WEST Control Solutions

The CAL range of temperature controllers

PMA WEST CAL Partlow

CAL Temperature Controllers

Auto-tuning P.I.D. Controllers with RS232/485 Communication, Charting and Logging Software

The CAL range of temperature controllers are designed to be easy to use, low cost and reliable in the most demanding applications, including plastics, packaging, drying and laboratory equipment.

Integrated auto-tune makes P.I.D. control simple and efficient, while the unique dAC function minimises overshoot problems associated with conventional P.I.D. Controllers.

Model 9400
48 x 48 mm
(1/16TH DIN)

Model 9300
48 x 48 mm
(1/16TH DIN)

Model 3300
48 x 24 mm
(1/32ND DIN)

Functionality:

- Easy-to-use auto-tune program
- Simple menu-driven programming
- Full P.I.D. operation
- Single ramp/soak (dwell) program
- Heat/cool operation
- IP66 protection
- CE compliant

Inputs and Outputs:

- Thermocouple and PT100 (2 wire)
- Two outputs: SSR driver and/or Relay
- 5 alarm modes, full scale (high or low), deviation (high or low) & band
- RS232 or RS485 MODBUS communications RTU (retrofittable)

CAL 9500P - Programmable Profiling Temperature and Process Controller

The CAL9500P is a uniquely versatile and affordable programmable controller for temperature and process control applications. It is designed to offer the optimum functionality in a 48mmx48mm (1/16th DIN) package.

The CAL9500P shares the same unique features as the 3300, 9300 and 9400 and also offers:

Programmer functionality

- Up to 31 programs (profiles)
- Up to 126 segments
- Event outputs via the 2nd and 3rd outputs
- Copy/Paste/Edit/Delete functions to simplify program building
- Call another program as a sub-program segment
- Up to 999 program loop cycles, or continuous loop cycling
- Hold back function, to ensure the next segment is not started until the last segment reaches the set-point
- 3 power fail recovery options, (Hold, Continue or Reset)
- Front panel interrogation of the program position
- Memory usage indication during programming

(note: program capacity is a memory function and different types of segments use more or less memory).

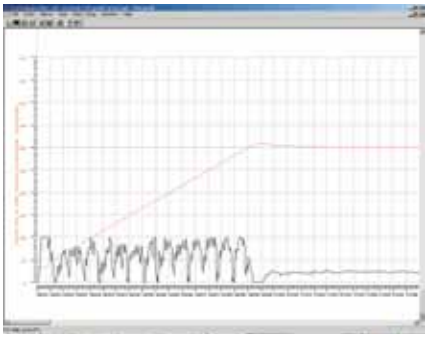
Inputs and Outputs:

- Input: Thermocouple PT100 (2 or 3 wire), 4-20mA, 0-5V or 0 to 10V
- 3 Outputs: Relay, SSD, 4-20 mA 0-5V and 0 to 10V

CALGrafix - Process Monitoring and Configuration Software

Cost-effective process monitoring and controller configuration software, providing even greater value to CAL's range of temperature controllers. With powerful functions including data logging and process data archiving, chart recorder, virtual instrument display and on-screen alarm and display, CALGrafix software is the ideal solution for control of critical data, for quality control, and health and safety and machine development and build.

All features integrate seamlessly within one single user interface, providing total configuration features for ultimate control and even cloning of instrument settings.



Advantages of using CALgrafix:

- Reduce installation time – quick and simple controller configuration
- Access to detailed process data via the charting and logging features
- Lower cost alternative to SCADA
- Simple set up, no programming skills required
- Reduce changeover time for different process recipes

Configuration:

- Parameter set-up of 33/93/9400 and 9500P controllers
- Click and drag graphical profile set-up for 9500P controllers
- Multiple programs and profiles can be saved and recalled for various applications
- Instrument setting cloning reduces set up time

CALgrafix Applications:

- Environmental and test chambers
- Plastic injection and extrusion machines
- Ovens, autoclaves, furnaces, and kilns
- Scientific research and testing
- Food processing equipment

and your application ……

Ordering information

3300, 9300 & 9400		Code
Model	48 x 24 mm 48 x 48 mm 48 x 48 mm dual display	33 93 94
Outputs (Reversible)	SSD / 2A relay 2A relay / 1A relay SSd / SSd	00 11 22
Unused		00
Comms	None fitted RS232 fitted RS485	0 2 4
Supply	100-240V AC 12-24V AC/DC*	0 3
Unused		00

*Models 3311, 9311, 9400, 9411 and 9422 are not currently available in low voltage 12-24V option

9500P		Code
Model	48 x 48 mm	95
Outputs 1 & 2 (Reversible)	SSd / relay relay / relay SSd / SSd 4-20mA / relay 4-20mA / ssd 0-5V / relay 0-5V / ssd 0-10V / relay 0-10V / ssd	00 11 22 B1 B2 C1 C2 D1 D2
Output 3	Always relay	1
Programmer		P
Inputs	Sensor 4-20mA 0-5V 0-10V	A B C D
Communications	None fitted RS232 fitted RS485 fitted	0 2 4
Unused		00

Ordering example 1
Model 3300 48x24mm,
SSd / relay, RS485, 12-24V

33	00	00	4	3	00

Ordering example 2
Model 9500P ssd / relay / relay outputs
4-20mA input, RS485 fitted

95	00	1	B	4	00

Codes for additional software and hardware

CALgrafix	10	03	GB	0	0	0
Communications board RS232	3C	00	00	2	0	0
Communications board RS485	3C	00	00	4	0	0
RS232 to RS485 converter	3C	25	00	0	K	3

Input	
Thermocouple	9 types: Type B,E,J,K,L,N,R,S,T
Standards	IEC 584–1–1 : EN60584–1
CJC rejection	20:1 (0.05°/°C) typical
External resistance	100Ω maximum
Resistance Temperature Detector – (RTD)	**3300 / 9300 / 9400:** PT100 2 wire, **9500P:** PT100 2 or 3 wire
Standards	IEC751: EN60751 (100Ω 0°C/138.5Ω 100°C Pt)
Bulb current	0.2mA maximum
Linear process inputs	Analogue process inputs 0 to 50mV, +/- 0.1%. **9500P:** 0-20mA, 4-20mA, +/- 0.1%. 0-5V, +/- 0.1%. 0-10V, +/- 0.1%
Applicable to all Thermocouple and RTD inputs (SM =sensor maximum)	
Calibration accuracy	±0.25%SM ±1°C
Sampling frequency	Input 10Hz, CJC 2 sec
Common mode rejection	Negligible effect up to 140dB, 240V, 50-60Hz
Series mode rejection	60dB, 50-60Hz
Temperature coefficient	**3300 / 9300 / 9400:** 150ppm/°C SM, **9500P:** 50ppm/ °C SM typical
Reference conditions	22°C ±2°C, rated voltage after 15 minutes settling times
Output devices	
SSd	SSd1 and SSd2: Solid state relay driver: To switch a remote SSR 6Vdc (nominal) 20mA non-isolated
Miniature power relay	Relay 1,2,3 Miniature power relay: Form A/SPST contacts (AgCdO): 2A/250Vac resistive load. **3300 / 9300 / 9400:** Relay 1, 2 only
Linear outputs: **9500P only**	Analogue output: 4–20mA 500Ω max +/- 0.1% full scale typical, 0–5Vdc 10mA (500Ω min) +/- 0.1% full scale typical, 0–10Vdc 10mA (1KΩ min) +/- 0.1% full scale typical
General	
Displays	Main (upper) display:, 4 digits high brightness green LED, 10mm high Lower display **9400 / 9500P:** 4 digits high brightness orange LED, 9mm high
LED output indicators	Flashing SP1 square, green, SP2 round red
Keypad	3 full travel elastomeric buttons
Environmental	
Safety	UL 873, EN 61010, CSA 22.2 No. 1010.1-92
Humidity	Max 95% non-condensing
Altitude	Up to 2000m
Installation	Categories II and III
Pollution	Degree II
Protection	NEMA 4X, IP66
EMC emission	EN50081-1, FCC Rules 15 subpart J Class A
EMC immunity	EN50082-2
Ambient	0–50°C
Mouldings	Flame retardant polycarbonate
Dimensions	
Front facia Models	**9300 / 9400 / 9500P:** 51.0 x 51.0mm (includes gasket). **3300:** 51.0 x 28.5 (includes gasket)
Controller depth All models	106.7mm (with gasket fitted)
Fascia dimensions	**9300 / 9400 / 9500P:** 44.8 x 44.8mm, **3300:** 44.8 x 22.0mm
Overall length	All models – 116.2mm
Weights	**3300:** 110g, **9300:** 120g, **9400:** 130g, **9500P:** 180g (6.4oz)
Supply Voltage	100–240Vac, 50–60Hz +/- 10% maximum permitted fluctuation, 12V - 24V (AC/DC) +/-20% 4.5 VA Polarity not required
Digital range: 9500P only	199 to 9999. Hi-res mode -199.9 to 999.9
Programmer: 9500P only	
Segments	Total of 126 per program
Programs	Maximum of 31 programs
Program memory	351 Bytes
Approvals	CE, UL, cUL, FM (3545)

WEST Control Solutions - your global partner for measurement and control technology

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For more details on the complete product range from West Control Solutions please contact your local distributor or visit **www.West-CS.com**.

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