NEWPORT Controller
Feature-Rich, State-of-the-Art Controller

The PLATINUM™ Controller family is a state-of-the-art Temperature and Process Loop controller. They offer an advanced PID control algorithm augmented with a Fuzzy Logic based adaptive control mechanism providing unprecedented performance, flexibility and ease-of-use in the mid-range controller market.

PLATINUM™ Series

Temperature/Process Measurement and Control

- High Accuracy
- PID and Fuzzy Logic
- 99 Ramp and Soak
- Universal Inputs
- 3 Outputs-Analog
- USB Standard

PLATINUM Controllers
Industry Leading Performance...and Easy to Use!

A RISC based processor provides high speed execution, providing 20 sample/second inputs to ensure concise control and is coupled to a high performance 24-bit A/D providing 0.1% accuracy for a full range of thermocouple, RTD (2-, 3- and 4-wire) and thermistor inputs. It also supports a wide range of bi-polar process voltage inputs (±0.1, 1.0, and 10V) and 0 to 20, 4 to 20 and 0 to 24 mA process current inputs. An innovative universal input circuit is configured entirely under firmware control, eliminating the need for jumper settings or multiple model options and all inputs are provided with a 'loss of signal' detect mechanism.

A second auxiliary input is provided to support a remote setpoint capability, supporting cascaded control schemes as well as other applications where a remote measurement is used to derive the process setpoint. An internal menu selectable auxiliary power supply provides 5, 10, 12 or 24 Vdc for external sensor power and for powering a transmitter used to drive the remote setpoint function.

Flexible output configurations allow for relay, DC Pulse, SSR and analog control, as well as analog signal retransmission at 0 to 5 or 0 to 10 Vdc as well as 0 to 20, 4 to 20 or 0 to 24 mA with 0.1% accuracy. Each output is fully assignable between PID, ON-OFF control, alarm, ramp/soak state monitoring and scalable signal retransmission. The relay, SSR and DC pulse PWM outputs support cycle times of 0.1 to 199.9 seconds, supporting both traditional PWM control as well as servo-control systems.

The PID control function allows one-button auto scaling, user adjustable tuning parameters and a fuzzy logic rule based adaptive control to provide accurate and precise process control. An extensive ramp and soak control function that supports up to 99 profiles, each containing up to 8 ramp/soak cycles and the ability to chain multiple profiles together allows arbitrarily complex control schemes to be implemented including temperature profiling, batching applications and complex temperature cycling systems.

The PLATINUM controller provides two independent alarm controls each supporting ABOVE, BELOW, IN-BAND and OUT-OF-BAND monitoring using absolute triggers or triggers based on deviation from the setpoints. Alarm conditions may be directed to change the color of the display, activate a front panel annunciator and/or activate an output, with dead band and latching capability to eliminate false trigging.

PLATINUM controllers feature a signed (-9999 to +9999) 4-digit 9-segment tri-color LED display for enhanced viewing in dimly lit or harsh environments. A second 4-digit setpoint display is available to allow visual tracking of process value verses setpoint. Display color may be user selected and forced to change under alarm conditions, providing an immediate visual indication.

A flat, simplified menu structure (see Figure 1) modelled after a standard spreadsheet format ensures ease of use, adapting to the hardware configuration and current user choices to present only relevant options at each stage. User options are maintained in non-volatile memory, allowing the option of automatic start-up when power is applied. A 3 level password mechanism allows locking out sensitive configuration options and simplified operation from line operators.

All PLATINUM controllers are provided with a standard USB interface that may be configured as a serial channel to host computers, tablets, or smart phones, and used as a 'thumb drive' interface, allowing configuration data to be easily transported between units for rapid deployment.

Figure 1: Example piece from menu structure.

Optional serial and ethernet channels support a proprietary OMEGA protocol which is backwards compatible to NEWPORT® iSeries products as well as MODBUS®/ASCII, MODBUS/RTU (see Figures 2 and 3) and MODBUS/TCPIP.

Designed and manufactured in the United States the PLATINUM controller is UL, cUL, CE and RoHS certified, is offered in 1/8, 1/16 and 1/32 DIN sizes, may be powered from 12 to 36 Vdc or 90 to 240 Vac, and is backed with a 5 year warranty.

Applications

As a general purpose temperature/process loop controller the PLATINUM product addresses the needs of the well-established process control industry.

Existing industrial use includes a wide range of temperature and process control in applications as diverse as metal refining/smelting, chemical process control, heat exchangers, temperature cycling, refinery, food processing, environmental control and pharmaceuticals.

The higher performance in accuracy, loop control timing, and configuration capability, together with the additional auxiliary analog input, opens up applications that have traditionally required high end controllers for industries including semiconductor processing, scientific laboratory, medical monitoring, test calibration equipment and cascaded control systems.

The flexible ramp and soak programming, with the ability to trigger external events based on the ramp or soak state,

the option to guarantee ramp, soak or overall cycle time and the ability to chain multiple profiles together, allows the PLATINUM to address a wide range of complex batching and temperature cycling applications as found in the plastics, dry goods processing, packaging, annealing, metal processing and manufacturing industries.

The communications structure, coupled with the auxiliary analog and digital input/output capabilities and extensive ramp and soak sequencing, have positioned the PLATINUM to address process control needs currently implemented using PLC's coupled with internal PLC control blocks and customized control firmware.

Adhering to the industry standard MODBUS protocol, providing full access to the internal data base of the platinum controller, and utilizing industry standard file formats for configuration data transferred through the USB thumb drive, allows the PLATINUM to be quickly integrated into educational and scientific lab applications.

A Platform Foundation

The PLATINUM controller offers many features found in 'high-end controllers' at a mid-market price. Key features include:

- 24-bit, high performance ADC with universal user configurable inputs
- 32-bit, high performance RISC processor with integral floating point operating under a robust RTOS system
- Simplified menu navigation using familiar spread sheet format with adaptive enabling
- Advanced 'model generated' PID control with fuzzy logic
- Extensive communication support
- Plug and play hardware configuration, universal input to minimize inventory requirements
- Advanced ramp and soak capability with chaining for complex controlled profile, cycling and batching systems
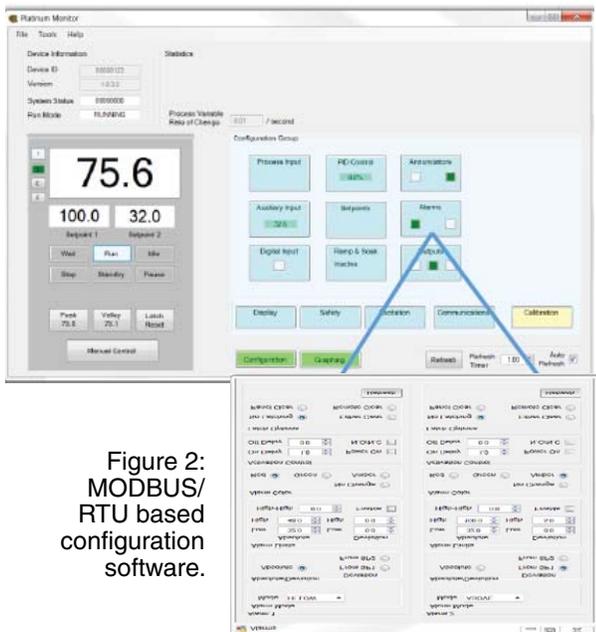
Figure 2:
MODBUS/
RTU based
configuration
software.

Figure 3: MODBUS/RTU based charting with zoom capability for process tuning and monitoring.

In the past compromises were made between price and performance, with many existing mid-range controllers offering ±2°C accuracy vs the PLATINUM ±0.1°C. Coupled with the high 20 sample/second input rate, the PLATINUM will greatly simplify the design choice in applications requiring anything more than mediocre control.

Due to the relative low performance and lack of communication options in similar priced controllers the industry has seen some shift to PLC based closed loop control. Arguments in favor of this trend is the need for interaction between the PID control and other aspects of the controls system, lack of available panel space, and the higher perceived performance of PLC based systems that allow user optimization of the control loop. The cost of the necessary control block required for PLC based systems is typically the same as a standalone mid-range controller.

Counter arguments have been the lack of a 'user accessible' control panel—an added component in PLC based designs, and the cost of adding and maintaining the control firmware in the PLC, compared to the optimized functionality and control point responsiveness offered in a dedicated controller.

The PLATINUM addresses the interaction with other control functions by providing multiple means to control the process setpoint—front panel, remote analog signal or through any of the communication channels. Using the analog retransmission capability the process control signal or the raw process input signal can be provided to the PLC. Finally, the current state of the control cycle is readily accessible through relay outputs. The flexible communication options provide access to the entire internal database allowing any PLC full access and control of the closed loop control system.

In addition to providing full accessibility, the PLATINUM provides an integral display/keyswitch interface in as little as a ¹⁄₃₂ DIN panel footprint, with suitable password lock-outs to allow line operators display and interaction, an extensive suite of alarm monitoring features to off-load from the PLC, and high precision, high performance loop control firmware without the user needing to customize and maintain a specialized PLC code.

Related to embedding PID control in PLC's has been the need to augment PID controllers with simple sequencers in applications such as batch processing and temperature cycling. The PLATINUM ramp and soak control has been designed to address these needs by allowing the RAMP/SOAK states to be presented as digital signals. A multi-segment ramp and soak profile that uses a constant SOAK temperature and 'guaranteed cycle times' allow the state information to act as sequence control signals, with the chaining capability enabling temperature cycling, batching or continuous processing.

The PLATINUM controller platform has been designed and implemented as a set of flexible, independent control modules, opening a wide range of choices to OEM's requiring customized controllers. In the simplest case, it may just be the streamlining of the menu choices offered to inexperienced operators, supported thru a multi-level password protection mechanism that locks out specific parts of the menu structure.

In more advanced cases OEM's have been required to fund the full development of custom control subsystems due to specific operating interface requirements, specialized I/O configurations, or even application specific control algorithms. The underlying control algorithm may be defined by the OEM using MATLAB, the operator interface may be defined in familiar spreadsheet format, and initial prototypes may be returned in weeks. The PLATINUM controller offers a UL, cUL, CE and RoHS certified platform that can be quickly adapted to specialized requirements at a fraction of the typical development cost.

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.*