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PLATINUM™ Series Temperature and Process Controllers

Industry Leading Performance...and Easy to Use



Pt16D Series shown actual size.



Pt8D Series shown actual size.

Pt32, Pt16, and Pt8 Series

5 YEAR WARRANTY



Pt32 Series shown actual size.

- High Performance, Extremely Versatile
- Easy and Intuitive to Use
- Bright 3-Color (RED, GREEN, and AMBER) 9 Segment LED Display with Wide Viewing Angle
- High Accuracy Inputs and Outputs
- Full Autotune PID with Fuzzy Logic Adaptive Control
- Up to 99 Programs with 16 Ramps and Soaks Including Ramp/Soak Events
- Ramp and Soak Program Chaining for Virtually Unlimited Program Flexibility
- Universal Inputs for Thermocouples, RTD's, Thermistors, and Process Voltage/ Current
- No Jumpers to Set, Totally Firmware Configurable
- Automated Configuration Recognition, "Smart" Menu Flow
- Up to 20 Samples per Second with 24-Bit ADC
- Comes with 2 or 3 Programmable Control/ Alarm/Retransmission Outputs: Choice of DC Pulse, Solid State Relays, Mechanical Relays, Analog Voltage and Current
- Standard USB, Optional Ethernet and RS232/ RS485 with MODBUS® Serial Communications
- Built-In Excitation Firmware Selectable at 5V, 10V, 12V, and 24V
- Full Scale Positive and Negative Readings
- NEMA 4 (IP65) Front Bezel (1/32 and 1/16 DIN) or NEMA 1 (1/8 DIN)
- Analog Remote Setpoint for Cascaded Control
- Remote Latch Reset, Remote Ramp and Soak Start

The PLATINUM Series family of microprocessor-based PID controllers offer unparalleled flexibility in process measurement. While extremely powerful and versatile, great care has gone into designing a product that is very easy to set-up and use. The automatic hardware configuration recognition eliminates the need for jumpers and allows the firmware to automatically simplify itself, eliminating all menu options that do not apply to a specific configuration. Offered in 1/32, 1/16, and 1/8 DIN sizes, the 1/16 and 1/8 DIN models can be configured with dual displays.

Each unit allows the user to select the input type from 9 thermocouple types (J, K, T, E,

R, S, B, C, and N), Pt RTDs (100, 500, or 1000 Ω, with either 385, 392, or 3916 curve), thermistors (2250 Ω, 5K Ω, and 10K Ω), DC voltage, or DC current. The voltage or current inputs are bipolar and fully scalable to virtually all engineering units, with a selectable decimal point that is perfect for use with pressure, flow, or other process input.

Control can be achieved by using the on/off or PID heat/cool control strategy. PID control can be optimized with an auto-tune feature; and in addition, a fuzzy logic adaptive tuning mode allows the PID algorithm to be continuously optimized. The instrument offers up to 16 ramp and soak segments per ramp and soak program, with auxiliary event actions available with each segment. Up to 99 saved programs which can be chained to create up to 1584 discreet segments. Multiple alarms can be configured for above, below, hi/lo, and band triggering using either absolute or deviation alarm trigger points.

The PLATINUM Series device features a large, three-color, programmable display with the capability to change color and/or change the state of designated outputs every time an Alarm is triggered. Various configurations of mechanical relay, SSR, dc pulse, and analog voltage or current outputs are available. Every unit comes standard with USB communications for firmware updates, configuration management, and data transfer. Optional ethernet (1/16 DIN and 1/8 DIN models only) and RS232/RS485 serial communications are also available. The Analog Output is fully scalable and may be configured as a proportional controller or as retransmission to follow your display. The universal power supply accepts 90 to 240 Vac. The low voltage power option accepts 24 Vac or 12 to 36 Vdc.

Additional features usually found only on more expensive controllers make this the most powerful product in its class. Some of these additional standard features are: remote setpoint for cascaded control set-ups, high-high/low-low alarm functionality, external latch reset, external ramp and soak program initiation, combination heat/cool control mode, configuration save and transfer, and configuration password protection.

Embedded Ethernet and Serial Communications

Optional “embedded ethernet” on the 1/16 and 1/8 DIN models allow the units to connect directly to an Ethernet network and transmit data in standard TCP/IP packets, or serve Web pages over a LAN or the Internet. Optional serial communications are also available configurable as RS232 or RS485, with straightforward ASCII commands or MODBUS®. All three types of communications interfaces (USB, Ethernet, and Serial) can be installed and active simultaneously.

Cascade Control

The remote setpoint feature of the PLATINUM Series Controllers can be used in a variety of applications where setpoints can be sent to the controllers from remote devices such as manual pots, transmitters, computers, etc. This feature can also be used to set-up a “cascade control” system, where the remote setpoint input is generated by another controller. Figure 1 below shows a generic diagram of a cascade control system and Figure 2 shows a typical example, in this case a heat exchanger application.

Cascade control schemes can provide tighter control of a process when you have two linked variables, one of which has a much slower (typically 4X or more) response than the other. The slower responding variable is used as the input to the primary or master controller, and the faster responding variable is used as the input to the secondary or slave controller. The output of the primary controller is scaled to be used as the setpoint for the secondary controller.

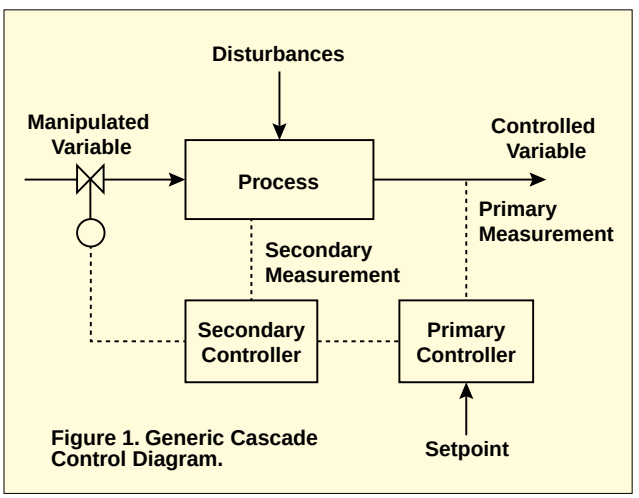


Figure 1. Generic Cascade Control Diagram.

For the heat exchanger application (shown in Figure 2) the primary goal of the application is to control the temperature of the effluent. Therefore the desired effluent temperature becomes the setpoint for the primary controller, which is a temperature controller (TC). The process input for the temperature controller is the measured temperature of the effluent (TT). The output of the temperature controller is the flow setpoint for the secondary controller, which is a flow controller (FC). The process input for the secondary (flow) controller is the flow rate of the steam that is used to heat the process flow through the heat exchanger (FT). The output of the secondary (flow) controller is a control signal for the proportional valve controlling the flow of the steam.

By isolating the slowly changing effluent temperature control loop from the rapidly changing flow control loop, a more predictable, robust, and tighter control scheme results.

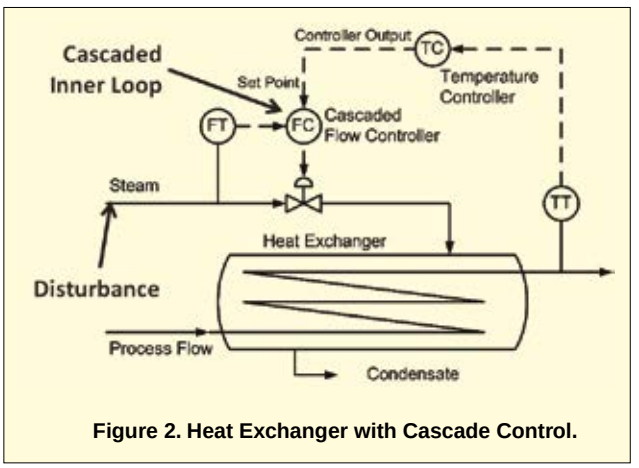


Figure 2. Heat Exchanger with Cascade Control.

Pt Series Features—Usability	Vs Competition	Benefits/Applications
Bright, 3-Color, 9 Segment LED Display with Wide Viewing Angle	Best in class.	Applications where visual verification is important (factory automation, laboratory research). 9 Segments makes programming easier.
No Jumpers to Set, Completely Firmware Configurable	Best: new to market.	Easier to learn, easier to use, and fewer setup/ configuration errors benefits all levels of users across all applications.
Automated Configuration Recognition, “Smart” Auto Simplifying Menu Flow	Best: new to market.	
Universal Inputs for Thermocouples (9 Types), RTD’s, Thermistors, Bidirectional Process Voltage/ Current, Infrared Thermocouples	Best in class.	Flexibility for users that have multiple setups such as laboratory research and QC/QA. Also enables standardization for customers with many controllers deployed across a variety of applications.
Full Scale Positive and Negative Readings (-9999 to +9999)	One of the best, many limited to (-1999 to 9999).	Needed for full scale bi-directional measurement related applications such as load/strain control. Factory automation and mechanical testing are examples.
Digital Input for Remote Latch Reset, Remote Ramp & Soak Program Start	Some have more digital channels but charge extra.	Limit controller applications where redundancy is needed for safety reasons such as process control.
UL, cUL, CE Certified, NEMA Front Panel, 5 Year Warranty	Many have certs, none offer 5 yr warranty.	Global deployment.
Pt Series Features—Performance	**Vs Competition**	**Benefits**
High Accuracy Inputs, See Table on next page	Best in class.	Better control precision for demanding applications such as semiconductor and pharmaceutical processing, clinical.
Up to 20 Input Samples per Second with 24-bit ADC	Best in class.	Improved control for responsive systems such as flow or weight control in factory automation and process industries.
Full Autotune PID with Fuzzy Logic Adaptive Control	One of the best.	Faster and better reaction to system disturbances such as those found in furnace, oven, and chamber applications.
Up to 99 Programs with 16 Ramps and Soaks Including Ramp/Soak Events and Remote Start. Chainable for unmatched programmability.	Best in class.	Combines with the measurment accuracy feature to provide precise control in menu-driven applications such as plastics, food, and ceramics processing.
Analog Output with 0.1% of FS Accuracy for Control, Retransmission, and Remote Setpoint	One of the best.	Allows for cascade control schemes popular in heat exchanger applications. Also important for data logging and analysis for general troubleshooting.
Built-in Excitation, Firmware Selectable at 5V, 10V, 12V, and 24V	Best in class.	Used with strain gauge based applications involving load and pressure and also for powering 4 to 20 mA transmitter loops in process control.
Pt Series Features—Functionality	**Vs Competition**	**Benefits**
2 or 3 Programmable Control/Alarm/ Retransmission Outputs: Choice of DC Pulse, Solid State Relays, Mechanical Relays, Analog Voltage and Current; Flexible Configurability, can program multiple outputs for all modes	One of the best, some have more available output channels but with less programming flexibility.	This level of configurability and flexibility allows these units to be used for a broad range of applications. In addition, for applications where setup reconfiguration occurs often, such as laboratory research, this capability is critical.
Standard USB Host Mode Communication on All Models; Firmware Updates, Configuration and Data Transfer, and PC-based Control	One of the best, only a few have USB and these don’t support host mode.	Almost all of today’s PC’s have USB ports but few of them have serial communications. USB memory sticks can be used to replicate firmware configurations without a computer connection.
Optional Ethernet (1/16 and 1/8 DIN models) and RS232/RS485 Serial Communications, MODBUS® Available.	Simultaneous communications make it one of the best.	Serial comms are still important for connecting with PLC’s in process control applications. Ethernet enables enterprise connectivity.
Remote Setpoint for a Variety of Remote Sensing Applications and also Cascaded Control.	One of the best, few have it and usually charge extra.	The other side of cascade control. Also useful when the control setpoint is dependent on a remote measurement.
Alarm Programmablity: Above, Below, In-Band, or High-Low, All with Absolute or Deviation Referencing, All with High-High Indication, Digital Input Latch Clear.	Best in class in terms of programmability and flexibility.	Alarm functionality is important across all applications. The flexibility offered here is augmented by the communications choices available.

Specifications

INPUTS

Input Types: Thermocouple, RTD, thermistor, analog voltage, analog current

Current Input: 4 to 20 mA, 0 to 24 mA scalable

Voltage Input: -100 to 100 mV, -1 to 1 V, -10 to 10 Vdc scalable

Thermocouple Input (ITS 90): K, J, T, E, R, S, B, C, N

RTD Input (ITS 90): 100/500/1000 Ω Pt sensor, 2-, 3- or 4-wire; 0.00385, 0.00392 (100 Ω only), or 0.003916 (100 Ω only) curves

Thermistor Input: 2252 Ω, 5K Ω, 10K Ω

Configuration: Differential

Polarity: Bipolar

Resolution: 0.1° temperature; 10 µV process

Input Impedances:
- **Process Voltage:** 10M Ω for ±100 mV, 1M Ω for other voltage ranges
- **Process Current:** 5 Ω
- **Thermocouple:** 10K Ω max
- **Auxiliary Input (Remote Setpoint):** 3.5K Ω for 0 to 10V, 50K Ω for 0 to 1V, 50 Ω for current

Temperature Stability:
- **RTD:** 0.04°C/°C
- **Thermocouple @ 25°C (77°F):** 0.05°C/°C (cold junction compensation)
- **Process:** 50 ppm/°C

A/D Conversion: 24-bit sigma delta

Reading Rate: 20 samples per second

Digital Filter: Programmable from 0.05 seconds (filter = 1) to 6.4 seconds (filter = 128)

CMRR: 120 dB

Excitation: Firmware selectable (no jumpers to set) to 5, 10, 12, and 24 Vdc @ 25 mA

Setpoint Adjustment: -9999 to +9999 counts

Warm-Up to Rated Accuracy: 30 mins

CONTROL MODES

Action: Reverse (heat), direct (cool), or heat/cool

Auto-Tune: Operator initiated from front panel

Adaptive Tune: User selectable; fuzzy logic continuous PID tuning optimization

Control Modes: ON/OFF or the following time/amplitude proportional control modes; selectable manual or auto PID, proportional, proportional with integral, proportional with derivative

Cycle Time: 0.1 to 199 seconds

Ramp and Soak: Up to 99 saved ramp and soak programs, up to 8 ramp and 8 soak segments with individually selectable events per program, chainable

Ramp and Soak Segment Times: 00.00 to 99.59 (HH:MM) or 00.00 to 99.59 (MM:SS)

CONTROL OUTPUTS

Analog Output: Non-isolated, Proportional 0 to 10 Vdc or 0 to 20 mA; 500 Ω max; programmable for control or retransmission; accuracy is 0.1% of full scale

DC Pulse: Non-isolated; 10 Vdc at 20 mA

SPST Relay: Single pole, single throw mechanical relay, 250 Vac or 30 Vdc at 3 A (resistive load)

SPDT Relay: Single pole, double throw mechanical relay, 250 Vac or 30 Vdc at 3 A (resistive load)

SSR: 20 to 265 Vac at 0.05 to 0.5 A (resistive load); continuous

COMMUNICATIONS (USB STANDARD, OPTIONAL SERIAL AND ETHERNET)

Connection:
- **USB:** Female micro-USB
- **Ethernet:** Standard RJ45
- **Serial:** Screw terminals

USB: USB 2.0 host or device

Ethernet Standards Compliance: IEEE 802.3 10/100 Base-T auto-switching, TCP/IP, ARP, HTTPGET

Serial: Software selectable RS232 or RS485; programmable 1200 to 115.2 K baud

Protocols: OMEGA ASCII, MODBUS® ASCII/RTU

ISOLATION

Approvals: UL, cUL, CE

Power to Input/Output: 2300 Vac per 1 min test; 1500 Vac per 1 min test (low voltage/power option)

Power to Relays/SSR Outputs: 2300 Vac per 1 min test

Relays/SSR to Relay/SSR Outputs: 2300 Vac per 1 min test

RS232/RS485 to Inputs/Outputs: 500 Vac per 1 min test

Ranges and Accuracies for Supported Inputs

Thermocouple Input Type	Description	Range	Accuracy
Process	Process Voltage	±100 mV, ±1, ±10 Vdc	0.03% FS
Process	Process Current	Scalable within 0 to 24 mA	0.03% FS
J	Iron-Constantan	-210 to 1200°C (-346 to 2192°F)	0.4°C (0.7°F)
K	CHROMEGA®-ALOMEGA®	-270 to -160°C (-454 to -256°F) -160 to 1372°C (-256 to 2502°F)	1.0°C (1.8°F) 0.4°C (0.7°F)
T	Copper-Constantan	-270 to -190°C (-454 to -310°F) -190 to 400°C (-310 to 752°F)	1.0°C (1.8°F) 0.4°C (0.7°F)
E	CHROMEGA®-Constantan	-270 to -220°C (-454 to -364°F) -220 to 1000°C (-364 to 1832°F)	1.0°C (1.8°F) 0.4°C (0.7°F)
R	Pt/13%Rh-Pt	-50 to 40°C (-58 to 104°F) 40 to 1788°C (104 to 3250°F)	1.0°C (1.8°F) 0.5°C (0.9°F)
S	Pt/10%Rh-Pt	-50 to 100°C (-58 to 212°F) 100 to 1768°C (212 to 3214°F)	1.0°C (1.8°F) 0.5°C (0.9°F)
B	30%Rh-Pt/6%Rh-Pt	100 to 640°C (212 to 1184°F) 640 to 1820°C (1184 to 3308°F)	1.0°C (1.8°F) 0.5°C (0.9°F)
C	5%Re-W/26%Re-W	0 to 2320°C (32 to 4208°F)	0.4°C (0.7°F)
N	Nicrosil-Nisil	-250 to -100°C (-418 to -148°F) -100 to 1300°C (-148 to 2372°F)	1.0°C (1.8°F) 0.4°C (0.7°F)
RTD	Pt, 0.00385, 100 Ω, 500 Ω, 1000 Ω	-200 to 850°C (-328 to 1562°F)	0.3°C (0.7°F)
RTD	Pt, 0.003916, 100 Ω	-200 to 660°C (-328 to 1220°F)	0.3°C (0.7°F)
RTD	Pt, 0.00392, 100 Ω	-200 to 660°C (-328 to 1220°F)	0.3°C (0.7°F)
Thermistor	2252 Ω	-40 to 120°C (-40 to 248°F)	0.2°C (0.35°F)
Thermistor	5K Ω	-30 to 140°C (-22 to 284°F)	0.2°C (0.35°F)
Thermistor	10K Ω	-20 to 150°C (-4 to 302°F)	0.2°C (0.35°F)

GENERAL

Display: 4-digit, 9-segment LED
Pt32, Pt16 and Pt16D: 10.2 mm (0.40")
Pt8: 21 mm (0.83")
Pt8D (Dual Display): 21 mm (0.83") and 10.2 mm (0.40")

Dimensions:
Pt8 Series:
48 H x 96 W x 127 mm D (1.89 x 3.78 x 5")
Pt16 Series:
48 H x 48 W x 127 mm D (1.89 x 1.89 x 5")
Pt32 Series:
25.4 H x 48 W x 127 mm D (1.0 x 1.89 x 5")

Panel Cutout:
Pt8 Series: 45 H x 92 mm W (1.772 x 3.622"), ⅛ DIN
Pt16 Series: 45 mm (1.772") square, 1/16 DIN
Pt32 Series: 22.5 H x 45 mm W (0.886 x 1.772"), 1/32 DIN

Environmental Conditions:
0 to 50°C (32 to 122°F), 90% RH non-condensing

External Fuse Required:
Time-Delay, UL 248-14 Listed:
100 mA/250 V; 400 mA/250 V (low voltage option)
Time-Lag, IEC 127-3 Recognized:
100 mA/250 V; 400 mA/250 V (low voltage option)

Line Voltage/Power: 90 to 240 Vac ±10%, 50 to 400 Hz*, 110 to 375 Vdc, equivalent voltage
**No CE compliance above 60 Hz.*
Pt8, Pt16, Pt32 Models: 4 W power
Pt8D, Pt16D Models:
5 W power

Low Voltage/Power Option: External power source must meet Safety Agency Approvals; units can be powered safely with 24 Vac power, but no certification for CE/UL is claimed

Pt8, Pt16, Pt32 Models: 12 to 36 Vdc, 3 W power **Pt8D, Pt16D Models:**
20 to 36 Vdc, 4 W power

Protection:
Pt32, Pt16, Pt16D Models:
NEMA 4X (IP65) front bezel
Pt8, Pt8D Models:
NEMA 1 front bezel

Weight:
Pt8 Series: 295 g (0.65 lb)
Pt16 Series: 159 g (0.35 lb)
Pt32 Series: 127 g (0.28 lb)

To Order

Model No.	Size/ Cutout	Input Types	Output 1	Output 2	Output 3	Display
Pt32-330	1/32 DIN	T/C, RTD, thermistor, process	SPDT Relay	SPDT Relay	—	Single
Pt32-220	1/32 DIN	T/C, RTD, thermistor, process	0.5 A SSR	0.5 A SSR	—	Single
Pt32-304	1/32 DIN	T/C, RTD, thermistor, process	SPDT Relay	DC Pulse	—	Single
Pt32-305	1/32 DIN	T/C, RTD, thermistor, process	SPDT Relay	Analog	—	Single
Pt32-440	1/32 DIN	T/C, RTD, thermistor, process	DC Pulse	DC Pulse	—	Single
Pt32-224	1/32 DIN	T/C, RTD, thermistor, process	0.5 A SSR	0.5 A SSR	DC Pulse	Single
Pt32-225	1/32 DIN	T/C, RTD, thermistor, process	0.5 A SSR	0.5 A SSR	Analog	Single
Pt32-144	1/32 DIN	T/C, RTD, thermistor, process	SPST Relay	DC Pulse	DC Pulse	Single
Pt32-145	1/32 DIN	T/C, RTD, thermistor, process	SPST Relay	DC Pulse	Analog	Single
Pt32-444	1/32 DIN	T/C, RTD, thermistor, process	DC Pulse	DC Pulse	DC Pulse	Single
Pt32-445	1/32 DIN	T/C, RTD, thermistor, process	DC Pulse	DC Pulse	Analog	Single
Pt16-330	1/16 DIN	T/C, RTD, thermistor, process	SPDT Relay	SPDT Relay	—	Single
Pt16-145	1/16 DIN	T/C, RTD, thermistor, process	SPST Relay	DC Pulse	Analog	Single
Pt16D-220	1/16 DIN	T/C, RTD, thermistor, process	0.5 A SSR	0.5 A SSR	—	Dual
Pt16D-444	1/16 DIN	T/C, RTD, thermistor, process	DC Pulse	DC Pulse	DC Pulse	Dual
Pt8-304	⅛ DIN	T/C, RTD, thermistor, process	SPDT Relay	DC Pulse	—	Single
Pt8-144	⅛ DIN	T/C, RTD, thermistor, process	SPST Relay	DC Pulse	DC Pulse	Single
Pt8D-305	⅛ DIN	T/C, RTD, thermistor, process	SPDT Relay	Analog	—	Dual
Pt8D-224	⅛ DIN	T/C, RTD, thermistor, process	0.5 A SSR	0.5 A SSR	DC Pulse	Dual

Comes complete with quickstart manual with downloadable operator's manual.

***Note:** All available Pt32 output combinations shown, but only representative Pt16 and Pt8 combinations shown.*

***Ordering Examples: Pt32-330-DC,** 1/32 DIN temperature/process controller with two single pole double throw relays and 12 to 36 Vdc power supply. **Pt16D-145-EIP,** 1/16 DIN dual display temperature/process controller with a single pole/single throw relay, DC pulse output, analog ouput, and embedded ethernet web server.*

Additional Options

Ordering Suffix	Description
-EIP	Ethernet with embedded web server
-C24	Isolated RS232/RS485 @ 1200 to 115,200 baud
Power Supply	
-DC	12 to 36 Vdc; 20 to 36 Vdc for dual display or ethernet option

***Note:** Ethernet options not available on 1/32 DIN models.*

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