

MLS300: 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

- Minimal panel space per loop
- Reduced installation time
- More reliable: fewer parts mean fewer failures

Auto-tune

- Less time tuning
- Achieve excellent control with less expertise

Menu guided operation with full text display

- Set up controller quickly
- Easy to operate

Store and recall eight jobs

- Change quickly from one process to another

Multiple and mixed inputs

- Easy to change sensor types at the last minute
- Less to learn, less inventory

Sensor fail detection

- Reduce time troubleshooting reversed, shorted and open sensors

High/low process and deviation alarms for each input

- Configure alarms as needed to integrate with PLC or other control elements

34 digital outputs

- Flexible configuration: use outputs as needed for control and alarms

TIA/EIA-232 and 485 communications

- Use software to configure and operate
- Integrate with other controllers and software

CIM300 option

- Small footprint per loop
- Reduced installation time



The Watlow Anafaze MLS300 SERIES 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 setpoint.

The remote analog input options allow for shorter sensor wires and flexible mounting which reduces sensor cost and installation time. Watlow's new CIM option provides OEMs with a space and labor saving alternative to the standard AIM module. This innovation allows users to construct a wiring harness to attach sensors via a connector instead of connecting individual wires to the controller.

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



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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

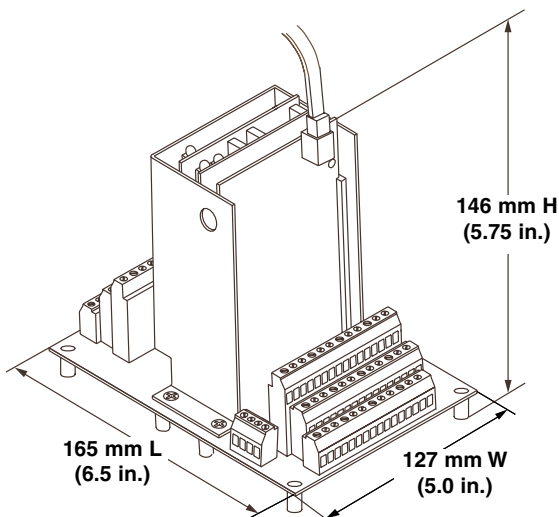
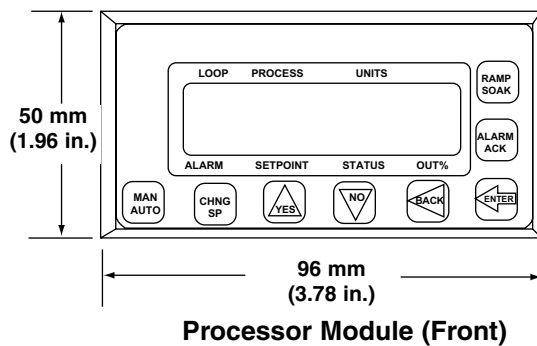
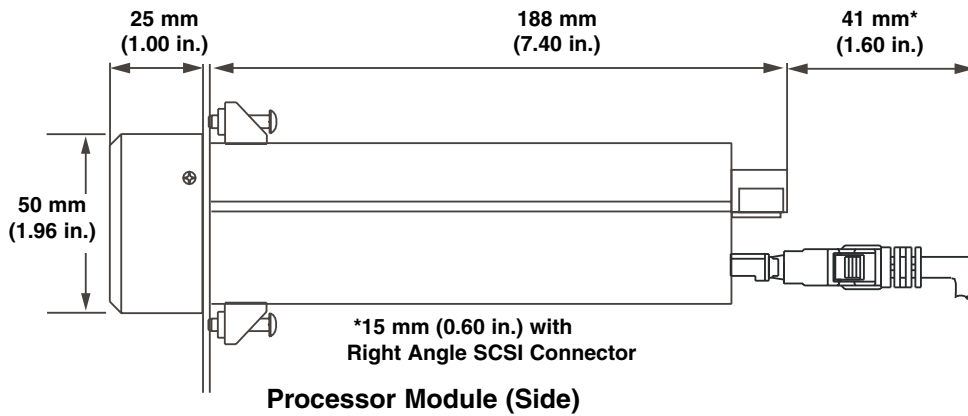
The optional DAC and SDAC modules are available for Watlow Anafaze MLS300 controllers.

DAC

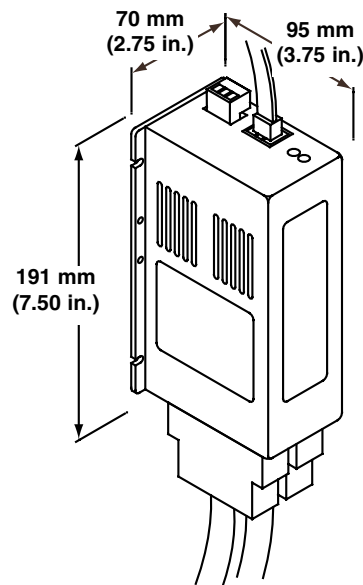
The DAC (digital to analog converter) converts one or two of the controller's distributed zero crossing (DZC) output signals to analog signals. Each output is field configurable for 4-20mA_{rms}(dc), 0-5V_{rms}(dc), or 0-10V_{rms}(dc).

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.



**Analog Input Module
(AIM332 shown)**



**Compact Input Module
(CIM332 shown)**

MLS300 Specifications

Operator Interface

- 32-character vacuum fluorescent display
- Eight-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

- MLS316 16 Differential
- 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 T/C 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	-100.0 to 275°C	-148.0 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 @ 60Hz

Each channel has the following scans per second:

- MLS316: 1.5 samples per second, (update time: 0.667 sec.)
- 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
- Eight inputs and one pulse input with 50-pin terminal board option

Digital Outputs

- 34 outputs available with 50-pin terminal board option
- One or two 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® 916, Standard for Energy Management Equipment
- CE Mark: Electromagnetic Compatibility (EMC) Directive 89/336/EEC

Firmware Options

Choose firmware with the features needed for the application:

- Standard—includes closed-loop PID control, 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 setpoint, 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 setpoint requires two controller channels. Unused control outputs on any channel can be configured for retransmit.

Because the 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

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 = No terminal board accessory
- 1 = 50-pin terminal board, includes 3 foot SCSI cable

Power Supply

- 0 = None
- 2 = 120/240V~(ac) 50/60Hz power supply adapter (5V=[dc] @ 4A, 15V=[dc] @ 1.2A) CE Approved

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

- 0 = No special SCSI cable (3 foot cable is included with 50-pin terminal board)
- 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 = No special cable (4 foot cable comes with input module)
- 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

Accessories

The following accessories are available for the MLS300.

Software Ordering Information

WATVIEW Human Machine Interface software supports MLS300 SERIES controllers with standard, enhanced features or extruder firmware option.

WATVIEW-C

Configurator Edition

Includes spreadsheet display, setup screens, recipe manager without calendar start, communication diagnostics, password security, online help, Active X (OLE 2.0) server.

WATVIEW-R

Runtime Edition

Includes all the features of the Configurator edition plus data logging, trend graphing, alarm management, recipe calendar start, and user event log

WATVIEW-D

Developer Edition

Includes all the features of the Runtime edition plus capability of developing custom screens.

Ordering Information

DAC/SDAC

Code Number

D A C -

DAC/SDAC Type

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

Power Supply

- A = None
- C = 120/240V~(ac), 50/60Hz power supply adapter, (5V=[dc] @ 4A and 15V=[dc] @ 1.2A) Powers up to 13 SDACs or 12 DACs

Your Authorized Watlow Distributor Is:

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