

Temperature Controller

1/16 DIN - 48 x 48 mm

Platinum™ Series M10 Line



Flexibility and ease of operation, with highly valued features

Athena's Platinum™ Series M10 is a compact 48x48 mm size controller suitable for a wide range of applications, such as plastics and food processing, furnaces, packaging, and environmental chambers. The M10 provides high reliability and functionality in a

small format and at a low price. It offers easy configuration and simple operation, combined with standard features including auto-tuning, two standard outputs, and IP65 front-panel protection. Options include serial communications, analog retransmission output, transmitter power supply, choice of two front bezel colors, and DIN-rail mounting.

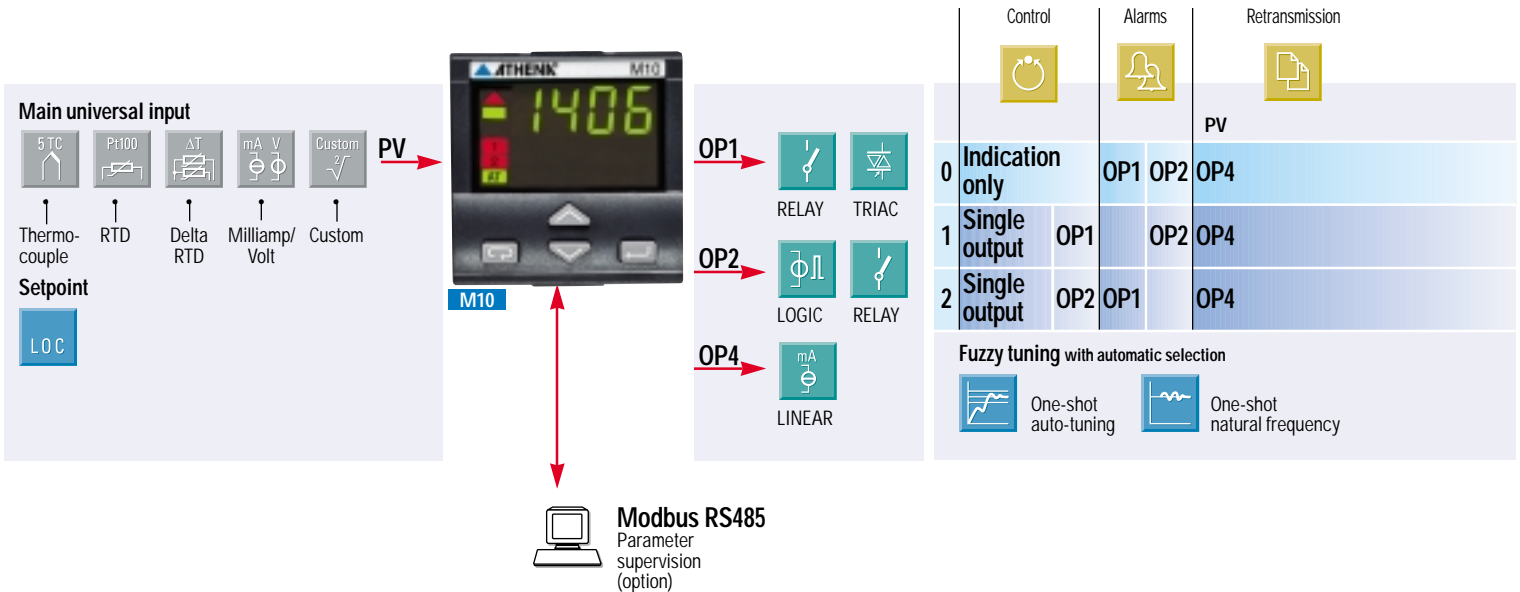


ATHENA CONTROLS, INC.
5145 Campus Drive,
Plymouth Meeting, PA 19462-1129
U.S.A.



Your Need	Our Solution
Easy replacement and quick start-up	Configuration by simple to use codes
Correct tuning for any condition	Automatic selection between two different tuning methods
Alarm signaling	Absolute, band, and deviation alarms
Interfacing with other devices	Serial communications at 9600 baud Modbus/Jbus protocol, analog retransmission output
Short learning curve	All Platinum Series models share the same operating method
Ergonomic compatibility with other devices	Two colors: beige or dark gray front panels
Environmental protection	IP65 front-panel protection (indoor dust and water protection)
Easy to use	Ergonomic keypad, clear and comprehensive display
Noise immunity	Electromagnetic compatibility
Universal input signals, linear as well as non-linear	Configurable input (TC, RTD, mA, volt and ΔT , infrared sensor)
Reliability and safety	CE compatibility, cULus, 3 year warranty
Technical support	Technical applications assistance from ATHENA sales and after sales service

Resources Operating Mode



Technical Data

Features at Env. 25°C	Description		
Total configurability	From keypad or serial communications, the user selects: type of input - associated functions and corresponding outputs - type of control algorithm - type of output and safe conditions - alarm types and functionality - control parameter values		
Process Variable (PV) input (for signal ranges see Table 1)	Common characteristics	A/D converter with 50,000 points Update measurement time: 0.2 sec Sampling time: 0.5 sec Input shift: ± 60 digits Input filter: 1...30 sec (OFF= 0)	
	Accuracy	0.25% ± 1 digit (T/C and RTD) 0.1% ± 1 digit (mA* and mV)	Between 100 and 240V~ error is minimal
	Resistance thermometer (for ΔT: R1+R2 must be <320Ω)	Pt100Ω at 0°C (IEC 751) °C/°F selectable	2 or 3 wire connection Line: 20Ω max (3 wire) Thermal drift 0.35°C/10°C env. T. <0.35°C/10Ω line resist.
	Thermocouple	L,J,T,K,S (IEC 584) °C/°F selectable	Internal cold junction compensation Line: 150Ω max Thermal drift <2μV/°C env. T. <5μV/Ω line resist.
	DC input (current)	0/4...20mA with 2.5Ω ext. Shunt Rj > 10MΩ	Engineering units, floating decimal point, Low range -999...9999
	DC input (voltage)	0/10...50mV, Rj > 10MΩ	High range -999...9999 100 digits minimum
Operating modes	1 single output P.I.D. loop or ON/OFF with 1 alarm		
Control mode	Algorithm	P.I.D. with overshoot control or ON/OFF	
	Proport. band (P)	0.5...999.9%	
	Integral time (I)	0.1...100.0 min	OFF = 0
	Derivative time (D)	0.01...10.00 min	
	Cycle time	1...200 sec.	
	Overshoot control	0.01...1.00	
	High limit	100.0...10.0% (heat) -100.0...-10.0% (cool)	
Hysteresis	0.1...10.0%		
OP1 output	SPST relay N.O., 2A/250V~ for resistive load Triac, 1A/250V~ for resistive load		
OP2 output	Logic (SSR drive) not isolated: 5V~, ± 10%, 30mA max SPST relay N.O., 2A/250V~ for resistive load		
AL1 alarm (indicator with 2 alarms)	Hysteresis 0.1 ... 10.0% of range		
	Active high	Absolute threshold, whole range	
AL2 alarm	Hysteresis 0.1 ... 10.0% of range		
	Action	Active high	Deviation threshold ± range
		Active low	Action type
	Special function	Sensor break	
Setpoint	Up and down ramps		0.1...999.9 digit/min (OFF = 0)
	Low limit		from low range to high limit
	High limit		from low limit to high range
Retransm. output (option) PV	Galvanically isolated: 500V~/1min Resolution: 12bit (0.025%) Accuracy: 0.1%		Current output: 0/4...20mA 750Ω/15V max
One-shot Fuzzy tuning	Depending on the process condition, the controller applies the best method		Step response Natural frequency

*Requires field calibration for 0.1% accuracy

Input Type	Scale Range
RTD	-99.9...300.0 °C
	-99.9...572.0 °F
Pt100Ω a 0°C	-200...600 °C
	-328...1112 °F
T/C type L	0...600 °C
Fe-Const.	32...1112 °F
T/C type J	0...600 °C
Fe-Cu 45% Ni	32...1112 °F
T/C type T	-200...400 °C
Cu - CuNi	-328...752 °F
T/C type K	0...1200 °C
Chromel-Alumel	32...2192 °F
T/C type S	0...1600 °C
Pt10%Rh-Pt	32...2912 °F
0/4...20 mA	Configurable engineering units mA, mV, V, bar, psi, RH, pH
0/10...50 mV	

Table 1: Process Variable (PV) inputs/Signal Ranges

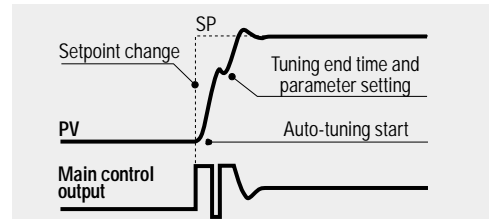
Fuzzy Tuning

Two methods of tuning are available:

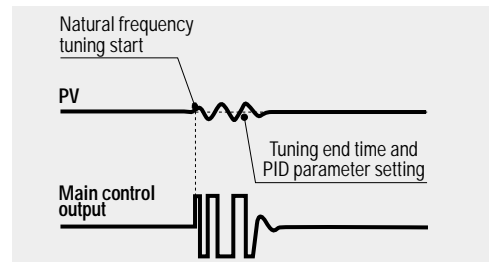
- Auto-tuning (one-shot)
- Natural frequency (one-shot)

Fuzzy Tuning automatically selects one of the two methods which ensure the best result for each condition.

The **Auto-Tuning** method works best on the step response basis. When activated, if a deviation exists between the setpoint and process variable larger than 5% of scale range, the controller modifies the output value. Then, in a short time, it calculates the P.I.D. parameters and the new algorithm is operational immediately. The main advantages of this method are fast calculation and quick implementation.



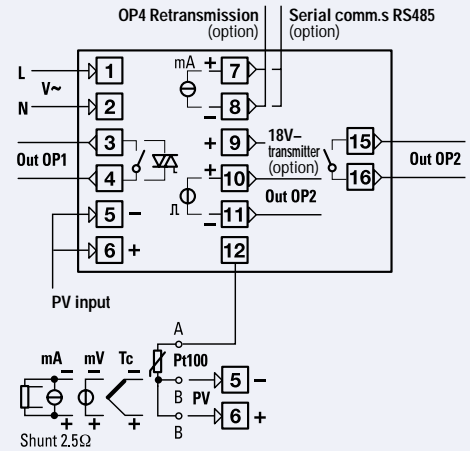
The **Natural Frequency** method works best when the process variable is very near to the setpoint. When activated, it causes a process oscillation around the setpoint value. The main advantage of this method is a reduced disturbance to the process.



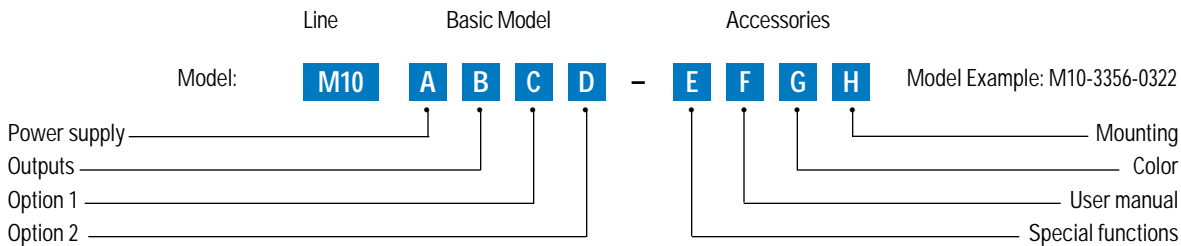
Technical Data

Features at Env. 25°C	Description	
Ser. comms. (opt.)	RS485 isolated, Modbus/Jbus protocol 1200, 2400, 4800, 9600 bit/sec, two wires	
Aux. power sup.	+18V- ±20%, 30mA max for external transmitter supply (option)	
Operational safety	Measured input	Detection of out of range, short circuit or sensor break with automatic activation of the safety strategies and alerts on display
	Control output	Safety value (user enabled/disabled): 0%, 100%
	Parameters	A permanent, non-volatile memory stores all parameter and configuration values
	Password	A password protects access to the instrument's configuration and parameters
	Power supply	100-240V~ (-15% +10%) 50/60Hz or 24V~ (-25% +12%), 50/60Hz and 24V~ (-15% +25%). Power consumption 1.6W max
General characteristics	Safety	Compliance EN61010-1 (IEC 1010-1), installation class 2 (2500V), pollution class 2, class II instrument
	Electromagnetic compatibility	Compliance to CE standards for industrial system and equipment
	Protection EN60529 (IEC 529)	IP65 front panel
	Overall dimensions	1/16 DIN - 48 x 48mm, depth 120 mm, weight 130g appr. Panel cut-out: 45 ^{+0.6} x 45 ^{+0.6} mm
	Approvals	cULus

Electrical Wiring



Ordering Codes



Power Supply		A
100-240V~ (-15% +10%)		3
24V~ (-25% +12%) or 24V~ (-15% +25%)		5
OP1 Output	OP2 Output*	B
Relay	Logic or relay	0
Triac	Logic or relay	3
Option 1	Option 2	C D
None	None	0 0
	Transmitter power supply	0 6
	Transmitter power supply + retransmission	0 7
RS 485 Modbus/Jbus protocol	None	5 0
	Transmitter power supply	5 6
Special Functions		E
None		0
User Manual		F
English-Spanish		3
Front Bezel Color	0/4-20 mA input shunt resistor**	G
Dark/gray (std)	Standard resistor	0
Beige	Standard resistor	1
Dark/gray (std)	High-accuracy resistor	2
Beige	High-accuracy resistor	3
Mounting	(DIN Rail excludes UL)	H
Panel	(Std.)	0
DIN Rail with display		1
DIN Rail without display (req's CD code of 50 or 56)		2

*OP2 field-configurable via hardware jumper

**Std. shunt resistor without field calibration = 1.10% input accuracy
 High-accuracy shunt resistor without field calibration=0.20% Input accuracy
 Either shunt resistor with field calibration=0.10% Input accuracy

Input Type	Scale Range
RTD Pt100 IEC751	-99.9...300.0 °C -99.9...572.0 °F
RTD Pt100 IEC751	-200...600 °C -328...1112 °F
TC L Fe-Const DIN43710	0...600 °C 32...1112 °F
TC J Fe-Cu45% Ni IEC584	0...600 °C 32...1112 °F
TC T Cu-CuNi	-200...400 °C -328...752 °F
TC K Chromel -Alumel IEC584	0...1200 °C 32...2192 °F
TC S Pt10%Rh-Pt IEC584	0...1600 °C 32...2912 °F
0...50mV linear (0...20mA)	Engineering units
10...50mV linear (4...20mA)	Engineering units

Output Configuration	
P.I.D.	control OP1 / alarm AL2 on OP2 control OP2 / alarm AL2 on OP1
On-off	control OP1 / alarm AL2 on OP2 control OP2 / alarm AL2 on OP1
Indicator with 2 alarms	alarm AL1 on OP1 / alarm AL2 on OP2 alarm AL1 on OP2 / alarm AL2 on OP1

Type of Control	Safety
Reverse (AL1 active low)	0%
Direct (AL1 active high)	0%
Reverse (AL1 active low)	100%
Direct (AL1 active high)	100%

AL2 Type and Function	
Disabled	
Sensor break alarm	
Absolute	active high active low
Deviation	active high active low
Band	active out active in