



## 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 3 outputs; relay, 4-20mA, SSR driver, Triac
- Control, alarms (process, deviation/band); retransmission output functions
- PID, ON/OFF, profile (ramp/dwell) control
- Optional RS-485 serial communications
- Program security

## 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 &amp; 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 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)

\* 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.

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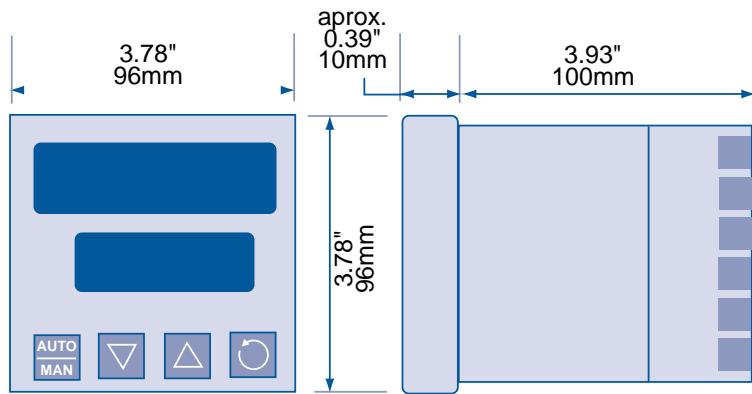
Partlow Brand MIC 1460 Data Sheet (7/05)

**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
<b>1460</b>	<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.

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