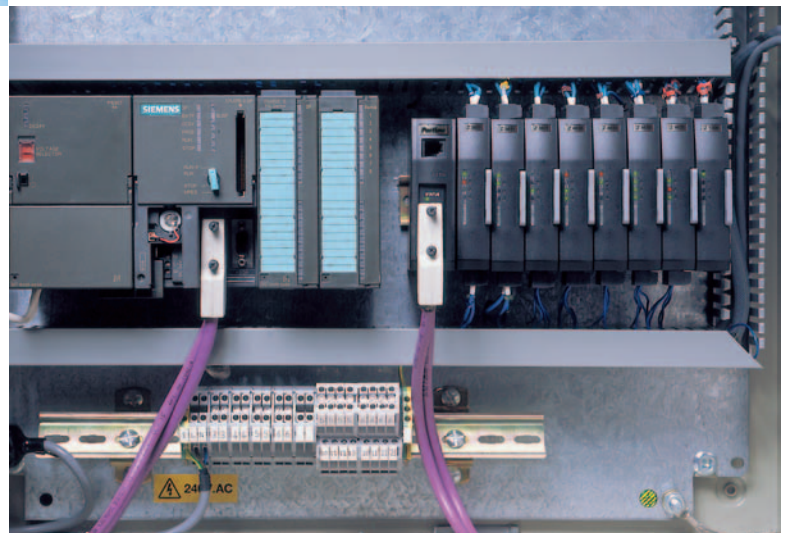
*Environmental Test Chambers*

*And many others where lower costs, smaller size, and unmatched connectivity are critical requirements.*

## Description

The new generation Partlow brand MLC 9000+ is a **modular, behind the panel, multi-loop temperature control system. This new controller offers the highest number of field bus protocols, lowest per-loop cost, and the smallest size in the industry.** It operates either within a stand-alone system or in a PLC environment. It is a compact, DIN-rail mounted device comprised of a bus control module (BCM) and up to eight loop control modules (LCM) or “slave” modules. This provides up to 32 control loops per BCM – all in only 206mm (8.1”) of space. The MLC 9000+ base bus control module has a height and width 25 to 50 percent smaller than the base bus control modules of any other competitive controller.

The MLC 9000+ system provides maximum productivity and application versatility. It overcomes many of the weaknesses of PLC temperature control or multiple front to panel (FTP) discrete controllers. For example, the MLC 9000+ bus based control system can be programmed in as little as 30 minutes rather than hours or days.



Compared to multiple discrete controller applications, the MLC 9000+ dramatically reduces the cost of installation by eliminating wiring and reducing the number of holes that have to be cut into the panel. Wiring costs and time are reduced by up to 30 percent on a typical temperature controller application. It also reduces the overall panel size for applications with space constraints.

Within PLC/PC applications, the MLC 9000+ improves PLC performance. It frees up the PLC’s capacity by outsourcing loop control to the MLC 9000+. It reduces installation time and costs, and it provides faster reaction to process disturbances. And, you can buy only the loops you need, resulting in less waste and the lowest cost-per-loop among North American suppliers.



Programming is centralized. With its easier-to-use configuration software, you can set up 32 loops via a dedicated bus port in less than 30 minutes. And you have access to all control loops or an HMI.

The MLC 9000+ is the first multi-loop PID controller to offer system compatibility with all major/popular field bus protocols including NEW Ethernet/IP™, Modbus®/TCP and CANopen. It also includes a new 3 loop module with heater break alarm.

With numerous state-of-the-art control features and 100ms real-time scan rates, reliable single-loop control performance and integrity are never sacrificed. Built-in tuning algorithms include continuous/adaptive tune, loop enable/disable, on-demand and auto-tuning.

The MLC 9000+ is an **affordable value** that surpasses competitive offerings. It effectively **ends the compromise** between the need for performance and the need for integration – in one **neat, compact system**.

## SPECIFICATIONS\*

### STANDARD FEATURES

**Functionality:** Behind the panel (BTP), multi-loop PID controller system consisting of Bus Control Module (BCM) and Loop Control Modules (LCM)

Compact, modular DIN rail construction

Up to 8 LCM modules per BCM; 1, 3 or 4 loops per module (for a max of 32 loops); larger systems require multiple BCMs

100ms sample input rates

Hot-swap with auto-configure

Centralized Programming

Easy-Tune/Pre-Tune/Soft Start and Manual Tune

Alarm Inhibit

**NEW** Continuous Adaptive/Self Tune

**NEW** Improved Sensor Management

**NEW** Loop Enable/Disable

**Construction/Enclosure:** ABS black plastic housing

### OPERATING CHARACTERISTICS

(APPLIES TO BOTH BCM/LCM)

**Operating Temp:** 32° to 131°F (0° to 55°C)

**Storage Temp:** -4° to 176°F (-20° to 80°C)

**Humidity:** 30% to 90% non-condensing R.H.

### ELECTRICAL

**Supply Voltage:** Powered by BCM w/in its operating condition

**Power Consumption:** 25W max.

**Line Voltage:** 18-30VDC (including ripple)

### INPUTS

#### LCM INPUT TYPES

Choose from 1, 3 or 4 loops with standard Universal input (thermocouple, RTD and DC Linear);

**Max # of Inputs:** 1-4 per loop (dependent on loop module you choose)

**Thermocouples:** B, E, N, J, K, L, T, R, S

**RTD:** PT100 (platinum) or NI120 (nickel), 100 ohm, 3 wire; 0.00385 ohms/ohm/°C

**DC Linear (Scalable -32000 to +32000):**

**Volts:** 0-5, 1-5, 0-10 or 2-10 VDC

**DC Milliamps:** 0-20mA or 4-20mA

**DC Millivolts:** 0-50; 10-50 mV

**Heater Current Input:** 0-50mA, sinusoidal rms from current transformer; scalable 0.1 to 1000.0A AC

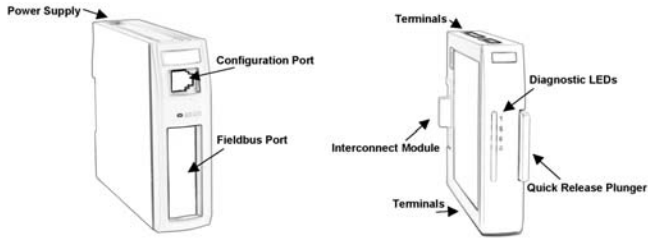
### OUTPUTS

#### LCM OUTPUT TYPES (HARDWARE OPTIONS):

All LCM output types are user-selectable and customizable based on desired application drive control; choose from the following output types:

**Relay:** SPST; 120-240VAC 2.0A Resistive; Lifetime:>500,000 operations at rated voltage/current

# SPECIFICATIONS\*



**SSR Driver:** Drive capability: 12VDC Nominal (10VDC minimum) @30mA max.

**DC Linear:** Optional (on two modules only Z1300 and Z1301); Resolution: 8 bits in 250 msec (10 bits in one second typical); Accuracy  $\pm 0.25\%$  (mA into 250K ohm load, V into 2 ohm load); Degrading linearly to +0.5% for increasing burden to maximum drive capacity

**Triac:** N/A

**Heater Break Alarm (Optional on Single and 3-Loop Modules Only Z1301):** Compares heater current to nominal; alarms for high/low current or short circuit output

## LCM OUTPUT FUNCTIONS (HARDWARE OPTIONS):

All LCM output functions are user-selectable and customizable based on desired application drive control; choose from the following functions:

**Control Output 1:** Usually heat but can be custom configured

**Control Output 2:** Usually cool but can be custom configured

**Alarm 1** – Standard alarm for process monitoring

**Alarm 2** – Standard alarm for process monitoring

**Recorder / Retransmission Output** – Ideal for recorder or for input signal re-transmission (setpoint) (available on Z1300 and Z1301 models only)

**Heater Break Alarm** – Ideal for plastics applications (available on Z1301 and Z3XXX models only)

## ELECTRICAL PERFORMANCE

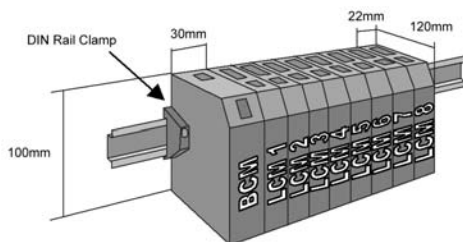
### GENERAL:

**Accuracy:** All input types: 1.0% of span;  $\pm 1$  LSD; RTD  $\pm 0.2\%$  of span;  $\pm 0.3^\circ\text{C}$ ; Thermocouple:  $\pm 0.2\%$  of span;  $\pm 1^\circ\text{C}$  for CJC;  $\pm 0.3^\circ\text{C}$  for  $0.1^\circ\text{C}$  resolution ranges, or  $1^\circ\text{C}$  resolution ranges

**Input Sample Rate:** 10Hz (100 msec) for all loops

**Ambient Temperature Stability/Error:** 0.01% of span per degree C deviation from  $25^\circ\text{C}$

**Sensor Fault (Break) Detection:** Programmable sensor break; If fault detected, control loop can maintain power or turn itself off



## COMMUNICATIONS INTERFACES

### BCM Only (Not Applicable to MLC9000+ LCM):

User-selectable via order matrix; choose from all popular standard industry protocols, including: Modbus®, DeviceNet™, Profibus, EtherNet/IP™, Modbus®/TCP and CANopen

## RATINGS/AGENCY APPROVALS

(APPLICABLE TO BOTH MLC 9000+ LCM AND BCM)

**Safety:** EN61010 and UL/ULc 3121

**EMC:** Certified EN61326-1: 1997

**Other:** ISO 9002 Registered; Modbus® organization approval pending; ODVA approval pending; Profibus approval pending; CiA approval pending

## PROTECTION

(APPLICABLE TO BOTH MLC 9000+ LCM AND BCM)

IEC IP20; Designed for installation in an enclosure which is sealed against dust and moisture

## PHYSICAL DIMENSIONS

**Width:** 0.87" (22mm); Up to 8.11" (206mm) for 8 module system up to 32 loops

**Depth:** 3.94" (100mm)

**Height:** 4.72" (120mm)

**Weight:** 5.3 oz (0.15kg)

**Mounting:** DIN rail mounting via supplied interconnect module, fits DIN standard EN55022, DIN 46277-3

## OPTIONS/ACCESSORIES

**NEW** Expanded Fieldbus Communication Options (user-selectable via order matrix); choose from DeviceNet™, Modbus®, Profibus; NEW EtherNet/IP™, NEW Modbus®/TCP; NEW CANopen

**NEW** Expanded Loop Module Options (user-selectable via order matrix); choose from 1, 3 and 4 loop configurations; including NEW 3-loop module with heater break alarm option

**Diverse Alarms (User-Select Options):** Process High/Low, Deviation, Band; Short-Circuit Heater Break Alarm

**NEW** Improved Windows Configuration Software (purchase separately)

**NEW Expanded Loop Control Options** – Including 3-loop module with heater break alarm (available on Z1301 and Z3XXX models only)

## WARRANTY

3 Years

\* Specifications subject to change without notice in accordance with our DBS policy of continuous improvement.