

Modular Loop System Providing up to 32 Zones of Control

Features and Benefits

PID control of up to 16 heat and cool loops or 32 heat loops

- Minimizes panel space per loop
- Reduces installation time
- Increases reliability, fewer parts mean fewer failures

Auto-tune

- Requires less time tuning
- Achieves excellent control with less expertise

Menu guided operation with full text display

- Allows quick setup of the controller
- Simplifies operation

Store and recall eight jobs

- Changes quickly from one process to another

Multiple and mixed inputs

- Accepts combinations of thermocouples, RTDs, linear dc voltage and linear dc current sensors
- Reduces learning curve and inventory

Sensor fail detection

- Reduces time troubleshooting reversed, shorted and open sensors

High/low process and deviation alarms for each input

- Integrates as needed with PLC and other control elements

34 digital outputs

- Provides flexible configuration
- Allows use of outputs as needed for control and alarms

TIA/EIA-232 and 485 communications

- Connects to software for easy configuration and operation
- Allows integration with controllers and software

CIM300 option

- Small footprint per loop
- Reduces installation time

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The SERIES MLS300 is a powerful line of controllers that combines performance and flexibility with compact design. The 16 and 32 loop versions provide complete control solutions for a broad range of applications. Support for multiple types of sensor inputs is available; including thermocouples, RTDs, linear voltage, current and frequency. Each controller can operate as a stand-alone system, and includes built-in serial communications for computer interface and data acquisition. Optional, programmable ramp and soak features allow complex batch processing and sequencing. The enhanced features option offers cascade, ratio and differential control, process variable retransmit and remote analog set point.

The remote analog input options allow for shorter sensor wires and flexible mounting which reduces sensor cost and installation time. Watlow offers two input modules. The analog input module (AIM) provides screw terminations for sensors. The compact input module (CIM) provides connector terminations in a compact size, which saves OEMs space and labor costs. This innovation allows users to construct a wiring harness to attach sensors via a connector instead of connecting individual wires to the controller.

The SERIES MLS300 controllers are UL® and C-UL® listed, meet the requirements of the European Community EMC Directive and carry the CE mark.



Better Thermal Solutions...Faster

1241 Bundy Boulevard
Winona, Minnesota 55987-5580 USA
Phone: +1 (507) 454-5300
Fax: +1 (507) 452-4507
Internet: www.watlow.com
E-mail: info@watlow.com

WIN-MLS-0307

ISO 9001



WATVIEW Software

WATVIEW is an optional, Windows®-based Human-Machine Interface (HMI) program that can be used as the primary interface to one or more Watlow controllers. WATVIEW provides channel setup and monitoring of multiple controllers at the same time. The easy-to-use Graphical User Interface (GUI) allows you to set control parameters, create user-defined recipes, view and manage alarms, set up and view trend plots and real-time data and export logged data to spreadsheet applications. WATVIEW requires less configuration time than other more expensive packages, because it is designed specifically for Watlow controllers.

DAC and SDAC Modules

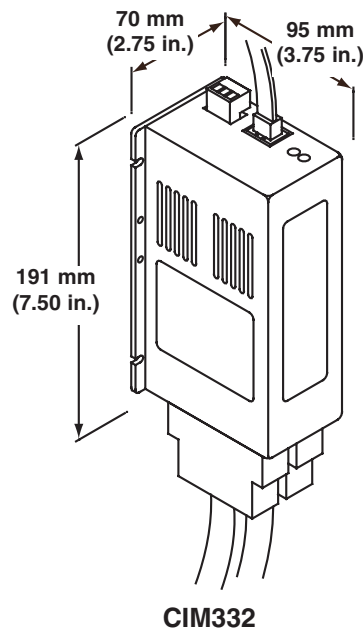
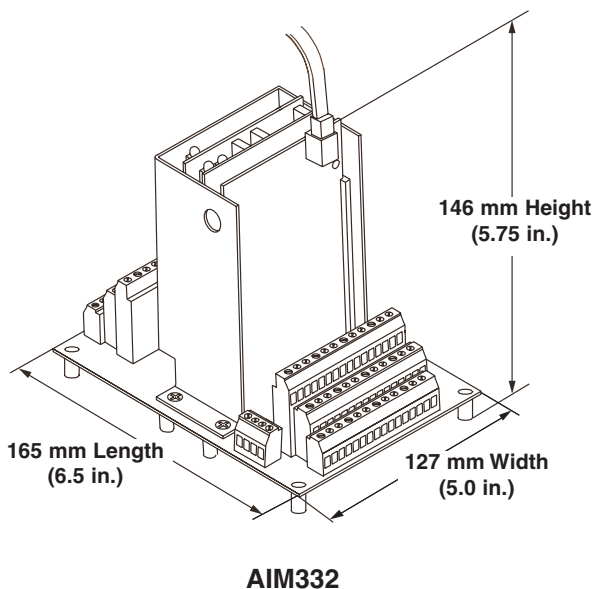
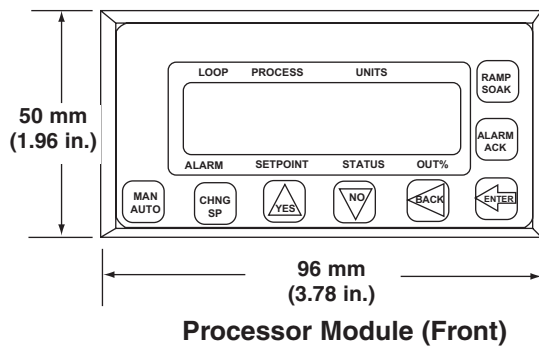
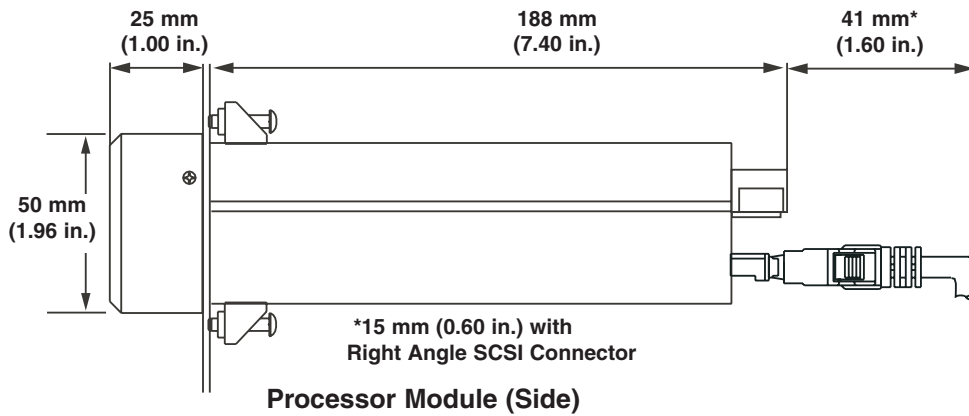
The optional DAC and SDAC modules are available for Watlow's SERIES MLS300 controllers.

DAC

The DAC (digital to analog converter) converts one or two of the controller's distributed zero crossing (DZC) output signals to analog signals. Each output is field configurable for 4-20mA_{dc}, 0-5V_{dc} or 0-10V_{dc}.

SDAC

The SDAC (serial digital to analog converter) converts one controller output to a precise analog voltage or current signal. The unit is typically used for process variable retransmit, open-loop control, motor or belt speed control or phase-angle fired SCR power controllers. The SDAC bears the CE mark and is UL® and C-UL® listed.



MLS300 Specifications

Operator Interface

- 32-character vacuum fluorescent display
- 8-key keypad to access guided menus and prompts, enter passkey sequence, set values, switch between single channel and multiple channel displays
- Controller's configuration can be loaded through the standard serial port

Analog Inputs

- SERIES MLS316 16 differential
- SERIES MLS332 32 differential

Noise Rejection

- 120dB at 60Hz

Temperature Coefficient

- 40 ppm/°C

Temperature Sensors

- Thermocouples: User selectable type, direct connection, linearization, reference junction compensation, reversed and shorted thermocouple detection and upscale break protection with output averaging.
- RTD: 2-or 3-wire, platinum, 100Ω @ 0°C, DIN 0.003850Ω/Ω/°C curve, user-selectable range. Two user-selectable ranges offer different resolutions. Requires special inputs. See ordering information.

Input Range and Accuracy

Sensor	Range (°C)	Range (°F)	Accuracy
Type B	66 to 1760°C	150 to 3200°F	±4.0°C
Type E	-200 to 787°C	-328 to 1448°F	±1.0°C
Type J	-212 to 760°C	-350 to 1400°F	±1.2°C
Type K	-268 to 1371°C	-450 to 2500°F	±1.3°C
Type R	-18 to 1766°C	0 to 3210°F	±2.8°C
Type S	-18 to 1760°C	0 to 3200°F	±2.8°C
Type T	-268 to 399°C	-450 to 750°F	±1.6°C
RTD1	-100 to 275°C	-148 to 527.0°F	±1.1°C
RTD2	-120 to 840°C	-184 to 1544°F	±1.6°C

Note: Accuracy @ 25°C (77°F) ambient. Valid for 10 to 100 percent of span except Type B, which is specified for 427°C (800°F) to 1760°C (3200°F). RTD is for 100 percent of span.

Linear Voltage and Current Inputs

Requires special inputs. See Ordering Information.

- 0-10mA_{rms}(dc)
- 0-20mA_{rms}(dc)/4-20mA_{rms}(dc)
- 0-100mV_{rms}(dc)
- 0-500mV_{rms}(dc)
- 0-1V_{rms}(dc)
- 0-5V_{rms}(dc)
- 0-10V_{rms}(dc)
- 0-12V_{rms}(dc)

Other ranges available. Consult factory.

Pulse Input

One TTL-level square wave input up to 2kHz

Input Sampling Rate at 60Hz

Each channel has the following scans per second:

- SERIES MLS316: 1.5 samples per second, (update time: 0.667 sec.)
- SERIES MLS332: 0.75 samples per second, (update time: 1.33 sec.)

Internal Measurement Resolution

- 0.006 percent, greater than 14 bits

Calibration

- Automatic zero and full scale

Digital Inputs

- TTL level used for selecting recipes or jobs, or R/S triggers
- 8 inputs and one pulse input with 50-pin terminal board option

Digital Outputs

- 34 outputs available with 50-pin terminal board option
- 1 or 2 control outputs are user assigned for each loop
- Each control output can be configured for on-off, time proportioning or distributed zero crossing
- Outputs sink up to 60mA each at 5V_{rms}(dc)

Alarm Outputs

- Independent process and deviation alarms for each channel
- Alarms can operate any output not used for control
- Programmable deadband, delay and startup suppression
- Global alarm output activates when any alarm occurs
- Watchdog output indicates controller is functioning correctly

Serial Interface

- EIA/TIA-232 or EIA/TIA-485

Baud Rate

- 2400, 9600 or 19200, user-selectable

Communication Protocol

- Modbus[®] RTU

Line Voltage/Power

- 15 to 24V_{rms}(dc) ± 3V_{rms}(dc) @ 1A

Agency Approvals

- UL[®], C-UL[®] listed: UL[®] 61010-1 safety requirements for measurement, control and laboratory equipment
- CE Mark: See Declaration of Conformity for details

Firmware Options

Choose firmware with the features needed for the application:

- Standard—includes closed-loop PID controller, auto-tune, alarms, job memory and failed sensor detection.
- Extruder— includes the standard firmware features, with PID control specifically adapted for plastic extruders.
- Ramp and Soak—includes the standard firmware features with the addition of ramp and soak and process variable retransmit. Each channel can be configured for standard PID control or ramp and soak operation. Unused control outputs on any channel can be configured for retransmit.
- Enhanced Features— includes the standard firmware features with the addition of process variable retransmit, remote analog set point, cascade control, ratio control and differential control algorithms. Each channel can be configured for standard PID control or one of the other control algorithms. Each channel of cascade control or remote analog set point requires two controller channels. Unused control outputs on any channel can be configured for retransmission.

Because the SERIES MLS300 has no onboard analog outputs, applications that use process variable retransmit typically require one SDAC module per retransmitted signal.

Input Module Options

Choose the input module appropriate for the application:

- AIM316 and AIM332 provides screw terminations for 16 or 32 sensors
- CIM316 and CIM332 provides DB-50 connector terminations for 16 or 32 sensors in a compact size

Ordering Information

SERIES MLS300 Code Number

Input Module

- 16 = 16 channel analog input module (AIM316)
- 32 = 32 channel analog input module (AIM332)
- C1 = 16 channel compact input module (CIM316)
- C2 = 32 channel compact input module (CIM332)

Processor Module (MLS300-PM)

- 0 = Input module only (No MLS300-PM)
- 1 = MLS300-PM with standard firmware
- 2 = MLS300-PM with extruder firmware
- 3 = MLS300-PM with enhanced features firmware
- 4 = MLS300-PM with ramp and soak firmware

Terminal Board

- 0 = SCSI connector only, user supplies cable and terminal board
- 1 = 50-pin terminal board, includes 3 foot SCSI cable

Power Supply

- 0 = None
- 3 = 120/240V~(ac) 50/60Hz power supply adapter (15V=[dc] @ 1.2A) (CE, UL® Class 2 approved)

SCSI Cables (For use with 50-pin terminal board)

- 0 = 3 foot SCSI cable with terminal board option 2 (no cable with option 0)
- 1 = 6 foot SCSI cable
- 2 = 3 foot right angle SCSI cable
- 3 = 6 foot right angle SCSI cable

Serial Communication Cables

(For communications with computer)

- 0 = No serial comm. cable
- 1 = 10 foot RS-232 comm. cable, DB-9 female/RJ12 phone plug
- 2 = 25 foot RS-232 comm. cable, DB-9 female/RJ12 phone plug
- 3 = 50 foot RS-232 comm. cable, DB-9 female/RJ12 phone plug
- 7 = RS-485 terminal block with 2 foot cable
- 8 = RS-485 terminal block with 4 foot cable

Module Interconnect Cables

- 0 = 4 foot cable, RJ45 connector/RJ45 connector
- 1 = 10 foot cable, RJ45 connector/RJ45 connector
- 2 = 25 foot cable, RJ45 connector/RJ45 connector

Serial Communications Jumper

- 0 = EIA-TIA-232
- 1 = EIA-TIA-485
- 2 = EIA-TIA-485 Terminated

Special Inputs

(Standard unit is configured for thermocouples and -10 to 60mV linear inputs. For other sensors, order special inputs.)

- 00 = Thermocouples and -10 to 60mV inputs only
- XX = Number of current, voltage, or RTD inputs. Include leading zero as needed.

Special Input Type

- 20 = RTD 1: 0.1° Platinum, -100 to 275°C (-148 to 527°F)
- 21 = RTD 2: 1° Platinum, -120 to 840°C (-184 to 1544°F)
- 43 = 0-10mA=(dc)
- 44 = 0-20mA=(dc)/4-20mA=(dc)
- 50 = 0-100mV=(dc)
- 52 = 0-500mV=(dc)
- 53 = 0-1V=(dc)
- 55 = 0-5V=(dc)
- 56 = 0-10V=(dc)
- 57 = 0-12V=(dc)

Start Channel

XX = Channel Number XX

End Channel

XX = Channel Number XX

MLS300SI

Accessories

The following accessories are available for the SERIES MLS300.

Software Ordering Information

WATVIEW HMI Software

Run-time Edition includes spreadsheet display, setup screens, recipe manager with calendar-start, alarm management, event log, data logging and trend graphing.

WV00-ROU0-000 - (USB key)

WV00-R0P0-000 - (Parallel key)

Developer Edition includes all the features of the Run-time edition plus capability of developing custom screens.

WV00-DOU0-000 - (USB key)

WV00-D0P0-000 - (Parallel key)

Ordering Information

DAC/SDAC

Code Number

D A C -

DAC/SDAC Type

- 1 = DAC with 2 each 0 to 5V=(dc) outputs
- 2 = DAC with 2 each 0 to 10V=(dc) outputs
- 3 = DAC with 2 each 4 to 20mA=(dc) outputs
- 4 = Serial digital to analog converter (SDAC)

Power Supply

- A = None
- H = 120/240V~(ac), 50/60Hz power supply adapter, (15V=[dc] @ 1.2A) powers up to 12 dual DAC modules
- L = 120/240V~(ac), 50/60Hz power supply adapter, (5V=[dc] @ 3A) powers up to 10 SDAC modules

Your Authorized Watlow Distributor Is:

To be automatically connected to the nearest North American Technical and Sales Office call:

1-800-WATLOW2

International Technical and Sales Offices: Australia, +61-3-9335-6449 • China, +86-21-3950-9510 • France, +33 (0) 3073-2425 • Germany, +49 (0) 7253-9400-0 • Italy, +39 (0) 2 458-8841 • Japan, +81-3-3518-6630 • Korea, +82-2-575-9804 • Malaysia, +60-3-7980-7741 • Mexico, +52 (442) 217-6235 • Shanghai, +86-21-3950-9504 • Singapore, +65-6773-9469 • Spain, +34 91 675 1292 • Sweden, +46 35-27-11-66 • Taiwan, +886-7-288-5168 • United Kingdom, +44 (0) 115-964-0777