Chromalox®
PRECISION HEAT AND CONTROL

Chromalox®
4080 Advanced Temperature & Process Controllers

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Affordable Temperature and Process Control with Advanced Functionality

The Chromalox® 4080 is an affordable temperature and process controller with advanced functionality including profiling and data-logging options. It incorporates a graphic/text LCD display and is designed to improve user efficiency with many features integrated to reduce startup time, simplify operation, and minimize downtime.

- 1/4 DIN Format
- Up to 9 Outputs: Control, Alarms, Profiler Events, Retransmit & 24 Vdc Transmitter Power Supply
- Up to 5 Programmable Event Outputs: Process High/Low, Deviation & Band, Sensor Break, Loop
- Reinforced Safety Isolation from Outputs and Inputs
- Profiling Option
  - ✓64 Programs Using 255 Segments
  - ✓Ramp, Dwell, Hold, Loop, Join, End & Repeat
- Data-Logging Option (Data, Alarms & Events)
- Real-Time Clock
- USB Port to Access Files
- Large Graphic/Text LCD Display
  - ✓Trend View
  - ✓Color-Change LED Backlight on Alarm
  - ✓Configurable User Menu Structure
- Simplified Programming Wizard
- Ratio Control
- Valve Motor Control
- 2nd Universal Input for Monitoring
- Modbus RS-485 & Modbus TCP Ethernet
- ChromaloxPro™ Configuration Software
- Multiple Language Option

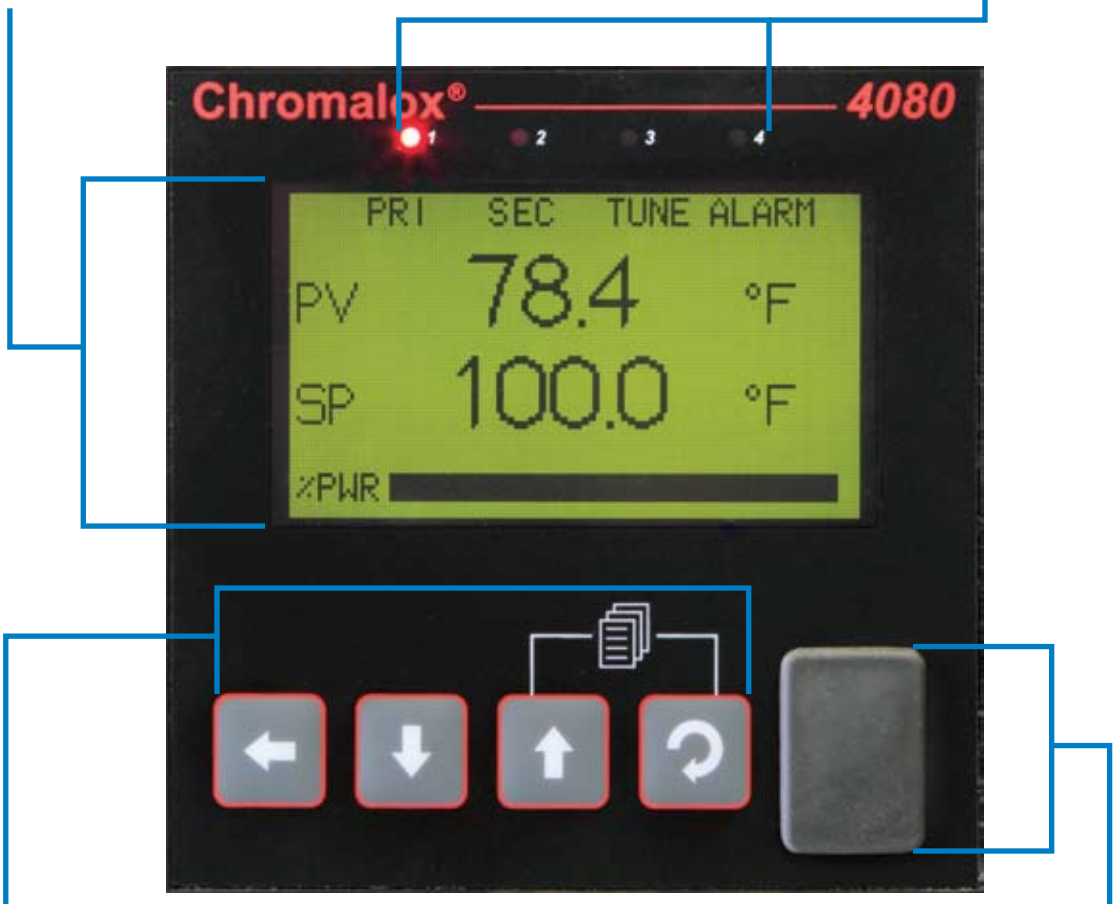
User Interface Designed for User Efficiency

Display

The primary feature of the front panel on the Chromalox® 4080 advanced controller is its generous 160- x 80-pixel monochrome LCD with a red/green dual-color backlight to display text and graphic data. Illumination is bright enough and resolution sharp enough to make it easy to read in all lighting conditions. If desired, the backlight color can be changed to indicate the presence of an active alarm.

LEDs

Four red LEDs indicate the status of primary and secondary control outputs, automatic tuning, and alarm status. Labels for the LEDs appear on the top line of the display. The function of the LEDs and their labels can be changed using ChromaloxPro™ configuration software.



Keypad

Four keypad switches below the display are used to navigate the user menus and adjust the parameter values. Context-sensitive scrolling help text is displayed on configuration screens to guide the user about the function of the keys.

USB Port

A USB port is present on USB and data recorder versions of the 4080 controller. The USB port enables the user to upload or download instrument settings via a USB memory stick, or transfer process recordings captured by the data recorder to a USB memory stick.

Designed for Superior Maintenance and Improved Operation of Your System or Process

Improved Process Visibility

One of the key factors in maintaining and improving operation of a system is to have high visibility of the process. The LCD screen displays clear, real-text messages, removing ambiguity that can be caused by mnemonic codes.

Simplified Operation

Operators can improve efficiency and reduce the possibility of errors by creating an optimized menu structure for screen navigation. The configuration tool provides operators with the specific parameters needed in the desired order. Security is assured with password protection on supervisor and configuration parameter access levels.

Optional ChromaPro™ configuration software allows the owner to program multiple units efficiently and store parameter settings for later use.

A Complete and Compact Control Solution

Advanced process and temperature control, extensive profiling capability, high-visibility alarms, and data-logging functions are all packaged within a single ¼ DIN product. Integrated control and monitoring functions translates into fewer system control components. This reduces wiring, shrinks the panel footprint, and compresses installation time, resulting in a lower system cost.

Minimize Setup Time

Time is money. Constantly referring to instruction manuals increases startup time and can lead to confusion. A number of tools are available with the 4080 to simplify the configuration process: an easy setup wizard; on-screen help; ChromaloxPro™ software for on- or off-line programming; and secure local configuration with a memory stick via the optional front-access USB port.

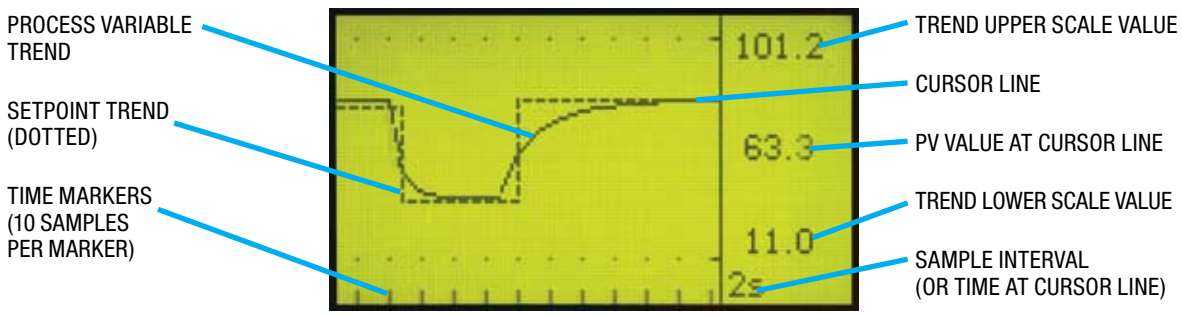
Customizable Operating Screens Display the Data You Want to See, How You Want to See It

Base Operating Screen

This is the usual screen displayed during operation. It provides “at-a-glance” information about the process.

Trend View

This screen displays a graphic representation of recent process conditions. Its scale automatically adjusts for the best resolution for the visible data.



Features

Advanced Process Control

- Easy setup wizard for quick configuration
- Universal input for T/C, RTDs, and Linear DC signals
- Up to 9 output options, including TRIAC and Linear DC
- Digital input
- Configurable menus
- Pre-tune and self-tune functions
- RS-485 Modbus or Ethernet option
- USB port for local files access
- Master-slave configuration for multi-zone apps

Profiling Functionality

- 255 segments used within 64 programs
- Ramp, dwell, hold, loop, or jump to other profile
- User-defined text profile names
- Delayed or day/time profile start
- Detailed overview of profile status
- Up to 5 event outputs
- Bar graph profile and segment progress

Integrated Data Logging Option

- 255 segments used within 64 programs
- Historic data for analysis or reporting
- Trend view and alarm indication
- Export data files via front USB or communications
- Log PVs, SPs, or alarms (including minimum, maximum, average)
- Run/Stop or FIFO (first-in-first-out) recording
- Logging time intervals from 1 second to 30 minutes

Real-Text Display with Graphics

- Easy-to-read green/red LCD display
- Screen color can be set to change on alarm
- Multi-language option
- Custom splash-screen on startup
- Graphical trend view
- LED indication of heat, cool, auto-tuning, and alarms

ChromaloxPro™ Configuration Suite

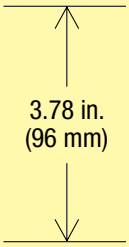
Save time with ChromaloxPro™ software configuration tools.

- Change parameter settings
- PID tuning
- Off-line simulation tools to reduce risk
- Visibility of live process data
- Fine-tune settings for optimum performance
- Back up all settings for quick reconfiguration

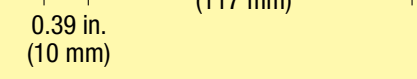
Customize 4080 for your process.

- Optimized menu structure to simplify operation
- Modify text labels to match system operation
- Create a company contact page

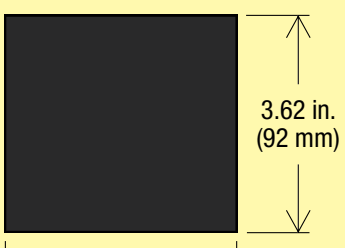
Front View



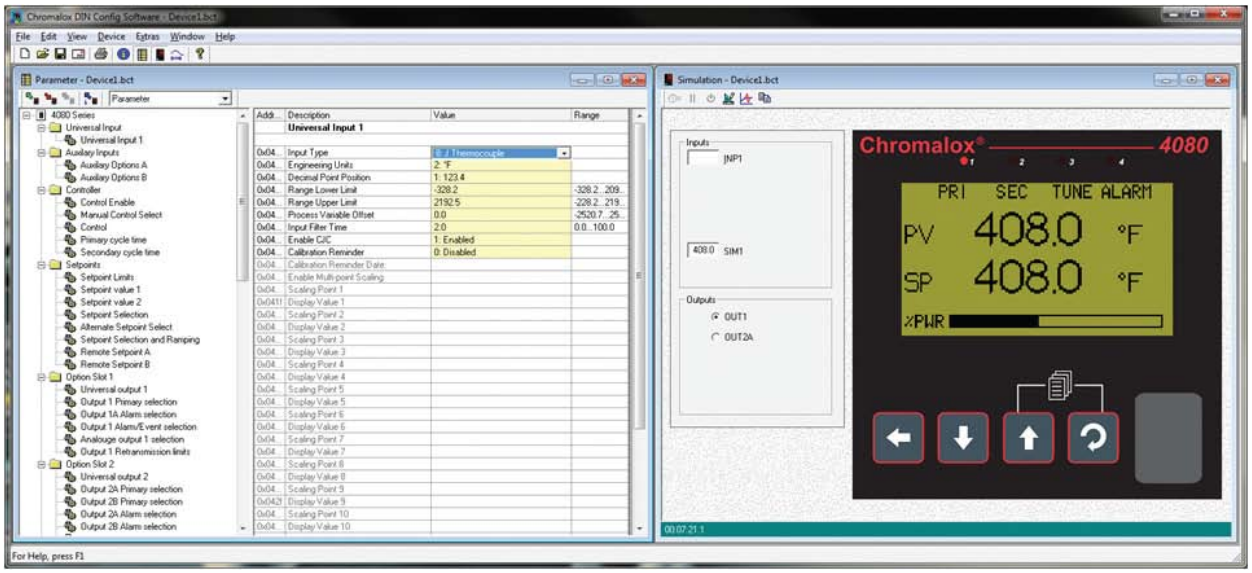
Side View



Panel Cutout



Easily Configure Your 4080 Controller On- or Off-Line with ChromaloxPro™ Software



Save Time and Money

ChromaloxPro™ configuration software allows you to be more efficient during controller setup and more accurate when dealing with multiple parameter settings.

It enables you to:

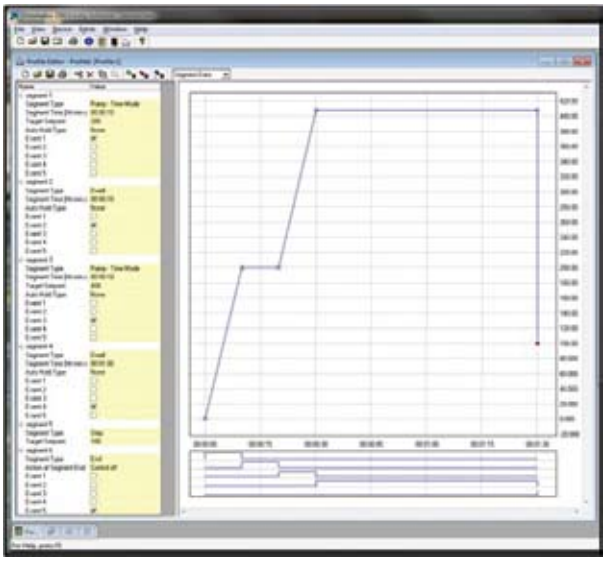
- Create and change parameter settings
- Employ PID tuning
- Back up all settings for quick reconfiguration

Take the Guesswork Out of New Profiles

With ChromaloxPro™ software, you can construct, evaluate, and manipulate process profiles segment by segment off-line on your computer. Then transfer all settings and profiles from your computer to the controller. This reduces risk and provides added confidence during controller programming.

Customize the 4080 Controller for Your Process

ChromaloxPro™ configuration software can be used to optimize the menu structure of the 4080 controller for your process to simplify operation. Modify text labels to match your system or process operation. Even create a company contact page.



Monitor Process Data Real-Time

With ChromaloxPro™ software and your computer on-line, you can view process data live and fine-tune settings for optimum performance.

Specifications

Features

Control Types	Full PID with pre-tune, auto-pretune, self-tune or manual tuning, heat only or heat and cool
Auto/Manual	Selectable with “bumpless” transfer when switching between auto and manual control
Output Configuration	Up to 9 for control, alarms, profiler event outputs, 24 Vdc transmitter power supply & retransmission
Alarms	Up to 5 alarms selectable as process high, process low, deviation & band, plus sensor break and loop alarms. Logical OR alarm outputs.
HMI	Display: 160 x 80 pixels, monochrome graphic LCD with a dual-color (red/green) backlight; 4-button operation; 4 LEDs to indicate heat, cool, auto-tuning, and alarm
PC Configuration	ChromaloxPro™ configuration and commissioning software

Input

Thermocouple	J, K, R, S, T, B, C, D, E, L, N, Pt RH 20%:40%
T/C Accuracy	±0.1% of input range ±1 LSD, thermocouple CJC, (Aux Input: ±0.25% of input range ±1 LSD)
RTD	3-wire PT100, NI120
DC Linear	0 to 20 mA, 4 to 20 mA, 0 to 50 mV, 10 to 50 mV, 0 to 5 V, 1 to 5 V, 0 to 10 V, 2 to 10 V (0 to 100 mV and 2K Ω pot also on aux-B input), scaling -1999 to 9999
Sampling Rate	Process input: 10 per second. Aux input: 4 per second.
Resolution	16 bits
Sensor Break	Detected within 2 seconds, control goes to user preset power value
Digital Inputs	Functions: setpoint select, control output, enable/disable, auto/manual control, profiler run/hold/abort, datalogger start/stop
Volt-Free Contact or DC Voltage	Open contact / 2 to 24 Vdc signal = Logic high. Closed contact / -0.6 to 0.8 Vdc signal = Logic low.
Isolation	Isolated from all outputs (except SSR Driver) at 240 Vac

Outputs

Relay	Single relay: 2 amp resistive SPDT at 120/240 Vac, >500,000 operations; dual & quad relay: 2 amp resistive SPST at 120/240 Vdc, >200,000 operations (dual) or >500,000 operations (quad)
SSR Driver	Voltage >10 V into 500 Ω min
TRIAC	Operating voltage: 20 to 280 Vrms (47 to 63 Hz), rating 0.01 to 1 amp @ 25°C
Linear DC	Ranges: 0 to 5 V, 0 to 10 V, 1 to 5 V, 2 to 10 V, 0 to 20 mA and 4 to 20 mA (selectable) ±0.25% of range (mA @250 Ω, V @ 2 kΩ)
Transmitter PSU	Power rating 24 V nominal (19 to 28 Vdc) into 910 Ω min (option to use DC Linear output as 0 to 10 V adjustable Tx PSU)
Isolaton	All above have reinforced safety isolation from inputs and other outputs
Communications	RS-232 via RJ11 cable (configuration only); RS-485 - Modbus RTU master or slave; Ethernet - Modbus TCP slave (10 base-T or 100 base-T); Ver. 1.1/2.0 USB host for memory stick

Loop Control

Tuning Types	Pre-tune, auto pre-tune, self-tune, or manual tuning
Proportional Bands	Primary & secondary (e.g. heat & cool) 0.5% to 999.9% of input span in 0.1% increments, or ON/OFF control
Automatic Reset	Integral time constant, 1 second to 99 minutes 59 seconds and OFF
Rate	Derivative time constant, 1 second to 99 minutes 59 seconds and OFF
Manual Reset	Bias 0 to 100% (-100% to +100% primary & secondary)
Dead Band/ Overlap	-20% to +20% of primary & secondary proportional band
ON/OFF Differential	0.1% to 10.0% of input span
Auto/Manual Control	Selectable with “bumpless” transfer when switching between automatic and manual control
Cycle Times	Selectable from 0.5 to 512 seconds
Setpoint Ramp	Ramp rate selectable 1 to 9999 LSDs per hour and infinite

Alarms

Alarm Types ..... Up to 5 alarms selectable as process high, process low, band, deviation, rate of signal change (per minute), sensor/input break, and loop alarm. Band and deviation (high or low) alarm values are relative to the current setpoint value.

Alarm Hysteresis ..... A dead band from 1 LSD to full span (in display units) for process, band, or deviation alarms. Rate-of-change alarm hysteresis is the shortest time (1 to 9999 seconds). The rate of change must be above the threshold for the alarm to activate or fall below the threshold to deactivate. Note: If the duration is less than this time, the alarm will not activate no matter how fast the rate of rise.

Combination Alarm Outputs ..... Logical OR of alarms 1 & 2, 1 to 3, 1 to 4, or 1 to 5. Logical AND of alarms 1 to 5 with profiler events 1 to 5.

Profiler

Memory ..... 255 segments can be freely allocated in up to 64 programs

Segment Types ..... Ramp (rate or time), dwell (soak), hold (manual guaranteed soak or real-time profiling), loop (to previous segment), join another profile, end or repeat sequence

Control ..... Run, hold, abort, profile select, jump to next segment, delayed profile start, real-time clock profile start

Data Logger

Data Record Options ..... PV (process variable), max and min PV between samples, actual SP (setpoint), output power, alarm & event status, power on/off

Record Modes ..... FIFO (circular buffer) or run-then-stop (fixed buffer)

Recording Interval ... 1, 2, 5, 10, 15, 30 seconds or 1, 2, 5, 10, 15, 30 minutes

Control ..... Manual; serial communications; digital input; synchronized with profile; PV rate of change; log on alarm

Additional Digital Input Options

Selectable Digital Input Functions ....

Function	Logic High	Logic Low
Profile Run /Hold	Hold	Run
Hold Segment Release	Release	No Action
Profile Abort	Abort	No Action
Data Recorder	Stop	Start

Digital Input Sensitivity ..... Edge sensitive. Requires high to low or low to high transition to change function. Response within <0.25 seconds.

Recording Interval ... 1, 2, 5, 10, 15, 30 seconds or 1, 2, 5, 10, 15, 30 minutes

Additional Communications Options - USB

Connection ..... Locates in option slot C. Connection via front-mounted connector.

Protocol ..... USB 1.1 or 2.0 compatible, mass storage class.

Supply Current ..... Up to 250 mA

Targeted Peripheral ..... USB memory stick

Isolation ..... Reinforced safety isolation from all inputs and outputs

Additional Alarms Options

Combination Alarm Outputs ..... Logical AND of alarms 1 to 5 with profiler events 1 to 5

Environmental

Standards ..... CE, UL, cUL. EMI - EN61326, Safety EN61010-1 & UL61010C-1 Pollution degree 2, Installation category II

Protection ..... Front panel: NEMA 4, IP66 (IP65 with USB fitted). Behind panel IP20.

Temperature & RH ..... 0˚ to 55˚C (-20˚ to 80˚C Storage), 20% to 95% RH non-condensing

Ordering Information

Model 4080 — **Advanced Temperature & Process Controller**, ¼ DIN

Code	Unit Type
C	Controller
U	Controller with USB Port
R	Controller/Recorder with USB Port & Real-Time Clock

Code	Profiler Option
0	Not Fitted
P	Profiler

Code	Output 1
0	None
R	Relay (2 A resistive at 240 Vac)
S	SSR (0/10 Vdc, 500 Ω Minimum Load)
A	Analog (0 to10 V, 0 to 20 mA, 0 to 5 V, 2 to 10 V, 4 to 20 mA)
T	TRIAC (1 amp ac)

Codes		Output 2 & Output 3 (Choose Appropriate Codes for Each)
Out 2	Out 3	Output Type
0	0	None
R	R	Relay (2 A resistive at 240 Vac)
S	S	SSR (0/10 to Vdc, 500 Ω Minimum Load)
A	A	Analog (0 to 10 V, 0 to 20 mA, 0 to 5 V, 2 to 10 V, 4 to 20 mA)
T	T	TRIAC (1 amp ac)
M	M	Dual Relay Output - 2 amp 240 Vac, (X2), Form A, normally open, comm. term
W	W	Dual SSR Output - Non-Isolated, (X2), 0/10 Vdc, 500 Ω Minimum Load
P	P	Isolated Power Supply 24 Vdc, 910 Ω Minimum Load

Code	Output 4
0	None
1	4-Relay Output: 2 A, 240 Vac, Form A, normally open, NOT comm. term

Code	Feature Option A
0	None
1	RS-485 (Modbus/RTU) Digital Communications
2	Digital Input (Voltage-Free or TTL Input)
3	[1]Remote Setpoint - Manual Set (RSP) Analog Input A
4	Ethernet Port - Modbus TCP Slave

Code	Feature Option B
0	None
1	[1]Enhanced Remote Setpoint Input & Digital Input

Code	Feature Option C
0	None

Code	Power Supply
0	100 to 240 Vac
1	24 to 48 Vac/dc

4080	–	U	P	S	S	R	–	0	1	0	0	0	**Typical Model Number**

[1]Between Feature Options A and B only *one* Remote Setpoint may be selected.

Accessories

Item	Part Number
ChromaloxPro Configuration Software & Cable	0149-50061
Snubber	0149-01305

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