

- INDICATION
- SETPOINT CONTROL
- LIMIT CAPABILITY
- PROFILING

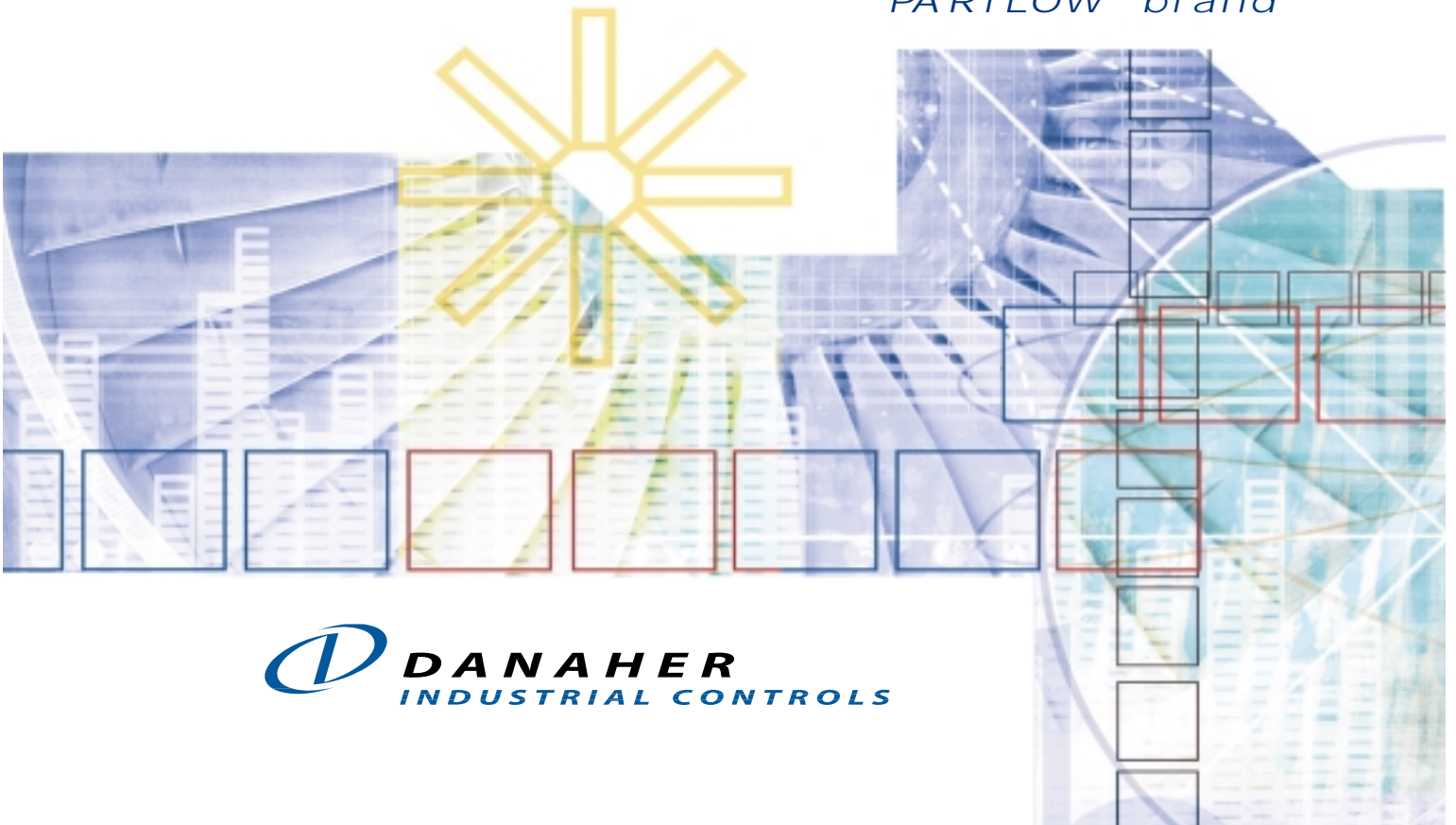
PROCESS AND TEMPERATURE CONTROL

Process Automation

2006 Product Catalog



PARTLOW™ brand



Introduction to Partlow & Danaher Industrial Controls

About Us

Process Control and Validation... Made Simple™

About Partlow and Danaher Industrial Controls Over 80 Years Strong...

Partlow offers the world's broadest range of reputable brand name mechanical, analog and digital micro-based temperature controller and circle chart recorder products to satisfy a full range of industrial applications including temperature, pressure, level and flow.

A Reputable Brand with an established legacy of performance experience, you can rely on...

Partlow™ - is a respected U.S. leader in rugged and reliable circle chart recorders and state-of-the-art single loop and multi-loop temperature controllers servicing industry and machine builders in their process automation applications for over 80 years (since 1920). From quality validation to trend analysis and product safety applications, Partlow brand basic to high end controllers offer excellent value. In addition, Partlow circle chart recorder products (request separate catalog) provide the additional benefit of a paper document record of process control results for traceability. Partlow has been a division of Danaher Industrial Controls Group since 1993.

No Supplier Offers More Process Control and Validation Solutions....

DICG Partlow brand controllers and recorders come in a variety of types, sizes and accessory options. Consider just a few of the following of our controller and recorder varieties:

Controller Product Types/Varieties

Basic

- Simple Controllers
- Indicators

General-Purpose / Application - Industry Specific

- Limit Controllers
- Process / Temperature Controllers

High-End

- Profiling Controllers
- Multi-Loop Controllers

In the following pages, you will find the comprehensive range of temperature / process controls and related accessories available from Partlow. Our extensive network of process automation distributors are ready to provide knowledgeable responsive local technical support, along with our own group of factory based engineers and customer service personnel who are immediately available and only a phone call away to assist you.

We invite you to read on and look forward to serving you!

GENERAL INFORMATION

ABOUT US

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CONTROLLER BASICS

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CONTROLLER SELECTION GUIDES

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TEMPERATURE AND PROCESS CONTROLLER PRODUCT RANGE

**Basic
Indicators/Controllers**

**General-Purpose
Controllers**

**High-End
Controllers**

BASIC PAGE

ANALOG

SERIES 1000™ 1/4 DIN CONTROLLER / LIMIT DEVICE 2.1

INDICATORS

MIC 3200™ 1/32 DIN CONTROLLER / INDICATOR 2.4

SERIES 1880™ 1/8 DIN ANALOG INPUT PANEL METER 2.7

NEW PLUS SERIES 1610+™ 1/16 DIN INDICATOR 2.10

NEW PLUS SERIES 1810+™ 1/8 DIN INDICATOR 2.13

GENERAL-PURPOSE

LIMIT

SERIES 1000™ 1/4 DIN LIMIT CONTROLLER (analog) 2.1

MIC 1162™ 1/16 DIN LIMIT DEVICE 3.1

NEW PLUS SERIES 1161+™ 1/16 DIN LIMIT CONTROLLER 3.4

NEW PLUS SERIES 1801+™ 1/8 DIN LIMIT CONTROLLER 3.7

NEW PLUS SERIES 1401+™ 1/8 DIN LIMIT CONTROLLER 3.10

TEMPERATURE/PROCESS CONTROL

MIC 3200™ 1/32 DIN CONTROLLER / INDICATOR 2.4

NEW PLUS SERIES 1160+™ 1/16 DIN CONTROLLER 3.13

NEW PLUS SERIES 1800+™ 1/8 DIN CONTROLLER 3.16

NEW PLUS SERIES 1400+™ 1/4 DIN CONTROLLER 3.19

MIC 2000™ 1/4 DIN PID CONTROLLER 3.22

MIC 8200™ 1/4 DIN DUAL DISPLAY CONTROLLER 3.25

HIGH END

PROFILE CONTROLLERS

MIC 1166™ 1/16 DIN PROFILE CONTROLLER 4.1

MIC 1460™ 1/4 DIN PROFILE CONTROLLER 4.4

MIC 1462™ 1/4 DIN ENHANCED PROFILE CONTROLLER 4.7

MIC 6000™ 1/4 DIN PROFILE CONTROLLER 4.10

MULTI-LOOP CONTROL SYSTEM

NEW PLUS SERIES MLC9000+ SYSTEM DESCRIPTION 4.13

NEW PLUS SERIES MLC9000+ BUS CONTROL MODULES (BCM) 4.17 - 4.29

NEW PLUS SERIES MLC9000+ LOOP CONTROL MODULES (LCM) 4.31 - 4.35

Experience

No one understands factory and process automation better than Danaher Industrial Controls (DICG). When productivity, performance and cost are on the line and predictability, consistency and repeatability dictate success, our wide range of factory and process automation, measurement and sensing controls work for you, providing measurable results that put you in control of the critical production and process drivers that influence your world.

Process Automation & Measurement Controls

The ability to sense and track an established series of steps or operations in a manufacturing process such as temperature, flow and pressure with accuracy and predictability is made possible with DICG Partlow brand temperature and process controls, including controllers and recorders designed to validate critical process variables toward a desired result, outcome or product.

To understand the complete line of DICG process automation controls, including Partlow brand, refer to the DICG Website at:

www.danaherindustrialcontrols.com
or
www.partlow.com

The Industry's Shortest Lead Times...

At Partlow, we are obsessed with quick lead times. Due to thousands of possible "standard combinations" of configurations available, all Partlow recorders and controllers are built to order utilizing efficient "Just In Time" (JIT) manufacturing processes. Standard lead times on Partlow controllers and recorders is 3-5 days for most models. Our answer to your question "when can I get it?" is "when do you want it?" Rush orders are also available to meet your specific project needs or deadlines. Inquire with our Customer Service Representatives at **+1.800.390.6405**, or our Applications Engineers at **+1.800.866.6659**.

...More Choices from a One Source Global Supplier

Other Reputable Controller-Recorder Brands to consider from DICG:

PMA™ brand

For over 75 years, PMA has developed leading edge digital process control and measurement technology. Key products include a complete line of bus and PLC systems used for temperature, pressure, flow and level applications. A respected European brand, PMA's slogan "*wir kriegen's geregelt*" is loosely translated to "*close the loop with PMA*". The PMA group was acquired in 2005 by Danaher Industrial Controls.

WEST™ brand

Renowned European leader state-of-the-art, value packed single loop and multi-loop temperature controllers, West has served industry and machine builders process automation needs for over 50 years. West was among the first controller manufacturers to design a microprocessor based temperature controller and was on the forefront of the development of self-tune algorithms. More recently, West launched the first multi-loop controller to combine the integrity of a discrete controller with the benefits of bus integration. West has been a division of Danaher Industrial Controls since 1994.

RUSTRAK™ brand

DC Signal, and Thermocouple strip recorder are custom classic products that have provided reliable results and traceability in process control in flow, PH, temperature and current/voltage applications for over 40 years.

LFE™ brand

DIN electronic controllers are custom classics that have provided rugged and reliable control of process applications for over 50 years.

For precision control, quality validation, trend analysis and product safety applications, there's a Partlow brand controller or recorder especially suited to your needs – all providing excellent quality and value. The Partlow brand controllers featured in this catalog provide process control and alarm capabilities and/or specialized application-specific features.

Controller Advantages:



Recorder Advantages:




- Range of controller types to choose from including limit device and profile to fit your budget and application need.
- Choice of standard DIN size front to panel and behind the panel models
- Reliable operation and control in all applications
- Jumperless input configuration and auto-detect output module hardware on all new generation Plus Series controllers for fast, easy setup
- Flexible plug-in output modules
- Fast input sample rates
- High visibility LED's and protection ratings for different environment conditions

- Range of circle chart products from basic 1-pen, one process to sophisticated multiple input, multiple equation recorders.
- Reliable operation in rugged environments
- High/low limit requirements for critical applications
- Provides printed paper document for quality validation, trend analysis, regulatory compliance and product safety
- Delivers data traceability for customer's finished product, including FDA applications
- Process variables can be seen at a glance for quick effective process management
- Provides excellent value for data collection per data point (1-4 pts)

Note: This catalog will assist you in choosing the right Temperature/Process Controller for your specific application. For information on Partlow Circle Chart Recorders, request our short form line brochure or full line recorder product catalog.

● Standard ● Optional

INDUSTRIAL-DUTY SINGLE LOOP TEMPERATURE & PROCESS CONTROLLERS																INDUSTRIAL-DUTY MULTI-LOOP BUS CONTROLLER
BASIC				GENERAL-PURPOSE								HIGH-END/PROFILERS				
ANALOG		INDICATORS		LIMIT		TEMPERATURE/PROCESS CONTROL										
																
MODEL NUMBR	Series 1000	MIC 3200	MIC 1880	NEW 1610+ 1810+	Series 1000	MIC 1162	NEW 1161+ 1401+ 1801+	MIC 3200	NEW 1160+ 1400+ 1800+	MIC 2000	MIC 8200	MIC 1166	MIC 1460 1462	MIC 6000	NEW MLC 9000+	
TYPE	Sgl. Loop Analog	Sgl. Loop G.P.	Sgl. Loop Basic	Sgl. Loop Basic	Sgl. Loop Analog	Sgl. Loop G.P.	Sgl. Loop G.P.	Sgl. Loop G.P.	Sgl. Loop G.P.	Sgl. Loop G.P.	Sgl. Loop G.P.	Sgl. Loop High-End	Sgl. Loop High-End	Sgl. Loop High-End	Multi-loop	
	Analog/Limit	Digital	Digital	Digital	Analog/Limit	Digital	Digital	Digital	Digital	Digital	Digital	Digital	Digital	Digital	Digital	
DIN SIZE	FTP	FTP	FTP	FTP	FTP	FTP	FTP	FTP	FTP	FTP	FTP	FTP	FTP	FTP	BTP	
FUNCTION	1/4	1/32	1/8	1/16 (1610+), 1/8 (1810+)	1/4	1/16	1/16 (1161+), 1/8 (1801+), 1/4 (1401+)	1/32	1/16 (1160+), 1/8 (1800+), 1/4 (1400+)	1/4	1/4	1/16	1/4	1/4	DIN Rail Mount	
INDICATOR/PANEL METERS		●	●	●			●	●	●	●	●	●	●	●	●	
MICROPROCESSOR BASED		●	●	●		●	●	●	●	●	●	●	●	●	●	
TEMPERATURE CONTROLLER	●	●						●	●	●	●	●	●	●	●	
PROCESS CONTROLLER		●						●	●	●	●	●	●	●	●	
VALVE MOTOR CONTROLLER													● 1462			
LIMIT CONTROLLER					●	●	●									
PROFILER/CONTROLLER												●	●	●		
DISPLAY	Dial				Dial								N/A			
SINGLE 4 DIGIT		●	5-digit	●				●	●	●	●	●	●	●	●	
DUAL 4 DIGIT						●	●	●	●	●	●	●	●	●	●	
INPUTS																
DC LINEAR V			●	●		●	●	●	●	●	●	●	●	●	●	
DC LINEAR mA/DC LINEAR mV		●	●	●		●	●	●	●	●	●	●	●	●	●	
THERMOCOUPLE/RTD	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
REMOTE SETPOINT									●	●	●					
HEATER CURRENT															●	
OUTPUTS																
MAX. # OF OUTPUTS	1	2	2	4/5											2-6 per loop	
RELAY	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
SSR DRIVER	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
DC LINEAR			●	●		●	●	●	●	●	●	●	●	●	●	
TRIAC				●			●					●	●	●	●	
OUTPUT FUNCTION																
CONTROL OP1 (HEAT POWER)	●	●			●			●	●	●	●	●	●	●	●	
CONTROL OP2 (COOL POWER)	●	●			●			●	●	●	●	●	●	●	●	
LIMIT OUTPUT						●	●									
ALARM 1		●	●	●		●	●	●	●	●	●	●	●	●	●	
ALARM 2			●	●		●	●	●	●	●	●	●	●	●	●	
RECORDER OUTPUT			●	●		●	●									
HEATER BREAK ALARM															●	
DUAL SETPOINT									●						●	
REAL TIME CLOCK													●			
TRANSMITTER POWER SUPPLY				●		●			●	●			●	●		
COMMUNICATIONS																
RS-485		●	●	●		●	●	●	●	●	●	●	●	●	●	
DEVICENET															●	
ETHERNET / IP															●	
PROFIBUS															●	
MODBUS/RTU		●		●		●	●	●	●	●	●	●	●	●	●	
MODBUS/TCP															●	
CANOPEN															●	
PC CONFIGURATION			●			●		●							●	
AGENCY APPROVALS																
UR & cUR	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
CSA	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
CE	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
FM	●				●										●	
NEMA 4X		●	●	●		●	●	●	●	●	●	●	●	●	●	
POWER SUPPLY																
90-264V AC		●	●	●		●	●	●	●	●	●	●	●	●	●	
115VAC OR 230VAC	●				●					●	●				●	
20-50V AC/22-65VDC		●	●	●		●	●	●	●	●	●	●	●	●	18-30VDC	
PID TUNING TYPES																
PRE-TUNE								●	●			●	●		●	
SELF-TUNE									●						●	
EASY TUNE		●							●						●	
MANUAL TUNE		●						●	●	●	●	●	●	●	●	

Controller Applications for Industry

Temperature & Process Control You Can Measure™

About Us

Real Answers to Your Real Process Automation Control Problems...

Danaher Industrial Controls Partlow™ brand temperature & process controller products have been helping customers with their heat, temperature and process control needs for a over 80 years. Our broad product range is used on an incredibly wide variety of industrial applications. With Partlow's many years of experience, serving many thousands of individual customer applications, chances are we have already solved temperature or process control problems very similar to your own.

A reputable brand with an established legacy of performance experience, you can rely on...

Reliable Partlow™ brand temperature & process controllers provide rugged, reliable and versatile control of your process applications. From quality monitoring and control, to product safety applications, Partlow's basic to high-end controller products offer excellent value.

Typical Applications

The following are just a few of the more common temperature & process controller industrial applications:

Environmental Control

- Temperature
- Humidity
- Pressure

Process Control

- Liquid Level / Flow
- PH

Environmental Control

Environmental control, as its name implies, refers to critical process variables such as *temperature*, *humidity* and *pressure* that are critical in process applications such as ovens:

Temperature Control

Temperature controllers provide closed-loop control of industrial and laboratory heating and cooling processes. In a typical temperature (environmental control) application, temperature is sensed using a thermocouple (T/C) or RTD input device whereby the measured temperature is constantly compared to a specified user setpoint. When the actual temperature deviates from the set point, an output signal and or high/low alarm is produced for control of the heating elements, compressors, etc

Pressure Control

Controllers can further be used to monitor and provide feedback on process variables such as pressure that can be vital in laboratory, test chambers or industrial heating and cooling applications. In a pressure tracking application, controllers monitor pressure using a transducer that feeds a signal back to the controller whereby the measured pressure is constantly compared to a specified user setpoint. When the actual pressure deviates from the set point, an output signal is triggered by the controller that sends out a 4-20mA output signal to a valve to signal it to adjust the air or steam pressure back down to the specified parameter range. Pressure is critical in food canning applications, where the food must be heated and cooked for sterilization purposes as well as pressurized to prevent the can from bursting during the cooking process.



Typical Application – Canning/Bottling Plant

Process Control

Process control can involve many different variables from liquid level and flow control to pH control. Consider the following application examples:

Flow Control

Controllers can be used to monitor Flow for applications that involve liquid process control or gas flow. In a typical gas flow application, a controller can be used to control the gas flow on a burner within a production line. When the actual flow deviates from a setpoint, an output signal will either open or close a valve in order to maintain flow rate within the required range.

Level Control

A liquid level sensor input continually compares actual liquid level in a vessel to a specified setpoint. The control can trigger various pumps that will keep the liquid at the desired level.

pH Control

In water treatment and monitoring applications, a pH sensor monitors a process and transmits to a controller that continually compares the process value to the specified setpoint. A controller can actuate a relay output that turns on dosing pumps to either increase or decrease the acid or base of the liquid to ensure that the optimum pH level is maintained.



Typical Application – Power Generation

Partlow Controllers By Market

Put DICG Partlow brand process and temperature control technology to work for you in your manufacturing operation to monitor, track and protect a specific process to ensure optimum efficiency, quality output and reduced incidence of waste.

As a leading supplier in the temperature and process controls industry, Danaher Industrial Controls Partlow brand process controllers can help you design the perfect solution for your specific application need

Typical Temperature & Process Controller Industries/Applications include:

- Plastics Processing
- Packaging – Plastics Shrink Wrapping
- Glass Manufacture – Melting & Annealing
- Food and beverage processing - Dairy & Smokehouses
- Woodworking - Kilns
- Healthcare – Blood Banks
- Tourism – Cruise Line Water Treatment
- Tourism – Airline Food Storage
- Metal processing
- Production of fine chemicals & pharmaceuticals
- Environmental monitoring
- Power generators/utility
- Offices, labs, computer rooms
- Textile production
- Heat treating

And much more...

For more detailed information on Danaher Industrial Controls Partlow brand controller product applications and markets, we invite you to browse our industry solutions on our website at www.partlow.com which have been classified by market and application for your convenience.

Expert Technical Support

At DICG, we employ a professional staff of Application Engineers whose full time responsibility is to help you select the proper controller or recorder, install it correctly and get it up and running to your satisfaction. These friendly and knowledgeable people are available during business days from **7:00 am to 4:45 pm Central Standard Time (CST)**.

Partlow - Customer Care

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Regional Offices & Territory Managers

DICG Distributors are supported by Regional Account Managers who are also available to assist you with any of your unusually demanding applications, present on site customer seminars, determine your custom product needs or respond to any of your high volume requirements. To find the Partlow Territory Manager nearest you, simply refer to the Territory Manager Locator on the **www.partlow.com** website or contact us directly at **+1.800.390.6405**.

If you don't see exactly what you need in this catalog, call us....

If you don't see exactly what you need in this catalog, call our Applications Support Hotline at **+1.800.866.6659**... or simply detail your application design, performance and cost requirements to us using the **Application Assistance Form** available online at **www.partlow.com** - service and support area. Our Application Engineers will review your specifications and contact you with a recommendation.

Global Network of Service Partners

DICG sells its products through a network of highly skilled and trained Partlow distributors that offer a variety of value-added services, from pre-sale consultation and support to systems integration. They have the experience and flexibility to deliver a solution to meet your specific application need and are ready to assist you in selecting and applying DICG Partlow brand controller/recorder products. To find the Partlow Distributor nearest you, simply refer to the Distributor Locator on the **www.partlow.com** Website or contact us directly at **+1.800.390.6405**.

Control Capabilities

Expanded user- selectable operator modes – including auto- tune, manual tune and ramping for improved controller accuracy and comprehensive process control. *See individual specifications for details.*

NEW Faster Communications

New faster communication speed and user selectable ASCII and Modbus® serial communications available on new generation + Series models; New improved PC configuration software *See individual product specifications for details.*

Display

New improved easy to use Human Machine Interface (HMI) with larger digits and customizable operator menu for quick setup ability to display only the necessary application information parameters to prevent operator information overload.

NEW Jumperless Configuration

New jumperless configuration requiring no link jumpers for simple error free setup via keypad/ front panel

Power Supply

Most standard voltages supported by Partlow products for easy installation, including 100 - 240VAC 50/60Hz, 20 - 48VAC 50/60Hz, and 22 - 55VDC. *See individual specifications for details.*

Function

Choose from a variety of controller types including temperature, process, limit and profile controller models ; *See individual model specs for details.*

Inputs

Thermocouple, RTD, DC Linear Volt/ Amp and choice of remote or local setpoint option available on new + Series controllers for precise process control; *See individual product specifications for details.*

Agency Approvals

Partlow controllers are rated and available with the agency approvals UR/cUR, CE and NEMA 4X to comply with user process application and operating environment needs.

Outputs

New plug and play output cards include relay, SSR driver, Triac and DC Linear options making it possible to stock one 1/4, 1/ 8 or 1/ 16 DIN base unit adding extra boards only as needed; Process and loop alarms and transmitter power supply option also available on new + Series controllers for comprehensive control and user application flexibility; *See individual product specifications for details.*

Backwards Compatibility

Backward compatible panel cutout, housing and wiring terminal capability ensure that no time is wasted changing wiring diagrams from older generation to new.



Principles of Operation

Partlow offers a wide variety of recorder and controller models and accessories designed for temperature, process and environmental control applications. Recorders and controllers overall control functionality is very similar with the primary difference, between recorders and controllers, being that recorders also offer a paper hardcopy of process results for validation purposes.

Recorder - Controller Selection Modes/Technologies Comparison

The common categories of closed-loop temperature and process controllers are General-Purpose, Limit, and Profile controllers. Other Partlow brand controller distinctions include *mechanical* versus digital (electronic) microprocessor based controllers and front-to-panel versus behind the panel construction.

Mechanical (Analog) vs Digital Microprocessor based Recorders/Controllers

Mechanical temperature controllers are self-operating, requiring no operating power but are usually limited in their functionality and accuracy compared to digital microprocessor based controllers. ON-OFF controllers are available with one or two switches, for heating, cooling, or heat-cool applications. Proportional units are for use with position proportioning motors, pneumatic devices, or provide time proportioning outputs. Some mechanical controllers also have dual setpoints for alarming or auxiliary heating.

The mechanical, non-indicating, temperature controllers are self-operating, ON-OFF controllers for use in a wide variety of applications. They provide simple control and require no operating power.

Mechanical Controller Advantages:

- Low cost
- Simple control
- Self-operating, requiring no operating power

Limitations:

- Low accuracy
- Limited in their functionality versus microprocessor-based models

ON/OFF or Limit Device Controls

ON/OFF control is the simplest form of control, used by almost all domestic appliance thermostats.

Limit control is used for processes which require an extra device for safety reasons. Power to control the element is switched through the contacts on the limit device, which “drop out” if the temperature goes above or below a specified range. Many limit controllers are factory mutual (FM) approved and have latching relays which require a front panel reset to re-engage the contacts.

ON/OFF - Device Advantages

- Simplest form of control
- Involve only one parameter that needs to be tuned
- Minimizes control element cycling
- Provides fast output reaction
- Low cost controller

Limitations

- Low accuracy
- Minimizes control element cycling

Profile Controllers

Profiling controllers, also called Ramp-Soak controllers, are controllers that will allow the operator to program a number of setpoints and the time to sit at each set point. The changing of the setpoints are called “Ramp” and the time to sit at each set point is called “Soak”.

A profiler offers the ability to enter a number of segments to allow complex temperature “profiles”. There are many applications for a profiling controller. The profiles are often referred to as “recipes” by the operator and are often kept on a computer and downloaded via a communications channel directly into the controller as needed.

Profile Controller Advantages

- Moderate to high accuracy (model dependent)
- Allow operator to program a number of setpoints and the time to sit at each set point.
- Ability to enter a number of segments to allow complex temperature “profiles” for enhanced control

Limitations

- Although the ideal instruments for complex profile control, care must be taken in the selection of the appropriate model for a specific application need..

Front-to-Panel (FTP) Mounting

Most Partlow controllers may be front panel mounted. The MLC 9000+ series is a behind the panel mounting (BTP), distributed control system.



**Plus Series, 1160+™
1/16 DIN Temperature Controller**



**Plus Series, 1810+™
1/8 DIN Digital Indicator**

The choice is simple with Partlow brand...

Before you can select the ideal controller, be sure to assess your process control application requirements. Key questions to ask yourself about your process application from a *Form, Fit and Function* perspective include:

FORM/FIT

- Where will the controller need to be mounted to be able to be read by the machine operator (*i.e. FTP front of the panel or BTP behind the panel*)?
- Are there any unique application requirements and or environmental conditions that will affect your controller? (*For example, limited space, high ambient temperature, dust/dirt protection, explosive/corrosive environment, other.*)
Controller housings come rated with various agency approvals and environmental protection ratings (*i.e., NEMA4X/IP65*) and are better suited for certain application environments than others.
- Are there any specific mounting size requirements? (*1/32 DIN, 1/16 DIN, 1/8 DIN, 1/4 DIN*)
- What power voltage is available? (*120 VAC, 120/240 VAC, 12-24 VAC, 12-24 VDC*)
- If this is a temperature control application, what is the temperature range of the application?





FUNCTION

- What specific purpose(s) will the controller serve?
What do you want to control or drive? (*For example, will a temperature controller drive an electric heating element, gas burner, gas valves, etc.?*)
- What process or steps (recipe) will the controller be required to go through?
- How many controllers does your process require for the task? One or multiple?
- How many control loops do you need?
- What type of control action do you need? *Direct acting (cooling), reverse acting (heating), time/temp profiling (ramping), retransmit, etc.*
- What process tasks such as temperature, pressure, pH or flow require monitoring and controlling?
- What type of control mode do you intend to use? (*ON/OFF, PID*)
- What type of sensor(s) do you intend to use? (*Thermocouple, 2- or 3-wire RTD, infrared, other*)
- Do you intend to use process inputs? (*4-20mA DC/0-5 VDC*)
- Do you intend to use event outputs? (*Available as a option on profiling controller/recorder models only*)
- What type of control output do you need? (*Relay, SSR driver, triac, linear*)
- Do you need alarm outputs?
- Do you need communication?

Model Overview

Product Feature Overview and Page Location

● Standard ● Optional

BASIC				
	ANALOG	INDICATORS		
				
MODEL NUMBER	Series 1000	MIC 3200	MIC 1880	1610+/ 1810+
PAGE NUMBER	2.1	2.4	2.7	2.10, 2.13
TYPE	Sgl. Loop Analog	Sgl. Loop G.P.	Sgl. Loop Basic	Sgl. Loop Basic
	Analog/Limit/FTP	Digital/FTP	Digital/FTP	Digital/FTP
DIN SIZE	1/4	1/32	1/8	1/16 (1610+), 1/8 (1810+)
FUNCTION				
Indicator/Panel Meters		●	●	●
Microprocessor Based		●	●	●
Temperature Controller	●	●		
Process Controller		●		
Valve Motor Controller				
Limit Controller	●			
Profiler / Controller				
DISPLAY				
	Dial		Dial	
Single 4 Digit		●	5-digit	●
Dual 4 Digit				
INPUTS				
DC Linear V			●	●
DC Linear mA/DC Linear mV		●	●	●
Thermocouple/RTD	●	●	●	●
Remote Setpoint				
Heater Current				
OUTPUTS				
Max. # of Outputs	1	2	2	4/5
Relay	●	●	●	●
SSR Driver	●	●	●	●
DC Linear			●	●
Triac				●
OUTPUT FUNCTION				
Control OP1 (Heat Power)	●	●		
Control OP2 (Cool Power)		●		
Limit Output				
Alarm 1		●	●	●
Alarm 2			●	●
Recorder Output			●	●
Heater Break Alarm				
Dual Setpoint				
Real Time Clock				
Transmitter Power Supply				●
COMMUNICATIONS				
RS-485		●	●	●
DeviceNet				
Ethernet/IP				
Profibus				
Modbus/RTU		●		●
Modbus/TCP				
CANopen				
PC Configuration				
AGENCY APPROVALS				
UR & cUR	●	●	●	●
CSA	●			
CE	●	●	●	●
FM	●			
NEMA 4X		●	●	●
POWER SUPPLY				
90-264V AC		●	●	●
115VAC OR 230VAC	●			
20-50V AC/22-65VDC		●	●	●
PID TUNING TYPES				
Pre-Tune				
Self-Tune				
Easy Tune		●		
Manual Tune		●		



Series 1000™

Very Easy to Use - Dial Setpoint

1/4 DIN Analog Controller / Limit Device

DESCRIPTION

The Series 1000 are versatile analog controllers designed for rugged, reliable, low cost control of process variables in harsh industrial environments, even those plagued by environmental electronic noise.

Available as a non-indicating analog on/off controller or high or low limit device, it offers a quality level not commonly found in comparably priced devices. It is a 1/4 DIN instrument with a depth of only 5.8 inches. All versions are UL recognized and CSA certified as controllers and limit devices are FM approved.

The Series 1000 can accommodate J, K, T, R, B, and S thermocouples. Outputs are either SPST or SPDT electro-mechanical relay or solid state relay drivers.

APPLICATIONS:

Ideal for temperature control or high or low limit applications requiring a value-priced, non-display, dial set controller.

INDUSTRIES:

- Industrial and lab ovens/furnaces, plastics and thermal forming
- Form/fill and seal
- Packaging applications
- And any others where low cost and simplicity are critical requirements.

FEATURES/BENEFITS

- Non-display, easy dial setting
- 1/4 DIN panel mount
- Thermocouple input
- Sensor fault detection
- Relay or SSR driver output
- High or Low Limit or On/Off control

Series 1000™

Very Easy to Use - Dial Setpoint

BASIC CONTROLLER/
LIMIT DEVICE

1/4 DIN Analog Controller / Limit Device

SPECIFICATIONS*

STANDARD FEATURES

Output via relay or SSR driver
Available inputs for popular thermocouple types
Sensor fault detection
Optional Remote Reset

ENVIRONMENTAL CHARACTERISTICS

Operating Temperature: 0 to 55°C, 32 to 131°F
Storage Temperature: -40 to 65°C, -40 to 149°F
Humidity: 0 to 95% RH, non condensing

ELECTRICAL

Line Voltage: 115 or 230 VAC, ±10%, 50/60Hz
Power Consumption: 15VA maximum

INPUTS

Thermocouple types: J, K, T, R, S and B
Sensor Fault Detection: Upscale or downscale for thermocouple inputs

OUTPUTS

Relay: SPST or SPDT
115VAC: 5.0A Resistive; 1/8 HP or 250VA
230VAC: 5.0A Resistive; 1/8 HP or 250VA
SSR Driver: Open collector output short circuit protected at 40mA maximum.
Provides 5VDC at 23mA or 3VDC at 30mA.

INDICATORS

High or Low Limit devices incorporate an alarm indication with green and red LEDs.
On/Off controllers incorporate a red LED that denotes the output relay is energized and a green LED to indicate power.

SETPOINT ADJUSTMENT

Adjusted via a potentiometer which is fitted with a knob.
Limit devices are equipped with a clamp arrangement providing a lock to prevent setpoint changes.

RESET

Limit devices include switch to reset the control once the alarm condition is removed.

PERFORMANCE

Measurement Accuracy: ±1% of span, at 25 deg C
Ambient Temperature Error: ±0.04% of span /deg C deviation from 25 deg C
Noise Rejection:
Common mode: >85dB at 60Hz, 115VAC maximum
Normal Mode: >65dB at 60 Hz) or greater, 0.5V p-pmax. for no relay chatter with 1% hysteresis

PHYSICAL DIMENSIONS

Dimensions: 1/4 DIN front panel, 147mm (5.8") deep
Weight: 3 lbs. maximum
Vibration: 0.5 to 100Hz at 0.5g

RATINGS/AGENCY APPROVALS

UL & cUL recognized (E67237)
CSA (LR39885)
FM (120694.MMO) Limit Only

WARRANTY

1 year

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Series 1000™

Very Easy to Use - Dial Setpoint

1/4 DIN Analog Controller / Limit Device

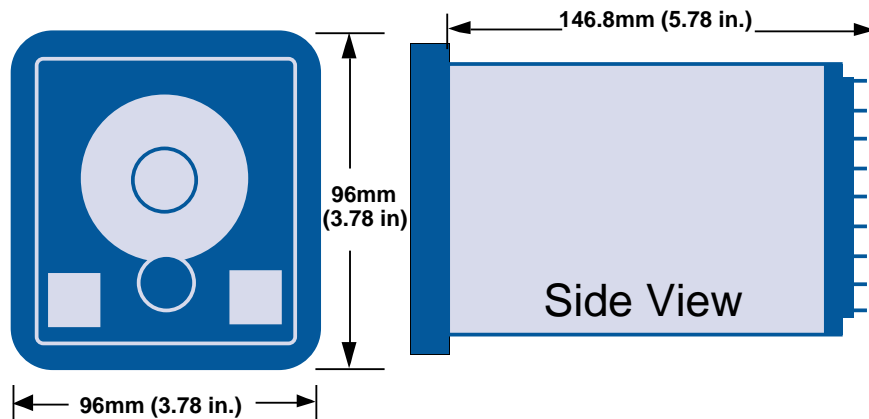
**BASIC CONTROLLER/
LIMIT DEVICE**

MODELS

Code 1: Model #	Code 2: Type	Code 3: Input (Code - Type T/C - C - F)	Code 4: Output	Code 5: Options	Code 6: Voltage	Code 7: Jumper Config	
10	0		0				
I/4 DIN Analog Temperature Controller and Limit Device	0 Controller 1 High Limit 2 Low Limit	11 J 0 to 400 C 12 J 0 to 750 C 13 J 0 to 120 C 21 K 0 to 1350 C 31 T -100 to 200 C 32 T -100 to 200 C 41 R 200 to 1660 C 51 B 500 to 1800 C 61* S 200 to 1650 C 71* E 0 to 750 C	40 to 750 F 40 to 1400 F 32 to 250 F 50 to 2500 F (C Only) -150 to 400 F 400 to 3000 F 900 to 3300 F 400 to 3000 F	1 Relay - SPST N.O. Contact 2 SSR Driver 3 Relay SPDT N.O./N.C. Contact	0 None 1 Remote Reset	1 115 VAC 2 230 VAC	000 High Limit with Upscale Sensor Break 001 Low Limit with Downscale Sensor Break 101 On/Off Direct Controller (Cooling) with Downscale Break 200 On/Off Reverse Controller (Heating) with Upscale Sensor Break

* Available only on a High Limit

DIMENSIONS - 1/4 DIN



Panel Cutout: 92mm x 92mm (3.62" x 3.62")



MIC 3200™

Small Size – Big Capability

1/32 DIN Temperature Controller/Indicator

DESCRIPTION

The MIC 3200 is straightforward, easy to use, and designed to offer users a smaller controller without sacrificing functionality. The controller comes equipped with specially developed hands-free PID (easy tune) for excellent general control.

For more specific performance requirements, there is also pre-tune followed by manual fine-tune to get the very best control for a specific application.

APPLICATIONS:

Ideal for temperature control applications requiring a compact, value-priced, easy-to-use general-purpose controller.

INDUSTRIES:

- Industrial and lab ovens/furnaces, plastics and thermal forming
- Form/Fill and seal
- Packaging applications
- And any others where low costs, smaller size and unmatched connectivity are critical requirements.

FEATURES/BENEFITS

- Single, 4-digit, 0.39" LED display
- 1/32 DIN panel mount
- Universal Input for thermocouple, RTD, DC linear mA/mV; user-selectable
- 1 or 2 outputs; relay or SSR driver
- Process or deviation/band alarm functions
- ON/OFF, direct/reverse acting PID Control
- Optional RS-485 serial communications

MIC 3200™

Small Size – Big Capability

1/32 DIN Temperature Controller/Indicator

BASIC CONTROLLER/
LIMIT DEVICE

SPECIFICATIONS*

STANDARD FEATURES

Full PID capability
Single or dual outputs via relay or SSR driver
Indicator only, indicator with alarm or full controller models available
One or two alarm outputs
Universal Input for thermocouple, RTD, DC linear mA/mV

ENVIRONMENTAL CHARACTERISTICS

Operating Temperature: 0 to 55°C, 32 to 131°F
Storage Temperature: -20 to 80°C, -4 to 176°F
Humidity: 20 to 90% RH, non condensing

ELECTRICAL

Line Voltage: 90 to 264VAC, 50/60 Hz standard; 12 to 24VAC 50/60Hz or 12 to 30VDC (optional)
Power Consumption: 4 Watts maximum

INPUTS

Thermocouple types: J, K, T, R, S, B, and N.
RTD: 100 ohm (.00385 Ohm/Ohm/°C)
Millivolts: 0 to 50mVDC, 10 to 50mVDC
Milliamps: 0 to 20 or 4 to 20mADC,

OUTPUTS

Relay: SPDT, 2.0 A Resistive @ 120/240VAC
SSR Driver: >10V DC into 500Ω minimum (50mA maximum)

DISPLAY

Digital Display: Four 7 segment LEDs, 0.39" high
Status Indicators: Individual LED indicators for Control, Alarm, and Configuration status

ALARM ADJUSTMENT

Process Alarm: ± Input Span
Deviation Alarm: -1999 to + Input Span
Deviation Band Alarm: 1 to Input Span

CONTROL ADJUSTMENTS

On/Off Hysteresis: 0.1% to 10.0% of Input Span
Proportional Band: 0.5% to 999.9%
Manual Reset: 0% to 100%
Auto Reset: 1 sec to 99 minutes 59 seconds and OFF
Rate: 0 (OFF) to 9 mins. 59 sec
Cycle Time: 0.5 sec (SSR Drive only) 1, 2, 4, 8, 16, 32, 64, 128, 256, and 512 seconds
Control Algorithms: Direct/reverse acting PID or ON/OFF
Automatic Tuning Types: Pre-Tune or EASY TUNE

PERFORMANCE

Measurement Accuracy: ± 0.1% of span, ± 1 LSD at 20 deg C
Note: Reduced performance with Type "B" thermocouple between 100-600C (212-1112F).
Ambient Temperature Error: 0.01% of span /deg C change in ambient
Linearization Accuracy: (TC and RTD)
Better than ± 0.2 deg C any point, 0.1 deg C range (± 0.05 deg C typical).
Better than ± 0.5 deg C any point, any 1 deg C range
Cold Junction Compensation: Better than ± 0.7 deg C
Noise Rejection: Common mode: >120dB at 50/60Hz giving negligible effect at up to 264V 50/60Hz
Series Mode: >500% of span (at 50/60Hz) causes negligible effects.
Source Resistance: 1000 ohm maximum (thermocouple)
Lead Resistance: 50 ohm per lead maximum balanced (Pt100)

PHYSICAL DIMENSIONS

Dimensions: 1/32 DIN front panel, 100mm (3.9") deep
Weight: 100 g. (3.53 oz.)

COMMUNICATIONS

Type: Serial asynchronous UART-to UART Link
Data Format: 1 start bit, selectable parity (odd, even or none), 8 data bits, 1 stop bit.
Physical Layer: RS-485 (two wire)
Presentation Layer: Modbus RTU protocol
Maximum Number of Zones: 128
Baud Rate: Selectable in range 9600, 4800, 2400, 1200
Zone Address Range: 1 to 128

RATINGS/AGENCY APPROVALS

UL & cUL recognized (E67237), CE

WARRANTY

3 years

MIC 3200™

Small Size – Big Capability

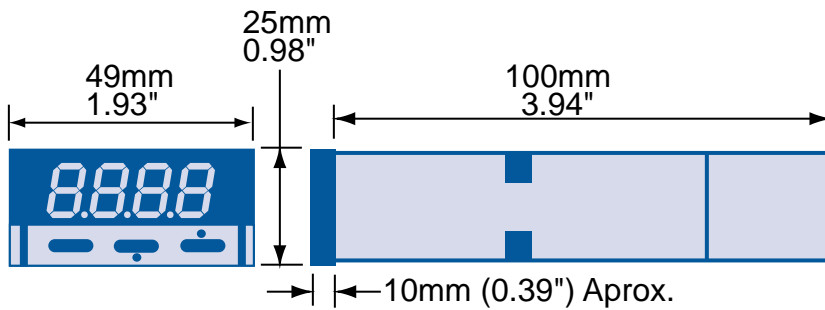
**BASIC CONTROLLER/
LIMIT DEVICE**

1/32 DIN Temperature Controller/Indicator

MODELS

Code 1: Model #	Code 2: Process & Alarm 1 Outputs	Code 3: Option	Code 4: Display Color/ Line Voltage
3200	□ □	□	□
1/32 DIN Temperature Controller/Indicator	00 Indicator Only 01 Indicator with Relay Output for Alarm 1 02 Indicator with SSR Driver Output for Alarm 1 12 Controller with Relay Output and SSR Alarm 1 Output 21 Controller with SSR Driver Output and Relay Alarm 1 Output	0 None 1 Relay Alarm 2 2 RS-485 Comms	0 Green Display 90-264VAC 1 Red Display 90-264VAC 2 Green Display 24V AC/DC 3 Red Display 24V AC/DC

DIMENSIONS - 1/32 DIN



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Mounting
 Panel Thickness: 6mm (0.24"), maximum
 Panel Cutout: 45mm x 22.5mm (1.77" x 0.89")



MIC 1880™

Process and AC/DC Volts & Current Metering

1/8 DIN Process Indicator with Alarm

DESCRIPTION

The Partlow brand MIC 1880 is a series of 1/8 DIN instruments which offer breakthrough display technology as well as easy-to-program user setup. Its large LED display features the ability to change color based on process status such as exceeding the count preset. Therefore, when monitoring critical values, the MIC 1880 panel meter provides operators with an instant visual alert to changes in the application's status.

Models with input characteristics for temperature, DC Process, and AC or DC Volts/Amps are available. These intelligent units offer multiple control & alarm outputs, optional serial communication, and specialized functions on analog input units. The front panel is rated NEMA 4X/IEC IP65 for use in washdown or dusty environments.

APPLICATIONS:

The Partlow MIC 1880 digital indicator is an easy-to-use, low cost solution for indication and display within industrial temperature and process measurement applications – providing high visibility and excellent accuracy in a compact size.

INDUSTRIES

- Industrial and lab ovens/furnaces
- Plastics and thermal forming
- Packaging applications
- And any other display of process measurement especially where visible notification an out-of-range alarm condition is a requirement

FEATURES/BENEFITS

- Large Red/Green Color Selection Display also may be set to change color at alarm condition.
- 1/8 DIN - NEMA 4X/IP65 Front Panel Sealing
- Thermocouple, Process, Voltage and Current Input
- Optional Serial Communications
- Relay, Open-Collector and Linear Outputs
- High or Low Alarm Conditions

MIC 1880™

Basic Indicators

Process and AC/DC Volts & Current Metering

1/8 DIN Process Indicator with Alarm

BASIC INDICATORS

SPECIFICATIONS*

STANDARD FEATURES

- 4 per second input sample rate
- Simple 4 button operation, Large 4 digit 18mm high red or green display with color change on alarm possible
- Plug-in output modules – install just the function needed
- Multipoint scaling & Tare functions
- Jumperless input configuration
- Auto-detection of installed output modules
- Process alarms
- Rugged ABS Plastic housing

ENVIRONMENTAL CHARACTERISTICS

- Operating Temperature:** 0° to 55° Celsius, 32° to 131° Fahrenheit
- Storage Temperature:** -20° to 80° Celsius, -4° to 176° Fahrenheit
- Relative Humidity:** 20% to 95% non-condensing

ELECTRICAL

- Supply Voltage:** 90-264 VAC, 50/60 Hz, or 20-50 VAC/VDC
- Power Consumption:** 5 Watts

DISPLAY:

- Type:** Red/Green, 7 segment LED, 5 digit primary display, single digit secondary display
- Height:** 0.71" (18mm) primary display, 0.3" (7mm) secondary display
- Annunciators:** Output 1 & 2 status

CONTROL INPUTS:

- Type:** Sinking, Edge Sensitive
- Logic:** Low \leq 2.0 VDC, High \geq 3.0
- Response Time:** 25 ms
- Impedance:** 4.7 k Ω to +Voltage
- Function:** Programmable

SENSOR/PROCESS INPUTS:

- Temperature:** B, J, K, N, S, & T thermocouples, 3 & 4 wire RTDs
- DC Process:** to 50 mA, \pm 10Volts DC, \pm 100 mV
- AC Volts/Amps:** from 0-1 VAC to 0-600 VAC, 0-1 mA to 0-1 amp
- DC Volts/Amps:** from 0-100 mV to 0-600 VDC, 0-1 mA to 0-2 amps

OUTPUTS

- Solid State:** NPN open collector, 30 VDC max., 100 mA max.
- Relay:** SPDT, 5A resistive @110 VAC
- Latency:** 75 μ seconds, plus 8 ms for relay pull-in
- Linear Outputs:** 0-20mA, 4-20mA, 0-10V, 2-10V, 0-5V, 1-5V (field selectable)
- Accessory Power Supply:** 24VDC nominal; 30mA max.

OUTPUT FUNCTIONS

- Alarm Modes (Alarm 1 and 2):** High/Low

ELECTRICAL PERFORMANCE

- Accuracy:** \pm 0.1% of span (\pm 0.01% of span for DC Process)

COMMUNICATIONS INTERFACE

- Interface:** RS-485; West ASCII
- Baud Rate** selectable from 9600, 4800, 2400, or 1200
- Maximum Zones:** 99

RATINGS/AGENCY APPROVALS

- Conformance:** UL, CUL, CE

PROTECTION

- IEC IP65 (NEMA 4X) front panel

PHYSICAL DIMENSIONS

- Panel Cutout:** 1.77" x 3.62" (45mm x 92mm)
- Width:** 3.78" (96mm)
- Height:** 1.89" (48mm)
- Depth:** 3.93" (100mm)
- Weight:** 9 oz. (254g)
- Mounting:** Panel Mount (bracket supplied)

WARRANTY

- 1 Year

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MIC 1880™

**Process and AC/DC
Volts & Current Metering**

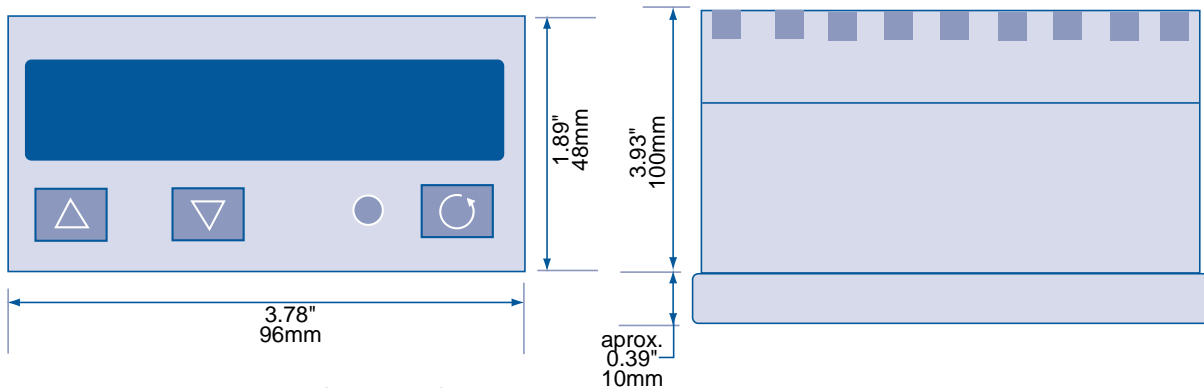
BASIC INDICATORS

1/8 DIN Process Indicator with Alarm

MODELS

Code 1: Model #	Code 2: Function	Code 3: 2nd Relay Option	Code 4: Linear Output Option	Code 5: Serial Communication Option	Code 6: Power Supply
1880	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I/8 DIN Analog Input Process Indicator with Alarms	1 Temperature <ul style="list-style-type: none"> • Thermocouple • RTD 2 DC Process <ul style="list-style-type: none"> • 0 to 50mA • ± 10 Volts DC • ± 100mV 3 AC Volts/Amps 5 DC Volts/Amps	0 None 1 2nd Relay	0 None 3 Linear Output	0 Not fitted 5 RS-485 Serial Comms 6 Digital Input Option	0 90-264 VAC 2 20-50 VAC/VDC

DIMENSIONS - 1/8 DIN



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NEW



1/16 DIN Indicator with Alarm

DESCRIPTION

The Partlow 1610+ is a new digital panel indicator providing a high contrast, high visibility display, designed for optimal ease of use in a wide variety of temperature and related process applications.

The 1610+ is fast, accurate and easy to read with a jumperless configuration, plug in output boards and an improved PC configurator for quick and simple setup. The new generation 1610+ may be specified with either red or green LED displays.

In addition, plug-in modules allow PV retransmission or transmitter power supply and up to 4 alarm relays (latching or non-latching).

The 1610+ indicator is affordable, full featured, easy to use and compact with performance features characteristic of the + Series product line that work for you making temperature and process display simple.

The 1610+ is an easy to use low cost solution for temperature and process display applications - providing excellent visibility and high accuracy all within an affordable and ultra compact housing.

1610+™

*Affordable, High Contrast,
Compact and Easy to Use*

APPLICATIONS:

The Partlow 1610+ digital indicator is an easy-to-use, low cost solution for indication and display within industrial temperature and process measurement applications – providing high visibility and excellent accuracy in a compact size.

INDUSTRIES

- Industrial and lab ovens/furnaces
- Plastics and thermal forming
- Packaging applications
- And any other display of temperature or other process measurement especially where an out-of-range alarm condition is a requirement

FEATURES/BENEFITS

- 10V SSR driver output allows drive of up to 3 typical SSR/SCR inputs
- Plug-in Output Modules for SSR driver, Triac, Relay and linear outputs – easily field changeable
- Common HMI and styling with other Partlow + Series products promoting uniform system appearance and operation
- Latching Alarms - Included as standard.
- PC Configurator with easy to use “wizard” suits both novice and experienced users
- Jumperless configuration with self-recognition of optionboards – promotes simple, error free set-up
- Multi-point Scaling and Tare features included as standard.

1610+™

Affordable, High Contrast,
Compact and Easy to Use

1/16 DIN Indicator with Alarm

SPECIFICATIONS*

STANDARD FEATURES

4 per second input sample rate
 Universal input
 Improved HMI, 3 button operation,
 4 digit 11mm high red, green, indicators for
 5 alarms
 Plug-in output modules – install just the
 function needed
 Multipoint scaling & Tare functions
 Jumperless input configuration
 Auto-detection of installed output modules
 Improved PC configuration software
 Process alarms (NEW standard latching
 alarm)
 Rugged ABS Plastic housing

ENVIRONMENTAL CHARACTERISTICS

Operating Temp: 32° to 131°F (0° to 55°C)
Storage Temp: -4° to 176°F (-20° to 80°C)
Humidity: 20% to 95% non-condensing RH

ELECTRICAL

Supply Voltage: 100-240V, 50/60Hz, Optional
 20-48VAC 50/60Hz / 22-65VDC
Power Consumption: 5W / 7.5 VA Maximum

DISPLAY

Type: Red or Green, 7 segment LED, 4 digit
Height: 10mm (0.39")
Annunciators: LED indicators for output and
 status

INPUTS

T/C's: J, T, K, L, N, B, R, S, C; Pt Rh20%
 vs. Pt 40% Rh
RTD: 3-wire, PT100
DC Linear (Scalable -1999 to +9999)
Volts: 0-5V, 1-5V, 0-10V, 2-10V
DC milliamps: 0-20mA or 4-20mA
DC millivolts: 0-50mV, 10-50mV

OUTPUTS

All outputs are user-selectable and customized
 based on desired application; choose from the
 following output types
Max # of Outputs: 4 for alarm, 24 VDC
 transmitter power supply or retransmit of
 process value
Single Alarm Relay: Optional SPDT; 240VAC 2A
 resistive; Lifetime >500,000 operations at
 rated voltage/current
Dual Alarm Relays: Optional, Two x SPST
 contacts with shared common. 2 Amp
 resistive at 240V AC, >200,000 operations.
 Latching or non-latching
SSR Drive: Optional drive capability: >10 VDC
 nominal into 500 ohm minimum
DC Linear: Optional 0-20mA, 4-20mA into 500
 ohm max; 0-10V, 1-5V, 2-10V, 0-5V into 500
 ohm min; Outputs have 2% over/under drive
 applied; Accuracy +0.25% (mA into 250 ohm
 load, V into 2k ohm load); degrading linearity
 to +0.5% for increasing burden to specified
 limits
Triac: Optional 0.01 to 1A AC, 20 to 280Vrms,
 47-63 Hz (Limit 2)
Transmitter Power Supply: Optional 24 VDC
 (Limit 1)

OUTPUT FUNCTIONS

Process Alarm: (reverse or direct)
Alarm Modes (Alarm 1 through 5): High/Low,
 logical OR/AND
Retransmit: Process value

ELECTRICAL PERFORMANCE

Accuracy: ± 0.1% of input range ±1 LSD (T/C
 CJC better than 1 degree C)
Input sample rate: 4 per second, 14 bit
 resolution
Impedance: >10M ohm for the thermocouple
 and mV ranges, 47k ohm for V ranges and
 5 ohm for mA ranges
Sensor Break Detection: <2 seconds (except
 zero based DC ranges), high alarms activate
 for T/C, RTD and mV ranges, low alarms
 activate for mA or V ranges

COMMUNICATIONS INTERFACE

User-selectable: 2-wire, RS-485 serial
 communications option with choice of Modbus
 RTU or West ASCII protocol; 1200 to 19200
 baud
PC Configuration: Offline configuration from
 serial port to dedicated configuration socket
 (comms option not required)

RATINGS/AGENCY APPROVALS

Conformance: CE, UR, cUR UL File # 67237
Safety: EN61010
EMC: EN61326

PROTECTION

IEC IP66 (NEMA 4X) front panel
 IEC IP20 (behind the panel protection)

PHYSICAL DIMENSIONS

Panel Cutout: 1.77" x 1.77" (45mm x 45mm)
Width: 1.89" (48mm)
Height: 1.89" (48mm)
Depth: 4.33" (110mm)
Weight: 0.46 lbs (0.21 kg)
Mounting: Plug in panel with fixing strap

OPTIONS/ACCESSORIES

Digital Input 1: Selects volt-free or TTL input
 RS-485 serial communication: speeds and user-
 selectable (Modbus/RTU or West ASCII) option
 Transmitter Power: 24VDC transmitter power
 supply option
Choice of Led colors: red or Green

WARRANTY

3 Years

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 features only unless otherwise noted. Specifications
 subject to change without notice in accordance with
 our DBS policy of continuous improvement. All
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1610+™

*Affordable, High Contrast,
Compact and Easy to Use*

BASIC INDICATORS

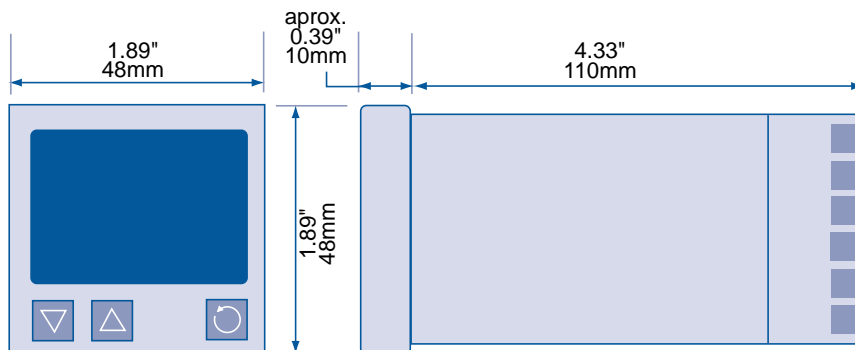
1/16 DIN Indicator with Alarm

MODELS

Code 1: Model #	Code 2: Option Slot 1	Code 3: Option Slot 2	Code 4: Option Slot 3	Code 5: Option Slot A	Code 6: Power Supply
P1610	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
1/16 DIN Indicator with Alarm Function	0 Not Fitted 1 Relay 2 DC for SSR 3 Linear 8 Triac*	0 Not fitted 1 Relay 2 DC Driver for SSR 3 Linear 8 Triac* 9 Dual Relay	0 Not fitted 1 Relay 2 DC Driver for SSR 3 Linear 4 Transmitter Power Supply 8 Triac*	0 Not fitted 1 RS-485 Serial Communication 2 Digital Input 3 Green Display 4 RS-485 & Green Display 5 Digital Input & Green Display	00 100-240 AC 02 24-48 AC or DC

* Maximum of two Triac outputs per unit

DIMENSIONS - 1/16 DIN



Panel Cutout: 45mm x 45mm (1.77" x 1.77")

NEW



1/8 DIN Indicator with Alarm

DESCRIPTION

The Partlow 1810+ is a new digital panel indicator providing a high contrast, high visibility display, designed for optimal ease of use in a wide variety of temperature and related process applications.

The 1810+ is fast, accurate and easy to read with a jumperless configuration, plug in output boards and an improved PC configurator for quick and simple setup. The new generation 1810+ further provides a new user-selectable dual color display option with fixed red or green displays or a green to red color change when an alarm condition occurs.

In addition, plug-in modules allow PV retransmission or transmitter power supply and up to 5 alarm relays (latching or non-latching).

The 1810+ indicator is affordable, full featured, easy to use and compact with performance features characteristic of the + Series product line that work for you making temperature and process display simple.

The 1810+ digital indicator like its predecessor, the 1810, remains an easy to use low cost solution for temperature and process display applications - providing excellent visibility and high accuracy all within an affordable and ultra compact housing.

1810+™

*Affordable, High Contrast,
Compact and Easy to Use*

APPLICATIONS:

The Partlow 1810+ digital indicator like its predecessor, the 1810, remains an easy-to-use, low cost solution for indication and display within industrial temperature and process measurement applications – providing high visibility and excellent accuracy in a compact size.

INDUSTRIES

- Industrial and lab ovens/furnaces
- Plastics and thermal forming
- Packaging applications
- And any other display of temperature or other process measurement especially where an out-of-range alarm condition is a requirement

FEATURES/BENEFITS

- **NEW** 10V SSR driver output allows drive of up to 3 typical SSR/SCR inputs
- **NEW** Plug-in Output Modules for SSR driver, Triac, Relay and linear outputs – easily field changeable
- **NEW** Common HMI and styling with other Partlow + Series products promoting uniform system appearance and operation
- **NEW** Latching Alarms - Included as standard.
- **NEW** Improved PC Configurator with easy to use “wizard” suits both novice and experienced users
- **NEW** Jumperless configuration with self-recognition of optionboards – promotes simple, error free set-up
- **NEW** Multi-point Scaling and Tare features included as standard.

1810+™

Affordable, High Contrast,
Compact and Easy to Use

1/8 DIN Indicator with Alarm

SPECIFICATIONS*

STANDARD FEATURES

4 per second input sample rate

Universal input

NEW Improved HMI, 3 button operation, 4 digit 13mm high red, green or red/green display (color change on alarm), indicators for °C/°F, set-up, alarms (5) and max. & min. indicators. Labels for 27 common units provided for mount behind clear window

NEW Plug-in output modules – install just the function needed

NEW Multipoint scaling & Tare functions

NEW Jumperless input configuration

NEW Auto-detection of installed output modules

NEW Improved PC configuration software
Process alarms (**NEW** standard latching alarm)

Rugged ABS Plastic housing

ENVIRONMENTAL CHARACTERISTICS

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

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

Humidity: 20% to 95% non-condensing RH

ELECTRICAL

Supply Voltage: 100-240V, 50/60Hz, Optional 20-48VAC 50/60Hz / 22-65VDC

Power Consumption: 5W / 7.5 VA Maximum

DISPLAY

Type: Red/Green, 7 segment LED, 4 digit primary display, single digit secondary display

Height: 0.53" (13mm) primary display, 0.39" (10mm) secondary display

Annunciators: LED indicators for output and status

INPUTS

T/C's: J, T, K, L, N, B, R, S, C; Pt Rh20% vs. Pt 40% Rh

RTD: 3-wire, PT100

DC Linear (Scalable -1999 to +9999)

Volts: 0-5V, 1-5V, 0-10V, 2-10V

DC milliamps: 0-20mA or 4-20mA

DC millivolts: 0-50mV, 10-50mV

OUTPUTS

All outputs are user-selectable and customized based on desired application; choose from the following output types

Max # of Outputs: 5 for alarm, 24 VDC transmitter power supply or retransmit of process value

Single Alarm Relay: Optional SPDT: 240VAC 2A resistive; Lifetime >500,000 operations at rated voltage/current

Dual Alarm Relays: Optional, Two x SPST contacts with shared common. 2 Amp resistive at 240V AC, >200,000 operations. Latching or non-latching

SSR Drive: Optional drive capability: >10 VDC nominal into 500 ohm minimum

DC Linear: Optional 0-20mA, 4-20mA into 500 ohm max; 0-10V, 1-5V, 2-10V, 0-5V into 500 ohm min; Outputs have 2% over/under drive applied; Accuracy +0.25% (mA into 250 ohm load, V into 2k ohm load); degrading linearity to +-0.5% for increasing burden to specified limits

Triac: Optional 0.01 to 1A AC, 20 to 280Vrms, 47-63 Hz (Limit 2)

Transmitter Power Supply: Optional 24 VDC (Limit 1)

OUTPUT FUNCTIONS

Process Alarm: (reverse or direct)

Alarm Modes (Alarm 1 through 5): High/Low, logical OR/AND

Retransmit: Process value

ELECTRICAL PERFORMANCE

Accuracy: ± 0.1% of input range ±1 LSD (T/C CJC better than 1 degree C)

Input sample rate: 4 per second, 14 bit resolution

Impedance: >10M ohm for the thermocouple and mV ranges, 47k ohm for V ranges and 5 ohm for mA ranges

Sensor Break Detection: <2 seconds (except zero based DC ranges), high alarms activate for T/C, RTD and mV ranges, low alarms activate for mA or V ranges

COMMUNICATIONS INTERFACE

User-selectable: 2-wire, RS-485 serial communications option with choice of Modbus RTU or West ASCII protocol; 1200 to 19200 baud

PC Configuration: Offline configuration from serial port to dedicated configuration socket (comms option not required)

RATINGS/AGENCY APPROVALS

Conformance: CE, UR, cUR UL File # 67237

Safety: EN61010

EMC: EN61326

PROTECTION

IEC IP66 (NEMA 4X) front panel

IEC IP20 (behind the panel protection)

PHYSICAL DIMENSIONS

Panel Cutout: 1.77" x 3.62" (45mm x 92mm)

Width: 3.78" (96mm)

Height: 1.89" (48mm)

Depth: 3.93" (100mm)

Weight: 0.46 lbs (0.21 kg)

Mounting: Plug in panel with fixing strap

OPTIONS/ACCESSORIES

Digital Input 1: Selects volt-free or TTL input

NEW Faster RS-485 serial communication speeds and user-selectable (Modbus/RTU or West ASCII) option

NEW 24VDC transmitter power supply option

Choice of Led colors: red or Green

WARRANTY

3 Years

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1810+™

Affordable, High Contrast, Compact and Easy to Use

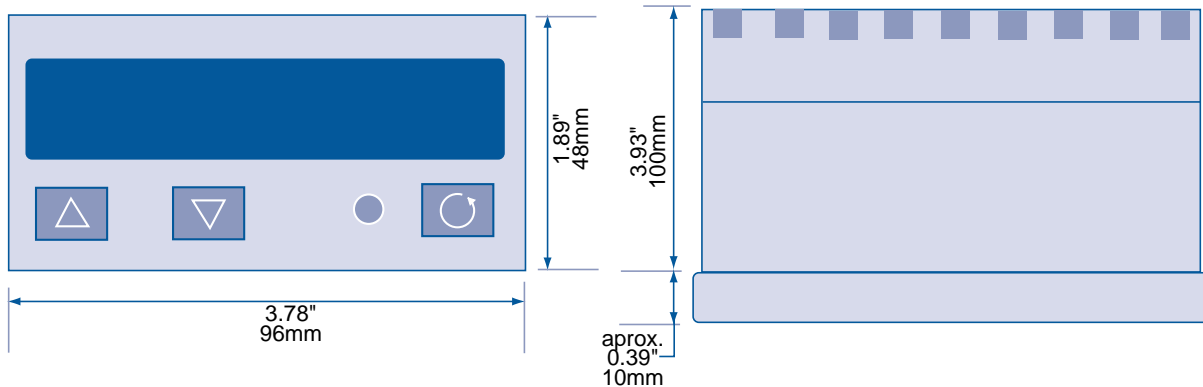
1/8 DIN Indicator with Alarm

MODELS

Code 1: Model #	Code 2: Option Slot 1	Code 3: Option Slot 2	Code 4: Option Slot 3	Code 5: Option Slot A	Code 6: Power Supply
P1810	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
I/8 DIN Indicator with Alarm Function	0 Not Fitted 1 Relay 2 DC for SSR 3 Linear 8 Triac*	0 Not fitted 1 Relay 2 DC Driver for SSR 3 Linear 8 Triac* 9 Dual Relay	0 Not fitted 1 Relay 2 DC Driver for SSR 3 Linear 4 Transmitter Power Supply 8 Triac* 9 Dual Relay	0 Not fitted 1 RS-485 Serial Communication 2 Digital Input 3 Green Display 4 RS-485 & Green Display 5 Digital Input & Green Display 6 Red/Green Changable Display 7 RS-485 & Red/Green Changable Display 8 Digital Input & Red/Green Changable Display	00 100-240 AC 02 24-48 AC or DC

* Maximum of two Triac outputs per unit

DIMENSIONS - 1/8 DIN



Panel Cutout: 92mm x 45mm (3.62" x 1.77")








BASIC INDICATORS

Model Overview

General-Purpose Controllers

Product Feature Overview and Page Location

● Standard ● Optional

GENERAL-PURPOSE							
LIMIT			TEMPERATURE/PROCESS CONTROL				
							
MODEL NUMBER	Series 1000	MIC 1162	1161+ 1801+ 1401+	MIC 3200	1160+ 1800+ 1400+	MIC 2000	MIC 8200
PAGE NUMBER	2.1	3.1	3.4 3.7 3.10	2.4	3.13 3.16 3.19	3.22	3.25
TYPE	Sgl. Loop Analog	Sgl. Loop G.P.	Sgl. Loop G.P.	Sgl. Loop G.P.	Sgl. Loop G.P.	Sgl. Loop G.P.	Sgl. Loop G.P.
	Analog/Limit/FTP	Digital/FTP	Digital/FTP	Digital/FTP	Digital/FTP	Digital/FTP	Digital/FTP
DIN SIZE	1/4	1/16	1/16 (1161+), 1/8 (1801+), 1/4 (1401+)	1/32	1/16 (1160+), 1/8 (1800+), 1/4 (1400+)	1/4	1/4
FUNCTION							
Indicator/Panel Meters				●			
Microprocessor Based		●	●	●	●	●	●
Temperature Controller				●	●	●	●
Process Controller				●	●	●	●
Valve Motor Controller						●	●
Limit Controller	●	●	●				
Profilerer/Controller							
DISPLAY							
Dial							
Single 4 Digit				●		●	
Dual 4 Digit		●	●		●		●
INPUTS							
DC Linear V		●	●		●	●	●
DC Linear mA/DC Linear mV		●	●	●	●	●	●
Thermocouple/RTD	●	●	●	●	●	●	●
Remote Setpoint					●	●	●
Heater Current						●	●
OUTPUTS							
Max. # of Outputs	1	3	3	3	3		5
Relay	●	●	●	●	●	●	●
SSR Driver	●	●	●	●	●	●	●
DC Linear		●	●		●	●	●
Triac			●		●		
OUTPUT FUNCTION							
Control OP1 (Heat Power)	●			●	●	●	●
Control OP2 (Cool Power)	●			●	●	●	●
Limit Output		●	●				
Alarm 1		●	●	●	●	●	●
Alarm 2		●	●		●	●	●
Recorder Output		●	●		●	●	●
Heater Break Alarm							
Dual Setpoint					●		
Real Time Clock							
Transmitter Power Supply		●			●	●	●
COMMUNICATIONS							
RS-485		●	●	●	●	●	●
DeviceNet							
Ethernet/IP							
Profibus							
Modbus/RTU		●	●	●	●		
Modbus/TCP							
CANopen							
PC Configuration			●		●		
AGENCY APPROVALS							
UR & cUR	●	●	●	●	●	●	●
CSA	●					●	●
CE	●	●	●	●	●		
FM	●		●				
NEMA 4X		●	●	●	●		
POWER SUPPLY							
90-264V AC		●	●	●	●		
115VAC OR 230VAC	●					●	●
20-50V AC/22-65VDC		●	●	●	●		
PID TUNING TYPES							
Pre-Tune				●	●		
Self-Tune					●		●
Easy Tune				●			
Manual Tune				●	●	●	●

GENERAL-PURPOSE CONTROLLERS



MIC 1162

Fail Safe Protection

1/16 DIN Limit Controller

DESCRIPTION

MIC 1162 limit controllers provide a programmable safety cutout and optional alarm for use in a wide variety of applications.

Packaged in 1/16 DIN, the MIC 1162 provides a latched relay output which is activated when process parameters either exceed or fall below the desired value, providing a fail safe shutoff that requires manual reset before the process can continue.

The instrument can be configured to be either a high limit unit where the relay will de-energize when the PV is above the limit point setpoint, or a low limit where the relay will drop out when the PV falls below the setpoint, or both. LED indication shows when limits have been exceeded and when the relay is latched out.

It offers a full range of universal sensor input options, versatile configuration and a front panel sealed to NEMA4 type/IP65.

The MIC 1162 can provide a valuable safety control element in most applications and systems.

APPLICATIONS:

Fail-safe protection device to prevent damage to equipment or products. It will shut down a process when a preset temperature is reached and cannot be reset by the operator until the process has returned to a safe condition.

INDUSTRIES

- Industrial and lab ovens/furnaces
- Plastics and thermal forming
- Packaging applications
- And any other where protection against out-of-range temperature condition is a critical requirement

FEATURES/BENEFITS

- Dual, 4-digit, 0.36" LED displays
- 1/16 DIN panel mount
- Universal Input for thermocouple, RTD, DC linear mA/V/mV user-selectable
- Up to 3 outputs; relay, 4-20mA
- Limit, alarm, retransmission output functions
- High and Low Limit Control
- Optional RS-485 serial communications
- Optional Remote Reset
- Program security

MIC 1162™

Fail Safe Protection

General-Purpose
Controllers

1/16 DIN Limit Controller

SPECIFICATIONS*

STANDARD FEATURES

- Dual Display for fast view of process and control parameters
- High/Low Limit output via relay
- Separate alarm output
- Retransmission via 4-20 mA current output
- Universal input plus remote reset and sensor fault detection
- Maximum/Minimum Hold:** Feature that tracks and saves the maximum (high limit) and minimum (low limit) excursions of the process variable
- Time Exceed:** Feature that measures the amount of time that the limit is exceeded

ENVIRONMENTAL CHARACTERISTICS

- Operating Temperature:** 0 to 55°C, 32 to 131°F
- Storage Temperature:** -20 to 80°C, -4 to 176°F
- Humidity:** 20 to 95% RH, non condensing

ELECTRICAL

- Line Voltage:** 90 - 264VAC, 50/60Hz; 20-50VAC, 50/60Hz; 22-65VDC
- Power Consumption:** 4 Watts

INPUTS

- Thermocouple types:** J, K, T, R, S, B, L, and N.
- RTD:** 100 ohm platinum (.00385 Ohm/Ohm/C)
- Volts (VDC):** 0 to 5, 1 to 5, 0 to 10, 2 to 10
- Millivolts:** 0 to 50mVDC, 10 to 50mVDC
- Milliamps:** 0 to 20 or 4 to 20mADC
- Remote Reset:** Voltage-free contact closure required to reset
- Sensor Fault Detection:** Display indicates fault for thermocouple or RTD inputs and sensor break, SnSr. Control outputs set to OFF (0% power); alarms operate as if the has gone over-range (TC) or under-range (RTD & V, mV, mA)

OUTPUTS

- Limit Output:** SPDT Relay; 5.0 A Resistive at 120/240 VAC
- Alarm Output:** Relay; 2.0A Resistive at 120/240 VAC
- Retransmit Output:**
 - 0-20mADC into 500 ohm maximum
 - 4-20mADC into 500 ohm maximum
 - 0-10VDC 500 ohm minimum
 - 0-5VDC 500 ohm minimum
- Resolution:** >10 bits in >1000ms typical

DISPLAY

- Digital Display:** Dual 7 segment LED; Top: .36" high, Bottom .28" high.
- Status Indicators:** Individual LED indicators for OUT, Exceed, ALM, and when in Setup

ALARMS

- Maximum Number:** Two "soft" alarms
- Maximum # Outputs:** Up to 2 outputs can be used for alarm purposes
- Comb. of Alarms:** Logical ORing and ANDing of alarms to an individual hardware output is available
- Process Alarm Adjustment:** ± Input Span

PERFORMANCE

- Measurement Accuracy:** ± 0.25% of span, ± 1 LSD at 20 deg C
- Note: Reduced performance with Type "B" thermocouple between 100-600C (212-1112F)
- Ambient Temperature Error:** 0.01% of span /deg C change in ambient
- Linearization Accuracy:** Better than ± 0.2 deg C any point, (TC and RTD) any 0.1 deg C range (± 0.05 deg C typical). Better than ± 0.5 deg C any point, any 1 deg C range
- Cold Junction Compensation:** Better than ± 0.7 deg C
- Scan Rate:** 4 per second
- Noise Rejection:** Common mode: >120dB at 50/60Hz giving negligible effect at up to 264V 50/60Hz
- Series Mode: >500% of span (at 50/60 Hz) causes negligible effect
- Source Resistance:** 1000 ohm maximum (thermocouple)
- Lead Resistance:** 50 ohm per lead maximum balanced (Pt100)

PHYSICAL DIMENSIONS

- Dimensions:** 1/16 DIN front panel, 110mm (4.3") deep
- Weight:** 227 g. (8 oz.) maximum

COMMUNICATIONS

- Type:** RS-485 serial communication port
- Protocol:** MODBUS/RTU

RATINGS/AGENCY APPROVALS

- CE, UL & cUL recognized (E67237),

WARRANTY

- 3 years

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MIC 1162™

Fail Safe Protection

1/16 DIN Limit Controller

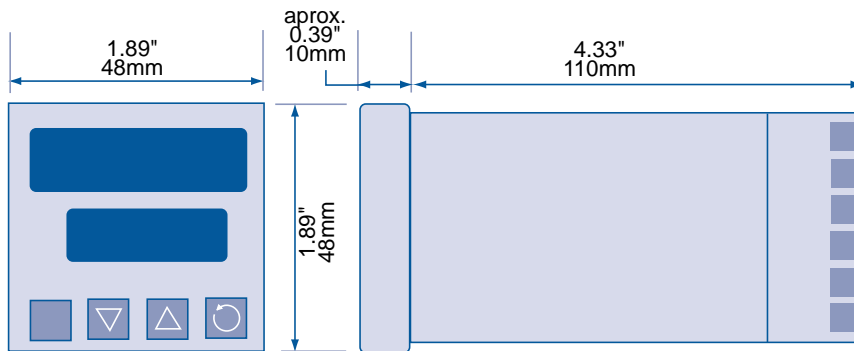
MODELS

Code 1: Model #	Code 2: Output 1	Code 3: Output 2	Code 4: Output 3	Code 5: Options	Code 6: Suffix
1162	1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
1/16 DIN Limit Controller	1 Relay	0 None 1 Relay*	0 None 1 Relay 2 4-20mA**	0 None 1 RS-485 Communications 2 Remote Reset	(Blank) None 02 Line Voltage 24 V AC/DC

* For alarm output only.
** For retransmission only.

GENERAL-PURPOSE CONTROLLERS

DIMENSIONS - 1/16 DIN



Panel Cutout: 45mm x 45mm (1.77" x 1.77")

NEW



1161+™

*Affordable, Well-Featured,
Easy to Use and Adaptable*

1/16 DIN Limit Controller

DESCRIPTION

The Partlow 1161+ is part of a range of new generation '+' Series limit devices that share the same distinctive styling as the '+' Series temperature controllers.

The expanded '+' Series limit controller platform includes 1/4, 1/8 and 1/16 DIN models that incorporate numerous product specification, communication, display interface and software improvements that surpass competitive limit device offerings in ease of use, delivery and value-per dollar characteristic of the growing '+' Series product family.

By adding more versatile features and user-friendly functionality like digital inputs, an easy-to-use HMI, jumperless and auto-hardware configuration, 24VDC transmitter power supply and MODBUS communication across the range - the new generation Partlow + Series limit controllers transform the complicated into the simple while saving you time (as much as 50% on product set-up), reducing inventory stock and virtually eliminating the likelihood of operator errors.

The + Series limit controllers are affordable, well-featured, easy to use and adaptable with performance features that work for you to make limit control simple.

APPLICATIONS:

Fail-safe protection device to prevent damage to equipment or products. It will shut down a process when a preset temperature is reached and cannot be reset by the operator until the process has returned to a safe condition.

INDUSTRIES

- Industrial and lab ovens/furnaces
- Plastics and thermal forming
- Packaging applications
- And any other where protection against out-of-range temperature condition is a critical requirement

FEATURES/BENEFITS

- **NEW** Improved easy-to-use HMI
- **NEW** Jumperless input configuration
- **NEW** Auto-hardware recognition
- **NEW** Improved Windows PC configuration software
- Process alarms
- Optional digital input and remote reset
- Optional 10V SSR driver output
- Faster communication speeds in selectable MODBUS or ASCII format
- FM Approved
- Backward compatible panel cutout, housing and terminal wiring capability

1161+™

Affordable, Well-Featured,
Easy to Use and Adaptable

1/16 DIN Limit Controller

SPECIFICATIONS*

STANDARD FEATURES

4 per second input sample rate
 Universal input
NEW Improved HMI, 4 button operation, dual 4-digit LED display
NEW Plug-in output modules – install just the function needed
NEW Jumperless input configuration
NEW Auto-detection of installed output modules
NEW Improved PC configuration software
 Process alarms
Construction/Enclosure: Rugged ABS Plastic housing

ENVIRONMENTAL CHARACTERISTICS

Operating Temp: 32° to 131°F (0° to 55°C)
Storage Temp: -4° to 176°F (-20° to 80°C)
Humidity: 20% to 95% non-condensing RH

ELECTRICAL

Supply Voltage: 100-240V, 50/60Hz, Optional 20-48VAC 50/60Hz or 22-65VDC
Power Consumption: 5W / 7.5 VA Maximum

DISPLAY:

Type: Red or Green, 7 segment LED, 4 digit upper and lower displays
Height: 10mm (0.39") upper display, 8mm (0.31") lower display
Annunciators: 5 LED indicators for output and status

INPUTS

T/C's: J, T, K, L, N, B, R, S, C; Pt Rh20% vs. Pt 40% Rh
RTD: 3-wire, PT100
DC Linear (Scalable -1999 to +9999)
Volts: 0-5V, 1-5V, 0-10V, 2-10V
DC milliamps: 0-20mA or 4-20mA
DC millivolts: 0-50mV, 10-50mV

OUTPUTS

Output 1 (limit relay) fixed; outputs 2 and 3 (alarm relay) are user-selectable and customized based on desired application; choose from the following output types
Max # of Outputs: 3 for alarm, 24 VDC transmitter power supply or retransmit of process value/limit trip setpoint
Limit Relay: SPDT; 240VAC 5A resistive; Lifetime >100,000 operations at rated voltage/current
Alarm Relay: Optional SPDT; 240VAC 2A resistive; Lifetime >500,000 operations at rated voltage/current
SSR Drive: Optional drive capability: >10 VDC nominal into 500 ohm minimum
DC Linear: Optional 0-20mA, 4-20mA into 500 ohm max; 0-10V, 1-5V, 2-10V, 0-5V into 500 ohm min; Outputs have 2% over/under drive applied; Accuracy +0.25% (mA into 250 ohm load, V into 2k ohm load); degrading linearity to +-0.5% for increasing burden to specified limits
Triac: Optional 0.01 to 1A AC, 20 to 280Vrms, 47-63 Hz (Limit 2)
Transmitter Power Supply: Optional 24 VDC (Limit 1)

OUTPUT FUNCTIONS

Process Alarm: (reverse or direct)
Modes (Alarm 1 and 2): High/Low, Band, Deviation, logical OR/AND
Retransmit: Process value or limit setpoint

ELECTRICAL PERFORMANCE

Accuracy: ± 0.1% of input range ± 1 LSD (T/C CJC better than 1 degree C)
Input sample rate: 4 per second, 14 bit resolution
Impedance: >10M ohm for the thermocouple and mV ranges, 47k ohm for V ranges and 5 ohm for mA ranges
Sensor Break Detection: <2 seconds (except zero based DC ranges), limit output opens, low alarms activate for RTD, mA or V ranges

COMMUNICATIONS INTERFACE

User-selectable: 2-wire, RS-485 serial communications option with choice of Modbus RTU or ASCII protocol; 1200 to 19200 baud
PC Configuration: Offline configuration from serial port to dedicated configuration socket (comms option not required)

RATINGS/AGENCY APPROVALS

Conformance: FM, CE, UR, cUR UL File # 67237
Safety: EN61010
EMC: EN61326

PROTECTION

IEC IP66 (NEMA 4X) front panel
 IEC IP20 (behind the panel protection)

PHYSICAL DIMENSIONS

Panel Cutout: 1.77" x 1.77" (45mm x 45mm)
Height: 1.89" (48mm)
Width: 1.89" (48mm)
Depth: 4.33" (110mm)
Weight: 0.46 lbs (0.21 kg)
Mounting: Plug in panel with fixing strap

OPTIONS/ACCESSORIES

Digital Input 1 (Optional): remote reset
NEW Faster RS-485 serial communication speeds and user-selectable (Modbus or ASCII) option
NEW 24VDC transmitter power supply option
Choice of Led colors: red/red, red/green, green/red, green/green

WARRANTY

3 Years

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1161+™

*Affordable, Well-Featured,
Easy to Use and Adaptable*

1/16 DIN Limit Controller

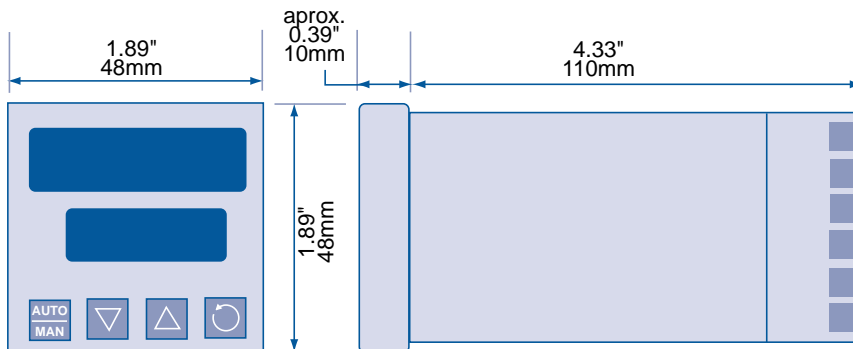
MODELS

Code 1: Model #	Code 2: Option Slot 1	Code 3: Option Slot 2	Code 4: Option Slot 3	Code 5: Option Slot A	Code 6: Power Supply
P1161	1				
1/16 DIN Limit Controller	1 Relay Output	0 Not fitted 1 Relay Output 2 DC Drive SSR Output 3 Linear DC Output 4 Transmitter Power Supply † 8 Triac Output	0 Not fitted 1 Relay Output 2 DC Drive SSR Output 3 Linear DC Output 4 Transmitter Power Supply † 8 Triac Output	0 Not fitted 1 RS-485 Serial Comms 2 Green Upper Display 3 RS-485 Serial Comms & Green Upper Display 4 Green Lower Display 5 RS-485 Serial Comms & Green Lower Display 6 Green Upper/Lower Display 7 RS-485 Serial Comms & Green Upper/Lower Display 8 Digital Input 9 Digital Input & Green Upper Display A Digital Input & Green Lower Display B Digital Input & Green Upper/Lower Display	00 100-240V AC 02 24-48 AC or DC

† One Transmitter Power Supply per Unit

GENERAL-PURPOSE CONTROLLERS

DIMENSIONS - 1/16 DIN



Panel Cutout: 45mm x 45mm (1.77" x 1.77")



Customer Service +1 800.390.6405
 Technical Support +1 800.866.6659
www.partlow.com • www.danaherindustrialcontrols.com

NEW



1801+™

*Affordable, Well-Featured,
Easy to Use and Adaptable*

1/8 DIN Limit Controller

DESCRIPTION

The Partlow 1801+ is part of a range of new generation '+' Series limit devices that share the same distinctive styling as the '+' Series temperature controllers.

The expanded '+' Series limit controller platform includes 1/4, 1/8 and 1/16 DIN models that incorporate numerous product specification, communication, display interface and software improvements that surpass competitive limit device offerings in ease of use, delivery and value-per dollar characteristic of the growing '+' Series product family.

By adding more versatile features and user-friendly functionality like digital inputs, an easy-to-use HMI, jumperless and auto-hardware configuration, 24VDC transmitter power supply and MODBUS communication across the range - the new generation Partlow + Series limit controllers transform the complicated into the simple while saving you time (as much as 50% on product set-up), reducing inventory stock and virtually eliminating the likelihood of operator errors.

The + Series limit controllers are affordable, well-featured, easy to use and adaptable with performance features that work for you to make limit control simple.

APPLICATIONS:

Fail-safe protection device to prevent damage to equipment or products. It will shut down a process when a preset temperature is reached and cannot be reset by the operator until the process has returned to a safe condition.

INDUSTRIES

- Industrial and lab ovens/furnaces
- Plastics and thermal forming
- Packaging applications
- And any other where protection against out-of-range temperature condition is a critical requirement

FEATURES/BENEFITS

- **NEW** Improved easy-to-use HMI
- **NEW** Jumperless input configuration
- **NEW** Auto-hardware recognition
- **NEW** Improved Windows PC configuration software
- Process alarms
- Optional digital input and remote reset
- Optional 10V SSR driver output
- Faster communication speeds in selectable MODBUS or ASCII format
- FM Approved
- Backward compatible panel cutout, housing and terminal wiring capability

1801+™

Affordable, Well-Featured,
Easy to Use and Adaptable

1/8 DIN Limit Controller

SPECIFICATIONS*

STANDARD FEATURES

4 per second input sample rate
Universal input
NEW Improved HMI, 4 button operation, dual 4-digit LED display
NEW Plug-in output modules – install just the function needed
NEW Jumperless input configuration
NEW Auto-detection of installed output modules
NEW Improved PC configuration software
Process alarms
Construction/Enclosure: Rugged ABS Plastic housing

ENVIRONMENTAL CHARACTERISTICS

Operating Temp: 32° to 131°F (0° to 55°C)
Storage Temp: -4° to 176°F (-20° to 80°C)
Humidity: 20% to 95% non-condensing RH

ELECTRICAL

Supply Voltage: 100-240V, 50/60Hz, Optional 20-48VAC 50/60Hz or 22-65VDC
Power Consumption: 5W / 7.5 VA Maximum

DISPLAY:

Type: Dual, Red or Green, 7 segment LED, 4 digit upper and lower displays
Height: 10mm (0.39") upper display, 8mm (0.31") lower display
Annunciators: 5 LED indicators for output and status

INPUTS

T/C's: J, T, K, L, N, B, R, S, C; Pt Rh20% vs. Pt 40% Rh
RTD: 3-wire, PT100
DC Linear (Scalable –1999 to +9999)
Volts: 0-5V, 1-5V, 0-10V, 2-10V
DC milliamps: 0-20mA or 4-20mA
DC millivolts: 0-50mV, 10-50mV

OUTPUTS

Output 1 (limit relay) fixed; outputs 2 and 3 (alarm relay) are user-selectable and customized based on desired application; choose from the following output types
Max # of Outputs: 3 for alarm, 24 VDC transmitter power supply or retransmit of process value/limit trip setpoint
Limit Relay: SPDT; 240VAC 5A resistive; Lifetime >100,000 operations at rated voltage/current
Alarm Relay: Optional SPDT; 240VAC 2A resistive; Lifetime >500,000 operations at rated voltage/current
SSR Drive: Optional drive capability: >10 VDC nominal into 500 ohm minimum

DC Linear: Optional 0-20mA, 4-20mA into 500 ohm max; 0-10V, 1-5V, 2-10V, 0-5V into 500 ohm min; Outputs have 2% over/under drive applied; Accuracy +0.25% (mA into 250 ohm load, V into 2k ohm load); degrading linearity to +0.5% for increasing burden to specified limits

Triac: Optional 0.01 to 1A AC, 20 to 280Vrms, 47-63 Hz (Limit 2)

Transmitter Power Supply: Optional 24 VDC (Limit 1)

OUTPUT FUNCTIONS

Process Alarm: (reverse or direct)
Modes (Alarm 1 and 2): High/Low, Band, Deviation, logical OR/AND
Retransmit: Process value or limit setpoint

ELECTRICAL PERFORMANCE

Accuracy: ± 0.1% of input range ±1 LSD (T/C CJC better than 1 degree C)
Input sample rate: 4 per second, 14 bit resolution
Impedance: >10M ohm for the thermocouple and mV ranges, 47k ohm for V ranges and 5 ohm for mA ranges
Sensor Break Detection: <2 seconds (except zero based DC ranges), limit output opens, low alarms activate for RTD, mA or V ranges

COMMUNICATIONS INTERFACE

User-selectable: 2-wire, RS-485 serial communications option with choice of Modbus RTU or ASCII protocol; 1200 to 19200 baud
PC Configuration: Offline configuration from serial port to dedicated configuration socket (comms option not required)

RATINGS/AGENCY APPROVALS

Conformance: FM, CE, UR, cUR UL File # 67237
Safety: EN61010
EMC: EN61326

PROTECTION

IEC IP66 (NEMA 4X) front panel
IEC IP20 (behind the panel protection)

PHYSICAL DIMENSIONS

Panel Cutout: 1.77" x 3.62" (45mm x 92mm)
Height: 3.78" (96mm)
Width: 1.89" (48mm)
Depth: 3.93" (100mm)
Weight: 0.46 lbs (0.21 kg)
Mounting: Plug in panel with fixing strap

OPTIONS/ACCESSORIES

Digital Input 1 (Optional): remote reset
NEW Faster RS-485 serial communication speeds and user-selectable (Modbus or ASCII) option
NEW 24VDC transmitter power supply option
Choice of Led colors: red/red, red/green, green/red, green/green

WARRANTY

3 Years

* Specifications are for base models with standard features only unless otherwise noted. Specifications subject to change without notice in accordance with our DBS policy of continuous improvement. All product and brand names are trademarks of their respective owners. All rights reserved.

1801+™

General-Purpose Controllers

*Affordable, Well-Featured,
Easy to Use and Adaptable*

1/8 DIN Limit Controller

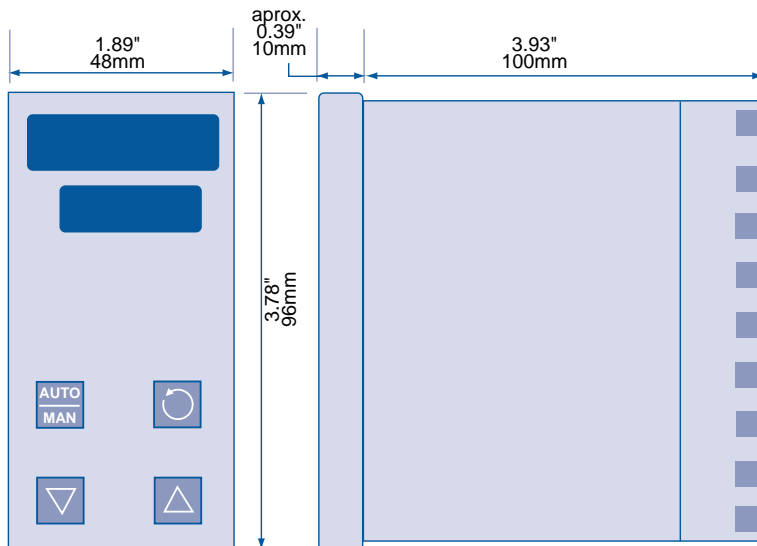
MODELS

Code 1: Model #	Code 2: Option Slot 1	Code 3: Option Slot 2	Code 4: Option Slot 3	Code 5: Option Slot A	Code 6: Power Supply
P1801	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
1/8 DIN Limit Controller	1 Relay Output	0 Not fitted 1 Relay Output 2 DC Drive SSR Output 3 Linear DC Output 4 Transmitter Power Supply † 8 Triac Output	0 Not fitted 1 Relay Output 2 DC Drive SSR Output 3 Linear DC Output 4 Transmitter Power Supply † 8 Triac Output	0 Not fitted 1 RS-485 Serial Comms 2 Green Upper Display 3 RS-485 Serial Comms & Green Upper Display 4 Green Lower Display 5 RS-485 Serial Comms & Green Lower Display 6 Green Upper/Lower Display 7 RS-485 Serial Comms & Green Upper/Lower Display 8 Digital Input 9 Digital Input & Green Upper Display A Digital Input & Green Lower Display B Digital Input & Green Upper/Lower Display	00 100-240V AC 02 24-48 AC or DC

† Only one Transmitter Power Supply may be installed per unit

GENERAL-PURPOSE CONTROLLERS

DIMENSIONS - 1/8 DIN



Panel Cutout: 45mm x 92mm (1.77" x 3.62")

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 Technical Support +1 800.866.6659
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NEW



1/4 DIN Limit Controller

DESCRIPTION

The Partlow 1401+ is part of a range of new generation '+' Series limit devices that share the same distinctive styling as the '+' Series temperature controllers.

The expanded '+' Series limit controller platform includes 1/4, 1/8 and 1/16 DIN models that incorporate numerous product specification, communication, display interface and software improvements that surpass competitive limit device offerings in ease of use, delivery and value-per dollar characteristic of the growing '+' Series product family.

By adding more versatile features and user-friendly functionality like digital inputs, an easy-to-use HMI, jumperless and auto-hardware configuration, 24VDC transmitter power supply and MODBUS communication across the range - the new generation Partlow + Series limit controllers transform the complicated into the simple while saving you time (as much as 50% on product set-up), reducing inventory stock and virtually eliminating the likelihood of operator errors.

The + Series limit controllers are affordable, well-featured, easy to use and adaptable with performance features that work for you to make limit control simple.

1401+™

*Affordable, Well-Featured,
Easy to Use and Adaptable*

APPLICATIONS:

Fail-safe protection device to prevent damage to equipment or products. It will shut down a process when a preset temperature is reached and cannot be reset by the operator until the process has returned to a safe condition.

INDUSTRIES

- Industrial and lab ovens/furnaces
- Plastics and thermal forming
- Packaging applications
- And any other where protection against out-of-range temperature condition is a critical requirement

FEATURES/BENEFITS

- **NEW** Improved easy-to-use HMI
- **NEW** Jumperless input configuration
- **NEW** Auto-hardware recognition
- **NEW** Improved Windows PC configuration software
- Process alarms
- Optional digital input and remote reset
- Optional 10V SSR driver output
- Faster communication speeds in selectable MODBUS or ASCII format
- FM Approved
- Backward compatible panel cutout, housing and terminal wiring capability

1401+™

Affordable, Well-Featured,
Easy to Use and Adaptable

1/4 DIN Limit Controller

SPECIFICATIONS*

STANDARD FEATURES

4 per second input sample rate
 Universal input
NEW Improved HMI, 4 button operation, dual 4-digit LED display
NEW Plug-in output modules – install just the function needed
NEW Jumperless input configuration
NEW Auto-detection of installed output modules
NEW Improved PC configuration software
 Process alarms
Construction/Enclosure: Rugged ABS Plastic housing

ENVIRONMENTAL CHARACTERISTICS

Operating Temp: 32° to 131°F (0° to 55°C)
Storage Temp: -4° to 176°F (-20° to 80°C)
Humidity: 20% to 95% non-condensing RH

ELECTRICAL

Supply Voltage: 100-240V, 50/60Hz, Optional 20-48VAC 50/60Hz or 22-65VDC
Power Consumption: 5W / 7.5 VA Maximum

DISPLAY:

Type: Dual, Red or Green, 7 segment LED, 4 digit upper and lower displays
Height: 13mm (0.53") upper display, 10mm (0.39") lower display
Annunciators: 5 LED indicators for output and status

INPUTS

T/C's: J, T, K, L, N, B, R, S, C; Pt Rh20% vs. Pt 40% Rh
RTD: 3-wire, PT100
DC Linear (Scalable –1999 to +9999)
Volts: 0-5V, 1-5V, 0-10V, 2-10V
DC milliamps: 0-20mA or 4-20mA
DC millivolts: 0-50mV, 10-50mV

OUTPUTS

Output 1 (limit relay) fixed; outputs 2 and 3 (alarm relay) are user-selectable and customized based on desired application; choose from the following output types
Max # of Outputs: 3 for alarm, 24 VDC transmitter power supply or retransmit of process value/limit trip setpoint
Limit Relay: SPDT; 240VAC 5A resistive; Lifetime >100,000 operations at rated voltage/current
Alarm Relay: Optional SPDT; 240VAC 2A resistive; Lifetime >500,000 operations at rated voltage/current
SSR Drive: Optional drive capability: >10 VDC nominal into 500 ohm minimum
DC Linear: Optional 0-20mA, 4-20mA into 500 ohm max; 0-10V, 1-5V, 2-10V, 0-5V into 500 ohm min; Outputs have 2% over/under drive applied; Accuracy +/-0.25% (mA into 250 ohm load, V into 2k ohm load); degrading linearity to +/-0.5% for increasing burden to specified limits
Triac: Optional 0.01 to 1A AC, 20 to 280Vrms, 47-63 Hz (Limit 2)
Transmitter Power Supply: Optional 24 VDC (Limit 1)

OUTPUT FUNCTIONS

Process Alarm: (reverse or direct)
Modes (Alarm 1 and 2): High/Low, Band, Deviation, logical OR/AND
Retransmit: Process value or limit setpoint

ELECTRICAL PERFORMANCE

Accuracy: ± 0.1% of input range ±1 LSD (T/C CJC better than 1 degree C)
Input sample rate: 4 per second, 14 bit resolution
Impedance: >10M ohm for the thermocouple and mV ranges, 47k ohm for V ranges and 5 ohm for mA ranges
Sensor Break Detection: <2 seconds (except zero based DC ranges), limit output opens, low alarms activate for RTD, mA or V ranges

COMMUNICATIONS INTERFACE

User-selectable: 2-wire, RS-485 serial communications option with choice of Modbus RTU or ASCII protocol; 1200 to 19200 baud
PC Configuration: Offline configuration from serial port to dedicated configuration socket (comms option not required)

RATINGS/AGENCY APPROVALS

Conformance: FM, CE, UR, cUR UL File # 67237
Safety: EN61010
EMC: EN61326

PROTECTION

IEC IP66 (NEMA 4X) front panel
 IEC IP20 (behind the panel protection)

PHYSICAL DIMENSIONS

Panel Cutout: 3.62" x 3.62" (92mm x 92mm)
Height: 3.78" (96mm)
Width: 3.78" (96mm)
Depth: 3.93" (100mm)
Weight: 0.46 lbs (0.21 kg)
Mounting: Plug in panel with fixing strap

OPTIONS/ACCESSORIES

Digital Input 1 (Optional): remote reset
NEW Faster RS-485 serial communication speeds and user-selectable (Modbus or ASCII) option
NEW 24VDC transmitter power supply option
Choice of Led colors: red/red, red/green, green/red, green/green

WARRANTY

3 Years

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1401+™

*Affordable, Well-Featured,
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1/4 DIN Limit Controller

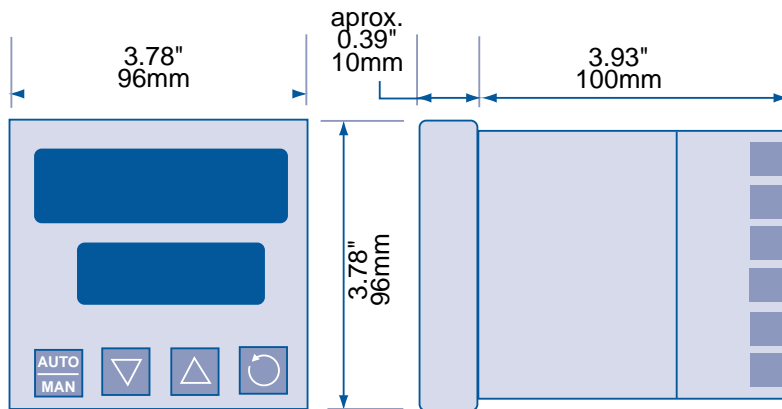
MODELS

Code 1: Model #	Code 2: Option Slot 1	Code 3: Option Slot 2	Code 4: Option Slot 3	Code 5: Option Slot A	Code 6: Power Supply
P1401	1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
I/4 DIN Limit Controller	1 Relay Output	0 Not fitted 1 Relay Output 2 DC Drive SSR Output 3 Linear DC Output 4 Transmitter Power Supply † 8 Triac Output	0 Not fitted 1 Relay Output 2 DC Drive SSR Output 3 Linear DC Output 4 Transmitter Power Supply † 8 Triac Output	0 Not fitted 1 RS-485 Serial Comms 2 Green Upper Display 3 RS-485 Serial Comms & Green Upper Display 4 Green Lower Display 5 RS-485 Serial Comms & Green Lower Display 6 Green Upper/Lower Display 7 RS-485 Serial Comms & Green Upper/Lower Display 8 Digital Input 9 Digital Input & Green Upper Display A Digital Input & Green Lower Display B Digital Input & Green Upper/Lower Display	00 100-240V AC 02 24-48 AC or DC

† Only one Transmitter Power Supply may be installed per unit

GENERAL-PURPOSE CONTROLLERS

DIMENSIONS - 1/4 DIN



Panel Cutout: 92.0mm x 92mm (3.62" x 3.62")



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 Technical Support +1 800.866.6659
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NEW



1/16 DIN Temperature Controller

DESCRIPTION

The Partlow 1160+ is a new generation of '+' Series controller that takes flexibility and ease of use to new levels. The expanded '+' Series platform of 1/4, 1/8 and 1/16 DIN model controllers incorporates numerous product specification, communication, display interface and configuration software improvements that surpass competitive offerings in ease of use, delivery and value-per-dollar.

By adding more versatile features and user-friendly functionalities – like remote setpoint inputs, digital inputs, plug-in output modules, a customizable operator/HMI menu, jumperless and auto-hardware configuration, and 24VDC trans-mitter power supply – the new generation 1160+ Series controller transforms the complicated into the simple while saving you time (as much as 50% on product set-up), reducing inventory stock and virtually eliminating the likelihood of operator errors.

Making things complicated is easy – the clever trick with the new generation 1160+ Series controller from Partlow is to make it simple.

1160+™

*Affordable, Well-Featured,
Easy to Use and Adaptable*

APPLICATIONS:

Ideal for temperature control applications requiring a value-priced, user-friendly, versatile and well featured general-purpose controller.

INDUSTRIES

- Industrial and lab ovens/furnaces, plastics and thermal forming
- Form/Fill and seal
- Packaging applications
- And any others where low costs, smaller size and unmatched connectivity are critical requirements.

FEATURES/BENEFITS

- Dual setpoints with optional remote selection
- Plug-in output modules allow installing just the functions needed
- Expanded user-selectable operator modes
- User-selectable plug-and-play output cards
- Process and loop alarms
- Adjustable hysteresis
- Optional 10V SSR driver
- Improved Windows® PC configuration software
- Improved easy-to-use HMI
- Jumperless input configuration
- Auto-hardware recognition
- Faster communication speeds
- More security options
- Backward compatible panel cutout, housing and terminal wiring capability

1160+™

General-Purpose
Controllers

Affordable, Well-Featured,
Easy to Use and Adaptable

1/16 DIN Temperature Controller

SPECIFICATIONS*

STANDARD FEATURES

Dual setpoints with optional remote selection
Plug-in output modules installing just the functions needed
NEW Improved HMI; four button operation, dual 4-digit LED displays
4 per second input sample rate
Universal input
Full PID or ON/OFF control
Heat/Cool operation (with dual outputs ordered)
Selectable pre-tune, self-tune, manual tune
Ramping setpoint
Process and Loop alarms
NEW Jumperless input configuration
NEW Auto-detection of installed output modules.
NEW Improved PC configuration software (comms option not required)
Construction/Enclosure: Rugged ABS plastic housing

ENVIRONMENTAL CHARACTERISTICS

Operating Temp.: 32° to 131°F (0° to 55°C)
Storage Temp.: -4° to 176°F (-20° to 80°C)
Humidity: 20% to 95% non-condensing RH

ELECTRICAL

Supply Voltage: 100–240V 50/60Hz; optional 24VDC (20–48VAC / 22–65 VDC)
Power Consumption: 5W / 7.5VA max

DISPLAY

Type: Dual 4 digit displays, Red or Green, 7 segment LED
Height: 10mm (0.39") upper display, 8mm (0.31") lower display
Annunciators: LED indicators for output and status

INPUTS

Standard Universal input (T/C, RTD and DC Linear):
T/Cs: J, K, C, R, S, T, B, L, N and Pt 20% Rh vs. Pt 40% Rh
RTD: 3-wire; PT100; 50Ω per lead maximum (balanced)
DC Linear (scalable -1999 to +9999):
Volts: 0–5, 1–5, 0–10 or 2–10VDC
DC milliamps: 0–20mA or 4–20mA
DC millivolts: 0–50, 10–50mV

OUTPUTS

All output types are user-selectable and customizable based on desired application; choose from the following output types:
Max. # of Outputs: Three for control, alarm, 24VDC transmitter power supply or retransmit of process value or setpoint
Relay: Optional SPDT; 240VAC 2.0A resistive. Lifetime: >500,000 operations at rated voltage/current
SSR Driver: Optional drive capability: >10VDC nominal into 500Ω minimum
DC Linear: Optional 0–20mA, 4–20mA into 500Ω max.; 0–10V, 1–5V, 2–10V, 0–5V into 500Ω minimum; control outputs have 2% over/under drive applied; accuracy ±0.25% (mA into 250Ω load, V into 2kΩ load); degrading linearly to ±0.5% for increasing burden to specified limits
Triac: Optional 0.01 to 1A AC, 20 to 280Vrms, 47–63Hz (limit 2)
Transmitter Power Supply: Optional 24VDC (limit 1)

OUTPUT FUNCTIONS

All output functions are user-selectable and customizable based on the application:
Heat Power
Cool Power
Process Alarm (reverse or direct)
Modes (Alarms 1 and 2): High/low, SP deviation, band, logical OR/AND
Loop Alarm (reverse or direct)
Retransmit (setpoint or process value)

ELECTRICAL PERFORMANCE

GENERAL:
Accuracy: ±0.1% of input range ±1 LSD (T/C CJC better than 1°C)
Input Sample Rate: 4 per second; 14 bit resolution
Impedance: >10MΩ for thermocouple and mV ranges, 47kΩ for V ranges and 5Ω for mA ranges
Sensor Break Detection: <2 seconds (except zero based DC ranges), control O/Ps turn off, high alarms activate for T/C and mV ranges, low alarms activate for RTD, mA or V ranges

COMMUNICATIONS INTERFACE

User-selectable: 2-wire, RS-485 serial communications option with choice of Modbus® or ASCII protocol; 1200 to 19,200 baud
PC Configuration: Off-line configuration from serial port to dedicated configuration socket (comms option not required)

RATINGS/AGENCY APPROVALS

Safety: CE, UR, cUR, UL file #E67237
EMC: Certified EN61326
Other: ISO 9002 registered

PROTECTION

IEC IP66; NEMA 4X (front panel)
IEC IP20 (behind the panel protection)

PHYSICAL DIMENSIONS

Panel Cutout: 1.77" (45mm) × 1.77" (45mm)
Width: 1.89" (48mm)
Depth: 4.33" (110mm)
Height: 1.89" (48mm)
Weight: 0.46 lbs (0.21kg)
Mounting: Plug-in with panel mounting fixing strap

OPTIONS/ACCESSORIES

NEW 24VDC transmitter power supply option
NEW Faster RS-485 serial communication speeds and user-selectable (Modbus® or ASCII) option
Digital Input 1 (Optional): Selects between two setpoints or auto/manual control; volt free or TTL input
Basic Remote Setpoint Input (Optional): 0–20mA, 4–20mA, 0–10V, 2–10V, 0–5V; scalable -1999 to 9999; local or remote setpoint selected from front panel
Optional Choice of LED colors: (red/red, red/green, green/red, green/green); plus five indicators

WARRANTY

3 years

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1160+™

General-Purpose Controllers

*Affordable, Well-Featured,
Easy to Use and Adaptable*

1/16 DIN Temperature Controller

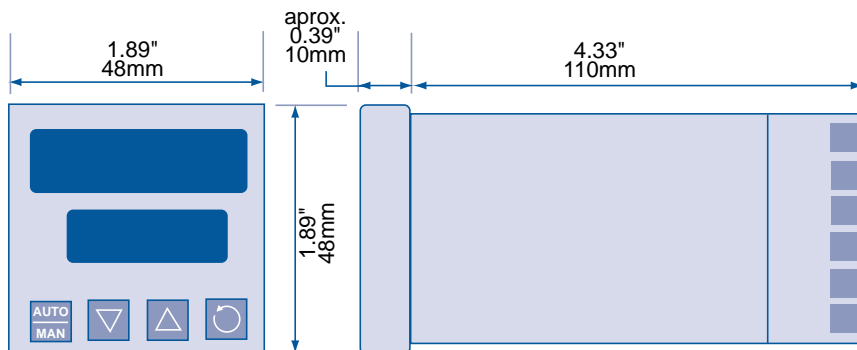
MODELS

Code 1: Model #	Code 2: Option Slot 1	Code 3: Option Slot 2	Code 4: Option Slot 3	Code 5: Option Slot A	Code 6: Power Supply
P1160	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
1/16 DIN Temperature Controller	0 Not fitted 1 Relay Output 2 DC Drive SSR Output 3 Linear DC Output 8 Triac Output*	0 Not fitted 1 Relay Output 2 DC Drive SSR Output 3 Linear DC Output 4 Transmitter Power Supply † 8 Triac Output*	0 Not fitted 1 Relay Output 2 DC Drive SSR Output 3 Linear DC Output 4 Transmitter Power Supply † 8 Triac Output*	0 Not fitted 1 RS-485 Serial Comms 2 Green Upper Display 3 RS-485 Serial Comms & Green Upper Display 4 Green Lower Display 5 RS-485 Serial Comms & Green Lower Display 6 Green Upper/Lower Display 7 RS-485 Serial Comms & Green Upper/Lower Display 8 Digital Input 9 Digital Input & Green Upper Display A Digital Input & Green Lower Display B Digital Input & Green Upper/Lower Display C Basic Remote Setpoint Input D Basic RSP & Green Upper Display E Basic RSP & Green Lower Display F Basic RSP & Green Upper/Lower Display	00 100-240V AC 02 24-48 AC or DC

*Two triac outputs maximum † Only one Transmitter Power Supply may be installed per unit

GENERAL-PURPOSE CONTROLLERS

DIMENSIONS - 1/16 DIN



Panel Cutout: 45mm x 45mm (1.77" x 1.77")



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NEW

**1800+**[™]*Affordable, Well-Featured,
Easy to Use and Adaptable*

1/8 DIN Temperature Controller

DESCRIPTION

The Partlow 1800+ is a new generation of '+' Series controller that takes flexibility and ease of use to new levels. The expanded '+' Series platform of 1/4, 1/8 and 1/16 DIN model controllers incorporates numerous product specification, communication, display interface and configuration software improvements that surpass competitive offerings in ease of use, delivery and value-per-dollar.

By adding more versatile features and user-friendly functionalities – like remote setpoint inputs, digital inputs, plug-in output modules, a customizable operator/HMI menu, jumperless and auto-hardware configuration, and 24VDC transmitter power supply – the new generation 1800+ Series controller transforms the complicated into the simple while saving you time (as much as 50% on product set-up), reducing inventory stock and virtually eliminating the likelihood of operator errors.

Making things complicated is easy – the clever trick with the new generation 1800+ Series controller from Partlow is to make it simple.

APPLICATIONS:

Ideal for temperature control applications requiring a value-priced, user-friendly, versatile and well featured general-purpose controller.

INDUSTRIES:

- Industrial and lab ovens/furnaces, plastics and thermal forming
- Form/fill and seal
- Packaging applications
- And any others where low costs, smaller size and unmatched connectivity are critical requirements.

FEATURES/BENEFITS

- Dual setpoints with optional remote selection
- Plug-in output modules allow installing just the functions needed
- Expanded user-selectable operator modes
- User-selectable plug-and-play output cards
- Process and loop alarms
- Adjustable hysteresis
- Optional 10V SSR driver
- Improved Windows® PC configuration software
- Improved easy-to-use HMI
- Jumperless input configuration
- Auto-hardware recognition
- Faster communication speeds
- More security options
- Backward compatible panel cutout, housing and terminal wiring capability

1800+™

Affordable, Well-Featured,
Easy to Use and AdaptableGeneral-Purpose
Controllers

1/8 DIN Temperature Controller

SPECIFICATIONS*

STANDARD FEATURES

Dual setpoints with optional remote selection
Plug-in output modules installing just the functions needed
NEW Improved HMI: four button operation, dual 4-digit LED displays
4 per second input sample rate
Universal input
Full PID or ON/OFF control
Heat/Cool operation (with dual outputs ordered)
Selectable pre-tune, self-tune, manual tune
Ramping setpoint
Process and Loop alarms
NEW Jumperless input configuration
NEW Auto-detection of installed output modules.
NEW Improved PC configuration software (comms option not required)
Construction/Enclosure: Rugged ABS plastic housing

ENVIRONMENTAL CHARACTERISTICS

Operating Temp.: 32° to 131°F (0° to 55°C)
Storage Temp.: -4° to 176°F (-20° to 80°C)
Humidity: 20% to 95% non-condensing RH

ELECTRICAL

Supply Voltage: 100–240V 50/60Hz; optional 24VDC (20–48VAC / 22–65 VDC)
Power Consumption: 5W / 7.5VA max

DISPLAY

Type: Dual 4 digit displays, Red or Green, 7 segment LED
Height: 10mm (0.39") upper display, 8mm (0.31") lower display
Annunciators: LED indicators for output and status

INPUTS

Standard Universal input (T/C, RTD and DC Linear):
T/Cs: J, K, C, R, S, T, B, L, N and Pt 20% Rh vs. Pt 40% Rh
RTD: 3-wire; PT100; 50Ω per lead maximum (balanced)
DC Linear (scalable -1999 to +9999):
Volts: 0–5, 1–5, 0–10 or 2–10VDC
DC milliamps: 0–20mA or 4–20mA
DC millivolts: 0–50, 10–50mV

OUTPUTS

All output types are user-selectable and customizable based on desired application; choose from the following output types:
Max. # of Outputs: Three for control, alarm, 24VDC transmitter power supply or retransmit of process value or setpoint
Relay: Optional SPDT; 240VAC 2.0A resistive. Lifetime: >500,000 operations at rated voltage/current
SSR Driver: Optional drive capability: >10VDC nominal into 500Ω minimum
DC Linear: Optional 0–20mA, 4–20mA into 500Ω max.; 0–10V, 1–5V, 2–10V, 0–5V into 500Ω minimum; control outputs have 2% over/under drive applied; accuracy ±0.25% (mA into 250Ω load, V into 2kΩ load); degrading linearly to ±0.5% for increasing burden to specified limits
Triac: Optional 0.01 to 1A AC, 20 to 280Vrms, 47–63Hz (limit 2)
Transmitter Power Supply: Optional 24VDC (limit 1)

OUTPUT FUNCTIONS

All output functions are user-selectable and customizable based on the application:
Heat Power
Cool Power
Process Alarm (reverse or direct)
Modes (Alarms 1 and 2): High/low, SP deviation, band, logical OR/AND
Loop Alarm (reverse or direct)
Retransmit (setpoint or process value)

ELECTRICAL PERFORMANCE

GENERAL:
Accuracy: ±0.1% of input range ±1 LSD (T/C CJC better than 1°C)
Input Sample Rate: 4 per second; 14 bit resolution
Impedance: >10MΩ for thermocouple and mV ranges, 47kΩ for V ranges and 5Ω for mA ranges
Sensor Break Detection: <2 seconds (except zero based DC ranges), control O/Ps turn off, high alarms activate for T/C and mV ranges, low alarms activate for RTD, mA or V ranges

COMMUNICATIONS INTERFACE

User-selectable: 2-wire, RS-485 serial communications option with choice of Modbus® or ASCII protocol; 1200 to 19,200 baud
PC Configuration: Off-line configuration from serial port to dedicated configuration socket (comms option not required)

RATINGS/AGENCY APPROVALS

Safety: CE, UR, cUR, UL file# E67237
EMC: Certified EN61326
Other: ISO 9002 registered

PROTECTION

IEC IP66; NEMA 4X (front panel)
IEC IP20 (behind the panel protection)

PHYSICAL DIMENSIONS

Panel Cutout: 1.77" (45mm) × 3.62" (92mm)
Width: 1.89" (48mm)
Depth: 3.93" (100mm)
Height: 3.78" (96mm)
Weight: 0.46 lbs (0.21kg)
Mounting: Plug-in with panel mounting fixing strap

OPTIONS/ACCESSORIES

NEW 24VDC transmitter power supply option
NEW Faster RS-485 serial communication speeds and user-selectable (Modbus® or ASCII) option
Digital Input 1 (Optional): Selects between two setpoints or auto/manual tune control; volt free or TTL input
Basic Remote Setpoint Input (Optional): 0–20mA, 4–20mA, 0–10V, 2–10V, 0–5V; scalable -1999 to 9999; local or remote setpoint selected from front panel
Full Remote Setpoint Input (Optional): 0–20mA, 4–20mA, 0–5V, 1–5V, 0–10V, 2–10V, 0–100mV; scaleable -1999 to 9999; potentiometer (2kΩ minimum); local or remote setpoint selected from front panel; digital input can be configured to switch between setpoints (either setpoint 1 and 2 or between local setpoint and remote setpoint) or between auto and manual control modes. Not available on Model 1160+
Optional Choice of LED colors: (red/red, red/green, green/red, green/green); plus five indicators

WARRANTY

3 years

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1800+™

General-Purpose Controllers

*Affordable, Well-Featured,
Easy to Use and Adaptable*

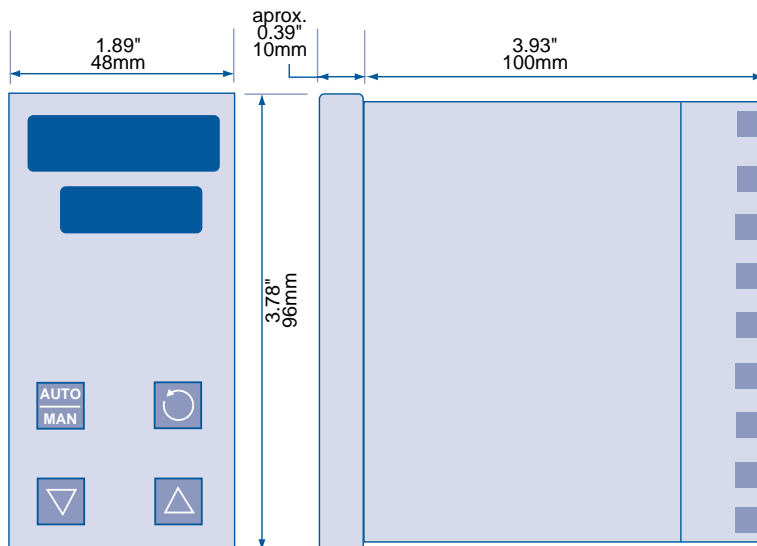
1/8 DIN Temperature Controller

MODELS

Code 1: Model #	Code 2: Option Slot 1	Code 3: Option Slot 2	Code 4: Option Slot 3	Code 5: Option Slot A	Code 6: Power Supply
P1800	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
I/8 DIN Temperature Controller	0 Not fitted 1 Relay Output 2 DC Drive SSR Output 3 Linear DC Output 8 Triac Output*	0 Not fitted 1 Relay Output 2 DC Drive SSR Output 3 Linear DC Output 4 Transmitter Power Supply † 8 Triac Output*	0 Not fitted 1 Relay Output 2 DC Drive SSR Output 3 Linear DC Output 4 Transmitter Power Supply † 8 Triac Output*	0 Not fitted 1 RS-485 Serial Comms 2 Green Upper Display 3 RS-485 Serial Comms & Green Upper Display 4 Green Lower Display 5 RS-485 Serial Comms & Green Lower Display 6 Green Upper/Lower Display 7 RS-485 Serial Comms & Green Upper/Lower Display 8 Digital Input 9 Digital Input & Green Upper Display A Digital Input & Green Lower Display B Digital Input & Green Upper/Lower Display C Basic Remote Setpoint Input D Basic RSP & Green Upper Display E Basic RSP & Green Lower Display F Basic RSP & Green Upper/Lower Display	00 100-240V AC 02 24-48 AC or DC RR Remote Setpoint Input (full with Secondary Digital Input)** R2 24-48VAC/DC & Remote Setpoint (full)**

*Two triac outputs maximum † Only one Transmitter Power Supply may be installed per unit

DIMENSIONS - 1/8 DIN



Panel Cutout: 45mm x 92mm (1.77" x 3.62")

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GENERAL-PURPOSE CONTROLLERS

NEW



1400+™

*Affordable, Well-Featured,
Easy to Use and Adaptable*

1/4 DIN Temperature Controller

DESCRIPTION

The Partlow 1400+ is a new generation of '+ Series controller that takes flexibility and ease of use to new levels. The expanded '+ Series platform of 1/4, 1/8 and 1/16 DIN model controllers incorporates numerous product specification, communication, display interface and configuration software improvements that surpass competitive offerings in ease of use, delivery and value-per-dollar.

By adding more versatile features and user-friendly functionalities – like remote setpoint inputs, digital inputs, plug-in output modules, a customizable operator/HMI menu, jumperless and auto-hardware configuration, and 24VDC transmitter power supply – the new generation 1400+ Series controller transforms the complicated into the simple while saving you time (as much as 50% on product set-up), reducing inventory stock and virtually eliminating the likelihood of operator errors.

Making things complicated is easy – the clever trick with the new generation 1400+ Series controller from Partlow is to make it simple.

APPLICATIONS:

Ideal for temperature control applications requiring a value-priced, user-friendly, versatile and well featured general-purpose controller.

INDUSTRIES:

- Industrial and lab ovens/furnaces, plastics and thermal forming
- Form/Fill and seal
- Packaging applications
- And any others where low costs, smaller size and unmatched connectivity are critical requirements.

FEATURES/BENEFITS

- Dual setpoints with optional remote selection
- Plug-in output modules allow installing just the functions needed
- Expanded user-selectable operator modes
- User-selectable plug-and-play output cards
- Process and loop alarms
- Adjustable hysteresis
- Optional 10V SSR driver
- Improved Windows® PC configuration software
- Improved easy-to-use HMI
- Jumperless input configuration
- Auto-hardware recognition
- Faster communication speeds
- More security options
- Backward compatible panel cutout, housing and terminal wiring capability

1400+™

Affordable, Well-Featured,
Easy to Use and AdaptableGeneral-Purpose
Controllers

1/4 DIN Temperature Controller

SPECIFICATIONS*

STANDARD FEATURES

Dual setpoints with optional remote selection
Plug-in output modules installing just the functions needed
NEW Improved HMI; four button operation, dual 4-digit LED displays
4 per second input sample rate
Universal input
Full PID or ON/OFF control
Heat/Cool operation (with dual outputs ordered)
Selectable pre-tune, self-tune, manual tune
Ramping setpoint
Process and Loop alarms
NEW Jumperless input configuration
NEW Auto-detection of installed output modules.
NEW Improved PC configuration software (comms option not required)
Construction/Enclosure: Rugged ABS plastic housing

ENVIRONMENTAL CHARACTERISTICS

Operating Temp.: 32° to 131°F (0° to 55°C)
Storage Temp.: -4° to 176°F (-20° to 80°C)
Humidity: 20% to 95% non-condensing RH

ELECTRICAL

Supply Voltage: 100–240V 50/60Hz; optional 24VDC (20–48VAC / 22–65 VDC)
Power Consumption: 5W / 7.5VA max

DISPLAY

Type: Dual 4 digit displays, Red or Green, 7 segment LED
Height: 13mm (0.53") upper display, 10mm (0.39") lower display
Annunciators: LED indicators for output and status

INPUTS

Standard Universal input (T/C, RTD and DC Linear):
T/Cs: J, K, C, R, S, T, B, L, N and Pt 20% Rh vs. Pt 40% Rh
RTD: 3-wire; PT100; 50Ω per lead maximum (balanced)
DC Linear (scalable -1999 to +9999):
Volts: 0–5, 1–5, 0–10 or 2–10VDC
DC milliamps: 0–20mA or 4–20mA
DC millivolts: 0–50, 10–50mV

OUTPUTS

All output types are user-selectable and customizable based on desired application; choose from the following output types:
Max. # of Outputs: Three for control, alarm, 24VDC transmitter power supply or retransmit of process value or setpoint
Relay: Optional SPDT; 240VAC 2.0A resistive. Lifetime: >500,000 operations at rated voltage/current
SSR Driver: Optional drive capability: >10VDC nominal into 500Ω minimum
DC Linear: Optional 0–20mA, 4–20mA into 500Ω max.; 0–10V, 1–5V, 2–10V, 0–5V into 500Ω minimum; control outputs have 2% over/under drive applied; accuracy ±0.25% (mA into 250Ω load, V into 2kΩ load); degrading linearly to ±0.5% for increasing burden to specified limits
Triac: Optional 0.01 to 1A AC, 20 to 280Vrms, 47–63Hz (limit 2)
Transmitter Power Supply: Optional 24VDC (limit 1)

OUTPUT FUNCTIONS

All output functions are user-selectable and customizable based on the application:
Heat Power
Cool Power
Process Alarm (reverse or direct)
Modes (Alarms 1 and 2): High/low, SP deviation, band, logical OR/AND
Loop Alarm (reverse or direct)
Retransmit (setpoint or process value)

ELECTRICAL PERFORMANCE

GENERAL:
Accuracy: ±0.1% of input range ±1 LSD (T/C CJC better than 1°C)
Input Sample Rate: 4 per second; 14 bit resolution
Impedance: >10MΩ for thermocouple and mV ranges, 47kΩ for V ranges and 5Ω for mA ranges
Sensor Break Detection: <2 seconds (except zero based DC ranges), control O/PS turn off, high alarms activate for T/C and mV ranges, low alarms activate for RTD, mA or V ranges

COMMUNICATIONS INTERFACE

User-selectable: 2-wire, RS-485 serial communications option with choice of Modbus® or ASCII protocol; 1200 to 19,200 baud
PC Configuration: Off-line configuration from serial port to dedicated configuration socket (comms option not required)

RATINGS/AGENCY APPROVALS

Safety: CE, UR, cUR, UL file# E67237
EMC: Certified EN61326
Other: ISO 9002 registered

PROTECTION

IEC IP66; NEMA 4X (front panel)
IEC IP20 (behind the panel protection)

PHYSICAL DIMENSIONS

Panel Cutout: 3.62" (92mm) × 3.62" (92mm)
Width: 3.78" (96mm)
Depth: 3.93" (100mm)
Height: 3.78" (96mm)
Weight: 0.46 lbs (0.21kg)
Mounting: Plug-in with panel mounting fixing strap

OPTIONS/ACCESSORIES

NEW 24VDC transmitter power supply option
NEW Faster RS-485 serial communication speeds and user-selectable (Modbus® or ASCII) option
Digital Input 1 (Optional): Selects between two setpoints or auto/manual tune control; volt free or TTL input
Basic Remote Setpoint Input (Optional): 0–20mA, 4–20mA, 0–10V, 2–10V, 0–5V; scalable -1999 to 9999; local or remote setpoint selected from front panel
Full Remote Setpoint Input (Optional): 0–20mA, 4–20mA, 0–5V, 1–5V, 0–10V, 2–10V, 0–100mV; scaleable -1999 to 9999; potentiometer (2kΩ minimum); local or remote setpoint selected from front panel; digital input can be configured to switch between setpoints (either setpoint 1 and 2 or between local setpoint and remote setpoint) or between auto and manual control modes. Not available on Model 1160+
Optional Choice of LED colors: (red/red, red/green, green/red, green/green); plus five indicators

WARRANTY

3 years

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1400+™

*Affordable, Well-Featured,
Easy to Use and Adaptable*

1/4 DIN Temperature Controller

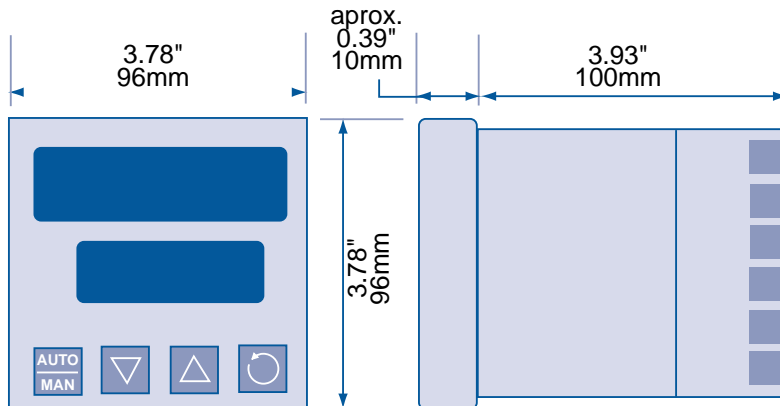
MODELS

Code 1: Model #	Code 2: Option Slot 1	Code 3: Option Slot 2	Code 4: Option Slot 3	Code 5: Option Slot A	Code 6: Power Supply
P1400	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
1/4 DIN Temperature Controller	0 Not fitted 1 Relay Output 2 DC Drive SSR Output 3 Linear DC Output 8 Triac Output*	0 Not fitted 1 Relay Output 2 DC Drive SSR Output 3 Linear DC Output 4 Transmitter Power Supply † 8 Triac Output*	0 Not fitted 1 Relay Output 2 DC Drive SSR Output 3 Linear DC Output 4 Transmitter Power Supply † 8 Triac Output*	0 Not fitted 1 RS-485 Serial Comms 2 Green Upper Display 3 RS-485 Serial Comms & Green Upper Display 4 Green Lower Display 5 RS-485 Serial Comms & Green Lower Display 6 Green Upper/Lower Display 7 RS-485 Serial Comms & Green Upper/Lower Display 8 Digital Input 9 Digital Input & Green Upper Display A Digital Input & Green Lower Display B Digital Input & Green Upper/Lower Display C Basic Remote Setpoint Input D Basic RSP & Green Upper Display E Basic RSP & Green Lower Display F Basic RSP & Green Upper/Lower Display	00 100-240V AC 02 24-48 AC or DC RR Remote Setpoint Input (full with Secondary Digital Input)** R2 24-48VAC/DC & Remote Setpoint (full)**

*Two triac outputs maximum † Only one Transmitter Power Supply may be installed per unit

GENERAL-PURPOSE CONTROLLERS

DIMENSIONS - 1/4 DIN



Panel Cutout: 92.0mm x 92mm (3.62" x 3.62")

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 Technical Support +1 800.866.6659

www.partlow.com • www.danaherindustrialcontrols.com



MIC 2000™

Versatile with High-End Features

1/4 DIN Temperature Controller

DESCRIPTION

The MIC 2000 is a single loop, 1/4 DIN controller capable of controlling a variety of processes ranging from simple on/off to dual 4-20mA output with full PID. Inputs include thermocouple, RTD, millivolt, volt, and milliamp.

Standard features include: isolated process input, setpoint and output limits, and .56 inch high LEDs. It will display programming of process deviation and setpoint, of percent output, and scaling with decimal point positioning.

Optional features include: up to three relay outputs, three types of alarms, remote setpoint input, electric motor modulation, RS-485 communications and process value retransmission output as well as restricted security access. Access to configuration parameters and setpoint may be restricted by using the instrument's security-access mode.

APPLICATIONS:

Ideal for temperature control applications requiring a value-priced, user-friendly, versatile and full featured temperature controller.

INDUSTRIES:

- Industrial and lab ovens/furnaces, plastics and thermal forming
- Form/Fill and seal
- Packaging applications
- And any others where low costs, smaller size and unmatched connectivity are critical requirements.

FEATURES/BENEFITS

- Single, 4-digit, 0.56" LED display
- 1/4 DIN panel mount
- Universal Input for thermocouple, RTD DC linear V, DC linear mA/mV user-selectable
- Up to 3 outputs; relay, SSR driver, 4-20mA
- Process or deviation/band alarm functions
- ON/OFF, position proportioning, PID Control
- Optional RS-485 serial communications
- Program security

MIC 2000™

Versatile with High-End Features

1/4 DIN Temperature Controller

SPECIFICATIONS*

STANDARD FEATURES

Full PID capability
Single or dual outputs via relay, 4-20 mA current or SSR driver
Separate alarm output
Universal input plus remote setpoint and sensor break detection

ENVIRONMENTAL CHARACTERISTICS

Operating Temperature: 0 to 55°C, 32 to 131°F
Storage Temperature: -40 to 65°C, -40 to 149°F
Humidity: 0 to 90% RH, non condensing
Vibration: 0.5 to 100Hz at 0.5g

ELECTRICAL

Line Voltage: 115/230VAC +/- 10% 50/60 Hz
Power Consumption: 15VA maximum
Transmitter Power Supply: Provides up to 40mA @ 24 VDC.

INPUTS

Thermocouple types: J, K, T, R, S, E, B, N, and C.
RTD: 100 ohm platinum (.00385 Ohm/Ohm/C)
Volts: 0 to 5VDC, 1 to 5 VDC
Millivolts: 0 to 25mVDC, 0 to 50mVDC, 10 to 50mVDC
Milliamps: 0 to 20 or 4 to 20mADC, accommodated via the addition of a shunt resistor
Remote Setpoint: 0 to 5VDC, 1 to 5 VDC
Sensor Fault Detection: Displays Hi or Lo for thermocouple or RTD inputs (10% above or below range) and sensor break, SnSr. On/Off outputs go off, proportional outputs go to 0%. Sensor fault detection is not functional for 0 to 5VDC or 0 to 20mADC.

OUTPUTS

Relay: SPST
115VAC: 5.0 A Resistive; 1/8HP or 250VA
230VAC: 2.5 A Resistive; 1/8HP or 250VA
SSR Driver: Open collector output Short circuit protected at 100mA maximum
Provides 4VDC at 20mA or 3VDC at 40mA
Current Output: 0-20 or 4-20 mADC into 650 ohms maximum

DISPLAY

Digital Display: Four 7 segment LEDs each .56 inches high. Status Indicators
Individual LED indicators for Setpoint, Out 1, Out 2, Manual, Alarm, Degrees F, Degrees C, or Engineering Units, and minus sign for negative values.

ALARM ADJUSTMENT

Process Alarm: -9999 to 9999 units
Deviation Alarm: -3000 to 3000 units
Deviation Band Alarm: 1 to 3000 units

CONTROL ADJUSTMENTS

On/Off Hysteresis: 0 to 300 units
Proportional Band: 1 to 3000 units
Manual Reset: -1500 to 1500 units
Auto Reset: 0.0 to 100.0 repeats/minute
Rate: 0.0 to 10.0 minutes
Cycle Time: 1 to 240 seconds
Position Prop. Sensitivity: 0.0 to 50.0%
First Output Position: -1000 to 1000 units
Spread: -1000 to 1000 units
(Second Output Position)

PERFORMANCE

Measurement Error Limit:

- Type J, K, T, E, N, C thermocouples and RTD +/- 0.25% of reading plus 1 degree at 25°C
- Type R, S, B thermocouple +/- 0.25% of span at 25°C
- mVDC, mA DC and VDC +/- 0.25% of span, plus 1 least-significant-digit at 25°C

Ambient Temperature Error: 0.01% of span per degree C deviation from 25°C

Scan Rate: 1 scan per second (3 scans per second available on EA option)

Display Resolution: T/C & RTD: 0.1 or 1 degree mV & VDC: 0.001, 0.01, 0.1, or 1.0

Auto Reset Windup Inhibit: Auto reset is disabled when the process is outside of the proportional band

Cold Junction Compensation: Self compensation for ambient temperature. All calibration values are stored in memory.

Noise Rejection: Normal mode, 85dB minimum @ 60Hz or greater. Common mode, 90dB minimum ±8 VDC maximum peak for RTD input, 115VAC maximum for other inputs.

PHYSICAL DIMENSIONS

Dimensions: 1/4 DIN front panel, 5.8" deep
Weight: 3 pounds maximum

COMMUNICATIONS

Type: RS-485 serial communication port
Protocol: Partlow ASCII

RATINGS/AGENCY APPROVALS

UL & cUL recognized (E67237),
CSA (LR39885)

WARRANTY

3 years

Made in USA

MIC 2000™

Versatile with High-End Features

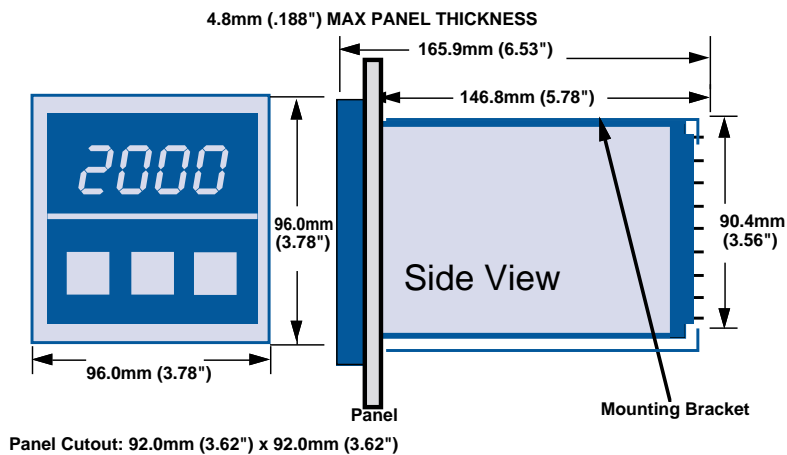
1/4 DIN Temperature Controller

MODELS

Code 1: Model #	Code 2: Input	Code 3: Output 1	Code 4: Output 2	Code 5: Alarm	Code 6: Remote	Code 7: Voltage	Code 8: Option Suffix
2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1/4 DIN Temperature Controller	1 T/C or mV 2 Volts/mA 3 RTD 4 All Inputs	1 Relay 2 SSR Driver 3 4-20mA	0 None 1 Relay 2 SSR Driver 3 4-20mA	0 None 1 Relay 2 SSR Driver	0 None 1 Position Proportioning* 2 Remote Setpoint 3 RS-485 Standard Com.** 5 RS-485 Total Access Com.**	1 115 VAC Input & Relays 2 230 VAC Input & Relays 3 115 VAC Input & 230 VAC Relays	(Blank) None BA Remote Keypad EA Extended Feature Software† EB Extended Feature Software*** † XP 24VDC Transmitter Power Supply XA 24VDC Power Supply††

GENERAL-PURPOSE CONTROLLERS

DIMENSIONS - 1/4 DIN



* Limited to Model 2X11X1X or 2X22X1X.
 ** Cannot be included when Output 2 selection is 3.
 *** Suffix Option EB includes the EA features.
 † Not available with RS-485 Standard Com.
 †† ALARM not available when XA suffix is ordered.
 Note: RS-485 Total Access Com. includes Options EA and EB at no charge.



MIC 8200™

Versatile – Full Featured

1/4 DIN Dual Display Controller

DESCRIPTION

Sophisticated controller handles processes ranging from simple on-off control to full PID with auto-tune, and provides constant visual indication of process and setpoint.

The top display may be programmed to show the process variable or deviation from setpoint. The lower display, when programmed, is keypad selectable to show setpoint 1, setpoint 2, or percent output.

Options include single or dual 4-20mA output, up to three relay outputs, three types of alarms, remote setpoint input, electric motor modulation, and RS-485 communications. Process value retransmission output is also available.

Access to configuration parameters and setpoint may be restricted by using the instrument's security-access mode.

APPLICATIONS:

Ideal for applications requiring a full-featured, user-friendly and highly programmable temperature/process controller.

INDUSTRIES:

- Industrial and lab ovens/furnaces, plastics and thermal forming
- Form/Fill and seal
- Packaging applications
- And any others where maximum capability, smaller size and unmatched connectivity are critical requirements.

FEATURES/BENEFITS

- Dual, 4-digit, 0.36" LED displays
- 1/4 DIN panel mount
- Universal Input for thermocouple, RTD, DC linear mA/V/mV user-selectable
- Up to 3 outputs; relay, SSR driver, 4-20mA
- Process or deviation/band alarm functions
- ON/OFF, position proportioning, PID Control
- Optional RS-485 serial communications
- Program security

MIC 8200™

Versatile – Full Featured

1/4 DIN Dual Display Controller

SPECIFICATIONS*

STANDARD FEATURES

Dual Display for fast view of process and control parameters
Full PID capability
Single or dual outputs via relay, 4-20 mA current or SSR driver
Separate alarm output
Universal input plus remote setpoint and sensor fault detection

ENVIRONMENTAL CHARACTERISTICS

Operating Temperature: 0 to 55°C, 32 to 131°F
Storage Temperature: -40 to 65°C, -40 to 149°F
Humidity: 0 to 90% RH, non condensing
Vibration: 0.5 to 100Hz at 0.5g

ELECTRICAL

Line Voltage: 115/230VAC +/- 10% 50/60 Hz
Power Consumption: 15VA maximum
Transmitter Power Supply: Provides up to 40mA @ 24 VDC.

INPUTS

Thermocouple types: J, K, T, R, S, E, B, N, and C.
RTD: 100 ohm platinum (.00385 Ohm/Ohm/C)
Volts: 0 to 5VDC, 1 to 5 VDC
Millivolts: 0 to 25mVDC, 0 to 50mVDC, 10 to 50mVDC
Milliamps: 0 to 20 or 4 to 20mADC, accommodated via the addition of a shunt resistor
Remote Setpoint: 0 to 5VDC, 1 to 5 VDC
Sensor Fault Detection: Displays Hi or Lo for thermocouple or RTD inputs (10% above or below range) and sensor break, SnSr. On/Off outputs go off, proportional outputs go to 0%. Sensor fault detection is not functional for 0 to 5VDC or 0 to 20mADC.

OUTPUTS

Relay: SPST
115VAC: 5.0 A Resistive; 1/8HP or 250VA
230VAC: 2.5 A Resistive; 1/8HP or 250VA
SSR Driver: Open collector output Short circuit protected at 100mA maximum
Provides 4VDC at 20mA or 3VDC at 40mA
Current Output: 0-20 or 4-20 mADC into 650 ohms maximum

DISPLAY

Digital Display: Dual, each four 7 segment LEDs each .36 inches high.
Status Indicators: Individual LED indicators for Setpoint, Out 1, Out 2, Manual, Alarm, Degrees F, Degrees C, or Engineering Units, and minus sign for negative values, Process Value, Percent Output-1, Percent Output-2, and Remote Setpoint

ALARM ADJUSTMENT

Process Alarm: -9999 to 9999 units
Deviation Alarm: -3000 to 3000 units
Deviation Band Alarm: 1 to 3000 units

CONTROL ADJUSTMENTS

On/Off Hysteresis: 0 to 300 units
Proportional Band: 1 to 3000 units
Manual Reset: -1500 to 1500 units
Auto Reset: 0.0 to 100.0 repeats/minute
Rate: 0.0 to 10.0 minutes
Cycle Time: 1 to 240 seconds
Position Prop. Sensitivity: 0.0 to 50.0%
First Output Position: -1000 to 1000 units
Second Output Position: -1000 to 1000 units

PERFORMANCE

Measurement Error Limit:
• Type J, K, T, E, N, C thermocouples and RTD +/- 0.25% of reading plus 1 degree at 25°C
• Type R, S, B thermocouple +/- 0.25% of span at 25°C
• mVDC, mADC and VDC +/- 0.25% of span, plus 1 least-significant-digit at 25°C
Ambient Temperature Error: 0.01% of span per degree C deviation from 25°C
Scan Rate: 1 scan per second (3 scans available)
Display Resolution: T/C & RTD: 0.1 or 1 degree mV & VDC: 0.001, 0.01, 0.1, or 1.0
Auto Reset Windup Inhibit: Auto reset is disabled when the process is outside of the proportional band
Cold Junction Compensation: Self compensation for ambient temperature. All calibration values are stored in memory.
Noise Rejection: Normal mode, 85dB minimum @ 60Hz or greater. Common mode, 90dB minimum ±8 VDC maximum peak for RTD input, 115VAC maximum for other inputs.

PHYSICAL DIMENSIONS

Dimensions: 1/4 DIN front panel, 5.8" deep
Weight: 3 pounds maximum

COMMUNICATIONS

Type: RS-485 serial communication port
Protocol: Partlow ASCII

RATINGS/AGENCY APPROVALS

UL & cUL recognized (E67237),
CSA (LR39885)

WARRANTY

3 years

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MIC 8200™

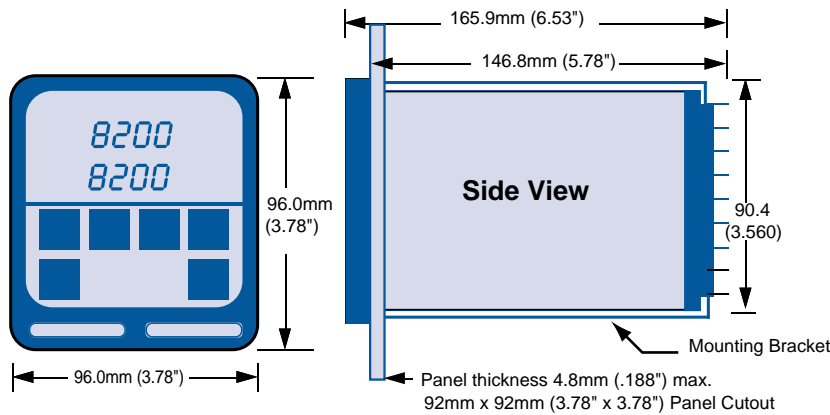
Versatile – Full Featured

1/4 DIN Dual Display Controller

MODELS

Code 1: Model #	Code 2: Output 1	Code 3: Output 2	Code 4: Alarm	Code 5: Remote	Code 6: Voltage	Code 7: Option Suffix
82	□	□	□	□	□	□ □
I/4 DIN Temperature Controller	1 Relay 2 SSR Driver 3 4-20mA & Relay 4 4-20mA & SSR Driver	0 None 1 Relay 2 SSR Driver 3 4-20mA 4 4-20mA & Relay 5 4-20mA & SSR Driver	0 None 1 Relay 2 SSR Driver	0 None 1 Position Proportioning* 2 Remote Setpoint 3 RS-485 Standard Com.** 4 RS-485 Standard Com.*** 5 RS-485 Total Access Com.** 6 RS-485 Total Access Com.***	1 115 VAC Input & Relays 2 230 VAC Input & Relays 3 115 VAC Input & 230 VAC Relays	(Blank) None AB Extended Feature Software AD Auto Reset Adj. 0/10.00 AE AB plus Prop. Band of 9999 XP 24VDC Transmitter Power Supply XA 24VDC Power Supply†

DIMENSIONS - 1/4 DIN



* Limited to Model 8211X1X or 82X22X1X.
 ** Output Group 2 cannot be 3, 4, or 5.
 *** Output Group 3 cannot be 1 or 2.
 † ALARM not available when XA suffix is ordered.





Note: Option Suffix AB not available with RS-485 Standard Com.

GENERAL-PURPOSE CONTROLLERS

Selection Guide

Product Feature Overview and Page Location

● Standard ● Optional

	HIGH-END PROFILERS			INDUSTRIAL-DUTY MULTI-LOOP BUS CONTROLLER
				NEW 
MODEL NUMBER	MIC 1166	MIC 1460 MIC 1462	MIC 6000	MLC 9000+
PAGE NUMBER	4.1	4.4 4.7	4.10	System Disc. 4.13 Bus Control Modules 4.17 Loop Control Modules 4.31
TYPE	Sgl. Loop High-End	Sgl. Loop High-End	Sgl. Loop High-End	Multi-loop
	Digital	Digital	Digital	Digital
	FTP	FTP	FTP	BTP
DIN SIZE	1/16	1/4	1/4	DIN Rail Mount
FUNCTION				
Indicator/Panel Meters				
Microprocessor Based	●	●	●	●
Temperature Controller	●	●	●	●
Process Controller	●	●	●	●
Valve Motor Controller		●1462	●	
Limit Controller				
Profiler/Controller	●	●	●	
DISPLAY				
Single 4 Digit			●	N/A
Dual 4 Digit	●	●		
INPUTS				
DC Linear V	●	●	●	●
DC Linear mA/DC Linear mV	●	●	●	●
Thermocouple/RTD	●	●	●	●
Remote Setpoint				
Heater Current				●
OUTPUTS				
Max. # of Outputs	3	8	5	2–6 per loop
Relay	●	●	●	●
SSR Driver	●	●	●	●
DC Linear	●	●	●	●
Triac	●	●		
OUTPUT FUNCTION				
Control OP1 (Heat Power)	●	●	●	●
Control OP2 (Cool Power)	●	●	●	●
Limit Output				
Alarm 1	●	●	●	●
Alarm 2	●	●	●	●
Recorder Output	●	●	●	●
Heater Break Alarm				●
Dual Setpoint				●
Real Time Clock		●		
Transmitter Power Supply		●	●	
COMMUNICATIONS				
RS-485	●	●	●	●
DeviceNet				●
Ethernet/IP				●
Profibus				●
Modbus/RTU	●	●		●
Modbus/TCP				●
CANopen				●
PC Configuration				●
AGENCY APPROVALS				
UR & cUR	●	●	●	●
CSA			●	
CE	●	●		●
FM				
NEMA 4X	●	●		
POWER SUPPLY				
90-264V AC	●	●		
115VAC OR 230VAC			●	
20-50V AC/22-65VDC	●	●		18-30VDC
PID TUNING TYPES				
Pre-Tune	●	●		●
Self-Tune		●		●
Easy Tune				●
Manual Tune	●	●	●	●



MIC 1166

Small Size - Maximum Functions

1/16 DIN Profile Controller

DESCRIPTION

The Partlow brand MIC 1166 1/16 DIN profiler may seem small, but it packs a punch with holding up to 4 programs of 16 free-format segments each and includes an event output. The controller can be configured from the front of the instrument or by a PC through a configuration port. The configuration port has a dual purpose; first it can be used to modify the controller setups and secondly, it can be used to transfer programs or profiles.

This control has RaPID, Response Assisted PID, a fuzzy logic algorithm plus a pre-tune algorithm, that when combined provide shorter start-up times and reduced overshoot.

The Partlow brand MIC 1166 contains many of the features of larger more expensive profilers such as: guaranteed soak, delayed start, profile active output, profile recovery features, profile cycling, plus an optional digital input for remote run/hold. RS-485 communications is also available with convenient, full access to all profile data.

Modular I/O options allow for field upgrades by adding or replacing boards.

APPLICATIONS:

Programmable profile device stores and implements temperature control sequences including ramp/soak profiles using exclusive PID techniques.

INDUSTRIES

- Industrial and lab ovens/furnaces, plastics and thermal forming
- Form/fill and seal
- Packaging applications
- And any others where low costs, smaller size and unmatched connectivity are critical requirements.

FEATURES/BENEFITS

- Dual, 4-digit, LED displays
- 1/16 DIN panel mount
- Universal Input for thermocouple, RTD, DC linear mA/V/mV user-selectable
- Up to 3 outputs; relay, 4-20mA, SSR driver, Triac
- Alarm, control, retransmit, event output functions
- PID, ON/OFF, profile (ramp/soak) control
- Optional RS-485 serial communications
- Program security

MIC 1166™

High-End Controllers

Small Size - Maximum Functions

1/16 DIN Profile Controller

SPECIFICATIONS*

STANDARD FEATURES

Dual Display for fast view of process and control parameters
Full PID capability
Universal input for voltage, current, thermocouple and RTD
Profile Cycling
Program loading via communications port

ENVIRONMENTAL CHARACTERISTICS

Operating Temperature: 0 to 55°C, 32 to 131°F
Storage Temperature: -20 to 80°C, -4 to 176°F
Humidity: 20 to 95% RH, non condensing

ELECTRICAL

Line Voltage: 90 - 264VAC, 50/60 Hz;
Optional 20 - 50VAC, 50/60Hz; 22 - 65VDC
Power Consumption: 4 Watts
Common Mode Rej.: 120 db at 50/60 Hz
Series Mode Rej.: > 500% of span 50/60 Hz

INPUTS

Thermocouple types: J, K, T, R, S, B, L, and N.
RTD: Three-wire PT100, DIN 43760
Volts (VDC): 0 to 5, 1 to 5, 0 to 10, 2 to 10
Millivolts: 0 to 50mVDC, 10 to 50mVDC
Milliamps: 0 to 20 or 4 to 20mADC
Sample Rate: 250 ms

OUTPUTS

Relay: SPDT rated at 2 amps resistive at 120/240 VAC
SSR Driver: > 4.3 VDC into 250Ω minimum
Triac Output: 1 amp @ 40°C derated to 1/2 amp @ 80°C
Current Output: 0 - 20 mA, 4 - 20 mA, eight bit resolution
Volts DC Output: 0 - 10 V, 0 - 5 V, eight bit resolution

CONTROL

Control Types: RaPID, PID, PID/on-off, on-off
RaPID: Response Assisted PID is a fuzzy logic mixing/weighting of P, I, and D terms to provide dramatic performance improvements as compared to conventional PID techniques.
Auto Tune Types: Pre-Tune
Proportional Bands: 0 (OFF), 0.5% to 999.9% of input span @ 0.1% increments
Auto Reset: 1s-99min 59sec and OFF
Rate: 0 (OFF) - 99min 59sec

Manual Reset: Adjustable in the range 0-100% of output power (single output) or -100% to +100% of output power (dual output)

Deadband/Overlap: -20% to +20% of proportional band 1 + proportional band 2

ON/OFF Hysteresis: 0.1% to 10.0% of input span

Auto/Manual Control: User-selectable with "bumpless" transfer into and out of Manual control.

Cycle Times: Selectable for 0.5sec to 512sec in binary steps

Setpoint Range: Limited by Setpoint Upper and Setpoint Lower Limits

Setpoint Ramp: Ramp rate selectable 1-9999 LSDs per hour and infinite. Number displayed is decimal point aligned with selected range.

ALARMS

Maximum Number: Two "soft" alarms

Maximum # Outputs: Up to 2 outputs can be used for alarm purposes

Combination Alarms: Logical OR or AND of alarms to an individual hardware output is available.

DISPLAY

Digital Display: Dual 7 segment LED;
Top: .36" high, Bottom .28" high.

Status Indicators: Individual LED indicators for OUT, Exceed, ALM, and when in Setup

PROGRAM/PROFILE SPECIFICATIONS

Programs: Four with 16 free form steps each

Length of program: 16 steps per program

Step Types: Ramp, dwell (soak), or end

Program cycling: 1 to 9999 cycles, or infinite

Delayed start: 0 to 99:59 hours:minutes or minutes seconds, depending on the time base selected.

Control: Start, Run, Hold and Abort from keypad if remote run/hold is not used. Remote start, run, and hold if the option is turned on.

Start From: Current process value or setpoint.

At End: Controls at the last setpoint.

Guaranteed Soak: During dwells (soak) the controller can be programmed to stop advancing the dwell time while the process value is outside a specific band around setpoint. This capability can be disabled or the controller can be set to wait until instructed to "run" after the soak time has expired.

Time Base: Hours:Minutes or Minutes:Seconds.

Step Time: 0 to 99:59 hours:minutes or minutes seconds, depending on the time base selected.

Ramp Rate: 0 to 9999 least significant digits per hour or minute, depending on the time base. (this applies only when the program mode is set to Rate.)

Event Output: Programmable to ON or OFF at the beginning of each step. Output 2 or 3 can be used as the event output.

Profile Active: Output 2 or 3 can be set to be energized or de-energized whenever a profile/program is running.

Power Loss Recovery: If power is removed and applied while a profile is running, the unit can be programmed to re-start or continue the profile.

REMOTE RUN/HOLD INPUT (OPTION)

Type: Voltage free or TTL compatible

ON - Currently selected program will run or (if currently held) resuming running.

OFF - Currently running program will be held.

Voltage free Operation: Connection of contacts to external switch or relay; contacts open = OFF (minimum contact resistance = 5000Ω), contacts closed = ON (maximum contact resistance = 50Ω)

TTL levels: ON: -0.6V to 0.8V

OFF: 2.0V to 24V

Maximum Input Delay (OFF-ON): 1 Second

Minimum Input Delay (ON-OFF): 1 Second

PHYSICAL DIMENSIONS

Dimensions: 1/16 DIN front panel, 110mm (4.3") deep

Front Panel Rating: NEMA 4X/IP65

Weight: 227 g. (8 oz.) maximum

COMMUNICATIONS

Type: RS-485 serial communication port

Protocol: MODBUS/RTU

RATINGS/AGENCY APPROVALS

CE, UL & cUL recognized (E67237),

WARRANTY

3 years

* Specifications are for base models with standard features only unless otherwise noted. Specifications subject to change without notice in accordance with our DBS policy of continuous improvement. All product and brand names are trademarks of their respective owners. All rights reserved.

MIC 1166™

Small Size - Maximum Functions

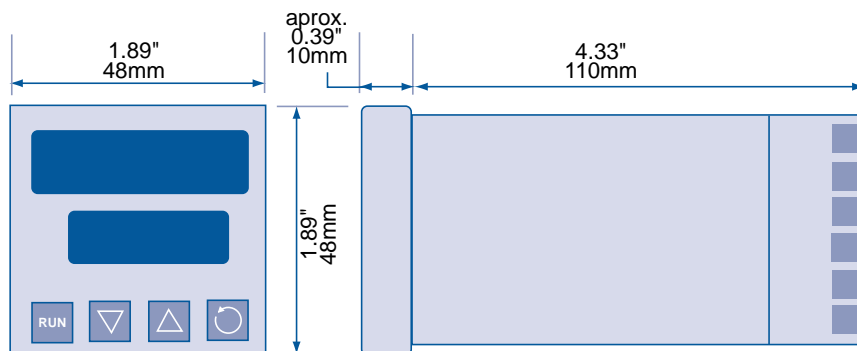
1/16 DIN Profile Controller

MODELS

Code 1: Model #	Code 2: Output 1	Code 3: Output 2	Code 4: Output 3	Code 5: Options	Code 6: Options
1166	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
1/16 DIN Profile Controller	1 Relay 2 SSR Driver 3 4-20mA* 8 Triac†	0 None 1 Relay 2 SSR Driver 3 4-20mA* 8 Triac†	0 None 1 Relay 2 SSR Driver 3 4-20mA** 8 Triac†	0 None 1 RS-485 Communications 2 Remote Run/Hold	(Blank) None 02 Line Voltage 24 V AC/DC

* For control output only
 ** For retransmission only
 † Two Triac Outputs, max.

DIMENSIONS - 1/16 DIN



Panel Cutout: 45mm x 45mm (1.77" x 1.77")

HIGH-END CONTROLLERS



Customer Service +1 800.390.6405
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www.partlow.com • www.danaherindustrialcontrols.com



MIC 1460

Multi-Program Profile Control

1/4 DIN Profile Controller

DESCRIPTION

The MIC 1460 is a 1/4 DIN microprocessor based, single loop process controller with programmable setpoint programs.

It can function either as a basic process controller, utilizing manual setpoint changes, or it can execute any one of eight setpoint programs. Each program is adjustable in the range of 1 to 16 segments and are cascadable to a maximum length of 121 segments. Each segment may be a ramp, a dwell, a join or an end.

A delayed start feature is standard as is an end of program relay. By using the auto-hold feature, assured dwells are possible.

The instrument can include two 4-20mA current outputs which can be used for control and a third current output to be used for retransmission. In lieu of current control outputs, relays or SSR drivers are available.

Four event outputs (relay) are available as an option.

APPLICATIONS:

Programmable profile device stores and implements temperature control sequences including ramp/soak profiles using exclusive PID techniques.

INDUSTRIES

- Industrial and lab ovens/furnaces, plastics and thermal forming
- Form/fill and seal
- Packaging applications
- And any others where low costs, smaller size and unmatched connectivity are critical requirements.

FEATURES/BENEFITS

- Dual, 4-digit, LED displays
- 1/4 DIN panel mount
- Universal Input for thermocouple, RTD, DC linear mA/V/mV user-selectable
- Sensor fault detection
- Up to 8 outputs; relay, 4-20mA, SSR driver, Triac
- Control, alarms (process, deviation/band); events; retransmission output functions
- PID, ON/OFF, profile (ramp/dwell) control
- Optional RS-485 serial communications
- Program security

MIC 1460

Multi-Program Profile Control

1/4 DIN Profile Controller

SPECIFICATIONS*

STANDARD FEATURES

Dual Display for fast view of process and control parameters
Full PID capability
OR, AND alarm output via relay
Universal input for voltage, current, thermocouple and RTD
Profile Cycling
Program loading via communications port

ENVIRONMENTAL CHARACTERISTICS

Operating Temperature: 0 to 55°C
Storage Temperature: -20 to 80°C
Humidity: 20 to 95% non condensing

ELECTRICAL

Line Voltage: 90 to 264VAC 50/60 Hz (standard)
20 to 50V AC 50/60Hz or 22 to 65V DC (optional)

Power Consumption: 4 Watts

Source Resistance: 1000 ohm maximum (thermocouple)

Lead Resistance: 50 ohm per lead maximum balanced (Pt100)

EMI Susceptibility: Designed to meet EN50082 Part 2

EMI Emissions: Designed to meet EN50081 Part 2

INPUT

Thermocouple types: R, S, J, T, K, L, B, and N
RTD: 100 ohm (.00385 ohm/ohm/°C)

Volts: 0 to 5VDC, 1 to 5VDC, 0 to 10VDC and 2 to 10 VDC

Millivolts: 0 to 50mVDC and 10 to 50mVDC

Milliamps: 0 to 20mADC and 4 to 20mADC

Sensor Fault Detection: Displays an alert for thermocouple or RTD inputs and sensor break, SnSr.
Control outputs set to OFF (0% power); alarms operate as if the process variable has gone over-range (TC) or under-range (RTD & V, mV, mA)

OUTPUTS

OUTPUT 1 & 2

Relay: SPDT; 2.0 A Resistive at 120/240 VAC

SSR Driver: > 4.2V DC into 1K ohms minimum

Current Output: 0 to 20mADC into 500 ohms max; 20mADC into 500 ohms max

Volts DC Output: 0 to 10VDC 500 ohms minimum; 0 to 5VDC 500 ohms minimum

Transmitter Power (output 2 only): 20 to 28VDC (24VDC nominal); Load Impedance: 910 ohms (22mA @ 20VDC)

Triac Output: 1 amp @ 40°C derated to 1/2 amp @ 80°C

OUTPUT 3

Relay: SPDT, 2.0 A Resistive at 120/240 VAC

SSR Driver: > 4.2V DC into 1K ohms minimum

Current Output (retransmission only): 0 to 20mADC into 500 ohms maximum, 4 to 20mADC into 500 ohms maximum

Volts DC Output (retransmission only): 0 to 10VDC 500 ohms minimum, 0 to 5VDC 500 ohms minimum

Transmitter Power: 20 to 28VDC (24VDC nominal); Load Impedance: 910 ohms (22mA @ 20VDC)

Triac Output: 1 amp @ 40°C derated to 1/2 amp @ 80°C

DISPLAY

Digital Display: Four 7 segment LEDs, top .53" high; bottom .36" high; message .19" high; profile/segment .25" high

Status Indicators: Individual LED indicators for Output 1, Output 2, Manual, Alarm, Pre or Auto Tune, Run, Hold, Times 60 Time Base, and Event 1 thru Event 4

ALARM

Process Alarm: ± Input Span

Deviation Alarm: ± Input Span

Deviation Band Alarm: 0 to Input Span

CONTROL

On/Off Hysteresis: 0.1% to 10.0% of Input Span

Proportional Band: 0 (Off), 0.5% to 999.9% of Input Span

Manual Reset: 0% to 100% of Output Power

Auto Reset: 1 sec to 99 min 59 sec/repeat and OFF

Rate: 0 sec to 99 mins. 59 sec

Cycle Time: .5, 1, 2, 4, 8, 16, 32, 64, 128, 256, and 512 seconds

Deadband/Overlap: -20% to +20% of PropBand 1 + PropBand 2

PROGRAM SPECIFICATIONS

Programs: Eight, each with free-form segments

Length of Program: 1 to 16; cascable max of 121 segments

Segment Types: Ramp, Dwell, Join, Repeat or End

Program Cycling: 1 to 9999, infinite

Delayed Start: 0 to 99 hrs 59 mins

Control: Run, Hold, Abort, Time Base x60 (local/remote); select program (local/remote); jump to next segment

Start From: Current process variable or controller setpoint value, user selectable

End On: Final Value or Controller Setpoint, user selectable

PERFORMANCE

Measurement Accuracy: ± 0.25% of span, ± 1 LSD at 20 deg C

Note: Reduced performance with Type "B" thermocouple between 100-600C (212-1112F)

Ambient Temperature Error: 0.01% of span /° C change in ambient Linearization Accuracy Better than ± 0.2 deg C any point, (TC and RTD) any 0.1 deg C range (± 0.05 deg C typical). Better than ± 0.5 deg C any point, any 1 deg C range

Cold Junction Compensation: Better than ± 0.7 deg C

Noise Rejection: Common mode: >120dB at 50/60Hz giving negligible effect at up to 264V 50/60Hz

Series Mode: >500% of span (at 50/60Hz) causes negligible effect

Dimensions: Front panel: 96mm x 96mm (3.78" x 3.78") 100mm deep

Weight: 16 ounces maximum

Front Panel Sealing: IP65/NEMA4

DIGITAL COMMUNICATIONS

Type: RS-485 serial communication port:

Protocol: MODBUS/RTU or West ASCII

PHYSICAL DIMENSIONS

Dimensions: 1/4 DIN front panel, 100mm (3.9") deep

Front Panel Rating: NEMA 4/IP65

Weight: 454 g. (16 oz.) maximum

STANDARDS

CE, UL & cUL recognized (E67237)

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MIC 1460

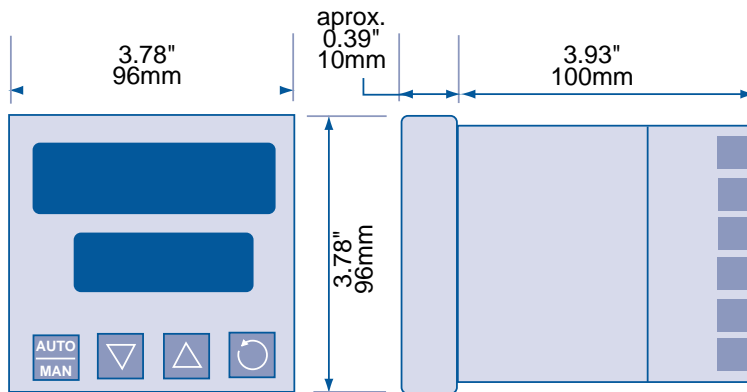
Multi-Program Profile Control

1/4 DIN Profile Controller

MODELS

Code 1: Model #	Code 2: Output 1	Code 3: Output 2	Code 4: Output 3	Code 5: Option 1	Code 6: Option 2	Code 7: Suffix
1460	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
1/4 DIN Profile Controller	1 Relay 2 SSR Driver 3 4-20mA* 8 Triac†	0 None 1 Relay 2 SSR Driver 3 4-20mA* 4 Transmitter Power Supply+ 8 Triac†	0 None 1 Relay 2 SSR Driver 3 4-20mA** 4 Transmitter Power Supply++ 8 Triac†	0 None 1 RS-485 Communications	00 None 10 Event Outputs (4) 20 Remote profile control inputs (6)*** 30 Both event outputs & remote inputs 40 Real Time Clock 50 Real Time Clock & Event Outputs (4) 60 Real Time Clock & Remote Profile Control Inputs 70 Event Outputs, Remote Profile Control Inputs & Real Tim Clock	Blank None 02 Low Line Voltage Option 24 V AC/DC

DIMENSIONS - 1/4 DIN



Panel Cutout: 92.0mm x 92mm (3.62" x 3.62")

* For control output only.
 ** For retransmission only.
 *** Remote Control available - Run/Hold, Abort, Time Base Change (x60), and three (binary coded) Program Select.
 + Cannot be included if output 3=4.
 ++ Cannot be included if output 2=4.
 † Two Triac Outputs, max.

HIGH-END CONTROLLERS



MIC 1462

Multi-Program Profile Control with Enhanced HMI

1/4 DIN Profile Controller

DESCRIPTION

The MIC 1462 is a 1/4 DIN microprocessor based, single loop process controller with programmable setpoint programs. It can function either as a basic process controller, utilizing manual setpoint changes, or it can execute any one of eight setpoint programs.

Each program is adjustable in the range of 1 to 16 segments and are cascadable to a maximum length of 121 segments. Each segment may be a ramp, a dwell, a join or an end. A delayed start feature is standard as is an end of program relay. By using the auto-hold feature, assured dwells are possible.

The instrument can include two 4-20mA current outputs which can be used for control and a third current output to be used for retransmission. In lieu of current control outputs, relays or SSR drivers are available.

Four event outputs (relay) are available as an option.

APPLICATIONS:

Programmable profile device stores and implements temperature control sequences including ramp/soak profiles using exclusive PID techniques.

INDUSTRIES

- Industrial and lab ovens/furnaces, plastics and thermal forming
- Form/fill and seal
- Packaging applications
- And any others where low costs, smaller size and unmatched connectivity are critical requirements.

FEATURES/BENEFITS

- Dual, 4-digit, LED displays
- Enhanced HMI
- 1/4 DIN panel mount
- Universal Input for thermocouple, RTD, DC linear mA/V/mV user-selectable
- Sensor fault detection
- Up to 8 outputs; relay, 4-20mA, SSR driver, Triac
- Control, alarms (process, deviation/band); event; retransmission output functions
- PID, ON/OFF, profile (ramp/dwell) control
- Optional RS-485 serial communications
- Program security

MIC 1462

Multi-Program Profile Control with Enhanced HMI

1/4 DIN Profile Controller

SPECIFICATIONS*

STANDARD FEATURES

Dual Display for fast view of process and control parameters - Enhanced Human-Machine Interface
Full PID capability
OR, AND alarm output via relay
Universal input for voltage, current, thermocouple and RTD
Profile Cycling
Program loading via communications port

ENVIRONMENTAL CHARACTERISTICS

Operating Temperature: 0 to 55°C
Storage Temperature: -20 to 80°C
Humidity: 20 to 95% non condensing

ELECTRICAL

Line Voltage: 90 to 264VAC 50/60 Hz (standard)
20 to 50V AC 50/60Hz or 22 to 65V DC (optional)
Power Consumption: 4 Watts
Source Resistance: 1000 ohm maximum (thermocouple)
Lead Resistance: 50 ohm per lead maximum balanced (PI100)
EMI Susceptibility: Designed to meet EN50082 Part 2
EMI Emissions: Designed to meet EN50081 Part 2

INPUT

Thermocouple types: R, S, J, T, K, L, B, and N
RTD: 100 ohm (.00385 ohm/ohm/C)
Volts: 0 to 5VDC, 1 to 5VDC, 0 to 10VDC and 2 to 10 VDC
Millivolts: 0 to 50mVDC and 10 to 50mVDC
Milliamps: 0 to 20mADC and 4 to 20mADC
Sensor Fault Detection: Displays an alert for thermocouple or RTD inputs and sensor break, SnSr.
Control outputs set to OFF (0% power); alarms operate as if the process variable has gone over-range (TC) or under-range (RTD & V, mV, mA)

OUTPUTS

OUTPUT 1 & 2
Relay: SPDT; 2.0 A Resistive at 120/240 VAC
SSR Driver: > 4.2V DC into 1K ohms minimum
Current Output: 0 to 20mADC into 500 ohms max; 20mADC into 500 ohms max
Volts DC Output: 0 to 10VDC 500 ohms minimum; 0 to 5VDC 500 ohms minimum
Transmitter Power (output 2 only): 20 to 28VDC (24VDC nominal), Load Impedance: 910 ohms (22mA @ 20VDC)

Triac Output: 1 amp @ 40°C derated to 1/2 amp @ 80°C

OUTPUT 3

Relay: SPDT, 2.0 A Resistive at 120/240 VAC

SSR Driver: > 4.2V DC into 1K ohms minimum

Current Output: 0 to 20mADC into 500 ohms max

(retransmission only): 4 to 20mADC into 500 ohms max

Volts DC Output: 0 to 10VDC 500 ohms minimum

(retransmission only): 0 to 5VDC 500 ohms minimum

Transmitter Power: 20 to 28VDC (24VDC nominal), Load Impedance: 910 ohms (22mA @ 20VDC)

Triac Output: 1 amp @ 40°C derated to 1/2 amp @ 80°C

DISPLAY

Digital Display: Four 7 segment LEDs, top .53" high; bottom .36" high; message .19" high; profile/segment .25" high

Status Indicators: Individual LED indicators for Output 1, Output 2, Manual, Alarm, Pre or Auto Tune, Run, Hold, Times 60 Time Base, and Event 1 thru Event 4

ALARM

Process Alarm: ± Input Span
Deviation Alarm: ± Input Span
Deviation Band Alarm: 0 to Input Span

CONTROL

On/Off Hysteresis: 0.1% to 10.0% of Input Span
Proportional Band: 0 (Off), 0.5% to 999.9% of Input Span
Manual Reset: 0% to 100% of Output Power
Auto Reset: 1 sec to 99 min 59 sec/repeat and OFF
Rate: 0 sec to 99 mins. 59 sec
Cycle Time: .5, 1, 2, 4, 8, 16, 32, 64, 128, 256, and 512 seconds
Deadband/Overlap: -20% to +20% of PropBand 1 + PropBand 2

PROGRAM SPECIFICATIONS

Programs: Eight, each with free-form segments
Length of Program: 1 to 16; cascadable max of 121 segment
Segment Types: Ramp, Dwell, Join, Repeat or End
Program Cycling: 1 to 9999, infinite

Delayed Start: 0 to 99 hrs 59 mins

Control: Run, Hold, Abort, Time Base x60 (local/remote); select program (local/remote); jump to next segment

Start From: Current process variable or controller setpoint value, user selectable

End On: Final Value or Controller Setpoint, user selectable

PERFORMANCE

Measurement Accuracy: ± 0.25% of span, ± 1 LSD at 20 deg C

Note: Reduced performance with Type "B" thermocouple between 100-600C (212-1112F)

Ambient Temperature Error: 0.01% of span /° C change in ambient Linearization Accuracy Better than ± 0.2 deg C any point, (TC and RTD) any 0.1 deg C range (± 0.05 deg C typical). Better than ± 0.5 deg C any point, any 1 deg C range

Cold Junction Compensation: Better than ± 0.7 deg C

Noise Rejection: Common mode: >120dB at 50/60Hz giving negligible effect at up to 264V 50/60Hz

Series Mode: >500% of span (at 50/60Hz) causes negligible effect

Dimensions: Front panel: 96mm x 96mm (3.78" x 3.78") 100mm deep

Weight: 16 ounces maximum

Front Panel Sealing: IP65/NEMA4

DIGITAL COMMUNICATIONS

Type: RS-485 serial communication port:
Protocol: MODBUS/RTU or West ASCII

PHYSICAL DIMENSIONS

Dimensions: 1/4 DIN front panel, 100mm (3.9") deep

Front Panel Rating: NEMA 4/IP65

Weight: 454 g. (16 oz.) maximum

STANDARDS

CE, UL & cUL recognized (E67237)

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MIC 1462

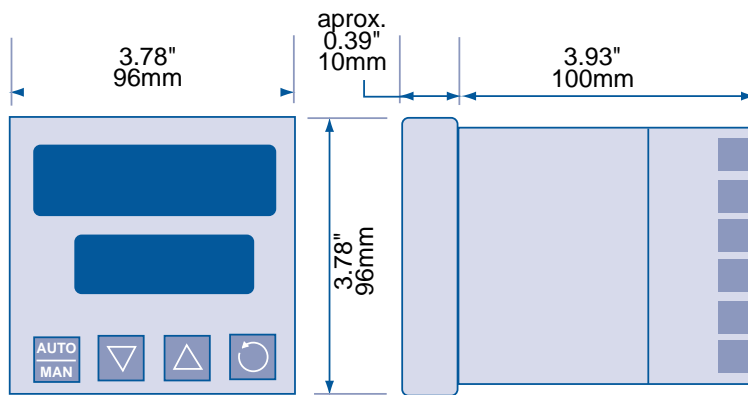
**Multi-Program Profile Control
with Enhanced HMI**

1/4 DIN Profile Controller

MODELS

Code 1: Model #	Code 2: Output 1	Code 3: Output 2	Code 4: Output 3	Code 5: Option 1	Code 6: Option 2	Code 7: Suffix
1462	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
1/4 DIN Profile Controller	1 Relay 2 SSR Driver 3 4-20mA* 8 Triac†	0 None 1 Relay 2 SSR Driver 3 4-20mA* 4 Transmitter Power Supply+ 8 Triac†	0 None 1 Relay 2 SSR Driver 3 4-20mA** 4 Transmitter Power Supply++ 8 Triac†	0 None 1 RS-485 Communications	00 None 10 Event Outputs (4) 20 Remote profile control inputs (6)*** 30 Both event outputs & remote inputs 40 Real Time Clock 50 Real Time Clock & Event Outputs (4) 60 Real Time Clock & Remote Profile Control Inputs 70 Event Outputs, Remote Profile Control Inputs & Real Tim Clock	Blank None 02 Low Line Voltage Option 24 V AC/DC

DIMENSIONS - 1/4 DIN



Panel Cutout: 92.0mm x 92mm (3.62" x 3.62")

- * For control output only.
- ** For retransmission only.
- *** Remote Control available - Run/Hold, Abort, Time Base Change (x60), and three (binary coded) Program Select.
- + Cannot be included if output 3=4.
- ++ Cannot be included if output 2=4.
- † Two Triac Outputs, max.

HIGH-END CONTROLLERS



Customer Service +1 800.390.6405
 Technical Support +1 800.866.6659
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MIC 6000

Eight Ramp/Soak Profiles

1/4 DIN Profile Controller

DESCRIPTION

The MIC 6000 is a 1/4 DIN, microprocessor based, single loop, profiling, process controller. It can function either as a basic process controller, utilizing manual setpoint changes or it can also execute any one of eight setpoint profiles; each profile can have six ramp and six soak segments.

Access to configuration parameters and setpoint may be restricted by using the instrument's security-access mode.

The MIC 6000 can provide single or dual control outputs and up to three event outputs. The unit can include two 4-20mA current outputs which can be used for control or optional process value retransmission.

APPLICATIONS:

Programmable profile device stores and implements temperature control sequences including ramp/soak profiles.

INDUSTRIES

- Industrial and lab ovens/furnaces, plastics and thermal forming
- Form/fill and seal
- Packaging applications
- And any others where low costs, smaller size and unmatched connectivity are critical requirements.

FEATURES/BENEFITS

- 4-digit, 0.56" high, LED display
- 1/4 DIN panel mount
- Input options for thermocouple, RTD, DC linear mAV/mV
- Sensor fault detection
- Up to 5 outputs; relay, 4-20mA, SSR driver
- Process, deviation, deviation band alarms
- Eight Ramp/Soak profiles
- Optional RS-485 serial communications
- Program security

MIC 6000

Eight Ramp/Soak Profiles

1/4 DIN Profile Controller

SPECIFICATIONS*

STANDARD FEATURES

Up to 5 outputs via relay, 4-20 mA current or SSR driver
Alarm or Event output
Available inputs for T/C, RTD, Voltage or Current
Sensor fault detection
Optional remote Run/Hold, Position Proportioning or RS-485 Communications

ENVIRONMENTAL CHARACTERISTICS

Operating Temperature: 0 to 55°C, 32 to 131°F
Storage Temperature: -40 to 65°C, -40 to 149°F
Humidity: 0 to 90% RH, non condensing
Vibration: 0.5 to 100Hz at 0.5g

ELECTRICAL

Line Voltage: 115/230VAC +/- 10% 50/60 Hz
Power Consumption: 15VA maximum
Transmitter Power Supply: Provides up to 40mA @ 24 VDC.

INPUTS

Thermocouple types: J, K, T, R, S, E, B, N, and C.
RTD: 100 ohm platinum (.00385 Ohm/Ohm/C)
Volts: 0 to 5VDC, 1 to 5 VDC
Millivolts: 0 to 25mVDC, 0 to 50mVDC, 10 to 50mVDC
Milliamps: 0 to 20 or 4 to 20mADC, accommodated via the addition of a shunt resistor
Remote Run/Hold: Dry contact-closure
Sensor Fault Detection: Displays Hi or Lo for thermocouple or RTD inputs (10% above or below range) and sensor break, SnSr. On/Off outputs go off, proportional outputs go to 0%. Sensor fault detection is not functional for 0 to 5VDC or 0 to 20mADC.

OUTPUTS

Relay: SPST
115VAC: 5.0 A Resistive; 1/8HP or 250VA
230VAC: 2.5 A Resistive; 1/8HP or 250VA
SSR Driver: Open collector output Short circuit protected at 100mA maximum Provides 4VDC at 20mA or 3VDC at 40mA
Current Output: 0-20 or 4-20 mADC into 650 ohms maximum

DISPLAY

Digital Display: Four 7 segment LEDs each 0.56 inches. Individual LED indicators for Setpoint, Out 1, Out 2, Manual, Alarm, Degrees F, Degrees C, or Engineering Units, and minus sign for negative values, Segment 1 – 6, ramp and soak

ALARM ADJUSTMENT

Process Alarm: -9999 to 9999 units
Deviation Alarm: -3000 to 3000 units
Deviation Band Alarm: 1 to 3000 units

CONTROL ADJUSTMENTS

On/Off Hysteresis: 0 to 300 units
Proportional Band: 1 to 3000 units
Manual Reset: -1500 to 1500 units
Auto Reset: 0.0 to 100.0 repeats/minute
Rate: 0.0 to 10.0 minutes
Cycle Time: 1 to 240 seconds
Position Prop. Sensitivity: 0.0 to 50.0%
First Output Position: -1000 to 1000 units
Spread: -1000 to 1000 units (Second Output Position)
Profile Time Base:
Selectable for ramp time and soak time as:
HHH.T (hrs. & tenths)
HH.MM (hrs. & min.)
MM.SS (min. & sec.)
Selectable for ramp rate (EO option only) as:
XXX.X (units per hour)
XXX.X (units per minute)

PERFORMANCE

Measurement Error Limit:

- Type J, K, T, E, N, C thermocouples and RTD +/- 0.25% of reading plus 1 degree at 25°C
- Type R, S, B thermocouple +/- 0.25% of span at 25°C
- mVDC, mADC and VDC +/- 0.25% of span, plus 1 least-significant-digit at 25°C

Ambient Temperature Error: 0.01% of span per degree C deviation from 25°C

Scan Rate: 1 scan per second (3 scans per second available on EA option)

Display Resolution: T/C & RTD: 0.1 or 1 degree mV & VDC: 0.001, 0.01, 0.1, or 1.0

Auto Reset Windup Inhibit: Auto reset is disabled when the process is outside of the proportional band

Cold Junction Compensation: Self compensation for ambient temperature. All calibration values are stored in memory.

Noise Rejection: Normal mode, 85dB minimum @ 60Hz or greater. Common mode, 90dB minimum ±8 VDC maximum peak for RTD input, 115VAC maximum for other inputs.

PHYSICAL DIMENSIONS

Dimensions: 1/4 DIN front panel, 5.8" deep
Weight: 3 pounds maximum

COMMUNICATIONS

Type: RS-485 serial communication port
Protocol: Partlow ASCII

RATINGS/AGENCY APPROVALS

UL & cUL recognized (E67237),
CSA (LR39885)

WARRANTY

3 years

* Specifications are for base models with standard features only unless otherwise noted. Specifications subject to change without notice in accordance with our DBS policy of continuous improvement. All product and brand names are trademarks of their respective owners. All rights reserved.

MIC 6000

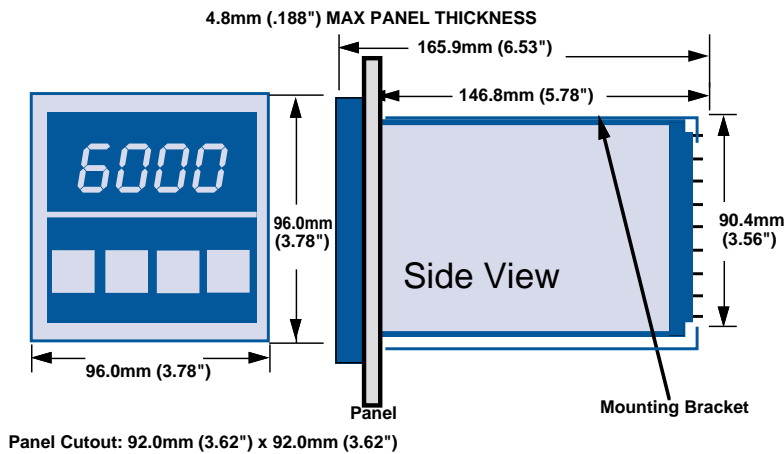
Eight Ramp/Soak Profiles

1/4 DIN Profile Controller

MODELS

Code 1: Model #	Code 2: Input	Code 3: Output Group 1 Control Group 1 and/or Event	Code 4: Output Group 2 Control Output 2 or Event	Code 5: Output Group 3 Alarm or Event	Code 6: Remote	Code 7: Voltage	Code 8: Option Suffix
6	□	□	□	□	□	□	□
1/4 DIN Profile Controller	1 T/C or mV 2 Volts/mA 3 RTD 4 All Inputs	1 Relay 2 SSR Driver 3 4-20mA and Relay 4 4-20mA and SSR Driver	0 None 1 Relay 2 SSR Driver 3 4-20mA 4 4-20mA and Relay 5 4-20mA and SSR Driver	0 None 1 Relay 2 SSR Driver	0 None 1 Position Proportioning* 2 Remote Run/Hold 3 RS-485 Standard Com.** 4 RS-485 Standard Com.*** 5 RS-485 Total Access Com.** 6 RS-485 Total Access Com.***	1 115 VAC Input & Relays 2 230 VAC Input & Relays 3 115 VAC Input & 230 VAC Relays	(Blank) None BA Remote Keypad EO Extended Feature Software XP 24VDC Transmitter Power Supply XA 24VDC Power Supply†† AI 40 Profiles†

DIMENSIONS - 1/4 DIN



* Limited to Model 6X11X1X or 6X22X1X.
 ** Output Group 2 cannot be 3, 4, or 5.
 *** Output Group 3 cannot be 1 or 2.
 † If com is required, only Total Access Com. is available.
 †† ALARM not available when XA suffix is ordered.

Note: RS-485 Total Access Com. includes Option EO. Option E



MLC 9000+™

**Maximum Productivity and
Versatility for Control without
Compromise!**

Bus Compatible PID Control System

DESCRIPTION

The new generation MLC 9000+ is the newest addition to the Partlow brand product range. Like its proven predecessor the MLC 9000, the MLC 9000 + represents a modular, multi-loop temperature control system consisting of a bus control module (BCM) and up to eight loop control modules (LCM's) per BCM. This new controller offers the highest number of field bus protocols, lowest per-loop cost, and the smallest size in the industry.

The MLC9000+ is equipped with more field bus communication and loop control options than ever before; an enhanced tuning algorithm; and an easier to use PC configurator for enhanced application versatility. It's an affordable value that ends the compromise between the need for control performance and integration - in one!

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+ 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+ offers superior control performance and lower installation costs enabling multiple discrete controllers to be taken out of the panel and multiple loops out of the PLC in place of multiple discrete controllers.

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.

INDUSTRIES

- Packaging
- Plastics
- Converting
- Semiconductor
- Food Processing
- Heat Treating

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

FEATURES/BENEFITS

- Compact DIN Rail mounting - behind the panel
- Easily Expandable
- Modules for 1, 3 or 4 loop configurations
- Fully configured 32 loop system requires only 8.1 inches width.
- Available in all popular field-bus communications types
- Integrates with PLC and HMI for centralized control



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MLC 9000+™

Multi-Loop Control System

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Compromise!**

Bus Compatible PID Control System

THE MLC9000+ SYSTEM... AS EASY AS 1 - 2 - 3

1 - Choose a BCM



MLC 9000+ Bus Control Modules (BCM). The heart the MLC 9000+ system that masters communication of up to 8 single or four loop PID controller modules from PLCs, PCs, HMIs, SCADA and fieldbus network systems.

For BCM information, see pages 4.17 - 4.29



2 - Choose one or more LCMs

MLC 9000+ Loop Control Modules (LCM). Each LCM is a self-contained PID with input and output connections for either one, three or four loops that are all driven and controlled by the master BCM.

For LCM information, see pages 4.31 - 4.35



3 - A complete MLC9000+ Bus Compatible Temperature Controller is ready for your Application



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 system can be programmed in as little as 30 minutes rather than hours or days.

Compared to multiple discrete controller applications, it dramatically reduces the cost of installation by eliminating wiring and reducing the number of holes that have to be cut into the panel. 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.



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MLC 9000+™

Multi-Loop Control System

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Bus Compatible PID Control 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
- Continuous Adaptive/Self Tune
- Improved Sensor Management
- Loop Enable/Disable
- Construction/Enclosure:** ABS black plastic housing

OPERATING CHARACTERISTICS (applies to 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

SSR Driver: Drive capability: 12VDC Nominal (10VDC minimum) @30mA max.; short circuit protected

DC Linear: Optional (on two modules only Z1300 and Z1301); Resolution: 8 bits in 250 msec (10 bits in one second typical); Accuracy ±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 retransmission (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; ±1 LSD; RTD ±0.2% of span; ±0.3°C; Thermocouple: ±0.2% of span; ±1°C for CJC; ±0.3°C for 0.1°C resolution ranges, or 1°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°C

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

MLC 9000+™

Multi-Loop Control System

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Bus Compatible PID Control System - Specifications

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 all MLC 9000+)

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

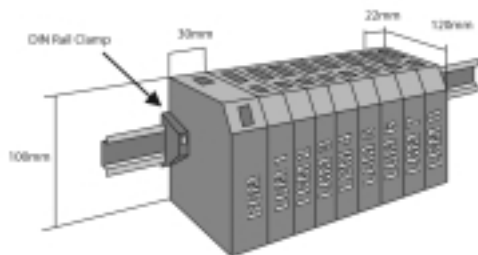
Width: 0.87" (22mm); Up to 8.11" (206mm) for 8 module system up to 32 loops

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

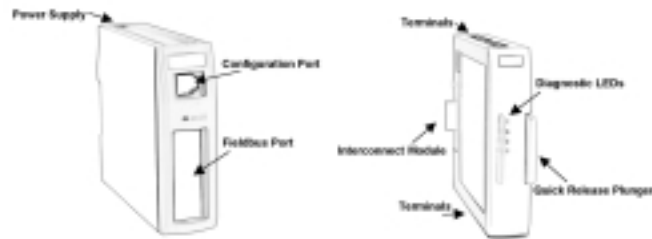
Improved Windows Configuration Software (purchase separately)

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.





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Basic Bus Communication Module

DESCRIPTION

The Basic Bus Communication Module (BCM) is part of the MLC 9000+ DIN rail mount PID control system. The BCM handles the supervision of the Loop Controller Modules. The Basic BCM is for standalone systems that require no supervision by a master device such as a PLC system.



APPLICATIONS:

Ideal for multi-zone temperature or process control applications (speed, flow, pressure, etc). Takes the place of either a PLC and multiple discrete controllers or combination PLC/HMI. For users seeking an integrated solution for improved PLC performance.

INDUSTRIES

Packaging, plastics, converting, semi-conductor, food processing, heat treat and environmental test chambers to name a few.

FEATURE/BENEFITS

- Configuration Port
- Software Configurable
- DIN Rail Mounting
- Fully Isolated from any other System

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Basic Bus Communication Module

SPECIFICATIONS*

STANDARD FEATURES

Function: Supports up to 8 LCM modules per BCM (for max of 32 loops); Larger systems require multiple BCM's (dependent on bus module(s) type ordered). Equipped with Partlow Configuration Port

Construction/Enclosure: Compact, modular, behind the panel (BTP), DIN rail design; NEW ABS black bus module with dedicated configuration port

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

Power Consumption: 30W Max

Power Supply: 2-way; 5.08mm (0.2"); Combicon type

Line Voltage: 18-30VDC (including ripple)

CONFIGURATION PORT

Protocol: Partlow PC Configuration protocol only

Function: Communicates with Partlow MLC 9000+ Configuration Software allowing the user to fully customise the communication interface to the MLC 9000+ system.

Diagnostics: Three color LED, indicating Power Fail, Bus Alarm & Communications Status

Connector: 6-way; RJ11 Type

RATINGS/AGENCY APPROVALS

Safety: EN61010 and UL/Ulc 3121-1

EMC: Certified EN61326-1: 1997

Other: ISO 9002 Registered

PROTECTION

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

PHYSICAL DIMENSIONS

Width: 1.18" (30mm); Up to 8.11" (206mm) for 8 module system up to 32 loops

Depth: 4.72" (120mm)

Height: 3.94" (100mm)

Weight: 5.3 oz (0.15kg)

Mounting: directly fitted onto 35mm Top-Hat DIN rail mounting (EN55022, DIN 46277-3)

WARRANTY

3 Years

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ORDERING INFORMATION

MLC 9002-BM210-NF

BCM with Configuration Port only



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DeviceNet Bus Communication Module

DESCRIPTION

The DeviceNet Bus Communication Module (BCM) is part of the MLC 9000+ DIN rail mount PID control system. The BCM handles communication between up to 8 single or multi loop controller modules and the DeviceNet network. Systems larger than 32 loops can be built using multiple BCMS, within the limitations of your DeviceNet system.



APPLICATIONS:

Ideal for multi-zone temperature or process control applications (speed, flow, pressure, etc). Takes the place of either a PLC and multiple discrete controllers or combination PLC/HMI. For users seeking an integrated DeviceNet protocol.

INDUSTRIES

Packaging, plastics, converting, semi-conductor, food processing, heat treat and environmental test chambers to name a few.

FEATURE/BENEFITS

- DeviceNet Configuration Port
- Supports up to 500kbps
- DIN Rail Mounting
- Software Configuration
- Configuration Data Assemblies

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DeviceNet Bus Communication Module

SPECIFICATIONS*

STANDARD FEATURES

Protocol: DeviceNet (Class 2 Slave Device)
Supports up to 8 LCM modules per BCM (for max of 32 loops); Larger systems require multiple BCM's (dependent on bus module(s) type ordered)
Equipped with DeviceNet Port and Partlow Configuration Port
Construction/Enclosure: Compact, modular, behind the panel (BTP), DIN rail design; NEW ABS black bus module with dedicated Partlow configuration port

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

Power Consumption: 30W Max
Power Connector: 2-way; 5.08mm (0.2"); Combicon type
Line Voltage: 18-30VDC (including ripple)

COMMUNICATIONS INTERFACES

DeviceNet PORT
Protocol: DeviceNet (Class 2 Slave Device)
Port: Connects to a DeviceNet system
Function: Connection of the MLC 9000+ system to a DeviceNet Master Device
Data Rate: 125kbps, 250 kbps or 500kbps; MAC ID 0 – 63 (Defaults 125kbps, ID 63). Configured using the MLC 9000 Configurator software, via the configuration port
I/O Size: Dependant on Data Assembly Configuration. Maximum 256 bytes (total) of input/output data limited by DeviceNet
Messaging Supported: Implicit messages and Explicit messages
Diagnostics: Two Color LED, indicating On/Off-line, Self Test, Bus Fault and Communication Status
EDS File: The EDS file is defined by the MLC9000+ Configuration Software
CONFIGURATION PORT
Protocol: Partlow PC Configuration protocol only
Function: Communicates with Partlow MLC 9000+ Configuration Software allowing the user to fully customize the communication interface to the MLC 9000+ system. The user drags and drops the required parameters into the data assemblies which creates an EDS file for use with your DeviceNet master device.
Diagnostics: Three color LED, indicating Power Fail, Bus Alarm & Communications Status
Connector: 6-way; RJ11 Type

RATINGS/AGENCY APPROVALS

Safety: EN61010 and UL/ULc 3121-1
EMC: Certified EN61326-1: 1997
Other: ISO 9002 Registered; ODVA approval pending.

PROTECTION

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

PHYSICAL DIMENSIONS

Width: 1.18" (30mm); Up to 8.11" (206mm) for 8 module system up to 32 loops
Depth: 4.72" (120mm)
Height: 3.94" (100mm)
Weight: 7.4 oz (0.21kg)
Mounting: directly fitted onto 35mm Top-Hat DIN rail mounting (EN55022, DIN 46277-3)

WARRANTY

3 Years

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ORDERING INFORMATION

MLC 9002-BM230-DN BCM with DeviceNet & Configuration Ports



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PROFIBUS Bus Communication Module

DESCRIPTION

The PROFIBUS Bus Communication Module (BCM) is part of the MLC 9000+ DIN rail mount PID control system. The BCM handles communication between up to 8 single or multi loop controller modules and the PROFIBUS network. Systems larger than 32 loops can be built using multiple BCMs, within the limitations of your PROFIBUS system.



APPLICATIONS:

Ideal for multi-zone temperature or process control applications (speed, flow, pressure, etc). Takes the place of either a PLC and multiple discrete controllers or combination PLC/HMI. For users seeking an integrated PROFIBUS protocol.

INDUSTRIES

Packaging, plastics, converting, semi-conductor, food processing, heat treat and environmental test chambers to name a few.

FEATURE/BENEFITS

- PROFIBUS DP Port
- Auto Detects Data Rate
- DIN Rail Mounting
- Software Configuration
- Configurable Data Assemblies

MULTI-LOOP CONTROL SYSTEMS
Bus Module - Profibus



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PROFIBUS Bus Communication Module

SPECIFICATIONS*

STANDARD FEATURES

Protocol: PROFIBUS DP (Slave Device)
Supports up to 8 LCM modules per BCM (for max of 32 loops); Larger systems require multiple BCM's (dependent on bus module(s) type ordered)
Equipped with PROFIBUS Port and Partlow Configuration Port
Construction/Enclosure: Compact, modular, behind the panel (BTP), DIN rail design; NEW ABS black bus module with dedicated configuration port

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

Power Consumption: 30W Max
Power Connector: 2-way; 5.08mm (0.2"); Combicon type
Line Voltage: 18-30VDC (including ripple)

COMMUNICATIONS INTERFACES

PROFIBUS PORT
Protocol: PROFIBUS DP (Slave Device)
Port: Connects to a PROFIBUS system
Function: Connection of the MLC 9000+ system to a PROFIBUS Master Device
Data Rate: Auto detected from 9.6kbps, 19.2kbps, 45.4kbps, 93.75kbps, 187.5kbps, 500kbps, 1.5Mbps, 3Mbps, 6Mbps and 12Mbps.
Profibus Address: 0 – 126 (Default = 126). Configured using the MLC9000+ Configurator software, via the configuration port
I/O Size: Dependant on Data Assembly Configuration. Maximum 256 (total) bytes of input/output data limited by PROFIBUS
Messaging Supported: Cyclic and Acyclic messages
Diagnostics: Two Color LED, indicating On/Off-line, Self Test, Bus Fault and Communication Status
GSD/GSE File: The GSD/GSE file is defined by the MLC 9000+ configuration software
Connector: 9-way D-Type
CONFIGURATION PORT
Protocol: Partlow PC Configuration protocol only
Function: Communicates with Partlow MLC 9000+ Configuration Software allowing the user to fully customize the communication interface to the MLC 9000+ system. The user drags and drops the required parameters into the data assemblies which creates an EDS file for use with your PROFIBUS master device.
Diagnostics: Three color LED, indicating Power Fail, Bus Alarm & Communications Status
Connector: 6-way; RJ11 Type

RATINGS/AGENCY APPROVALS

Safety: EN61010 and UL/ULc 3121-1
EMC: Certified EN61326-1: 1997
Other: ISO 9002 Registered; PROFIBUS approval pending.

PROTECTION

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

PHYSICAL DIMENSIONS

Width: 1.18" (30mm); Up to 8.11" (206mm) for 8 module system up to 32 loops
Depth: 4.72" (120mm)
Height: 3.94" (100mm)
Weight: 7.4 oz (0.21kg)
Mounting: directly fitted onto 35mm Top-Hat DIN rail mounting (EN55022, DIN 46277-3)

WARRANTY

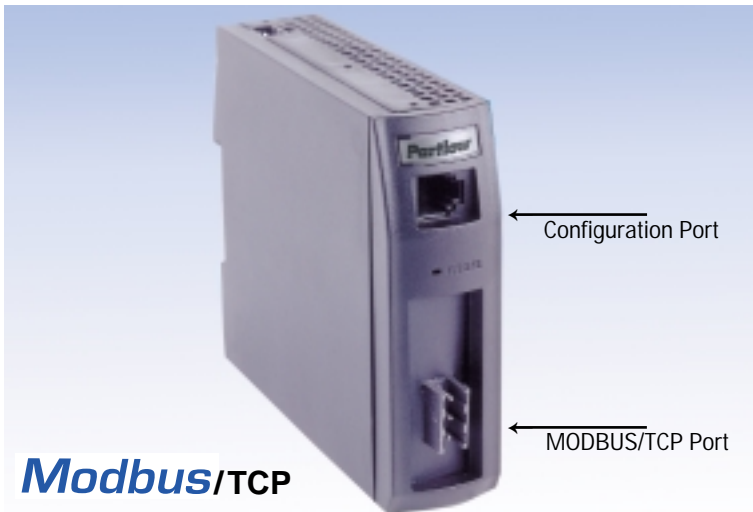
3 Years

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ORDERING INFORMATION

MLC 9002-BM240-PB

BCM with PROFIBUS & Configuration Port

**Modbus/TCP****MODBUS/TCP Bus Communication Module****DESCRIPTION**

The MODBUS/TCP Bus Communications Module (BCM) is part of the MLC 9000+ DIN-Rail mount PID control system. The BCM handles communication between up to 8 single or multiple loop controller modules and the MODBUS/TCP network. Systems larger than 32 loops can be built using multiple BCMs, within the limitations of your MODBUS/TCP system.

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APPLICATIONS:

Ideal for multi-zone temperature or process control applications (speed, flow, pressure, etc). Takes the place of either a PLC and multiple discrete controllers or combination PLC/HMI. For users seeking an integrated MODBUS/TCP protocol.

INDUSTRIES

Packaging, plastics, converting, semi-conductor, food processing, heat treat and environmental test chambers to name a few.

FEATURE/BENEFITS

- MODBUS/TCP Port
- 10/100BaseT supported
- DIN Rail Mounting
- Software Configuration
- Configuration Data Assemblies

MLC 9000+™

Maximum Productivity and Versatility
for Control without Compromise!

MODBUS/TCP Bus Communication Module

SPECIFICATIONS*

STANDARD FEATURES

Protocol: MODBUS/TCP (Slave Device)
Supports up to 8 LCM modules per BCM (for max of 32 loops); Larger systems require multiple BCM's (dependent on bus module(s) type ordered)
Equipped with MODBUS/TCP Port and Partlow Configuration Port
Construction/Enclosure: Compact, modular, behind the panel (BTP), DIN rail design; NEW ABS black bus module with dedicated Partlow configuration port

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

Power Consumption: 30W Max
Power Connector: 2-way; 5.08mm (0.2"); Combicon type
Line Voltage: 18-30VDC (including ripple)

COMMUNICATIONS INTERFACES

MODBUS/TCP PORT

Protocol: MODBUS/TCP (Slave Device)
Port: Connects to a MODBUS/TCP system
Function: Connection of the MLC 9000+ system to a MODBUS/TCP Master Device
Configuration: IP Address, MAC Address and Modbus port Address 0 – 257 (Default = 96); Configured using the MLC9000+ Configurator software, via the configuration port
Messaging Supported: Function codes 01, 02, 03, 04, 05, 06, 08, 0Fh, 10h and 17h
Connector: RJ45 type conforming to CAT5 10/100BaseT

Diagnostics: Two Color LED, indicating On/Off-line, Self Test, Bus Fault and Communication Status

CONFIGURATION PORT

Protocol: Partlow PC Configuration protocol only
Function: Using the MLC 9000+ configuration software the user can define the data assemblies for communication via MODBUS/TCP. This allows the user to fully customize the communication interface to the MLC 9000+ system. The user drags and drops the required parameters into the data assemblies allowing the MODBUS/TCP master to gather a several parameters in a single message.
Diagnostics: Three color LED, indicating Power Fail, Bus Alarm & Communications Status
Connector: 6-way; RJ11 Type

RATINGS/AGENCY APPROVALS

Safety: EN61010 and UL/ULc 3121-1
EMC: Certified EN61326-1: 1997
Other: ISO 9002 Registered; MODBUS Organization approval pending.

PROTECTION

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

PHYSICAL DIMENSIONS

Width: 1.18" (30mm); Up to 8.11" (206mm) for 8 module system up to 32 loops
Depth: 4.72" (120mm)
Height: 3.94" (100mm)
Weight: 7.4 oz (0.21kg)
Mounting: directly fitted onto 35mm Top-Hat DIN rail mounting (EN55022, DIN 46277-3)

WARRANTY

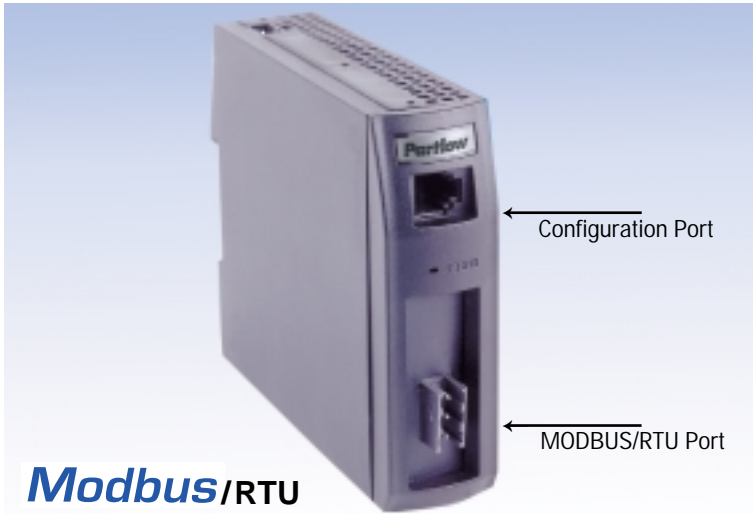
3 Years

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ORDERING INFORMATION

MLC 9002-BM250-MT

BCM with MODBUS/TCP & Configuration Port



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MODBUS/RTU Bus Communication Module

DESCRIPTION

The MODBUS/RTU Bus Communications Module (BCM) is part of the MLC 9000+ DIN-Rail mount PID control system. The BCM handles communication between up to 8 single or multiple loop controller modules and the MODBUS/RTU network. Systems larger than 32 loops can be built using multiple BCMs, within the limitations of your MODBUS/RTU system.



APPLICATIONS:

Ideal for multi-zone temperature or process control applications (speed, flow, pressure, etc). Takes the place of either a PLC and multiple discrete controllers or combination PLC/HMI. For users seeking an integrated MODBUS/RTU protocol.

INDUSTRIES

Packaging, plastics, converting, semi-conductor, food processing, heat treat and environmental test chambers to name a few.

FEATURE/BENEFITS

- MODBUS/RTU Port
- Configurable Data Rate
- DIN Rail Mounting
- Software Configuration
- Configurationable Assemblies

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MODBUS/RTU Bus Communication Module

SPECIFICATIONS*

STANDARD FEATURES

Protocol: MODBUS/RTU (Slave Device)
Supports up to 8 LCM modules per BCM (for max of 32 loops); Larger systems require multiple BCM's (dependent on bus module(s) type ordered)
Equipped with MODBUS/RTU Port and Partlow Configuration Port
Construction/Enclosure: Compact, modular, behind the panel (BTP), DIN rail design; NEW ABS black bus module with dedicated Partlow configuration port

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

Power Consumption: 30W Max
Power Connector: 2-way; 5.08mm (0.2"); Combicon type
Line Voltage: 18-30VDC (including ripple)

COMMUNICATIONS INTERFACES

MODBUS/TCP PORT
Protocol: MODBUS/RTU (Slave Device)
Port: Connects to a MODBUS/RTU system
Function: Connection of the MLC 9000+ system to a MODBUS/RTU Master Device
Configuration: Data Rate auto detected by BCM from 2.4kbps, 4.8kbps, 9.6kbps and 19.2kbps
Address 0 – 257 (Default = 96). Configured using the MLC9000+ Configurator software, via the configuration port
Messaging Supported: Function codes 01, 02, 03, 04, 05, 06, 08, 0Fh, 10h and 17h
Connector: 3-way 5.08mm combicon type
Diagnostics: Two Color LED, indicating On/Off-line, Self Test, Bus Fault and Communication Status
CONFIGURATION PORT
Protocol: Partlow PC Configuration protocol only
Function: Using the MLC 9000+ configuration software the user can define the data assemblies for communication via MODBUS RTU. This allows the user to fully customize the communication interface to the MLC 9000+ system. The user drags and drops the required parameters into the data assemblies allowing the MODBUS master to gather a several parameters in a single message
Diagnostics: Three color LED, indicating Power Fail, Bus Alarm & Communications Status
Connector: 6-way; RJ11 Type

RATINGS/AGENCY APPROVALS

Safety: EN61010 and UL/ULc 3121-1
EMC: Certified EN61326-1: 1997
Other: ISO 9002 Registered; MODBUS Organization approval pending.

PROTECTION

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

PHYSICAL DIMENSIONS

Width: 1.18" (30mm); Up to 8.11" (206mm) for 8 module system up to 32 loops
Depth: 4.72" (120mm)
Height: 3.94" (100mm)
Weight: 7.4 oz (0.21kg)
Mounting: directly fitted onto 35mm Top-Hat DIN rail mounting (EN55022, DIN 46277-3)

WARRANTY

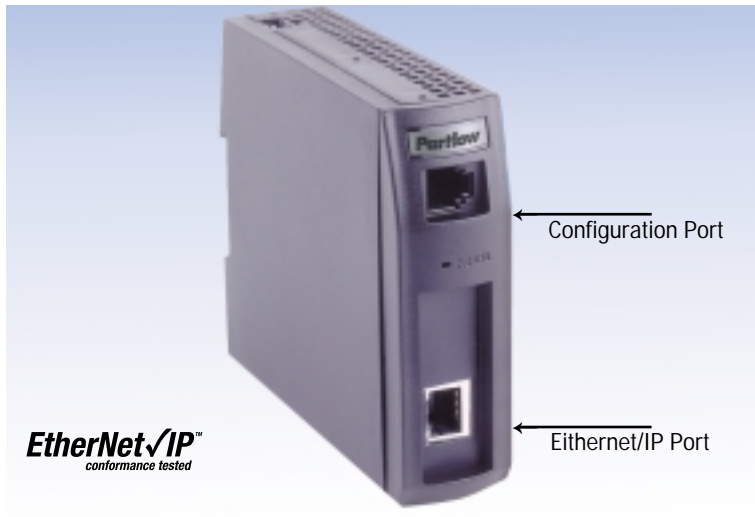
3 Years

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ORDERING INFORMATION

MLC 9002-BM220-MB

BCM with MODBUS RTU & Configuration Port



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Ethernet/IP Bus Communication Module

DESCRIPTION

The Ethernet/IP Bus Communication Module (BCM) is part of the MLC 9000+ DIN rail mount PID control system. The BCM handles communication between up to 8 single or multi loop controller modules and the Ethernet/IP network. Systems larger than 32 loops can be built using multiple BCMs, within the limitations of your Ethernet/IP system.



APPLICATIONS:

Ideal for multi-zone temperature or process control applications (speed, flow, pressure, etc). Takes the place of either a PLC and multiple discrete controllers or combination PLC/HMI. For users seeking an integrated Ethernet/IP protocol.

INDUSTRIES

Packaging, plastics, converting, semiconductor, food processing, heat treat and environmental test chambers to name a few.

FEATURE/BENEFITS

- Ethernet/IP Port
- 10/100 Base T Supported
- DIN Rail Mounting
- Software Configuration
- Configurable Data Assemblies

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Ethernet/IP Bus Communication Module

SPECIFICATIONS*

STANDARD FEATURES

Protocol: Ethernet/IP (Slave Device)
Supports up to 8 LCM modules per BCM (for max of 32 loops); Larger systems require multiple BCM's (dependent on bus module(s) type ordered)
Equipped with Ethernet/IP and Partlow Configuration Port
Construction/Enclosure: Compact, modular, behind the panel (BTP), DIN rail design; NEW ABS black bus module with dedicated configuration port

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

Power Consumption: 30W Max
Power Connector: 2-way; 5.08mm (0.2"); Combicon type
Line Voltage: 18-30VDC (including ripple)

COMMUNICATIONS INTERFACES

Ethernet/IP PORT
Protocol: Ethernet/IP (Slave Device)
Port: Connects to a Ethernet/IP system
Function: Connection of the MLC 9000+ system to a Ethernet/IP Master Device
Configuration: IP Address and MAC Address. Configured using the MLC9000+ Configurator software, via the configuration port.
Messaging Supported: Implicit messages and Explicit messages
Diagnostics: Two Color LED, indicating On/Off-line, Self Test, Bus Fault and Communication Status

CONFIGURATION PORT

Protocol: Partlow PC Configuration protocol only
Function: Communicates with Partlow MLC 9000+ Configuration Software allowing the user to fully customise the communication interface to the MLC 9000+ system. The user drags and drops the required parameters into the data assemblies allowing the Ethernet/IP master to gather a several parameters in a single message.
Diagnostics: Three color LED, indicating Power Fail, Bus Alarm & Communications Status
Connector: 6-way; RJ11 Type

RATINGS/AGENCY APPROVALS

Safety: EN61010 and UL/Ulc 3121-1
EMC: Certified EN61326-1: 1997
Other: ISO 9002 Registered; ODVA approval pending.

PROTECTION

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

PHYSICAL DIMENSIONS

Width: 1.18" (30mm); Up to 8.11" (206mm) for 8 module system up to 32 loops
Depth: 4.72" (120mm)
Height: 3.94" (100mm)
Weight: 7.4 oz (0.21kg)
Mounting: directly fitted onto 35mm Top-Hat DIN rail mounting (EN55022, DIN 46277-3)

WARRANTY

3 Years

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ORDERING INFORMATION

MLC 9002-BM250-EI

BCM with Ethernet/IP & Configuration Port



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CANopen Bus Communication Module

DESCRIPTION

The CANopen Bus Communication Module (BCM) is part of the MLC 9000+ DIN rail mount PID control system. The BCM handles communication between up to 8 single or multi loop controller modules and the CANopen network. Systems larger than 32 loops can be built using multiple BCMs, within the limitations of your CANopen system.



APPLICATIONS:

Ideal for multi-zone temperature or process control applications (speed, flow, pressure, etc). Takes the place of either a PLC and multiple discrete controllers or combination PLC/HMI. For users seeking an integrated solution for improved PLC performance with CANopen protocol.

INDUSTRIES

Packaging, plastics, converting, semi-conductor, food processing, heat treat and environmental test chambers to name a few.

FEATURE/BENEFITS

- CANopen Configuration Port
- Supports up to 1024kbps
- DIN Rail Mounting
- Software Configuration
- Configuration Data Assemblies

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CANopen Bus Communication Module

SPECIFICATIONS*

STANDARD FEATURES

Protocol: CANopen (Slave Device)
Supports up to 8 LCM modules per BCM (for max of 32 loops); Larger systems require multiple BCM's (dependent on bus module(s) type ordered)
Equipped with CANopen Port and Partlow Configuration Port
Construction/Enclosure: Compact, modular, behind the panel (BTP), DIN rail design; NEW ABS black bus module with dedicated configuration port

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

Power Consumption: 30W Max
Power Supply: 2-way; 5.08mm (0.2"); Combicon type
Line Voltage: 18-30VDC (including ripple)

COMMUNICATIONS INTERFACES

CANopen PORT
Protocol: CANopen Slave device
Port: Connects to a CANopen system
Function: Connects the MLC9000+ system to a CANopen Master Device
Data Rate: Data Rate 125kbps, 250kbps, 500kbps or 1024kbps; Node ID 1 – 127 (Defaults 125kbps, Node ID 1). Configured using the MLC 9000+ Configurator software, via the configuration port .
I/O Size: Dependent on data assembly configuration; Maximum 256 bytes total of input/output data limited by CANopen
Messaging Supported: Cyclic and Acyclic Messaging
EDS File: The EDS file is defined by the MLC9000+ Configuration Software
Connector: 5-way 5.08mm combicon type
Diagnostics: Two Color LED, indicating On/Off-line, Self Test, Bus Fault and Communication Status
CONFIGURATION PORT
Protocol: Partlow PC Configuration protocol only
Function: Communicates with Partlow MLC 9000+ Configuration Software allowing the user to fully customise the communication interface to the MLC 9000+ system. The user drags and drops the required parameters into the data assemblies an EDS file is then created for use with your CANopen master device.
Diagnostics: Three-color LED indicating Power Fail, Bus Alarm and Communication Status
Connector: 6-way; RJ11 Type

RATINGS/AGENCY APPROVALS

Safety: EN61010 and UL/ULc 3121-1
EMC: Certified EN61326-1: 1997
Other: ISO 9002 Registered; CiA approval pending.

PROTECTION

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

PHYSICAL DIMENSIONS

Width: 1.18" (30mm); Up to 8.11" (206mm) for 8 module system up to 32 loops
Depth: 4.72" (120mm)
Height: 3.94" (100mm)
Weight: 5.3 oz (0.15kg)
Mounting: directly fitted onto 35mm Top-Hat DIN rail mounting (EN55022, DIN 46277-3)

WARRANTY

3 Years

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ORDERING INFORMATION

MLC 9002-BM230-CO

BCM with CANopen & Configuration Ports



MLC 9000+ Single Loop Controller Module

DESCRIPTION

The Single Loop Controller Module (LCM), when combined with a Bus Control Module (BCM), is part of the MLC 9000+ DIN rail mount PID control system. Each Single Loop Controller Module (LCM), is an independent PID controller. Up to a max of eight LCMs can be configured for each Bus Communication Module (BCM). Each LCM contains its own PID processor as well as all input and output connections. Mixed installations of Single Loop and Four Loop LCMs are possible. Each LCM can be removed and replaced ("hot swapped") while the process is running.



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APPLICATIONS:

Ideal for multi-zone temperature or process control applications (speed, flow, pressure, etc). Takes the place of either a PLC and multiple discrete controllers or combination PLC/HMI. For users seeking an integrated solution for improved PLC performance with factory networks.

INDUSTRIES

Packaging, plastics, converting, semi-conductor, food processing, heat treat and environmental test chambers to name a few.

FEATURE/BENEFITS

- Heat/Cool Operation
- Process & Heater Alarms
- 100ms Scan Time
- Soft Start
- Heater Current Monitoring
- Hot Swapping with Auto Loop Configuration

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MLC 9000+ Single Loop Controller Module

SPECIFICATIONS*

STANDARD FEATURES

Power Supply: Powered by BCM within its operating condition
Function: One loop temperature or DC process input. Type and scale user selectable
Measuring Accuracy: DC = ±0.1% of span ±1 LSD; RTD = ±0.1% of span, ±0.3°C; Thermocouple = ±0.1% of span, +1°C for CJC, +0.3°C for 0.1°C resolution ranges, or 1°C for 1° resolution ranges
Input sample rate: 10Hz (100msec)
Sensor Break Detection: Break detected within two seconds; Control outputs turn to off (0% power); Alarms activate (except heater break alarms)
Construction/Enclosure: Compact, modular, behind the panel (BTP), DIN rail design.

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.

UNIVERSAL INPUT

Input will accept signal from any of the following:
Thermocouple: B, N, J, R, K, S, L, T; Spans from -400°F to +3198°F (-240°C to +1759°C) dependent on T/C type
RTD: 3-Wire PT100; -327.3°F to 1472.5°F (-199.9°C to +800.3°C)
DC Linear: 0-20mA, 4-20mA, 0-50mV, 10-50mV, 0-5V, 1-5V, 0-10V, 2-10V; Scaleable -32000 to +32000

HEATER BREAK ALARM

Function: Optional. Compares heater current to nominal. Alarms for High/Low current or Short Circuit output
Heater Current Input: 0 to 50mA Sinusoidal rms, from Current Transformer. Scaleable 0.1 to 1000.0A AC

OUTPUTS

Output types provided is dependent upon specific LCM model. See "ORDERING INFORMATION" for details.
Relay Outputs: Contact type: Single Pole Single Throw (SPST); Rating: 2A resistive @ 120/240 VAC; Lifetime: >500,000 operations at rated voltage/current
SSR Driver Outputs: Drive Capability: 12VDC nominal (10V minimum), at up to 20mA; Isolation: Isolated from process input and relay outputs. Not isolated from each other, other similar outputs or linear outputs in the same system.
Linear Output: Only available on 3 O/P models. Resolution: 8 bits in 250msec, (10 bits in 1 second typical); Accuracy ±0.25% (mA into 250 ohm load, V into 2kohm load), degrading linearly to ±0.5% for increasing burden to maximum derive capability (500 ohm).

RATINGS/AGENCY APPROVALS

Safety: EN61010 and UL/ULC 3121-1
EMC: Certified EN61326-1: 1997
Other: ISO 9002 Registered; CiA approval pending.

PROTECTION

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

PHYSICAL DIMENSIONS

Width: 0.87" (22mm)
Depth: 4.72" (120mm)
Height: 3.94" (100mm)
Weight: 5.3 oz (0.15kg)
Mounting: directly fitted onto 35mm Top-Hat DIN rail mounting (EN55022, DIN 46277-3)

WARRANTY

3 Years

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ORDERING INFORMATION

MLC 9002-Z1200-00	One Universal input, two SSR/relay outputs
MLC 9002-Z1300-00	One Universal input, two SSR/relay outputs and one Linear output or three SSR/relay outputs
MLC 9002-Z1301-00	One Universal input, one Heater Break input, two SSR/relay outputs and one Linear output or three SSR/SP relay outputs



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MLC 9000+

Three Loop & Heater Break Controller Module

DESCRIPTION

The Loop Control Module (LCM), when combined with a Bus Control Module (BCM), forms the basis of the MLC 9000+ DIN rail mount PID control system. Each Three Loop Controller Module (LCM) and Heater Break is an independent PID controller with 3 loops of control and heater break detection. Up to a max of eight LCMs can be configured for each Bus Communications Module (BCM). Each LCM contains its own PID processor as well as all input and output connections. Mixed installations of Single, Three and Four Loop LCMs are available. Each LCM can be removed and replaced ("hot swapped") while the process is running.

APPLICATIONS:

Ideal for multi-zone temperature or process control applications (speed, flow, pressure, etc). Takes the place of either a PLC and multiple discrete controllers or combination PLC/HMI. For users seeking an integrated solution for improved PLC performance with factory networks.

INDUSTRIES

Packaging, plastics, converting, semi-conductor, food processing, heat treat and environmental test chambers to name a few.

FEATURE/BENEFITS

- Heat/Cool Operation
- Process & Heater Alarms
- 100ms Scan Time
- Soft Start
- Three Heater Currents Monitored with a Single Input
- Hot Swapping with Auto Loop Configuration



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MLC 9000+ Three Loop & Heater Break Controller Module

SPECIFICATIONS*

STANDARD FEATURES

Power Supply: Powered by BCM within its operating condition
Function: Three loop temperature or DC process input. Type and scale user-selectable
Measuring Accuracy: DC = ±0.1% of span ±1 LSD; RTD = ±0.1% of span, ±0.3°C; Thermocouple = ±0.1% of span, +1°C for CJC, +0.3°C for 0.1°C resolution ranges, or 1°C for 1° resolution ranges
Input sample rate: 10Hz (100msec)
Sensor Break Detection: Break detected within two seconds; Control outputs turn to off (0% power); Alarms activate (except heater break alarms)
Construction/Enclosure: Compact, modular, behind the panel (BTP), DIN rail design.

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.

UNIVERSAL INPUTS

Each input will accept signal from any of the following:
Function: Three loop temperature or DC process input. Type and scale user selectable
Thermocouple: B, N, J, R, K, S, L, T; Spans from -400°F to +3198°F (-240°C to +1759°C) dependent on T/C type
RTD: 3-Wire PT100; -327.3°F to 1472.5°F (-199.9°C to +800.3°C)
DC Linear: 0-20mA, 4-20mA, 0-50mV, 10-50mV, 0-5V, 1-5V, 0-10V, 2-10V; Scaleable -32000 to +32000

HEATER BREAK ALARM

Function: Compares heater current to nominal. Alarms for High/Low current or Short Circuit output
Heater Current Input: 0 to 50mA Sinusoidal rms, from Current Transformer. Scaleable 0.1 to 1000.0A AC

OUTPUTS

Output types provided are dependent upon specific LCM model. See "ORDERING INFORMATION for details".
Relay Outputs: Contact type: Single Pole Single Throw (SPST); Rating: 2A resistive @ 120/240 VAC; Lifetime: >500,000 operations at rated voltage/current
SSR Driver Outputs: Drive Capability: 12VDC nominal (10V minimum), at up to 20mA; Isolation: Isolated from process input and relay outputs. Not isolated from each other, other similar outputs or linear outputs in the same system.

RATINGS/AGENCY APPROVALS

Safety: EN61010 and UL/ULc 3121-1
EMC: Certified EN61326-1: 1997
Other: ISO 9002 Registered; CiA approval pending.

PROTECTION

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

PHYSICAL DIMENSIONS

Width: 0.87" (22mm)
Depth: 4.72" (120mm)
Height: 3.94" (100mm)
Weight: 5.3 oz (0.15kg)
Mounting: directly fitted onto 35mm Top-Hat DIN rail mounting (EN55022, DIN 46277-3)

WARRANTY

3 Years

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ORDERING INFORMATION

MLC 9002-Z3621-00	Three Universal inputs, one Heater Break input, six SSR outputs
MLC 9002-Z3611-00	Three Universal inputs, one Heater Break input, six Relay outputs
MLC 9002-Z3651-00	Three Universal inputs, one Heater Break input, three SSR, three Relay outputs



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MLC 9000+ Four Loop Controller Module

DESCRIPTION

The Loop Control Module (LCM), when combined with a Bus Control Module (BCM), forms the basis of the MLC 9000+ DIN rail mount PID control system. Each four Loop Controller Module (LCM) is an independent PID controller with 4 loops of control. Up to a max of eight LCMs can be configured for each Bus Communication Module (BCM). Each LCM contains its own PID processor as well as all input and output connections. Mixed installations of Single, Three and Four Loop LCMs are available. Each LCM can be removed and replaced (“hot swapped”) while the process is running.

APPLICATIONS:

Ideal for multi-zone temperature or process control applications (speed, flow, pressure, etc.) Takes the place of either a PLC and multiple discrete controllers or combination PLC/HMI. For users seeking an integrated solution for improved PLC performance with factory networks.

INDUSTRIES

Packaging, plastics, converting, semiconductor, food processing, heat treat and environmental test chambers to name a few.

FEATURE/BENEFITS

- Heat/Cool Operation
- Process & Loop Alarms
- 100ms Scan Time
- Soft Start
- Universal Input
- Hot Swapping with Auto Loop Configuration

MULTI-LOOP CONTROL SYSTEMS
Loop Control Module - 4 Loop



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MLC 9000+ Four Loop Controller Module

SPECIFICATIONS*

STANDARD FEATURES

Power Supply: Powered by BCM within its operating condition

Function: Four loop temperature or DC process inputs. Type and scale user selectable

Measuring Accuracy: DC = $\pm 0.1\%$ of span ± 1 LSD; RTD = $\pm 0.1\%$ of span, $\pm 0.3^\circ\text{C}$; Thermocouple = $\pm 0.1\%$ of span, $+1^\circ\text{C}$ for CJC, $+0.3^\circ\text{C}$ for 0.1°C resolution ranges, or 1°C for 1° resolution ranges

Input sample rate: 10Hz (100msec)

Sensor Break Detection: Break detected within two seconds. Control outputs turn off (0% power). Alarms activate (except heater break alarms)

Construction/Enclosure: Compact, modular, behind the panel (BTP), DIN rail design.

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.

UNIVERSAL INPUTS

Each input will accept signal from any of the following:

Thermocouple: B, N, J, R, K, S, L, T; Spans from -400°F to $+3198^\circ\text{F}$ (-240°C to $+1759^\circ\text{C}$) dependent on T/C type

RTD: 3-Wire PT100; -327.3°F to 1472.5°F (199.9°C to $+800.3^\circ\text{C}$)

DC Linear: 0-20mA, 4-20mA, 0-50mV, 10-50mV, 0-5V, 1-5V, 0-10V, 2-10; Scaleable -32000 to $+32000$

OUTPUTS

Output types provided are dependent upon specific LCM model. See "ORDERING INFORMATION for details".

Relay Outputs: Contact type: Single Pole Single Throw (SPST); Rating: 2A resistive @ 120/240 VAC; Lifetime: $>500,000$ operations at rated voltage/current

SSR Driver Outputs: Drive Capability: 12VDC nominal (10V minimum), at up to 20mA; Isolation: Isolated from process input and relay outputs. Not isolated from each other, other similar outputs or linear outputs in the same system.

RATINGS/AGENCY APPROVALS

Safety: EN61010 and UL/ULC 3121-1

EMC: Certified EN61326-1: 1997

Other: ISO 9002 Registered; CIA approval pending.

PROTECTION

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

PHYSICAL DIMENSIONS

Width: 0.87" (22mm)

Depth: 4.72" (120mm)

Height: 3.94" (100mm)

Weight: 5.3 oz (0.15kg)

Mounting: directly fitted onto 35mm Top-Hat DIN rail mounting (EN55022, DIN 46277-3)

WARRANTY

3 Years

* Specifications subject to change without notice in accordance with our DBS policy of continuous improvement. All product and brand names are trademarks of their respective companies. All rights reserved.

ORDERING INFORMATION

MLC 9002-Z4620-00 Four Universal inputs, six SSR outputs

MLC 9002-Z4610-00 Four Universal inputs, six relay outputs

MLC 9002-Z4660-00 Four Universal inputs, four SSR outputs, two Relay outputs

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